

# Piper PA-25-235, G-AZPA

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Category: 1.3

**Aircraft Type and Registration:** Piper PA-25-235, G-AZPA

**No & Type of Engines:** 1 Lycoming O-540-B2C5 piston engine

**Year of Manufacture:** 1970

**Date & Time (UTC):** 28 April 2001 at 1331 hrs

**Location:** Talgarth Airfield, South Wales

**Type of Flight:** Glider Towing

**Persons on Board:** Crew - 1

Passengers -  
None

**Injuries:** Crew - None

Passengers - N/A

**Nature of Damage:** Damage to left wing

**Commander's Licence:** Private Pilots Licence

**Commander's Age:** 68 years

**Commander's Flying Experience:** 5,610 hours (of which 226 were on type)

Last 90 days - 7 hours

Last 28 days - 5 hours

**Information Source:**

Aircraft Accident Report Form submitted by the pilot

## History of the flight

The aircraft was taking off for the seventh glider aero-tow of the day when, just prior to lift-off at about 50 mph the left wing suddenly dropped, halted momentarily, and then dropped onto the grass runway. After the left wing had contacted the grass, the aircraft had ground-looped to the left through some 160° before coming to rest within the airfield boundary. The pilot had closed the throttle and stopped the engine using the magneto switches. The glider pilot, on observing the tug's behaviour, had immediately applied the brake and turned his glider to the right in order to avoid a collision. There were no injuries sustained in the accident and there was only relatively minor damage to the underside of the tug aircraft's left wing.

## Left landing gear leg failure

Subsequent examination revealed that a failure had occurred in the left landing gear truss at the point where it attached to the bottom of the spring damper unit. This was a bolted joint with a fork end on the truss which attached to a lug on the damper, such that the bolt was loaded in 'double shear'. It was found that the front lug on the truss fork, together with the bolt, had failed. Although the lug and one half of the bolt were found on the grass runway, they were not available for later metallurgical examination since the lug had been welded back onto the truss during the related repair, and the bolt portion had been mislaid. However, photographs taken of the failed lug and bolt appeared to show age-related staining on part of the lug fracture, indicative of a pre-existing fatigue fracture in the lug, and a low cycle fatigue failure of the bolt. The lug failure would have placed the bolt in single shear, inducing the rapid low cycle fatigue failure. Figure 1 (*JPG 134kb*) shows photographs of the failures and the layout of the landing gear.

In common with many other aircraft of this type, this aircraft was fitted with a modification consisting of a wire strop on each main landing gear (also shown in Figure 1) that looped around both the truss and the internal wing structure. This strop was designed to prevent a complete collapse of a leg in the event of a failure of the bungee cord which was incorporated within the spring/damper unit. The consequences of a failure of either the truss fork or the spring/damper are the same in that the truss will rotate about its outboard attachment until 'caught' by the wire strop. In this case the strop had failed immediately after it had been loaded as a result of the truss fork failure, thus accounting for the two-stage process of the leg collapse. Subsequent investigation revealed that the strop cable had been weakened by corrosion, most probably as a result of the accumulation of water within the sheath that contained the cable. During the associated repair, the sheath was replaced with a clear plastic tube which will enable the condition of the cable to be visually monitored.