FAA
Aviation Safety

SPECIAL AIRWORTHINESS INFORMATION BULLETIN

SAIB: CE-14-07
SUBJ: WING SPAR – Main Spar Lower Cap Cracks **Date:** December 12, 2013

This is information only. Recommendations aren't mandatory.

CORRECTED: Figures 2 and 3 have had their labels corrected to appropriate positions.

Introduction

This Special Airworthiness Information Bulletin (SAIB) alerts you, owners and operators of certain **Piper Aircraft, Inc. (Piper) Models PA-31*, PA-31-300, PA-31-325, and PA-31-350** airplanes, of cracking discovered in the wing main spar lower cap at the aircraft centerline spar splice plate. This SAIB also provides guidance on recommended inspections for these Piper airplane models at the damage location.

*Note: The Model PA-31 may also be identified as a PA-31-310, even though the PA-31-310 is not a model recognized by the Federal Aviation Administration (FAA) on the type certificate data sheet.

At this time, this airworthiness concern has not been determined to be an unsafe condition that would warrant AD action under Title 14 of the Code of Federal Aviation Regulations (14 CFR) part 39.

Background

During a teardown of a Piper Model PA-31-350, two crack indications were discovered in the main spar lower cap fastener holes common to the centerline splice plate (See Figures 1 through 3 to better identify the damage location). The indications resulted from the bolt hole eddy current inspection (BHEC) method in report DOT/FAA/AR-07/64 "Teardown Examination of a 1975 Piper Navajo Chieftain Model PA 31-350 Airplane". The cracks were confirmed by metallurgical lab evaluation.

Note: The FAA previously issued Airworthiness Directive (AD) 98-09-25, which requires replacement of the lower spar splice plate and reworking the lower spar caps.

Note: The Australian regulatory authority has issued life limits on the wing spar (e.g., 13,000 hours for Model PA-31-350 airplanes).

Item 1: The first crack was discovered in the right wing main spar lower "T-shaped" cap (Piper P/N 40420-23) in the outboard-most fastener hole common to the spar splice plate. This damage measured 0.020" and was confirmed as a standard fatigue crack.

Item 2: The second crack was discovered in the left wing main spar lower cap "L-shaped" aft reinforcing angle (Piper P/N 44677-16) in the inboard-most fastener hole common to the spar splice plate. This damage measured 0.054" deep x 0.34" long and was confirmed as a stress corrosion crack.

