

Log 2361



National Transportation Safety Board

Washington, D.C. 20594
Safety Recommendation

Date: May 13, 1992

In reply refer to: A-92-38

Honorable Barry L. Harris
Acting Administrator
Federal Aviation Administration
Washington, D.C. 20591

On April 25, 1992, the number 3 engine and pylon separated from the right wing of a Boeing 707-324C airplane operated by Tampa Airlines S.A. Cargo, Columbian Registration HK-3604-X, during takeoff from Miami International Airport. After separation from the wing, the number 3 engine and pylon struck the number 4 engine nose cowling, impacted the departure runway, and came to rest on the grass area adjacent to runway 9R. The airplane returned and landed without incident or injury to the crew of three. There was no injury to ground personnel or damage to equipment. Although the inlet cowling and pylon skin of the number 4 engine was damaged, it continued to operate normally. The airplane was equipped with Tracor/Shannon hush kits and had accumulated a total of 20,399 cycles in 53,257 service hours.

Examination of the airplane revealed that the engine pylon to wing support fittings had fractured. Initial, on-site metallurgical examination of the fractured pylon support fittings revealed that the fracture of the inboard midspar fitting stemmed from a small (1/4 inch by 1/4 inch) preexisting fatigue crack. Further examination revealed that the fatigue crack had initiated on the inboard face of the fitting near the upper edge and the fracture propagated outboard across the body of the fitting, 1.25 inches forward of the lug bore centerline. Corrosion deposits were found on the fracture face covering the fatigue zone and much of the overstress area, indicating that at least a portion of the overstress fracture had existed for some time before the final separation of the engine and pylon.

On March 31, 1992, a Kabo Air Cargo, Boeing 707-321C, Nigerian registry 5N-MAS, lost its number 3 and 4 engines while climbing through 31,000 feet over southern France. The investigation of the accident is being conducted by Bureau Enquetes Accidents (BEA) of France. The airplane landed safely at Le'Pbe Airbase. Both engines were located about 90 miles northeast of the airbase. At the time of the accident, the airplane had 60,779 service hours and 17,873 cycles. Preliminary information indicates that the inboard midspar fitting on the number 3 engine had a fatigue fracture through the lug on the aft end of the fitting. The engines had been modified with Tracor/Shannon hush kits in May of 1986. The BEA and the Safety Board are unaware of any other maintenance that may have been performed.

Airworthiness Directive (AD) 88-24-10 (12/21/88), which incorporates Boeing service bulletin (SB) 3183 Rev 2 (1/28/88), requires recurrent on-wing visual inspections of the inboard mid spar fittings on the number 2 and 3 engine pylons. The service bulletin reported 35 cases of midspar fittings with cracks at either the lug hole at the aft end of the fitting or across the horizontal tangs near the middle of the fitting. Of the 35 cases, two reportedly resulted in complete separation of the engine and pylon from the airplane. The location of the fatigue fracture on the pylon support fitting of the Tampa Boeing 707 was between the fracture locations cited in the service bulletin. The AD requires removal of an inspection cover on the pylon and visual inspection of the fitting. Shaking of the engine nose cowl is also recommended to produce an audible indication of a fractured fitting. Because of the configuration and assembly of the fittings within the pylon, only a portion of the fitting is readily accessible for visual inspection. However, the location of the fatigue crack on the Tampa airplane was readily accessible and directly visible through the inspection cover.

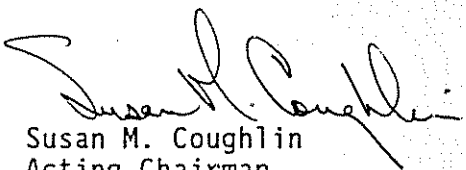
For Boeing 707 series 300 airplanes, AD 88-24-10 requires an inspection every 1,500 hours or 600 flight cycles, whichever occurs first. Tampa records for HK-3604-X indicate that the recurrent inspections of AD 88-24-10 had last been accomplished on January 2, 1992, at 52,436 hours and 20,071 cycles. At the time of the accident, the airplane had 679 hours or 272 flight cycles remaining before its next required inspection.

The Safety Board is concerned that the inspection schedule mandated by the AD is not sufficient to readily detect cracking prior to complete fracture of the midspar fitting, and that failure of this fitting can result in the loss of the inboard engine and pylon, with possible catastrophic results. The separated inboard engine can impact the outboard engine, possibly resulting in its failure during a critical phase of flight. The Safety Board is also concerned that the required visual inspection method is not sufficient to detect relatively small critical cracks and believes that an improved, more sensitive method should be required.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Revise Airworthiness Directive 88-24-10 applicable to Boeing 707 series 300 airplanes to (1) significantly decrease the times between inspection intervals and (2) require an improved means of inspection to detect small cracks. (Class I, Urgent Action) (A-92-38)

Acting Chairman COUGHLIN, and Members LAUBER, HART, HAMMERSCHMIDT, and KOLSTAD concurred in this recommendation.


By: Susan M. Coughlin
Acting Chairman