LUFTFARTSVERKET
Luftfartsinspektionen

LUFTVÄRDIGHETSDIREKTIV (LVD)

Helikopter
Enstrom
LVD Nr 2301

Sektion 2. Utlandstillverkad flygmateriel

TITEL: **Kontroll/modifiering av stjärtrotordrivning**

GÄLLER:

1. Enstrom modell F-28, F-28A, F-28C, F-28C-2, F-28F, 280, 280C, 280F och 280FX. (Gäller FAA AD 90-17-02)

2. Alla Enstrom modell F-28A, F-28C, F-28C-2 280 och 280C; Modell F-28F med S/N 506, 507, 509, 510, 511, 512, 513, 514, 515, 517, 527, 700, 701, 702 och 704 och modell 280F med S/N 1212 och 1500. (Gäller FAA AD 90-17-03)

ÅTGÄRD:

För att undvika skador i stjärtrotordrivningen och som följd eventuellt haveri utför åtgärder enligt:

1.1 Bifogad kopia av FAA AD 90-17-02 och Enstrom Service Directive Bulletin 0080 daterad oktober 18, 1989 eller senare utgåva.

2.1 Bifogad kopia av FAA AD 90-17-03 och Enstrom Service Directive Bulletin 0065 Revision A daterad juni 1, 1984 eller senare utgåva.

TID FÖR ÅTGÄRD:

Inom 5 flygtimmar räknat från 90-09-15.

UNDERLAG:

1.1.1 FAA AD 90-17-02, Enstrom Service Directive Bulletin 0080 daterad oktober 18, 1989 eller senare utgåva.

2.2.2 FAA AD 90-17-03, Enstrom Service Directive Bulletin 0065 Revision A daterad juni 1, 1984 eller senare utgåva.

REFERENS:

FAA AD 90-17-02, FAA AD 90-17-03 och LFV skrivelse L 9008-1986-31203 daterad 1990-08-28, sänd till ägare/brukare.

UTGIVNINGS-DATUM:

1990-10-11

LFS: 1990:26

Åtgärd enligt LVD utgör nödvändig förutsättning för ifrågavarende flygmateriels luftvärdighet. Referens BCL M 1.11. Anteckning om åtgärd, som vidtagits i enlighet med LVD, skall införas i teknisk journal för berörd flygmateriel med hänvisning till ifrågavarande LVD-nummer. Angivet underlag refererar till senaste gällande revision/utgåva. LVD utges i luftfartsverkets författningssamlingar LFS.

L 1563-1

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601 79 NORRKÖPING	Vikboplan 11	Int +46 11 - 19 20 00	Norrköping	64250

U.S. Department of Transportation
Federal Aviation Administration

AIRWORTHINESS DIRECTIVE

AVIATION STANDARDS NATIONAL FIELD OFFICE
P.O. BOX 26460
OKLAHOMA CITY, OKLAHOMA 73125

The following Airworthiness Directive issued by the Federal Aviation Administration in accordance with the provisions of Federal Aviation Regulations, Part 39, applies to an aircraft model of which our records indicate you may be the registered owner. Airworthiness Directives affect aviation safety. They 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 (FAR 39.3).

90-17-02 ENSTROM HELICOPTER CORPORATION: Amendment 39-6688. Docket No. 90-ASW-28.

Applicability: Enstrom Model F-28, F-28A, F-28C, F-28C-2, F-28F, 280, 280C, 280F, and 280FX series helicopters certificated in any category.

Compliance: Required as indicated, unless already accomplished.

To prevent the loss of tail rotor thrust and directional control that could result in substantial damage or loss of the helicopter, accomplish the following:

(a) Within the next 5 hours' time in service after the effective date of this AD, inspect the tail rotor drive shaft couplings. Enter the part number of the two drive shaft couplings installed, the number of hours' time in service on each coupling, and the date in the log book.

NOTE: Enstrom helicopters use one of the following three coupling designs:

(1) splined coupling P/N 28-13609-1, (2) five-plate flex pack coupling (Dana Corp. Element No. A005-1991); or (3) seven-plate flex pack coupling, (Dana Corp. Element No. A005-1992).

