

Milestone #4 – Initial Vehicle Construction and Additional Solid Modeling

DUE: 6 March

DESCRIPTION:

Your first part order should be in transit now, and shipping usually takes about one week (except McMaster!). During this time, you should continue designing in Solidworks the frame, drivetrain, and other parts of your vehicle that you will be fabricating later. It is important to keep working and preparing for fabrication time as your parts ship so you have an idea of what parts need to be made, how they should be made, and in what sequence you should build them. You are welcome to model parts using basic representative geometries and “spec sheet” dimensions if you do not physically have them yet, but please update the models when you do get the parts in.

Milestones from here on will not have directed questions and tasks. You should be aware of your design well enough to pace yourself through the next few milestones, which will focus exclusively on fabrication. **Your vehicle must be ready for a Rolling Frame inspection on Friday, March 29th, as stipulated in the syllabus.** That’s a little more than 1 month from now!

The vehicle should be *mechanically done* at the inspection – motors and drivetrain should turn and the brakes and steering should work.

Parts Ordering:

Parts order will continue to be aggregated and sent every Wednesday. To request a purchase, send to the instructor and master of parts purchasing (charlesg@mit.edu) a **TEXT FILE**, with the following information for each item requested:

- **Vendor, [Part number], Quantity, or**
- **[Direct link to product (e.g. Amazon or eBay)], Quantity**

Please name your file something easily identifiable with your team members’ names. For example, *SmithWilliams-20feb2013.txt* is acceptable, *stuff.txt* is not.

Waterjet Queue:

Pursuant to the class focus on rapid prototyping and construction, waterjet access will be available. To submit files for waterjet cutting, email the instructor a **2D DXF** file exported from a Solidworks drawing of R2000 format (do not use “Export to DXF/DWG” on a part face – this uses the latest version by default). Your parts may be individual or pre-tiled. Tiled parts and specific placement instructions must be approved by the instructor first.

The instructor will take your file and your plates of material and use the Building 35 (LMP) waterjet or the Hobby Shop waterjet to machine the parts. Files submitted by **End of lab Wednesday** will be turned around by **the following Monday**, end-of-day, unless special arrangements are made.

FORMAT OF DELIVERABLE: 2-4 pages in your notebook documenting your progress this week. Pictures of construction, CAD models, assembly sketches, fabrication drawings, etc. with commentary are encouraged.

Four Solidworks models from your vehicle, as pictures in your notebook with explanation of how you intend to fabricate it. (Four total for entire group)

OTHER ACTIVITY: Shop and machine familiarization will occur on a rolling and as-needed basis this Wednesday and Friday.

RESOURCES:

Reading through the vehicle build reports for MIT student vehicles (links found in the STELLAR EV Resources document) will likely be helpful to your design and fabrication process.

Use the How to Build Your Everything... Instructable as a reference for designing parts of your frame and drivetrain!

<http://www.instructables.com/id/How-to-Build-your-Everything-Really-Really-Fast/>

Additionally, feel free to look through the Chibikart instructable for examples of go-kart specific implementation.

<http://www.instructables.com/id/Chibikart-Rapid-Prototyping-a-Subminiature-Electr/>