

**AAIB Bulletin No:** 11/95

**Ref:** EW/C95/6/4

**Category:** 1.1

**Aircraft Type and Registration:** BAe 146-200, G-JEAJ

**No & Type of Engines:** 4 Lycoming ALF 502-R5 turbofan engines

**Year of Manufacture:** 1988

**Date & Time (UTC):** 30 June 1995 at 1141 hrs

**Location:** Stansted Airport

**Type of Flight:** Public Transport

**Persons on Board:** Crew - 5 Passengers - 88

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

**Nature of Damage:** Nose landing gear and forward lower fuselage

**Commander's Licence:** Airline Transport Pilot's Licence

**Commander's Age:** 59 years

**Commander's Flying Experience:** 11,300 hours (of which 528 were on type)  
Last 90 days - 44 hours  
Last 28 days - 22 hours

**Information Source:** AAIB Field Investigation

On the arrival of the aircraft at Stansted, some of the handling company, who were off-loading the passengers' baggage, inadvertently off-loaded the Captain's suitcase. This led to some confusion as attempts were made by the pushback crew to locate and return it to the aircraft in time for the scheduled departure.

Both the tug driver and the pushback supervisor state that they did the pre-departure walk round check which normally includes checking that chocks are removed.

The aircraft was being dispatched using AC power from a ground power unit because of problems with the auxiliary power unit (APU). The Co-pilot received ATC clearance to start all four engines on the stand and the Captain relayed this and confirmed with the pushback supervisor on intercom that his team were also ready. All four engines were then started. Once the aircraft generators were on-line, the Captain requested the pushback supervisor to disconnect ground power and stand by. The Co-pilot then received pushback clearance from ATC and the Captain relayed this to the pushback supervisor.

The Captain stated that he released the aircraft brakes and called to the supervisor that the brakes were released and brake pressure checked at zero. The Co-pilot also visually checked and noted that this was the case. There was a short pause during which the Captain considered nothing was happening; he therefore reconfirmed to the supervisor "brakes released, pressure zero". At about this time both the Captain and the supervisor were conscious of the tug appearing to rear up and most of those present were aware of a loud bang and other noises. The Co-pilot saw the tug jumping around violently in front of the nose with a very startled driver being almost bounced out of his seat. There was a general perception that the aircraft moved backwards suddenly before slowly rolling forwards. The standing cabin crew members in the aircraft were also thrown off balance.

The supervisor then saw that the aircraft was rolling forward towards the tug and called to the flight crew to check and then to apply the brakes. Once this was done, the supervisor realised that there was damage to the towing bar and to the nosewheel lugs. He therefore advised the Captain to shut down the engines and leave the flight deck to inspect the damage to the lugs. Further inspection revealed considerable structural damage in the forward lower fuselage.

The accident was not notified to the AAIB until repairs to the aircraft were underway; the towing attachment was also repaired before it could be examined by the AAIB. No effort was made to preserve the cockpit voice recording. AAIB was subsequently able to examine the partly repaired aircraft, the repaired towing bar, the failed shear pin removed from the towing bar and the tug reportedly used for the pushback. The flight data recording was also examined. The tug was removed from service immediately after the accident and subjected to an examination by the handling agents and the Airport operator. No defects were reported.

G-JEAJ was equipped with a flight data recorder which did not record brake pressure. The recorder type is switched on when any generator is on line and the parking brake is released. Examination of the record shows that at the time the recorder started Nos 2, 3 and 4 engines were already running; the parking brake must therefore have been released at that time. Approximately 15 seconds later, No 1 engine was started and 28 seconds after the recorder started, a rearwards acceleration of 0.32 g occurred, accompanied by 1 or 2 seconds of minor perturbations in acceleration in other axes. Ten seconds after the rearward longitudinal g was recorded, all four engines were shut down and about 23 seconds after this the recorder stopped.

Later examination of the towing bar, failed shear pin and tug suggested that the tug had supplied sufficient force to fail the shear pin and the front of the vehicle had then struck the end of the towing bar, thus inflicting a loading on the nose leg no longer limited by the strength of the shear pin. Damage to the aircraft was consistent with a high rearward load being applied to the nose leg and resisted at the main gear positions. Subsequent checks of the aircraft braking system revealed no defects. It was not possible to confirm independently whether the brake pressure was fully released or the chocks removed from behind the main gear units at the time of pushback.