(b) Before further flight, remove any five-plate flex-pack couplings, Dana Corp. P/N A005-1991, found during the inspection. After removal:

(1) Inspect the condition of the coupling hub flanges, Enstrom P/N 28-13613-1 and 28-13614-1, to which the couplings mount. The flanges must be flat within 0.010-inch, and the bolt holes must not have any evidence of elongation. Replace any flange deformed beyond these limits with an airworthy part before further flight; and

(2) Install the seven-plate flex-pack coupling, Enstrom Kit No. 28-01041-1.

NOTE: Enstrom Kit No. 28-01041-1 includes all of the necessary parts to replace a five-plate coupling with a seven-plate coupling. Two kits per rotorcraft are required. The replacement beveled washers for the seven-plate flex-pack coupling are 0.010-inch thinner than beveled washers for the five-plate flex-pack coupling. Consequently, a direct exchange should not require any additional shimming.

(c) Within the next 100 hours' time in service and at 100-hour intervals thereafter, inspect each seven-plate flex-pack coupling, Dana Corp. P/N A005-1992 or Enstrom Kit No. 28-01041-1, for compliance with deformation and airworthiness limits as follows:

(1) Locate the tension and compression sides by comparing the couplings to Figure 1.

(2) Inspect the couplings for flex pack distortion in the shape of a bow. Compare any distortion to the acceptable limits shown in Figure 2.

(3) Inspect the couplings for flex pack distortion in the shape of an offset bend. The acceptable limits shown in Figure 3 are as follows:

(i) The offset on one set of plates must not exceed 0.015 inches.

(ii) The maximum difference in offset from side to side (one pair of bolts to the other pair) must be less than 0.007 inches.

(iii) The maximum allowable shim thickness is 0.072 inches (not including bevel washers).

NOTE: The replacement of the five plate coupling with the seven-plate coupling requires a thinner set of beveled washers which are included in Enstrom Kit Number 28-01041-1.

(4) Replace any seven-plate coupling, that either--

(i) Exceeds the airworthiness limits specified by paragraph (c); or,

(ii) Has accumulated 1,200 hours' time in service.

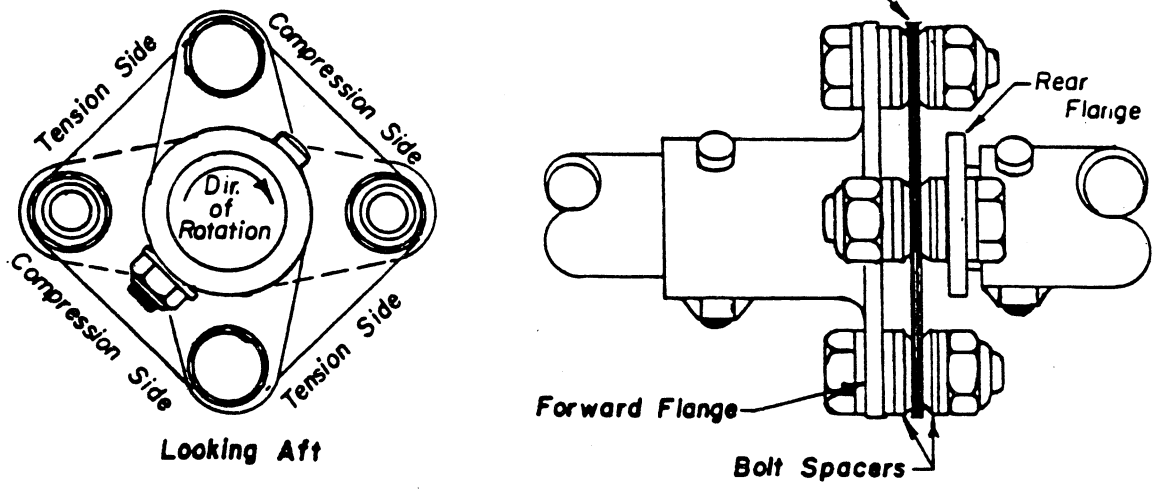

FIGURE 1
Tension Sides Versus Compression Sides
Tail Rotor Drive Shaft Coupling Installation.
Rear coupling shown; forward coupling similar.
NOTE: Tie-wraps eliminated for clarity.

