IMPORTANT - STATE AIRCRAFT REGISTRATION NUMBER IN ALL CORRESPONDENCE

MOONEY AIRCRAFT, INC.

M-l8 SERVICE LETTER NO.17

(This Service Letter is FAA. Approved)

DATE:	OCTOBER 24, 1959
SUBJECT:	REAR BULKHEAD REINFORCEMENT
MODELS AFFECTED:	NOTED
TIME OF COMPLIANCE:	IN CONJUNCTION WITH MOONEY M-l8 SERVICE LETTER NO. 16

PARTS LIST:

Kit #1, P/N 1310 Block (l)
Kit #2, P/N 1307 Plate (Front) (1)
P/N 1308 Plate (Rear) (1)
P/N 1309-7/-8 Fittings (1 ea.)
Kit #3, P/N 1307 Plate (Front) (1)
P/N 1308 Plate (Rear) (1)
P/N 1314-7/-8 Clips (Upper) (1 ea.)
P/N 1315-7/-8 Clips (Lower) (1 ea.)

INTRODUCTION

Reports involving M-l8 aircraft, manufactured prior to 1953 have been received concerning the following defects in the rear-most bulkhead.

1) Loose glue joint between bulkhead and tail cone skin at top of bulkhead.

2) Separation of plywood web and spruce core.

3) Cracks of plywood web and/or spruce core in the area of the empennage attachment brackets.

This rear bulkhead area should be carefully inspected (see M-18 Service Letter No. 16, Item A-8) with particular attention to the items listed above on all M-18 aircraft including those manufactured from 1953 on. These later aircraft had clips (P/N 1157-1/-2) attached to the upper longerons (on top) which picked up the upper bolt through the empennage attachment bracket.

The rework described below is divided into parts with the airplanes affected listed in Item 1 of each part. Parts for the required rework are available at no cost.

PART A

1. All airplanes having the defect described in Item 1 of the Introduction are to be repaired in accordance with Figure 1 or Figure 2 depending on the type of elevator control system.

2. Order Rework Kit SL 18-17-1.

PART B

1. All airplanes not having P/N 1137-1/-2 clips installed and all airplanes having the defects described in Items 2 or 3 of the Introduction are to be repaired as follows:

a. Remove the following items from bulkhead:

   i. Elevator bellcrank bracket
   ii. Lead ballast weight if installed
   iii. Longeron clips P/N 1157-1/-2 (if installed) by removing bolt through upper longeron

b. Clean excess paint or glue off faces of bulkhead so that plates bear on flat surface.

c. Attach P/N 1307 and 1308 plates to bulkhead using AN3 bolts through the tail attachment holes, elevator bellcrank bracket and holes, and lead ballast and holes. NOTICE - Do not reassemble tail attachment brackets at this stage.

d. Using P/N 1308 as template drill 3/16 diameter holes (10) through bulkhead and P/N 1307. Exercise care to drill holes perpendicular to bulkhead. Install AN3 bolts specified in Figure 3 for attachment of elevator bellcrank bracket, lead ballast, and through holes drilled. Exercise care in tightening bolts so as not to crush bulkhead.

PART C

1. For all airplanes not having P/N 1151-1/-2 clips installed, the following must be accomplished after compliance with Part B:

   a. Mark the location on the outside of tail cone of the four holes through the upper longeron as shown on Figure 4.

   b. Drill one of the holes on each side with a 1/16 diameter drill perpendicular to skin. Examine the inner face of the longerons. The holes should be in the center of the longeron. If the hole is off-center, correct the error as much as the original hole will allow by re-drilling the other two holes with a 1/8 diameter drill. Applying the same correction, drill the other two holes with a 1/8 diameter drill.

   c. Install P/N 1309-7/-8 fittings, empennage attachment brackets and cable guides as shown in Figure 4.

   d. Block fittings to prevent play and, using 1/8 diameter holes as guides, drill 11/64 diameter holes (4) through longerons and 1309 fittings. Using 11/64 diameter holes as guides, drill out holes to 3/16 diameter.

   e. Bolt the 1309-7/-8 fittings to the longerons as shown in Figure 4. Exercise care in tightening bolts so as not to crush wood.

