

## XI.F. Secondary Stalls

**About:** Stall that occurs after a recovery from a preceding stall

Typically caused by abrupt control inputs or attempting to return to the desired flightpath too quickly and the critical AOA is exceeded a second time

**TSW:** Understand the importance of recovering from a stall the first time, as the second stall will likely be more pronounced.

### Procedure:

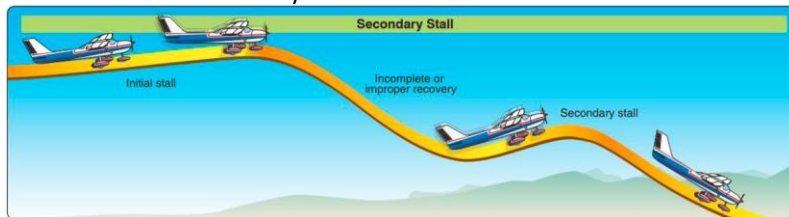
1. 1500 AGL for recovery 2x 90 degree clearing turns
2. **Perform a power-off stall or power-on stall**
  - a. **Power Off**
    - i. Reduce power to decent power (1500 RPM)- carb heat
    - ii. Extend landing flaps
    - iii. Establish normal decent speed- TRIM
    - iv. Power to idle
    - v. Apply back pressure to maintain altitude
  - b. **Power On**
    - i. Power Idle- carb heat on
    - ii. Slow to liftoff speed ( $V_r$ )
    - iii. Add takeoff power (no less than 65%)- remove carb heat
    - iv. Smoothly increase the pitch to induce stall

### **Secondary Stall**

3. At full stall release back pressure
4. Pull back on the control column before the airplane has regained sufficient flying speed.
  - a. Allow airplane to stall for a second time

### **Recovery**

5. Release back pressure on yoke
6. Full power- **R Rudder**
7. Wings level with coordinated rudder and aileron
8. Retract flaps to 20° establish climb pitch attitude
9. Retract flaps in 10° increments accelerating through  $V_y$
10. Stabilize climb out at  $V_y$



### Situation

1. A stall recovery close to the ground
  - a. In the case the recovery must happen quickly (the aircraft is close to the ground), the pilot may prematurely raise the nose into a second stall
2. Abrupt, overaggressive control movements
  - a. This may be the result of nerves, fear, etc.
  - b. Use smooth, controlled movements
3. Attempting to recover from a stall using power only
  - a. Pitch must be used to recover from a stall, the AOA must be reduced
  - b. In most general aviation aircraft, adding power while maintaining the nose high stalled attitude will result in a second stall (power-on stall in this case)

### Discussion Points:

11. The secondary stall is often deeper and more aggressive than the first and can result in more altitude lost
12. The nose may drop farther, and yaw/roll more violently
13. Attempting to recover too aggressively, recovering only with power (no pitch correction), or recovering before the stall has been broken can quickly lead to a secondary stall
14. Prolonged Recovery
  - a. It takes longer to recover from two stalls than one. If close to the ground and time and altitude are limited, the secondary stall may be the difference between hitting the ground and recovering
15. Startle Factor
  - a. Not only does it take longer, and more altitude, to recover from two stalls than one, but the startle factor and unexpected nature of the second stall could lead to an additional delay in recovering if the pilot isn't sure what is happening

### Common errors:

16. Improper or inadequate demonstration of the recognition of and recovery from an elevator trim stall.
17. Not applying sufficient back pressure to induce secondary stall.
18. Not explaining the "what, why, and how" of secondary stalls adequately.

### Evaluations/ Standards:

1. Demonstrate and explain secondary stalls in selected landing gear and flap configurations.
2. Analyze and correct simulated common errors.