

NATIONAL TRANSPORTATION SAFETY BOARD WASHINGTON, D.C.

ISSUED: April 9, 1980

Forwarded to:

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

SAFETY RECOMMENDATION(S)

A-80-26

On February 2, 1980, a Piper Model PA-22-135, N3747A, crashed at Princeton, Illinois, after the right wing separated in flight. On February 18, 1978, a Piper Model PA-22, N1693P, sustained an inflight failure of the right wing and plummeted to the ground at Camden, Tennessee. In each accident, both persons aboard were killed.

Both investigations disclosed that the right front fork assembly, attaching the front wing lift strut to the fuselage, failed in the threaded portion due to metal fatigue. Both assemblies were cadmium plated, steel fork models and were configured with cut-threads. Forks with rolled-threads are stronger and less prone to metal fatigue. For this reason, Piper Aircraft Corporation currently produces these forks with rolled-threads only, although replacement forks with cut-threads may still be available.

On April 21, 1977, a related, nonfatal accident involving a Piper Model J-5, N38702, occurred at Hindsville, Arkansas. The investigation disclosed that the left rear lift strut fork failed and the strut detached itself from the fuselage. Despite severe control difficulty, the pilot made a successful emergency landing.

Airworthiness Directive 58-10-02, applicable to Piper Models PA-22, -20, -19, -18, -16, -14, and -12, J-4, J-5, AE-1, and HE-1 series aircraft, requires that all lift strut forks be replaced every 1,000 hours on seaplanes and every 2,000 hours on landplanes. Service experience indicates that continual operation on rough terrain or rough water could cause fatigue failure of the fork. The forks, P/N 14481-00, are identical on all models except for the J-4 where it is P/N 11431.

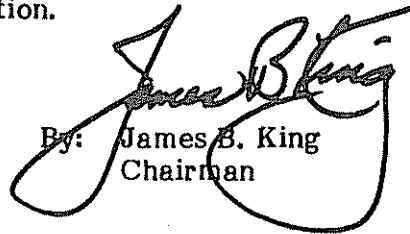
The failed fork from N3747A, a landplane, had been magnetically inspected in 1958 just before being installed in this aircraft. Maintenance records indicate that the fork had accumulated approximately 2,000 flight-hours at the time of the accident. The failed forks from landplanes N1693P and N38702 had accumulated 1,899 flight-hours and 830 flight-hours, respectively.

Recently, several incidents of cracking or breaking of these forks have been reported to the Federal Aviation Administration's Maintenance Analysis Center. One of these incidents involved another Piper Model J-5 airplane and occurred in flight. The right rear lift strut fork had broken in half in the threaded area after accumulating only 236 flight-hours.

In view of the above, it would appear that the requirements outlined in Airworthiness Directive 58-10-02 are not conservative enough to ensure an adequate margin of safety under all conditions. Consequently, the National Transportation Safety Board recommends that the Federal Aviation Administration:

Issue an Airworthiness Directive requiring an immediate inspection of all lift strut forks on those Piper Aircraft enumerated in Airworthiness Directive 58-10-02 for indications of cracking. Institute fork replacement/inspection intervals more stringent for forks with cut-threads than those specified in Airworthiness Directive 58-10-02. Limit acceptable replacement forks to those with rolled-threads. (Class I, Urgent Action) (A-80-26)

KING, Chairman, DRIVER, Vice Chairman, McADAMS, GOLDMAN, and BURSLEY, Members, concurred in this recommendation.


By: James B. King
Chairman