PART D

1. For airplanes which had P/N 1157-1/-2 clips installed and which have been reworked in accordance with Part B, the following shall be accomplished:

   a. Reinstall empennage attachment brackets and cable guides and replace P/N 1157-1/-2 clips with P/N 1314-7/-8 clips and add P/N 1315-7/-8 clips on lower side of upper longeron picking up lower bolt of empennage attachment brackets as shown in Figure 5. Install vertical bolt through two clips and longeron as shown.

2. Order Kit No. SL 18-17-3.

PART E

1. All airplanes having been reworked according to Part B shall have the following accomplished:

   a. Reinstall empennage and check for empennage play (see M-18 Service Letter No. 16, Item A-9).

   b. The elevator control system shall be adjusted as necessary to correct for the addition of .051 thick plates to bulkhead. In adjusting heim bearings (1 to 2 turns) exercise care that the end of the threaded shank is not pulled out past the inspection hole on the side of the female threaded rod end.

      (1) Remove forward access panel on the right hand side of the airplane for access to elevator control system linkage.

      (2) With stabilizer in approximately level position, set control stick in neutral position (perpendicular to horizontal reference).

      (3) For airplanes which feature a cable control elevator system forward of the rear bulkhead, the adjustment of the elevators is done by adjusting turnbuckles (take up on one and unscrew the other) until elevators are in a neutral position while maintaining control stick in approximately neutral position,.

      (4) For airplanes which feature a push-pull rod elevator control system forward of the rear bulkhead, the adjustment of the elevators is done by adjustment of the heim bearing at either the rear or the front of the push-pull rod in the tail cone until the elevators are level with the stabilizer with the control stick in the neutral position.

   c. The trim control system shall be adjusted as described below so as to have the correct angular travel after installation of P/N 1307 and 1308 plates.

      (1) Level airplane until front face of main wing spar is perpendicular to horizontal reference. Pull seat forward for access to spar.

      (2) Set trim control to "nose up" position.

      (3) For airplanes equipped with a cable control trim system, the adjustment is made as follows:

         i. Remove chain from screwjack by removing bolt connecting sprocket chain to cable on one side. See Figure 6.
         ii. Turn screwjack at sprocket until the leading edge of vertical fin is inclined forward 3.5° to vertical reference.
         iii. Reinstall chain around sprocket and connecting bolt to cable end.
         iv. Check "nose down" trim position for vertical fin leading edge inclination rearward of 1.5° to vertical reference.

      (4) For airplanes equipped with push-pull rod trim control system forward of the rear bulkhead, the adjustment is made as follows:

         i. inclined forward 3.5° with trim setting in "nose up" position.
         ii. Check inclination of leading edge of vertical fin for 1.5° rearward for trim in "nose down" position.

