**Task Description**

Design and fabricate the structures that couple the electric motors to the rear wheels. Must design for peak torque of 160nm per motor. Design should not deform plastically at 40g collision. Torsional flex of axle at peak torque no more than .7 degrees. Compatible with purchased planetary gearboxes. Max weight per axle (not including electric motor or planetary) 5 kg.

**Responsible Parties**

Dante Archangeli and Patrick Lawe will co-design the structure. Patrick supplies the physics knowledge while Dante supplies the material strength knowledge and design skills.

Dante will lead fabrication.

**Deliverables**

Structure to hold electric motor, planetary, and half shaft. Selection of half shaft, joints, and hub. Design documentation.

**Budget**

|  |  |  |  |
| --- | --- | --- | --- |
| 1 | Aluminum Sheet | $145 | $145 |
| 1 | Steel Cylinder | $100 | $100 |
| 1 | Steel Sheet | $100 | $100 |
| 2 | Outer Tripod housing | $200 | $400 |
| 4 | Inner Tripod Housing | $200 | $400 |
| 2 | Axles | $200 | $400 |
| 4 | Bearings | $25 | $100 |
| 2 | Rear hubs | $1000 | $2000 |
| 2 | Front hubs | $800 | $1600 |
| 4 | Tripod Joints | $150 | $600 |
|  |  |  | $6000 |

**Resources (human and machine)**

Discussion with Joe belter (.3 Hours)

New car time to weld tabs (2 hours)

Machining and fabrication (10+ hours) (Dave Johnson and Nick Bernadino)

**Time to complete**

Estimate 60 hours of 2 peoples work. 3 weeks of design followed by 3 weeks of fabrication.

**Measures of Success**

Completion of the design within the time frame with high level of quality. Design should meet the characteristics described in the description. Additionally, the design should distribute loads to chassis nodes and should be have a working life beyond this racing season.

**Required Inputs**

Finalized rear axle location.