

SPACE PROPULSION SYMPOSIUM (C4)  
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DEVELOPMENT STATUS OF THE CRYOGENIC OXYGEN/HYDROGEN YF-77 ENGINE FOR  
LONG-MARCH 5

**Abstract**

The YF-77 engine, designed by the Academy of Aerospace Propulsion Technology (AALPT), China, is a high performance and reliability LH<sub>2</sub>/LO<sub>2</sub> booster designed for the next-flagship Chinese launch vehicle, called Long-March 5. Two YF-77 engines fly on the core stage of the Long-March 5 launch vehicle. The engine utilizes a gas generator cycle, and each engine provided 700-kN at an oxidizer-to-fuel mixture ratio (O/F) of 5.5. Issues resolved by design modifications and stricter quality control during development include bearing and seal wear as well as fuel turbopump rotor crack, chamber damage due to combustion instability, excessive fuel leaks, and etc. The reliability and safety of YF-77 is well demonstrated before its maiden journey. This discussion will cover engine system design and operating characteristics as well as component design and operating characteristics of the YF-77. The scope of testing performed to qualify this engine for flight is also included.