4.3 Force Analysis

The Chief adapter plate was the only concern when stresses were involved. By observing the CAD drawings in Appendix A you will notice the thin grove that secures the stop plate and the yaw bearing cap into place. The computer program Algor FEMPRO was used to test our CAD models under the maximum stress of 50lbs around the center whole in the plate. For the analysis, Aluminum 2024 was used instead of the stronger and more durable Aluminum 6061 because the program Algor, did not have the material properties installed. Even though the analysis was done on 2024 the data will still be accurate because Aluminum 2024 is actually weaker and if the results were positive than we could safely say that the design was acceptable. The analysis was able to pinpoint where the maximum points of stress and how they were distributed throughout the solid. The maximum displacement at the center was .00078 in, see Apendix C. While the maximum stress of the plate were the four corners where it is attached. Because we are using a stronger aluminum the displacement will be much less allowing the design to stay stable under constant vibration from the VCCT.