

DATE: February 5, 1974
TITLE: CONTROL SURFACE TORQUE TUBE REPAIR KIT
SERIALS AFFECTED: All AA-1, AA-1A, AA-1B, and AA-5 Model Aircraft
WEIGHT AND BALANCE CHANGE: Negligible

PARTS LIST

<u>QUANTITY</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
5	904003-1	Sleeve
5	904003-2	Sleeve
10	904003-3	Bearing
7	904003-4	Spacer
A/R (40 supplied in kit)	904003-5	Spacer
1	904003-6	Spacer
1 50 CC Can	LOCKTITE-601-31	Loctite #601
1 50 CC Can	74-31 (Alternate)	Loctite #74 Nut Lock

DESCRIPTION OF MODIFICATION

This kit provides the instructions and material required to repair worn torque tube bearing areas on the ailerons, elevators and rudder for one aircraft. The modification requires removing the control surfaces and installing a stainless steel sleeve over the original worn bearing surface area on the torque tube. New bearings and spacers (included in kit) with slightly larger bores must be installed to compensate for the larger diameters of the stainless steel repair sleeves.

MODIFICATION

A. AILERONS

1. Remove wing tips.
2. Remove baggage compartment floor covering and access covers.
3. Remove nuts and bolts securing aileron horns to the torque tubes and remove horns from torque tubes by rotating and sliding from the end of the tubes.

N O T E

DO NOT DISTURB CABLE TURNBUCKLES OR CONTROL SURFACE RIGGING.

4. Remove fasteners from outboard aileron torque tube bearing supports and disconnect aileron ground straps, if installed.
5. Withdraw ailerons, torque tubes and support bearings by pulling entire assemblies outboard.

NOTE: REVISION A INCREASES QUANTITY OF 904003-5 SPACERS FROM 6 TO 40.

NOTE

KEEP ALL TORQUE TUBE BEARING SPACERS TOGETHER, AS REMOVED, TO AID REASSEMBLY.

6. Remove balance weight and fasteners then remove and discard 902014-3 spacers on each end of ailerons. (See Note Above).
7. Clean the 904003-2 sleeves and aileron torque tubes thoroughly, especially in bearing areas, with MEK or an equivalent solvent.
8. Inspect aileron torque tube bearing surfaces for wear. Maximum allowable torque tube wear is .030" reduction in wall thickness. Ailerons with torque tubes worn more than this must be replaced.
9. Slide the 904003-2 sleeves in place over the worn bearing surfaces and lock in place with "Loctite #601" or "#74 Nut Lock", or equivalent. (See Figure 1 and 2).
10. Replace original bearing inserts on inboard and outboard aileron support brackets with new larger bore #904003-3 bearings. Round out or "size" new bearings to seat firmly in support brackets.
11. Replace original spacers between outboard ends of flaps and the bearing support brackets with larger bore #904003-5 spacers supplied in the Kit. Discard original spacers. (See Figure 2).
12. Install one 904003-4 spacer (Chamfered bore toward rib) on each end of the ailerons to replace the original spacers removed earlier. (See Figure 1 and 2).
13. Lubricate aileron bearings with a light film of Aeroshell grease #6 or equivalent per MIL-G-7711.
14. Install ailerons in reverse of removal procedure. Replace any original thin (.020" thick), spacers between outboard aileron rib and bearing support bracket with #904003-5 spacers supplied in Kit. Add these spacers as required to maintain .020" to .060" aileron end play. (See Figure 1).
15. After installation is complete, check ailerons for freedom of movement and full travel. Check balance weight movement thru wing tip hole.

