

Factual Report

The Investigation Report was written in accordance with para 18 Law Relating to the Investigation into Accidents and Incidents Associated with the Operation of Civil Aircraft stating facts only.

Identification

Type of Occurrence:	Incident
Date:	19 May 2017
Location:	Wartenberg
Aircraft:	Cargo airplane
Manufacturer / Model:	Boeing Company / B 747-400 F
Injuries to Persons:	None
Damage:	Minor damage to aircraft
Other Damage:	None
State File Number:	BFU17-0540-TX

Factual Information

During the approach the track hinge fairing of the right outer flap drive separated from the airplane.

History of the Flight

The freighter had departed Frankfurt Main Airport and at 0748 hrs¹ was on final approach to Munich Airport. Three persons were on board: Two pilots and one licensed aircraft mechanic. The pilot in the left-hand seat was Pilot Flying (PF). Approach was flown to runway 26R. The crew stated that at a distance of 12 km before the threshold as the flaps were extended to 30° they heard some sound. At that time the indicated approach speed was 146 kt (KIAS).

The landing occurred without further incident on runway 26R. The airplane taxied to the parking position.

Personnel Information

The 61-year-old Pilot in Command (PIC) held an Airline Transport Pilot's Licence (ATPL(A)) issued on 4 August 2016 by the Luftfahrt-Bundesamt (German aviation authority, LBA) in accordance with Part-FCL (Flight Crew Licensing). The licence listed the ratings as PIC for B747-400 and for flights in accordance with instrument flight rules (PIC IR); valid until 31 July 2017.

He held a class 1 medical certificate valid until 22 August 2017.

According to the operator he had a total flying experience of 23,978 hours, of which 6,578 hours were conducted on Boeing B747-400.

The co-pilot, age 44, held an Airline Transport Pilot's Licence (ATPL(A)) issued on 6 December 2012 by the civil aviation authority of United Kingdom in accordance with Part-FCL. The licence listed the ratings for Boeing B747-400 and flights in accordance with instrument flight rules (IR). Both ratings were valid until 30 November 2017.

He held a class 1 medical certificate valid until 3 May 2018, which was provided to the BFU.

According to the operator he had at the time of the incident a total flying experience of 6,981 hours; of which 3,621 hours were flown on B747-400.

¹ All times local, unless otherwise stated.

Aircraft Information

The B747-400 F manufactured by The Boeing Company is an all-metal, low-wing aircraft with retractable tricycle nose wheel landing gear. The airplane was powered by four General Electric CF6-80C2B5F jet engines. Maximum take-off mass was 412,796 kg. Maximum landing mass was 296,195 kg. The aircraft with the manufacturer's serial number 32870 was built in 2004. Total operating time of the aircraft was 51,612 hours and 7,609 cycles.

The aircraft was registered in Great Britain and operated by a British operator.

According to the operator the aircraft was delivered on 22 April 2017.

Prior to delivery a substantial C-check was performed. During the check and maintenance work the track hinge fairing of the outer flap drive (No 8) on the right wing was removed and re-installed. This was documented in corresponding job cards.

Meteorological Information

The aviation routine weather report (METAR) at Munich Airport of 0520 UTC described the weather conditions as follows:

Wind:	270°/ 6 kt
Visibility:	More than 10 km
Clouds:	No clouds below 5,000 ft (CAVOK)
Temperature:	15°C
Dewpoint:	13°C
Barometric air pressure (QNH):	1,009 hPa

Aids to Navigation

The flight was conducted in accordance with Instrument Flight Rules (IFR). The landing on runway 26R at Munich Airport was conducted using the Instrument Landing System (ILS).

Aerodrome Information

Munich Airport has two parallel concrete runways. Both runways are 4,000 m long and 60 m wide with a direction of 082°/262°.

Flight Recorder

The aircraft was equipped with a L-3COM FA 2100 Flight Data Recorder (FDR) and a L-3COM FA 2100 CVR. The recorders have been made available to the BFU for evaluation purposes.

Wreckage and Impact Information

After the airplane had reached the parking position at the apron it was determined that the track hinge fairing of the outer flap drive (No 8) on the right wing was missing. Some brackets and connection rods in the vicinity of the flap track and carriage were fractured or bent (see Appendix Image 1). The aft flap was slightly dented on the lower surface in the area of the right, outer flap drive.

In the vicinity of the township Wartenberg (about 2 km south-west) a fairing, originating from an aircraft, was found on a meadow (see Appendix Image 2). It was located about 12 km east of the threshold 26R in the area of the approach centreline.

After the salvage operation and transport to Munich Airport it was confirmed that the fairing was indeed the one missing.

The two bolt lead-throughs of the front mounting points (see Appendix Image 3) showed scratching and friction traces on the flap track and carriage and the fairing side (see Appendix Images 4 and 5). Both bolt connections were missing. The bolts were neither found in the periphery of the flap drive nor at the meadow.

On the aft fairing extension mechanism the support fitting had been turned by almost 180° and ripped. The bolt receptacle had forcibly been torn out (see Appendix Image 6). The bolt was found in the support fitting on the wing. The bolt receptacle of the adjustable rod had been torn off the support fitting of the wing. This bolt was found in the fixing eyelet of the adjustable rod.

Fire

There was no fire.

Additional Information

Regarding loss of track hinge fairings the manufacturer issued the Fleet Team Digest 747-FTD-27-10001 and the Service Letters 747-SL-27-199-A and 747 SL-27-66-D. These describe the possible causes resulting in loss of fairings and corrective action to be taken.

