

ACCIDENT

Aircraft Type and Registration:	Piper PA-28-181 Cherokee Archer III, G-MPAA	
No & Type of Engines:	1 Lycoming O-360-A4M piston engine	
Year of Manufacture:	2002	
Date & Time (UTC):	2 March 2008 at 1045 hrs	
Location:	Rochester Airfield, Kent	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 2
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Nose frame and nosewheel spat damaged	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	51 years	
Commander's Flying Experience:	313 hours (of which 73 were on type) Last 90 days - 4 hours Last 28 days - 2 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

The aircraft landed nosewheel first after bouncing on initial touchdown, causing damage to the engine frame and wheel spat.

History of the flight

The aircraft had flown from Biggin Hill and was making an approach to grass Runway 34 at Rochester. The pilot obtained a forecast indicating that the surface wind at Rochester was 280°/17 kt, gusting up to 27 kt. As he approached the airfield, the Rochester AFISO informed him that the surface wind was 290°/18 kt.

The pilot selected one stage of flap¹ before turning onto

Footnote

¹ There are three extended flap settings, known as "stages" – 10°, 25° and 40°.

base leg and a second stage before turning onto final. In his report to the AAIB he stated that he focussed much of his attention on "maintaining an accurate approach, crabbing in nose left to counter a gusting crosswind from left to right". He commented that he was also "aware of the increased weight of the aircraft and the need, therefore, for a slightly increased approach and touchdown speed" but that he overestimated these. The aircraft touched down at approximately 75 kt and bounced slightly. On the subsequent touchdown it bounced "much higher" and, in an attempt to control the bounce, the pilot "released back pressure" on the control column (reducing nose-up elevator) and applied "a very small amount of power to regain control of the aircraft". During the final touchdown the nosewheel contacted the

runway before the main wheels. The pilot was able to taxi clear of the runway and was not aware of any damage to the aircraft until a subsequent visual inspection.

Damage to aircraft

During an inspection of Runway 34, five pieces of the nosewheel spat were recovered. There was no evidence of the propeller having contacted the runway and a subsequent inspection by the maintenance provider to the aircraft operator indicated that damage was limited to the engine frame and nosewheel spat.

Aircraft information

The PA28-180 Archer III *'Pilot's operating handbook'* states a *'maximum demonstrated crosswind velocity'* of 17 kt. In the section entitled *'Normal procedures'* it recommends an initial approach speed of 75 kt and a final approach speed with "flap extended" of 66 kt². No speed is given for landing with two stages of flap set, but the handbook contains the following advice:

'The amount of flap used during landings and the speed of the aircraft at contact with the runway should be varied according to the landing surface and conditions of wing and airplane loading. It is generally good practice to contact the ground at the minimum possible safe speed consistent with existing conditions.'

Flying instructors familiar with the Archer III to whom the AAIB spoke all commented that two stages of flap was appropriate for landing in a gusting crosswind. The maximum permitted mass for takeoff and landing was 2,550 lb. Information provided by the pilot indicated that the takeoff mass was 2,531 lb.

Discussion

The AAIB receives several reports each year of light aircraft that have suffered damage as a result of landing nosewheel first, often following a bounce on initial touchdown. The nosewheel of most aircraft with tricycle landing gear is intended to provide steering and stability on the ground and is not designed to support the loads imposed by initial contact with the runway on landing. Accordingly, pilots are taught to touch down on the main wheels first. If the first attempt is unsuccessful, one option is to go around and reposition for another approach and landing.

Any control input which results in lowering of the nose close to the ground increases the risk that the nosewheel will make contact with the runway before the main wheels. As airspeed increases, a lower nose attitude is required to maintain the desired approach path, which also increases the likelihood of landing nosewheel first.

Footnote

² In the Performance section of the handbook this speed corresponds to landing with 40° of flap set.