Portfolio Publication 1
Gimble Parametric Modelling Process

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DESP3000

Reference Geometry and Solidworks discipline.

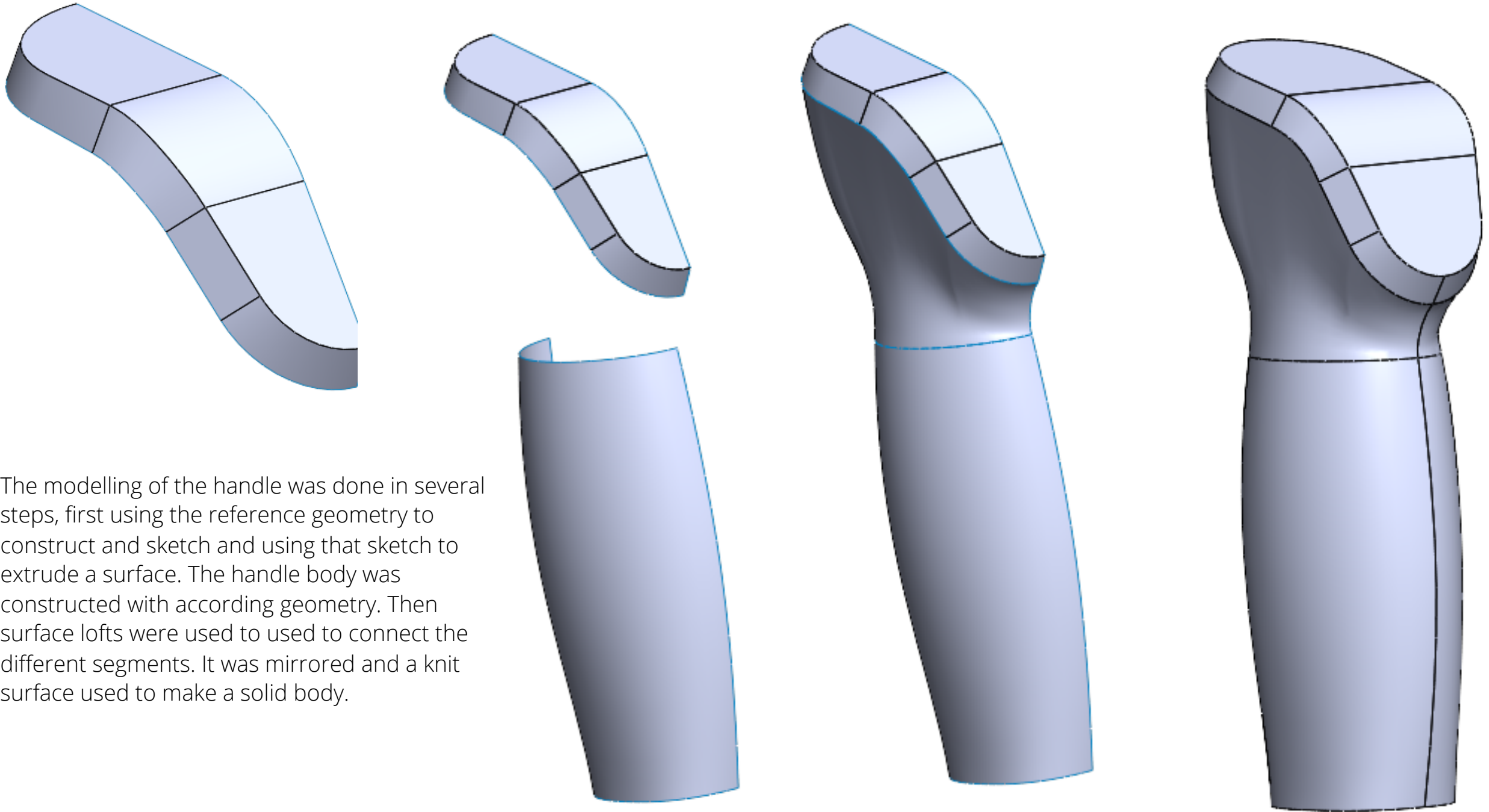- ▸ 📁 REFEERENCE GEOMETRY
- ▸ 📁 HANDLE
- ▸ 📁 PIVOT BOSS ARRAY TASK
- ▸ 📁 HANDLE ADDITION
- ▸ 📁 PIVOT -HANDLE
- ▸ 📁 STEM
- ▸ 📁 STEM CAP
- ▸ 📁 ARM
- ▸ 📁 PHONE MOUNT
- ▸ 📁 INTERNAL FEATURES (Handle)
- ▸ 🔷 Handle Cap Body
- 📄 Plane16
- ▸ 🔷 Internal Rib
- ▸ 📁 Button Insert
- ▸ 📁 Trigger
- ▸ 📁 Phone Grips
- ▸ 📁 Overmoulding handle
- ▸ 📁 Additional Fillets
- ▸ 📁 Lip and Groove v2
- ▸ 📁 Additional Details
- ▸ ◻ Gimbal Stand
- ▸ 📁 Gimbal Pivot Points
- ▸ 📁 Handle Snap Hooks

The modelling process beings with reference geometry. An image helps to plan and correctly align the main structure of the model.

Working in a disciplined manor within Solidworks allows for an ease when it comes to collaborative modelling. Having the different modelling elements clearly marked and sorted allows for an easier collaborative experience.

HANDLE FORM RH PLANE
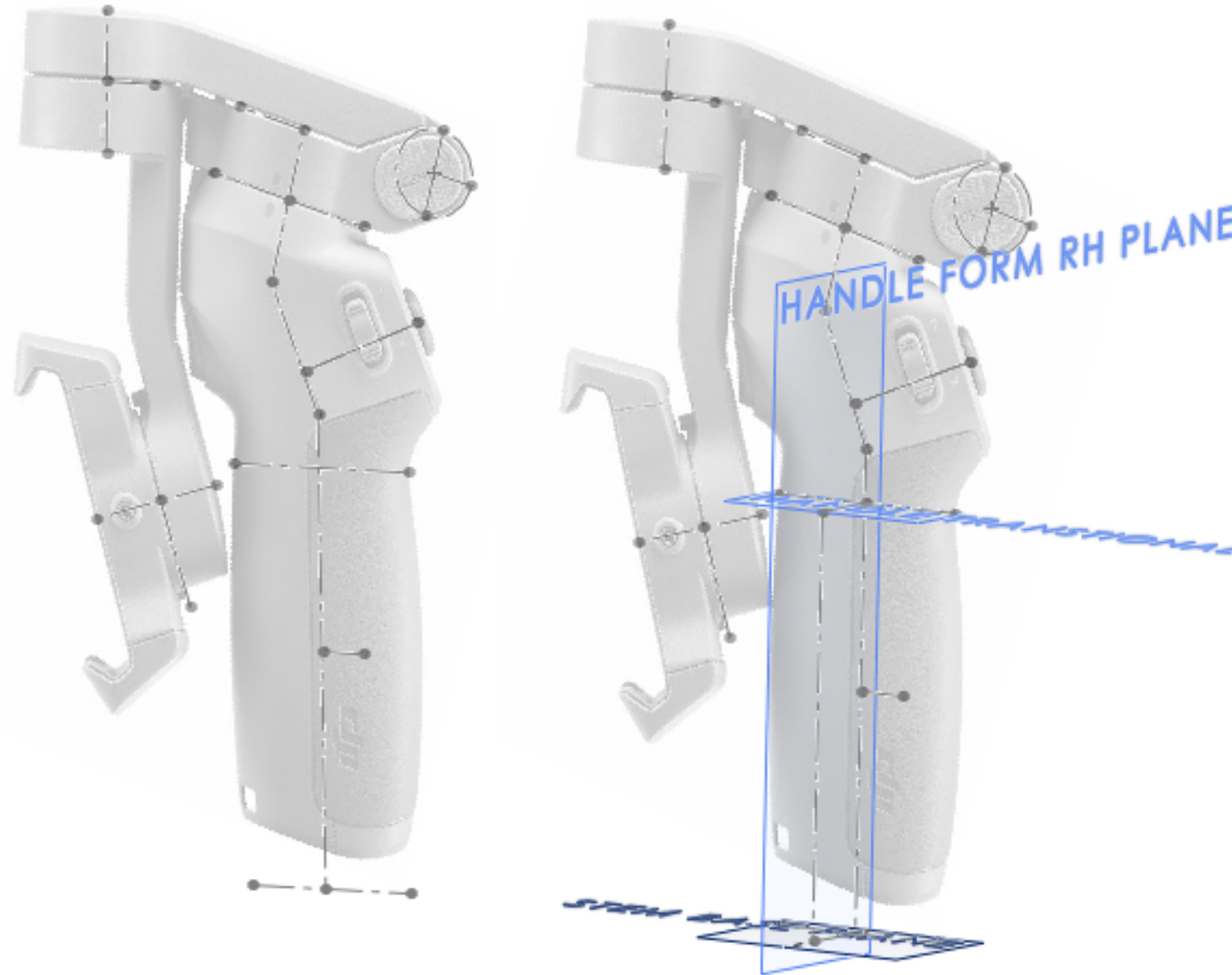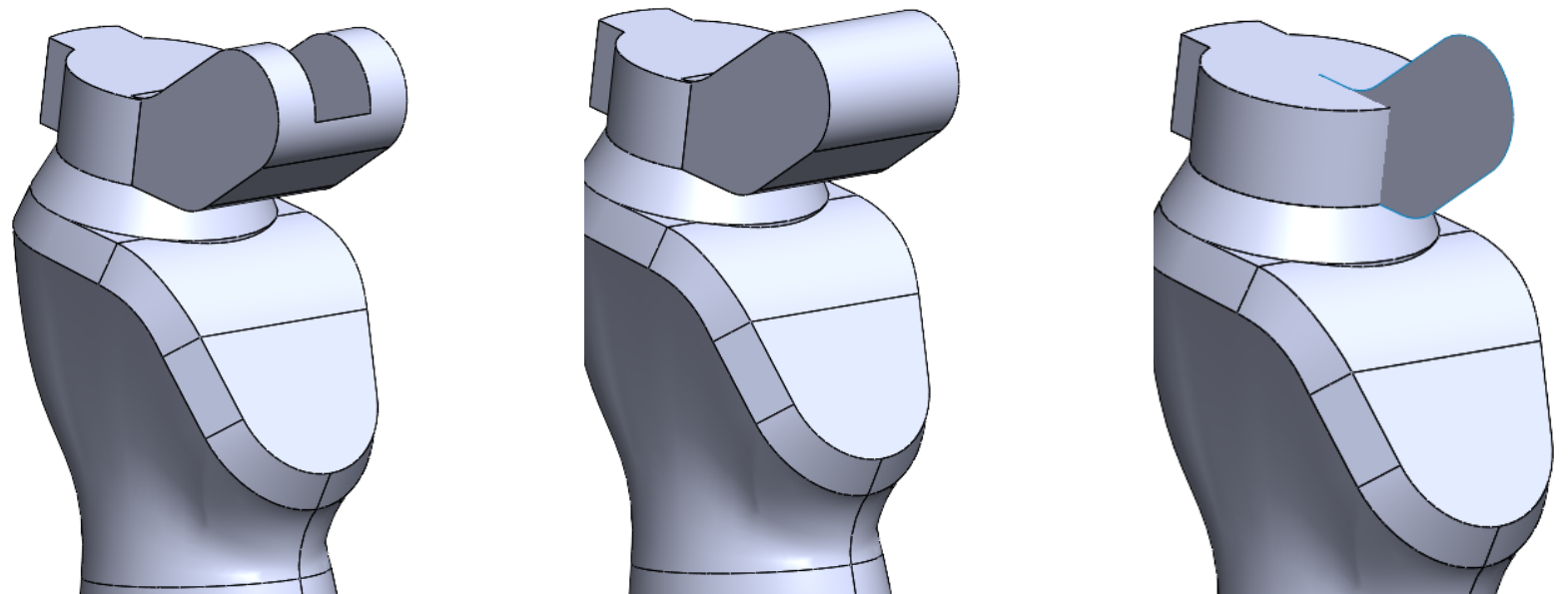
Handle surface modelling.

