**STEVE KROG**
**COMMENTARY /** THE CLASSIC INSTRUCTOR

# Pietenpol Transition

Taking time to understand the idiosyncrasies

BY STEVE KROG

**A MIDDLE-AGED GENTLEMAN STOPPED** by the hangar recently. "I could use some advice and some dual instruction," he said. He came to me after doing a self-evaluation, a good practice for all pilots. He was a private pilot wanting to receive some additional tailwheel dual before attempting to fly a recently completed homebuilt tailwheel airplane.

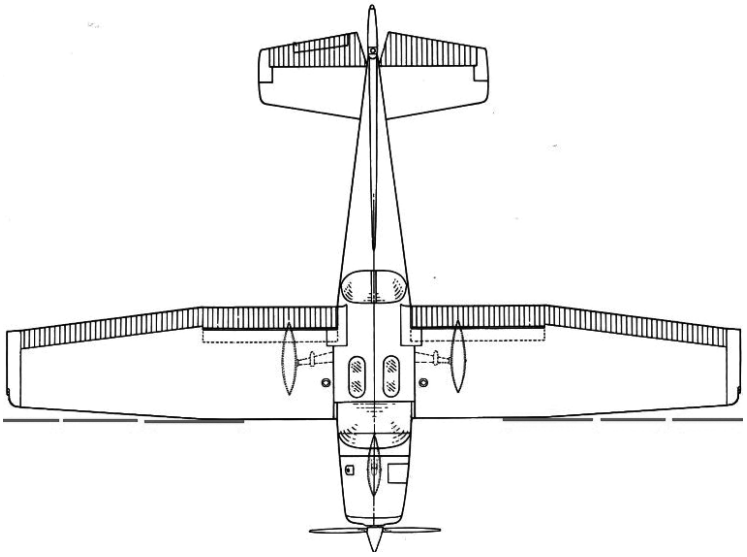
Before flying, we first discussed the type of flight training he had received previously, the type and frequency of the flying he was currently doing, flight characteristics of the aircraft he was planning to fly, what he wanted to accomplish to safely and comfortably fly the homebuilt aircraft, and the type of airport from which he would be flying the plane.

Although this gentleman had been flying for several years, he felt his previous training was lacking a true understanding of learning to "feel" an airplane throughout the various in-flight inputs. Accumulated flight hours had been done in a small handful of aircraft. He learned to fly in Cessna aircraft and was taught to fly more so by the numbers rather than by understanding and developing a feel for the aircraft being flown. He needed attitude flying.

He had been flying about 50 hours per year, making him not only current but also proficient, all in tricycle-type aircraft. Although he had received tailwheel training several years prior and had earned a tailwheel endorsement, his gut instinct told him he needed more training before safely flying his newly completed aircraft.

I'm from the old school of flight training where a student is taught to "attitude fly" the airplane. No, that doesn't mean entering the cockpit in a good frame of mind but rather learning where the aircraft's nose is in relation to the horizon given the common power settings. (I've provided detailed input for doing this in previous articles.) I also teach "feeling" the airplane. The plane is always talking to the pilot in command. It moans and groans when skidding, slipping, or whenever placed in a noncoordinated attitude and position. Listen closely when flying these older, low-horsepower aircraft. The engine is telling you when it is under a load or running at a faster rpm than it desires. Learn to listen for that cruise power "sweet spot" and run it there when flying, either for pleasure or especially when flying cross-country.

After our "attitude" discussion we talked about the airplane he had built — a Pietenpol powered by a 65-hp Continental engine. The wing design is like the Piper J-3 Cub in that the leading edge is straight from wing root to wingtip. This type of wing will fully stall. The Cessna aircraft my pilot friend had been flying has a tapered wing with a bit of a twist in it, preventing the wing from entering a full stall without exaggerated inputs. The tapered wing with a twist allows the ailerons to remain effective during a stall, and the pilot's operating handbook recommends using opposite aileron application along with opposite rudder and lowering the nose when initiating a stall recovery.



*Note how the outer half of the wing tapers away from the wing leading edge.*

When initiating a stall recovery in the Pietenpol, the ailerons should remain neutral. Rudder input opposite the direction of the wing drop, together with applying forward pressure on the control stick, aids the nose to a downward attitude. Once the wing is again generating lift, elevator back pressure and aileron inputs can be safely applied to return the plane to a straight-and-level flight attitude.



