American Champion Aircraft Corp. Rochester, WI 53167

Service Letter : 406 Revision A

Date: May 6, 1998

Title: Wood Spar Inspection

Applicable Models: All Model 7's, 8's and 11's with wood spar wings

Description: There have been reports of cracks developing in wood spars, both front and rear. There are many possible causes to the cracking including: high flight time, wing damage history, high acrobatic time, over-stress history, or having been exposed to changes in humidity over several years. Compression cracks have been found emanating from the upper and lower surfaces of the front and rear wing spars at both ends of the reinforcement plate for the lift strut attachment. Longitudinal cracks have been reported in all areas of both front and rear spars, including through the wing root. See figure 1 for example locations of spar cracks.

Approval: Revision A to this service letter is approved by the FAA, Manager, Chicago Aircraft Certification Office, ACE-115C, by letter dated May 6, 1998, as an alternative method of compliance with AD 98-05-04, paragraphs (a)(1), (a)(2), (a)(4) and (f), only.

Compliance: American Champion Aircraft recommends that the inspection presented herein be accomplished before acrobatic flight, within the next 30 days, or 10 hours of flight and at each 100 hour / annual inspection, thereafter. Also, immediate inspection is mandatory if the aircraft is involved in an over stress condition, tip ground strike, or nose over.

The inspection procedures described herein are not intended to be a substitute for a properly performed 100 hour / annual inspection. Refer to Advisory Circular (AC) 43.13-1A: Acceptable Methods, Techniques, and Practices; Aircraft Inspection and Repair.

Inspection: Remove all wing inspection covers and wing root gap cover. Using traditional (Sides/Ends) methods, (such as flashlight and mirror) inspect full span along the front and rear wing spars for longitudinal cracks through bolt, nail, and spacer holes. Inspect the butt end of both spars for cracks. Additional inspection holes should be added as necessary to do a thorough inspection and check all areas of concern. Service Letter 417, Revision C, may be used as a guide for installing additional inspection holes.

Inspect for loose or missing rib nails per Service Letter C-139. If loose or missing nails are found, inspect spar by the rib for damage resulting from the rib rubbing against the spar. If the friction between the rib and spar has broken the wood grain completely across the spar and more than 1/16" deep, this is cause for rejection. Also inspect for nail hole elongation. Rejection must also occur if the nail holes have elongated such that wood grains are broken more than 1/16".

Inspection: The only area where it is possible to positively identify a compression crack is on (Bottom/Top) the top and bottom surfaces of the spar. Both front and rear spars need to be inspected. The key areas to be concerned with are shown in figure 1. Additional inspection holes may be necessary to do a thorough inspection. Service Letter 417, Revision C, may be used as a guide for installing additional inspection holes.

> ***Warning :*** *Compression failures are often difficult to detect with the unaided eye. Do not expect an open crack or gap. Compression failures start as barely visible, minute, jagged series of lines running cross grain on the top or bottom of the spar.*
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> ***Important :*** *The initial inspection described below does not guarantee adequate access to complete the inspection and, is not recommended for inspectors without wood compression failure experience. Also, this method is inadequate for aircraft with wing damage history since last spar inspection.*

For initial inspection of the spar top, a high intensity flexible light (for example: ‘Bend-A-Light’) and small inspection mirror can be used in conjunction with a small wooden wedge. First temporarily push the leading edge skin away from the front spar cap gently with the wooden wedge. After closely illuminating the area of concern with the ‘Bend-A-Light’, inspect, as closely as possible, with the small inspection mirror. This method is useful at the ends of the doubler plates on top of the front spar. This is considered an initial inspection only. If there are any questionable findings, further inspection through additional inspection holes is required.

For initial inspection of the spar bottom, a high intensity flexible light and two mirrors can be used. After resting one mirror on the fabric under the area of concern and placing the ‘Bend-A-Light’ adjacent to the area, inspect with the other mirror, using the reflection off of the former mirror. Again, this is considered an initial inspection only. If there are any questionable findings, further inspection through additional inspection holes is required.

Note : It may be helpful during compression failure inspection to apply upward or downward force at the wing tip.

Alternatively, the top and bottom of the front and rear spar may be inspected through inspection holes on the bottom of the wing using a flexible probe borescope.

Instructions: If any damage was found in above inspections, it requires that the spar be repaired or replaced. Minor chafing and small indentations are not cause of rejection. Spar repair shall be accomplished in accordance with AC 43.13-1A Acceptable Methods, Techniques and Practices or other Federal Aviation Administration approved data.