

A • P • U
ASIA PACIFIC UNIVERSITY
OF TECHNOLOGY & INNOVATION

INDIVIDUAL ASSIGNMENT TECHNOLOGY PARK MALAYSIA

EE010-3-1 ENGINEERING DESIGN

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INTRODUCTION

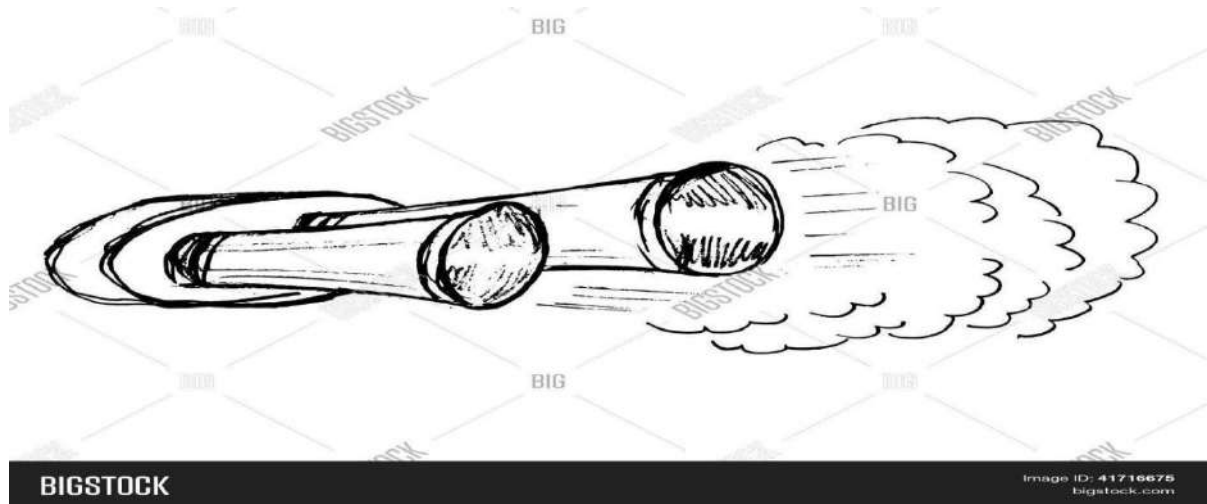
A bumper car is a special model of vehicle that was designed many years ago. Today, you can find this model of car in most of the countries around the world, however, there are also places where this model of car does not exist such as in my country Equatorial Guinea. This is my individual report reflecting the design of the four components that I have worked on in particular for the "Bumper car" design project.

OBJECTIVE

The objective of this assignment is to understand engineering design concepts, as well as to interpret them, either using Solidworks or other materials that complement the subject matter.

IDEAS OF MY COMPONENTS

➤ EXHAUST PIPES



IDEA / FIGURE 1

In idea or figure 1 you can see the representation of my first component, 'exhaust pipes'. In Solidworks the component in the idea 1 is not represented in the same way since I made some arrangements and I adapted it to the form that came to my mind. I transformed it in a way that in the design it looks different but the idea in the bottom is the same since both perform the same function in the Bumper car which is basically in charge of expelling all combustion gases from the muffler to the outside of the vehicle.

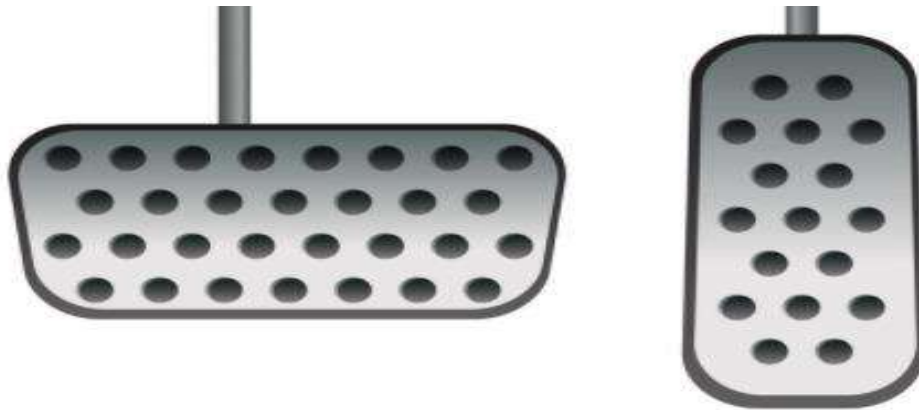
➤ RUBBER BUMPER



IDEA / FIGURE 2

The next component that was assigned to me was "base bumper". The idea is represented in figure 2. Of course there will be some changes in Solidworks since I made it simpler and easier to interpret but we can not rule out that in the end the idea is the same since both perform the same function, which is to support the vehicle and ensure its stability.

➤ GAS PEDAL

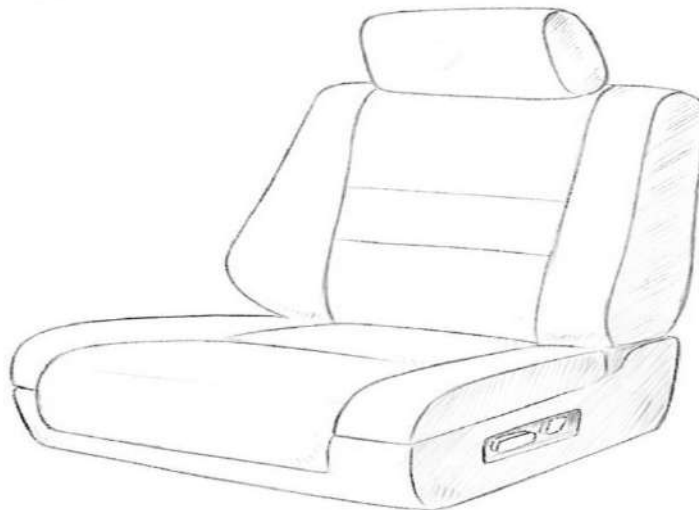


IDEA /FIGURE 3

The third component is "gas pedal" which is located on the right side in the idea or figure 3. Specifically we separate both the gas pedal and brake pedal. My group partner took care of the "brake pedal" (left side in figure 3) and I took care of the "gas pedal" (right side). The "gas pedal" is also called a throttle, which is a mechanism that vehicles have to control the amount of power to the drive wheels.

➤ SEAT

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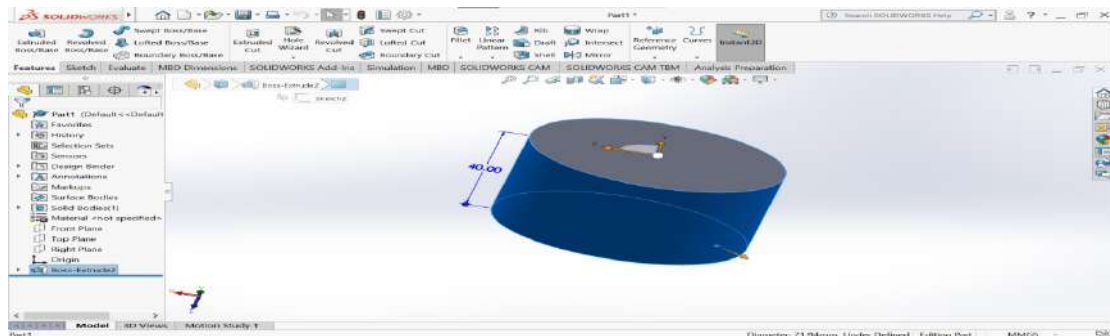
IDEA / FIGURE 4

Finally, in figure 4 is represented the idea of a bumper car seat, which was designed in Solidworks in a slightly different perspective and shape, but that keeps a similar relationship with the idea. Obviously, we already know the function of the seat of any vehicle, which is where the driver sits to steer the vehicle.

