

ACCIDENT

Aircraft Type and Registration:	Beech Baron 95-B55, G-UROP	
No & Type of Engines:	2 Continental Motors Corp IO-470-L piston engines	
Year of Manufacture:	1982 (Serial no: TC-2452)	
Date & Time (UTC):	27 March 2021 at 1215 hrs	
Location:	Wellesbourne Mountford Airfield, Warwickshire	
Type of Flight:	Private	
Persons on Board:	Crew - 2	Passengers - 1
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Damage to left outer wing, nose and landing gear components. Both propellers damaged and engines shock-loaded	
Commander's Licence:	Commercial Pilot's Licence	
Commander's Age:	65 years	
Commander's Flying Experience:	12,129 hours (of which 19 were on type) Last 90 days - 5 hours Last 28 days - 5 hours	
Information Source:	Aircraft Accident Report Form submitted by the pilot and further enquiries by the AAIB	

Synopsis

The aircraft's landing gear retracted during a touch-and-go whilst the aircraft was on the runway. The cause of the landing gear retraction could not be conclusively identified.

History of the flight

The flight was the first since an annual maintenance check had been completed on 19 March 2021, and it was also planned to provide training for the aircraft's co-owner whose Multi Engine Piston (MEP) class rating had expired. The co-owner, acting as pilot flying, occupied the left cockpit seat and an instructor, acting as aircraft commander, occupied the right seat. The pilot flying and the instructor agreed that the pilot flying would fly the aircraft and manipulate the engine controls, and the instructor would move the flap and landing gear controls as required. A second co-owner was seated in the rear of the aircraft, as a passenger. The pilot flying stated that the takeoff weight was 2,215 kg, which is below the maximum landing weight of 2,272 kg, and that the centre of gravity was within approved limits.

The aircraft took off from Wellesbourne Airfield and after approximately 20 minutes of general handing, returned to the airfield for a number of touch-and-go circuits. The aircraft entered the circuit pattern for Runway 18 and the landing gear was extended as part of

the pre-landing checks. The landing gear position indicator lights showed 'three-greens', indicating that the landing gear was down and locked. Full flap was selected on final approach and the aircraft touched down normally, however as the pilot flying increased engine power the aircraft was observed to settle onto its nose and left wingtip, and both propellers struck the runway surface. The right main landing gear leg remained locked in the down position. The aircraft slid to a halt slightly left of the runway centreline (Figure 1). The occupants were not injured and were able to vacate the aircraft without incident, using the cockpit door.



Figure 1

G-UROP following the landing accident

The instructor commented that during the landing, he had placed his hands in front of the dual control yoke bar¹ in anticipation of any excessive de-rotation of the aircraft onto the nose landing gear during the touch-and-go. In doing so, his left hand was close to the landing gear switch and it was possible it may have inadvertently contacted the switch. He stated that he had not selected the landing gear switch to UP on the ground roll.

Aircraft examination

The aircraft was recovered by lifting it beneath the wings and extending the nose and left main landing gear legs, which locked down allowing the aircraft to be towed from the runway. Examination of the aircraft revealed that the outboard end of the right main landing gear inner door was abraded due to contact with the runway during the accident (Figure 2). This door is mechanically sequenced to open when the landing gear is extended or retracted, and is closed when the landing gear is either fully up or down. The damage indicated that the right main landing gear had partially retracted and then extended during the ground roll.

Footnote

¹ Beech Baron aircraft produced prior to approximately 1984 have a dual-control horizontal yoke bar, to which the left and right control yokes are attached. Later Baron aircraft have individual left and right control yokes mounted directly to the main instrument panel.

