

## STABILATOR MODIFICATION

PA-24-250 - Serial Nos. 24-1, 24-103 to 24-3641 inclusive, 24-3643 to 24-3687 inclusive

PA-24-260 - Serial Nos. 24-3642, 24-4000 to 24-5047 inclusive

<u>PART NO.</u>	<u>QUANTITY</u>	<u>NOMENCLATURE</u>
	1	Paperwork (R740805)
16895-06	2	Plate - Reinforcement (center)
16895-07	2	Plate - Reinforcement (outboard)
20257-04	2	Block - Attachment
20257-05	2	Block - Attachment
21510-02	6	Pin - Stabilator tab hinge
21564-00	1	Plate - Balance
22515-04	1	Plate - Reinforcement (L. Inboard)
22515-05	1	Plate - Reinforcement (R. Inboard)
24191-00	2	Plate - Reinforcement (Inboard)
24192-00	2	Plate - Reinforcement (Inboard)
24193-00	2	Plate - Reinforcement (Center)
24193-02	2	Plate - Reinforcement (Outboard)
28033-00	2	Weight - Tip
28035-00	2	Tube Assembly
28039-03	2	Reinforcement Assembly - Rib
28041-00	2	Fairing Assembly - Tip
80042-70	3	Shim
81262-80	1	Plate - Balance
81262-81	1	Plate - Balance
400 438	2	Bolt - AN3-4A

## STABILATOR MODIFICATION

<u>PART NO.</u>	<u>QUANTITY</u>	<u>NOMENCLATURE</u>
400 443	2	Bolt - AN3-12A
404 833	4	Nut - MS20364-832C
407 564	8	Washer - AN960-10
415 286	2	Screw - #10-32 x 1 1/2" L. Phillips Oval Hd. Plated
415 289	2	Screw - #10-32 x 2" L. Phillips Oval Hd. Plated
415 315	4	Screw - MS27039-0823
420 201	40	Rivet - MS20470AD3-4
420 216	12	Rivet - MS20470AD4-4
420 218	120	Rivet - MS20470AD4-6
422 988	10	Rivet - AD42H
454 867	2	Clip - Turnbuckle safety (NAS651-16S)
522 881	10	Rivet - NAS1738B4-1
522 882	42	Rivet - NAS1738B4-2
522 883	24	Rivet - NAS1738B4-3
757 441	4	Plate - Identification (PS10006-3)

PAPERWORK FOR STABILATOR MODIFICATION KIT

Kit List (Rev. 8/5/74)

Paperwork List (R740805)

Installation Instructions (R740805)

Sketch "A" (740129)

Sketch "B" (740129)

Sketch "C" (740129)

Sketch "D" (740129)

Sketch "E" (740129)

Owner's Handbook Page - Airspeed Calibration Chart (Adhesive back)

## INSTALLATION INSTRUCTIONS

## CAUTION

Before performing any part of this installation, it will be necessary to inspect the existing stabilator and stabilator tab assemblies to determine whether they fulfill the criteria for airworthy units. The use of any stabilator or stabilator tab control surface with access holes, patch plates or the use of any filler material normally used for repair of minor dents and/or materials used for filling the inside of surfaces is prohibited. Repairs that do not maintain the original configuration, strength, stiffness and weight distribution are also unacceptable. Furthermore the stabilator, stabilator trim tab and tab mechanism must be checked for free play as outlined in the PA-24 Service Manual P/N 753 516 Dated 8/18/72. If it is elected to install new stabilator assembly P/N 20193-48 (left) or 20193-49 (right) Revision BA or later or new stabilator tab assembly P/N 20194-28 (left) or 20194-29 (right) Revision N or later, it will be noted that the hinges have been reinforced and the outboard B.L. 73.0 rib has been revised to include the reinforcement and anchor nuts to attach the tip balance tube P/N 28035-00 and tip fairing P/N 28041-00. Refer to the PA-24 Service Manual P/N 753 516 for stabilator and stabilator tab installation information. Complete the following procedures of the kit instructions when installing new assemblies:

Section A - Steps 8, 9, 10, 11, 12, 13 and 14

Section C - Steps 6, 7 and 8

Sections D, E and F - All Steps.

**A. STABILATOR BALANCE WEIGHT INSTALLATION**

1. Remove the stabilator tip fairing and fuselage tail cone fairing.
2. Remove the existing stabilator tip fairing attachment blocks.
3. Cut a notch in the outboard end of the stabilator leading edge skin at B.L. 73.0 rib so tube assembly Part No. 28035-00 will lie flat against reinforcement assembly Part No. 28039-03. Refer to Figure 1 on Sketch "A".
4. Cut a clearance hole in the B.L. 73.0 rib for the anchor nut mounted on reinforcement assembly Part No. 28039-03. Refer to Sketch "A".
5. Remove the ten existing rivets (5 top and 5 bottom) fastening the stabilator leading edge skin to the B.L. 73.0 rib.
6. Locate and drill five .129 holes in the B.L. 73.0 rib using reinforcement assembly Part No. 28039-03 as a template and/or the dimensions given on Sketch "A". Fasten the reinforcement assembly to the rib with five AD42H rivets.
7. Drill ten .098 holes thru the reinforcement flanges using the existing leading edge skin and rib rivet holes as locators. Extreme caution should be exercised so the existing holes are not enlarged or elongated. Fasten the skin, rib and reinforcement together with MS20426AD3-4 rivets.

8. Install tube assembly Part No. 28035-00 using AN3-12A bolt and AN960-10 washer in the forward bolt location and AN3-4A bolt and AN960-10 washer in the rear bolt location as shown in Sketch "B". Refer to bolt callout and Note 1 on Sketch "B" for Torque Specifications.
9. Install weight Part No. 28033-00 on the tube assembly using two MS27039-0823 screws, AN960-10 oversize washers and MS20364-832C nuts. The washers must be placed between the lead and the nut as shown on Sketch "B". Refer to screw callout and Note 1 on Sketch "B" for Torque Specifications.
10. Cement block Part No. 20257-04 to the tube assembly and block Part No. 20257-05 to the rib at the existing rear anchor nut, to keep blocks in place when installing the tip fairing. Use 3M Cement #EC-847.
11. Position the fairing assembly Part No. 28041-00 and secure with a #10-32 x 1 1/2" L. oval Phillips head machine screw in the forward hole and a #10-32 x 2" oval Phillips head machine screw in the rear hole. Refer to Sketch "B".
12. Place the stabilator leading edge in a full down position, locate and drill a .191 drain hole in the fairing at the lowest point. Be certain the hole is in lowest point to insure complete drainage.
13. Paint information "NO HAND HOLD" in same area on fairing assembly, in relation to stabilator, as on stabilator tip that was removed.
14. Make same installation on the opposite stabilator.

