

CHAPTER

55

STABILIZERS



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55-EFFECTIVE PAGES		55-10-01 IDENTIFICATION 3 (cont)		55-10-01 IDENTIFICATION 5 (cont)	
1 thru 14	Jul 10/2016	10	Mar 10/2015	22	Mar 10/2015
55-CONTENTS		11	Mar 10/2015	23	Nov 10/2012
1	Jul 10/2013	12	Mar 10/2015	24	Mar 10/2015
2	Mar 10/2014	13	Mar 10/2015	55-10-01 ALLOWABLE DAMAGE 1	
3	Mar 10/2014	14	Mar 10/2015	101	Nov 10/2012
4	Mar 10/2014	15	Mar 10/2015	102	Nov 10/2012
5	Mar 10/2015	16	Mar 10/2015	103	Nov 10/2012
6	Mar 10/2015	55-10-01 IDENTIFICATION 4		104	Nov 10/2014
7	Mar 10/2015	1	Nov 10/2012	105	Nov 10/2014
8	BLANK	2	Nov 10/2012	106	Nov 10/2014
55-10-00 IDENTIFICATION GENERAL		3	Jul 10/2015	107	Nov 10/2014
1	Nov 10/2012	4	Jul 10/2015	108	Mar 10/2013
2	Jul 10/2014	5	Jul 10/2015	109	Mar 10/2013
3	Nov 10/2012	6	Jul 10/2015	110	Nov 10/2014
4	BLANK	55-10-01 IDENTIFICATION 5		111	Nov 10/2014
55-10-01 IDENTIFICATION 1		1	Nov 10/2012	112	Mar 10/2013
1	Nov 10/2012	2	Mar 10/2015	113	Mar 10/2013
2	Nov 10/2012	3	Nov 10/2012	114	Nov 10/2014
3	Nov 10/2012	4	Nov 10/2015	115	Nov 10/2014
4	Nov 10/2012	5	Nov 10/2015	116	BLANK
55-10-01 IDENTIFICATION 2		6	Mar 10/2015	55-10-01 ALLOWABLE DAMAGE 2	
1	Nov 10/2012	7	Nov 10/2012	101	Nov 10/2012
2	Nov 10/2012	8	Nov 10/2012	102	Nov 10/2012
3	Nov 10/2012	9	Mar 10/2015	103	Nov 10/2012
4	BLANK	10	Nov 10/2012	104	Nov 10/2012
55-10-01 IDENTIFICATION 3		11	Nov 10/2012	105	Nov 10/2012
1	Nov 10/2012	12	Mar 10/2015	106	Nov 10/2012
2	Nov 10/2015	13	Nov 10/2012	107	Nov 10/2012
3	Mar 10/2015	14	Nov 10/2012	108	Nov 10/2012
4	Mar 10/2015	15	Mar 10/2015	109	Nov 10/2012
5	Mar 10/2015	16	Nov 10/2012	110	Nov 10/2012
6	Mar 10/2015	17	Nov 10/2012	111	Nov 10/2012
7	Mar 10/2015	18	Mar 10/2015	112	Nov 10/2012
8	Mar 10/2015	19	Nov 10/2012	55-10-01 ALLOWABLE DAMAGE 3	
9	Mar 10/2015	20	Nov 10/2012	101	Nov 10/2012
		21	Mar 10/2015	102	Nov 10/2015

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103	Nov 10/2015	207	Nov 10/2012	208	Nov 10/2012
104	Nov 10/2015	208	Nov 10/2012	209	Nov 10/2012
105	Nov 10/2015	209	Nov 10/2014	210	Nov 10/2012
106	Nov 10/2015	210	Nov 10/2014	55-10-01 REPAIR 7	
107	Nov 10/2015	55-10-01 REPAIR 2		201	Nov 10/2012
108	Nov 10/2015	201	Nov 10/2014	202	Nov 10/2012
109	Nov 10/2015	202	Nov 10/2012	203	Nov 10/2012
110	Nov 10/2015	203	Mar 10/2013	204	Nov 10/2012
111	Nov 10/2015	204	Mar 10/2013	205	Nov 10/2012
112	Nov 10/2015	205	Nov 10/2012	206	Nov 10/2012
113	Nov 10/2015	206	Nov 10/2012	207	Nov 10/2012
114	Nov 10/2015	55-10-01 REPAIR 3		208	Nov 10/2012
115	Nov 10/2015	201	Nov 10/2012	55-10-01 REPAIR 8	
116	Nov 10/2015	202	Nov 10/2012	201	Mar 10/2013
117	Nov 10/2015	203	Nov 10/2012	202	Nov 10/2012
118	Nov 10/2015	204	Nov 10/2012	203	Nov 10/2012
119	Nov 10/2015	205	Jul 10/2013	204	Nov 10/2012
120	BLANK	206	Nov 10/2012	205	Nov 10/2012
207	Nov 10/2012	206	Nov 10/2012	206	Nov 10/2012
55-10-01 ALLOWABLE DAMAGE 4		208	Nov 10/2012	207	Nov 10/2012
101	Nov 10/2012	209	Nov 10/2012	208	Nov 10/2012
102	Nov 10/2012	210	Nov 10/2012	55-10-01 REPAIR 9	
103	Nov 10/2012	211	Nov 10/2012	201	Nov 10/2012
104	Nov 10/2012	212	Nov 10/2012	202	Nov 10/2012
105	Nov 10/2012	213	Nov 10/2012	203	Mar 10/2013
106	BLANK	214	Jul 10/2013	204	Nov 10/2015
55-10-01 REPAIR GENERAL		215	Nov 10/2012	205	Nov 10/2012
201	Jul 10/2013	216	BLANK	206	Mar 10/2014
202	BLANK	55-10-01 REPAIR 4		55-10-01 REPAIR 10	
55-10-01 REPAIR 1		201	Nov 10/2012	201	Nov 10/2015
201	Jul 10/2013	202	Nov 10/2012	202	Nov 10/2012
202	Nov 10/2012	203	Nov 10/2012	203	Nov 10/2012
203	Nov 10/2012	204	Nov 10/2012	204	BLANK
204	Nov 10/2012	205	Nov 10/2012	55-10-01 REPAIR 11	
205	Nov 10/2012	206	Mar 10/2013	201	Jul 10/2015
206	Nov 10/2012	207	Mar 10/2014	202	Jul 10/2015

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203	Nov 10/2012	1	Nov 10/2012	4	Nov 10/2012
204	Nov 10/2012	2	Nov 10/2012	5	Nov 10/2012
205	Nov 10/2012	3	Nov 10/2012	6	Mar 10/2014
206	Jul 10/2015	4	BLANK	7	Nov 10/2012
207	Nov 10/2015	55-10-09 IDENTIFICATION 1		8	BLANK
208	Jul 10/2015	1	Jul 10/2015	55-10-09 ALLOWABLE DAMAGE 1	
209	Jul 10/2015	2	Jul 10/2015	101	Mar 10/2014
210	Nov 10/2012	3	Nov 10/2012	102	Mar 10/2014
211	Jul 10/2015	4	Nov 10/2012	103	Mar 10/2014
212	Jul 10/2015	5	Nov 10/2012	104	Nov 10/2015
213	Jul 10/2015	6	Nov 10/2012	105	Mar 10/2014
214	Jul 10/2015	7	Nov 10/2012	106	Mar 10/2014
215	Jul 10/2015	8	Nov 10/2012	107	Mar 10/2014
216	Nov 10/2012	55-10-09 IDENTIFICATION 2		108	BLANK
217	Nov 10/2012	1	Nov 10/2012	55-10-09 REPAIR 4	
218	Jul 10/2015	2	Mar 10/2014	201	Jul 10/2015
219	Nov 10/2012	3	Nov 10/2012	202	Jul 10/2015
220	BLANK	4	Nov 10/2012	203	Jul 10/2015
55-10-01 REPAIR 12		5	Nov 10/2012	204	Nov 10/2015
201	Nov 10/2012	6	Nov 10/2012	205	Nov 10/2015
202	Nov 10/2012	7	Nov 10/2012	206	Jul 10/2015
203	Jul 10/2013	8	Nov 10/2012	207	Nov 10/2015
204	Nov 10/2015	9	Nov 10/2012	208	Nov 10/2015
205	Nov 10/2012	10	Nov 10/2012	55-10-10 IDENTIFICATION 1	
206	Nov 10/2012	11	Nov 10/2012	1	Nov 10/2012
207	Nov 10/2012	12	Nov 10/2012	2	Nov 10/2012
208	Nov 10/2012	13	Nov 10/2012	3	Nov 10/2012
209	Nov 10/2012	14	Nov 10/2012	4	Nov 10/2012
210	Nov 10/2012	15	Nov 10/2012	55-10-10 IDENTIFICATION 2	
211	Nov 10/2012	16	Nov 10/2012	1	Nov 10/2012
212	Nov 10/2012	17	Nov 10/2012	2	Nov 10/2012
213	Jul 10/2013	18	Nov 10/2012	3	Nov 10/2012
214	Nov 10/2012	55-10-09 IDENTIFICATION 3		4	Nov 10/2012
215	Nov 10/2012	1	Nov 10/2012	O 5	Jul 10/2016
216	BLANK	2	Mar 10/2014	6	Nov 10/2012
		3	Nov 10/2012	7	Nov 10/2012

