ACS HELICOPTER MANEUVER SERIES · 16 OF 24

Autorotation with Turns

Area of Operation VI — Performance Maneuvers

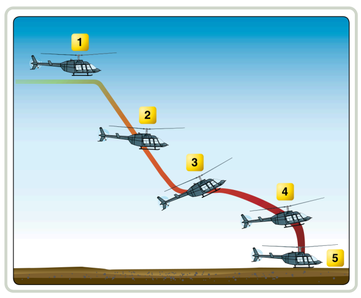
Private Pilot task PH.VI.C **Commercial Pilot task** CH.VI.C

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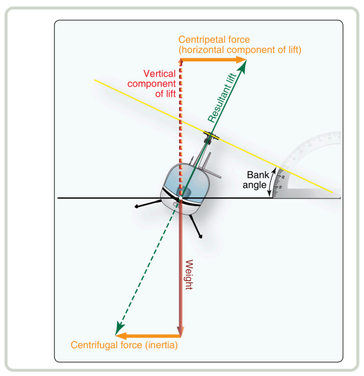
Objective. To determine the applicant exhibits satisfactory knowledge, risk management, and skills associated with autorotation with turns.

HOW IT IS FLOWN

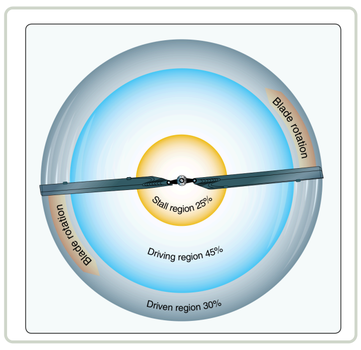
condensed from the FAA Helicopter Flying Handbook, Chapter 11 — Autorotation with Turns (180°)



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



HFH Figure 2-45. *Forces acting on the helicopter during turning flight.*



HFH Figure 2-47. *Blade regions during autorotational descent.*

1. Turns are made early so the rest of the autorotation is flown like a straight-in. The common turns are 90° and 180°.
2. Set up downwind at the RFM entry airspeed, parallel to the touchdown point, about 200 ft laterally offset from the course line (closer/farther in strong crosswind).
3. Abeam the touchdown point: smoothly lower collective, reduce throttle to split the needles, pedal for trim, cyclic for attitude/airspeed. Keep crosschecking attitude, rotor rpm, airspeed and trim ball.
4. With airspeed established, roll into the 180° turn: at least 30° bank, never more than 60°. Rotor rpm builds with G-load — use timely up collective to hold it in range, then lower it again on rollout. Pitot airspeed may lag in the turn; fly attitude. Nose pitching up or down causes rpm excursions.
5. Approaching 90°, check the landing area: too close → shallow the bank; too far → steepen. Roll out on the course line aligned into the wind with as much altitude as possible; set the crosswind correction.
6. Abort with a smooth power recovery and go-around if, by 200 ft AGL, you are not stabilized, aligned, within rpm limits and at the proper attitude/airspeed. Then fly the flare, level-off and touchdown/recovery as for a straight-in; the scan goes almost entirely outside once on the course line.

COMMON ERRORS — HFH LIST

- Wrong entry altitude or airspeed; entering uncoordinated or not level.
- Not correcting the initial deceleration to a steady attitude.
- Poor pedal use on entry; drifting without crosswind correction.
- Uncoordinated flight through the turn (sink rate rises).
- Rotor rpm outside the RFM range.
- Flaring too high/low or too much/little.
- Late power reapplication; heading loss when power is reapplied; landing not level or misaligned.

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 aircraft properly trimmed and autorotation airspeed, ±5 knots.**
S8	Maintain main rotor (Nr) within normal limits.	
S9	Maneuver to avoid undershooting or overshooting the selected landing area.	
S10	Roll out no lower than 300 feet above ground level (AGL) along the flight path to the selected landing area.	
S11	Use proper deceleration and collective pitch application that permits safe clearance between the aircraft tail boom and the surface.	
S12	Initiate proper power recovery.	
S13	**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 above 700 feet AGL or a suitable higher entry altitude in strong wind conditions. At least two 90 degree turns in the same direction or one continuous 180-degree turn must be performed. The 180-degree turn refers to a change in direction with respect to ground track, and not an exact reciprocal heading. If the applicant does not roll out of the turn by 300 feet AGL then the evaluator must direct the applicant to perform a power recovery and initiate a go-around, and the Task is considered unsatisfactory.

KNOWLEDGE

PH.VI.C.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.C.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.
- Excessive rate of descent.
- Powerplant failure during the maneuver.
- Rolling out of the turn.
- 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.

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