Appendix A: Expectations

Project 1 Guidelines

1. The goal of this project is to demonstrate analytically that the performance specifications in Table B.1 can be met. You will earn credit for engineering analyses that support this goal.
2. You will need to communicate to us the basic flywheel specifications and the overall performance of the Stirling engine that you are analyzing.
3. Please use MATLAB for performing all of the calculations used in your analyses. (Doing so will enable you to quickly iterate the design.) Please structure your code to meet the coding expectations for this class. Use MATLAB to create your plot(s).

Project 1 Deliverables

Project 1 is a group project. Please upload a report to the Canvas course site that includes, at a minimum, the following:
1. The basic flywheel design and dimensions to be used on this Stirling engine.
2. The power output of this Stirling engine, demonstrating that this was calculated using two different methods.
3. The following plots are required:
    a. Pressure vs specific volume for both the Stirling cycle & Stirling engine over a complete engine cycle
    b. Torque vs crank angle for a single engine cycle
    c. Rotational velocity vs crank angle for a single engine cycle
    d. Energy per cycle vs phase angle
4. A textual description of the analyses that you have done. Include all relevant equations.
5. A textual summary of the results of your analyses.
6. Well structured, fully documented MATLAB code that implements your analyses. For ease of grading, please combine all of your code into one ".m" file. Please upload your MATLAB code (the ".m" file) to a separate link, tied to Gradescope, provided in the Project 1 module on the Canvas course site. The MATLAB script file needs to run and generate any plots that are used in the report.

The report should take the form of an "executive summary". The expected length of the report is 6-10 pages. It should meet professional standards, with no grammar or spelling errors.

The report should include an introduction paragraph that enables the reader to understand what the report is about, and that briefly describes the contents of the report. The report should include a conclusion paragraph that briefly describes the key findings of your analyses both qualitatively and quantitatively. The conclusions should clearly state if your design meets all specifications, and if not, which specifications have not been met.

Since the MATLAB code is being submitted separately, you do not need to include a listing of the MATLAB code in the report. Computer generated figures are expected in the report and are expected to be generated with the code submitted.