

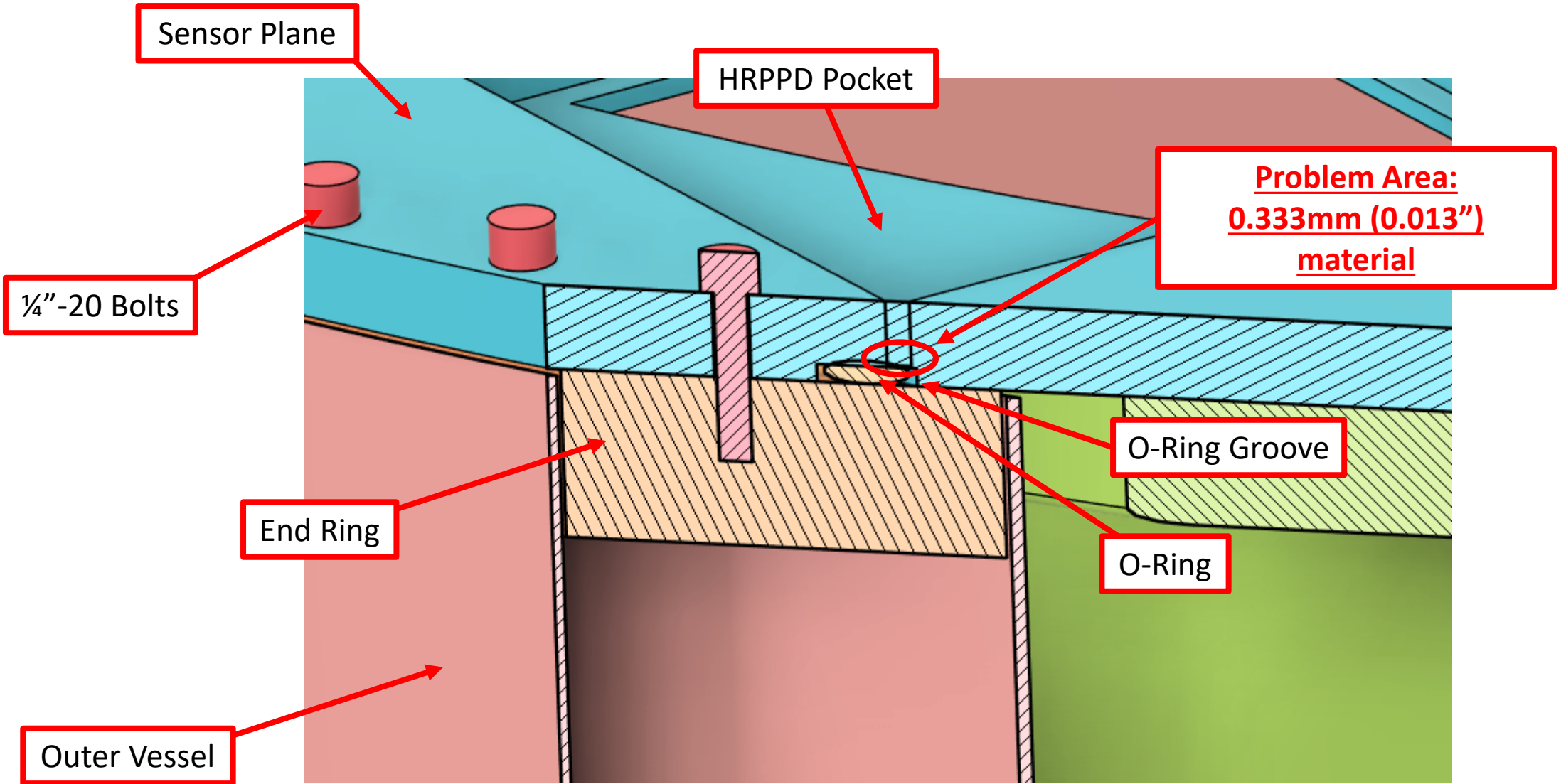
End Ring O-Ring?

