STEVE KROG
COMMENTARY / THE CLASSIC INSTRUCTOR

Landing Incidents

Why do they keep happening?

BY STEVE KROG

I SPEND A GREAT deal of time teaching students the art and science of landing an airplane safely and correctly, especially a tailwheel airplane. Some students get it figured out in a matter of three or four hours while others take a few more. In either case, the same principles apply. It's just a matter of how quickly students absorb the elements of the sight picture and then apply what they have learned in a repeated, consistent manner.

A good landing always begins at about the midpoint of the downwind leg of the traffic pattern. If the attitude, altitude, and airspeed are managed properly and the approach is stable at this point, the initial portion of the landing will be good as well. Having to fix any of the three elements while on the final approach will create an unstable approach and lead to a marginal landing at best.

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In the past three weeks or so, I had six students take and pass their initial checkrides. I preached every day leading up to their checkrides that they should always opt for executing a go-around rather than trying to salvage a landing from a poor or unstable approach. Recently, one of the students made three go-arounds before performing the requested landing, all because the student was not comfortable with how things looked after turning onto the final approach leg. At the post-flight briefing, the examiner commented that the student made the right decision by opting to go around each time before performing the desired soft-field landing.

ESTABLISHING A GOOD APPROACH

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Prior to working in the pattern with students, I often employ a demonstration while on the ground to help them visualize what they should be looking for to understand how to judge their altitude while on the final approach. Place a magazine on the floor to represent the approach end of a runway. Step back from it about 5 or 6 feet. While facing the magazine, bring your hands up to just below eye level and extend your thumbs horizontally until they touch. You're now looking through the make-believe windshield at your aim point on the runway. Remain in this position and raise your hands while looking at the magazine. The magazine will appear to be dropping down and moving toward you. This indicates that you are too high on your approach to land.

While still in the same standing position, lower your connected hands while looking at the magazine. Now it will appear as if the magazine is rising up and moving away from you. This tells you the approach is too low.

PHOTOGRAPHY BY **JIM KOEPNICK**

Looking through your hands at the simulated runway aim point. If the aim point appears to be moving downward and toward you, you are too high on the approach.

If the aim point appears to be moving upward and away from you, you are too low on the approach.

If on the desired glide path, the aim point should remain centered in your view through the windshield until you are ready to level off.

Finally, position yourself in the same manner with your thumbs touching and arms extended just below eye level. Walk slowly toward the magazine while at the same time lowering your hands simulating a descent, keeping your thumbs touching. You've just simulated an approach to land on the desired glide path.

SIGHT PICTURE

Having "walked" through the approach and proper sight picture on the ground, it's time to try it in the air. I teach students to fly a reasonably tight pattern as I'm not a fan of the 1 mile or longer final approaches. The pattern you fly will need to be adjusted depending on the size and speed of the aircraft being flown. Our flight school uses the Piper J-3 Cub for at least the first 10 hours, or more, of flight time. As a result, the downwind leg is approximately one-quarter mile horizontally away from the intended runway.

When abeam the numbers of the approach end of the runway, power is reduced to about 1800 rpm, and the downwind leg is extended until reaching an approximate 45-degree angle off the approach end centerline. A descending left turn is then executed rolling out perpendicular to the runway. At midpoint of this base leg, I want to be about 500 feet AGL.

The descending left turn onto final is then made. Upon rolling out of the turn, the aim point is established. Power changes are made as needed to maintain the desired glide path to the aim point. Think in terms of being a lawn dart. If the descent wasn't stopped 8-10 feet above the runway, the aircraft would arrive nose first on your aim point.

