HEADQUARTERS, ARMY AIR FORCES
WASHINGTON 25, D. C.

TECHNICAL ORDER
NO. 01-60J-18

April 8, 1944

AIRPLANES AND MAINTENANCE PARTS

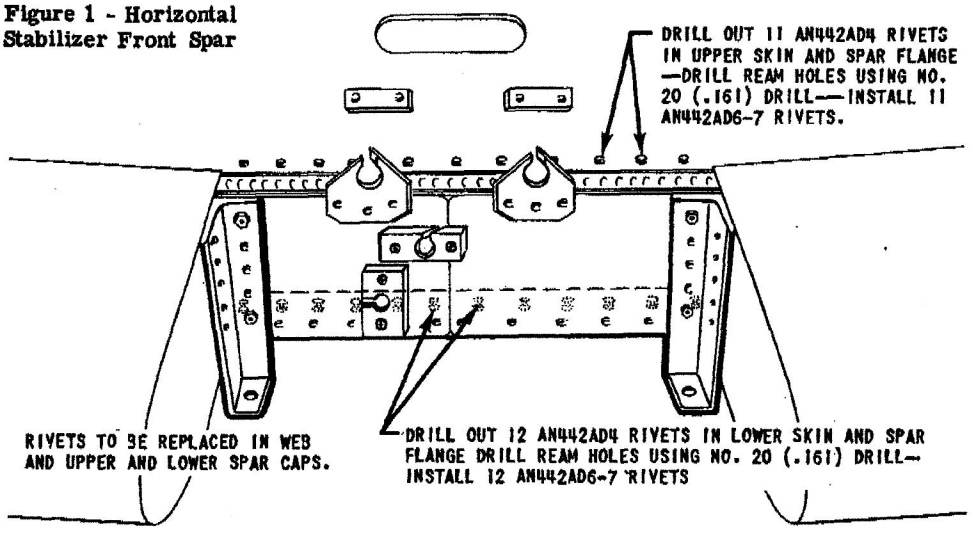
NORTH AMERICAN—REINFORCEMENT OF HORIZONTAL STABILIZER AND FIN—P-51B, P-51C, AND P-51D

NOTE The provisions of T. O. No. 00-20A will be complied with in this case, these instructions being entered on AAF Forms 60-A for the airplanes affected. The work directed herein will be accomplished as soon as possible and not later than the next 100-hour inspection period by service activities with the aid of sub-depots, if necessary. Spare stabilizers, part No. 73-21001-100, in stock will be reworked in accordance with sections I, II, III, and the applicable portions of section IV of paragraph 2. Spare fins, part No. 73-23001, in stock will be reworked in accordance with the applicable portions of section IV of paragraph 2.

1. To reduce the possibility of empennage failure the horizontal stabilizer and fin of affected P-51 series airplanes will be reworked in accordance with the applicable sections of the instructions contained in paragraph 2. as follows:

MODEL	AF SERIAL NOS.	APPLICABLE SECTION
P-51B	43-6313 to 43-7202 inclusive	I - II - III - IV
	43-12093 to 43-12492 inclusive	I - II - III - IV
	42-106429 to 42-106538 inclusive	I - II - III - IV
	42-106541 to 42-106765 inclusive	I - II - III - IV
	42-106766 to 42-106963 inclusive	II - III - IV
	42-106964 to 42-106966 inclusive	II - III
	42-106967 to 42-106978 inclusive	II
P-51C	42-102979 to 42-103307 inclusive	I - II - III - IV
	42-103308 to 42-103538 inclusive	II - III - IV
	42-103539 to 42-103578 inclusive	IV
P-51D	44-13253 to 44-13256 inclusive	I - II - III - IV
	44-13257 and 44-13258	II - III - IV
	44-13259 to 44-13267 inclusive	II
	42-106540	I - II - III - IV

Figure 1 - Horizontal Stabilizer Front Spar



The Drury Ptg. Co. 4-6-44—19M

Compliance with these instructions is MANDATORY within the continental United States. Within theaters of operation, compliance will be at the discretion of Task Force Commanders concerned.

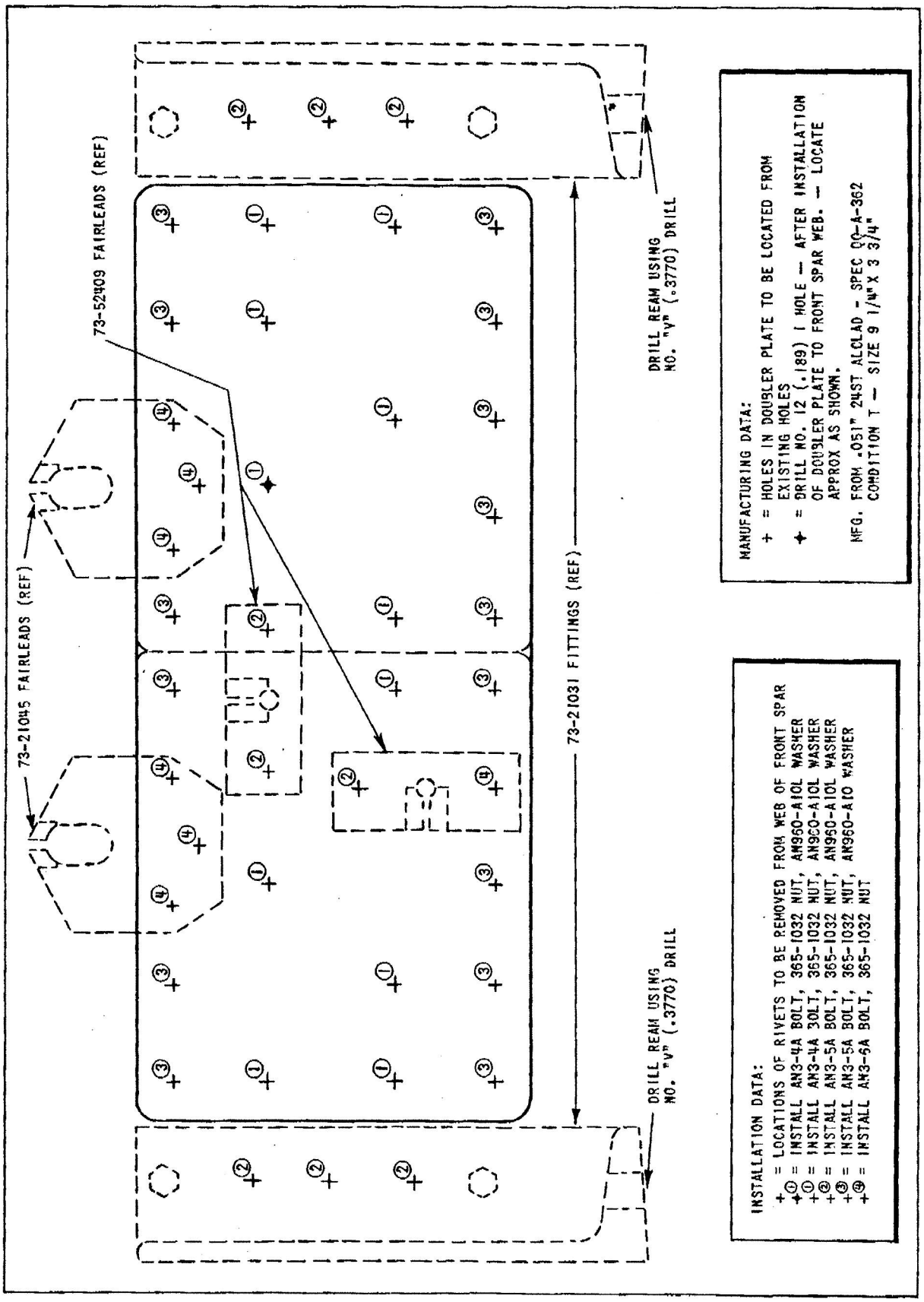


Figure 2 - Horizontal Stabilizer Front Spar Reinforcing Doubler

NOTE Accomplishment of the modifications outlined herein will not lift the flight restrictions imposed by T. O. No. 01-60J-6B, dated January 27, 1944. The restriction prohibiting slow rolls in P-51B, P-51C, and subsequent P-51 series airplanes will remain in force until further notice.

2. The instructions for accomplishing these changes are as follows:

GENERAL

a. The modifications outlined in sections I, II, III, and IV, require varying degrees of disassembly of the empennage in order to gain access to the area affected.

b. To accomplish sections I, II, and III remove the empennage fairing, the rudder, and the fin in accordance with existing instructions. The following additional operations are also required and are applicable only as noted:

(1) SECTIONS I and II.

(a) Remove the horizontal stabilizer in accordance with existing instructions.

(2) SECTION III.

(a) Remove the elevators in accordance with existing instructions.

(b) Remove the four bolts, nuts, and washers which retain the bracket, part No. 73-21009, to the web of the horizontal stabilizer rear spar.

c. To accomplish section IV it is necessary only to remove the rudder and elevators. This modification may be accomplished without removal of the fin or horizontal stabilizer but is facilitated if the fin and stabilizer have already been removed to accomplish section I, II, or III.