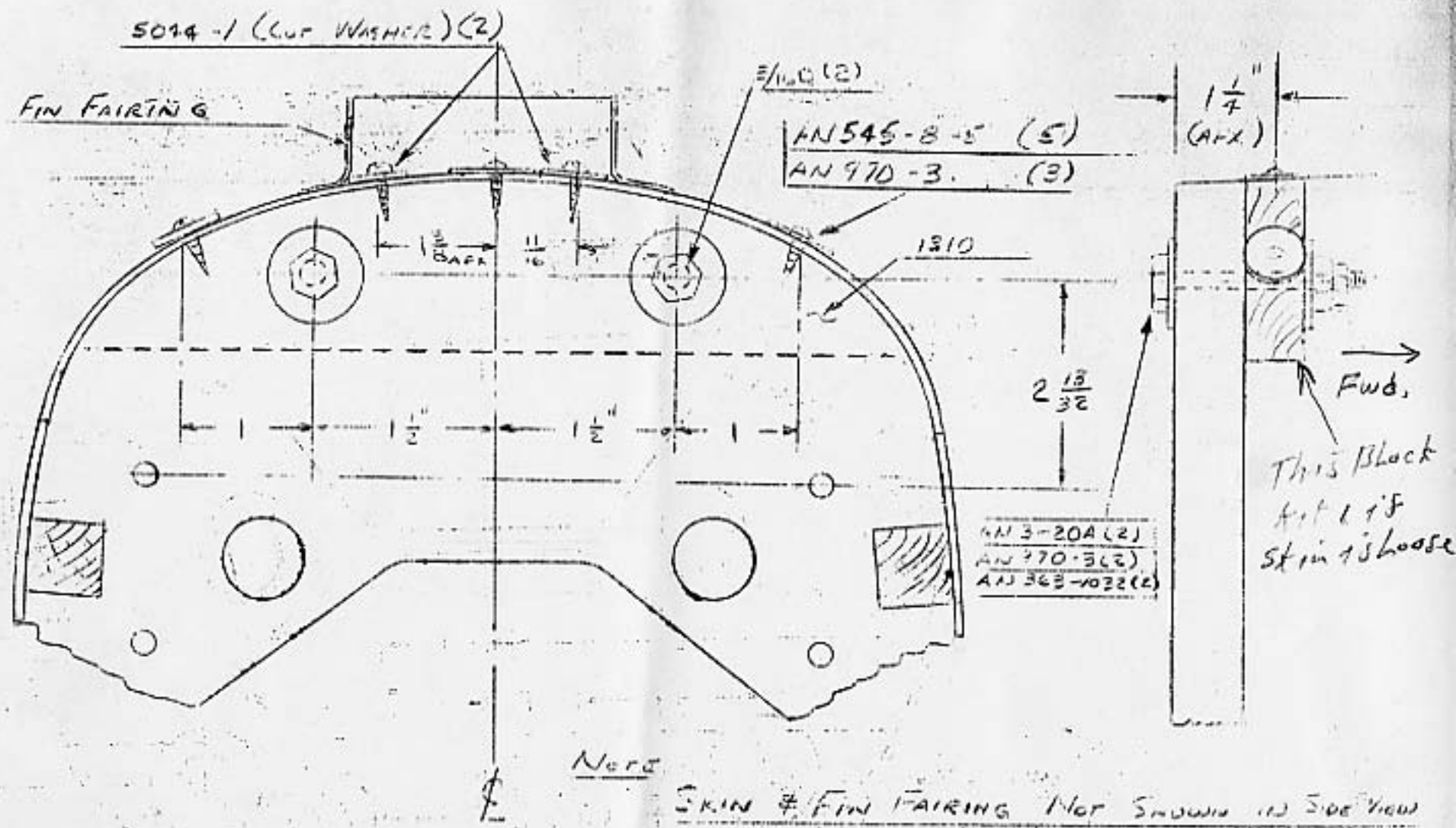


FIG. 1

NOTE. THIS DRAWING IS FOR M-13 MODELS EQUIPPED WITH THE PUSH-PULL ELEVATOR CONTROL SYSTEMS.

