Short-Field Takeoff and Maximum Performance Climb

OBJECTIVE: To develop proficiency in conducting short-field takeoffs and climbs.
STANDARDS: Sport/Recreational/Private - Airspeed: V_X +10/-5 knots until obstacle is cleared or until at least 50' above the surface, then V_Y +10/-5 knots
CONDITIONS: Awareness of obstacles during all takeoffs.

DESCRIPTION:

1. • Ensure that the Before Takeoff Checklist has been completed.
2. • Set flaps as appropriate – ensure that flaps come down equally.
3. • Ensure that the items on the Line-up Checklist have been completed and/or reviewed.
4. • Visually check for traffic on Downwind, Base, and Final in the active and other traffic patterns.
5. • Communicate, as appropriate – non-towered airport make traffic advisory call, towered airport read back takeoff clearance.
   - Taxi onto the runway, as appropriate. Complete the items from the Line-up Checklist while taxiing. Use the phrase "lights, camera, action" to help remember the items deferred (lights = lights as appropriate, camera = transponder on/altitude, action = mixture rich as required).
   - Taxi the aircraft into position, centered on the runway with the nosewheel straight, as close to the approach end as possible.
   - Hold the brakes, preventing any movement of the aircraft.
6. • Smoothly and positively apply full power. Keep a hand on the throttle in the event an abort becomes necessary.
   - Check engine instruments (engine rpm and all other "engine instruments in the green").
   - Immediately drop heels onto floor, release the brakes, and apply slight forward pressure on the yoke, allowing the aircraft to accelerate as quickly as possible.
   - Check airspeed indicator ("airspeed alive").
7. • Rotate at V_{LOF}, then establish V_X pitch attitude.
   - Once the aircraft lifts off, establish a Wind Correction Angle (WCA) to maintain the runway centerline with level wings.
8. • Maintain V_X or manufacturer's recommended airspeed until clear of obstacles and at least 50 feet above the surface.
9. • After clearing obstacles, establish V_Y pitch attitude. Maintain a ground track along the runway and extended centerline with coordinated use of rudder and aileron.

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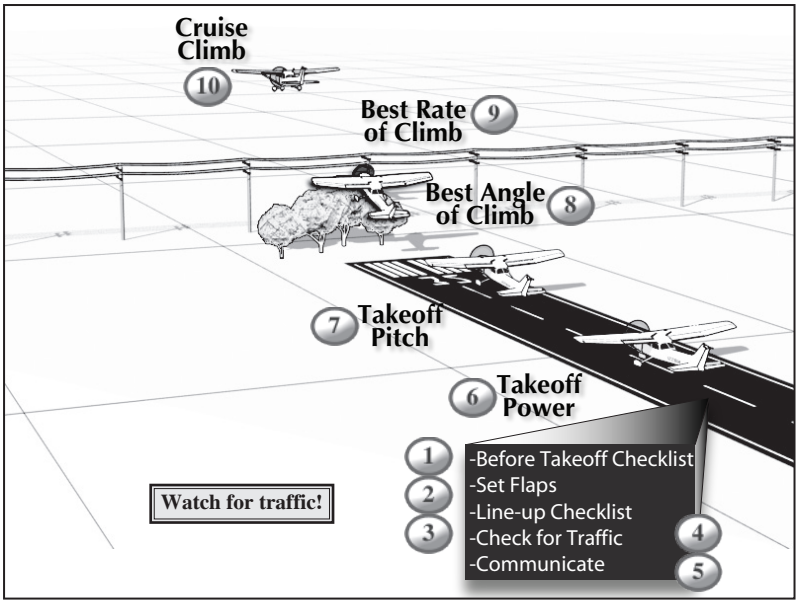
- Retract flaps after clearing all obstacles and establishing the recommended airspeed, climb out at V_Y

NOTE: In an airplane with retractable landing gear, ensure a positive rate of climb, tap the brakes, and retract the gear when insufficient runway remains to land the airplane.

10 • Establish cruise climb above a minimum safe altitude (500-1000' AGL).

NOTE: You should compute takeoff and landing performance data prior to all flights. Special emphasis should be placed on determining that adequate runway exists.



COMMON ERRORS:

- Failure to adequately clear the area prior to taxiing onto the active runway.
- Failure to utilize all available runway/ takeoff area.
- Failure to have the airplane properly trimmed prior to takeoff.
- Premature lift-off resulting in high drag.
- Holding the airplane on the ground unnecessarily with excessive forward-elevator pressure.
- Inadequate rotation resulting in excessive speed after lift-off.
- Inability to attain/maintain best angle-of-climb airspeed.

NOTES: