

22 February 1948

## AIRCRAFT AND MAINTENANCE PARTS

NORTH AMERICAN—INSPECTION AND REWORK OF ELEVATOR AND RUDDER  
FRONT BEAMS—P-51B, P-51C, P-51D, P-51K, F-6C, F-6D, AND F-6K

**NOTE** In accordance with T. O. No. 00-20A-2, the periodic inspection prescribed in paragraph 1.a. will be entered in the applicable Aircraft Inspection and Maintenance Guide. In the event inspection, as prescribed in paragraph 1.a., reveals the necessity for the rework described herein, the work will be accomplished as soon as possible and preferably prior to further flight, by service activities with the aid of base maintenance facilities. The provisions of T. O. No. 00-20A will be complied with whenever rework is found necessary and appropriate reference to this Technical Order will be entered on AAF Forms 60-A for the aircraft affected.

1. a. To reduce the possibility of failure an inspection will be made of the elevator and rudder front beams on the following listed airplanes during each 25-hour inspection period. Inspection for fatigue cracks, sheared rivets, or other defects will be made on the forward side of the front beams in the area adjacent to the elevator outboard hinge fitting and the rudder upper hinge fitting.

**NOTE** Inspection may be accomplished without removing the elevators and rudder from the airplanes since the hinge and surrounding area

may be seen through the hinge cut-out. The area immediately adjacent to the hinge fitting will be closely examined for cracks. Determine that the outboard or upper hinge fitting is solidly attached to the front beam and that there are no sheared rivets, by applying force at the tip of the elevator or rudder being inspected.

b. Whenever inspection reveals any of the aforementioned defects, the airplanes will be reworked in accordance with the provisions of the applicable sections in paragraph 2., as indicated.

