E-Baja Conversion Team

Final Prototype

Shamlan Albahar
Fahad Alhowaidi
LeAlan Kinlecheenie
Andres Parra
Drew Stringer

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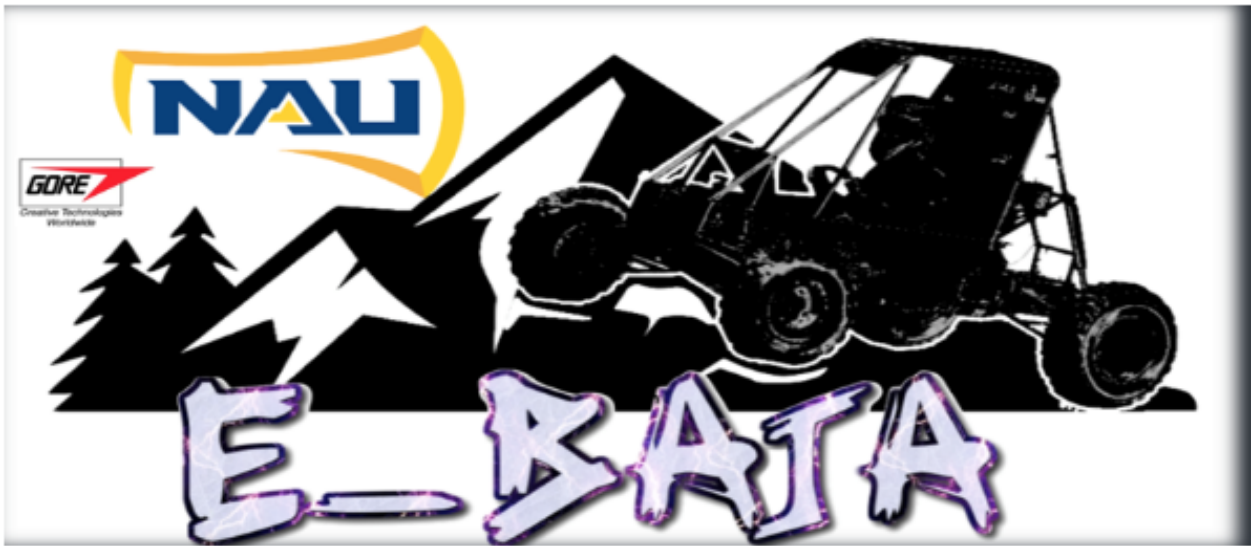

