



Air Accident Investigation Unit Ireland

FACTUAL REPORT

**Accident
Piper PA 18-95, G-PIPR
Navan Airfield, Co. Meath**

22 January 2017



**An Roinn Iompair
Turasóireachta agus Spóirt**
Department of Transport,
Tourism and Sport

Foreword

This safety investigation is exclusively of a technical nature and the Final Report reflects the determination of the AAIU regarding the circumstances of this occurrence and its probable causes.

In accordance with the provisions of Annex 13¹ to the Convention on International Civil Aviation, Regulation (EU) No 996/2010² and Statutory Instrument No. 460 of 2009³, safety investigations are in no case concerned with apportioning blame or liability. They are independent of, separate from and without prejudice to any judicial or administrative proceedings to apportion blame or liability. The sole objective of this safety investigation and Final Report is the prevention of accidents and incidents.

Accordingly, it is inappropriate that AAIU Reports should be used to assign fault or blame or determine liability, since neither the safety investigation nor the reporting process has been undertaken for that purpose.

Extracts from this Report may be published providing that the source is acknowledged, the material is accurately reproduced and that it is not used in a derogatory or misleading context.

¹ **Annex 13:** International Civil Aviation Organization (ICAO), Annex 13, Aircraft Accident and Incident Investigation.

² **Regulation (EU) No 996/2010** of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

³ **Statutory Instrument (SI) No. 460 of 2009:** Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulations 2009.



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In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No 996/2010 and the provisions of SI No. 460 of 2009, the Chief Inspector of Air Accidents on 22 January 2017, appointed Mr Paul Farrell as the Investigator-in-Charge to carry out an investigation into this Accident and prepare a Report.

Aircraft Type and Registration:	Piper PA 18-95, G-PIPR	
No. and Type of Engines:	1 x Continental Motors Corporation C90-12F	
Aircraft Serial Number:	18-832	
Year of Manufacture:	1951	
Date and Time (UTC)⁴:	22 January 2017 @ 12.30 hrs	
Location:	Navan Airfield (EIHH), Co. Meath	
Type of Operation:	General Aviation	
Persons on Board:	Crew - 1	Passengers - Nil
Injuries:	Crew - Nil	
Nature of Damage:	Substantial	
Commander's Licence:	Commercial Pilot Licence (CPL) issued by the Irish Aviation Authority (IAA)	
Commander's Age:	56 years	
Commander's Flying Experience:	1,697 hours, of which 79 were on type	
Notification Source:	Airfield Operator	
Information Source:	AAIU Report Form submitted by the Pilot, AAIU Field Investigation	

⁴ **UTC:** Co-ordinated Universal Time. All timings in this report are quoted in UTC which was coincident with local time on the date of the event.

SYNOPSIS

While the aircraft, a tail-wheeled Piper Cub, was backtracking at Navan Airfield, Co. Meath, the Pilot experienced increasing resistance to aircraft movement which necessitated increased engine power to maintain taxi speed. On encountering an upward-sloping section of the airfield, further application of engine power resulted in the aircraft tipping forward onto its nose and the propeller striking the grass surface. The Pilot exited the aircraft unaided and no injuries were reported.

NOTIFICATION

The AAIU was notified of the event by the Airfield Operator, who informed the Investigation that the Pilot had left the airfield to travel to another location where she was scheduled to embark on another flight. The AAIU Inspector-on-Call made telephone contact with the Pilot to obtain an account of the event. The Pilot indicated that she was shocked following the event and had decided that it would not be wise to fly again on that day. Therefore she cancelled her scheduled flight. She said that due to the shock she experienced she had omitted to inform the AAIU of the accident.

1. FACTUAL INFORMATION

1.1 History of the Flight

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The Pilot told the Investigation that she was conducting circuits at EIHH. She informed the Investigation that she completed a circuit, departing from Runway (RWY) 27 and landing on RWY 07 after which she continued to backtrack on RWY 25. Her next circuit was a left hand circuit following which she landed on RWY 25. **Figure No. 1** shows a schematic of the airfield and runways.

