



making perfect  
**takeoffs &  
landings**



**IN LIGHT AIRPLANES**

*Ron Fowler*

*Making Perfect Takeoffs and Landings in Light Airplanes*

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# basic considerations of a normal takeoff

All too often many pilots think of their takeoff as only those few seconds between pushing the throttle forward and lifting the wheels from the runway. This is erroneous thinking that practically guarantees a takeoff lacking in concentration. As an example of what I mean, consider the pro golfer readying for a drive down the fairway. That pro does not consider the swing and millisecond of ball contact as the sum total of the drive. Rather, as integral parts of the effort, the golfer includes those moments spent in addressing the ball before the strike and the follow-through afterward. The pro understands the need for that brief moment before the swing and uses it to bring concentration into sharp focus on the job at hand and to personally synchronize with ball and club. The pro knows too that a follow-through is needed to prevent a premature break in concentration during that critical instant of truth that delivers the drive straight down the fairway.

So it is with takeoffs. Your takeoff will have its address, delivery, and follow-through. You need to include those steps that put you in tune with the plane and the sky. Steps that bring focus and ensure concentration. Think then of your takeoff as a series of steps that begin long before the plane is astride the center line and continue well after the wheels lift off. Perform each step with precision, each step having its own goal to achieve.

1. Starting the engine.
2. Taxiing to the runway.
3. Performing the pretakeoff checks.
4. Taking the runway.
5. Making the takeoff run.
6. Lifting off.
7. Flying the initial climbout.

8. Leaving the pattern.
9. Climbing to cruise altitude.
10. Leveling to cruise.

## Starting the Engine

Starting an aircraft engine is no trivial matter and cannot be handled in a cavalier manner. There is too much at stake for that. The two prime considerations of an engine-starting procedure must be:

1. The safety of those in and around the aircraft.
2. The protection of the plane's power plant and airframe accessories.

Use a checklist to achieve a professional and precise engine-start procedure. Here are some items that should be included in a typical light-plane engine-starting checklist.

1. Seat belt and harness: fastened.
2. Seat position: locked in track.
3. Landing-gear handle or switch: down and locked.
4. Fuel-tank selector: freedom of movement; proper tank.
5. Cowl flaps: open.
6. Carburetor heat: closed.
7. Propeller: set for high RPM.
8. Avionics and electrical equipment: off.
9. Fuel mixture: full rich or as required.
10. Throttle: start position.
11. Primer pump: prime engine.
12. Propeller area: Clear!
13. Electrical master switch: on.
14. Auxiliary electric fuel pump: on.
15. Brakes: hold or set.
16. Magnetos: on.
17. Start engine: avoid prolonged cranking.
18. Throttle: adjust for warm-up (1,000–1,200 RPM).
19. Oil pressure: normal within 30 seconds.
20. Ammeter: normal.

Let's take a moment to discuss some of the *significances* that lie behind each of these checklist items.

### ***Seat Belt and Harness: Fastened***

It is important that every occupant be belted and harnessed before taxi begins. A collision with converging taxiing aircraft is just as devastating as an auto accident.

Federal Aviation Regulations (FARs) require the pilot to instruct passengers in the fastening and unfastening of belt and harness. This is important for safety. Different belts buckle differently. It is conceivable that a situation could occur wherein split seconds count in unbuckling and evacuating the aircraft. Make this instruction an integral part of checklist item number one.

### ***Seat Position: Locked in Track***

After you have adjusted your seat position, wiggle to make certain that the seat is locked on its track. A pilot who slides out of reach of the rudder pedals at rotation is bound to attract the attention of all on board. (A sliding seat may present the pilot with another distraction. If the front-seat passenger's seat cuts loose, that passenger may try to stem the slide by grabbing the yoke. Be ready.)

Improper seat position is often the reason for erratic rudder control. Many pilots sit with the seat entirely too close to the controls. Adjust the seat so that near-full leg extension still allows firm brake pressure with full rudder deflection.

### ***Landing Gear: Down and Locked***

Make certain that the landing-gear handle or switch is in the down-and-locked position. It is very possible for a boarding passenger to accidentally flip an electrical switch to the "retract" position. Then when the master switch is thrown, surprises may occur. Although gears may be equipped with a "squat" switch to keep the wheels from coming up when the weight of the aircraft rests on the gear, these sensitive switches are checked only once a year.

### ***Fuel-Tank Selector: Freedom of Movement; Proper Tank***

Rotate the fuel-selector handle through its full travel before positioning it to the takeoff tank. This is to make sure you can switch to the next tank when the time comes. Handles do become stuck, or a boarding

passenger could step on and bend it. I've even had handles come off when I've turned them.

Consult your aircraft manual to determine the proper takeoff tank. Most light-plane manuals suggest "fullest tank," but a few specify a certain fuel cell.

Here is a rule of thumb to follow: never take off with less than one-quarter capacity showing on the gauges, not even for a quick turn about the pattern. Even though you may anticipate a flight of only a few minutes, a runway situation, for example, or an aircraft discrepancy aloft may prolong your need to stay airborne.

### ***Cowl Flaps: Open***

If you are flying a plane with cowl flaps, for proper cooling they should be open during taxi, run-up, and climb (Figure 1-1). Now is the time to open them, lest you forget.



Henry Geijsbeek

[figure 1-1] Unless the conditions are extremely cold, cowl flaps should be open during ground operations and climb.