#### B. REINFORCEMENT OF STABILATOR HINGES - Refer to Sketch "C"

1. Remove the stabilator tab. Refer to PA-24 Service Manual P/N 753 516 for procedure.
2. Mark the positions of the existing hinges to gain a reference point when using the locating dimensions for new rivet holes.
3. Remove the existing rivets from hinges, rear attachment fitting and sufficient top skin attaching rivets in the rear spar and inboard rib to gain access for bucking inboard plate rivets.
4. Remove the existing rivets in the spar at points where new rivets will be used to attach the reinforcing plates for the center and outboard hinges. Note positions of existing tool holes and rivets that are not to be removed. Do not remove doublers.
5. With the existing inboard hinge in place, position plate Part No. 24191-00 at the inboard end and plate Part No. 24192-00 at the outboard end of the hinge. Locate and drill holes at the new and existing rivet locations and attach the plates to the spar using rivets as shown.
6. Drill holes through the plates using the existing hinge rivet pattern and rivet the hinge in place as shown in the sketch. Replace the rivets removed to gain access to buck the inboard plate rivets.
7. With the existing center hinge in place, position plate Part No. 24193-00. Locate and drill holes at the new and existing rivet locations and attach the plate to the spar using rivets as shown.
8. With the existing outboard hinge in place, position plate Part No. 24193-02. Locate and drill holes at the new and existing rivet locations and attach the plate to the spar using rivets as shown.
9. Drill holes through the center and outboard reinforcement plates using the existing rivet pattern and rivet the hinges in place as shown.

NOTE

All hinge reinforcement plates must be positioned so that hinge rivets can be installed on the flats between formed areas of the plates.

10. Make same installation on opposite stabilator.

C. REINFORCEMENT OF STABILATOR TAB HINGES - Refer to Sketch "D".

1. Remove the existing hinges and doublers (discard doublers). Note position from which hinge was removed.
2. Position shim Part No. 80042-70, the existing inboard hinge and reinforcement plate Part No. 22515-04 (left side) or 22515-05 (right side). With the shim between the hinge and spar flange and the reinforcement plate against the spar and hinge, locate and drill the new and existing rivet holes and fasten the components to the spar as shown in the sketch. The existing hinge rivet pattern will be used when installing the eight top rivets.
3. The same procedure is to be followed on the center and outboard hinges. Use shim Part No. 80042-70 and reinforcement plate Part No. 16895-06 with the existing center hinge and shim Part No. 80042-70 and plate Part No. 16895-07 with the existing outboard hinge.

NOTE

All hinge reinforcement plates must be positioned so that hinge rivets can be installed on the flats between the formed areas of the plates.

4. Take particular note of the existing tool and rivet holes when drilling holes and installing rivets.
5. Install pressure sensitive identification plates Part No. 757 441 on the spars of the stabilator and tab next to the existing part number plates. On tab assemblies that do not have part number plates, the plates will be installed on the spar next to the inboard hinge. Marking and installation shall be accomplished as follows: -
  - a. Marking:
    1. Do not remove the masking paper on the front of the plate.
    2. Place plate into a manual or electric typewriter with appropriate type size.
    3. Place the typewriter selector in the blank (no ribbon) position.
    4. Type the applicable information in the appropriate blanks.
  - b. Installation:
    1. Wipe the area of the assembly where the plate is to be installed with a clean dry cloth or paper wiper. If there is any indication of oil, or other contamination not removed by the wiper, clean with a wiper moistened with trichloroethylene, followed by a clean dry wiper.
    2. Remove the plate from the backing. Hold the plate by its edges; do not allow the fingers to contact the adhesive.
    3. Press the plate firmly into the position specified, using thumb or finger pressure.
    4. If assembly is to be painted, do not remove the masking paper on the plate, until after final painting.

6. Install the tabs on the stabilators. Insert new hinge pins Part No. 21510-02 and bend the ends to secure them in the hinges. Refer to PA-24 Service Manual P/N 753 516.
7. Check hinge alignment, ease of operation etc., correct as necessary.
8. Make same installation on the opposite tab.

**D. STABILATOR CENTER BALANCE WEIGHT MODIFICATION (Steel Forging) - Refer to Sketch "E".**

1. Gain access to the stabilator control cable turnbuckles and slacken cables sufficiently to remove the cables from the steel balance weight.
2. Remove the control cables from the weight and the weight from the balance arm. Retain the hardware and side balance plates for reuse.
3. Drill four .50 holes through the lower part of the weight. It is recommended that a drill press be employed to drill these holes. Additional lightening holes, if required, are to be drilled only in the area indicated by the dotted line in Detail A on Sketch "E".

**NOTE**

Static balancing of the complete stabilator assembly is required when all components of this kit have been installed including paint if applied. Refer to the PA-24-250 and PA-24-260 Service Manual Part No. 753 516 for the correct balancing procedures.

4. On completion of the balancing, remove and weigh the center balance weight and all attaching hardware (nuts, bolts, washers and balance plates) with the exception of the control cable attaching hardware.
5. The weight of the balance weight and hardware (excepting cable attaching hardware) is 3 lbs. 15 ozs. maximum and 3 lbs. 8 ozs. minimum. If these limits are exceeded, it will be necessary to locate the problem and correct it prior to flight. Problems may arise from previous improper maintenance and/or repairs such as excessive use of putty, wrong components, etc.

**CAUTION**

Do not allow any metal chips or dirt to get into the controls or the interior of the aircraft.

6. When stabilator balancing has been completed, connect the control cables and rig per the PA-24-250 and PA-24-260 Service Manual Part No. 753 516.
7. Safety the turnbuckles with new NAS651-16S clips.
8. Check controls for proper operation.

**E. COMPLETION OF INSTALLATION**

1. Install access panels and tail cone fairing previously removed.
2. Remove Airspeed Restrictive Placard of 203 MPH from face of airspeed indicator.

