

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: July 10, 1981

Forwarded to:

Honorable J. Lynn Helms  
Administrator  
Federal Aviation Administration  
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-81-71 and -72

On June 27, 1981, an Aerospatiale AS350 helicopter, N1381BH, experienced a severe tail rotor vibration while in flight. The pilot was able to execute a successful emergency landing. The tail rotor vibrated because a tail rotor pitch change horn, PN350A12-1368-01, had failed as a result of fatigue cracking where it attaches to the blade root. Total operating time on the failed part was 950 hours.

In recent months, there have been four similar fatigue failures of the tail rotor pitch change horn, one in Canada and three in the United States. Operating times ranged from 450 to 1,800 hours. The pitch change horn presently has no prescribed life limit. The most recent failure occurred despite the operator's compliance with Federal Aviation Administration Emergency Airworthiness Directive 81-13-09 dated June 16, 1981, which made Aerospatiale Telegraphic Service Bulletin 01.07A mandatory for all Aerospatiale AS350 model helicopters (173 AS350 helicopters are registered in the United States). The AD required the following inspection criteria:

Within 10 flight-hours, remove the pitch change horns from the two tail rotor blades, thoroughly clean the mounting bolt areas of the horn flange, conduct a fluorescent dye penetrant inspection of the horns for evidence of cracks, thoroughly clean the mating surfaces of the horn and the blade root flange, and check for flatness of the mating surfaces by performing a trial installation. Once reassembled, conduct a daily preflight visual inspection of the pitch horns using a 5 power magnifying glass in the area of the mounting bolt countersink and adjacent radii of the yoke.

Although the pitch change horn on the accident aircraft had been inspected in accordance with the Airworthiness Directive, the existing fatigue area had apparently missed detection. The Board noted when examining the failed part that the horn surface had been cleaned but residue remained in the area of the fatigue cracks.

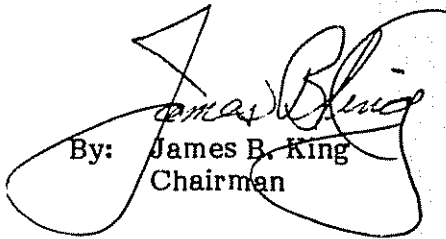
The manufacturer has indicated to the Safety Board that a 400-hour service life for the PN350A12-1368-01 tail rotor pitch change horn is being considered. The Safety Board believes that this proposed action should be reviewed expeditiously to determine a proper life limit on the tail rotor pitch change horn.

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

Take immediate action to revise the existing inspection instructions of AD-81-13-09 to stress the importance of thoroughly cleaning the pitch change horn in the area of the mounting bolt countersinks and adjacent yoke radii before performing the dye penetrant and visual inspections required. (Class I, Urgent Action) (A-81-71)

Expedite review of the recent failure history and existing flight-load data on the AS350, PN350A-12-1368-01, tail rotor pitch change horn and issue an Emergency Airworthiness Directive to establish a life limit for the part. (Class I, Urgent Action) (A-81-72)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.

  
By: James B. King  
Chairman