

NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C.

ISSUED: November 21, 1980

Forwarded to:

Honorable Langhorne M. Bond
Administrator
Federal Aviation Administration
Washington, D.C. 20591

SAFETY RECOMMENDATION(S)

A-80-120 through -122

On Monday, November 17, 1980, a Piper PA-38 crashed and two persons were killed near Santa Rosa, California, when the plane's engine failed shortly after takeoff. The engine, a Lycoming O-235-L2A, was manufactured in 1979 and had accumulated about 70 hours at the time of the accident.

Safety Board investigators and a representative of the engine manufacturer disassembled the engine and found that two intake valve pushrods had failed, and as a result their length had been shortened. One of the pushrods was too short to operate the rocker arm; the other pushrod was still operating its rocker arm, but the amount of valve opening and the valve timing had been reduced considerably.

The pushrods consisted of a hollow aluminum tube with a steel ball-end insert which was pressed into the end of the tube. When the rods failed the aluminum tube bulged immediately below the flange of the steel insert. One aluminum tube had split longitudinally and had peeled back, and as a result, the steel insert had been forced into the tube more than one-fourth inch. The operator of the PA-38 is inspecting all O-235 engines in his fleet. Thus far he has discovered two other engines with similar pushrod damage. Both were Lycoming O-235-L2C. In one case, the tube bulging was visible on two rods but was not considered severe; the engine had 350 service hours since new. In the other case, all eight tubes were severely compressed or bulged and were beginning to split; this engine had 1,050 service hours since new.

The engine manufacturer has indicated that it is aware of pushrod problems in service, but that it has not been aware of any failures that have progressed to the point of engine failure. According to the manufacturer, the rate of occurrence of these failures has been decreasing, and it has no plans to take further corrective action.

However, in view of the potentially serious consequences associated with an engine failure, the Safety Board believes that immediate action to preclude further engine failures of this type is warranted.

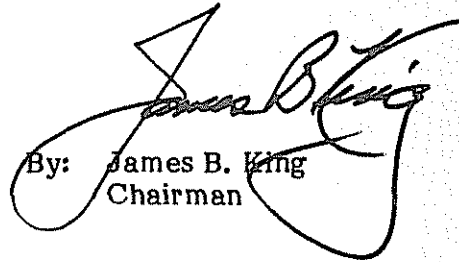
Therefore, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an emergency Airworthiness Directive requiring, before further flight, (1) the immediate inspection of pushrods, of all Lycoming O-235-L2A and -L2C engines and (2) replacement of damaged or bulging aluminum pushrods. (Class I, Urgent Action) (A-80-120)

Establish, in consultation with the manufacturer, an inspection interval which will assure that damaged pushrods are discovered before the damage progresses to the point of engine failure. (Class II, Priority Action) (A-80-121)

Issue an Airworthiness Directive requiring that all Lycoming O-235-L2A and -L2C engines be inspected at the established interval and that damaged pushrods be replaced. (Class II, Priority Action) (A-80-122)

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


By: James B. King
Chairman