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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA-2006-25173; Directorate Identifier 2006-NE-24-AD; Amendment 39-16021; AD 2009-19-04]

RIN 2120-AA64

Airworthiness Directives; McCauley Propeller Systems Propeller Models B5JFR36C1101/114GCA-0, C5JFR36C1102/L114GCA-0, B5JFR36C1103/114HCA-0, and C5JFR36C1104/L114HCA-0

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Final rule.

SUMMARY: The FAA is superseding an existing airworthiness directive (AD) for McCauley Propeller Systems propeller models B5JFR36C1101/114GCA-0, C5JFR36C1102/L114GCA-0, B5JFR36C1103/114HCA-0, and C5JFR36C1104/L114HCA-0. That AD currently requires initial and repetitive fluorescent penetrant inspections (FPI) and eddy current inspections (ECI) of propeller blades for cracks, and if any crack indications are found, removing the blade from service. That AD also mandates a life limit for the blades. This AD requires the same inspections, adds a visual inspection, and mandates a new propeller blade life limit. This AD also requires removing propeller blades with more than 10,000 operating hours time-since-new (TSN), before further flight. This AD also requires removal from service of all the propeller blades and the propeller hub if one or more propeller blades have been found cracked on a propeller assembly. This AD also requires removing from service all C-5963 split retainers. This AD results from eight reports of propeller blades found cracked since May of 2006. We are issuing this AD to detect cracks in the propeller blade that could cause failure and separation of the propeller blade and loss of control of the airplane.

DATES: This AD becomes effective October 27, 2009. The Director of the Federal Register approved the incorporation by reference of certain publications listed in the regulations as of October 27, 2009.

ADDRESSES: You can get the service information identified in this AD from McCauley Propeller Systems, 5800 E. Pawnee, Wichita, KS 67218, telephone (800) 621-7767.

The Docket Operations office is located at Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12-140, Washington, DC 20590-0001.

FOR FURTHER INFORMATION CONTACT: Jeff Janusz, Aerospace Engineer, Wichita Aircraft Certification Office, FAA, Small Airplane Directorate, 1801 Airport Road, Room 100, Wichita, KS 67209; e-mail: jeff.janusz@faa.gov; telephone: (316) 946-4148; fax: (316) 946-4107.

SUPPLEMENTARY INFORMATION: The FAA proposed to amend 14 CFR part 39 by superseding AD 2008-08-01, Amendment 39-15453 (73 FR 19971, April 14, 2008). The proposed AD applies to McCauley Propeller Systems propeller models B5JFR36C1101/114GCA-0, C5JFR36C1102/L114GCA-0, B5JFR36C1103/114HCA-0, and C5JFR36C1104/L114HCA-0. We published the proposed AD in the Federal Register on January 21, 2009 (74 FR 3462). That action proposed to require an FPI and ECI of propeller blades for cracks, visual inspection of the blade shank for a step condition, and a new propeller blade life limit of 3,500 hours TSN. That action also proposed to require removal of blades with more than 10,000 operating hours TSN before further flight. That action also proposed to require removal from service of all the propeller blades and the propeller hub if one or more propeller blades have been found cracked on a propeller assembly. That action also proposed to require removing from service all C-5963 split retainers at time of next inspection.

Guidance From McCauley Product Support

If there is any question as to the acceptability of a blade shank "step condition", the ability to accurately measure 0.005-inch wear, or the acceptability of any other wear present, we recommend that you contact McCauley Product Support for guidance.

Examining the AD Docket

You may examine the AD docket on the Internet at <http://www.regulations.gov>; or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (telephone (800) 647-5527) is provided in the ADDRESSES section. Comments will be available in the AD docket shortly after receipt.

Comments

We provided the public the opportunity to participate in the development of this AD. We have considered the comments received.

Claim That Blade Failure Is Primarily Due to a Blade Material Condition

Four commenters provided numerous observations that infer the probable cause for propeller blade failure is primarily due to a propeller blade material condition, which is the result of a manufacturing defect. The commenters did not present any examination or determination as to the cause of initiation of the propeller blade fatigue cracks. They did not present any evaluation or determination of the effect airplane operations in the restricted propeller RPM ranges have on propeller blade cracking, or any evaluation or determination of the effect the propeller blade material condition has, with respect to propeller fatigue life and thus propeller blade operating life.

We respect the commenters' observations, but the observations do not provide factual data to state a singular probable cause of propeller blade cracking. Therefore, as stated in the NPRM we have not yet determined if the blade cracking is the result of a design issue, an operational issue, or a combination of the two. We did not change the AD.

Concern Over Cost of Airplane Operations

Three commenters highlight and express their concern with the increase in cost of airplane operations associated with the proposed AD.

