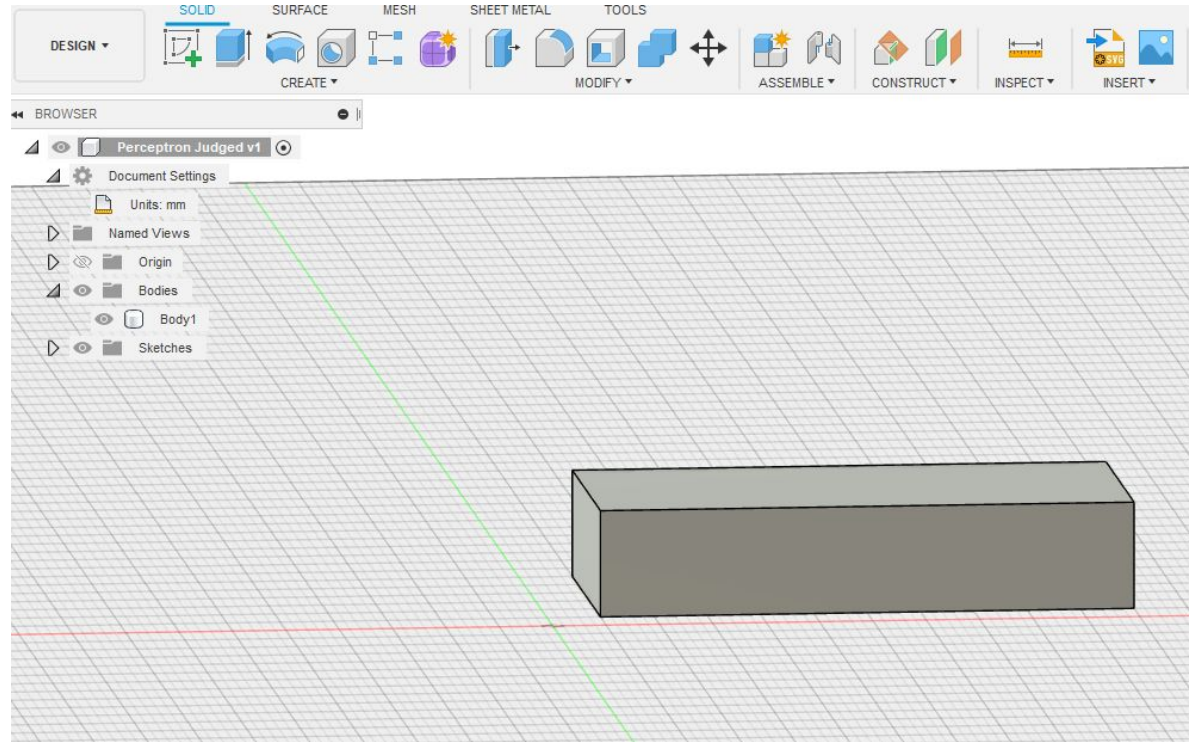
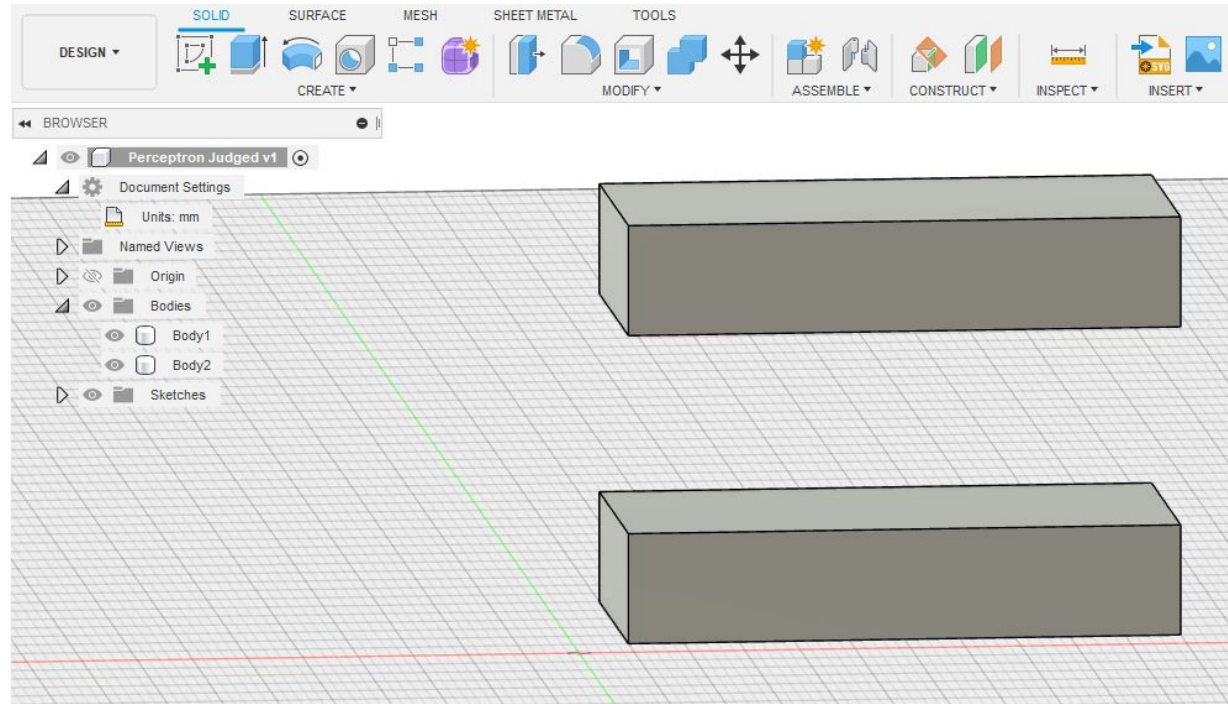


