

Wheel Landings

The why and how

BY STEVE KROG



I'M FREQUENTLY ASKED ABOUT wheel landings. Why do you do them? How do you do them? Aren't they difficult? One of the guys at the airport commented, "Aren't wheel landings dangerous?" I've often heard these questions, comments, and more.

Wheel landings, touching down on the main gear while keeping the tail in the air, are neither dangerous nor difficult. But doing them correctly and safely requires a bit of patience and some finesse. Why are they feared by many tailwheel pilots? Mostly, the fear is due to listening to the "expert" hangar flyers sharing their so-called "wisdom" about things they do not understand. When taught properly and understood, wheel landings are as easy as making medium-banked turns. And wheel landings are required when earning a tailwheel endorsement. So, let's take the fear out of the equation. For discussion purposes, I'll use the Piper J-3 Cub as the training aircraft.

Working with students, I have a step-by-step procedure I follow when teaching wheel landings. Before beginning the wheel landing phase of training, I first work with the student to establish, or reestablish, stable and consistent approaches. The approach speed is slightly different when planning a wheel landing. I use the normal approach speed of 60 mph and then add 5 more mph while carrying a power setting 100-200 rpm above idle. A stable approach makes the landing much easier, smoother, and safer. Once the approach is perfected, we can move on to the next step.

Step two, when teaching wheel landings, involves leveling off at 2-3 feet above the runway, with enough power to remain there, and then working on the sight picture both forward and peripherally. Keep the runway in view while using peripheral vision to remain centered on the runway. About three-quarters down the runway apply full power and go around. Repeat this maneuver two or three times, or until you feel comfortable flying low over the runway.

Once at ease with the low pass, the next step involves establishing the low pass attitude over the runway as discussed in the previous paragraph. Then slowly reduce the slight power you are using. The aircraft will want to descend, but hold it off the runway with slight back-pressure on the control stick.

Unlike the three-point landing where forward visibility is obscured by the nose-high attitude in the flare, forward visibility can usually be maintained. You are in control of the descent, so try to let it settle just inches at a time. Too much back-pressure and a climb is initiated. Too little back-pressure and the aircraft drops onto the runway, creating a bounce.

Once the main gear contacts the runway, relax any back-pressure and apply slight forward-pressure, keeping the gear in full positive

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contact with the runway. Hold this attitude for several seconds, and then apply full power to go around. A frequent mistake occurring at this point is that the pilot will apply far too much forward-pressure on the control stick. This downward load on the gear will usually make it spring back, launching the aircraft back into the air.

This is the point in the wheel landing where pilots make mistakes and sometimes get in trouble. Commonly, when within a foot or so of the runway, a pilot gets anxious and pushes the stick forward, driving the aircraft into the runway. This forces the airplane to bounce, sending it back into the air. You have two options if this happens. Either add full power and go around, or add enough power to recover from the bounce, stabilizing the aircraft. Then, if there is more than adequate runway in front of you, set up and attempt a second wheel landing. Attempting a second try at the wheel landing after the bounce without adding power will commonly cause second and third bounces, creating an unsafe situation. The rule of thumb for wheel landings is that a go-around is always better and safer than trying to salvage a bounced landing.

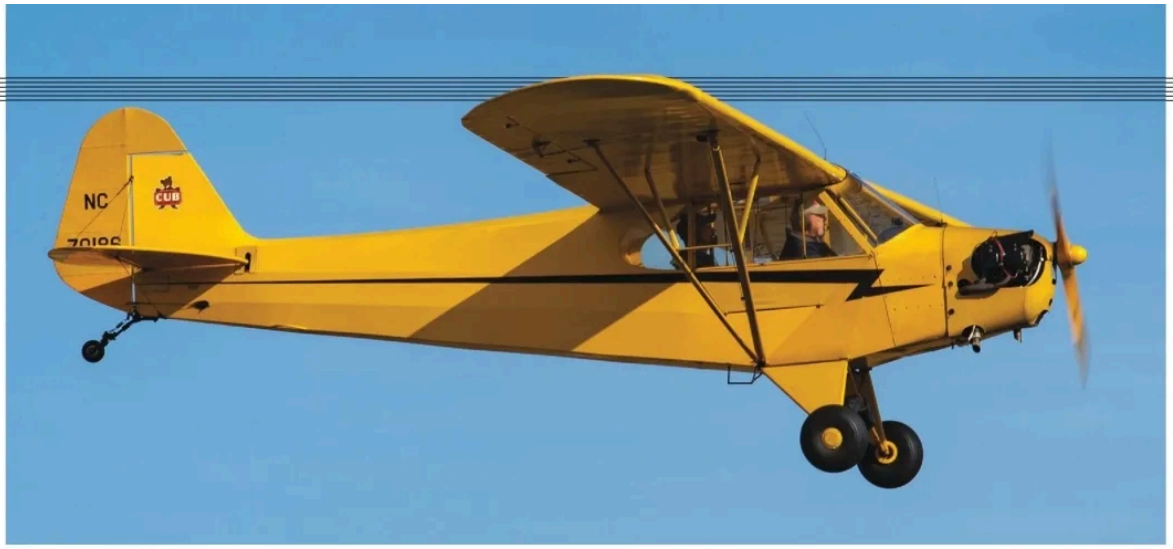
After trying several approaches and landings with a 3-5 second touchdown and getting more comfortable, it is time to try the wheel landing with a full stop. Establish the stable approach 5 mph above the normal approach speed while carrying slightly increased power beyond idle. Level the aircraft over the runway. As it slows and begins to descend, apply slight back-pressure to slow and control the rate of descent. While doing so, begin reducing the power to idle and continue applying slight back-pressure. The aircraft will contact the runway without any bounce if done correctly.