**NOTE**

It is mandatory that this kit be installed in its entirety and the Rudder Balance Weight Kit installed (Ref. Service Bulletin 362A) prior to removal of the Airspeed Restrictive Placard. Furthermore, these tail surface improvements must be maintained when any future repairs and/or servicing is performed for continuation of the unrestricted airspeed capability.

**F. AIRCRAFT PAPERWORK**

1. Complete Form 337 with the following statement: Installed Stabilator Balance Weight Installation Kit 760 747 in accordance with Piper Kit Instructions and Sketches.
2. Make Logbook entry of installation and enter weight and balance computations in the Weight and Balance Section of the Airplane Flight Manual.

Weight and Arm of Kit installed: Weight 7 lbs/Arm + 260 inches

3. Remove Airplane Flight Manual Supplement No. 1770 from Flight Manual and destroy.
4. Attach revised Owner's Handbook page in the following Owner's Handbooks, over the existing Airspeed Calibration Chart.

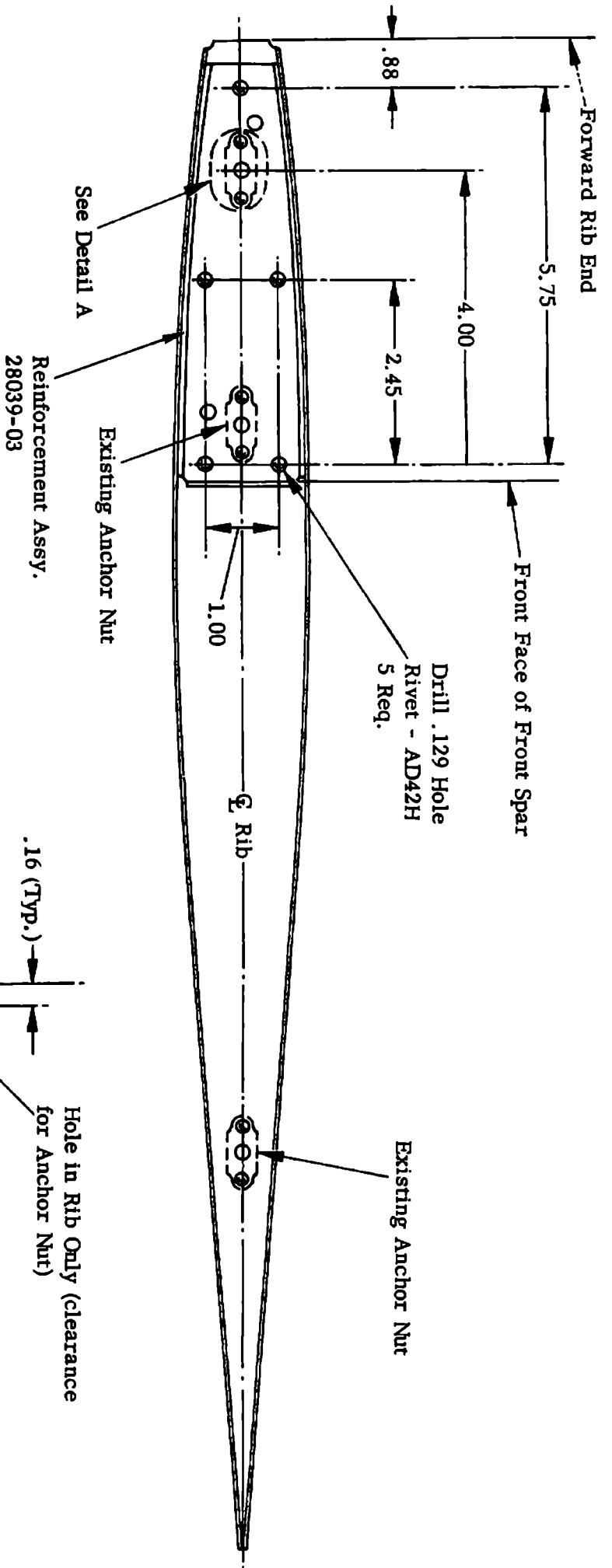
PA-24-260 Comanche "C" Handbook (Part No. 753 774) - Attach to Page 44

PA-24-260 Turbo Comanche "C" Handbook (Part No. 753 823) - Attach to Page 42

**NOTE**

Discard the Owner's Handbook page contained in kit if your handbook is not one of the two listed above.





Remove existing rivets -  
 five top and five bottom.  
 Replace with MS20426AD3-4  
 rivets thru skin, rib and  
 reinforcement. Drill .098  
 holes. 10 Req.

Remove this Section of skin  
 (clearance for tube assy.)

