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NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

FOR RELEASE: 6:30 A.M., E.D.S.T., SEPTEMBER 19, 1975

ISSUED: September 19, 1975

Forwarded to:

Honorable Asaph H. Hall
Administrator
Federal Railroad Administration
400 Seventh Street, S.W.
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

R-75-39 thru 41

On August 1, 1975, three Massachusetts Bay Transportation Authority (MBTA) transit trains collided in Boston, Massachusetts. As a part of its on-going investigation into the accident, the National Transportation Safety Board has reviewed stopping-distance tests to determine if the braking capability of the transit cars could have contributed to the accident.

The first tests were conducted on August 10, 1975, using seven of the eight cars involved in the collisions. One additional "Silverbird" (1969-model car) was added to replace a destroyed car. The eight cars were tested as two trains, one consisting of four 1963-model "Bluebird" cars and the other of four "Silverbird" cars. Twenty-eight test stops were made from various speeds ranging from 6 mph to 45 mph. Two test stops were made from each speed, one using full-service braking (a blend of dynamic and pneumatic braking) and one using emergency braking (all pneumatic braking).

In 12 of the 14 tests, full-service braking provided a quicker and shorter stop than emergency braking. The "Bluebird" train's stopping distance averaged 22 percent less in the full-service mode than in the emergency braking mode, and the "Silverbird" train's stopping distance averaged 38 percent less in the full-service mode than in the emergency braking mode. The average deceleration rate from speeds above 18 mph in the full-service braking mode was 2.6 mph per second for the "Bluebird" train and 3.0 mph per second for the "Silverbird" train. The comparable average deceleration rate for both trains in the emergency braking mode was 2.1 mph per second.

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The lower deceleration rate in the emergency braking mode is significant for three reasons. First, the cars were constructed to decelerate 0.5 mph per second faster in the emergency braking mode than in the full-service mode. Second, the emergency braking mode is the fail-safe mode; that is, if the motorman becomes incapacitated or cars separate, emergency braking is activated. Third, the testimony of MBTA personnel indicates that MBTA motormen are instructed to use the emergency braking mode for the quickest stop in an emergency.

The Safety Board subsequently arranged for other stopping distance tests on August 28. These tests involved four "Silverbird" cars selected by MBTA personnel as being in good condition. These tests consisted of nine stops in the emergency mode and nine stops in the full-service mode from speeds similar to those of previous tests.

In each of these tests, the train stopped quicker in the emergency braking mode than in the full-service mode. However, subsequent checks of the equipment indicated that on two of the four cars in this second test, brake cylinder pressures were significantly higher than those called for by MBTA maintenance specifications. The difference in brake cylinder pressures could account for the improved emergency braking.

The Safety Board cannot be sure how much effect brake cylinder pressure had on the August 10 tests. However, the Safety Board believes the August 10 and August 28 tests indicate that problems do exist which warrant immediate technical analysis and corrective action as necessary.

The Safety Board's investigation is continuing. In the interim, the National Transportation Safety Board recommends that the Federal Railroad Administration:

- (1) Require the Massachusetts Bay Transportation Authority to insure, immediately, that all of its rail rapid transit cars are capable of the decelerations specified in their designs for emergency braking. (Recommendation R-74-39) (Class I)
- (2) Require the Massachusetts Bay Transportation Authority to check periodically to insure that the specified emergency braking capability is maintained. (Recommendation R-75-40) (Class I)

(3)

- (3) Determine whether this problem of inadequate emergency braking systems may exist in similar rapid transit cars in other parts of the country and take whatever corrective action is necessary. (Recommendation R-75-41) (Class I)

REED, Chairman, McADAMS, THAYER, BURGESS, and HALEY, Members, concurred in the above recommendation.

by: John H. Reed
Chairman

cc: Mr. Robert R. Kiley
Chairman
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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.

