Figure 24: Section View of Transition Piece Demonstrating Conical Section

Figure 25: Top View of the Transition Piece Before Use

5.2.4 The Reservoir

In order for the reservoir to conform to SANS 347 standards the total volume of pressurised air needs to be ⬛⬛⬛⬛ This is calculated by taking the total volume of the reservoir and subtracting the volume of materials inside of it such as the pump tube, transition piece and piston. This allows for the entire length of the pump tube to be utilised while still remaining in the SEP sector. The reservoir is a simple cylinder that will be fitted onto the flanges encompassing the entire pump tube assembly. The cylinder is designed to be thick enough to withhold the pressure of 10 bar that will be the input to the system.

The diameter of the reservoir was mainly determined by its length as the length of the piston's stroke needed to be maximised. However, since the pump tube was being re-used, the length was also designed to fit this existing part as well as include the length of the transition piece. Therefore, the diameter was chosen to match these lengths and still be less than 5 L, however the volume occupied by the internal components needed to be factored in and so the diameter could be larger than originally thought due to these components inside the reservoir. The calculation is shown below;