Alex Eslinger (JLab)

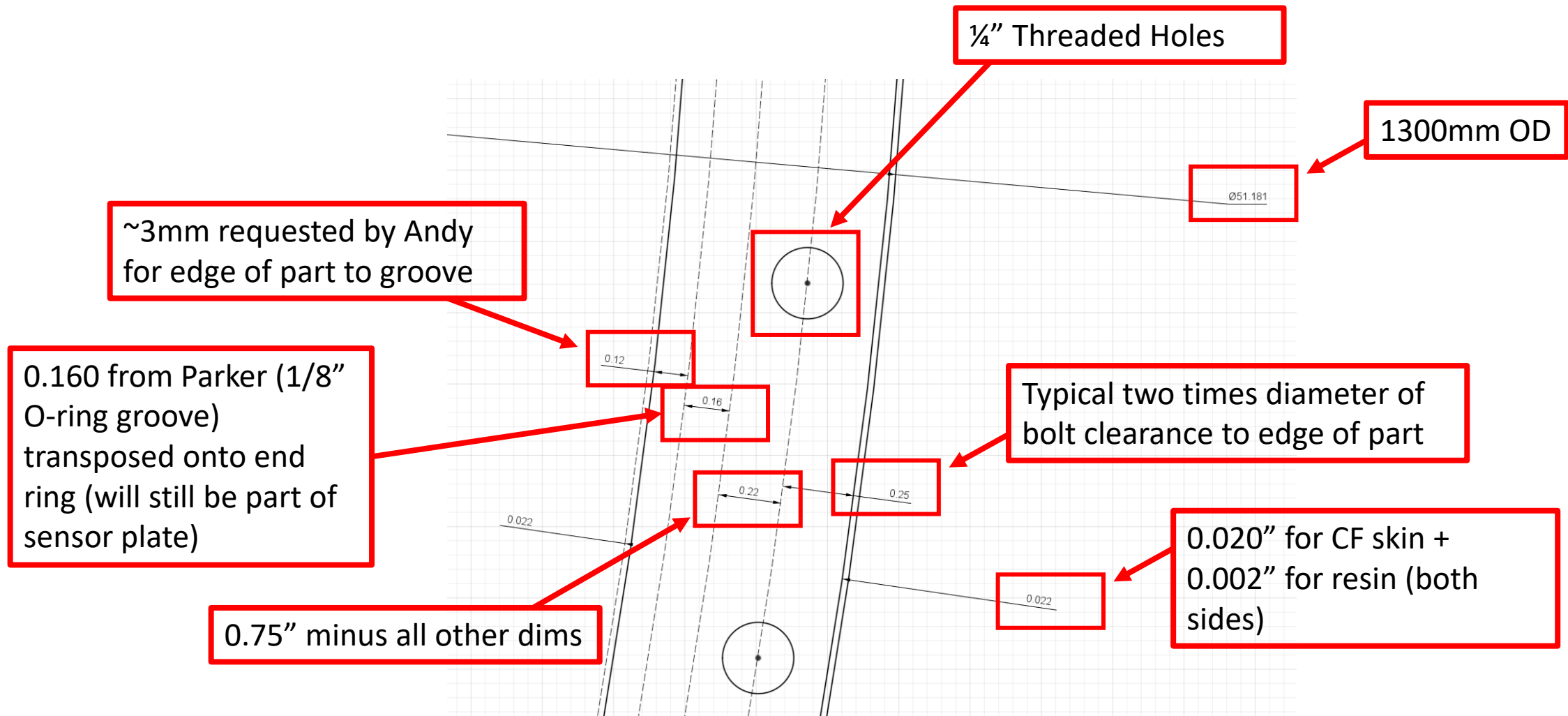
5/13/24

Summary of Problem

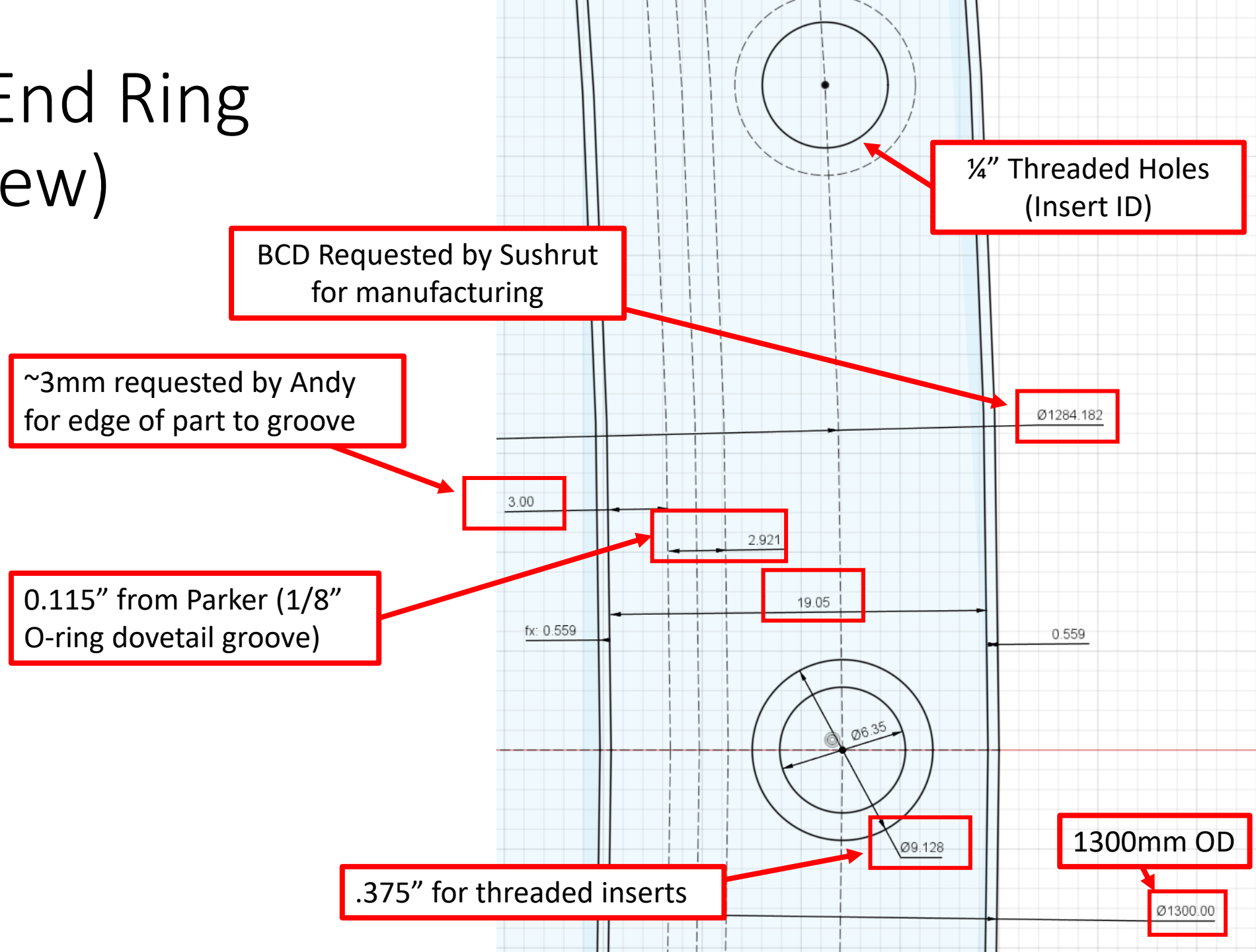
- The current design for the sensor plate o-ring groove is problematic since there are areas of the sensor pocket design that leave insufficient material between the o-ring groove and the sensor pocket itself (shown in last week's meeting).
- The first solution that was proposed was to locally or globally thicken the sensor plate by an estimated 2mm in order to move the sensor pocket further away from the o-ring groove.
- Another proposed solution was to move the o-ring groove to the end ring.
- Since moving the o-ring groove back to the end ring was the least interruptive, I spent some time investigating it first. However, the machining for this groove (if chosen as the way ahead) would be completed while the end ring is still in sections. This meant that until this decision was made, Purdue would be delayed on bonding the end ring.