Faculty Advisor: David Willy
Instructor: Dr. Sarah Oman

Prototypes of Subsystems

Steering

Figure 1. Top View of Steering Attachment Link

Figure 2. Isometric View of Steering Attachment Link

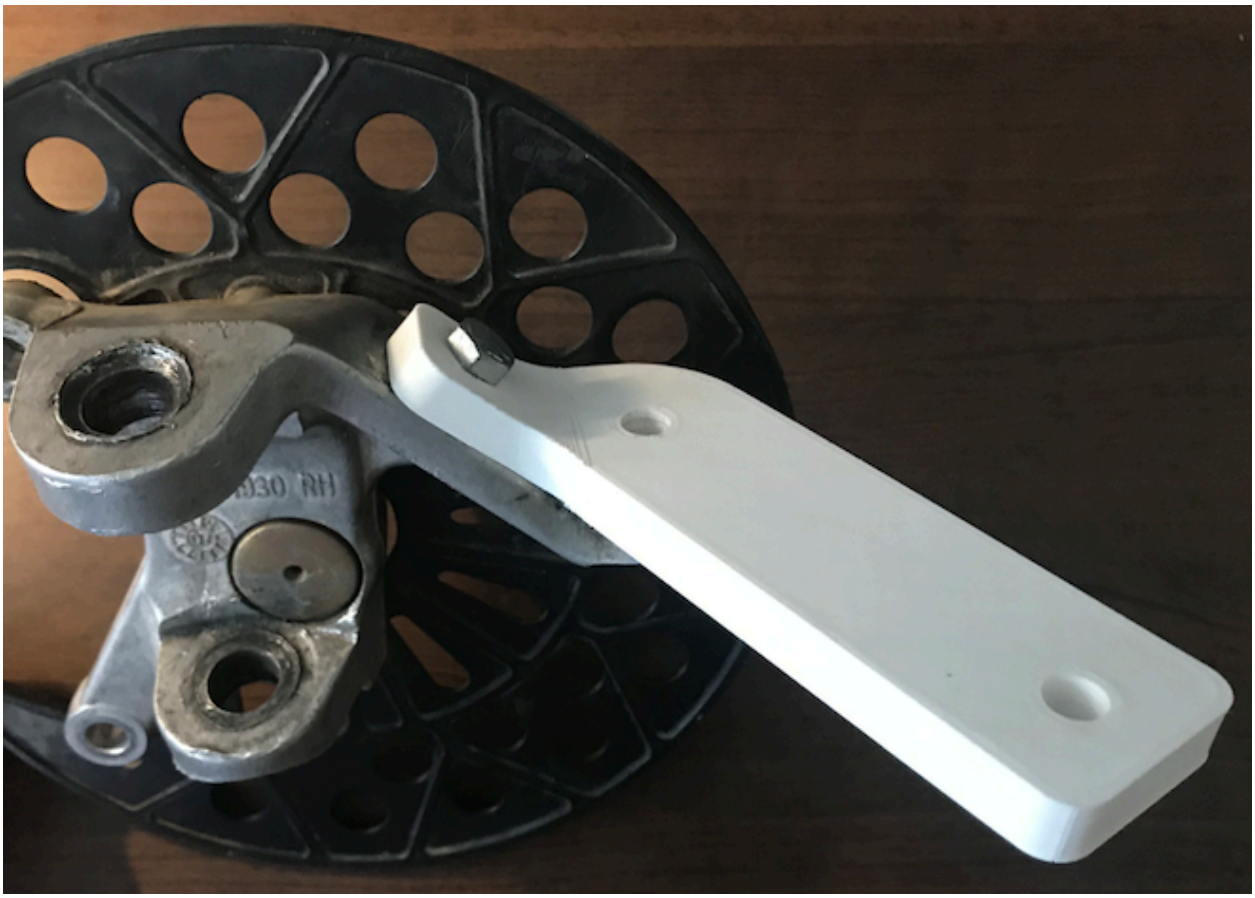

Figure 3. Steering Knuckle with Steering Attachment Link Connected

The new design of the steering attachment link will allow the steering system to operate more ideal than the previous design. The prototype was made of 3D print PLA and is a working prototype. By next semester, the prototype will have an updated design for both left and right steering knuckles and will be position on the vehicle then tested for the turning analysis. Our client, Willy, suggested that a 3D print model could be made and tested for the kinematics of turning the wheels. This prototype was designed to finalize dimensions and be ready for testing during next semester.

Front Suspension

Figure 4. Front suspension

Figure 5. Heim joints on front suspension

The front suspension is not being redesigned and only being fixed with parts being replaced. The major issues on the front suspension are yielded heim joints and the bolts connecting the heim joints to the frame. There is a part on the frame that has been bent and yielded its structural strenght and will be replaced as well. The team agreed on using M16 size heim joints to fix the problem and is supported by calculations reported to our client, Willy. After installing the new heim joints, the front suspension will be working great and will function better.

