

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. 2001-SW-28-AD; Amendment 39-12479; AD 2001-22-01]

RIN 2120-AA64

Airworthiness Directives; Enstrom Helicopter Corporation Model F-28, F-28A, F-28C, F-28F, 280, 280C, 280F and 280FX Helicopters

AGENCY: Federal Aviation Administration, DOT.

ACTION: Final rule; request for comments.

SUMMARY: This amendment supersedes an existing airworthiness directive (AD) for Enstrom Helicopter Corporation (EHC) Model F-28, F-28A, and 280 helicopters. That AD currently requires inspecting the main rotor shaft (shaft) for a crack or other evidence of damage until appropriately modifying or replacing the shaft with an airworthy shaft at specified time intervals. This amendment adds EHC Model F-28C, F-28F, 280C, 280F, and 280FX helicopters and establishes life limits after which all unmodified shafts must be retired. This amendment requires determining the radius of the shaft fillet, certain visual and dye-penetrant inspections before further flight, and replacing certain main rotor transmissions. This amendment is prompted by the failure of a shaft on an EHC Model F-28A helicopter due to a fatigue crack. The actions specified by this AD are intended to prevent shaft failure and subsequent loss of control of the helicopter.

DATES: Effective November 13, 2001.

Comments for inclusion in the Rules Docket must be received on or before December 28, 2001.

ADDRESSES: Submit comments in triplicate to the Federal Aviation Administration (FAA), Office of the Regional Counsel, Southwest Region, Attention: Rules Docket No. 2001-SW-28-AD, 2601 Meacham Blvd., Room 663, Fort Worth, Texas 76137. You may also send comments electronically to the Rules Docket at the following address: 9-asw-adcomments@faa.gov.

FOR FURTHER INFORMATION CONTACT: Joseph McGarvey, Fatigue Specialist, FAA, Chicago Aircraft Certification Office, Airframe and Administrative Branch, 2300 East Devon Ave., Des Plaines, Illinois 60018, telephone (847) 294-7136, fax (847) 294-7834.

SUPPLEMENTARY INFORMATION: On August 16, 1976, the FAA issued AD 76-17-08, Amendment 39-2700 (41 FR 36015, August 26, 1976). On September 16, 1976, the FAA revised that AD issuing AD 76-17-08 R1, Amendment 39-3043 (42 FR 51563, September 29, 1977), for EHC Model F-28, F-28A, and 280 helicopters to establish service time limits after which all unmodified shafts must be replaced. That AD was prompted by FAA's determination, after a review of the service experience, that shaft crack sites may be introduced by allowing the shafts to remain in service for extended periods without modification. That condition, if not corrected, could result in shaft failure and subsequent loss of control of the helicopter.

Since the issuance of that AD, EHC has issued Service Directive Bulletin No. 0094, Revision 1, dated May 31, 2001, specifying certain inspections for a crack in certain shafts due to failure of a shaft on an EHC Model F-28A helicopter.

The FAA and the National Transportation Safety Board (NTSB) investigated the accident involving the failure of a shaft on the EHC Model F28A helicopter. The shaft was designed with a small upper fillet radius of 0.13 inch and failed due to a fatigue crack. Such a shaft design causes a high stress concentration. That, coupled with the occurrence of more frequent than anticipated high flight load conditions, can accelerate the development of fatigue cracks. Preliminary investigation revealed that the shaft installed in the transmission, P/N 28-13101-1-R, failed because of a fatigue crack in the fillet area of the shaft directly beneath the main rotor hub. The FAA concluded, based on its investigation and after reviewing NTSB Report 01-052, dated April 13, 2001, that an inspection should be made of such shafts for cracks before further flight. The FAA determined that since inspections for cracks are imprecise and detection of all existing cracks is uncertain, a shaft with a small radius fillet should be replaced with an airworthy shaft with a large radius fillet on certain model helicopters within 300 hours time-in-service (TIS).

