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AN 01-75FJ-3

*STRUCTURAL REPAIR
INSTRUCTIONS*

FOR

**AIRPLANE
ARMY MODEL
P-80 A**

*Published under joint authority of the Commanding General, Army Air
Forces, and the Chief of the Bureau of Aeronautics,*

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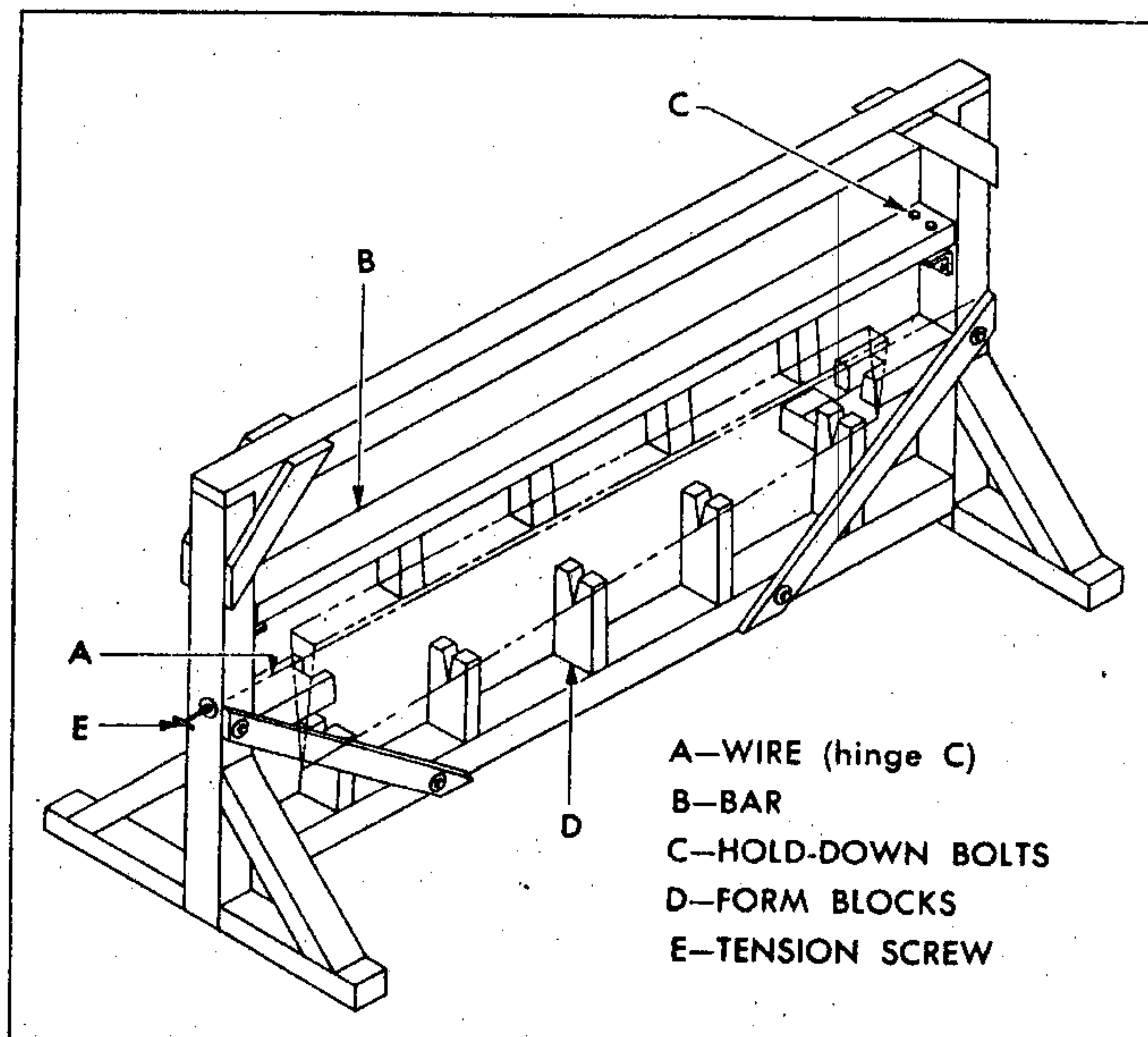


Figure 3 — Sample Jig

b. LAYOUT AND CONSTRUCTION OF TEMPLATES AND FORM BLOCKS.—Use the basic dimension diagrams to lay out templates. All basic dimensions are measured to the inside skin line with the exception of those for the fillets, which are measured to the outside skin line.

EXAMPLE

Assume that the stabilizer rib at station 43 must be replaced. The original shape of the rib must be duplicated in order that correct contour be maintained. Build the rib to an accurately constructed template as follows:

On a metal plate, scribe the rib contour from the dimensions given for station 43 on figure 63. Cut out the template as shown in figure 4. Construct a hardwood form block from the template. Round the corners to conform to the flange bend radius obtained from AN 01-1A-1, "General Manual for Structural Repair." Bend the rib on the form block and check the completed part against the template.

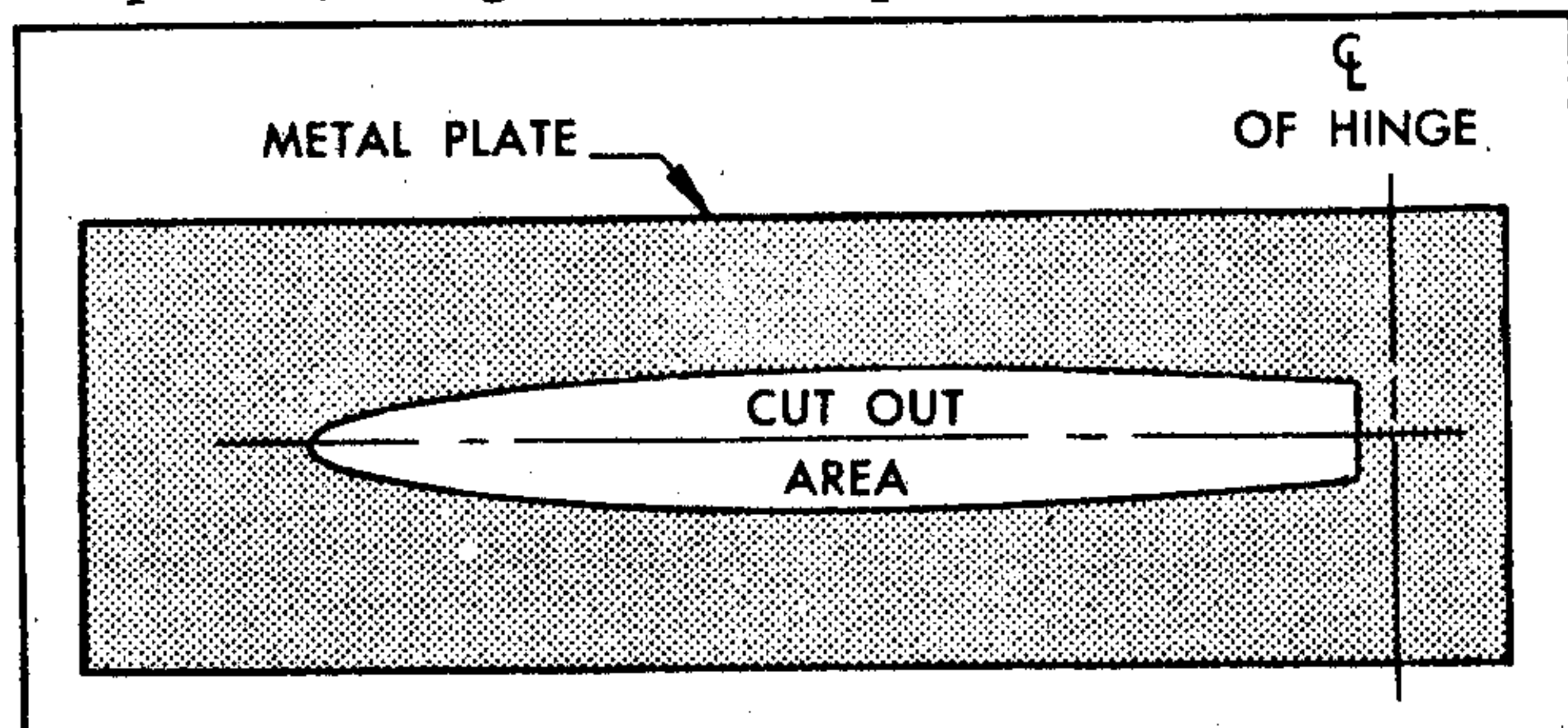


Figure 4 — Sample Template

c. CHECKING ALIGNMENT.—Before repairs are started, take measurements between reference points on adjacent parts unaffected by the damage. Compare these measurements with related points on the repaired member to determine whether distortion has occurred. Damage involving the major components, or large portions of the airplane, will require an alignment check of the airplane after repairs have been completed. See paragraph 10, this section, for instructions for checking alignment and symmetry.

