Power-On Stall aka The Take-off Stall

AIR ECHO ALPHA 51, LLC.

Objective: A pilot must recognize the flight conditions that are conducive to stalls, the stall characteristics of the aircraft, and know how to apply the necessary corrective actions.

Common Errors

- ❑ Failure to establish specified configuration
- ❑ Improper pitch, heading, airspeed and bank control
- ❑ Failure to recognize the first indications of a stall
- ❑ Excessive pitch attitude
- ❑ Failure to reduce airspeed to T.O. or departure airspeed before initiating the stall
- ❑ Failure to achieve a stall
- ❑ Uncoordinated controls
- ❑ Poor recovery technique
- ❑ Excessive loss of altitude
- ❑ Excessive airspeed during recovery
- ❑ Secondary stall during recovery
- ❑ Spin

Completion Standards

- ❑ Adheres to recommended safety precautions
  - Selects appropriate altitude
  - Clears the area
- ❑ Exhibits knowledge of the elements & aerodynamics of a stall & when a stall is most likely to occur
- ❑ Understands the method used to initiate a power-on stall
- ❑ Recognize the first indications of an impending stall
- ❑ Can demonstrate a stall
- ❑ Performs proper recovery method
  - Promptly reduces AOA with min loss of alt & increases throttle to maximum power
- ❑ Maintains heading +- 10°
- ❑ Accelerates to V_X /V_Y & positive rate of climb before final flap/gear retraction
- ❑ Returns to initial alt, heading & airspeed
- ❑ Uses Checklists

PAVE &Preflight Discussion

20- Min

❑ The **Pilot** & Crew
I'M Safe Checklist & Delegate Duties

❑ The **Plane**
POH - Stall speeds, CG location, Weight, Configuration (flaps) & bank angles

❑ The En**vironment**
The effects of environmental elements on aircraft performance related to stalls (turbulence, wind shear, and high-density altitude)

❑ **External** Pressures
Factors & situations that could lead to an inadvertent power-on stall
Distractions, improper task management, loss of situational awareness, or disorientation.
Limitations of stall warning horns/speeds

❑ Phases of flight that can lead to an inadvertent stall
Excessively nose-high attitude immediately after takeoff or during a climbing turn
When trying to clear/avoid an obstacle or raising terrain after take-off
During a Go-around
Poorly exicuted touch and go
Improper shoft/soft field Take-off tecnique
Density altitude too high for aircraft performance leading to excessivly high nose-high picth attitdue
Poor recovery technique from a bounce, balloon or porpoise during landing

❑ Recognizing the stall
Vision, hearing, kinesthesia, control pressures, warning horns & IAS

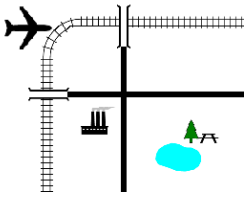
❑ Spin Awareness

Flight Maneuver- The Power-on Stall

20- Min

❑ Clear the Area
Altitude: Task completed > 1,500 ft
Airspeed: @ or below V_A
Airspace: E or G
Area Clear: No traffic

❑ The Set-up
Simulate Take-off (Departure or Upwind-to-Crosswind climb)
Choose a ground reference point to simulate a runway (road or train track)
Note: Heading & virtual Rwy elevation



Complete the Before Take-off Checklist
Take-off Configuration
Throttle - Reduce as needed
Airspeed - Reduce to +5 V_R, V_X or V_Y
Adjust pitch & power (throttle) and trim to maintain airspeed & altitude

**Reducing the airspeed to lift-off airspeed or climb speed before the throttle is advanced to a take-off setting to avoid excessively steep nose-up attitudes*

❑ The Stall
Simulate Take-off & Departure or Upwind-to-Crosswind Climb
Throttle - smoothly increase to full or partial power (no less than 65% power)
Simultaneously transition smoothly from the takeoff or departure attitude to a pitch attitude that will induce a stall.
(Less than 30° nose up)
Maintain **coordinated** directional control

** Announce the first indications of an impending stall*
** Visualize the wing's AOA in any particular profile (compare the relative-wind to the cord-line of the wing)*

❑ The Recovery
Decrease AOA
Throttle - full power
Accelerate to V_X or V_Y
Directional control - Rudder (correct for left turning tendencies)
@ V_X or V_Y & positive rate-of-climb retract the landing gear & flaps if used
Return to starting altitude, heading, and airspeed

** Build a habit of Recovering @ the stall horn, or first indication of an impending stall.*

Traffic Pattern

15-Min

❑ Normal Take-off
Complete the Before Take-off Checklist
Take-off configuration, AS & RPM

❑ Recall where Power-on Stalls are most likely to occur & note your Pitch Attitude, Power Setting, Airspeed on **departure & upwind-to-crosswind**