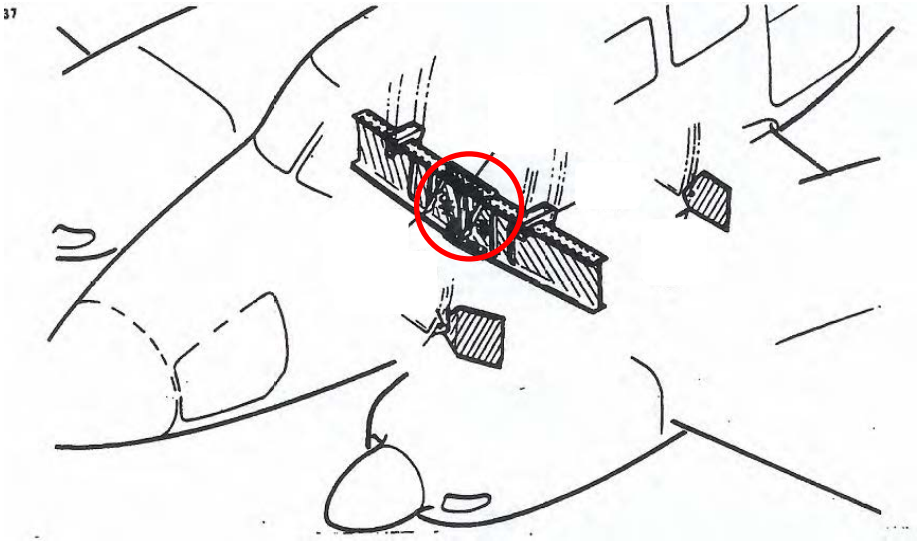

Figure 1 – Aircraft-level view of damage area

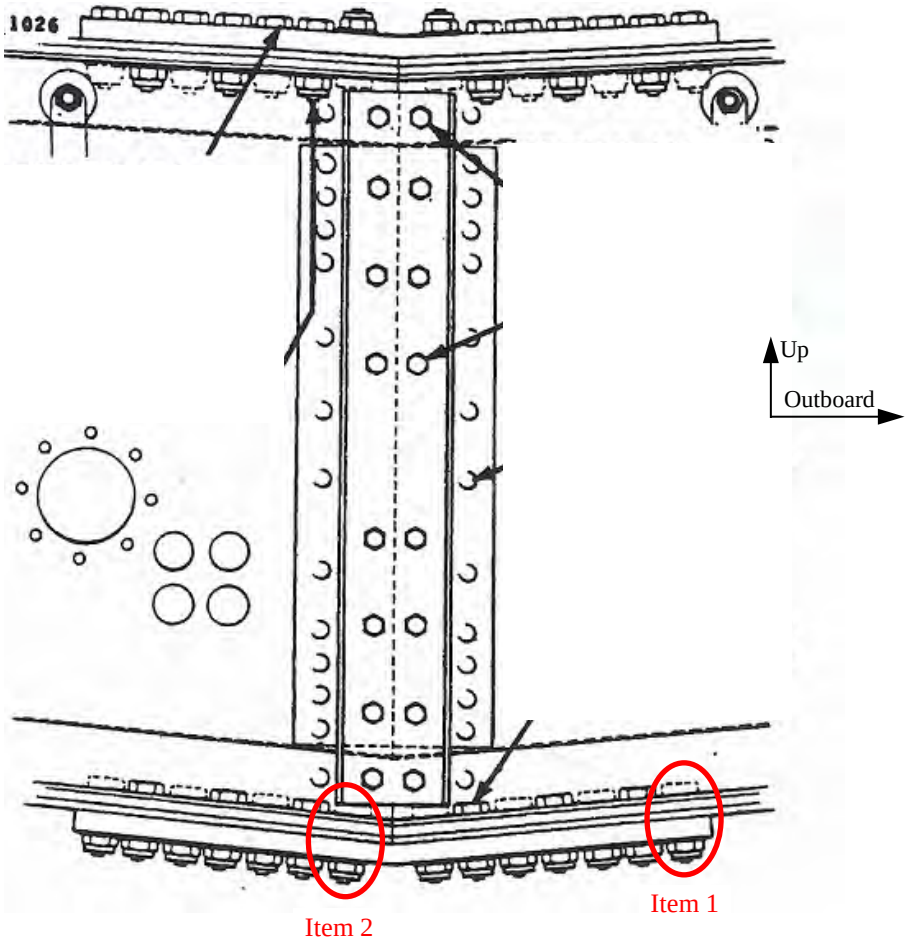

Figure 2 – Detail view of damage area (*view looking aft*)

