No: 6/92 **Ref: EW/C92/4/5** **Category: 1a**

Aircraft Type and Registration:	Boeing 757-236, G-BMRE
No & Type of Engines:	2 Rolls-Royce RB 211-535C turbofan engines
Year of Manufacture:	1988
Date & Time (UTC):	17 April 1992 at 1019 hours
Location:	London (Heathrow) Airport
Type of Flight:	Public Transport
Persons on Board:	Crew - 7 Passengers - 173
Injuries:	Crew - None Passengers - None
Nature of Damage:	Gouge and hole in the fuselage beneath the left hand pilot's seat
Commander's Licence:	Airline Transport Pilot's Licence (A)
Commander's Age:	46 years
Commander's Flying Experience:	10,019 hours (of which 503 were on type) Last 90 days - 114 hours Last 28 days - 34 hours
Information Source:	AAIB Field Investigation

History of the flight.

The aircraft had arrived at Heathrow earlier that day and was parked on stand C30 on pier number 3 where it was prepared for the BA500 service to Lisbon which was scheduled to leave the stand at 0925 hrs UTC. The flight crew consisted of a training captain who occupied the co-pilot's seat (the commander) and a captain under training who acted as pilot-in-command under supervision (hereafter called the first pilot). They arrived at the aircraft at approximately 0850 hrs; the commander went to the flight deck and the first pilot carried out the pre-departure inspection. He noticed nothing amiss with the aircraft, boarded it and occupied the left hand pilot's seat. Whilst the pilots prepared the aircraft, the passengers came on board via the jetty and freight plus baggage was transferred from road vehicles to the aircraft's holds. The aircraft was ready to depart close to the scheduled time but departure was delayed because an appropriate ATC slot time was not available. The aircraft's external doors were closed, the jetty was withdrawn and the aircraft remained on the stand for about 20 minutes to await the allocated take-off slot time of 1021 hrs. During this waiting period the ground engineer

waited in a nearby office and the pilots were not aware of any vehicles in close proximity to the aircraft.

After ATC clearance to leave the stand was granted at 1007 hrs, the aircraft was pushed backwards to face out of the cul-de-sac. Throughout this manoeuvre it was observed by the tractor driver, a ground engineer in headset contact with the pilots, and a wingman. No-one noticed any damage to the aircraft and the jetty was well clear of the fuselage throughout the procedure. The ground engineer completed his post engine-start checks, removed his headset and gave the standard "thumbs up" sign that all was well from a position abeam the flight deck and to the left of the first pilot. The aircraft then taxied to the departure runway without overtaking another aircraft and no aircraft overtook it. The crew prepared for a normal take-off with the first pilot handling. The weather was cloudy but benign with no risk of airframe icing on the ground although engine anti-icing was selected on as a precaution. The take-off roll and rotation were normal and the aircraft entered cloud at about 700 feet agl. At 1000 feet agl and approximately 160 kt the first pilot instructed the commander to commence flap retraction and to select climb power. As he did so both pilots heard a loud bang followed by persistent airframe vibration. The commander checked the instruments and displays for any abnormalities but found none; the first pilot continued the standard instrument departure. The senior cabin crew member had also heard a bang and he came forward to the flight deck to report this to the pilots. The first pilot decided that the noise and vibration were indicative of a serious problem so he declared an emergency to ATC and obtained clearance to terminate the departure at 6000 feet and low airspeed. Radar vectors for a return ILS approach to land were given by ATC and the emergency services were placed on full standby. The first pilot engaged an autopilot and instructed the commander to handle the aircraft in accordance with the company's standard procedures whilst he managed the flight and briefed the cabin crew and passengers. During the approach both pilots noted that the noise and vibration reduced in amplitude as airspeed was reduced but they could find no other symptoms of abnormal handling or system malfunction.

After landing at 1033 hrs and vacating the runway the aircraft was inspected by the fire section who reported a hole in the fuselage beneath the first pilot's position. The left engine was shut down and the aircraft returned to the apron with a fire vehicle escort where the passengers were disembarked via the normal exits.

