ACS HELICOPTER MANEUVER SERIES · 15 OF 24

Straight-In Autorotation

Area of Operation VI — Performance Maneuvers

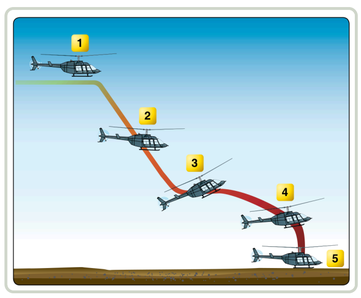
Private Pilot task PH.VI.B **Commercial Pilot task** CH.VI.B

Poster 15 of 24

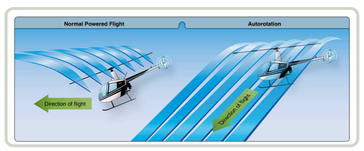
Objective. To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with a straight-in autorotation to a power recovery.

HOW IT IS FLOWN

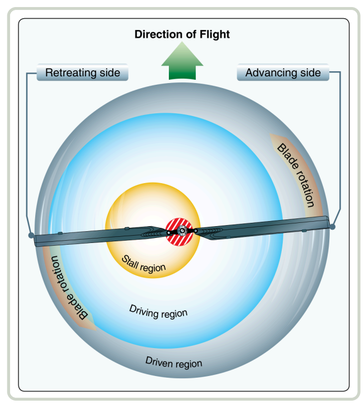
condensed from the FAA Helicopter Flying Handbook, Chapter 11 — Autorotation, Straight-In Autorotation, Power Recovery



HFH Figure 11-2. *Straight-in autorotation.*



HFH Figure 11-1. *During an autorotation, the upward flow of relative wind permits the main rotor blades to rotate at their normal speed. In effect, the blades are "gliding" in their rotational plane.*



HFH Figure 2-49. *Blade regions in forward autorotation descent.*

1. Entry (1): from level flight at the appropriate airspeed, 500–700 ft AGL, into the wind — smoothly but firmly lower the collective full down, aft cyclic to prevent a nose-low attitude, pedal for trim. Reduce throttle to split the needles, then reset it above idle.
2. Descent (2): set the manufacturer's autorotation (best glide) airspeed with cyclic; hold rotor rpm in the lower green with collective — small increases only; a large increase decays rpm fast and leads to 'chasing the rpm'. Crosscheck attitude, trim, rotor rpm and airspeed; don't stare straight down.
3. Headwind steepens the glide (slower groundspeed) and reduces the flare needed. Rate of descent is lowest near 50–60 kt; very low or very high airspeeds are more critical.
4. Flare (3) at the recommended height: aft cyclic to reduce airspeed and rate of descent, pedals for heading, rpm in the green. Not so abrupt that it climbs; not so slow that it fails to arrest the descent (tail strike risk). Proper flare attitude gives a slow-run groundspeed.
5. At the slowest desired groundspeed (4), forward cyclic to a level landing attitude at about 3–15 ft skid height; avoid an excessive nose-high, tail-low attitude below 10 ft. Touchdown (5): collective to cushion, opposite pedal to normal flight, land level and sliding straight. Collective full down only after stopping; never use aft cyclic to stop the slide.
6. Power recovery (training): at 3–15 ft level with forward cyclic; just before level, coordinate up collective with throttle to join the needles at operating rpm; pedal for heading; go to a hover or go around. Use rotor energy to cushion — holding the helicopter off the surface causes a hard landing.

COMMON ERRORS — HFH LIST

- Not entering immediately on power loss.
- Insufficient pedal when power is reduced.
- Nose lowered too abruptly → dive.
- Rotor rpm not held in the descent.
- Up collective at excessive altitude → hard landing, heading loss.
- Not leveling to the landing attitude; lateral movement or misalignment at touchdown.
- Not going around when outside limits.

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	Select a suitable landing area.	
S4	Clear the area.	
S5	Select an appropriate entry altitude.	
S6	Initiate the maneuver at the proper point.	
S7	**Establish power-off glide with the helicopter trimmed and autorotation airspeed, ±10 knots.**	**Establish power-off glide with the helicopter trimmed and autorotation airspeed, ±5 knots.**
S8	Maintain main rotor (Nr) within normal limits.	
S9	Compensate for wind speed and direction as necessary to avoid undershooting or overshooting the selected landing area.	
S10	Use proper deceleration and collective pitch application that permits safe clearance between the aircraft tail boom and the surface.	
S11	Initiate proper power recovery.	
S12	**Terminate autorotation to a stabilized hover within 200 feet of a designated point.**	**Terminate autorotation to a stabilized hover, within 100 feet of a designated point.**

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

CHECKRIDE RULES — ACS APPENDIX 3

The minimum entry altitude must be a least 500 feet AGL or a suitable higher entry altitude in strong wind conditions. Initiating a go-around as a result of an applicant's inability to complete this Task within the tolerances specified in the skill elements is considered unsatisfactory. Landing area safety concerns beyond the control of the applicant or evaluator that necessitate a go-around would not be considered unsatisfactory. The applicant and evaluator must not sacrifice the safety of flight and force a landing to complete this Task.

KNOWLEDGE

PH.VI.B.K1–K5 · the applicant demonstrates understanding of:

- Effects of wind, weight, temperature, and density altitude.
- Main rotor (Nr) speed.
- Energy management.
- Causes and effects of high descent rates.
- Effect of varying bank angles, airspeeds, and rotor rpm.

RISK MANAGEMENT

PH.VI.B.R1–R14 · identify, assess and mitigate risk associated with:

- Low entry altitudes.
- Flight control inputs.
- Turbulence, including wake turbulence.
- Windshear.
- Energy management.
- Main rotor (Nr) speed.
- Low rotor rpm or rotor stall.
- Main rotor (Nr) overspeed.
- Excessive rate of descent.
- Powerplant failure during the maneuver.
- Collision hazards.
- Terminating an autorotation.
- Power recovery and go-around.
- 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:** AC 61-140; 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.

flyheliadk.com · (518) 634-6375
North Country Heli Flight · Harris Airport (83K), Fort Ann, NY
Hangar teaching series · 24 × 36 in