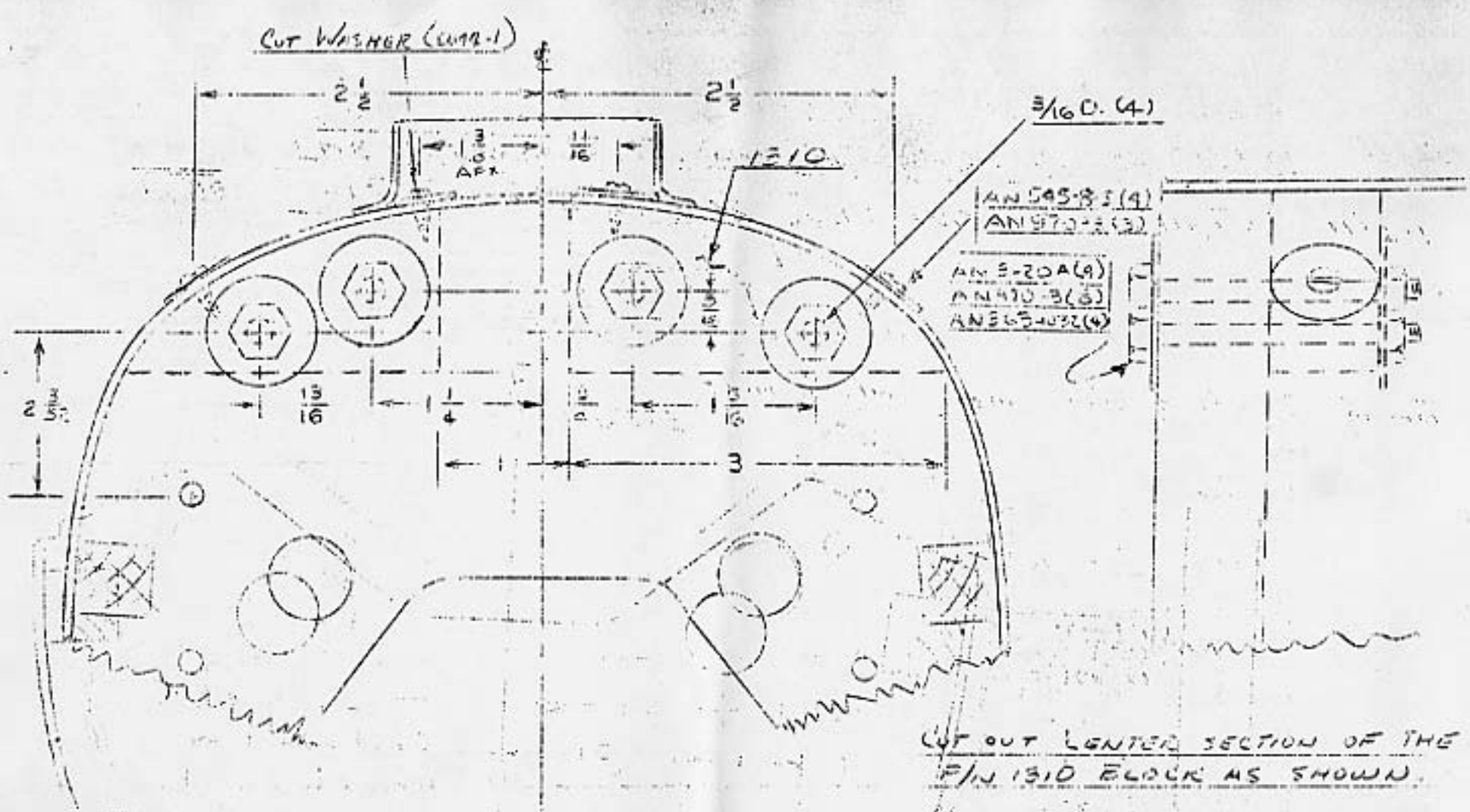


FIG. 2

NOTE:

THIS DRAWING IS FOR M-18 MODELS EQUIPPED WITH THE CABLE ELEVATOR CONTROL SYSTEMS.