DESIGN OF MY COMPONENTS

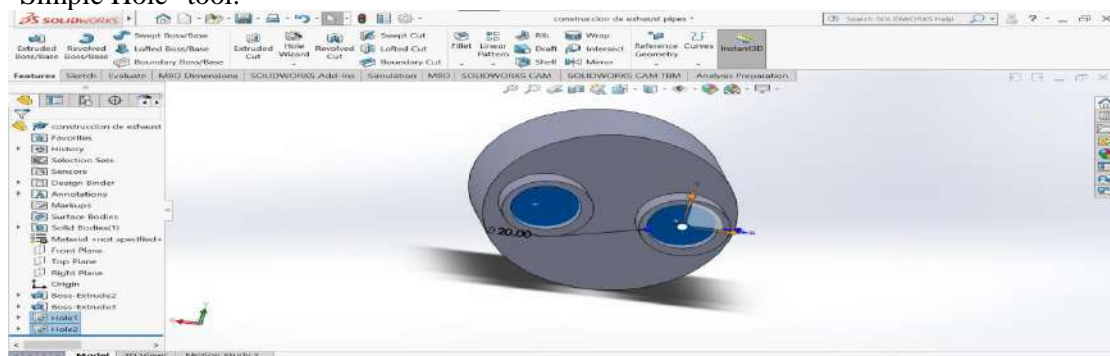
a) EXHAUST PIPES

First I create a circle in the center and then use the Extruded Boss/Base tool.



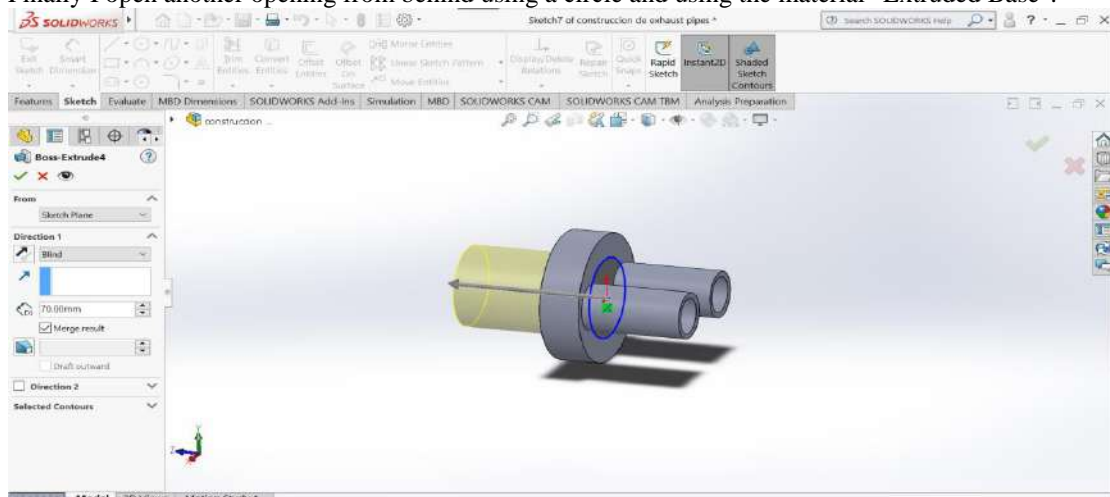
IDEA DESIGN 1.1

Then from inside the circle I create two openings and insert holes in the openings using the "Simple Hole" tool.



IDEA DESIGN 1.2

Finally I open another opening from behind using a circle and using the material "Extruded Base".



IDEA DESIGN 1.3

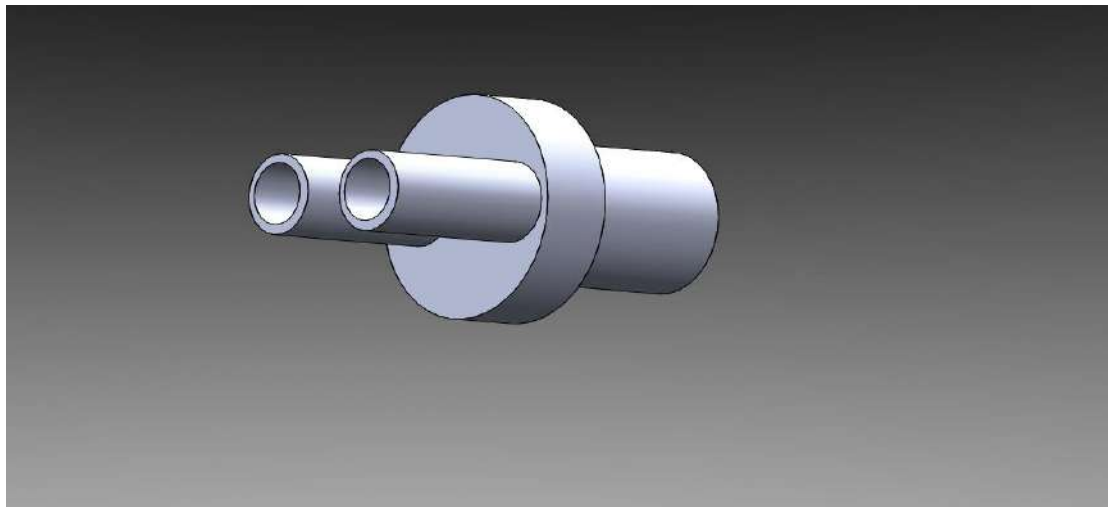
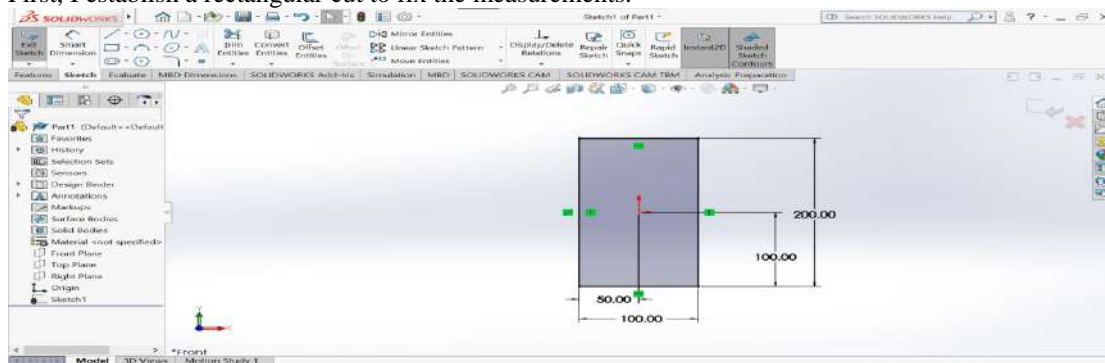