We have identified an unsafe condition that is likely to exist or develop on other helicopters of the same type designs. This AD supersedes AD 76-17-08 and 76-17-08 R1 for EHC Model F-28, F-28A, and 280 helicopters to add Model F-28C, F-28F, 280C, 280F, and 280FX helicopters, to require the following:

- Before further flight, determine the transmission P/N and the radius of the shaft fillet.
- For certain models, replace any transmission having a shaft with a small radius fillet with an airworthy transmission before further flight.
- For certain other models, replace the transmission having a small radius shaft fillet that is not P/N 28-13101-1 or -1-R with an airworthy transmission before further flight.
- For certain models with transmission, P/N 28-13101-1 or -1-R, having a small radius shaft fillet installed:
 - Before further flight and at recurring intervals, visually inspect the shaft for a crack. If a crack is suspected, dye penetrant inspect the shaft before further flight.
 - Within 5 hours TIS and thereafter at specified intervals, dye penetrant inspect the shaft for a crack, and polish out specified nicks and scratches.
 - If a crack is found or if a nick or scratch exceeds a specified limit, replace the transmission with an airworthy transmission before further flight.
 - Within 300 hours TIS or at the next transmission overhaul after the effective date of this AD, whichever occurs first, replace transmission, P/N 28-13101-1 or -1-R, with an airworthy transmission having a large radius shaft fillet.

Installing a transmission with a shaft, P/N 28-13104-1-1 or -1-R, Revision K, L, M, N, P, R, or S or P/N 28-13140-1 or -1-R, any revision, is terminating action for the requirements of this AD.

The short compliance time involved is required because the previously described critical unsafe condition can adversely affect the controllability and structural integrity of the helicopter. Therefore, determining the transmission P/N and the shaft fillet radius, conducting the required inspections, and replacing any unairworthy transmission with an airworthy transmission are required before further flight, and this AD must be issued immediately.

Since a situation exists that requires the immediate adoption of this regulation, it is found that notice and opportunity for prior public comment hereon are impracticable, and that good cause exists for making this amendment effective in less than 30 days.

The FAA estimates that 17 helicopters will be affected by this AD, that it will take approximately 1.4 work hours to accomplish the inspections and that the average labor rate is \$60 per work hour. A replacement shaft will cost approximately \$3,000 per helicopter, and overhauling the transmission and replacing the shaft will cost approximately \$12,000. Based on these figures, the total cost impact of the AD on U.S. operators is estimated to be \$256,428 assuming replacement of the transmission after an inspection of every helicopter affected by this AD.

Comments Invited

Although this action is in the form of a final rule that involves requirements affecting flight safety and, thus, was not preceded by notice and an opportunity for public comment, comments are invited on this rule. Interested persons are invited to comment on this rule by submitting such written data, views, or arguments as they may desire. Communications should identify the Rules Docket number and be submitted in triplicate to the address specified under the caption ADDRESSES. All communications received on or before the closing date for comments will be considered, and this rule may be amended in light of the comments received. Factual information that supports the commenter's ideas and suggestions is extremely helpful in evaluating the effectiveness of the AD action and determining whether additional rulemaking action would be needed.

Comments are specifically invited on the overall regulatory, economic, environmental, and energy aspects of the rule that might suggest a need to modify the rule. All comments submitted will be available in the Rules Docket for examination by interested persons. A report that summarizes each FAA-public contact concerned with the substance of this AD will be filed in the Rules Docket.

Commenters wishing the FAA to acknowledge receipt of their mailed comments submitted in response to this rule must submit a self-addressed, stamped postcard on which the following statement is made: "Comments to Docket No. 2001-SW-28-AD." The postcard will be date stamped and returned to the commenter.

The regulations adopted herein 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. Therefore, it is determined that this final rule does not have federalism implications under Executive Order 13132.

The FAA has determined that this regulation is an emergency regulation that must be issued immediately to correct an unsafe condition in aircraft, and that it is not a "significant regulatory action" under Executive Order 12866. It has been determined further that this action involves an emergency regulation under DOT Regulatory Policies and Procedures (44 FR 11034, February 26, 1979). If it is determined that this emergency regulation otherwise would be significant under DOT Regulatory Policies and Procedures, a final regulatory evaluation will be prepared and placed in the Rules Docket. A copy of it, if filed, may be obtained from the Rules Docket at the location provided under the caption ADDRESSES.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Safety.

Adoption of the Amendment

Accordingly, pursuant to the authority delegated to me by the Administrator, the Federal Aviation Administration amends part 39 of the Federal Aviation Regulations (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.

