

No: 7/89

Ref: EW/G89/01/21

Category: 2c

**Aircraft Type
and Registration:**

Augusta Bell 206B, G-BKDA

No & Type of Engines:

1 Allison 250-C20 turboshaft engine

Year of Manufacture:

1973

Date and Time (UTC):

29 January 1989 at 1500 hrs

Location:

Grassmere, Cumbria

Type of Flight:

Private (pleasure)

Persons on Board:

Crew - 1

Passengers - 3

Injuries:

Crew - None

Passengers - 1 (minor)

Nature of Damage:

Major damage to the airframe, main rotor blades and rotor head, tail boom and tail rotor

Commander's Licence:

Private Pilot's Licence (helicopter)

Commander's Age:

33 years

**Commander's Total
Flying Experience:**

700 hours (of which 70 were on type)

Information Source:

Aircraft Accident Report Form submitted by the pilot, video films taken by witnesses and an engineering examination by AAIB

The helicopter was engaged in a departure from the lawn of a local hotel. The estimated wind was west to southwesterly at 20-25 kt, and the air temperature was 5°C. The take-off weight of the helicopter was approximately 3100 lb, 100 lb below the maximum take-off weight.

The helicopter was facing a clear departure lane, into wind, but the site was otherwise fairly restricted by adjacent trees and the hotel building. The pilot has stated that it was his intention to perform a "towering take-off", a manoeuvre whereby full power is applied from a low hover, to produce a vertical climb, clear of surrounding obstacles, before transitioning into forward flight. This manoeuvre is normally used when the lift-off area is totally surrounded by obstructions, and is not likely to be required at an approved helicopter site.

Two amateur video photographers recorded the lift-off, one from ahead of the helicopter and the other from its left side. These recordings show that it lifted-off and then began to rotate to the right, at an increasing rate, as it climbed. After three complete turns to the right the pilot, believing that a tail rotor control failure had occurred, lowered the collective lever fully. The rotation ceased, within 1/4 of a turn, and the helicopter fell to the ground heavily and with some forward speed. After the initial impact, the helicopter rapidly tipped forward before settling back onto its skids. One of the 3 passengers suffered minor injury.

The wreckage was removed to a helicopter engineering base, where a detailed examination took place. All failures evident on the tail rotor drive shaft had occurred whilst the shaft was under rotational power and were consistent with the effects of failure of the tailboom, which had occurred at a point just aft of the tailboom/fuselage join. The tailboom had failed due to overstressing induced by the force of the initial ground impact. Examination of the tail rotor pitch controls and tail rotor gearbox revealed no pre-impact failures.

The video recordings were examined and it was confirmed that the tail rotor had been rotating under considerable power, almost up to the time of the ground impact.

Type of flight:	Private (pleasure)
Persons on Board:	Crew - 1 Passenger - 3
Injuries:	Crew None Passenger - 1 (minor)
Nature of Damage:	Major damage to the tailboom, main rotor blades and rotor head, tail boom and tail rot.
Commander's Licence:	Private Pilot's Licence (PPL)
Commander's Age:	33 years
Commander's Total Flight Experience:	700 hours (of which 50 were as PIC)
Information Source:	Accident Report Form submitted by the pilot, witness statements and an engineering examination by AAIB.

The helicopter was engaged in a departure from the site at 14:00 hours. The engine was running at 20-25 kt and the air temperature was 9°C. The take-off weight of the helicopter was approximately 1100 lb, 100 lb below the maximum take-off weight.

The helicopter was flying a clear departure route, however, the pilot was unable to see the terrain ahead of the helicopter. The pilot had stated that it was his intention to perform a "power take-off", a manoeuvre whereby the helicopter is hoisted into the air by a winch or hoist, producing a climb-clear of surrounding obstacles before transitioning into forward flight. This manoeuvre is normally used when the lift-off area is totally surrounded by obstructions, and a lift-off area is required at an approved helicopter site.

Two amateur video photographs recorded the lift-off. The pilot was standing on the helicopter and the video from the left side. These recordings show that the helicopter began to rotate to the right as it increased rate as it climbed. After three complete rotations the right tail boom, believed to be the control failure, had occurred, followed the engine failure. The rotation ceased, with the helicopter and the helicopter fell to the ground vertically with the tail boom. The helicopter rapidly tipped forward before settling on its side. The helicopter suffered minor damage.