The modelling of the handle was done in several steps, first using the reference geometry to construct and sketch and using that sketch to extrude a surface. The handle body was constructed with according geometry. Then surface lofts were used to used to connect the different segments. It was mirrored and a knit surface used to make a solid body.

# Arm Base modelling and construction.
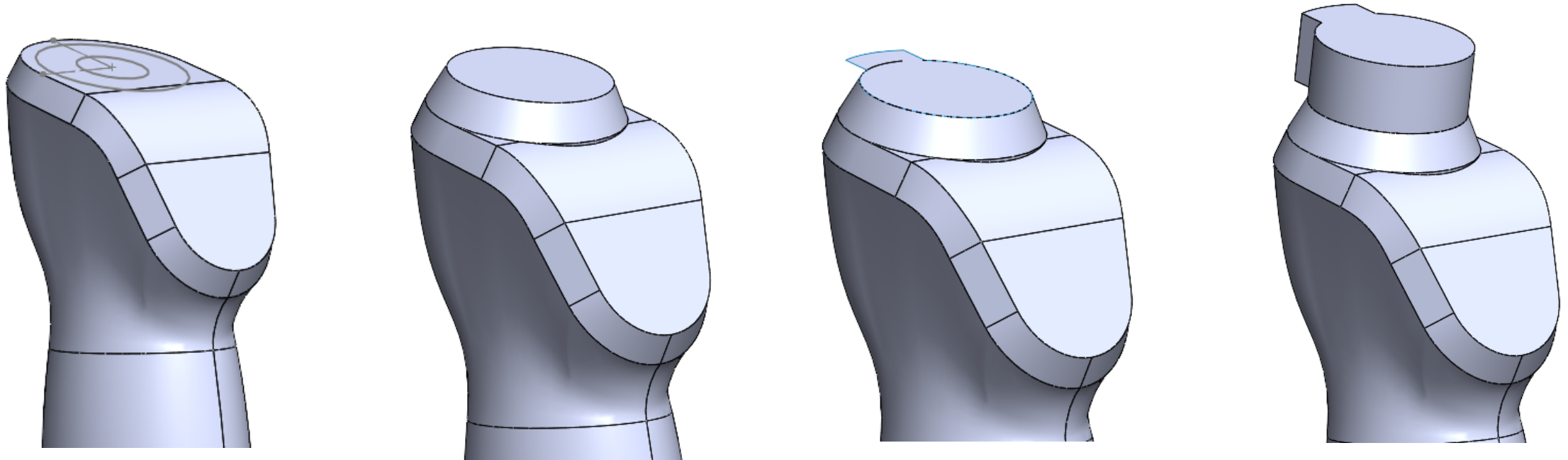
The arm base was constructed by sketching out the desired shape, using the planar surface tool then using the thicken tool to make it a solid body. I then repeated the previous steps of sketching making a surface to create the body of the arm end. I used the cut extrude tool along with a sketch to cut out the attachment for the mid arm component.
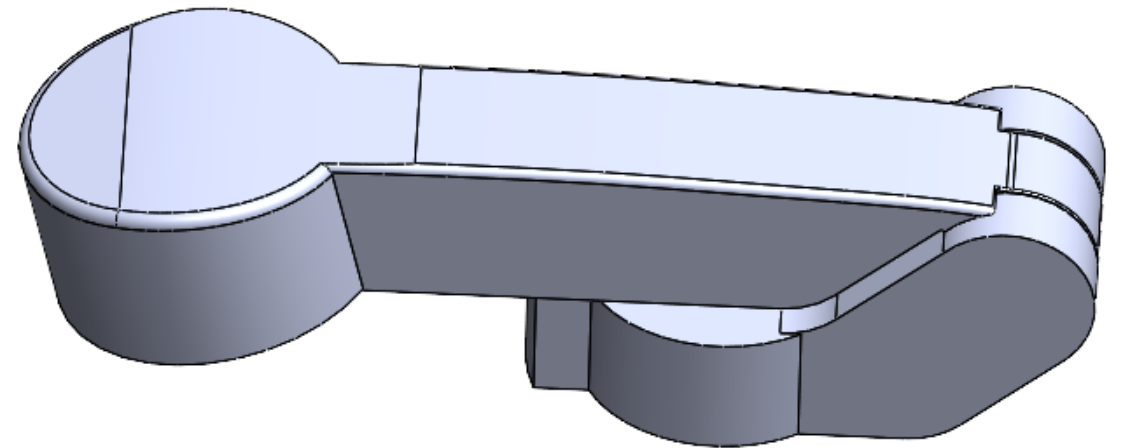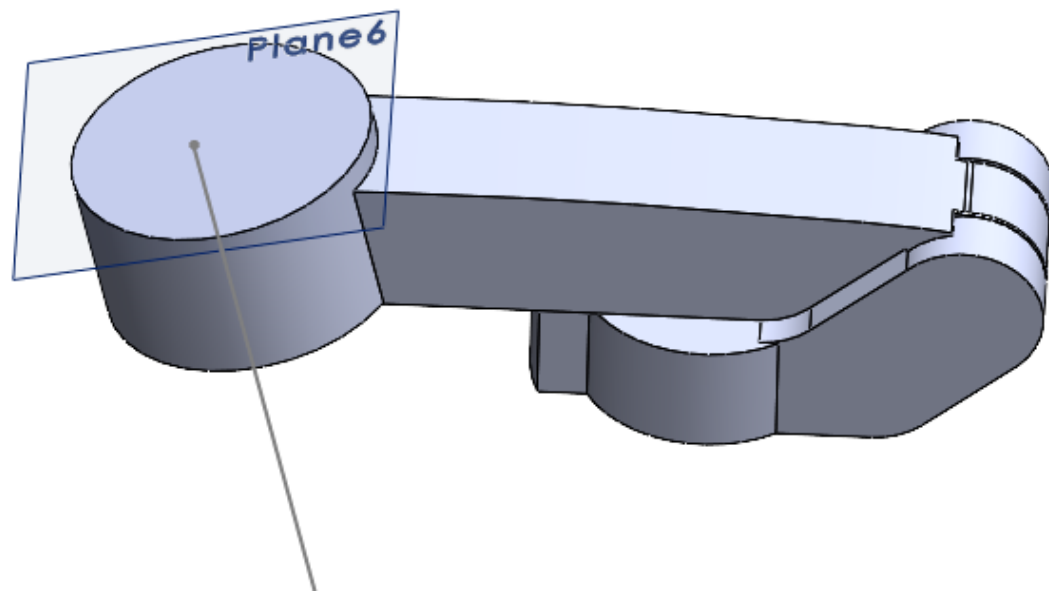
Arm mid surface modelling.
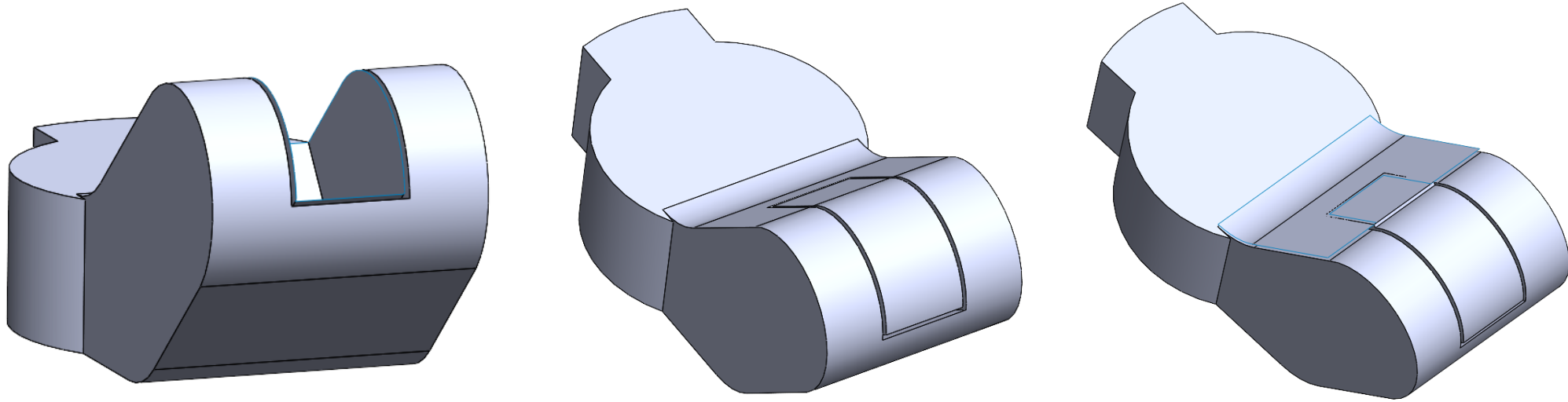
The mid arm component was constructed by using the surface offset tool to get the shape of external end arm correct. Then I used a sketch along with the planar surface tool to construct the mid arm body, then the knit tool was used to make this a solid body.
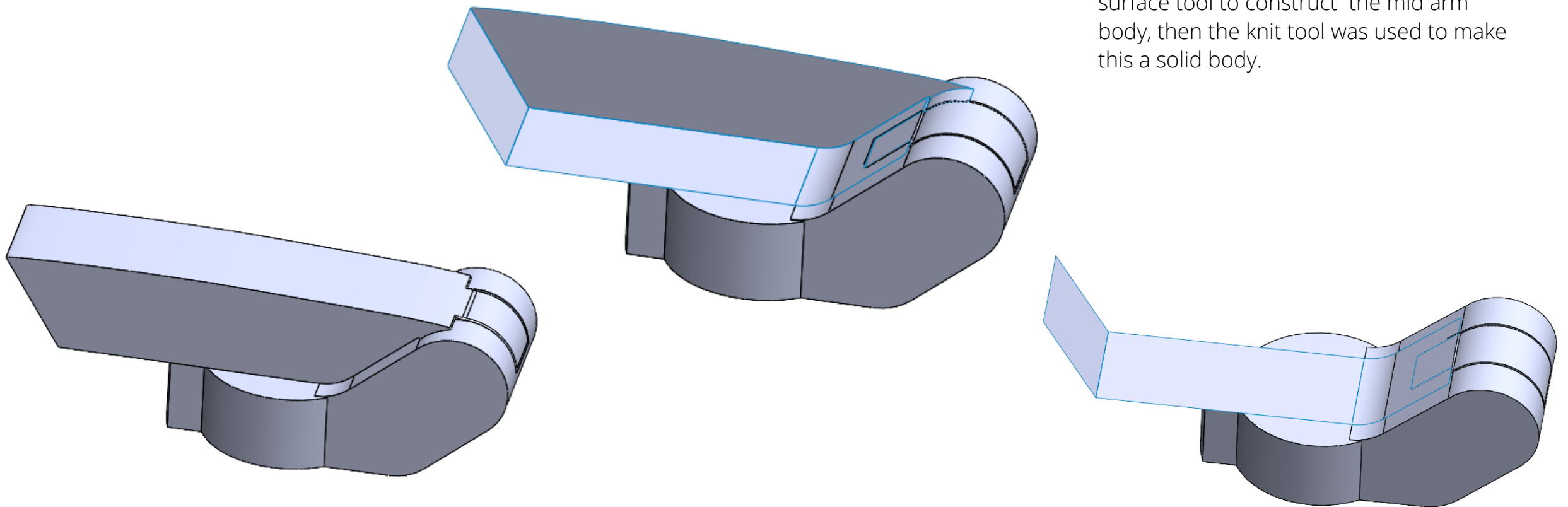
Arm mid pivot attachment.