Once comfortably on the runway, continue applying slight, steady forward-pressure on the control stick, keeping the tail in the air and the main gear in positive contact with the runway. Directional control is maintained with the flying rudder. As the aircraft continues slowing down, the tail will begin settling. Relax the forward-pressure and apply steady continuous back-pressure, bringing the tail

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wheel into contact with the runway. Directional control has now been transferred from the flying rudder to the steerable tail wheel. Continue the rollout until forward motion is such that a safe turn onto the taxiway can be conducted.

If I encounter a pilot who has difficulty keeping the aircraft in line with the runway centerline, I have another exercise I like to do. After aligning the aircraft with the runway centerline in preparation for takeoff, I will have the student use the rudder only. I will control the power and control stick. Just enough power is added to raise the tail. The pilot then has the challenge of straddling the centerline using rudder inputs.

Several trips down the runway employing this exercise will usually help the pilot relax and apply rudder inputs as needed for a straight-line track down the runway. Then we can go back to working on the wheel landings and follow-through.

I frequently get quizzed about which type of landing I prefer when encountering a crosswind, and my reply is that it depends. A three-point landing is more than comfortable and safe when dealing with a moderate steady crosswind. Using either the crab angle or the wing into the wind and opposite rudder approach is acceptable. It just depends on which method feels more comfortable to you.

Should the crosswind be of the gusty nature, I personally prefer to make a wheel landing. I use the crab angle approach on final, and then transition to a wing-down opposite-rudder configuration, aligning the airplane with the runway centerline.

I'll include the rule of thumb of adding one-half the gust factor to my approach speed. Once over the runway, I'll slowly descend using slight back-pressure and power reduction all while maintaining the windward wing down and opposite rudder application. If it is quite gusty, I will make this transition much more slowly while encountering the gusts. Don't forget to continue feeding in more aileron as the airplane slows.

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Rather than allowing the tail to continue flying until it no longer can remain in the air, I'll start easing the stick back a bit sooner and getting the tail wheel firmly in contact with the runway. Directional control is now maintained with the steerable tail wheel while the windward aileron is fully deflected toward the wind.

It is also vital that the control stick is kept in the full aft or back position once the tail is down. Allowing the tail to get back in the air due to a lapse in control inputs will probably send you on a short cross-country flight into the weeds next to the runway.

The key points to remember when working on wheel landings are:

1. First establish a stable approach.
2. Carry about 5 mph increased approach speed using slight power above idle.
3. Level and start the flare about 3-4 feet above the runway.
4. Establish your sight picture.
5. Begin reducing power while applying slight back-pressure to control the rate of descent.
6. Upon touching down, relax back-pressure and begin applying slight forward-pressure on the control stick.
7. Slowly reduce the power to idle while continuing to keep the tail in the air.
8. As the tail begins to settle, apply back-pressure to establish firm runway contact with the tail wheel.
9. Keep the control inputs in place until the aircraft comes to a stop.

Some pilots will disagree with my methods. I don't mind. If you have a different but safe method to make wheel landings, by all means continue doing so. The system I use for teaching wheel landings has worked successfully for me and the many pilots who have come to Cub Air for tailwheel endorsements for the past 22 years.

Stay focused and fly safely. EAA

Steve Krog, EAA 173799, has been flying for more than five decades and giving tailwheel instruction for nearly as long. In 2006 he launched what is now Kylie's Cub Air Flight, a flight training school using tailwheel aircraft for all primary training.

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