

VII.K. Power-Off 180° Accuracy Approach and Landing

References: FAA-H-8083-3

Objectives	The student should develop knowledge of the elements related to the power-off 180° accuracy approach and landing as required in the PTS.
Key Elements	<ol style="list-style-type: none">1. Best Glide Airspeed2. Wind Correction3. Stabilized Approach
Elements	<ol style="list-style-type: none">1. General2. Selecting a Touchdown Point3. The Maneuver
Schedule	<ol style="list-style-type: none">1. Discuss Objectives2. Review material3. Development4. Conclusion
Equipment	<ol style="list-style-type: none">1. White board and markers2. References
IP's Actions	<ol style="list-style-type: none">1. Discuss lesson objectives2. Present Lecture3. Ask and Answer Questions4. Assign homework
SP's Actions	<ol style="list-style-type: none">1. Participate in discussion2. Take notes3. Ask and respond to questions
Completion Standards	The student can perform a power-off 180° accuracy approach and landing, landing within 200' beyond the selected landing point. The student will understand when corrections should be made and will have the ability to make the necessary corrections in order to maintain a stabilized approach to landing.

Instructors Notes:

Introduction:

Attention

Interesting fact or attention grabbing story

The power-off 180 is a challenging and very fun maneuver. Personally, it's one of my favorites...

Overview

Review Objectives and Elements/Key ideas

What

An approach and landing made by gliding with the engine idling through a 180° pattern, begun abeam a specified touchdown point on the runway, to a touchdown at or within 200' beyond that point.

Why

It instills judgment and procedures necessary for accurately flying the plane, without power, to a safe landing.

How:

1. General

- A. Constant checking and adjusting of the airplane's glide path
- B. Configuring the Airplane
 - i. Normal landing configuration, but flaps are used as necessary to control the glide path of the approach
 - ii. Trim the airplane for best glide airspeed
 - a. Pitch attitude is used to maintain the desired airspeed
 - Lowering the nose (increasing airspeed) results in a steeper descent angle
 - Raising the nose (decreasing airspeed) results in rapid settling due to a slow airspeed and insufficient lift
 - a. Never try to stretch a glide to reach the desired landing spot
 - iii. **CE** - Improper use of power, wing flaps, or trim
 - a. Correct for deviations from glide path without power
 - b. Do what's necessary if the approach not be completed safely without the addition of power
 - c. Trim to relieve control pressures to help in stabilizing the approach
- C. Attempt to fly a normal pattern
 - i. Wind and altitude conditions may change this
 - ii. Not a mechanical maneuver, altitudes, etc. will need to be adjusted daily and at different airports
- D. Coordination
 - i. Like always, keep the airplane coordinated (exception is a slip)
 - ii. Don't attempt to increase the rate of turn with rudder; this could lead to a crossed-control stall

2. Selecting a Touchdown Point

- A. Select a point within the 1st third of the runway
 - i. Don't select a point at the edge of the landing area as the aiming point will be short of the runway
- B. Once a touchdown point has been selected, choose an aiming point
 - i. The airplane will normally glide approximately 400' - 500' (approximately 2 runway stripes)
 - a. This can change based on wind conditions
- C. **CE** - Failure to consider the effect of wind and landing surface

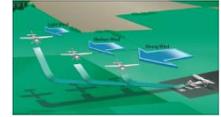
- i. Adjust the aim point based on the wind (the stronger the headwind, the less the aircraft will float, and the closer the aim point will need to be to the point of touchdown)

3. The Maneuver

A. Downwind Leg - 1,000' AGL

- i. Complete the before landing checklist as normal (midpoint)
- ii. **CE** - Failure to establish approach and landing configuration at proper time or in proper sequence
- iii. Abeam the selected touchdown point, reduce the throttle to idle ***Key Point**

- a. Upon doing this, maintain altitude until reaching best glide (73) and *trim*
- b. At this point, you should have some idea of the speed/direction of wind
 - Based on this knowledge, you can begin planning the rest of the approach



- c. **CE** - Failure to identify the key points in the pattern
 - Failure to identify key points will result in improper performance
 - Reduce power to idle at the proper point for the desired performance

iv. Turning to the Base Leg

- a. If the wind is strong, the base leg will need to be started early to avoid landing short
 - Groundspeed will be lower resulting in less ground covered
- b. If the wind is calm, the downwind leg will need to be extended to avoid overshooting
- c. **CE** - Failure to consider the effect of wind
 - Understand how the wind will affect the approach and plan accordingly

B. Base Leg

- i. Immediately after turning onto the base leg you will be at the ***Base Key Point**
 - a. ***Evaluate** and make necessary corrections before getting deep into the approach
 - b. **CE** - Failure to identify the key points in the pattern
 - Failure to identify will result in improper performance; e.g. not recognizing/correcting glide

ii. Landing With a Crosswind

- a. If the crosswind results in a tailwind on the base leg, the tendency is to be high (and vice versa)
 - The airplane will not lose as much altitude because of the higher groundspeed
- b. **CE** - Failure to consider the effect of wind
 - Understand how the wind will affect the approach and plan accordingly

iii. Aiming Point

- a. Observe the aiming point and look for up or downward movement in the window
 - This will decide when to turn to final (sideward movement will occur and should be ignored)
 - If no up/down movement the airplane is on a proper approach; continue normal approach
 - If there is movement make necessary corrections (or if the airplane looks high)
 - a. If moving down (getting too high) use flaps, adjust airspeed, increase the approach length
 - b. If moving up (getting low) wait on flaps, maintain best glide, turn directly to the point