The mid arm pivot attachment which links the mid arm to the arm end, this was done by making a plane perpendicular the line which is going to be the angle which the arm end sits at. Then I sketched a circle onto this plane and used boss extrude to make a solid body. A cut extrude was then used to make this attachment blend with the arm mid body. Fillets were added to finish this component.

Arm end modelling and surface modelling.
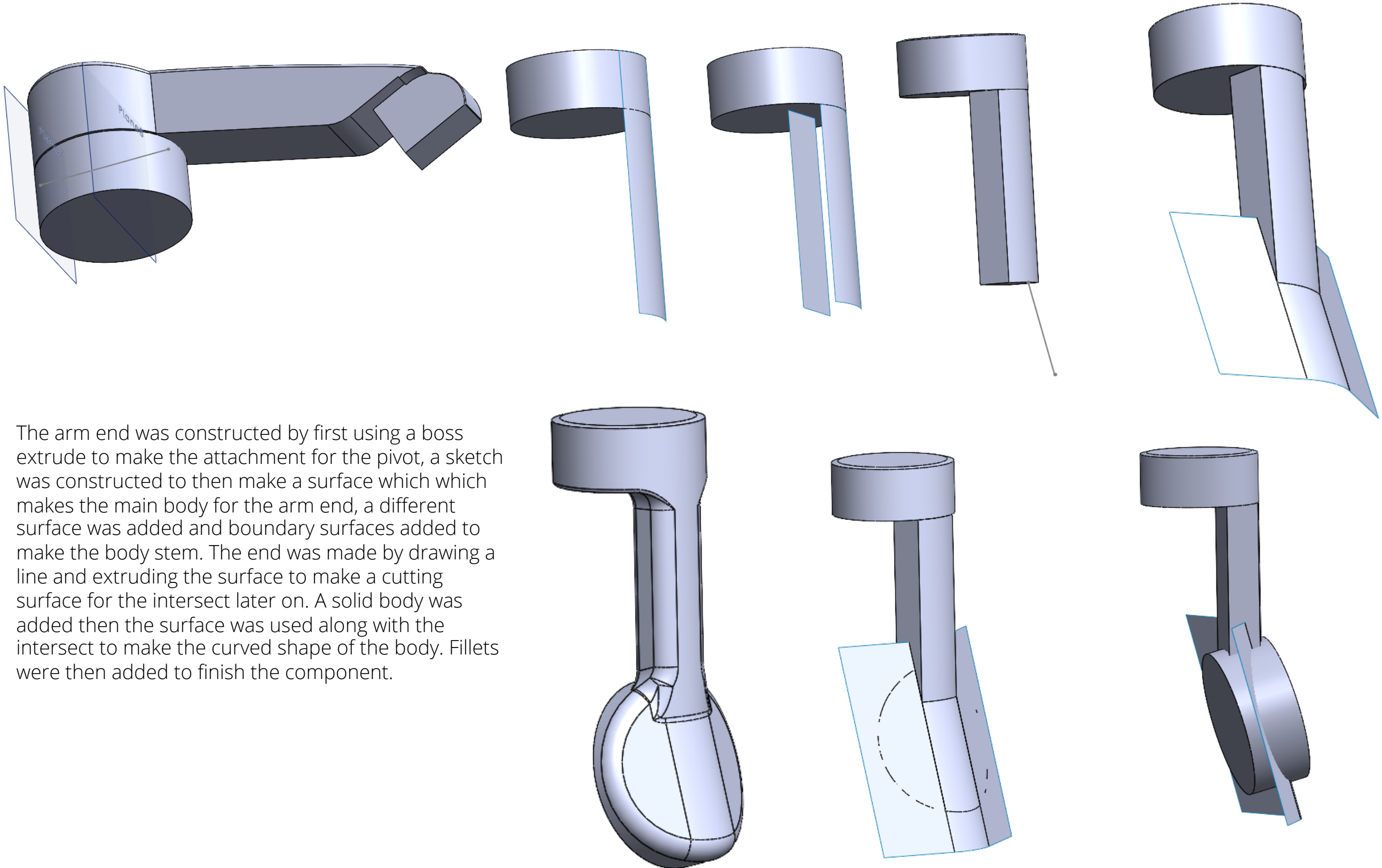
The arm end was constructed by first using a boss extrude to make the attachment for the pivot, a sketch was constructed to then make a surface which which makes the main body for the arm end, a different surface was added and boundary surfaces added to make the body stem. The