



Power Off Stalls

Private Pilot Approach Stalls

Lesson #

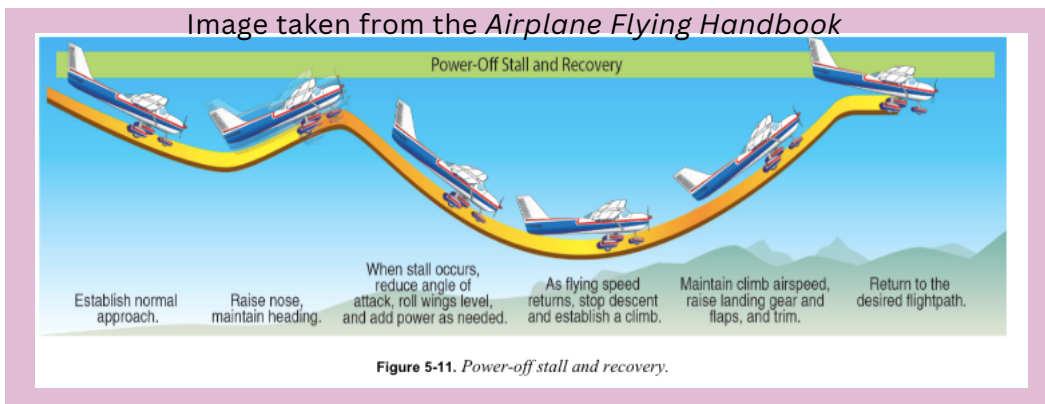
Introduction: Power Off Stalls, or “approach stalls”, are taught to students alongside the recovery procedures to help prepare student pilots for the approach/landing phase of flight. During this phase, pilots are more susceptible to stall/spin incidents, especially during the base/final turn. Students learn the warning signs of a stall and how to avoid an emergency situation.

Power Off stalls are done in a **landing configuration**. This means gear down, flaps extended, and in a descent. Once the plane reaches the approach speed, power is reduced to **idle** and the student induces a stall by pitching up.

Ground Topics:

- Angle of Attack
- Load Factor
- Relative Wind
- Left Turning Tendencies
- Aft CG vs Forward CG

Image taken from the *Airplane Flying Handbook*



Common Errors:

- Improper recovery leading to a secondary stall (not enough push on the yoke when power is added, flap retraction done too quickly, etc.).
- Failure to maintain heading/visual reference.
- Failure to maintain coordination (need more rudder).
- Recovering before the stall occurs (wait for the nose drop).
- Failure to initiate a climb during recovery.
- Forgetting to CLEAR THE AREA FIRST!



Power Off Stalls

CHAIR FLYING WORKSHEET

CLEAR THE AREA

ESTABLISH ALTITUDE

Altitude:

AIRSPEED (AT OR BELOW Va)

Airspeed:

HEADING/REFERENCE

Heading/Landmark:

RPM SETTING

RPMs:

BEGIN THE MANEUVER

SLOW DOWN

RPMs:

Airspeed:

Flap Setting:

Student should be keeping their eyes outside **80% of the time** throughout the maneuver, dividing their attention between their reference point, scanning for traffic, and interpreting the instruments.

The goal is to remain coordinated throughout the maneuver, most likely adding a fair amount of **right rudder**.

Student should also call out the **warning signs** of the stall: horn, buffet, stall light, etc.

DESCEND/CONFIGURE

RPMs:

Airspeed:

Flap Setting:

SLOW DOWN TO APPROACH SPEED

RPMs:

Airspeed:

Flap Setting:

STALL & RECOVERY

PUSH

FULL POWER

FLAPS 10

ESTABLISH STABLE CLIMB Vx

or Vy

FLAPS UP

Vx:

Vy:

At approach speed: Power IDLE, PULL UP gradually



Power On Stalls

Private Pilot Departure Stalls

Lesson #

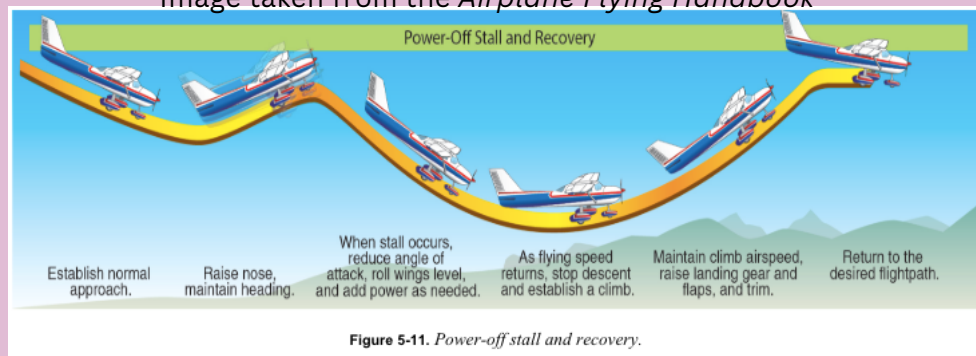
Introduction: Power On Stalls, or “departure stalls”, are taught to students alongside the recovery procedures to help prepare student pilots for the takeoff/departure phase of flight. During this phase, pilots are more susceptible to stall/spin incidents, especially in a busy pattern, on takeoff or on a go around. Students learn the warning signs of a stall and how to avoid an emergency situation.

Power On stalls are done in a **takeoff configuration and attitude**. This means 0-10° flaps, as specified by the evaluator. Once the plane reaches the rotation speed, power is set to **at least 65%** of power and the student induces a stall by pitching up.

Ground Topics:

- Angle of Attack
- Load Factor
- Relative Wind
- Left Turning Tendencies
- Aft CG vs Forward CG

Image taken from the *Airplane Flying Handbook*



Common Errors:

- Improper recovery leading to a secondary stall (not enough push on the yoke when power is added, flap retraction done too quickly, etc.).
- Failure to maintain heading/visual reference.
- Failure to maintain coordination (need more rudder).
- Recovering before the stall occurs (wait for the nose drop).
- Failure to initiate a climb during recovery.
- Forgetting to CLEAR THE AREA FIRST!



Power On Stalls

CHAIR FLYING WORKSHEET

CLEAR THE AREA

ESTABLISH ALTITUDE

Altitude:

AIRSPEED (AT OR BELOW Va)

Airspeed:

HEADING/REFERENCE

Heading/Landmark:

RPM SETTING

RPMs:

BEGIN THE MANEUVER

SLOW DOWN

RPMs:

Airspeed:

Flap Setting:

Student should be keeping their eyes outside **80% of the time** throughout the maneuver, dividing their attention between their reference point, scanning for traffic, and interpreting the instruments.

The goal is to remain coordinated throughout the maneuver, most likely adding a fair amount of **right rudder**.

Student should also call out the **warning signs** of the stall: horn, buffet, stall light, etc.

CONFIGURE/CLIMB

RPMs:

Airspeed:

Flap Setting:

SLOW DOWN TO ROTATION SPEED

RPMs:

Airspeed:

Flap Setting:

STALL & RECOVERY

PUSH

FULL POWER

FLAPS 10

ESTABLISH STABLE CLIMB Vx

or Vy

FLAPS UP

Vx:

Vy:

At Rotation speed: ADD Power, PULL UP gradually



Steep Turns

Private Pilot Steep Turns

Lesson #

Introduction: Steep Turns are a constant altitude, 360° turn in a constant bank of 45°. This maximum performance maneuver can be used to escape surrounding terrain or obstacles. Additionally, it teaches students how to anticipate and counteract certain aerodynamic behaviors of the aircraft, and develop coordination & smoothness. Students will also develop a more efficient scan between outside and the instrument panel.

Steep Turns should begin straight and level, with an outside reference dead ahead, and at an airspeed **at or below maneuvering speed**. The student should initiate the turn after clearing the area, and start applying added power and back pressure once they pass 30°, and into 45°. The goal is to maintain your entry altitude, and roll out on your entry heading, within ACS standards.

Ground Topics:

- Overbanking Tendency
- Load Factor
- Left Turning Tendencies
- Rate and Radius of Turn
- Adverse Yaw
- Accelerated Stalls

Image taken from the *Airplane Flying Handbook*



Common Errors:

- Not using enough rudder to maintain coordinated flight.
- Allowing the plane to overbank and exceed 45°.
- Failure to scan outside for traffic and collision hazards.
- Descending too much on the left turn, climbing too much on the right turn due to skewed sight picture.
- Failure to add enough power to avoid the stall indications.
- Improper altitude recovery technique.