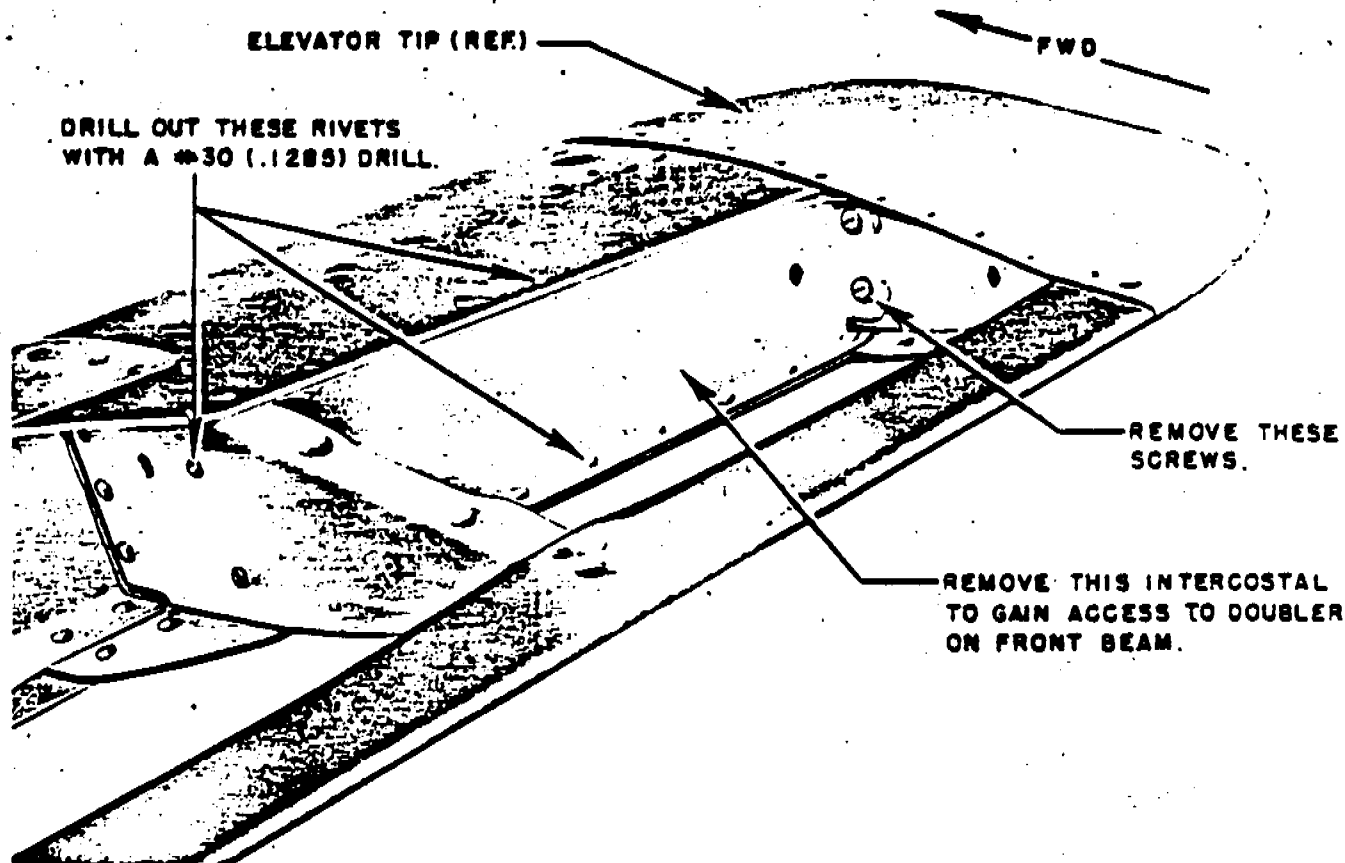


Figure 1 - General View - Elevator Tip

**NOTICE:** This document contains information affecting the national defense of the United States within the meaning of the Espionage Act, 50 U. S. C., 31 and 32, as amended. Its transmission or the revelation of its contents in any manner to an unauthorized person is prohibited by law.

| MODEL           | AF SERIAL NOS.                   | APPLICABLE SECTIONS |
|-----------------|----------------------------------|---------------------|
| P-51B and F-6C. | 43-12093 to 43-12492 inclusive   | I - II              |
|                 | 43-6313 to 43-7202 inclusive     | I - II              |
|                 | 42-106429 to 42-106538 inclusive | I - II              |
|                 | 42-106841 to 42-106978 inclusive | I - II              |
|                 | 43-24752 to 43-24901 inclusive   | I - II              |
| P-51C and F-6C  | 42-102979 to 42-103978 inclusive | I - II              |
|                 | 43-24902 to 43-25251 inclusive   | I - II              |
|                 | 44-10753 to 44-11152 inclusive   | I - II              |
| P-51D and F-6D  | 44-13253 to 44-15752 inclusive   | I - II              |
|                 | 44-63160 and 44-63161            | I - II              |
|                 | 44-63162 to 44-63559 inclusive   | II                  |
|                 | 44-11153 to 44-11352 inclusive   | II                  |
|                 | 44-11353 to 44-11752 inclusive   | I - II              |
| P-51K and F-6K  | 44-11753 to 44-12052 inclusive   | II                  |

**NOTE A.** Airplanes affected by section II only have been previously modified by the contractor in accordance with section I, prior to delivery. Inspection of the rudder front beam only is necessary on these airplanes.

**B.** The fabric covered elevators on all the preceding listed P-51D, P-51K, F-6D, and F-6K airplanes are to be subsequently replaced by metal-covered elevators. After installation of metal-covered elevators, inspection of the rudder front beam only will be necessary.

**C.** Inspection of the front beams, the elevators and rudder of all P-51B, P-51C, and F-6C airplanes must be continued throughout the life of the airplanes or until the modification outlined in paragraph 2, is accomplished.

**D.** In the event spare elevators or rudders not identified by the marking "Modified per T. O. No. 01-60-97" (see paragraph 2.c.(1) section I, and paragraph 2.c.(1) section II) are used to replace modified elevators or rudders, the inspection, prescribed in paragraph 1.a, will be resumed and continued throughout the life of the airplane, or until the replacement assembly is modified as outlined in paragraph 2.

The following listed airplanes will be modified by the contractor prior to delivery.

| MODEL          | AF SERIAL NOS.                 |
|----------------|--------------------------------|
| P-51D and F-6D | 44-63560 to 44-64159 inclusive |
|                | 44-72627 to 44-75026 inclusive |
|                | 44-12853 to 44-13252 inclusive |
|                | 44-84390 to 44-84989 inclusive |
| P-51K and F-6K | 44-12053 to 44-12852 inclusive |

2. The instructions for accomplishing this modification, as contained in North American Service Bulletin P-51-244, are as follows:

**SECTION I**

**REWORK OF ELEVATOR FRONT BEAM**

**NOTE** All rework applies to either left or right elevator.

**a. REMOVAL OF ELEVATOR.**

- (1) Disconnect the elevator trim tab actuating rod e trim tab.
- (2) Remove the left and right side stabilizer fillets.

(3) Disconnect the elevator from the elevator horn assembly located between the elevators by removing the three attaching bolts and nuts.

(4) Remove the bolt from the elevator outboard hinge fitting. Support the elevator and remove the bolt from the center hinge fitting.

