

ACCIDENT

Aircraft Type and Registration:	Minicab (JB01 Standard), G-AWEP	
No & Type of Engines:	1 Continental Motors Corp C90-8F piston engine	
Year of Manufacture:	1969 (Serial no: PFA 1801)	
Date & Time (UTC):	6 July 2013 at 1230 hrs	
Location:	Sittles Farm Airstrip, Lichfield, Staffordshire	
Type of Flight:	Private	
Persons on Board:	Crew - 1	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to propeller, cowling, canopy, cabin front and roof	
Commander's Licence:	Private Pilot's Licence	
Commander's Age:	55 years	
Commander's Flying Experience:	144 hours (of which 44 were on type) Last 90 days - 14 hours Last 28 days - 4 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional enquiries by the AAIB	

Synopsis

The aircraft was landing at a farm strip. Approach and touchdown were normal but, as the pilot started to apply the brakes, the aircraft swung to the left and he was unable to prevent it from veering off the runway at slow speed and into a tall crop, where it overturned. Subsequent examination found that wear in a component of the left main landing gear leg was allowing considerable torsional movement of the left wheel, causing an uncommanded application of the cable brake on that side.

History of the flight

The pilot and his passenger were planning to depart from New York Farm in Lincolnshire to attend a fly-in

at Sittles Farm near Litchfield. As he had not flown in there before, he telephoned the airstrip to obtain permission and receive an airfield briefing to back up the information he had learned from their website. He also checked the weather and NOTAM information before notifying RAF Coningsby of his intentions.

The weather was good, with light winds from the south and the pilot resolved that he would only land if Runway 09/27 was in use; at 530 metres long he felt it preferable to Runway 17/35, which was 350 metres long. He states that he would have been prepared to accept a 10 kt crosswind component, but expected closer to 5 kt.

He took off from Runway 26 at New York Farm with RAF Coningsby providing him with the information that the wind was 190°/7 kt. He reports that he felt that he was having to apply a lot more right rudder than normal to counter a left drift during the takeoff roll, even though the windsock appeared slack.

Arriving at Sittles Farm, he had been given Runway 27 and could see that the windsock was hanging limp and concluded that there was no crosswind component. Following a stable approach at 50 kt, the aircraft touched-down in a three-point attitude at a speed of 45 kt at the start of the runway. It rolled straight without requiring correction and the pilot started to apply the heel brakes gently, feeling that he had plenty of runway left. However, as he applied the brakes, the aircraft started to yaw left and he released the brakes and corrected with right rudder. As this did not appear to be effective he used right brake as well but, even with full opposite rudder and brake, the pilot could not prevent the aircraft from veering off the left side of the runway at an estimated speed of 10–15 kt and entering a crop of beans standing about 4 feet high. The aircraft almost immediately came to a halt and flipped inverted.

Having checked that his passenger was uninjured, the pilot started to break away the remains of the shattered canopy and was about to exit when help arrived and the left wing was lifted to make egress easier.

Description of the main landing gear

Minicab aircraft have two main landing gear (MLG) legs and a tailwheel. The MLG legs comprise a polished steel tube with the axle assembly welded to it (see Figure 1) and an aerofoil-shaped fixed housing which is bolted to the wing main spar. The upper part of the housing is filled with rubber blocks and separator plates which are compressed under landing loads by a Duralumin 'piston' attached to the top of the steel tube. These attachments comprise two mild steel pins which are a force fit into the piston, filed flush and then locked with a pin punch. They are additionally retained by two brass sealing strips which are attached to the piston using countersunk screws. It will be evident that the attachment pins also control the toe angle of the wheel, since it is they which prevent the tubular leg from rotating relative to the housing. Independent mainwheel braking is achieved by two cable-operated drum brakes actuated by heel pedals.

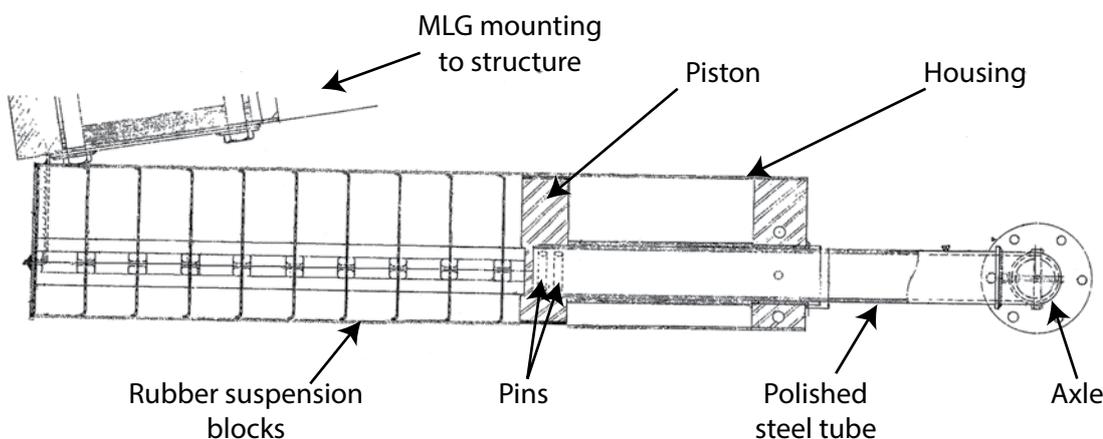


Figure 1

Drawing of Minicab MLG leg showing the Duralumin piston and steel pins which provide torsional location of the leg

