ACCIDENT

Aircraft Type and Registration:	Pioneer 300, G-OWBA	
No & Type of Engines:	1 Rotax 912ULS piston engine	
Year of Manufacture:	2013 (Serial no: LAA 330-15155)	
Date & Time (UTC):	26 March 2023 at 1620 hrs	
Location:	North Weald Aerodrome, Essex	
Type of Flight:	Training	
Persons on Board:	Crew - 2	Passengers - None
Injuries:	Crew - None	Passengers - N/A
Nature of Damage:	Damage to the left wing and left main landing gear retraction mechanism	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	27 years	
Commander's Flying Experience:	2,900 hours (of which 17 were on type) Last 90 days - 81 hours Last 28 days - 20 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot	

Synopsis

During the landing roll the left main landing gear collapsed because the landing gear was not in the down and locked position. Examination could not positively identify the reason that the gear was not locked down, however it is considered likely that the landing gear had not been set up correctly after a recent part replacement.

History of the flight

A student pilot was landing with a slight crosswind from the left. Just before the flare the instructor added right rudder and left aileron before they made a 'smooth and symmetrical' touchdown. The instructor recalled that after approximately 5 seconds the aircraft started to veer to the left. He then noticed that the left wing had contacted the runway. The aircraft departed the runway and struck a runway light. Assessment of the aircraft after the accident identified that the left main landing gear had collapsed.

During the previous flight, when the landing gear was lowered for landing, the right main landing gear green light did not illuminate, indicating that it was not down and locked. The pilot, who was the instructor of the accident flight, flew the aircraft past the tower and received confirmation that the gear was visually down. He then made a successful landing. He discussed the event with the maintainer who advised making an adjustment to the right main gear down microswitch as it was considered likely that, during recent

maintenance in which landing gear actuation system components were replaced, the microswitch position may not have been correctly set.

Aircraft information

The Alpi Pioneer 300 is a small two-seat, low-wing aircraft, of mainly wooden construction. The aircraft is fitted with electrically operated retractable tricycle landing gear (Figure 1).

The nosewheel retracts rearwards and the mainwheels retract outwards into wheel wells on the underside of the wings. An electric motor drives a retraction/extension gearbox which drives jack screws that, when lowering the landing gear, extend the mechanisms. Once at full travel an over-centre mechanism locks the gear in the down position. Microswitches sense that the mechanisms are in the down and locked position and illuminate green lights on the instrument panel indicating their respective landing gear leg's position.

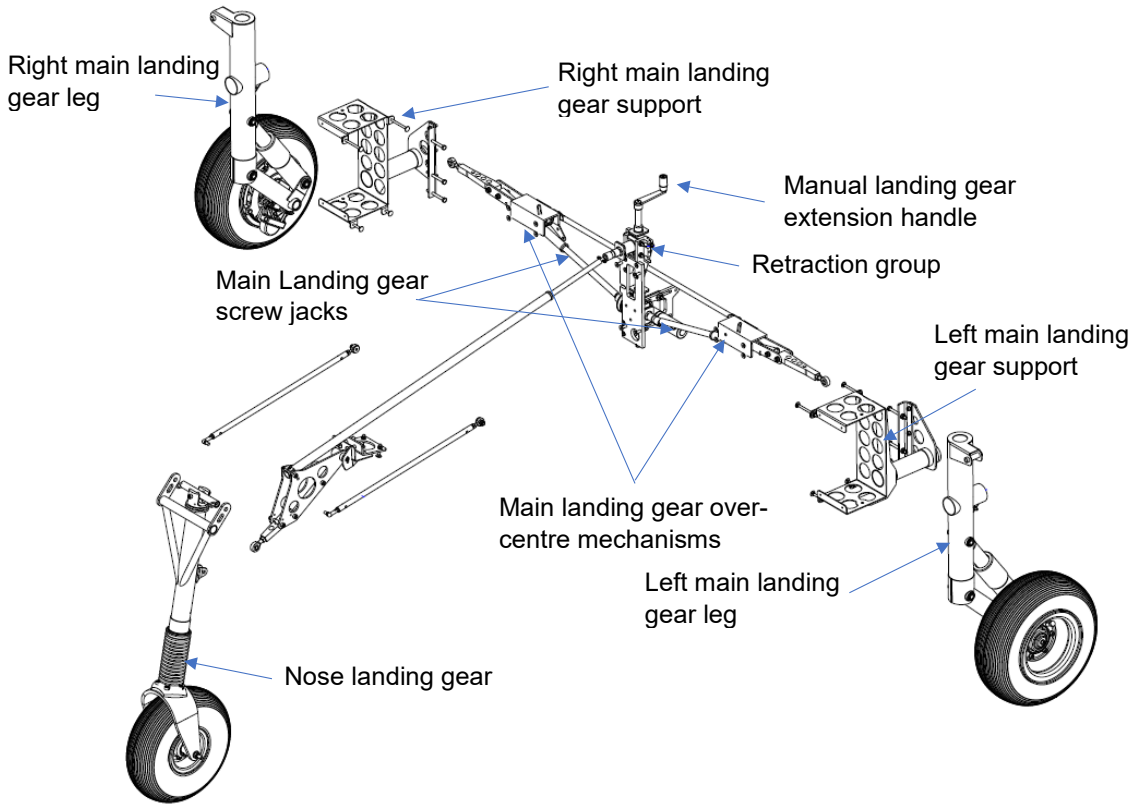

Figure 1

Alpi Pioneer 300 landing gear configuration

In August 2022, approximately three flying hours before the accident, the main landing gear extension/retraction mechanism was replaced due to several components, including the jack screws, gearbox shafts and jack screw universal joints, being distorted and bent. The left over-centre arm assembly was also found to be coming away from the spar box fixing bolts, so was replaced.

Aircraft examination

The left main landing gear threaded bar had buckled, fracturing towards its outboard/ extended end (Figure 2).

Figure 2

Buckled and fractured G-OBWA left main gear jack screw

A scuff mark was identified in the wheel well (Figure 3), which indicated that the tyre had contacted the wheel well wall. Assessment of the wheel identified that the tyre fitted was not specified in the maintenance manual and was 2 inches wider than the specified tyre.

Figure 3

G-OBWA left wheel well (underside of wing) showing scuffing

Analysis

When an outward side load is applied to the landing gear the load path should be through the over-centre mechanism and into the airframe. However, as the jack screw was buckled it indicated that the load path was through the extension/retraction mechanism and that the gear was not locked down during the landing.

With the damage to the components, it was not possible to establish why the mechanism was not locked down; however, it is considered possible that the landing gear had not been correctly set up when the new components had been installed. As the jack screw had failed whilst in the extended position, it is considered unlikely that the issue identified with the incorrect tyre being fitted was linked to the landing gear failure.

The landing gear indication issue that occurred during the flight before the accident may have been related to the landing gear not travelling to the full extent when being lowered, rather than a maladjusted microswitch. A more thorough investigation of the issue may have identified the over-centre mechanism issue and prevented the failure of the screw jack.

This event serves as a reminder for all issues to be fully investigated to understand their root cause. Even if an easy fix may, on the face of it, rectify a fault an underlying issue may remain.

The installation of the incorrect tyre, although unrelated to the landing gear failure, also serves as a reminder to ensure that only components included in the defined parts list should be fitted to an aircraft.