ILLUSTRATION DESIGN

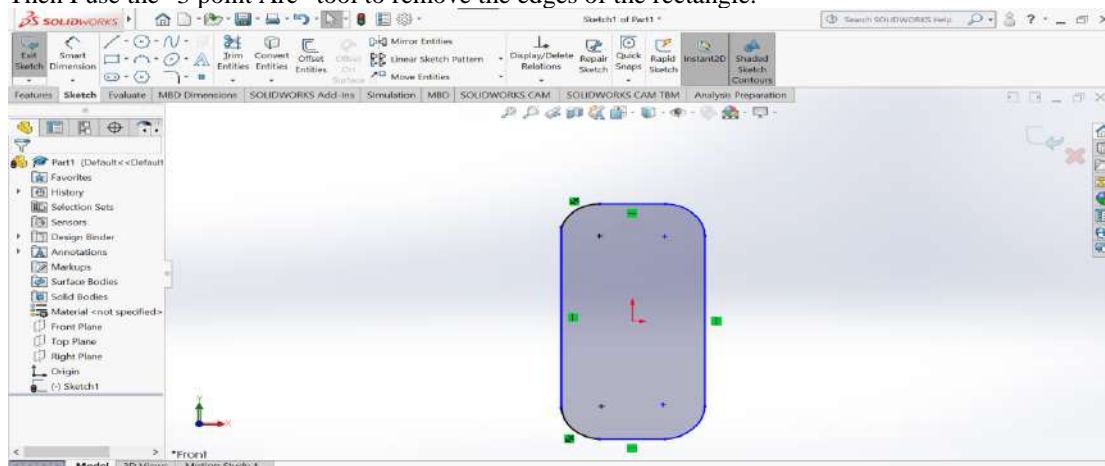
b) RUBBER BUMPER

First, I establish a rectangular cut to fix the measurements.



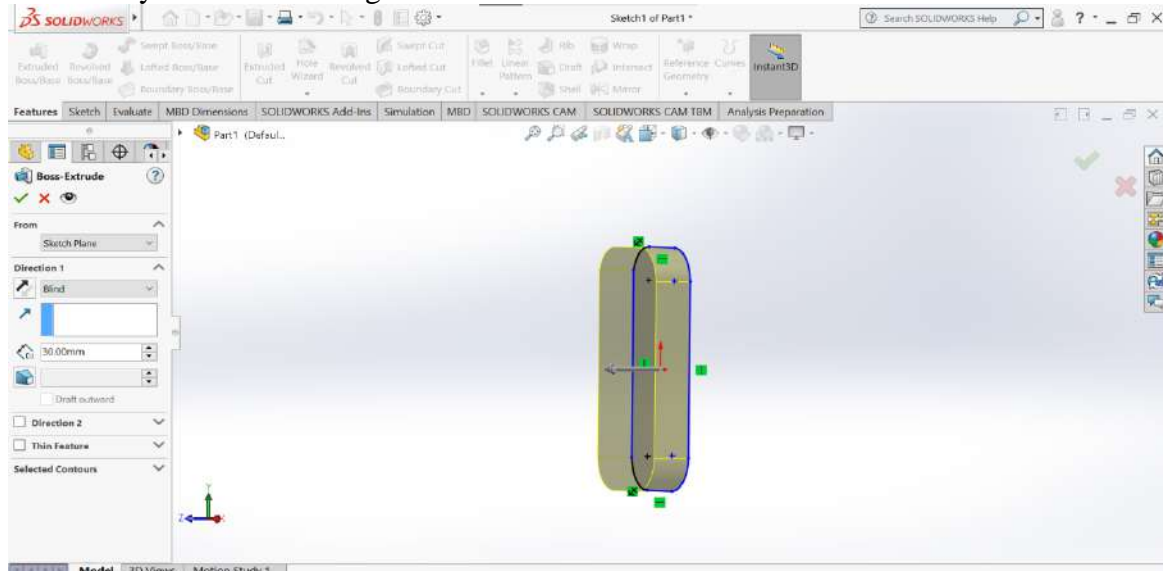
IDEA DESIGN 2.1

Then I use the "3 point Arc" tool to remove the edges of the rectangle.



IDEA DESIGN 2.2

And finally I extruded it to get the final outcome.



