ACS HELICOPTER MANEUVER SERIES · 8 OF 24

Maximum Performance Takeoff and Climb

Area of Operation V — Takeoffs, Landings, and Go-Arounds

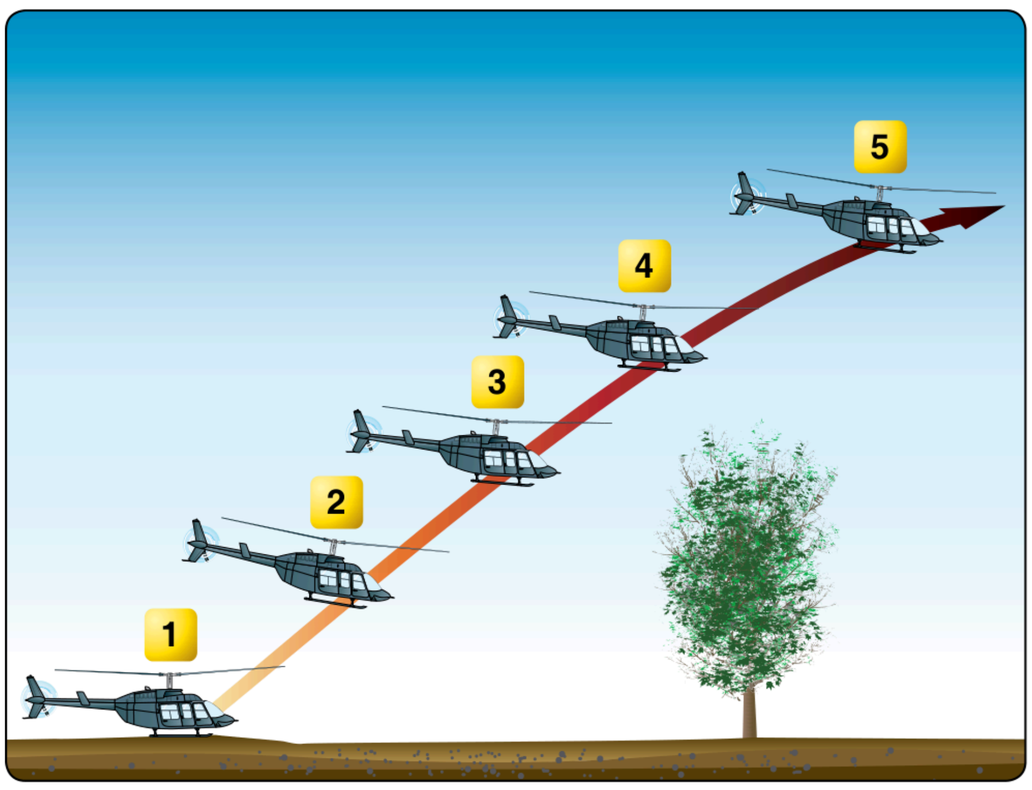
Private Pilot task PH.V.C **Commercial Pilot task** CH.V.C

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Objective. To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with maximum performance takeoff and climb.

HOW IT IS FLOWN

condensed from the FAA Helicopter Flying Handbook, Chapter 10 — Maximum Performance Takeoff



HFH Figure 10-1. *Maximum performance takeoff.*

1. Used to climb steeply over barriers. Requires power to hover OGE — do a hover power check first. Consider wind, temperature, density altitude, gross weight and CG. Expect to pass through the shaded H/V area.
2. Reposition to the most downwind point of the area, note excess power, check balance and controls, position into the wind if possible, return to the surface. Pick reference points along the takeoff path and an abort plan.
3. Light on the skids (1): pause and neutralize all movement. Slowly increase collective and set the cyclic for a lift-off in about a 40-kt attitude (about the light-on-skids attitude).
4. Continue increasing collective slowly to maximum power available (takeoff power is normally about 10% above hover power) — this needs a large pedal input to hold heading (2). Cyclic controls the climb angle (3).
5. Hold rotor rpm at maximum; never let it droop (you would have to lower collective to regain it). Hold these inputs until clear of the obstacle, or 50 ft for demonstration (4), then set normal climb attitude and power (5).
6. If forward airspeed is impossible, a vertical takeoff is acceptable: climb vertically, do not accelerate until clear of obstacles — but it keeps you in the H/V avoid area longer and needs OGE hover power.

COMMON ERRORS — HFH LIST

- Not checking performance data and the H/V diagram.
- Nose too low initially → horizontal rather than vertical flight.
- Not holding maximum permissible rpm.
- Abrupt control movements.
- Not resuming normal climb power and airspeed after clearing the obstacle.

SKILLS — THE STANDARD

the applicant exhibits the skill to:

	PRIVATE · ACS-15	COMMERCIAL · ACS-16
S1	Complete the appropriate checklist(s).	
S2	Make radio calls as appropriate.	
S3	Use control inputs to initiate lift-off from the takeoff position using a forward climb attitude to fly the departure profile.	
S4	Maintain powerplant and rotor rpm within normal limits.	
S5	Use required takeoff power, or power as specified by the evaluator.	
S6	After clearing all obstacles, transition to normal climb attitude, airspeed, **±5 knots**, and power setting.	
S7	Maintain directional control, ground track, and proper wind-drift correction throughout the maneuver.	

▢ Shaded rows are where the Commercial standard is tighter than Private. Unshaded rows apply to both certificates.

KNOWLEDGE

PH.V.C.K1–K3 · the applicant demonstrates understanding of:

- Situations where this maneuver is appropriate.
- Effects of atmospheric conditions, including wind and temperature, on takeoff and climb performance.
- Factors affecting the profile of the height/velocity (H/V) diagram.

RISK MANAGEMENT

PH.V.C.R1–R13 · identify, assess and mitigate risk associated with:

- Selection of takeoff path based on helicopter performance and limitations, available distance, and wind.
- Effects of:
  a. Crosswind
  b. Windshear
  c. Tailwind
  d. Turbulence, including wake turbulence
  e. Surface conditions
- Abnormal operations including:
  a. Rejected takeoff
  b. Powerplant failure in takeoff/climb phase of flight
- Collision hazards.
- Low rotor rpm.
- Distractions, task prioritization, loss of situational awareness, or disorientation.

Standards: FAA-S-ACS-15 Private Pilot Helicopter and FAA-S-ACS-16 Commercial Pilot Helicopter (text reproduced from the current ACS). **References:** AIM; FAA-H-8083-2, FAA-H-8083-21, FAA-H-8083-25; POH/RFM. **Figures and technique:** FAA Helicopter Flying Handbook, FAA-H-8083-21B — figures reproduced unmodified. Always confirm tolerances against the ACS in force on your checkride date and procedures against the R44 POH/RFM.

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