end was made by drawing a line and extruding the surface to make a cutting surface for the intersect later on. A solid body was added then the surface was used along with the intersect to make the curved shape of the body. Fillets were then added to finish the component.
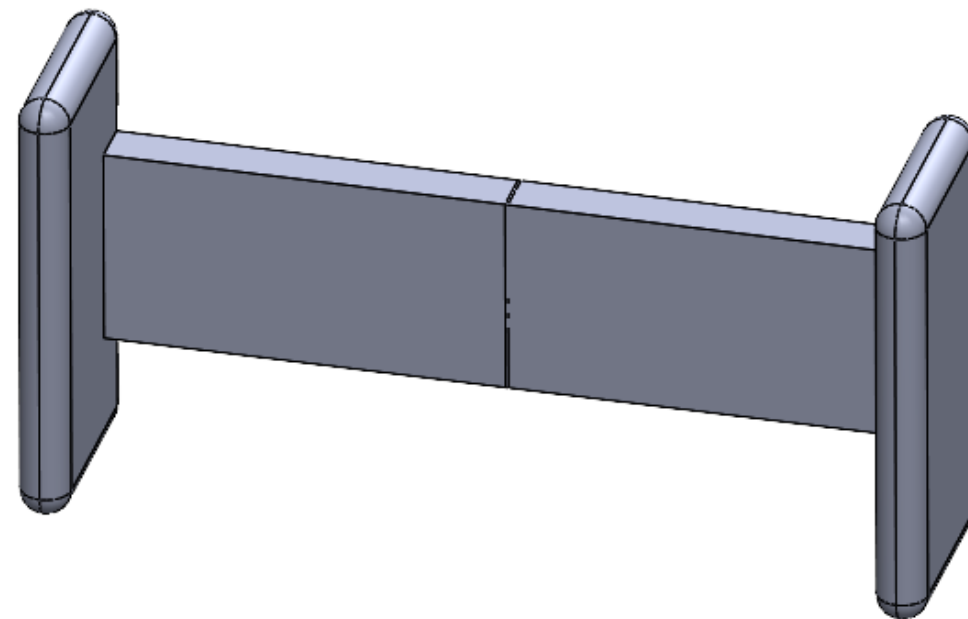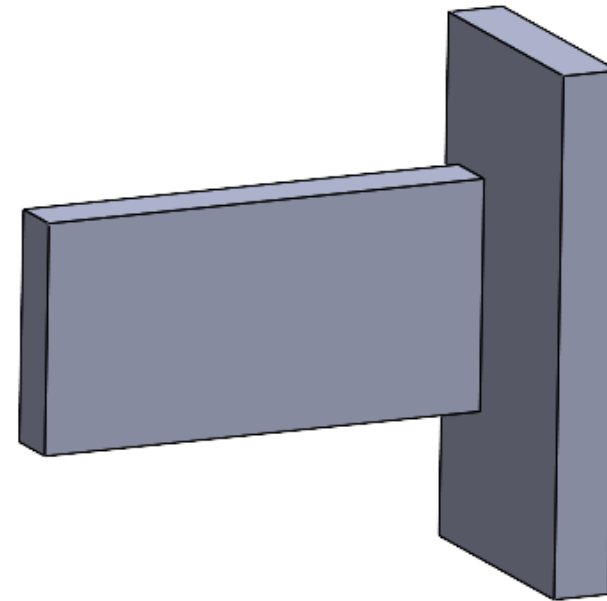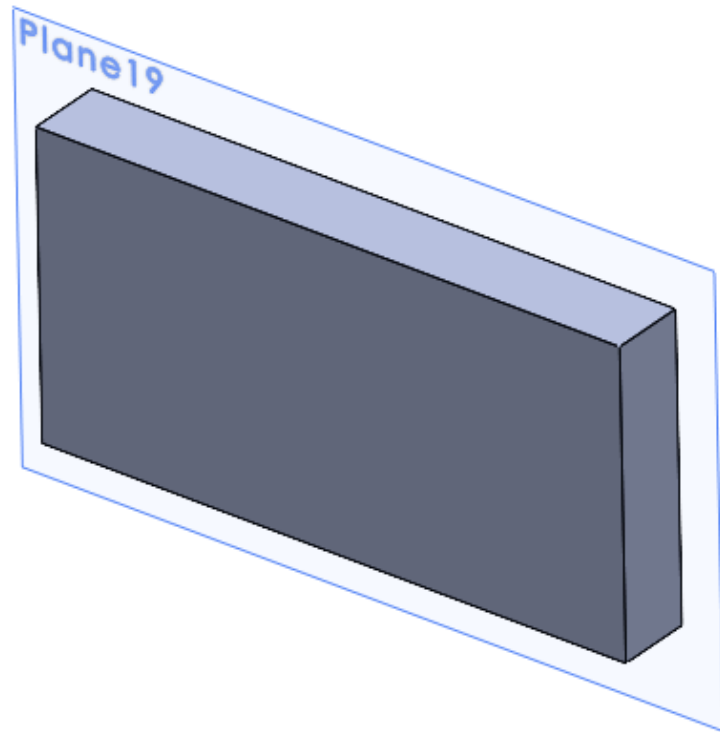
Phone grip base modelling.
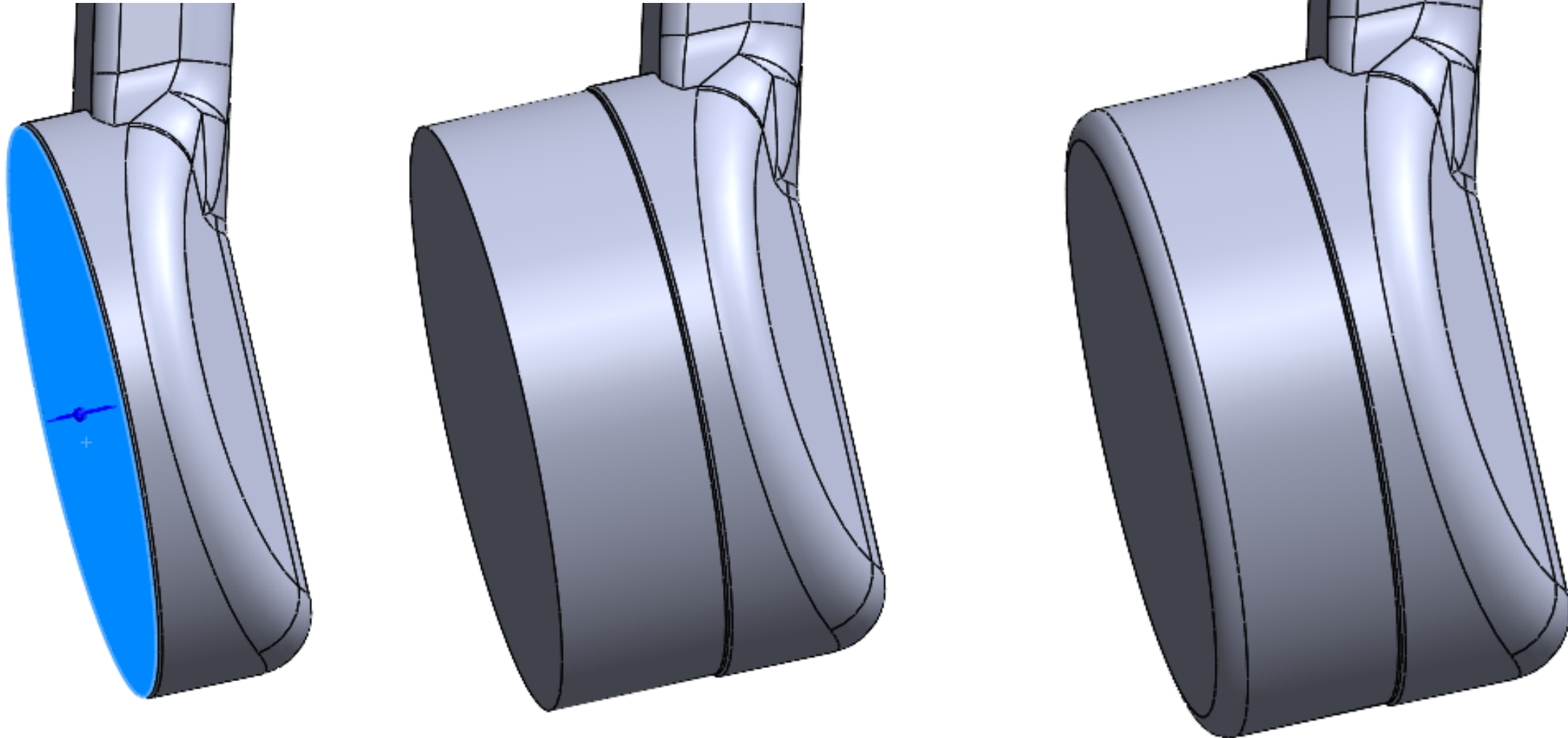
The phone grip base was made by offsetting the surface of the arm end, this offset surface was thickened and fillets were added to finish it. Offsetting the surface allows the component to stay consistent with the other component.
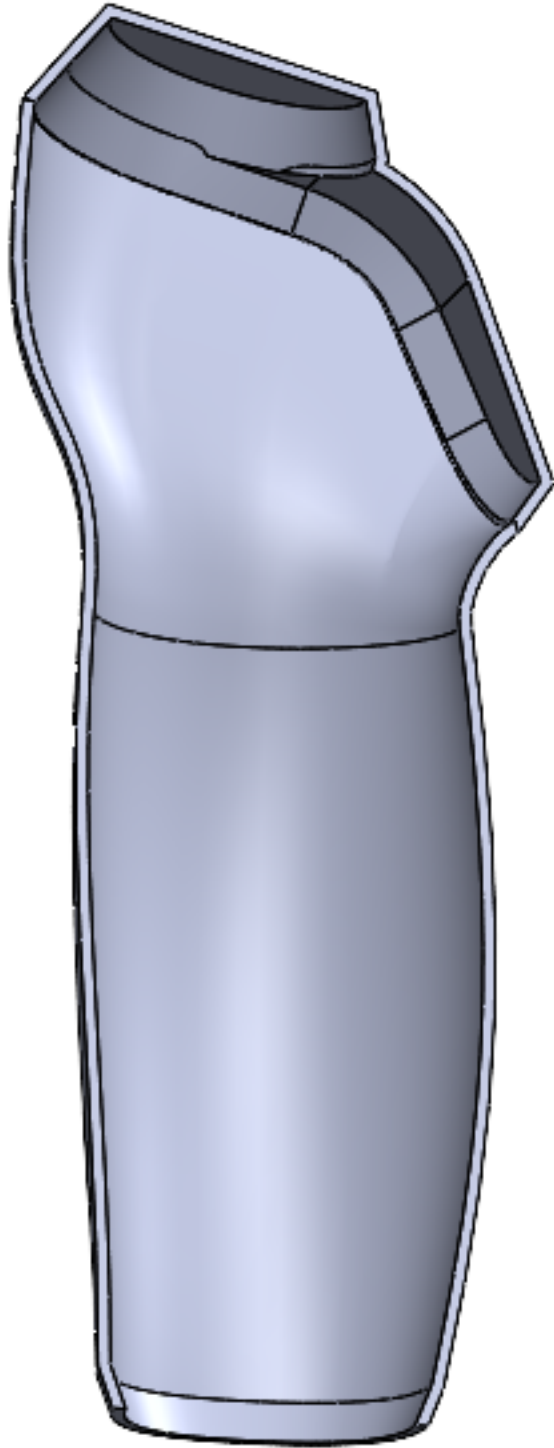
Phone grips modelling.

