

EMERGENCY AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

U.S. Department
of Transportation
**Federal Aviation
Administration**

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DATE: March 2, 2005

AD #: 2005-05-52

Send to all owners and operators of The Cessna Aircraft Company (Cessna) Models 402C and 414A airplanes. This AD applies to all Models 402C and 414A airplanes that do not have a spar strap modification incorporated on each wing spar following the original release of (or a later FAA-approved revision to) Cessna Service Bulletin MEB02-5 and Cessna Service Kit SK402-47 (currently at MEB02-5 Revision 2 and SK402-47B).

Discussion

What events caused previous FAA AD action? The FAA has received reports of (and is analyzing data from) cracks found in the wings of two Cessna Model 402C airplanes.

On the first airplane, early information indicates the airplane had severe cracking on its left wing in the vicinity of the forward spar and outboard engine beam. The main lower spar cap had completely failed at about Wing Station (WS) 114. The airplane also had cracks in the lower wing skin and the web splice doubler. Also found were two popped rivets: one between the heat shield and the wing skin and another between the factory installed web splice doublers and web. The airplane had 20,355 total hours time-in-service (TIS).

During the airplane's most recent flights before the cracking was found, the pilot noticed that roll trim was required. The flights required the pilot to use aileron trim for level flight to keep the wings level. The airplane landed safely and inspection revealed the cracks.

On the second airplane, fatigue cracks were found at about WS 114 in the main lower spar cap of another Model 402C airplane that had over 20,000 total hours TIS.

Fatigue analysis shows that similar fatigue cracks could also develop in the wings of the Model 414A airplanes.

Airworthiness Directive (AD) 2000-23-01, Amendment 39-11971 (65 FR 70645), required repetitive visual inspections of the forward, aft, and auxiliary wing spars for cracks on Cessna Model 402C airplanes. These inspections are at intervals not to exceed 110 hours TIS.

Logbook records indicated that both airplanes with cracked spars were in compliance with AD 2000-23-01.

The FAA's analysis of the incidents presented above showed that, in the interim, the inspections of AD 2000-23-01 should be done more frequently and particular attention paid to certain areas.

Therefore, FAA issued Emergency AD 2005-05-51 to detect and correct cracking in the wing spars of the Cessna Models 402C and 414A airplanes before the cracks grow to failure. Such a wing failure could result in the wing separating from the airplane with consequent loss of control of the airplane.

Emergency AD 2005-05-51 superseded AD 2000-23-01 and:

- required the visual inspections of the forward, aft, and auxiliary wings spars for cracks more frequently on Model 402C airplanes including special emphasis areas;
- added inspection requirements for the Model 414A airplanes; and
- included provisions to position the airplane to a home base, hangar, maintenance facility, etc.

Emergency AD 2005-05-51 does not affect those airplanes that incorporate a spar strap modification on each wing following the original release of (or a later FAA-approved revision to) Cessna Service Bulletin MEB02-5 and Cessna Service Kit SK402-47 (currently at MEB02-5 Revision 2 and SK402-47B).

What has caused this particular AD action? Emergency AD 2005-05-51 was considered an interim action to immediately require visual inspection of the forward, aft, and auxiliary wing spars for cracks. The intent was to detect immediate and existing cracking before it grew to wing failure.

The FAA has also received a report of a third crack found at WS 112 on a Model 402C airplane.

—Cessna has developed new inspection techniques (eddy current) for the forward spar that are more effective at detecting cracks before the structural integrity of the wing is compromised. These inspection techniques will allow for longer intervals between repetitive inspections than in emergency AD 2005-05-51.

Recent fatigue analysis that Cessna did and the FAA reviewed reveals that eddy current inspections of the forward wing spars combined with visual inspections of the aft and auxiliary spars will address the unsafe condition of these airplanes until long-term continued operational safety is assured through the Cessna-developed and FAA-approved spar strap modifications. Specifically:

- the eddy current inspection will replace the visual inspection of the forward spar that emergency AD 2005-05-51 currently requires; and
- the visual inspections of the aft and auxiliary spars will be maintained from emergency AD 2005-05-51, but will only be required repetitively every 100 hours TIS instead of every 15 hours TIS.
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Cessna has issued the following service information to include procedures to eddy current inspect the Models 402C and 414A airplanes:

- Cessna Service Bulletin MEB99-3, Revision 2, dated February 28, 2005 (Model 402C); or
- Cessna Service Bulletin MEB00-7, Revision 2, dated February 28, 2005 (Model 414A).

