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AMESim仿真技术在高速电磁阀中的应用

High speed solenoid valve with the application of AMESim

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中文摘要:

以某型航空发动机电子控制系统中的高速电磁阀为研究对象, 针对建模仿真问题进行了研究. 分析了高速电磁阀工作原理, 运用AMESim建模仿真平台, 建立了高速电磁阀较为精确的数学模型, 并对所建模型的占空比-流量特性进行仿真分析, 与该型电磁阀试验数据进行比较, 分析所建数学模型的精度及准确性. 仿真结果表明: 所建高速电磁阀数学模型的占空比-流量特性误差保持在8%以内, 能够满足产品所规定的精度要求.

英文摘要:

The issue of modeling and simulation of a kind of high speed solenoid valve used for an electronic control system of a certain engine was discussed. According to the analysis of the operating principle of the high speed solenoid valve, the mathematical model of high accuracy for the high speed solenoid valve was built by use of the simulation software AMESim. The analysis on the duty ratio-volume flow characteristic was completed according to the simulation result of the model. By comparison of the experimental data of the electrical valve, the accuracy and precision of the mathematical model were analyzed. Simulation results show that the error of the duty ratio-volume flow characteristic of mathematical model for high speed solenoid valve is no more than 8%, thus satisfying the accuracy requirements set by the products.

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