

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: November 28, 1979

Forwarded to:
Honorable Langhorne Bond
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)
A-79-92

On August 18, 1979, a Boeing 737 owned and operated by Wien Air Alaska was involved in a landing accident at Dillingham, Alaska. During the landing roll, the lower attachment bolt for the right main landing gear upper drag strut failed and the landing gear folded rearward causing considerable damage to the aircraft. The National Transportation Safety Board's investigation revealed that the upper drag strut lower attach bolt, PN69-39473-12, had fractured sometime before this landing. During the landing the drag strut pulled through the two halves of the bolt and the gear folded rearward. The cause of the initial fracture has yet to be determined.

As a result of the accident the operator inspected the upper drag strut attach bolts on its aircraft. Initially, the operator borescoped the bolts, but later decided to replace them when it determined that the failure may have been initiated by stress corrosion. During the removal of the bolts from one aircraft, the operator noted that a lower attach bolt had been installed in an upper attach bolt location. The Safety Board is concerned that other upper attach bolts may have been incorrectly installed in the lower attach bolt location which, because of design differences in the bolts, could affect the crashworthiness of the airplane.

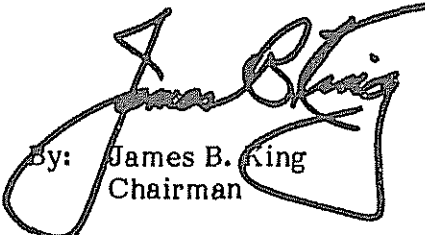
The upper and lower bolts are both fuse points in the landing gear, have nearly identical exterior dimensions, and appear to be interchangeable. However, they have differing strengths. The upper attach bolt, PN69-39476-5,6, is manufactured from 4330M (vacuum hardened) steel with a strength of 220 - 235 KSI. The bolt is hollow with an inside diameter of 0.75 inch. The lower bolt is made of 4340M steel with a strength of 270 - 300 KSI and has an inside diameter of 0.50 inch. Both bolts have an approximate outside diameter of 1.5 inches.

The selection of these values is significant since the sequence of failure of these bolts when they are overloaded during some accident environments will determine the direction in which the landing gear fails and the subsequent effects on other parts of the aircraft's structure. The use of the higher strength lower attach bolt in the upper "fuse" position may change the breakaway characteristics which were designed into the landing gear to minimize secondary effects of failure, and which were approved in the FAA type certification process.

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

Require an immediate inspection of all Boeing 737 aircraft main landing gear upper drag strut attach bolts to ascertain that the correct bolts are installed in the proper locations. (Class II - Priority Action)
(A-79-92)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in this recommendation.


By: James B. King
Chairman