Per Order FAA-IR-M-8040.1B, we must consider the cost impact of an AD, including the direct cost to operators. We performed the economic analysis to include initial labor and parts costs, but we did not include the cost of aircraft down time, as we are not required to include it. Since we published the proposed AD, we became aware there are more affected airplanes with the subject propeller on the U.S. registry, bringing the number of propellers from 8 to 34. We also became aware that the total cost estimate we gave in the proposed AD was for the worldwide fleet. We changed the cost of compliance paragraph to cover only the U.S. fleet, and to reflect a corrected estimated cost, including the cost of prorated propeller life lost, which is a total of \$1,523,049.

Revise the AD To Include the BAE Systems Regional Aircraft Proposal To Increase the Propeller Blade Life to 5,000 Hours

Five commenters, including BAE Systems (Operations) Ltd., point out that European Aviation Safety Agency (EASA) AD 2009-0038 mandates the installation of a propeller speed warning system per BAE Systems (Operations) Ltd. Service Bulletin No. SB J41-61-014. BAE Systems (Operations) Ltd. proposed that the propeller blade life could be increased to 5,000 hours with the installation of new, zero-time-since-new propeller blades. The commenters suggest that we revise our AD to do the same actions.

We do not agree. The above suggestions were not proposed as part of the proposed AD. The commenters state the reason for cracking as that stated in the McCauley Propeller Systems Service Bulletin No. ASB255A, included in the NPRM by reference; which is "The blade cracks are caused by operation in the restricted and placarded regions." We have not yet determined if the blade cracking is the result of a design issue, an operational issue, or a combination of the two. The commenters presented observations that propellers have operated beyond the proposed AD 3,500-hour life limit satisfactorily without cracking. The commenters present that EASA is mandating by AD the propeller speed warning system and state that this system will provide a means to keep the propeller out of the restricted operating range. The proposed AD does not mandate a propeller speed warning system. We agree that this type of system has the potential to help limit the amount of time a propeller is operated in the restricted range. However, this type of system does not guarantee operations of the propeller will be conducted outside of the restricted operating range. The commenters did not examine or determine the cause of initiation of the propeller blade fatigue cracks, nor evaluate or determine the effect airplane operations in the restricted propeller RPM ranges have on propeller blade cracking. The commenters did not evaluate or determine the effect the propeller blade material condition has with respect to propeller fatigue life and thus propeller blade operating life. The commenters did not present any factual data to support increasing the life limit to 5,000 hours. Since May of 2006, we have received reports of eight propeller blades which were found cracked at fewer than 5,000 hours time-since-new. We did not change the AD.

Credit for Monitoring Propeller Operations

Two commenters present observations that infer credit should be given to operators for Digital Flight Data Recorder (DFDR) downloads to monitor operations of the airplane and hence monitor operations of the propeller in the restricted RPM ranges.

We do not agree. We find merit in monitoring of propeller operations, but as stated in the NPRM we have not yet determined if the blade cracking is the result of a design issue, an operational issue, or a combination of the two. We do not have any control over how the airplane is operated, as this AD relates to the type certification of the propeller. We did not change the AD.

Revise AD To Include a Wear Measurement Technique That Is Not Difficult and Is Practical

One commenter believes the wear measurement technique provided in the McCauley Propeller Systems Service Bulletin No. ASB255A and included in the proposed AD by reference, will be difficult and not practical, and requests a revised and more appropriate procedure be developed and included in the AD. McCauley Propeller Systems has defined this wear measurement criteria in the past in other Service Bulletins related to this propeller model. FAA has previously mandated the same criteria in now superseded ADs. There were no adverse comments to the superseded ADs while they were being proposed, from the propeller repair shops that are tasked with addressing the AD requirements at the propeller hardware level.

We find some merit to elaborate on the criticality of the wear measurement criteria and we have added wording to the Supplementary Information section of this AD, recommending that McCauley Product Support be contacted for additional guidance with this measurement.

Correction to Paragraph (i)

We found incorrect compliance information that was inadvertently placed in the first sentence of paragraph (i) of the proposed AD. We corrected that sentence in the AD from "Remove the serial number (SN) propeller blades and the hubs listed in Table 1 of this AD from service, using the inspection compliance schedule in Table 2 of this AD" to "Before further flight, remove the serial number (SN) propeller blades and the hubs listed in Table 1 of this AD from service."

Paragraph Added To Address Parts Not Reported on

We realized that since we state in paragraph (i) of the proposed AD that there may be other affected propeller assemblies, blades, hubs, or hub assemblies that we have not received reports on, and that we should address that population in a separate paragraph. We added a new paragraph (j) to the AD that states: "Before further flight, remove from service any propeller blades and hubs found or documented to have been installed in any propeller assembly that has had one or more cracked propeller blades at any time. Propeller blades and the propeller hub of a propeller assembly that has had one or more cracked propeller blades are prohibited from installation in any configuration on any airframe."