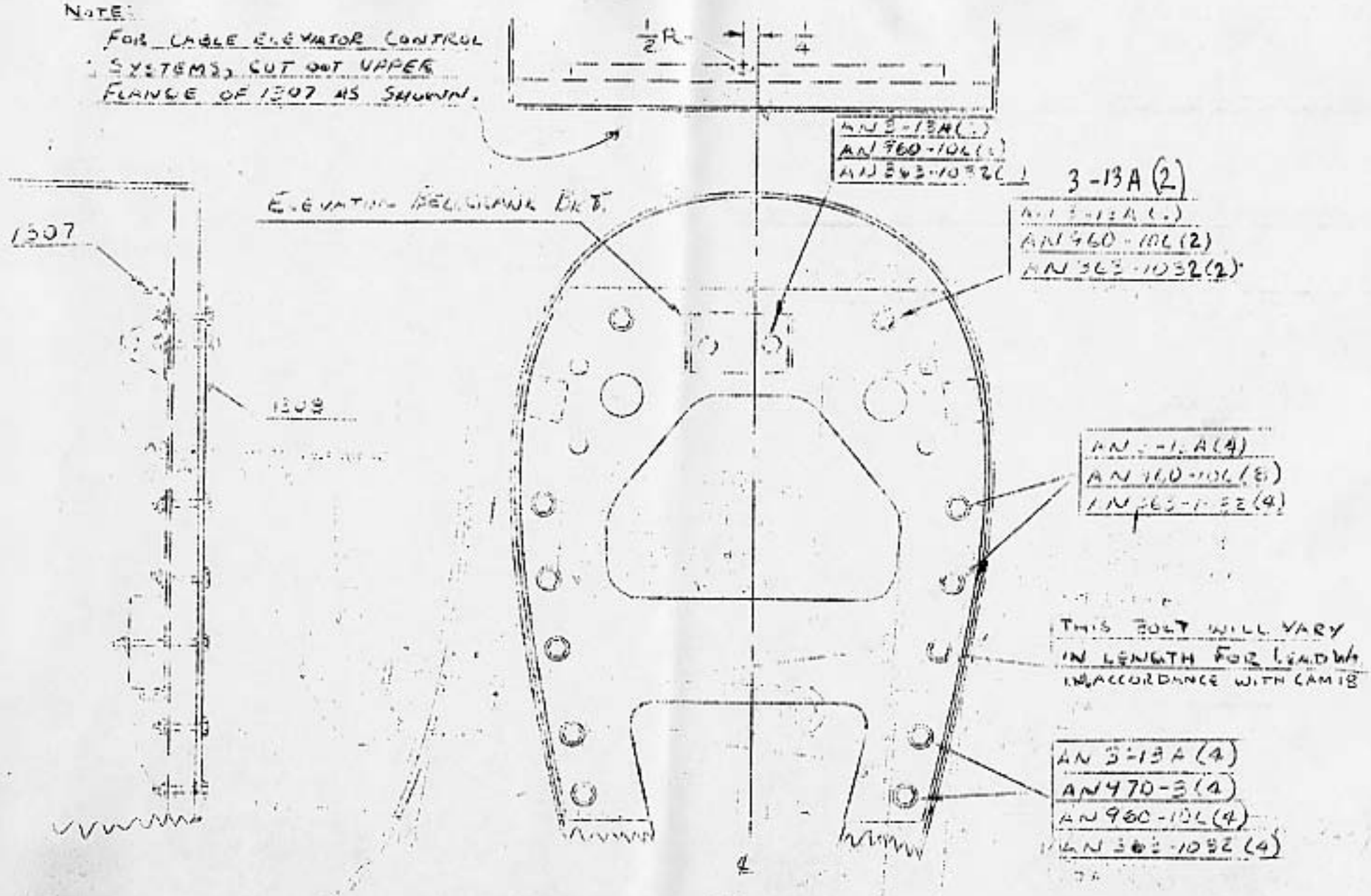