Detailed Explanation of Creation of Perceptron Guide

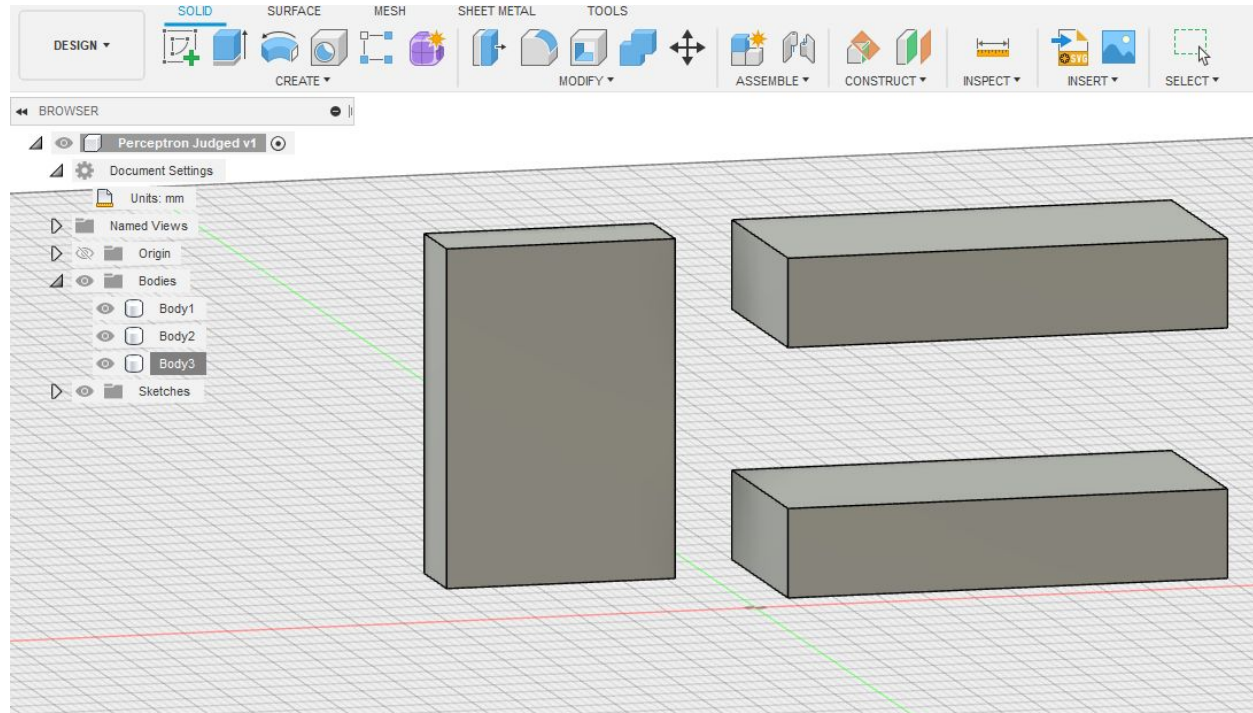
First I saved a file under Perceptron and used the unit measurement of millimeters. Next I made a sketch of a rectangle using the two point rectangle tool. I made the dimensions 50 mm by 25 mm, and then used the press pull tool to give the rectangle a depth of 10 mm. Next I copied this rectangular box and moved it 28 mm up.



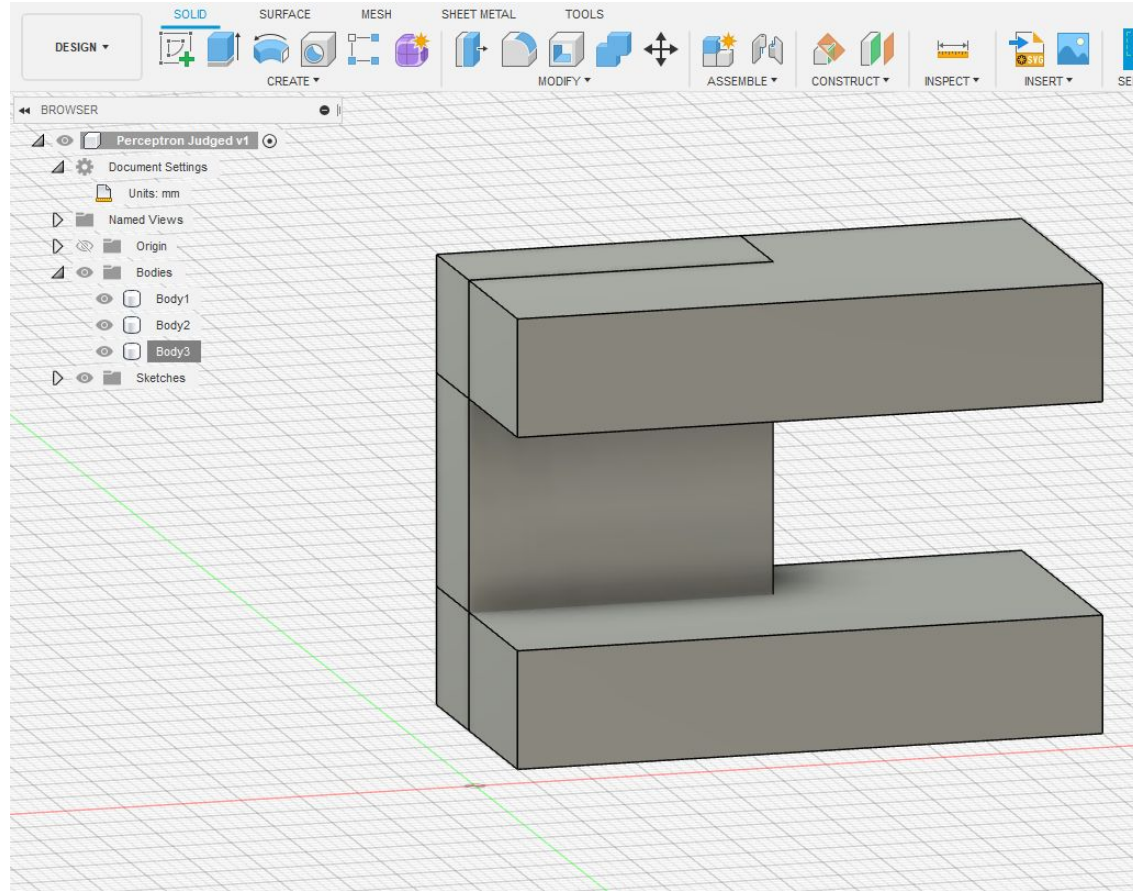
Next I copied this rectangular box and moved it 28 mm up.



