



CALIFORNIA STATE SCIENCE FAIR 2010 PROJECT SUMMARY

Name(s) Jonathan Deming; Anthony Mosallam	Project Number S0206
Project Title The Search for a Cleaner Jet Fuel	
<p style="text-align: center;">Abstract</p> <p>Objectives/Goals The purpose of our experiment was to test for the cleanest running jet fuels from a choice of propane and Av-gas, and compare them to the most commonly used jet fuel, Jet-A. We predicted that if we use propane, the jet engine will produce less residue buildup than other common fuels.</p> <p>Methods/Materials We used the jet engine as the constant in the test. Our test variables were propane in a fuel bottle, and av-gas (general aviation fuel for internal combustion engines 100 low lead). Jet-A (jet engine fuel and our control) was used as the experimental control since it is the most commonly used fuel in jet engines today. We tested each fuel at three rates of burn, idle: (minimal fuel injected for engine to run), cruise: (medium fuel injected for engine to run, established by finding the median of idle and max power), full power: (the maximum pressure of fuel the engine could handle without flooding). To perform our first test a fuel regulator was installed from the propane tank to the main injector on the engine connected by a 50 foot safety line. Running the av-gas (general aviation fuel) and the Jet-A fuel (commercial jet engine fuel) required an electric fuel pump connected to a 12 volt car battery. Jet A required higher p.s.i. than the previous fuels as they seemed to be thicker and had trouble maintaining operating pressure. We used a laser heat gun to measure the heat give off during the test. After each fuel test we opened the burn can (combustion chamber) and inspected for carbon with a q-tip for buildup recording the results.</p> <p>Results We found that propane had run consistently hotter than the other fuels thus theoretically proving it could burn the carbon excess it produces. We know there is no consistency at which the carbon emissions occur between the fuels, so to further stabilize our results.</p> <p>Conclusions/Discussion We predicted that propane would run cleanest. It is well established that propane gives off less carbon monoxide and because of this we thought it would perform just as well in running clean. There was a significant increase in temperature from propane to the other fuels in our results. Both Av-gas and Jet-A left significant amounts of residue where propane left little, proving that propane runs hotter and has less carbon buildup. This doesn't prove that propane puts out less carbon emissions, however it can accurately prove that less build up will exist.</p>	
Summary Statement Our project was intended to find another way to reduce carbon emissions in the jet engine by finding a fuel that leaves less residue in the cobustion chamber of our jet engine.	
Help Received Father Mr. Deming, helped build the board, Grandpa Deming helped edit and revise all text. Father Mr. Mosallam helped purchase materials required for building the jet engine and provided his shop for us to build it and test it.	