B. ELEVATORS

1. Remove elevator tips and elevator tip ribs (2-place aircraft only).
2. Remove tailcone being careful to disconnect tail light wires at aft bulkhead.
3. Remove bolts which connect elevator torque tubes to elevator bellcrank. (See Figure 3)
4. Remove fasteners connecting trim tab bellcrank to trim drive-bungee assembly, on 2-place aircraft. On 4-place aircraft, remove trim tab bellcrank center bolts, and bolts and roll pin attaching the two trim drive connecting brackets to the bellcrank.
5. Remove elevator ground straps if installed.
6. Remove screws from outboard bearing support brackets.
7. Carefully remove elevators by sliding torque tubes out of inner support bearings.

NOTE

KEEP ALL TORQUE TUBE BEARING SPACERS TOGETHER, AS REMOVED, TO AID REASSEMBLY

8. Lay elevator assemblies on a padded work bench (to prevent scratching).

9. Inspect torque tube bearing surfaces for wear. Maximum allowable torque tube wear is .030" reduction in wall thickness. Elevators with torque tubes worn more than this must be replaced.
10. Clean four 904003-1 sleeves and elevator torque tubes thoroughly, especially in bearing areas, with MEK or an equivalent solvent.

NOTE

ON 2-PLACE AIRCRAFT, BEFORE 904003-1 SLEEVES ARE INSTALLED, BE SURE TRIM TAB DRIVE BELLCRANK IS IN PLACE ON R. H. ELEVATOR TORQUE TUBE AND ALUMINUM SPACER (BELLCRANK HALF ON 4-PLACE AIRCRAFT), IS IN PLACE ON L. H. ELEVATOR. SEE FIGURE 3.

11. Slide 904003-1 sleeves (inboard), and 904003-1 sleeves (outboard), in place over worn bearing surfaces and lock in place with "Loctite #601" or "#74 Nut Lock" or equivalent. See Figure 3 and 4.
12. Replace original spacers at outboard ends of elevators with 904003-4 spacers (1 on each outboard end with chamfered bore toward rib). Discard original spacers. See Figure 4.
13. Replace original bearing inserts on inboard and outboard elevator support brackets with new larger bore 904003-3 bearings. Round out or "size" new bearings to seat firmly in support brackets. See Figure 3 and 4.
14. Lubricate elevator bearings with a light film of Aeroshell #6 grease or equivalent per MIL-G-7711.
15. Install elevators in reverse of removal procedure. Replace any original thin (.020" thick) spacers between outboard elevator spacer (904003-4) and support bearing with larger bore 904003-5 spacers supplied in Kit. Discard original spacers. Add 904003-5 spacers as required to maintain a maximum of .030" elevator end play. See Figure 4.
16. After installation is complete, (except for tailcone installation), check elevators for freedom of movement and full travel.

C. RUDDER

1. Remove L.H. inspection cover below vertical stabilizer and disconnect flashing beacon lead.
2. Remove rudder bellcrank and lower torque tube spacer.
3. Disconnect rudder ground strap, if installed.
4. Remove upper bearing support screws.
5. Carefully remove rudder by lifting out of lower bearing support while sliding flashing beacon lead out of vertical stabilizer.
6. Lay rudder assembly on a padded work bench (to prevent scratching), remove screws from tip and pull tip away far enough to allow access to tip rib fasteners.
7. Remove tip rib fasteners, remove tip rib and upper bearing support bracket.

NOTE

KEEP ALL TORQUE TUBE BEARING SPACERS TOGETHER, AS REMOVED, TO AID REASSEMBLY.

8. Remove and discard spacers at top end of rudder. (See Note Above).
9. Clean a 904003-1 sleeve, a 904003-2 sleeve and the rudder torque tube thoroughly, especially in bearing areas, with MEK or an equivalent solvent.