SECTION I

a. Visually inspect center of front spar (figure 1) of the horizontal stabilizer to determine if the doubler illustrated in figure 2 has been installed and secured to the front spar between the fittings, part No. 73-21031, with 3/16-inch bolts. Also inspect fittings to determine if the center three rivets through the front spar have also been removed and replaced with 3/16-inch bolts. If doubler has not been installed or if additional bolts are required proceed in accordance with applicable portions of the following instructions:

NOTE An undetermined number of the airplanes were either completely or partially modified by the contractor prior to delivery.

b. Manufacture a horizontal stabilizer front spar reinforcing doubler in accordance with figure 2.

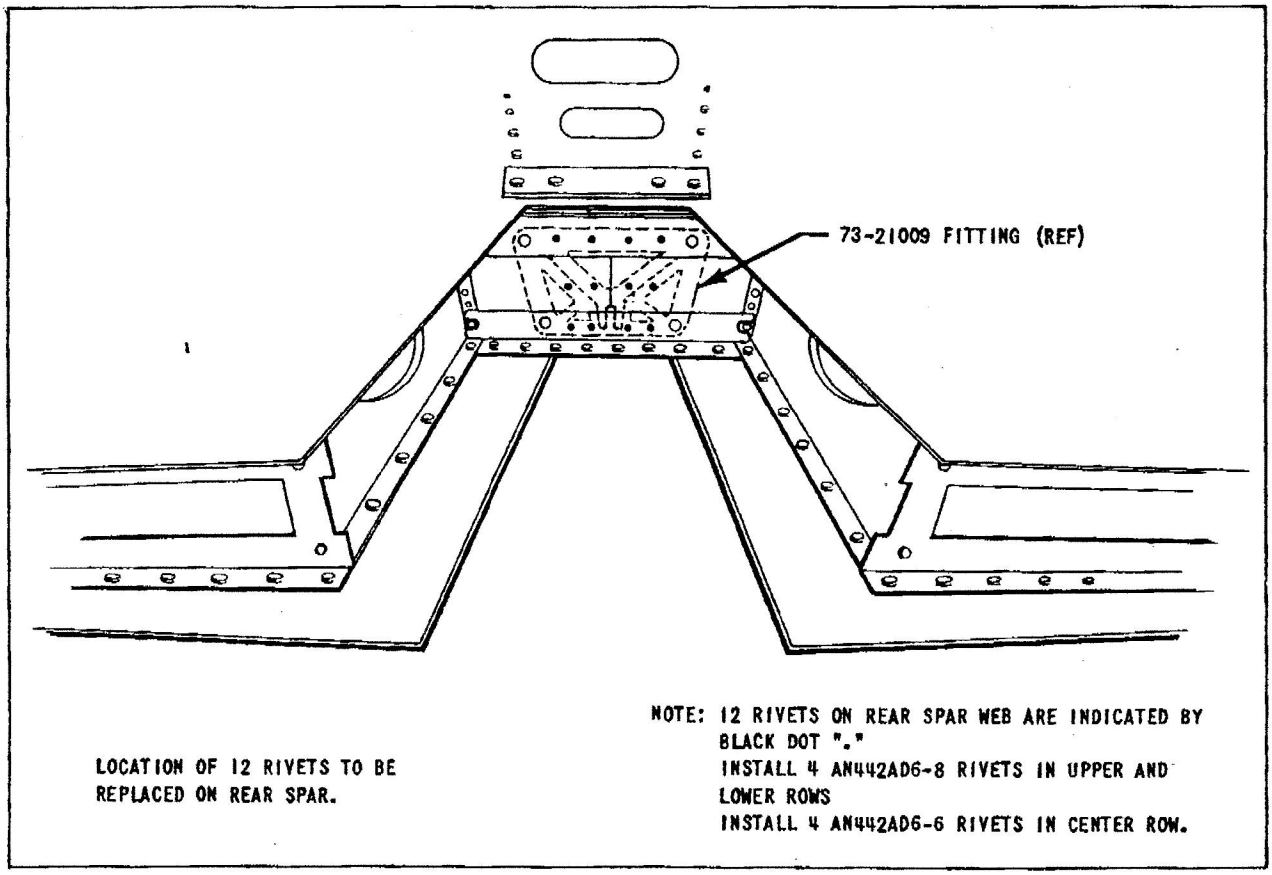


Figure 3 - Aft View of Horizontal Stabilizer

c. Remove two fair-leads, part No. 73-21045, and two fair-leads, part No. 73-52409, from the front spar by drilling out rivets using a No. 21 (.159-inch) drill, or removing screws and nuts. Retain fair-leads for subsequent reinstallation.

d. Drill out all rivets securing the existing doublers to the front spar except those installed in the two vertical fittings, part No. 73-21031, at either side. Use a No. 21 (.159-inch) drill to remove rivets.

e. Place the new doubler on the aft side of the front spar. Mark the positions of all holes through the existing holes in the front spar from which rivets were removed.

f. Remove the new doubler and ascertain that when holes are drilled adequate edge distance will be maintained.

g. Place doubler back in position on aft side of front spar. Drill all holes through the doubler picking them up from existing holes in spar web. Use a No. 21 (.159-inch) drill.

h. Remove the new doubler. Cut holes in the doubler for the trim tab cables.

i. Place the doubler into position on the forward side of the front spar so that the holes in the doubler match those in the spar. Ream all holes (except trim tab holes) with a No. 12 (.189-inch) drill.

j. Secure the new doubler to the forward side of the front spar using bolts as indicated in figure 2. Install bolts so that nuts are on aft side of spar and washer is under bolt head.

k. Enlarge the holes in the fair-leads, part Nos. 73-21045 and 73-52409, by drill reaming using a No. 12 (.189-inch) drill.

l. Secure the four fair-leads to the spar using AN3- bolts as indicated in figure 2. Install bolts so that nuts are on aft side of spar.

m. Locate a point 1/2 inch below the left-hand fair-lead, part No. 73-21045, on the fair-lead center line, and drill a No. 12 (.189-inch) hole through the doubler and spar. (See figure 2.) Install bolt and secure with nut on aft side of spar and washer under bolt head.

n. Remove three rivets securing each fitting, part No. 73-21031, to the front spar. (See figures 1 and 2.) Drill ream the holes using a No. 12 (.189-inch) drill and install one AN3- bolt in each hole. Install bolts so that nuts are on aft side of spar and washer is under bolt head.

NOTE If head of bolt does not seat properly it will be necessary to spot-face fitting.

o. Drill ream the hole in the bottom of each fitting, part No. 73-21031, using a No. "V" (.3770-inch) drill.

p. Drill ream the two holes in the fuselage rear section horizontal bulkhead, part No. 73-31125, at station 281 which mate with the holes in the fittings, part No. 73-21031, when the horizontal stabilizer is installed. Use a No. "V" (.3770-inch) drill.

SECTION II

a. Drill out the 11 rivets which attach the upper center skin of the horizontal stabilizer to the top flange of the front spar. (See figure 1.) Use a No. 21 (.159-inch) drill.

b. Drill out the 12 rivets which attach the lower center skin of the horizontal stabilizer to the bottom flange of the front spar (figure 1) using a No. 21 (.159-inch) drill.

c. Drill ream the 11 holes in the top flange of the spar and the 12 holes in the bottom flange of the spar using a No. 11 (.191-inch) drill.

d. Install 23 rivets, part No. AN442AD6-7, in the holes.

SECTION III

a. Drill out the 12 center rivets located on the web of the horizontal stabilizer rear spar (3 rows - 4 rivets per row) as shown in figure 3 using a No. 12 (.189-inch) drill.

b. Drill ream the 12 holes using a No. 11 (.191-inch) drill.

c. Install four rivets, part No. AN442AD6-8, in the upper and lower rows of holes.

d. Install four rivets, part No. AN442AD6-6, in the center row of holes.

SECTION IV

a. Locate the station 70-1/2 horizontal stabilizer ribs which are just outboard of the elevator counterbalance weight cut-out and the station 61-1/2 fin rib which is just above the rudder counterbalance weight cut-out. Inspect the sections of the ribs aft of the rear beam for cracks in corners at flange bend radius, for

cracks through the hinge fitting rivet holes, and for cracks across the web of the rib.

b. Manufacture three reinforcing doubler channels in accordance with figures 4 and 5.

IMPORTANT Manufacture from aluminum-alloy sheet, condition T, Specification No. QQ-A-362. Material to be .040 inch if inspection above reveals cracks and .032 inch if no cracks are found. The doubler installation is to be used for reinforcing strength only. Additional repair in accordance with existing instructions will be completed when cracks are present.

c. To install the doublers on the horizontal stabilizer proceed as follows:

(1) Remove tips from stabilizer by removing the screws which retain the tips.

(2) Drill out five rivets, part No. AN442AD5, attaching the hinge fitting, part No. 73-21008, to the rib. Remove the fitting and retain for subsequent reinstallation.

(3) Remove the angle, part No. 73-21037-2, by drilling out the six rivets, part No. AN442AD4.

(4) Remove the modification plate, part No. 49-00107, or serial plate, part No. B1221D, depending on whether the right or left side of the stabilizer is being worked on. Retain both plates for subsequent reinstallation.

