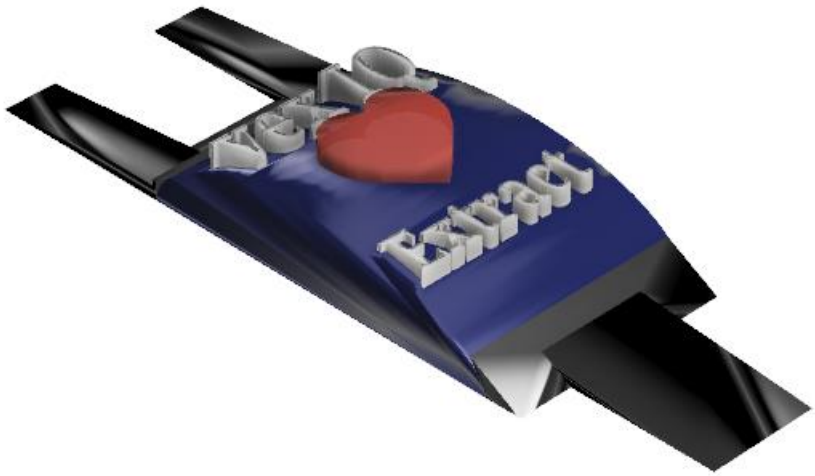


Make It Real CAD Engineering Challenge

VEX IQ EXTRACT DRIVER

Vex IQ Extract Driver helps to detach Vex IQ connectors, battery from brain and Battery lid.

Midnight Owls

Team - 86348K

THE CHALLENGE

One of the challenges that many teams have struggled with is detaching/ejecting, or taking out battery from the Vex IQ Brain. Detaching connectors is always a struggle.

Our team initially started using screwdriver for disconnecting. But we being kids, our parents were not comfortable we using the screwdriver always.

PROBLEM STATEMENT

While working with Vex IQ Robots we always struggle with detaching various connectors from the beams. Gears etc. Often time we our hurting our fingers, our thumbs while disconnecting connectors.

We have often also found ourselves in a situation where we are not able to eject/detach the battery from the brain.

We have a Vex IQ battery back, which uses AA battery, and often the back lid is stuck, and it's a pain to get the back lid, and then the batteries from the VEX IQ battery pack.

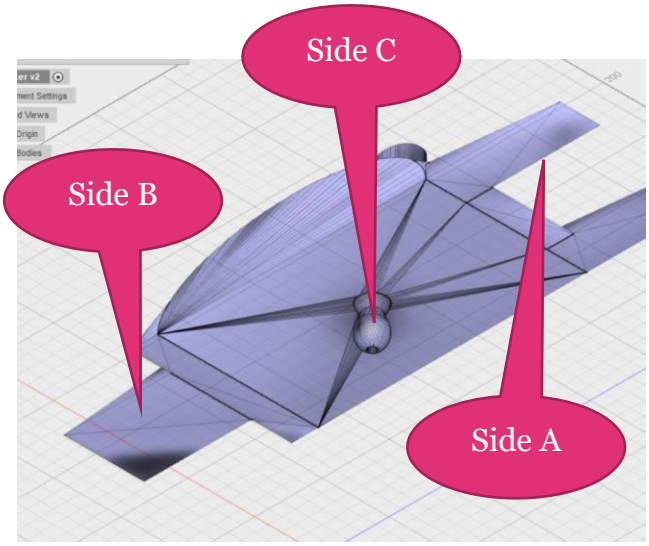
Following are main problems.

1. Injury Risk – We injured ourself with these tight connectors
2. Damage to parts - To much can break these parts.
3. Too much time – We spend lot of time in just detaching these parts.

PROBLEM WE FACED, AND ACTIONS THAT TRIGGERED THE SOLUTION

We participated in our very first vex competition last month. During competition our battery pack got stuck, which caused us to lose lot of time.

ABOUT OUR COMPONENT



Our component is intended to do multiple task.

1. Side A

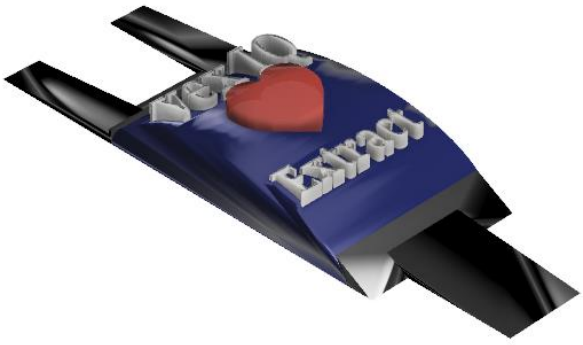
Side A have two prongs. And is used to easily eject or detach the battery from the brain.

2. Side B

Side B have one prong, this is used to easily detach the battery cover, this is also used for easily detaching the AA battery's from the battery holder.

