

---

## Lightning strike, Fokker F28 Mark 0100, G-UKFK

---

**Micro-summary:** Following a lightning strike in climb, this Fokker F-28 elected to return to base.

---

**Event Date:** 1997-10-13 at 0705 UTC

**Investigative Body:** Aircraft Accident Investigation Board (AAIB), United Kingdom

**Investigative Body's Web Site:** <http://www.aaib.dft.gov/uk/>

**Note:** Reprinted by kind permission of the AAIB.

---

### Cautions:

1. Accident reports can be and sometimes are revised. Be sure to consult the investigative agency for the latest version before basing anything significant on content (e.g., thesis, research, etc).
  2. Readers are advised that each report is a glimpse of events at specific points in time. While broad themes permeate the causal events leading up to crashes, and we can learn from those, the specific regulatory and technological environments can and do change. ***Your company's flight operations manual is the final authority as to the safe operation of your aircraft!***
  3. Reports may or may not represent reality. Many many non-scientific factors go into an investigation, including the magnitude of the event, the experience of the investigator, the political climate, relationship with the regulatory authority, technological and recovery capabilities, etc. It is recommended that the reader review all reports analytically. Even a "bad" report can be a very useful launching point for learning.
  4. Contact us before reproducing or redistributing a report from this anthology. Individual countries have very differing views on copyright! We can advise you on the steps to follow.
-

# Fokker F28 Mark 0100, G-UKFK

**AAIB Bulletin No: 9/98 Ref: EW/G97/10/24      Category: 1.1**

**Aircraft Type and Registration:** Fokker F28 Mark 0100, G-UKFK

**No & Type of Engines:** 2 Rolls Royce Tay 620-15 turbofan engines

**Year of Manufacture:** 1988

**Date & Time (UTC):** 13 October 1997 at 0705 hrs

**Location:** Amsterdam, Schipol Airport, The Netherlands

**Type of Flight:** Public Transport

**Persons on Board:** Crew - 5 - Passengers - 100

**Injuries:** Crew - Nil - Passengers - Nil

**Nature of Damage:** Various rivets on left-hand side of nose damaged, outer static discharger missing from right-hand stabiliser, additional small part of right-hand stabiliser missing, pitot head had small residual metal pieces welded to it, a number of dents were present in fuselage top. Two electrical switches in elevator system ceased to function.

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

**Commander's Age:** 42 years

**Commander's Flying Experience:** 10,500 hours (of which 2,600 were on type)  
Last 90 days - 160 hours  
Last 28 days - 50 hours

**Information Source:** Aircraft Accident Report Form submitted by the pilot and subsequent inquiries by AAIB

The Captain reported that the aircraft reached FL60 on departure from Schiphol, with the autopilot off. Whilst in IMC, it encountered precipitation in the form of small hail stones; the weather radar was in use and showed no hard core closer than 5 nm. The aircraft then received a lightning strike. The cabin crew observed what they described as fire-balls in the cabin, originating at the front and appearing to exit in the region of the overwing emergency doors. The Captain observed the *master caution* lights operating and warnings of EL 1 and EL 2 appearing on the MFDU, indicating that hydraulic pressure had fallen in both right and left systems of the elevator hydraulic control unit.

The crew check list calls for the appropriate illuminated push button on the overhead hydraulic panel to be operated (a 'fault' caption normally illuminates in the appropriate push button when hydraulic pressure falls in the relevant actuator causing the Flight Warning System to be signalled). Operation of the button places the appropriate hydraulic elevator boost system in bypass mode. Should fault warnings appear on both elevator buttons, the check list calls for both to be operated, hence placing both systems in bypass. This action removes all hydraulic boost from the elevator control, causing it to revert to manual operation. Under such conditions the elevator gearing alters.

The checklist actions were carried out and the crew elected to return to Schiphol (in manual elevator mode) where an uneventful landing was carried out. It is understood that flying with manual elevator is a procedure periodically practised in the simulator. The commander commented that the aircraft 'felt a bit peculiar' operating in this mode.

Subsequent examination of the aircraft indicated that the lightning had routed through the aircraft between the nose area and the elevators. Damage included functional failure of both elevator boost system Sequence Valve Proximity Switches, (sometimes known as the bypass switches). These are sited on the left and right manifold assemblies of the elevator hydraulic boost controller, itself positioned in the area of the junction between the fin and tailplane. The switches are normally each operated by movement of the associated sequence valve in the left or right hand manifold assembly respectively when loss of hydraulic pressure within the relevant manifold allows spring forces to move the valves fully to the shut-off position. The manufacturers state that under such conditions, the switches provide signal to the Flight Warning Computer, the Flight Control Computer (for autopilot functions) and the Maintenance and test panel (for maintenance purposes only).

It is presumed from the information available that the fault conditions found in each proximity switch caused the Flight Warning Computer to receive signals in the same way as would have occurred had pressure been lost in both elevator boost systems, although no movement of either sequence valve had apparently taken place and hydraulic pressure remained available to both boost units. Thus both EL 1 and EL 2 failure indications would have illuminated in the overhead panel. Actioning by the crew of the check-list items for EL 1 and EL 2 failure would then have signalled the pilot valves to the closed position causing both boost systems to cease providing hydraulic assistance. Thereafter, the elevator system would have operated in a purely manual mode. Thus correct crew response to a false warning resulted in a serviceable boost system being switched off.

Analysis of available records from ground based lightning recording equipment did not reveal major lightning discharges at the relevant time or place.