6. LOCATION OF LEVELING POINTS.

The leveling pads are located on the lower fuselage longerons in the nose wheel well, as shown in figure 5. Level the airplane by jacking at the nose and wing jack points as shown in figure 18.

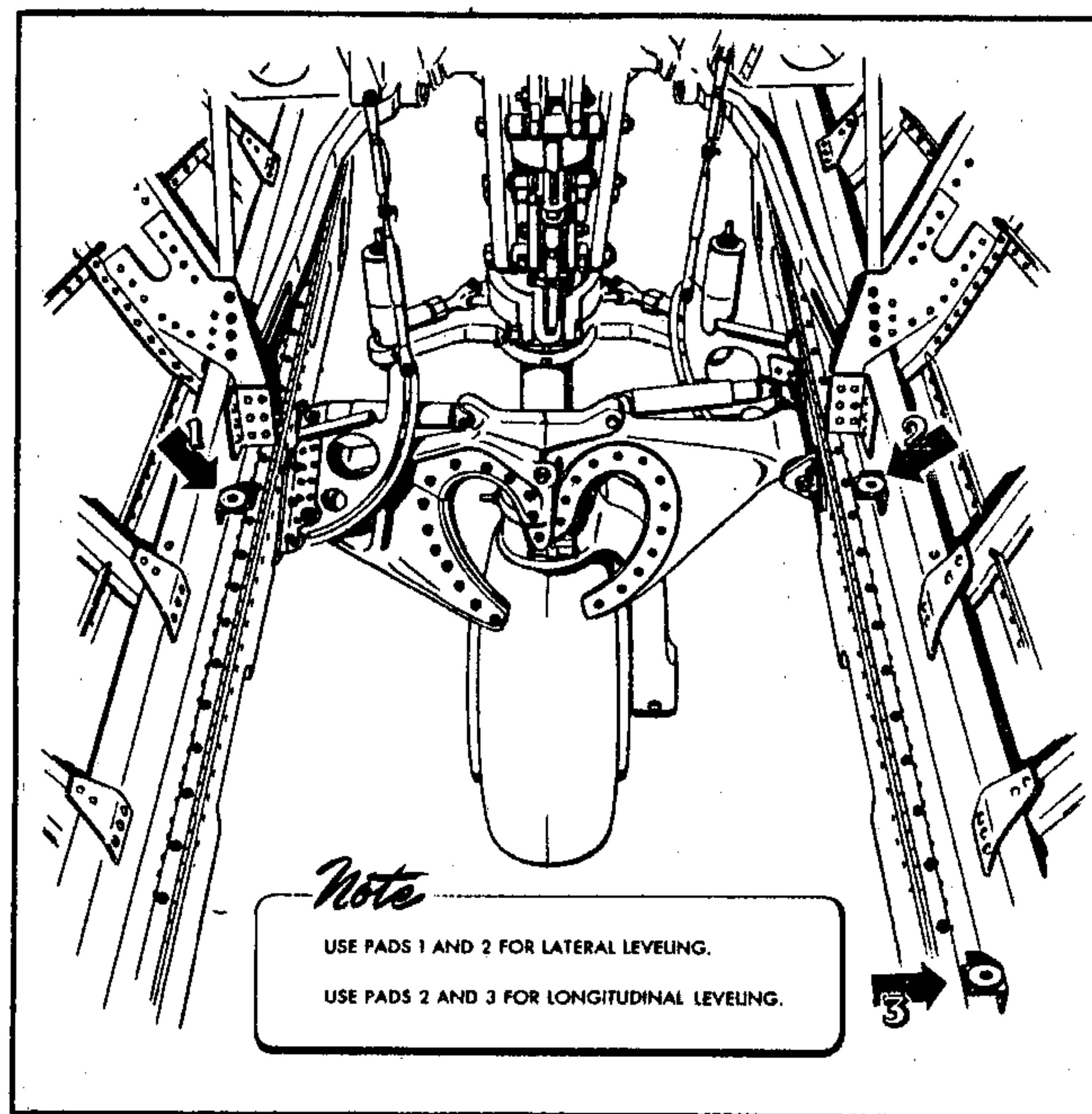


Figure 5 — Leveling Points

7. TYPES OF REPAIRS.

Most parts of the airplane may be repaired with patches and splices of aluminum Alclad sheet or NE8630 steel sheet (normalized). Rivets and bolts are the most common fasteners for attaching patches and splices. Do not use a blind fastener unless its use is specified by the applicable repair drawing.

a. MATERIAL FOR REPAIR AND REPLACEMENT.—Make replacement parts from material identical to that of the original part, as indicated on the keys to the reference diagrams included in this handbook. If identical materials are not available, the specification tables in section VI of AN 01-75FJ-2, "Handbook of Erection and Maintenance Instructions," will give a basis for the substitution of comparable materials.

