

## ACCIDENT

<b>Aircraft Type and Registration:</b>	Piper PA-32R-301T, N414AG	
<b>No &amp; Type of Engines:</b>	1 Lycoming T10-540-AH1A piston engine	
<b>Year of Manufacture:</b>	2000 (Serial no: 3257184)	
<b>Date &amp; Time (UTC):</b>	23 August 2017 at 0827 hrs	
<b>Location:</b>	5 miles south of Linton-on-Ouse Airfield	
<b>Type of Flight:</b>	Private	
<b>Persons on Board:</b>	Crew - 1	Passengers - None
<b>Injuries:</b>	Crew - None	Passengers - N/A
<b>Nature of Damage:</b>	Extensive	
<b>Commander's Licence:</b>	Commercial Pilot's Licence	
<b>Commander's Age:</b>	63 years	
<b>Commander's Flying Experience:</b>	3,088 hours (of which 1,904 were on type) Last 90 days - 188 hours Last 28 days - 56 hours	
<b>Information Source:</b>	Aircraft Accident Report Form submitted by the pilot	

## Synopsis

The engine failed when heavy rain was encountered while flying in sight of the ground at approximately 1,900 ft agl. A forced landing was made in a field but, before the aircraft came to a halt, it hit trees and was extensively damaged.

## History of the flight

The pilot was flying in a northerly direction from Retford (Gamston) Airport towards Bagby (Thirsk) Airfield and the forecast weather was for rain showers and a consequential reduction in visibility to six kilometres. As the aircraft approached York, in Instrument Meteorological Conditions (IMC), the pilot encountered rain and observed on his Stormscope<sup>1</sup> a large number of returns from precipitation close to his route. He reduced power and descended to 2,000 ft amsl (approximately 1,900 ft agl) but, once below cloud and in sight of the surface, the rain became extremely heavy. While he was levelling (he was unsure if he had begun to increase the power or not), the engine suddenly stopped and the propeller then windmilled.

No unusual noises were apparent before the engine stopped and it did not "cough", as it might when starved of fuel, but the pilot immediately switched to the right fuel tank and turned-on the electric fuel pump. He also cycled the magneto switch and adjusted the mixture before switching back to the left fuel tank, which contained more fuel. None of these

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### Footnote

<sup>1</sup> A Stormscope provides a pilot with information about weather hazards.

actions restarted the engine so he selected the alternate air intake source while establishing the aircraft in a glide, with 10° of flap extended for the optimum glide angle. When the engine still did not restart, he re-selected the primary air source and, passing approximately 1,000 ft agl, he chose a group of small fields to aim towards. He could see there were cattle in these fields and therefore assumed they would be relatively flat and not furrowed.

During his descent the pilot was in radio contact with RAF Linton-on-Ouse and when he declared an emergency he was asked to select the emergency code 7700 on his transponder. He started to do this before realising that he ought to keep his attention outside, where he estimated that the slant visibility was approximately 3,000 m. He continued towards his chosen fields on a northerly heading, aware that the estimated wind at ground level was five knots from the southeast but thought it better to accept a tailwind than to look for an alternative landing site.

Approximately 200 ft above the chosen field he selected the landing gear down and full flap, maintaining a relatively fast airspeed to avoid stalling; he had read of this happening to other pilots when on final approach for a forced landing. He also managed to reach across the cockpit and release the door catch. He wanted to jam the door open with an available object but this proved impracticable from the left seat.

As the pilot flared the aircraft he retracted the flaps to try to improve the braking action on wet grass, and he turned off the master switch. The touchdown and ground roll felt relatively gentle and it became apparent that the aircraft was going to pass through an old hedge line consisting of numerous trees and bushes. The pilot steered towards a gap between two trees but the right wing and associated landing gear detached upon impact with one of the trees (Figure 1). The outboard section of the left wing also hit a tree and sustained damage, but without detaching from the fuselage. The aircraft then skidded across the adjoining field, losing the left main landing gear leg in the process. However, the nosewheel steering was still effective and the pilot used this to direct the aircraft between two ponds which he spotted ahead.



**Figure 1**

Detached right wing with trees which the aircraft hit in the background

The aircraft came to a halt approximately one metre from the edge of one of the ponds (Figure 2) and the pilot, who was uninjured, escaped through the door without difficulty. He checked the left wing tank and estimated it still held 25 gallons of fuel but the tank in the right wing had burst and he was unable to determine how much fuel it contained at touchdown.



**Figure 2**

Final position of N414AG close to the pond

### Engineering inspection

Several days after the accident, engineers inspected the engine and noted the paper air filter element was swollen and puffy, indicating that it had been very wet but had begun to dry out. The air filter was replaced and the engine subsequently started and ran normally. It was assessed that the extremely heavy rain had caused the paper element in the air filter to become saturated with water and this had starved the engine of air.

The alternate air source bypasses the air filter and the engineers suggested that, had it been selected before the primary source became blocked, the engine may have continued to run. The pilot has since heard anecdotal evidence from another pilot who believed that his aircraft's air filter was partially blocked by water while in heavy rain but, although his engine ran roughly, it did not stop. When this pilot opened the alternate air source, the engine immediately recovered.

### AAIB comment

In 2010, the engine manufacturer wrote a 'Tech Tips' document appertaining to its range of general aviation aircraft engines and included the following generic statement concerning piston engines:

*'Several years ago, there was a reported loss of engine power in heavy rain. In that case, a paper air filter was being used. When saturated with water, the paper filter element became swollen so that airflow was impeded. In this case, the use of carburettor heat to bypass the filter and re-leaning to achieve a better fuel/air mixture were successful tactics that kept the aircraft flying until*

*a safe, on-airport landing could be made. We should keep in mind that it is not the ingestion of water through the engine that causes a serious loss of power; it is the reduced airflow.'*

It should be noted that the accident described in this report concerned an aircraft with a turbo-charged engine which was not fitted with carburettor heat control.