FAA Safety Team
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CFI Training
61-67c

Stall and Spin Training

FAA.(2000) AC 61-67C - *Stall and spin awareness training*, Retrieved from: http://www.faa.gov/regulations_policies/advisory_circulars/index.cfm/go/document.information/documentID/99862

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Unusual Attitude?

What is an “unusual attitude”?

Any attitude that isn’t usual.

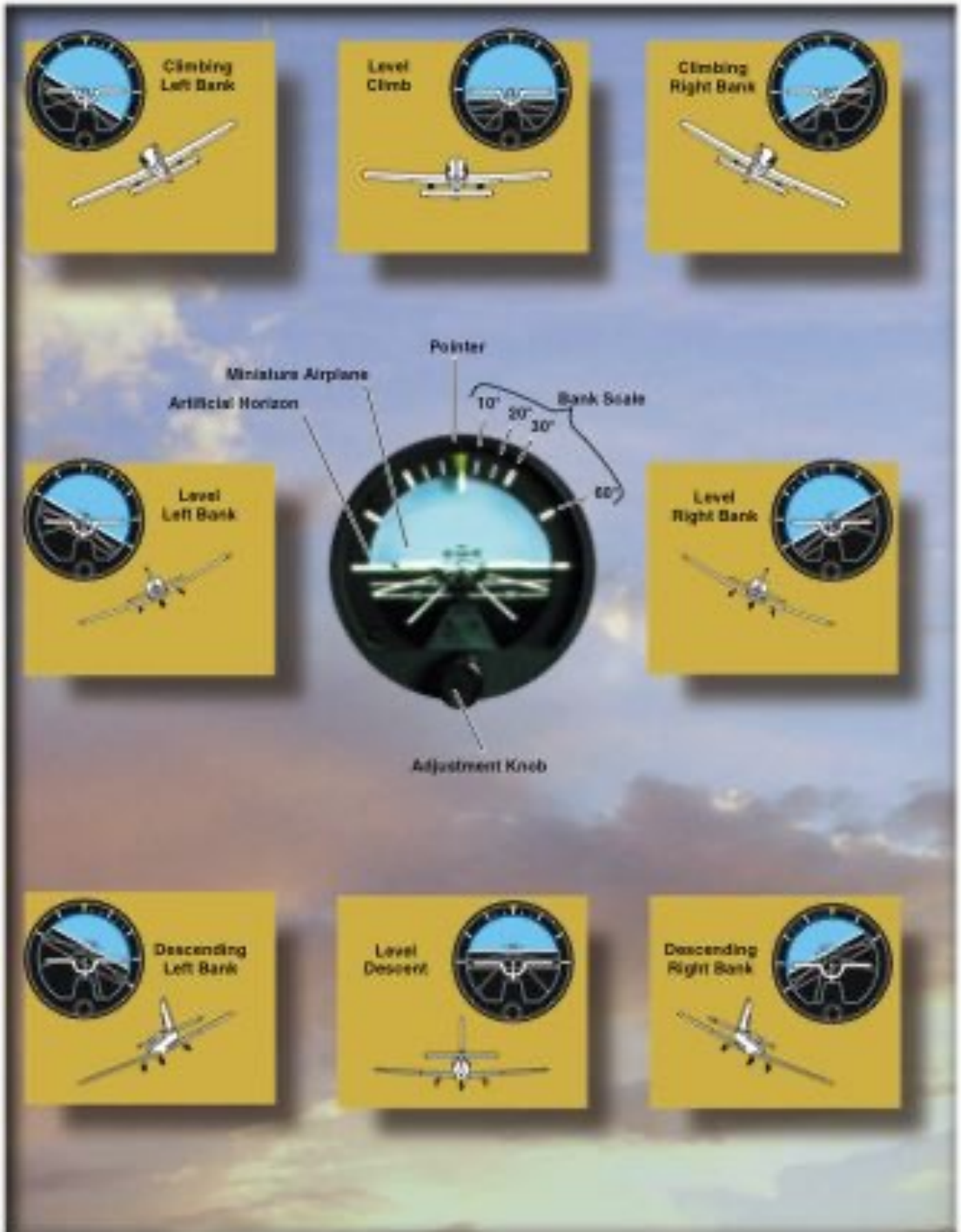
Straight and Level

Unusual = Upset

FAA:

Instrument

VFR


Climbing
Left Bank
Level
Climb
Climbing
Right Bank
Pointer
Miniature Airplane
Artificial Horizon
Bank Scale
10°
20°
30°
60°
Level
Left Bank
Level
Right Bank
Adjustment Knob
Descending
Left Bank
Level
Descent
Descending
Right Bank

STALL TRAINING.

Flight instructor-airplane and flight instructor-glider applicants must be able to give stall training.