Sec. 39.13 [Amended]

2. Section 39.13 is amended by removing Amendment 39-2700 (41 FR 36015, August 26, 1976) and Amendment 39-3043 (42 FR 51563, September 29, 1977), and by adding a new airworthiness directive (AD), Amendment 39-12479, to read as follows:

AIRWORTHINESS DIRECTIVE



Aircraft Certification Service
Washington, DC

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

We post ADs on the internet at "av-info.faa.gov"

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Title 14 of the Code of Federal Regulations (14 CFR) part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety and are regulations which require immediate attention. You are cautioned that no person may operate an aircraft to which an Airworthiness Directive applies, except in accordance with the requirements of the Airworthiness Directive (reference 14 CFR part 39, subpart 39.3).

2001-22-01 Enstrom Helicopter Corporation: Amendment 39-12479. Docket No. 2001-SW-28-AD. Supersedes AD 76-17-08, Amendment 39-2700, and AD 76-17-08 R1, Amendment 39-3043, Docket 76-GL-15.

Applicability: Model F-28, F-28A, F-28C, F-28F, 280, 280C, 280F, and 280FX helicopters, certificated in any category.

Note 1: This AD applies to each helicopter identified in the preceding applicability provision, regardless of whether it has been otherwise modified, altered, or repaired in the area subject to the requirements of this AD. For helicopters that have been modified, altered, or repaired so that the performance of the requirements of this AD is affected, the owner/operator must request approval for an alternative method of compliance in accordance with paragraph (e) of this AD. The request should include an assessment of the effect of the modification, alteration, or repair on the unsafe condition addressed by this AD; and if the unsafe condition has not been eliminated, the request should include specific proposed actions to address it.

Compliance: Required as indicated, unless accomplished previously.

To prevent main rotor shaft (shaft) failure and subsequent loss of control of the helicopter, accomplish the following:

(a) Before further flight, determine the part number (P/N) of the main rotor transmission (transmission) and the radius of the upper fillet of the shaft (see Figure 1).

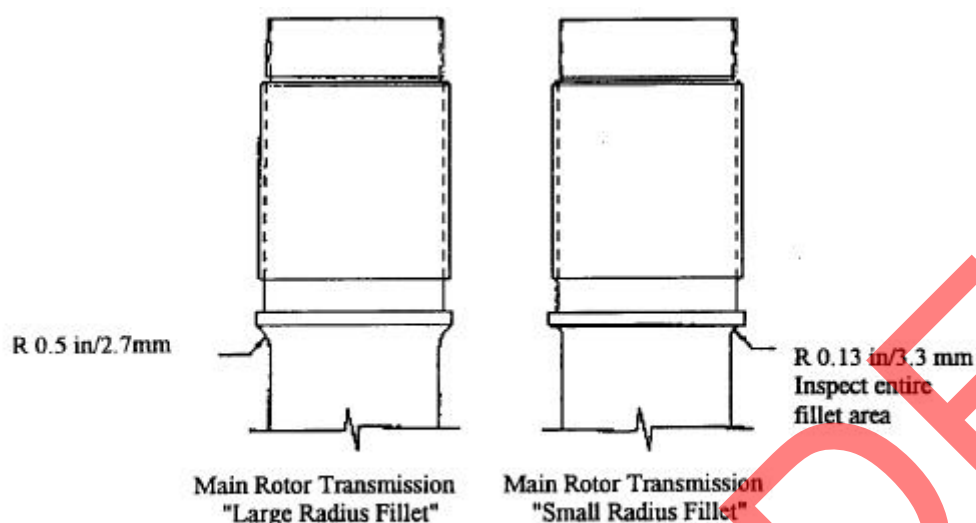


Figure 1. Main Rotor Shaft Inspection

(b) For EHC Model F-28C, F-28F, 280C, 280F, and 280FX helicopters, before further flight, replace any transmission having a small radius shaft fillet with an airworthy transmission having a large radius shaft fillet as specified in Table 1 of this AD.

(c) For EHC Model F-28, F-28A and 280 helicopters:

(1) If the transmission has a shaft with a small radius fillet and the transmission P/N is not listed in Table 1, before further flight, replace the transmission with an airworthy transmission specified in Table 1 of this AD.