(d) After removal of either seven-plate flex-pack coupling, inspect and replace, as necessary, the coupling hub flanges in accordance with paragraph (b)(1) of this AD.

(e) In accordance with FAR Sections 21.197 and 21.199, flight is permitted to a base where the requirements of this AD may be accomplished.

(f) An alternate method of compliance or adjustment of the compliance time, which provides an equivalent level of safety, may be used if approved by the Manager, Chicago Aircraft Certification Office, ACE-115C, FAA, 2300 East Devon Avenue, Des Plaines, Illinois 60018.

This amendment (39-6688, AD 90-17-02) becomes effective on September 7, 1990.

FOR FURTHER INFORMATION CONTACT:

Mr. Joseph H. McGarvey, ACE-115C, Chicago Aircraft Certification Office, Federal Aviation Administration, 2300 East Devon Avenue, Des Plaines, Illinois 60018; telephone (312) 694-7136.

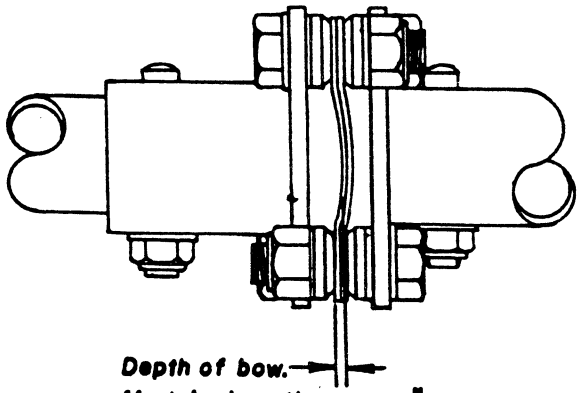

Figure 2 - Acceptable Limits of Bowed Flex Packs.
NOTE: Tie-wraps eliminated for clarity.

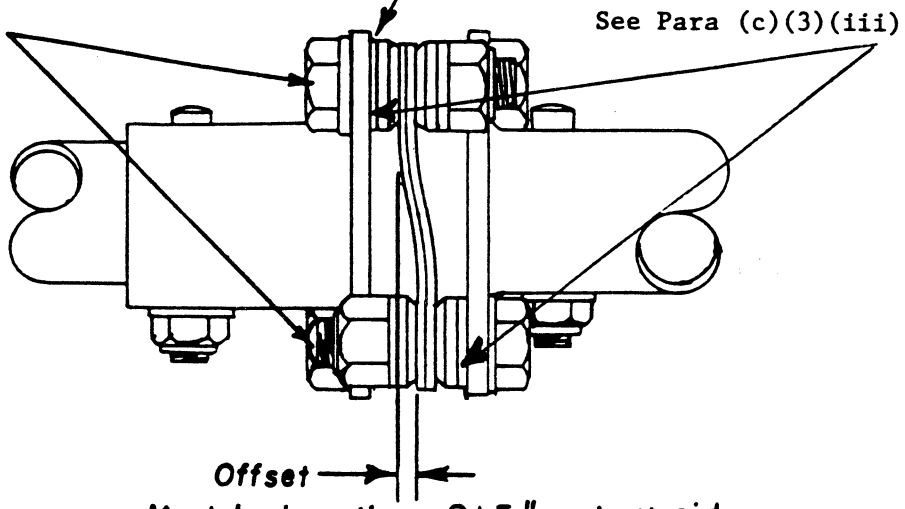

Figure. 3 - Acceptable Limits of Flex Packs with Offset Bends.
NOTE: Tie-wraps eliminated for clarity.

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P.O. BOX 26460
OKLAHOMA CITY, OKLAHOMA 73125

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90-17-03 ENSTROM HELICOPTER CORPORATION: Amendment 39-6686. Docket No. 83-ASW-39.