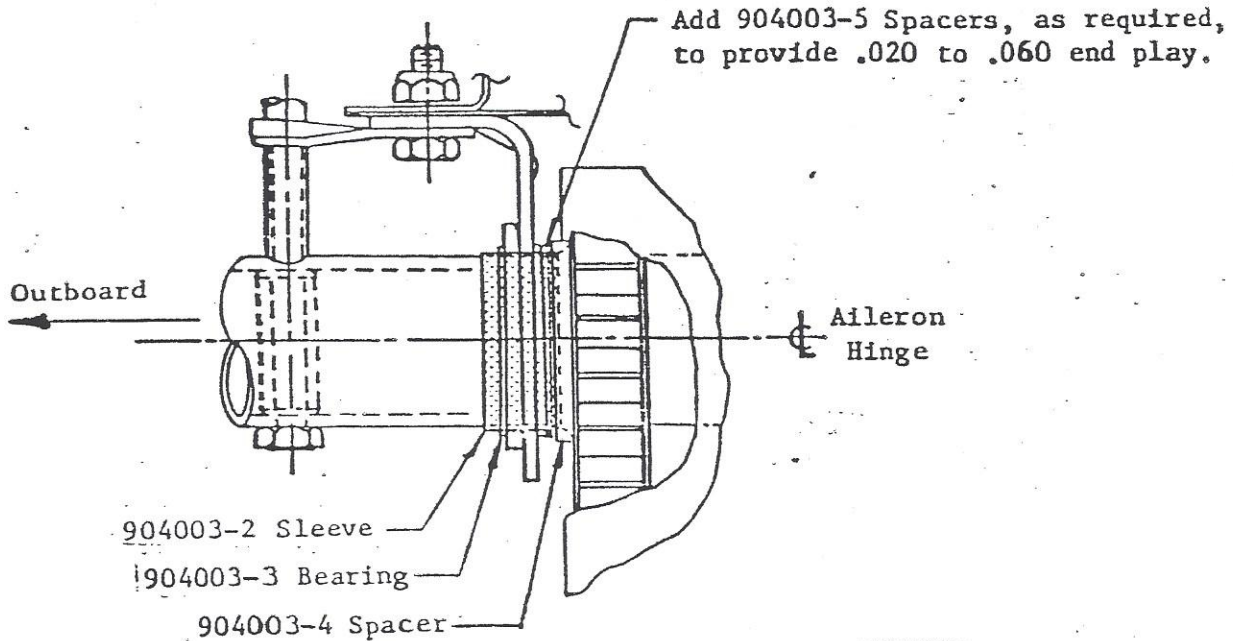


FIGURE 1. AILERON OUTBOARD BEARING REPAIR.
(LH Shown, RH Opposite)

