

Kasia Badger

April 22, 2024

Private Pilot Research - Weight & Balance (Weight Control)

Works Cited

“Aircraft Weight and Balance Handbook.” *BigCommerce*,

<https://cdn11.bigcommerce.com/s-m5qljysoqy/content/look-inside/8083-1B.pdf>. Accessed 22 April 2024.

“Aircraft Weight and Balance Management Tools.” *AeroData*,

<https://www.aerodata.co/en-US/weight-balance/>. Accessed 22 April 2024.

Alexander, Ron. “Weight & Balance: Weighing and measuring your safety.” *Experimental Aircraft Association*,

<https://www.eaa.org/ea/aircraft-building/builderresources/while-youre-building/building-articles/weight-and-balance/weight-and-balance>. Accessed 22 April 2024.

“Aviation operational measures for fuel and emissions - Weight management.” *ICAO*,

<https://www.icao.int/Meetings/EnvironmentalWorkshops/Documents/ICAO-TransportCanada-2006/Viscotchi.pdf>. Accessed 22 April 2024.

“PHAK Chapter 10.” *Federal Aviation Administration*,

https://www.faa.gov/sites/faa.gov/files/12_phak_ch10.pdf. Accessed 22 April 2024.

“Understanding Weight and Balance | Safety First.” *Safety First | Airbus*,

<https://safetyfirst.airbus.com/understanding-weight-and-balance/>. Accessed 22 April 2024.

“Weight and Balance.” *CFI Notebook*,

<https://www.cfinotebook.net/notebook/aerodynamics-and-performance/weight-and-balance>. Accessed 22 April 2024.

“Weight and Balance Control System: Common Mistakes and How to Prevent Them | CTS Blog.”

Computer Training Systems, 26 January 2018,

<https://www.ctsys.com/weight-and-balance-control-system-common-mistakes-and-how-to-prevent-them/>. Accessed 22 April 2024.

“Weight & Balance Handbook (FAA-H-8083-1B).” *Federal Aviation Administration*,

https://www.faa.gov/sites/faa.gov/files/2023-09/Weight_Balance_Handbook.pdf. Accessed 22 April 2024.

Weight control is extremely important because it ensures a safe and efficient flight. When an aircraft is overweight, not only will it most likely be unable to takeoff, but it may be unlandable after takeoff. Thankfully, however, weight from fuel can be burned off throughout the course of a flight. This means that in most cases, if an aircraft is able to takeoff, it will also be able to land. The reason overweight aircraft are unsafe during takeoff is because the aircraft may not have enough time to generate enough lift to takeoff from the runway. On the other hand, overweight aircraft are unsafe to land because landing gear can only take so much landing force. If an overweight aircraft lands and its landing gear cannot take the force of the landing, the landing gear could become damaged, which is very dangerous. Some other effects of an overweight aircraft are the following:

- Higher takeoff speed
- Longer takeoff distance
- Reduced rate of climb
- Reduced angle of climb
- Lower maximum altitude
- Shorter range
- Reduced cruising speed

- Reduced maneuverability
- Higher stalling speed
- Higher approach speed
- Higher landing speed
- Longer landing distance
- Excessive weight on landing gear, especially nose or tail gear