ACCIDENT

Aircraft Type and Registration:	Piper PA-28-140 Cherokee, G-ZANG
No & Type of Engines:	1 Lycoming O-320-E3D piston engine
Year of Manufacture:	1972, Serial no: 28-7225178
Date & Time (UTC):	22 October 2011 at 1625 hrs
Location:	Netherthorpe Airfield, South Yorkshire
Type of Flight:	Private
Persons on Board:	Crew - 1 Passengers - 1
Injuries:	Crew - 1 (Minor) Passengers - 1 (Minor)
Nature of Damage:	Damage to propeller, engine, both wings, nosewheel, instrument panel and windows
Commander's Licence:	Private Pilot's Licence
Commander's Age:	35 years
Commander's Flying Experience:	203 hours (of which 127 were on type) Last 90 days - 8 hours Last 28 days - 4 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

Synopsis

During takeoff from Runway 24 at Netherthorpe the pilot realised there was insufficient runway ahead. He aborted the attempt but was unable to prevent the aircraft from colliding with bushes beyond the end of the runway.

History of the flight

The pilot, who had flown from Netherthorpe on "three or four occasions", departed Blackpool earlier in the day with the fuel level described as "below tabs", meaning that the tanks would be approximately two-thirds full. The aircraft was not refuelled after arrival at Netherthorpe.

Runway 24, which has a takeoff run available (TORA) of 490 metres, was used for the intended return flight to Blackpool. The first stage of flap was selected for takeoff. In his short report, the pilot commented that the headwind component had reduced close to the anticipated takeoff point. Having reached the "point of no return" he assessed that there was insufficient runway remaining and decided to abort the takeoff. However he was unable to prevent the aircraft from colliding with bushes beyond the end of the runway, before crossing a road and coming to rest in a field on the far side.

Other information

A weather observation taken on the airfield before the accident recorded a temperature of 13ºC, CAVOK and a wind direction and speed of 180º and 8-10 kt. Conditions

were reported as dry, although the pilot stated that the grass on the runway was damp.

Reference to the performance charts in a generic flight manual for this aircraft type revealed that, for an assumed aircraft weight of 1,500 lb (the maximum takeoff weight being approximately 2,150 lb) and a temperature of 13ºC, the required 'still air' takeoff distance from rest to a height of 50 ft was approximately 1,400 ft, or 427 m. This figure accounted for the 1.9% uphill gradient of Runway 24 and the airfield elevation of 250 ft but is otherwise valid for a dry 'Tarmac' surface and the flaps in the retracted position. Notes in the flight manual indicated that the derived value should be increased by 6.5% for a short, dry grass runway surface which gave a revised takeoff distance of 455 m. No data was provided for the flaps in their extended position, although most flying schools using PA-28 series aircraft tend to promote the use of the second stage of flap for 'short field' takeoffs.

The pilot did not provide sufficient information to enable an accurate assessment to be made of the aircraft weight, with the 1,500 lb value used above being a typical weight with two average-sized occupants and half to two-thirds full of fuel. Thus the derived takeoff distance of 455 m provides only an approximate guide, although the performance charts clearly indicated that there was insufficient runway length for a takeoff at maximum aircraft weight. In addition, grass length, soft ground and/or low tyre pressures, incorrect technique, degradation in engine and propeller performance would all serve to increase the takeoff distance.

In conclusion, this accident highlights the necessity of consulting the aircraft's flight manual or pilot's operating handbook prior to conducting a takeoff on limiting runways. In addition, the UK CAA's Safety Sense Leaflet No 7 contains relevant information on such topics as the use of performance data, performance planning and the application of safety factors.