

N7412W Private Pilot Maneuvers

Steep Turns (PA-28-180)

Objective:

To develop coordination, orientation, division of attention and smooth control techniques while executing high performance turns.

Description:

The maneuver consists of a 360° turn using a bank angle of approximately 45° while maintaining a constant airspeed and altitude.

Setup

Procedure:

- 1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
- 2) Perform clearing turns.
- 3) Adjust the mixture in accordance with the POH.
- 4) Reduce power to establish an airspeed of 105 Mph.
- 5) Enter a coordinated 45° banking turn to the left or right.
- 6) Increase power and adjust trim and pitch as required to maintain altitude and airspeed.
- 7) Begin rollout at ½ the bank angle prior to rollout heading.
- 8) Reduce power and pitch on rollout as needed to remain at 105 Mph.
- 9) Return to cruise flight and complete cruise checklist to include leaning procedures.

Flight Proficiency Standards:

- Exhibits knowledge of the elements related to steep turns.
- Establishes the manufacturer's recommended airspeed (95 kts) or if one is not stated, a safe airspeed not to exceed V_A .
- Rolls into a coordinated 360° turn; maintains a 45° bank.
- Perform the task in the opposite direction, as specified by the instructor.
- Divide attention between airplane control and orientation.
- Maintain the entry altitude, ± 100 feet, airspeed, ± 10 kts, bank, $\pm 5^\circ$; and roll out on the entry heading, $\pm 10^\circ$.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning

Outcomes:

- Explain why load factor increases as bank angle increases.
- Discuss the relationship between load factor and stall speed.
- Discuss the principle of over-banking tendency.
- Explain how to maintain altitude and airspeed.
- Explain limit load factor and what happens if it's exceeded.

Safety Considerations:

- Do not exceed manufacturer's recommended airspeed or V_A .
- Always clear the area before initiating the maneuver.
- The maneuver is to be completed no lower than 1,500' AGL.
- Division of attention between maneuver and scanning for traffic.

Common Errors:

- Improper pitch, bank, and power coordination during entry and rollout.
Uncoordinated use of flight controls.
Improper procedure in correcting altitude deviations.
Loss of orientation.

Maneuvering During Slow Flight (PA-28-180)

Objective:

To demonstrate the flight characteristics and controllability of an airplane at speeds lower than normal cruise and develop proficiency in performing maneuvers that require slow airspeeds.

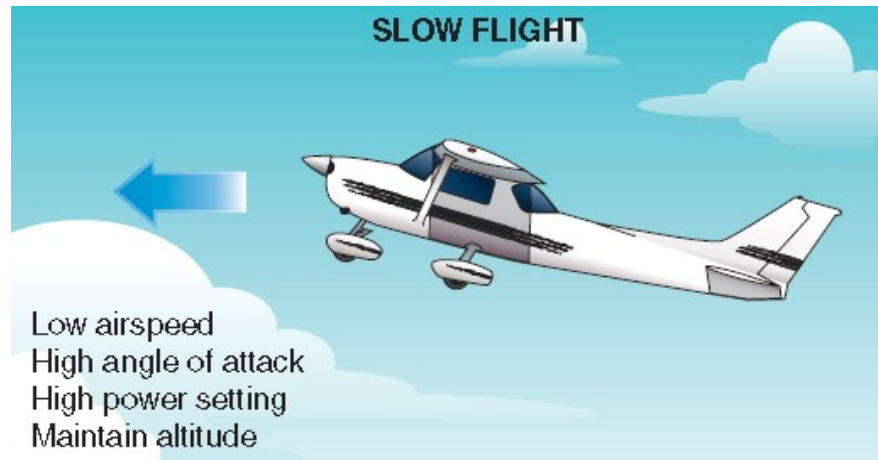
Description:

Slow flight consists of slowing the aircraft to a minimum controllable airspeed in the landing configuration and maneuvering the aircraft while maintaining altitude and airspeed.