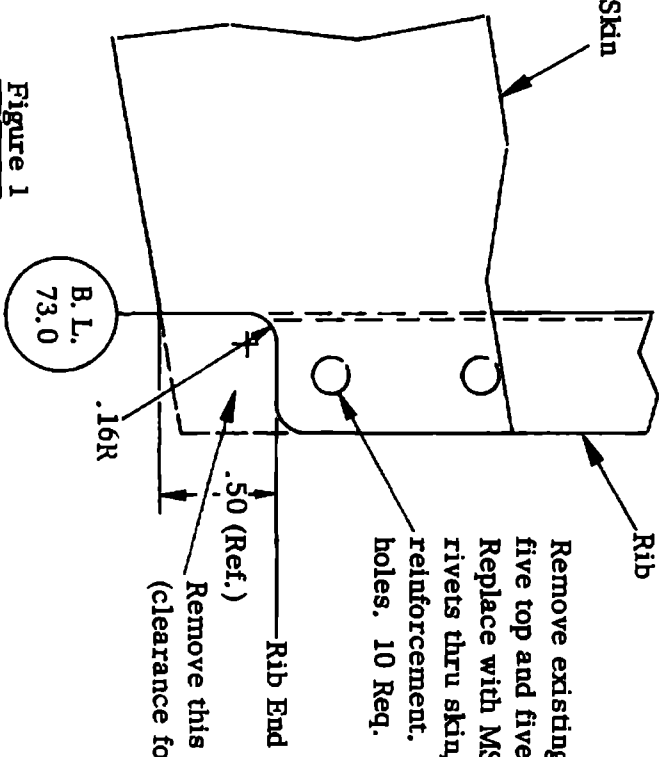
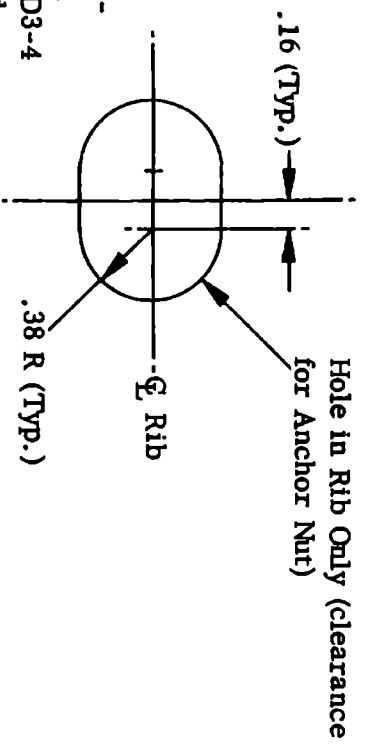
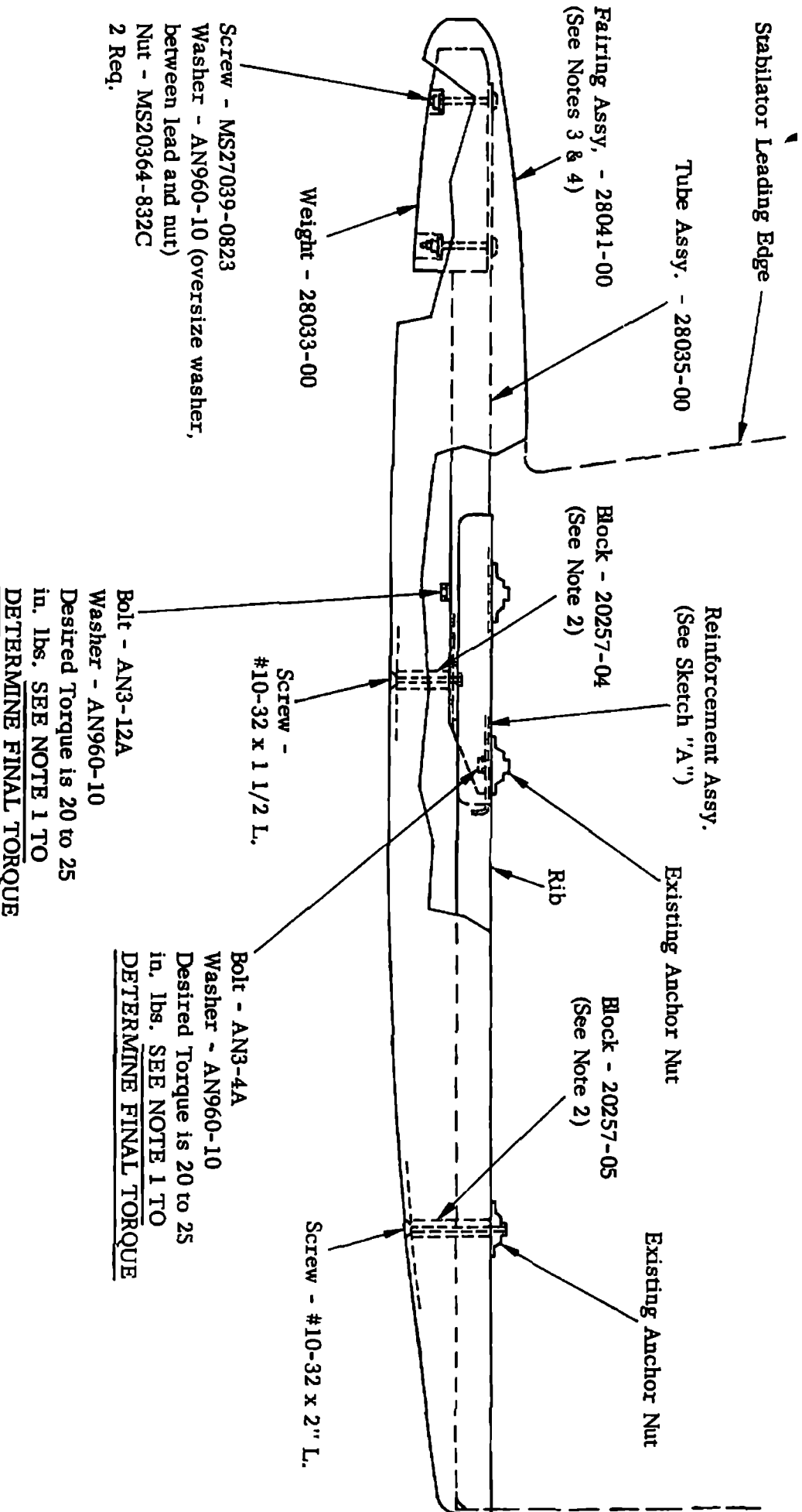


Figure 1

Stabilator Modification	
Sketch "A"	KIT 760 747
PIPER AIRCRAFT CORPORATION	
LOCK HAVEN, PENNSYLVANIA	



