

log 1402

AI-4

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: April 7, 1982

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A-82-32 and -33

The National Transportation Safety Board has recently investigated two accidents involving Beech airplanes in which a wing panel attachment tension bolt in the lower forward wing spar attachment fitting failed in flight. The outboard wing panels of both airplanes were secured to the wing center sections by single tension bolts at the top and bottom of each wing spar. A failure of any one of the tension bolts could result in a wing panel separation in flight. This design is not unique to Beech aircraft. In both accidents involving the Beech airplanes, the bolt failure was attributed to stress corrosion that initiated after the protective coating on the bolt had been either scored or worn off. The first accident occurred on January 22, 1980, and involved a Beech Model 200 airplane, which was able to make an emergency landing without injury to the persons on board. The second accident occurred on October 26, 1981, and involved a Beech Model E-90 airplane, in which the wing panel separated in flight; the pilot was fatally injured as a result of the accident.

After the accidents, the Federal Aviation Administration (FAA) issued Airworthiness Directives 80-07-05 and 81-23-01, respectively, which required a one-time removal and inspection of the lower forward tension bolts on certain model Beech airplanes. Prior to these airworthiness directives there were no requirements to remove and inspect these bolts, nor is there currently an FAA requirement to periodically remove and inspect these bolts on a continuing basis. Recently the Beech Aircraft Corporation issued Service Instructions Nos. 1140 and 1208 which instructed airplane operators to remove and inspect all four tension bolts on each wing and to do this every 2 years. The Safety Board believes the Beech service instructions were well founded and that the FAA should act to make these instructions a required procedure.

The service instructions were made applicable only to Beech aircraft that have tension bolts made of H-11 steel, which is highly susceptible to stress corrosion, because it was believed that only these type bolts required periodic removal and inspection. While the smaller model Beech aircraft, such as the Beech 35, 50, 55, and 60 use tension bolts made of a steel alloy that is less susceptible to stress corrosion deterioration, a review of FAA service difficulty reports over the past 5 years disclosed two cases involving Beech 35 airplanes in which the wing spar tension bolts were found to have corrosion damage. Although our review did not extend to other airplanes and these may have been two isolated cases, the Safety Board believes it would be prudent to conduct a comprehensive

investigation to determine if the Beech Model 35 and all other airplanes which use a wing spar tension bolt assembly design should be required to have the tension bolts removed and inspected periodically.

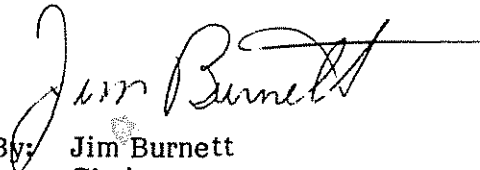
Despite the limited indications of a problem developed in our review of the SDR's, the serious consequences that result from an in-flight wing separation lead the Safety Board to believe that positive action is necessary to identify any wing spar tension bolts which may be susceptible to stress corrosion so that they are removed periodically and inspected fully.

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

Require compliance with Beech Service Instructions Nos. 1140 and 1208 which recommend that all four tension bolts on each wing of specified model Beech aircraft be removed and inspected every 2 years. (Class II, Priority Action) (A-82-32.)

Initiate a Directed Safety Investigation to determine if the Beech 35 and all other aircraft which use a wing spar tension bolt assembly design should be required to have the tension bolts removed and inspected periodically and take appropriate action if indicated. (Class II, Priority Action) (A-82-33.)

BURNETT, Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.

  
By: Jim Burnett  
Chairman