(5) Drill out the second, third, and fourth rivets in the upper and lower skin along the elevator counterbalance cut-out adjacent to the rib, part No. 73-21017, counting from the aft edge of the stabilizer.

(6) Place one of the station 70 1/2 horizontal stabilizer rib reinforcing doubler channels into place against the inboard side of the station 70 1/2 rib with the side flanges turned inboard. Clamp into place.

(7) Drill three No. 30 (.1285-inch) holes in the forward end of the doubler. The holes in the web of the doubler should be located from the three existing holes in the rib web provided for the angle, part No. 73-21037-2. The three pilot holes in the end flange of the doubler should be drill reamed to match the existing holes in the beam.

(8) Attach the doubler to the rib and beam using three rivets, part No. AN442AD4-5, to attach the doubler to the rib web, two rivets, part No. AN442AD4-6, to attach the doubler to the beam (upper and lower rivets) and one rivet, part No. AN442AD4-5, to attach the doubler to the beam (center rivet).

(9) Drill five No. 10 (.1935-inch) holes in the aft end of the doubler to match the five holes provided in the rib web for the hinge fitting, part No. 73-21008. Drill ream holes in the rib web and hinge fitting to the same size.

(10) Attach the hinge fitting, part No. 73-21008, to the rib and doubler using five rivets, part No. AN442AD6-8.

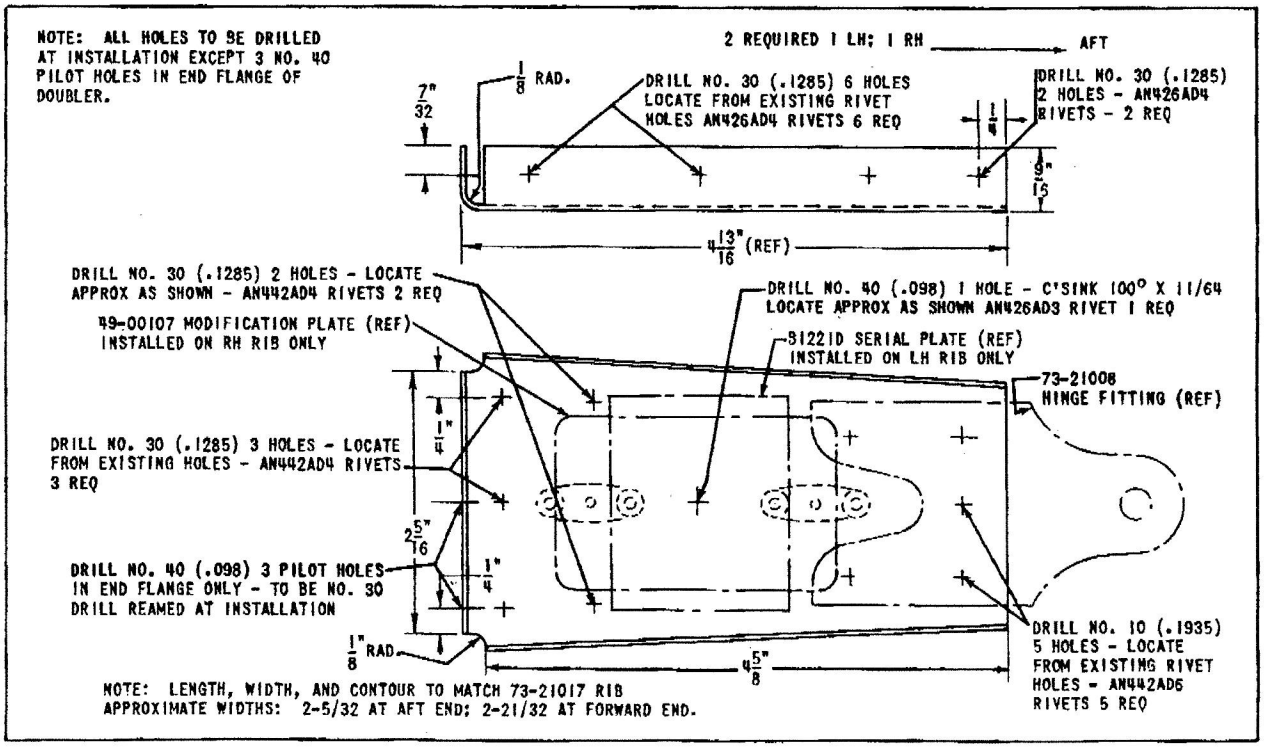


Figure 4 - Station 70 1/2 Horizontal Stabilizer Rib Reinforcing Doubler Channel

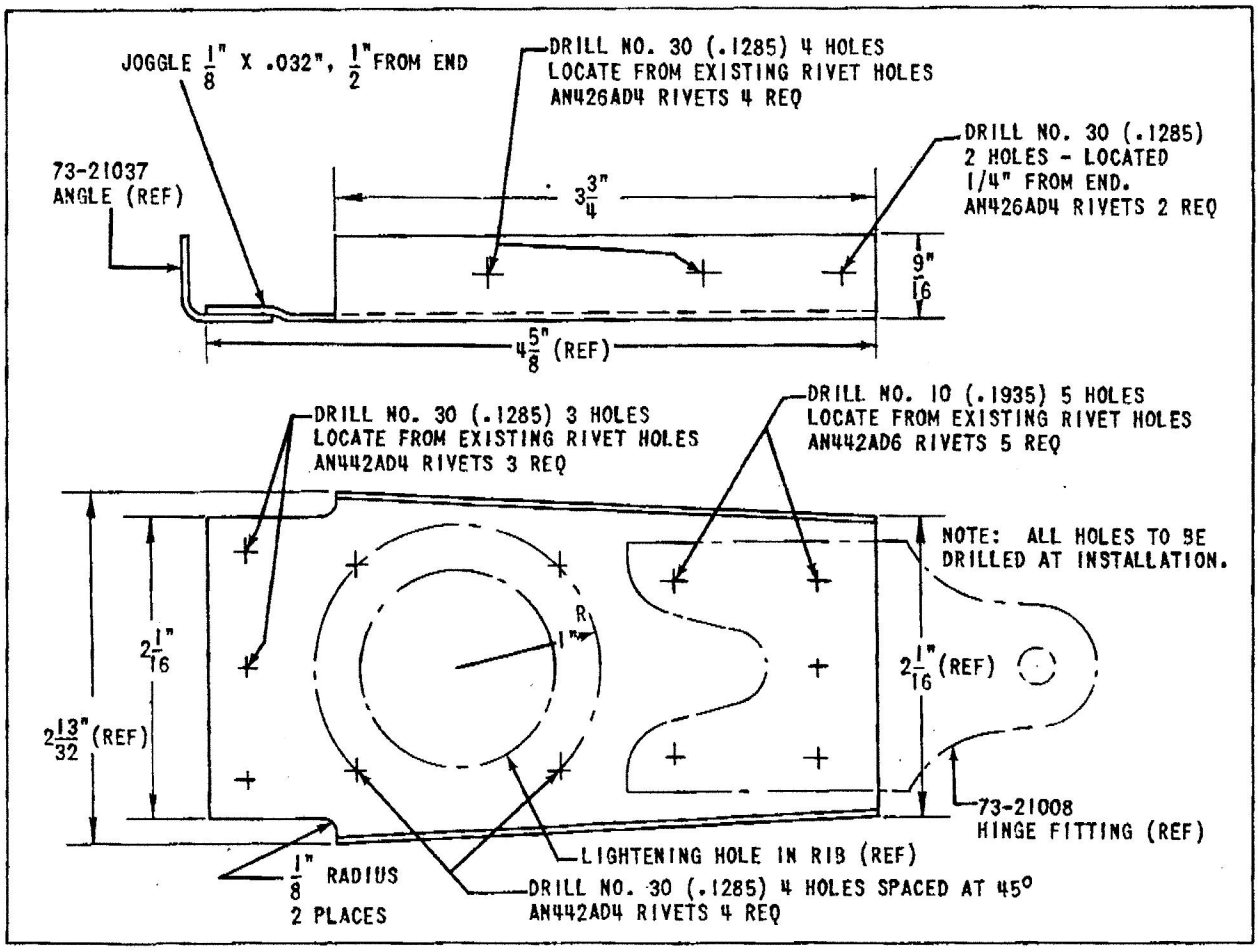


Figure 5 - Station 61 1/2 Fin Rib Reinforcing Doubler Channel

(11) Drill six No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler. Locate the holes from the existing skin rivet holes. No. 30 drill ream the skin holes and countersink the skin 100 degrees by 7/32 inch.

(12) Drill two No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler and through the skin, locating the holes 1/4 inch from the aft end of each flange of the doubler. Countersink the skin 100 degrees by 7/32 inch.

(13) Attach the doubler to the skin using eight rivets, part No. AN426AD4-5.

(14) Rivet the doubler web to the rib web using rivets, part Nos. AN442AD4-5 and AN426AD3-4, as required.

NOTE The webs should be riveted together in at least three places as indicated in figure 4. Additional rivets will be required if the rib web has been cracked; these should be located as necessary to properly reinforce the rib web.

(15) Reinstall the modification plate, part No. 49-00107, or serial plate, part No. B1221D, using screws previously removed or rivets, part No. AN442AD2-4, as required.

