



**ENSTROM**

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March 6, 2000

**TO:** Recipients of Enstrom Helicopter Service Directive Bulletins.

**SUBJECT:** REVISION OF SERVICE DIRECTIVE BULLETIN NO. 0091, LOWER  
SWASHPLATE INSPECTION

This letter transmits Revision 1 of Service Directive Bulletin No. 0091. This is a COMPLETE revision. Replace the previous issue with this edition.

This revision adds the current design of the lower swashplate assembly, P/N 28-16101-939, and requires upgrading to the current design if unserviceable parts are found during inspection of older design lower swashplate assemblies.

**NOTE**

Enstrom is pleased to offer special pricing on the "-939" overhaul and upgrade kit, P/N 28-01053-5, for a period of six (6) months from the issue date of this Service Directive Bulletin. Please contact your local dealer, service center, or Enstrom Customer Service for pricing information.

TECHNICAL PUBLICATIONS  
ENSTROM HELICOPTER CORPORATION



## SERVICE DIRECTIVE BULLETIN

SERVICE DIRECTIVE BULLETIN 0091

Revision 1

Page 1 of 4

DATE: March 6, 2000

1. SUBJECT: Lower Swashplate Assembly Inspection
2. MODEL: F-28A, F-28C, F-28F, 280, 280C, 280F, and 280FX
3. EFFECTIVITY: All serial numbers
4. BACKGROUND:

Enstrom has received several excessively worn universal shafts and tie rods from operators in the last few months. These assemblies reportedly wore in a very short period of time (e.g., less than 100 hours of flight time). Subsequent inspection did not reveal any obvious cause for the excessive wear.

Three designs of the lower swashplate assembly were previously used. The first two, P/N 28-16101-905 and 28-16101-910/924, have been in service the longest. These two assemblies use the DU washers as part of the stack-up for setting the preload of the swashplate and for proper torque up of the tie rod and universal shaft joint. The difference between the assemblies is that the "-910/924" assembly incorporates a grease fitting for the cyclic bearing. The third design, P/N 28-16101-927, is similar to the design used on the TH-28/480 model. This design was supplied on recent new production F-28F (S/N 791 and subsequent) and 280FX (S/N 2078 and subsequent) aircraft. It was also available as an exchange unit for all F-28/280 series aircraft, and a kit (28-01053-3) was available to upgrade older swashplates to the "-927" configuration. This kit has since been replaced as described in the following paragraph.

Enstrom has subsequently reviewed the design of the lower swashplate assembly, P/N 28-16101-927, and has incorporated a number of improvements. As a result, the lower swashplate assembly has been re-identified as P/N 28-16101-939. This lower swashplate assembly is eligible for installation on all models of the F-28/280 series aircraft and is available as an exchange unit. A modification kit (Lower Swashplate Modification Kit, P/N 28-01053-5) is available to upgrade older configurations.

March 6, 2000

**NOTE**

**Enstrom will no longer supply spare/repair parts for lower swashplate assemblies other than P/N 28-16101-939. Unserviceable lower swashplate assemblies must be upgraded to "-939" configuration. Refer to Service Information Letter No. 0150, Revision 1, for maintenance instructions and parts information.**

This Service Directive Bulletin mandates one time and repetitive 100 hour inspections of the lower swashplate assemblies to insure that any and all unacceptable wear characteristics are discovered before they develop into safety of flight problems.

## 5. COMPLIANCE:

- a. For a lower swashplate assembly with less than 100 hours total time in service (i.e. new aircraft or exchange swashplate assemblies purchased from Enstrom), inspect the lower swashplate assembly in accordance with paragraph 5.1 at or before the next 100 hour/annual inspection.
- b. For a lower swashplate assembly with more than 100 hours total time in service regardless of overhauls, inspect the lower swashplate assembly in accordance with paragraph 5.1 within the next 10 hours.

## 5.1. INSPECTION:

**NOTE**

Perform all maintenance procedures in accordance with the applicable aircraft maintenance manual. Contact Enstrom Customer Service for clarifications to maintenance procedures as required.

- a. Remove both side panel cowls.
- b. Disconnect the pitch change bellcranks located on the main rotor hub from the main rotor control rods located in the mast and from the pivot brackets.
- c. With the aid of an assistant, remove the collective friction and move the collective up and down throughout the range and wiggle the cyclic stick (movement of the collective and cyclic stick does not have to occur simultaneously). Observe and *carefully* feel the lower swashplate assembly for any looseness (e.g. vertical play at the universal joint or end play along the universal shaft and tie rod axes). Any looseness is most noticeable with a collective control reversal and/or reversal of the cyclic controls. NOTE: Vertical looseness

March 6, 2000

may also be evident at the collective stick as a sudden change in stick force or may exhibit itself as a clinking sound. Using a 9/16 inch crows foot and torque wrench set to 60 in-lbs/6.8 Nm, check that the torque required to rotate the tie rod assembly at the nut on the end of the tie rod assembly is more than 60 in-lbs/6.8 Nm. Do not remove the cotter pin from the nut during the check and stop the torque check if 60 in-lbs/6.8 Nm is reached without the tie rod assembly rotating. Any rotation of the tie rod with less than 60 in. lbs./6.8 Nm of torque is unacceptable.

d. If neither looseness nor loss of torque is evident, reconnect the pitch change bellcranks and return the aircraft to service.

e. If any looseness or loss of torque is found, remove the lower swashplate assembly from the aircraft and disassemble the lower swashplate assembly and inspect the detail parts in accordance with the applicable aircraft maintenance manual. Use Service Information Letter No. 0150, Revision 1, for "-927" swashplate assemblies.

f. Upgrade the lower swashplate assembly to "-939" configuration if unserviceable parts are found. Refer to Service Information Letter No. 0150, Revision 1.

g. Reinstall the lower swashplate assembly and reconnect the pitch change bellcranks.

## 5.2. PARTS:

Refer to Service Information Letter No. 0150, Revision 1, for upgrading to "-939" swashplate assemblies.

## 6. SPECIAL TOOLS:

Refer to the applicable aircraft maintenance manual or Service Information Letter No. 0150, Revision 1, for special tool requirements.

## 7. MAN-HOURS:

1 Man-hours if it is not necessary to remove the lower swashplate. 8 Man-hours if the lower swashplate is disassembled.

## 8. WARRANTY: Per Enstrom Warranty Policy

## 9. WEIGHT CHANGE: None

## 10. LOG BOOK ENTRY: Enter compliance with this Service Directive Bulletin.

March 6, 2000

**NOTE**

Please notify Enstrom Customer Service (Tel: 906-863-1200, Ext. 118; Fax: 906-863-6821; or email: [enstrom@cybrzn.com](mailto:enstrom@cybrzn.com)) of any unserviceable lower swashplate assemblies.

11. REPETITIVE INSPECTION:

Inspect the lower swashplate assembly at 100 hour intervals in accordance with paragraph 5.1.