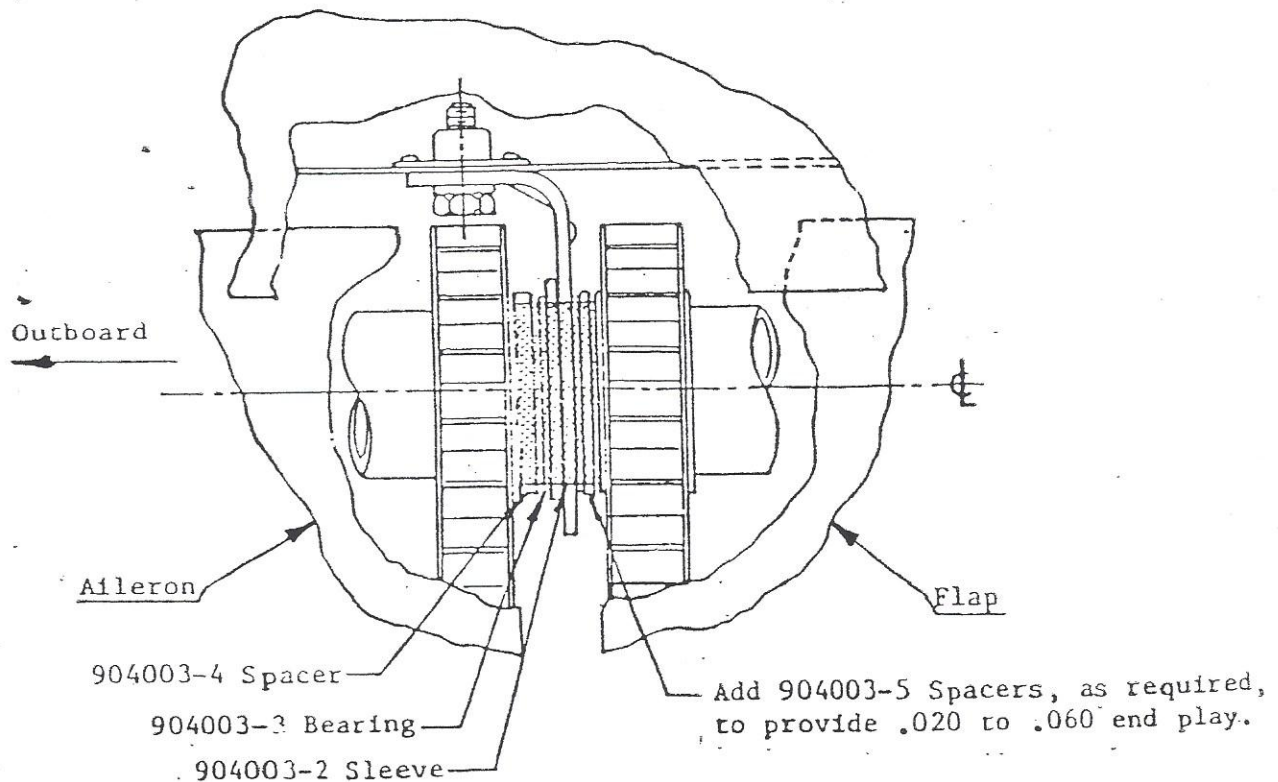


FIGURE 2. AILERON INBOARD BEARING REPAIR
(LH Shown, RH Opposite)