3. Side C

This in the bottom of the component, and is used to detach connectors from the beams, and other vex parts.



The face of the components has embossed effect to provide grip.

SOFTWARE WE USED

We used Tinkarcad for initial designing, followed by Fusion 360 for rendering.

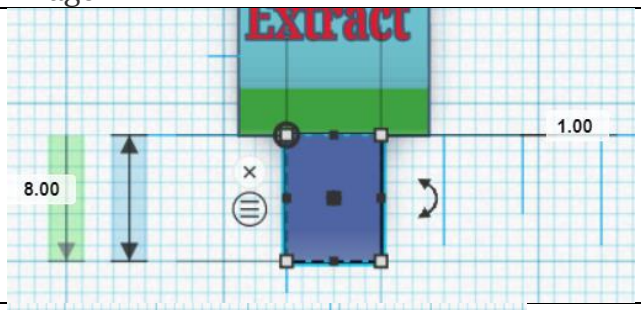
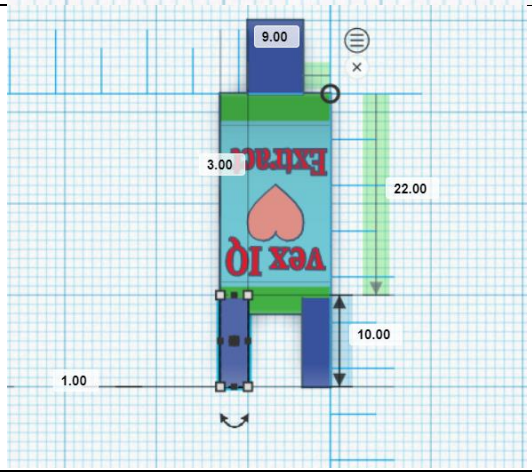
STEPS FOR DESIGNIG

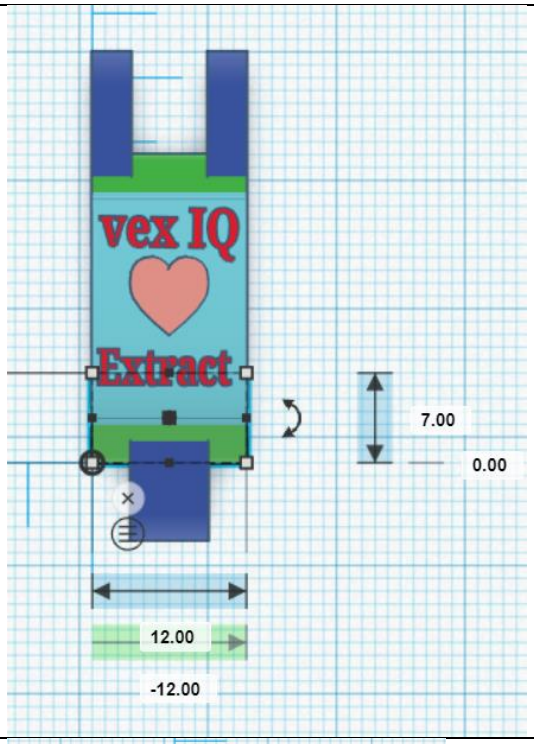
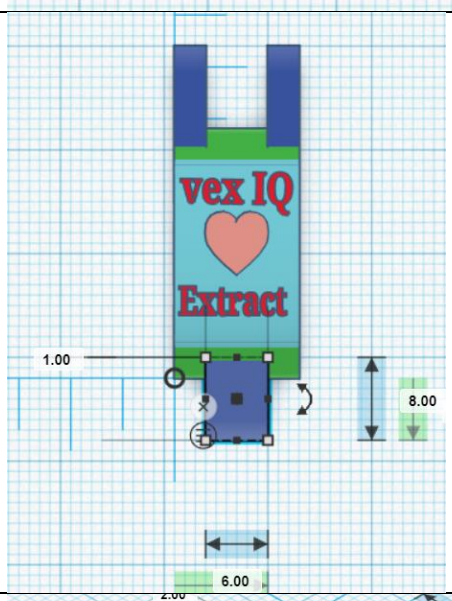
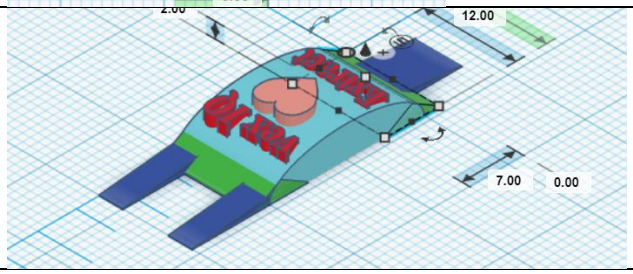
First, we saw videos on YouTube to understand Tinkercad, and we found it to be really intuitive and easy.

