Quit Stalling…

Like a recurring dream that doesn't quite classify as a nightmare, yet none the less leaves you feeling a wee bit disconcerted, I was once again witnessing a scenario that always puts me in a defensive mode. I was prepared for the possibility of having to say "I have the controls" as I aided the errant pilot in the recovery of a spin.

Although the scenario could occur while teaching advanced maneuvers such as a chandelle, or lazy eight, or perhaps while working through basic aerobatics, that's not where I witness it time after time. While it might occur as a client attempts to stretch a glide in a simulated power failure, or when a pilot, uncomfortable in the bank angle of a steep turn, unconsciously holds top rudder and neglects to add power, that's not it either.

Instead, I witness this scenario on the majority of the flight reviews and practical tests that I conduct. It happens almost every time I ask a client, or applicant to demonstrate a simple straight ahead power off stall. The scenario typically unfolds like this: First the pilot reduces power sufficient to slow the airplane to VFE, and then deploys the flaps; but then, rather than establishing a "stabilized descent… transitioning smoothly… to a pitch attitude that will induce a stall" (as stated in the Private and Commercial Practical Test Standards), they haul back on the yoke or stick pitching up into an accelerated stall.

Typically the right wing falls off as a result of the gyroscopic precession created by the rapid pull up, and rarely is the pilot prepared for this. Thus they quite often neglect the use of their feet as they attempt to pick the wing up with aileron alone, and that is why I so often find myself in a defensive mode whenever I ask a pilot to demonstrate a stall.

Every time this happens I silently ask myself "why is the pilot doing this? Would they ever find themselves pulling back rapidly on the stick in a power off situation?" I am sure the answer is no, yet why then does pilot after pilot do this during a flight review or practical test. I think the answer lies in the fact that the instructor that first introduced them to stalls found that the pilot couldn't recognize when the airplane actually stalled. So to counter this they encouraged the pilot to accelerate the stall, and I am sure we will all agree that there is no way a pilot will not recognize that their airplane has stalled when the nose (and usually the wing as well) rapidly drop off in an accelerated stall.

Unfortunately this is not teaching pilots to recognize those situations when they might very well inadvertently stall in a power off situation. It is not teaching them how to recognize that their airplane might very well be stalled, even though the nose hasn't dropped in a stomach churning negative G pitch change. In introducing a beginning pilot to stalls I sometimes describe a stall by saying, "pull

back on the stick and the houses get smaller… keep pulling on the stick and the houses get bigger."

Returning to a more serious vein I then state that any time you are pulling back on the yoke but the nose of the aircraft is dropping you are most likely stalled (obviously this doesn't apply to inverted flight). I then go on to describe that a stall occurs any time that the wing exceeds it's critical angle of attack and that this can occur at any airspeed or attitude. I describe the first hammerhead stall that I flew. Shortly after entering the dive after reversing direction at the top of the maneuver, I pulled a little too aggressively on the stick, to recover from the dive, only to observe the nose of the airplane (which appeared to me to be pointed virtually straight down) come slightly forward and then move back even though I was still pulling on the stick. I had indeed stalled even though the nose of the airplane appeared to me to be pointed straight down. This experience showed me what up to then I had only understood intellectually. You can indeed stall in any pitch attitude, and at any airspeed.

It's all about angle of attack. Exceed the critical angle of attack, and the wing will stall. If we remember that the angle of attack is the angle formed between the chord line of the wing and the relative wind, it becomes easier to visualize how a wing can stall in any attitude. Thus, if we pull rapidly and strongly back on the stick, the airplane will most likely stall. But who, other than aerobatic pilots, (and, it would seem, pilots asked to demonstrate a stall on a flight review or practical test) would ever do this?

More typically the stall occurs as a pilot tries to maintain altitude, by increasing pitch without adding power, as they get low and slow on an approach to landing. Or perhaps it occurs as they try to stretch a glide after the engine has failed (certainly no adding power here, to assist). If a turn is involved, as in the base to final turn, and the pilot does not maintain coordinated flight, the airplane not only stalls, but enters a spin.

So I would like to suggest that you practice stalls more often than once every other year. To prevent your instructor or examiner from getting into a state of anxiety, and for you to recognize not only when your airplane is stalled, but more importantly for you to recognize all the signals that your airplane will send to you telling you that a stall is imminent, try it this way.

