

## PROCEDURE 3.080

### FLAP TORQUE TUBE INSTALLATION

*In this procedure...*

The flap torque tubes, collars, brackets and bearings will be temporarily installed in the wing. The flap actuator arm will also be installed. After fit, all parts need to be removed, cleaned, greased, and then re-installed during wing closure.

For this procedure, the following parts will be required:

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
111-24-060	Flap Torque Tube- Outboard, Left	1
111-24-061	Flap Torque Tube- Outboard, Right	1
111-24-062	Outboard Flap Bracket	2
111-24-064	Flap Torque Tubes Inboard	2
111-24-065	Bearing Bracket	2
111-24-066	Collar, Flap Torque Tube	2
111-24-073	Arm, Torque Tube Actuator	1
111-24-071	Actuator	1
111-24-074	Spacer, Actuator	2
J1812	Bearing, Inboard Bracket	2
J1616	Bearing, Outboard Bracket	2
CR3213-4-4	Rivet, Cherry Max	16
AN3-10A	Bolt, Rib Bracket	8
AN3-14A	Bolt, Torque Tube Left Side	1
AN3-15A	Bolt, Torque Tube Right Side	1
AN4-14A	Bolt, Outboard Bracket	4
AN960-10	Washer	28
AN960-416	Washer	8
AN365-1032	Nut	14
AN365-428	Nut	4
AN396-33	Clevis Pin	1
MS24665-134	Cotter Pin	1

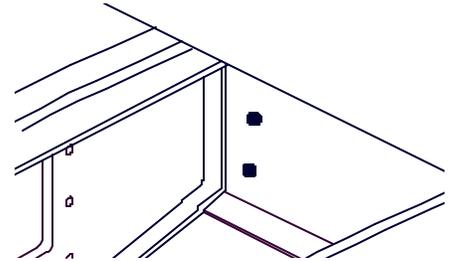
**Step 1 Install Outboard Bracket.**

A. Locate and draw a vertical line at wing BL 31.5 on the aft shear web. This line is the vertical centerline for the outboard flap bracket mounting holes. Measure from the wing skin surface to the top edge of the aft shear web and find the center point of the vertical line. The two mounting holes are located 1 inch from the center point on the vertical line.



B. Drill the top 3/16" hole. Place a bolt through the bracket and the hole in the shear web. Clamp bracket in place, insure the bottom hole is centered on the vertical line and drill the bottom hole through the shear web.

C. Remove the bracket and install the bearing. Then insert the outboard torque tube through the mounting bracket. Reinstall the bracket to the shear web and tighten the bolt so that the bracket is snug to the shear webs.

**Step 2 Install the Bearing Support in Rib J.**

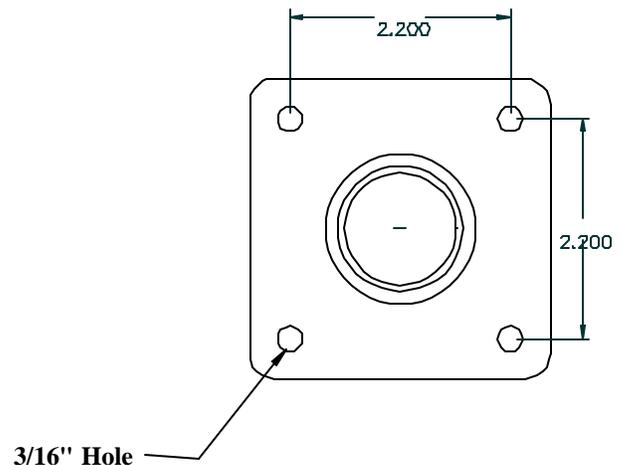
A. Insure that the torque tube is running parallel with the main spar. If necessary the outboard bracket may be bent a small amount to obtain this alignment.

B. Level the torque tube and mark Rib J where the center of the tube will pass through the rib.

C. Drill a 1 1/2" hole through Rib J using a hole-saw.

D. Drill four 3/16" holes in four corners of the bearing support. (See drawing at right).

E. Install the bearing in the bearing support and insert the bearing block into the 1-1/2 inch hole previously drilled in Rib J. The flat plate should be on the outboard side of Rib J.



- F. Install the four AN3 bolts and screw four plain nuts onto the bolts finger tight.
- G. Slip the inboard torque tube through the bearing and into the outboard torque tube. Rotate the torque tube and check for freedom of rotation. Tighten each nut down equally  $\frac{1}{2}$  rotation at a time, checking for freedom of rotation after each tightening sequence. If the torque tube becomes stiff, determine which bolt caused the binding and place a thin washer between the plate and the rib. Repeat this step until you have the nuts tightened to a torque value of 20 lb/in. and the torque tube turns without any binding. Remove the inboard torque tube and loosen the nuts. Take care to insure that the washer stack-ups are not mixed up.
- H. Mix up a thick cab-o-cil and milled fiber mix; remove the bearing block far enough to get the milled fiber between the plate and the rib. Replace the bolts and the washers, install AN365 nuts and torque the nuts to 20 lb/in. Clean all milled fiber from the edges around the bearing plate. **(NOTE: Make sure torque tube still rotates freely as you tighten the nuts).**

### Step 3 Install Actuator Arm

Remove the inboard torque tube from the bearing block and slip the collar onto the tube. Insert the tube back through the bearing and install the flap actuator arm. Slide the inboard torque tube in until the end of the torque tube is 3 inches from the inboard side of rib I. Position the collar against the bearing; rotate the torque tube so that the push/pull tube arm is horizontal and 3" from the upper wing skin. Rotate the actuator arm so that the actuator attachment hole center is 2" from the upper wing skin.

- A. Make sure to maintain alignment and drill  $\frac{3}{16}$ " holes through the actuator arm assembly. Install AN3 bolts, washers and AN365, Fiber Lock Nuts and torque to 20 lb/in. Drill two #30 holes through the collar and tube and install Cherry Max rivets.