The flight instructor should emphasize that techniques and procedures for each aircraft may differ and that pilots should be aware of the flight characteristics of each aircraft flown.

Report No. FAA-RD-77-26, General Aviation Pilot Stall Awareness Study:

simulation of scenarios that can lead to inadvertent stalls by creating distractions while the student is practicing certain maneuvers.

(Stall demonstrations and practice, including maneuvering during slow flight and other maneuvers with distractions that can lead to inadvertent stalls, should be conducted at a sufficient altitude to enable recovery above 1,500 feet AGL in single-engine airplanes and 3,000 feet AGL in multiengine airplanes.)

Stall Avoidance

1) Assign a heading and an altitude. Have the student reduce power and slow to an airspeed just above the stall speed, using trim as necessary.

(2) Have the student maintain heading and altitude with the stall warning device activated.

(3) Demonstrate the effect of elevator trim (use neutral and full noseup settings) and rudder trim, if available.

(4) Note the left turning tendency and rudder effectiveness for lateral/directional control. **(5)** Emphasize how right rudder pressure is necessary to center the ball indicator and maintain heading.

Stall Avoidance Practice

- **(6)** Release the rudder and advise the student to observe the left yaw.
- **(7)** Adverse yaw demonstration. While at a low airspeed, have the student enter left and right turns without using rudder pedals.
- **(8)** Have the student practice turns, climbs, and descents at low airspeeds.
  (9) Demonstrate the proper flap extension and retraction procedures while in level flight
- to avoid a stall at low airspeeds. Note the change in stall speeds with flaps extended and retracted.

Stall Avoidance Practice

10) Utilize realistic distractions at low airspeeds. Give the student a task to perform while flying at a low airspeed. Instruct the student to divide his/her attention between the task and flying the aircraft to maintain control and avoid a stall. The following distractions can be used:

(a) Drop a pencil. Ask the student to pick it up.

(b) Ask the student to determine a heading to an airport using a chart.

(c) Ask the student to reset the clock to Universal Coordinated Time.

(d) Ask the student to get something from the back seat.

(e) Ask the student to read the outside air temperature.

Stall Avoidance Practice

- **(f)** Ask the student to call the Flight Service Station (FSS) for weather information.
- **(g)** Ask the student to compute true airspeed with a flight computer.
- **(h)** Ask the student to identify terrain or objects on the ground.
- **(i)** Ask the student to identify a field suitable for a forced landing.
- **(j)** Have the student climb 200 feet and maintain altitude, then descend 200 feet and maintain altitude.
- **(k)** Have the student reverse course after a series of S-turns.

Power-on (Departure) Stall.

(1) At a safe altitude, have the student attempt coordinated power-on (departure) stalls straight ahead and in turns. Emphasize how these stalls could occur during takeoff.

(2) Ask the student to demonstrate a power-on (departure) stall and distract him/her just before the stall occurs. Explain any effects the distraction may have had on the stall or recovery

Engine Failure in a Climb Followed by a Gliding Turn.

Engine Failure in a Climb Followed by a Gliding Turn. This demonstration will show the student how much altitude the airplane loses following a power failure after takeoff and during a turn back to the runway and why returning to the airport after losing an engine is not a recommended procedure. This can be performed using either a medium or a steep bank in the turn, but emphasis should be given to stall avoidance.

Engine Failure in a Climb Followed by a Gliding Turn.

- **(1)** Set up best rate of climb (VY). Directly below you there should be a straight line landmark (i.e., road or power line) parallel to your flight-path.
- **(2)** Reduce power smoothly to idle as the airplane passes through a cardinal altitude.
  (3) Lower the nose to maintain the best glide speed and make a 260° turn at the best glide
- speed. Emphasize that this turn should be into the wind (if there is a crosswind).

Engine Failure in a Climb Followed by a Gliding Turn.

(4) Re-intercept your final outbound course over the landmark you chose, inbound with an 80° turn in the opposite direction.

(5) Point out the altitude loss and emphasize how rapidly airspeed decreases following a power failure in a climb attitude.

NOTE: Depending on winds, length of runway, and altitude the 260/80° turns may need to be modified (250/70° or 270/90°) to meet the existing situation.

Cross Controlled Stalls in Gliding Turns

Perform stalls in gliding turns to simulate turns from base to final. Perform the stalls from a properly coordinated turn, a slipping turn, and a skidding turn. Explain the difference between slipping and skidding turns. Explain the ball indicator position in each turn and the aircraft behavior in each of the stalls.

Power-off (Approach-To-Landing) Stalls

(1) Have the student perform a full-flap, gear extended, power-off stall with the correct recovery and cleanup procedures. Note the loss of altitude.

(2) Have the student repeat this procedure and distract the student during the stall and recovery and note the effect of the distraction. Show how errors in flap retraction procedure can cause a secondary stall.