IDEA DESIGN 2.3

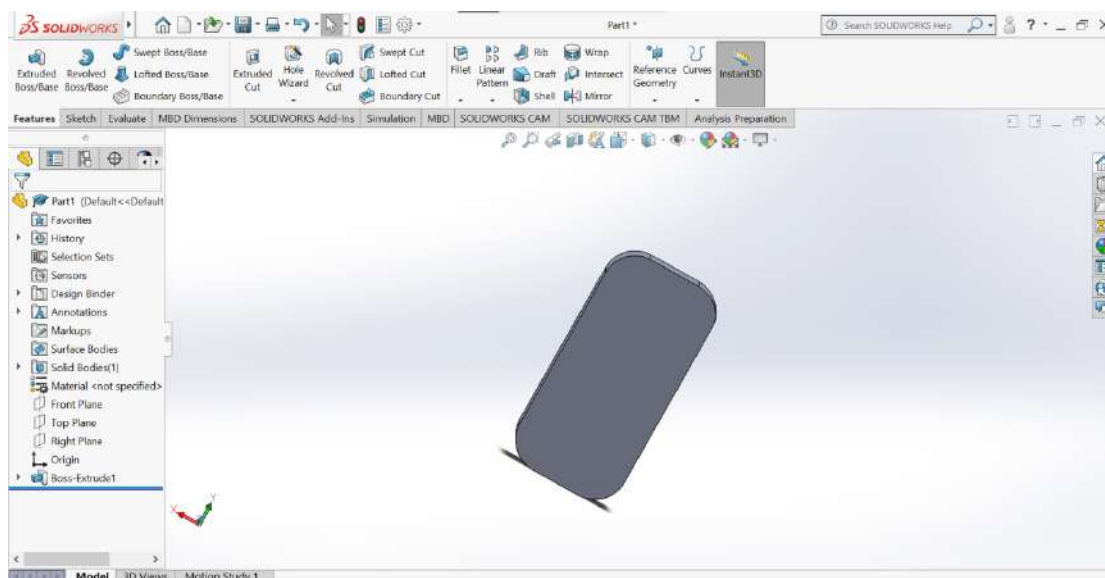
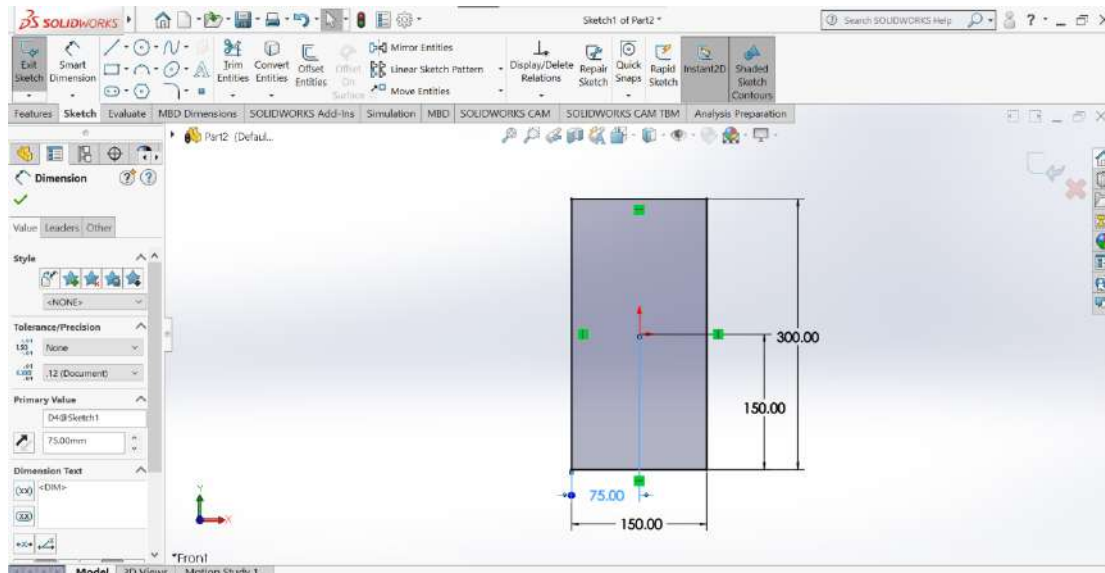
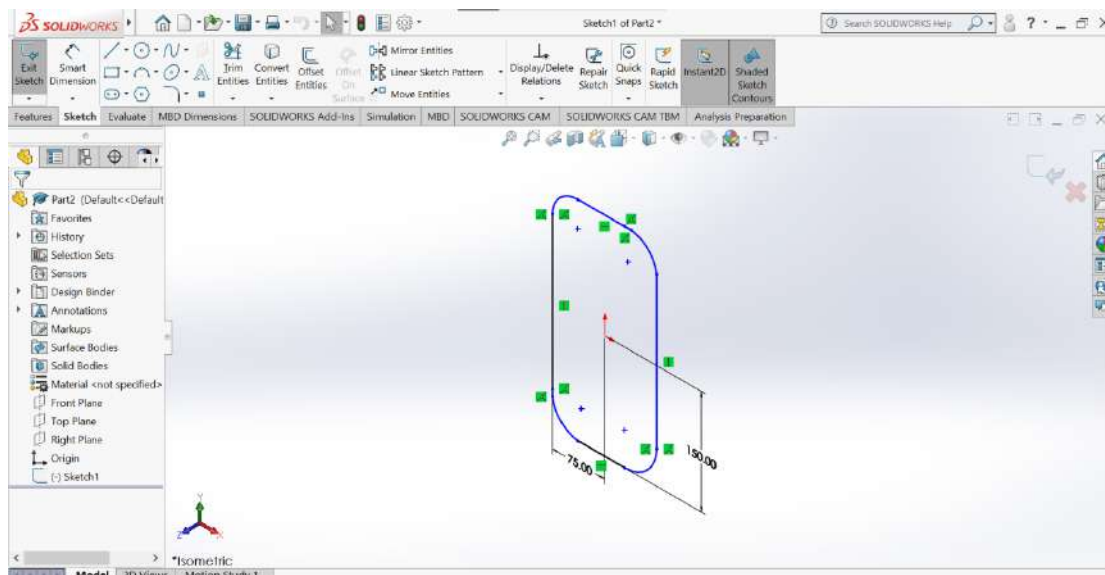