Applicability: All Enstrom Model F-28A, F-28C, F-28C-2, 280, and 280C series helicopters; to Model F-28F series helicopters with serial numbers (S/N's) 506, 507, 509, 510, 511, 512, 513, 514, 515, 517, 527, 700, 701, 702, and 704; and to Enstrom Model 280F series helicopter with S/N's 1212 and 1500.

Compliance: Required as indicated, unless already accomplished.

To prevent tail rotor drive shaft coupling failure that could result in loss of directional control and possible loss of the helicopter, accomplish the following:

(a) Within 5 hours' time in service after the effective date of this AD, determine if splined tail rotor drive shaft couplings, P/N 28-13009-1, are installed. Enter the part number of the tail rotor drive shaft couplings that are installed, the number of hours time in service, and the date in the log book.

NOTE: There are two tail rotor drive shaft couplings for each aircraft and there are two coupling designs approved for use on Enstrom helicopters: (1) the splined coupling, P/N 28-13609-1, and, (2) the 7-plate flex pack coupling (Dana Corp. Element No. A005-1992).

(b) For splined couplings found to have P/N 28-13609-1--

(1) Before further flight, remove from service and replace with an airworthy coupling any splined coupling which has 1200 or more hours' time in service;

(2) Before further flight, disassemble the tail rotor drive shaft couplings with less than 1200 hours' time in service and accomplish the following:

(i) Visually and dimensionally inspect for wear and proper tooth contact in accordance with Figure 1. Measure the height of the spline crown shown in Figure 2 at the center with a steel scale (having graduations of 1/100 inch) and a 10 power glass. Replace with airworthy parts any couplings that have a center crown height of less than 0.015 inch.

(ii) Test both the male and female portions of the coupling for material hardness. Test the male portion on the inner circular face as shown in Figure 3. Test the end of the stud of the female portion as shown in Figure 4. Use three readings and average the readings. Replace with airworthy parts any couplings which have average readings below 25 on the Rockwell "C" scale.

(iii) Magnetic particle inspect both portions of those couplings that have been installed on aircraft having a history of crash damage. Replace any couplings found to be cracked with airworthy parts.

(iv) Lubricate and reassemble couplings which meet the requirements of this paragraph before return to service.

NOTE: Enstrom Service Directive Bulletin 0065, Revision A, dated June 1, 1984, and the Maintenance Manual/Maintenance Manual Supplement for the respective models pertain to these procedures.

(3) At intervals not to exceed 100 hours' time in service after the initial inspection of paragraph (b)(2), partially disassemble the forward and aft tail rotor drive shaft couplings, P/N 28-13609-1. Repack the couplings with LE3752, Andok-B, Shell-14, Shell-16, or any grease meeting MIL-G-18709, prior to return to service;

NOTE: Enstrom Maintenance Manual, pages MM 3-5, MM 3-6, and MM 3-7 pertain to this procedure.

(4) Within 600 hours' time in service or at the next annual inspection, whichever occurs first after the initial inspections of paragraph (b)(2), and thereafter at each annual inspection, inspect and lubricate the forward and aft tail rotor drive shaft couplings in accordance with paragraphs (b)(2)(i) and (b)(2)(iv) of this AD; and

(5) Before reaching 1200 hours' time in service, replace with airworthy parts all couplings with P/N 28-13609-1.

(c) Rotorcraft that have Enstrom 7-plate flex pack couplings, P/N 28-01041-1, are exempt from the requirements of paragraph (b) of this AD.

(d) An alternate method of compliance, which provides an equivalent level of safety, may be used when approved by the Manager, Chicago Aircraft Certification Office, FAA, 2300 East Devon Avenue, Room 232, Des Plaines, Illinois 60018.

(e) In accordance with Sections 21.197 and 21.199, flight is permitted to a base where the maintenance required by this AD may be accomplished.

This amendment supersedes AD 83-18-04, Amendment 39-4721.

This amendment (39-6686, AD 90-17-03) becomes effective on September 7, 1990.

FOR FURTHER INFORMATION CONTACT:

Joseph H. McGarvey, ACE-120C, Chicago Aircraft Certification Office, Federal Aviation Administration, 2300 East Devon Avenue, Des Plaines, IL 60018; telephone (312) 694-7136.