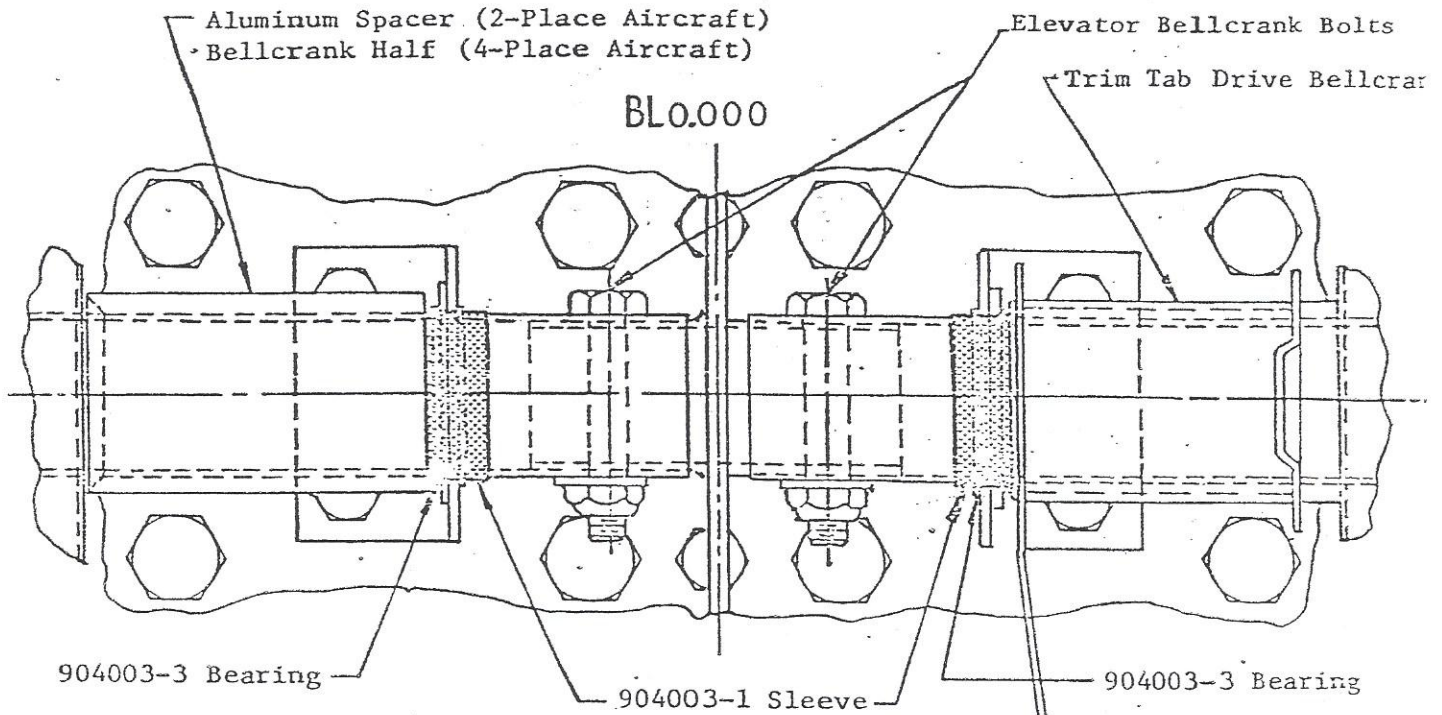


FIGURE 3. INBOARD ELEVATOR BEARING REPAIR
(View Looking Forward)

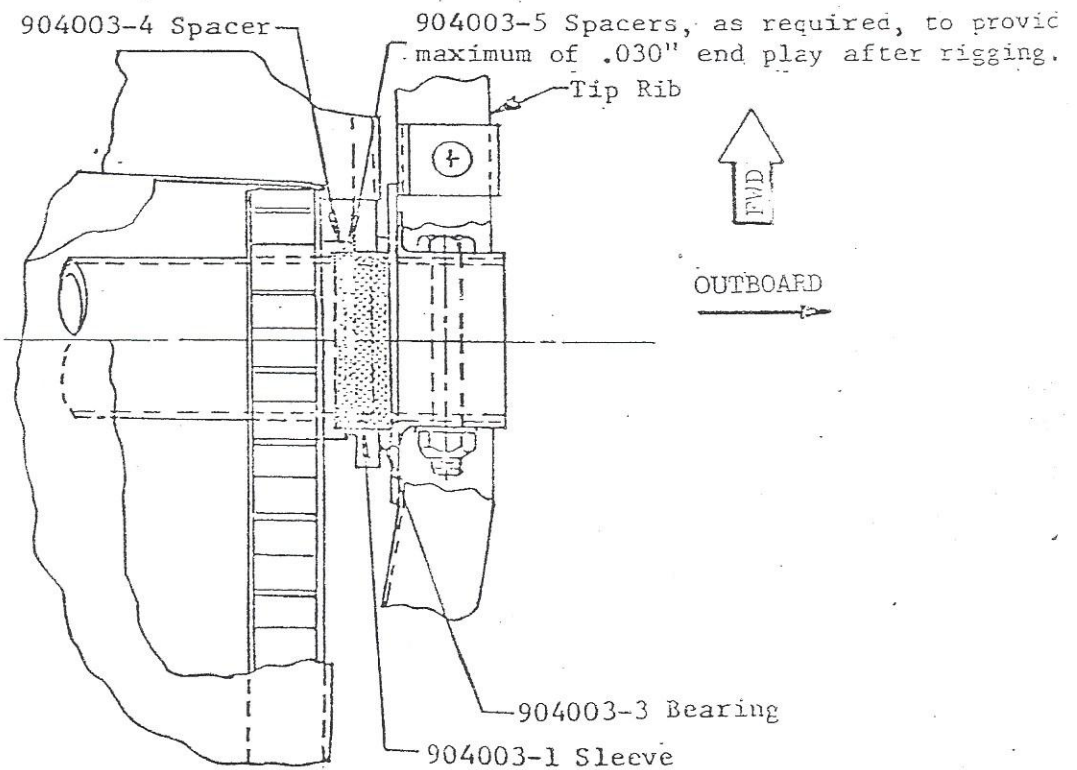


FIGURE 4. LH & RH ELEVATOR OUTBOARD BEARING REPAIR
(RH SHOWN, LH Opposite)

