

Fan Jet Falcon 20F, G-BGOP

AAIB Bulletin No: 12/99 **Ref:** EW/G99/05/11 **Category:** 1.1

Aircraft Type and Registration: Fan Jet Falcon 20F, G-BGOP

No & Type of Engines: 2 General Electric CF700-2D2 turbofan engines

Year of Manufacture: 1979

Date & Time (UTC): 11 May 1999 at 1130 hrs

Location: Farnborough Airport, Hampshire

Type of Flight: Private

Persons on Board: Crew - 2 - Passengers - None

Injuries: Crew - None - Passengers - N/A

Nature of Damage: No 2 engine nacelle damaged; hole in fuselage; damage to front windscreens

Commander's Licence: Airline Transport Pilot's Licence

Commander's Age: 53 years

Commander's Flying Experience: 11,387 hours (of which 1,754 were on type)

Last 90 days - 105 hours

Last 28 days - 45 hours

Information Source: Aircraft Accident Report Form submitted by the pilot and enquiries by the AAIB

The commander and his co-pilot entered the cockpit to prepare the aircraft for flight. Initially, the commander applied the parking brake and heard the noise of hydraulic pressure being supplied. He then cleared the ground engineers to remove the chocks and confirmed that the aircraft remained at rest. Subsequently, following completion of his external checks, the commander left the aircraft for a few minutes to return to the handling agents. Shortly afterwards, the co-pilot who was positioned in the right crew seat felt the aircraft moving forward. He immediately applied the emergency brakes but with no success. He then attempted to dry run No 2 engine to try and provide hydraulic power for the parking brake system. There was no response from No 2 engine so the co-pilot tried to dry run No 1 engine; again, there was no response. G-BGOP was parked directly opposite and facing a Gulfstream 3, registration PK-PJA. The Falcon slowly turned to the left as it moved forward and the right side of the Falcon contacted the right wing of the Gulfstream; there was damage to the right wing of the Gulfstream.

The commander estimated that the time between removal of chocks and G-BGOP moving was approximately 5 to 10 minutes. He also stated that the aircraft had just undergone rectification for a reported generator fault; following the rectification, the generator switches had been left off. Normally, these switches are left on but, left in the off position, would preclude an engine start. The emergency and parking brakes are on the same hydraulic system and powered from No 2 engine pump. There is an electrical pump for the standby hydraulic system and this can power the normal brakes.

The flight deck includes a caption labelled PARK BRAKE on the master fault panel. This caption is lit when a pressure switch at the brake accumulator senses a pressure below 1,200psi and thus warns of a condition where there is inadequate accumulator pressure for safe use of the Park/Emergency brake. However, at the time the commander applied the parking brake the aircraft did not have any electrical power applied and thus this caption would not have been lit.

Following this accident, G- BGOP underwent a period of structural repair. During that time a number of the components from the Parking brake system were checked. The hydraulic valves in the system were each found to be operating correctly but the parking brake accumulator was found to have an internal leak, resulting in a loss of pressure over time. It was also found that the Park/Emergency brake handle was stiff and the cable was found to have snapped. However, the fact that, in the accident to G-BGOP, the commander had applied the parking brake and heard the noise of hydraulic pressure being applied, indicates that this failure of the cable had occurred later.

Before the replacement accumulator was fitted to the aircraft, a pressure gauge was installed at the charging valve, to give a check of accumulator pressure. This aircraft model does not include brake pressure gauges on the flight deck and, without this gauge on the accumulator, there is no indication at all of accumulator pressure when electrical power is off. The addition of the pressure gauge is presented as an Option (number 00-27-18) in the Falcon 20 Illustrated Parts Catalog.

This accident highlights that it is unwise to remove chocks from a parked aircraft without the means to ensure adequate accumulator pressure for the parking brake and the means to apply emergency braking.