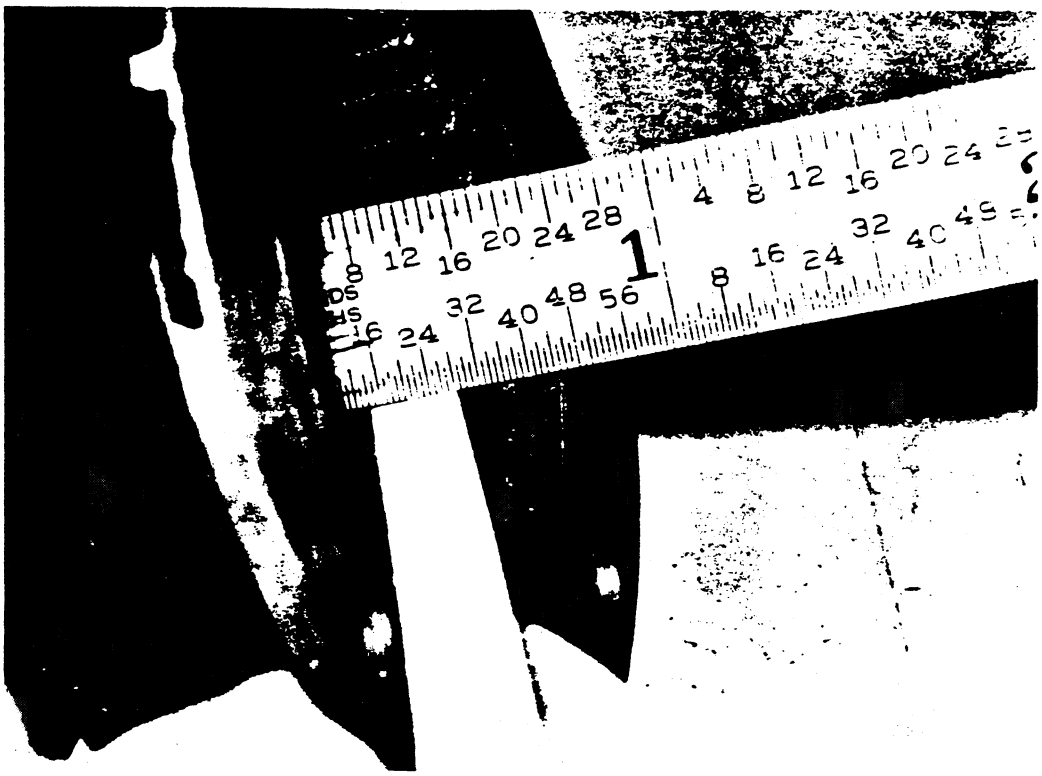

Figure 1. Checking inner spline wear on coupling.

NOTE: Tooth wear is measured by placing a 6 inch steel rule parallel to the crown at the top edge of the driven side. A piece of .125 x .010 inch shim stock is then placed between the tooth and the rule, and pressing the rule against the tooth, check if the shim can be removed. If the shim slips out, the coupling is to be rejected and replaced with an airworthy component.

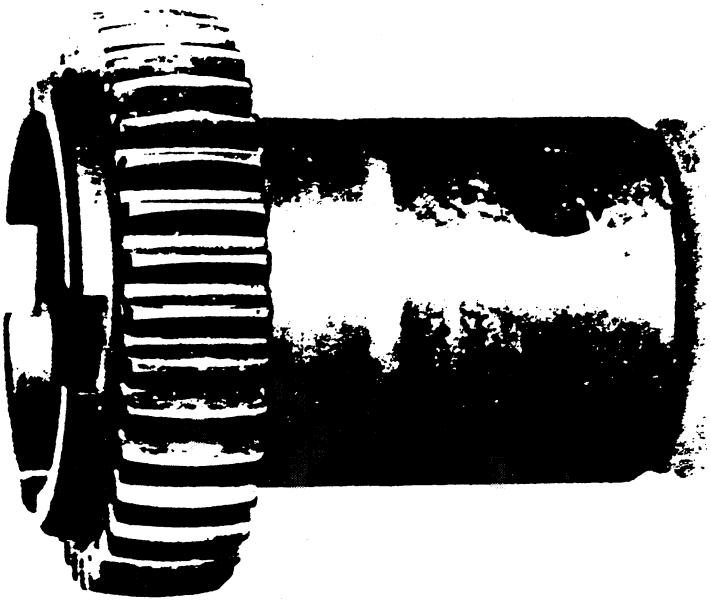

Figure 2. Checking outer spline wear on male coupling.

