

NATIONAL TRANSPORTATION SAFETY BOARD

WASHINGTON, D.C.

ISSUED: March 20, 1981

Forwarded to:

Mr. Charles E. Weithoner
Acting Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-81-26 through -28

On June 4, 1977, a Piper PA-28-140 Cherokee crashed near Lavina, Montana, while attempting to take off from a narrow unpaved country road. The aircraft departed the road at a bend and struck an embankment. Family members and local residents who were watching the takeoff arrived moments after the accident. They observed at least one occupant alive. She was unable to extricate herself and was asking for assistance. Repeated attempts were made to open the cabin door and break out the windows. Shortly thereafter, a small fire erupted and quickly spread to the cabin. Efforts to contain the fire with a portable chemical fire extinguisher were unsuccessful, and the occupants died in the fire.

The National Transportation Safety Board's investigation of the accident disclosed aircraft design features which can seriously compromise occupant survival and rescue. Safety Board accident records from 1975 through 1978 revealed five other Cherokee accidents in which emergency egress difficulties were experienced. These five accidents accounted for 2 fatalities and 13 injuries. Summaries of these five accidents are as follows:

On July 5, 1975, a Piper PA-28-160 experienced an engine failure while flying along a beach area near Ruskin, Florida. Since there were people on the beach the pilot ditched the aircraft in the water. The aircraft immediately took on water and sank. The pilot stated that the door was jammed. Fortunately, the three occupants were able to swim out of the aircraft through the windshield which had broken on impact.

On August 26, 1975, near Whittier, Alaska, the right wingtip of a PA-28-180 struck a tree shortly after takeoff. The aircraft rolled to the right and impacted inverted. A fire erupted immediately. The two passengers in the rear of the cabin escaped by kicking out a window. Once outside the aircraft they heard a cry for help from within. Rescuers arrived shortly thereafter and contained the fire sufficiently with a handheld fire extinguisher so that they could remove the right front seat occupant. The pilot was not rescued. The survivors sustained burn injuries.

A similar egress was made by the pilot of a PA-28-140 which crashed while attempting a crosswind landing on July 1, 1976, near Memphis, Tennessee. The pilot stalled the aircraft during an attempted go-around and struck power lines and trees. The aircraft impacted inverted and caught fire immediately. The pilot, unable to open the door, kicked out the window and escaped. He received second- and third-degree burns.

On August 7, 1976, a PA-28R-200, while executing a tight turn on final approach at Oshkosh, Wisconsin, developed a high sink rate and touched down almost simultaneously on the aircraft's right main gear, nose gear, and right wingtip. The aircraft bounced and the gear collapsed on the second touchdown. The aircraft skidded, flipped over, caught fire, and burned. The two front seat occupants escaped by kicking out a back window. The third occupant died in the fire.

The fifth accident involved a PA-28-151 which crashed on July 30, 1977, 1/2 mile short of runway 24 while attempting to land in marginal weather conditions at Martha's Vineyard Airport. The aircraft clipped the tops of the trees and impacted the ground inverted. A fire erupted immediately. The passenger door was either jammed or blocked by a fallen tree. Nevertheless, all four persons aboard, although severely burned, escaped from the burning aircraft through a broken window on the right side of the cabin.

The cabin door on the Cherokee, like several other single-engine aircraft designed for five or less persons, is the only available exit. Therefore, when the cabin door becomes jammed, blocked, or otherwise unusable during an accident, there are no alternate means of egress. Furthermore, the Cherokee door is designed with two separate latches: a locking latch located on the rearward side of the door, and a safety latch at the center top of the door which should be latched prior to flight to provide a proper seal around the door. The prompt location and operation of the top safety latch can be difficult for occupants and rescuers alike. If the occupants have not been briefed on the operation of the Cherokee door and/or their experience has been with doors with only one latch or handle, they could easily overlook the top latch. Also, rescue personnel unfamiliar with the Cherokee door may not be aware of the additional latch at the top of the door. This latch is not clearly marked and, to those who are not familiar with it, may go unnoticed in an emergency.

It is not the Safety Board's purpose to single out the Piper Cherokee as presenting a singular problem; other single-engine aircraft have just one exit. The Cherokee was identified for study as a result of its recent accident history. These accidents alerted the Safety Board to the unique Cherokee door design and the hazards associated with all single-exit aircraft in a postcrash environment, particularly one involving fire or water.

An entry door meeting the requirements of CAR 3.389 or 14 CFR 23.783 is the only required emergency exit for this class of aircraft as specified in CAR 3.387 or 14 CFR 23.807; i.e., on a single-engine aircraft with a seating capacity of five or less, no additional emergency exits are required. The Safety Board believes that additional emergency exits on small, single-engine aircraft are necessary and feasible, and in the case of the PA-28, could be easily provided. Discussions with Piper engineers have indicated that a rear window opposite the cabin door could readily be converted to an emergency exit window without airframe structural modifications. Windows on other aircraft models also could be readily converted to emergency exits without extensive alterations.

The Safety Board further believes that the airworthiness and operating regulations for general aviation aircraft specified in 14 CFR 23 and 14 CFR 91 should require exits to be easily operated with a single handle, be clearly marked as to their use, and be operable from outside the aircraft. The Board also believes that pilots should be encouraged to properly brief passengers on the emergency exits regardless of aircraft size or passenger capacity.

Small, single-engine aircraft represent a large portion of the general aviation fleet. Currently, there are over 19,000 active Cherokees in a fleet of over 198,000 single-engine aircraft. The Safety Board believes that an important increase in the level of protection offered to the general aviation flying public as a whole can be achieved by measures to improve egress from small, single-engine aircraft in an emergency.

Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Amend 14 CFR 23.783 to require that each external door on all aircraft manufactured after a specified date can be opened using only one handle or latching mechanism and that the means of operation be simple and apparent. (Class II, Priority Action) (A-81-26)

Amend 14 CFR 23.807(a)(1) to require all aircraft with a seating capacity of two or more, excluding aircraft with canopies, manufactured after a specified date to have at least one emergency exit located on the opposite side of the cabin from the main door and to require that each emergency exit can be opened from both the inside and the outside of the aircraft. (Class II, Priority Action) (A-81-27)

Amend 14 CFR 23.783, 14 CFR 23.807(b)(3), and 14 CFR Part 91 to require external doors and emergency exits of aircraft to be conspicuously marked on the outside with directions for opening the door. (Class II, Priority Action) (A-81-28)

KING, Chairman, DRIVER, Vice Chairman, and McADAMS, GOLDMAN, and BURSLEY, Members, concurred in these recommendations.


By: James B. King
Chairman