

**Aviation Safety Investigation Report
198900807**

Bell 47-G5

13 May 1989

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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: 198900807
Location: 14 km NW Mountain Valley NT
Date: 13 May 1989
Highest Injury Level: Nil
Injuries:

Occurrence Type: Accident
Time: 1518

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

Aircraft Details: Bell 47-G5
Registration: VH-LEH
Serial Number: 7850
Operation Type: Aerial Work
Damage Level: Substantial
Departure Point: 14 km W Katherine NT
Departure Time: 1328
Destination: Bulman NT

Approved for Release: 20th December 1989

Circumstances:

The pilot departed on a positioning flight with the helicopter fueled to capacity. While cruising at 2500 feet and 60 knots the pilot heard and felt a buzzing sensation which lasted for about 3 seconds. The helicopter then suddenly yawed rapidly to the right and the engine RPM increased by 150 RPM. The pilot reduced the throttle setting to idle and entered an autorotation at 55 to 60 knots. Power was applied at 1000 feet to check on controllability but the helicopter again yawed rapidly to the right, so the pilot again entered autorotation. As the pilot commenced to flare the helicopter directional control was again lost, so the pilot made a run-on landing avoiding the largest trees in the process. However, the area is heavily timbered and the main rotors struck several smaller trees, prior to and after touchdown. The investigation established that the failure was initiated by excessive wear of the inner track of bearing PN47-620-929-1. The wear caused an increase in the centre distance between the ring gear and the pinion gear. This resulted in increased loading and wear on the crowns of the teeth of the output drive shaft gear because the drive was being transmitted by the crowns rather than the full length of the teeth. Drive to the tail rotor was lost when the crowns of the teeth were worn away. Secondary damage to the bearing inner track removed all of the original surface layer. This prevented further examination to determine what initiated the wear. There was no suitable terrain available for the pilot to make a successful autorotational landing.

Significant Factors:

The following factors were considered relevant to the development of the accident

1. Excessive wear of bearing PN47-620-929-
1. It could not be established what initiated the excessive wear.

2. The drive to the tail rotor was lost when the crowns of the gear teeth were worn away.
3. The terrain was unsuitable for a forced landing.