

R-644

NATIONAL TRANSPORTATION SAFETY BOARD

Washington, D.C. 20594



Safety Recommendation

Date: August 17, 1993

In Reply Refer To: R-93-16

Mr. S. Mark Lindsey
Acting Administrator
Federal Railroad Administration
ROA-1
400 7th Street, S.W.
Washington, D.C. 20590

On December 17, 1991, National Railroad Passenger Corporation (Amtrak) train 87, Silver Meteor, operating on CSX Transportation Inc. track, derailed at milepost A697.6 in Palatka, Florida. Train 87 consisted of a locomotive and eight cars; the locomotive and first six cars derailed. The derailed equipment struck two homes and blocked the street north of the Palatka station. Eleven passengers sustained serious injuries and 41 received minor injuries. Five operating crewmembers and four on-board service personnel had minor injuries.¹

The four coach cars of train 87 were Amfleet cars, which are newer model passenger cars. These cars are equipped with a dual-braking system that consists of two disc brakes and two tread brakes on each car axle. Disc brakes provide 60 percent and tread brakes provide 40 percent of the required braking effort.

¹For more detailed information, read Railroad Accident/Incident Summary Report--*Derailed Amtrak Train 87, Silver Meteor, in Palatka, Florida, on December 17, 1991* (NTSB/RAR-93/02/SUM).

Whether equipped with disc, tread, or dual brakes, Amtrak equipment must be maintained and inspected in accordance with Federal Railroad Administration (FRA) regulations. These regulations state that an initial terminal air-brake test must be performed when a locomotive is first coupled to its consist or when that consist is significantly changed. Title 49 Code of Federal Regulations (CFR) 232.12 requires that:

- 1) The train air-brake system is charged to required air pressure, the angle cocks and the cutout cocks are properly positioned, and the air hoses are properly coupled and in condition for service.
- 2) An examination is made for leaks, and necessary repairs are made to reduce leakage to a minimum.
- 3) A 15-pound per square inch (psi) brake pipe service reduction is made with the automatic brake valve; after which, note brake pipe leakage per minute by brake pipe gage, increase to full service, and inspect train brakes to determine that angle cocks are properly positioned, that brakes are applied on each car, that piston travel is correct, that the brake rigging does not bind or foul, and that all parts of the brake equipment are properly secured.
- 4) The brakes must be released, and each brake inspected to see that they have released.
- 5) The brake pipe leakage must not exceed 5 pounds psi per minute.

Amtrak mechanical personnel testified that before train 87 left Jacksonville, Florida, on December 17, 1991, they completed an initial terminal air-brake test that met the requirements of 49 CFR 232.12.

During the postaccident inspection, National Transportation Safety Board investigators discovered four defective tread-brake units on three dual-brake Amfleet cars. The brake shoe was not tight against the wheel tread when fully applied; therefore, the four defective units were not effectively braking. These units were probably defective when the initial terminal air-brake test was conducted because the observed failure usually results from long-term wear, vibration, and internal component contamination. The detection of failed brake system components is a primary objective of the initial terminal air-brake test; however, the test procedure for train 87 on the day of the accident did not detect that the tread brakes were not applying properly.

Title 49 CFR 232.11(c) requires that brakes be in effective operating condition but does not define the term "effective" braking for a passenger car. This regulation describes the typical freight car arrangement in which one brake cylinder controls all brakes on the car. The FRA regulation states:

Each train must have the airbrakes in effective operating condition
. . . . When piston travel is in excess of 10 1/2 inches, the
airbrake cannot be considered in effective operating condition.

The Amfleet passenger car has 16 separate brake cylinders: eight on the tread-brake units and eight on the disc-brake units. Piston travel is 1/2 to 1 inch, maximum, on the Amfleet equipment, and 10 1/2 inches is not physically possible for this passenger car.

An FRA inspector stated:

Historically with the tread-brake unit, they have an automatic slack adjuster system which keeps the brakes within the proper piston travel, you might say, on them, and they have a tendency to break in there and become inoperative or out of adjustment. And that's typical of all tread-brake units on all passenger equipment. . . . We with FRA and Amtrak both understand that from time to time brakes become inoperative or fail on a certain car, and we allow them to run to the next follow-up point. . . . if the percentage is not exceeded by 15 percent.

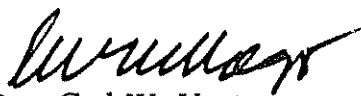
The FRA regulations do not reflect this particular understanding. Amtrak mechanical personnel performed the initial terminal air-brake test but detected no defective tread-brake units. However, even if they had discovered the four failed tread-brake units, the regulations contain no guidance on how many of the 16 brake cylinders must function to provide effective braking. The Safety Board concludes that the initial terminal air-brake test procedures contained in the FRA regulations are inadequate for inspecting brake equipment on modern passenger cars.

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

Amend the power brake regulations, 49 Code of Federal Regulations 232.12, to provide appropriate guidelines for inspecting brake equipment on modern passenger cars. (Class II, Priority Action) (R-93-16)

Also, the Safety Board issued Safety Recommendation R-93-17 to the National Railroad Passenger Corporation. If you need additional information, you may call (202) 382-6840.

Chairman VOGT, Vice Chairman COUGHLIN, and Members LAUBER, HART, and HAMMERSCHMIDT concurred in this recommendation.


By: Carl W. Vogt
Chairman