



National Transportation Safety Board
Washington, DC 20594

Safety Recommendation

Date: October 29, 1997

In Reply Refer To: H-97-36

Mr. Bradley L. Mallory
Secretary
Pennsylvania Department of Transportation
555 Walnut Street
Harrisburg, Pennsylvania 17101-1900

About 3:25 p.m. on April 25, 1996, a 1988 Mack truck with a concrete mixer body was unable to stop as it approached a "T" intersection at the bottom of an exit ramp in Plymouth Meeting, Pennsylvania. As the truck proceeded through the intersection, it collided with and overrode a 1985 Subaru passenger car. The Subaru driver was killed; the truckdriver sustained minor injuries. The truckdriver was unrestrained; the Subaru driver was found restrained in her vehicle. The weather was clear and dry. No fire ensued, and no other vehicle occupants were involved in the accident.¹

During its investigation, the National Transportation Safety Board identified as safety issues the maintenance and truck inspection practices of JDM Materials Company, Inc., (the owner of the truck) and the adequacy of Federal and State guidelines for conducting truck air brake system inspections.

Postaccident examination and testing of the accident truck operating systems revealed that the only deficiencies were in the truck's braking system, specifically, a broken drain valve on the secondary air brake air reservoir tank, an inoperative low-air-pressure warning switch, and reverse-connected air brake lines at the truck's treadle valve.

¹For more detailed information, read Highway Accident Summary Report—*Truck Loss of Braking Control on Steep Downgrade and Collision with a Vehicle near Plymouth Meeting, Pennsylvania, April 25, 1996* (NTSB/HAR-97/02/SUM).

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Because the low-air-pressure warning switch was inoperative, it did not warn the truckdriver when the secondary air supply tank became depleted. The Safety Board concluded that had both low-air-pressure warning switches on the accident truck been operable, the truckdriver would have had earlier warning of the depleted air supply and may have been able to stop the truck and avoid the accident.

The air brake lines on the accident vehicle were most likely reversed during March 1994 when JDM mechanics performed the only documented maintenance on the treadle valve of the accident truck. At no time before the accident did the motor carrier's mechanics detect the reversed air lines, even though the accident truck was in service in this condition for almost 2 years before the accident.

So long as both of the truck's air systems remained intact, the operation of the truck's brakes appeared normal; however, the reversed air lines bypassed a vital backup in the air brake system. The rear axle spring brakes, which automatically activate when a loss of air occurs in the primary air system, did not activate in this accident, because the primary air system remained intact. The secondary air system, which on the accident truck was providing air to operate the rear brakes, was not equipped with a backup system. The Safety Board concluded that the motor carrier's improper installation of the treadle valve air lines on the accident truck effectively bypassed an important safety feature and resulted in reducing the truck's braking capability under certain emergency conditions.

The treadle valve manufacturer publishes an air brake troubleshooting guide that outlines a test procedure that would have detected reversed treadle valve air line connections and inoperative low-air-pressure warning switches. The Safety Board concluded that if JDM employees had followed the treadle valve manufacturer's installation tests and inspection procedures when performing maintenance on the treadle valve of the accident truck, they would probably have recognized the improper installation problems or inoperative brake components or both, and the accident may have been prevented.

After the treadle valve on the accident truck was replaced in 1994, the truck successfully passed four semiannual Pennsylvania State safety inspections. The reversed air brake lines were not detected during any of the inspections. The inspections also failed to detect the inoperative low-air-pressure warning switch. The air brake testing procedure used by the State inspectors involves depleting the air pressure from both air brake systems simultaneously until the low-air-pressure warning buzzer sounds. Using this procedure, either both low-air-pressure warning switches or the warning buzzer or light itself would have to be inoperable for the vehicle to fail the test. The Safety Board therefore concluded that had the Pennsylvania State inspection procedures been adequate to detect the reversed air brake lines or the inoperative low-air-pressure warning switch or both, the air brake system deficiencies in the accident truck may have been discovered, and the accident may not have occurred.

The Safety Board therefore believes that the Pennsylvania Department of Transportation should:

Develop an easily administered inspection protocol for detecting reversed air lines and inoperative low-air-pressure warning switches on dual air brake system vehicles. (H-97-36)

Also, the Safety Board issued Safety Recommendations H-97-31 to the Federal Highway Administration; H-97-32 to the Commercial Vehicle Safety Alliance; H-97-33 to the American Trucking Associations, Inc.; H-97-34 to the National Ready Mix Concrete Association; H-97-35 to the JDM Materials Company, Inc.; H-97-37 to the Truck Manufacturers Association; H-97-38 to the National Highway Traffic Safety Administration; and H-97-39 to the Society of Automotive Engineers.

The National Transportation Safety Board is an independent Federal agency with the statutory responsibility "to promote transportation safety by conducting independent accident investigations and by formulating safety improvement recommendations" (Public Law 93-633). The Safety Board is vitally interested in any action taken as a result of its safety recommendations. Therefore, it would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendation H-97-36 in your reply. If you need additional information, you may call (202) 314-6440.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHMIDT, GOGLIA, and BLACK concurred in this recommendation.


By: Jim Hall
Chairman