



ENSTROM

HELICOPTER CORPORATION

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February 15, 2002

TO: Recipients of Enstrom Helicopter Service Directive Bulletins.

SUBJECT: REVISION OF SERVICE DIRECTIVE BULLETIN NO. 0094, CRACKED
MAIN ROTOR SHAFT

This letter transmits Revision 2 of Service Directive Bulletin No. 0094. This is a COMPLETE revision. Replace the previous issue with this edition.

Revision 2:

1. Identifies additional main rotor transmission part numbers that may have been equipped with a small radius main rotor shaft and revises the inspection requirements for these main rotor transmissions..
2. Adds the additional main rotor transmission part numbers to Table1 and also adds additional effectivity information.

TECHNICAL PUBLICATIONS
ENSTROM HELICOPTER CORPORATION



SERVICE DIRECTIVE BULLETIN

SERVICE DIRECTIVE BULLETIN NO. 0094

Revision 2

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DATE: February 15, 2002

1. SUBJECT: Cracked Main Rotor Shaft
2. MODEL: F-28A, F-28C, F-28F, 280, 280C, 280F, and 280FX
3. EFFECTIVITY: All Serial Numbers
4. BACKGROUND:

An operator reported the failure of a main rotor shaft on an F-28A model helicopter. Preliminary investigation revealed that the main rotor shaft installed in the main rotor 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 28-13101-1(-R) main rotor transmission is equipped with a small radius main rotor shaft (Refer to Figure 1). Main rotor transmission, P/Ns 28-13101-2(-R), -3(-R), -5(-R), -8(-R), and -9(-R), may also be equipped with a small radius main rotor shaft.

NOTE

“-R” at the end of the part number signifies an overhauled main rotor transmission.

5. COMPLIANCE:
 - 5.1. BEFORE NEXT FLIGHT:
 - A. All models: Determine the part number of the main rotor transmission installed in the helicopter and verify the radius of the main rotor shaft fillet (Refer to Figure 1).
 - B. F-28C, F-28F, 280C, 280F, and 280FX models: Any helicopter with a main rotor transmission equipped with a small radius main rotor shaft is unairworthy until

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the main rotor transmission is removed and replaced with an airworthy main rotor transmission equipped with a large radius main rotor shaft. Refer to Table 1 for applicable main rotor transmission part numbers. Contact Enstrom Customer Service for disposition instructions for removed main rotor transmissions (Refer to paragraph 5.3.B. for Enstrom contact information).

- C. F-28A and 280 models: If the helicopter has a main rotor transmission equipped with a small radius main rotor shaft, perform a visual inspection of the main rotor shaft fillet area using a 10X magnifying glass (Refer to Figure 1). Inspect the fillet area for cracks. Repeat the inspection using a dye penetrant inspection kit if a crack is suspected. If the main rotor shaft is cracked, the helicopter is unairworthy until the main rotor transmission is removed and replaced with an airworthy main rotor transmission equipped with a large radius main rotor shaft (Refer to Table 1). If the main rotor shaft is not cracked, the helicopter may be returned to service.

NOTE

Licensed pilots may perform the preceding visual inspection but are not authorized to perform the dye penetrant inspection if required.

NOTE

Painted main rotor shafts will require removal of the paint from the fillet area of the main rotor shaft using a chemical paint remover before inspection of the fillet area using a dye penetrant kit. Follow the instructions provided with the paint remover for removing the paint.

- D. All models: No further action is required if the helicopter has a main rotor transmission equipped with a large radius main rotor shaft.

5.2. WITHIN THE NEXT 5 HOURS TIME IN SERVICE:

- A. F-28A and 280 model helicopters with a main rotor transmission equipped with a small radius main rotor shaft: Perform a dye penetrant inspection of the fillet area of the main rotor shaft directly under the main rotor hub (Refer to Figure 1). Inspect the fillet area for cracks, nicks, and/or scratches. Polish out nicks and/or scratches less than .005 in./13 mm deep (.008 in./2 mm maximum repair depth). If the main rotor shaft is cracked or the nicks and/or scratches exceed the limits, the helicopter is unairworthy until the main rotor transmission is removed and replaced with an airworthy main rotor transmission equipped with a large radius

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main rotor shaft (Refer to Table 1). If the main rotor shaft is not cracked and any nicks/scratches are repaired, the helicopter may be returned to service.

