IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.53
Volume 4, Issue 1, March 2024

# Design and Analysis of Landing Gear

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**Abstract:** *The landing gear system is of paramount importance during ground operations and take-off procedures, as it bears the brunt of the aircraft's weight and forces during these critical phases. It is evident that a significant proportion of aircraft structural failures can be attributed to landing gear malfunctions.*
*During landing and take-off, the landing gear must withstand various types of loads, including side loads, compressive loads, and drag loads. Although compressive loads are predominant, the magnitudes of drag and side loads are comparatively smaller. Consequently, the landing gear is typically treated as a one-dimensional structure. Its primary function is to absorb the energy generated upon landing, thereby mitigating the impact on the aircraft frame.*
*For heavier aircraft, the preferred landing gear configuration is often the oleo pneumatic landing gear strut. In addition to static strength considerations, an essential criterion in its design is its ability to absorb and dissipate kinetic energy effectively during the landing process. We then take an aircraft's conventional landing gear and it is designed using CATIA and evaluated using Auto desk inventor software for structural protection. The assembly of landing gears is analysed using AUTO DESK INVENTOR tools for various composite materials and metal alloys. By importing the model landing gear into the AUTO DESK INVENTOR program, Estimation of aircraft landing gear linear stresses and deformation and analysis on main landing gear as well the nose landing gear of an aircraft by linear static structural analysis. The results of the materials listed are compared and the material with the highest factor of safety and the least value of the extreme stress generated will be regarded as the best material to prevent structural failures of the model landing gear system.*

**Keywords:** Factor of Safety, Landing gear, Static analysis, Stress, Total Deformation

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