

We will consider all comments received on or before the closing date. We may amend this proposed rule in light of comments received. Factual information that supports your ideas and suggestions is extremely helpful in evaluating the effectiveness of this proposed AD action and determining whether we need to take additional rulemaking action.

Are There Any Specific Portions of This Proposed AD I Should Pay Attention to?

The FAA specifically invites comments on the overall regulatory, economic, environmental, and energy aspects of this proposed rule that might suggest a need to modify the rule. You may view all comments we receive before and after the closing date of the rule in the Rules Docket. We will file a report in the Rules Docket that summarizes each contact we have with the public that concerns the substantive parts of this proposed AD.

How Can I Be Sure FAA Receives My Comment?

If you want FAA to acknowledge the receipt of your mailed comments, you must include a self-addressed, stamped postcard. On the postcard, write "Comments to Docket No. 2002-CE-05-AD." We will date stamp and mail the postcard back to you.

Discussion

Has FAA Taken Any Action to This Point?

Reports of fatigue cracks on Cessna 401, 402, and 411 series airplanes caused FAA to take AD action (AD 79-10-15 R2, Amendment 39-3711) to require repetitive inspections of the right and left wing spar lower cap areas for fatigue cracks and to require wing spar cap repair or replacement as necessary.

Accomplishment of the inspections required by AD 79-10-15 R2 is required in accordance with Cessna Service Bulletin ME79-16, Revision 3, dated February 8, 1980.

AD 79-10-15 R2 allowed for the incorporation of Cessna Service Kit SK402-36 or SK411-56 on the front wing spar lower cap as terminating action for the repetitive inspections on the applicable wing.

What Has Happened Since AD 79-10-15 R2 To Initiate This Proposed Action?

Since issuance of AD 79-10-15, Cessna has analyzed the wing, including fatigue and crack growth analyses, on the affected airplanes. Analysis included:

- A determination of the probable location and modes of damage based

on analytical results, available test data, and service information;

- Classical fatigue analyses;
- Crack growth and residual strength analyses including use of linear elastic fracture mechanics methods;
- Full-scale ground testing to validate analytical models; and
- A flight strain survey to develop stress spectra used in the analyses.

The inspections required by AD 79-10-15 R2 in accordance with Cessna Service Bulletin ME79-16, Revision 3, are accomplished using a surface eddy current inspection method.

Based on the analysis, Cessna has found that the eddy current method will not find the crack until it is .03 inch longer than the critical crack length. When the crack reaches the critical length, it is not reliably detectable because it is under the head of the fastener. Once the main spar cap is severed, the remaining structure will no longer meet the residual strength requirements. Wing separation could then occur under loading conditions significantly less than those established for the design limit load.

Cessna reported only one instance where cracks were detected using the nondestructive inspection (NDI) eddy current procedure. There are other reported instances where cracks were detected visually in the wheel well area on the aft flange. The problem with visual inspections is the access doubler flanges cover a large percentage of the forward spar flange. This limits the effectiveness of the visual inspections.

To meet industry NDI standards, cracks need to be found on Cessna Models 401, 401A, 401B, 402, 402A, 402B, 411, and 411A airplanes through NDI inspection methods with a 90-percent probability of detection at a 95-percent confidence level.

Cessna's analysis indicates that the probability and confidence levels are not being met.

Is There Service Information That Applies to This Subject?

Cessna has issued the following:

- Service Bulletin MEB01-06 and Service Kit SK402-46, both dated September 24, 2001; and
- Service Bulletin MEB01-07 and Service Kit SK411-59, both dated September 24, 2001.

This service information includes procedures for inspecting and modifying the lower wing spar caps.

The FAA's Determination and an Explanation of the Provisions of This Proposed AD

What Has FAA Decided?

After examining the circumstances and reviewing all available information related to the incidents described above, we have determined that:

- Cessna's analysis of the problems with the eddy current inspection on the wing spar cap area on the Cessna 401, 402, and 411 series airplanes is valid;
- The unsafe condition referenced in this document exists or could develop on these airplanes that are the same type design;
- The actions specified in the previously-referenced service information should be accomplished on the affected airplanes; and
- AD action should be taken in order to correct this unsafe condition.

What Would This Proposed AD Require?

This proposed AD would supersede AD 79-10-15 R2 with a new AD that would require you to either (depending on the aircraft configuration):

- For airplanes that do not incorporate one of certain Cessna Service Kits: repetitively inspect the wing spar caps for fatigue cracks and repair or replace the wing spar caps as necessary and incorporate a spar strap modification on each wing spar; or
- For airplanes that incorporate one of certain Cessna Service Kits: repetitively inspect the wing spar caps for fatigue cracks and repair or replace the wing spar caps as necessary.

How Does the Revision to 14 CFR Part 39 Affect This Proposed AD?

On July 10, 2002, FAA published a new version of 14 CFR part 39 (67 FR 47997, July 22, 2002), which governs FAA's AD system. This regulation now includes material that relates to special flight permits, alternative methods of compliance, and altered products. This material previously was included in each individual AD. Since this material is included in 14 CFR part 39, we will not include it in future AD actions.

Cost Impact

How Many Airplanes Would This Proposed AD Impact?

We estimate that this proposed AD affects 400 airplanes in the U.S. registry.