Rear Suspension

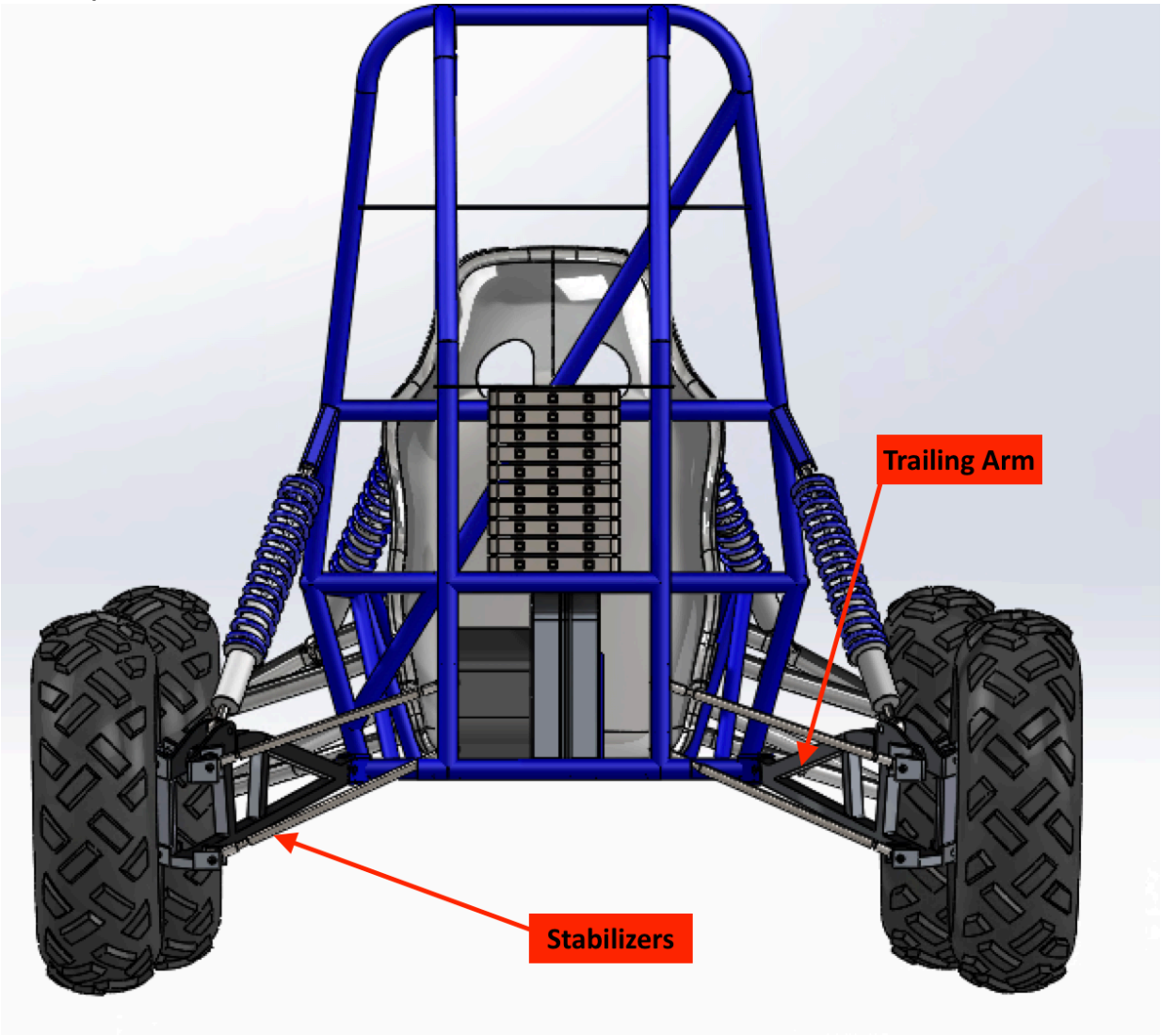

Figure 6: Vehicle's Back View Displaying the Rear Suspension

