ACCIDENT

Aircraft Type and Registration:	Piper PA-22-160 Tri-Pacer, G-ARFD
No & Type of Engines:	1 Lycoming O-320-B3B piston engine
Year of Manufacture:	1960 (Serial no: 22-7565)
Date & Time (UTC):	25 May 2013 at 1349 hrs
Location:	Elstree Aerodrome, Hertfordshire
Type of Flight:	Training
Persons on Board:	Crew - 1 Passengers - 2
Injuries:	Crew - None Passengers - None
Nature of Damage:	Damage to engine compartment, propeller and nosewheel
Commander's Licence:	Commercial Pilot's Licence
Commander's Age:	48 years
Commander's Flying Experience:	706 hours (of which 2 were on type) Last 90 days - 12 hours Last 28 days - 10 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional enquiries by the AAIB

Synopsis

The aircraft was landing at Elstree Aerodrome when the pilot sensed that the brakes had failed and realised that it would not stop before the end of the paved surface. At a very slow speed the aircraft ran onto the grass and came to a halt in a nose-down attitude with the nosewheel in a ditch. The braking system was found to be operational after the aircraft was recovered; the reason for the overrun could not be established.

History of the flight

The aircraft was returning to Elstree after a 30-minute trial lesson with two passengers. A normal approach to asphalt Runway 08, which has a Landing Distance Available (LDA) of 651 metres, was carried out at 65 kt; the wind was light and variable and landing flap was selected.

After the aircraft touched down in the normal area, as confirmed by witnesses, the pilot reached for the lever underneath the instrument panel which applies the brakes (an unmodified Tri-Pacer such as G-ARFD does not have differential toe brakes). At first, the pilot reported that his pull on the lever generated some retardation but it progressively deteriorated until, by the mid-point of the runway, he realised that he was not going to stop before the end of the paved surface and radioed the ATC tower that he "had no brakes". After further attempts using his maximum strength with both hands, he sensed further retardation but insufficient to prevent the aircraft from over-running the end of the runway, crossing a patch of long grass before the nose landing gear dropped into a small ditch. Although the

nose gear did not collapse, the aircraft came to rest in a nose-down attitude with the propeller spinner embedded in the far side of the ditch. The pilot radioed the tower to advise there were no injuries before shutting down the aircraft, and then he and his passengers exited the aircraft normally. The pilot could smell fuel and saw some leaking from the cowling area.

Discussion

The original PA-22 aircraft was not equipped with differential toe brakes, relying instead on a single hydraulic master cylinder operated by a handle under the instrument panel which applies drum brakes on both wheels. Whilst there have been a number of Supplemental Type Certificate (STC) modifications to improve the braking system, including fitment of disc brakes, G-ARFD did not have any of these.

The pilot attributes the overrun to "brake failure combined with downhill sloping runway". However, the operator reports that, during the recovery operation, it was found that the brakes were working and that it has therefore not been possible to establish the reason for the overrun.