
Methodological support and calculation of operational parameters of experimental testing of model rocket-ramjet engines

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The objective of this project was to develop a calculating technique for ensuring necessary operational parameters of pneumohydraulic system of a bench complex for testing model rocket-ramjet engines. We solved this problem by using a fire air heater simulating the conditions on entering the afterburner. The conditions were similar to those in the flight. We developed sets of equations and performed thermodynamic calculations of the working body structure produced by a heating gas generator at kerosene combustion in the air and oxygen regeneration by additional oxygen consumption directly in front of the afterburner. We obtained the equilibrium temperature values and the values of relative mass concentration of combustion products. The values are necessary for determining the operational parameters of the bench equipment and analysis of the experimental data obtained at fire bench tests.

Keywords: rocket-ramjet engine, testing, operational parameters, heated air, oxygen concentration, thermodynamic calculation.

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