ILLUSTRATION DESIGN

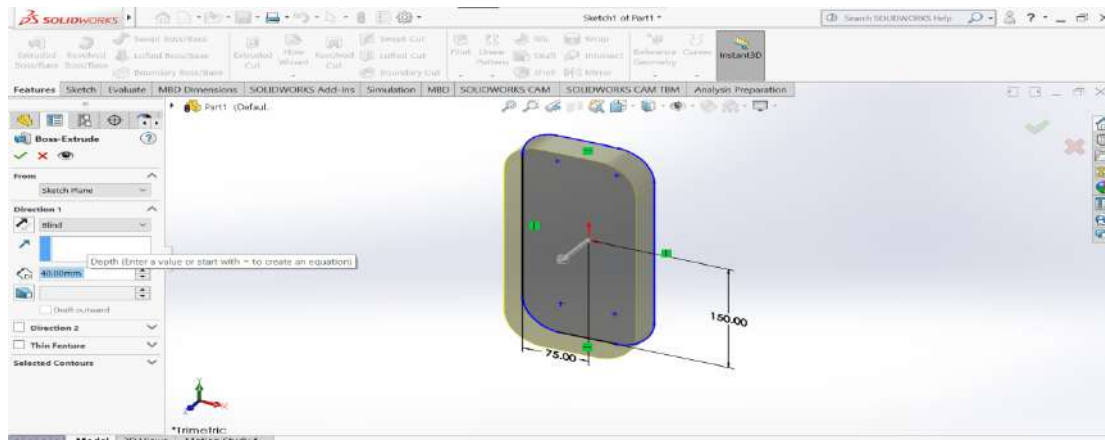
c) GAS PEDAL



IDEA DESIGN 3.1

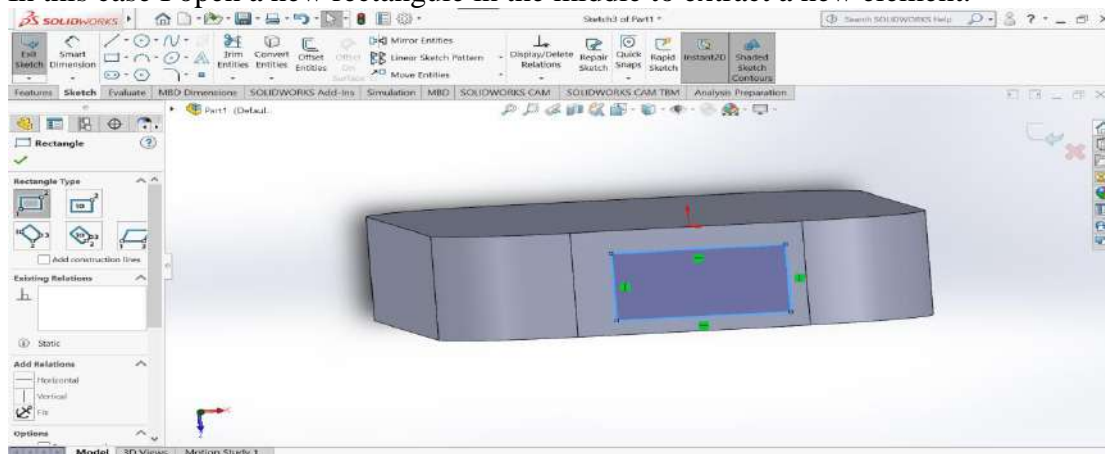


IDEA DESIGN 3.2

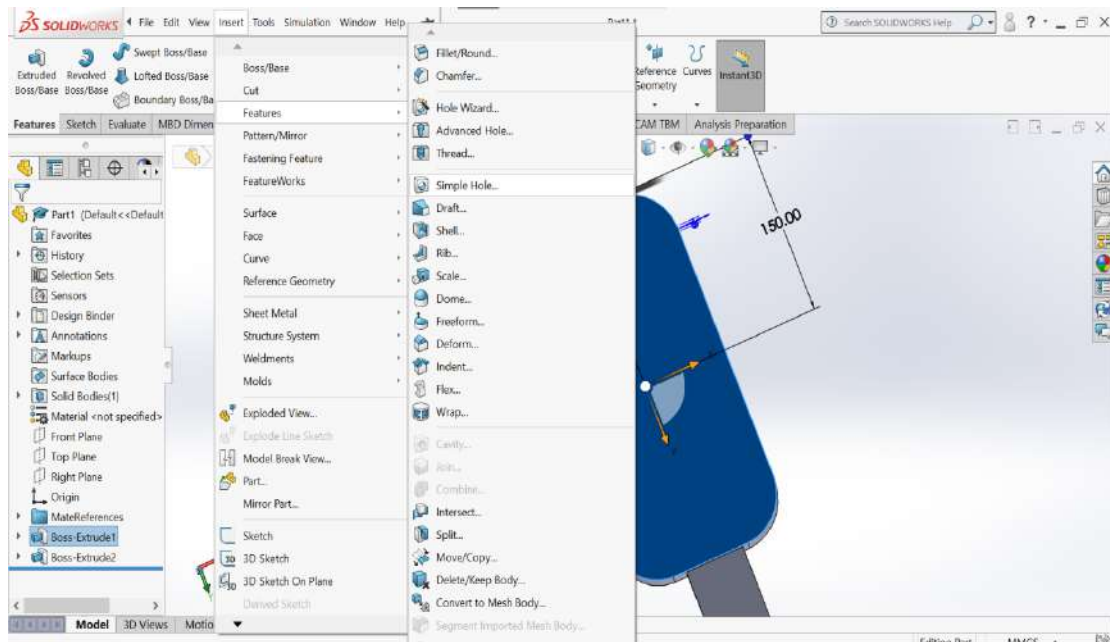


IDEA DESIGN 3.3

In this case I open a new rectangle in the middle to extract a new element.

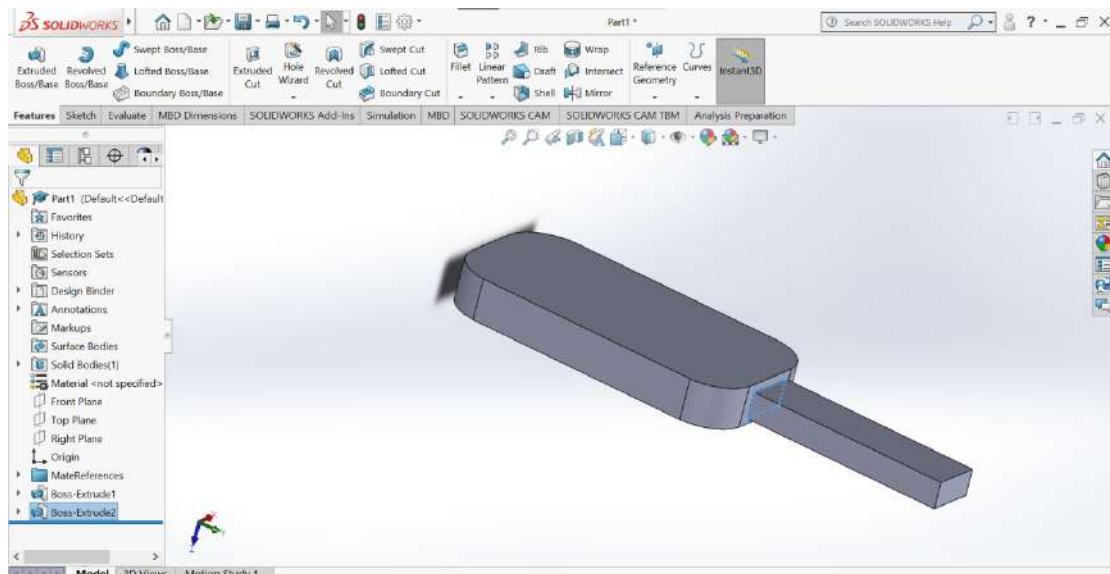


IDEA DESIGN 3.4

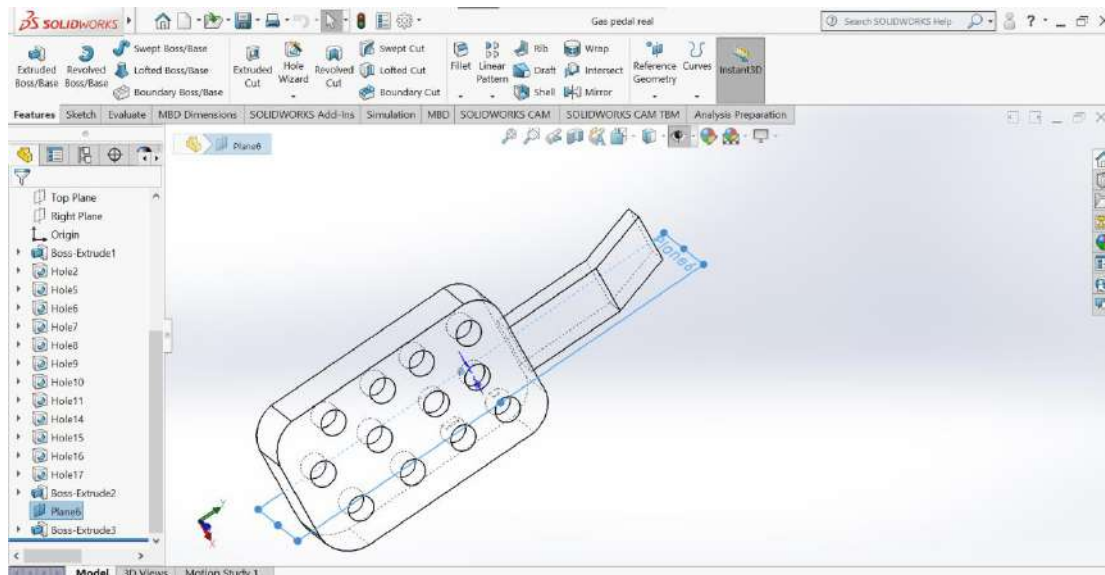


IDEA DESIGN 3.5

As you can see in the figure 3.5 I use the “Single Hole” tool to set new holes into the component.