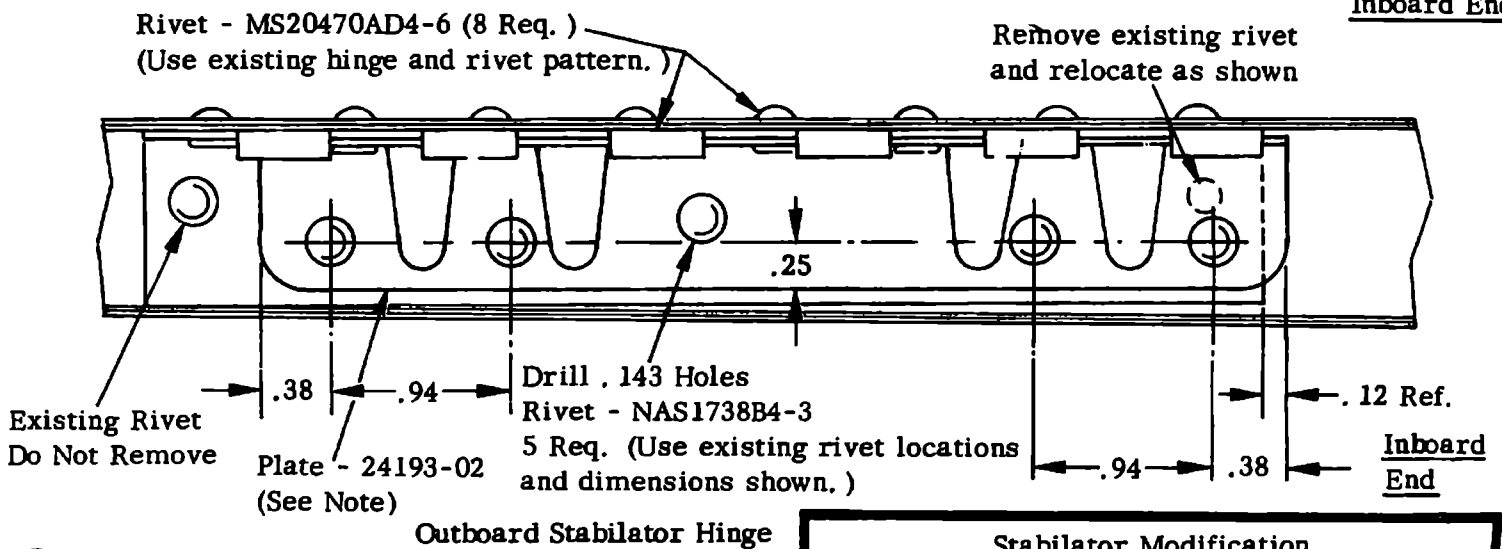
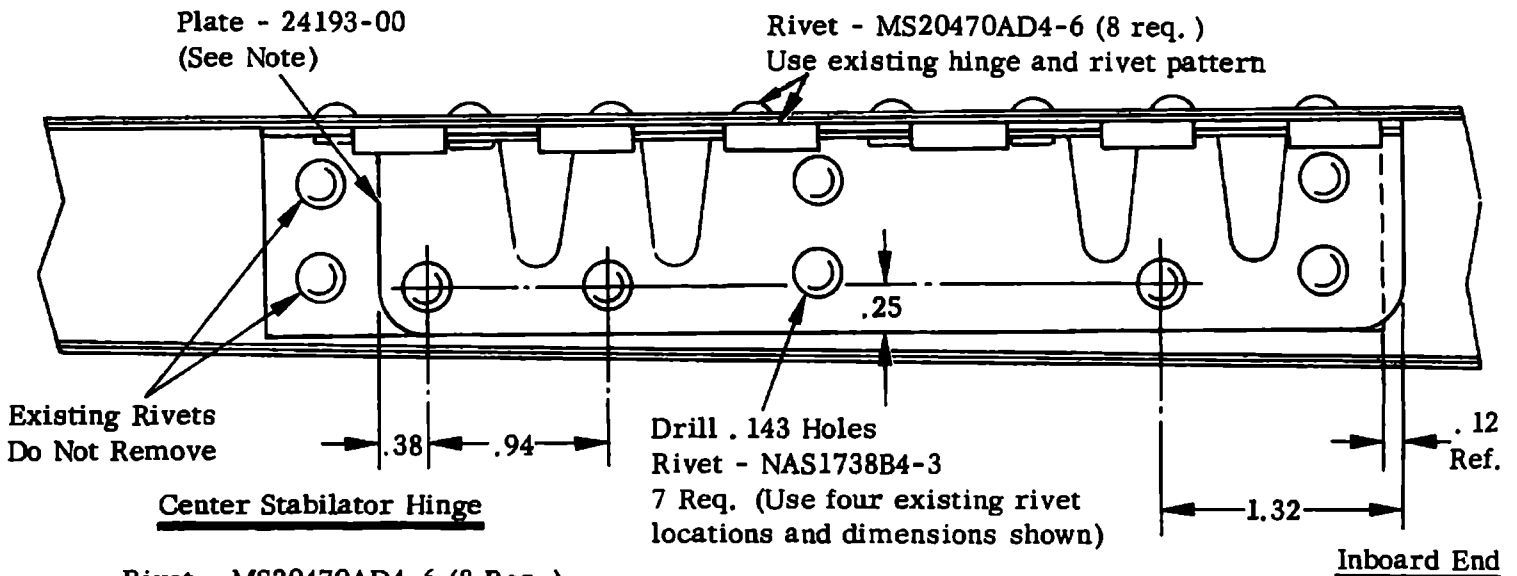
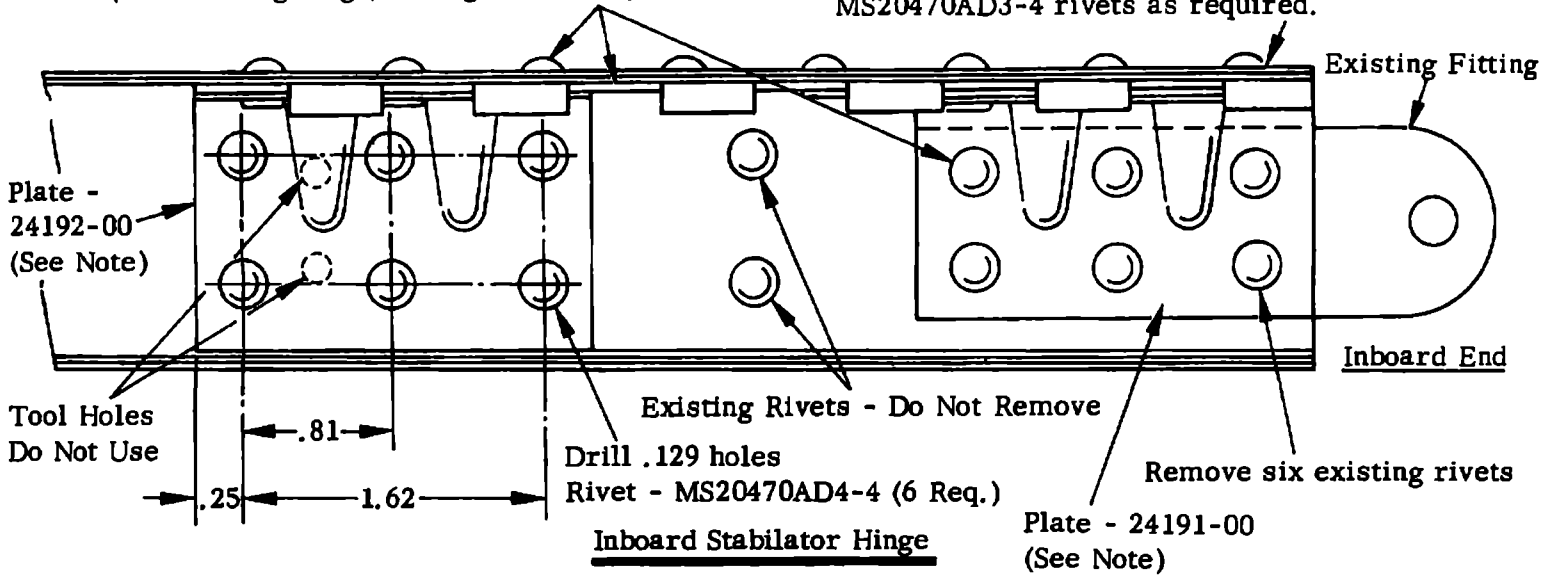
● Notes :