Steep Turns

CHAIR FLYING WORKSHEET

CLEAR THE AREA

ESTABLISH ALTITUDE

Altitude:

AIRSPEED (AT OR BELOW Va)

Airspeed:

HEADING/REFERENCE

Heading/Landmark:

RPM SETTING

RPMs:

BEGIN THE MANEUVER

Straight & Level

RPMs:

Airspeed:

Flap Setting:

Student should be keeping their eyes outside **80% of the time** throughout the maneuver, dividing their attention between their reference point, scanning for traffic, and interpreting the instruments.

Begin Turn

RPMs:

Airspeed:

Flap Setting:

The goal is to remain coordinated throughout the maneuver, most likely adding a fair amount of **right rudder**.

Student should maintain a **sight picture** of the nose in reference to the horizon.

45° Bank

RPMs:

Airspeed:

Flap Setting:

Roll Out

Begin roll out 20° or so early. Take out the extra power/trim. Confirm roll out landmark/heading, airspeed & altitude.



Ground Reference

Private Pilot Ground Ref.
Maneuvers

Lesson #

Introduction: Ground Reference Maneuvers are the building blocks for flying the traffic pattern. By learning how to complete Turns Around a Point, S Turns and Rectangular Course successfully, you'll develop the skills required to fly a consistent and safe traffic pattern. Through proper aircraft control, division of attention and wind correction, students will learn how to place the airplane in relationship to specific references on the ground.

For all ground reference maneuvers, you want to enter on a **downwind** to establish the steepest bank of the maneuver. So you'll first need to identify **the direction the wind is coming from**. The reference could be a tree, a pond, an intersection of roads, or anything else that's not moving and where you have **options to land in the case of an emergency**.

Each maneuver should be completed between **600' AGL-1,000' AGL** to mimic a typical traffic pattern altitude. Treat your reference point like a runway!

BONUS TIP: Do some of these maneuvers with different flap settings to familiarize yourself with the plane's handling characteristics.

Ground Topics:

- Types of airspeeds
- Wind Correction
 - Ground Track, Drift
- Rate & Radius of Turn
- Instrument Scan
- Minimum Safe Altitudes
- Traffic Pattern Legs

BONUS TIP: Rectangular Course is a great maneuver to practice radio calls with your CFI! Don't actually transmit, but say the radio calls out loud when you're on each "leg" of your course.

Common Errors:

- Fixation on the reference point and lack of situational awareness.
- Failure to divide attention between outside and the instruments.
- Overusing the throttle and changing the RPM settings too much, causing fluctuations in airspeed and altitude.
- Failure to properly assess wind direction and apply the appropriate corrections.
- Failure to maintain coordination with aileron and rudder.
- Failure to maintain altitude and airspeed.
- Failure to select a proper ground reference (don't choose someone's house, and make sure you have emergency landing spots nearby).



Ground Reference

CHAIR FLYING WORKSHEET

CLEAR THE AREA

Find a Reference Point

- NOT A HOUSE
- Trees, flag poles, intersecting roads...
- Have emergency landing spots available.

Determine the wind direction

- A 360° constant bank turn around your point to see how the airplane drifts.
- Flag poles, grass, dust or smoke will help indicate wind direction.
- Check the weather at a nearby airport.

Set up to enter on a downwind

ESTABLISH ALTITUDE

Altitude:

AIRSPEED (AT OR BELOW Va)

Airspeed:

HEADING/REFERENCE

Heading/Landmark:

RPM SETTING

RPMs:

Student should be keeping their eyes outside **80% of the time** throughout the maneuver, dividing their attention between their reference point, scanning for traffic, and interpreting the instruments.

Remember, a **faster groundspeed will require a steeper turn** to maintain a constant radius. Your turns shouldn't be steeper than **30°**, because you wouldn't do steeper than that in a traffic pattern! If the wind is pushing you **away from your point, you need a steeper turn**. If the wind is pushing you **toward your point, you need a shallower turn**.

Ensure you're trimmed out and have positive aircraft control **before you begin the maneuver**.