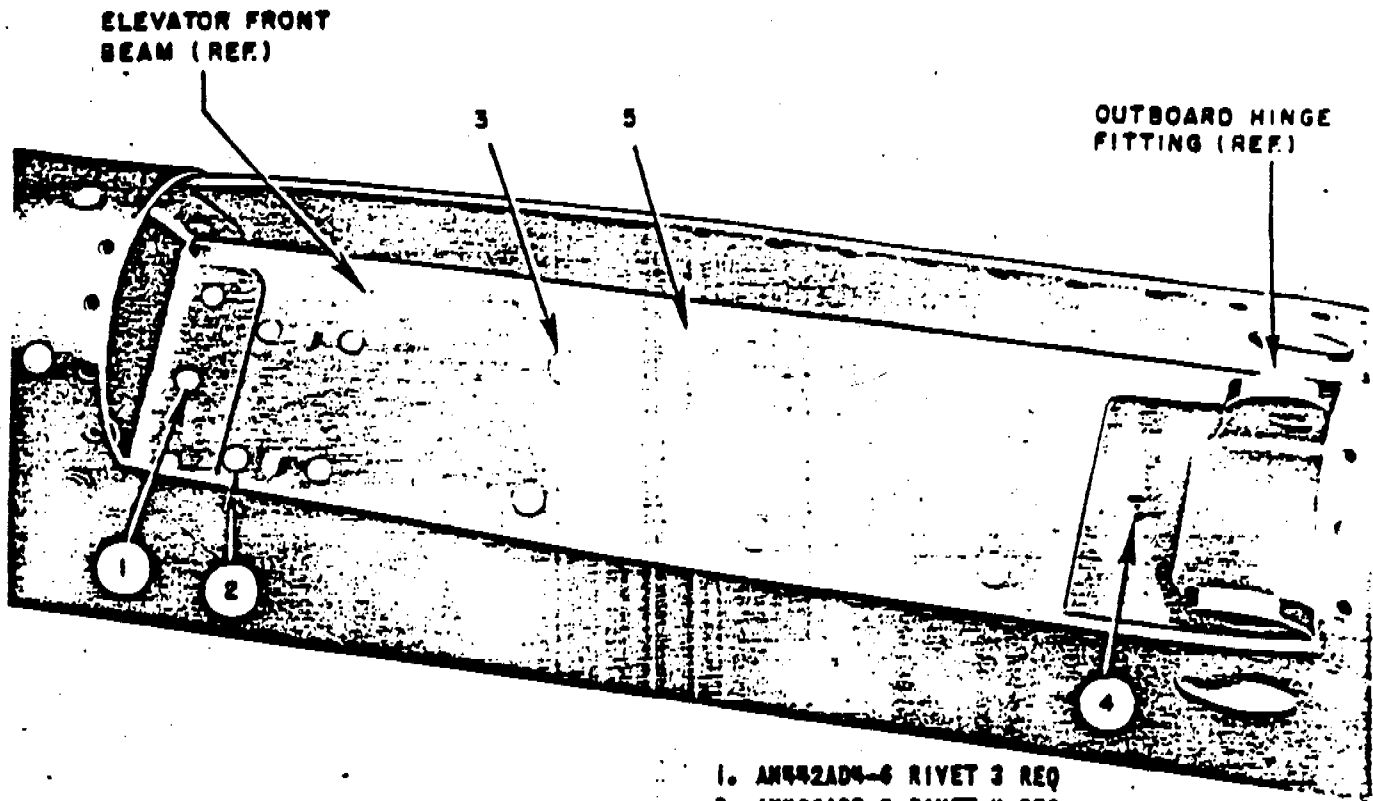
(5) Guide the elevator straight aft from the horizontal stabilizer until it clears the trim tab rod.

**b. INSTALLATION OF DOUBLER ON ELEVATOR FRONT BEAM.** - This rework involves removing the doubler located on the aft side of the elevator front beam in the area adjacent to the outboard hinge fitting. A new doubler extending to the outboard end of the beam will be installed in its place.

(1) Remove the counterbalance weight from the elevator.

(2) Remove enough fabric from the elevator to expose the tip and the next three ribs inboard. Remove the outboard hinge fitting from the elevator front beam.

(3) Remove the intercostal from between the first and second ribs at the tip of the elevator. Drill out the rivets securing the intercostal with a No. 30 (.1285-inch) drill. (See figure 1.)



NOTE : AD4 RIVET HOLES REQUIRE #30 (.1285) DRILL AD3 RIVET HOLES REQUIRE #40 (.098) DRILL ALL NUT PLATE BOLT HOLES REQUIRE #10 (.193) DRILL

Figure 2 - Looking at Elevator Front Beam

1. AN442AD4-6 RIVET 3 REQ
2. AN426AD3-4 RIVET 4 REQ
3. AN426AD4-4 RIVET 8 REQ
4. AN426AD3-6 RIVET 2 REQ TO SECURE NUT PLATE UNDER THIS HOLE. AN426AD3-6 RIVET 4 REQ. TO SECURE OTHER TWO NUT PLATES UNDER BRACKET.
5. REMOVE OLD DOUBLER FROM AFT SIDE OF BEAM. FABRICATE NEW .040 DOUBLER 9-9/16 IN. LONG FROM ALUM.-ALLOY SHEET. NEW DOUBLER TO BE FLANGED AS OLD DOUBLER AND WILL EXTEND TO OUTBOARD END OF BEAM.

(4) Remove the outboard hinge bracket from the front beam by removing the two bolts securing it.

(5) Drill out the rivets securing the nut plates to the back of the beam and doubler. Use a No. 40 (.098-inch) drill. There are five such nut plates. (See figure 2.)

(6) Drill out the rivets securing the doubler to the aft side of the beam. Use a No. 30 (.1285-inch) drill. There are 11 such rivets. (See figure 2.) Also drill out the rivets securing the doubler flanges to upper and lower surface of elevator.