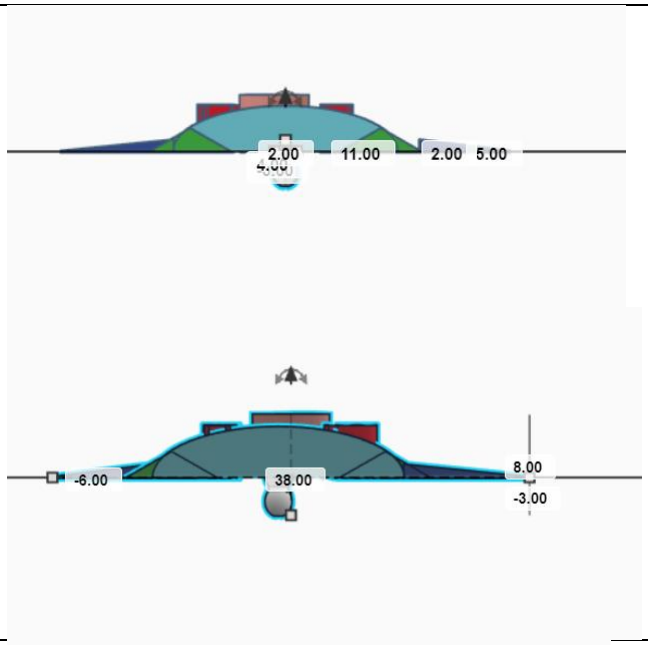
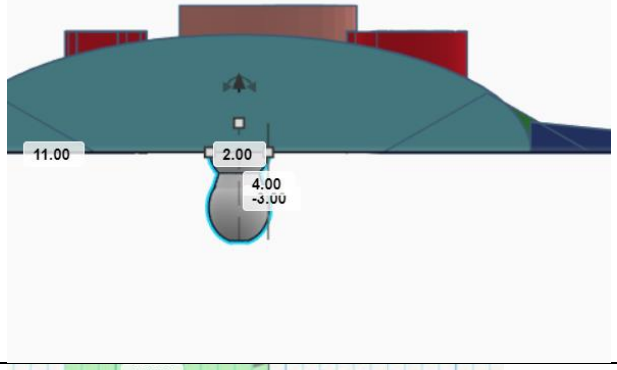
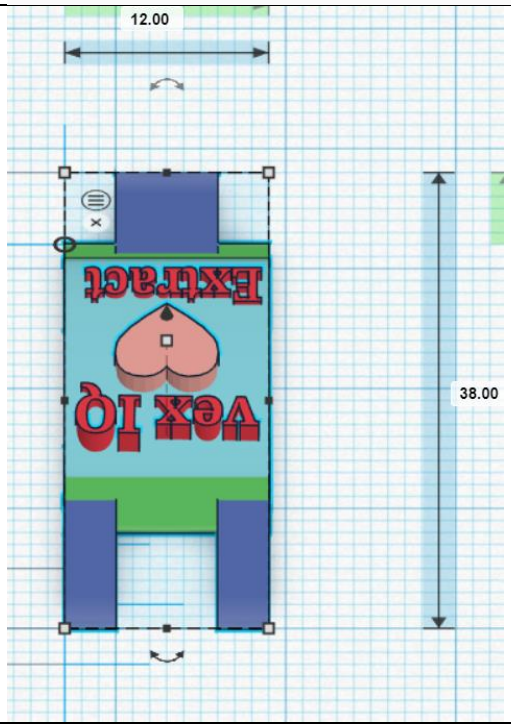
We followed the following steps –

