

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: May 15, 1974

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Forwarded to:

Honorable Alexander P. Butterfield  
Administrator  
Federal Aviation Administration  
Washington, D. C. 20591  
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SAFETY RECOMMENDATION(S)

A-74-41

During its preliminary investigation of the accident involving Trans World Airlines, Flight 742, on August 28, 1973, the National Transportation Safety Board submitted Safety Recommendations A-73-76 through 78. In your initial response to these recommendations, you stated that additional action would be taken after the investigation was completed.

As indicated in your subsequent response of March 4, 1974, the investigation has been completed. The conclusion was that the abnormal flight control characteristics of Boeing 707-331B, N8705T, were produced when the boundary layer on the horizontal stabilizer-elevator assembly thickened. The thickening was caused by a combination of excessive skin waviness on the upper surface of the stabilizer and the existing vertical dimension of the stabilizer to elevator fair at the elevator hinge line.

Since this dimension can be modified by adding or subtracting shims between the stabilizer trailing edge beam and the elevator hinge support structure, corrective action is possible. However, since the dimensions on the accident aircraft were all within tolerances specified in applicable drawings and maintenance documents, these tolerances should be changed and other fleet aircraft should be inspected to ensure that they are not susceptible to the control problems.

The Safety Board is aware of Boeing Company's intentions to establish new tolerances, modify maintenance manuals, and issue a service bulletin to require inspection and accomplish modification, if needed. The Safety Board believes that Federal Aviation Administration action is required to ensure that corrective measures are implemented.

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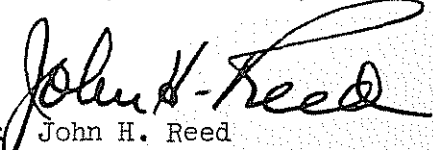
Honorable Alexander P. Butterfield (2)

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration: (Safety Recommendation A-74-41)

1. Issue an Airworthiness Directive which:
  - (a) specifies new tolerances for the vertical dimensions of the Boeing 707/720 stabilizer to elevator fair at the elevator hinge line;
  - (b) describes procedures for measuring and establishing proper dimensions;
  - (c) requires that all Boeing 707/720 aircraft be inspected, at the next scheduled maintenance visit, for the proper dimensional relationship of the stabilizer to elevator fair at the elevator hinge line in accordance with the procedures established, and
  - (d) requires those aircraft found to have an out-of-tolerance condition to be modified according to prescribed procedures.

The findings of the investigation and tests made subsequent to submission of Safety Recommendations A-73-76 through 78 notwithstanding, the Safety Board continues to believe that excessive control surface friction can further aggravate undesirable control system characteristics and that these recommendations are still relevant.

REED, Chairman, McADAMS, THAYER, and HALEY, Members, concurred in the above recommendation. BURGESS, Member, was absent, not voting.

By:   
John H. Reed  
Chairman

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DEPARTMENT OF TRANSPORTATION  
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