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Safety Notice SN-11

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LOW-G PUSHOVERS – EXTREMELY DANGEROUS

Pushing the cyclic forward following a pull-up or rapid climb, or under some conditions even from level flight, may produce a low-G (weightless) flight condition. During a low-G condition the thrust from the rotor disc is reduced and the ability to generate the moments necessary for attitude control is reduced. Helicopters have low rotational inertia about the roll axis and any imbalance in aerodynamic forces will lead to an accelerating roll. The severity of the roll increases significantly with increasing airspeed and when lightly loaded, and is strongly influenced by the type of horizontal stabilizer fitted to the helicopter:

- Helicopters equipped with the asymmetric horizontal stabilizer (earlier version, mounted adjacent to the tail rotor gearbox) may experience a rapid right roll under low-G conditions.
- Helicopters equipped with the symmetric horizontal stabilizer (later version, mounted under tailcone forward of tail rotor) may experience a less severe roll to the right OR left.

With reduced thrust from the rotor, the decreased control effectiveness can result in the pilot making large control inputs to counteract rolling motion; low-G mast bumping can occur as a result of these improper control inputs. Severe in-flight low-G mast bumping usually results in main rotor shaft separation and/or rotor blade contact with the fuselage.

The rotor must be reloaded before lateral cyclic can stop any roll. To reload the rotor, immediately apply a gentle aft cyclic, but avoid any large cyclic inputs.

Never attempt to demonstrate or experiment with low-G maneuvers, regardless of your skill or experience level. Even highly experienced test pilots have been killed investigating the low-G flight condition. Always use great care to avoid any maneuver or condition which could result in a low-G condition. Low-G mast bumping accidents are almost always fatal.

Pushovers are not the only cause of low-G conditions. A pilot's improper response to turbulence may also introduce a dangerous loss of loading on the rotor. See SN-32 for more information.

NEVER PERFORM A LOW-G PUSHOVER!!