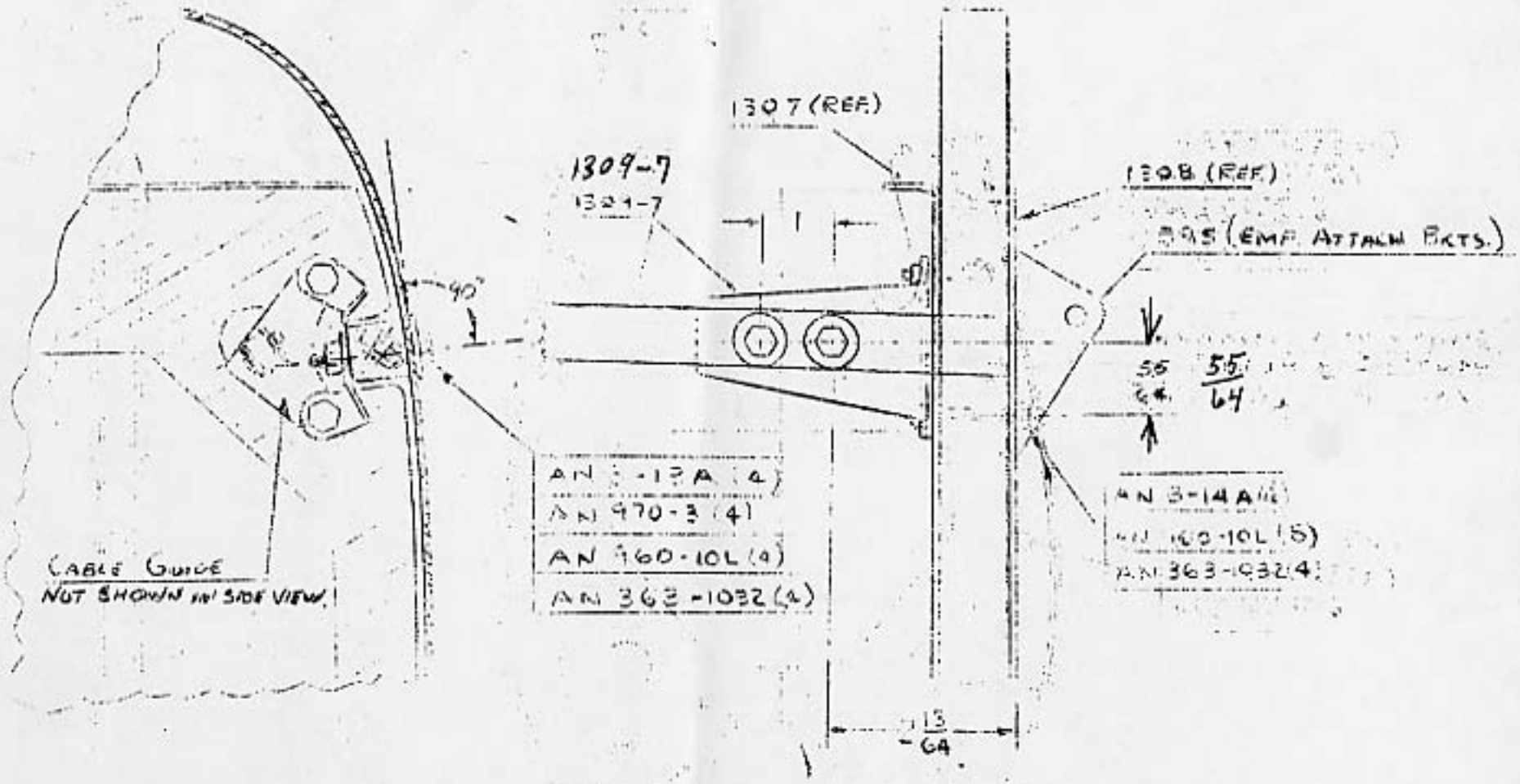

