



STEVE KROG

COMMENTARY / THE CLASSIC INSTRUCTOR

Soft-Field Takeoffs and Landings

Practice makes perfect

BY STEVE KROG

IF YOU WERE ASKED to explain a soft-field takeoff and landing, could you do it? How long has it been since you've done one? Like many people, you may not have attempted one since your initial checkride with an examiner. Others may have tried to demonstrate either, or both, during a flight review, but soft-field procedures are seldom practiced.

Soft-field takeoff and landing techniques are a mandatory training segment for all sport, private, and commercial pilots. However, very few students ever experience true soft-field conditions. Rather, the procedure is taught on hard-surface runways and taught just well enough to pass the checkride. Unfortunately, this practice can lead to an unplanned incident.

We've experienced significant amounts of rainfall throughout the country this year. Too much rain, in fact. Farm fields are flooded, waterways are overflowing their banks, and turf runways are oftentimes unusable. We had to cancel numerous training flights this past summer and fall due to standing water on all our turf runways. When they do dry out somewhat, we practice a lot of soft-field takeoffs and landings out of necessity. We've had no problem practicing these procedures under real conditions due to the excess rainfall we've experienced.

I mentioned this to our local FAA Safety Team manager when he stopped by recently. He rolled his eyes and asked us to please keep doing this as he'd recently been involved in inspecting three incidents where the aircraft ended up on its back due to soft-field conditions.

What is the key objective when attempting a soft-field takeoff? Obviously, to get the aircraft out of the muck and off the muddy surface as quickly and safely as possible. But how do we do this? There may be several ways to teach soft-field techniques, but this is how I prefer teaching it.

If we know the takeoff is to be made from a soft field and requires that we taxi on the soft field, it is imperative that we take care of all pre-takeoff checks prior to taxiing onto the soft field. Mags are checked, flaps are checked and set (if so equipped), and radio is checked. We do not want to have to stop our movement once on the soft surface. Should we stop, it may be very difficult to have enough power to get moving again. If back-taxiing is required, do so along either edge of the runway to allow room for making a 180-degree turn for takeoff. Clear the approach end of the runway visually while back-taxiing to prevent any conflict with landing traffic.

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When flying a conventional gear or tailwheel aircraft, it is important to keep the tail wheel in contact with the runway surface for directional control, but use common sense and a bit of finesse so as not to bury the tail wheel in the muck. Light back-pressure on the stick or yoke should be applied rather than full back-pressure, which is the proper procedure under normal conditions.

As you approach the departure end of the runway and have visually cleared the final approach area, begin your 180-degree turn onto the center of the runway and continue adding power to keep the aircraft moving. As full power is applied, begin moving the stick or yoke forward taking the downward pressure off the tail wheel. Once the tail wheel has broken ground, keep the tail low while accelerating, establishing a positive angle

of attack. As groundspeed is increased, move the stick or yoke very slightly fore and aft, helping the main gear become free of the sticky muck. Once airborne, remain in ground effect by lowering the nose while building airspeed. As you approach either V_x or V_y , initiate a normal climb attitude and continue climbing out of the traffic pattern.

If flying a tricycle gear, it is important to keep the nose wheel from burrowing into the mud. This is done by holding back-pressure on the yoke and keeping as much weight off the nose wheel as is safely possible without compromising directional control. While back-taxiing, clear the approach end of the runway and then begin your turn onto the center of the runway. Hold the yoke in the full aft position while continuously adding power to prevent the soft surface from stopping you.



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Once aligned with the approximate runway centerline, smoothly apply full power, keeping the yoke in the full aft position. As groundspeed increases and the full prop blast passes over the tail surfaces, the elevator becomes effective causing the nose to rise off the runway surface. Here is where a bit of finesse and practice become quite beneficial. Too much back-pressure and the nose is too high, creating a stall configuration for the wings as well as banging the tail off the runway. Too little back-pressure and the nose wheel drops onto the soft surface and begins digging in. Neither configuration is safe or desirable.

When teaching students in a tricycle-gear aircraft, I'll first practice soft-field takeoffs on a hard surface. I control the power while the students have all of the other controls. Just enough power is applied to feel the nose lifting off the runway. Then I'll work with the students to hold that attitude for four to five seconds before applying full power. As the aircraft becomes airborne, we push the nose over and fly in ground effect for several more seconds before initiating the climb. Assisting students through this procedure three or four times significantly increases their ability to recognize each step, safely execute the needed inputs, and then perform the procedure with confidence. Then I'll move students over to the soft field for demonstrating the takeoff under real circumstances. If the aircraft is flap equipped, flap application as recommended in the pilot's operating handbook is employed.

Landing on a soft field also requires some finesse. The primary objective is to get the aircraft to touch down as softly and lightly as possible while maintaining some forward momentum, preventing the aircraft from bogging down and possibly going up on its nose or, even worse, flipping on its back.

When teaching soft-field landings in tailwheel aircraft, I begin by having students set up to make a normal three-point landing. Then, while in the flare attitude and just before touching down, I'll apply about 150-200 rpm. The airplane is suspended in ground effect well below the published stall speed. While students hold this attitude, I'll slowly reduce the power, and the airplane gently settles onto the runway. Once the wheels touch the runway, a slight bit of power is again added to help

maintain a bit of forward momentum while the airplane continues settling onto the surface. Maintain some back-pressure on the stick or yoke, but not full back-pressure. We want to keep the tail wheel on the ground for handling directional control, but we don't want to bury it in the mud.

After students have experienced two or three approaches and landings with me operating the power, they're ready to take over and demonstrate it for me. I add one additional step, however. They are to explain to me every input they're making during the approach, touchdown, and roll-out. Getting students to verbalize while flying a maneuver helps drive home the procedure so they never forget.

When landing a tricycle gear aircraft on a soft field, my approach to teaching is quite like the tailwheel approach. The student does the flying while I control the power for the first two or three landings. A normal approach is flown. Then, as the aircraft is leveled off and begins the flare, I'll add just enough power to keep the airplane airborne for a couple of seconds before slightly reducing power, allowing the main gear to touch down. Some power is still maintained, or slight additional power is even added, to keep the nose gear from touching while the groundspeed is dissipating. Once the nose wheel has touched down, I continue to hold enough back-pressure on the yoke to prevent the wheel from sinking or digging into the muck. It is also important at this stage to keep moving until reaching higher ground or a firm surface. If you allow the airplane to stop, you may need help to get it moving again. I never use a full flap setting when teaching soft-field landings in a flap-equipped aircraft. Too much flap and the nose has a tendency to drop hard onto the landing surface creating a problem that can easily be avoided.

Soft-field takeoffs and landings are not difficult, but they do require a bit of practice from time to time to establish and maintain the level of proficiency needed should you find yourself in a situation where they are required. *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.