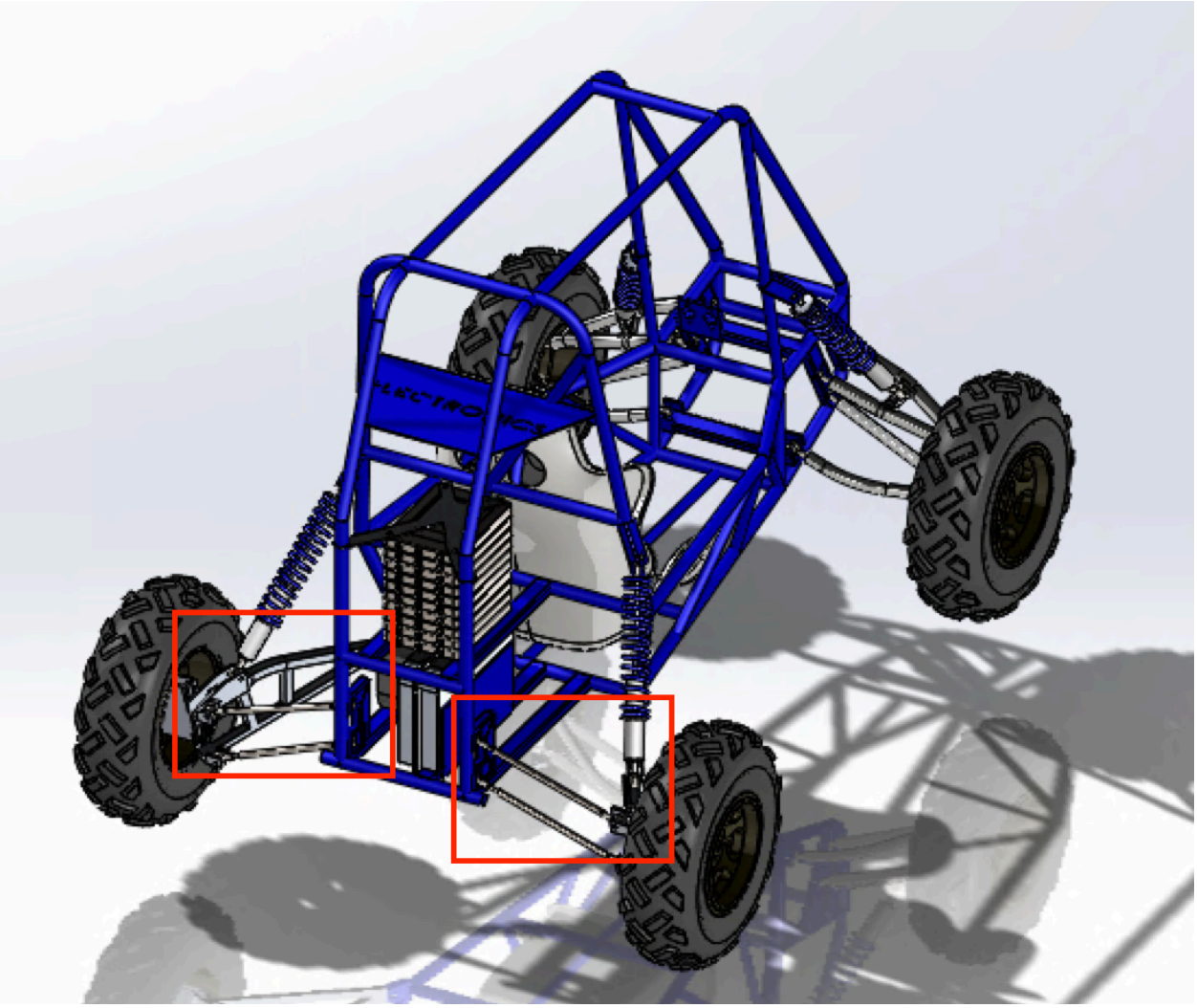

Figure 7: Rear Isometric View Displaying the Rear Suspension