ACS HELICOPTER MANEUVER SERIES · 6 OF 24

Normal Takeoff and Climb

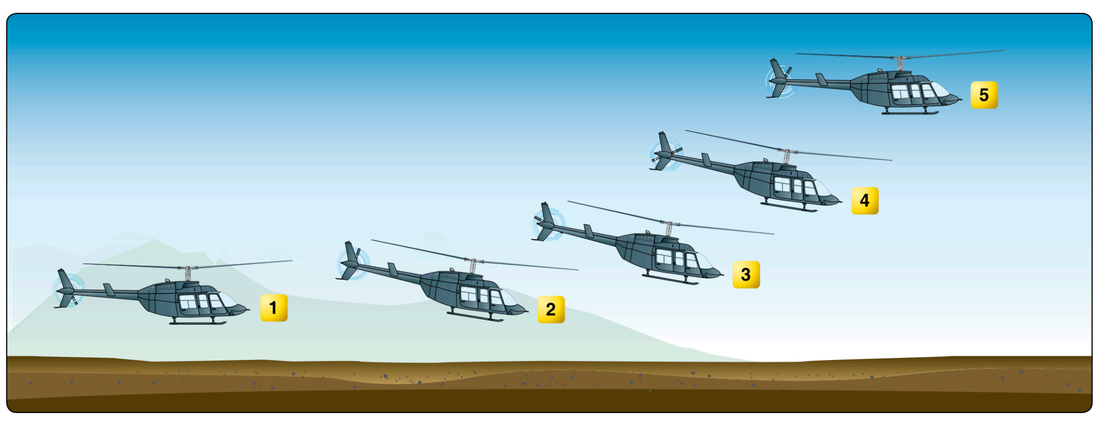
Area of Operation V — Takeoffs, Landings, and Go-Arounds
Private Pilot task PH.V.A **Commercial Pilot task** CH.V.A

Poster 06 of 24

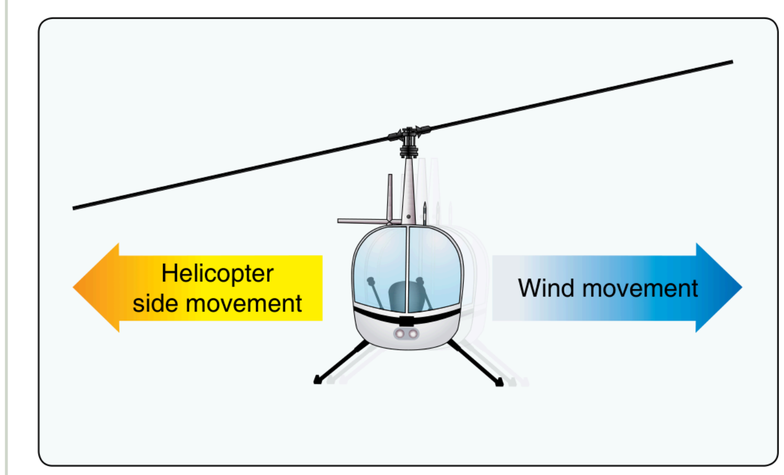
Objective. To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with normal takeoff, climb operations, and rejected takeoff procedures.

HOW IT IS FLOWN

condensed from the FAA Helicopter Flying Handbook, Chapter 9 — Normal Takeoff from a Hover, Crosswind Considerations



HFH Figure 9-12. *The helicopter takes several positions during a normal takeoff from hover.*



HFH Figure 9-13. *During a slip, the rotor disk is tilted into the wind.*

1. At a hover (1) perform the hover and systems check: power (excess power = power available minus hover power), balance (cyclic position), flight controls. Clear the area.
2. Ease the cyclic forward smoothly (2). As the helicopter moves, add collective to stop any sink, throttle for rpm, pedal for heading. Keep a straight takeoff path.
3. Through effective translational lift (3) the helicopter climbs and the nose tends to rise: set climb power and add enough forward cyclic to hold the attitude.
4. Hold an attitude (4) that accelerates smoothly toward climb airspeed with a matching gain in altitude — a profile that stays out of the shaded areas of the H/V diagram.
5. As airspeed increases (5) trim, let a crab develop to hold ground track, then raise the nose smoothly to the normal climb attitude at best rate of climb.
6. Crosswind: hold the cyclic into the wind (slip) early in the takeoff and heading with pedals; after about 50 ft, turn into the wind (crab) to hold ground track.

COMMON ERRORS — HFH LIST

- Not enough collective → altitude loss before translational lift.
- Adding power too fast without forward cyclic → climbing before gaining airspeed.
- Extreme nose-down attitude near the surface.
- Not holding the ground track.
- Wrong airspeed in the climb; rpm not held with throttle.
- Not transitioning from slip to a level crab.

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	Verify assigned/correct runway, if at an airport.	
S4	Determine wind direction with or without visible wind direction indicators.	
S5	Clear the area, taxi into the takeoff position, and align the helicopter on the runway centerline or with takeoff path.	
S6	Establish a stationary position on the surface or a stabilized hover prior to takeoff in headwind and crosswind conditions.	
S7	Confirm takeoff power and instrument indications prior to forward movement.	
S8	**After clearing all obstacles, transition to normal climb attitude, airspeed, ±10 knots, and power setting.**	**After clearing all obstacles, transition to normal climb attitude, airspeed, ±5 knots, and power setting.**
S9	Maintain powerplant and main rotor (Nr) speed within normal limits.	
S10	Maintain proper ground track with crosswind correction, as needed.	
S11	Comply with noise abatement procedures, as applicable.	
S12	Use runway incursion avoidance procedures, if applicable.	

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

KNOWLEDGE

PH.V.A.K1–K2 · the applicant demonstrates understanding of:

- Effects of atmospheric conditions, including wind, on takeoff and climb performance.
- Factors affecting the profile of the height/velocity (H/V) diagram.

RISK MANAGEMENT

PH.V.A.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. Runway/departure point surface/condition
- Abnormal operations, including planning for:
  a. Rejected takeoff
  b. Powerplant failure in takeoff/climb phase of flight
- Collision hazards.
- Distractions, task prioritization, loss of situational awareness, or disorientation.
- Runway incursion.

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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