

Log 1959



National Transportation Safety Board

Washington, D.C. 20594

Safety Recommendation

Date: April 10, 1987

In reply refer to: A-87-40 through -42

Honorable Donald D. Engen
Administrator
Federal Aviation Administration
Washington, D.C. 20591

On March 30, 1987, a Piper PA-28-181, N8191V, crashed following an in-flight wing separation at the wing root attachment while in cruise flight at low altitude near Marlin, Texas. The pilot, the sole occupant, received fatal injuries. The airplane, which was owned and operated by Griffin Pipeline Patrol Company, was patrolling a pipeline right of way at the time of the accident.

Although the investigation is continuing, preliminary examination by the Safety Board's Materials Laboratory disclosed features indicative of fatigue cracking in the separated left wing main spar. Fatigue cracking initiated at two locations just outboard of the outermost forward attachment bolt hole in the lower T-shaped spar cap of the main spar. Fatigue propagation was upward through the thickness and chordwise completely through the forward leg of the lower spar cap (about 1.3 inches). A small area of fatigue cracking also was noted in the forward web fracture piece adjacent to the forward outboard attachment bolt hole.

Examination of the left wing at the accident site disclosed evidence of an approximate 10-inch-long crack that had been stop-drilled in the upper wing skin. The crack was located forward of the main spar at the wing root and was oriented chordwise parallel to the fuselage.

Examination of the accident airplane's log showed the airplane had acquired approximately 7,488 service hours since new.

After the accident, another PA-28-181 operated by the Griffin Pipeline Patrol Company and having a total service life of 7,878 hours, was examined for evidence of cracks in the wing root. Examination of the upper skin disclosed cracks that had been stop-drilled similar to those found on the accident airplane. Both wings were removed, and a visual inspection of the spar caps at the outboard attachment bolt holes disclosed crack indications in areas corresponding to the fatigue crack initiation area of the accident airplane.

Representatives of Piper Aircraft Corporation (Piper) indicate that other Piper models have wing spar structures similar to that of the PA-28.

The Safety Board is concerned that numerous Piper model 28, and possibly other Piper model airplanes that have relatively high time service hours, also may have similar fatigue cracking in the wing main spars. Because such cracking could lead to a catastrophic wing separation under normal flight conditions, the Safety Board believes that the Federal Aviation Administration needs to take immediate action to preclude the possibility of further failures.

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

Issue an airworthiness directive to require an immediate inspection of the main wing spars and upper wing skin at the wing root of Piper PA-28 airplane with over a specified number of service hours for evidence of cracking. Particular attention should be placed on inspecting the bottom surface of the lower spar cap adjacent to the outboard forward attachment bolt hole at the wing root attachment, as well as along the upper wing skin adjacent to the fuselage just forward of the main spar. (Class I, Urgent Action) (A-87-40)

Based on the inspection described in Safety Recommendation A-87-40, establish a recurrent periodic inspection of the wing root area for cracks by an approved method to identify those cracks before they become critical. (Class I, Urgent Action) (A-87-41)

Conduct a Directed Safety Investigation to inspect the lower spar cap and upper skin on other Piper model airplanes that have a similarly configured wing spar structure to that of the model PA-28 airplane. (Class I, Urgent Action) (A-87-42)

BURNETT, Chairman, GOLDMAN, Vice Chairman, and LAUBER and NALL, Members, concurred in these recommendations.


By: Jim Burnett
Chairman