Out with the old, in with the new

A New Year's Day adage that has exceptions

By Ralph Butcher

I'll give away my entire aviation library before I'll part with my copy of *Stick and Rudder*, Wolfgang Langewiesche's (*Long-gah-vee-shay)* timeless book first published in 1944 and still in print. That's a testament to the book's value, so if you have a copy, don't throw it out.

Chapter four, "The Flying Instinct," explains how you sense what Langewiesche calls *buoyancy*. He states, "For this is perhaps the most hard-to-get-at skill in the whole art of flying—the sensing of 'lift,' the gauging of the firmness of one's sustentation, the 'feel' a pilot must have for his ship's Angle of Attack, the ability to know how close the ship is to the stalled condition: this is what pilots used to call the flying instinct."

Modern flight training often ignores the factors that Langewiesche discusses—factors that are not inconsequential. They are critical for competent airmanship. Ignoring them explains the increased stall/spin accidents of recent years, because basic flight training in many cases has become mechanical with an overemphasis on instrument reference.

The proper use of your physical senses is the concern, and hearing is the first consideration. Airflow noise past doors or windows and through air vents is a direct indication of airspeed. Engine noise is a direct indication of engine power. Using a modern headset diminishes these sensory inputs, particularly if it is a noise-attenuating headset. Like most pilots, I prefer the advantages that headsets and boom mics provide, and even though external sounds are muted, I can still hear clues that tell me what the airplane and the engine are doing. But I learned to use these clues long before headset usage was commonplace in light airplanes.

Control feel is an indirect indication of airspeed. As airspeed decreases, control resistance decreases; as airspeed increases, control resistance increases. Rudder and aileron feel can be misleading because they are influenced by the propeller's slipstream when power is applied, but that is not the case for aileron feel. Control position is an indirect indication of angle of attack. If the yoke is well aft, angle of attack is larger than it would be when the yoke is well forward at the same power setting. Control response is an indirect indication of controllability. Making slight, momentary control inputs when flying at approach speeds yields important information. If attitude response is positive, you have an airspeed safety margin. If attitude response is sluggish, the safety margin is minimal.

At the end of the chapter, Langewiesche asks two questions: "But what about the airspeed indicator? Can't you always tell by the airspeed indicator how far you are from the stall, how much buoyancy you have?"

He then answers his own question. "The answer is neither a straight yes nor an outright no. The airspeed indicator is indeed the pilot's most important flight instrument. As our airplanes are now equipped, it is the only instrument that indicates anything at all concerning buoyancy, Angle of Attack, closeness to the stall. But it is not a simple and straightforward instrument. In the first place, it can develop mechanical trouble. In the second place, it has some peculiarities that must be understood before it can be used as a buoyancy meter or a stall-warning device. Ignorance of its peculiarities has cost may a pilot his life."

Langewiesche would be greatly alarmed at modern pilots, many of whom barrel down the runway watching the airspeed indicator and jerk the airplane into the air when they reach a specific airspeed. Jets and large two-pilot airplanes do have rotation speeds, but they also have dual instrumentation so that both airspeed indicators can be validated for accuracy during the initial takeoff roll. That is impossible to do when the airplane has only one airspeed indicator.

In that situation, which means most light airplanes, well-trained pilots establish the takeoff pitch attitude when they feel the control pressures come alive, which takes longer in a T-tail airplane because the horizontal stabilizer is above the prop wash. As the airplane continues to accelerate, you should maintain that attitude and let the airplane fly off the runway when the wing is ready to fly.

At liftoff move the yoke forward slightly to *maintain* the liftoff attitude for rapid acceleration to the desired climb speed—all airplanes tend to pitch up slightly just after liftoff and when exiting ground effect. Maintaining the proper attitude is impossible to do if you have not developed a sense of feel for the airplane and an awareness of attitude deviations while looking outside the cockpit.

Fly smart, fly safe. Learn to use your physical senses to back up the airspeed indicator.

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