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National Transportation Safety Board
Washington, DC 20594

Safety Recommendation

Date: October 29, 1997

In Reply Refer To: H-97-35

Mr. Harry Robinson
Vice President -- Operations
JDM Materials Company, Inc.
851 County Line Road
Huntington Valley, Pennsylvania 19006

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., 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).

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 spring brake system (parking brake) on a heavy truck can be manually applied at any time. The truckdriver could have applied the parking brakes as he descended the grade, and this may have slowed the truck. However, the truckdriver stated that he had already applied the foot brake and pulled the hand control valve to apply the rear axle brakes and that the truck was not slowing. About 150 feet from the intersection, the truckdriver chose to steer around the stopped traffic. The brake calculations performed by the Safety Board revealed that the truckdriver would not have been able to stop the truck with the parking brake in combination with the front axle brake and minimum engine retardation.

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.

JDM officials told the Safety Board that its mechanics use service manuals provided by component manufacturers and by Mack Truck, Inc., in performing vehicle repairs and periodic maintenance. Mack Truck publishes an air brake service manual that also contains individual component maintenance information. The brake maintenance section of the Mack maintenance and lubrication manual includes brake adjustment procedures and specifications; however, the manuals in use before this accident did not contain procedures for comprehensively testing the operation of dual-circuit brake systems. Also, the Mack Truck air brake service manual did not provide any system function test procedures that would have detected reversed lines or malfunctioning low-air-pressure warning switches.

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 the inoperative brake components or both, and the accident may have been prevented.

The Safety Board notes JDM's prompt postaccident inspection of its entire truck fleet as a result of the preliminary findings of this accident investigation. However, to further improve the effectiveness of the company's maintenance procedures, the Safety Board believes that the JDM Materials Company, Inc., should:

Implement procedures that will ensure that air brake manufacturers' suggested installation, inspection, and functional test procedures are adhered to by company mechanics performing maintenance on the company's truck brake systems. (H-97-35)

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-97-36 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.

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-97-35 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