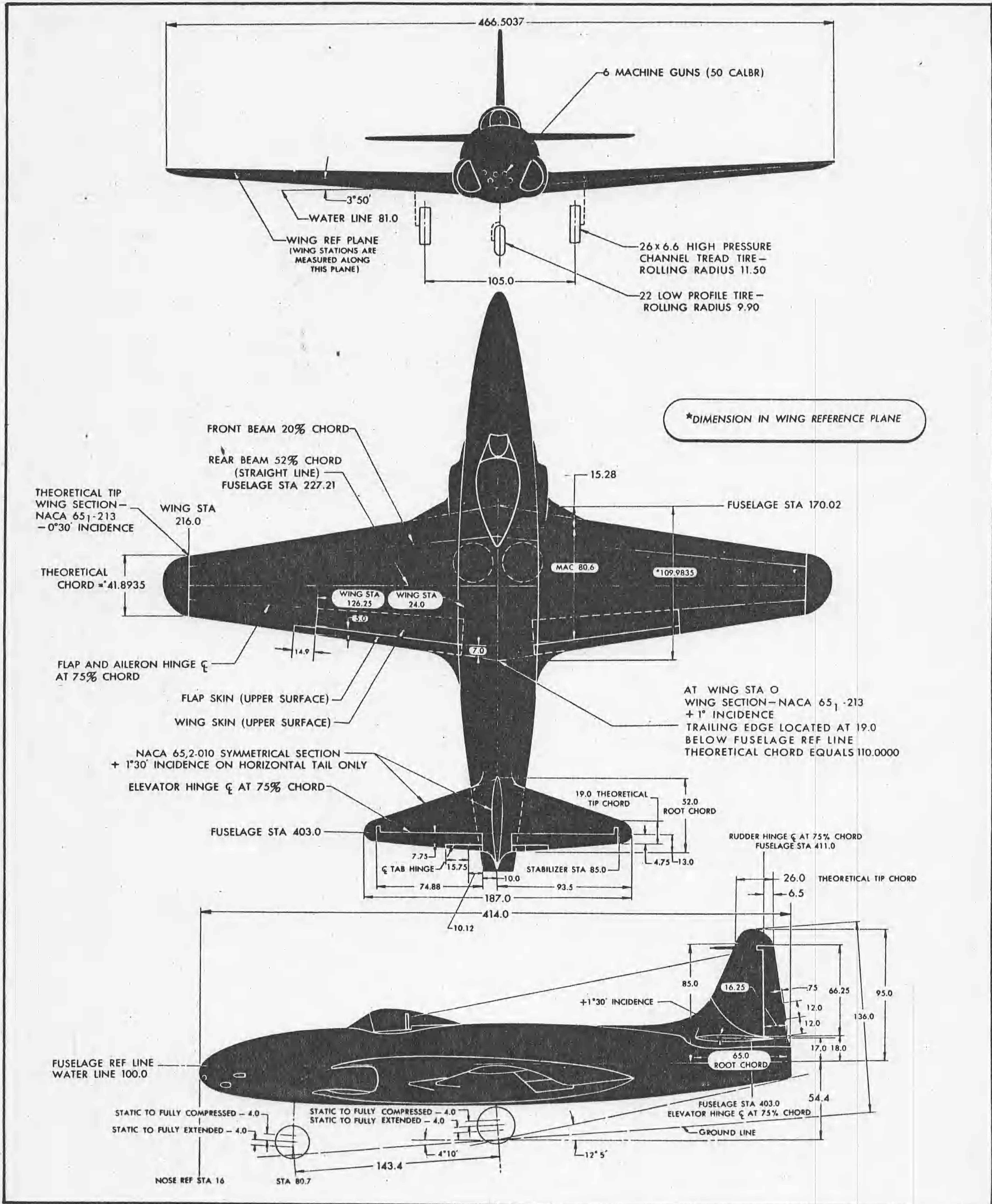


Figure 2 — Principal Dimensions

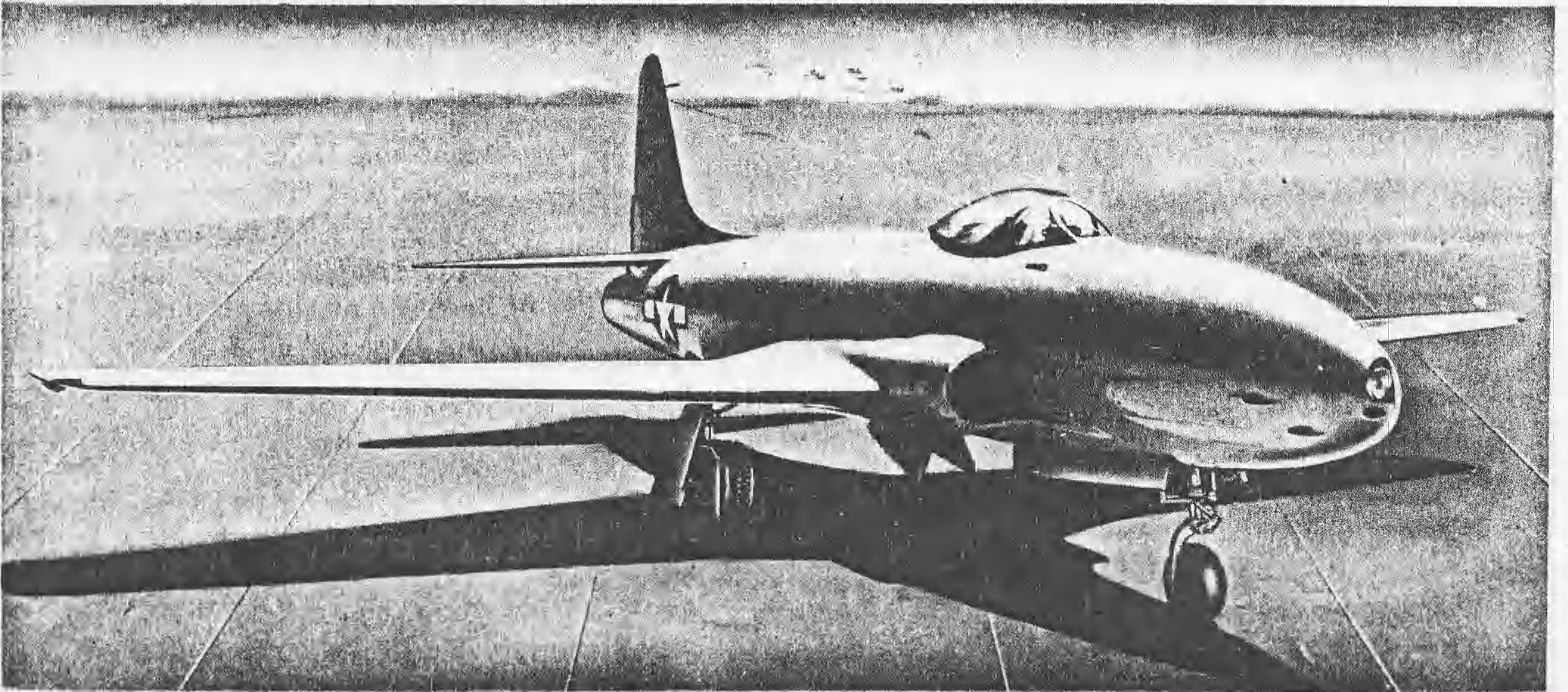


Figure 1 — P-80A Airplane

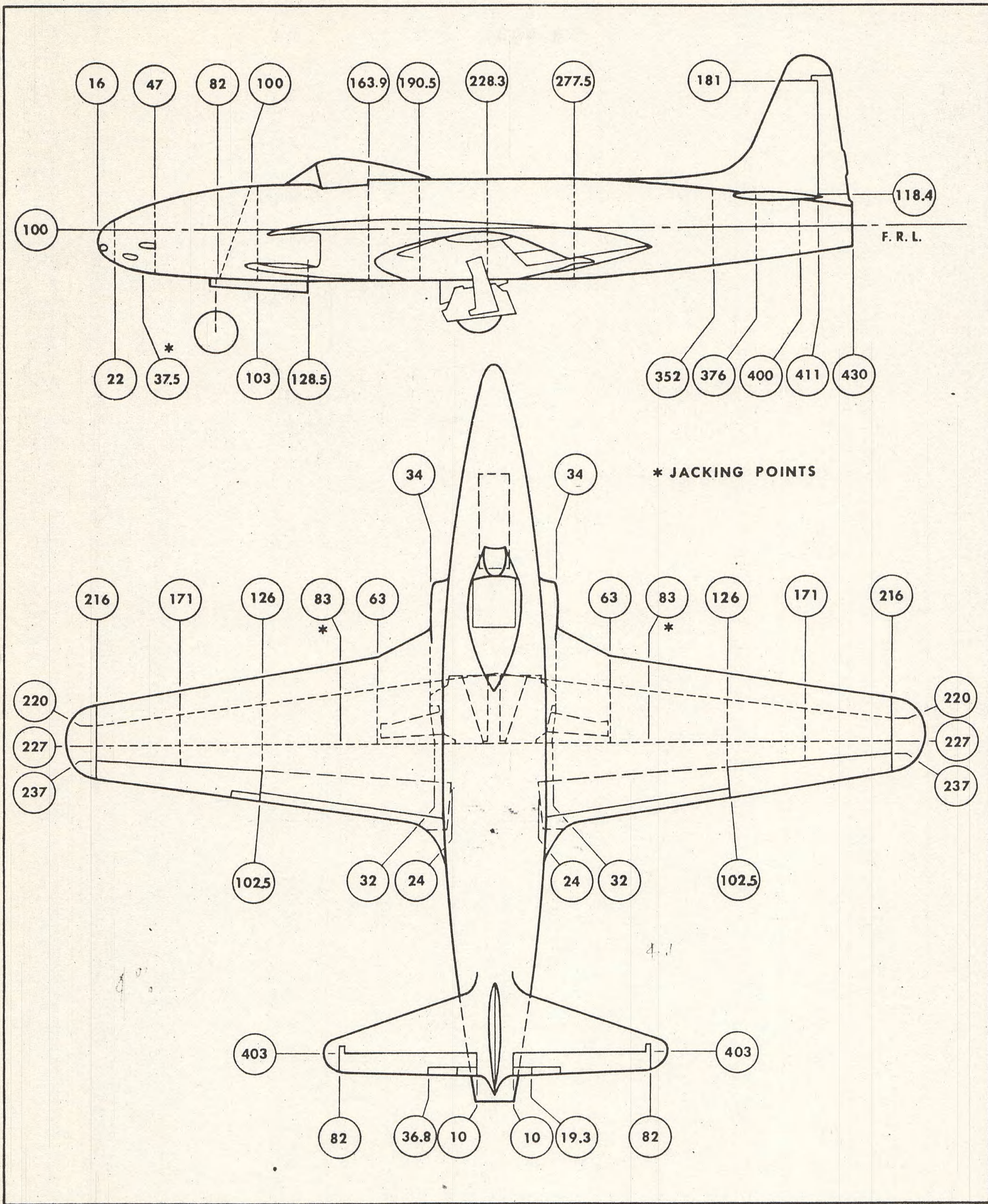
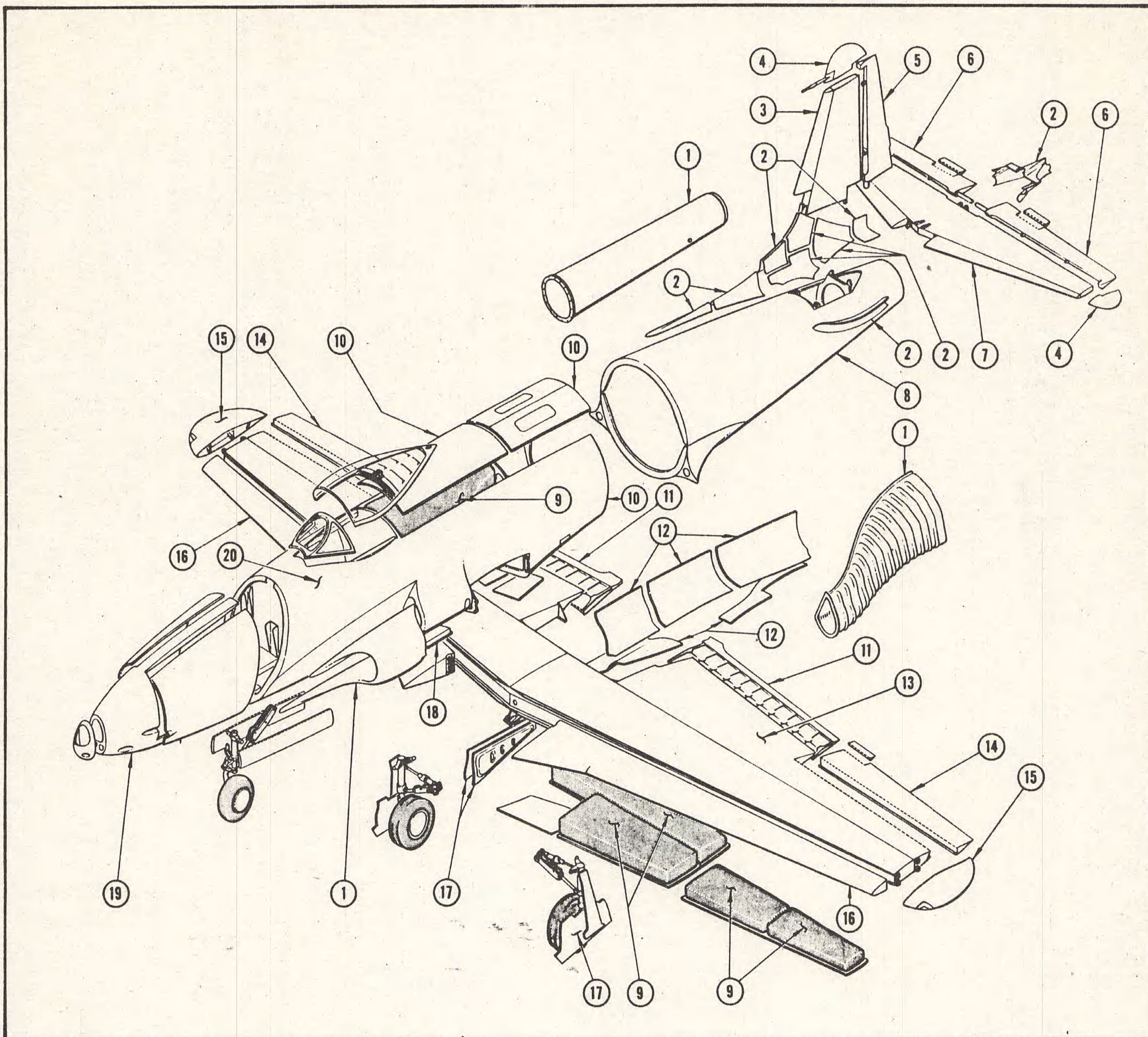