(16) Reinstall the tips on the horizontal stabilizer using the screws previously removed.

d. To install the doubler on the fin proceed as follows:

(1) Remove vertical stabilizer rear tip rib, part No. 73-23022, to gain access to the upper side of the station 61 1/2 rib, part No. 73-23008, by drilling out the eight rivets which attach the rib to the tip skin. Retain for subsequent reinstallation.

(2) Remove the upper hinge fitting, part No. 73-21008, from the station 61 1/2 rib web by drilling out the five rivets which attach the fitting to the rib.

(3) Drill out the three rivets which attach the angle, part No. 73-21037, to the station 61 1/2 rib web. This row of rivets is located just aft of the fin rear beam and is accessible through the rudder counterbalance cut-out.

(4) Drill out the second and third rivets in the upper and lower skin along the rudder counterbalance cut-out adjacent to the rib, part No. 73-23008, counting from the aft edge of the fin.

(5) Place the station 61 1/2 fin rib reinforcing doubler channel into place against the lower side of

the station 61 1/2 rib. The side flanges of the doubler should be turned down. Clamp into place.

(6) Drill three No. 30 (.1285-inch) holes in the forward end of the channel. The holes should be located from the three existing holes in the angle, part No. 73-21037.

(7) Attach the doubler to the angle and rib using three rivets, part No. AN442AD4-5.

(8) Drill five No. 10 (.1935-inch) holes in the aft end of the doubler to match the five holes provided in the rib web for the hinge fitting, part No. 73-21008. Drill ream the holes in the rib web and hinge fitting to the same size.

(9) Attach the hinge fitting, part No. 73-21008, to the rib and doubler using five rivets, part No. AN442AD6-8.

(10) Drill four No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler. Locate the holes from the existing skin rivet holes. No. 30 drill ream the skin holes and countersink the skin 100 degrees by 7/32 inch.

(11) Drill two No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler and through the skin locating the holes 1/4 inch from the aft end of each flange of the doubler. Countersink the skin 100 degrees by 7/32 inch.

(12) Attach the doubler to the skin using six rivets, part No. AN426AD4-5.

(13) Rivet the doubler web to the rib web using rivets, part No. AN442AD4-5, as required.

NOTE The webs should be riveted together in at least four places as indicated in figure 3.

Additional rivets will be required if the rib web has been cracked; these should be located as necessary to properly reinforce the rib web.

(14) Reinstall the vertical stabilizer rear tip rib, part No. 73-23022, using eight rivets, part No. AN426AD3-4.

REASSEMBLY

a. The empennage should be reassembled in the order listed below and should be accomplished in accordance with existing instructions.

(1) Reinstall the bracket, part No. 73-21009, on the web of the horizontal stabilizer rear spar using the bolts, nuts, and washers previously removed.

(2) Reinstall the horizontal stabilizer inserting two bolts, part No. AN6-12A, through the two front fittings, part No. 73-21031, and installing one washer, part No. AN960-A616, and one nut, part No. 365-624, on each bolt. Reinstall the 7/16-inch bolts, previously removed, to secure the horizontal stabilizer rear fittings. The 3/8-inch bolts should be tightened to torque between 160 and 190 inch-pounds, and the 7/16-inch bolts should be tightened to torque between 450 and 500 inch-pounds.

NOTE The elevators may be installed on the stabilizer before the stabilizer is installed on the empennage.

(3) Reinstall the fin.

(4) Reinstall the fairing and any access hole cover plates previously removed.

(5) Reinstall the elevators and rudder.

3. a. The following parts are required per airplane to accomplish this rework:

QTY	STOCK NO.	PART NO.	NOMENCLATURE	CLASS	SOURCE
			SECTION I		
1			Horizontal Stabilizer Front Spar Reinforcing Doubler Mfr. from: (See figure 2.)	01-M	Local Mfr.
			Alum. Alloy - Sheet condition T, heat treated, .051 inch, Specification No. QQ-A-362, stock No. 6800-142010	23-A	AF Stock
11	6500-032010	AN3-4A	Bolt - Aircraft, steel, No. 10-32 x 1/2 inch without cotter pin hole	04-A	AF Stock
24	6500-032020	AN3-5A	Bolt - Aircraft, steel, No. 10-32 x 5/8 inch without cotter pin hole	04-A	AF Stock
7	6500-032030	AN3-6A	Bolt - Aircraft, steel, No. 10-32 x 3/4 inch without cotter pin hole	04-A	AF Stock
2	6500-033414	AN6-12A	Bolt - Aircraft, steel, 3/8-24 x 1-1/4 inches without cotter pin hole	04-A	AF Stock
42	6500-514000	365-1032	Nut - Self-locking, steel, No. 10-32, fine thread	04-A	AF Stock
2	6500-514400	365-624	Nut - Self-locking, steel 3/8-24, fine thread	04-A	AF Stock
17	6500-982340	AN960-A10L	Washer - Plain aluminum No. 10 bolt	04-A	AF Stock
15	6500-981150	AN960-A10	Washer - Plain aluminum No. 10 bolt	04-A	AF Stock
2	6500-981220	AN960-A616	Washer - Plain aluminum 3/8-inch bolt	04-A	AF Stock
			SECTION II		
23	6700-497892	AN442AD6-7	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 7/16 inch	29	AF Stock
			SECTION III		
8	6700-497896	AN442AD6-8	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 1/2 inch	29	AF Stock
4	6700-497888	AN442AD6-6	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 3/8 inch	29	AF Stock

QTY	STOCK NO.	PART NO.	NOMENCLATURE	CLASS	SOURCE
			SECTION IV		
2			Station 70 1/2 Horizontal Stabilizer Rib Reinforcing Doubler Channel Mfr. from: (See figure 4.)	01-M	Local Mfr.
			Sheet - Alum.-alloy, condition T, heat-treated, .032 inch, Specification No. QQ-A-362, stock No. 6800-141980	23-A	AF Stock
			or		
			Sheet - Alum.-alloy, condition T, heat-treated, .040 inch, Specification No. QQ-A-362, stock No. 6800-142000	23-A	AF Stock
1			Station 61 1/2 Fin Rib Reinforcing Doubler Channel Mfr. from: (See figure 5.)	01-M	Local Mfr.
			Sheet - Alum.-alloy, condition T, heat-treated, .023 inch, Specification No. QQ-A-362, stock No. 6800-141980	23-A	AF Stock
			or		
			Sheet - Alum.-alloy, condition T, heat-treated, .040 inch, Specification No. QQ-A-362, stock No. 6800-142000	23-A	AF Stock
2	6700-497700	AN442AD2-4	Rivet - Alum.-alloy, flathead, type AD, 1/16 x 1/4 inch	29	AF Stock
13	6700-497796	AN442AD4-5	Rivet - Alum.-alloy, flathead, type AD, 1/8 x 5/16 inch	29	AF Stock
2	6700-497800	AN442AD4-6	Rivet - Alum.-alloy, flathead, type AD, 1/8 x 3/8 inch	29	AF Stock
10	6700-497896	AN442AD6-8	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 1/2 inch	29	AF Stock
14	6700-489141	AN426AD4-5	Rivet - Alum.-alloy, countersunk head, 100 degrees, type AD, 1/8 x 5/16 inch	29	AF Stock
9	6700-489135	AN426AD3-4	Rivet - Alum.-alloy, countersunk head, 100 degrees, type AD, 3/32 x 1/4 inch	29	AF Stock

b. The following parts removed and not reinstalled will be disposed of in accordance with AAF Regulation 65-43.

QTY	PART NO.	NOMENCLATURE
2 each	73-21037-2	Angle
2 each	AN5-12A	Bolt
2 each	AN960-516	Washer
2 each	365-524	Nut

By Command of General ARNOLD:

Prepared by Aircraft Section,
Maintenance Div, Hq, ASC.

WALTER H. FRANK,
Major General, U. S. A.,
Commanding General, Air Service Command.

HEADQUARTERS, ARMY AIR FORCES
WASHINGTON 25, D. C.

TECHNICAL ORDER
NO. 01-60J-18

15 January 1945

AIRCRAFT AND MAINTENANCE PARTS

NORTH AMERICAN—REINFORCEMENT OF HORIZONTAL STABILIZER AND FIN—P-51B, P-51C, P-51D, AND P-51K

This Technical Order replaces T. O. No. 01-60J-18, dated 8 April 1944, to include new and additional information indicated by black revision line. The purpose of this revision is to require the use of 1/4-inch rivets in lieu of 3/16-inch rivets to attach the elevator outboard and rudder upper hinge fittings, part No. 73-21008, to the stabilizer ribs, providing additional shear strength to reduce the possibility of shearing these rivets.

NOTE As prescribed in T. O. No. 00-20A, appropriate reference to this Technical Order will be entered on AAF Forms 60-A for the aircraft affected. The work directed herein will be accomplished as soon as possible and not later than the next 100-hour inspection period by service activities with the aid of base maintenance facilities, if necessary. Spare stabilizers, part No. 73-21001-100, in stock will be reworked in accordance with sections I, II, III, and the applicable portions of section IV of paragraph 2. Spare fins, part No. 73-23001, in stock will be reworked in accordance with the applicable portions of section IV of paragraph 2.