Investigator in charge: Nehmsch

Assistance:

Field Investigation: Rattelmüller; Hoppert

Braunschweig 31 August 2017

Appendices



Image 1: Location of the track hinge fairing

Source: BFU



Image 2: Outer flap drive and flap track and carriage on the right wing

Source: BFU

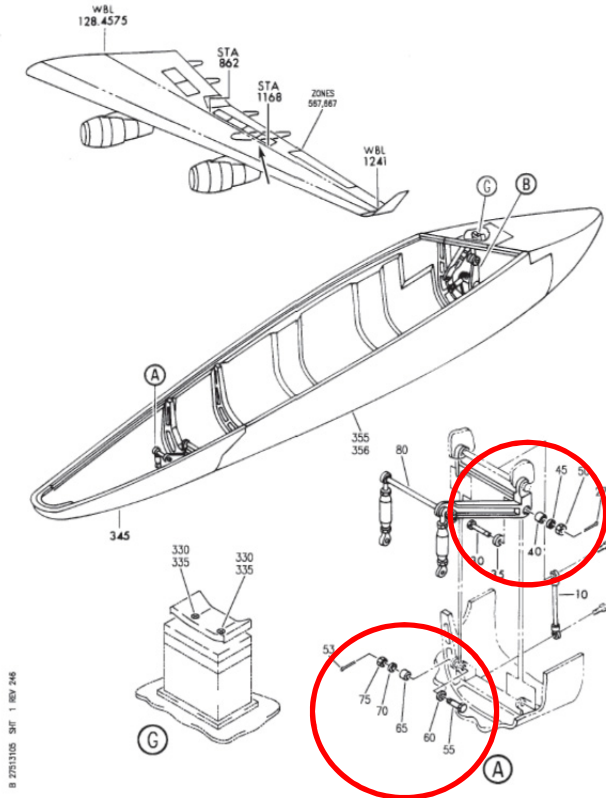


Image 3: Front mounting of the fairing (red circles)

Source: Manufacturer



Image 4: Front mounting points on the flap track and carriage

Source: BFU



Image 5: Front mounting points on the fairing

Source: BFU

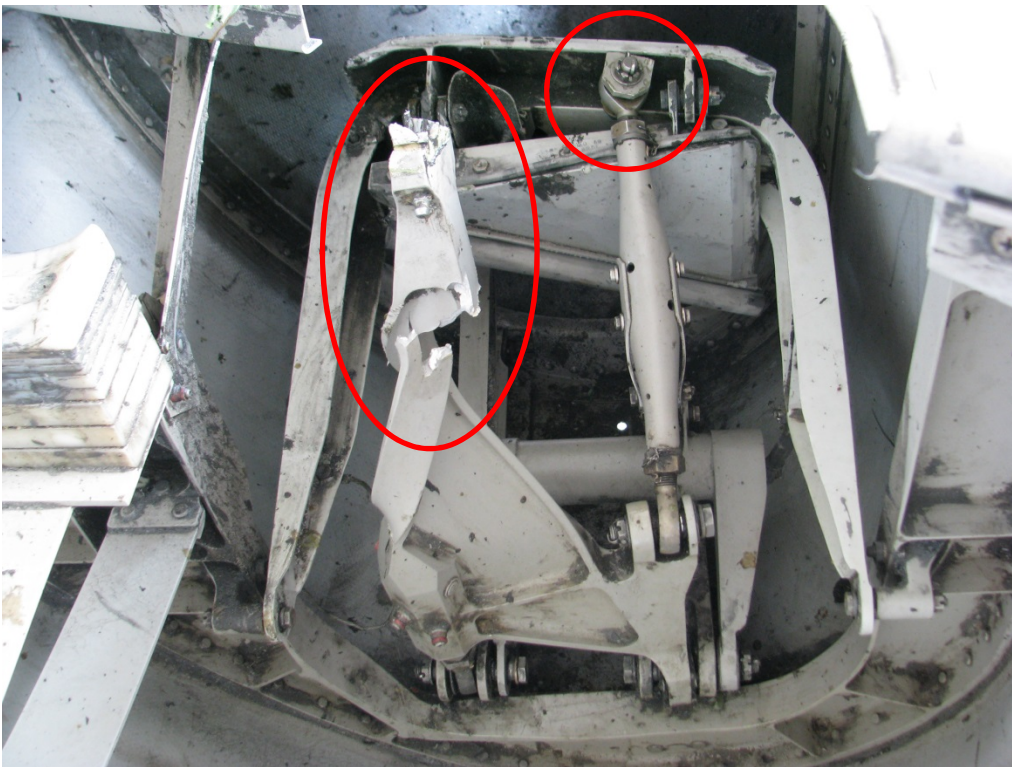


Image 6: Aft mounting points (red circle)

Source: BFU

This investigation was conducted in accordance with the regulation (EU) No. 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and the Federal German Law relating to the investigation of accidents and incidents associated with the operation of civil aircraft (*Flugunfall-Untersuchungs-Gesetz - FIUUG*) of 26 August 1998.

The sole objective of the investigation is to prevent future accidents and incidents. The investigation does not seek to ascertain blame or apportion legal liability for any claims that may arise.

This document is a translation of the German Investigation Report. Although every effort was made for the translation to be accurate, in the event of any discrepancies the original German document is the authentic version.

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