Setup

Procedure:

- 1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
- 2) Perform clearing turns.
- 3) Set mixture to $\frac{1}{4}$ inch lean of full rich.
- 4) Reduce power to 1,500 RPM or less.
- 5) Below 115 MPH, set flaps to 10° .
- 6) Adjust pitch and power as necessary to maintain altitude.
- 7) Below 90 MPH, set flaps to 25° and 45° allowing the aircraft to stabilize between each setting.
- 8) Establish and maintain an airspeed that may intermittently activate the stall warning horn.
 - a. Slow flight should be practiced at varying speeds and configurations above the 1G stall speed of the aircraft as specified by the instructor.
- 9) Maneuver as instructed.
- 10) Recover when instructed by:
 - a. Adding full power
 - b. Set flaps to 25° and allow the aircraft to stabilize.
 - c. Then set flaps to 10° and 0° allowing the aircraft to stabilize between each setting.
- 11) Return to cruise flight and perform the cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to maneuvering during slow flight.
- Selects an entry altitude that will allow the task to be completed no lower than 1,500'AGL.
- Establishes and maintains an airspeed at which any further increase in angle of attack, increase in load factor, or reduction in power, would result in an immediate stall.
- Accomplishes coordinated straight and level flight, turns, climbs, and descents with landing gear and flap configurations specified by the instructor.
- Divides attention between airplane control and orientation.
- Maintains the specified altitude, ± 100 feet; specified heading, $\pm 10^\circ$; airspeed, $+10/-0$ kts; and specified angle of bank, $\pm 10^\circ$.

Learning Outcomes:

- Explain the relationship between pitch and power in maintaining airspeed and altitude during slow flight.
- Discuss how flight at minimum airspeeds develops the ability to estimate the margin of safety above the stalling speed.
- Compare the practice of slow flight to various phases of flight such as; takeoffs, climbs, descents, go-arounds, and approaches to landing.

Safety Considerations:

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified gear and flap configuration.
- Improper entry technique.
- Failure to establish and maintain the specified airspeed.
- Excessive variations of altitude and heading.
- Rough or uncoordinated control technique.
- Improper correction for left turning tendency.
- Improper trim technique.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – Off Stall (PA-28-180)

Objective:

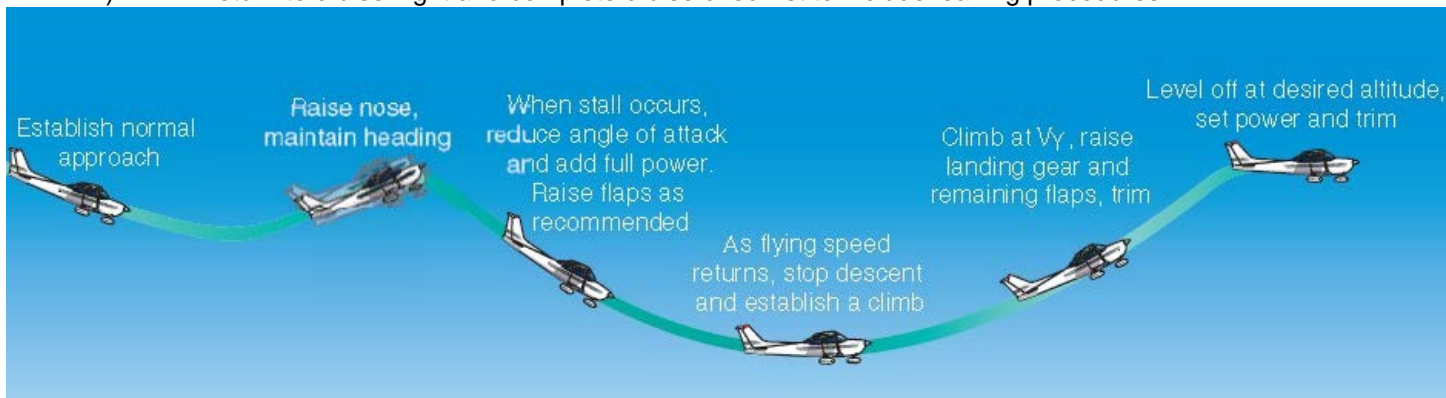
To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop the skills to prevent and recover from stalls in the landing configuration.