1. To reduce the possibility of empennage failure the horizontal stabilizer and fin of affected P-51 series airplanes will be reworked in accordance with the applicable sections of the instructions contained in paragraph 2, as follows:

MODEL	AF SERIAL NOS.	APPLICABLE SECTION
P-51B	43-6313 to 43-7202	I, II, III, IV
	43-12093 to 43-12492	I, II, III, IV
	42-106429 to 42-106538	I, II, III, IV

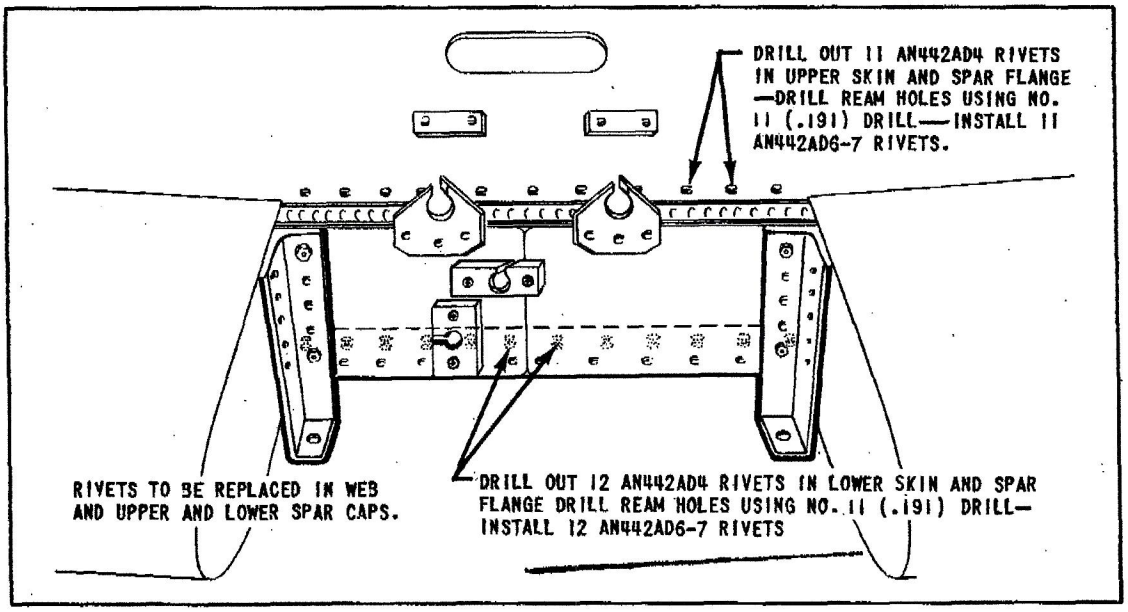
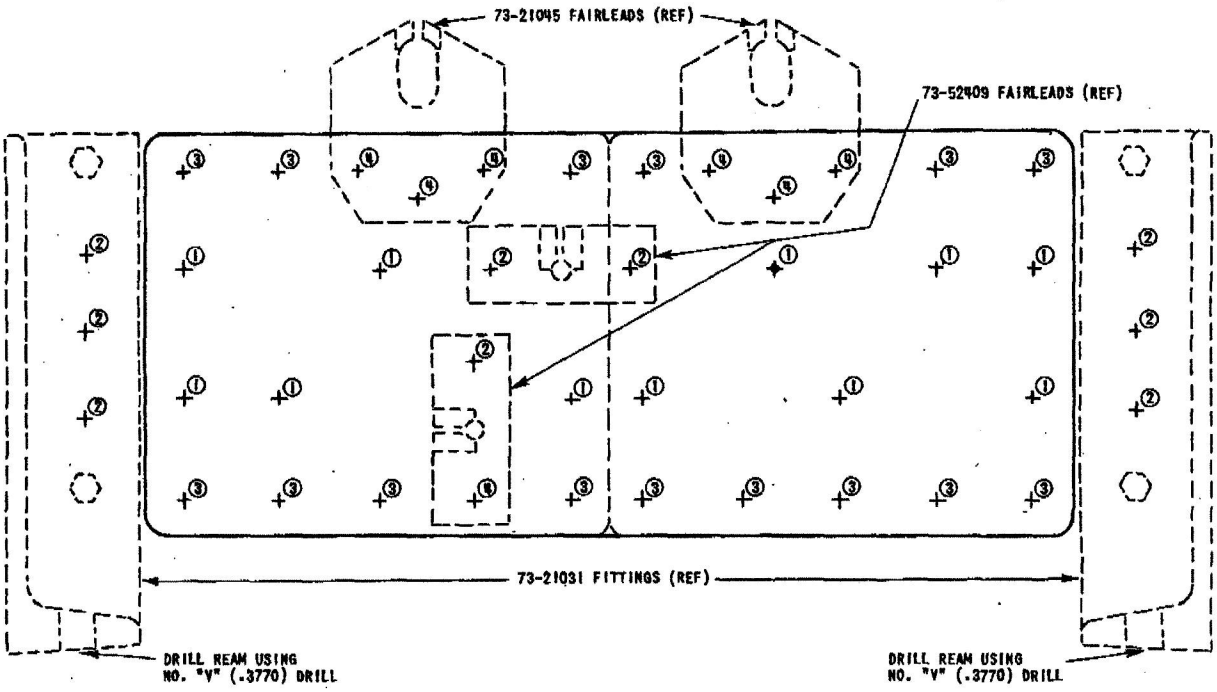


Figure 1 - Horizontal Stabilizer Front Spar



INSTALLATION DATA:
+ = LOCATIONS OF RIVETS TO BE REMOVED FROM WEB OF FRONT SPAR
+① = INSTALL AN3-4A BOLT, 365-1032 NUT, AN960-A10L WASHER
+① = INSTALL AN3-4A BOLT, 365-1032 NUT, AN960-A10L WASHER
+④ = INSTALL AN3-5A BOLT, 365-1032 NUT, AN960-A10L WASHER
+④ = INSTALL AN3-5A BOLT, 365-1032 NUT, AN960-A10 WASHER
+⑥ = INSTALL AN3-6A BOLT, 365-1032 NUT

MANUFACTURING DATA:
+ = HOLES IN DOUBLER PLATE TO BE LOCATED FROM EXISTING HOLES
✦ = DRILL NO. 12 (.189) 1 HOLE — AFTER INSTALLATION OF DOUBLER PLATE TO FRONT SPAR WEB. — LOCATE APPROX AS SHOWN.
MFG. FROM .051" 24ST ALCLAD - SPEC AN-A-13 CONDITION T — SIZE 9 1/8" X 3 3/4"

Figure 2 - Horizontal Stabilizer Front Spar Reinforcing Doubler

MODEL	AF SERIAL NOS.	APPLICABLE SECTION
P-51B	42-106541 to 42-106765	I, II, III, IV
	42-106766 to 42-106963	II, III, IV
	42-106964 to 42-106966	II, III, V
	42-106967 to 42-106978	II, V
	43-24752 to 43-24901	V
P-51C	42-102979 to 42-103307	I, II, III, IV
	42-103308 to 42-103538	II, III, IV
	42-103539 to 42-103578	IV
	42-103579 to 42-103978	V
	43-24902 to 43-25251	V
	44-10753 to 44-11152	V
P-51D	44-13253 to 44-13256	I, II, III, IV
	44-13257 and 44-13258	II, III, IV
	44-13259 to 44-13267	II, V
	44-13268 to 44-15052	V
	44-11153 to 44-11352	V
	42-106540	I, II, III, IV
P-51K	44-11353 to 44-11376	V

Airplanes subsequent to those affected by each section will be modified by the contractor prior to delivery. Model P-51D airplane, AF No. 44-15053 and subsequent, and P-51K airplane, AF No. 44-11377 and subsequent, will be completely modified by the contractor.

NOTE Production modifications are not necessarily identical in appearance to those outlined herein, however, equal or superior structural strength is obtained.

2. The instructions for accomplishing these changes are as follows:

GENERAL

a. The modifications outlined in sections I, II, III, and IV, require varying degrees of disassembly of the empennage in order to gain access to the area affected.

b. To accomplish sections I, II, and III remove the empennage fairing, the rudder, and the fin in accordance with existing instructions. The following additional operations are also required and are applicable only as noted:

(1) SECTIONS I AND II.

(a) Remove the horizontal stabilizer in accordance with existing instructions.

(2) SECTION III.

(a) Remove the elevators in accordance with existing instructions.

(b) Remove the four bolts, nuts, and washers which retain the bracket, part No. 73-21009, to the web of the horizontal stabilizer rear spar.

c. To accomplish sections IV and V it is necessary only to remove the rudder and elevators. This modification may be accomplished without removal of the fin or horizontal stabilizer but is facilitated if the fin and stabilizer have already been removed to accomplish section I, II, or III.

SECTION I

a. Visually inspect center of front spar (figure 1) of the horizontal stabilizer to determine if the doubler illustrated in figure 2 has been installed and secured to the front spar between the fittings, part No. 73-21031, with 3/16-inch bolts. Also inspect fittings to determine if the center three rivets through the front spar have also been removed and replaced with 3/16-inch bolts. If doubler has not been installed or if additional bolts are required proceed in accordance with applicable portions of the following instructions:

NOTE An undetermined number of the airplanes were either completely or partially modified by the contractor prior to delivery.

b. Manufacture a horizontal stabilizer front spar reinforcing doubler in accordance with figure 2.

