

National Transportation Safety Board

Office of Aviation Safety

Washington, DC 20594



WPR23LA317

EXAMINATION REPORT

September 11, 2023

A. ACCIDENT

Location: Fullerton, California
Date: August 8, 2023
Time: 1500 LCL
Airplane: Piper PA-24-260, N503JA

B. EXAMINATION REPORT

IIC Elliott Simpson
National Transportation Safety Board

Party Coordinator Craig Schneider
Federal Aviation Administration FSDO
Long Beach, CA

C. SUMMARY

The bolt, nut and washer that connected the stabilator tab actuator to the control tab were missing. Circumferential scoring to the tab surface adjacent to the connecting bolt indicated that the bolt was loose for a period before it either failed or the nut came completely loose. No other flight control anomalies were noted, and the damage sustained to the stabilator was consistent with aerodynamic flutter.

The airplane had undergone an annual inspection, completed on July 1, 2023, 6.5 flight hours before the accident. A cursory examination indicated the airplane to be in good general condition.

D. DETAILS OF THE EXAMINATION

1.0 Examination

Examination of the airframe revealed a crack in the spar web and lower cap of the right stabilator, about midspan (figure 1). The stabilator had creased and preformatted at its leading edge in the midspan area. There was no evidence of corrosion or preexisting damage to any of the failed structure.

Examination of the stabilator tabs revealed that both were in place at their respective hinges, and both sustained perforations to their trailing edges and a diagonal crease on their inboard sides next to the control tabs (figure 2).

All flight controls functioned normally when operated from the cockpit. The stabilator trim assembly was intact and functional, with no slop or looseness within the system.

However, the stabilator tab actuator was disconnected from the control tab, and the bolt, nut and washer that connected them were missing (figure 3).

The tabs sustained extensive scrape and peening damage to both their inner and forward surfaces consistent with high frequency oscillatory contact with the actuator arm fitting (figures 4, 5). The paint around the end of the tab actuator arm had chipped away revealing similar peening damage to its steel surface (figures 6).

Neither the bolt nor the nut that connected the tabs to the actuator were located, and although there was circumferential scoring to the tabs in the vicinity of the bolt hole (figure 7), neither bolt hole appeared to be unduly elongated. Likewise, the bushing within the actuator did not appear to be out of round.

According to the airplanes illustrated parts catalog, the actuator retaining nut was supposed to be a self-locking type, with no provisions for a cotter pin. According to the mechanic who had just serviced the airplane, he did not remove or replace either the bolt or the nut during the annual inspection and performed a functional check of the pitch trim system rather than a disassembly, with no anomalies noted. Examination of the maintenance logbooks did not reveal any evidence that the nut had ever been replaced.

2.0 Examination Photos



Figure 1 - Damage to right stabilator



Figure 2 - Stabilator control tab damage.



Figure 3 - Stabilator tab actuator disconnected.



Figure 4 - Right stabilator tab.



Figure 5 - Left stabilator tab.



Figure 6 - Tab actuator arm.



Figure 7 - Circumferential scoring around tab bolt hole.

Submitted by:

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