NOTE:
FOR CABLE ELEVATOR CONTROL SYSTEMS, CUT OUT UPPER FLANGE OF 1307 AS SHOWN.
1/2 R
1/4
AN 3-13A(1)
AN 960-10L(1)
AN 363-1032(1)
3-13A (2)
AN 3-13A(1)
AN 960-10L(2)
AN 363-1032(2)
ELEVATOR BELLCRANK BOLT
1307
1309
AN 3-13A(4)
AN 960-10L(8)
AN 363-1032(4)
THIS BOLT WILL VARY IN LENGTH FOR LEADING IN ACCORDANCE WITH CAM 18
AN 3-13A (4)
AN 470-3(4)
AN 960-10L(4)
AN 363-1032 (4)
℄

FIG. 3



NOTE
SKIN NOT SHOWN FOR CLARITY.

LEFT SIDE SHOWN

FIG. 4

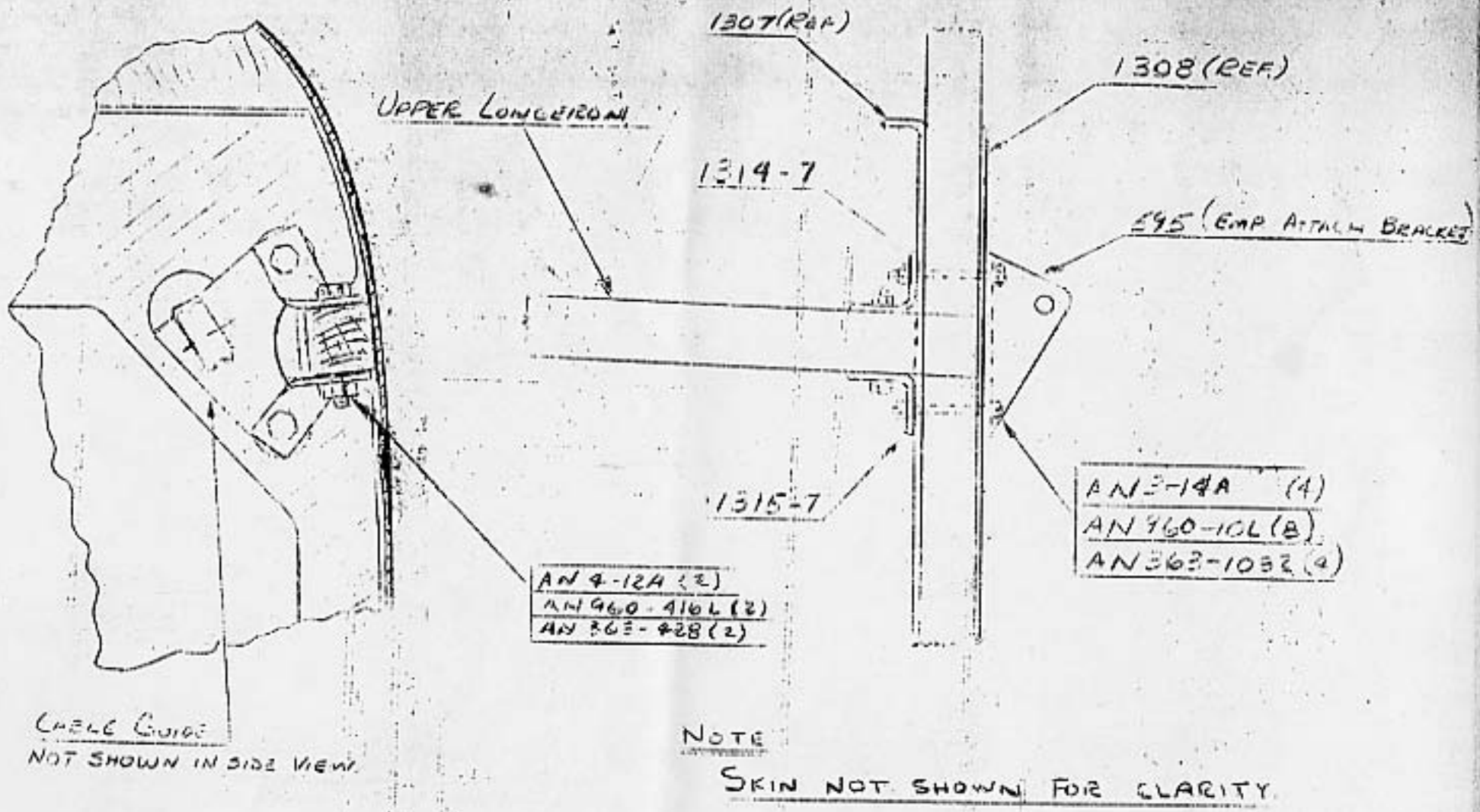

1307 (REF)
1308 (REF)
UPPER LONGERON
1314-7
595 (EMP ATTACH BRACKET)
1315-7
AN 3-14A (4)
AN 960-10L (8)
AN 363-1032 (4)
AN 4-12A (2)
AN 960-416L (2)
AN 363-428 (2)
CABLE GUIDE
NOT SHOWN IN SIDE VIEW
NOTE
SKIN NOT SHOWN FOR CLARITY