(7) Remove the doubler from the aft side of the beam. Fabricate a new doubler from aluminum-alloy sheet .040 x 4-1/2 (all bend radii to be 3/32 minimum) identical to the one just removed except that it shall be 9-9/16 inches long. Flange the top and bottom just as on old doubler. Joggle each end of both flanges so that the doubler will fit on aft side of beam. The additional length of the new doubler will extend it to the outboard end of the beam.

**NOTE** If a fatigue crack is apparent in the beam, drill a No. 40 (.098-inch) hole in each end of the crack.

(8) Hold the new doubler in position on the aft side of the beam and drill the 11 rivet holes through the doubler using the eleven No. 30 (.1285-inch) hole in the beam as templates.

(9) Secure the new doubler to the aft side of the beam at these holes using eight rivets, part No. AN426AD4-4, and three rivets, part No. AN442AD4-6 (See figure 2.)

(10) Drill the rivet holes for the five nut plates previously removed. Use a No. 40 (.098-inch) drill using the holes in the beam as templates.

(11) Drill the bolt holes for the nut plates with a No. 10 (.193-inch) drill.

(12) Secure the nut plates and their fillers to the back of the new doubler with four rivets, part No.

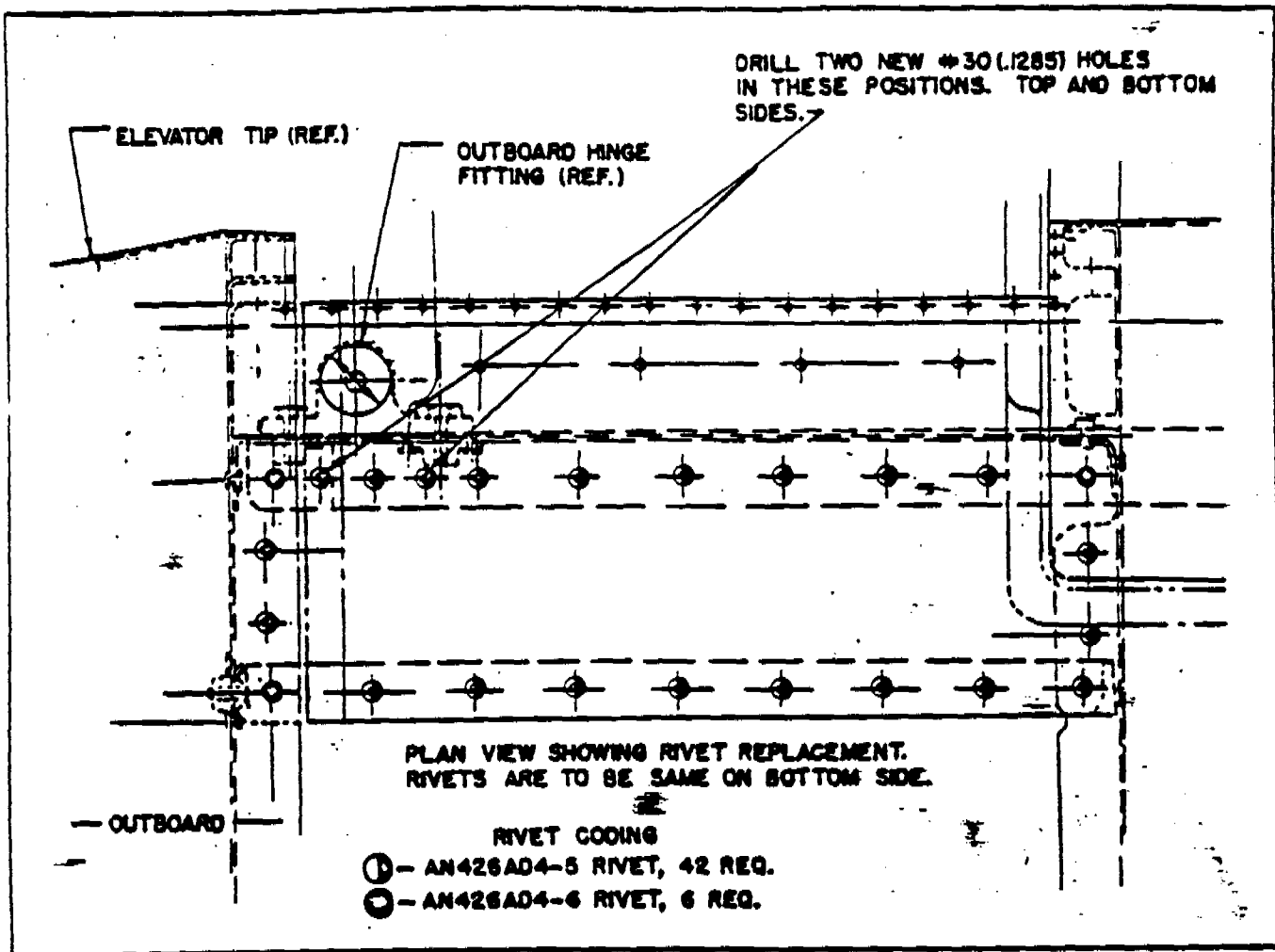


Figure 3 - Top View - Elevator Tip

AN426AD3-6, for the two outboard nut plates; two rivets, part No. AN426AD3-5, for the center nut plate; and four rivets, part No. AN426AD3-4, for the two inboard nut plates. (See figure 2.)