System Boxed in Red

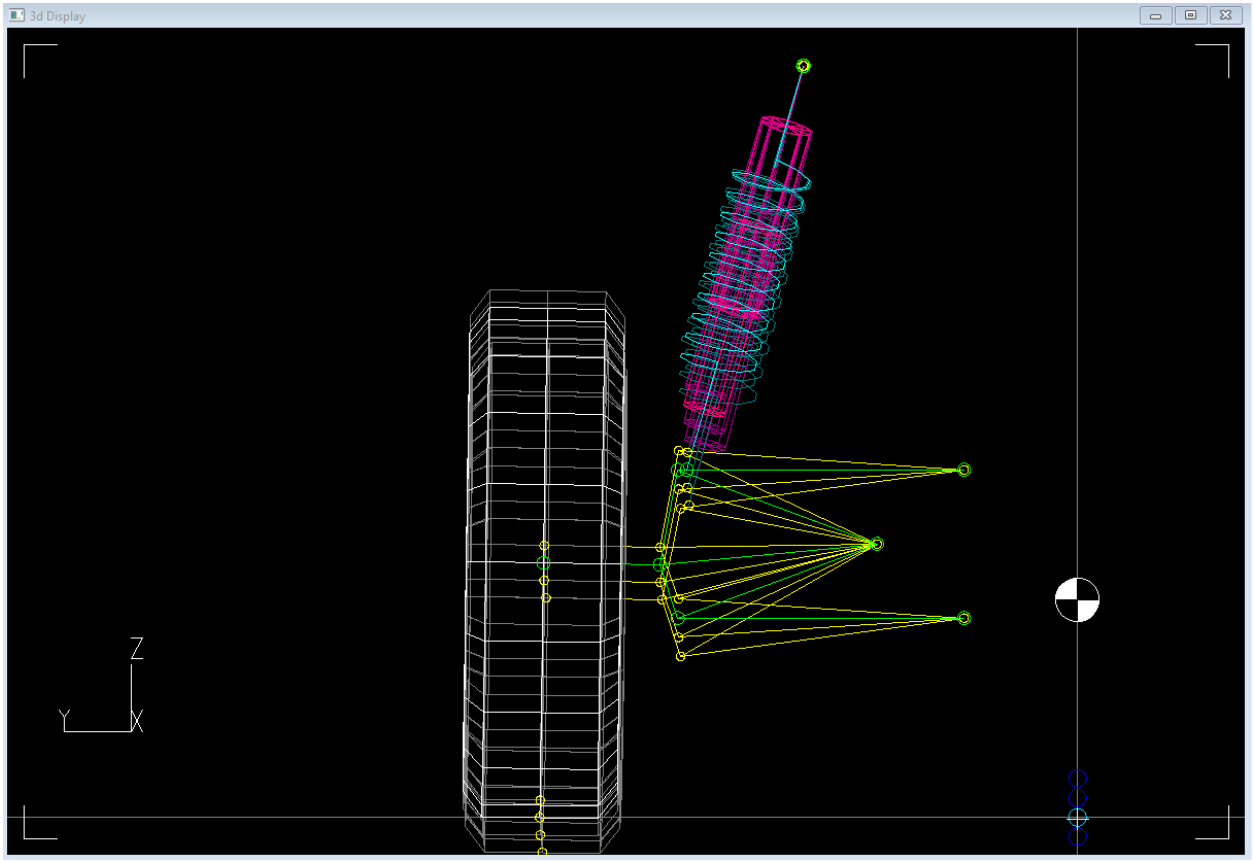

Figure 8: Lotus Range of Motion (Z-Y Axis)