Description:

The aircraft is slowed down and placed in the landing configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup Procedure:

- 1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
- 2) Perform clearing turns.
 - 3) Set mixture to $\frac{1}{4}$ inch lean of full rich.
 - 4) Reduce power to 1,500 RPM or less allowing the aircraft to slow to approach speed while maintaining altitude.
 - 5) Below 115 MPH, set flaps to 10° .
 - 6) Below 90 MPH, set flaps to 25° and 40° allowing the aircraft to stabilize between each setting. 7
 - 7) Establish a stabilized descent at 85 MPH.
 - 8) Reduce power to idle.
 - 9) Maintain coordinated flight and altitude until recognition of the stall. As the stall occurs, recover from the stall by simultaneously reducing the angle of attack, adding full power, and leveling the wings.
- 10) Set flaps to 25° .
 - 11) Accelerate the aircraft to V_X (recommended) or V_Y and climb while retracting the remaining flaps one notch at a time.
 - 12) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-off stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500'AGL.
- Establishes a stabilized descent in the approach or landing configuration, as specified by the instructor.
 - Transitions smoothly from the approach or landing attitude to a pitch attitude that will induce a stall.
 - Maintains a specified heading, $\pm 10^\circ$, in straight flight; maintains a specified angle of bank not to exceed 20° , $\pm 10^\circ$; in turning flight, while inducing the stall.
 - Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power to maximum allowable and leveling the wings to return to a straight and level flight attitude with minimum loss of altitude appropriate for the airplane.
 - Retracts the flaps to the recommended setting; retracts the landing gear, if retractable, after a positive rate of climb is established.
 - Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring. ▪ Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane. ▪ Explain how to avoid a spin. **Safety Considerations:**

- Altitude selection too low.
- Uncoordinated flight.
- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration. ▪ Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or excessive airspeed during recovery. ▪ Secondary stall during recovery. **References:**

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Power – On Stall (PA-28-180)

Objective:

To familiarize the pilot with the conditions that produce stalls, to assist in recognizing an approaching stall, and to develop skills to prevent and recover from stalls in the takeoff configuration.

Description:

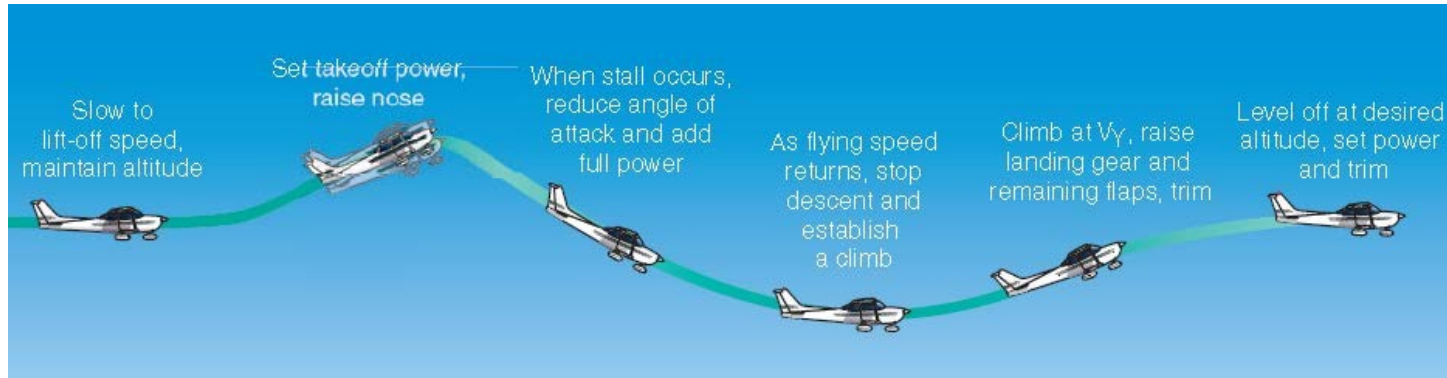
The aircraft is slowed down and placed in the takeoff configuration after which a stall is induced and recovery initiated returning the aircraft to normal cruise flight.

Setup

Procedure:

- 1) Select an altitude which allows recovery to be completed no lower than 1,500' AGL.
- 2) Perform clearing turns.
- 3) Set mixture to ¼ inch lean of full rich.
- 4) Reduce power to 1300 RPM or less, allowing the aircraft to slow to takeoff speed (60 MPH) while maintaining altitude.
- 5) Increase power to 1700 RPM at 60 MPH (V_R).
- 6) Transition smoothly to the pitch attitude that will induce a stall.