Stalls During Go-arounds

(1) Have the student perform a full-flap, gear extended, power-off stall, then recover and attempt to climb with flaps extended. If a higher than normal climb pitch attitude is held, a secondary stall will occur. (In some airplanes, a stall will occur if a normal climb pitch attitude is held).

(2) Have the student perform a full-flap, gear extended, power-off stall, then recover and retract the flaps rapidly as a higher than normal climb pitch attitude is held. A secondary stall or settling with a loss of altitude may result.

Elevator Trim Stall

(1) Have the student place the airplane in a landing approach configuration, in a trimmed descent.

(2) After the descent is established, initiate a go-around by adding full power, holding only light elevator and right rudder pressure.

(3) Allow the nose to pitch up and torque to swerve the airplane left. At the first indication of a stall, recover to a normal climbing pitch attitude.

(4) Emphasize the importance of correct attitude control, application of control pressures, and proper trim during go-arounds.

SPIN TRAINING

SPIN TRAINING

Spin training is required for flight instructor-airplane and flight instructor-glider applicants only. Upon completion of the training, the applicant's log book or training record should be endorsed by the flight instructor who provided the training.

SPIN TRAINING

a. Spin training must be accomplished in an aircraft that is approved for spins. Before practicing intentional spins, the AFM or POH should be consulted for the proper entry and recovery techniques.

b. The training should begin by practicing both power-on and power-off stalls to familiarize the applicant with the aircraft's stall characteristics. Spin avoidance, incipient spins, actual spin entry, spin, and spin recovery techniques should be practiced from an altitude above 3,500 feet AGL.

SPIN TRAINING

c. Spin avoidance training should consist of stalls and maneuvering during slow flight using realistic distractions such as those listed in chapter 2. Performance is considered unsatisfactory if it becomes necessary for the instructor to take control of the aircraft to avoid a fully developed spin.

d. Incipient spins should be practiced to train the instructor applicant to recover from a student's poorly performed stall or unusual attitude that could lead to a spin. Configure the aircraft for a power-on or power-off stall, and continue to apply back elevator pressure. As the stall occurs, apply right or left rudder and allow the nose to yaw toward the stalled wing. Release the spin inducing controls and recover as the spin begins by applying opposite rudder and forward elevator pressure. The instructor should discuss control application in the recovery.

SPIN TRAINING

e. Spin entry, spin, and spin recovery should be demonstrated by the instructor and repeated in both directions by the applicant.

(1) Apply the entry procedure for a power-off stall. As the airplane approaches a stall, smoothly apply full rudder in the direction of desired spin rotation and continue to apply back elevator to the limit of travel. The ailerons should be neutral.

(2) Allow the spin to develop, and be fully recovered no later than one full turn. Observe the airspeed indicator during the spin and subsequent recovery to ensure that it does not reach the red line (VNE).

(3) Follow the recovery procedures recommended by the manufacturer in the AFM or POH. I most aircraft, spin recovery techniques consist of retarding power (if in a powered aircraft), applying opposite rudder to slow the rotation, neutralizing the ailerons, applying positive forward elevator movement to break the stall, neutralizing the rudder as the spinning stops, and returning to level flight.

SPIN TRAINING

SPIN TRAINING AND PARACHUTES. Part 91, § 91.307(c), prohibits the pilot of a civil aircraft from executing any intentional maneuver that exceeds 60° of bank relative to the horizon, or exceeds 30° noseup or nosedown attitude relative to the horizon, unless an approved parachute is worn by each occupant (other than a crewmember).

Section 91.307(d) states, in part, that § 91.307(c) does not apply to flight tests for a pilot certificate or rating; or spins and other flight maneuvers required by the regulations for any certificate or rating when given by a certified flight instructor (CFI) or an airline transport pilot (ATP) instructing in accordance with § 61.167.

SPIN TRAINING

a. Section 61.183(i) requires an applicant for a flight instructor certificate or rating to receive flight training in stall awareness, spin entry, spins, and spin recovery procedures.

The applicant must also possess and demonstrate instructional proficiency in these areas to receive the certificate or rating.

SPIN TRAINING

b. Because spin entry, spins, and spin recovery are required for a flight instructor certificate or rating,

a person receiving instruction from a CFI (or an ATP instructing in accordance with § 61.167) need not wear an approved parachute while instruction is being provided in these maneuvers.

SPIN TRAINING

This provision applies regardless of the certificate or rating for which the person is receiving training and also if the person is receiving instruction that is not being provided for the purpose of obtaining any additional certificate or rating. The instructor providing the training is also not required to wear an approved parachute while providing this flight training.

SPIN TRAINING

c. Any pilot or required crewmember may perform a maneuver that exceeds the limits prescribed in § 91.307(c) without wearing an approved parachute, provided there are no other occupants in the aircraft or the other occupants are wearing approved parachutes.

SPIN TRAINING

Questions?

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