

UNITED STATES OF AMERICA  
NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: July 6, 1972

Adopted by the NATIONAL TRANSPORTATION SAFETY BOARD  
at its office in Washington, D. C.  
on the 23rd day of June 1972.

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FORWARDED TO: )  
Honorable John H. Shaffer )  
Administrator )  
Federal Aviation Administration )  
Washington, D. C. 20591 )  
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SAFETY RECOMMENDATIONS A-72-97 & 98

The National Transportation Safety Board is investigating an accident involving an American Airlines McDonnell Douglas DC-10-10, N103AA, which occurred shortly after takeoff from Detroit Metropolitan-Wayne County Airport on June 12, 1972.

The aft left-hand cargo door opened while the aircraft was at approximately 12,000 feet. The cabin floor over this cargo compartment then failed as a result of depressurization loading, and the floor dropped partially into the cargo compartment. This displacement of the floor caused serious disruption of the control cables which are routed through the floor beams to the empennage control systems and the engine controls. With the exception of the right rudder pedal cable, all of the cables on the left side of the fuselage broke. The cable runs on the right side were also damaged -- the cable guides tore from their attachments to the floor beams, and the cables were deflected downward by the floor structure.

Preliminary investigation has revealed that the door latches were not driven fully closed, and the lock-pins which should have prevented the latches from opening were not in place. The reason these door latches were not driven over center to the fully closed position has not yet been determined. However, although the Safety Board believes this was relevant and a contributing factor, we are more concerned over the failure of the door safety features to preclude dispatch with an unlocked door. The design of the door should have precluded the dispatch of the aircraft with this door

improperly closed. With the lock-pins not engaged, a small vent door on the cargo door should have remained open, preventing normal pressurization of the aircraft. Also, the vent door handle should not have stowed.

However, tests conducted at Douglas Aircraft Company have demonstrated that the vent door can be closed, and the handle stowed, without the lock-pins engaged. Apparently, some combination of deflection of the operating mechanisms and tolerances permitted such operation when a force of approximately 120 pounds was applied to the operating handle. During these tests our investigator observed bending of the sliding lock-tube which caused the cap end of the tube to make contact with the pilot indicator switch actuating arm. This arm moves through a very small arc to actuate the switch, and the Board believes that a similar contact on the accident aircraft door probably actuated the switch and gave the pilots a door safe indication on the annunciator light panel.

Finally, the Board believes that sudden loss of pressure in this cargo compartment for any reason should not jeopardize the safety of the flight. In this case, the loss of the door and resultant cabin floor failure caused an unwanted rudder input, severely restricted the elevator control available to the crew and disrupted the No. 2 engine controls.

We are aware of the inspection procedures currently in effect to ensure safety of operations of the DC-10 as well as the existing safety features of the door design. Nevertheless, in order to preclude the recurrence of similar accidents, the Safety Board recommends that the Federal Aviation Administration:

1. Require a modification to the DC-10 cargo door locking system to make it physically impossible to position the external locking handle and vent door to their normal door locked positions unless the locking pins are fully engaged.
2. Require the installation of relief vents between the cabin and aft cargo compartment to minimize the pressure loading on the cabin flooring in the event of sudden depressurization of the cargo compartment.

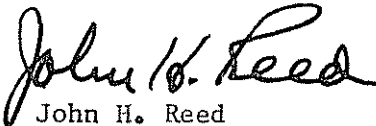
Members of our Bureau of Aviation Safety will be available for consultation in the above matter if desired.

These recommendations 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.

Honorable John H. Shaffer

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Reed, Chairman, McAdams, Thayer, Burgess and Haley, Members, concurred in the above recommendations.

  
By: John H. Reed  
Chairman