

# Beech 76, G-BNYO

**AAIB Bulletin No: 7/99 Ref: EW/G98/08/30      Category: 1.3**

**Aircraft Type and Registration:** Beech 76, G-BNYO

**No & Type of Engines:** 2 Lycoming O-360-A1G6D piston engine

**Year of Manufacture:** 1979

**Date & Time (UTC):** 18 August 1998 at 1858 hrs

**Location:** RAF St Mawgan, Cornwall

**Type of Flight:** Private

**Persons on Board:** Crew - 1 - Passengers - 2

**Injuries:** Crew - None - Passengers - None

**Nature of Damage:** Nosewheel doors, nose and propeller

**Commander's Licence:** Private Pilot's Licence with IMC & Night Rating

**Commander's Age:** 49 years

**Commander's Flying Experience:** 511 hours (of which 46 were on type)  
Last 90 days - 29 hours  
Last 28 days - 16 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot

At the start of the downwind leg at Bodmin airport, the pilot began his pre-landing checks. On selecting the landing gear down, he noted that only two green lights had illuminated. The gear was selected up and reselected down, but again only the two main gear greens were obtained. The gear was retracted and a landing gear status light bulb check was carried out; this was satisfactory, so the gear was again selected down, with the same result. The pilot then carried out the emergency gear extension procedure several times, with and without the application of 'g' to assist the deployment of the nose gear, but to no avail.

The pilot then called St Mawgan and requested a fly-by past the tower for a visual check, which confirmed that the nosewheel was not down and that the nose doors appeared to be closed. As the aircraft carried sufficient fuel the pilot elected to remain on frequency with St Mawgan whilst he continued to recycle the gear, using both the normal and emergency extension procedures. After about ten unsuccessful attempts to release the nosewheel, the pilot considered his options in view of the reducing daylight and the stress being caused to his passengers. He decided to carry out a landing on the two main wheels, well beyond the threshold of Runway 31, to the left of the centreline to avoid the raised runway lights, and using the gear up landing check list. After a final

attempt to lower the nose gear, followed by an abrupt pull-up, ATC informed him that the doors appeared jammed, but slightly open, and that the bottom of the tyre was visible above the doors.

The pilot briefed his two passengers, turned on to short finals, selected full flap and started his descent. Once he was over the threshold he trimmed the aircraft for 85 kt and, at approximately 400 feet, closed the throttles to idle, retrimmed the aircraft and closed the mixtures to the cut-off position. Shortly before touchdown, he switched to off the master switch, alternators and the magnetos. When he was sure the main wheels were on the ground he turned the fuel selectors to off and held the nose up for as long as possible. Once the aircraft had settled onto its nose the pilot unlatched both doors and used the brakes to keep the aircraft straight.

The nose landing gear on the Beech 76 carries a pin, an extension of the upper and lower drag leg pivot bolt. During nose leg retraction the pin engages with a fork fitting to activate the door operating mechanism. (Figure 1) If the pin does not engage the fork correctly but contacts the lower outside face of the fork the door mechanism is driven to overtravel and to cause the link assembly to go 'overcentre'. In this condition when the landing gear is selected down the nose leg begins to lower but is not engaged with the fork and so consequently is not driving the door mechanism. The nosewheel contacts and presses against the inside of the doors but they are locked by the overcentre condition of the link assembly. A significant number of nose landing gear failing to extend have been attributed to this mechanism.

The drag leg pin can fail to engage the fork correctly if the door operating mechanism is not correctly rigged or the doors for some reason are not fully open when the gear is retracted. Experience has shown that the doors can fail to achieve or remain at the fully open position due to stiffness of the door hinges, weak door actuating shaft torsion springs, poor lubrication of the operating mechanism or even sideslipping during gear retraction.

The manufacturer has issued a number of maintenance communications on this subject. 'Service Instructions (SI) No 1209' issued in May 1983, called for 'replacement of the nose landing gear door hinge pins and replacement of the bushings in the nose landing gear door actuating linkage'. 'Mandatory Service Bulletin (SB) No 2310' issued in October 1989 called for 'Inspection of the nose landing gear door linkage and lubrication of the nose landing gear door hinges'. Repeat lubrication of the hinges was called for 'each 60 days thereafter, if operating under more severe conditions, lubricate the hinges more frequently.

After the accident the door hinges were stiff but they had suffered distortion in the accident. The door link assembly was reported to be correctly adjusted and inspection did not reveal a cause for the malfunction. The requirements of SI No 1209 and SB No 2310 had been complied with.

Five in-flight failures of Duchess nose gears to extend were reported to the AAIB in the time between 1982 and the issue of Mandatory SB No 2310 in October 1989. The subject of this report is the second accident notified to AAIB since the introduction of the SB; the other accident occurred in January 1994. This evidence is consistent with application of the Service Bulletin reducing the occurrence of nose gear door jams. However, it remains apparent that the Beech 76 nose landing gear door mechanism requires both accurate rigging and vigilant maintenance. It is important to achieve adequate lubrication consistent with the operating environment and to ensure uninhibited free action of the mechanism to operate as designed.