

Beechcraft Baron B55, N55BN, 31 January 1996

AAIB Bulletin No: 5/96 Ref: EW/G96/01/09 Category: 1.2

Aircraft Type and Registration:Beechcraft Baron B55, N55BN

No & Type of Engines:2 Continental IO-470-L piston engines

Year of Manufacture:1973

Date & Time (UTC):31 January 1996 at 1441 hrs

Location:Meppershall Airfield, Bedfordshire

Type of Flight:Private

Persons on Board:Crew - 1 Passengers - 1

Injuries:Crew - None Passengers - None

Nature of Damage:Damage to left wing tip, aileron, flap, engine and propeller

Commander's Licence:Private Pilot's Licence with Instrument, IMC and Night Ratings

Commander's Age:45 years

Commander's Flying Experience:1,836 hours (of which 255 were on type)

Last 90 days - 24 hours

Last 28 days - 4 hours

Information Source:Aircraft Accident Report Form submitted by the pilot

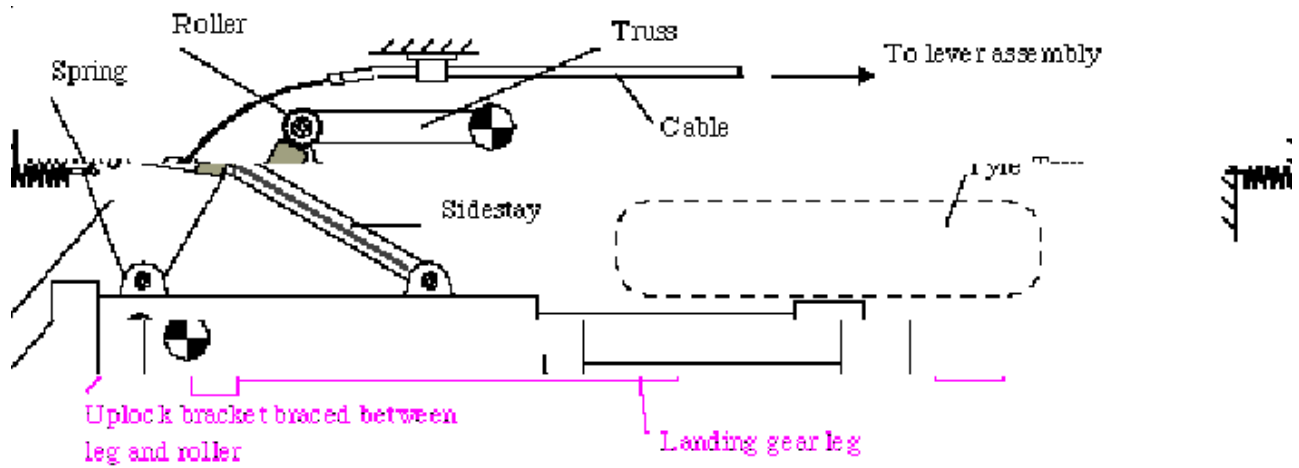
The aircraft was on a short flight from Denham to Meppershall Airfield. After joining the circuit from the overhead position the pilot completed his downwind checks, which included lowering the landing gear and checking the single green 'down' light, in addition to the mechanical nose wheel indicator. Following a normal approach and landing, the pilot became aware of a crosswind from the right, for which he attempted to correct by applying right aileron and rudder. Shortly afterwards however, the left wing sank to the ground and the aircraft veered to the left into an adjacent barley crop.

