

PRIVATE PILOT

IV. AREA OF OPERATION: TAKEOFFS, LANDINGS AND GO-AROUNDS

E. TASK: SHORT-FIELD TAKEOFF (CONFINED AREA – ASES) AND MAXIMUM PERFORMANCE CLIMB

OBJECTIVE

To determine that the applicant:

1. Exhibits knowledge of the elements related to short-field (confined area – ASES) takeoff and maximum performance climb.
2. Positions the flight controls for the existing wind conditions; sets the flaps as recommended.
3. Clears the area; taxies into takeoff position utilizing maximum available takeoff area and aligns the airplane on the runway center / takeoff path.
4. Selects an appropriate take off path for the existing conditions (ASES).
5. Applies brakes (if appropriate), while advancing the throttle smoothly to takeoff power.
6. Establishes and maintains the most efficient planning / lift-off attitude and corrects for porpoising and skipping (ASES).
7. Lifts off at the recommended airspeed, and accelerates to the recommended obstacle clearance airspeed or V_X .
8. Establishes a pitch attitude that will maintain the recommended obstacle clearance airspeed, or $V_X + 10/-5$ knots, until the obstacle is cleared, or until the airplane is 50 feet (20 meters) above the surface.
9. After clearing the obstacle, establishes the pitch attitude for V_Y , accelerates to V_Y , and maintains $V_Y + 10/-5$ knots, during the climb.
10. Retracts the landing gear, if appropriate, and flaps after clear of any obstacles or as recommended by the manufacturer.
11. Maintains takeoff power and $V_Y + 10/-5$ knots to a safe maneuvering altitude.
12. Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
13. Completes the appropriate checklist.

ELEMENTS

1. Know the recommended power / flap settings, V_X and V_Y from the POH / AFM.
2. Ensure flaps are extended to the recommended setting.
3. Begin the takeoff roll from the very beginning of the available takeoff area, aligned with the takeoff path.
4. Hold the brakes until the maximum obtainable engine RPM is achieved before takeoff run.
5. Release the brakes and accelerate, keeping neutral elevator control in nosewheel-type airplanes (resulting in lowest drag and quickest acceleration). Avoid application of down elevator to keep the nosewheel on the runway since this may result in "wheelbarrowing."
6. Apply back pressure and rotate at the recommended V_R speed. If the airplane begins lifting off prior to V_R due to ground effect, reduce pitch attitude to level and remain in ground effect until V_X is attained.
7. Lift-off smoothly and firmly to a pitch attitude that will result in V_X .
8. Maintain a wings-level climb at V_X until obstacles have been cleared or 50 feet AGL.
9. Lower the nose to a pitch attitude that will result in V_Y until reaching a safe altitude.
10. Retract the gear (if equipped) and flaps (in increments) after the airplane is stabilized at V_Y .
11. At 500 feet AGL, reduce to normal recommended climb power or a recommended noise abatement power setting.
12. Lower the nose to a pitch attitude that will result in V_Y until reaching a safe altitude.
13. Complete the After Takeoff Checklist or the Climb Checklist.

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COMMON ERRORS

- a. Failure to adequately clear the area.
- b. Improper runway incursion avoidance procedures.
- c. Failure to use all available runway / takeoff area.
- d. Failure to have the airplane properly trimmed prior to takeoff.
- e. Improper use of controls during a short-field takeoff.
- f. Improper lift-off procedures.
- g. Premature lift-off resulting in high drag.
- h. Holding the airplane on the ground unnecessarily with excessive forward elevator pressure.
- i. Inadequate rotation resulting in excessive speed after lift-off.
- j. Improper initial climb attitude, power setting, and airspeed (V_X) to clear obstacle.
- k. Inability to attain / maintain best angle of climb airspeed (V_X).
- l. Improper use of checklist.

REFERENCES

1. FAA-H-8083-3A, Airplane Flying Handbook, Chapter 5.
2. POH / AFM, Pilot Operating Handbook / FAA-Approved Airplane Flight Manual.