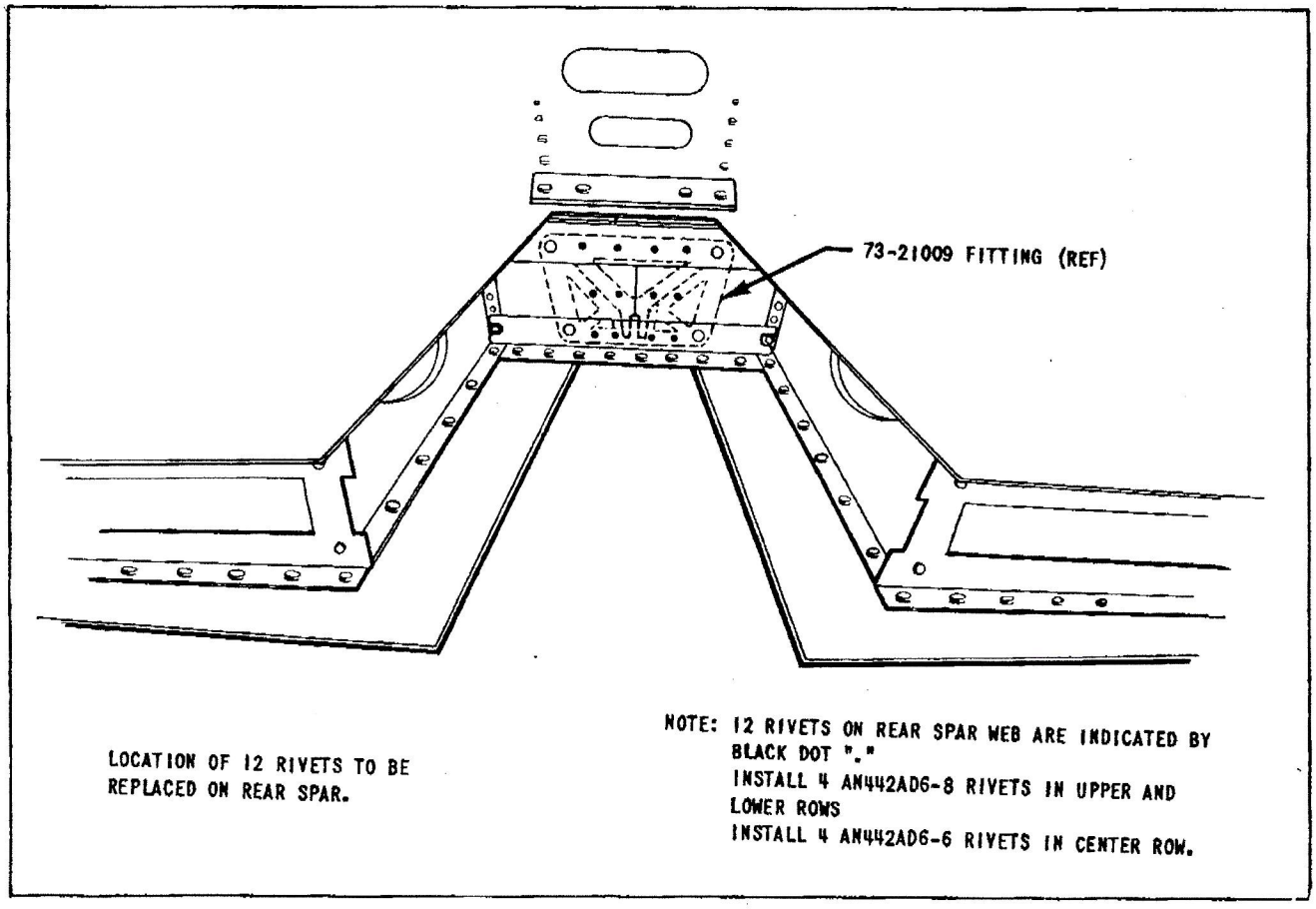


Figure 3 - Aft View of Horizontal Stabilizer

c. Remove two fair-leads, part No. 73-21045, and two fair-leads, part No. 73-52409, from the front spar by drilling out rivets using a No. 21 (.159-inch) drill, or removing screws and nuts. Retain fair-leads for subsequent reinstallation.

d. Drill out all rivets securing the existing doublers to the front spar except those installed in the two vertical fittings, part No. 73-21031, at either side. Use a No. 21 (.159-inch) drill to remove rivets.

e. Place the new doubler on the aft side of the front spar. Mark the positions of all holes through the existing holes in the front spar from which rivets were removed.

f. Remove the new doubler and ascertain that when holes are drilled adequate edge distance will be maintained.

g. Place doubler back in position on aft side of front spar. Drill all holes through the doubler picking them up from existing holes in spar web. Use a No. 21 (.159-inch) drill.

h. Remove the new doubler. Cut holes in the doubler for the trim tab cables.

i. Place the doubler into position on the forward side of the front spar so that the holes in the doubler match those in the spar. Ream all holes (except trim tab holes) with a No. 12 (.189-inch) drill.

j. Secure the new doubler to the forward side of the front spar using bolts as indicated in figure 2. Install bolts so that nuts are on aft side of spar and washer is under bolt head.

k. Enlarge the holes in the fair-leads, part Nos. 73-21045 and 73-52409, by drill reaming using a No. 12 (.189-inch) drill.

l. Secure the four fair-leads to the spar using AN3- bolts as indicated in figure 2. Install bolts so that nuts are on aft side of spar.

m. Locate a point 1/2 inch below the left-hand fair-lead, part No. 73-21045, on the fair-lead center line, and drill a No. 12 (.189-inch) hole through the doubler and spar. (See figure 2.) Install bolt and secure with nut on aft side of spar and washer under bolt head.

n. Remove three rivets securing each fitting, part No. 73-21031, to the front spar. (See figures 1 and 2.) Drill ream the holes using a No. 12 (.189-inch) drill and install one AN3- bolt in each hole. Install bolts so that nuts are on aft side of spar and washer is under bolt head.

NOTE If head of bolt does not seat properly it will be necessary to spot-face fitting.

o. Drill ream the hole in the bottom of each fitting, part No. 73-21031, using a No. "V" (.3770-inch) drill.

p. Drill ream the two holes in the fuselage rear section horizontal bulkhead, part No. 73-31125, at station 281 which mate with the holes in the fittings, part No. 73-21031, when the horizontal stabilizer is installed. Use a No. "V" (.3770-inch) drill.

SECTION II

a. Drill out the 11 rivets which attach the upper center skin of the horizontal stabilizer to the top flange of the front spar. (See figure 1.) Use a No. 21 (.159-inch) drill.

b. Drill out the 12 rivets which attach the lower center skin of the horizontal stabilizer to the bottom flange of the front spar (figure 1) using a No. 21 (.159-inch) drill.

c. Drill ream the 11 holes in the top flange of the spar and the 12 holes in the bottom flange of the spar using a No. 11 (.191-inch) drill.

d. Install 23 rivets, part No. AN442AD6-7, in the holes.

SECTION III

a. Drill out the 12 center rivets located on the web of the horizontal stabilizer rear spar (3 rows - 4 rivets per row) as shown in figure 3 using a No. 12 (.189-inch) drill.

b. Drill ream the 12 holes using a No. 11 (.191-inch) drill.

c. Install four rivets, part No. AN442AD6-8, in the upper and lower rows of holes.

d. Install four rivets, part No. AN442AD6-6, in the center row of holes.

SECTION IV

a. Locate the station 70-1/2 horizontal stabilizer ribs which are just outboard of the elevator counterbalance weight cut-out and the station 61-1/2 fin rib which is just above the rudder counterbalance weight cut-out. Inspect the sections of the ribs aft of the rear beam for cracks in corners at flange bend radius, for

cracks through the hinge fitting rivet holes, and for cracks across the web of the rib.

b. Manufacture three reinforcing doubler channels in accordance with figures 4 and 5.

IMPORTANT Manufacture from aluminum-alloy sheet, condition T, Specification No. AN-A-13. Material to be .040 inch if inspection above reveals cracks and .032 inch if no cracks are found. The doubler installation is to be used for reinforcing strength only. Additional repair in accordance with existing instructions will be completed when cracks are present.

c. To install the doublers on the horizontal stabilizer proceed as follows:

(1) Remove tips from stabilizer by removing the screws which retain the tips.

(2) Drill out five rivets, part No. AN442AD5, attaching the hinge fitting, part No. 73-21008, to the rib. Remove the fitting and retain for subsequent reinstallation.

(3) Remove the angle, part No. 73-21037-2, by drilling out the six rivets, part No. AN442AD4.

(4) Remove the modification plate, part No. 49-00107, or serial plate, part No. B1221D, depending on whether the right or left side of the stabilizer is being worked on. Retain both plates for subsequent reinstallation.

(5) Drill out the second, third, and fourth rivets in the upper and lower skin along the elevator counterbalance cut-out adjacent to the rib, part No. 73-21017, counting from the aft edge of the stabilizer.