STEVE KROG

LANDING — WHERE THINGS CAN GO HAYWIRE

The landing, whether three-point or wheel in a tailwheel, or in a tricycle, begins about 8-10 feet above the runway. Here is where I've observed things going wrong:

1. A pilot realizes the airplane is too high and then pushes the nose over to realign with the aim point and crosses the runway threshold 10-15 mph beyond the desired approach speed. Floating for what feels like minutes, the pilot tries to force the airplane onto the runway. In a tricycle-gear aircraft, the nose wheel touches down first, creating what is referred to as a wheelbarrow landing. Then the pilot pulls back on the yoke, causing the airplane to fly again. Realizing the error, the pilot pushes forward on the yoke, slamming the nose gear onto the runway and often causing damage. The nose gear collapses due to the exaggerated down force, causing the prop to strike the runway. When the aircraft finally slides to a stop, it immediately becomes a reportable situation — as well as a costly one! Most important, though, it could have been prevented had the pilot paid attention to attitude, altitude, and airspeed.

2. If landing a tailwheel aircraft in a similar situation, a pilot's first reaction will be to apply slight back-pressure to try to configure the aircraft for a three-point landing. The excess speed causes the aircraft to climb 10-15 feet. Realizing the error, the pilot relaxes the stick pressure allowing the aircraft to begin settling rapidly. Rather than adding full power and executing a go-around, the pilot pulls the stick into the full aft position allowing the airplane to slam onto the runway. Depending on the type of landing gear, the aircraft may or may not remain on the runway. A Cub with the bungee-style gear, for example, will launch the airplane back into the air. With no airspeed remaining and the pilot out of ideas on how to save the landing, the aircraft slams onto the runway a second time, often doing damage to the landing gear and creating another incident or even an accident. Again, it could have been prevented had the pilot been more situationally aware of altitude, attitude, and airspeed.

3. Another common error I've observed is when a pilot becomes fixated on the aim point and then doesn't properly arrest the approach descent, allowing the aircraft to drive itself into the runway. A tricycle aircraft will usually do two things when this occurs. First, it will bounce back into the air. While doing so the nose then pitches slightly downward, allowing the nose wheel to hit hard and causing the wheelbarrow effect. Loss of directional control then occurs, often ending in an excursion off the runway and into surrounding tall grass. I once observed a brand-new Mooney attempt to land too fast. After the first bounce, the nose wheel was in contact with the runway for nearly 1,000 feet, but the main gear wheels never made contact. The Mooney shot off the end of the runway and down a shallow embankment while the prop kicked up a cloud of dust. The whole affair could have been prevented with better airspeed control, but instead it resulted in a reportable incident!

4. Failing to flare and driving a tailwheel aircraft onto the runway generally causes it to bounce or spring back into the air, sometimes quite high. Forward momentum is almost always exhausted during the bounce, and the aircraft is airborne with no airspeed. The resulting second bounce can easily bend a landing gear, causing loss of control. Had power been applied and a go-around initiated, this incident could have been prevented.

5. One of the most common errors I've observed is seeing a pilot relax on the controls immediately after touching down. A pilot may get away with this in a tricycle-gear aircraft. However, this action will cause a remarkably interesting ride in a tailwheel aircraft. Upon touchdown with the stick or yoke all the way aft in a tailwheel aircraft, the pilot relaxes on the stick allowing it to move forward. Instantly the tail rises off the runway and the wings are again generating lift. Without instant corrective action, this situation will usually lead to another off-runway excursion. The tail is in the air, but neither the tail wheel nor rudder can provide directional control. Should there be a slight crosswind, the aircraft will have a mind of its own. It will weathervane, point itself into the wind, and begin off-roading until stopping. Sometimes the only damage is to the ego of said pilot. However, often this situation leads to gear, structure, and prop damage, all becoming a required reportable incident.

If the attitude, altitude, and airspeed are managed properly and the approach is stable at this point, the initial portion of the landing will be good as well. Having to fix any of the three elements while on the final approach will create an unstable approach and lead to a marginal landing at best.

There are numerous other errors I've observed, but the most common mistakes leading to landing incidents described above could have been prevented with better altitude, attitude, and airspeed control. Always remember to remain situationally aware and fly the airplane from the moment the prop begins turning until it stops in front of the hangar. Doing so will help keep the landing incidents and accidents to a minimum.

Enjoy the sky and keep flying safe! EAA

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