

DETERMINATION OF TEMPERATURE MODE OF ROTARY BEARINGS OF GAS TURBINE ENGINE WITH AIR AND FUEL LUBRICATION SYSTEM

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The article is devoted to the problem of choosing the optimal parameters of the air-fuel mixture in gas turbine engines (GTE) with the air-fuel lubrication system. Currently, determining the optimal parameters of the air-fuel mixture is significantly complicated by the inability to calculate the temperature mode of the bearings. The main specific characteristics of the gas turbine engine significantly depend on the amount of air and fuel taken from the flow part and the fuel line of the engine. Therefore, determining the dependence of the bearing temperature on their operating conditions (parameters of the air-fuel mixture and operating modes) is an urgent task.

The purpose of this work is to develop a method for determining the temperature of a bearing that is lubricated and cooled by an air-fuel mixture.

The paper analyzes the thermal state of bearings installed in the rotor supports of a gas turbine engine with an air-fuel lubrication system. On the basis of the test results of hybrid ball radial thrust bearings 45-126205PЯ the dependences of the friction moment and the coefficient of convective heat transfer on the parameters of the air-fuel mixture and operating modes are determined. A method for calculating the temperature of a bearing that is lubricated and cooled by an air-fuel mixture has been developed. The use of the obtained results in the design of promising short-life gas turbine engines with air-fuel lubrication system will lead to improved engine performance and will contribute to expanding the scope of its application.

Keywords: gas turbine engine, air-fuel mixture, lubrication system, method, bearing temperature.

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