Plane19

The phone grips were constructed by adding a plane parallel with the phone base, so that the angle of the phone grips were the same, some boss extrudes were done to construct the main grips, fillets were added to give a better shape. This component was mirrored to add the left grip.

Shell and Trigger assembly.

The main body was shelled to allow the trigger surround to be formed. A plane was constructed with a line on the front plane which determines the angle of the angle of the surround. A sketch was then drawn on this plane and and a body extruded to make the main trigger surround. It was then intersected to merge with the handle body. Chamfers were added to make the surround blend better with the body.
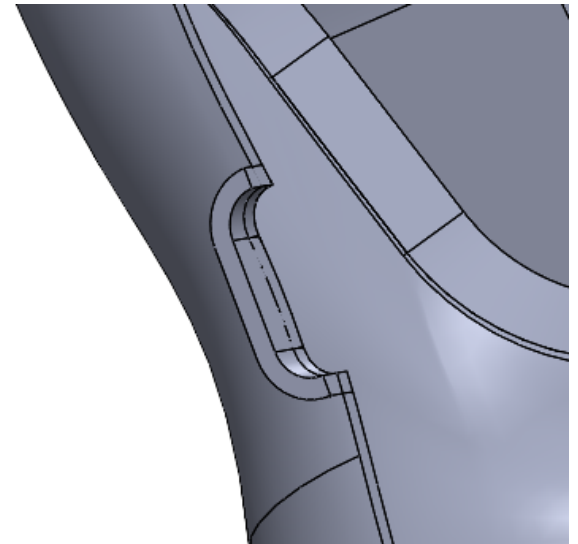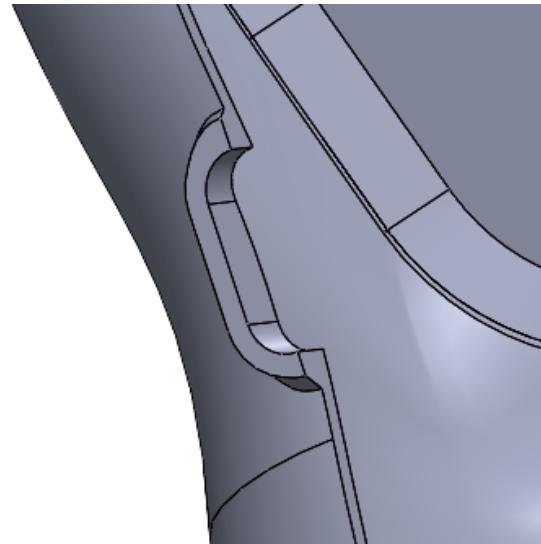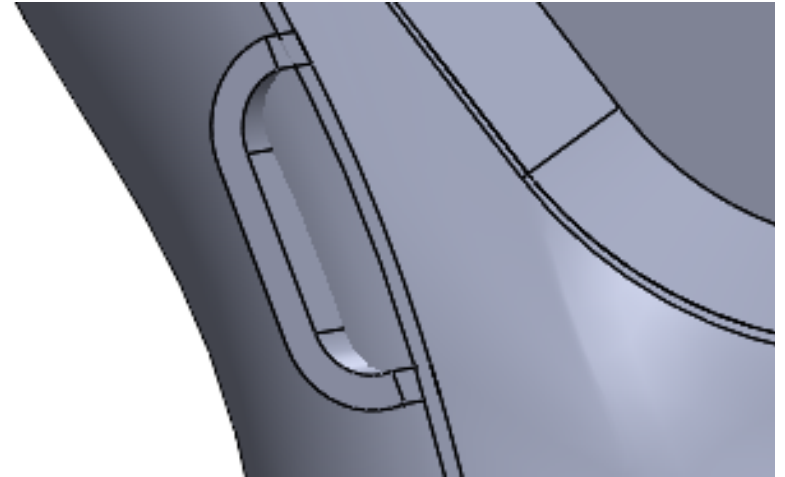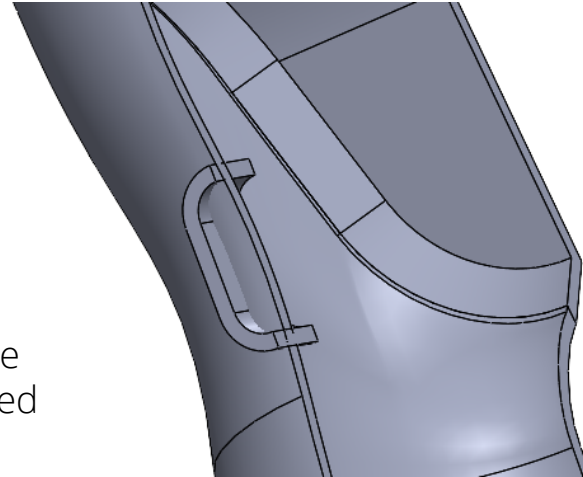
Ribs and Handle bottom.

Ribs were added to make the body more ridged and decrease the stress on it. Segments were then cut out the ribs so there's room for the internal components.