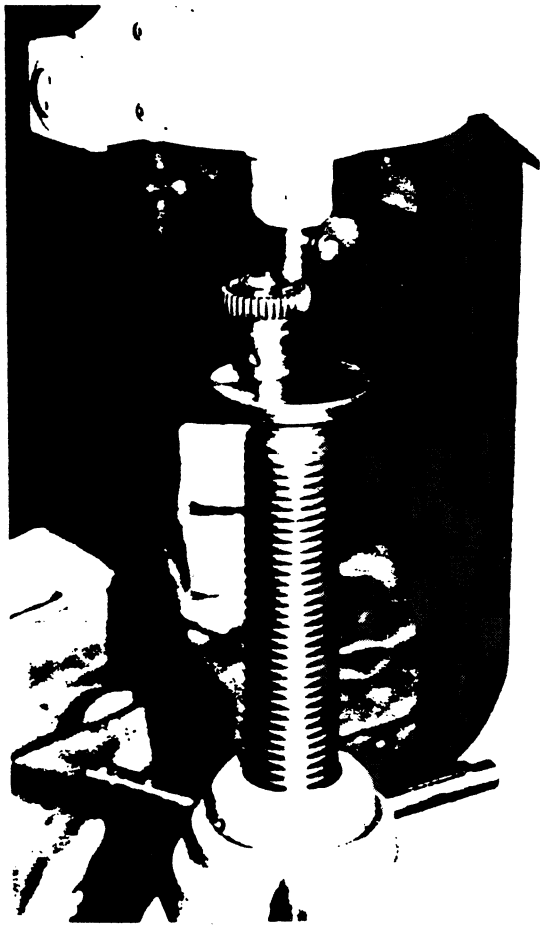

Figure 3.
Checking hardness on male portion of coupling.

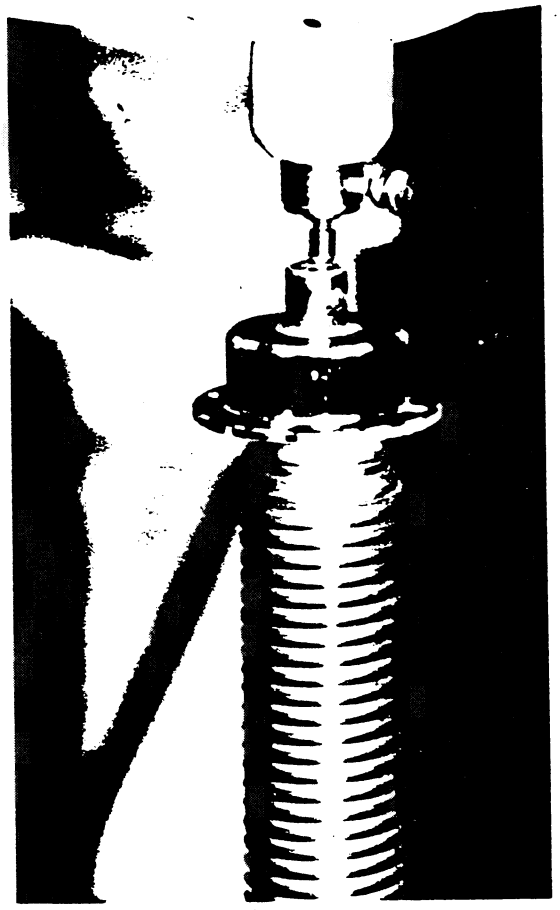

Figure 4.
Checking hardness on female portion of coupling.