C. Final Approach

- i. Double check the landing checklist has been done by completing the checklist again
- ii. Evaluate the approach and make necessary adjustments to reach the aim point
 - a. Flaps may be used to increase the descent rate and also to slow the airplane to landing speed
 - Remember, flaps will result in a slower airspeed and increased sink rate
 - a. It may be necessary to be slightly high when using the flaps or it may be necessary to accept the balloon when adding flaps to maintain the correct approach
- iii. Stabilized Approach
 - a. Aiming point
 - Do not allow movement in the window and make adjustments as necessary

VII.K. Power-Off 180° Accuracy Approach and Landing

- a If the point moves up, don't use flaps immediately, go directly to the runway, if it's close, use flaps closer to the ground to balloon/float further
 - 1. If the point is moving up in the windscreen, the aircraft is getting low
 - b If the point moves down, use remaining flaps, S-turns, slip, reduce the airspeed or decrease the pitch attitude and aim slightly before the original aiming point (100' - 150')
 - 1. If the point is moving down in the windscreen, the aircraft is getting high
 - Slight adjustments help to maintain a stabilized approach and a good, on target landing
 - a Do not wait for large aiming point changes, be proactive in correcting changes
 - **CE** - Failure to establish and maintain a stabilized approach
 - a Make small, frequent adjustments in pitch/configuration to establish glide path and airspeed
 - b. Up and Downdrafts may result in the approach being high one instant and low the next
 - Therefore, constantly make small adjustments
- D. Roundout and Touchdown
- i. Make a normal landing in the proper touchdown attitude at or within 200' of the touchdown point
 - a. Remember, the airplane will normally glide approximately 400' - 500' before touching down
 - b. If necessary, hold the airplane off the runway until reaching the touchdown point
 - ii. While spot touchdowns are important, a properly executed approach/landing is essential to the maneuver
 - a. Don't sacrifice a good approach and landing to hit the spot
 - Don't force the plane down/don't stretch the glide, it may result in a hard landing/stall
 - iii. **CE** - Failure to hold back elevator pressure after touchdown
 - a. Land on the main landing gear and keep pressure off the nosewheel as long as possible
 - iv. **CE** - Improper procedure during roundout and touchdown
 - a. Be aware of rounding out too high/low and floating/ballooning; Go around if necessary
- E. Directional Control
- i. Maintain directional control with rudder and while slowing apply the necessary crosswind correction
 - ii. **CE** - Poor directional control after touchdown and Improper use of brakes
 - a. Use minimum braking, and don't apply the brakes until firmly on the ground/under control
 - b. Use equal pressure on both brakes to prevent swerving or loss of control

Common Errors:

- Failure to establish approach and landing configuration at proper time or in proper sequence
- Failure to identify the key points in the pattern
- Failure to establish and maintain a stabilized approach
- Failure to consider the effect of wind and landing surface
- Improper use of power, wing flaps, or trim
- Improper procedure during roundout and touchdown
- Failure to hold back elevator pressure after touchdown
- Poor directional control after touchdown
- Improper use of brakes

Conclusion:

Brief review of the main points

The power-off 180° accuracy approach and landing consists of constantly evaluating and adjusting the approach as necessary based on the wind, altitude, groundspeed, and other factors.

PTS Requirements:

To determine that the applicant:

1. Exhibits instructional knowledge of the elements of a 180° power-off accuracy approach and landing by describing:
 - a. Configuration and trim.
 - b. Effects of wind and selection of a touchdown area.
 - c. The key points in the pattern.
 - d. A stabilized approach at the recommended airspeed to the selected touchdown area.
 - e. Coordination of flight controls.
 - f. Timing, judgment, and control procedure during roundout and touchdown.
 - g. Directional control after touchdown.
 - h. Use of checklist.
 - i. After landing runway incursion avoidance procedures.
2. Exhibits instructional knowledge of common errors related to a 180° power-off accuracy approach and landing by describing:
 - a. Failure to establish approach and landing configuration at proper time or in proper sequence.
 - b. Failure to identify the key points in the pattern.
 - c. Failure to establish and maintain a stabilized approach.
 - d. Failure to consider the effect of wind and landing surface.
 - e. Improper use of power, wing flaps, or trim.
 - f. Improper procedure during roundout and touchdown.
 - g. Failure to hold back elevator pressure after touchdown.
 - h. Poor directional control after touchdown.
 - i. Improper use of brakes.
3. Demonstrates and simultaneously explains a 180° power-off accuracy approach and landing from an instructional standpoint.
4. Analyzes and corrects simulated common errors related to a 180° power-off accuracy approach and landing.

