The shock tube at Stephen F. Austin State University (SFASU) has been developed to study mixtures of various fuels and oxidizers at elevated temperatures and pressures. The SFASU shock tube is a bursting-diaphragm design that is fabricated entirely of stainless-steel. The tube is comprised of a 2.14-meter-long driver section and a 4.28-meter-long driven section. The connections between each portion of the shock tube are made with welded pocket-flanges, which allows for crucial concentricity and consistency through the entire tube. To conduct experiments with the shock tube, the driver side is pressurized with Helium until the diaphragm bursts. This large difference in pressure between the driver and driven sections creates a shockwave that then travels down the driven section, which is filled with the test mixture of interest. When the shockwave makes impact with the end of the tube, the reflected shock will create a region of elevated temperature and pressure. The speed of the shockwave and other data is collected during the entirety of the experiment using spectroscopic instruments and fast-acting pressure transducers. The data is then used to determine the temperature and pressure in the test region created by the reflected shock. A series of vacuums are used for venting the gases and neutralizing the pressure inside the tube. The shock tube is then opened at the diaphragm mechanism and the diaphragm is replaced. This entire process takes approximately 30-45 minutes, depending on the mixture that is being tested. Shocks tubes for use in chemical kinetic research at academic institutions are ongoing, which allows for undergraduate students to conduct cutting edge research validating chemical kinetics mechanisms.