

## **PRIVATE PILOT**

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

#### **C. TASK: SOFT FIELD TAKEOFF AND CLIMB**

##### **OBJECTIVE**

To determine that the applicant:

1. Exhibits knowledge of the elements related to soft-field takeoff and climb.
2. Positions the flight controls for existing wind conditions and to maximize lift as quickly as possible.
3. Clears the area; taxies onto the takeoff surface at a speed consistent with safety without stopping while advancing the throttle smoothly to takeoff power.
4. Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
5. Lifts off at the lowest possible airspeed and remains in ground effect while accelerating to  $V_X$  or  $V_Y$ , as appropriate.
6. Establishes a pitch attitude for  $V_X$  or  $V_Y$ , as appropriate, and maintains selected airspeed +10/-5 knots, during the climb.
7. Retracts the landing gear, if appropriate, and flaps after clear of any obstacles or as recommended by the manufacturer.
8. Maintains takeoff power and  $V_X$  or  $V_Y$  +10/-5 knots to a safe maneuvering altitude.
9. Maintains directional control and proper wind-drift correction throughout the takeoff and climb.
10. 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. When taxiing a tricycle gear airplane, maintain full up elevator to transfer as much of the weight as possible to the main landing gear (unloading the nose gear).
4. Keep the airplane in continuous motion while lining up for the takeoff roll.
5. Apply full power smoothly and rapidly.
6. Get the nose gear off the ground as soon as possible and maintain a positive angle of attack during the takeoff roll by applying the appropriate elevator pressure.
7. Allow the airplane to fly itself off the ground and into ground effect.
8. Lower the nose gently to allow the airplane to accelerate to  $V_X$  in ground effect.
9. Climb at  $V_X$  to avoid obstacles then lower the nose and accelerate to  $V_Y$ .
10. If departing from an airstrip with wet snow or slush on the takeoff surface, do not retract the gear too soon – allow time for the gear to be air-dried.
11. Retract the gear (if equipped) and flaps (in increments) after the airplane is stabilized at  $V_Y$ .
12. At 500 feet AGL, reduce to normal recommended climb power or a recommended noise abatement power setting.
13. Lower the nose to a pitch attitude that will result in  $V_Y$  until reaching a safe altitude.
14. 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. Insufficient back-elevator pressure during initial takeoff roll resulting in an inadequate angle of attack.
- d. Failure to cross-check engine instruments for indications of proper operation after applying power.
- e. Improper use of controls during a soft-field takeoff.
- f. Poor directional control.
- g. Improper liftoff procedures.
- h. Abrupt and/or excessive elevator control while attempting to level off in ground effect and accelerate after liftoff.
- i. Allowing the airplane to “mush” or settle resulting in an inadvertent touchdown after lift-off.
- j. Attempting to climb out of ground effect area before attaining sufficient climb speed.
- k. Climbing too steeply after reaching  $V_x$ .
- l. Failure to anticipate an increase in pitch attitude as the airplane climbs out of ground effect.
- m. Improper climb attitude, power setting, and airspeed ( $V_Y$  or  $V_X$ ).
- n. 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.