

XI.B. Power-On Stalls

About: Practiced from straight climbs and climbing turns (15-20° bank) to help the pilot recognize the potential for an accidental stall during takeoff, go around, climb or when trying to clear an obstacle.

TSW: Become familiar with the conditions that produce power-on stalls and will develop the habit of taking prompt preventative and/or corrective action when in a situation resulting in a stall.

Procedure:

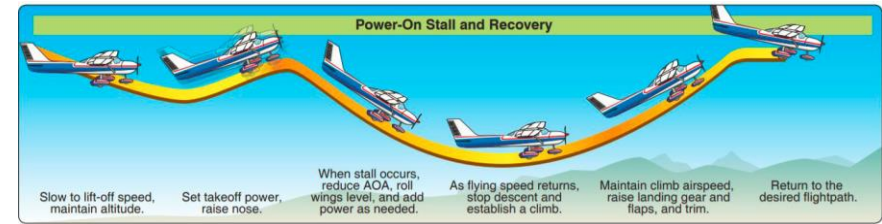
1. No lower than 1500 AGL: two 90 degree clearing turns
2. Slow to liftoff speed (Vr)- Carb heat
3. Add takeoff power (no less than 65%)- remove carb heat
 - a. If turning, maint coordination with rudder and stall within first 90°
4. Smoothly increase the pitch to induce stall.
5. Announce "imminent stall" at stall warning horn
6. Announce "stall" when stall occurs

Recovery

7. Release back pressure on yoke
8. Level the wings with coordinated aileron and rudder
9. Resume normal flight attitude, power, and airspeed w/ minimal loss of alt
10. Accelerate to Vy

Discussion Points:

11. Stall occurs when the critical angle of attack is exceeded (~15-20°)
12. Stall speed in a turn is higher than in level flight. In a turn wings must produce additional lift to maintain alt. This lift comes from additional back pressure which increases the angle of attack.
13. As weight increases stall speed increases. Greater weight means more lift required to maint level flight. This comes from increasing angle of attack.
14. Forward CG = Higher stall speed. Higher tail downforce required to maint level flight, thus AOA must be increased to counter additional load.
15. Recover promptly after the stall occurs by simultaneously decreasing pitch attitude, applying full power, and leveling the wings using coordinated aileron and rudder. Return to straight and level flight attitude with minimal loss of altitude.
 - a. Excessive pitch down can result in excessive alt loss
 - b. Insufficient pitch down won't break stall or cause secondary stall.
16. Do not attempt to level wings prior to reducing AOA.
17. Retract flaps after positive rate of climb is established, Accelerate to Vy before final flap retraction.



Common errors:

1. Not reducing power initially to slow the airplane to a typical takeoff and departure airspeed.
2. Increasing the pitch attitude too much, too quickly, resulting in an excessive steep nose-up attitude and an unrealistic situation.
3. Failure to achieve a stall
4. Rough and/or uncoordinated use of flight controls.
 - a. Not using rudder to assist in maintaining initial directional control.
 - b. All aileron and no rudder will only aggravate the situation, especially before the wings have had time to regain sufficient airflow.
5. Poor stall recognition and delayed recovery (**recover at first indication**)
6. Secondary stall during recovery (**don't aggressively lift nose**)

Evaluations/ Standards:

18. Clear the area.
19. Selects an entry altitude that allows the task to be completed no lower than **1500 feet AGL**.
20. Establishes the takeoff or departure configuration. Sets power to no less than **65 percent available power**.
21. Transitions smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
22. Maintains a specified heading **+ - 10°, in straight flight**; maintains a specified angle of bank, not to exceed **20°, + -10°, in turning flight**, while inducing the stall.
23. Recognized and recovers promptly at the "onset" (buffeting) stall
24. Retracts flaps to the recommended setting, retracts the landing gear if retractable, after a positive rate of climb is established.
25. Accelerates to Vx or Vy speed before the final flap retraction; returns to the normal climb attitude, airspeed, and configuration.