

No: 11/89 **Ref: EW/G89/07/31** **Category: 1a**

Aircraft Type and Registration: BAC One-Eleven Series 525, EI-BSZ

No & Type of Engines: 2 Rolls-Royce Spey 512-14DW gas turbine engines

Year of Manufacture: 1982

Date and Time (UTC): 13th July 1989, at 1835 hrs

Location: Runway 26, Luton International Airport

Type of Flight: Airline Scheduled Pax

Persons on Board: Crew - 5 Passengers - 88

Injuries: Crew - None Passengers - None

Nature of Damage: Damage to right main landing gear outboard wheel, tyre, brake pack and axle, hydraulic lines and fittings

Commander's Licence: Airline Transport Pilot's Licence with Instrument Rating

Commander's Age: 41 years

Commander's Total Flying Experience: 10,116 hours (of which 9,862 were on type)

Information Source: Aircraft Accident Report Form submitted by the aircraft commander and visit of an AAIB engineer to the maintenance organisation at Luton Airport

The aircraft had departed the stand and back-tracked on runway 26 prior to take-off when the crew noted a loss of hydraulic contents on number 2 system. The aircraft was taxied off the runway and inspected. The number 4 (right hand outer) main wheel inner half had broken up and damaged the hydraulic system on the oleo-leg.

There was no evidence of rapid decompression of the tyre. Several small pieces of wheel rim and other parts were found on the runway. Further examination showed that the inner half of the number 4 wheel had fractured around its diameter, thus separating the entire cylindrical portion and its rim from the flange face near the attachment bolts.

Metallurgical examination of the fractured surfaces confirmed that the fracture had initiated from a small area of fatigue at the flange end of the brake rotor drive blocks. Considerable unrelieved stresses were evident in the fractured parts. There has been only one similar failure previously, which was attributed to fatigue cracking and which had not been detected during routine Non-Destructive Test (NDT) inspections. Following that incident, a requirement for NDT at every tyre change was introduced and for new wheels stress-relieving and shot-peening were introduced as part of the manufacturing process.

In this latest incident, the wheel half met the recently introduced "roll-on-rims" requirement, but had not been stress-relieved during manufacture. It had completed 48 landings since inspection by the manufacturer. However the area from which the fracture initiated was not covered by the existing inspection requirements. A mandatory Alert Service Bulletin has been issued by the manufacturer which requires wheel halves of the same type to be inspected and eventually withdrawn from service.

Year of manufacture:	1982
Date and time (UTC):	13th July 1989, at 18:22 hrs
Location:	Runway 20, Lamon International Airport
Type of flight:	Airline scheduled passenger
Persons on board:	Crew - 5 Passengers - 88
Injuries:	Crew - None Passengers - None
Nature of damage:	Damage to right main landing gear outward wheel eye, brake back and axle, hydraulic lines and fittings
Commander's license:	Airline Transport Pilot's License with Instrument Rating
Commander's Age:	41 years
Commander's Total Flying Experience:	10,116 hours (of which 8,882 were on type)
Information Source:	Aircraft Accident Report Form submitted by the aircraft commander and visit of an AAIB engineer to the maintenance organization at Lamon Airport

The aircraft had departed the stand and back-taxed on runway 20 prior to take-off when the crew noted a loss of hydraulic pressure on number 2 system. The aircraft was taxied off the runway and inspected. The number 4 (right hand outer) main wheel inner half had broken up and damaged the hydraulic system on the oleo-leg.

There was no evidence of rapid decomposition of the tyre. Several small pieces of wheel rim and tyre parts were found on the runway. Further examination showed that the inner half of the number 4 wheel had fractured around its diameter, thus separating the entire cylindrical portion and its rim from the flange face near the attachment bolts.

Metallogical examination of the fractured surfaces confirmed that the fracture had initiated from a small area of fatigue at the flange end of the brake rotor drive blocks. Considerable unrelieved stresses were evident in the fractured parts. There has been only one similar failure previously, which was attributed to fatigue cracking and which had not been detected during routine Non-Destructive Test (NDT) inspection. Following that incident, a requirement for NDT at every tyre change was introduced and for new wheels stress-relieving and shot-peening were introduced as part of the manufacturing process.