Thomas Hanna
Solid Works Personal Project
Lugged Bicycle Frame
E-design 100
5/5/2015
(1) Overall Frame:

(2) Seat Post Lug

(3) Bottom Bracket Lug

(4) Dropout Assembly
I chose to build a lugged bike frame for my solid works project. Biking has become one of my hobbies this year and I am biking across the country this summer, so I thought it would be appropriate to make something I am very involved with. Along with riding, I am very interested in the mechanical aspects of bikes, how they work and how they are assembled. Lugged bike frames are an older type of frame that aren’t really made anymore, they consist of the lugs, joints that hold the bike together, and the tubes of the frame. Many older lugged frames are really interesting and intricately designed. Because of the many different parts, I thought it would be a good project to do in Solid works. I loosely based my design off a track frame, although some of the measurements are probably not exactly what you would want in a track frame.

I learned a lot from this project. There were many unforeseen problems that arose during this project. One of the most difficult parts was creating the lugs that had multiple pieces radiating out of them at different angles, and ensuring this piece would fit with all of the other pieces. The final product has about twenty different parts, help together with over twenty mates. Making sure that all of these aligned was challenging and required a lot of forethought and careful measurement. I learned a lot about creating reference planes, especially angled ones, during this project. The most complicated part was the bottom bracket, which had 14 planes to allow for the many angled parts protruding from it. I learned how to create angled reference planes from this part, which helped a lot later on. I also learned a lot about assembling parts for this project as well. Figuring out how to mate all 20+ pieces together so that all of the angles matched up and nothing conflicted was really difficult, but I became quite proficient at it. Another skill I learned was using the measuring tool. This allowed me to mock up the bike with oversized tubes, and once everything fit, I could take measurements for the final tubes.
Lugged frame, lugs are chrome, tubes are red (1)

http://1.bp.blogspot.com/-Gt5TQDLR7Wk/UWVVbbGOzJI/AAAAAAAAAY/NSAe_qXxyZ4/s1600/YH-10-003%25E7%25B4%2585%25E8%2589%25B2.JPG

(2) http://www.kraussbicycles.com/2011/03

lugs by themselves