(13) Drill the rivet holes through the upper and lower flanges of the doubler with a No. 30 (.1285-inch) drill. Use the holes in the upper and lower surface of the elevator as templates. Secure the doubler at these holes with rivets as shown in figure 3.

(14) Reinstall the intercostal using rivets as shown in figure 3.

(15) Reinstall the outboard hinge bracket on the front beam.

c. Cover the elevator using fabric, Specification No. AN-CCC-C-399, dope, Specification No. AN-TT-D-514, and dope, Specification No. AN-TT-D-551.

(1) Stencil the words "Modified per T. O. No. 0-97" in black letters 1 inch high approximately 1/2 inch a. of and parallel to the leading edge on the upper surface of each elevator between the center and outboard hinges.

(2) Reinstall the counterbalance weight.

d. Reinstall the elevator on the airplane.

## SECTION II

### REWORK OF RUDDER FRONT BEAM

#### a. REMOVAL OF RUDDER.

(1) Disconnect the rudder trim tab actuating rod at the trim tab and remove the rod fairing from the rudder.

(2) Remove the metal cap from the bottom of the rudder and disconnect the rudder actuating rod at the lower hinge casting.

(3) Remove the bolt from the upper and lower hinge fittings. Support the rudder, remove the bolt from the center hinge fitting, disconnect the navigation light wire, and guide the rudder straight aft off the vertical stabilizer until it is clear of the trim tab rod.

b. INSTALLATION OF DOUBLER ON RUDDER FRONT BEAM. - This rework involves removing the

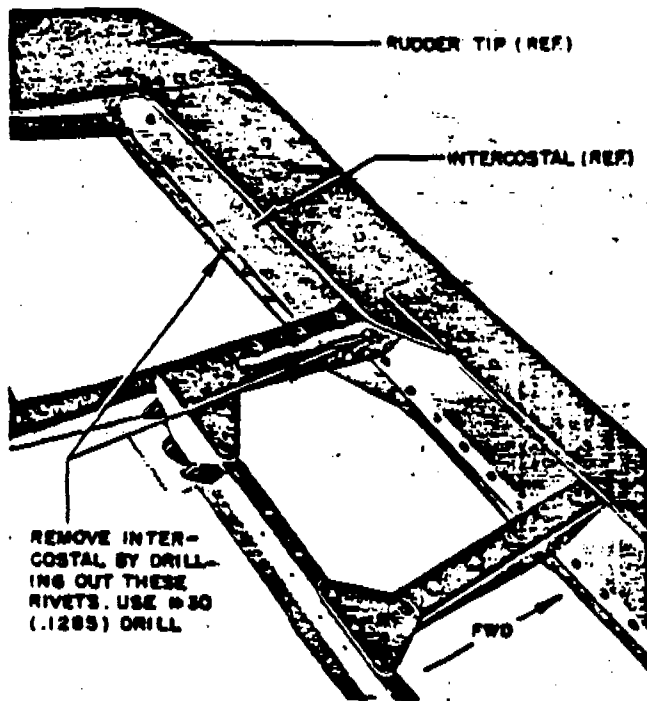


Figure 4 - General View - Rudder Tip

doubler located on the aft side of the rudder front beam in the area adjacent to the upper hinge fitting. A new doubler extending to the upper end of the beam will be installed in its place. It is recommended that the rework be accomplished on a workbench, preferably in a major repair depot.