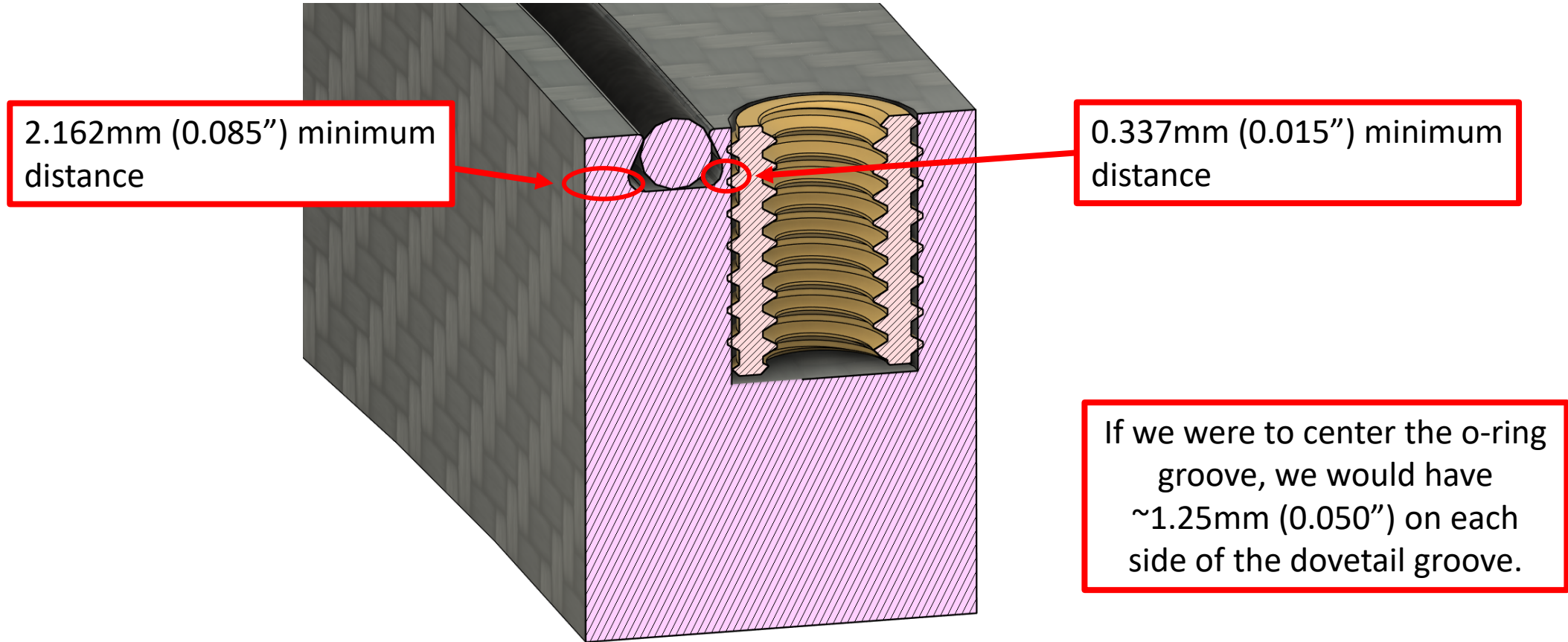
End Ring (Sketch View)



