

## VII.C. Soft Field Takeoff and Climb

**About:** Simulating or taking off from a field that is soft/ uneven. A surface which could produce enough drag to prevent the airplane from reaching normal takeoff speeds.

**TSW:** Learn to execute a takeoff and climb making judicious use of ground effect.

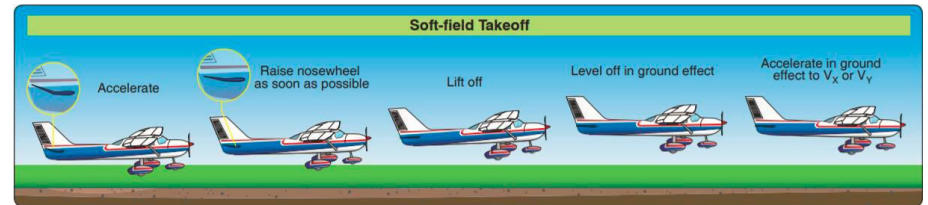
**How:** This is shown by transferring the support of the airplanes weight as rapidly as possible from the wheels to the wings as the takeoff roll proceeds by establishing and maintaining a relatively high AOA/ nose high pitch attitude as early as possible.

### Procedure:

1. Complete run up and pre-takeoff checklist
2. Receive takeoff clearance or make radio call, check for traffic
3. Refer to POH for your aircraft. For the 1965 C172:
4. Flaps 10°
5. Taxi out onto the runway **without stopping** holding **aft elevator pressure**
6. Keeps heels on floor, not on breaks
7. Without stopping apply full throttle smoothly
8. During grd run **hold aft elevator to keep weight off nose wheel**
9. Reduce aft elevator as speed builds for earliest possible liftoff
10. Once airborne, **stay within 10ft of the ground** (in ground effect)
11. Accelerate to  $V_y$  and climb at  $V_y$
12. After definite climb established retract flaps, maint  $V_y$

### Discussion Points:

1. Ensure proper trim prior to takeoff
2. Elevator full aft during taxi, keep turns shallow, don't stop
3. Maintain constant motion with sufficient power while on ground as stopping on a soft surface (mud, snow, soft sand, tall grass) might bog the airplane down.
4. Look out for animals and debris, soft fields can be minimally maintained.
5. Do a wheelie down the runway, adjust back pressure to keep nose off grd.
6. Don't stall once off the ground, stay in ground effect, accelerate
  - a. However, too much forward pressure will lead to ground contact
7. Remember to use R-rudder
8. If departing from a wet/slushy airstrip, the gear should not be retracted immediately, allowing it to air dry
9. It is not recommended to take off immediately behind other aircraft, especially large aircraft: Wake turbulence



### Ground Effect:

10. When you're flying very close to the ground, the ground limits your wingtip vortices - they can't get as big. So, they cause less downwash.
11. Less Downwash = More Vertical Lift And Less Drag

### Common errors:

12. Failure to adequately clear the area prior to taxiing into position on the active runway.
13. Does not check for traffic before crossing a runway hold line and before entering a taxiway.
14. Insufficient back-elevator pressure during initial takeoff roll, resulting in inadequate angle of attack and delaying lift-off.
15. Not reducing full-up elevator during takeoff roll, resulting in delayed lift-off.
16. Poor directional control – not correcting for torque effect; overcorrecting for left-turning tendency; not correcting for crosswind
17. Allowing the airplane to “mush” or settle, resulting in an inadvertent touchdown after lift-off.
18. Attempting to climb out of ground effect area before attaining sufficient climb speed

### Evaluations/ Standards:

19. Utilizes procedures before taxiing onto the runway or takeoff area to ensure runway incursion avoidance.
20. Positions flight controls to maximize lift as quickly as possible.
21. Clears the area, taxis onto takeoff surface without stopping while advancing the throttle smoothly to takeoff power.
22. Establishes and maintains a pitch attitude that will transfer the weight of the airplane from the wheels to the wings as rapidly as possible.
23. Rotates and lifts off at the lowest possible airspeed and remains in ground effect while accelerating to  $V_x$  or  $V_y$  as appropriate.
24. Establishes a pitch attitude for  $V_x$  or  $V_y$ , as appropriate, and maintains selected airspeed +/- 5 knots, during the climb.
25. Retracts the landing gear if appropriate, and flaps clear of any obstacles or as recommended by manufacturer.