Conclusion

We have carefully reviewed the available data, including the comments received, and determined that air safety and the public interest require adopting the AD with the changes described previously. We have determined that these changes will neither increase the economic burden on any operator nor increase the scope of the AD.

Costs of Compliance

We estimate that this AD will affect 34 propeller assemblies installed on airplanes of U.S. registry. We estimate that it will take about 44 work-hours per propeller to perform the required actions, and that the average labor rate is \$80 per work-hour. Required parts will cost about \$260 per propeller, if no cracks are found. We estimate that one propeller will fail the blade inspection required by this AD, and the propeller replacement cost will be about \$67,067. Prorated life lost for the propeller assembly will cost about \$39,043 per propeller. Based on these figures, we estimate the total cost of the AD to U.S. operators to be \$1,523,049.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, Section 106, describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the Agency's authority.

We are issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, "General requirements." Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

We have determined that this AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a "significant regulatory action" under Executive Order 12866;
- (2) Is not a "significant rule" under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979); and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

We prepared a summary of the costs to comply with this AD and placed it in the AD Docket. You may get a copy of this summary at the address listed under ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

Adoption of the Amendment

Accordingly, under the authority delegated to me by the Administrator, the Federal Aviation Administration amends 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by removing Amendment 39-15453 (73 FR 19971, April 14, 2008) and by adding a new airworthiness directive, Amendment 39-16021, to read as follows:



2009-19-04 McCauley Propeller Systems: Amendment 39-16021. Docket No. FAA-2006-25173; Directorate Identifier 2006-NE-24-AD.

Effective Date

(a) This airworthiness directive (AD) becomes effective October 27, 2009.

Affected ADs

(b) This AD supersedes AD 2008-08-01, Amendment 39-15453.

Applicability

(c) This AD applies to McCauley Propeller Systems propeller models B5JFR36C1101/114GCA-0, C5JFR36C1102/L114GCA-0, B5JFR36C1103/114HCA-0, and C5JFR36C1104/L114HCA-0. These propellers are installed on, but not limited to, BAE Systems (Operations) Limited Jetstream Model 4100 and 4101 series airplanes (Jetstream 41).

Unsafe Condition

(d) This AD results from eight reports of propeller blades found cracked since May of 2006. We are issuing this AD to detect cracks in the propeller blade that could cause failure and separation of the propeller blade and loss of control of the airplane.

Compliance

(e) You are responsible for having the actions required by this AD performed within the compliance times specified unless the actions have already been done.

Life Limit

(f) For propeller blades with more than 10,000 operating hours time-since-new (TSN) on the effective date of this AD, remove the propeller blades from service before further flight. These propeller blades are prohibited from installation in any configuration on any airframe.

(g) For propeller blades with more than 3,000 operating hours TSN on the effective date of this AD, remove the propeller blades from service within the next 500 operating hours, not to exceed 10,000 operating hours TSN. These propeller blades are prohibited from installation in any configuration on any airframe.

(h) For propeller blades with 3,000 or fewer operating hours TSN on the effective date of this AD, remove the propeller blades from service at or before reaching 3,500 operating hours TSN. These propeller blades are prohibited from installation in any configuration on any airframe.

Removal From Service of Propeller Blades and Hubs From Propeller Assemblies That Have Had One or More Cracked Propeller Blades

(i) Before further flight, remove the propeller blades and the hubs listed in Table 1 of this AD from service. The propeller blades and hubs listed in Table 1 are prohibited from installation in any configuration on any airframe.

(j) Before further flight, remove from service any propeller blades and hubs found or documented to have been installed in any propeller assembly that has had one or more cracked propeller blades at any time. Propeller blades and the propeller hub of a propeller assembly that has had one or more cracked propeller blades are prohibited from installation in any configuration on any airframe.

Table 1 – Propeller Blade and Hub Serial Numbers Requiring Removal from Service Before Further Flight and are Prohibited from Installation in Any Configuration on Any Airframe

Hub Serial Number	Blade Serial Number
023062	XH31043, XH31131, XE31002, XH31025, XI31014
040296	YA31058, YA31055, YB31084, YB31088, YB31090
041016	XB31009, XA31073, XA31071, XA31063, WK31013
051193	XH31018, XH31077, XH31081, XL31008, XL31043
040282	XG31015, XG31016, XH31113, XH31117, XI31017
051204	XI31049, XH31140, XH31129, XH31084, XH31074
051194	WF31010, WD31032, WF31002, WF31029, WF31078