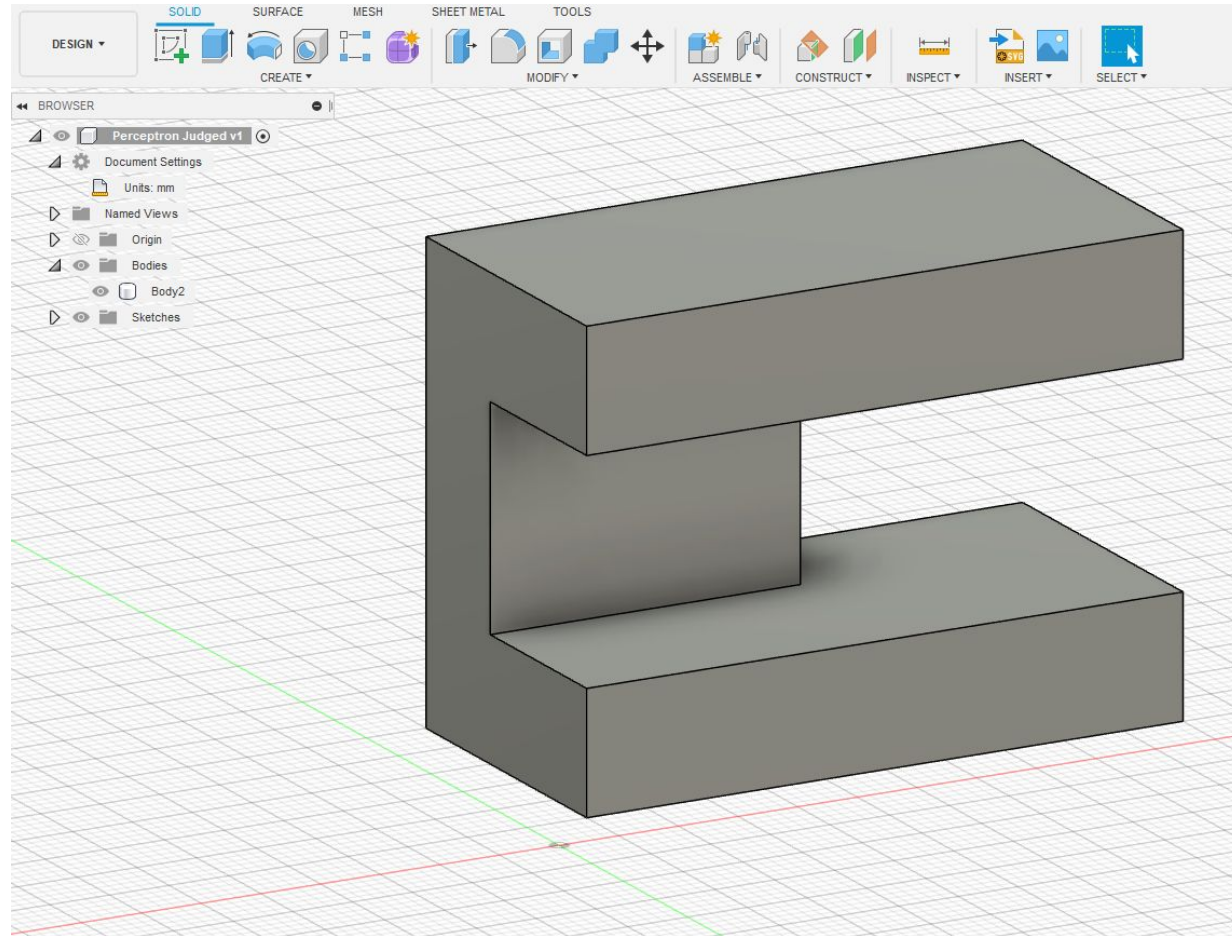
Then I created a second sketch of a rectangle using the same two point rectangle tool. The dimensions of this rectangle was 10 mm by 26 mm. Then I used the push pull tool to create a rectangular cube with a depth of 38 mm.