- B. Notify Enstrom Customer Service of the aircraft serial number, main rotor transmission serial number, results of the inspection, and time since new and/or overhaul for each F-28A and 280 model helicopter with a main rotor transmission equipped with a small radius main rotor shaft (Refer to paragraph 5.3.B).

5.3. WITHIN THE NEXT 300 HOURS TIME IN SERVICE OR AT THE NEXT MAIN ROTOR TRANSMISSION OVERHAUL, WHICH EVER OCCURS FIRST:

- A. F-28A, and 280 models: Remove from service all main rotor transmissions equipped with a small radius main rotor shaft. Contact Enstrom Customer Service for disposition instructions.

- B. Contact Information: Enstrom Helicopter Corporation
Attn: Customer Service
P.O. Box 490
Menominee, MI 49858-0490
Tel: 906-863-1200
Fax: 906-863-6821
Email: customerservice@enstromhelicopter.com

5.4. SPECIAL INSPECTION:

- A. F-28A, and 280 model helicopters with a main rotor transmission equipped with a small radius main rotor shaft: Return the main rotor transmission to Enstrom for inspection after any history of a main rotor blade strike (rotor blades turning).

5.5. MAINTENANCE PROCEDURES:

- A. Perform all maintenance in accordance with the applicable helicopter model maintenance manual.

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5.6. PARTS:

Table 1. Main Rotor Transmission Effectivity

PART NUMBER	DESCRIPTION	QTY PER ASSY							
			F-28A	280	F-28C	280C	F-28F	280F	280FX
28-13101-1(-R)	. Main Rotor Gearbox (.13 in. Radius Fillet M/R Shaft)	1	X	X					
28-13101-2(-R)	. Main Rotor Gearbox (.13 in. or .5 in. Radius Fillet M/R Shaft)	1	X	X	**	**			
28-13101-3(-R)	. Main Rotor Gearbox (.13 in. or .5 in. Radius Fillet M/R Shaft)	1	X	X	**	**			
28-13101-5(-R)*	. Main Rotor Gearbox (.13 in. or .5 in. Radius Fillet M/R Shaft)	1	X	X	**	**			
28-13101-8(-R)	. Main Rotor Gearbox (.13 in. or .5 in. Radius Fillet M/R Shaft)	1	X	X	**	**	**	**	
28-13101-9(-R)	. Main Rotor Gearbox (.13 in. or .5 in. Radius Fillet M/R Shaft)	1	X	X	**	**	**	**	
28-13101-101(-R)*	. Main Rotor Gearbox (.5 in. Radius Fillet, Heavy M/R Shaft)	1	X	X	X	X			
28-13170-1(-R)	. Main Rotor Gearbox (.5 in. Radius Fillet M/R Shaft)	1	X	X	X	X	X	X	
28-13170-3(-R)*	. Main Rotor Gearbox (.5 in. Radius Fillet M/R Shaft)	1	X	X	X	X	X	X	
28-13170-7(-R)*	. Main Rotor Gearbox (.5 in. Radius Fillet, Heavy M/R Shaft)	1	X	X	X	X	X	X	
28-13170-9(-R)*	. Main Rotor Gearbox (.5 in. Radius Fillet, Heavy M/R Shaft, Magnetic Chip Detector, and Low Rotor RPM Pick-Up)	1	X	X	X	X	X	X	X
28-13170-101(-R)*	. Main Rotor Gearbox (.5 in. Radius Fillet, Heavy M/R Shaft, Magnetic Chip Detector, and Low Rotor RPM Pick-Up)	1	X	X	X	X	X	X	X
28-13170-103(-R)*	. Main Rotor Gearbox (.5 in. Radius Fillet, Heavy M/R Shaft, Magnetic Chip Detector, and Low Rotor RPM Pick-Up)	1	X	X	X	X	X	X	X

Note: “-R” indicates an overhauled main rotor transmission.