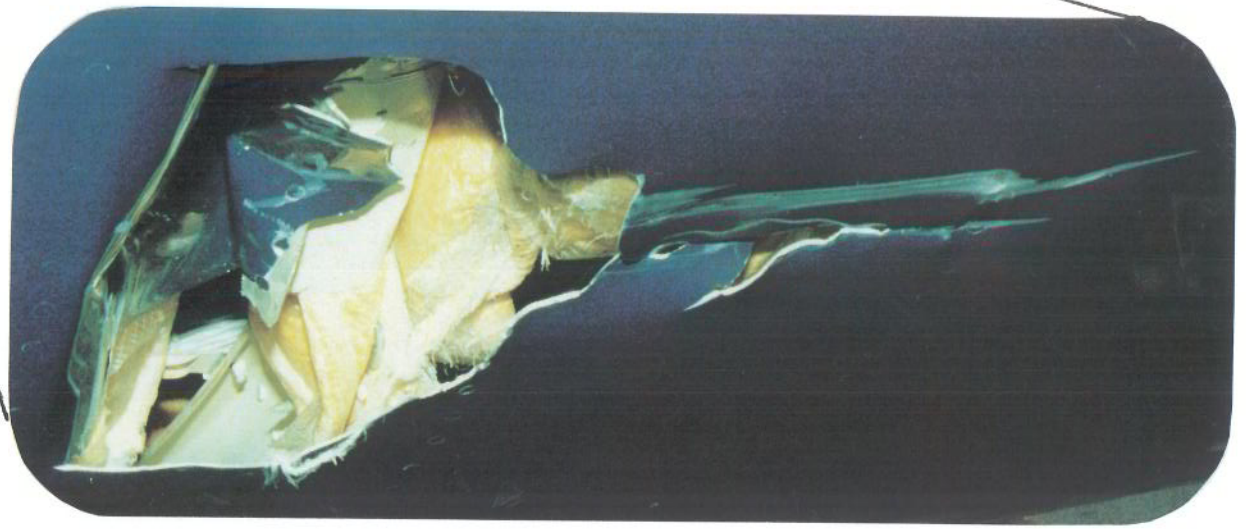
Flight Data Recorders

The cockpit voice recorder (CVR) was a Fairchild A100 which has a 30 minute duration using an endless loop of tape. A satisfactory replay was obtained using AAIB facilities. The tape had overwritten the take-off and landing and recording began after touchdown. The Quick Access

Recorder (QAR) was removed and replayed by British Airways later that day, and as the QAR records more information than the mandatory Flight Data Recorder (FDR), the FDR was not replayed. No abnormalities were recorded by the QAR and hence the loud bang heard by the crew could not be attributed to any system malfunction. The QAR records a cabin auto pressurisation failed indication but this discrete was normal throughout the flight.

Examination of the damage

Examination of the damage revealed a rupture to the pressure hull which measured 11 inches by 13 inches and was located in the lower side fuselage three feet below the first pilot's side window (photograph No.1). A more detailed examination of the damage indicated that it had occurred on the ground prior to take-off and that either the aircraft had been reversed into an object, or an object had been driven forward into the aircraft. The section of the object that had caused the damage had been 9 feet 11 inches from the ground, was painted grey and had struck the aircraft from the rear, approximately seven degrees from the aircraft's fore/aft axis, parallel with the ground and travelling at about 12 mph. No damage had been reported to any ground equipment or vehicle except the passenger jetway at the stand from which the aircraft had departed. Examination of the passenger jetway and interviews with the jetway operator and independent observers established positively that the jetway had not caused the damage to this aircraft. An extensive search and examination of the ground equipment and vehicles in the areas of Terminal 1, Terminal 2 the central and northern motor transport and ground equipment servicing and repair workshops and the cargo vehicle parking area revealed a Luton cargo vehicle that had recently received damage to the upper forward right corner of its box body which was painted grey (photograph No.2). Examination of this damaged area showed excellent evidence of the aircraft's paintwork embossed upon it and that it was 9 feet 11 inches from the ground. When the the damaged area of the aircraft, which had been cut away from the aircraft was offered up to the damaged area of the Luton cargo vehicle, the markings on the piece of the aircraft matched perfectly with the structure of the vehicle. The task sheet for this vehicle on the morning of the accident was for it to deliver fast freight to this aircraft on stand C30.



PHOTOGRAPH No. 1 DAMAGE TO THE AIRCRAFT

PHOTOGRAPH No. 2 DAMAGE TO THE 'LUTON' VAN