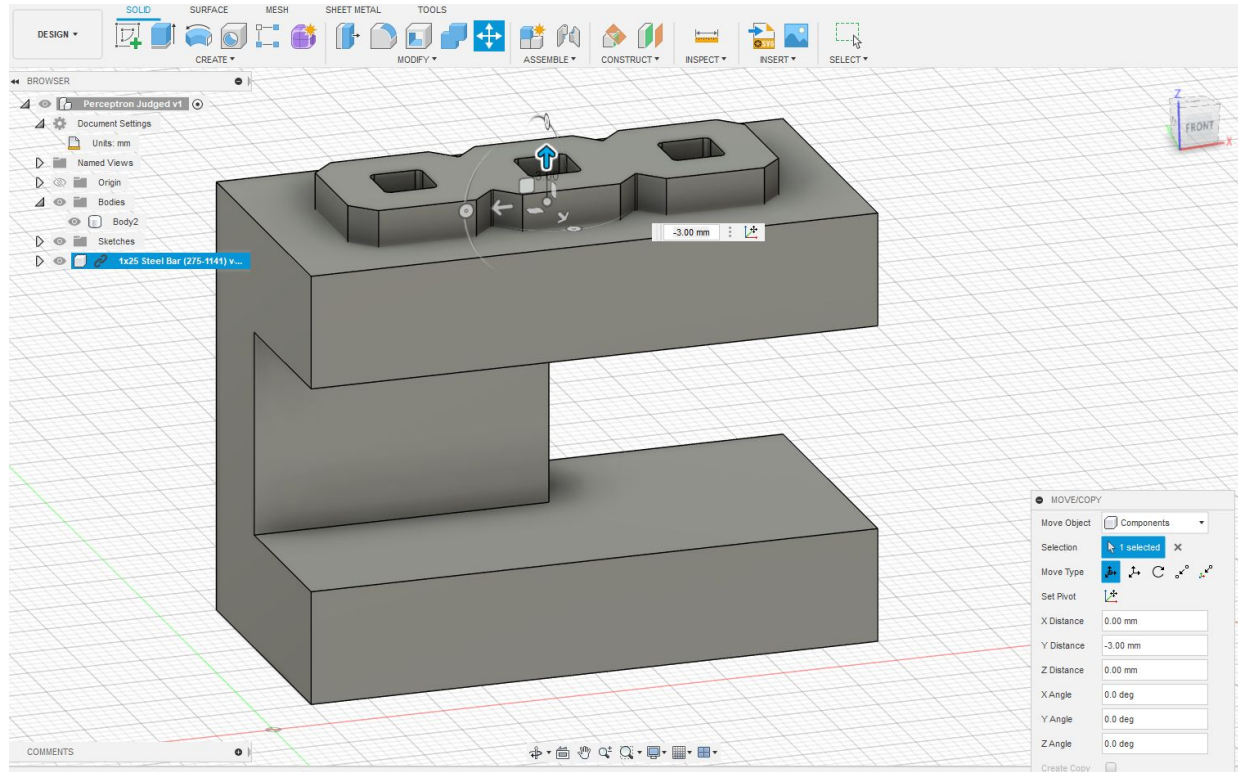
Then I moved the recently created body to match the face of the previously created two bodies. These three bodies were combined to create one body.



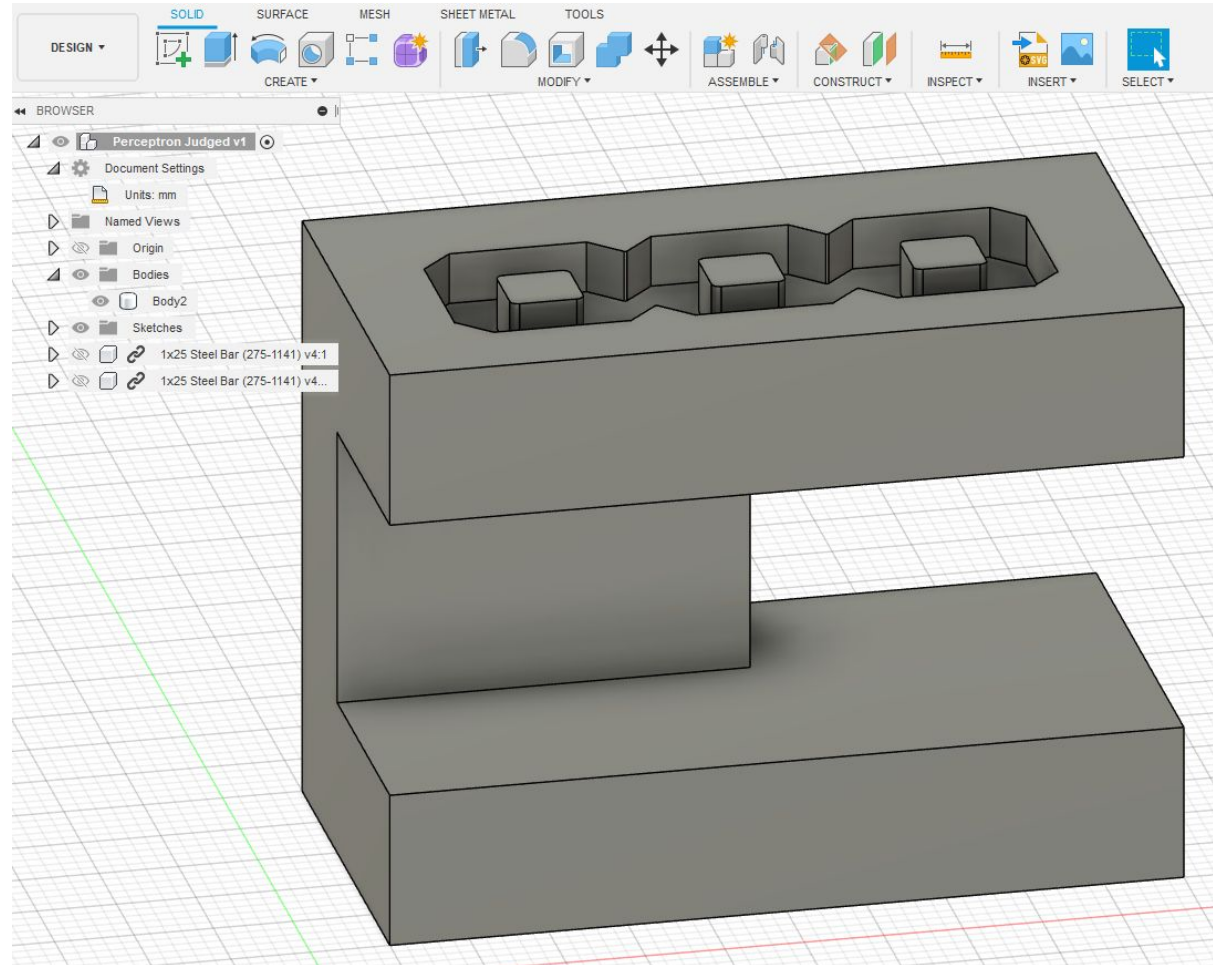
These three bodies
were combined to create one
body.