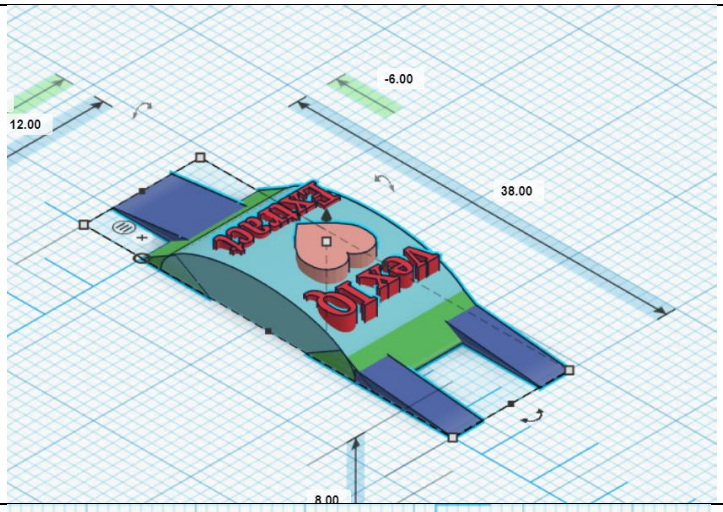
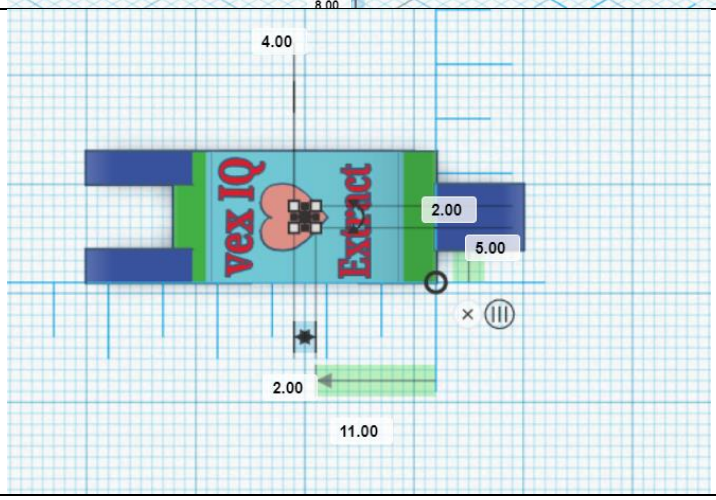
- Measured the specifications
  We measured the specifications on the existing battery back, and connectors
- Validate our Specifications
  We measured our Specification using the VEX CAD files using Snapcad
- Create Account
  Firstly we created our user account. This will allow us to save our designs.
- We sketched our design on paper
  This was done by the entire team to get the basic sketch.
- We added the design specifications
  We then added the design specifications, and measurements on our paper sketch.
- Create a Shape
  We then started by picking the basic shapes from the geometric drop-down menu. Then we increase or decrease the size of the shape, based on our design specifications
- Added Multiple Shapes
  We added multiple shapes as part of our design.
- Place Roof
  We placed roof of different kids on the workspace.
- Add Connector
  We also used ball angled connector
- Finalize Your Build
  We change the viewing perspective so that we can clearly see our design from different side.
- Rendered the design in Fusion 360
  We rendered the final design in Fusion 360

DESIGN SPECIFICATIONS

Sno	Image	Description
1		Side A Height 8mm
2		Main Body Length – 22 MM

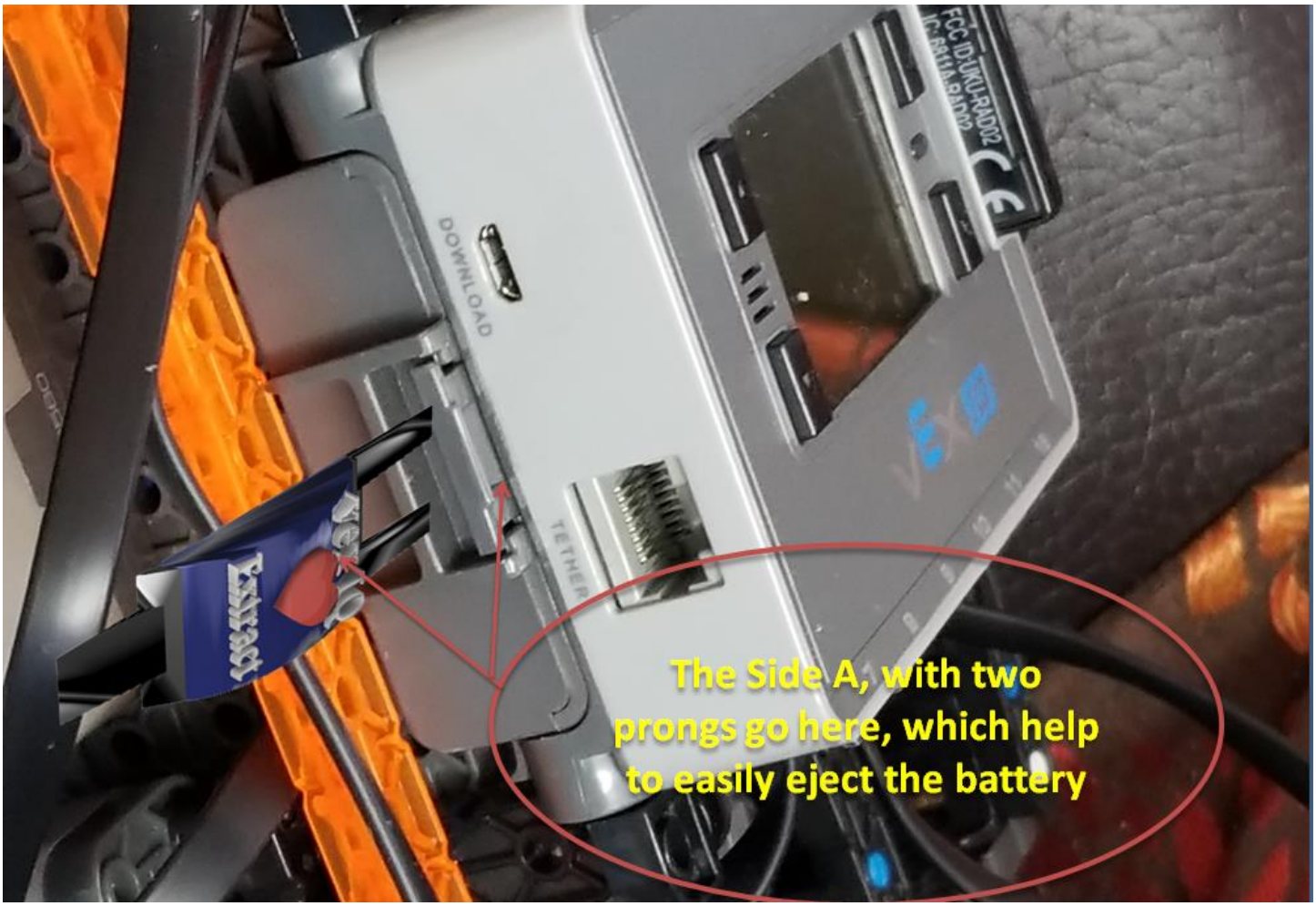
3		Main Body Width – 12 MM
4		Width of the Prong on Side B 6 MM
5		Distance from the lable to the edge 7mm

