

Task VII.J: Soft Field Approach and Landing

Table of Contents

Lesson Overview	1
Instructor Notes	2
Lesson Details	3
Research	3
Approach	3
Landing	4
After Landing Roll/Taxi	4
Conclusion	5
ACS Requirements	5
Private Pilot ACS Skills Standards	6
Commercial Pilot ACS Standards	7

Lesson Overview

Objective

The student has the knowledge and ability to perform a soft field approach and landing as necessary based on the ACS/PTS with and without a crosswind.

Reference

- Aircraft Flight Manual / Pilot's Operating Handbook
- Airplane Flying Handbook (FAA-H-8083-3) Chapter 8-21

Key Elements

1. Extend the approach in ground effect
2. Transfer weight from wings to wheels
3. Maintain Back Pressure

Elements

1. Objective
2. Determining Landing Performance and Limitations
3. Approach
4. Landing
5. After Landing Roll/Taxi

Schedule

1. Discuss Objectives
2. Review material
3. Development
4. Conclusion

Equipment

1. White board and markers
2. References

IP Actions

1. Discuss lesson objectives
2. Present Lecture
3. Ask and Answer Questions
4. Assign homework

SP Actions

1. Participate in discussion
2. Take notes
3. Ask and respond to questions

Completion Standards

The student can demonstrate knowledge of, and has shown proficiency in Soft Field approaches and landings, without the assistance of a flight instructor. The student can judge when to begin the flare, when to add power to the flare and can correct for any misjudgments. Finally, the student understands when to go-around and demonstrates the proper use of checklists, traffic scan and pertinent safety procedures.

Instructor Notes

Attention

How awesome would it be, once you get your private pilot license, to take a flying adventure and land in the wilderness or on a remote island, in the middle of nowhere using a dirt or sand strip?

Overview

Review Objectives and Elements/Key ideas

What

Landing on fields that are rough or have soft surfaces, such as snow, sand, mud, or tall grass.

Why

It is important to learn to land on soft field runways in order to ensure a safe landing. A normal landing on a runway like this could result in damage to the gear or the entire plane. By learning to safely set a plane down on different surfaces the pilot has many more airport available landing fields. In the case of an emergency landing this maneuver will be very important in

making a safe landing.

Lesson Details

Research

Performance

Ensure you research Chapter 5 of the POH for limitations and performance considerations with soft field landings for the field you're going to attempt to fly into.

- Landing Performance / Distances for runway type.
 - Remember, not all surfaces will be approved for the aircraft. For example, hard packed dirt vs. wet grass.
- Crosswind Component
 - It could be helpful to talk to pilots that have flown into the landing area before, and use the internet to get pictures and possibly video of planes landing in the area to know what to expect.

Approach

Similar to a normal approach, except that the airplane is held 1 to 2' off the surface in ground effect as long as possible to allow the wheels to gently touch down at minimum speed. A small amount of power is also used to cushion the touchdown.

1. Perform the before landing checklist.
2. Configure as directed by the POH — generally with landing flaps.
 - Flaps will aid in touching down at minimum speed and are recommended whenever practical
 - ☐☐ In low-wing airplanes the flaps may suffer damage from mud, stones, slush, etc.
3. Maintain a Stabilized Approach.
 - Maintain 70 kts / 32% power in PA28A (Per POH)
 - ☐☐ Higher approach speeds may result in excessive floating in ground effect which can make a smooth, controlled touchdown even more difficult
4. Trim the plane for the descent
5. Establish and maintain an aim point in front of your intended touchdown area.
6. Throughout the approach, one hand should be kept on the power lever as often as possible.
7. Maintain Coordination
8. Maintain Precise Ground track.

Landing

The major differences between a soft-field and a normal landing

1. The airplane is held 1 to 2' above the ground, in ground effect as long as possible.
2. A small amount of power is used during touchdown in order to cushion the landing.
3. After main wheel touchdown, hold sufficient back pressure to keep the nose wheel off the surface
 - ☐☐ This helps to prevent the nosewheel digging into the soft surface, and/or getting stuck
 - ☐☐ In a worst case scenario, it prevents the airplane from cartwheeling after striking the uneven, soft surface

Touchdown

1. Continue to maintain one hand on the throttle lever
2. Increase the power slightly just prior to touchdown in order to cushion the landing and assist in slowly transferring the weight from the wings to wheels.
3. Touchdown should be made at the lowest possible airspeed with the airplane in a nose-high pitch attitude.
4. When the main wheels touch the ground, maintain sufficient back-elevator pressure to keep the nose wheel off the surface.
5. Maintain directional control with the rudder, while maintaining crosswind correction with the ailerons
6. The use of brakes is not needed and should be avoided as this may tend to impose a heavy load on the nose gear due to premature or hard contact with the landing surface, causing the nose wheel to dig in
7. Once slowed, safe and under control, the pilot should gently lower the nose wheel to the surface