Figure 22 — Stations Diagram



No.	Item	Reference Diagrams		No.	Item	Reference Diagrams	
		Structure	Skin and Stiffeners			Structure	Skin and Stiffeners
1	Intake Ducts and Tail Pipe	123	123	11	Flaps	37	37
2	Tail Fillets	71	71	12	Wing Fillets	38	38
3	Fin	69	69	13	Wing	25, 25a, 26, 27, 28	29, 30
4	Fin and Stabilizer Tips	67	67	14	Aileron	35	35
5	Rudder	70	70	15	Wing Tip	33, 33a	33, 33a
6	Elevator	66	66	16	Wing Leading Edge	31, 32	31, 32
7	Stabilizer	64	65	17	Landing Gear Doors	121	121
8	Fuselage Aft Section	93	94	18	Dive Flaps	95	95
9	Self-sealing Tanks	See AN 01-1A-1		19	Fuselage Nose Station	87	88
10	Fuselage Mid Section (Sta 163-277)	91	92	20	Fuselage Mid Section (Sta 81-163)	89	90

Figure 23 — Exploded View and Index to Reference Diagrams

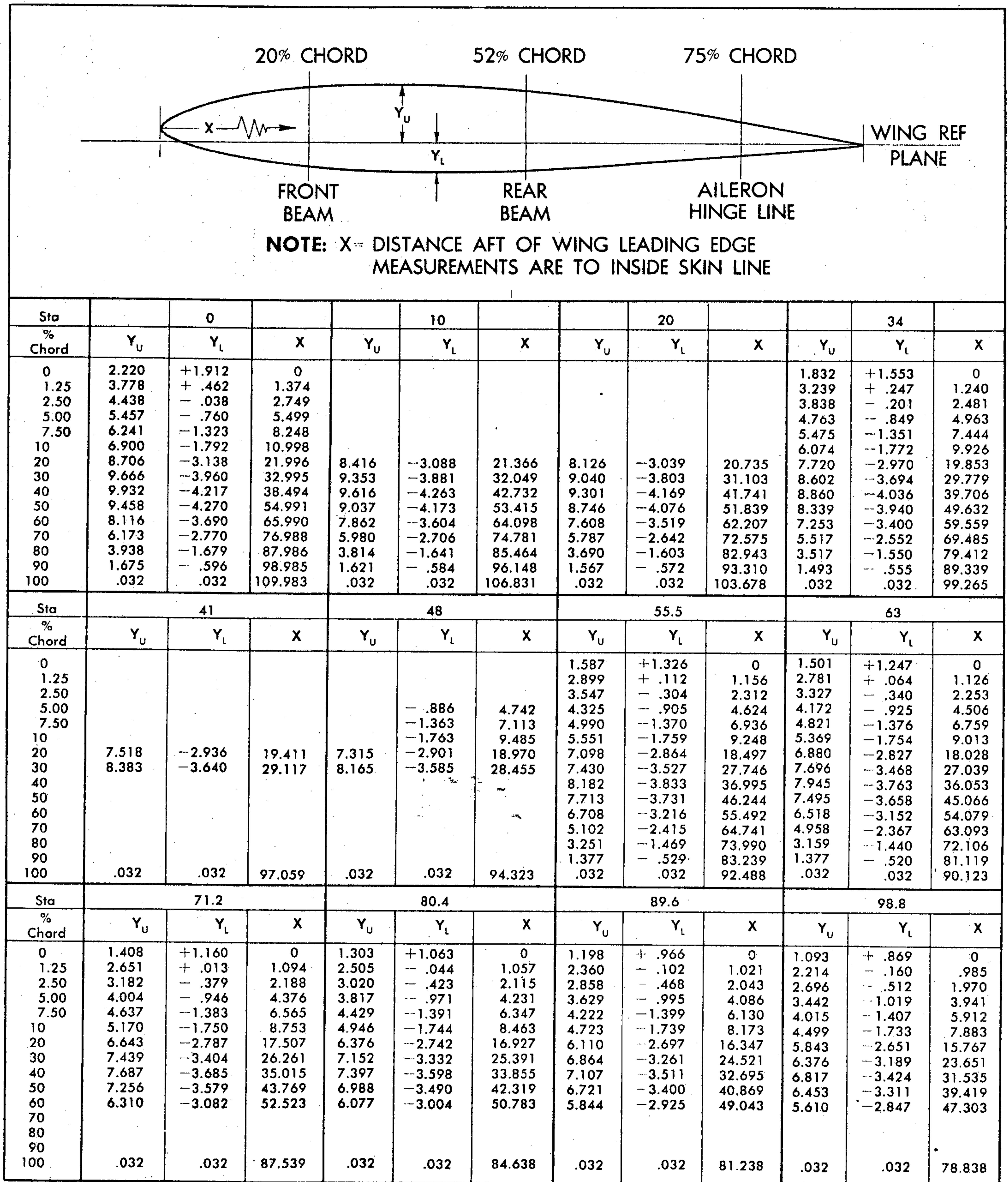


Figure 24 (Sheet 1 of 2 Sheets) — Wing Basic Dimensions

Sta	108			117.2			126.25			137.45		
% Chord	Y _U	Y _L	X	Y _U	Y _L	X	Y _U	Y _L	X	Y _U	Y _L	X
0	.988	+ .772	0	.883	+ .674	0	.780	+ .579	0	.652	+ .461	0
1.25	2.069	- .219	.949	1.923	- .277	.912	1.780	- .334	.877	1.602	- .404	.833
2.50	2.534	- .556	1.898	2.371	- .600	1.825	2.212	- .644	1.754	2.014	- .697	1.666
5.00	3.254	-1.043	3.796	3.066	-1.067	3.651	2.882	-1.091	3.509	2.653	-1.120	3.332
7.50	3.808	-1.415	5.695	3.600	-1.422	5.477	3.396	-1.430	5.263	3.149	-1.440	4.999
10	4.276	-1.728	7.593	4.053	-1.723	7.303	3.833	-1.717	7.018	3.561	-1.711	6.665
20	5.577	-2.606	15.187	5.310	-2.561	14.607	5.048	-2.516	14.037	4.729	-2.461	13.330
30	6.289	-3.117	22.781	6.001	-3.045	21.911	5.718	-2.975	21.055	5.368	-2.887	19.996
40	6.527	-3.338	30.375	6.236	-3.251	29.215	5.951	-3.165	28.074	5.598	-3.059	26.661
50	6.185	-3.222	37.969	5.917	-3.133	36.519	5.654	-3.045	35.092	5.328	-2.936	33.327
60	5.377	-2.769	45.563	5.144	-2.690	43.823	4.914	-2.613	42.111	4.630	-2.517	39.992
70							3.738	-1.963	49.129	3.522	-1.891	46.658
80							2.377	-1.201	56.148	2.238	-1.159	53.323
90							.999	- .444	63.166			
100	.032	.032	75.938		.032	73.038	.032	.032	70.185	.032	.032	66.654
Sta	148.65			159.85			171			182.25		
% Chord	Y _U	Y _L	X	Y _U	Y _L	X	Y _U	Y _L	X	Y _U	Y _L	X
0	.524	+ .342	0	.397	+ .224	0	.270	+ .106	0	.141	- .011	0
1.25	1.455	- .475	.789	1.248	- .545	.744	1.072	- .616	.670	.894	- .687	.656
