

46ESS-66: Ramjet Engines for Aircrafts

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Ramjet engines belong to the family of airbreathing engines, which are unique in that the engines themselves are devoid of any rotating parts. They employ the forward motion of the engine to compress the air using a diffuser. Then fuel is burnt in this compressed air in a combustion chamber, and the heated air is expelled through a propelling nozzle to produce the required thrust for flight.

It is a highly efficient propulsion option for supersonic and hypersonic travel. Owing to lack of rotary components, they have a relatively simple structure. But due to the complex flow conditions, and combustion challenges arising in the engine, especially at high Mach number flights where they are most efficient, it remains a challenge to master the ramjet technology.

This paper looks at the history, their working principle, evolution, design challenges and other facts about these fascinating engines. It will also look at their civil and military applications and the latest research in the field.