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8 BLANK		113 Nov 10/2012		108 Nov 10/2012	
55-10-10 IDENTIFICATION 3		114 Nov 10/2012		55-10-13 ALLOWABLE DAMAGE 2	
1 Nov 10/2012		115 Nov 10/2012		101 Nov 10/2012	
2 Jul 10/2013		116 Nov 10/2012		102 Nov 10/2012	
3 Nov 10/2012		55-10-10 REPAIR 1		103 Nov 10/2012	
4 Nov 10/2012		201 Nov 10/2012		104 Nov 10/2015	
5 Nov 10/2012		202 Nov 10/2012		105 Nov 10/2012	
6 BLANK		203 Nov 10/2015		106 Nov 10/2012	
55-10-10 ALLOWABLE DAMAGE 1		204 Mar 10/2013		107 Nov 10/2012	
101 Nov 10/2012		205 Nov 10/2012		108 Nov 10/2012	
102 Nov 10/2012		206 Nov 10/2012		109 Nov 10/2012	
103 Nov 10/2012		207 Nov 10/2012		110 Nov 10/2012	
104 Nov 10/2015		208 BLANK		55-10-13 REPAIR 1	
105 Nov 10/2012		55-10-13 IDENTIFICATION 1		201 Nov 10/2012	
106 Nov 10/2012		1 Nov 10/2012		202 Nov 10/2012	
107 Nov 10/2012		2 Nov 10/2012		203 Nov 10/2012	
108 Nov 10/2012		3 Nov 10/2012		204 BLANK	
109 Nov 10/2012		4 BLANK		55-10-13 REPAIR 2	
110 Nov 10/2012		55-10-13 IDENTIFICATION 2		201 Nov 10/2012	
111 Nov 10/2012		1 Nov 10/2012		202 Nov 10/2012	
112 Nov 10/2012		O 2 Jul 10/2016		203 Nov 10/2012	
113 Nov 10/2012		3 Nov 10/2012		204 BLANK	
114 BLANK		4 Mar 10/2013		55-10-30 IDENTIFICATION 1	
55-10-10 ALLOWABLE DAMAGE 2		5 Nov 10/2012		1 Nov 10/2012	
101 Nov 10/2012		6 Mar 10/2013		2 Mar 10/2015	
102 Nov 10/2012		7 Nov 10/2012		3 Mar 10/2015	
103 Nov 10/2012		8 Nov 10/2012		4 Nov 10/2012	
104 Nov 10/2012		55-10-13 ALLOWABLE DAMAGE 1		5 Nov 10/2012	
105 Nov 10/2015		101 Nov 10/2012		6 BLANK	
106 Nov 10/2012		102 Nov 10/2012		55-10-30 IDENTIFICATION 2	
107 Nov 10/2012		103 Nov 10/2012		1 Nov 10/2012	
108 Nov 10/2012		104 Nov 10/2012		2 Nov 10/2012	
109 Nov 10/2012		105 Nov 10/2015		3 Nov 10/2012	
110 Nov 10/2012		106 Nov 10/2012		4 Nov 10/2012	
111 Nov 10/2012		107 Nov 10/2012		5 Nov 10/2012	
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6	Nov 10/2012	1	Jul 10/2015	4	Nov 10/2012
7	Nov 10/2012	2	Nov 10/2012	5	Nov 10/2012
8	BLANK	3	Jul 10/2015	6	Nov 10/2012
55-10-30 ALLOWABLE DAMAGE 1		4	Nov 10/2012	7	Nov 10/2012
101	Nov 10/2012	5	Nov 10/2012	8	BLANK
102	Nov 10/2012	6	Nov 10/2012	55-20-01 IDENTIFICATION 2	
103	Nov 10/2012	7	Nov 10/2012	1	Nov 10/2012
104	Nov 10/2015	8	Nov 10/2012	2	Nov 10/2012
105	Nov 10/2012	9	Nov 10/2012	3	Nov 10/2012
106	Nov 10/2012	10	Nov 10/2012	4	Nov 10/2012
107	Nov 10/2012	11	Nov 10/2012	5	Mar 10/2014
108	Nov 10/2012	12	Nov 10/2012	6	Mar 10/2014
109	Nov 10/2012	55-10-90 IDENTIFICATION 2		7	Nov 10/2012
110	Nov 10/2012	1	Nov 10/2012	8	BLANK
111	Nov 10/2012	2	Nov 10/2012	55-20-01 IDENTIFICATION 3	
112	BLANK	3	Nov 10/2012	1	Nov 10/2012
55-10-30 ALLOWABLE DAMAGE 2		4	Nov 10/2012	2	Nov 10/2012
101	Nov 10/2012	5	Nov 10/2012	3	Nov 10/2012
102	Nov 10/2012	6	Jul 10/2013	4	Nov 10/2012
103	Nov 10/2015	7	Nov 10/2012	5	Nov 10/2012
104	Mar 10/2015	8	BLANK	6	Nov 10/2012
105	Mar 10/2015	55-10-90 REPAIR 1		7	Nov 10/2012
106	BLANK	201	Mar 10/2016	8	Nov 10/2012
55-10-30 REPAIR 1		202	Mar 10/2016	9	Nov 10/2012
201	Nov 10/2012	O 203	Jul 10/2016	10	Nov 10/2012
202	Nov 10/2012	204	Mar 10/2016	11	Nov 10/2012
203	Nov 10/2015	205	Mar 10/2016	12	Nov 10/2012
204	Nov 10/2012	206	Mar 10/2016	13	Nov 10/2012
205	Nov 10/2012	207	Mar 10/2016	14	Nov 10/2012
206	BLANK	208	Mar 10/2016	55-20-01 ALLOWABLE DAMAGE 1	
55-10-30 REPAIR 2		209	Mar 10/2016	101	Nov 10/2012
201	Nov 10/2012	210	Mar 10/2016	102	Nov 10/2012
202	Nov 10/2012	55-20-01 IDENTIFICATION 1		103	Mar 10/2013
203	Nov 10/2015	1	Nov 10/2012	104	Nov 10/2012
O 204	Jul 10/2016	2	Nov 10/2012	105	Nov 10/2012
		3	Nov 10/2012	106	Nov 10/2012

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107	Nov 10/2012	205	Nov 10/2012	3	Jul 10/2015
108	Nov 10/2012	206	Nov 10/2012	4	Jul 10/2015
109	Nov 10/2015	207	Nov 10/2012	5	Jul 10/2015
110	Nov 10/2012	208	BLANK	6	Jul 10/2015
111	Nov 10/2012	55-20-01 REPAIR 2		7	Jul 10/2015
112	Nov 10/2012	201	Nov 10/2012	8	Jul 10/2015
55-20-01 ALLOWABLE DAMAGE 2		202	Nov 10/2012	9	Jul 10/2015
101	Nov 10/2012	203	Nov 10/2012	10	Jul 10/2015
102	Nov 10/2012	204	Mar 10/2013	11	Jul 10/2015
103	Nov 10/2012	205	Nov 10/2012	12	Jul 10/2015
104	Nov 10/2012	206	Nov 10/2012	13	Jul 10/2015
105	Nov 10/2012	207	Nov 10/2012	14	Jul 10/2015
106	Nov 10/2012	208	BLANK	15	Jul 10/2015
107	Nov 10/2015	55-20-01 REPAIR 3		16	Jul 10/2015
108	Nov 10/2012	201	Mar 10/2013	55-20-02 IDENTIFICATION 2	
109	Nov 10/2012	202	Nov 10/2012	1	Nov 10/2012
110	Nov 10/2012	203	Nov 10/2012	2	Nov 10/2012
111	Nov 10/2012	R 204	Jul 10/2016	3	Nov 10/2012
112	Nov 10/2012	205	Nov 10/2012	4	Nov 10/2012
55-20-01 ALLOWABLE DAMAGE 3		206	Nov 10/2013	5	Nov 10/2012
101	Nov 10/2012	207	Nov 10/2015	6	Nov 10/2012
102	Nov 10/2012	R 208	Jul 10/2016	7	Nov 10/2012
103	Nov 10/2012	R 209	Jul 10/2016	8	Nov 10/2012
104	Nov 10/2012	210	BLANK	9	Nov 10/2012
105	Nov 10/2012	55-20-01 REPAIR 4		10	Nov 10/2012
106	Nov 10/2012	201	Nov 10/2012	11	Nov 10/2012
107	Nov 10/2012	202	Nov 10/2012	12	Nov 10/2012
108	Nov 10/2015	203	Nov 10/2012	13	Nov 10/2012
109	Nov 10/2012	204	Nov 10/2012	14	BLANK
110	Nov 10/2012	205	Nov 10/2012	55-20-02 IDENTIFICATION 3	
55-20-01 REPAIR 1		206	Nov 10/2012	1	Nov 10/2012
201	Nov 10/2012	O 207	Jul 10/2016	2	Nov 10/2012
202	Nov 10/2012	208	BLANK	3	Nov 10/2012
203	Nov 10/2012	55-20-02 IDENTIFICATION 1		4	Nov 10/2012
204	Nov 10/2012	1	Jul 10/2015	5	Nov 10/2012
		2	Jul 10/2015	6	Nov 10/2012

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7	Nov 10/2012	104	Nov 10/2012	1	Nov 10/2012
8	Nov 10/2012	105	Nov 10/2012	2	Nov 10/2012
9	Nov 10/2012	106	Nov 10/2012	3	Nov 10/2012
10	Nov 10/2012	107	Nov 10/2012	4	Nov 10/2012
55-20-02 ALLOWABLE DAMAGE 1		108	BLANK	55-20-30 ALLOWABLE DAMAGE 1	
101	Nov 10/2012	55-20-02 REPAIR 1		101	Nov 10/2012
102	Nov 10/2012	201	Nov 10/2012	102	Nov 10/2012
103	Nov 10/2012	202	Nov 10/2012	103	Nov 10/2012
104	Mar 10/2013	203	Nov 10/2012	104	Nov 10/2012
105	Nov 10/2012	204	Nov 10/2012	105	Nov 10/2012
106	Nov 10/2012	205	Nov 10/2012	106	BLANK
107	Nov 10/2012	206	Nov 10/2012	55-20-30 REPAIR 1	
108	Nov 10/2012	207	Nov 10/2012	201	Nov 10/2012
109	Nov 10/2012	208	Nov 10/2012	202	Nov 10/2012
110	Nov 10/2012	209	Nov 10/2012	203	Nov 10/2012
111	Nov 10/2012	210	Nov 10/2012	204	Nov 10/2015
112	Nov 10/2012	211	Nov 10/2012	205	Nov 10/2012
113	Nov 10/2012	212	Nov 10/2015	55-20-70 IDENTIFICATION 1	
114	Nov 10/2012	213	Mar 10/2013	1	Nov 10/2012
115	Nov 10/2012	214	Nov 10/2012	2	Nov 10/2012
117	Nov 10/2012	55-20-02 REPAIR 2		3	Nov 10/2012
118	Nov 10/2012	201	Nov 10/2012	4	Nov 10/2012
119	Nov 10/2012	202	Nov 10/2012	5	Nov 10/2012
120	Nov 10/2012	203	Nov 10/2012	6	BLANK
121	Nov 10/2012	204	Nov 10/2012	55-20-70 ALLOWABLE DAMAGE 1	
122	Nov 10/2012	205	Nov 10/2012	101	Nov 10/2012
123	Nov 10/2012	206	BLANK	102	Nov 10/2012
124	BLANK	55-20-02 REPAIR 3		103	Nov 10/2012
55-20-02 ALLOWABLE DAMAGE 2		201	Mar 10/2013	104	Nov 10/2012
101	Nov 10/2012	202	Nov 10/2012	105	Nov 10/2012
102	BLANK	203	Nov 10/2012	106	Nov 10/2012
55-20-02 ALLOWABLE DAMAGE 3		204	Nov 10/2012	55-20-70 REPAIR 1	
101	Nov 10/2012	205	Nov 10/2015	201	Nov 10/2012
102	Nov 10/2012	206	Nov 10/2012	202	Nov 10/2012
103	Nov 10/2012			203	Nov 10/2012

