

ADOPTED: 10/11/89



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

H-545A

Date: March 19, 1990

In reply refer to: H-89-53 and -54

To Members of the School
Bus Manufacturers Institute
and Manufacturers of Van
Conversion School Buses
(address list attached)

In 1977, a series of Federal Motor Vehicle Safety Standards (FMVSS) for school buses became effective, mandating different performance standards for school buses compared to other buses. Data on the crash performance of school buses built to these standards were lacking, so the National Transportation Safety Board conducted a series of in-depth accident investigations from 1984 to 1988 to determine how well Federal school bus standards are working to protect passengers from injury and whether changes in the standards are needed.

Federal standards for the design and operation of school buses differ according to the passenger capacity and gross vehicle weight rating of the bus. The Safety Board, therefore, studied the performance of large and small school buses separately, and two reports were planned.

The first report, published in 1987, examined the crash performance of large school buses (Type C and Type D school buses) built after the new standards for school buses became effective.^{1/} The second report on school bus safety is now completed; it focuses on the performance of small poststandard school buses and vans used for school transportation (Type A and Type B school buses).

The safety issues and the basis for the subsequent recommendations issued by the National Transportation Safety Board are discussed in detail in the report about the study.^{2/} A copy of the report is enclosed. The report is based on review of past research, crash tests, and the Safety Board's investigation of accidents involving vehicles used for school transportation manufactured after April 1, 1977.

^{1/} National Transportation Safety Board. 1987. Safety study: Crashworthiness of large poststandard schoolbuses. NTSB/SS-87/01. Washington, DC. 300 p.

^{2/} National Transportation Safety Board. 1989. Safety study: Crashworthiness of small poststandard school buses. NTSB/SS/89-02. Washington, DC. 223 p.

The Safety Board found that small school buses generally provided good crash protection to passengers. Few passengers sustained more than minor injuries. Some safety shortcomings were documented, however. One shortcoming was the finding that the boarding door controls of some small school buses have no positive latch locking mechanism. Discussion of boarding door performance is in the report's sections on "Structural Integrity" (p. 52-55) and "Evacuation" (p. 61-65), and in the case summaries (appendixes B and D).

If a school bus door opens during a crash, unrestrained or improperly restrained occupants seated nearby can be ejected through the opening created. The controls for opening and closing the right front door in some small school buses appear to be poorly designed, allowing the door to open during a crash.

Door opening led to the partial ejection and death of the driver of the school van in case 8. In that accident, the unrestrained school bus driver lost control of the bus on a wet gravel road; the bus rotated 180° and overturned onto its right side in a ditch. The driver was partially ejected and then crushed under the frame of the boarding door as the bus came to rest on its side. In three other cases, investigators documented that the right front boarding door either opened during the crash or was found with damaged controls after the crash.

The design of the opening control appeared to be relatively similar in all cases in which the boarding door was a safety issue. The door control in case 8 was described in the investigator's report as follows:

The passenger loading door latch consists of a handle near the center of the vehicle which is connected to the door by a long rod. The handle latches the door closed by being swung past center in an arc. This handle is easily bumped past center, allowing the door to open--several other drivers in the school district stated that, on rough roads, the latch did not keep the door from opening. The unrestrained school bus driver may have either bumped or grabbed the door handle of the passenger boarding door as she fell against the door. The door handle on the accident bus moved easily out of the locked position. A positive latch on the door handle could prevent this occurrence.

Not only can an open door be dangerous during a crash, it can jeopardize evacuation. For example, if a door opens even partially during the crash, it creates not only an avenue of ejection, similar to a dislodged windshield, but it can easily be crushed or jammed, thus eliminating the door's use as an emergency exit after the accident. In seven cases involving Type A school buses, the right boarding door could not be used as an emergency exit because it was jammed in some manner. The school bus usually had experienced a frontal impact followed by rollover.

Therefore, as a result of its study, the National Transportation Safety Board recommends that the (members of the School Bus Manufacturers Institute and manufacturers of van conversion school buses):

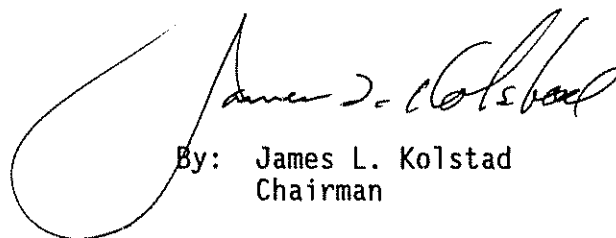
Work with National Highway Traffic Safety Administration to develop performance standards for a locking mechanism for the boarding doors of school buses with a gross vehicle weight rating of 10,000 pounds or less to eliminate the possibility of inadvertent door opening during frontal or rollover crash. (Class II, Priority Action) (H-89-53)

Provide retrofit kits for small school buses (gross vehicle weight rating of 10,000 pounds or less) currently without positive latch door control locking mechanisms. (Class II, Priority Action) (H-89-54)

Also as a result of the safety study, the National Transportation Safety Board issued Safety Recommendations H-89-46 through -52 to the National Highway Traffic Safety Administration, and H-89-55 to the National Association of State Directors of Pupil Transportation, the National Association for Pupil Transportation, and the National School Transportation Association.

The National Transportation Safety Board is an independent Federal agency with statutory responsibility "...to initiate and conduct special studies and special investigations on matters pertaining to safety in transportation..." (Public Law 93-633). The Safety Board is vitally interested in any actions taken as a result of its safety recommendations and would appreciate a response from you regarding action taken or contemplated with respect to the recommendation in this letter. Please refer to Safety Recommendations H-89-53 and -54 in your reply.

KOLSTAD, Chairman, BURNETT, LAUBER, NALL, and DICKINSON, Members concurred in these recommendations.



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