

ANALISIS PENGARUH COMPRESSOR PRESSURE RATIO TERHADAP SPECIFIC FUEL CONSUMPTION ENGINE TURBOFAN V2500-A1 PESAWAT AIRBUS A320-200 PADA KONDISI CRUISING

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ABSTRAK

Sistem turbin gas yang paling sederhana terdiri dari tiga komponen yaitu kompresor, ruang bakar dan turbin. Kompresor adalah alat mekanik yang berfungsi untuk meningkatkan tekanan fluida, yaitu udara. Pada engine pesawat terbang, kompresor digunakan untuk meningkatkan tekanan udara yang akan dibakar didalam combustion chamber. Tujuan peningkatan tekanan adalah untuk meningkatkan efisiensi pembakaran, sebab pada saat pesawat udara beroperasi yaitu terbang di ketinggian terbang cruising maka temperatur udaranya sangat rendah sehingga sangat sulit untuk dilakukan pembakaran. Oleh karena itu peningkatan atau penurunan compressor pressure ratio akan berpengaruh kepada performa engine pesawat udara yakni specific fuel consumption.

Salah satu cara untuk mengetahui pengaruh compressor pressure ratio terhadap specific thrust dan specific fuel consumption dapat dilakukan dengan metode parametric cycle analysis of real engine pada kondisi cruising, kemudian menganalisa hasil perhitungan yang didapat dengan inputan variasi compressor pressure ratio yang berbeda.

Hasil perhitungan performa engine V2500-A1 pada kondisi cruising 28000 feet didapatkan hasil specific thrust sebesar 18,664 lbf/(lbm/s), specific fuel consumption sebesar 0,71 (lbm/h)/lbf, efisiensi thermal sebesar 38,8%, efisiensi propulsive sebesar 64,7%, dan efisiensi overall sebesar 25,1%. Dari hasil pengaruh compressor pressure ratio terhadap performa engine adalah semakin besar compressor pressure ratio (π_c) maka specific thrust akan semakin besar, dan semakin besar compressor pressure ratio (π_c) maka specific fuel consumption akan semakin rendah.

Kata kunci : compressor pressure ratio, specific thrust, specific fuel consumption

**ANALYSIS OF EFFECT RATIO OF PRESSURE COMPRESSOR SPECIFIC FUEL
CONSUMPTION TURBOFAN V2500-A1 ENGINE AIRCRAFT AIRBUS A320-200
CONDITIONS ON CRUISING**

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ABSTRACT

System simplest gas turbine consists of three components: a compressor, combustor and turbine. The compressor is a mechanical device which serves to increase the pressure of the fluid, ie air. The compressor is divided into two low pressure compressor and high pressure compressore. In aircraft engines, compressors are used to increase the air pressure that will be burned in the combustion chamber. Interest is increasing pressure to improve combustion efficiency, because during the operation of aircraft that fly in cruising flight altitude of the air temperature is very low so it is very difficult to do the burning. Therefore, an increase or decrease in compressor pressure ratio will affect the engine performance aircraft that is specific fuel consumption.

One way to determine the effect of compressor pressure ratio of the specific thrust and specific fuel consumption can be achieved by parametric cycle analysis of real engine at cruising conditions, then analyze the results of calculations obtained by the input variations of different compressor pressure ratio.

The results of the performance calculation engine V2500-A1 at 28000 feet cruising conditions showed specific thrust amounted to 18,664 lbf / (LBM / s), specific fuel consumption ebesar 0.71 (LBM / h) / lbf, thermal efisiensi of 38,8%, 64,7% propulsive efficiency, and the overall efficiency of 25,1%. From the results of the presure compressor ratio to the engine performance is getting bigger compressor pressure ratio (π_c) the specific thrust will be greater, and the greater the compressor pressure ratio (π_c), the specific fuel consumption will be lower.

Keywords: compressore pressure ratio, specific thrust, specific fuel consumption