(6) Place one of the station 70 1/2 horizontal stabilizer rib reinforcing doubler channels into place against the inboard side of the station 70 1/2 rib with the side flanges turned inboard. Clamp into place.

(7) Drill three No. 30 (.1285-inch) holes in the forward end of the doubler. The holes in the web of the doubler should be located from the three existing holes in the rib web provided for the angle, part No. 73-21037-2. The three pilot holes in the end flange of the doubler should be drill reamed to match the existing holes in the beam.

(8) Attach the doubler to the rib and beam using three rivets, part No. AN442AD4-5, to attach the doubler to the rib web, two rivets, part No. AN442AD4-6, to attach the doubler to the beam (upper and lower rivets) and one rivet, part No. AN442AD4-5, to attach the doubler to the beam (center rivet).

(9) Drill five size D (.246-inch) holes in the aft end of the doubler to match the holes provided in the rib web for the hinge fitting, part No. 73-21008. Drill the holes in the rib web and hinge fitting to the same size. Ream the holes using a .250-inch reamer.

(10) Select five rivets, part No. AN442AD8-10, to give a tight fit when inserted in the five reamed holes. Attach the hinge fitting, part No. 73-21008, to the rib and doubler using the rivets selected.

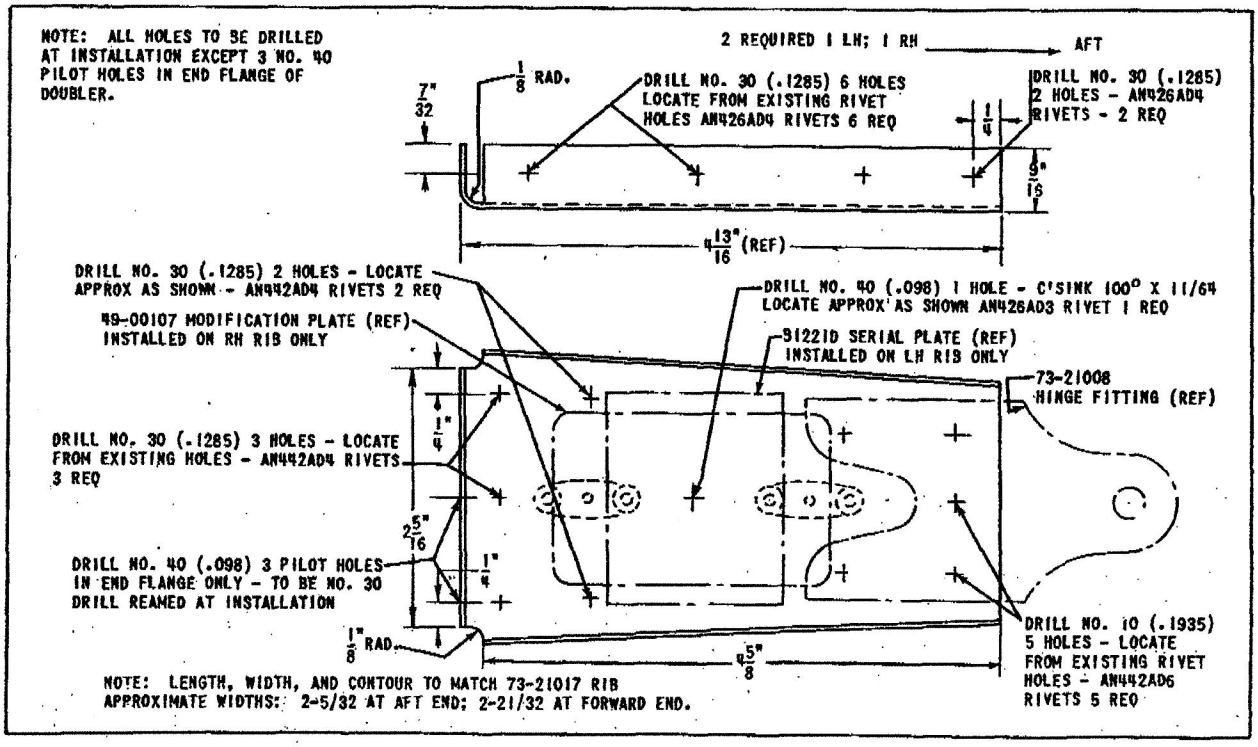


Figure 4 - Station 70 1/2 Horizontal Stabilizer Rib Reinforcing Doubler Channel

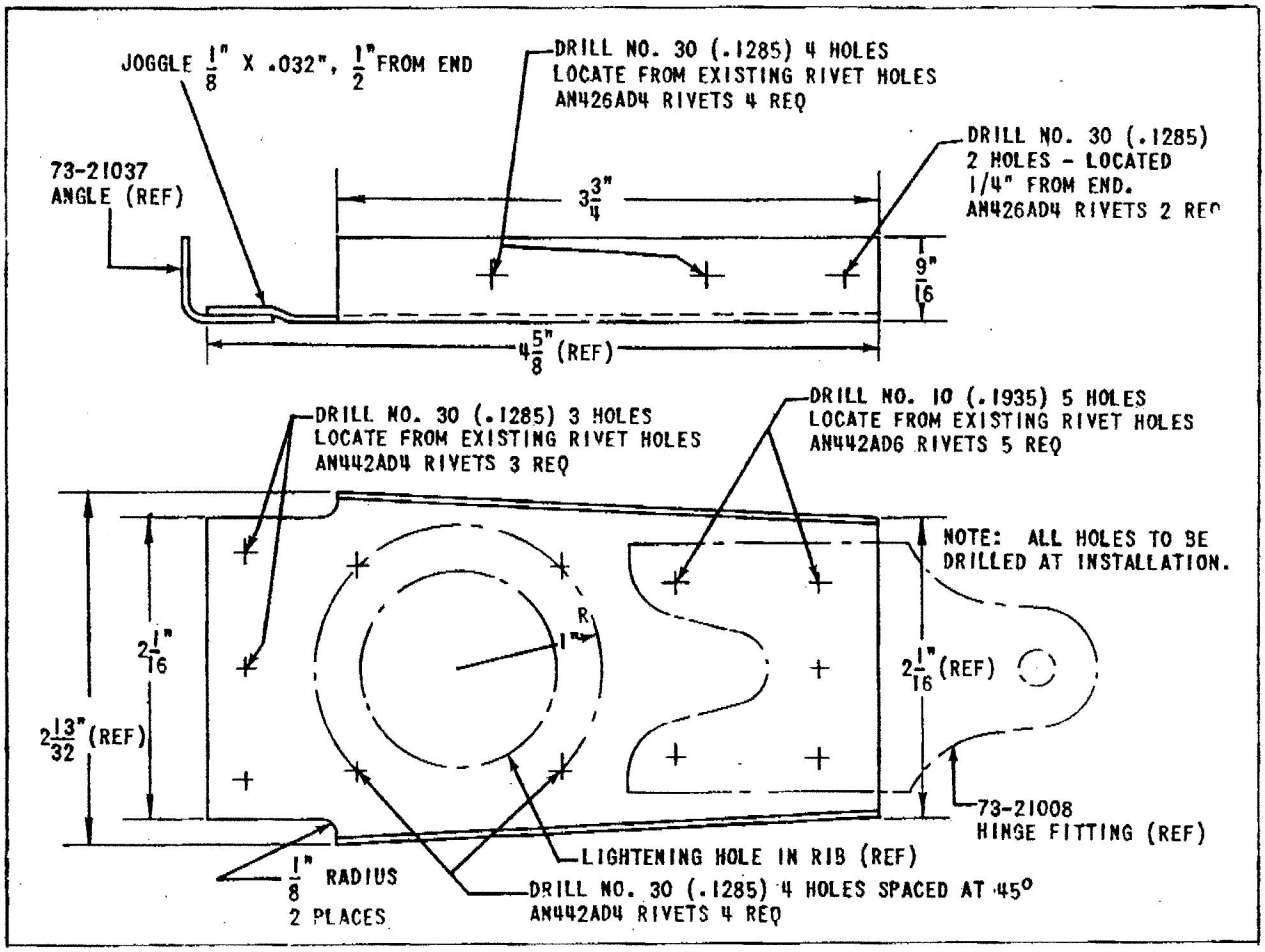


Figure 5 - Station 61 1/2 Fin Rib Reinforcing Doubler Channel

(11) Drill six No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler. Locate the holes from the existing skin rivet holes. No. 30 drill ream the skin holes and countersink the skin 100 degrees by 7/32 inch.

(12) Drill two No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler and through the skin, locating the holes 1/4 inch from the aft end of each flange of the doubler. Countersink the skin 100 degrees by 7/32 inch.

(13) Attach the doubler to the skin using eight rivets, part No. AN426AD4-5.

(14) Rivet the doubler web to the rib web using rivets, part Nos. AN442AD4-5 and AN426AD3-4, as required.

NOTE The webs should be riveted together in at least three places as indicated in figure 4. Additional rivets will be required if the rib web has been cracked; these should be located as necessary to properly reinforce the rib web.

(15) Reinstall the modification plate, part No. 49-00107, or serial plate, part No. B1221D, using screws previously removed or rivets, part No. AN442AD2-4, as required.