Table 1.-Main Rotor Transmission Effectivity

Description	Transmission P/N	Qty per assy	Models effectivity						
			F-28,	F-28A	280F-28C	280C	F-28F	280F	280FX
(i) Main Rotor Gearbox (0.13 in. radius fillet M/R shaft).	28-13101-1 or -1-R.....	1	X	X					
(ii) Main Rotor Gearbox (0.5 in. radius fillet M/R shaft).	28-13101-5 or -5-R*.....	1	X	X	X	X			
(iii) Main Rotor Gearbox (0.5 in. radius fillet M/R shaft).	28-13101-8 or -8-R.....	1	X	X	X	X	X	X	
(iv) Main Rotor Gearbox (0.5 in. radius fillet M/R shaft).	28-13101-9 or -9-R.....	1	X	X	X	X	X	X	

Table 1.--Main Rotor Transmission Effectivity

Description	Transmission P/N	Qty per assy	Models effectivity						
			F-28,	F-28A	280F-28C	280C	F-28F	280F	280FX
(v) Main Rotor Gearbox (0.5 in. radius fillet, heavy M/R shaft).	28-13101-101 or -101-R*....	1	X	X	X	X			
(vi) Main Rotor Gearbox (0.5 in. radius fillet M/R shaft).	28-13170-1 or -1-R.....	1	X	X	X	X	X	X	
(vii) Main Rotor Gearbox (0.5 in. radius fillet M/R shaft).	28-13170-3 or -3-R*.....	1	X	X	X	X	X	X	
(viii) Main Rotor Gearbox (0.5 in. radius fillet, heavy M/R shaft).	28-13170-7 or -7-R*.....	1	X	X	X	X	X	X	
(ix) Main Rotor Gearbox (0.5 in. radius fillet, heavy M/R shaft, magnetic chip detector, and low rotor RPM pick-up).	28-13101-9 or -9-R*.....	1	X	X

Note: "-R" indicates an overhauled transmission.

* Transmissions currently available from EHC.

(2) If the installed transmission is P/N 28-13101-1 or -1-R and has a small radius shaft, before further flight and thereafter at intervals not to exceed 25 hours TIS, visually inspect each transmission for a crack in the shaft upper fillet using a 10X or higher magnifying glass.

(i) If a crack is suspected, before further flight, a level II nondestructive inspector must dye-penetrant inspect the shaft using materials approved by MIL-I-25135.

(ii) If the shaft is cracked, before further flight, replace the transmission with an airworthy transmission having a large radius shaft fillet.

(3) If the transmission is P/N 28-13101-1 or -1-R, within 5 hours TIS, and thereafter at intervals not to exceed 100 hours TIS:

(i) Dye-penetrant inspect the shaft upper fillet for a crack, a nick, or a scratch.

(ii) Polish out nicks or scratches less than 0.005-inch deep.

(iii) If the shaft is cracked or has a nick or scratch 0.005 inch or more deep, replace the transmission with an airworthy transmission having a large radius shaft fillet before further flight.

(4) Within 300 hours TIS or at the next overhaul after the effective date of this AD, whichever occurs first, replace transmission, P/N 28-13101-1 or -1-R, with an airworthy transmission having a large radius shaft fillet.

(d) Installing an airworthy transmission with a shaft, P/N 28-13104-1 or -1-R, Revision K, L, M, N, P, R or S, or P/N 28-13140-1 or -1-R, is terminating action for the requirements of this AD.

Note 2: Enstrom Helicopter Corporation Service Directive Bulletin No. 0094, Revision 1, dated May 31, 2001, pertains to the subject of this AD.

(e) An alternative method of compliance or adjustment of the compliance time that provides an acceptable level of safety may be used if approved by the Manager, Chicago, Aircraft Certification Office (ACO), FAA. Operators shall submit their requests through an FAA Principal Maintenance Inspector, who may concur or comment and then send it to the Manager, Chicago ACO.

Note 3: Information concerning the existence of approved alternative methods of compliance with this AD, if any, may be obtained from the Chicago ACO.

(f) Special flight permits may be issued in accordance with 14 CFR 21.197 and 21.199 to operate the helicopter to a location where the requirements of this AD can be accomplished provided an inspection in accordance with paragraph (c)(2) of this AD reveals no crack in the shaft.

(g) This amendment becomes effective on November 13, 2001.

Issued in Fort Worth, Texas, on October 16, 2001.

Eric Bries,

Acting Manager, Rotorcraft Directorate, Aircraft Certification Service.

[FR Doc. 01-26965 Filed 10-26-01; 8:45 am]

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