Common Error: Closing the throttle too soon after touchdown

Crosswind Considerations

- Maneuver the airplane in the same way as for a normal approach
 - Touchdown in a sideslip, with the upwind wheel first, and the longitudinal axis of the airplane aligned with the centerline
- Be cautious with one wheel touching down at a time on a soft field runway, if control is in doubt, execute a go around

After Landing Roll/Taxi

1. Continue to maintain full aft elevator pressure, as well as wind correction
2. Maintain directional control through the rudders

3. As mentioned above, the use of brakes is not needed and should be avoided
4. Maintain enough speed to prevent becoming bogged down
5. Retract the flaps after the landing roll is completed
6. Perform the After-Landing Checklist once parked

Common Errors

- Improper use of landing performance data and limitations
- Failure to establish approach and landing configuration at appropriate time or in proper sequence
- Failure to establish and maintain a stabilized approach
- Failure to consider the effect of wind and landing surface
- Improper procedure in use of power, wing flaps, or trim
- Inappropriate removal of hand from throttle
- Improper procedure during roundout and touchdown
- Failure to hold back elevator pressure after touchdown
- Closing the throttle too soon after touchdown
- Poor directional control after touchdown
- Improper use of brakes

Conclusion

A soft field landing is very similar to a normal landing except that our main goal is to transfer the weight from the wings to wheels as gently as possible. When doing this it is also important to hold the nose wheel off the ground, and then slowly and gently bring it to the surface.

ACS Requirements

To determine that the applicant

1. Exhibits instructional knowledge of the elements of a soft-field approach and landing by describing:
 - a. How to determine landing performance and limitations.
 - b. Configuration and trim.
 - c. Obstructions and other hazards which should be considered.
 - d. Effect of wind and landing surface.
 - e. Selection of a touchdown area.
 - f. A stabilized approach at the recommended airspeed to the selected touchdown point.
 - g. Coordination of flight controls.

- h. A precise ground track.
 - i. Timing, judgment, and control procedure during roundout and touchdown.
 - j. Touchdown in a nose-high pitch attitude at minimum safe airspeed.
 - k. Proper use of power.
 - l. Directional control after touchdown.
 - m. Use of checklist.
 - n. After landing runway incursion avoidance procedures.
2. Exhibits instructional knowledge of common errors related to a soft-field approach and landing by describing:
- a. Improper use of landing performance data and limitations.
 - b. Failure to establish approach and landing configuration at appropriate time or in proper sequence.
 - c. Failure to establish and maintain a stabilized approach.
 - d. Failure to consider the effect of wind and landing surface.
 - e. Improper procedure in use of power, wing flaps, and trim.
 - f. Inappropriate removal of hand from throttle.
 - g. Improper procedure during roundout and touchdown.
 - h. Failure to hold back elevator pressure after touchdown.
 - i. Closing the throttle too soon after touchdown.
 - j. Poor directional control after touchdown.
 - k. Improper use of brakes.
3. Demonstrates and simultaneously explains a soft-field approach and landing from an instructional standpoint.
4. Analyzes and corrects simulated common errors related to a soft-field approach and landing.

Private Pilot ACS Skills Standards

Complete the appropriate checklist.

1. Make radio calls as appropriate.
2. Ensure the aircraft is aligned with the correct/assigned runway
3. Scan the landing runway and adjoining area for traffic and obstructions
4. Consider the wind conditions, landing surface, obstructions, and select a suitable touchdown point.
5. Establish the recommended approach and landing configuration and airspeed, and adjust pitch attitude and power as required to maintain a stabilized approach.

6. Maintain manufacturer's published airspeed, or in its absence, not more than 1.3 VSO, +10/-5 knots, with wind gust factor applied.
7. Maintain crosswind correction and directional control throughout the approach and landing sequence.
8. Make smooth, timely, and correct control inputs during round out and touchdown and, for tricycle gear airplanes, keep the nose wheel off the surface until loss of elevator effectiveness.
9. Touch down with minimum sink rate, no side drift, and with the airplane's longitudinal axis aligned with the centerline of the runway.
10. Maintain elevator as recommended by manufacturer during rollout and exit the "soft" area at a speed that would preclude sinking into the surface.
11. Execute a timely go-around if the approach cannot be made within the tolerances specified above or for any other condition that may result in an unsafe approach or landing.
12. Maintain proper position of the flight controls and sufficient speed to taxi on the soft surface.

Commercial Pilot ACS Standards

Same as the Private Pilot, except

1. Maintain manufacturer's published airspeed, or in its absence, not more than 1.3 VSO, +/-5 knots, with wind gust factor applied.