**Task Description**

Please design and fabricate the mechanical systems that couple the driver input and the movement of the wheels of the vehicle (ie the steering system). Your design should be robust and account for the forces outlined in Steve Foxe’s paper on steering forces and FH, FN, and FE rules governing components related to the steering systems. It should address problems with BR13. In the end, the new design should improve upon BR13 by reducing weight and minimizing the compliance by at least 10% while considering other changes that would improve driver experience. The design should be completed quickly such that members can be reassigned to other work.

**Responsible Parties**

Yossi Kohrman-glaser acts as the principle designer. He is responsible for organizing the efforts of his team and ensuring that design deadlines are hit on time. He is free to designate work as he chooses. His teammates are Nicholas Sherman and Noah Cho. They bring some practical (racing) knowledge to the team. He will keep tabs on their work.

**Deliverables**

The steering team should design and construct the components that couple driver arm movement (steering) to wheel movement. These may include, and are not limited to, steering rod, rack, steering column, column supports, and steering wheel. They will submit three designs, preliminary, transitionary, and final. These designs, coupled with a written report, will comprise the design documentation.

**Budget**

**See link to Budget (google sheet)**

<https://docs.google.com/a/yale.edu/spreadsheets/d/1eEpkCkBR4eAFqTBcncn3yApGopOcFFjAPhbX2K-CnaM/edit?usp=sharing>

**Resources (human and machine)**

|  |  |  |
| --- | --- | --- |
| Resource | Time | Price |
| Raw Materials | NA | See Budget |
| **Machining in Nick’s Shop** |  | Free |
| Planning (with Nick or other expert): Aluminum rack-extenders | 1 |  |
| Machining: Aluminum rack-extenders | 2–3 |  |
| Machining: Rack mount | 1 |  |
| Planning: Column Mount | 1 |  |
| Machining: Column Mount | 3–4 |  |
| Total new-member help for mfg, assembly | 10–20 |  |
| Welding | 5–10 |  |
| *Total:* | 25–40 |  |

**Time to complete**

10/11/15: Submit Project Info

10/20/15: First complete CAD assembly completed, using 2013 uprights

After Suspension Design is completed:

+3 weeks: New steering prototype CAD assembly completed

+4 weeks: Mfg planning completed

+7-10 weeks: Mfg completed

**Measures of Success**

[]All parts completed

[]Lighter than BDR 2013

[]10% less compliance than BDR2013 (too much free travel)

[]Passes tech-inspection

[]Steering Ratio within desired range (around 4 +/- 1)

[]Everybody had fun

**Required Inputs**

[]New Upright Designs

[]Any changes to dashboard

[]Driver cavity templates