Next I imported a prior cut 1 x 3 steel bar. This would serve as a guide for placing the holes for the motor as well as space to place an actual 1 x 3 bar to give the piece greater rigidity to support the motor.

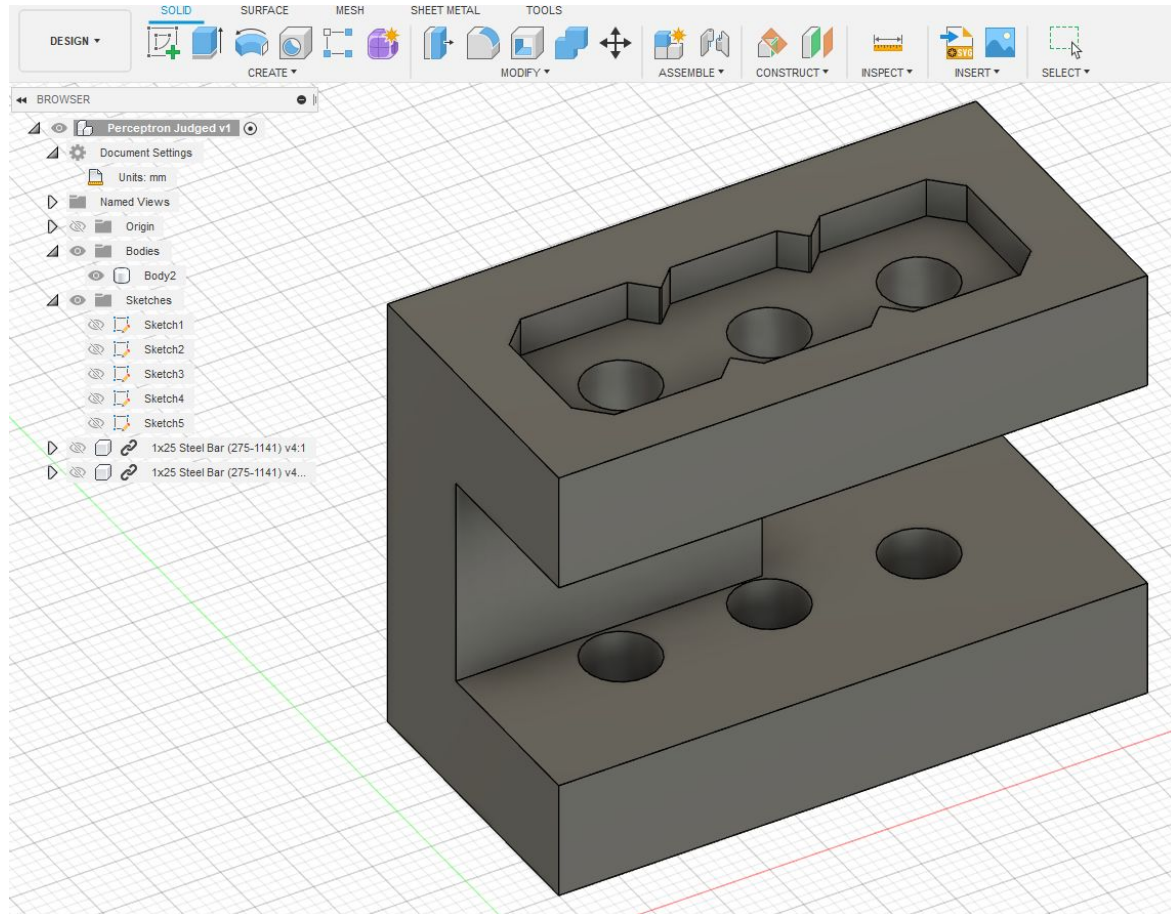


After importing it I moved it into place, so that I could use the combine function to create a negative space where the motor would be placed. The 1 x 3 bar was inset into the primary piece two mm above and below and to create a symmetrical negative space for the motor to be used on either side.

