



Interagency Aviation Lessons Learned



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Subject: Bell 206 B3 Ground Operations

Area of Concern: Potential For Aircraft damage

Distribution: All Aviation Activities

Discussion: On September 12, 2016, a contractor owned and operated Bell 206 B3 helicopter sustained substantial damage after landing in remote mountainous terrain. Neither the pilot nor the DOI employee sustained any injuries. After landing, the pilot rolled the throttle to idle and the DOI employee exited the helicopter. The DOI employee stated that while he was latching the door, the helicopter suddenly started to bounce and lurch with lateral oscillations. The pilot immediately adjusted the flight controls and increased the rotor RPM which stopped the oscillations. After the DOI employee got back in the helicopter, the pilot stated that she was going to shut down the aircraft and investigate further. After shutting down, the pilot and DOI employee exited the helicopter. When the pilot opened the transmission cowling, they discovered the interior compartment splattered with grease and metal shavings. The DOI employee stated that he could smell smoke coming from the transmission area and described hearing a metal on metal grinding before the helicopter was shut down. Damaged areas in the aircraft included the:

Main rotor mast.



Main rotor drive shaft coupling.



Isolation mount.

The Bell 206 B3 helicopter is fitted with a teetering, two-blade main rotor system. The teetering design allows the main rotor blades to flap to compensate for asymmetrical lift during flight. One static stop is mounted on either side of the main rotor hub to physically limit the amount of blade flapping when static. A condition known as “mast bumping” occurs if the static stops contact the mast due to excessive blade flapping during ground operations or in flight. Mast bumping will also occur during ground operations if the cyclic is incorrectly positioned or is moved sufficiently to tilt the rotor disc to an extreme position. If the static stop to mast contact is severe, pronounced helicopter oscillations may develop and the helicopter can sustain substantial damage. In flight, this type of damage can result in the main rotor system separating from the helicopter.

The corrective action is to immediately reposition the cyclic toward or near the neutral position so that the rotor disc resumes a flat (centered) position. During reduced or idle RPM, the rotor disc is less stable and more susceptible to larger deviations due to flapping.

This accident, originally reported through [Safecom 16-1006](#), is a reminder that an operating aircraft, even on the ground at idle RPM, requires the same amount of attention as if it were in flight. Never let your guard down. Remember, the flight isn't over until the rotor blades stop turning and all passengers and crew have disembarked.

Contact marks on main rotor mast.



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