FIG 5

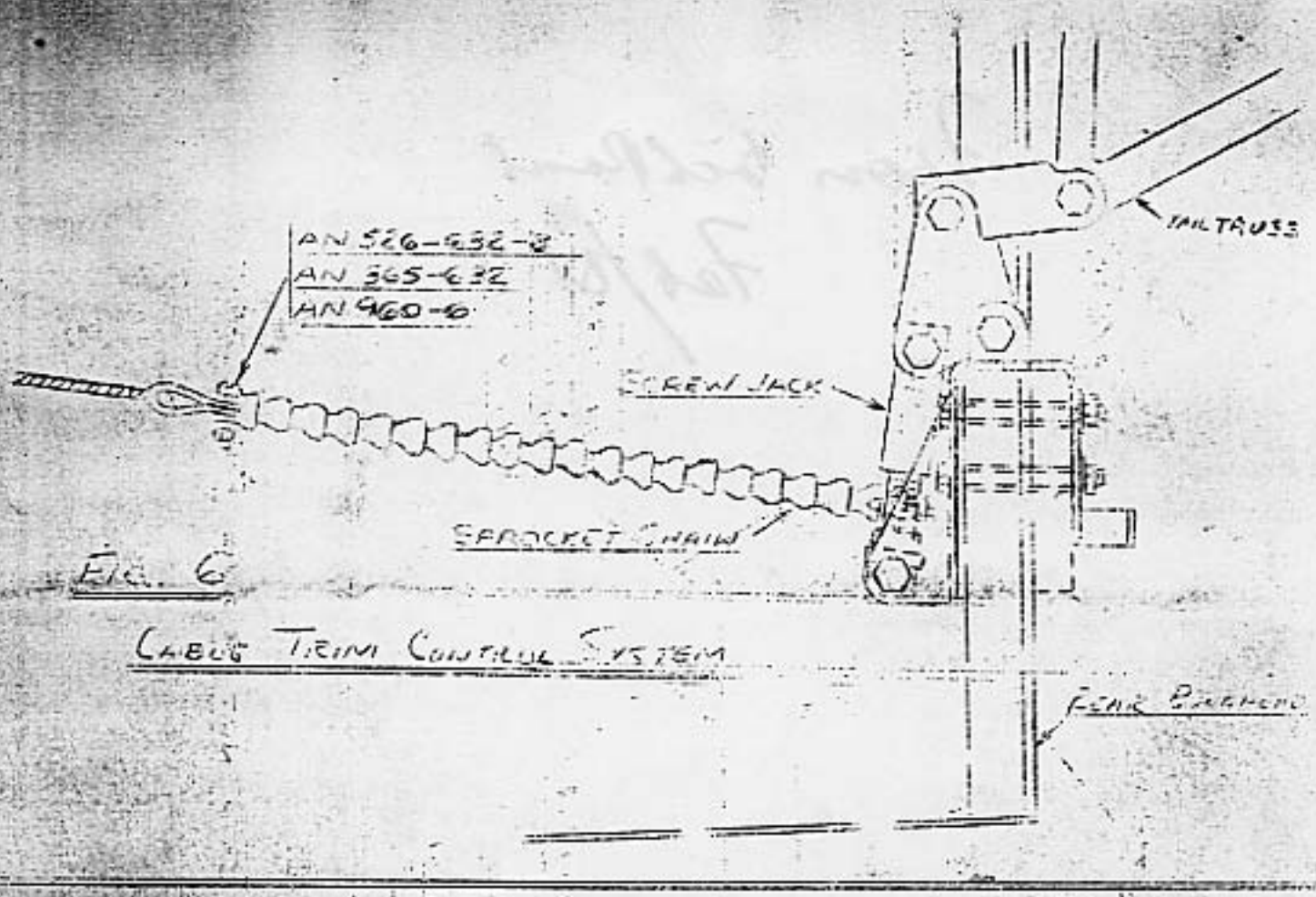


FIG. 6

CABLE TRIM CONTROL SYSTEM

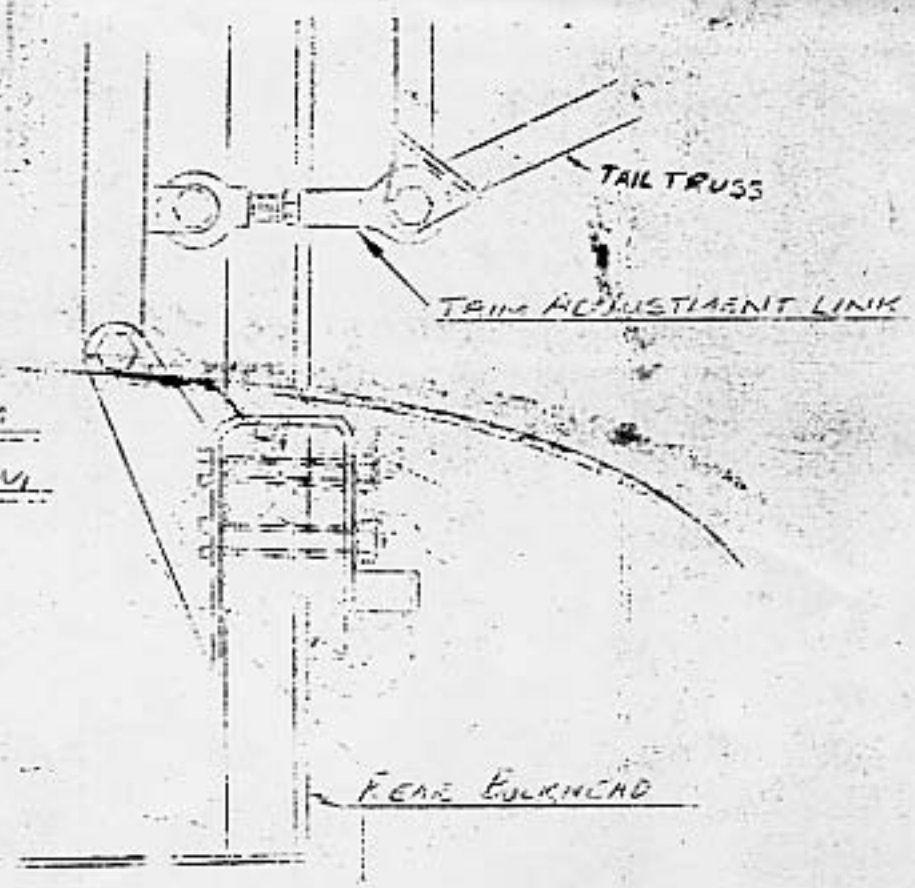


FIG. 7

PUSH-PULL TRIM CONTROL SYSTEM