Douglas Couto

Dry sump oil tank

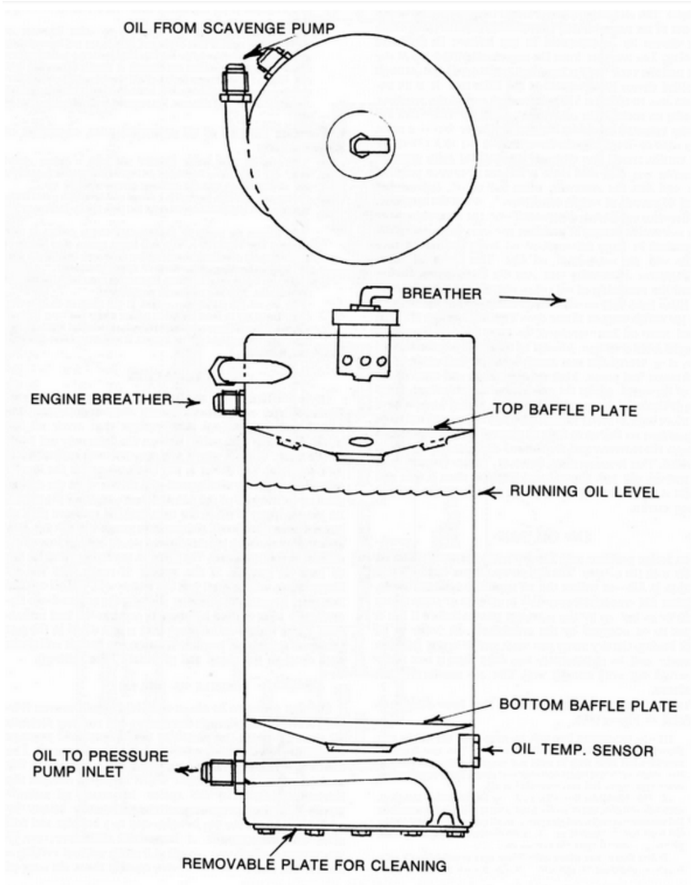
Essential component of the lubrication system, serves as a deaerator and reservoir

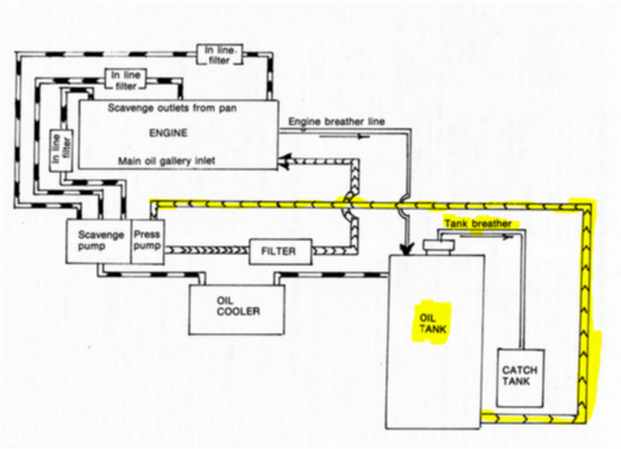
My main roles on this project

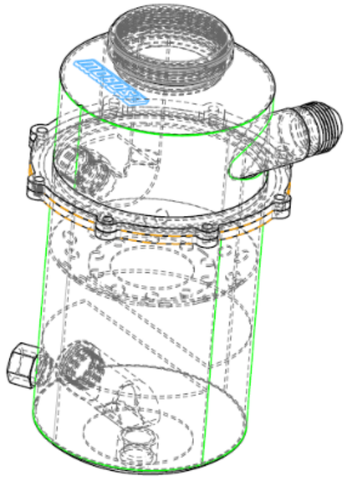
1. Base literature study
2. Cad model
3. Gt-Suite fluid slosh model
4. Overall documentation

Literature background is crucial

The first step to a solid project is checking your books, specially for a delicate system, such as lubrication.

