

Boeing 737-59D, G-BVZF

AAIB Bulletin No: 10/97 Ref: EW/G97/04/02 Category: 1.1

Aircraft Type and Registration:	Boeing 737-59D, G-BVZF
No & Type of Engines:	2 CFM56-3C1 turbofan engines
Year of Manufacture:	1990
Date & Time (UTC):	4 April 1997 at 0735 hrs
Location:	London Heathrow Airport, Middlesex
Type of Flight:	Public Transport
Persons on Board:	Crew - 6 - Passengers - 73
Injuries:	Crew - None - Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	35 years
Commander's Flying Experience:	7,500 hours (of which 2,000 were on type) Last 90 days - 160 hours Last 28 days - 40 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and inquiries by AAIB

The aircraft was being prepared for departure from Stand N78at Heathrow for a scheduled flight to Leeds-Bradford Airport. A tug had been attached to the nose landing gear leg via a towbar about 10 minutes before the incident. Just as cabincrew members were about to close the main cabin door, with the airbridge still connected and the aircraft's parking brake on, there was a bang and the aircraft jolted violently rearwards. Cabin crew members standing in the cabin reported that the lurch was such that they had to hold onto the backs of the seats to avoid falling over. It was found that the tug had moved forwards around 15 inches and the towbar had fractured near the end attached to the tug. The aircraft and the tug were taken out of service.

Subsequent aircraft inspection and cycle testing of the nose landing gear revealed no evidence of damage.

The tug was owned and operated by the airline operating the aircraft. It was fitted with automatic transmission; this could not be selected to Drive unless the foot brake pedal was applied. On this type

of vehicle the brakes are applied by springs and released pneumatically by means of pressurised air supplied from a tug compressor. The system is designed such that the brakes are automatically applied when the air pressure is below 4 bar and only released when the pressure reaches 5.8 bar and the handbrake lever and the footbrake pedal are off. A red light and an audio buzzer were provided to warn of low air pressure.

In this case the driver reported that the tug's handbrake had been applied after the tug had been connected to the aircraft. He found that the brake low pressure warning system operated, revved the engine to increase the pressure and managed to eliminate the warnings. He reported getting out of the tug in order to assist with loading the aircraft. As he alighted, the tug moved rapidly forwards and the aircraft was driven backwards. The driver re-entered the tug, applied the footbrake and turned off the engine.

Checks of the tug by the operator's motor transport workshop included inspection of the complete brake air system. The rate of air pressure build up was found to be low; this was attributed to a worn compressor. With this exception, examination and testing reportedly found no evidence of deficiencies in the relevant systems; the effectiveness of hand and footbrakes was found to be within limits, by rolling road and road testing, and the gearbox selector/footbrake interlock functioned. The tug was also tested by engaging Drive and increasing the engine RPM with the handbrake and footbrake engaged in turn; in each case the engine RPM reached 85-90% of maximum before the vehicle attempted to move.

In the absence of faults with the tug, the available evidence was consistent with the driver having suddenly applied the accelerator, possibly when exiting the cab, with Drive selected.

No evidence was found to suggest that this type of incident was a common occurrence. Following the incident the operator issued a Ramp Alert (No 08/97) instructing push back drivers, when the tug was connected to an aircraft, to ensure that the transmission was disengaged and the handbrake on before revving the engine in an attempt to increase brake pressure. It also warned that "On no account must full revs be used when connected to aircraft", but the reasons for this were not apparent and the acceptable maximum engine speed was not specified.