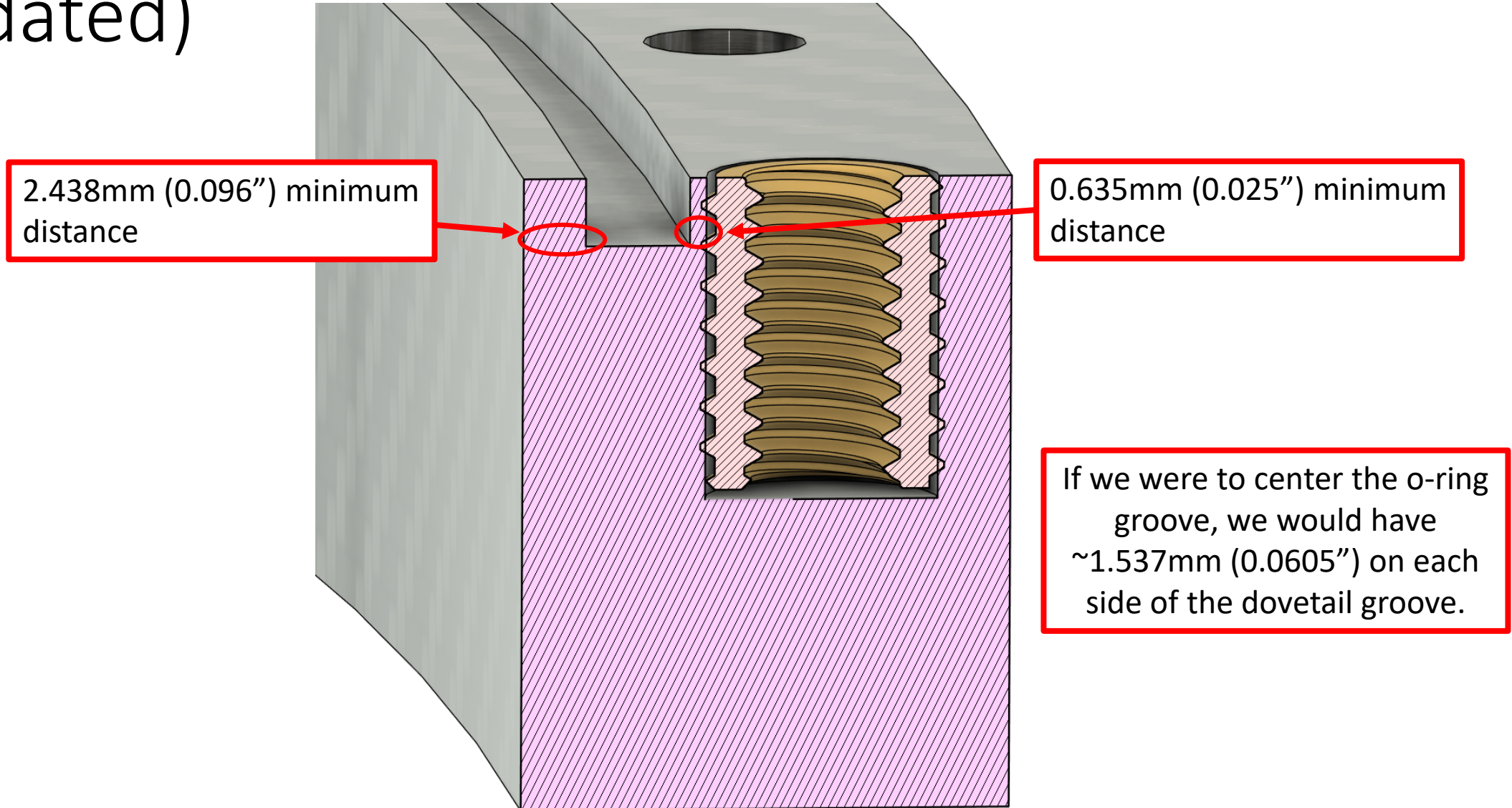
Updated End Ring (Sketch View)



3D Model of End Ring with Dovetail Groove (Updated)



3D Model of End Ring with Straight Groove (Updated)



Conclusion

- If we were to go ahead with the manufacturing of the end ring o-ring groove, it is extremely likely that we will have material tear-outs along the o-ring groove in the locations of the inserts (120 places).
- The inserts are not fully encapsulated in an epoxy, they are merely brushed in the middle with epoxy before installation. Meaning there are voids between the outer threads and the carbon fiber.
- Moving forward with machining the o-ring groove into the o-ring would create 120 points of possible leakage around the vessel.
- Therefore, I recommend we keep the o-ring groove on the sensor plane and proceed with a local or global thickness change to the sensor plane.

Questions?