

Discussion of Results

In the Brayton cycle lab we obtained experimental data for RPM, T3, T5, P3 and an infrared Temperature recorded at T5 obtained by an infrared thermometer. The computer also provided us with data from which we were able to calculate the thermal efficiency, turbine efficiency, compressor efficiency, BWR, compressor and turbine work, as well as the heat in and out of the brayton cycle system. Throughout all of our runs we found the the brayton cycle seems to work best around 55,000 rpms with a thermal efficiency around 16%, with thermal efficiencies peaking at this value and declining with the higher RPM's. However uncharacteristically the BWR of our systems grew with the higher RPM's instead of declining.

There are many possible causes for error in our experiment. There could be human error in reading and recording the data from the brayton cycle system module, since the system was extremely noisy and all team members were required to wear ear protection. There could have been calibration error with the computer equipment as well as the equipment on the brayton cycle module seeing as we did not calibrate prior to our test runs. Or there could possibly be error with the transducer, or some of the measurements of the thermocouples.

The differences in our experiments from what we experienced is a little confusing. Where we expected the thermal efficiencies to increase with increasing RPM and the BWR's to decrease, but the opposite seems to happen with our data. Perhaps with the increasing runs the turbine cleaned out and ran smoother assuming a more steady state rate of work to increase the BWR with increasing runs. Or perhaps the compressor didn't have to input as much work with higher RPM's and the Turbine was able to export