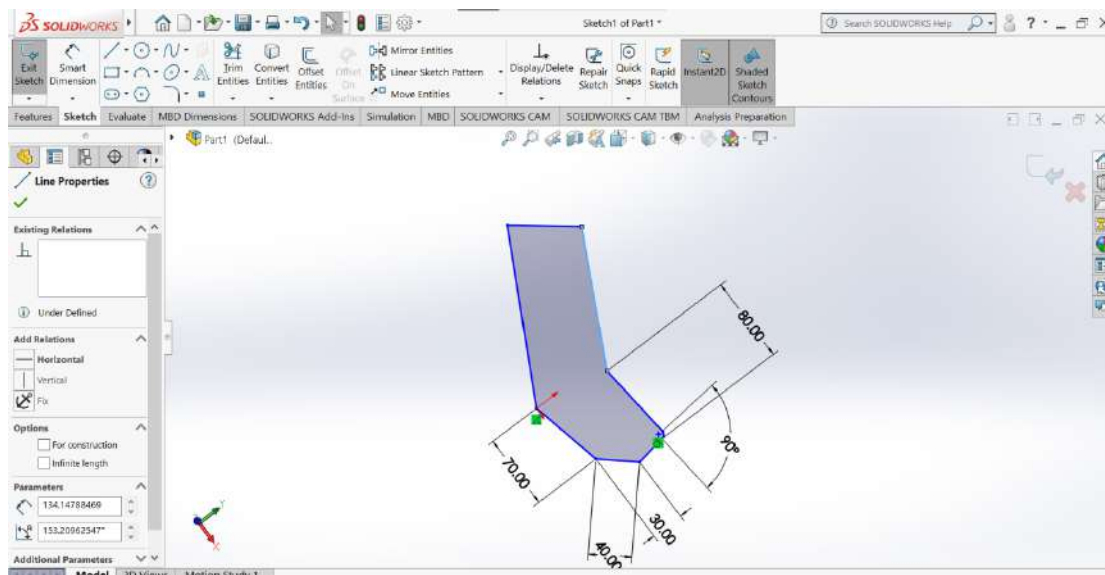
ILUSTRATION DESIGN 1



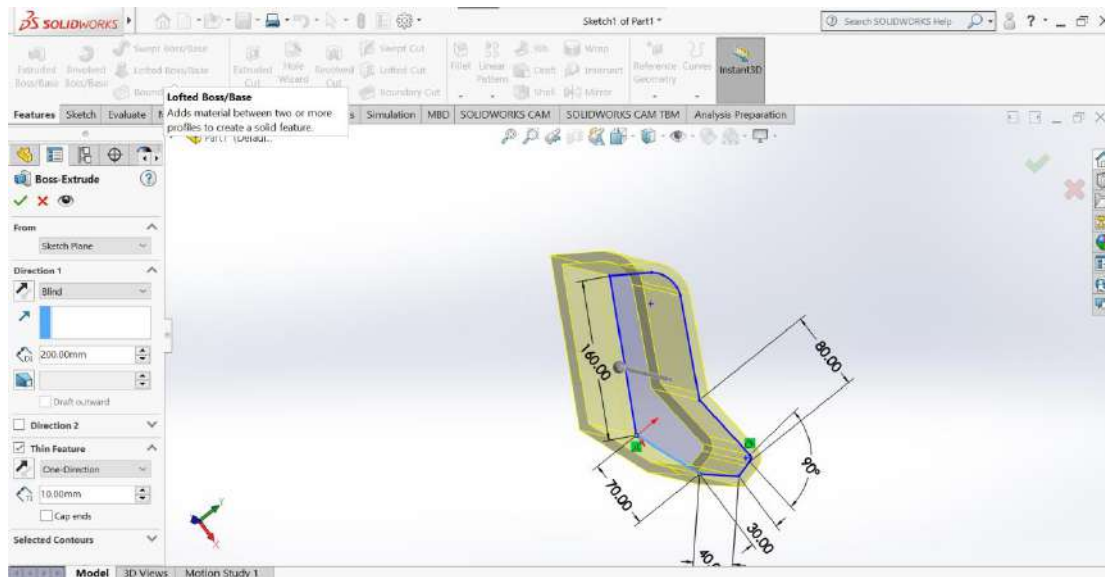
ILUSTRATION DESIGN 2

Finally I added a new plane at the end of the pivot to set an angle there as you can see in the illustration design right above.