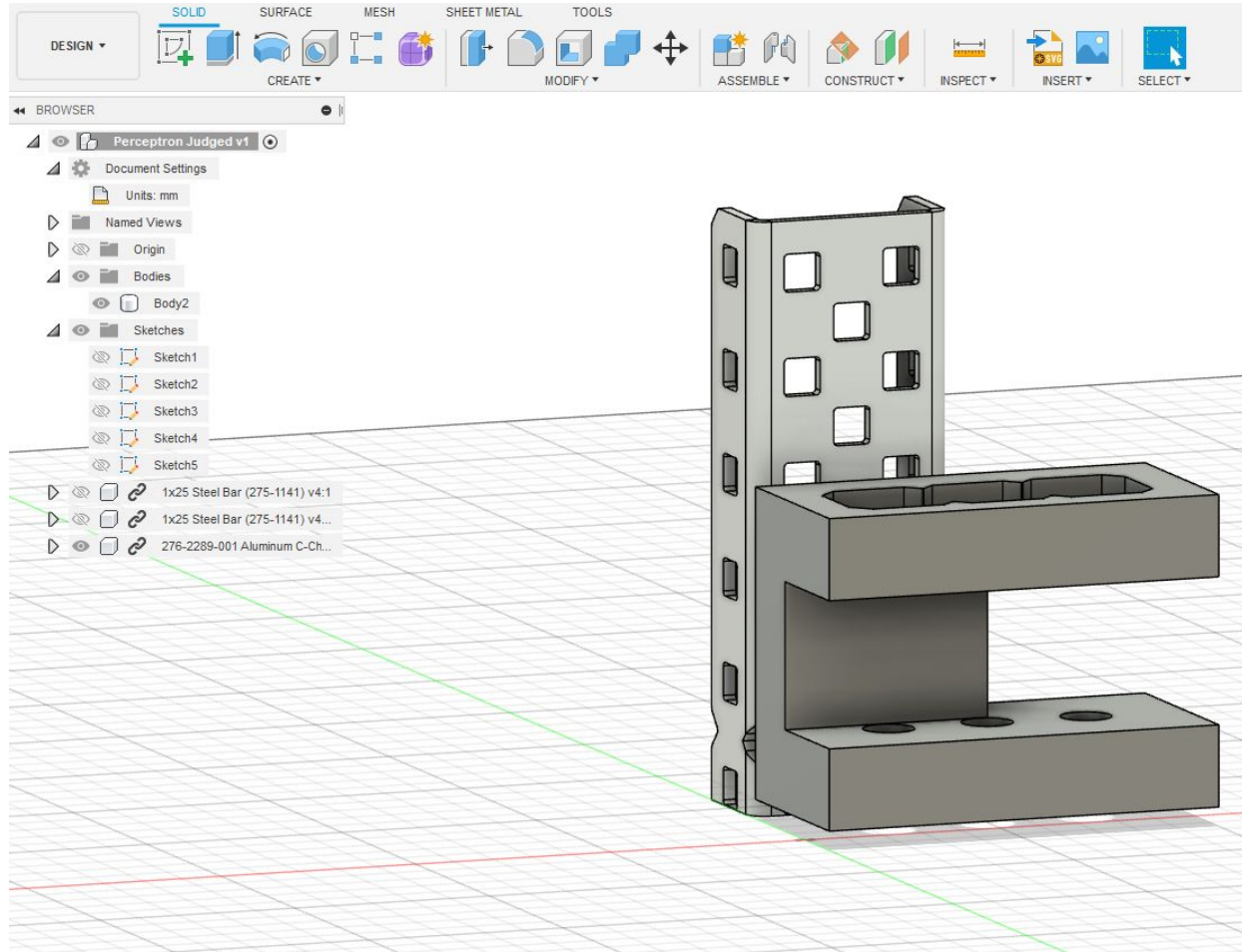


Additionally, I selected all the edges of the 1x 3 bar and using the push pull moved the planes back by 0.5 mm to accommodate the actual plate. The capability of the 3D printer does not allow for a flush design and the width of the printed material had to be taken into account.

Next I created a sketch of a circle using the center diameter circle tool. I chose a diameter of 6.3 mm. I used the press pull tool to create a cylinder that was 42 mm long and under the extrude pan chose a cut combination. This was done for the last two vertical holes, also.