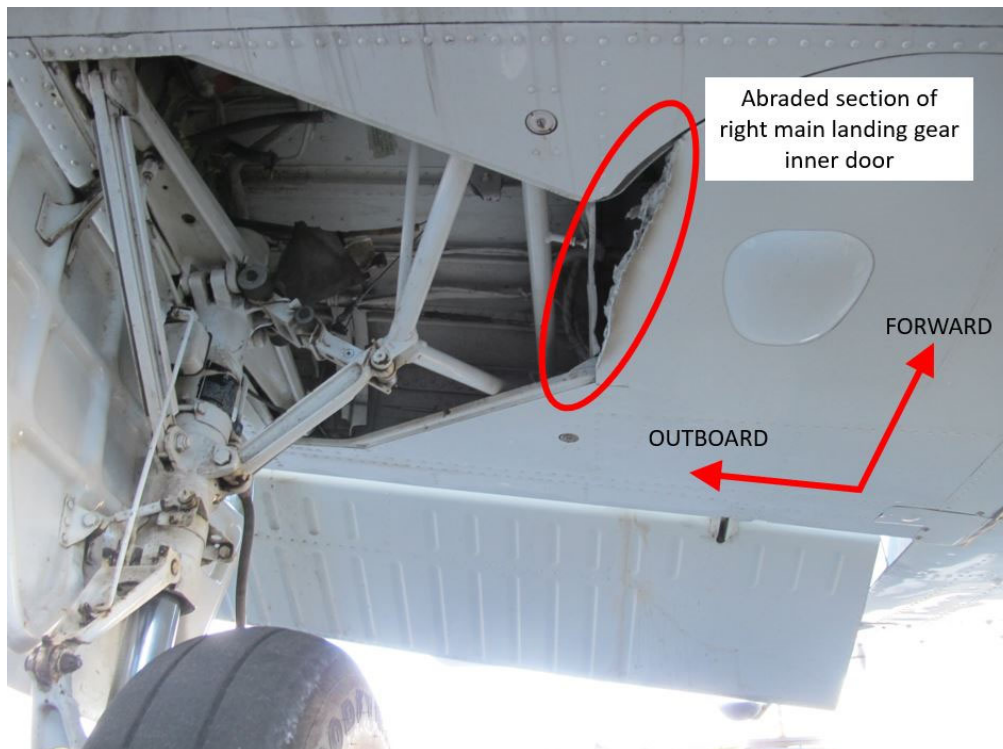


Figure 2

Abraded outer edge of right main landing gear inner door

The aircraft was supported on jacks and an attempt was made to raise and lower the landing gear, but accident damage to the weight-on-wheels switches prevented normal operation of the landing gear.

The aircraft was examined by the AAIB three weeks after the accident, including examination of the landing gear switch, which was found to be in an unserviceable condition. The switch's toggle teeth were misaligned by 90° and therefore the toggle function did not prevent operation of the switch when it was knocked either up or down. Following this examination, photographs were provided of the landing gear switch, taken two days after the accident, in which the switch appeared to be mechanically serviceable, with the toggle teeth aligned normally, indicating that the switch had been disturbed prior to the AAIB's examination. As the switch had been disturbed, it was not possible to accurately assess the mechanical or electrical state of the landing gear switch when the accident occurred.

Aircraft information

The maintenance organisation which performed the recent annual maintenance inspection and avionics upgrade stated that the landing gear switch had not been removed or otherwise disturbed during this activity. They stated that the switch is an 'on condition' component that does not require scheduled maintenance. The landing gear had been successfully cycled six times during the maintenance inspection and no abnormalities with the landing gear system had been apparent.

The aircraft was not fitted with an optional landing gear safety system, in which air pressure switches in the aircraft's pitot-static system prevent the landing gear being raised until an airspeed of 61 kt has been attained and the manifold pressure of one of the engines has exceeded 19 in-Hg. An additional guard for the landing gear switch, intended to prevent inadvertent operation of the switch, is also optionally available² but was not fitted to the aircraft.

Other information

The Air Safety Foundation of the American Bonanza Society (ABS), an owner's association for Beech Baron and Bonanza aircraft based in the United States, publishes safety information for its members. These include a '*Guide to Initial Pilot Checkout: Normally Aspirated Barons*'³, which contains the following advice, Figure 3:

Flight Training

General Recommendations

These recommendations come from experience as techniques for avoiding the most common causes of Baron accidents:

- *Do not perform touch and goes. There is a high correlation between touch and goes and inadvertent landing gear retraction on the runway. A large number of loss-control crashes also occur during the high-workload on-runway phase of a touch and go. Make all landings to a full stop and take time to reconfigure for another takeoff and traffic pattern.*
- *Do not retract flaps during the landing rollout. Reconfigure the airplane only after coming to a stop on the taxiway after clearing the runway.*

Figure 3

General Recommendations from ABS's '*Guide to Initial Pilot Checkout: Normally Aspirated Barons*'

The aircraft's Pilot Operating Handbook does not contain any limitation prohibiting touch-and-go landings.

Discussion

The abrasion damage to the right main landing gear inner door indicates that the landing gear had partially retracted before then extending again during the ground roll, whilst the aircraft was below flying speed. The nose and left main landing gear legs collapsed under the weight of the aircraft, but the right main landing gear remained extended, possibly due to it experiencing an outward side-load during the accident.

This was the first flight following an annual maintenance inspection, during which the landing gear retraction and extension was successfully tested six times, with no faults identified. Both pilots observed that the landing gear lowered normally during the approach to the

Footnote

² Beechcraft Class II Service Instruction 1215.

³ The American Bonanza Society's Beechcraft Pilot Proficiency Program (BPPP) Guide to Initial Pilot Checkout: Normally Aspirated Barons, Models 95-55, A55, B55, C55, D55, E55, 58, G58, December 2012.

runway, with three green lights indicating that the landing gear was locked in the down position.

The evidence available to the investigation was insufficient to conclusively determine the cause of the accident.