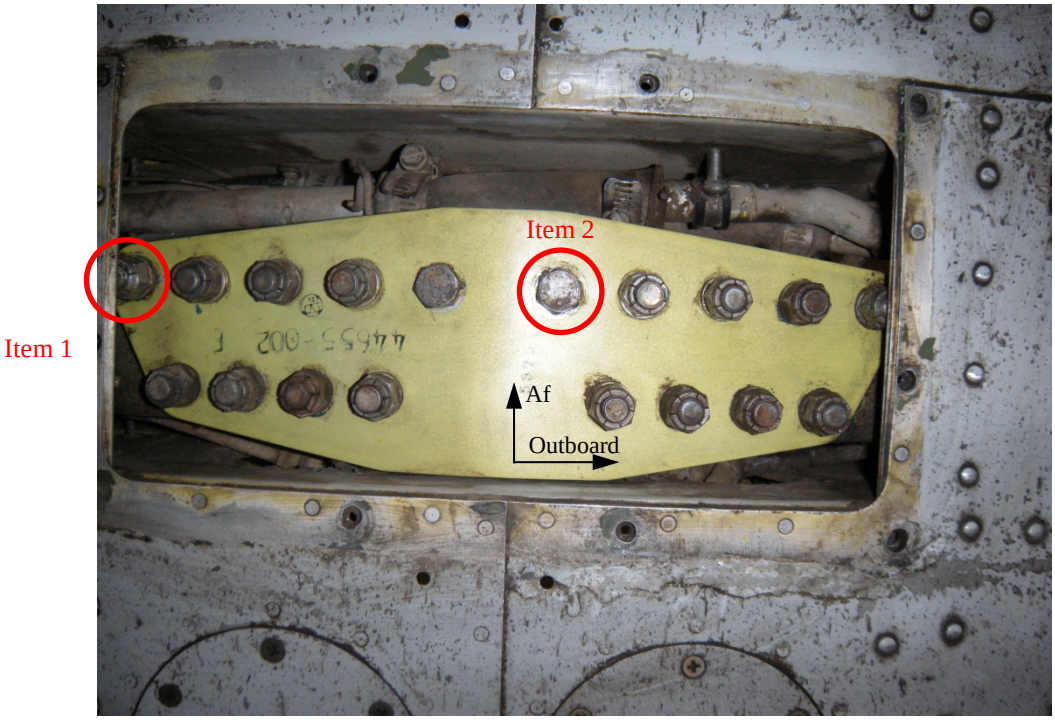

Figure 3 – Detail photographic view of damage area (*view looking up*)

Recommendations

The FAA recommends Piper airplane models PA-31, PA-31-300, PA-31-325, and PA-31-350 be inspected at the times in paragraph (a) using the methods in paragraph (b):

(a) Inspection times

- Airplanes that <u>have not</u> reached the compliance time (i.e., 6,000 or 13,000 hours) of or completed AD 98-09-25

  ✓ Initially inspect during compliance with AD 98-09-25.

  ✓ Repetitively inspect this area thereafter at intervals not to exceed 6,000 hours for Models PA-31, PA-31-300, PA-31-325 airplanes and at intervals not to exceed 13,000 hours for Model PA-31-350 airplanes.

  <u>Note</u>: The repetitive inspection does not require any action from the AD to be repeated, but only coincides with the initial compliance time.

- Airplanes that have reached the compliance time of or completed AD 98-09-25

  ✓ Initially inspect within the next 250 hours.

  ✓ Repetitively inspect this area thereafter at intervals not to exceed 6,000 hours for Models PA-31, PA-31-300, PA-31-325 airplanes and at intervals not to exceed 13,000 hours for Model PA-31-350 airplanes.

  Note: The repetitive inspection does not require any action from the AD to be repeated, but only coincides with the initial compliance time.

(b) Inspection methods

The aircraft should be jacked and shored per the maintenance manual to relieve the weight of the wings. The FAA recommends using the eddy current inspection methods in DOT/FAA/AR-07/64. Specifically, reference the following methods in Appendix A:

- JASC 5740, Wing Main Spar Splice Attachment Points – Surface Scan Eddy-Current Inspection

- JASC 5740, Wing Main Spar Splice Attachment Points – Bolthole Eddy-Current Inspection

Notes:

- Disassembly of wing as described in the AR-07/64 report is not required.

- The bolt hole inspection area covers the 9 inboard-most bolt holes on either side of the wing main spar lower cap centerline splice for a total of 18 holes.

- The two outermost bolt holes may have to be evaluated from the top due to interference from the fuselage lower skin.

Repair or replace damaged components if you find damage (cracks, corrosion, etc.). Piper Aircraft, Inc. has experience with repairs and rework in this area. Report damage to the FAA as a Malfunction/Defect Report (MDR) or Service Difficulty Report (SDR).

References

- DOT/FAA/AR-07/64 "Teardown Examination of a 1975 Piper Navajo Chieftain Model PA 31-350 Airplane"
  http://www.tc.faa.gov/its/worldpac/techrpt/ar0764.pdf

- Airworthiness Directive 98-09-25
  http://www.airweb.faa.gov/Regulatory_and_Guidance_Library/rgAD.nsf/0/E848EB69367B0346862569AC005E03D6?OpenDocument

- FAA MDR/SDR Reporting Site
  http://av-info.faa.gov/sdrx/

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