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55-20-70 REPAIR 1 (cont)		55-20-90 ALLOWABLE DAMAGE 2 (cont)		55-30-01 IDENTIFICATION 1	
204 BLANK		105 Nov 10/2012		1 Nov 10/2012	
55-20-90 IDENTIFICATION 1		106 Nov 10/2012		2 Nov 10/2012	
1 Nov 10/2012		107 Nov 10/2012		3 Nov 10/2012	
2 Nov 10/2012		108 Nov 10/2012		4 Nov 10/2012	
3 Nov 10/2012		109 Nov 10/2012		5 Nov 10/2012	
4 Nov 10/2012		110 Nov 10/2012		6 BLANK	
5 Nov 10/2012				55-30-01 IDENTIFICATION 2	
6 BLANK				1 Nov 10/2012	
55-20-90 IDENTIFICATION 2		101 Nov 10/2012		2 Nov 10/2012	
1 Nov 10/2012		102 Nov 10/2012		3 Nov 10/2012	
2 Nov 10/2012		103 Nov 10/2012		4 Nov 10/2012	
3 Nov 10/2012		104 Nov 10/2012		5 Nov 10/2012	
4 Nov 10/2012		105 Nov 10/2012		6 Nov 10/2012	
55-20-90 IDENTIFICATION 3		106 Nov 10/2012		7 Nov 10/2012	
1 Nov 10/2012		107 Nov 10/2012		8 Nov 10/2012	
2 Nov 10/2012		108 Nov 10/2012		9 Nov 10/2012	
3 Nov 10/2012		55-20-90 REPAIR 1		10 Nov 10/2012	
4 BLANK		201 Nov 10/2012		11 Nov 10/2012	
55-20-90 ALLOWABLE DAMAGE 1		202 Nov 10/2012		12 Nov 10/2012	
101 Nov 10/2012		203 Nov 10/2012		13 Nov 10/2012	
102 Nov 10/2012		204 BLANK		14 BLANK	
103 Nov 10/2012		55-20-90 REPAIR 2		55-30-01 IDENTIFICATION 3	
104 Nov 10/2012		201 Nov 10/2012		1 Nov 10/2012	
105 Nov 10/2012		202 Nov 10/2012		2 Nov 10/2012	
106 Nov 10/2012		203 Nov 10/2012		3 Nov 10/2012	
107 Nov 10/2012		204 Nov 10/2012		O 4 Jul 10/2016	
108 Nov 10/2012		55-20-90 REPAIR 3		5 Nov 10/2012	
109 Nov 10/2012		201 Jul 10/2015		6 Nov 10/2012	
110 Nov 10/2012		202 Nov 10/2012		7 Nov 10/2012	
111 Nov 10/2012		55-30-00 IDENTIFICATION		8 Nov 10/2012	
112 BLANK		GENERAL		9 Nov 10/2012	
55-20-90 ALLOWABLE DAMAGE 2		1 Nov 10/2012		10 Nov 10/2012	
101 Nov 10/2012		2 Nov 10/2012		11 Nov 10/2012	
102 Nov 10/2012		3 Nov 10/2012		12 Nov 10/2012	
103 Nov 10/2012		4 BLANK		13 Nov 10/2012	
104 Nov 10/2012				14 Nov 10/2012	

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15	Nov 10/2012	4	Nov 10/2012	107	Mar 10/2013
16	Nov 10/2012	5	Nov 10/2012	108	Mar 10/2013
17	Nov 10/2012	6	Nov 10/2012	109	Nov 10/2012
18	BLANK	55-30-01 ALLOWABLE DAMAGE 1		110	Nov 10/2012
55-30-01 IDENTIFICATION 4		101	Mar 10/2013	111	Nov 10/2012
1	Nov 10/2012	102	Nov 10/2012	112	BLANK
2	Nov 10/2012	103	Mar 10/2013	55-30-01 ALLOWABLE DAMAGE 4	
3	Mar 10/2013	104	Mar 10/2013	101	Nov 10/2012
4	Nov 10/2012	105	Mar 10/2013	102	Nov 10/2012
5	Nov 10/2012	106	Nov 10/2012	103	Nov 10/2012
6	Nov 10/2012	107	Mar 10/2013	104	Nov 10/2012
7	Nov 10/2012	108	Nov 10/2012	105	Mar 10/2016
8	Nov 10/2012	109	Nov 10/2012	106	Mar 10/2016
9	Nov 10/2012	110	Nov 10/2012	55-30-01 ALLOWABLE DAMAGE 5	
10	BLANK	111	Nov 10/2012	101	Nov 10/2012
55-30-01 IDENTIFICATION 5		112	Nov 10/2012	102	Nov 10/2012
1	Nov 10/2012	55-30-01 ALLOWABLE DAMAGE 2		103	Nov 10/2012
2	Nov 10/2015	101	Mar 10/2016	104	Mar 10/2013
3	Nov 10/2015	102	Nov 10/2012	105	Mar 10/2013
4	Nov 10/2015	103	Nov 10/2012	106	Mar 10/2013
5	Nov 10/2015	104	Nov 10/2012	107	Mar 10/2013
6	Nov 10/2015	105	Nov 10/2012	108	Nov 10/2012
7	Nov 10/2015	106	Mar 10/2016	109	Nov 10/2012
8	Nov 10/2015	107	Nov 10/2012	110	Nov 10/2012
9	Nov 10/2015	108	Mar 10/2016	55-30-01 REPAIR 1	
10	Nov 10/2015	109	Nov 10/2012	201	Nov 10/2012
11	Nov 10/2015	110	Nov 10/2012	202	Nov 10/2012
12	Nov 10/2015	111	Nov 10/2012	203	Nov 10/2012
13	Nov 10/2015	112	Nov 10/2012	204	Mar 10/2013
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15	Nov 10/2015	101	Nov 10/2012	206	Nov 10/2012
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1	Nov 10/2012	104	Nov 10/2012	202	Nov 10/2012
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204	Mar 10/2013	203	Nov 10/2012	203	Mar 10/2013
205	Nov 10/2012	204	Nov 10/2012	204	Nov 10/2015
206	Nov 10/2012	205	Nov 10/2012	205	Nov 10/2012
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202	Nov 10/2012	208	Nov 10/2012	201	Nov 10/2012
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204	Jul 10/2013	210	BLANK	203	Nov 10/2012
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206	Jul 10/2013	201	Nov 10/2012	205	Nov 10/2012
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211	Nov 10/2012	206	Nov 10/2012	203	Nov 10/2012
212	Nov 10/2012	55-30-01 REPAIR 7		204	Jul 10/2015
213	Nov 10/2012	201	Nov 10/2012	205	Nov 10/2012
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201	Nov 10/2012	204	Nov 10/2012	201	Nov 10/2012
202	Nov 10/2012	205	Nov 10/2012	202	Nov 10/2012
203	Nov 10/2012	206	Nov 10/2012	203	Nov 10/2012
204	Jul 10/2013	207	Nov 10/2012	204	Nov 10/2015
205	Nov 10/2012	208	Nov 10/2012	205	Nov 10/2012
206	Jul 10/2013	209	Nov 10/2012	206	BLANK
207	Nov 10/2012	210	BLANK	55-30-09 IDENTIFICATION 1	
208	Nov 10/2012	55-30-01 REPAIR 8		1	Nov 10/2012
209	Nov 10/2012	201	Nov 10/2012	2	Nov 10/2012
210	Nov 10/2012	202	Nov 10/2012	3	Nov 10/2012
211	Nov 10/2012	203	Nov 10/2012	4	BLANK
212	Nov 10/2012	204	Nov 10/2012	55-30-09 IDENTIFICATION 2	
213	Nov 10/2012	205	Nov 10/2012	1	Nov 10/2012
214	Nov 10/2012	206	Nov 10/2012	2	Nov 10/2012
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201	Nov 10/2012	201	Nov 10/2012	O	4 Jul 10/2016
202	Nov 10/2012	202	Nov 10/2012	5	Nov 10/2012