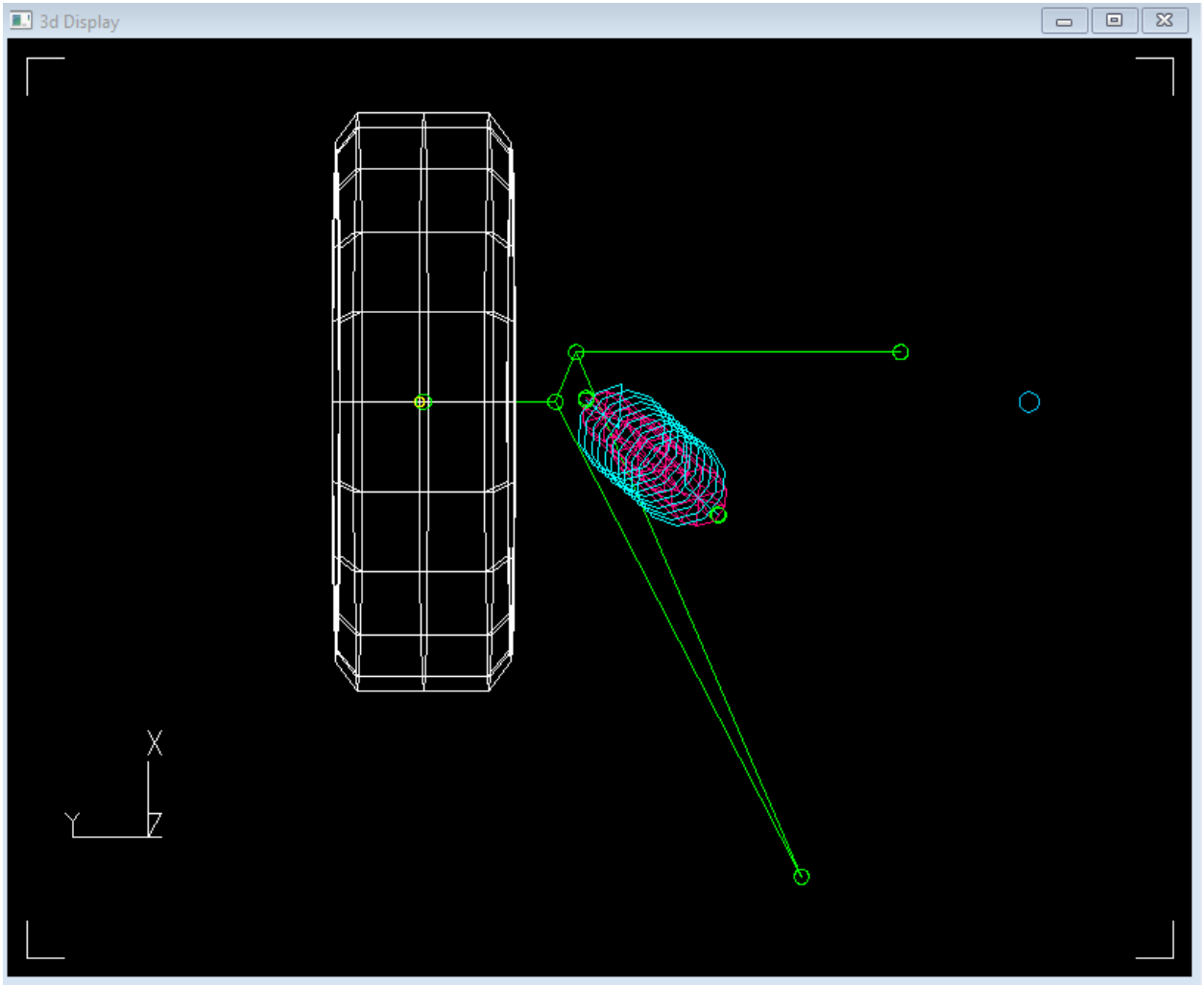

Figure 9: Lotus Design of Rear Suspension (Y-X Axis)