Propeller Blade Inspection

(k) Perform a fluorescent penetrant inspection and eddy current inspection of the propeller blades, and a visual inspection for a "step condition" of the blade shank. Use the Equipment Required and Accomplishment Instructions of McCauley Propellers Alert Service Bulletin (ASB) No. ASB255A, dated October 6, 2008, and the compliance schedule in Table 2 of this AD:

Table 2 – Inspection Compliance Schedule

If On the Effective Date of This AD, the Propeller Blade:	Then Inspect the Propeller Blade:
(1) Has more than 2,400 operating hours TSN, time-since-last inspection (TSLI), or time-since-overhaul (TSO) and has been inspected using AD 2008-08-01 or McCauley Propellers ASB No. ASB255, dated January 8, 2007 within the past 2,400 operating hours.	Upon reaching 2,500 operating hours TSLI. See TSLI definition paragraph (p) of this AD.
(2) Has more than 2,400 operating hours TSN, TSLI, or TSO and has not been inspected using AD 2008-08-01 or McCauley Propellers ASB No. ASB255, dated January 8, 2007 within the past 2,400 operating hours	Within the next 100 operating hours time-in-service.
(3) Has 2,400 or fewer operating hours TSN, TSLI, or TSO.	Upon reaching 2,500 operating hours TSN, TSLI, or TSO.

Propellers Failing Blade Inspection

(l) Remove from service all of the propeller blades, and the propeller hub, if one or more propeller blades are found cracked on a propeller assembly. Propeller blades and the propeller hub of a propeller assembly that has had one or more cracked propeller blades are prohibited from installation in any configuration on any airframe.

(m) Remove from service all propeller blades that exhibit a blade shank "step condition" of 0.005-inch or greater. Blades removed from service are prohibited from installation in any configuration on any airframe.

Removal of C-5963 Split Retainers From Service

(n) Remove from service all C-5963 split retainers at the time of blade inspection specified in paragraph (k) of this AD. C-5963 split retainers removed from service are prohibited from installation in any configuration on any airframe.

(o) After the effective date of this AD, do not install propeller assemblies with C-5963 split retainers on any airframe.

Definition

(p) For the purpose of this AD, TSLI refers only to inspections performed using AD 2008-08-01 or McCauley ASB No. ASB255, dated January 8, 2007.

Reporting Requirements

(q) Within 10 calendar days of the inspection, use the Reporting Form in McCauley ASB No. ASB255A, to report all inspection findings to the FAA, Wichita Aircraft Certification Office, 1801 Airport Road, Room 100, Wichita, KS 67209, Attention: Jeff Janusz; telephone (316) 946-4148; fax (316) 946-4107; e-mail: jeff.janusz@faa.gov.

(r) Include any photographs, and any other information related to the means of detection of the crack, and the history of the propeller and blades.

(s) The Office of Management and Budget (OMB) has approved the reporting requirements and assigned OMB control number 2120-0056.

Alternative Methods of Compliance

(t) The Manager, Wichita Aircraft Certification Office, has the authority to approve alternative methods of compliance for this AD if requested using the procedures found in 14 CFR 39.19.

Special Flight Permits

(u) Under 39.23, we are limiting the availability of special flight permits for this AD. Special flight permits are available only if:

- (1) The operator has not seen signs of external oil leakage from the hub;
- (2) The operator has not observed abnormal propeller vibration or abnormal engine vibration;
- (3) The operator has not observed any other abnormal operation from the propeller;

(4) The operator has not made earlier reports of abnormal propeller vibration, abnormal engine vibration, or other abnormal propeller operations that have not been addressed.

Related Information

(v) Contact Jeff Janusz, Aerospace Engineer, Wichita Aircraft Certification Office, FAA, Small Airplane Directorate, 1801 Airport Road, Room 100, Wichita, KS 67209; e-mail: jeff.janusz@faa.gov; telephone: (316) 946-4148; fax: (316) 946-4107, for more information about this AD.

Material Incorporated by Reference

(w) You must use McCauley Propellers Alert Service Bulletin No. ASB255A, dated October 6, 2008 to perform the actions required by this AD. The Director of the Federal Register approved the incorporation by reference of this service bulletin in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Contact McCauley Propeller Systems, 5800 E. Pawnee, Wichita, KS 67218, telephone (800) 621-7767 for a copy of this service information. You may review copies at the FAA, New England Region, 12 New England Executive Park, Burlington, MA; or at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202-741-6030, or go to: <http://www.archives.gov/federal-register/cfr/ibr-locations.html>.

Issued in Burlington, Massachusetts, on September 3, 2009.
Peter A. White,
Assistant Manager, Engine and Propeller Directorate,
Aircraft Certification Service.