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6	Nov 10/2012	7	Nov 10/2012	203	Nov 10/2012
7	Nov 10/2012	8	BLANK	204	Nov 10/2012
8	Nov 10/2012	55-30-10 IDENTIFICATION 2		205	Nov 10/2012
9	Nov 10/2012	1	Nov 10/2012	206	BLANK
10	BLANK	2	Nov 10/2012	55-30-10 REPAIR 2	
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1	Nov 10/2012	4	Nov 10/2012	202	Nov 10/2012
O 2	Jul 10/2016	O 5	Jul 10/2016	203	Nov 10/2015
3	Nov 10/2012	6	Nov 10/2012	204	Nov 10/2012
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1	Nov 10/2012	102	Nov 10/2012	207	Nov 10/2012
2	Nov 10/2012	103	Nov 10/2015	208	BLANK
3	Nov 10/2012	104	Nov 10/2012	55-30-10 REPAIR 3	
4	BLANK	105	Nov 10/2012	201	Nov 10/2012
55-30-09 ALLOWABLE DAMAGE 2		106	Nov 10/2012	202	Nov 10/2012
101	Nov 10/2012	107	Nov 10/2012	203	Nov 10/2015
102	Nov 10/2012	108	Nov 10/2012	204	Nov 10/2012
103	Nov 10/2012	109	Nov 10/2012	205	Nov 10/2012
104	Nov 10/2012	110	Nov 10/2012	206	Nov 10/2012
105	Nov 10/2012	111	Nov 10/2012	207	Nov 10/2012
106	Nov 10/2012	112	BLANK	208	Nov 10/2012
107	Nov 10/2012	55-30-10 ALLOWABLE DAMAGE 2		209	Nov 10/2012
108	Nov 10/2012	101	Nov 10/2012	210	BLANK
109	Nov 10/2012	102	Nov 10/2012	55-30-10 REPAIR 4	
110	Nov 10/2012	103	Nov 10/2015	201	Nov 10/2012
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3	Nov 10/2012	110	BLANK	208	Nov 10/2012
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201	Nov 10/2012	105	Nov 10/2012	103	Nov 10/2012
202	Nov 10/2012	106	Nov 10/2012	104	Nov 10/2012
203	Nov 10/2015	107	Nov 10/2012	105	Nov 10/2012
204	Nov 10/2012	108	Nov 10/2012	106	Nov 10/2012
205	Nov 10/2012	109	Nov 10/2012	107	Nov 10/2012
206	Nov 10/2012	110	Nov 10/2012	108	Nov 10/2012
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208	BLANK	55-30-30 ALLOWABLE DAMAGE 2		110	Nov 10/2012
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1	Nov 10/2012	102	Nov 10/2012	112	Nov 10/2015
2	Nov 10/2012	103	Nov 10/2012	113	Nov 10/2012
3	Nov 10/2012	104	Nov 10/2012	114	Nov 10/2012
4	BLANK	105	Nov 10/2012	115	Nov 10/2012
55-30-13 ALLOWABLE DAMAGE 1		106	BLANK	116	Nov 10/2012
101	Nov 10/2012	55-30-30 REPAIR 1		117	Nov 10/2012
102	Nov 10/2012	201	Nov 10/2012	118	Nov 10/2012
103	Nov 10/2015	202	Nov 10/2012	119	Nov 10/2012
104	Nov 10/2012	203	Nov 10/2015	120	Nov 10/2012
105	Nov 10/2012	204	Nov 10/2015	121	Nov 10/2012
106	BLANK	205	Nov 10/2012	122	Nov 10/2012
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201	Nov 10/2012	207	Nov 10/2012	124	Nov 10/2012
202	Nov 10/2012	208	BLANK		
55-30-30 IDENTIFICATION 1		55-30-30 REPAIR 2		55-30-90 ALLOWABLE DAMAGE 2	
1	Jul 10/2013	201	Nov 10/2012	101	Jul 10/2013
2	Jul 10/2013	202	Nov 10/2012	102	Jul 10/2013
3	Nov 10/2012	203	Nov 10/2015	103	Jul 10/2013
4	BLANK	O 204	Jul 10/2016	104	Jul 10/2013
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1	Nov 10/2012	1	Nov 10/2012	106	Jul 10/2013
2	Nov 10/2012	2	Nov 10/2012	107	Jul 10/2013
55-30-30 ALLOWABLE DAMAGE 1		3	Jul 10/2015	108	Jul 10/2013
101	Nov 10/2012	O 4	Jul 10/2016	109	Nov 10/2013
102	Nov 10/2012			110	BLANK

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202	Nov 10/2012	110	Nov 10/2012	18	Nov 10/2012
55-40-01 IDENTIFICATION 1		111	Nov 10/2012	19	Nov 10/2012
1	Nov 10/2012	112	Nov 10/2012	20	Nov 10/2012
O 2	Jul 10/2016	113	Nov 10/2012	21	Nov 10/2012
3	Mar 10/2015	114	Nov 10/2012	22	Nov 10/2012
4	Nov 10/2012	55-40-01 ALLOWABLE DAMAGE 2		23	Nov 10/2012
5	Nov 10/2012	101	Nov 10/2012	24	Nov 10/2012
6	Nov 10/2012	102	Nov 10/2012	25	Nov 10/2012
7	Nov 10/2012	103	Nov 10/2012	26	BLANK
8	Nov 10/2012	104	Nov 10/2012	55-40-02 IDENTIFICATION 2	
9	Nov 10/2012	55-40-01 REPAIR 1		1	Nov 10/2012
10	Nov 10/2012	201	Nov 10/2012	2	Nov 10/2012
11	Mar 10/2013	202	Nov 10/2012	O 3	Nov 10/2012
12	Nov 10/2012	203	Nov 10/2012	4	Jul 10/2016
13	Nov 10/2012	204	Nov 10/2015	5	Nov 10/2012
14	Nov 10/2012	O 205	Jul 10/2016	6	Nov 10/2012
15	Nov 10/2012	206	BLANK	7	Nov 10/2012
16	Nov 10/2012	55-40-02 IDENTIFICATION 1		8	Nov 10/2012
17	Mar 10/2013	1	Nov 10/2012	9	Nov 10/2012
18	Nov 10/2012	2	Nov 10/2012	10	Nov 10/2012
19	Mar 10/2013	3	Nov 10/2012	11	Nov 10/2012
20	Nov 10/2012	4	Nov 10/2012	12	Nov 10/2012
21	Mar 10/2013	5	Nov 10/2012	13	Nov 10/2012
22	Nov 10/2012	6	Nov 10/2012	14	Nov 10/2012
23	Mar 10/2013	7	Nov 10/2012	15	Nov 10/2012
24	BLANK	8	Nov 10/2012	16	Nov 10/2012
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101	Nov 10/2012	10	Nov 10/2012	18	Nov 10/2012
102	Nov 10/2012	11	Nov 10/2012	19	Nov 10/2012
103	Nov 10/2012	12	Nov 10/2012	20	Nov 10/2012
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105	Nov 10/2012	14	Nov 10/2012	22	Nov 10/2012
106	Nov 10/2012	15	Nov 10/2012	23	Nov 10/2012
107	Nov 10/2012	16	Nov 10/2012	24	Nov 10/2012
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26 Nov 10/2012		110 BLANK		O 205 Jul 10/2016	
55-40-02 IDENTIFICATION 3		55-40-02 REPAIR 1		206 BLANK	
1 Nov 10/2012		201 Nov 10/2012		55-40-90 IDENTIFICATION 1	
2 Nov 10/2012		202 Nov 10/2012		1 Nov 10/2012	
3 Nov 10/2012		203 Nov 10/2012		2 Nov 10/2012	
4 Nov 10/2012		204 Nov 10/2012		3 Nov 10/2012	
5 Nov 10/2012		205 Nov 10/2012		4 BLANK	
6 BLANK		206 Nov 10/2012		55-40-90 ALLOWABLE DAMAGE 1	
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101 Nov 10/2012		208 Nov 10/2012		102 Nov 10/2012	
102 Nov 10/2012		209 Nov 10/2012		103 Nov 10/2012	
103 Nov 10/2012		210 BLANK		104 Nov 10/2012	
104 Nov 10/2012		55-40-30 IDENTIFICATION 1		105 Nov 10/2012	
105 Nov 10/2012		1 Nov 10/2012		106 Nov 10/2012	
106 Nov 10/2012		2 Mar 10/2016		107 Nov 10/2012	
107 Nov 10/2012		3 Nov 10/2012		108 Nov 10/2012	
108 Nov 10/2012		4 Nov 10/2012		109 Nov 10/2012	
109 Nov 10/2012		5 Nov 10/2012		110 BLANK	
110 BLANK		55-40-90 REPAIR 1		201 Nov 10/2012	
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101 Nov 10/2012		7 Nov 10/2012			
102 Nov 10/2012		8 Nov 10/2012			
103 Nov 10/2012		9 Nov 10/2012			
104 Nov 10/2012		10 BLANK			
105 Nov 10/2012		55-40-30 ALLOWABLE DAMAGE 1			
106 Nov 10/2012		101 Nov 10/2012			
55-40-02 ALLOWABLE DAMAGE 3		102 Nov 10/2012			
101 Nov 10/2012		103 Nov 10/2012			
102 Nov 10/2012		104 Nov 10/2012			
103 Nov 10/2012		105 Nov 10/2012			
104 Nov 10/2012		106 BLANK			
105 Nov 10/2012		55-40-30 REPAIR 1			
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ALLOWABLE DAMAGE 2 - Rudder Balance Arm Skin			
REPAIR 1 - Rudder Skin			
RUDDER STRUCTURE			55-40-02
IDENTIFICATION 1 - Rudder Rib Structure			
IDENTIFICATION 2 - Rudder Spar Rib Structure			
IDENTIFICATION 3 - Rudder Balance Arm Structure			
ALLOWABLE DAMAGE 1 - Rudder Spar and Spar Ribs			
ALLOWABLE DAMAGE 2 - Leading Edge Ribs of the Rudder Structure			
ALLOWABLE DAMAGE 3 - Rudder Balance Arm Structure			
REPAIR 1 - Rudder Structure			
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IDENTIFICATION 1 - Rudder Tip Fairing Skins			
ALLOWABLE DAMAGE 1 - Rudder Tip Fairing Skins			
REPAIR 1 - Rudder Tip Fairing Skins			

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**CHAPTER 55
STABILIZERS**

SUBJECT

RUDDER FITTINGS

IDENTIFICATION 1 - Rudder Hinge Fittings

ALLOWABLE DAMAGE 1 - Rudder Hinge Fittings

REPAIR 1 - Rudder Hinge Fittings

**CHAPTER
SECTION
SUBJECT**

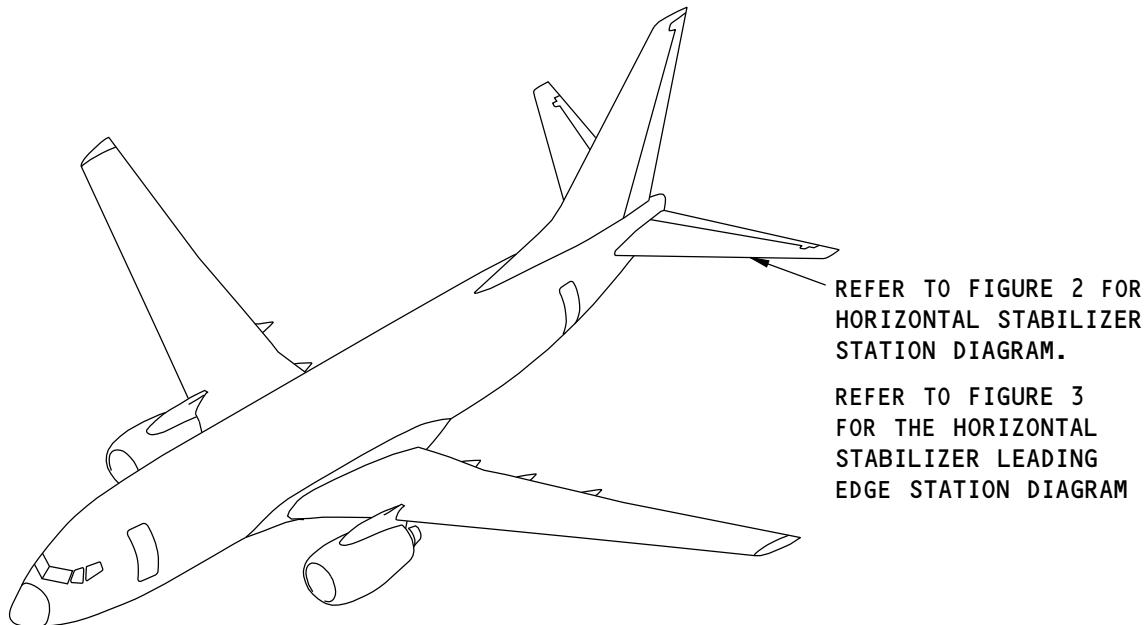
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IDENTIFICATION GENERAL - HORIZONTAL STABILIZER STATION DIAGRAM