- 7) Recognize and recover promptly after a fully developed stall occurs by simultaneously reducing the angle of attack, confirming full power, and leveling the wings.
- 8) Accelerate the aircraft to 85 MPH (V_Y) and climb.
- 9) Return to cruise flight and complete cruise checklist to include leaning procedures.



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to power-on stalls.
- Selects an entry altitude that allows the task to be completed no lower than 1,500' AGL.
- Establishes the takeoff or departure configuration. Sets power to no less than 65 percent available power.
- Transitions smoothly from the takeoff or departure attitude to the pitch attitude that will induce a stall.
- Maintains a specified heading, $\pm 10^\circ$, in straight flight; maintains a specified angle of bank not to exceed 20° , $\pm 10^\circ$, in turning flight, while inducing the stall.
- Recognizes and recovers promptly after the stall occurs by simultaneously reducing the angle of attack, increasing power as appropriate, and leveling the wings to return to a straight and level flight attitude with a minimum loss of altitude appropriate for the airplane.
- Retracts the flaps to the recommended setting; retracts the landing gear if retractable, after a positive rate of climb is established.
- Accelerates to V_X or V_Y speed before the final flap retraction; returns to the altitude, heading, and airspeed specified by the instructor.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Discuss the aerodynamics of a stall.
- Describe the indications of an impending stall and how to prevent a stall from occurring. ▪ Describe the steps in recovering from a stall.
- Discuss the factors that affect the stalling characteristics of the airplane. ▪ Explain how to avoid a spin. **Safety Considerations:**
- Altitude selection too low.
- Uncoordinated flight.

- Not clearing the area.
- Division of attention.

Common Errors:

- Failure to establish specified configuration. ▪ Improper pitch, heading, and bank control.
- Rough or uncoordinated control technique.
- Failure to recognize indications of a stall.
- Failure to achieve a stall.
- Improper torque correction.
- Poor stall recognition and delayed recovery.
- Excessive altitude loss or airspeed during recovery.
- Secondary stall during recovery. **References:**

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

Tracking A Straight Line (PA-28-180)

Objective:

To maintain a uniform ground track along a selected straight line or road with a constant airspeed and altitude while controlling the effect of wind drift on the airplane and the proper correction using varying crosswind correction.

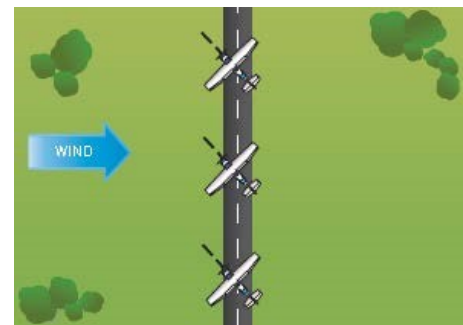
Description:

Tracking a straight line is a training maneuver, in which the ground track of the airplane is flown following a straight line on the ground correcting for wind drift.

Setup Procedure:

- 1) Select a straight line at least 1 mile in length with a crosswind in an area free of obstructions.
- 2) Perform clearing turns and establish 1,000' AGL.
- 3) Adjust the mixture in accordance with the POH.
- 4) Position the airplane to follow a path over or parallel to a straight line.
- 5) Maintain an equal distance from the straight line as you fly along it crabbing as necessary.
- 6) Return to cruise flight and perform the cruise checklist to include leaning procedures. **Flight Proficiency Standards:**

- Exhibits knowledge of the elements related to tracking a straight line.
- Selects a suitable reference area.
- Plans the maneuver so as to track the straight line, 1,000' AGL at an appropriate distance from the selected reference area.
- Applies adequate wind-drift correction during straight and turning flight to maintain a constant ground track along the straight line reference area.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ± 100 feet; maintains airspeed, ± 10 kts.



Learning Outcomes:

- Describe proper division of attention.

- Explain the correlation between the maneuver and a traffic pattern at an airport.
- Predict amount of wind correction based on conditions. **Safety Considerations:**
- Avoid tall obstacles and populated areas.
- Locate a landing area to use in the event of an emergency.
- Maintain separation from other aircraft.