6.		Part C Width at the base – 2mm Distance from base to the botton 3mm
7		Total Prong width – 4mm
8		Total Specifications Length – 12mm Width – 38 mm Height – 9 mm

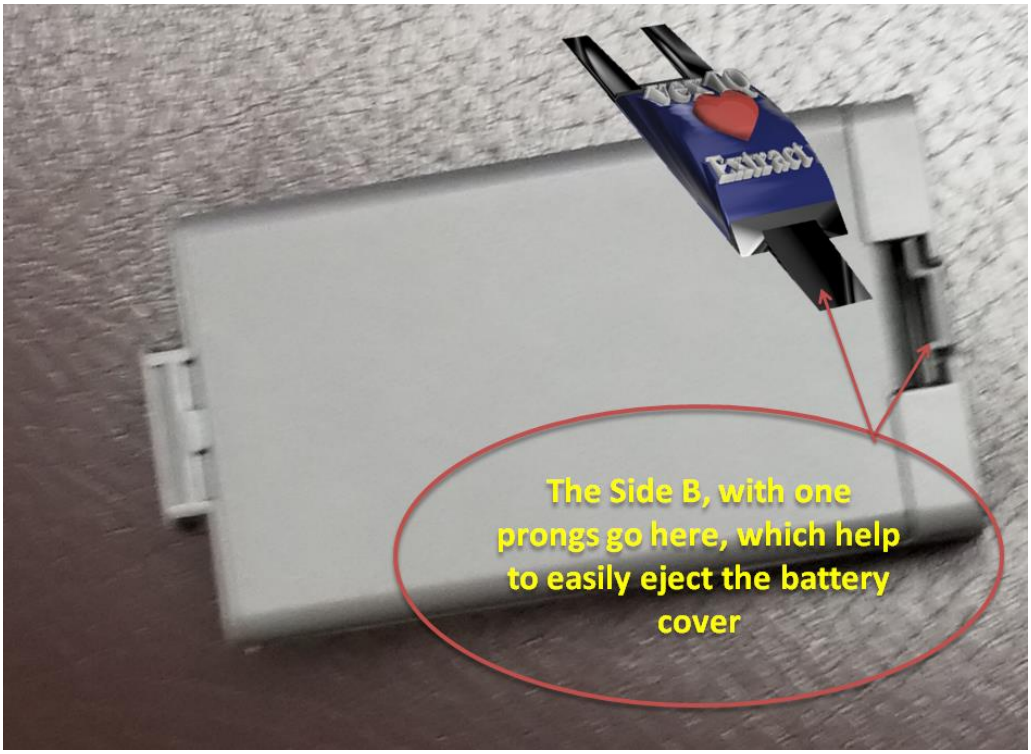
9		Side B Length 6 MM Width – 3 MM Height – 2 MM
10		Center Heart – 4 MM

