

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

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(202) 426-8787

ISSUED: March 15, 1976

Forwarded to:

Honorable John L. McLucas
Administrator
Federal Aviation Administration
Washington, D. C. 20591

SAFETY RECOMMENDATION(S)

A-76-5

Within the past 10 years at least five instances involving an in-flight loss of directional control have occurred in the Bell Model 47 series helicopter. The National Transportation Safety Board believes that these occurrences demonstrate a need for immediate corrective action.

On August 29, 1975, the pilot of a Bell Model 47G-2 helicopter (N6755D) lost tail rotor control while attempting to land at Pigeon Forge, Tennessee. A successful hovering autorotation was made and no injuries were sustained by the pilot or his two passengers. The Safety Board analyzed the failed tail rotor hub assembly bolt (P/N 47-641-052-3) at its metallurgical laboratory and found that the bolt failed in fatigue. The total time on this bolt was 472 hours.

On July 2, 1975, a Bell Model 47G-2 helicopter (N988B) crashed and burned immediately after takeoff about 5 miles west of Napa, California; the pilot, the only occupant, was killed. Investigation of the accident disclosed that the tail rotor hub assembly bolt (P/N 47-641-052-3) had failed. Although the total operating time on this aircraft was about 4,000 hours and the aircraft had recently been rebuilt, the total time on the tail rotor hub assembly bolt could not be determined from examination of the aircraft's logbooks.

On May 20, 1975, the pilot of a Bell Model 47H-1 helicopter (N13172) lost directional control at an altitude of 40 feet above ground level during a student-pilot training flight at Nashville, Tennessee. The instructor pilot and student were injured seriously. The Safety Board analyzed tail rotor hub assembly bolt (P/N 47-641-052-3) at its metallurgical laboratory and found that the bolt failed in fatigue. This bolt was purchased from an organization that modifies and overhauls Bell Model 47 helicopters, and its total time in service could not be determined. The sales receipt did not specify if the bolt was new, nor did it list any previous time in service. However, the service time accumulated on the bolt was 499.8 hours since installation.

On October 11, 1966, a Bell Model 47D-1 helicopter (N162B) was involved in an accident 10 miles WSW of Ellensburg, Washington, after a loss of tail rotor control at an altitude of approximately 500 feet. An immediate autorotation was made in an open area with no further damage to the aircraft. Metallurgical examination disclosed that the bolt (P/N 47-641-052-3) had failed in fatigue. The total service time on this bolt could not be ascertained.

On October 12, 1966, a Bell Model 47G helicopter (N979B) was involved in an accident soon after lift-off from the Tonasket, Washington, airport helipad when the pilot felt a severe vibration and saw something fly past the cockpit canopy. The helicopter was landed immediately with no further damage. Investigation revealed that the tail rotor hub assembly bolt (P/N 47-641-052-3) had failed in fatigue. The total service time on this bolt could not be ascertained.

On December 12, 1975, the Bell Helicopter Company sent an Operations Safety Notice to all operators of Bell Model 47B, B-3, D, D-1, G, G-2 and H-1 helicopters. The Notice advised operators to replace any tail rotor hub bolt, P/N 47-641-052-3, that they could not identify positively as having been purchased from the Bell Helicopter Company. The Notice also stated that several accidents may have occurred as a result of a failed 47-641-052-3 tail rotor hub bolt, and that some of the bolts did not conform to the Company's specifications and were not manufactured by Bell or its approved suppliers.

On January 5, 1976, the Bell Helicopter Company issued Mandatory Service Bulletin No. 47-76-1, which required that all tail rotor hub bolts, P/N 47-641-052-3 and -5, be removed no later than February 15, 1976, and be replaced with the new 47-641-194-1 bolts. Each new bolt has a vibro-etched serial number on the head and a service life of 600 hours.

Because of previous failures of the bolt, in 1952 the Federal Aviation Administration issued AD 52-1-5. Later, AD 56-20-3 and AD 70-14-2 were also issued. These AD's have not reduced effectively the in-flight failures of the bolt, although the service life has been reduced to 300 hours on the 47-641-052-1 bolt and to 600 hours on the 47-641-052-3 and -5 bolts.

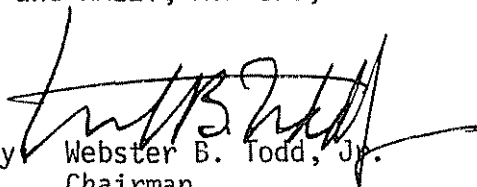
In view of the above, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Honorable John L. McLucas

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Issue an Airworthiness Directive to require immediate compliance with Bell's Mandatory Service Bulletin No. 47-76-1. (Class I--Urgent Followup)

TODD, Chairman, McADAMS, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendation.


By Webster B. Todd, Jr.
Chairman

THIS RECOMMENDATION WILL BE RELEASED TO THE PUBLIC ON THE ISSUE DATE SHOWN ABOVE. NO PUBLIC DISSEMINATION OF THE CONTENTS OF THIS DOCUMENT SHOULD BE MADE PRIOR TO THAT DATE.