

Tailwheel Flying Tips and Mistakes

Takeoff and landing edition

BY STEVE KROG



I'M OFTEN ASKED WHAT is so difficult about flying a tailwheel airplane. It's actually not difficult, but it does require focus, feel, hand and foot coordination, and knowledge of surface and surface wind.

If it isn't difficult, why are there so many incidents with tailwheel airplanes?

Two reasons: pilot error or bad tailwheel setup. As I read through the FAA published incident and accident reports, about 90 percent of the tailwheel events occur on either takeoff or landing. And, about 80 percent of the events in this group occur on landing. I'm going to focus on the pilots in this article.

There are repeated common mistakes made by the pilot. Beginning with the takeoff sequence, here's what I see occurring. The pilot will taxi onto the runway in preparation for the takeoff. But did the pilot taxi forward a few feet after the turn onto the runway? If not, the tail wheel may still be turned rather than aligned with the longitudinal axis of the airplane and runway centerline. Should aggressive power be added, the aircraft is going to want to turn, probably sharply depending on the horsepower. The pilot already has a problem and hasn't advanced more than a few feet down the runway. Some tailwheel aircraft are equipped with a locking tail wheel. If you know a pilot who flies a locking tailwheel aircraft, ask them if they have ever tried a takeoff without locking the tail wheel!

The next most common mistake is beginning the takeoff roll with the control stick or yoke in a neutral or forward position. When in a three-point position, the only directional control is via the steerable tail wheel. As soon as power is applied, the prop wash wants to turn the airplane and there is no downward pressure on the tail surfaces. The only means of steering the airplane for the first 5 or 10 seconds of the takeoff roll is dependent on the steerable tail wheel. If there is no downward pressure, the tail wheel is just along for the ride. Also, during this time frame the rudder is not effective as there is little or no relative wind passing around it.

Positioning the stick or yoke in the neutral or forward position is a common reaction for a pilot flying a tailwheel aircraft for the first time. With one or two aircraft exceptions, forward visibility is obscured in the three-point attitude. So, when starting the takeoff roll, it is only natural for the pilot to want to get the tail up, allowing forward visibility. This can really aggravate the takeoff roll, as mentioned above.

The method I like to teach is to locate the stick or yoke in the full aft position before beginning the takeoff. Smoothly apply power. I teach students to go from idle to full power over 3 to 5 seconds and to count out the seconds while doing so. At about 5 seconds, you can feel

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the relative wind pushing on the up elevator. Feeling this, relax the back-pressure slightly, allowing the tail to come off the ground. Try to position the tail so that it is only about a foot above the ground. The aircraft is now in a near ideal positive attitude for generating the maximum amount of lift. By keeping the aircraft in this attitude, it will fly itself off the ground without further input from the pilot.

During this takeoff roll, the pilot should be using a diagonal line of sight for maintaining a straight line takeoff roll and right rudder to offset torque and P-factor. When I speak of diagonal line of sight, I'm speaking of looking about 30 to 45 degrees left or right of center focusing on the runway edge. On a hard surface runway, this equates to about two runway lights forward of your position.

The most common mistake a tailwheel pilot will make at this point of the takeoff is to raise the tail high enough to see over the nose. In doing so, the wing is now in a neutral if not negative angle of attack. You can travel down a 10,000-foot runway and never lift off in this attitude. I like to establish a positive angle of attack and let the airplane do the flying when it is ready rather than forcing it into the air. The only time I might want to position my aircraft in a neutral or negative angle of attack might be when dealing with strong gusty winds. I'll want some extra groundspeed for liftoff in this situation.

LANDING MISTAKES WHEN TRANSITIONING FROM TRICYCLE TO TAILWHEEL AIRCRAFT

The approach to land in a tailwheel aircraft is no different than in a tricycle. Leveling off to stop the descent is also the same, as is establishing the flare to touch down. From this point forward inputs are quite different.

