

NATIONAL TRANSPORTATION SAFETY BOARD  
WASHINGTON, D.C.

ISSUED: May 1, 1978

Forwarded to:

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President  
Motor Vehicle Manufacturers  
Association of the United States,  
Inc.  
Suite 300, 1909 K Street, N.W.  
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SAFETY RECOMMENDATION(S)

H-78-18

About 4:20 p.m., on July 14, 1977, a 1972 Ford sedan southbound on U.S. Route 69 about 19.4 miles south of McAlester, Oklahoma, went out of control on wet pavement, crossed the centerline sideways, and collided with a northbound Midas Mini Motor Home. All six persons in the sedan were killed; the driver and right-front passenger in the motor home were also killed, and the six other passengers of the motor home were injured. 1/

The left door of the motor home opened during the impact and permitted the unrestrained driver to be ejected partially from the vehicle. When the vehicle overturned, it crushed the driver between the cab and the road surface. The left door's latch, manufactured by the Ford Motor Company, is typical of automotive door latches, wherein the striker enters the latch body and is captivated in a slot formed by two rotating plates. Neither inspection nor operation of the door latch after the accident revealed any visible impairment of function. There was no obvious distortion of any part of the latch, with the exception of the externally connected lever arm, which had a very slight twist. The actuating rod for the interior handle was bent and shortened by approximately 1 7/8 inches. The crushing of the door upon impact, which bent the rod, also unlatched the latching mechanism, and kept it unlatched. The original length of this rod was 12 3/4 inches and the distorted length was 10 7/8 inches.

When a vehicle body is distorted torsionally, the transverse load developed at the door latch assembly will cause a longitudinal door foreshortening due to the impact deformation of the door panel. This

1/ For more detailed information read "Highway Accident Report: Midas Mini Motor Home/Automobile Collision, U.S. Route 69, Near McAlester, Oklahoma, July 14, 1977" (NTSB-HAR-78-2).

load acts the same as longitudinal compression forces developed in the vehicle structure under conditions of head-on or rear-end impact. When the door panel is impacted in such a way as to cause a foreshortening of the panel in the longitudinal direction, the latch is subject not only to longitudinal tensile loads but also to rotational displacement between the latch and striker, thus adversely affecting latch performance. The latch assembly should function to maintain proper engagement between the rotor and striker under load conditions.

Federal Motor Vehicle Safety Standard (FMVSS) No. 206 requires that a latch be able to withstand an ultimate longitudinal load of 2,500 lbs in the fully latched position, and 1,000 lbs in the secondary latched position, which is the attitude that exists between the latch and striker when the latch holds the door in a position less than fully closed. The standard also states that the latch must be able to withstand an ultimate transverse load of 2,000 lbs in the fully latched position and 1,000 lbs in the secondary latched position. These requirements indicate that the latch must remain in the fully latched position when subjected to an inertia load of 30g from any direction. The Society of Automotive Engineers (SAE), in its Recommended Practice J839b, has developed non-dynamic, laboratory tests on door latch assemblies to meet the requirements of FMVSS No. 206. The interdependent components of the door latch system (including the door latch, striker assembly, outside handle, key cylinder, and any connecting mechanisms) require evaluation through a static test.

The actuation of the door latch was caused by the bending of the latch remote rod due to encroaching impact deformation of the door panel. Although some possible causes of accidental door openings have been anticipated prior to experimental testing, there could be other causes that can be discovered only by evaluating the dynamics of a door that opened under crash conditions.

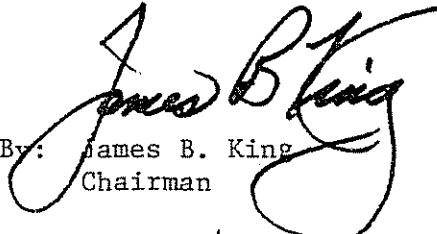
The latch assembly should be evaluated in a dynamic test even though it normally functions only under brief, low dynamic loading conditions. Whereas a static testing procedure cannot simulate the brief loading time occurring under actual impact conditions, dynamic testing in conjunction with static loading offers a more realistic simulation of actual loading conditions. Dynamic testing could be done by subjecting the latch and actuating system components to impact loads.

Therefore, the National Transportation Safety Board recommends that the Motor Vehicle Manufacturers Association of the United States, Inc.:

Inform its members of the details of the unwanted actuation of the door latch and encourage them to consider ways to prevent such failures in the manufacture of future door-latch assemblies.  
(Class I, Urgent Action) (H-78-18)

The Safety Board would appreciate being informed of the responses from association members concerning this recommendation.

KING, Chairman, McADAMS, HOGUE, and DRIVER, Members, concurred in the above recommendation.

  
By: James B. King  
Chairman