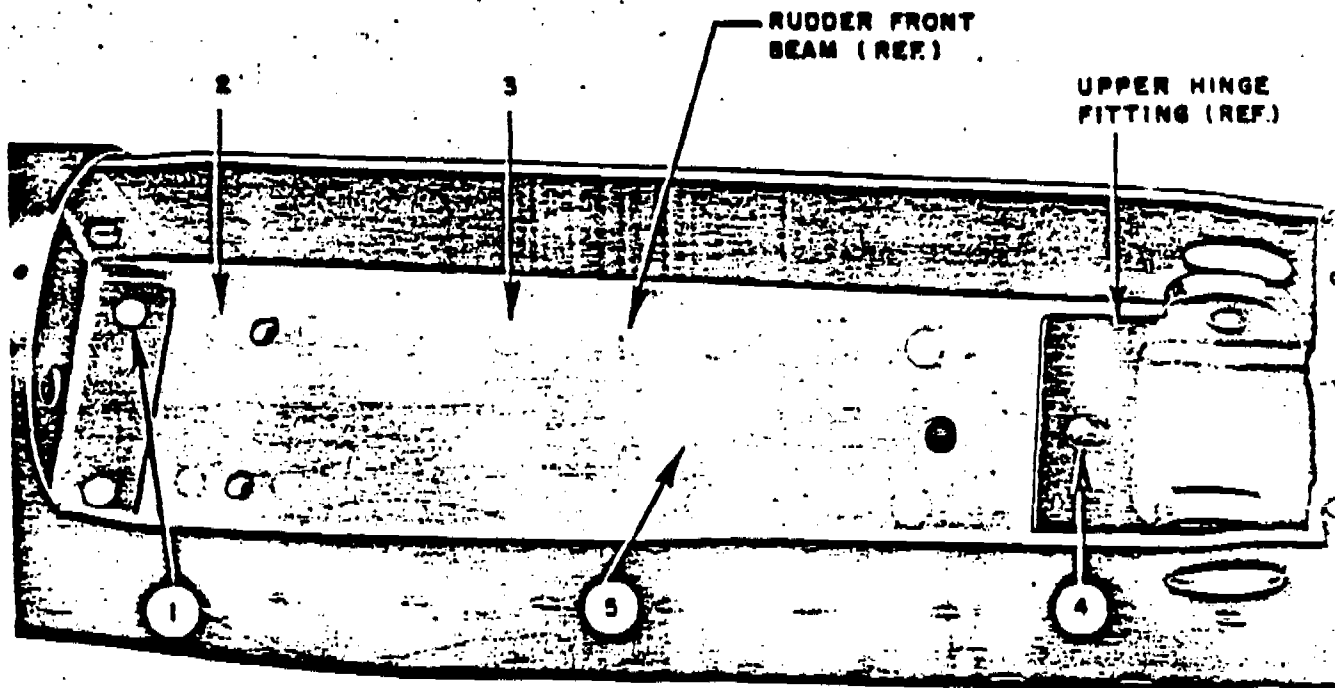
(1) Remove the counterbalance weight from the rudder.

(2) Remove enough fabric from the rudder to expose the tip and the next three ribs down. Remove the upper hinge fitting from the rudder front beam.

(3) Remove the intercostal from between the first and second ribs at the tip of the rudder. Drill out the rivets securing the intercostal with a No. 30 (.1285-inch) drill. (See figure 4.)

(4) Remove the upper hinge bracket from the front beam by removing the two bolts securing it.

(5) Drill out the rivets securing the nut plate to the back of the beam and doubler. Use a No. 4 (.098-inch) drill. There are five such nut plates. (See figure 5.)



NOTE: A04 RIVET HOLES REQUIRE # 30 (.1285) DRILL. A03 RIVET HOLES REQUIRE # 40 (.098) DRILL. ALL NUT PLATE BOLT HOLES REQUIRE # 10 (.193) DRILL.

1. AN42A04-6 RIVET 2 REQ
2. AN42A03-4 RIVET 4 REQ
3. AN42A04-4 RIVET 8 REQ
4. AN42A03-6 RIVET 6 REQ TO SECURE NUT PLATES.
5. REMOVE OLD DOUBLER FROM AFT SIDE OF BEAM. FABRICATE NEW .040 DOUBLER 9-1/8 IN. LONG FROM ALUM.-ALLOY SHEET. NEW DOUBLER TO BE FLANGED AS OLD DOUBLER AND WILL EXTEND TO UPPER END OF BEAM.