2.50	1.817	- .751	1.578	1.619	- .805	1.489	1.423	- .858	1.296	1.225	- .912	1.313
5.00	2.425	-1.150	3.156	2.197	-1.179	2.979	1.962	-1.208	2.548	1.740	-1.238	2.626
7.50	2.892	-1.499	4.734	2.639	-1.459	4.469	2.388	-1.468	3.800	2.135	-1.478	3.939
10	3.289	-1.704	6.312	3.016	-1.698	5.959	2.746	-1.691	5.052	2.472	-1.684	5.253
20	4.399	-2.406	12.624	4.074	-2.351	11.918	3.751	-2.296	10.060	3.425	-2.241	10.506
30	5.017	-2.800	18.937	4.667	-2.713	17.878	4.319	-2.626	15.068	3.967	-2.538	15.759
40	5.245	-2.954	25.249	4.892	-2.848	23.837	4.540	-2.743	20.076	4.186	-2.636	21.013
50	5.002	-2.828	31.562	4.676	-2.719	29.796	4.352	-2.611	25.084	4.025	-2.502	26.266
60	4.346	-2.422	37.874	4.064	-2.326	35.756	3.780	-2.231	30.092	3.494	-2.135	31.519
70	3.306	-1.820	44.187	3.090	-1.748	41.715	2.875	-1.677	35.100	2.658	-1.605	36.772
80	2.100	-1.116	50.499	1.962	-1.074	47.674	1.824	-1.032	40.108	1.685	- .979	42.046
90							.759	- .390	45.116	.699	- .377	47.279
100	.032	.032	63.124	.032	.032	59.593	.032	.032	56.078	.032	.032	52.532
Sta	193.5			204.75			216					
% Chord	Y _U	Y _L	X	Y _U	Y _L	X	Y _U	Y _L	X			
0	.013	- .130	0	- .114	- .249	0	- .243	- .368	0			
1.25	.716	- .758	.612	.538	- .829	.568	.360	- .900	.523			
2.50	1.026	- .966	1.224	.828	-1.020	1.136	.630	-1.075	1.047			
5.00	1.510	-1.267	2.449	1.281	-1.297	2.272	1.052	-1.327	2.094			
7.50	1.881	-1.487	3.673	1.628	-1.497	3.408	1.375	-1.507	3.142			
10	2.199	-1.678	4.898	1.926	-1.671	4.544	1.652	-1.665	4.189			
20	3.099	-2.185	9.797	2.773	-2.130	9.087	2.448	-2.075	8.378			
30	3.615	-2.450	14.695	3.263	-2.362	13.631	2.912	-2.275	12.568			
40	3.831	-2.530	19.594	3.476	-2.424	18.175	3.122	-2.318	16.757			
50	3.697	-2.393	24.493	3.370	-2.284	22.719	3.042	-2.175	20.946			
60	3.209	-2.039	29.391	2.924	-1.943	27.263	2.639	-1.848	25.136			
70	2.441	-1.533	34.290	2.224	-1.461	31.807	2.008	-1.390	29.325			
80	1.546	- .947	39.188	1.407	- .904	36.351	1.268	- .862	33.514			
90	.639	- .363	44.087	.579	- .350	40.895	.519	- .337	37.704			
100	.032	.032	48.986	.032	.032	45.439	.032	.032	41.893			

Figure 24 (Sheet 2 of 2 Sheets) — Wing Basic Dimensions

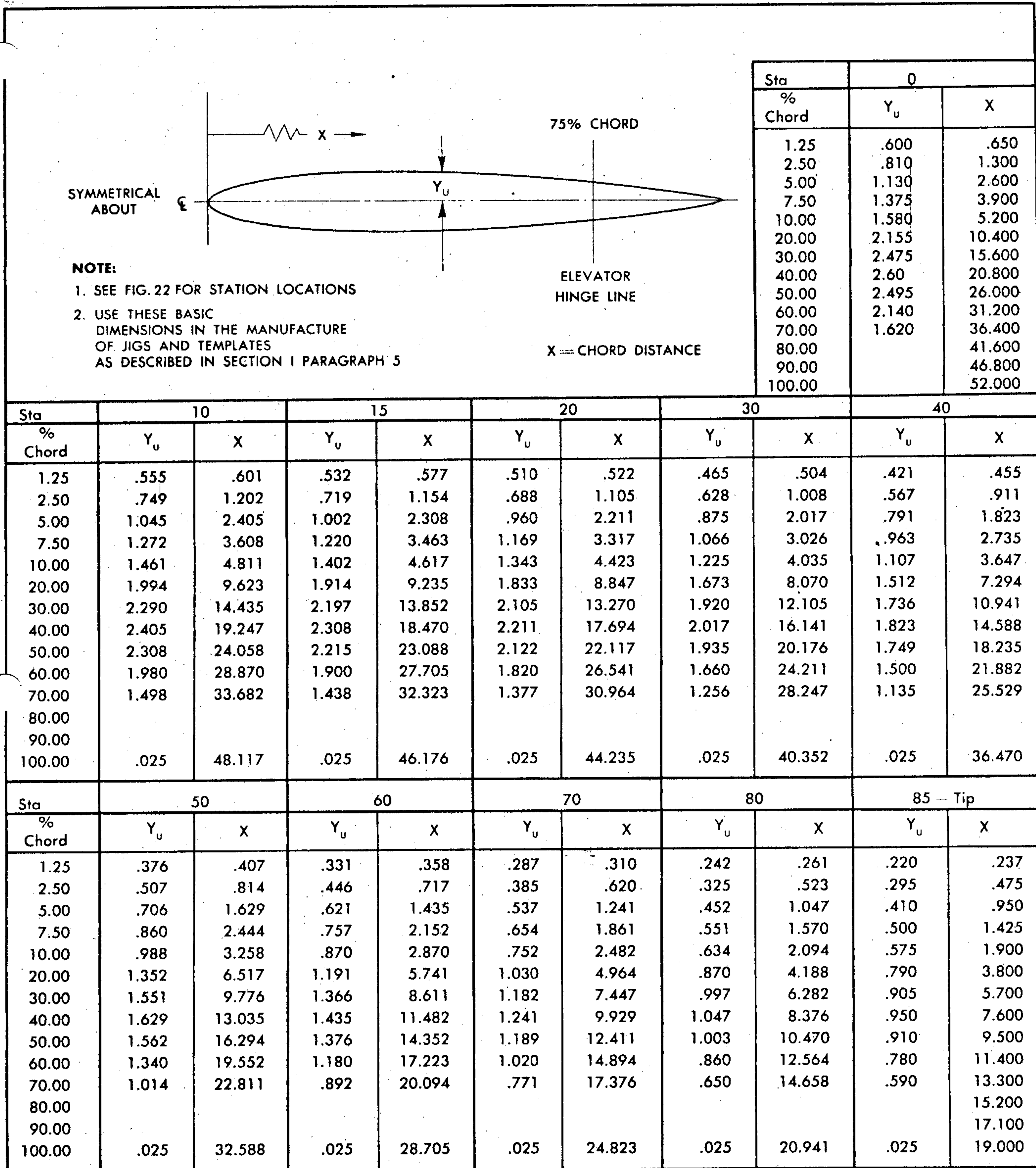
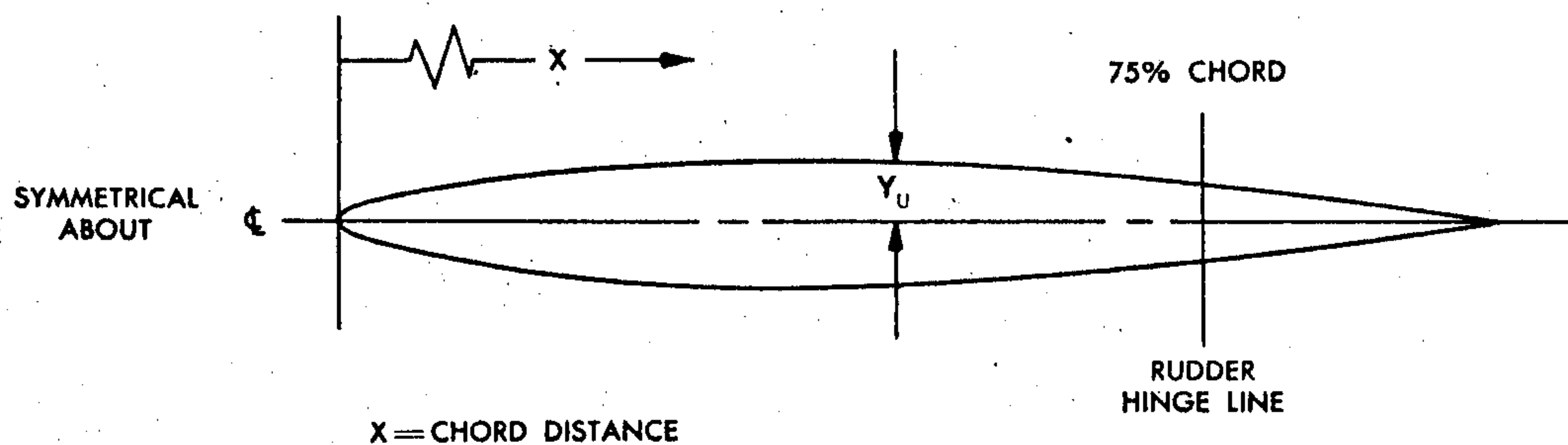


