Low-G Recognition and Recovery

Area of Operation VIII — Emergency Operations

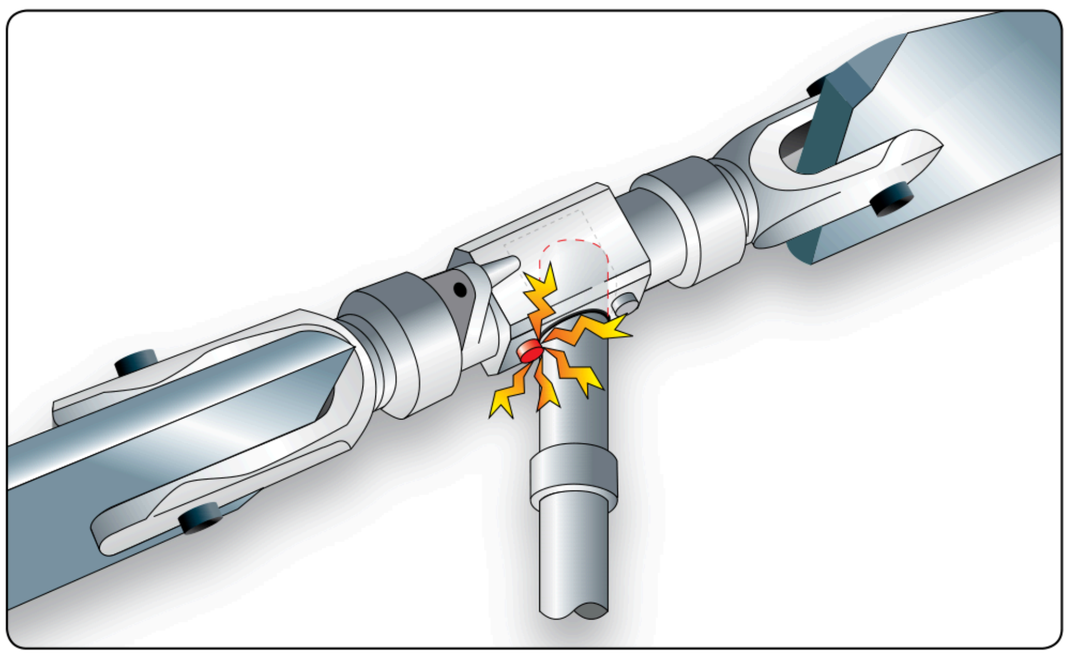
Private Pilot task PH.VIII.J **Commercial Pilot task** CH.VIII.J

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Objective. To determine the applicant exhibits satisfactory knowledge and risk management associated with low G conditions.

HOW IT IS FLOWN

condensed from the FAA Helicopter Flying Handbook, Chapter 11 — Low-G Conditions and Mast Bumping



HFH Figure 11-8. *Result of improper corrective action in a low-G condition.*

1. Low G is the weightless feeling of starting down in an elevator. Helicopters rely on positive G for their control response; a two-bladed teetering rotor (R22/R44) relies entirely on the tilt of the thrust vector — so low G can be catastrophic in these helicopters.
2. Cause: an abrupt forward cyclic input or pushover, particularly at higher airspeeds; also turbulence and severe downdrafts, especially combined with high airspeed. Slow-speed forward cyclic (takeoff from hover, VRS recovery) does not cause low G.
3. What happens: thrust drops and the pilot loses control of fuselage attitude without realizing it; tail rotor thrust often rolls the fuselage right (counterclockwise rotor). Correcting the roll with left cyclic puts the disk and fuselage at a large angle to each other, exceeding hub clearances — mast bumping (Figure 11-8) — which can sever the mast or let the blades strike the airframe.
4. Recovery: first gently apply aft cyclic to restore normal G, then and only then correct any roll. Uncommanded right roll means loss of control is imminent — act immediately.
5. Prevention: no abrupt forward cyclic in two-bladed helicopters (lower the collective for a rapid descent instead); in turbulence reduce power and fly slower than normal cruise — mast bumping is less likely at lower airspeeds; smooth, gentle inputs, no overcontrolling.

WATCH FOR — DRAWN FROM THE HFH DISCUSSION

- Pushing over abruptly, airplane-style, for collision avoidance or a descent.
- Correcting the right roll with left cyclic before restoring G.
- Not recognizing the weightless onset.
- Cruising fast in turbulence.

SKILLS — THE STANDARD

the applicant exhibits the skill to:

NO FLIGHT SKILL ELEMENTS

The ACS lists no Skill elements for this Task — it is evaluated through the Knowledge and Risk Management elements below (oral questioning and scenario discussion), for both the Private and the Commercial certificate.

KNOWLEDGE

PH.VIII.J.K1–K6 · the applicant demonstrates understanding of:

- Exhibits knowledge of the elements related to low G conditions by describing:
  - a. Aerodynamic factors related to low G conditions
  - b. Situations that contribute to low G conditions
  - c. Avoidance, recognition, and appropriate recovery procedures
- Effects of low G conditions on various rotor systems.
- Pilot responses that lead to mast bumping in a low G condition, if applicable.

RISK MANAGEMENT

PH.VIII.J.R1–R3 · identify, assess and mitigate risk associated with:

- Control inputs that cause low G conditions.
- Turbulence/gusty wind conditions.
- Control inputs that cause mast bumping.

Standards: FAA-S-ACS-15 Private Pilot Helicopter and FAA-S-ACS-16 Commercial Pilot Helicopter (text reproduced from the current ACS). **References:** 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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