Figure 5 - Looking at Rudder Front Beam

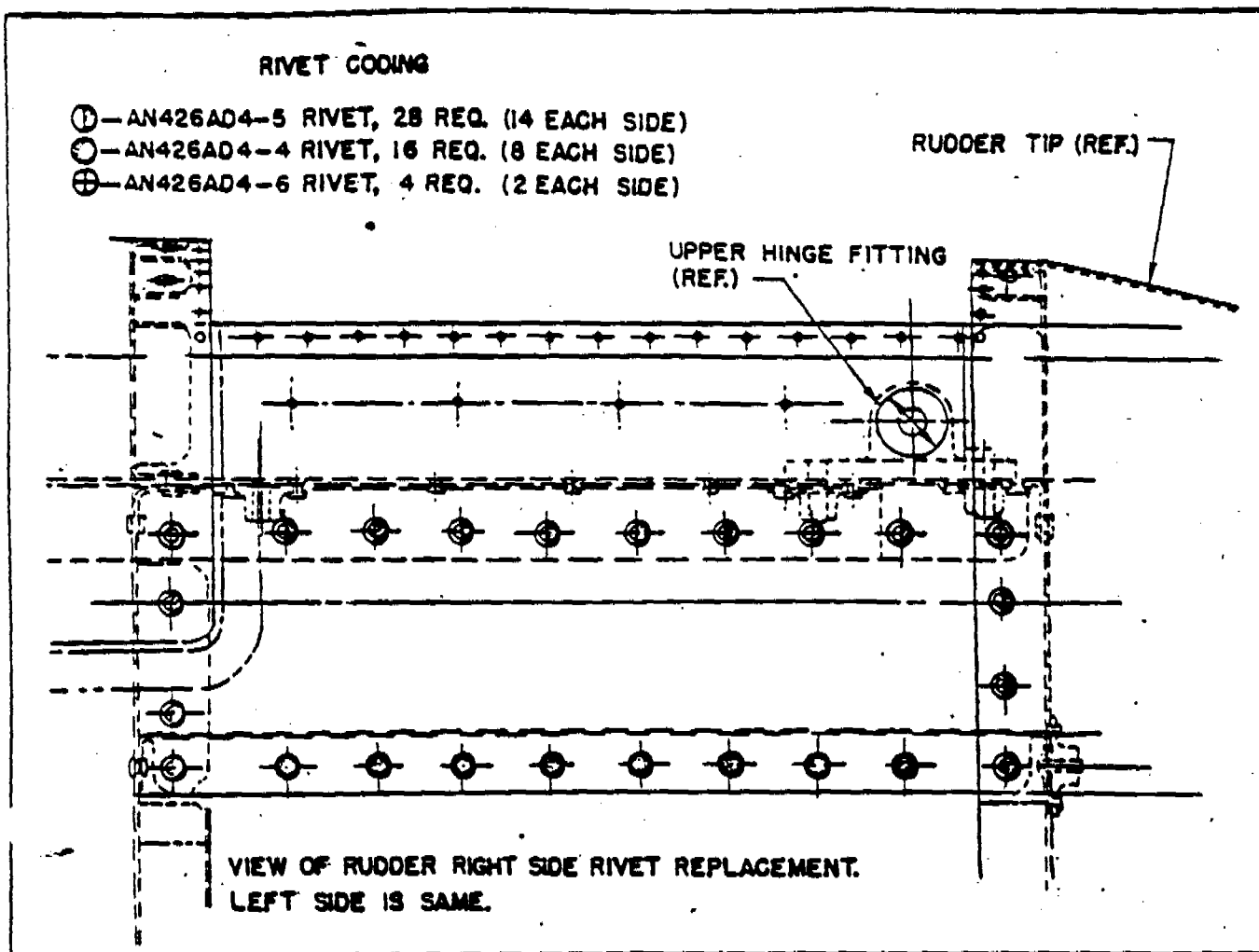


Figure 6 - Plan View - Rudder Tip

(6) Drill out all rivets securing the doubler to the aft side of the beam. (See figure 5.) Use a No. 30 (.1285-inch) drill. Drill out all rivets securing the doubler and beam flanges to the left and right surfaces of the rudder.

(7) Remove the doubler from the aft side of the beam. Fabricate a new doubler from aluminum-alloy sheet .040 x 4 inches (all bend radii to be 3/32 minimum) identical to the one just removed except that it shall be 9-1/8 inches long. Flange both sides just as on the old doubler. Joggle each end of both flanges so that the doubler will fit on the aft side of the beam. The additional length of the new doubler will extend it to the upper end of the beam.

**NOTE** If a fatigue crack is apparent in the beam, drill a No. 40 (.098-inch) hole in each end of the crack.

(8) Hold the new doubler in position on the aft side of the beam and drill the ten rivet holes through doubler using the ten No. 30 (.1285-inch) holes in beam as templates.

(9) Secure the new doubler to the aft side of the beam at these holes using eight rivets, part No.

AN426AD4-4, and two rivets, part No. AN442AD4-6. (See figure 5.)

(10) Drill the rivet holes for the five nut plates previously removed. Use a No. 40 (.098-inch) drill. Utilize holes in the beam as templates.

(11) Drill the bolt holes for the nut plates with a No. 10 (.193-inch) drill.

(12) Secure the nut plates and their fillers to the back of the new doubler with four rivets, part No. AN426AD3-4, for the two lower nut plates; and six rivets, part No. AN426AD3-5, for the three upper nut plates.

(13) Drill the rivet holes through the left and right flanges of the doubler with a No. 30 (.1285-inch) drill. Use the holes in the left and right surfaces of the rudder as templates. Secure the doubler at these holes with rivets as shown in figure 6.

(14) Reinstall the intercostal using rivets as shown in figure 6.

(15) Reinstall the upper hinge bracket on the front beam.

g. Cover the rudder with fabric, Specification No. AN-CCC-C-399, dope, Specification No. AN-TT-D-514, and dope, Specification No. AN-TT-D-551.

4 inches aft of and parallel to the leading edge on the left side of the rudder between the center and upper hinges.

(1) Stencil the words "Modified per T. O. No. 01-60-97" in black letters 1 inch high approximately

(2) Reinstall the counterweight.

g. Reinstall the rudder on the airplane.