An observer on the ground had witnessed the incident, and had noted that the left landing gear had failed to extend. The pilot had not been aware of this situation, since the gear indicator light on this type of aircraft is signalled from the output mechanism of an electric motor which operates the landing gear, as opposed to microswitches on the legs themselves. Thus the green light merely indicates that the motor has run to full travel. The motor output consists of a rotating lever assembly

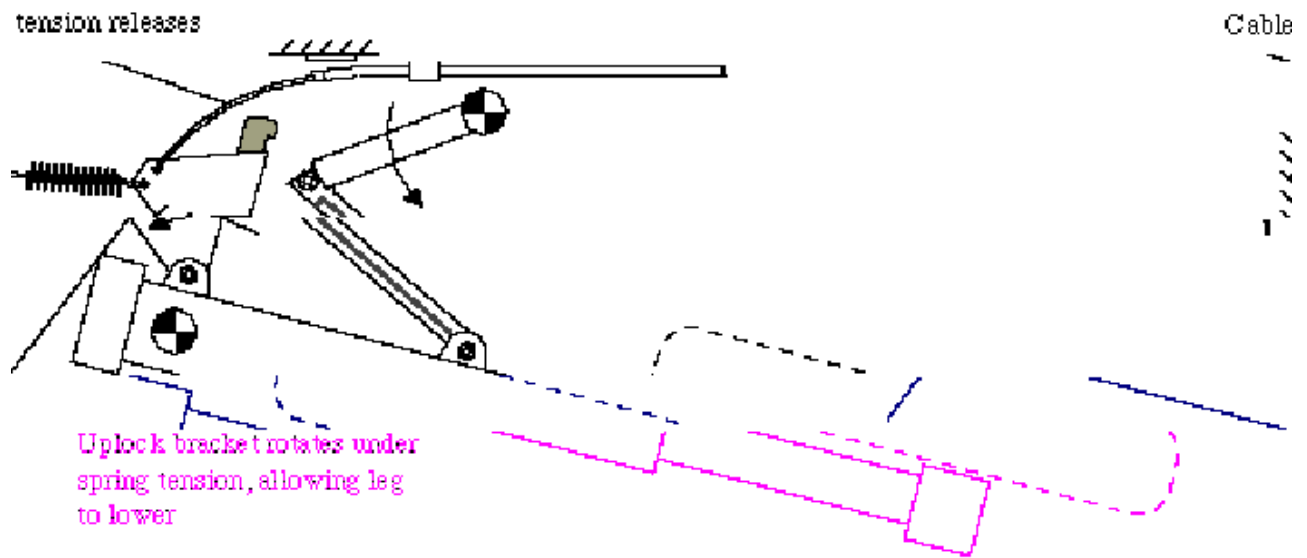
which is connected, via rigid rods, to each of the main gear trusses. These are in turn connected to sidestays on the gear legs, and incorporate a roller assembly. The uplock consists of a bracket assembly which operates by forming a geometric brace between its mounting on the gear leg, and the roller. The bracket is connected to the gear bay structure by a spring, the tension of which opposes a cable linking the bracket to the gear operating motor lever assembly. The system is designed such that the cable is under tension when the gear is retracted. When the gear is selected down, the first effect of the motor lever assembly is to relax the cable tension. This results in the spring tension moving the uplock bracket away from the roller, thus allowing movement of the truss/sidestay assembly, and in consequence, extension of the gear. The principle of operation is shown in the attached diagram.

Following the accident, the uplock was found jammed in the locked position, and the gear operating rod had buckled as a result of compressive overload. During subsequent investigation, it was noted that the roller had seized, although the absence of any wear patterns on the roller surface did not indicate that this had been the sole source of the problem. In addition, it was found that the bolt hole in the uplock bracket, which forms the pivot on the gear leg, was worn. This had resulted in some freeplay in the uplock bracket, which could have interfered with its engagement with the roller. However there was no evidence, in the form of witness marks, that this had actually occurred. Finally, it was observed that the cable seemed somewhat stiff in operation, which, coupled with a slightly weak spring, may have contributed towards a reluctance for the uplock to release.

The aircraft had not flown for a month prior to the incident, and moreover, had taken off on a damp day when the temperature was approximately 2°C on the ground. This led to the suggestion that ice formation may also have played a part in inhibiting the free movement of the mechanism, particularly the cable.



GEAR RETRACTED



GEAR STARTING TO LOWER

SCHEMATIC DIAGRAM OF BEECH 55 LANDING GEAR, SHOWING PRINCIPLE OF UPLOCK OPERATION

(Left hand gear shown, view looking forwards)