

Serious Incident

Aircraft Type and Registration:	Piper PA-22-108, G-ARNE	
No & Type of Engines:	1 Lycoming O-235-C1B piston engine	
Year of Manufacture:	1961 (Serial no: 22-8502)	
Date & Time (UTC):	23 May 2025 at 1820 hrs	
Location:	Old Buckenham Airfield, Norfolk	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Left aileron partly detached from the wing	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	55 years	
Commander's Flying Experience:	293 hours (of which 36 were on type) Last 90 days - 3 hours Last 28 days - 0 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and subsequent discussions with the maintenance organisation	

Synopsis

During the initial climb after takeoff, the left outboard aileron hinge detached. The pilot was able to maintain control and land without incident. Assessment of the aircraft revealed that a non-standard clevis pin had been fitted to the right outboard aileron hinge. It is possible that a similar non-standard part had been fitted to the left aileron and had failed, or fallen out during operation.

This event serves as a reminder to ensure that when maintaining aircraft the correct parts are used.

History of the flight

Shortly after takeoff from Old Buckenham Airfield, at approximately 400 ft, the pilot heard a 'clunk' and felt a jolt through the aircraft. He completed a troubleshooting scan of the aircraft and observed that the outboard end of the left aileron had partially detached from the wing.

Unsure of the effect on controllability or whether the aileron would detach completely, the pilot declared a MAYDAY. He began a steady climb before making some gentle control inputs. Assessing that he could manoeuvre using mainly rudder inputs, the pilot decided to attempt to land back at Old Buckenham. He made a successful landing on Runway 07, after completing a wide circuit to avoid populated areas and to minimise aileron control inputs.

Subsequent assessment of the aircraft identified that the left outboard aileron hinge clevis pin was missing (Figure 1). It was also noted that the hinge bracket through which the clevis pin fitted was worn.



Figure 1

G-ARNE left aileron outboard hinge with missing clevis pin (reproduced with permission)

Assessment by the aircraft repair organisation identified that the equivalent clevis pin on the right aileron was a non-standard part (Figure 2) and had a larger diameter than the part specified by the aircraft manufacturer (Figure 3), and that the hinge bracket was also worn.



Figure 2

Non-standard part fitted to the right outboard aileron hinge on G-ARNE



Figure 3

Unused clevis pin, part number AN394-41 that should be fitted to PA-22-108 aileron hinges

Assessment of the maintenance history for the aircraft did not identify when the pin had been replaced, so it was considered to pre-date the current ownership of the aircraft.

Analysis

Although the left aileron outboard clevis pin was missing, the wear identified on both sets of hinge brackets and the presence of a non-standard clevis pin fitted to the right outboard aileron hinge suggests that the left outboard aileron clevis pin had been replaced. With the hinge brackets showing signs of wear, it is likely that oversized replacement clevis pins were manufactured, or non-standard pins found, to fit the worn hinge holes and negate the need to replace the hinge brackets.

Given the absence of the clevis pin, it was not possible to determine whether it was missing because the split pin had been lost, allowing the clevis pin to migrate out of the hinge, or if the clevis pin itself had failed. However, the fitment of non-standard parts in place of those specified by the aircraft manufacturer may have led to the loss of the clevis pin.

Aircraft manufacturers specify parts to fulfil design requirements, such as operating loads, fatigue life and corrosion resistance. They are designed to operate through the life of the aircraft or, if maintained on-condition, replaced when inspections reveal they are failing or worn out. To maintain the airworthiness of the aircraft, replacement parts must be those specified by or repaired in accordance with the manufacturer's manuals and instructions. It seems that in this case a work-around was used to allow the aircraft to operate without use of the specified parts or correct repairs, possibly leading to a premature component failure.

The action taken by the pilot to calmly and methodically troubleshoot and identify the issue, before applying a threat-and-error-management strategy is good practice when responding to in-flight emergencies. In minimising the aileron control inputs by using the rudder, the aileron loading was reduced, lessening the possibility of the aileron detaching in flight.