When nearing the actual touchdown, keeping the aircraft, or longitudinal axis, aligned perfectly with the centerline is where the fun begins. Most but not all tailwheel aircraft block forward visibility as the flare is established. The pilot must be thinking well ahead of the airplane and using what we refer to as diagonal line of sight to keep it aligned with the centerline while maintaining depth perception.

If performing a three-point or full stall landing, controlling the last 3 or 4 feet of altitude before touching down is essential in preventing big bounces. Steady control yoke or stick back-pressure is required. As the airplane continues to settle, more back-pressure is applied, slowing the rate of descent. In an ideal three-point landing, all three wheels should smoothly touch the runway surface as the control stick reaches the full aft position.

If it isn't difficult, why are there so many incidents with tailwheel airplanes? Two reasons: pilot error or bad tailwheel setup.



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Learning to fly and handle a tailwheel airplane efficiently and safely is not difficult. But it does take a concentrated refinement of hand, eye, and foot coordination.

Many tricycle pilots, when reaching the touchdown point, will relax all control back-pressure while the aircraft rolls down the runway. Try that method in a tailwheel and you'll probably end up doing a short cross-country through the drainage ditch and neighboring bean field.

Another action I see tricycle pilots take is when landing with a crosswind, after touching down, the aileron correction is taken out. Do that in a tailwheel airplane and you are guaranteed a trip through that bean field.

Why is this so vital? Under normal wind conditions, the steerable tail wheel is your primary source for directional control. Assisting is the wing that is in a high angle of attack, or stall attitude, and not generating lift. Instead, it is creating drag, helping slow the aircraft. Relaxing on the control stick back-pressure at this instant allows the tail to rise slightly. The tail wheel is totally ineffective, but the wing is now at an angle of attack where it is generating some lift. This is the instant when a new tail wheel student loses the airplane and requires assistance. A tailwheel aircraft must be flown until it comes to a stop!

This is where ground loops, or worse, occur. The tail wheel is not touching the surface, and the rudder is ineffective. But the elevator has found enough energy to lift the tail, allowing the wing to generate lift. If there is even a hint of the aircraft turning left or right, the student unknowingly pushes the stick forward and moves it away from the direction of the turn. Bad move at this point. Any amount of wing drag is lost so there is little to slow the momentum.

As the ground loop progresses, the wing away from the direction of the turn drops. The pilot then moves the control stick opposite the direction of the turn, placing the aileron in the down position. Should the wingtip contact the ground during the loop, the aileron also hits the ground, causing damage to it and the wingtip.

I've flown with students where I first anticipate, and then see, a ground loop developing. It becomes a judgment call on my part, but if we're moving slowly enough and we're on a turf runway, I'll allow the ground loop to take place. My only input is to position the ailerons neutral and pull the control stick all the way to the full aft position.

When the airplane comes to a stop, there is always a moment of silence from the student. The first words uttered are, "What the heck did I just do?" followed by my response of, "You just experienced your first ground loop." Back at the hangar we will relive the event using a model airplane to show how and what happened.

We try to teach every one of our students the idea that when flying a tailwheel airplane, you fly it from the moment the propeller starts to turn until the propeller stops when parking in front of the hangar.

Over the past five years or so, we have worked with many experienced airline pilots. They've read articles, discussed the level of difficulty with fellow pilots, and have convinced themselves it is a worthy challenge to give it a try. Most of these pilots have commented afterward that mastering the tailwheel airplane has made them a much better, more efficient pilot. I've also had airline and corporate pilots share with me that they can tell within minutes if their first officer has had tailwheel training.

Learning to fly and handle a tailwheel airplane efficiently and safely is not difficult. But it does take a concentrated refinement of hand, eye, and foot coordination. I have taken tailwheel students who have soloed at around 15 hours and placed them in the Cessna 150. It will take them about two hours to handle it safely. I have taken students who have soloed the 150 in about 15 hours and put them in a J-3 Cub. It will take them about 15 hours to reach a safe solo point. Teaching foot work takes time, and there is a great difference in foot work between flying a tricycle and tailwheel aircraft safely.

Spring is upon us. Get out to the hangar, dust off the airplane, and get back in the air for a fun and safe flying season. EAA

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