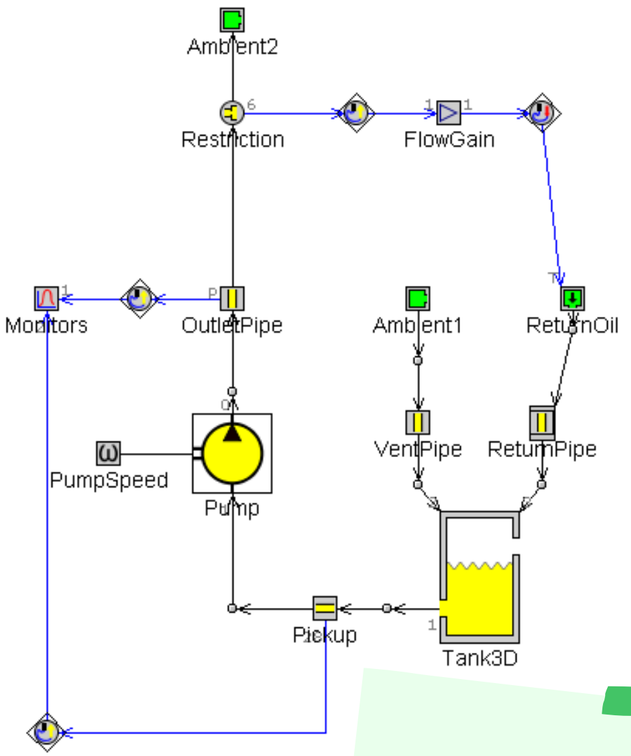




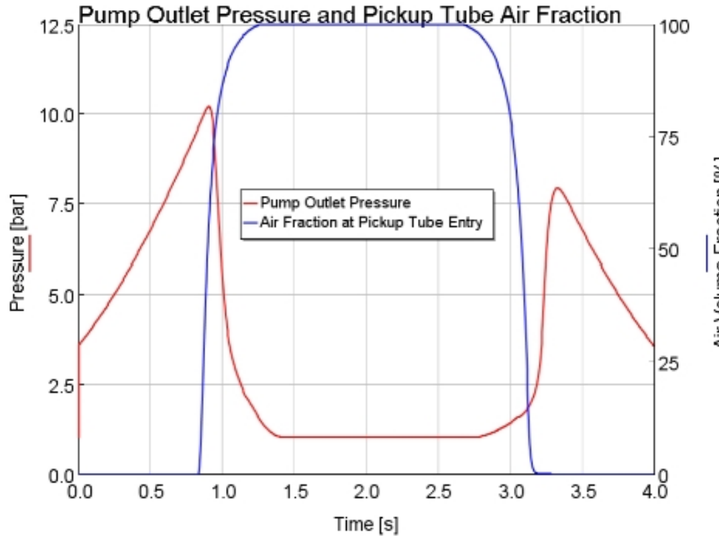


GT-Suite 1D simulation

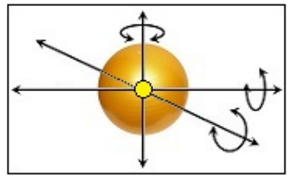
Here i modeled a system to run the fluid behavior inside my oil tank during a hotlap, using accelerations gathered from data acquisition.



Tank 3D is where i input the geometry as a mesh, discretizing inlet, outlet and vents



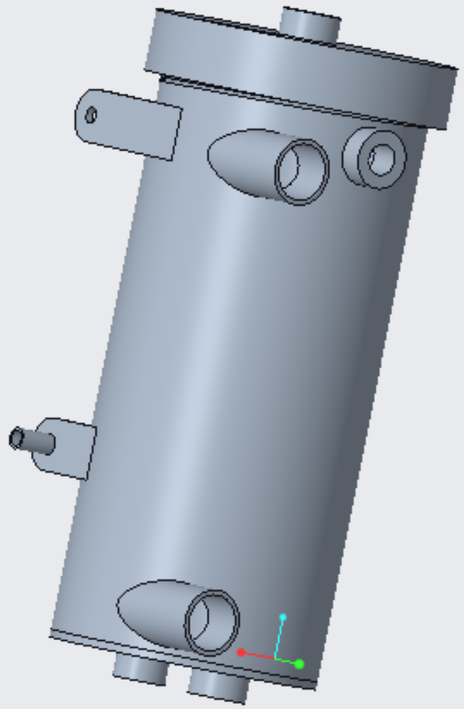
One of the results looks like this, a graph that essentially shows me when my model is **"cavitating"**



