

**No: 5/90**

**Ref: EW/C1148**

**Category: 1a**

**Aircraft Type  
and Registration:**

Handley Page Dart Herald 209, G-GNSY

**No & Type of Engines:** 2 Rolls Royce Dart 532-9 turboprop engines

**Year of Manufacture:** 1968

**Date and Time (UTC):** 26 February 1990 at 1830 hrs

**Location:** 40 nm northeast of Guernsey (Ortac)

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

**Persons on Board:** Crew - 3 Passengers - None

**Injuries:** Crew - None Passengers - N/A

**Nature of Damage:** Top section of the rear passenger door buckled

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

**Commander's Age:** 57 years

**Commander's Total  
Flying experience:** 16,000 hours (of which 636 were on type)

**Information Source:** AAIB Field Investigation

The aircraft was scheduled to carry out a Mail flight from Guernsey to Gatwick. It departed Guernsey on schedule, at 1845 hrs, and was flown by a crew of two plus a supernumary captain. Relevant portions of the weather report and forecast for their destination were:

Present weather: 1820 hrs. Wind 250°/21 kt, 20 km visibility, 4/8 cloud at 2500 feet.

Forecast: 1600-0100 hrs: 270°/ 25/47 kt, 10 km, 3/8 at 300 feet;  
Inter 1600-0100 hrs: 8 km, 87GR 5/8Cb 1500 feet;  
Prob 10 1600-1900 hrs 280°/ 30/62 kt, 96TSGR.

When the crew were aboard, and the loaders had left the aircraft and closed the doors, the supernumary captain went aft to check that the doors were properly secured. However, when he returned to the cockpit to report that they were secure, the rear door warning light was illuminated. He therefore went back to the door and confirmed that the handle was in the closed position and that the necessary electrical connection to the warning system had been properly made. On return to the cockpit the warning light was still illuminated but, as the commander and other company pilots had experienced many spurious door warning indications and the door had twice been checked by an experienced captain, it was decided that it would be safe to proceed with the flight.

The take-off and departure were uneventful and the aircraft pressurised at a normal rate, suggesting that the door was probably secure at this time. Furthermore, there was no hissing noise which would have been symptomatic of a leaking door seal. However, as the aircraft climbed through Flight Level 60, there was a sudden loud bang accompanied by very rapid decompression. The captain went aft to inspect the damage and returned to report to the commander that the top half of the rear passenger door had buckled outwards by about 30° or 40° but that the bottom half of the door was fully secure and there appeared to be little chance of further separation. The co-pilot also confirmed this and the commander decided to divert to the company base at Bournemouth, restricting the airspeed to 150 kt.

On changing radio frequency to Bournemouth ATC, the commander requested the Emergency Services who, following an uneventful landing by the aircraft, accompanied it down the runway and to the parking area.

### **Examination of aircraft**

The door had buckled about a horizontal line level with the lower hinge, as can be seen in the accompanying photograph. The upper hinge attachment had been torn from the outer skin of the door. The door operating mechanism is shown on the attached drawing.

The door, which is located immediately forward of the freight door, is locked by means of four drawbolts, one at each of the top and bottom edges and two at the aft edge. Those at the top and bottom engage with holes in the door aperture structure, whilst the bolts in the aft edge of the door engage with holes in the forward edge of the freight door. In addition, two fixed locating pins on the forward edge of the door engage with holes in the forward edge of the door aperture; these pins disengage due to the hinging movement when the door is opened.

The internal and external handles operate the drawbolt mechanism through two chain and cable systems. The bolts have red and green portions painted on them where they pass behind viewing ports: thus when the bolts are in the closed, *ie* safe position, green paint is visible through the ports; red paint shows if the bolts are partially or totally withdrawn.

When the door was examined, the upper drawbolts were withdrawn and the indicators showed red. It was clear that the lower bolts were still engaged, and these, together with the lower locating pin, had retained the door on the aircraft. It was noted however that the indicator paint on the bolts of this door, and those of a spare, had flaked and become smeared with grease, reducing the clarity of the indicator.

It was subsequently found that the operating cables for the upper drawbolt assembly were severely frayed where they passed over the pulleys, with the extending/locking cable completely severed. It was not possible to ascertain how far the bolts had been engaged prior to the decompression. However there was no sign of any tearing on the keep plates of the freight door or door frame. By contrast, it was clear that the upper locating pin had torn out of engagement, leaving the tip of the pin embedded in the side of the hole. It therefore seemed possible that the cable finally failed when the

door was closed at Guernsey, with the upper drawbolts at best partially engaged. There appeared to be some scope for the mechanism to move to the withdrawn position under gravity. The tapered ends of the bolts would also produce a tendency to withdraw under the action of pressurisation forces on the door in the event of partial engagement.

The electrical indication system operates via microswitches in the bolt engagement holes. These activate both the cockpit warning light and a magnetic indicator above the door. The system was found to operate satisfactorily.

The problem of frayed cables was well known to the operator, although this was the first time that a door had become partially detached. The pulleys on which the cables run are alloy, in accordance with a mandatory modification introduced in 1978. Prior to this they were of a Paxolin type, which displayed a tendency to split. Even with the old type of pulley however, cables frayed. Such an incident occurred in 1976 and appeared on the SDAU database. The cables were made from 30cwt stainless steel. The reason for the fraying was not apparent, although it was noted that the cable exited one pulley at an angle to the plane of the pulley, thus giving rise to a rubbing action. The angle was not however, considered excessive.

The cables were not lifed, but were removed for detailed inspection at each Check 3 (5000 hours). At every 1000 hours (alternate Check 1) there was an in situ inspection plus lubrication. The last Check 3 occurred in July 1979, 4140 hours previously. The last in situ inspection took place some 749 hours previously in May 1989.

Following the incident, the maintenance organisation proposed to amend the maintenance schedule to increase the frequency of the cable inspection to every Check 1 and to check visual indication of all door locking at Check A periods (72 hours elapsed time). Also, a Check 1 inspection will be raised to ensure clarity of the bolt viewing ports and the condition of the paint marks on the bolts.