1. FINAL TORQUE equals DESIRED TORQUE plus FRICTION DRAG TORQUE.  
To obtain FRICTION DRAG TORQUE, run nut or screw (whichever is rotated) down near contact with the washer or bearing surface and record the FRICTION DRAG TORQUE required to turn the nut or screw with a torque wrench. Add the FRICTION DRAG TORQUE to the DESIRED TORQUE to obtain the FINAL TORQUE which should register on the torque wrench.
2. Use 3M Cement #EC-847 to hold the block in place.
3. With all control surfaces rigged and stabilator leading edge in full down position, locate and drill a .191 drain hole in fairing at lowest point.
4. Paint information "NO HAND HOLD" in same area on fairing assembly, in relation to stabilator, as on stabilator tip that was removed.

Stabilator Modification	
Sketch "g"	KIT 760 747
PIPER AIRCRAFT CORPORATION	
LOCK HAVEN, PENNSYLVANIA	

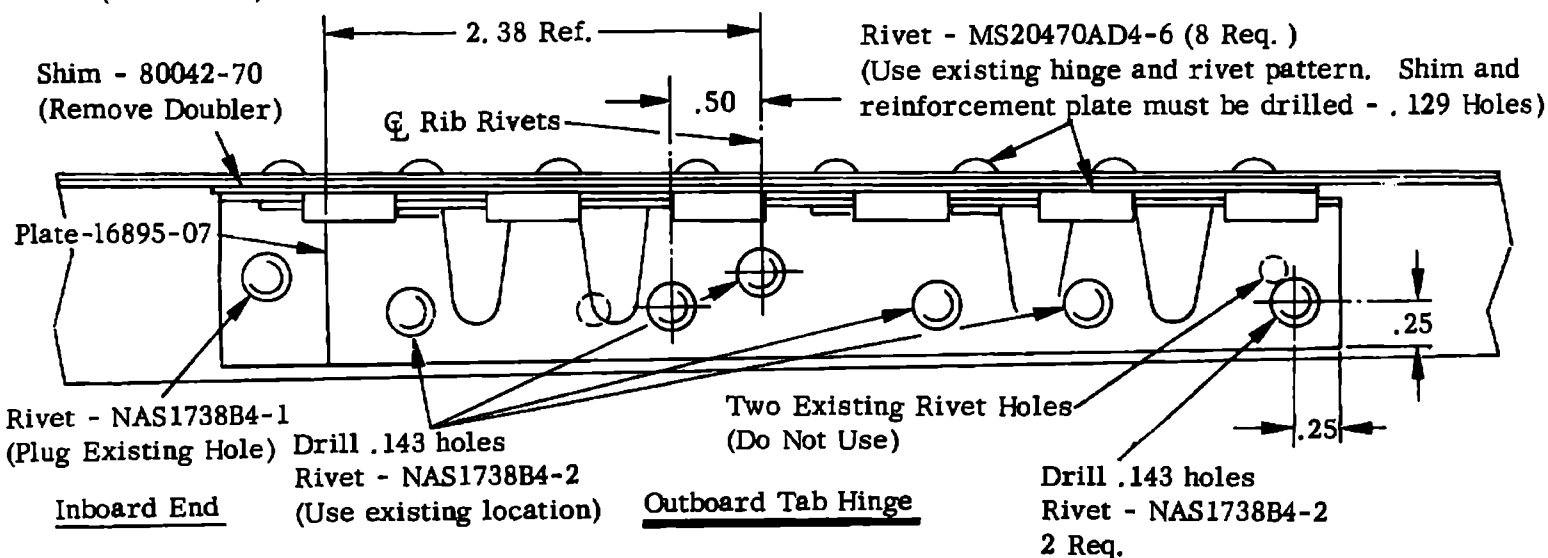
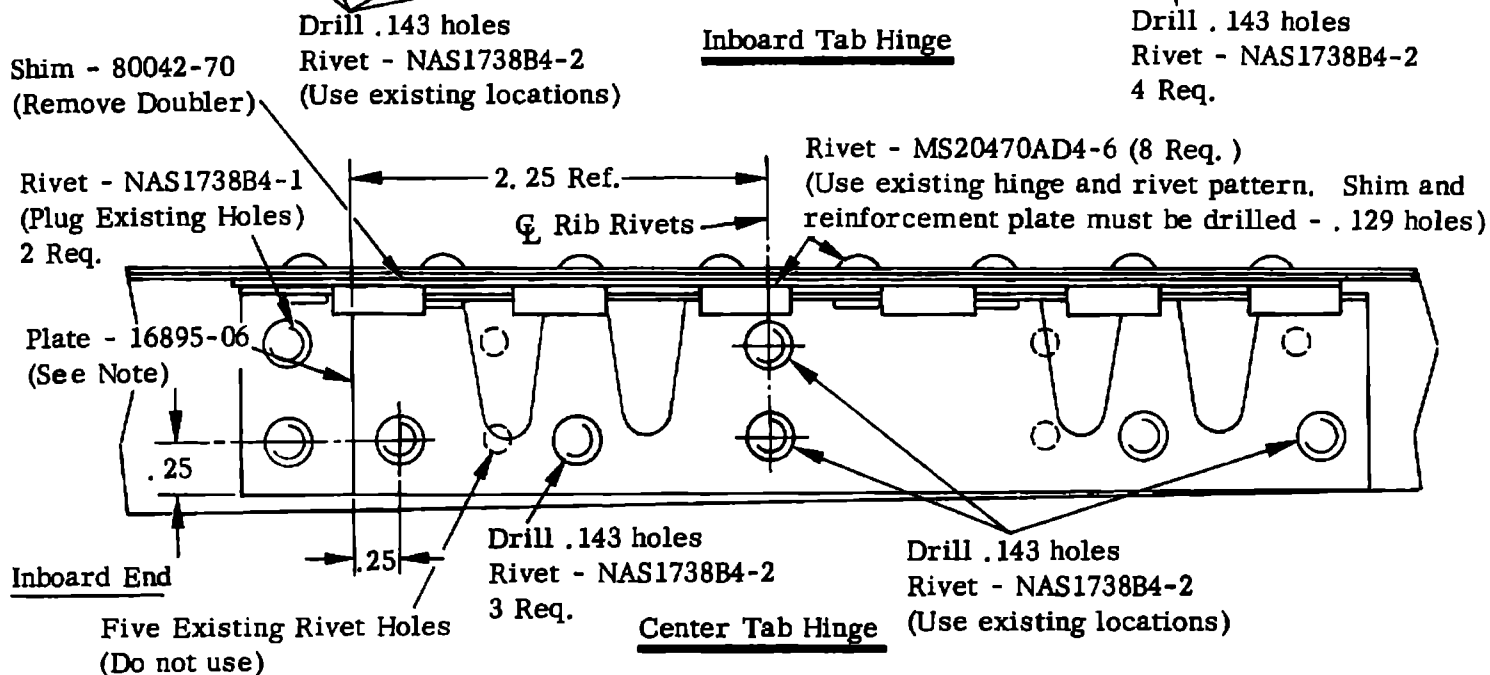
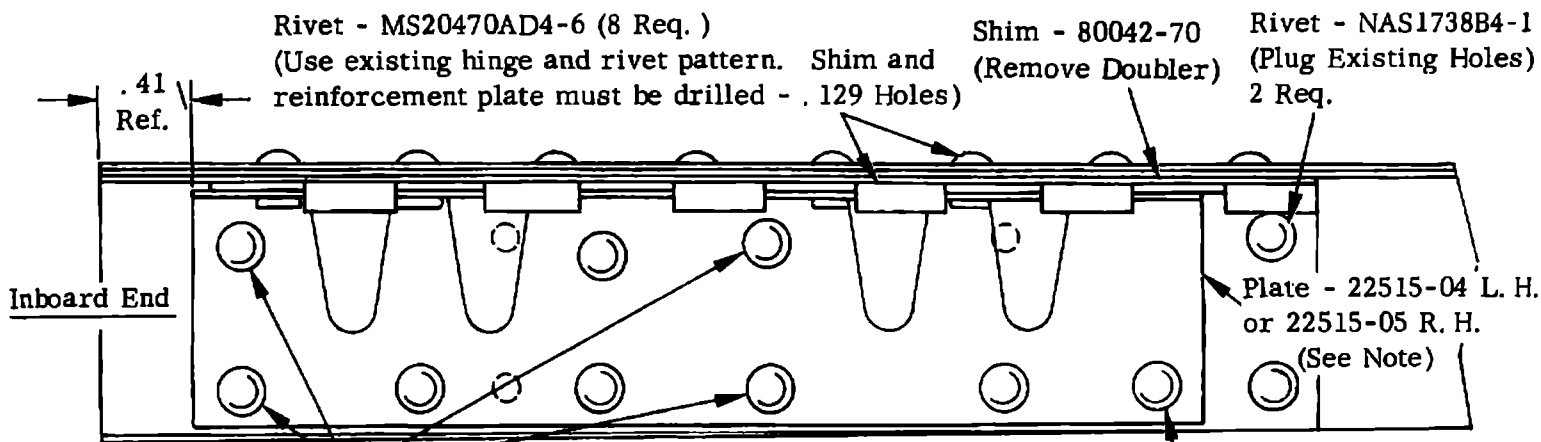
Rivet - MS20470AD4-6 (14 Req.)  
 (Use existing hinge, fitting and rivet pattern)