At this stage the bottom of the handle was also formed, by using a sketch and using the boss extrude tool with some draft to ensure the component could fall out. I ensured that the bottom of the ribs held this component in place.
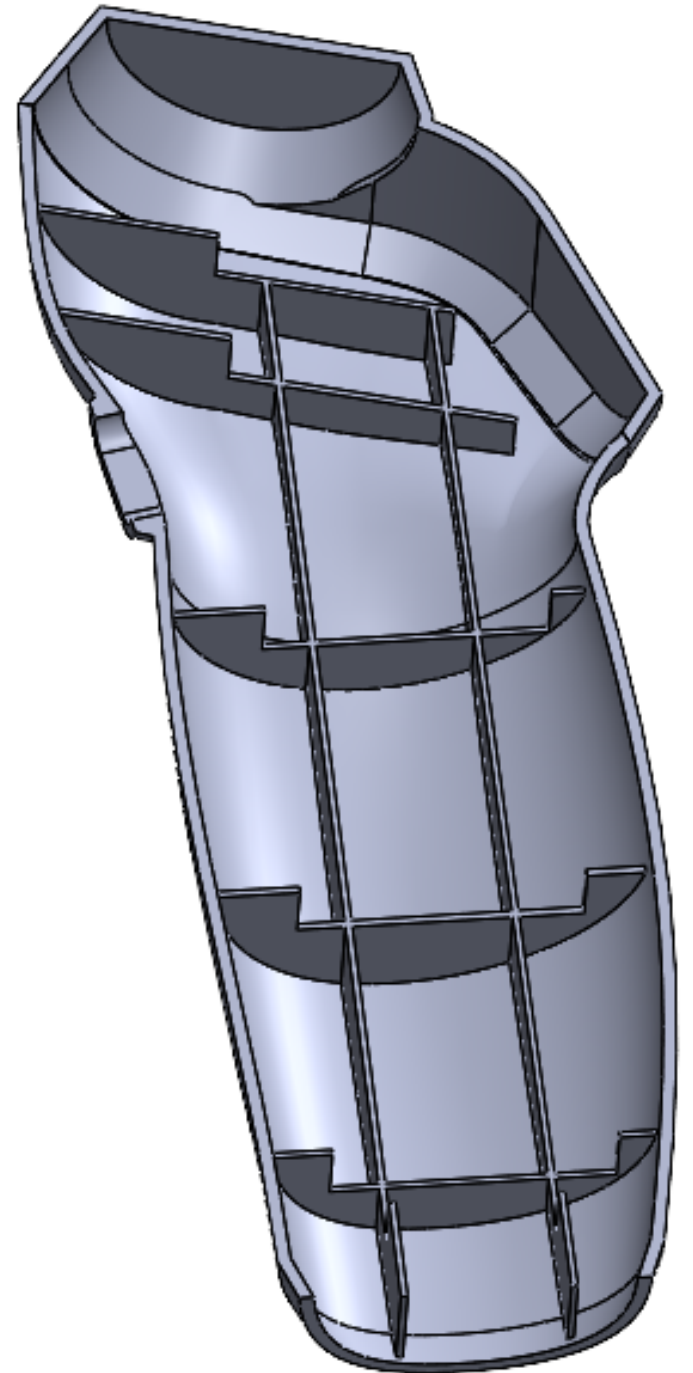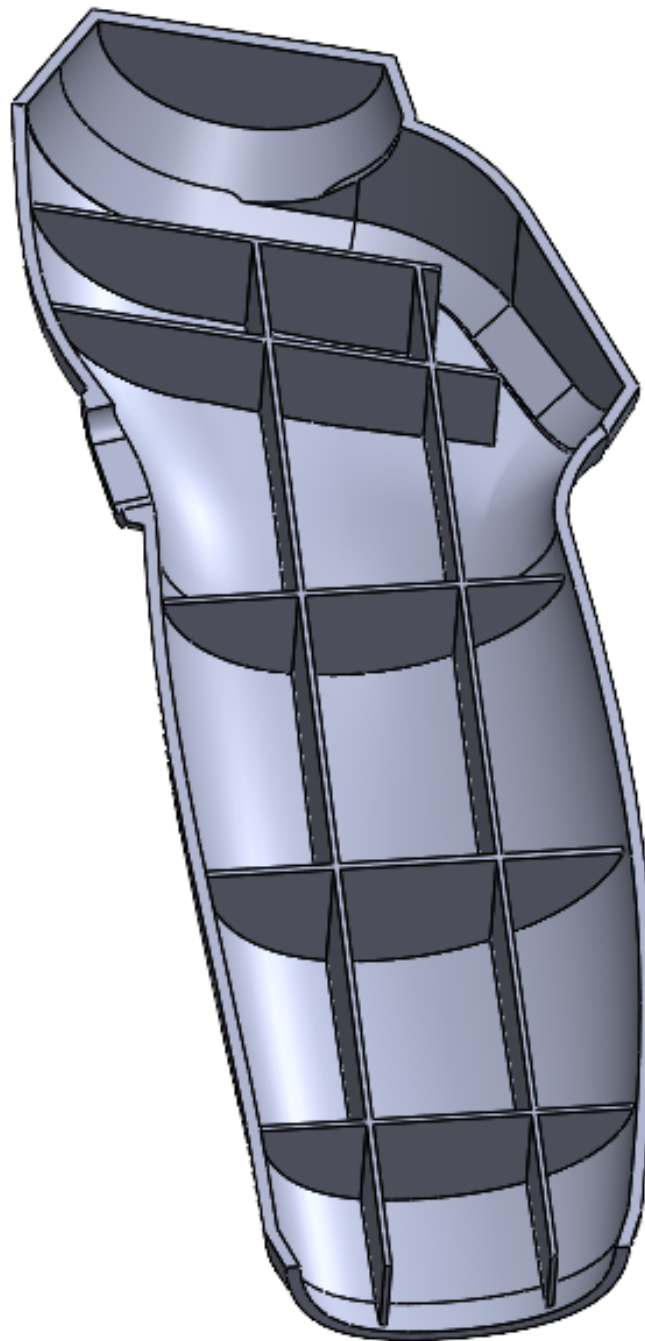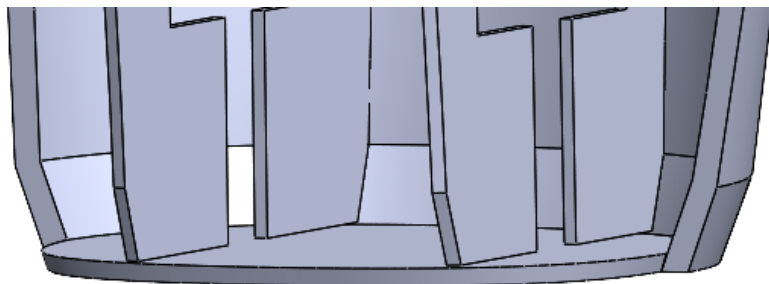
Internal ribs and Button insert.
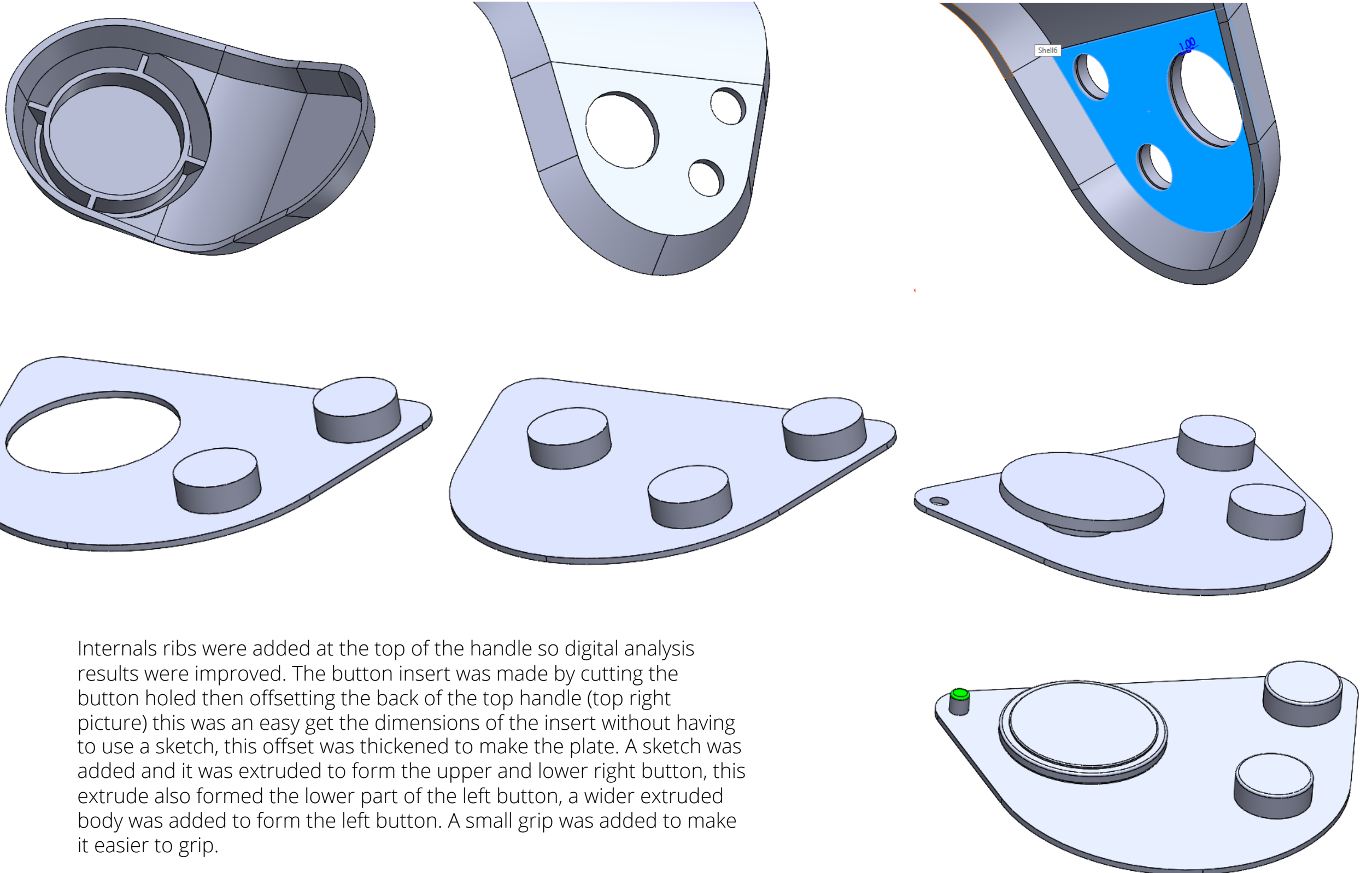
Internals ribs were added at the top of the handle so digital analysis results were improved. The button insert was made by cutting the button holed then offsetting the back of the top handle (top right picture) this was an easy get the dimensions of the insert without having to use a sketch, this offset was thickened to make the plate. A sketch was added and it was extruded to form the upper and lower right button, this extrude also formed the lower part of the left button, a wider extruded body was added to form the left button. A small grip was added to make it easier to grip.