Figure 63 — Stabilizer and Elevator Basic Dimensions



NOTE: SEE FIG. 22 FOR STATION LOCATIONS

Sta.	118		124		128		135		143	
% Chord	Y_U	X	Y_U	X	Y_U	X	Y_U	X	Y_U	X
1.25	.75	.810		.768	.682	.739	.635	.688	.582	.630
2.50	1.015	1.625		1.537	.923	1.479	.860	1.377	.787	1.261
5	1.410	3.250		3.075	1.283	2.958	1.195	2.755	1.094	2.522
7.50	1.720	4.875		4.613	1.565	4.438	1.457	4.132	1.333	3.783
10	1.975	6.500		6.150	1.798	5.917	1.674	5.510	1.532	5.044
20	2.695	13.00		12.301	2.453	11.835	2.285	11.020	2.092	10.089
30	3.095	19.5		18.452	2.818	17.753	2.624	16.531	2.402	15.134
40	3.25	26.0		24.602	2.958	23.671	2.755	22.041	2.522	20.179
50	3.12	32.5		30.753	2.840	29.589	2.644	27.552	2.420	25.223
60	2.675	39.0		36.904	2.435	35.507	2.267	33.062	2.076	30.268
70	2.025	45.5		43.055	1.843	41.425	1.716	38.573	1.571	35.313
80										
90										
100	.025	65.00	.025	61.507	.025	59.179	.025	55.104	.025	50.447
Sta.	151		160		170		181		185-Tip	
% Chord	Y_U	X	Y_U	X	Y_U	X	Y_U	X	Y_U	X
1.25	.528	.572	.467	.506	.400	.434			.3	.325
2.50	.714	1.144	.632	1.013	.541	.868			.405	.650
5	.993	2.289	.880	2.027	.754	1.736			.565	1.300
7.50	1.210	3.434	1.071	3.041	.916	2.604			.685	1.950
10	1.391	4.579	1.232	4.055	1.055	3.473			.79	2.6
20	1.899	9.158	1.682	8.110	1.441	6.946			1.080	5.2
30	2.181	13.737	1.932	12.165	1.655	10.419			1.24	7.8
40	2.289	18.316	2.027	16.220	1.736	13.892			1.3	10.4
50	2.196	22.895	1.944	20.276	1.664	17.365	1.356	14.164	1.245	13.00
60	1.884	27.474	1.668	24.331	1.429	20.838	1.165	16.997	1.070	15.6
70	1.426	32.053	1.263	28.386	1.082	24.311	.882	19.829	.810	18.2
80										
90										
100	.025	45.791	.025	40.552	.025	34.731	.025	28.328	.025	26.00

NOTE: USE THESE BASIC DIMENSIONS IN THE MANUFACTURE OF JIGS AND TEMPLATES AS DESCRIBED IN SECTION I PARAGRAPH 5

Figure 68 — Fin and Rudder Basic Dimensions

SECTION V

ALIGHTING GEAR

1. LANDING GEAR.

The landing gear consists of two main gears that retract inboard into the wing, and one nose gear that retracts aft into the fuselage. No repairs are authorized for these units other than rebushing of fittings. Do not install oversize pins. Oversize bushings (.032 oversize outside diameter) may be installed.

2. LANDING GEAR DOORS.

a. GENERAL.—Doors cover all landing gear so that they fair into the fuselage and wing and form portions of the airplane contour. See figure 121 for details of construction.

b. NEGLIGIBLE DAMAGE.—Refer to the negligible damage drawings indexed on the key to reference diagram, figure 121, for permissible damage to the landing gear doors. Negligible damage not indexed on this diagram is restricted to nicks and dents which, after being cleaned up to a regular shape, do not exceed $\frac{1}{16}$ inch in depth and do not occur closer than $\frac{3}{8}$ inch from a rivet or attachment hole. Bushings in the door operating mechanism may be replaced, but not with oversize

bushings. As the nose-gear door forms a portion of the lower nose fuselage contour, and the main-gear doors form a part of the lower wing skin surface, all dents and nicks in the outside skins must be filled in and the finish restored, as described in section I, paragraph 23.

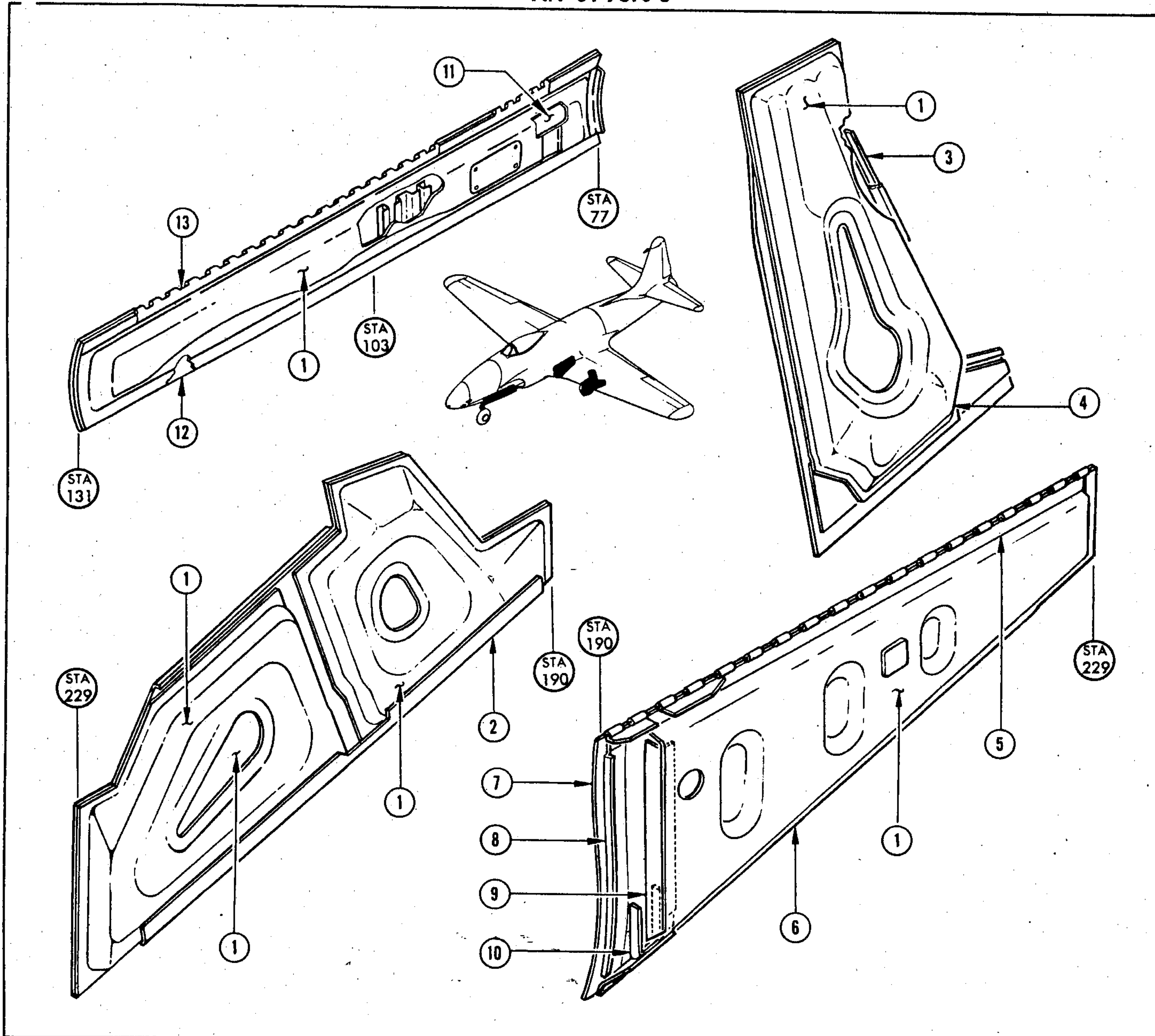
c. DAMAGE REPAIRABLE BY PATCHING.—The applicable repairs are indexed on the key to reference diagram, figure 121. Parts not indexed are not repairable, and are those items that are either too highly loaded, too inaccessible, or too small to be repaired economically.

