SERIOUS INCIDENT

Aircraft Type and Registration:	DHC-8-402 Dash 8, G-JECR
No & Type of Engines:	2 Pratt & Whitney Canada PW150A turboprop engines
Year of Manufacture:	2006 (Serial no: 4139)
Date & Time (UTC):	3 February 2016 at 1659 hrs
Location:	En route Birmingham to Aberdeen
Type of Flight:	Commercial Air Transport (Passenger)
Persons on Board:	Crew - 4 Passengers - 54
Injuries:	Crew - 1 (Minor) Passengers - None
Nature of Damage:	None
Commander's Licence:	Airline Transport Pilot's Licence
Commander's Age:	34 years
Commander's Flying Experience:	6,700 hours (of which 5,000 were on type) Last 90 days - 163 hours Last 28 days - 54 hours
Information Source:	Aircraft Accident Report Form submitted by the pilot and additional enquiries by the AAIB

Synopsis

The aircraft was climbing to Flight Level (FL) 190 but, at FL170, the crew heard a loud noise followed by the sound of rushing air and the commander suspected a rapid loss of cabin pressure. He initiated an emergency descent and both crew donned oxygen masks. The aircraft diverted to Manchester Airport, flying at FL100 with the cabin depressurised, and subsequently made an uneventful landing.

No structural or mechanical faults were found, although two components from the pressurisation system were removed and sent to the manufacturer for investigation.

History of the flight

The aircraft had taken off on a flight from Birmingham to Aberdeen and was climbing to FL190. As it passed over the Pennines at about FL170, the crew heard a 'mechanical' noise followed by a loud and distracting sound of rushing air. The commander quickly diagnosed a cabin pressurisation fault, which he reported was confirmed by the cabin altitude gauge registering a high rate of climb and the PRESSURISATION FAULT light illuminating on the cabin pressurisation overhead panel. However, the crew reported that there was no CABIN PRESSURE warning on the Central Warning Panel and no audio warnings.

The co-pilot, who was the pilot flying (PF), levelled off at FL174 and selected ALT HOLD on the autopilot. Both pilots were experiencing a sensation of light-headedness, tightness of

the chest and tingling in their fingers, so the commander ordered the use of oxygen and the co-pilot initiated an emergency descent by setting VERTICAL SPEED on the autopilot with a descent rate of 3,500 fpm. The autopilot was then selected to FL100 and a MAYDAY was declared.

In the passenger cabin, the crew heard neither the mechanical noise nor the sound of rushing air. They did experience the change of aircraft attitude and the change in engine note as the descent was initiated. The Senior Cabin Crew Member (SCCM) quickly contacted the flight crew on the interphone who confirmed that an emergency descent was being carried out. The SCCM ordered the cabin to be secured before both cabin crew members took their seats to await further instructions. Both had experienced their ears 'popping' and one had felt faint and went onto oxygen.

Upon levelling out at FL100, the commander completed the emergency descent check list and consulted the PRESSURISATION FAULT light drill, but instead decided it would be preferable to divert and land as soon as possible. He accordingly completed the check list for unpressurised flight and decided to divert to Manchester. He briefed the cabin crew accordingly and announced his intention to the passengers. The aircraft subsequently landed at Manchester Airport without further incident.

Engineering investigation

The aircraft was inspected on the ground, paying particular attention to the condition of door seals – no defects were found. In accordance with the Fault Isolation Manual procedure, for the PRESSURISATION FAULT light, both the Cabin Pressure Controller module and the Outflow Valve were replaced. The aircraft then underwent a pressurisation check, during which it performed normally, and afterwards returned to service. Analysis of the Flight Data Recorder indicated that a CABIN PRESSURE warning had not been annunciated, which would occur had the cabin altitude risen above 10,400 ft.

The Cabin Pressure Controller module and the Outflow Valve were returned to their manufacturer for strip examination. Testing there showed no defects with the Controller module but the Outflow Valve failed a number of tests and was found to have contamination and wear issues. It is considered that the valve was unserviceable and had been responsible for the depressurisation.