Boeing 767-323, N7375A, 4 December 2001 at 1403 hrs

AAIB Bulletin No: 8/2002	**Ref: EW/C2001/12/01**	**Category: 1.1**
Aircraft Type and Registration:	Boeing 767-323, N7375A	
No & Type of Engines:	2 General Electric Co CF6-80C2B7F turbofan engines	
Year of Manufacture:	Not Known	
Date & Time (UTC):	4 December 2001 at 1403 hrs	
Location:	Near Gent, Belgium	
Type of Flight:	Public Transport (Passenger)	
Persons on Board:	Crew - 12	Passengers - 65
Injuries:	Crew - None	Passengers - None
Nature of Damage:	Engine pylon strut fairing, leading edge slat	
Commander's Licence:	Airline Transport Pilot's Licence	
Commander's Age:	48 years	
Commander's Flying Experience:	10,000 hours (of which 5,000 were on type)	
	Last 90 days - 180 hours	
	Last 28 days - 60 hours	
Information Source:	AAIB Field Investigation	

History of flight

The aircraft was on a scheduled international flight from Brussels Airport, Belgium, to Chicago O'Hare, USA. After departure from Brussels, while climbing through FL137, the forward pylon strut fairing above the right engine detached and struck the adjacent leading edge slat. The commander noticed a slight noise at this time but did not consider it to be of significance.

Shortly afterwards a passenger advised the cabin crew that a piece of metal fairing had disappeared from above the right engine. The first officer went to inspect the area and saw that the pylon fairing was missing and that there was damage to the leading edge slat. He advised the commander who discontinued the climb and reduced the airspeed to 280 kt. Following discussion with his company operations the commander decided to divert the flight to London Heathrow Airport. On the

approach the flaps and slats deployed normally and an uneventful overweight landing was carried out.

Following the incident radar and flight recorder data were analysed in an attempt to identify the area where the fairing may have fallen. It was later recovered from a location near Gent, Belgium, which was consistent with the detachment having occurred at about FL137.

Flight recorders

The half-hour duration Cockpit Voice Recorder (CVR) had continued to record after the aircraft had parked on stand following the incident flight. Thus audio recordings pertinent to the event and subsequent landing had been overwritten.

The solid state Flight Data Recorder (FDR) had recorded a comprehensive set of parameters during the flight but no evidence was found of any anomaly related to the detachment of the fairing. In particular, no asymmetry was found in the operation of the leading edge slats.

In the absence of any perturbations in control inputs or aircraft performance at the point of detachment, aircraft track and prevailing wind conditions were used to establish an approximate position for the event. This was determined to be as the aircraft was climbing through 13,700 feet at 339kt; 2.4nm west of where the detached fairing was located. Relevant aircraft recorded wind direction and speed were approximately 275°/40 kt. Variations in the recordings of the accelerometer values indicated that the aircraft was flying through minor turbulence at that time.

The aircraft continued to climb to a maximum pressure altitude of FL240 where airspeed was reduced to 280 kt. Following an ILS approach to Runway 27R at Heathrow the aircraft made a flap 25 landing where a touchdown with maximum normal acceleration of 1.47g in a wings level attitude was recorded.

Aircraft Examination

The panel that detached from the aircraft was the No 2 forward pylon strut fairing. There were scrape marks on the engine cowling indicating that the fairing had rotated outboard about the aft end during the detachment process. It had then struck the No 8 slat and damaged an area approximately 0.4m in length along the leading edge. There was no other damage to the aircraft.

The fairing was recovered from the village of Sleidinge, north-east of Gent and returned to the AAIB. Examination showed no damage to the panel or its attachments. The hook latches were found in the engaged position, however, the L/H side button was not completely flush with the fairing. It therefore appeared that the hooks had not been in engagement with their associated pins (see description below).

No maintenance had been carried out in the area of the pylon at Brussels. The last 'B' check, where major maintenance was carried out, was on 1 December 2001 but a review of the inspection work package revealed that no maintenance was carried out in this area. Furthermore a review of the last 60 days of maintenance log book records showed that this area of the pylon had been undisturbed. Work on the pylon was carried out when the No2 engine was changed in September 2000. The aircraft had, however, flown 5,261 hours and completed 867 cycles since the engine change.

Fairing Installation

The forward pylon strut fairing on Boeing 767 aircraft equipped with GE engines is designed to be quickly removable to provide access to Line Replaceable Units (LRUs) and throttle controls. On Boeing 767 models with different engines the configuration does not require quick removal so the fairing is attached using bolts rather than latches.

The fairing is attached on this aircraft by two hook mounts on top of the engine cowl, and two hook latches, one on either side on the aft of the fairing (see figure 1 (jpg 69kb)). The fairing is installed by placing it on the strut and moving it aft to engage the hook mounts. The hook latches are then fastened by pushing the hook mechanism such that the hooks engage with their hook bolts. When fastened, the hook latch button is then flush with the surface of the fairing panel. Arrow tips are painted on the forward fairing and the adjoining aft section of pylon and there is a placard on the fairing which states: 'CAUTION ENSURE ARROW TIPS ARE ALIGNED AND TOUCHING. ENSURE HOOK IS PROPERLY LATCHED ON RETAINER PIN AND NOT PROTRUDING OUT'.

It is possible to carry out the procedure as described with the fairing not centralised so that the hook latches are not engaged with the retainer pins. The hook latch button would still be flush with the surface of the panel but the fairing would not be latched.

Previous history

The operator of the aircraft involved in this incident had a similar event in 1991 when the forward fairing was lost on take-off and found on the runway at New York JFK Airport. The operator concluded that the loss of the forward fairing was caused by improper latching onto the pylon. As a result it added a stencilled caution note, as described above, next to each latch. Since that time a further 'one or two panels' have been lost. Investigation into a further incident that occurred in 1996 on take-off, to another operator; also concluded that the forward fairing had been improperly latched.

Discussion and Recommendations

The cause of the separation of the forward pylon strut fairing on this flight could not be conclusively determined. However, given the previous history and the absence of any damage to the fairing latches, the likelihood is that the fairing had not been properly latched. It was not possible to determine with any certainty when the last maintenance activity took place in this area and therefore the fairing may have been unlatched for a significant period of time. In 1991 the operator introduced a placard to alert engineers to the possibility of latches not being properly engaged, however this appears not to have prevented this incident. The manufacturer is conducting a review of the forward pylon strut fairing latch design with a view to possible design changes.

Recommendation 2002-15

It is therefore recommended that the FAA, in conjunction with the manufacturer, ensure that the planned review of the B767 forward pylon strut fairing latch design leads to design changes that eliminate the potential for incorrect latching of the fairing.