
Hard landing in windshear, Boeing 747-436, G-BNLD, 11 October 1997

Micro-summary: Likely windshear produces a hard landing.

Event Date: 1997-10-11 at 0759 UTC

Investigative Body: Aircraft Accident Investigation Board (AAIB), United Kingdom

Investigative Body's Web Site: <http://www.aaib.dft.gov/uk/>

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Boeing 747-436, G-BNLD, 11 October 1997

AAIB Bulletin No: 4/98 Ref: EW/G97/10/06 Category: 1.1

Aircraft Type and Registration:	Boeing 747-436, G-BNLD
No & Type of Engines:	4 Rolls Royce RB211-524G turbofan engines
Year of Manufacture:	1989
Date & Time (UTC):	11 October 1997 at 0759 hrs
Location:	Lilongwe, Malawi, Africa
Type of Flight:	Public Transport
Persons on Board:	Crew - 17 - Passengers - 180
Injuries:	Crew - None - Passengers - None
Nature of Damage:	Hydraulic leak from left body gear
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	51 years
Commander's Flying Experience:	13,880 hours (of which 1,093 were on type) Last 90 days - 170 hours Last 28 days - 62 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot

History of the flight

The aircraft was planned to operate a scheduled passenger service from Lusaka (Zambia) to Lilongwe (Malawi). The aircraft was serviceable for the approach to Lilongwe where the runway in use was Runway 14. This runway has a high intensity approach lighting system and VASIs set at 3°, the landing distance is 11,614 feet with an asphalt surface, the touchdown threshold is 4,028 feet amsl and a serviceable ILS was available. Prior to the approach the reported meteorological conditions for the airfield included a surface wind of 070°/14 kt, visibility greater than 10 km with no significant cloud and a surface temperature of +26°C.

The commander was the handling pilot for the visual approach which was flown in clear air and no turbulence was noted during the approach. The pilot reported that the aircraft went slightly low on the glideslope during the latter stages of the approach but was soon re-established and, at 200 feet,

the aircraft was stabilised at $V_{ref} + 5$ kt. Shortly after the automatic '50 feet' call the pilot commenced a normal flare manoeuvre but the aircraft rate of descent did not reduce and the aircraft made a firm contact with the runway surface. The pilot commented upon the apparent absence of the usual ground effect associated with this type of aircraft. The roll-out and braking were normal but once stationary on the stand it was discovered that there was a significant hydraulic leak from the left body gear; on touchdown two of the ceiling panels in the cabin had also become dislodged. There were no injuries to the passengers or crew all of whom disembarked normally.

Data from the Optical Quick Access Recorder indicated that throughout the approach the airspeed was fairly stable at 146 kt (± 3 kt), although this increased to a maximum of 155 kt at 50 feet. Below 300 feet the aircraft was consistently about half a dot below the glideslope until at 30 feet, when it moved back towards the glideslope. The rate of descent at touchdown was around 10 ft/sec, this had remained fairly constant below 100 feet and did not show the effect of the flare which was initiated at about 50 feet when the pitch angle was increased from $+0.5^\circ$ to achieve $+3^\circ$ at touchdown. The recorded wind velocity was reasonably constant at $070^\circ/14$ kt during the approach, however, there was a shift in the wind velocity below 100 feet when the wind veered from 070° to 100° and decreased from 14 kt to 10 kt. The normal acceleration trace did indicate a level of light turbulence during the approach (around $\pm 0.125G$) which can be associated with windshear. Furthermore, despite the increase in airspeed to 155 kt at 50 feet the ground speed remained fairly constant between 150 kt to 152 kt throughout the approach. It is therefore probable that the aircraft encountered some minor windshear prior to and during the flare which could account for the firm touchdown.