Log R-402

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: March 18, 1982

Forwarded to:
Mr. John Simpson
President
New York City Transit Authority
370 Jay Street
Brooklyn, New York 11201

SAFETY RECOMMENDATION(S)
R-82-6 and -7

About 5:50 a.m. e.s.t., on December 15, 1981, the third and fourth cars of a nine-car southbound Independent Rapid Transit Line (IRT) subway train operated by the New York City Transit Authority (NYCTA) derailed just after departing Times Square Station in New York City. There were no fatalities as a result of this derailment; however, about 40 persons were treated for injuries.

The National Transportation Safety Board is conducting an investigation to determine the probable cause of this derailment. Preliminary findings indicate that the General Electric traction motor on the lead wheel set of the trailing truck of the third car (car No. 7260, a type R21 subway car) dropped onto the rotating axle after failure of both the upper and lower motor mount brackets. It appears that continued in-service operation of the car after the failure of the motor mount brackets resulted in the rotating axle's wearing away the safety lugs and a sufficient amount of the motor frame material to allow the traction motor to slip between the axle and the truck transom and then to the track.

On type R10 through R44 subway cars, all of which are similar to car No. 7260, the traction motor is attached to the truck transom with a nose mount on the upper portion of the motor frame and a foot mount on the lower portion of the motor frame. A nose mount bracket is welded to and cantilevered from the motor frame. It rests on and is bolted to a compatible companion support on the top of the truck transom. A removable key is provided for alignment of the motor in this mounting. A foot mount bracket--a substantial contoured steel block--is welded to the motor frame and bolted to a compatible support on the bottom of the truck transom. In this accident, the nose mount bracket failed at the key slot. The foot mount bracket failed through the throat of the attachment welds. Part or all of both mounting brackets remained bolted to the truck transom; there were no mounting bolt failures.

Failure of both mounts essentially leaves the traction motor, which then is connected with the truck or gearbox only through a drive coupling and the electrical wiring, free to drop. To prevent it from dropping to the running rails, two safety lugs are welded on the outside of the motor frame. If in-service operation of the car continues after the motor mounts fail, the fixed safety lugs ride on the rotating axle to support the traction motor. The degree of wear found on the traction motor frame and safety lugs

after the accident could have occurred only if the traction motor had been riding on the rotating axle for an extended period of time. A pre-service inspection was accomplished on car No. 7260 on December 10, 1981, just 5 days before the accident. It is probable that the traction motor was already in contact with the axle at the time of the inspection but was not detected.

On March 7, 1982, another IRT train derailed between Brooklyn Bridge Station and Spring Street Station while traveling northbound on the Lexington Avenue Line. Two of the 96 passengers on board the train at the time of the derailment were treated for minor injuries. Other than minor damage to the equipment, there was no further property damage reported. The derailment occurred when a traction motor on the rear truck of lead car No. 7959 (a type R28 subway car) fell to the ground. In addition to the rear truck of car No. 7959, both trucks of the second car, car No. 7762, were derailed. The traction motor mounts of car No. 7959 were reported to have been inspected during an NYCTA self-imposed inspection of the entire fleet following the traction motor mounting bracket failure and derailment on December 15, 1981. Moreover, car No. 7959 was given a "C" inspection on February 23, 1982, which would have required that specific attention be given to the traction motor mounting brackets and mount bolts.

Because a loose traction motor constitutes a serious safety hazard and increases the probability of a catastrophic derailment, and because NYCTA's inspection procedures appear to be deficient, the National Transportation Safety Board recommends that the New York City Transit Authority:

> Immediately perform a one-time, fully supervised undercar inspection of all R10 through R44 subway cars to determine if traction motor mount failure has occurred. Cars with evidence of traction motor mount failure or displaced traction motors should be removed from service until the defect has been corrected. (Class I, Urgent Action) (R-82-6)
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> Review existing traction motor periodic inspection procedures, including inspection intervals, immediately and implement necessary changes to correct any deficiencies in the procedures for detection and repair of failed traction motor mounts. (Class I, Urgent Action) (R-82-7)

BURNETT, Acting Chairman, and McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.

Jim Burnett

By: Jim Burnett
Acting Chairman