Trigger surface modelling and construction.
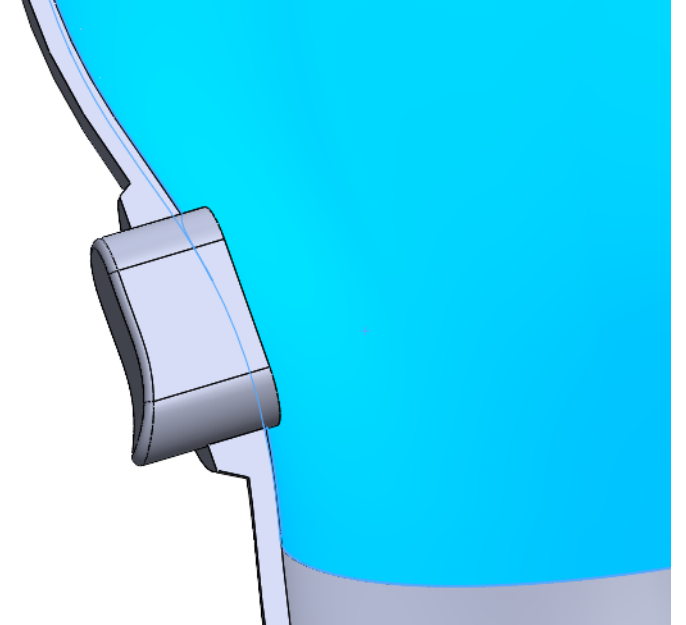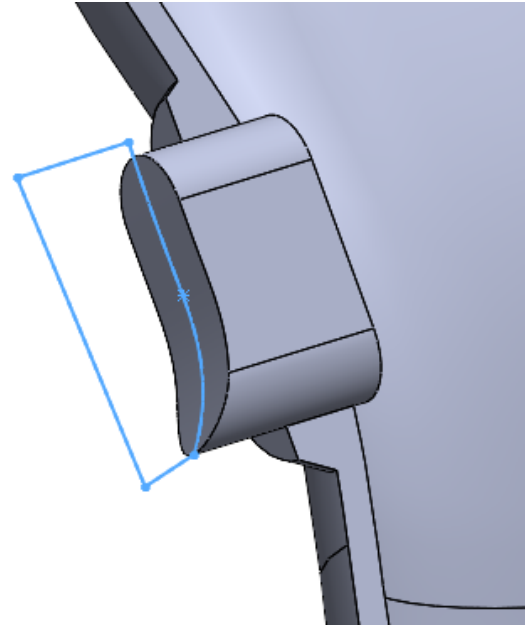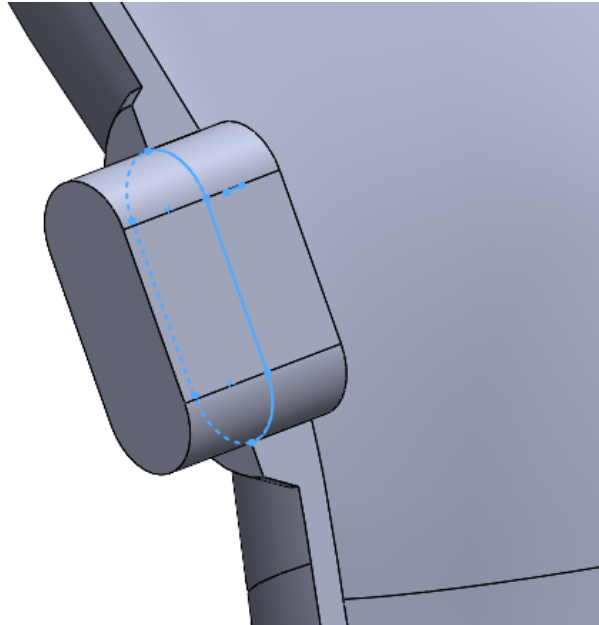
The trigger was created by using a 3D sketch to convert the lines on the trigger surround into a a sketch, this was the extruded to make the trigger body and cut extrude used to make the flared shape. The internal body of the handle was offset and used to form the part of the trigger which doesn't allow it to fall out, as shown by the imaged to the right.
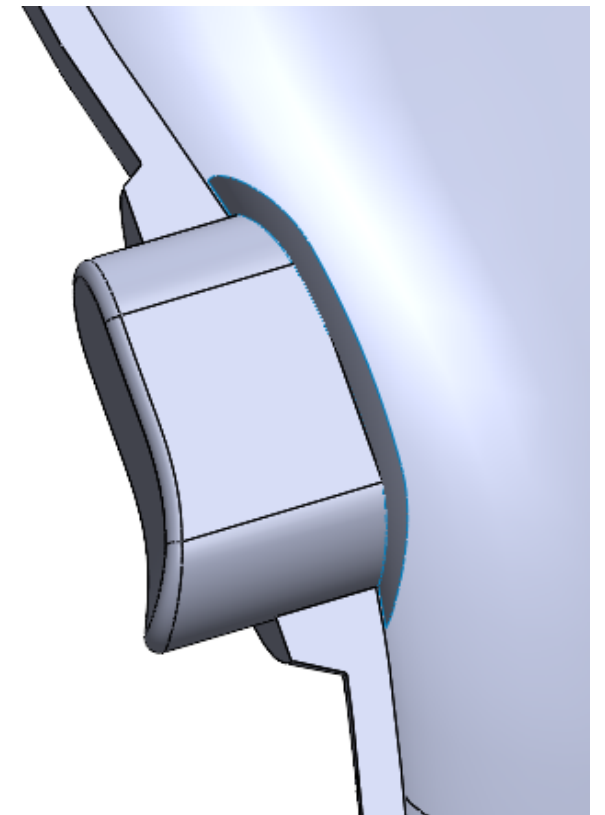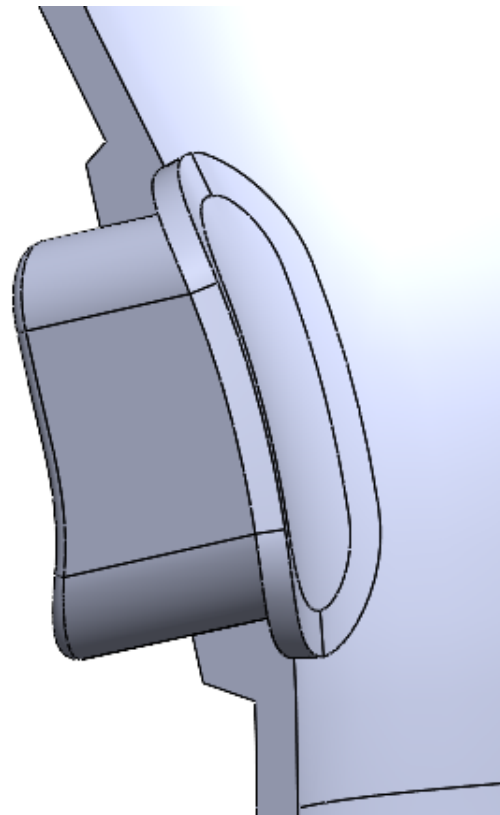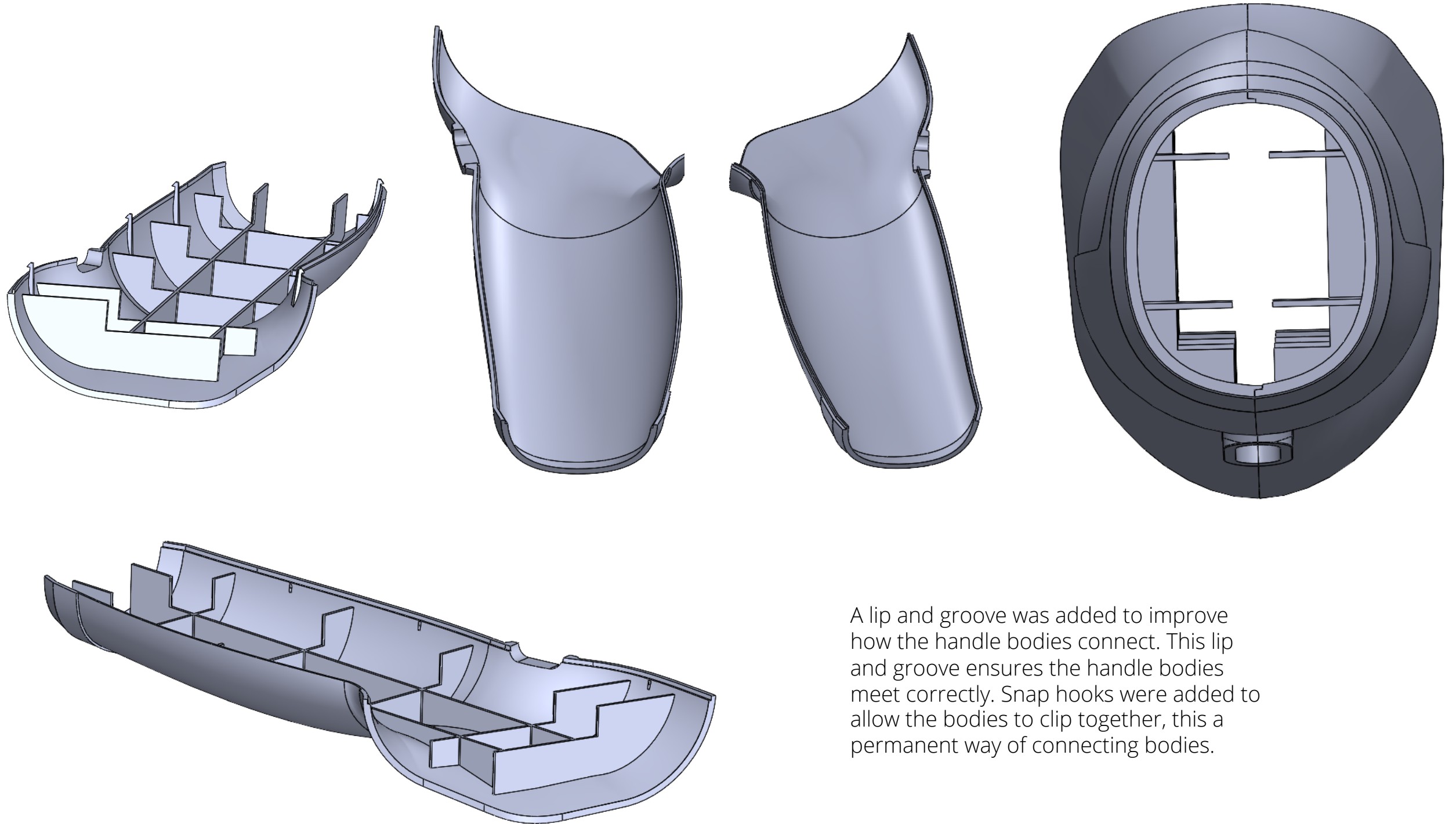
Over moulded handle grip.
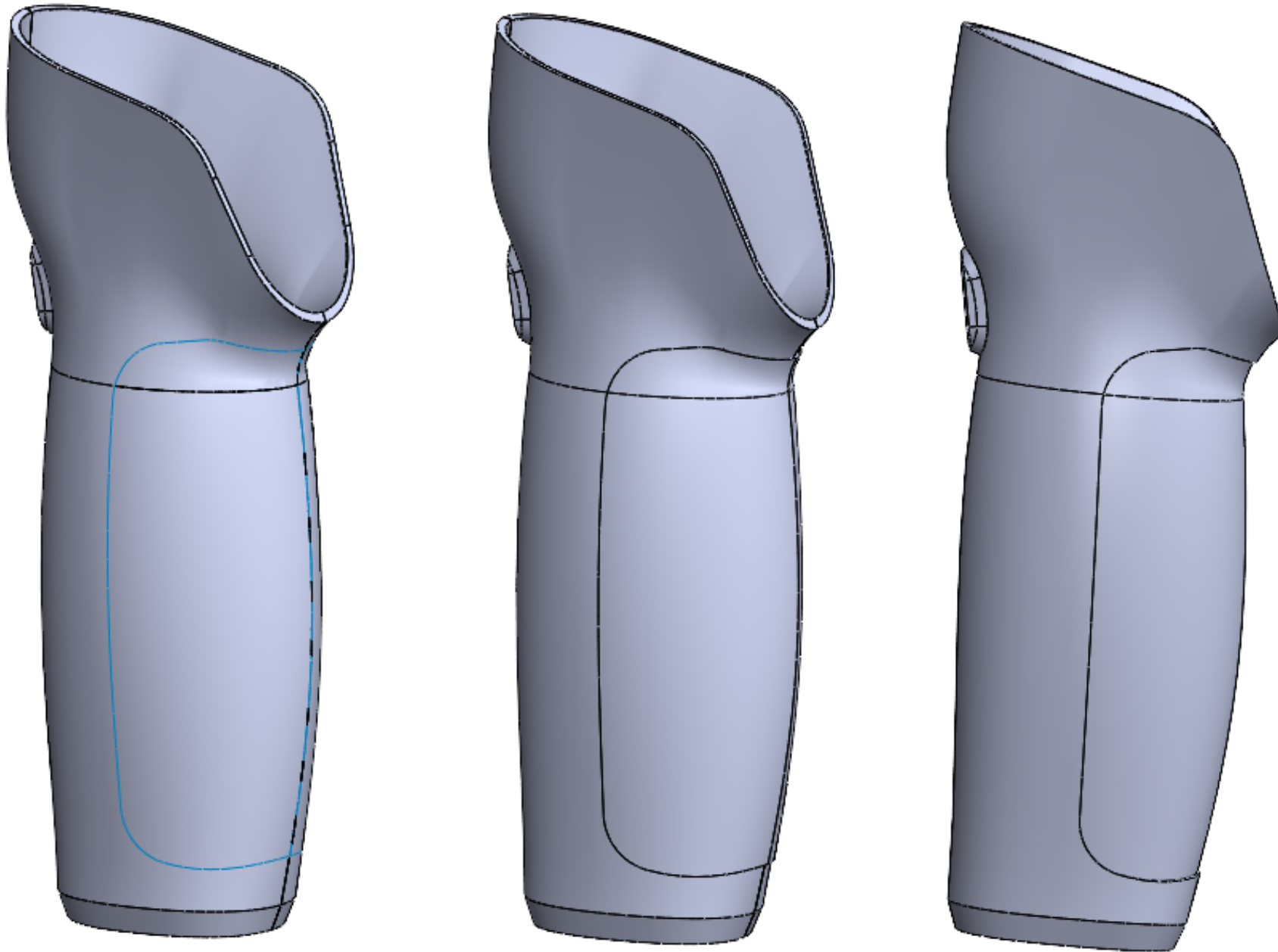