The FAA's Determination

After careful review of all available information related to the subject presented above, including the above-referenced service bulletins, FAA has determined that:

- the forward wings spars should be inspected using eddy current methods on Cessna Models 402C and 414A airplanes;
- the visual inspections of the aft and auxiliary spars should be maintained from emergency AD 2005-05-51 (but not inspected as often);
- AD action should be taken to detect and correct cracking in the wing spars before the cracks grow to failure. Such a wing failure could result in the wing separating from the airplane with consequent loss of control of the airplane; and
- the action will be issued as an emergency AD and will supersede emergency AD 2005-05-51.

Presentation of the Actual AD

This rule is issued under 49 U.S.C. Section 44701 (formerly section 601 of the Federal Aviation Act of 1958), pursuant to the authority delegated to me by the Administrator, and is effective immediately upon receipt of this action.

2005-05-52 THE CESSNA AIRCRAFT COMPANY: Directorate Identifier 2005-CE-07-AD.

When Does This AD Become Effective?

- (a) This emergency AD becomes effective upon receipt.

Are Any Other ADs Affected By This Action?

- (b) This AD supersedes emergency AD 2005-05-51, which superseded AD 2000-23-01.

What Airplanes Are Affected by This AD?

- (c) This AD affects Model 402C and 414A airplanes, all serial numbers, that:

- (1) are certificated in any category; and

(2) do not incorporate a spar strap modification on each wing spar following the original release of (or a later FAA-approved revision to) Cessna Service Bulletin MEB02-5 and Cessna Service Kit SK402-47 (currently at MEB02-5 Revision 2 and SK402-47B).

What is the Unsafe Condition Presented in This AD?

(d) This AD is the result of extensive cracks found on three wing spars of the affected airplanes. We are issuing this AD to detect and correct cracking in the wing spars before the cracks grow to failure. Such a wing failure could result in the wing separating from the airplane with consequent loss of control of the airplane.

What Must I do to Address This Problem?

(e) Visual Inspections for all Model 402C airplanes With Fewer than 15,000 Hours Total Time-in-service (TIS): Initially inspect upon accumulating 10,000 hours TIS on the airplane or at the next inspection that would have been required by AD 2000-23-01 or emergency AD 2005-05-51, whichever occurs later. Repetitively inspect thereafter at intervals not to exceed 110 hours TIS until accumulating 15,000 hours TIS:

(1) Perform both a visual external and internal inspection of the forward, aft, and auxiliary wing spars for cracks.

(2) Do these visual inspections following the ACCOMPLISHMENT INSTRUCTIONS section of Cessna Service Bulletin MEB99-3 (Model 402C), Revision 2, dated February 28, 2005.

(3) When doing the inspections, pay particular attention to the following areas:

(i) Just Outboard of the Engine Beam

(A) The main lower spar cap at Wing Station (WS) 114.

(B) The three rivets on both the inboard and outboard sides of WS 114 (total of six rivets) in the main lower spar cap as viewed from the access hole.

(C) The main spar web at WS 112.5.

(ii) Just Inboard of the Inboard Engine Beam

(A) The main lower spar cap between WS 80 and WS 89.

(B) The two attach bolts on the main spar just inboard of the WS 89.18 rib.

(f) Eddy Current and Visual Inspections: Perform eddy current inspections of the forward wing spars combined with visual inspections of the aft and auxiliary spars. Do these inspections following the ACCOMPLISHMENT INSTRUCTIONS section of Cessna Service Bulletin MEB99-3 (Model 402C) or Cessna Service Bulletin MEB00-7 (Model 414A) both at Revision 2 and both dated February 28, 2005.

