

ACCIDENT

Aircraft Type and Registration:	Alpi Aviation SRL Pioneer 400, G-CGAJ	
No & Type of Engines:	1 Rotax 912 ULS piston engine	
Year of Manufacture:	2009 (Serial no: 01)	
Date & Time (UTC):	17 December 2012 at 1029 hrs	
Location:	Gloucestershire Airport	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to landing gear and left wing and flap	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	69 years	
Commander's Flying Experience:	1,490 hours (of which 130 were on type) Last 90 days - 20 hours Last 28 days - 7 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

After the aircraft had taken off from a private strip, the pilot was unable to retract the landing gear or, subsequently, obtain down-and-locked indications. Anticipating that the gear was not fully locked down, he continued to his destination where the left main and nose landing gear legs collapsed following the touchdown. It is thought that maladjustment of the landing gear mechanism had caused failure of a main gear screwjack during the takeoff.

Description of the aircraft

The Alpi Aviation Pioneer 400 is a recent four-seat development of the Pioneer 300 light aircraft, which has two seats. G-CGAJ was undertaking the process of type appraisal by the Light Aircraft Association (LAA) with

a view to the eventual issue of a full United Kingdom Permit-to-Fly.

The aircraft is fundamentally of wooden construction and features a retractable tricycle landing gear. Retraction and extension is by an electric motor which drives three screw jacks (one for each landing gear). When the legs are fully extended, the jacks operate overcentre mechanisms which lock the landing gear down. If the electric motor fails, for any reason, a hand crank can be used to drive the mechanism manually.

The indications for the landing gear are conventional. Three green lights illuminate when the landing gear is down and locked and a landing gear unsafe amber light indicates that it is in transit or unsafe. A red light

and audio warning indicate that the landing gear is not locked down when the throttle is closed.

History of the flight

The aircraft departed from a private airstrip near Abergavenny, with two people onboard, for a flight to Gloucestershire Airport. After takeoff, the pilot selected the landing gear up but the landing gear actuator circuit breaker tripped. He reset the circuit breaker and it immediately tripped again. He then attempted to carry out the emergency manual landing gear procedure but was unable to move the landing gear up or down.

The pilot decided to continue to Gloucestershire Airport, where he considered the facilities were better able to deal with a possible emergency landing. Whilst en route, he made further attempts to lower the landing gear and succeeded in obtaining a green safe indication for the right main landing gear only, but with the GEAR UNSAFE amber light also illuminated. Upon arrival at Gloucestershire Airport, he performed a low circuit and requested a visual appraisal from the ATC Tower. He was advised that all three landing gear legs appeared to be down. The pilot therefore commenced an approach to Runway 22, stopping the engine with the propeller in the horizontal position before landing. At first, the touchdown appeared to be normal but then the left main

landing gear, followed by the nose gear, collapsed and the aircraft veered off the left side of the runway, striking a disused concrete manhole cover and causing damage to the left wing and flap.

Examination of the aircraft

The aircraft was examined by an engineer from the LAA the day after the accident. He found that all three landing gear screw jacks had fractured, almost certainly because they had been subjected to loads through the landing gear due to the overcentre mechanisms not being made. It appeared that the left main landing gear jack had probably failed during the takeoff and that the motor end of the fractured screw had rotated for a few turns before jamming against the rear spar, causing the circuit breaker to trip. In this condition, the manual extension mechanism would not operate.

The LAA noted that such a system relies heavily on correct rigging and adjustment of the mechanical components and the various microswitches, both for correct system operation and also for early indication that the system may be going out of adjustment. A number of recommendations on this subject have been drawn up by the LAA for discussion with the aircraft manufacturer.