DESIGN POINT PARAMETER ESTIMATION OF A LEGACY TWIN SPOOL TURBOJET ENGINE FOR HEALTH MONITORING

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Abstract

The estimation of component parameters of a twin spool turbo jet engine at design point is presented in this paper. Non-linear gas path analysis combined with constrained optimization based technique has been used for the estimation of the engine component parameters and overall performance of the engine. This work needs to be done as the engine manufacturer does not provide these details when supplying the engine to the user. The parameters estimated are pressure ratios and efficiencies of various components such as compressor, turbine and combustor. Parameters estimated were given as input to the simulation model and the error was calculated between simulated gas path parameters and experimental data collected from the engine test bed. It is observed that the simulation results, obtained with estimated parameters, agree closely with experimental data.