

Design and analysis of heat transfer for the front electric sustainer propulsion system of the PW-6 glider

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Abstract:

The PW-6 is a two-seat school glider designed and built at the Faculty of Power and Aeronautical Engineering of the Warsaw University of Technology in a team made up of students and graduates of the WUT. The PW-6 has been in continuous production for 24 years and is eagerly purchased by aviation clubs from all over the world. Research and development work is currently underway to modernize the design and build in an front electric sustainer propulsion system. A characteristic feature of electric propulsion systems is that a large amount of energy is converted by a small object such as an electric motor. Despite its high operating efficiency, the electric motor generates heat, which must be dissipated efficiently to the environment. This paper describes the designed solution and an analysis of the cooling efficiency of an electric FES drive. The analysis includes fluid mechanics and heat transfer issues. The presented solution is universal and can be adapted to other designs in which an FES drive is planned.

Keywords: Cooling, propulsion, electric engine, glider, CFD