



National Transportation Safety Board Aviation Incident Data Summary

Location:	Tacoma, WA	Incident Number:	SEA05IA115
Date & Time:	06/02/2005, 0600 PDT	Registration:	N27PG
Aircraft:	Piper PA-46-350P	Injuries:	1 None
Flight Conducted Under:	Unknown		

Analysis

During an annual inspection, a crack was found in the lower wing spar cap of the subject aircraft. That discovery was reported via email to the NTSB's Northwest Regional Office. It was later determined that a fatigue crack had initiated at a rivet hole on the horizontal surface of the right wing lower spar cap, and propagated through approximately 80 percent of that surface. The NTSB materials laboratory determined that there was no evidence of inclusions, discontinuities, corrosion pitting, or material defects at the crack origins. All dimensional measurements were within engineering drawing specifications, and hardness and conductivity parameters for the aluminum alloy specified for the wing spar cap material were within material tolerances. During the investigation it was determined that at the time the crack was detected, the aircraft had flown 5,273 hours. Of that total time, approximately 1,100 hours were flown as part of a low-level pipeline patrol mission. It was further determined that as part of the certification process, Piper Aircraft had determined that the "general use" safe time in service (TIS), adjusted with a scatter pattern of eight, was 10,723 hours for the wing structure. The certification process did not include determination of a safe time in service when any portion of the aircraft's life included being used in a "pipeline survey" mission profile. The investigation also determined that the two rivet holes through which the crack passed (one of which was the point of origin) were the locations where two of the rivets that held the lower wing skin on in an area addressed by Piper Service Bulletin 796B, Part One. This service bulletin was published by Piper to address "loose and working rivets along the lower spar cap." In part, the bulletin states, "If this condition exists, and is left uncorrected over an extended period of time, the structural integrity of the wing could be compromised." The actions delineated in this service bulletin had not been performed on this aircraft (N27PG) even though loose and working (smoking) rivets were found at the subject location on the lower skins of both wings.

Probable Cause

The National Transportation Safety Board determines the probable cause(s) of this incident to be: The initiation and propagation of a fatigue crack, over 5,273 hours of cyclic in-flight usage, through approximately 80 percent of the aircraft's right wing spar lower cap.

Findings

Occurrence #1: AIRFRAME/COMPONENT/SYSTEM FAILURE/MALFUNCTION
Phase of Operation: UNKNOWN

Findings

1. (C) WING,SPAR - FATIGUE
2. (C) WING,SPAR - FRACTURED

Pilot Information

Certificate:	Age:
Airplane Rating(s):	Instrument Rating(s):
Other Aircraft Rating(s):	Instructor Rating(s):
Flight Time:	

Aircraft and Owner/Operator Information

Aircraft Make:	Piper	Registration:	N27PG
Model/Series:	PA-46-350P	Engines:	1 Reciprocating
Operator:	Wade H. Perrow	Engine Manufacturer:	Lycoming
Operating Certificate(s) Held:	None	Engine Model/Series:	TIO-540-AE2A
Flight Conducted Under:	Unknown		

Meteorological Information and Flight Plan

Conditions at Accident Site:	Condition of Light:
Observation Facility, Elevation:	Weather Information Source: Unknown
Lowest Ceiling:	Wind Speed/Gusts, Direction: / ,
Temperature:	Visibility
Precipitation and Obscuration:	
Departure Point:	Destination:

Airport Information

Airport:	Runway Surface Type:
Runway Used:	Runway Surface Condition:
Runway Length/Width:	

Wreckage and Impact Information

Crew Injuries:	1 None	Aircraft Damage:	Minor
Passenger Injuries:	N/A	Aircraft Fire:	None
Ground Injuries:	N/A	Aircraft Explosion:	None
Latitude, Longitude:	47.268056, -122.578056		

Administrative Information

Investigator In Charge (IIC): Orrin K Anderson

Adopted Date: 10/03/2006

Investigation Docket: NTSB accident and incident dockets serve as permanent archival information for the NTSB's investigations. Dockets released prior to June 1, 2009 are publicly available from the NTSB's Record Management Division at pubinq@ntsb.gov, or at 800-877-6799. Dockets released after this date are available at <http://dms.nts.gov/pubdms/>.

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