F82990 S0006592396_V1

Horizontal Stabilizer Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
180A1540	Horizontal Tail Centerline Diagram

55-10-00

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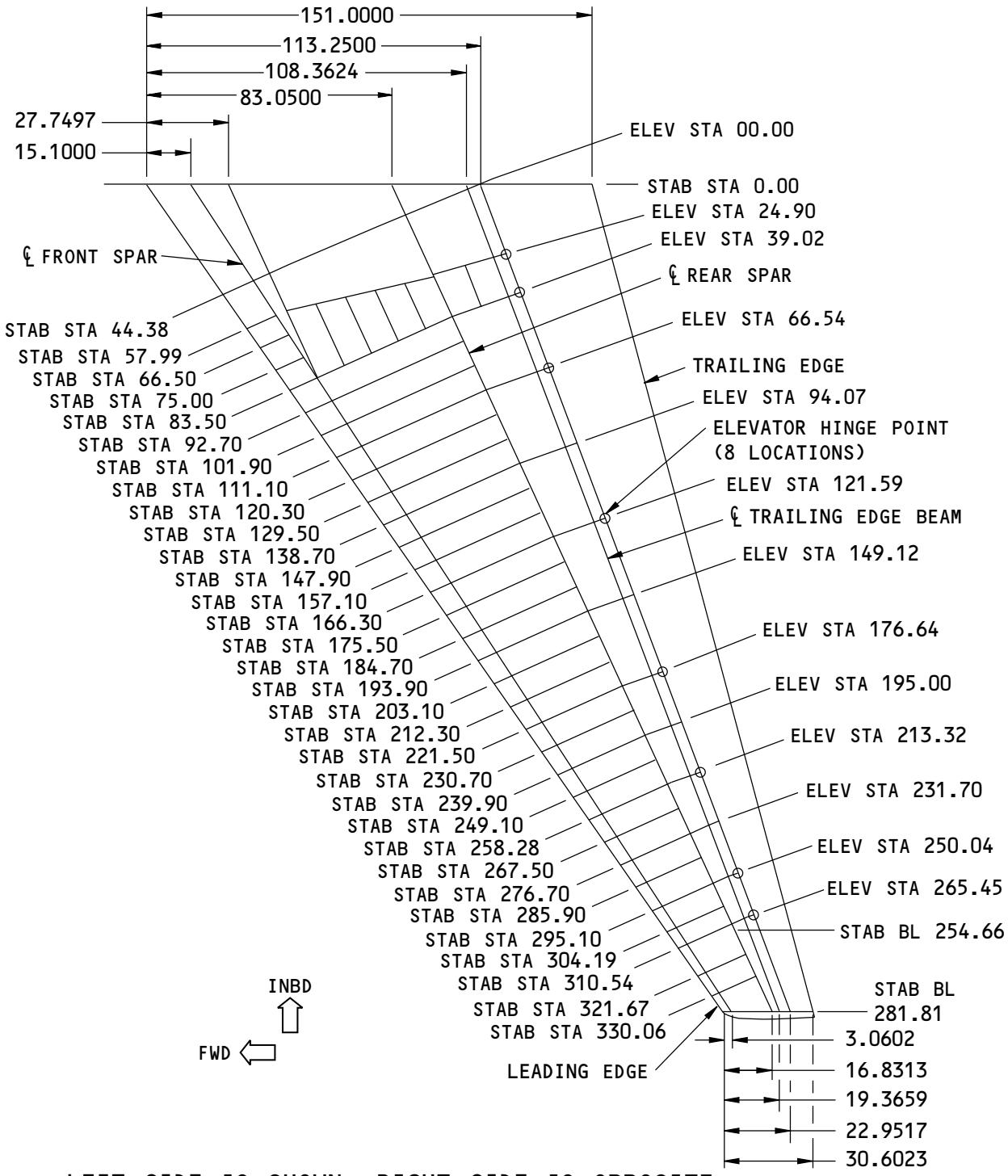
Nov 10/2012

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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F80454 S0006592398_V2

Horizontal Stabilizer Station Diagram
Figure 2

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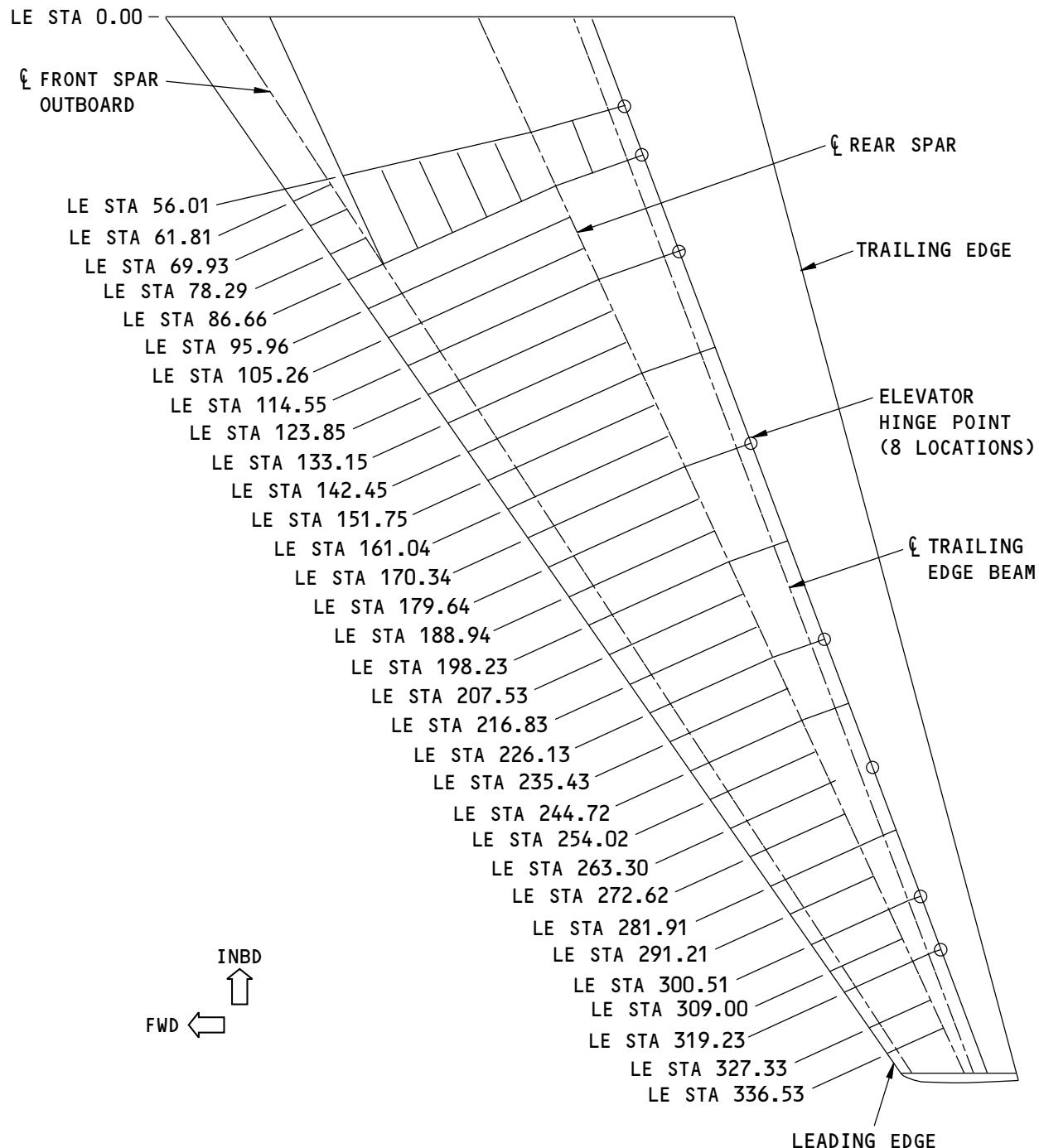
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F80462 S0006592399_V1

Horizontal Stabilizer Leading Edge Station Diagram
Figure 3

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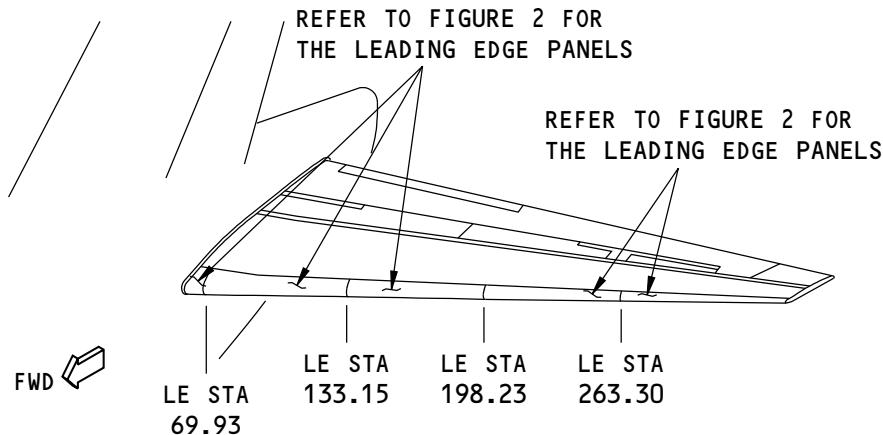
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IDENTIFICATION 1 - HORIZONTAL STABILIZER LEADING EDGE SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