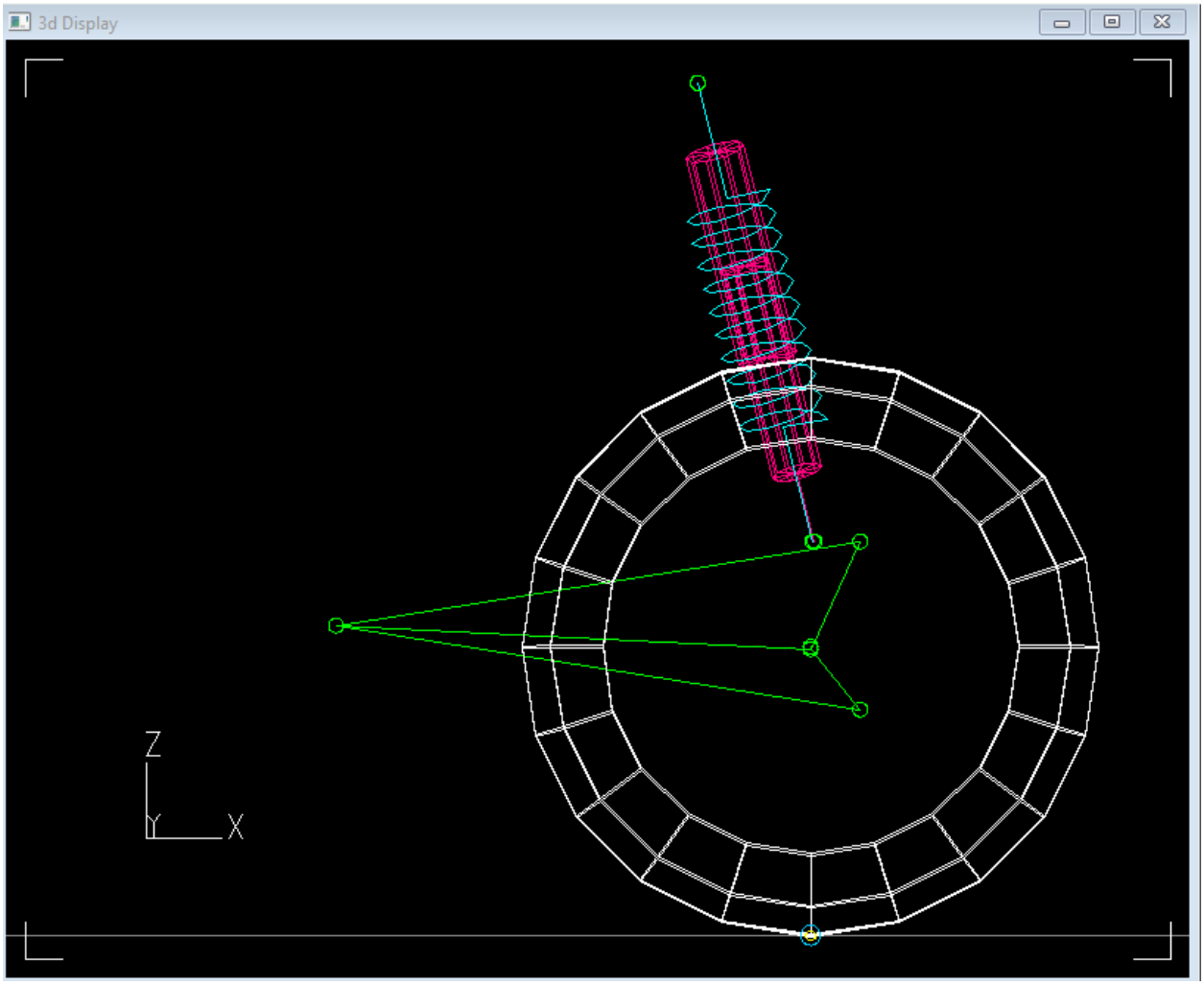

Figure 10: Lotus Design of Rear Suspension (Z-X Axis)

