

Log # H 592

National Transportation Safety Board  
Washington, DC 20594



Safety Recommendation

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Date: October 29, 1997

In Reply Refer To: H-97-31

Ms. Gloria Jeff  
Acting Administrator  
Federal Highway Administration  
Washington, DC 20590

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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.<sup>1</sup>

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.

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<sup>1</sup>For 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).

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 and/or inoperative brake components, 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 and the Federal 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 inoperative for the vehicle to fail the test.

Before the 1970s, heavy trucks were equipped with a single air brake system, and manufacturers of air brake systems developed inspection protocols for those systems. In the 1970s, as a result of Federal regulations, the single air brake system was upgraded to the dual air brake system, and the brake industry responded with the appropriate inspection procedures that would identify reversed air brake lines. However, the Federal and Pennsylvania State governments have not developed inspection protocols to accommodate dual air brake systems.

The Safety Board therefore believes that the Federal Highway Administration should:

In cooperation with the Commercial Vehicle Safety Alliance, develop an inspection protocol that could be easily administered by inspection personnel for detecting either reversed air brake lines or inoperative low-air-pressure warning switches on commercial vehicles equipped with dual air brake systems. (H-97-31)

Also, the Safety Board issued Safety Recommendations 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-97-36 to the Pennsylvania Department of Transportation; 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. 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