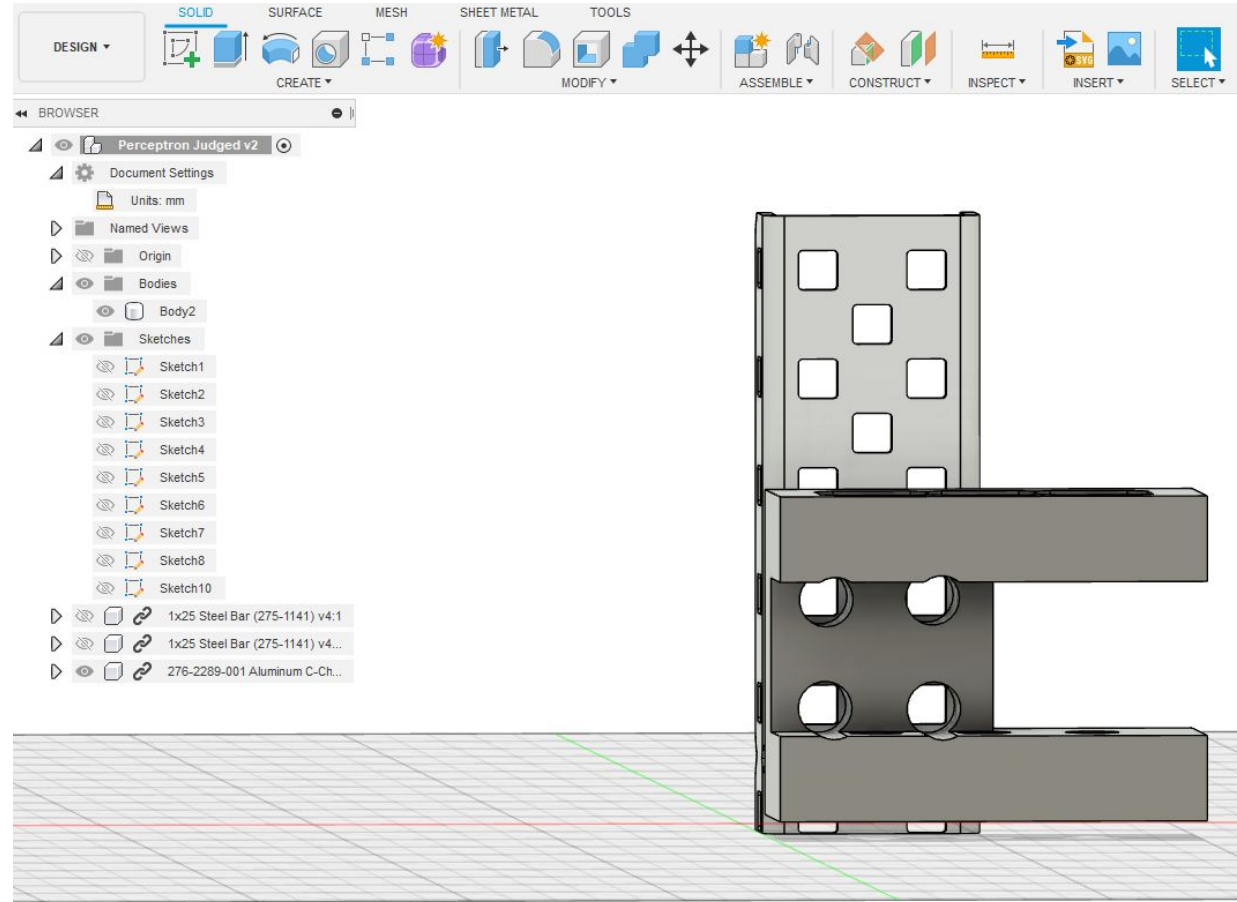


Next I imported a previously cut C channel so that I could have a guide about where to place the holes that would affix the piece to the metal structure.