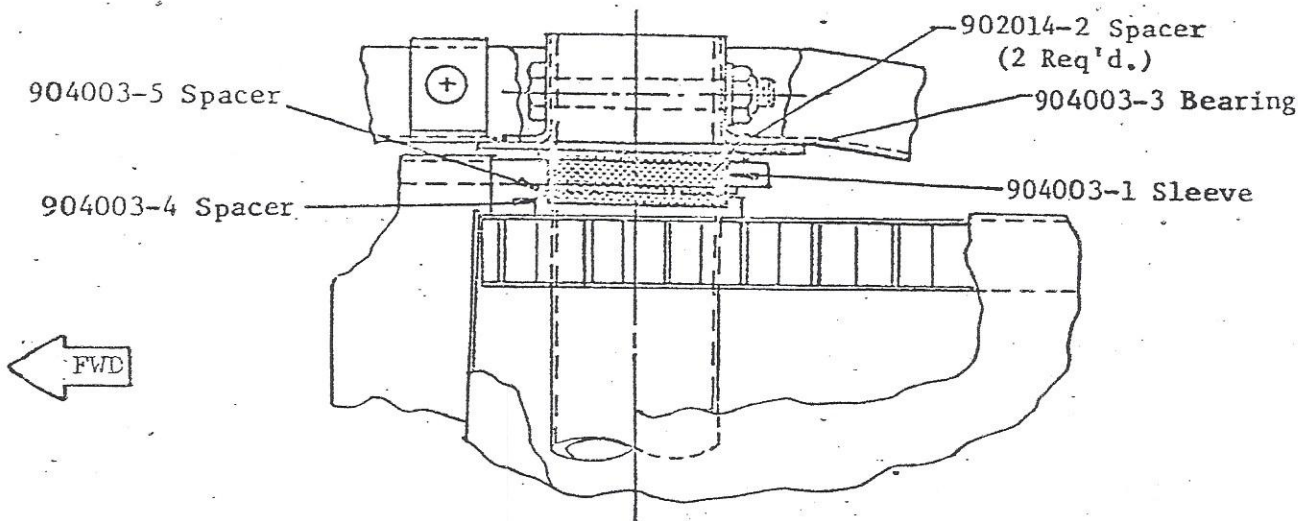


FIGURE 5. UPPER RUDDER BEARING REPAIR

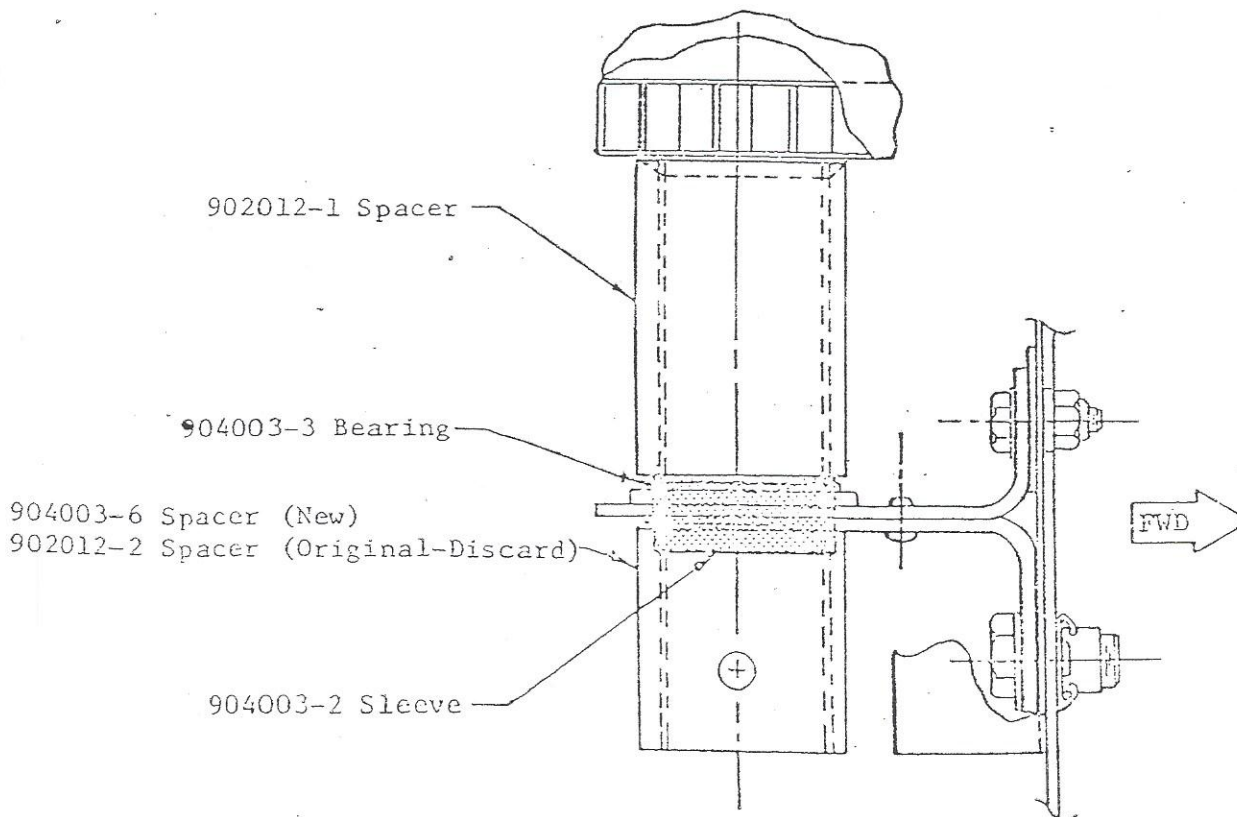


FIGURE 6. LOWER RUDDER BEARING REPAIR

10. Inspect rudder torque tube bearing surfaces for wear. Maximum allowable torque tube wear is .030" reduction in wall thickness. Rudders with torque tubes worn more than this, must be replaced.
11. Slide a 904003-1 sleeve (3/8" wide), in place over worn bearing surface at upper end of rudder and lock in place with "Loctite #601" or "#74 Nut Lock or equivalent. (See Figure 5).
12. Slide a 902012-1 spacer in place against lower rudder rib. Then slide a 904003-2 sleeve in place against spacer and lock in place with "Loctite #601 or #74 Nut Lock" or equivalent. (See Figure 6).
13. Replace original bearing inserts on upper and lower rudder support brackets with larger bore 904003-3 bearings. Round out or "size" new bearing insert to seat firmly in support brackets.
14. Replace original spacers at upper end of rudder with larger diameter 904003 spacer (chamfered bore toward rudder rib) (1 required), and 904003-5 spacers (same quantity as removed). (See Figure 5).
15. Lubricate rudder bearings with a light film of Aeroshell grease #6 or equivalent per MIL-G-7711.
16. Install upper bearing support and 902014-2 spacers (2 required), (See Figure 5).
17. Reinstall rudder tip rib and rudder tip in reverse of removal procedure.
18. Reinstall rudder on aircraft in reverse of removal procedure, except install a 904003-6 spacer on rudder torque tube below lower bearing support in place of original 902012-2 spacer. (See Figure 6).
19. After installation is complete, check rudder for freedom of movement.
20. Reinstall tailcone.

GRUMMAN AMERICAN AVIATION CORPORATION

RLJ:jd