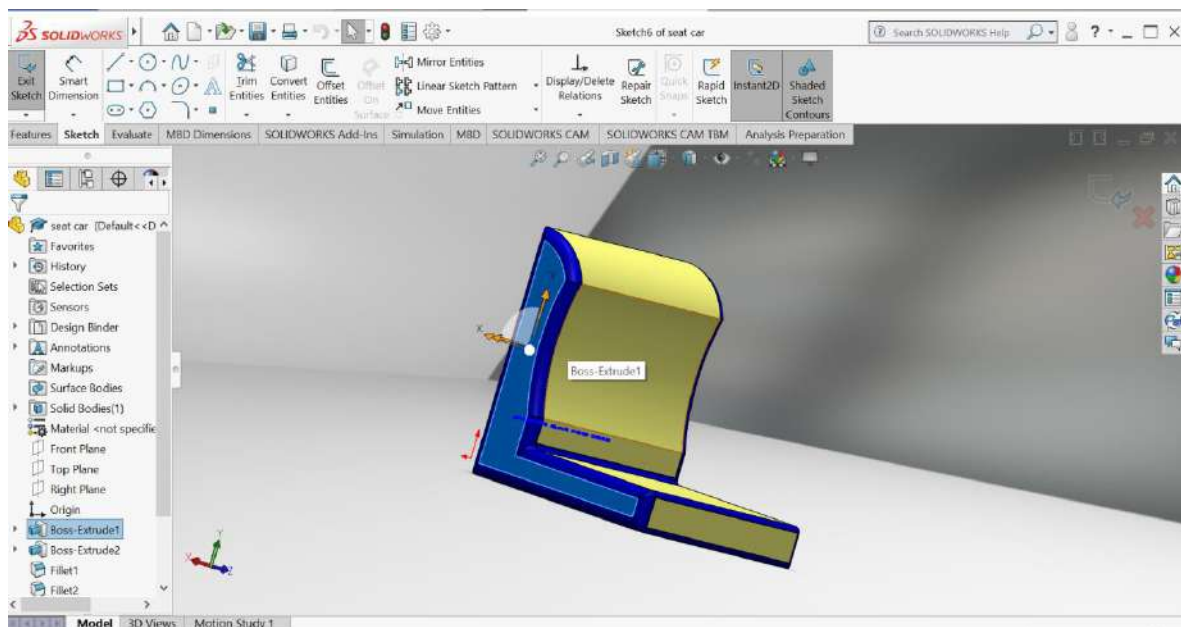
d) SEAT



IDEA DESIGN 4.1



IDEA DESIGN 4.2



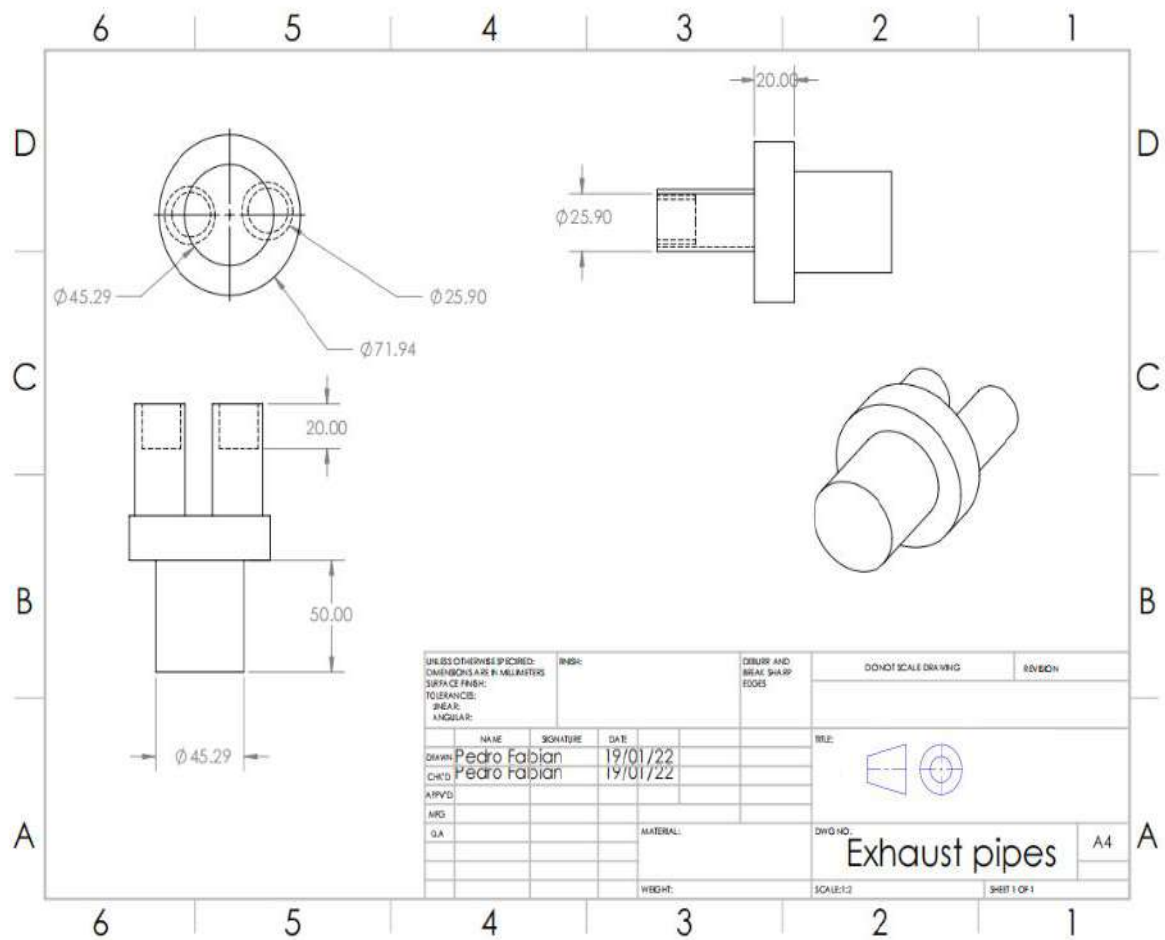
ILUSTRATION DESIGN

For the seat I used some tools such as “filled/round at the sides of the seat.

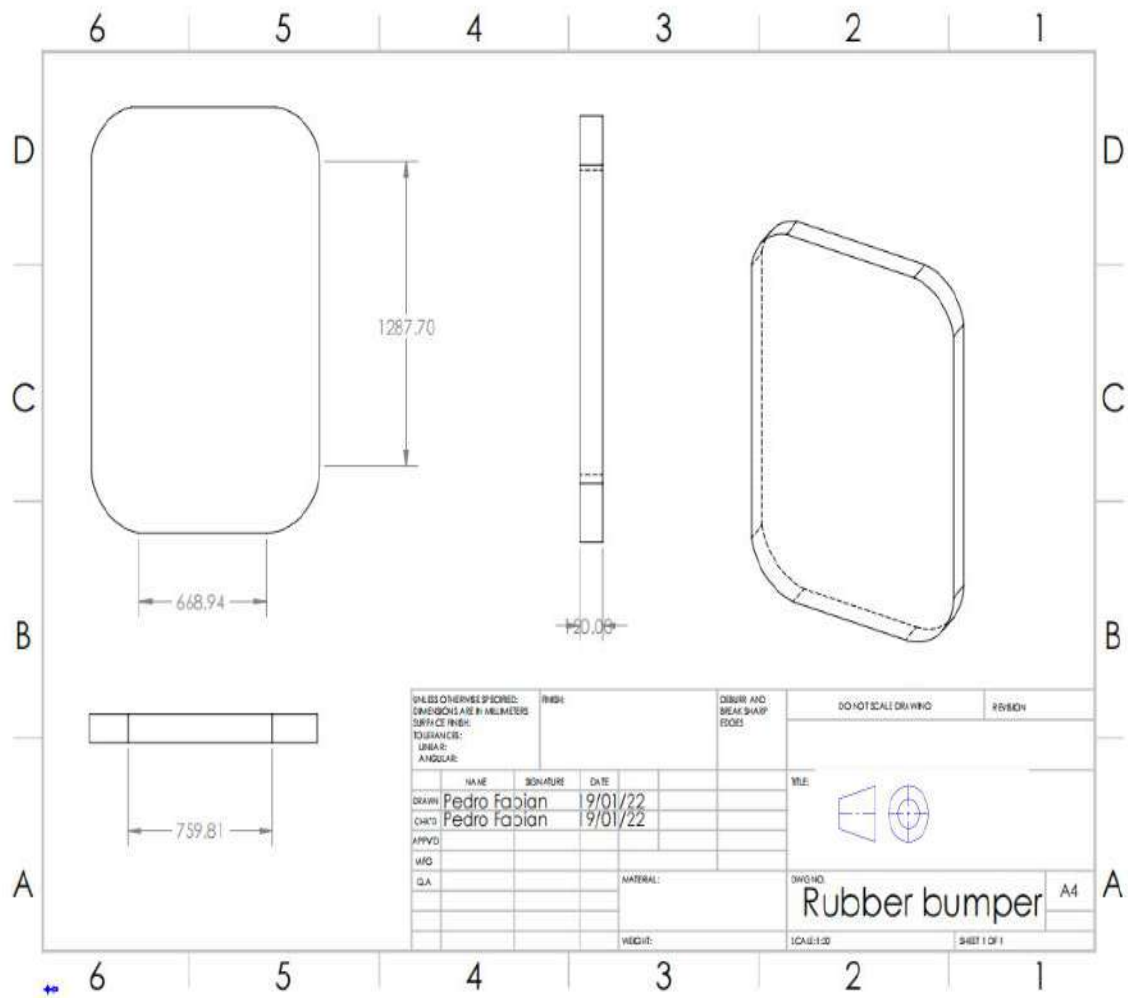
NOTE: I have used Solidworks for the components and with the help of some of the professor's videos as well as my own research I have done to successfully complete my components and thanks to some colleagues who have guided me in the process.

