

**Aviation Safety Investigation Report
198801385**

Bell 47-G2

5 March 1988

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NOTE: All air safety occurrences reported to the ATSB are categorised and recorded. For a detailed explanation on Category definitions please refer to the ATSB website at www.atsb.gov.au.

Occurrence Number: 198801385
Location: Moorabbin VIC
Date: 5 March 1988
Highest Injury Level: Nil
Injuries:

Occurrence Type: Accident

Time: 1413

	Fatal	Serious	Minor	None
Crew	0	0	1	1
Ground	0	0	0	-
Passenger	0	0	0	1
Total	0	0	0	2

Aircraft Details: Bell 47-G2
Registration: VH-JCN
Serial Number: 2556
Operation Type: Private
Damage Level: Substantial
Departure Point: Moorabbin VIC
Departure Time: N/A
Destination: Government House,
 Melbourne VIC

Approved for Release: 9 August 1988

Circumstances:

As the pilot lifted the helicopter into the hover he felt an unusual vibration and was unable to prevent an immediate turn to the left. Shortly afterwards the nose of the helicopter pitched up and down sharply and the tail rotor guard struck the ground two or three times. The guard broke and portions of the tail rotor blades were torn off. The helicopter then landed heavily, damaging the landing skid. Engineers found no significant fault with the helicopter. It is highly probable that the pilot took off with the hydraulic assist to the cyclic control inadvertently selected off. This helicopter has an electrical on/off hydraulic switch which is not common on the Bell 47-G2. The pilot was more familiar with the mechanical on/off system. He may have been distracted from completing his pre-take-off checks by explaining them to the passenger. With hydraulics selected off, feed back forces occur through the cyclic control; this could be felt as an unusual vibration. Because of the feed back forces, the pilot began to overcontrol the helicopter thereby causing him to channelize his attention to the cyclic control to the detriment of directional control. Although the pilot had been trained in "hydraulics off" emergency procedures in flight he had never before experienced lifting a helicopter into the hover with the hydraulics selected off.

Significant Factors:

It is considered that the following factors were relevant to the development of the accident

1. The pilot lacked recent experience on a Bell 47 equipped with an electric on/off selector switch for hydraulics.
2. The pilot may have inadvertently distracted himself by explaining cockpit checks to his passenger.
3. The pilot failed to complete the "hydraulics on" part of the cockpit checks.

4. The helicopter was lifted into the hover with hydraulic assist to the cyclic selected off.
5. Unexpected cyclic feed-back forces caused the pilot to overcontrol the cyclic control.
6. The pilot channelized his attention on the cyclic control to the detriment of directional control.

Reccomendations:

It is recommended that the Civil Aviation Authority gives consideration to requiring pilots to experience lifting a helicopter into the hover without hydraulic control assistance. This should form part of the emergency procedures training programme for some servo assisted helicopters, such as the Bell 47 etc, where it is physically possible to operate with the hydraulic system inoperative.