ABSTRAK

PT.GMF Aeroasia menyediakan perawatan dan perbaikan untuk mesin turbin seperti CFM56-3, -5B dan -7B. Untuk saat ini, dalam pengerjaan *Assembly* dan *Disassembly Engine* menggunakan kombinasi antara *Maintenance Stand* dan *Engine Gantry System* di area *Assy-Disassy Engine*. Sebelum proses *Assy/Disassy Engine* dilakukan, *Fan Frame Engine* yang terpasang pada *Maintenance Stand* mengalami permasalahan ketika akan dipindahkan ke *Engine Gantry System* dikarenakan tools support tidak sesuai dengan standar *Engine Service Manual*. Dalam penelitian ini, dilakukan perancangan sebuah *special tool* yaitu *Lifting Tool Fan Frame* untuk proses pemindahan *Engine Fan Frame* dari *Maintenance Stand* menuju *Engine Carrier Gantry*. Perancangan tersebut dibagi menjadi tiga tahap, yaitu perancangan awal dengan membuat gambar dua dimensi, perancangan akhir dengan membuat gambar tiga dimensi dan pengujian rancangan dengan melakukan *stress analysis* pada *software inventor*. Hasil akhir yang di dapat dari perancangan tersebut adalah tegangan (*stress*) yang terbesar (*maximum stress*) terjadi pada material Steel AISI 1018 209 QT sebesar 709,583 MPa dan yang terkecil berada pada material Steel AISI 440C sebesar 696,651 MPa. Sedangkan, regangan (*strain*) yang terbesar (*maksimum strain*) terjadi pada material Steel AISI 440C sebesar 0,00292683 dan yang terkecil berada pada material Steel AISI A36 Mild sebesar 0,00278967. *Safety Factor* terbesar didapatkan oleh material Steel AISI 440C sebesar 1,17645 sedangkan safety factor terkecil di dapatkan oleh material Steel AISI A36 Mild sebesar 0,354142 dan perpindahan (*Displacement*) yang terbesar terjadi pada material Steel AISI 440C sebesar 12,6585 mm dan perpindahan yang terkecil terjadi pada material Steel AISI A36 Mild sebesar 11,8681 mm.

Kata Kunci : *Engine, Engine Gantry System, Lifting Tool, Engine Fan Frame, Inventor*

THE DESIGN OF FAN FRAME LIFTING TOOL FOR ASSEMBLY/DISASSEMBLY ENGINE CFM56-3 WITH INFINITE ELEMENT METHOD USING SOFTWARE INVENTOR

ABSTRACT

PT. GMF Aeroasia provides maintenance and repairs for turbine engines such as the CFM56-3, -5B and -7B. For now, in the assembly and disassembly process, the engine uses a combination of the Maintenance Stand and the Engine Gantry System in the Assy-Disassy Engine area. Before the Assy/Disassy Engine process is carried out, The Fan Frame Engine attached to the Maintenance Stand experienced problems when it was moved to the Engine Gantry System because the support tools were not in accordance with the Engine Service Manual standards. In this research, a special tool is designed, namely the Lifting Tool Fan Frame for the process of moving the Engine Fan Frame from the Maintenance Stand to the Engine Carrier Gantry. The design is divided into three stages, namely the initial design by making two-dimensional drawings, the final design by making three-dimensional drawings and testing the design by performing stress analysis on the software inventor. The final result obtained from the design is the greatest stress (maximum stress) occurred in the AISI 1018 209 QT Steel material of 709.583 MPa and the smallest was in the AISI 440C Steel material of 696,651 MPa. Meanwhile, the largest strain (maximum strain) occurred in AISI 440C Steel material at 0.00292683 and the smallest was in AISI A36 Mild Steel material at 0,00278967. The largest safety factor was obtained by AISI 440C Steel material at 1.17645, while the smallest safety factor was obtained by AISI A36 Mild Steel material at 0.354142, and the largest displacement occurred in AISI 440C Steel material at 12.6585 mm and the smallest displacement. occurred in AISI A36 Mild Steel material of 11.8681 mm.

Keywords: *Engine CFM56-3, Engine Gantry System, Lifting Tool, Engine Fan Frame, Inventor*