Tail Rotor Spindle Assembly Repair Procedure

Disassembly

1. Remove tail rotor assembly and blade assemblies in accordance with:
   a. TH28/480 Series MM-9-107
   b. F-28F/280FX Series MM-10-2

2. Clamp spindle in a vise using brass jaws to avoid damaging spindle. (Fig-1)

![Brass Jaws.]

Figure 1

3. Remove snap ring. (Fig-2)

![Snap Ring Removal]

Figure 2
4. Remove end plate. *(Fig-3)*

   ![End Plate](image1)

   **NOTE:**
   When removing end plate keep track of thrust bumpers, and shims. Keep original shims and bumpers with respective end plate.

5. Remove thrust bumper from end plate. *(Fig-4)*

   ![Thrust Bumper](image2)

   **NOTE:**
   Inspect Thrust bumper for wear ridges on the inside, and outside diameters. Lay a strip of emery cloth on a flat surface and smooth ridges from thrust bumper surface.

6. Remove shims from end plate. *(Fig-5)*

   ![Shims](image3)

   **Figure 3**

   **Figure 4**

   **Figure 5**
7. Remove seal. *(Fig-6)*

8. Rotate spindle in vise and repeat steps 3, 4, 5, 6, and 7, on opposite spindle ear. *(Fig-7)*
9. Install T-2893 on spindle, secure tool in a vise, adjust tool so that T-2893 does not interfere with bearing, and press both bearing out as far as possible. (Fig-8)

**NOTE:**

Heating the bearings to **80-100 C** will make it easier to remove the bearings.

Apply heat in these two places

**NOTE:**

Rotate hub as shown in figure 8 before pressing bearings.

**NOTE:**

Bearings will NOT come all the way out.
10. Install half-moon spacers from tool T-2893 over journals, and press out bearings with T-2893. (Fig-9)

![Half-moon Spacers](image)

**Figure 9**

11. Repeat step 10 on remaining bearing.
12. Heat journals and remove from hub with special tool T-2893. Repeat this step on remaining journal, and remove hub from spindle bore. (Fig-10)

![Apply heat to journal](image)

**Figure 10**

**NOTE:**
Heat journals to **100-120 C** for 30 seconds to release the Loctite and facilitate removal.
NOTE:

a. Wash parts in cleaning solvent.
b. Wash bearings in clean solvent to prevent contamination of bearings.

13. Inspect in accordance with:
   a. TH28/480 Series MM-9-111 – 9-118
   b. F-28F/280FX Series MM-10-5, F

Assembly

1. Check hub, washers, and journals for slip fit.

NOTE:
Polish hub as required using scotchbrite pad or equivalent.

2. Apply Loctite 7649 primer to hub and journals. (Fig-12)

Figure 11
3. **Apply a small bead of Loctite 277 to inboard I.D. of each journal. (Fig-13)**

![Small Bead of Loctite](image1)

![Outboard](image2)

**Figure 12**

4. **Install hub assembly into spindle bore, then install washer (chamfer inboard to hub), install journal chamfer outboard to hub. (Fig-14)**

![Chamfer](image3)

**Figure 13**

**NOTE:**
Hub must be installed in spindle before installing washers, and journals.

**NOTE:**
Remove excess Loctite from end hub ears, and journals.
5. Using two 9/16 deep-set sockets, mount spindle into arbor press, or vise, apply light pressure, and high heat for approximately 30 seconds, at 40-80°C (Fig-16)

![Figure 14]

6. Insert bearing into spindle, flat end of bearing with writing facing outboard of spindle, and the rounded end facing inboard of spindle. (Fig-17)

![Figure 15]
7. Press bearings to the depth of special tool cap. *(Fig-18)*

*Figure 16*
8. Install seal. *(Fig-19)*

![Figure 17](image)

9. Install shims into end plate, using a micrometer start with .015” on each side. *(Fig-20)*

![Figure 18](image)

10. Install thrust bumper, notched end up, (notches inboard to hub). *(Fig-21)*

![Figure 19](image)
11. Install end plate, and then snap ring. *(Fig-22)*

**CAUTION:**
Assure snap rings is fully seated. If snap rings are not fully seated, an incorrect preload will be obtained.

**NOTE:**
The snap ring has a flat side (inboard) and a beveled side (outboard).
12. Repeat steps 9 through 12 to opposite side.

13. Construct an arm to install in the hub splines and measure 6 inches from the center of the hub. (Fig-23)

Figure 21
14. Using a spring scale, set drag to ½ to 1 lbs. break away force (Fig-24)

**NOTE:**

Adjust preload by adding shims (increase preload) or subtracting shims (decrease preload) until desired preload is obtained.

**NOTE:**

Shimming should be within .001 inches of either side.

15. Reinstall blade/grip assemblies, Tail rotor assembly, static/ dynamic balance.
   a. TH28/480 Series MM Para: 9-50 to 9-52
      i. Static balance MM Para: 9-42
      ii. Dynamic balance MM Para: 9-43
   b. F-28F/280FX Series MM-10-12 to 10-24