d. DAMAGE NECESSITATING REPLACEMENT.—Damage in excess of that described as negligible to items not indicated on the key to the reference diagram require replacement of the item involved. Skin originally constructed of aged material (24S-T80 and 24S-T81) must be replaced with identical material. The gage of the replacement part must be the same gage as that of the original, as the next heavier gage 24S-T will change the contour of the wing or fuselage. Interior structure originally constructed of aged 24S-T may be replaced with the next heavier gage 24S-T unaged, provided interferences are not so introduced.

Part No.	Material		Size or Gage	Remarks
	Spec. No.	Title		
24S-T	AN-A-13	Sheet, Aluminum Alclad	.040	For outer skin insertions.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.051	For skin and interior repairs.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.064	For interior repairs.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.072	For channel repairs.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.081	For "Z" section repair.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.040	For replacement of skin and doublers.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.051	For replacement of skin and "Z" sections.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.064	For replacement of channels.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.072	For replacement of "Z" sections.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.125	For replacement of support.
LS348	QQ-A-331	Extruded Hinge		For replacement of hinge.
LS3228	QQ-A-354	Angle Extrusion	.094	For replacement of angle.
	AN426AD4	Rivets—100° Countersunk	$\frac{1}{8}$	For skin repair.
	AN426AD5	Rivets—100° Countersunk	$\frac{5}{32}$	For skin repair.
	AN430AD5	Rivets—100° Countersunk	$\frac{5}{32}$	For interior repair.
	AN430DD6	Rivets—100° Countersunk	$\frac{3}{16}$	For interior repair.

* Aged Material. Age for ten hours at 375° F.

Table 6 — Material for Repair of Landing Gear Doors



Item	Part Name	Figure Reference		Remarks
		Neg. Damage	Repair	
1	Inner Skin	130	122	24S-T80 — .051
2	"Z"	131	148	24S-T80 — .051
3	Channel	131	143	24S-T80 — .064
4	Outer Skin	130	122	24S-T80 — .040
5	Hinge			53S-T Extr., LS348
6	"Z"	131	148	24S-T80 — .072
7	Outer Skin	130	122	24S-T81 — .051
8	Doubler			24S-T80 — .040
9	Angle	132	139	LS3228
10	Support			24S-T80 — .125
11	Outer Skin	130	122	24S-T81
12	Strip			LS2227
13	Hinge			LS3560

NOTE: Items not indicated are not repairable.

Figure 121 — Landing Gear Doors Reference Diagram

SECTION VI ENGINE SECTION

1. GENERAL.

The intake ducts and engine tail pipe are the only repairable portions of the engine section discussed in this handbook. The intake duct leading edges are constructed of 3S aluminum; the remainder is 24S-T material. The engine tail pipe consists of an inner skin of 347-1A corrosion-resistant steel, and an outer skin of light gage 24S-T Alclad. The two skins are separated by hat-section rings. See figure 123 for details of construction.

2. NEGLIGIBLE DAMAGE.

Refer to the negligible damage drawings indexed on the key to the reference diagram, figure 103, for permissible negligible damage to ducts and tail pipe. Negligible damage not indexed on this key is restricted to dents and nicks, which after being cleaned up to a regular shape, do not exceed $\frac{1}{16}$ inch in depth and do not occur closer than $\frac{3}{8}$ inch from a rivet or attaching hole. All holes in the skins must be repaired to prevent air leakage.

3. DAMAGE REPAIRABLE BY PATCHING.

The applicable repairs to intake ducts and tail pipe are indexed on the key to reference diagram, figure 123. Parts not indexed are not repairable. These are items which are either too highly loaded, too inaccessible, or too small to be repaired economically. Be sure that repairs to the inside skins do not permit leakage of air. The portion of the intake ducts constructed of 3S aluminum, and that portion of the tail pipe constructed of 347-1A steel may be repaired by welded patches. The tail pipe track and fittings are not repairable.

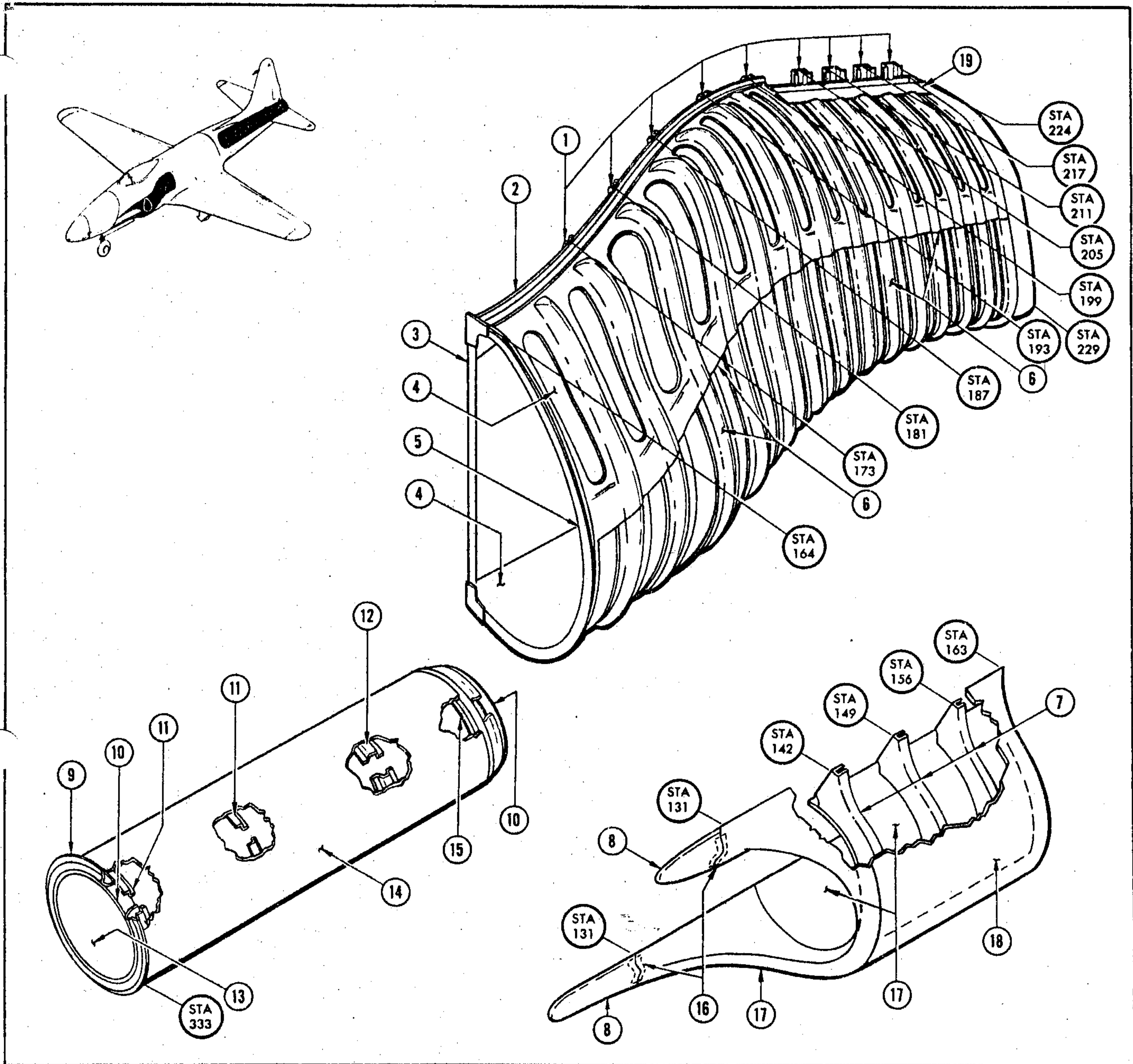
4. DAMAGE NECESSITATING REPLACEMENT.