HOW THE COMPONENT WORKS

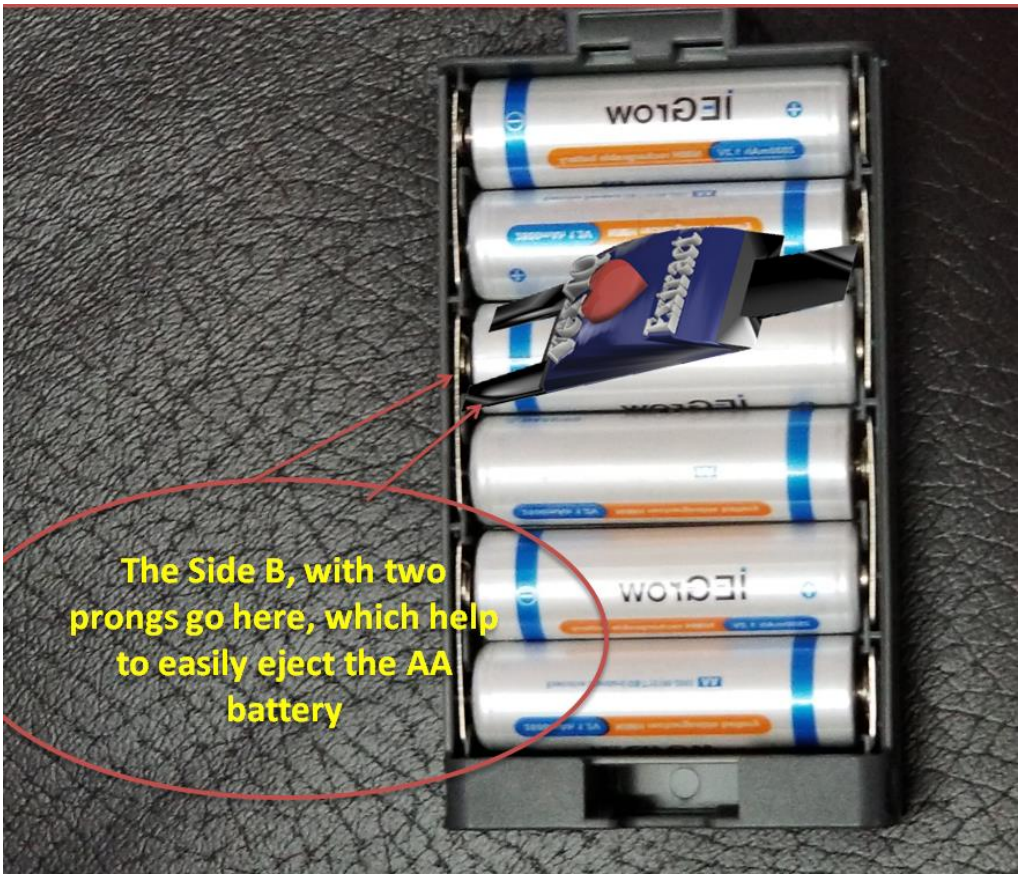
Option 1



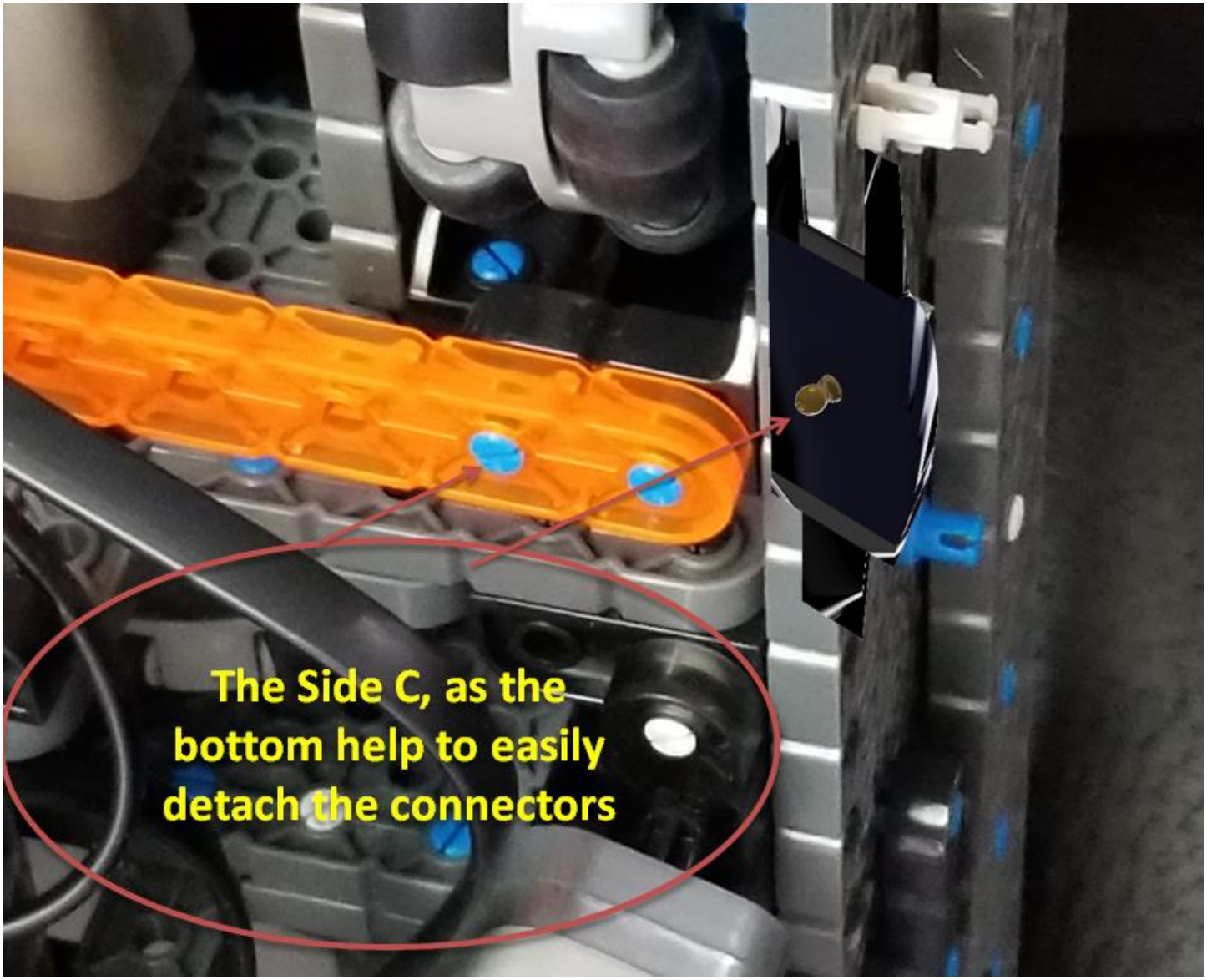
Option 2



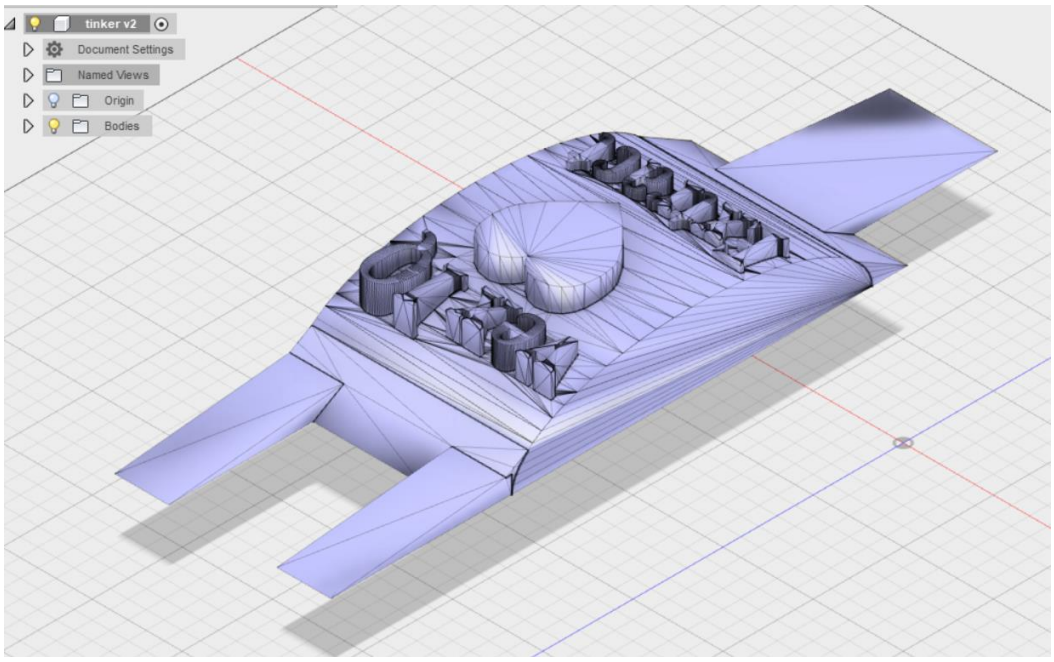