To begin with, insure that you have sufficient altitude (2000' AGL is my absolute minimum for this). Initially reduce the power so that you slow the airplane below flap and gear speed. If you are going to practice the maneuver in the landing configuration then lower your gear and flaps. Further reduce the power to idle power and allow the airplane to descend either at best glide speed (if you are practicing the maneuver clean) or final approach speed. Now, rather than pulling hard and entering an accelerated stall, just pull the nose up high enough to

maintain altitude. As the airspeed bleeds off, continue gently pulling on the yoke or stick. (Hmm… isn't this just what we do when we flare for a landing?)

Pay attention to recognizing how the controls will get "mushy". Pay attention to the buffeting that you might very well feel in the tail. Listen to the changes in sound. Watch as the nose, rather than suddenly dropping (depending on wing form) instead just starts to "bob". Notice how sometimes just a slight relaxing of backpressure on the stick gets rid of the buffeting and bobbing. If a wing drops, see how applying opposite rudder will bring that wing up more efficiently than the ailerons will. Notice how if the airplane has a stall warning (my Super Cruiser doesn't), that warning might start "moaning" like a sick cat (if you're in a Cessna) before the buffeting and that with slight addition of power you can fly all day with that horn blaring and not be stalled.

Once you have recognized that the airplane is stalled, see how it will recover with merely a reduction in angle of attack. It is true that we typically recover from a stall by adding full power, but the addition of power serves merely to minimize the altitude lost in the recovery. It really doesn't get the wing flying again. It's the reduction in angle of attack that does that. Practicing the recovery this way will also prepare you for the eventuality of having to recover from a stall after an engine failure.

As an aside, it is interesting to note that the term "stall" originated with Orville and Wilbur, two years before they put an engine on the Wright Flyer. In their early glider flights at Kitty Hawk, many a flight ended with the glider crashed in the sand. They wrote to Octave Chanute for help in understanding why their glider kept "stalling". The term obviously stuck. And for pilots that don't truly understand what leads to a stall, and the proper recovery techniques, it's often the nose of their airplane that gets stuck… in the ground.

Before I end, I would also like to discuss power on stalls. Again, what I typically experience pilots doing as they demonstrate the maneuver, is very similar to what I see when they perform power off stalls. Again, there is a reduction of power to slow down a bit, and then quite often the pilot will rapidly add full power while simultaneously quickly pitching up into yet another accelerated stall. Again I ask… when would a pilot ever intentionally do this?

What is unfortunately much more common is the following scenario. A pilot will be approaching an obstacle such as a mountain ridge. In addition to the high altitude, the hot, humid, low pressure system is pushing the density altitude even higher. Being on the leeward side of the mountain ridge, where the wind is blowing across the ridge and creating strong downdrafts, then compounds the problem. Oh, and did I mention that the pilot is approaching the ridge perpendicularly rather than at a forty five degree angle, and thus the possibility of turning away from the ridge to escape the sink becomes more difficult?

So with the engine barely making 55 or 60 percent power, the pilot is left trying to clear the ridge with the only tool he has… pulling back on the stick. The critical angle of attack is exceeded and the airplane stalls, and often, because the pilot has failed to maintain coordination due to all the left turning tendencies at work, spins.

So to prepare you for how that stall might feel, I suggest practicing a power on stall in the following manner. Reduce your power to a setting that will yield approximately 55% power. Allow the speed to bleed off, and then once it has, add enough backpressure to the yoke to slowly climb. As the speed bleeds off some more, slowly roll into a turn to the left while continuing to slowly add more backpressure to the yoke.

When the airplane does break into a stall remember that if this scenario were real, the engine would already be making all the power that is was capable of. Thus you would have no power left to aid in the recovery of the stall. So in your practice of this stall your recovery will have to be without the addition of any more power.

I strongly feel that if pilots practiced both power off and power on stalls in the manner I have suggested they would be much better prepared to recognize the onset of one of these stalls and thus be able to prevent it. And if by chance they didn't recognize the onset, they would at least be better prepared to recover once the stall had occurred.

So please quit stalling. Go out and practice some stalls. Remember that you want to learn to recognize the early warnings that a stall is imminent, and thus prevent one from happening. That way you will be better prepared the next time you are beckoned aloft by… blue skies and tailwinds!

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