Examination of the aircraft

The owner-pilot was initially unsure as to the reason for the loss of control, although he states that he sensed that the left brake may have been occasionally dragging after the aircraft was righted and was being wheeled into a hangar. However, once the aircraft was jacked, he noticed that the left wheel could be rotated around the axis of the MLG leg through about $\pm 10\text{-}12^\circ$ and that, at the fully 'toed-out' condition, a pull on the brake cable was also applying the brake. Upon removal of the tube and piston assembly from the housing, it could be seen that there was considerable rotary play between the piston and the tube and that, when the brass seal strips

were unscrewed, the two pins fell out freely from the piston, exhibiting considerable wear as well as ovality of the holes in the piston (see Figure 2). The right MLG also exhibited rotational looseness, but this was limited to about $\pm 3\text{-}5^\circ$.

The owner advised that he had carried out an overhaul of both brake assemblies fairly recently but had not noticed the degree of play, probably because the aircraft had been jacked on the bottom of each MLG leg. He has notified the Light Aircraft Association of his findings with a recommendation that other Minicab owners should check for this condition.

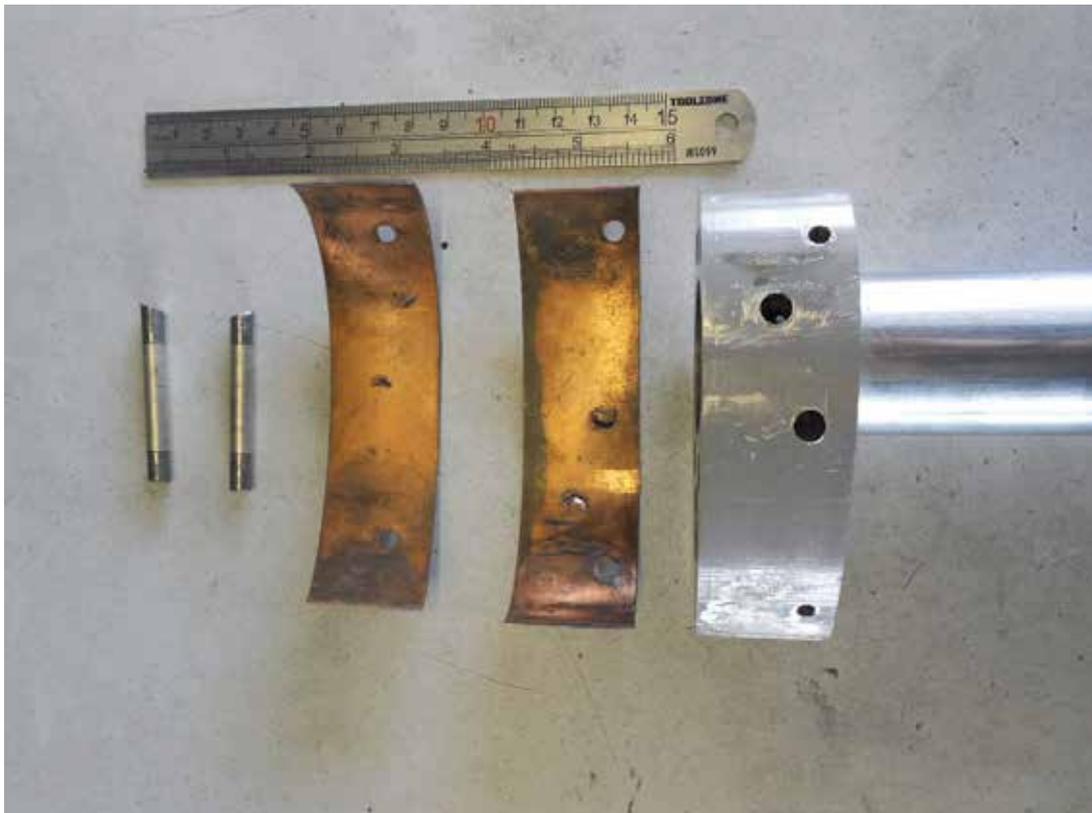


Figure 2

Photograph of disassembled piston, showing wear to the pins, ovalisation of the holes and indentations on the brass sealing strips showing lateral movement of the pins