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or allow edges to be raised between fasteners in schoolbus crashes. Such edges are a source of injury to passengers.

3) The joints employed to join structural members and potential load carrying panels in schoolbuses are often inadequate and "inefficient" in the technical sense because they employ relatively few fasteners and thus do not develop more than a small fraction of the structural strength which is potentially available.

4) Other types of buses, such as intercity buses and city transit buses, exhibit much more adequate joining of structural load carrying panels than do schoolbuses. This indicates that more adequate fastening of schoolbus structures is technically feasible.

5) The question whether the increased cost of more adequately fastened schoolbus bodies would be repaid in reduced fatality and injury is difficult to determine; however, the Safety Board believes that adequate joints are necessary in justice to the innocent schoolchildren passengers.

6) The correction of this problem is not a high priority matter in relation to the total numbers of national highway losses; however, it is an important matter of justice in the field of schoolbus manufacture and operation. Not only is it unfair to children to allow the sources of injury from inadequate joining to continue, it is also undesirable to allow a source of injury to continue in one field (schoolbuses) when it is voluntarily controlled in another field (intercity and transit buses).

RECOMMENDATIONS

The National Transportation Safety Board recommends:

H-71-33a 1) That the National Education Association and the schoolbus manufacturing industry adopt a policy of using fastening methods which inhibit the raising of sharp edges and which provide much greater efficiency of joints to prevent the disintegration of schoolbus bodies. This policy might well be implemented by voluntary specifications adopted by the National Education Association and used by schoolbus purchasers and manufacturers.

H-71-33b 2) That the National Highway Safety Bureau include in its accident research investigations and studies a search for evidence of the nature of schoolbus disintegration and the significance of the disintegration phenomena in injury causation.

3) That the National Highway Safety Bureau continue its consideration of the recommendation concerning school-bus safety made by the Safety Board in its report of the grade-crossing accident at Waterloo, Nebraska, which occurred October 2, 1967.

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DEPARTMENT OF TRANSPORTATION
NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20591

OFFICE OF
THE CHAIRMAN

APR 22 1971

Honorable Douglas W. Toms
Acting Administrator
National Highway Traffic Safety Administration
400 Seventh Street, S.W.
Washington, D. C. 20591

Dear Mr. Toms:

The National Transportation Safety Board has discussed its Special Study, "Inadequate Structural Assembly of Schoolbus Bodies," with officers and members of the School Bus Manufacturing Institute and some segments of the schoolbus manufacturing industry. This study, adopted July 29, 1970, also includes two recommendations to the National Highway Safety Bureau (now the National Highway Traffic Safety Administration (NHTSA)) of the Department of Transportation.

The Board has also explained its study at a meeting of the Vehicle Equipment Safety Commission (VESC), and VESC expects to issue a standard.

There now seems to be a general sentiment in the industry to increase greatly the efficiency of the fastenings of schoolbus body joints. Some segments of the industry are concerned that the VESC standard will not provide this for all the States, or for all of the States at the same time. They anticipate and are concerned with confusion in their market and possible undercutting by some manufacturers who use very few rivets.

The industry itself indicates there has been a wide variation in the effectiveness of fastenings employed by different manufacturers. One segment of the industry, the Ward School Bus Manufacturing Company, has indicated to us they would welcome an early standard by the National Highway Traffic Safety Administration, which would specify joint strength and schoolbus body strength for the entire industry.

Significantly, although the Board's special study was released only in August 1970, the Ward Company has already manufactured and tested bus sections which resolved the problem. Mr. Ward informed the Board that his own estimate of the added cost for full fastening of schoolbus bodies was not the $300.00 estimated by the Board, but only $150.00. This cost includes increasing the number of rivets from about 38 to 126 in each bow of a typical body, and other changes.

It appears that the Ward Company, at least, intends to use the greatly increased number of rivets on their buses as a selling point. Even though the VESC requirement would not become effective until July 1972, Ward could do it much earlier.

We certainly understand that an overall structural performance test is desirable. However, if NHTSA is able to move expeditiously in this field, it is entirely possible that the schoolbus manufacturers would follow the Federal specification at an early date -- assuming that the Federal specification were at least as extensive as that issued by VESC. In any event, the VESC requirement would be preempted by a NHTSA requirement as soon as issued.

The Safety Board would appreciate any comments you may have concerning this suggestion.

Sincerely yours,

Original signed by
John H. Reed

John H. Reed
Chairman

cc: NC-1(2), NM-2, NM-3, NM-4, NM-5, NE-1, NG-1, NP-1, NS-1, NS-2, NS-10(9701.10), NE-51, NE-515, NOTATION NO. 465-C Approved by the Board April 14, 1971.
Schmieg:alw:NS-10:4/19/71