

# Boeing 747-200, TF-ATF

**AAIB Bulletin No: 2/2001**

**Ref: EW/G2000/09/24 - Category: 1.1**

## INCIDENT

**Aircraft Type and Registration:** Boeing 747-200, TF-ATF

**No & Type of Engines:** 4 Pratt & Whitney JT9D-7A turbofan engines

**Year of Manufacture:** 1971

**Date & Time (UTC):** 25 September 2000 at 0905 hrs

**Location:** On take off from Manchester Airport

**Type of Flight:** Public Transport (Passenger)

**Persons on Board:** Crew - 18 - Passengers - 473

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

**Nature of Damage:** Damage to No 2 engine

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

**Commander's Age:** 50 years

**Commander's Flying Experience:** 8,500 hours (of which 4,000 were on type)

Last 90 days - 142 hours

Last 28 days - 70 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot

Just after take off from Manchester International Airport on a charter flight to Tenerife, 'smoke' appeared from below the centre console between the pilots and increased in intensity. The cabin crew then also reported smoke throughout the cabin, which was more concentrated in the forward section. At about the same time, ATC advised the crew that smoke had momentarily been seen to come from a left engine on the aircraft. The commander declared an emergency and made an immediate return to the airport, where an overweight landing was conducted without incident. Following the landing, the Airport Fire Service advised the crew that smoke was coming from the No 2 engine. This engine was then shutdown and the aircraft returned to the stand where the passengers were disembarked normally.

## Engineering inspection

Subsequent inspection of the aircraft by maintenance personnel eliminated the possibility of an electrical system problem, but there was evidence that engine oil had entered the air conditioning bleed ducts from the No 2 engine. After further examination it was suspected that the No 2 engine vane controller (EVC) was defective and an EVC trim run was therefore carried out. During this trim run, the EVC showed indications of failure. In addition, evidence of bird strikes was apparent across the front of the No 2 engine and there was also associated signs of slight damage to the fan blades, inlet guide vanes and fan exit guide vanes. The birds involved were thought to have been starlings. However, a borescope inspection revealed no damage to the high pressure compressor stages and so after cleaning the fan and guide vanes, a second EVC trim run and a high power run were conducted, with satisfactory results. Maintenance personnel concluded that the bird debris had affected the airflow sensing system for the inlet vane control system which had affected inlet vane scheduling, causing a reduction in compressor airflow and associated loss of the correct air pressure balance across one, or more, of the internal oil/air labyrinth seals. This had allowed oil to pass across the seals and to enter the airflow within the compressor stages, where the oil laden air would have become heated before being passed into the bleed duct for the air conditioning system. The resultant 'oil mist' had entered the flight deck and cabin, where it had been perceived as 'smoke'.

The aircraft was subsequently returned to service on the day following this incident and the engine was subsequently reported to have operated normally thereafter.