(16) Reinstall the tips on the horizontal stabilizer using the screws previously removed.

d. To install the doubler on the fin proceed as follows:

(1) Remove vertical stabilizer rear tip rib, part No. 73-23022, to gain access to the upper side of the station 61 1/2 rib, part No. 73-23008, by drilling out the eight rivets which attach the rib to the tip skin. Retain for subsequent reinstallation.

(2) Remove the upper hinge fitting, part No. 73-21008, from the station 61 1/2 rib web by drilling out the five rivets which attach the fitting to the rib.

(3) Drill out the three rivets which attach the angle, part No. 73-21037, to the station 61 1/2 rib web. This row of rivets is located just aft of the fin rear beam and is accessible through the rudder counterbalance cut-out.

(4) Drill out the second and third rivets in the upper and lower skin along the rudder counterbalance cut-out adjacent to the rib, part No. 73-23008, counting from the aft edge of the fin.

(5) Place the station 61 1/2 fin rib reinforcing doubler channel into place against the lower side of

the station 61 1/2 rib. The side flanges of the doubler should be turned down. Clamp into place.

(6) Drill three No. 30 (.1285-inch) holes in the forward end of the channel. The holes should be located from the three existing holes in the angle, part No. 73-21037.

(7) Attach the doubler to the angle and rib using three rivets, part No. AN442AD4-5.

(8) Drill five size D (.246-inch) holes in the aft end of the doubler to match the holes provided in the rib for the hinge fitting, part No. 73-21008. Drill the holes in the rib web and hinge fitting to the same size. Ream the holes using a .250-inch reamer.

(9) Select five rivets, part No. AN442AD8-10, to give a tight fit when inserted in the five reamed holes. Attach the hinge fitting, part No. 73-21008, to the rib using the rivets selected.

(10) Drill four No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler. Locate the holes from the existing skin rivet holes. No. 30 drill ream the skin holes and countersink the skin 100 degrees by 7/32 inch.

(11) Drill two No. 30 (.1285-inch) holes in the upper and lower flanges of the doubler and through the skin locating the holes 1/4 inch from the aft end of each flange of the doubler. Countersink the skin 100 degrees by 7/32 inch.

(12) Attach the doubler to the skin using six rivets, part No. AN426AD4-5.

(13) Rivet the doubler web to the rib web using rivets, part No. AN442AD4-5, as required.

NOTE The webs should be riveted together in at least four places as indicated in figure 3. Additional rivets will be required if the rib web has been cracked; these should be located as necessary to properly reinforce the rib web.

(14) Reinstall the vertical stabilizer rear tip rib, part No. 73-23022, using eight rivets, part No. AN426AD3-4.

NOTE If paragraph 2., section IV of T. O. No. 01-60J-18, dated 8 April 1944, has already been previously complied with on an affected airplane, the additional modification required herein may best be accomplished by compliance with section V. Original compliance with this Technical Order may best be accomplished by compliance with the instructions contained in section IV.

SECTION V

a. Drill out the aft row of three rivets retaining the elevator outboard and rudder upper hinge fittings to the stabilizer ribs and enlarge the holes using a size D (.246-inch) drill. Then ream the holes using a .250 reamer and select rivets to fit the holes tightly. Install the rivets.

b. Repeat this procedure for the two forward rivets in the hinge fitting.

NOTE The use of AN3 bolts is prohibited since the No. 10 (.1935-inch) holes previously drilled to permit the installation of AN442AD6 rivets do not conform to tolerances necessary for bolt installation. The 1/4-inch rivets will provide adequate shear strength (if properly installed) and will not reduce the strength of the fitting.

REASSEMBLY.

a. The empennage should be reassembled in the order listed below and should be accomplished in accordance with existing instructions.

(1) Reinstall the bracket, part No. 73-21009, on the web of the horizontal stabilizer rear spar using the bolts, nuts, and washers previously removed.

(2) Reinstall the horizontal stabilizer inserting two bolts, part No. AN6-12A, through the two front fittings, part No. 73-21031, and installing one washer, part No. AN960-A616, and one nut, part No. 365-624, on each bolt. Reinstall the 7/16-inch bolts, previously removed, to secure the horizontal stabilizer rear fittings. The 3/8-inch bolts should be tightened to torque between 160 and 190 inch-pounds, and the 7/16-inch bolts should be tightened to torque between 450 and 500 inch-pounds.

NOTE The elevators may be installed on the stabilizer before the stabilizer is installed on the empennage.

(3) Reinstall the fin.

(4) Reinstall the fairing and any access hole cover plates previously removed.

(5) Reinstall the elevators and rudder.

3. a. The following parts are required per airplane to accomplish this rework:

QTY	STOCK NO.	PART NO.	NOMENCLATURE	CLASS	SOURCE
			SECTION I		
1			Horizontal Stabilizer Front Spar Reinforcing Doubler	01-M	Local Mfr
			Mfr from:		(See figure 2.)
			Alum. Alloy - Sheet condition T, heat-treated, .051 inch, Specification No. AN-A-13, stock No. 6800-142010	23-A	AF Stock
11	6500-032010	AN3-4A	Bolt - Aircraft, steel, No. 10-32 x 1/2 inch without cotter pin hole	04-A	AF Stock
24	6500-032020	AN3-5A	Bolt - Aircraft, steel, No. 10-32 x 5/8 inch without cotter pin hole	04-A	AF Stock

QTY	STOCK NO.	PART NO.	NOMENCLATURE	CLASS	SOURCE
7	6500-032030	AN3-6A	Bolt - Aircraft, steel, No. 10-32 x 3/4 inch without cotter pin hole	04-A	AF Stock
2	6500-033414	AN6-12A	Bolt - Aircraft, steel, 3/8-24 x 1-1/4 inches without cotter pin hole	04-A	AF Stock
42	6500-514000	365-1032	Nut - Self-locking, steel, No. 10-32, fine thread	04-A	AF Stock
2	6500-514400	365-624	Nut - Self-locking, steel 3/8-24, fine thread	04-A	AF Stock
17	6500-982340	AN960-A10L	Washer - Plain aluminum No. 10 bolt	04-A	AF Stock
15	6500-981150	AN960-A10	Washer - Plain aluminum No. 10 bolt	04-A	AF Stock
2	6500-981220	AN960-A616	Washer - Plain aluminum 3/8-inch bolt	04-A	AF Stock
			SECTION II		
23	6700-497892	AN442AD6-7	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 7/16 inch	29	AF Stock
			SECTION III		
8	6700-497896	AN442AD6-8	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 1/2 inch	29	AF Stock
4	6700-497888	AN442AD6-6	Rivet - Alum.-alloy, flathead, type AD, 3/16 x 3/8 inch	29	AF Stock
			SECTION IV		
2			Station 70 1/2 Horizontal Stabilizer Rib Reinforcing Doubler Channel	01-M	Local Mfr (See figure 4.)
			Mfr from:		
			Sheet - Alum.-alloy, condition T, heat-treated, .032 inch, Specification No. AN-A-13, stock No. 6800-141980	23-A	AF Stock
			or		
			Sheet - Alum.-alloy, condition T, heat-treated, .040 inch, Specification No. AN-A-13, stock No. 6800-142000	23-A	AF Stock
1			Station 61 1/2 Fin Rib Reinforcing Doubler Channel	01-M	Local Mfr (See figure 5.)
			Mfr from:		
			Sheet - Alum.-alloy, condition T, heat-treated, .032 inch, Specification No. AN-A-13, stock No. 6800-141980	23-A	AF Stock
			or		
			Sheet - Alum.-alloy, condition T, heat-treated, .040 inch, Specification No. AN-A-13, stock No. 6800-142000	23-A	AF Stock
2	6700-497700	AN442AD2-4	Rivet - Alum.-alloy, flathead, type AD, 1/16 x 1/4 inch	29	AF Stock
19	6700-497796	AN442AD4-5	Rivet - Alum.-alloy, flathead, type AD, 1/8 x 5/16 inch	29	AF Stock
4	6700-497800	AN442AD4-6	Rivet - Alum.-alloy, flathead, type AD, 1/8 x 3/8 inch	29	AF Stock
15	6700-497944	AN442AD8-10	Rivet - Alum.-alloy, flathead, type AD, 1/4 x 5/8 inch	29	AF Stock
22	6700-489141	AN426AD4-5	Rivet - Alum.-alloy, countersunk head, 100 degrees, type AD, 1/8 x 5/16 inch	29	AF Stock
10	6700-489135	AN426AD3-4	Rivet - Alum.-alloy, countersunk head, 100 degrees, type AD, 3/32 x 1/4 inch	29	AF Stock
			SECTION V		
15	6700-497944	AN442AD8-10	Rivet - Alum.-alloy, flathead, type AD, 1/4 x 5/8 inch	29	AF Stock

b. The following part removed and not reinstalled in accordance with preceding instructions will be condemned at once and so tagged for disposition as condemned property:

PART NO.	NOMENCLATURE	CLASS
73-21037-2	Angle	01-M

By Command of General ARNOLD:

Prepared by Aircraft Section,
Maintenance Div, Hq, ATSC.

B. E. MEYERS
Major General, U.S.A.
Deputy Director
Air Technical Service Command