

Piper PA-28-161 Cherokee Warrior II, G-BNOM

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Category: 1.3

Aircraft Type and Registration:	Piper PA-28-161 Cherokee Warrior II, G-BNOM	
No & Type of Engines:	1 Lycoming 0-320-D3G piston engine	
Year of Manufacture:	1987	
Date & Time (UTC):	29 May 2003 at 0855 hrs	
Location:	Derby Airfield, Derbyshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to left wing, left side of fuselage, left main and nose landing gear, propeller and engine	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	19 years	
Commander's Flying Experience:	110 hours (of which 58 were on type)	
	Last 90 days - 34 hours	
	Last 28 days - 26 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

History of Flight

The aircraft was landing on Runway 35, which has a grass surface, after a flight from Blackbushe. This was the second time that the pilot had landed at this airfield but on the previous occasion, two days before, he had made an approach to Runway 23. The weather was good with calm wind, a visibility of seven kilometres in haze and scattered cloud at a height of 4,500 feet. The aircraft's landing weight was 993 kg and Runway 35 was the runway in use because it is the longest of the three on the airfield, with a declared Landing Distance Available (LDA) of 528 metres. When the pilot made initial contact with the airfield on their Air/Ground radio frequency he was advised of the active runway, the circuit pattern, the airfield pressure setting and the wind conditions. The pilot did not enquire as to the state of the runway surface, which was damp with the remains of overnight dew, and the Air/Ground radio operator did not offer this information, for which there is no requirement.

The pilot reported that the final approach was flown at 75 kt with full flap selected and reduced power, but he considered that the speed was 5 kt faster than it should have been at that stage. This concurred with the observations of two witnesses on the airfield who remarked that the aircraft appeared to be on the correct profile for final approach but faster than normal. The aircraft landed at 60 to 65 kt between one third and half of the way into the runway.

After touchdown the pilot applied the brakes and noted that the aircraft did not decelerate as quickly as he would have expected. Again, this was confirmed by the witnesses who saw no immediate reduction in speed. The pilot applied maximum braking but realised that the aircraft was going to run off the end of the runway and collide with the hedge and railway embankment beyond it. He dismissed the idea of converting the landing into a 'touch and go' because of the presence of trees and power cables in the immediate climb out path.

As the aircraft was approaching the end of the runway, the pilot turned it to the right through 90° so as to absorb the impact on the left wing. He decided that this was preferable to hitting the embankment head on and that it would afford greater protection for his passenger in the right hand seat. The aircraft struck the bank with its left wing, whilst travelling sideways, at about 10 kt. The right wing was seen to rise up to an angle of 45°, as if the aircraft was going to roll over, before descending back down onto its landing gear. Having come to a halt, the pilot shut the aircraft down and he and his passenger exited normally through the cabin door on the right side. Both were unhurt and there was no fire.

Aircraft Examination

Subsequent examination of the aircraft revealed no fault in the braking system. The throttle lever was found to be set in about the one-quarter open position and the tips of the propeller blades were bent forward. Whilst it is possible that the lever was knocked into this position when the aircraft was vacated, the forward bend on the fixed pitch propeller blades suggested that the engine had been developing more than idle power when the aircraft struck the bank at low speed. No restriction was observed in the movement of the throttle lever throughout its full range.

Aircraft Performance

Performance graphs in the Airplane Flight Manual (AFM) give a Landing Distance Required (LDR) of 492 metres for the conditions on the day. These assume a dry runway and the inclusion of the recommended safety factor for private flights of 1.43. Applying the increased safety factor for a wet grass runway, as quoted in the CAA's General Aviation Safety Sense Leaflet 7B, entitled *Aeroplane Performance*, the LDR becomes 591.5 metres, which is greater than the published LDA for Runway 35. The grass was described as damp with the remnants of overnight dew, so the wet performance figure was the more appropriate one on this occasion.

The AFM stipulates that its figures are applicable for the following conditions:

Wing Flaps 40° Fully Extended

Touch Down Speed Stall

Flaps retracted and maximum braking after touchdown.

The AFM also states that; the Ground Roll is approximately 50% of the total landing distance.

Regarding speed on final approach, the AFM stipulates that 'the airplane should be trimmed to an initial-approach speed of about 70 KIAS with final-approach speed of 63 KIAS with flaps extended to 40°..... It is generally good practice to contact the ground at the minimum possible safe speed consistent with the existing conditions'. The AFM performance graphs quote a touchdown speed of 42 KIAS for this aircraft's landing weight.

Of note, 'Pooleys Flight Guide' entry for Derby Airfield includes a caution for Runway 35. It states:

Power cables 100' aal immediately North of A/D. An early 'Go around' decision vital in the event of missed approach to Rwy 35.

Analysis

The extra speed during final approach and at touchdown, combined with a 'deep' landing and perhaps residual power applied as well, would have increased the LDR, which already exceeded the LDA,

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even further. If, after touch down, the flaps had been retracted and maximum braking applied, speed reduction would have been more pronounced and the ground roll might have been reduced to within the remaining runway available.

The pilot concluded that the accident was the result of inexperience and his decision to continue with the approach and landing rather than go around. This decision might have been modified if he had been aware that the grass runway still had a covering of dew and the consequent effect that had on the LDR for a dry runway, which was close to though less than the LDA.

General Aviation Safety Sense Leaflet 7B provides pilots with advice on many aspects of performance for light aeroplanes, including points to note when landing.