Option 3

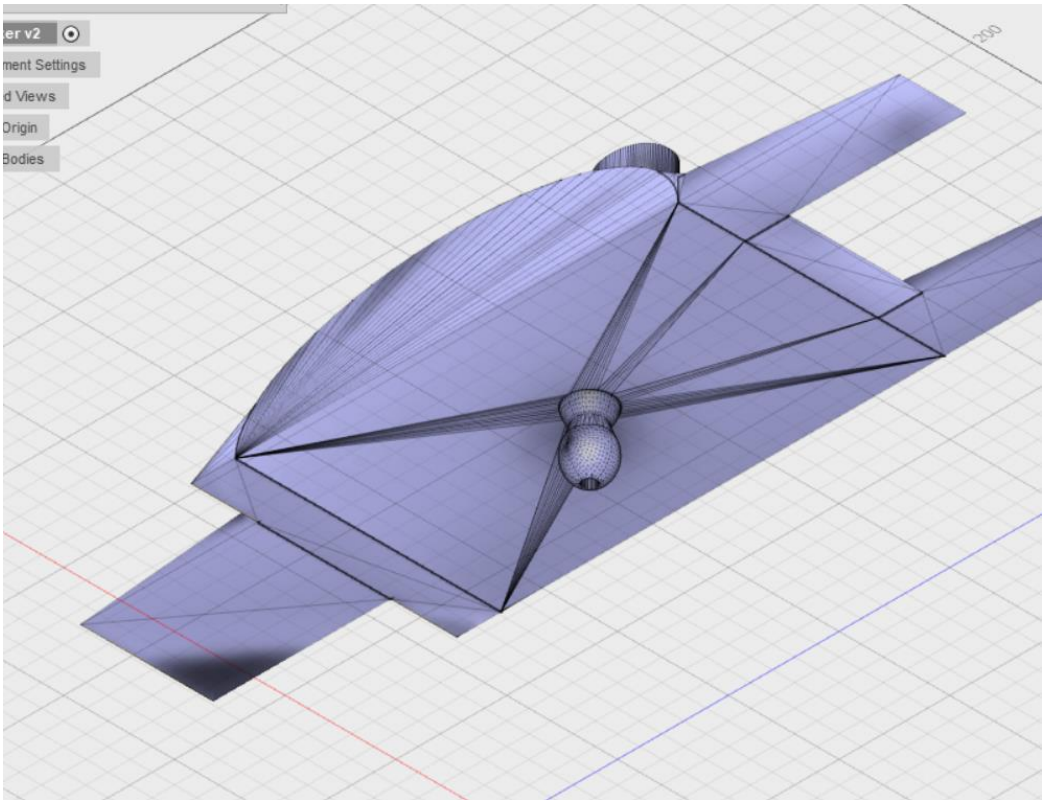


Option 4

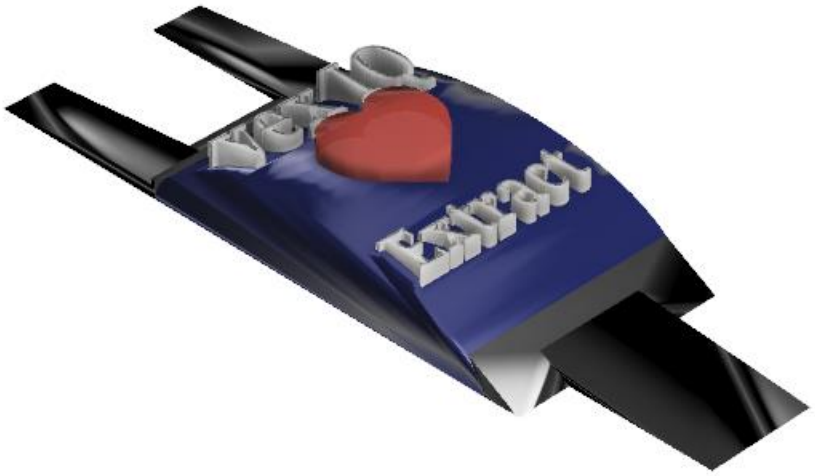

The Side C, as the bottom help to