BodyMotion is where i input the vehicle accelerations (Longitudinal, lateral and vertical)

Design evolution

creo® 6.0

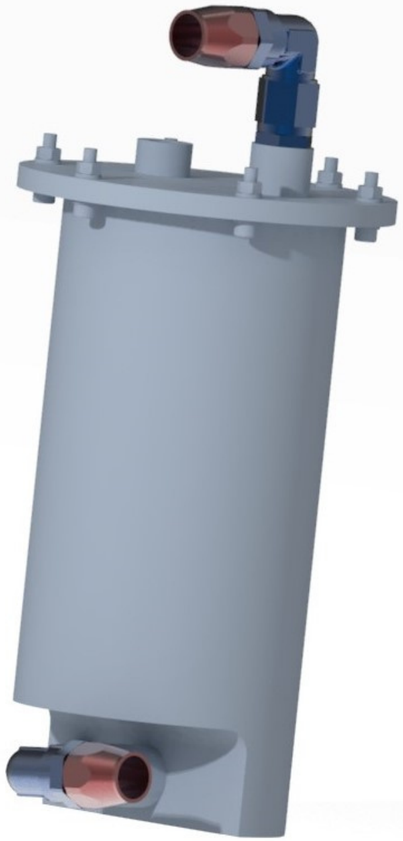


2019 version

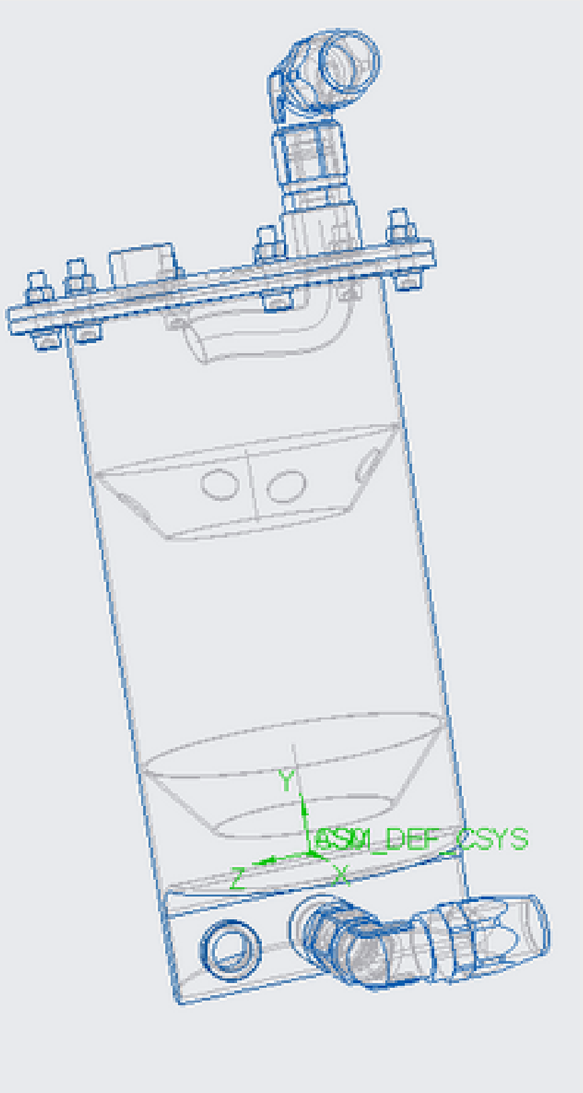
- External thread on body
- Tangent inlets
- Flat bottom
- Hard to manufacture
- Low to none documentation

2020 version

- Cap mounted with bolts
- Internal inlet
- Optimized bottom
- Cheaper and easier manufacturing
- Step by Step documentation, including simulation files and tutorials



Design evolution



2020 Overview

- Tangent inlet made possible by tube bending, wich is much easier to make than precision welded inserts
- Leak proof cap, design incorporates an o-ring.
- Easy to remove cap also allows easy cleaning, wich is a common procedure on oil tanks.
- Aeroquip Fittings allow easy disassembly and makes it easy to add inline filters
- Overall lighter and cheaper design, qhen compared to 2020 version