



Log 2458

# National Transportation Safety Board

Washington, D.C. 20594  
Safety Recommendation

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Date: October 18, 1993  
In reply refer to: A-93-126

Honorable David R. Hinson  
Administrator  
Federal Aviation Administration  
Washington D.C. 20591

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At 10:45 a.m. central daylight time on May 21, 1993, a Piper PA-25-150 airplane, N6453Z, crashed near Essex, Iowa, after the right wing separated in flight. According to a witness, the airplane was applying weed spray over a field when the right wing buckled upward and the airplane rolled to the right. The airplane was destroyed in the crash, and the pilot was fatally injured. The airplane had accumulated a total of 5,375 hours in service.

In its investigation of the accident, the Safety Board found that the forward spar fuselage attachment assembly for the right wing had separated at the clevis ears. The separation was through two fittings, P/N 61005 and P/N 61006, that had been welded together to form the two clevis ears of the assembly. Metallurgical examination of the fittings by the Safety Board materials laboratory revealed fatigue cracks originating from relief notches at the base of the forward and aft clevis ears. Examination also revealed an extensive oxidation layer between the sections making up the aft clevis ear. The extent of the oxidation layer indicated that corrosion had occurred over some time. Although the corrosion contributed to the failure of the attachment assembly, evidence indicates that the fatigue cracks in the relief notches at the base of the clevis ears caused the failure and resulted in the separation of the right wing.

The presence of fatigue cracks in the attachment assembly for the right wing raised questions about the condition of the attachment assembly for the left wing. Although the left wing had not separated, the Safety Board examined the attachment assembly for the left wing forward spar. A fatigue crack was found in the weld that filled the relief notch at the base of the aft clevis ear.

Safety concerns related to cracking and corroding of clevis ears were first raised by the September 21, 1991, crash of a Piper PA-25-235, N7509Z, near Brewton, Alabama. According to witnesses, the airplane had completed a spraying run over a field and was pulling up when the left wing separated from the airplane. The airplane was destroyed, and the pilot was seriously injured. The Safety Board determined that corrosion and progressive cracking of the clevis ears for the forward spar fuselage attachment assembly resulted in the in-flight separation of the left wing. The airplane had accumulated a total of 10,700 hours in service.

As a result of its investigation of the September 1991 accident, the Safety Board recommended urgent action by the Federal Aviation Administration (FAA) to avert additional in-flight wing separations. In Safety Recommendation A-92-36, issued May 13, 1992, the Board urged the FAA to issue an airworthiness directive (AD) for Piper PA-25 airplanes to require immediate inspection for corrosion and cracking of the clevis ears on the front spar fuselage attachment assemblies, repair of any assembly found to contain corrosion or a crack, and periodic inspections at intervals that will detect a crack before it becomes critical to the safe operation of the airplane. In its response of July 16, 1992, the FAA agreed with the intent of the recommendation and said it would consider issuing a notice of proposed rulemaking (NPRM) to address inspection and repair of attachment assemblies found to contain cracks or corrosion. Because the FAA did not take prompt action to issue an AD, the Safety Board classified Safety Recommendation A-92-36 "Open—Unacceptable Response."

On September 8, 1993, over a year after it received the urgent recommendation, the FAA issued an NPRM (Docket No. 92-CE-63-AD) concerning repetitive inspections of Piper PA-25 airplanes. According to the NPRM, the FAA proposes to adopt an AD that requires inspection of forward spar fuselage attachment assemblies for corrosion and cracks. Visual inspection is to be used to detect corrosion and an FAA-approved dye penetrant method is to be used to detect cracks. If corrosion or cracks are found, parts must be replaced in accordance with FAA Advisory Circular 43.13-1A. The forward spar fuselage attachment assemblies must be inspected and repaired within 3 months after the AD becomes effective. Thereafter, the assemblies are to be inspected every 12 months.

In the NPRM, the FAA indicates that calendar time instead of hours time-in-service is the most desirable interval for the required inspections. Although the unsafe condition addressed by the proposed AD is caused by corrosion, which can occur on an airplane regardless of whether the airplane is in service or in storage, the Safety Board cannot conclusively rule out the possibility that exposure to the corrosive spray chemicals might warrant the use of a time-in-service interval.


The Safety Board is pleased that the FAA is taking action, and the Board supports the inspection methods and repair procedures described in the proposed AD. Based on information that is presently available and the hours time-in-service for airplanes involved in the Iowa and Alabama accidents, the Safety Board believes that the 12-month inspection interval will be sufficient to detect cracks and corrosion on the wing forward spar fuselage attachment assemblies of PA-25 airplanes.

The Safety Board also believes that had the FAA acted more swiftly to require inspections of the forward spar fuselage attachment assembly, as described in Safety Recommendation A-92-36, the fatigue cracks in the right wing assembly of N6453Z may have been detected and repaired before they resulted in wing separation and the death of the pilot. Consequently, the Board reclassifies Safety Recommendation A-92-36 from "Open—Unacceptable Action" to "Closed—Unacceptable Action." More time, perhaps several months, may pass before the proposed AD is amended and becomes effective. Meanwhile, PA-25 airplanes may remain in service with undetected cracks and corrosion that could result in additional wing separations and casualties. Thus, the Safety Board believes that the requirements for inspections and repairs described in Docket No. 92-CE-63-AD should be issued as an emergency AD.

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

Issue an emergency airworthiness directive pertaining to the inspection and repair of wing forward spar fuselage attachment assemblies on Piper PA-25 airplanes. The emergency airworthiness directive should include the requirements described in Docket No. 92-CE-63-AD. (Class I, Urgent Action) (A-93-126) (Supersedes Safety Recommendation A-92-36).

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in this recommendation.

  
By: Carl W. Vogt  
Chairman