3. a. The following parts are required per airplane to accomplish the change prescribed in section I.

| QTY    | STOCK NO.      | PART NO.   | NOMENCLATURE  | CLASS | SOURCE    |
|--------|----------------|------------|---|-------|-----------|
| 1      |                |            | Doublers - .040 x 4-1/2 x 9-9/16 in.<br>Mfr from:   | 01-M  | Local Mfr |
| As req |                |            | Alum. Alloy - Sheet, cond T, heat-treated, .040 in., Specification No. AN-A-13, stock No. 6800-142000 | 23-A  | AF Stock  |
| 8      | 6700-489139    | AN426AD4-4 | Rivet - Alum.-alloy countersunk head 100-deg type AD 1/8 x 1/4 in.                                    | 29    | AF Stock  |
| 3      | 6700-497800    | AN442AD4-6 | Rivet - Alum.-alloy flathead type AD 1/8 x 3/8 in.  | 29    | AF Stock  |
| 4      | 6700-489136-23 | AN426AD3-6 | Rivet - Alum.-alloy countersunk head 100-deg type AD 3/32 x 3/8 in.                                   | 29    | AF Stock  |
| 2      | 6700-489136-2  | AN426AD3-5 | Rivet - Alum.-alloy countersunk head 100-deg type AD 3/32 x 5/16 in.                                  | 29    | AF Stock  |
| 4      | 6700-489136    | AN426AD3-4 | Rivet - Alum.-alloy countersunk head 100-deg type AD 3/32 x 1/4 in.                                   | 29    | AF Stock  |
| 42     | 6700-489141    | AN426AD4-5 | Rivet - Alum.-alloy countersunk head 100-deg type AD 1/8 x 5/16 in.                                   | 29    | AF Stock  |
| 6      | 6700-489143    | AN426AD4-6 | Rivet - Alum.-alloy countersunk head 100-deg type AD 1/8 x 3/8 in.                                    | 29    | AF Stock  |
| As req | 7100-238500    |            | Cloth - Mercerized cotton airplane grade A, 36 to 72 in. wide, Specification No. AN-CCC-C-399         | 21    | AF Stock  |
| As req | 7300-301500    |            | Dope - Cellulose nitrate, clear, Specification No. AN-TT-D-514  | 07    | AF Stock  |
| As req | 7300-304000    |            | Dope - Cellulose nitrate, clear, Specification No. AN-TT-D-551  | 07    | AF Stock  |
| As req | 7300-751000    |            | Pigment - Alum. paste, type 2, class B, Specification No. TT-A-468                                    | 07    | AF Stock  |

b. The following parts are required per airplane to accomplish the change prescribed in section II.

| QTY    | STOCK NO.   | PART NO.   | NOMENCLATURE   | CLASS | SOURCE    |
|--------|-------------|------------|--|-------|-----------|
| 1      |             |            | Doublers - .040 x 4 x 9-1/8 in.<br>Mfr from:   | 01-M  | Local Mfr |
| As req |             |            | Alum. Alloy - Sheet cond T, heat-treated, .040 in., Specification No. AN-A-13, stock No. 6800-142000 | 23-A  | AF Stock  |
| 24     | 6700-489139 | AN426AD4-4 | Rivet - Alum.-alloy countersunk head 100-deg type AD 1/8 x 1/4 in.                                   | 29    | AF Stock  |
| 2      | 6700-497800 | AN442AD4-6 | Rivet - Alum.-alloy flathead type AD 1/8 x 3/8 in.   | 29    | AF Stock  |

| QTY    | STOCK NO.     | PART NO.   | NOMENCLATURE  | CLASS | SOURCE   |
|--------|---------------|------------|---|-------|----------|
| 4      | 6700-489135   | AN426AD3-4 | Rivet - Alum.-alloy countersunk<br>head 100-deg type AD 3/32 x<br>1/4 in.                           | 29    | AF Stock |
| 6      | 6700-489136-2 | AN426AD3-5 | Rivet - Alum.-alloy countersunk<br>head 100-deg type AD 3/32 x<br>5/16 in.                          | 29    | AF Stock |
| 32     | 6700-489141   | AN426AD4-6 | Rivet - Alum.-alloy countersunk<br>head 100-deg type AD 1/8 x<br>5/16 in.                           | 29    | AF Stock |
| 4      | 6700-489143   | AN426AD4-6 | Rivet - Alum.-alloy countersunk<br>head 100-deg type AD 1/8 x<br>3/8 in.                            | 29    | AF Stock |
| As req | 7100-238500   |            | Cloth - Mercerized cotton airplane<br>grade A, 36 to 72 in. wide,<br>Specification No. AN-CCC-C-399 | 21    | AF Stock |
| As req | 7300-301500   |            | Dope - Cellulose nitrate, clear,<br>Specification No. AN-TT-D-514                                   | 07    | AF Stock |
| As req | 7300-304000   |            | Dope - Cellulose nitrate, clear,<br>Specification No. AN-TT-D-551                                   | 07    | AF Stock |
| As req | 7300-751000   |            | Pigment - Aluminum paste type 2,<br>class B, Specification No. TT-A-<br>468                         | 07    | AF Stock |

c. The doublers, part Nos. 73-22050-3 and 73-24043-4, removed, will be condemned at once and so tagged for disposition as condemned property.

4. a. Approximately 30 man-hours are required for the work outlined in section I.

b. Approximately 14 man-hours are required for the work outlined in section II.

5. The weight change effected by this modification is negligible.

BY COMMAND OF GENERAL ARNOLD:

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