

ANALISIS BEBAN STRUKTUR LANDING GEAR PADA PESAWAT GROB G120TP-A

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ABSTRAK

Landing gear merupakan salah satu komponen penting dalam struktur pesawat dan berfungsi menahan beban pesawat saat berada di darat dan karakteristik landing yang berbeda sesuai dengan karakteristik pesawat tersebut. Pesawat Grob G120TP-A menggunakan *landing gear* jenis "Retractable Tricycle Landing Gear" 1 *nose landing gear* dan 2 *main landing gear*. Dengan bentuk *tricycle* diharapkan pesawat lebih stabil saat di *ground* dan mampu menyerap *landing loads* dan *ground handling* yang kuat. Untuk mengetahui batas kekuatan struktur *landing gear* harus dilakukan analisis struktur.

Pada analisis beban *landing gear* telah dilakukan beberapa hal seperti melakukan seleksi pemilihan posisi *c.g* pada pesawat, analisa penetapan berat *landing gear*, dan analisa dinamika *landing gear* dengan metode pengumpulan data, metode pustaka, dan metode wawancara. Posisi *c.g* pesawat untuk koordinat X_T ialah 3,57 m serta koordinat Y_T adalah 1,48 m. Jarak antara *c.g* ke *landing edge* sepanjang MAC (X_{TO}) adalah 0,09 m. Jarak vertikal *c.g* dengan MAC (Y_{TO}) adalah 1,08 m. Untuk penetapan posisi *c.g* dalam persen MAC (\bar{X}_{TO}) adalah 6,48 % MAC serta (\bar{Y}_{TO}) adalah 77,81 % MAC dengan $H_{c.g}$ yaitu 1,36 m sedangkan H_{NLG} adalah 0,23 m dan H_{MLG} yaitu 1,30 m. Hasil analisis pembebanan pada *landing gear* pesawat dalam keadaan statik dan dinamika adalah: P_{mmax} 7123,71 N, P_{nmax} 4484,83 N, P_{nmin} 988,45 N, P_{ndyn} 7635,04 N, dan P_{mdyn} 11239,38 N. Hasil analisis dinamika berat pesawat saat *landing* adalah 1440 kg, sehingga energi kinetik yang direndam pesawat ketika *touchdown* adalah 1834,86 *joule*, $P_{dyntire}$ 12390,78 N, S_n -44,75 m, S_m -41,59 m.

Kata kunci: *landing gear*, pesawat Grob G120TP-A, *Mean Aerodynamic Chord*, beban statis, beban dinamik

LOAD ANALYSIS OF LANDING GEAR STRUCTURE ONG120TP-A GROB AIRCRAFT

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ABSTRACT

Landing gear is one of the important components in the structure of the aircraft and serves to withstand the weight of the aircraft while on the ground and different landing characteristics according to the characteristics of the aircraft. The Grob G120TP-A aircraft used "Retractable Tricycle Landing Gear" type with 1 nose landing gear and 2 main landing gears. With the tricycle shape, the aircraft is expected to be more stable on the ground and able to absorb landing loads and strong ground handling. To investigate the strength limit of the landing gear structure, a structural analysis must be carried out.

In the landing gear load analysis, several things were carried out such as selecting the c.g position on the aircraft, analyzing the landing gear weight determination, and analyzing the dynamics of the landing gear using data collection methods, library methods, and interview methods. The c.g position of the plane for the X_T coordinates was 3.57 m and the Y_T coordinate was 1.48 m. The distance between c.g to the landing edge along the MAC (X_{TO}) was 0.09 m. The vertical distance c.g with MAC (Y_{TO}) was 1.08 m. for positioning c.g in percent MAC (\bar{X}_{TO}) was 6.48% MAC and (\bar{Y}_{TO}) was 77.81 % MAC with $H_{c.g}$ was 1.36 m. While H_{NLG} was 0.23 m and H_{MLG} was 1.30 m. The results of the analysis of loading on the landing gear in static and dynamic conditions were: P_{mmax} 7123.71 N, P_{nmax} 4484.83 N, P_{nmin} 988.45 N, P_{ndyn} 7635.04 N, and P_{mdyn} 11239.38 N. The results of the aircraft load dynamics analysis when it was landing was 1440 kg, as a result the kinetic energy that the plane immersed when touchdown was 1834.86 joules, $P_{dymtire}$ 12390.78 N, S_n -44.75 m, S_m -41.59 m.

Keywords: landing gear, Grob G120TP-A aircraft, Mean Aerodynamic Chord, static load, dynamic load

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