UPPER SURFACE IS SHOWN

F57186 S0006592403_V1

Horizontal Stabilizer Leading Edge Skin Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
186A1001	Leading Edge Assembly/Installation - REM, Horizontal Stabilizer
186A1200	Skin Assembly - REM LE, Horizontal Stabilizer
186A2001	LE Installation - Fixed, Horizontal Stabilizer

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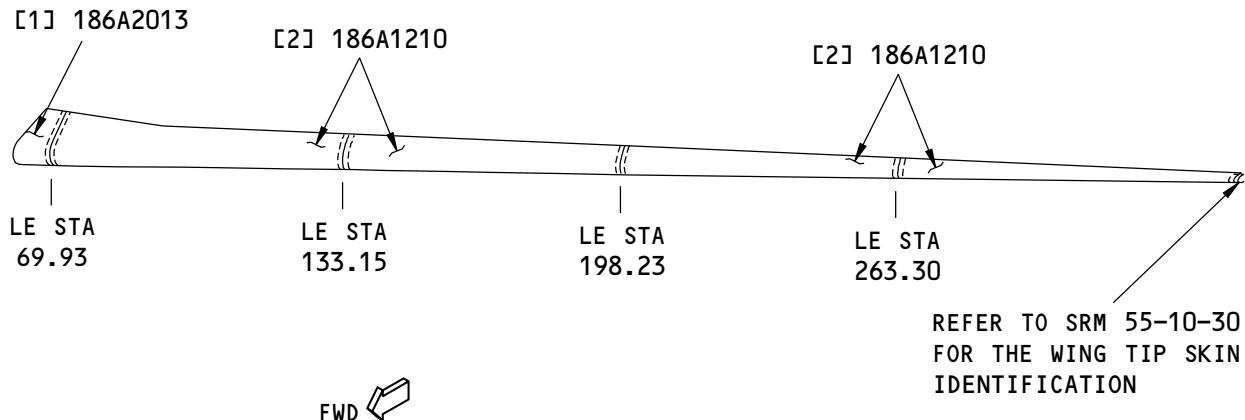
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F57215 S0006592405_V1

Horizontal Stabilizer Leading Edge Skin Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Fixed LE Panel Skin	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the different chem-mill thicknesses	
[2]	Removable LE Panel Skin	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-205/5. Refer to Figure 4 for the different chem-mill thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

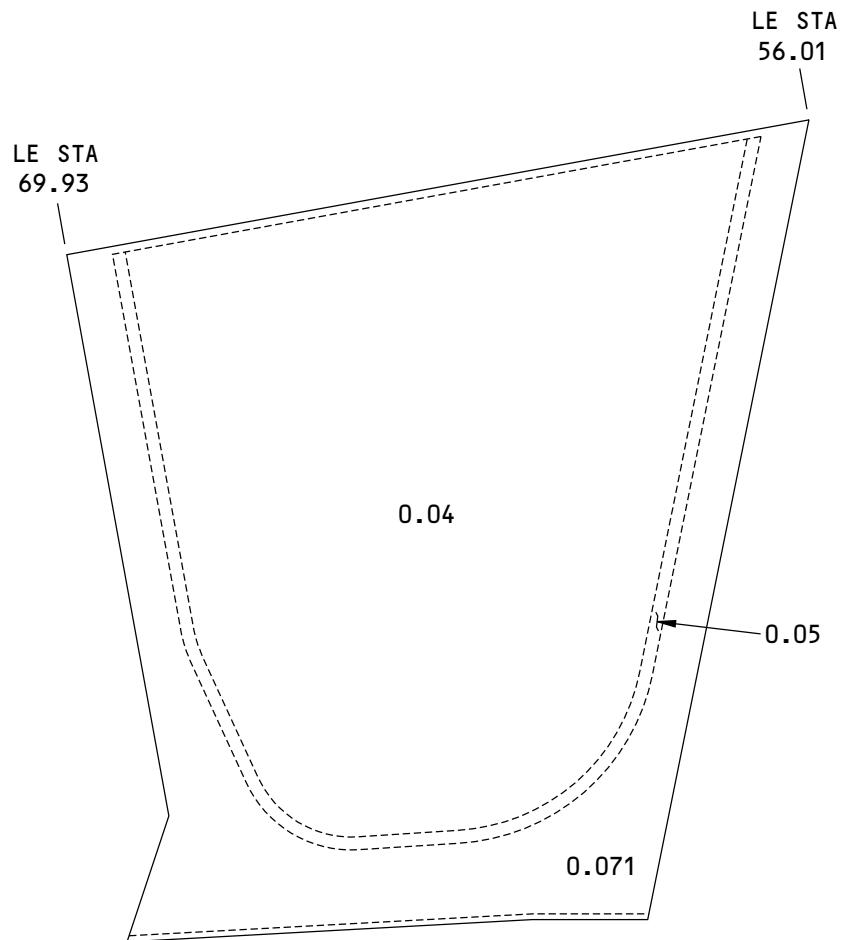
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F57314 S0006592407_V1

Chem-Milled Areas of Figure 2, Item [1]
Figure 3

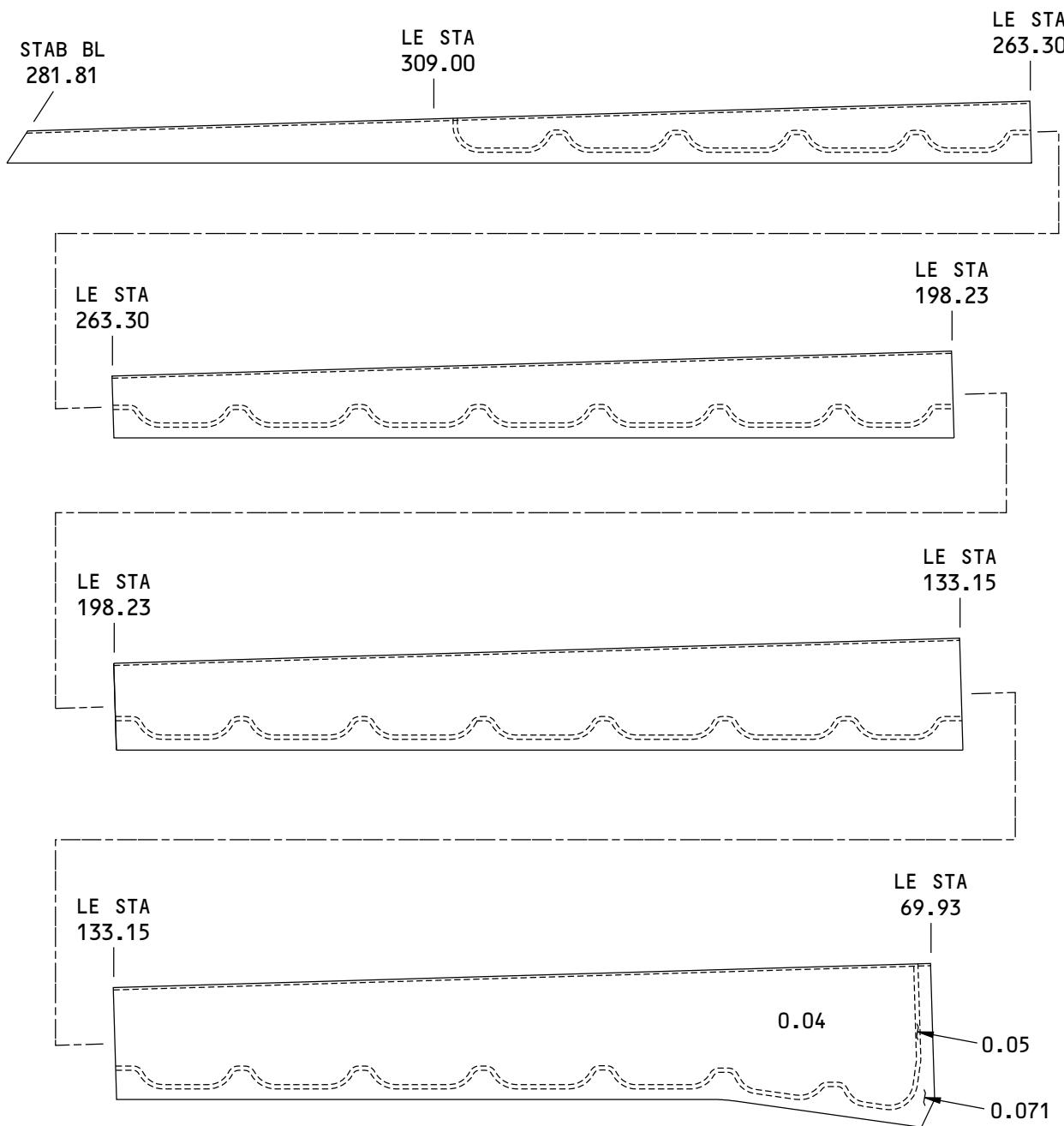
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F57503 S0006592408_V1

Chem-Milled Areas of Figure 2, Item [2]
Figure 4

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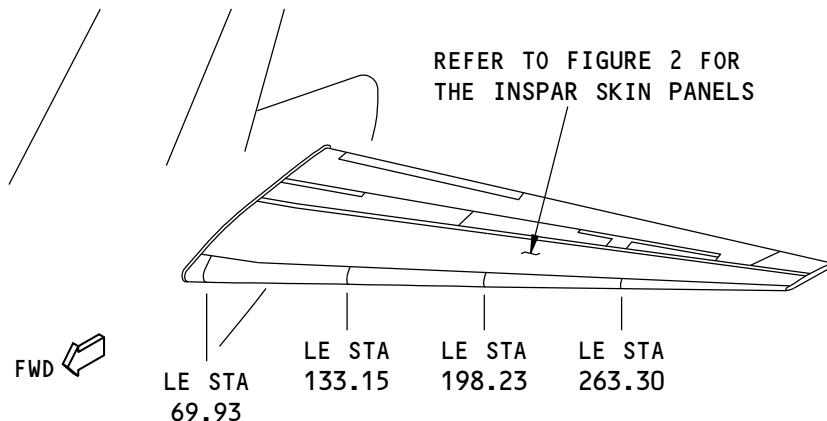
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IDENTIFICATION 2 - HORIZONTAL STABILIZER UPPER INSPAR SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

