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DUAL FLAME HOLDER DESIGN FOR ENHANCED EFFICIENCY AND BLOWOUT CONTROL IN LIQUID PROPELLANT ROCKET AFTERBURNERS

Abstract

This paper discusses a unique twin flame holder configuration for a liquid propellant rocket afterburner. The major goal of this design is to improve the engine's overall efficiency by encouraging complete fuel combustion and reducing blowout at low speeds. The twin flame holder system employs two unique flame holder geometries placed strategically within the afterburner. This arrangement is intended to achieve the following benefits:

Improved burning Efficiency: The two flame holders generate numerous stabilization zones within the afterburner, resulting in more uniform and complete burning of the injected propellants. Enhanced Blowout Control: The presence of two flame holders offers redundancy in the combustion stabilization process. We will go over the design considerations for each flame holder geometry, their placement in the afterburner, and the expected influence on combustion stability and efficiency Finally, the presentation will examine potential trade-offs and future optimization opportunities for this innovative afterburner design.