The over moulded handle grip was formed by offsetting the outer handle by 1mm and trimming the surface with a sketch on the front plane. This was thickened into a body. A copy of this body was made and the copy was used to intersect the handle body was a small segment was removed
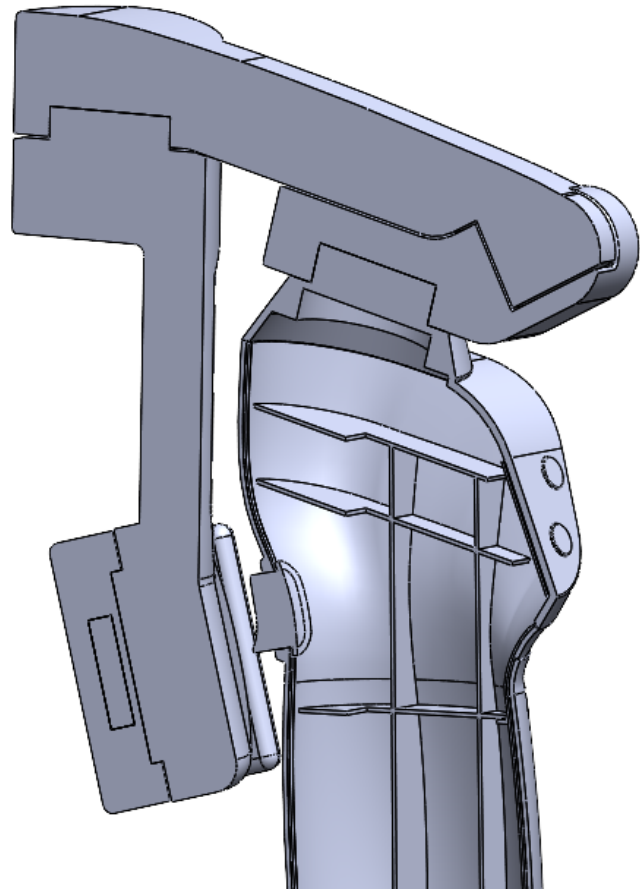
Lip and Groove plus snap hooks.

A lip and groove was added to improve how the handle bodies connect. This lip and groove ensures the handle bodies meet correctly. Snap hooks were added to allow the bodies to clip together, this a permanent way of connecting bodies.

Pivot Points.

Finally I added pivot points which are the points which link bodies and will be the points where motors move the different components.