ENGINEERING DESIGN

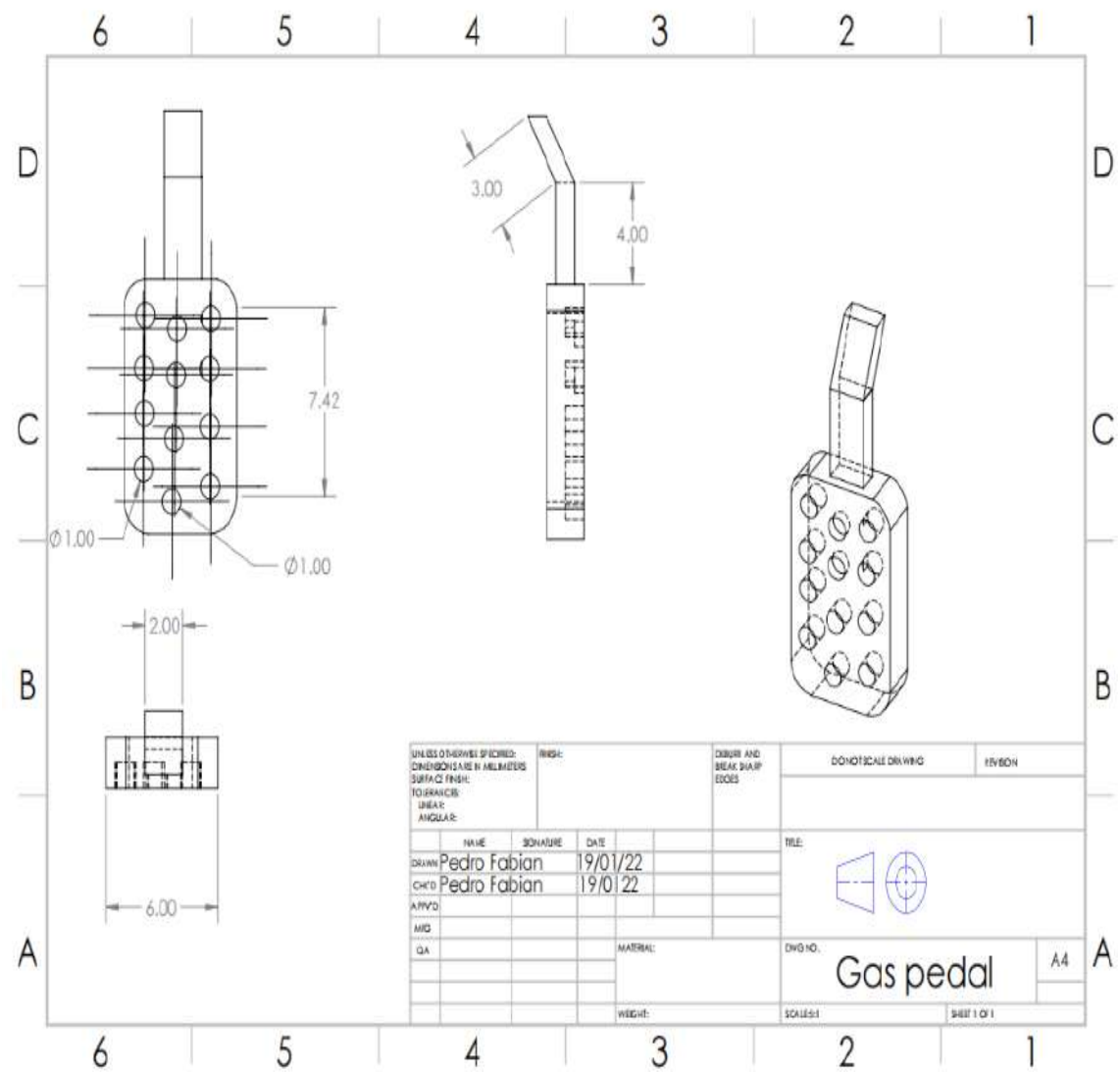
EXHAUST PIPES



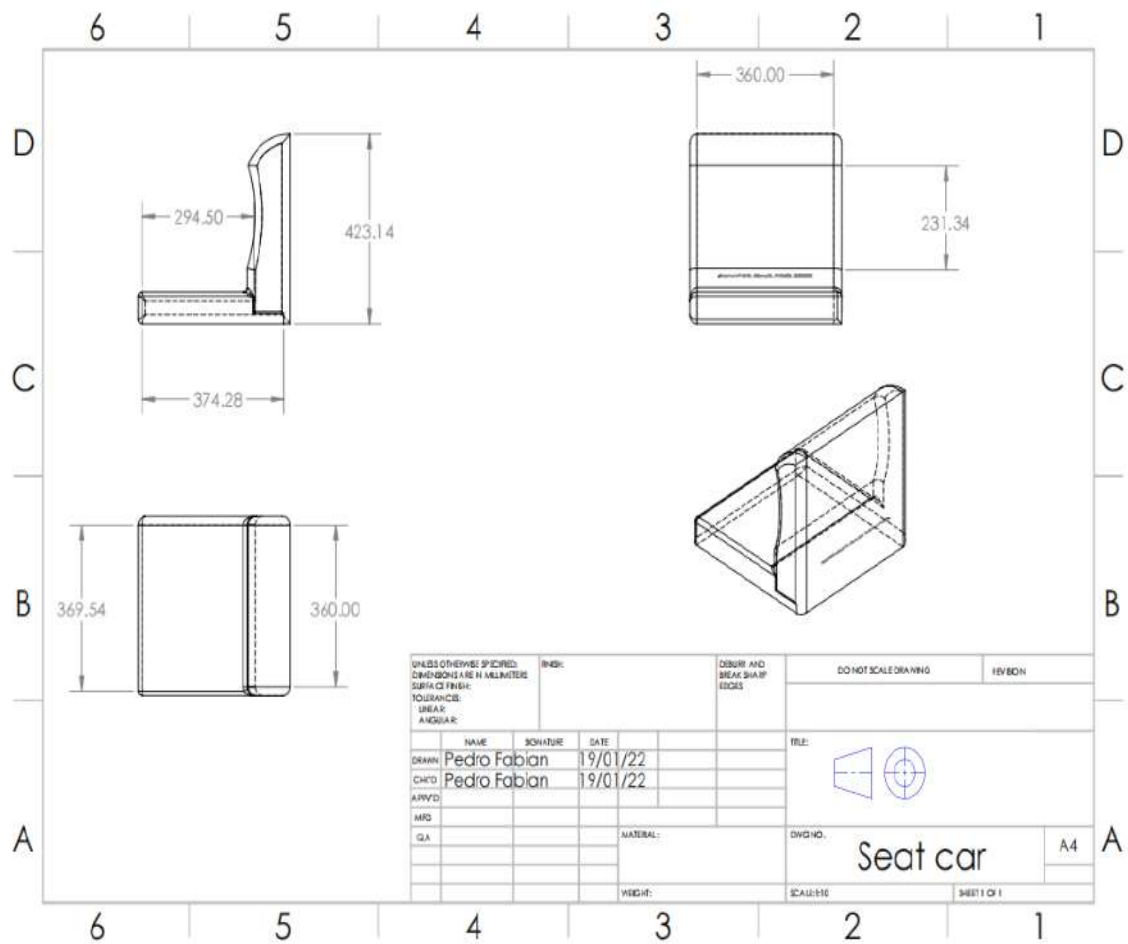
RUBBER BUMPER



GAS PEDAL



SEAT



DISCUSSION

Overall, this job was difficult for me at first because during the classes I was not practicing in SOLIDWORKS constantly enough to master and understand it. During the time with the group work and the good collaboration I have had with my group mates has motivated me a lot and has pushed me to start working and practicing a lot more in SOLIDWORKS and I can definitely say that I have gained a lot of knowledge and some skill using SOLIDWORKS. I hope to continue practicing it on my own in the following years for my own personal and professional development. The discussion has been very good with colleagues and very productive. There were some misunderstandings at times but we were able to coordinate with each other to complete the work.

CONCLUSION

In conclusion I would like to thank the professor and my classmates once again for their time and for having influenced my life in a positive way.