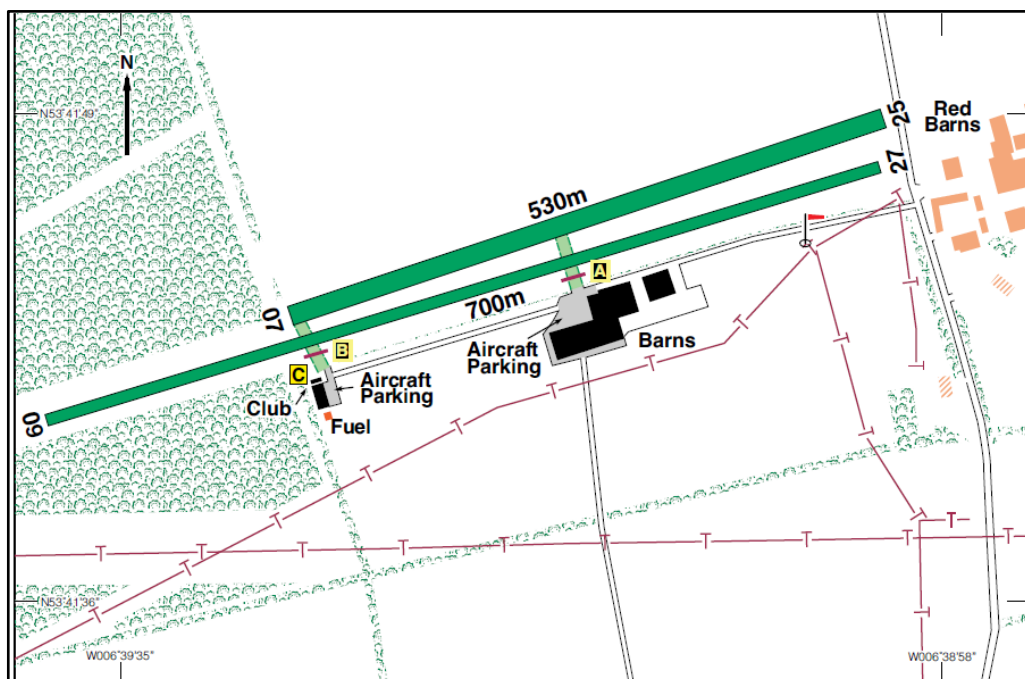


Figure No. 1: Schematic of the airfield runway layout (*Pooleys (Ireland) 2017*)



The Pilot recalled having “to apply a lot of brake after touchdown to bring the aircraft to a halt at the end of the runway”. The Pilot said that she exited RWY 25 and began backtracking on RWY 27. She informed the Investigation that halfway up the runway she crossed over to RWY 25; this involved two 90 degree turns, first to the left and then to the right.

The Pilot said that throughout the taxiing phase there was increasing resistance to the aircraft’s movement and that she was applying more power than usual to maintain taxi speed. The airfield has a sloped section around the mid-point of the runway length. The Pilot stated that she “had to apply more power to move the aircraft forward up the slope at which point the aircraft tipped over and the propeller struck the ground” (**Photo No. 1**). The Pilot said that she “shut everything down and vacated the aircraft”.



Photo No. 1: The aircraft’s final resting position

1.2 Airfield Examination

During an inspection of the airfield, tyre tracks and scuffed grass surface were in evidence over the length of the eastern half of RWY 25. The Investigation noted that the distance between the tracks matched the distance between the aircraft’s two main wheels. There was evidence of propeller contact with the grass surface at the site where the aircraft pitched forward.

1.3 Maintenance History

The aircraft was maintained by a UK-based Maintenance Organisation (MO). According to the records presented to the Investigation, the aircraft’s previous *Release to Service* was issued on 18 February 2016, following an Annual Check; the records for that Annual Check included an entry which read “Port brake binding – removed stripped, cleaned greased refitted *opc satis*.” The MO stated that no post maintenance check flight was performed after the Annual Check. Furthermore, the MO stated that it had no record of any communication from the Owner to say that he was experiencing any problems after he collected the aircraft following the Annual Check on 18 February 2016.

1.4 Aircraft Examination

On the day after the event, the Investigation carried out a preliminary inspection of the wheels and brakes. The Investigation noted that there was a binding force acting to resist the turning of the wheels, and rotation of the wheels was accompanied by grinding noises. The aircraft had suffered propeller damage and the engine may have been shock loaded.