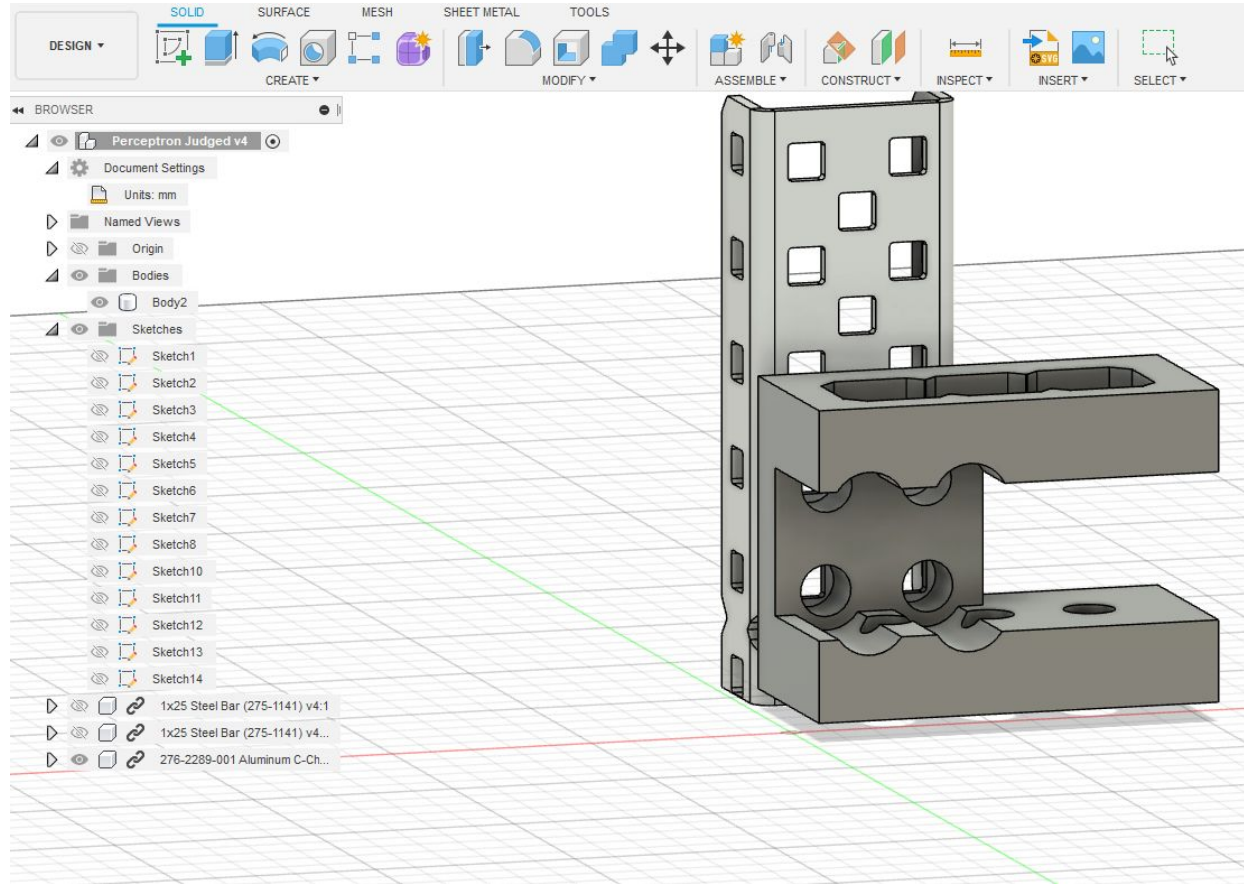


Then I used the C channel as a guide to make 4 cylindrical holes in the piece to allow the piece to be affixed to the metal structure.

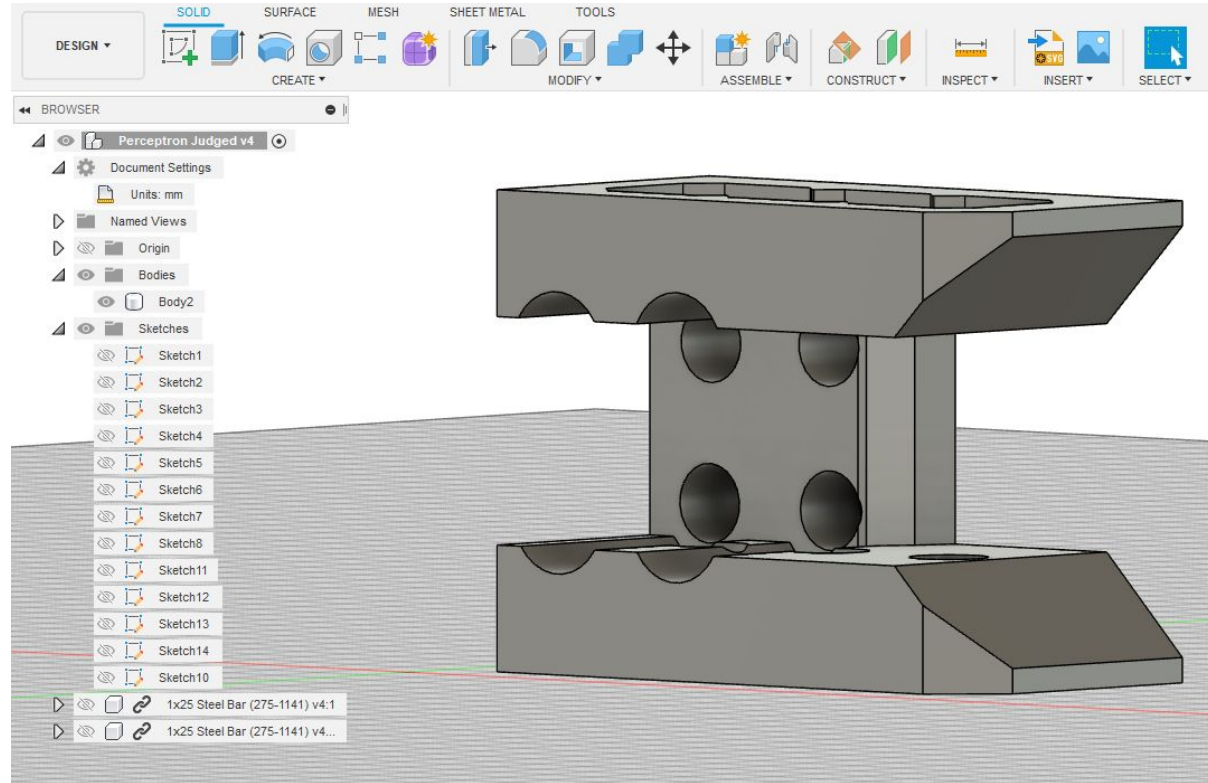
Although I could have done this more efficiently by choosing a thinner box to begin with, I used the push pull tool to make more room for the screw heads that will accept the motor.



Then, in a similar manner to before I used the sketch center diameter circle tool to create a circle and used the press pull tool to make room for the screws that would join the piece to the C-Channel



Next I used the chamfer tool three times on the horizontal component to make room for the sprocket. I also used chamfer on the roof and the base to decrease print material used. I decided to make the horizontal aspect 1 mm larger to provide more support. I used the press pull tool to do this. The last part involves making the guides for the rails. Here I brought in a CAD file from Vex for the 2 inch shaft. After orienting it and placing it 1 cm into the piece, I then used the combine/cut tool to make space for the rail shafts. This was repeated on the two faces of the piece that would hold the rails.



Lastly, I wanted to make an inset to accept the screws for the motor. I did this by creating a sketch using the Center Diameter Circle tool. Then I used the press pull tool to make a cylinder 23 mm long. I moved the body into position and used the combine cut function to make the inset. I repeated this for the second hole that accommodates the screw for the motor.