F57227 S0006592410_V1

Horizontal Stabilizer Upper Inspark Skin Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
182A3001	Skin, Upper-Inspark, Horizontal Stabilizer Installation

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IDENTIFICATION 2

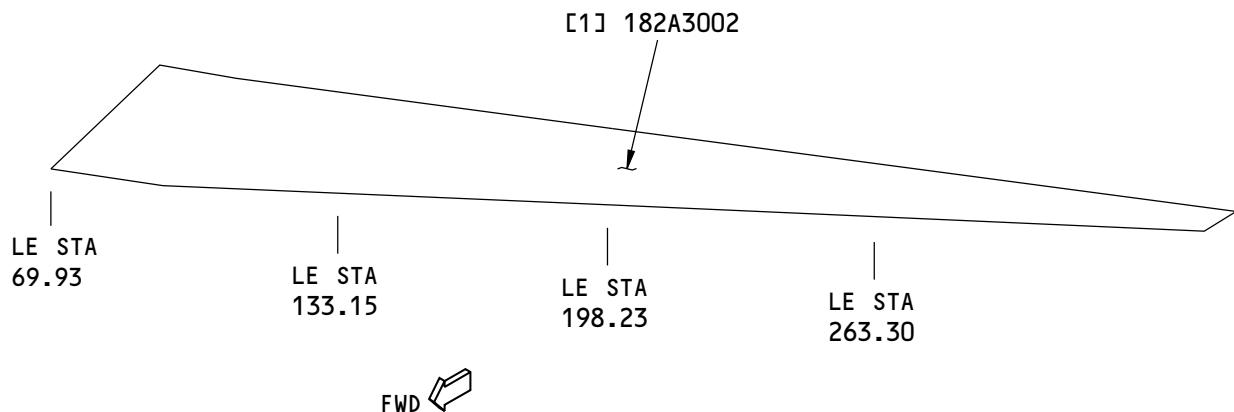
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

F57406 S0006592412_V1

Horizontal Stabilizer Upper Inspark Skin Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T*[1]	MATERIAL	EFFECTIVITY
[1]	Inspark Skin - Upper Panel	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the different chem-mill thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches.

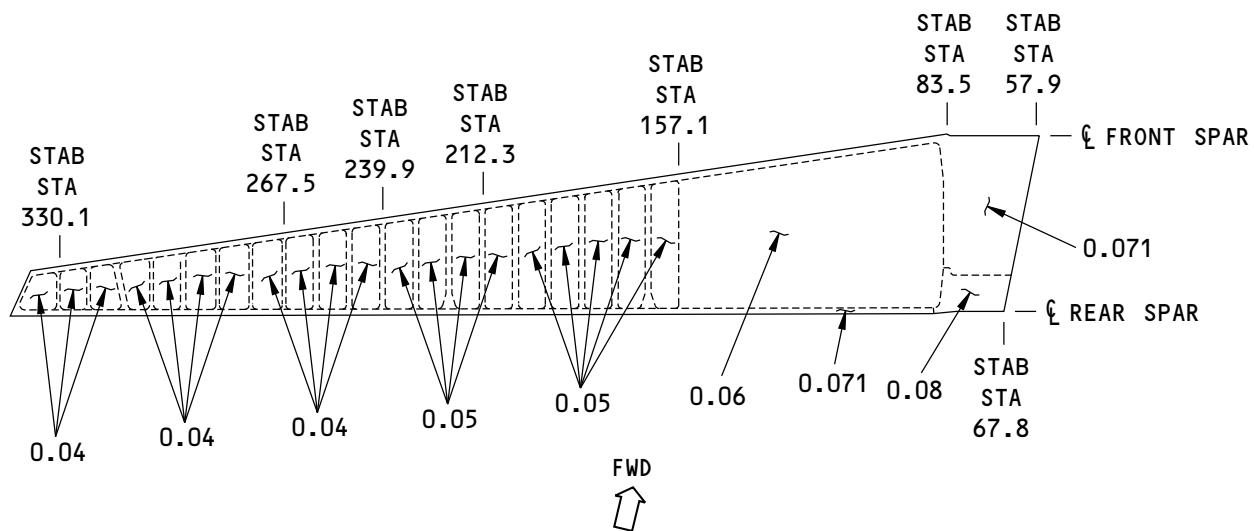
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F57282 S0006592414_V1

Chem-Milled Areas of Figure 2, Item [1]
Figure 3

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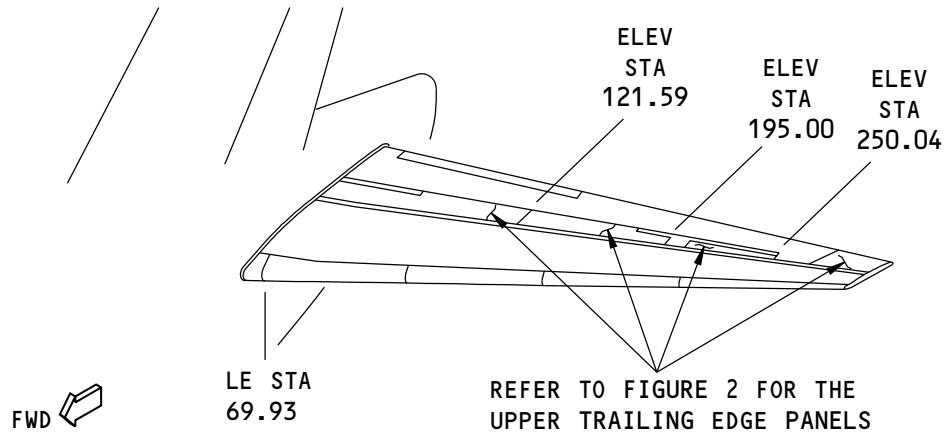
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IDENTIFICATION 3 - UPPER PANEL ASSEMBLY - HORIZONTAL STABILIZER TRAILING EDGE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

Horizontal Stabilizer Upper Trailing Edge Panel Locations

Figure 1

Table 1:

F57528 S0006592416_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
185A1700	Panel Installation - Trailing Edge, Horizontal Stabilizer
185A1800	Panel Installation - Outboard Trailing Edge, Horizontal Stabilizer

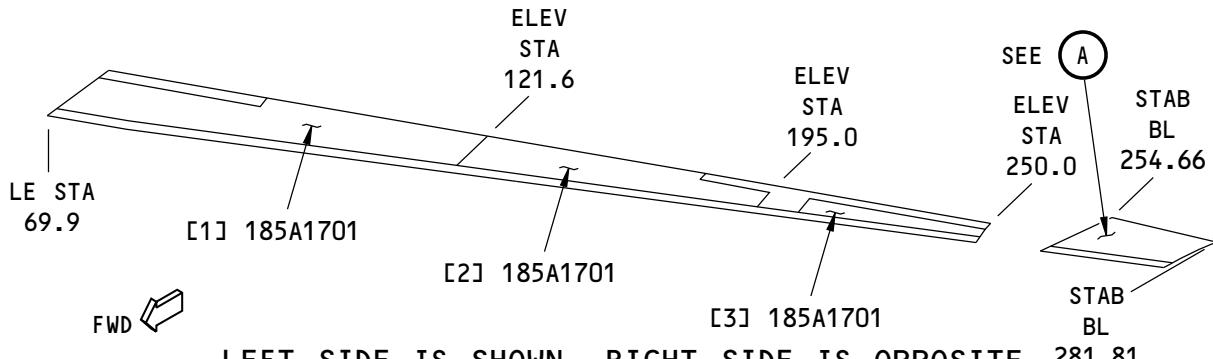
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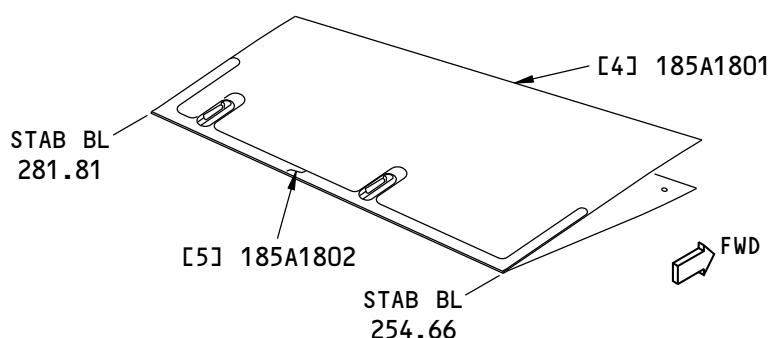
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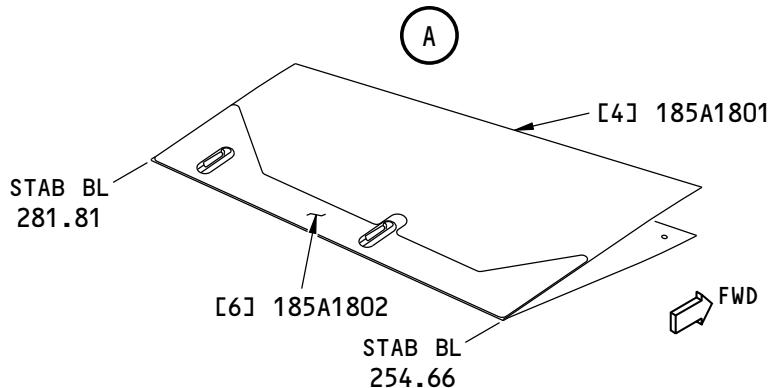
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UPPER SURFACE IS SHOWN



(FOR AIRPLANE LINE NUMBERS 1 THROUGH 2273
WITHOUT SB 737-55-1089 INCORPORATED)



(FOR AIRPLANE LINE NUMBERS 1 THROUGH 2273
WITH SB 737-55-1089 INCORPORATED, AND
AIRPLANES WITH LINE NUMBERS 2274 AND ON.)