* Main rotor transmissions currently available from Enstrom.

** Only authorized for installation if equipped with a large radius main rotor shaft.

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6. SPECIAL TOOLS: 10X Magnifying Glass, Dye Penetrant Inspection Kit
7. ESTIMATED MAN-HOURS: 1 Man-hour per dye penetrant inspection
.2 Man-hours per visual inspection
8. WARRANTY: Per Enstrom warranty policy.
9. WEIGHT CHANGE: N/A
10. LOG BOOK ENTRY: Enter compliance with this Service Directive Bulletin.
11. REPETITIVE INSPECTIONS:

F-28A, and 280 model helicopters with a main rotor transmission equipped with a small radius main rotor shaft: Perform a dye penetrant inspection of the main rotor shaft fillet area in accordance with paragraph 5.2.A, at 100 hour intervals.

NOTE

Installation of a main rotor transmission equipped with a large radius (.5 in/12.7 mm) main rotor shaft terminates the repetitive inspection requirements of this Service Direction Bulletin.

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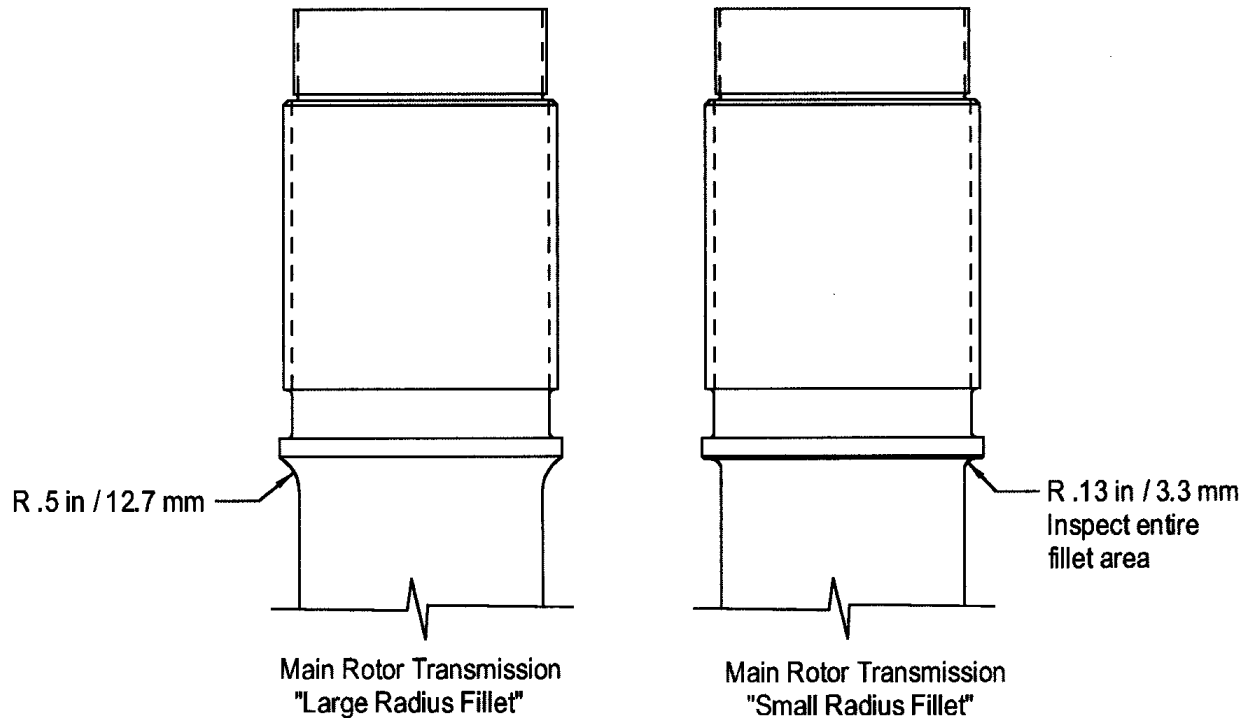


Figure 1. Main Rotor Shaft Inspection