Damage in excess of that described as negligible for items not indicated on the key to figure 123 requires replacement of the item involved. Skins and doublers originally constructed of aged material (24S-T81) must be replaced with identical material. The gage of the replacement part must be the same as the original skin or doubler. Interior structure originally constructed of aged 24S-T may be replaced with parts constructed of 24S-T unaged material if no interferences are encountered.

Part No.	Material		Size or Gage	Remarks
	Spec. No.	Title		
24S-T	AN-A-13	Sheet, Aluminum Alclad	.032	For repair of duct skins.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.040	For repair of skins.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.051	For repair of lips.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.064	For repair of hat and ring stiffeners.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.072	For repair of stiffeners.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.102	For angle repair.
24S-T	AN-A-13	Sheet, Aluminum Alclad	.020	For repair of tail pipe outer skin.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.032	For replacement of skin.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.040	For replacement of skin.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.064	For replacement of hat stiffeners and angles.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.081	For replacement of angles and doublers.
*24S-T	AN-A-13	Sheet, Aluminum Alclad	.091	For replacement of angles.
347-1A	AN-QQ-S-757	Corr. & Heat Res. Steel	.030	For replacement of rings, skins, and doublers.
347-1A	AN-QQ-S-757	Corr. & Heat Res. Steel	.037	For repair of rings, skin, and doublers.
3SO	QQ-A-359	Aluminum Alloy	.051	For repair of leading edge skin.
	AN426AD4	Rivets—100° Countersunk	$\frac{1}{8}$	For skin repairs.
	AN426AD5	Rivets—100° Countersunk	$\frac{5}{32}$	For skin repairs.
	AN430AD4	Rivets—Roundhead	$\frac{1}{8}$	For angle repairs.
	AN430AD5	Rivets—Roundhead	$\frac{5}{32}$	For angle and stiffener repairs.
	AN430AD6	Rivets—Roundhead	$\frac{3}{16}$	For stiffener repairs.
	QQ-R-571	Welding Rod, Type D		For welding leading edge skins.
	AC11313	Flux		For QQ-R-571 welding rod.

*Aged materials. Age 10 hours at 375°F.

Table 7 — Material for Repair of the Engine Section



Item	Part Name	Figure Reference	Neg. Damage	Repair	Remarks
1	Hat Stiffeners	131		145	24S-T80 — .064
2	Angle	131		139	24S-T80 — .081
3	Angle	131		139	24S-T80 — .064
4	Skin	130		135, 137	24S-T81 — .032
5	Angle	131		139	24S-T80 — .091
6	Reinforcement	131		145	24S-T80 — .040
7	Rings	131		118	.064
8	Lips			135, 136, 137	.051
9	Ring	131		145	347-1A .030 Corr-res. St. Sht.
10	Doubler				347-1A .030 Corr-res. St. Sht.
11	Ring	131			347-1A .030 Corr-res. St. Sht.

Item	Part Name	Figure Reference	Neg. Damage	Repair	Remarks
12	Ring	131			347-1A .030 Corr-res. St. Sht.
13	Skin	130		124	347-1A .030 Corr-res. St. Sht.
14	Skin	130			.012
15	Ring	130		135, 137	347-1A .030
16	Doubler				Corr-res. St. Sht.
17	Skin	130		*	.040
18	Skin			135, 136, 137	3S-O — .051
19	Doubler				24S-T81 — .040 24S-T81 — .081

NOTES: All material 24S-T unless otherwise noted.
Items not indicated are not repairable.
*See text, section VI, paragraph 3.

Figure 123 — Air Ducts and Tail Pipe Reference Diagram

SECTION VII FABRIC REPAIRS AND ATTACHMENT

Does not apply to this airplane.

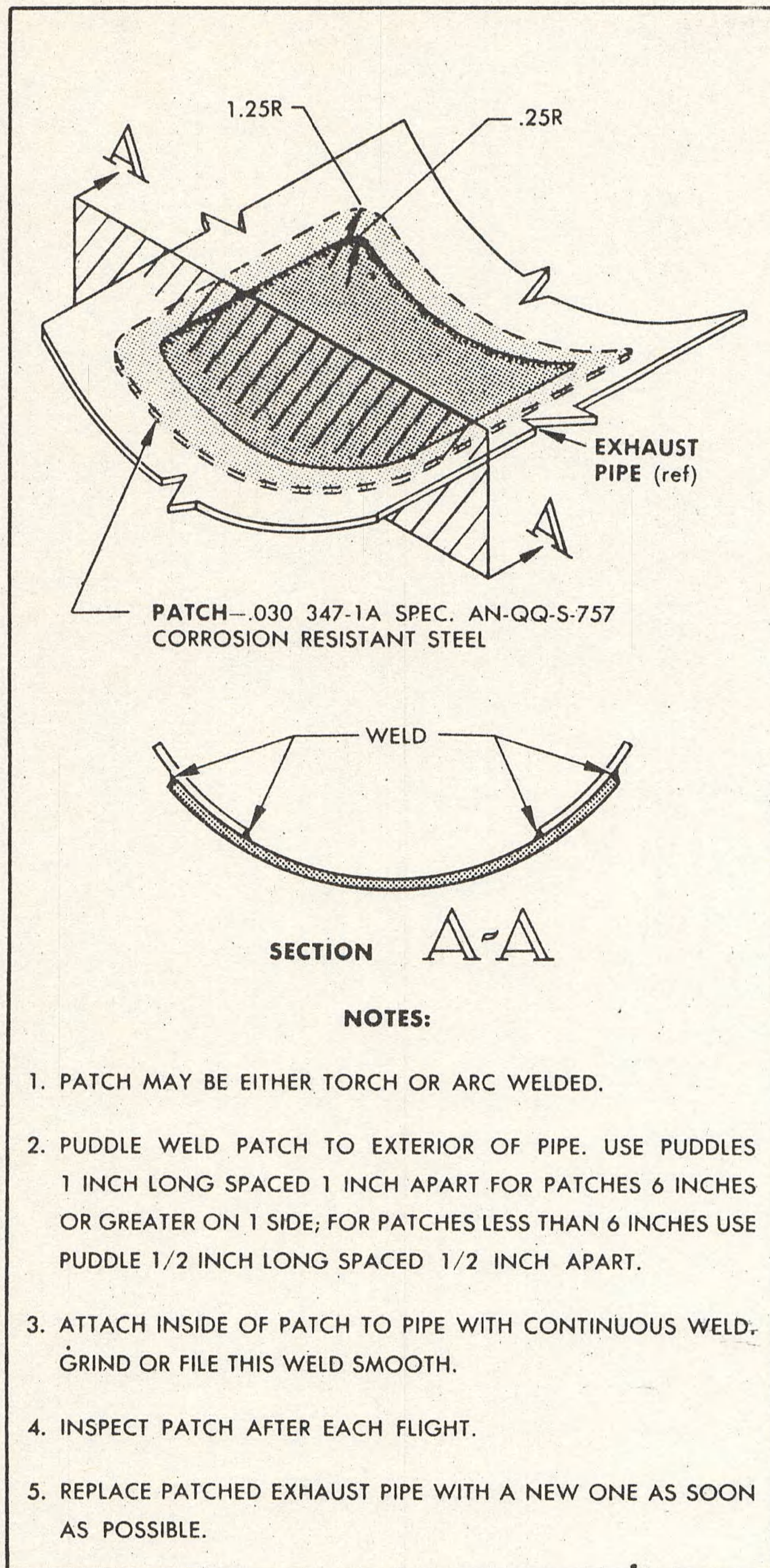


Figure 124 — Tail Pipe Repair