Remove sufficient skin attaching rivets, from spar and rib, to buck plate rivets. Replace with MS20470AD3-4 rivets as required.



**NOTE:**  
 Use this sketch when installing hinge reinforcement plates P/N 24191-00, 24192-00, 24193-00 and 24193-02. Position plates so that hinge rivets can be installed on flats between formed areas as shown. Left hand shown, right hand opposite.

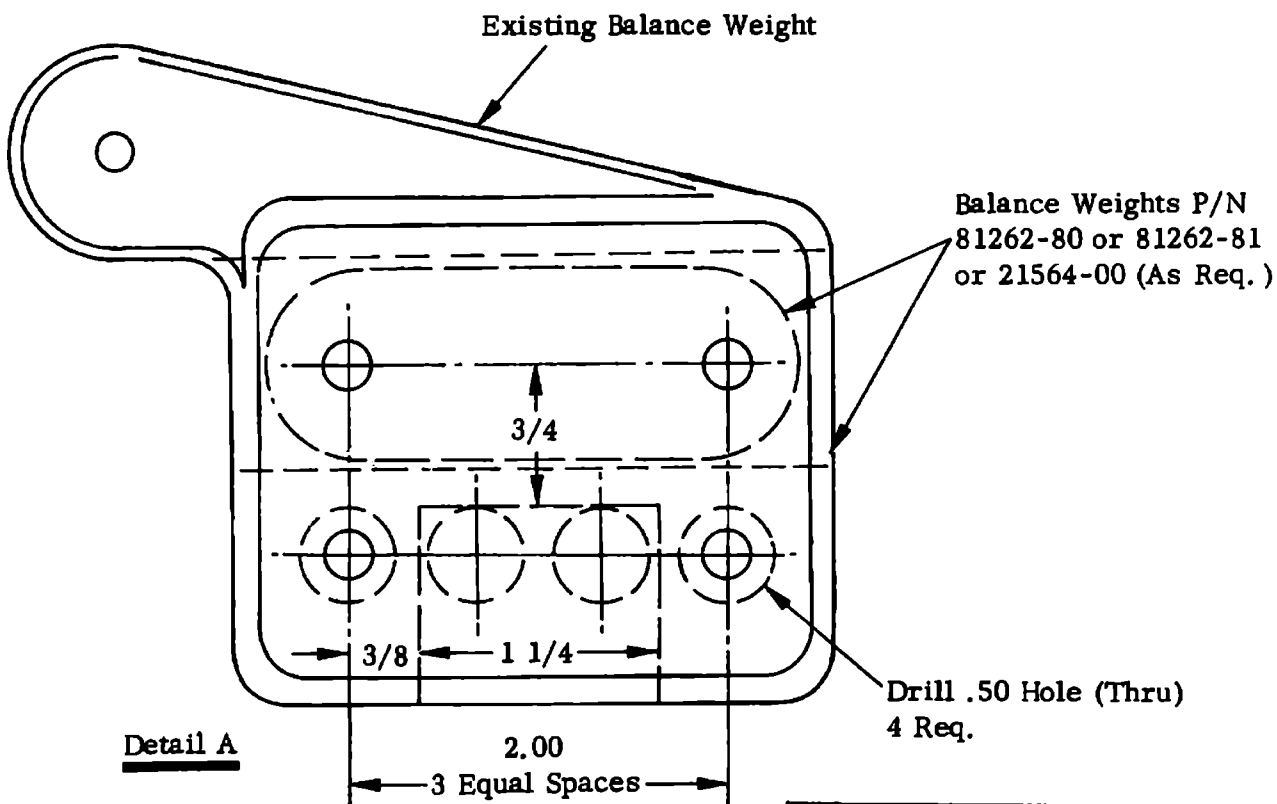
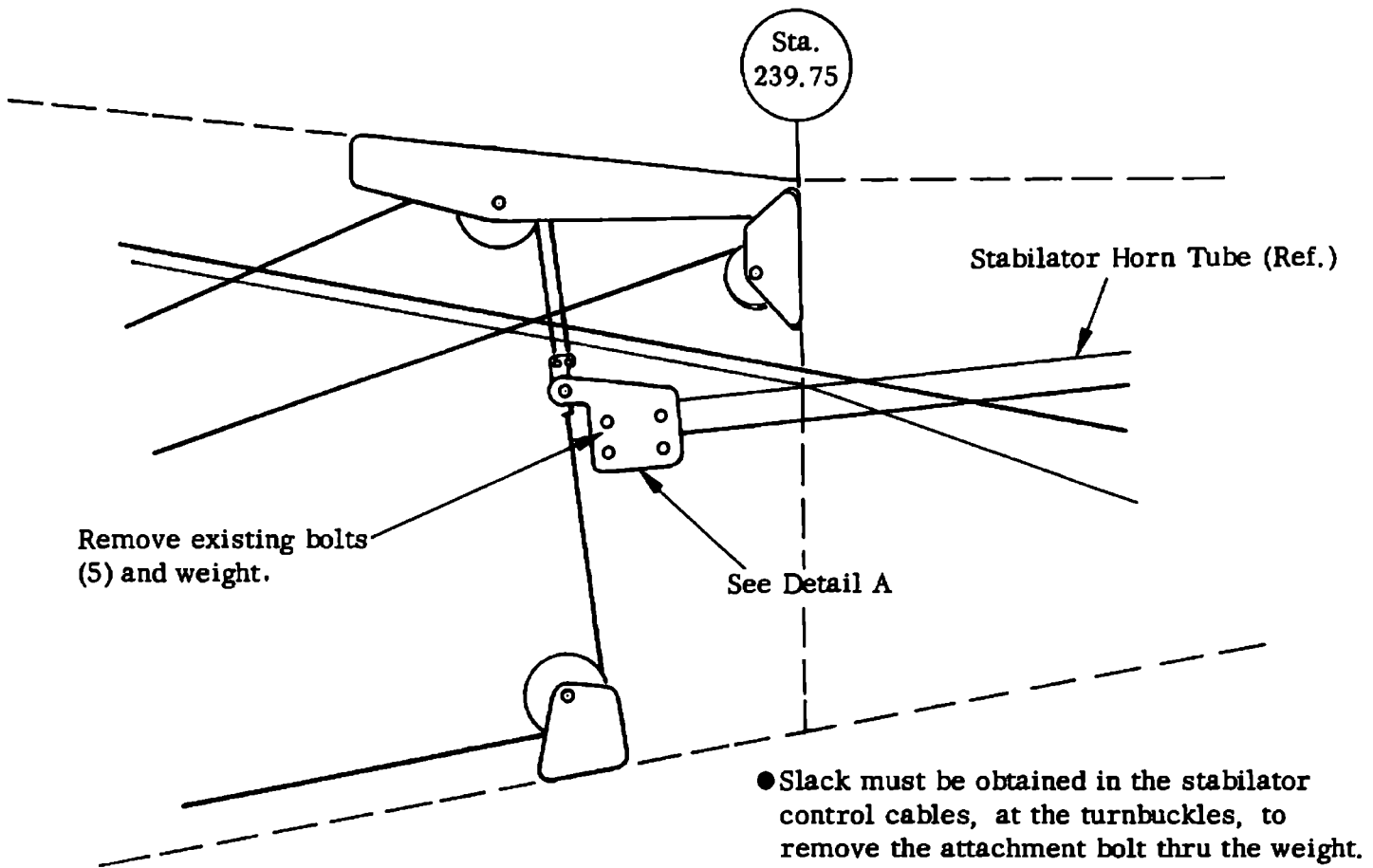
Stabilator Modification	
Sketch "C"	KIT 760 747
<b>PIPER AIRCRAFT CORPORATION</b>	
<b>LOCK HAVEN, PENNSYLVANIA</b>	



● **NOTE**

Use this sketch when installing tab hinge reinforcement plates P/N 16895-06, 16895-07, 22515-04 and 22515-05 and shims P/N 80042-70. Position plates so that hinge rivets can be installed on flats between formed areas as shown. Trim plates, on installation, if they protrude below the lower tab skin. Left hand shown, right hand opposite.

<b>Stabilator Modification</b>	
Sketch "D"	KIT 760 747
<b>PIPER AIRCRAFT CORPORATION</b>	
<b>LOCK HAVEN, PENNSYLVANIA</b>	



Additional lightening holes, if required, to be drilled in area designated by dotted line only. Add links P/N 81262-80 or 81262-81 or plate P/N 21564-00 as required. Use longer bolts (AN-4) as required. The maximum weight of weight and hardware (excepting cable attaching hardware) is 3 lbs. 15 ozs. and a minimum of 3 lbs. 8 ozs.

Stabilator Modification	
Sketch "E"	KIT 760 747
PIPER AIRCRAFT CORPORATION	
LOCK HAVEN, PENNSYLVANIA	