Affected Airplanes	Eddy Current and Visual Inspections	Repetitive Eddy Current and Visual Inspection Interval
(1) For Model 414A airplanes, serial numbers 414A0001 through 414A0047 and 414A0049 through 414A0200.	At whichever of the following occurs later: <ul style="list-style-type: none"> • Upon accumulating 8,500 hours TIS on the airplane; • At the next inspection that would have been required by emergency AD 2005-05-51 (required at intervals not to exceed 15 hours TIS); or • Within the next 2 days after receipt of this emergency AD. 	Thereafter at intervals not to exceed 100 hours TIS.

<p>(2) For the following airplanes that have 15,000 hours or more TIS or upon accumulating 15,000 hours TIS:</p> <p>(i) All Model 402C airplanes.</p> <p>(ii) Model 414A airplanes, serial numbers 414A0201 through 414A1212.</p>	<p>At whichever of the following occurs later:</p> <ul style="list-style-type: none"> • Upon accumulating 15,000 hours TIS on the airplane; • At the next inspection that would have been required by emergency AD 2005-05-51 (required at intervals not to exceed 15 hours TIS); or • Within the next 2 days after receipt of this emergency AD. 	<p>Thereafter at intervals not to exceed 100 hours TIS.</p>
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Note: The Cessna service bulletins allow for either a visual inspection or eddy current inspection of the forward spars on all airplanes affected by this AD. Visual inspections of the forward spars do not satisfy the requirements of this AD for the airplanes referenced in paragraphs (f)(1) and (f)(2). These airplanes must have the forward spars inspected using the eddy current methods specified in the Cessna service bulletins.

(i) Cracks Found: If you find any crack on any forward, aft, or auxiliary wing spar; or in surrounding structure such as spar webs or skins during any inspection required by this AD, before to further flight do the following:

(1) Obtain an FAA-approved repair scheme from the Cessna Aircraft Company, P.O. Box 7706, Wichita, Kansas 67277; telephone: (316) 517-5800, facsimile: (316) 942-9006; and

(2) Incorporate this repair scheme.

(h) Reporting Requirement: As soon as possible, but no later than 24 hours after any inspection required by this AD and as defined below:

(1) Submit a report of inspection findings to the Manager, Wichita Aircraft Certification Office (ACO), by fax: (316) 946-4107.

(i) Include a report for “cracks found” or “no cracks found” on the initial inspection; and

(ii) Include a report only for “cracks found” on the repetitive inspections.

(2) The report must include your name and a contact phone number, the results of the findings, a description of any cracking found, the airplane serial number, and the total number of hours TIS on the airplane. The “Lower Wing Spars and Skin Inspection Report” included in Cessna Service Bulletin MEB99-3 and MEB00-7 may be utilized for this reporting requirement.

May I Request an Alternative Method of Compliance?

(i) You may request a different method of compliance or a different compliance time for this AD by following the procedures in 14 CFR 39.19. Unless FAA authorizes otherwise, send your request to your principal inspector. The principal inspector may add comments and will send your request to the Manager, Wichita Aircraft Certification Office (ACO), FAA.

(1) For information on any already approved alternative methods of compliance or for further information about this AD, contact Paul Nguyen, Aerospace Engineer, FAA, Wichita ACO, 1801 Airport Road, Mid-Continent Airport, Wichita, Kansas 67209; telephone: (316) 946-4125; facsimile: (316) 946-4107; e-mail: paul.nguyen@faa.gov.

(2) Alternative methods of compliance that were approved for AD 2000-23-01 or emergency AD 2005-05-51 are not approved for this emergency AD.

May I Get Copies of the Documents Referenced in this AD?

(j) You may get copies of the documents referenced in this AD from the Cessna Aircraft Company, Product Support P.O. Box 7706, Wichita, Kansas 67277; telephone: (316) 517-5800; facsimile: (316) 942-9006.

Issued in Kansas City, Missouri, on March 2, 2005.

David R. Showers,
Acting Manager, Small Airplane Directorate,
Aircraft Certification Service.