

ACCIDENT

Aircraft Type and Registration:	Brantly B2B, G-BPIJ	
No & Type of Engines:	1 Lycoming IVO-360-A1A piston engine	
Year of Manufacture:	1967	
Date & Time (UTC):	21 May 2009 at 10:46 hrs	
Location:	Hardwick Airfield, Barondale Lane, Hardwick, near Norwich	
Type of Flight:	Aerial Work	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Beyond repair	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	68 years	
Commander's Flying Experience:	9,444 hours (of which 93 were on type) Last 90 days - 9 hours Last 28 days - 3 hours	
Information Source:	Aircraft Accident Report Form submitted by the commander, and follow up telephone inquiries and correspondence	

Synopsis

Whilst the pilot under instruction was turning downwind in the hover, tail rotor effectiveness was lost and the helicopter developed a high yaw rate. Although the instructor intervened, he was unable to stop the rate of yaw completely before the helicopter touched down. The left skid collapsed and the helicopter rolled on to its left side.

History of the flight

The accident occurred during a training flight for the revalidation of the pilot's type rating.

The pilot under instruction was established in a low hover at approximately 6 ft skid height, and with the relative wind about 20° off the nose to the left, when the instructor asked him to execute a right turn to point downwind. Whilst carrying out this manoeuvre, the aircraft rapidly and unexpectedly started to yaw right at an increasing rate, and to climb. The handling pilot is uncertain whether he actively raised the collective but, after having yawed through about 180° to 270° in a matter of seconds, and climbed to a height of about 20 ft with the throttle by that stage fully open and full left pedal applied, the instructor took control.

The instructor immediately lowered the collective in an attempt to recover the rotor speed, which had drooped, while maintaining full left pedal. By the time these actions started to take effect, the aircraft had climbed to a maximum height of 30 ft to 40 ft and drifted some 30m to 40m downwind from its initial hover position. It continued yawing right, albeit at reducing rate, as the height was reduced, until a gentle touchdown was affected under power, still with a residual yaw rate to the right, having turned through 3½ to 4½ turns in all. After touching down, the aircraft continued yawing to the right through about 60°. The left skid collapsed, causing the aircraft to roll left and the main rotor blades to strike the ground. The helicopter came to rest on its left side. Neither occupant was injured and both were able to vacate the aircraft through the right door, having first turned off all services.

The wrecked aircraft was subsequently inspected by the instructor for any signs of a disconnection or malfunction of the tail rotor pitch control linkages, or of the tail rotor drive mechanism. No such indications were found.

The instructor expressed the view that, had he been actively ‘following through’ on the controls, as he would have been had the student been an ab-initio pilot, as opposed to a qualified pilot undergoing refresher training, then he probably would have been able to intervene in time to have prevented the loss of control. As it was, the aircraft was already yawing and climbing uncontrollably before he was able to intervene.

Discussion

The tail rotor authority under the prevailing conditions of high main rotor torque in the hover was likely to have been marginal when associated with an increase in the collective pitch and reduction of rotor both main and tail rotor speed. If tail rotor authority is lost, the resulting uncontrolled yaw reportedly sets in very rapidly, and is inherently difficult to contain. This is particularly so if insufficient height is available to permit an immediate lowering of the collective to reduce the main rotor torque reaction, without risk of the aircraft contacting the ground prematurely with an unacceptably high rate of yaw.