



# National Transportation Safety Board

Washington, D.C. 20594

## Safety Recommendation

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**Date:** November 16, 1999

**In reply refer to:** A-99-79

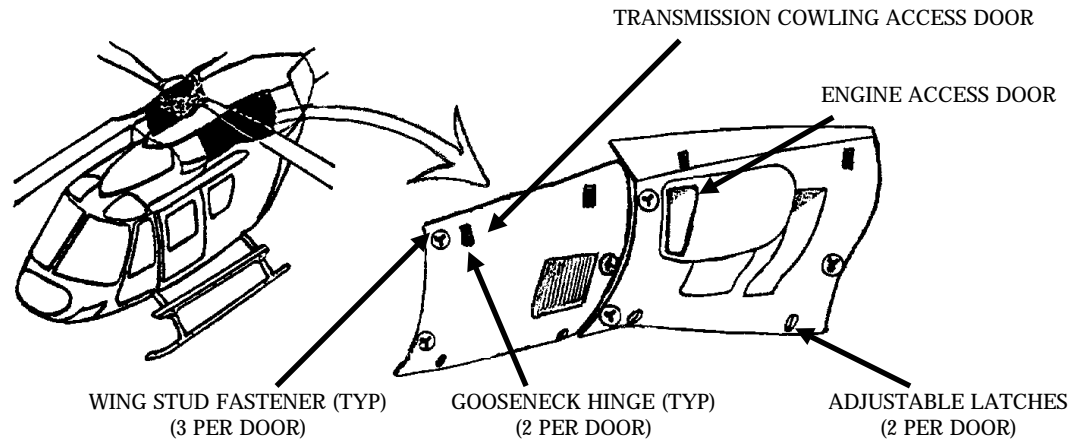
Honorable Jane F. Garvey  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

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On August 28, 1998, a Eurocopter BK 117 (BK 117) helicopter, operated by St. Louis Helicopters, dba Topeka Lifestar, touched down and then rolled over during an emergency landing after the No. 1 engine cowling and its access door separated during a landing approach at the Topeka-Forbes Airport, Topeka, Kansas. None of the three occupants were injured. The helicopter sustained substantial damage.

The accident occurred when the helicopter was returning to Topeka at the conclusion of a flight to test the No. 1 engine, which had been replaced. The pilot reported that there was a severe in-flight vibration, followed by a loud bang, before the accident. Postaccident examination revealed that the No. 1 engine cowling and its access door had separated in flight and impacted the main rotor blades and tail rotor blades, resulting in a tail rotor imbalance and subsequent departure of the tail rotor gear box.

The BK 117 engine and transmission cowling access doors are configured with two upper gooseneck hinge assemblies that secure the access doors to the cowling and allow them to open in the upward direction (see figure 1). Two lower adjustable latches secure the doors to the bracket attached to the airframe. These lower latches have an adjustable tension hook that, when properly adjusted, engages under the lip of the airframe bracket and secures the door for flight. The access doors are also secured to the airframe with three wing head stud fasteners (two forward and one aft).

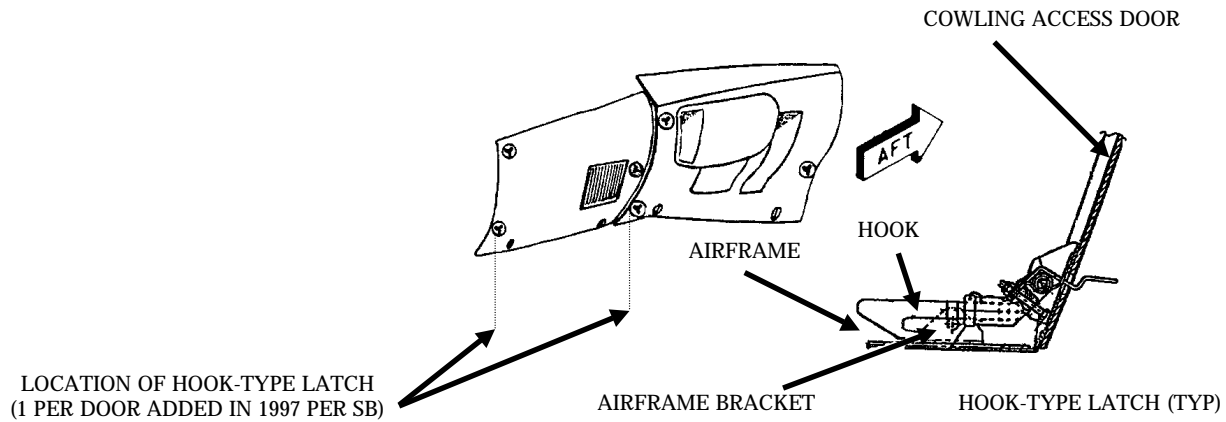


**Figure 1. BK 117 Cowling Access Door Latch Assembly**

Inspection of the separated engine cowling access door from the accident helicopter revealed that the forward adjustable latch was deformed and bent and that the aft latch was not damaged. All three wing head stud fasteners were missing, and the two forward wing head stud fastener holes were distorted. The investigation concluded that the aft adjustable latch of the engine cowling access door was not properly secured, which allowed the door to open fully upward and contact the main rotor blades. An examination revealed that it is possible for maintenance personnel and/or flight crews to believe that the latches are secure when, in fact, they are not, because the face of the latch covers the hook even when the hook is not engaged. The wing head stud fasteners are not designed to withstand in-flight airloads; therefore, if the cowling access door is not properly latched, in-flight separation of the door may occur.

On June 26, 1989, following several incidents involving in-flight separations of the engine or transmission cowling access doors, Messerschmitt, Bolkow, and Blohm (MBB) Helicopters (now Eurocopter) issued Alert Service Bulletin (ASB) MBB-BK 117-20-104, which recommended replacement and relocation of latches and the installation of wing head stud fasteners to ensure the secure fit of the access doors in the event of a gooseneck hinge failure. On April 10, 1995, the Federal Aviation Administration (FAA) issued Airworthiness Directive (AD) 95-08-12, which mandated the actions specified in this ASB. However, despite these actions, the cowling access doors continue to separate in flight. FAA and National Transportation Safety Board accident/incident data indicate that, in addition to the Topeka accident, there have been four cowling access door in-flight separations since 1995.

On June 16, 1997, Eurocopter issued Service Bulletin (SB) MBB-BK 117-20-109, which recommended that a hook-type latch be retrofitted to the cowling access doors (see figure 2). The hook-type latch was designed to prevent the cowling access door from opening fully if the adjustable latches failed or were not secured properly.



**Figure 2. Suggested BK 117 Access Door Latch Assembly**

The Safety Board is concerned that despite the issuance of AD 95-08-12, cowling access doors continue to open in flight, jeopardizing safety. Installation of a hook-type latch in accordance with SB MBB-BK 117-20-109 would enhance safety and prevent the cowling access doors from opening fully and coming in contact with the rotor blades in flight. Therefore, the Safety Board believes that the FAA should issue an AD to require compliance with SB MBB-BK 117-20-109 to reduce the potential for in-flight engine and transmission cowling access door separations.

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

Issue an airworthiness directive to require compliance with Eurocopter Service Bulletin MBB-BK 117-20-109 to reduce the potential for in-flight engine and transmission cowling access door separations. (A-99-79)

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred with this recommendation.

*[original signed]*

By: Jim Hall  
Chairman