

CAMPBELL HELICOPTERS LTD

Memorandum

To: All Pilots  
CC: Operations Manager  
Director of Maintenance  
From: Chief Pilot  
Date: 24 October 2006  
Re: COLLECTIVE BUILT-IN FRICTION ADJUSTMENT

In both the Bell 205 and Bell 212 there are two methods of adjusting collective friction. One method is through the collective friction adjustment knob located on the collective control and can be adjusted by the pilot in the air or on the ground. The second is through the collective built-in friction which can only be adjusted by an engineer through a floor mounted access plate.

This built-in friction is set to the appropriate value prior to sending the aircraft to the field. The collective will naturally feel "heavy" as it requires approximately 8-10 pounds of force – measured at the midpoint of the throttle (#1 for the Bell 212) – to overcome the upward break-away force, with the hydraulics powered up.

The built-in friction has a very specific purpose – to significantly reduce the potential of "collective bounce". Collective bounce, which can occur on the ground or in the air, is a vertical oscillation that manifests itself at three cycles per second. Once collective bounce commences, if immediate corrective action is not taken, these oscillations will rapidly increase in magnitude. Severe damage to the airframe and rotor system will result and may lead to an unrecoverable loss of aircraft control.

Occasionally, pilots feel that the built-in friction is set too high, particularly when long-lining, and request that the engineer make an in-field adjustment based on what the pilot "feels" is correct. An adjustment made through the subjective fidelity of a pilot will always result in a built-in friction value that is less than the required amount. Collective bounce potential increases dramatically when the built-in friction measures even slightly below eight pounds.

As is the norm, engineers will only make adjustments to the collective built-in friction using the procedures established in the appropriate Maintenance Manual. **Subjective adjustments are not authorized and are not to be requested of the engineer.**

Bill Snedden  
Chief Pilot