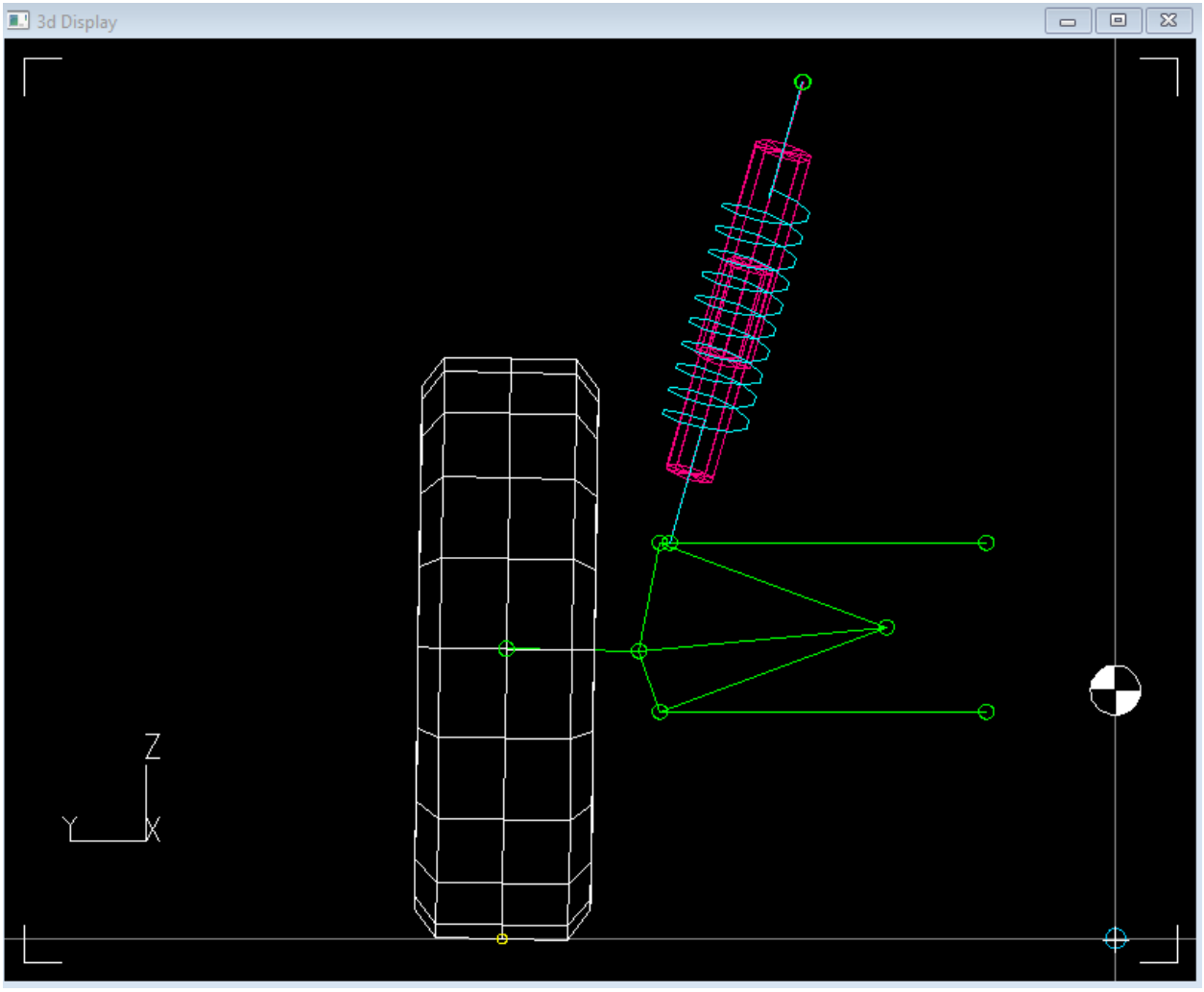

Figure 11: Lotus Design of Rear Suspension (Z-Y Axis)

Figure 12: Trailing Arm Design in CAD

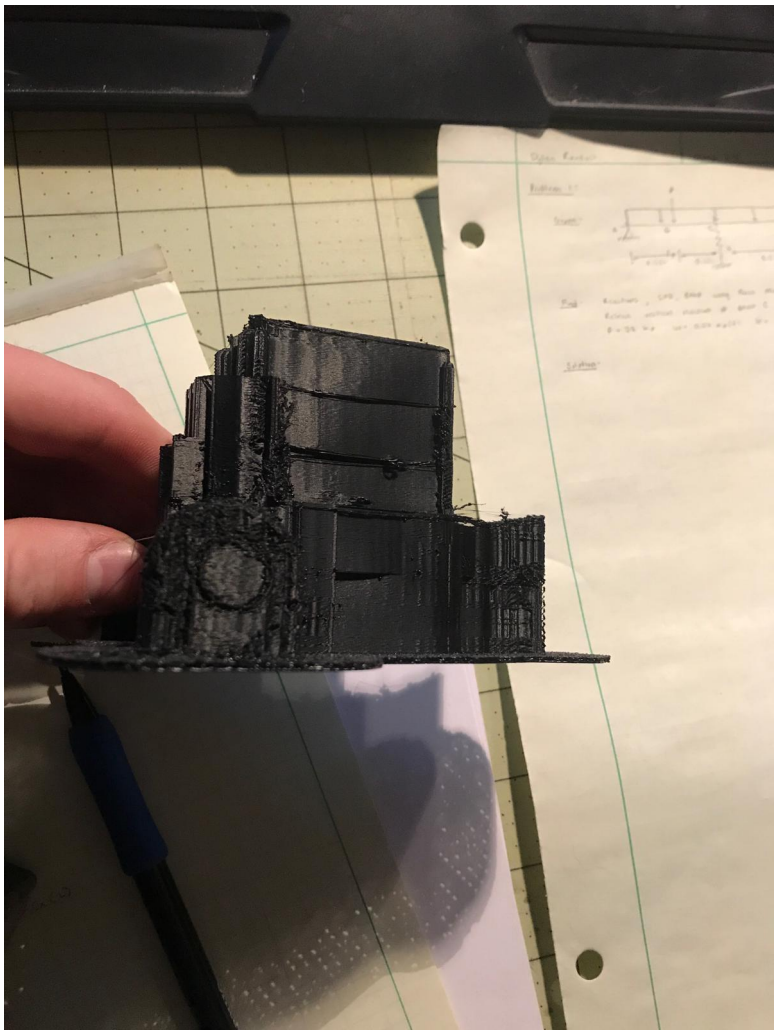

Figure 13: Damaged Prototype of the Rear Suspension

The rear suspension prototype was destroyed while in process of 3D printing. Our client, Willy, suggested we work more with the CAD model and the Lotus program to have a better understanding of the rear suspension, then a physical prototype. He suggested the programs would help us more than a physical prototype at the moment. The new design of the rear suspension will be the A-shaped trailing arm to have a better degree of freedom and two stabilizers to assist the rear wheel from unwanted tire wear. Also, it will provide more space for the Electrical engineers to mount their electrical components, motor and the batteries.