easily detach the connectors

RENDERED IMAGES

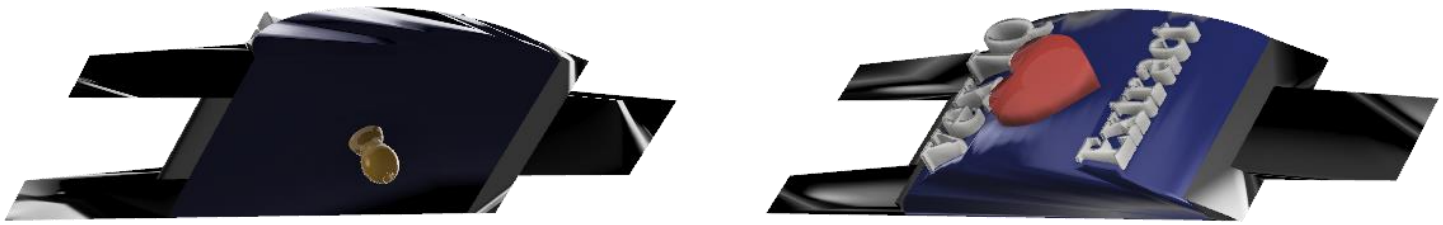





vex IQ
Extract


vex IQ
Extract


vex IQ
Extract


Vegemite
Extract