The Investigation was informed that on at least one occasion prior to the event, another pilot had experienced unusual resistance during taxiing and had noted that the brakes were quite hot at the time. It was reported that allowing the brakes to cool had resolved the resistance issue. The Pilot informed the Investigation that she had not been aware of this previous brake-related issue. The Investigation noted that it was not recorded on the aircraft's signing out sheet nor was there a record of a maintenance intervention to investigate the cause of the issue.

1.5 Examination by Maintenance Organisation

On Thursday 19 October 2017, nine months after the event and with the aircraft grounded for the intervening period, the MO inspected the aircraft. The MO found that on jacking the aircraft and rotating the left wheel, pronounced brake drag was noted. Following an application and release of the brakes the brake drag was more pronounced and significant force was required to rotate the wheel. The MO observed that the brake unit showed evidence of corrosion. On removal of the main wheels the MO noticed that the calipers *"were solid with no movement"*. The MO said that when the left caliper was removed it was found to be *"gummed with contaminated grease which when cleaned off"* allowed the *"callipers to float correctly"*. The MO commented that the caliper is located on the main landing gear by two dowels which allow *"sliding"* motion for balanced operation of the caliper and that during installation a small amount of grease is applied to the dowels.

The MO found that when the brake calipers were operated off the wheel, one piston did not retract after brake pressure was released; when the caliper was removed for strip inspection, significant force was required to retract the piston. The MO reported that the condition of the exposed portion of the pistons showed evidence of mechanical gripping on a previous occasion, and of surface corrosion.

The MO observed that the subject aircraft is different to others it maintained because it is operated from grass-surfaced, unpaved runways; the MO indicated that the moisture and other contamination associated with grass runway operations may have been a factor in the corrosion observed.

2. AAIU COMMENT

Tail-wheel aircraft such as the subject aircraft require careful handling during ground manoeuvring to maintain directional control and also to avoid tipping the nose down. Any unusual resistance encountered during manoeuvring of a tail-wheel aircraft, due to the axially separated forces of propeller thrust and surface (wheel) friction, can cause a (force) couple to pitch the aircraft nose down, particularly when combined with the increased thrust requirements demanded by an upslope on the airfield as happened in this case.



The Pilot noted that the aircraft required “*a lot of brake after touchdown*”. The tyre tracks and scuffed grass surface observed during runway examination suggested that the wheels had been locked and skidding during the landing. Examinations of the aircraft’s wheels and brakes did identify rotational resistance accompanied by grinding noises which could have generated significant heat during the heavy braking and backtrack taxiing which the Pilot reported. While heat generation (and dissipation) is not usually an issue with disc brakes, it appears that on this occasion, as on a previous occasion with this aircraft, the heat generated may have caused expansion leading to increasing rotational resistance. Increasing resistance, and an uphill slope, prompted the Pilot to apply more engine power which caused the aircraft to tip forward onto its nose resulting in the propeller striking the grass surface.

Had the Pilot been aware of the previous brake heating and resistance incident with the aircraft, she might have taken more notice of the progressive increase in resistance. However, this incident had not been recorded in the aircraft signing out sheet. No maintenance investigation of the previous incident was recorded.

It is a requirement of SI No. 460 of 2009 for pilots to inform the AAIU of any serious incident or accident as soon as practicable by the most rapid means available. While the airfield operator did report the matter to the AAIU, the Pilot left the scene of the accident without reporting the matter to the AAIU and initially intended to undertake another flight at a different airfield on the same day. When contacted by the AAIU Inspector-on-Call the Pilot indicated that following the event she had realised that she was shocked and had decided that it would not be wise to fly again on that day. She said that due to the shock she experienced she had omitted to inform the AAIU of the accident.

The circumstances of this accident serve as a reminder to general aviation pilots of the importance of recording aircraft technical problems, timely maintenance intervention and the obligation to inform the AAIU, as soon as practicable, when an accident or serious incident occurs.

- END -

In accordance with Annex 13 to the Convention on International Civil Aviation, Regulation (EU) No. 996/2010, and Statutory Instrument No. 460 of 2009, Air Navigation (Notification and Investigation of Accidents, Serious Incidents and Incidents) Regulation, 2009, the sole purpose of this Investigation is to prevent aviation accidents and serious incidents. It is not the purpose of any such investigation and the associated investigation report to apportion blame or liability.

A safety recommendation shall in no case create a presumption of blame or liability for an occurrence.

Produced by the Air Accident Investigation Unit

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