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*The one-piece wing is straight from wingtip to wingtip and has no dihedral.*

*Note the slight upward angle of the wing from the fuselage to the wingtip.*

Dihedral is another factor one should be consider when flying the Piet. The Pietenpol was designed with simplicity and ease of building in mind. The wing has neutral dihedral for the plansbuilt Piets. You may recall from your ground-school training that airplanes are designed to have positive, neutral, or negative dihedral in the wing installation. The more dihedral the greater the stability to remain or return to straight and level flight when banking or encountering light turbulence, provided the aircraft rigging is correct. The J-3 Cub has an approximate 2-1/2-degree wing dihedral making it quite stable. Other aircraft such as the Aeronca Champ have a greater dihedral making it one of the more stable high-winged, low-horsepower aircraft built in the 1940s.

The stall and the stall-break are different in a neutral dihedral aircraft, too. They are safe to practice but a bit more unpredictable. Due to Piet wing design, the full stall will break more sharply than most other training aircraft because the entire wing stalls versus a partial wing stalling like the Cessna tapered wing. When the full wing stalls, the aircraft may roll in either direction left or right depending on the prop rotation rpm and the coordination or lack thereof of the ailerons and rudder. It is nothing to be afraid of, but rather something to be aware of.



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Similar to the J-3 Cub, the Pietenpol is quite light in the tail. One can pick up the tail and move the aircraft with one hand. While this is good for moving the aircraft on the ground, it can create a problem for the pilot on landing. If the pilot becomes lax and doesn't continue to hold the control stick in the full aft position after touching down, the tail can and will come up. When this occurs, the wing is no longer in a full stall configuration and can generate lift depending on groundspeed and surface wind.

Another friend of mine shared an experience he had observed. A friend of his was landing a Pietenpol just ahead of him, and he was following in a Cub. The Piet touched down in a normal full stall or three-point attitude, but while rolling out the pilot relaxed on the control stick. The elevators moved to a neutral position, and the tail came off the runway. A light 20-degree crosswind of less than 8 knots prevailed at the time of the landing. Concerned with the tail lifting off the runway the pilot forgot the crosswind, and the Piet had a mind of its own. Before coming to rest it had exited the runway through a runway light and down into a drainage ditch. After coming to rest the only thing hurting on the pilot was his pride. The Piet, however, suffered significant damage to the wings and struts along with the prop and landing gear. All due to a short lapse in follow-through by the pilot.

The Pietenpol, like the Cub, has a light wing-loading factor (weight to lift). Consequently, it is more responsive to thermals while in flight and to wind and wind gusts when on the ground. It is extremely important that strict aileron and elevator positioning be practiced when taxiing, taking off, and landing.

I recently observed an incident where a beautifully built Pietenpol was taking off on turf with an estimated 8-knot crosswind. In the excitement, the pilot forgot about the wind. During the takeoff roll the tail came up, but there was no crosswind aileron input. Immediately the left wing came up and then stalled; the aircraft made several awkward bounces before coming to a rest. Gear, prop, wingtip, and ego all received damage.

Rudder inputs and usage are also a bit different when comparing a Cessna to the Pietenpol. The Cessna cruises along at about 100 mph while the Piet comfortably cruises at 60-70 mph. Rudder inputs are light but necessary when making a turn in the Cessna, although I find lack of rudder usage quite common when conducting flight reviews in a Cessna. The effectiveness of the rudder is directly proportional to the immediate airflow. The greater the speed of air flowing around the rudder, the higher its efficiency.

The slower-flying Piet requires additional and more aggressive rudder usage to control yaw than many other low–horsepower, single-engine aircraft. If transitioning from a Cessna — or even from a Cub — to a Piet, it is important to spend some time in the air developing a good feel for rudder inputs. It doesn't require heavy stomping on the rudder; smoothness and finesse will do the trick. It's important that one does this to prevent cross-control skidding turns as we all know what they can lead to.

**The Pietenpol is a simple, economical, and really fun airplane to fly. However, like most any other aircraft, it can "bite" you if you don't take time to understand some of its idiosyncrasies.**


*Note the large rudder compared to the vertical fin. A slow-flying aircraft will need more rudder surface to fly comfortably and safely.*

The Pietenpol is a simple, economical, and really fun airplane to fly. However, like most any other aircraft, it can "bite" you if you don't take time to understand some of its idiosyncrasies. I've had the opportunity to fly the Continental-, Corvair-, and Ford Model A-powered Piets. They are great fun and will treat you to a great flight provided you show them some understanding and respect.

Knowledge of the aircraft that you intend to fly and its sometimes-peculiar characteristics will make for a much more pleasant and safe flight. EAA

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