Common Errors:

- Improper crab angle.
- Fixation on one aspect of the maneuver.
- Uncoordinated flight. **References:**

Airplane Flying Handbook; POH/AFM;

Turns Around a Point (PA-28-180)

Objective:

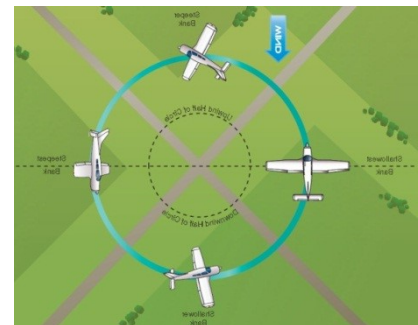
To maintain a uniform ground track around a reference point with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track makes two complete circles, with a constant radius, around a selected point on the ground.

Setup Procedure:

- 1) Select a prominent reference point on the ground.
- 2) Perform clearing turns and establish 1,000' AGL.
- 3) Adjust the mixture in accordance with the POH.
- 4) Maintain a safe airspeed (recommended 105 mph).
- 5) Enter the maneuver on the downwind.
- 6) Initiate the turn when abeam the point.
- 7) Apply wind correction, as necessary, to maintain a constant radius around the selected reference point.
- 8) Exit on the downwind.
- 9) Return to cruise flight and perform the cruise checklist to include leaning



Flight Proficiency Standards:

- Exhibits knowledge of the elements related to turns around a point.
- Selects a suitable ground reference point.
- Plans the maneuver so as to enter left or right at 1,000' AGL, at an appropriate distance from the reference point.
- Applies adequate wind-drift correction to track a constant radius turn around the selected reference point.
 - Divides attention between airplane control and the ground track while maintaining coordinated flight.
 - Maintains altitude, ± 100 feet; maintains airspeed, ± 10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Student should demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction. **Safety Considerations:**
 - Always clear area before beginning a maneuver.
 - Select area with an emergency landing field close.
 - Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
- Uncoordinated flight control application.
- Improper wind-drift correction.
- Failure to maintain selected altitude or airspeed.
- Failure to establish approximately 45° bank at the steepest point.

References:

Airplane Flying Handbook; POH/AFM; Private Pilot ACS; CFI PTS

S-Turns (PA-28-180)

Objective:

To maintain a uniform ground track of semicircles along a selected reference line with a constant airspeed and altitude while demonstrating the effect of wind drift on the airplane and the proper correction using varying bank angle.

Description:

The airplane's ground track describes semicircles of equal radii on each side of a selected straight line on the ground.

Setup Procedure:

- 1) Select a prominent line on the ground perpendicular to the wind.
- 2) Perform clearing turns and establish 1,000' AGL.
- 3) Adjust the mixture in accordance with the POH.
- 4) Maintain a safe airspeed (recommended 105 mph).
- 5) Enter the maneuver on the downwind.
- 6) Initiate the first turn upon reaching the reference line.
- 7) Apply wind correction, as necessary, to maintain a constant radius around a point on the reference line.
- 8) After a 180° turn, reverse the turn.
- 9) After two 180° turns are completed, exit on the downwind.
- 10) Return to cruise flight and perform the cruise checklist to include leaning procedures. **Flight**

Proficiency Standards:



- Exhibits knowledge of the elements related to S-turns.
- Selects a suitable ground reference line.
- Plans the maneuver so as to enter at 1,000' feet AGL, perpendicular to the selected reference line.
- Applies adequate wind-drift correction to track a constant radius turn on each side of the selected reference line. ▪ Reverses the direction of turn directly over the selected reference line.
- Divides attention between airplane control and the ground track while maintaining coordinated flight.
- Maintains altitude, ± 100 feet; maintains airspeed, ± 10 kts.

Note: These are the ACS standards and the CFI will refer to the syllabus for specific lesson completion standards, as they may be different.

Learning Outcomes:

- Demonstrate wind drift correction with varying bank angle and proper aircraft control to maintain the desired ground track.
- Plan maneuver radius by assessing wind speed and direction. **Safety Considerations:**
- Always clear area before beginning a maneuver.
- Select an area with an emergency landing field nearby. ▪ Avoid areas with towers or tall buildings/towns.

Common Errors:

- Faulty entry procedure.
- Poor planning or division of attention.
Uncoordinated flight control application.
Improper wind-drift correction.
Failure to maintain selected altitude or airspeed.