A

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F57532 S0006592418_V3

Horizontal Stabilizer Upper Trailing Edge Panel Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Panel - Bonded Part	0.400 (10.16)	Glass Fiber Reinforced Plastic (GFRP) and Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich Refer to Figure 3.	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[2]	Upper Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 4.	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[3]	Upper Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 5.	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[4]	Upper Panel - Bonded Assembly	0.400 (10.16)	(GFRP) and (CFRP) honeycomb sandwich. Refer to Figure 6.	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[5]	Conductive Strip	0.032 (0.813)	6061-T4 sheet as given in QQ-A-250/11	For airplane Line Numbers 1 through 2273, and airplanes without SB 737-55-1089 incorporated
[6]	Conductive Strip	0.032 (0.813)	6061-T6 sheet as given in QQ-A-250/11	For airplane Line Numbers 2274 and on, and airplanes with SB 737-55-1089 incorporated

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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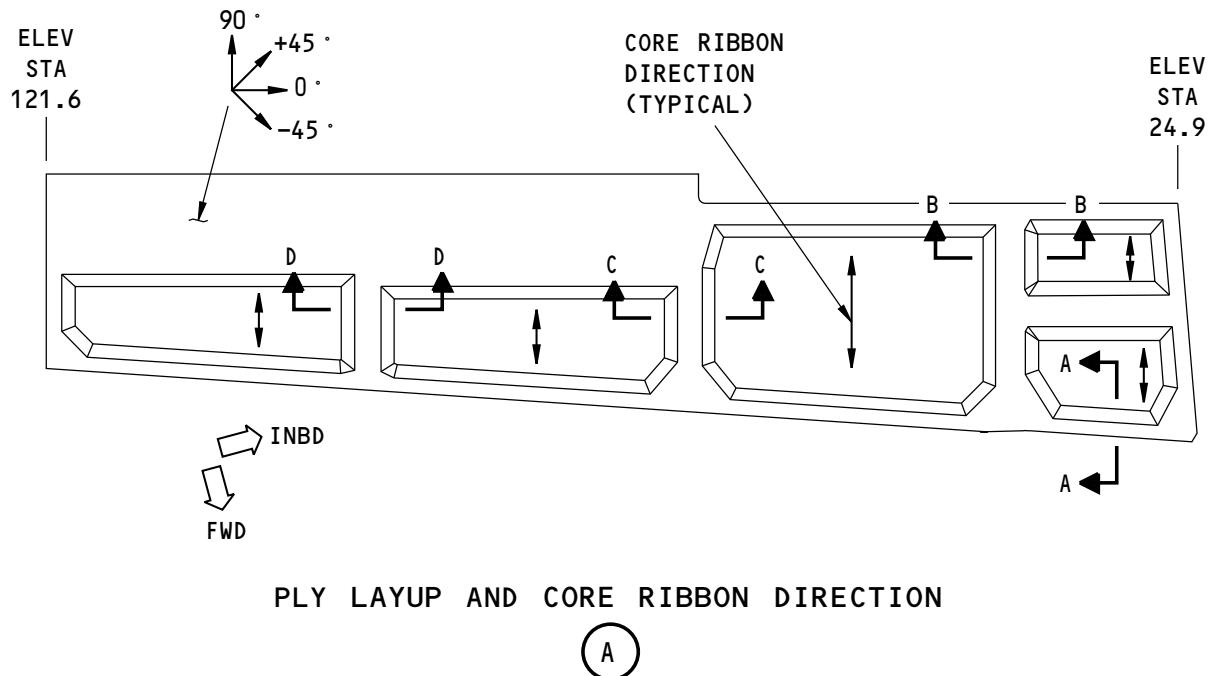
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A, B-B, C-C, AND D-D FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F58138 S0006592420_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [1]
Figure 3 (Sheet 1 of 3)

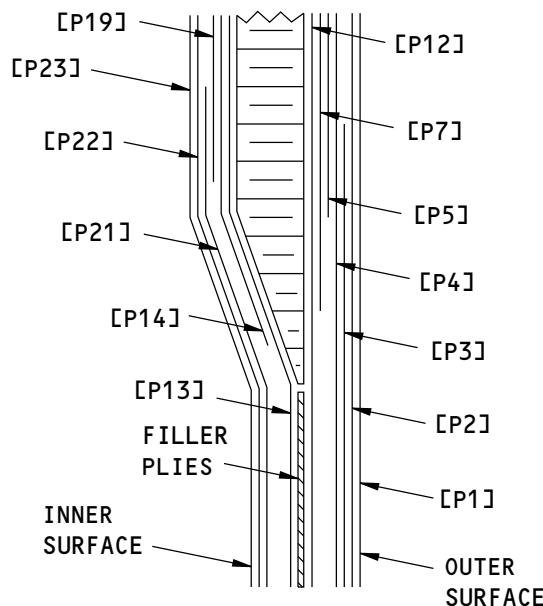
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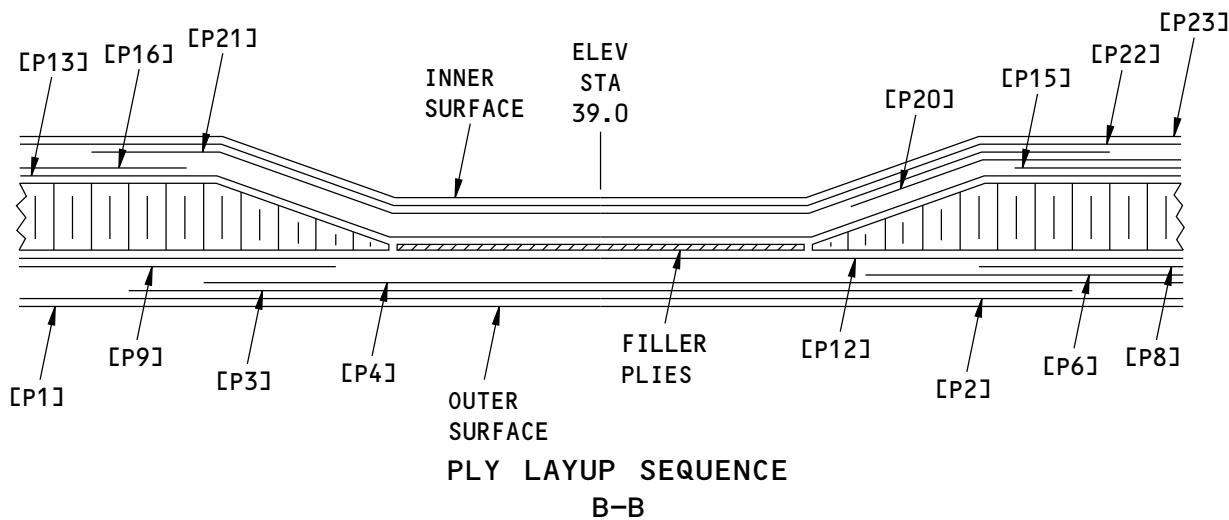
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PLY LAYUP SEQUENCE
A-A



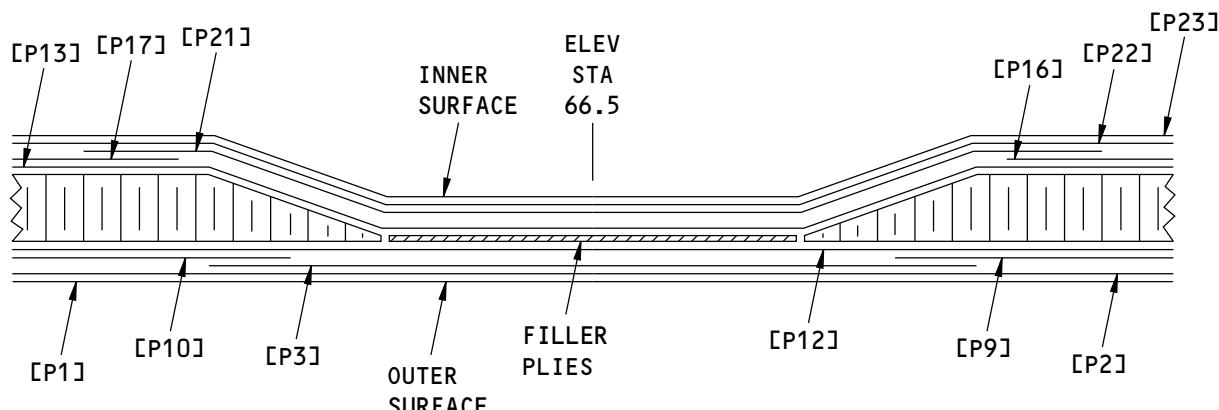
F57965 S0006592421_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [1]
Figure 3 (Sheet 2 of 3)

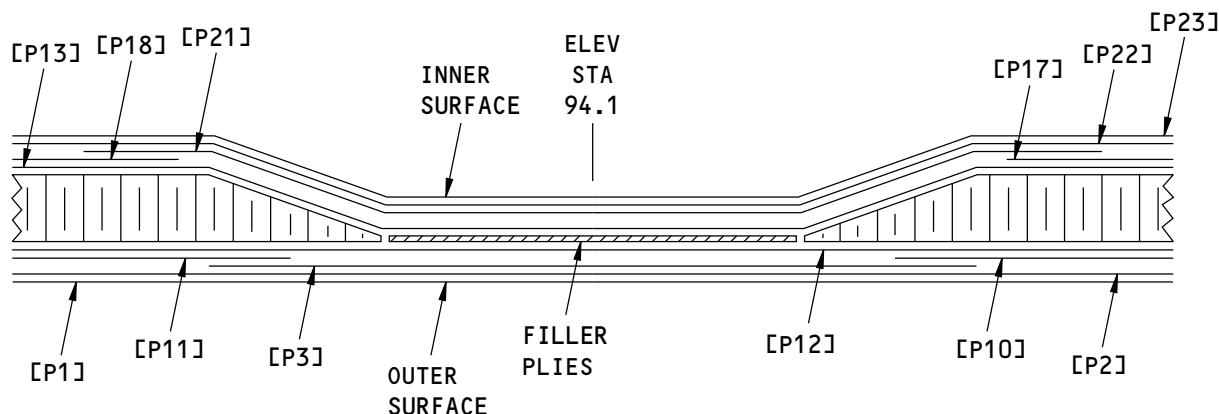
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PLY LAYUP SEQUENCE
C-C



PLY LAYUP SEQUENCE
D-D

F57933 S0006592422_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1	-----	Surfacing film as given in BMS 8-341, Type II (METALBOND 1515-3M film adhesive) (Optional: Surfacing film as given in BMS 8-341, Type III (SYNSKIN HC9837.1 composite surfacing film)) (Optional: Toolside surface treatment)
P2, P22	+ or - 45 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P4, P12, P13, P21	0 or 90 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P5, P6, P19, P20	0 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P7, P8, P9, P10, P11, P14, P15, P16, P17, P18	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P23	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film

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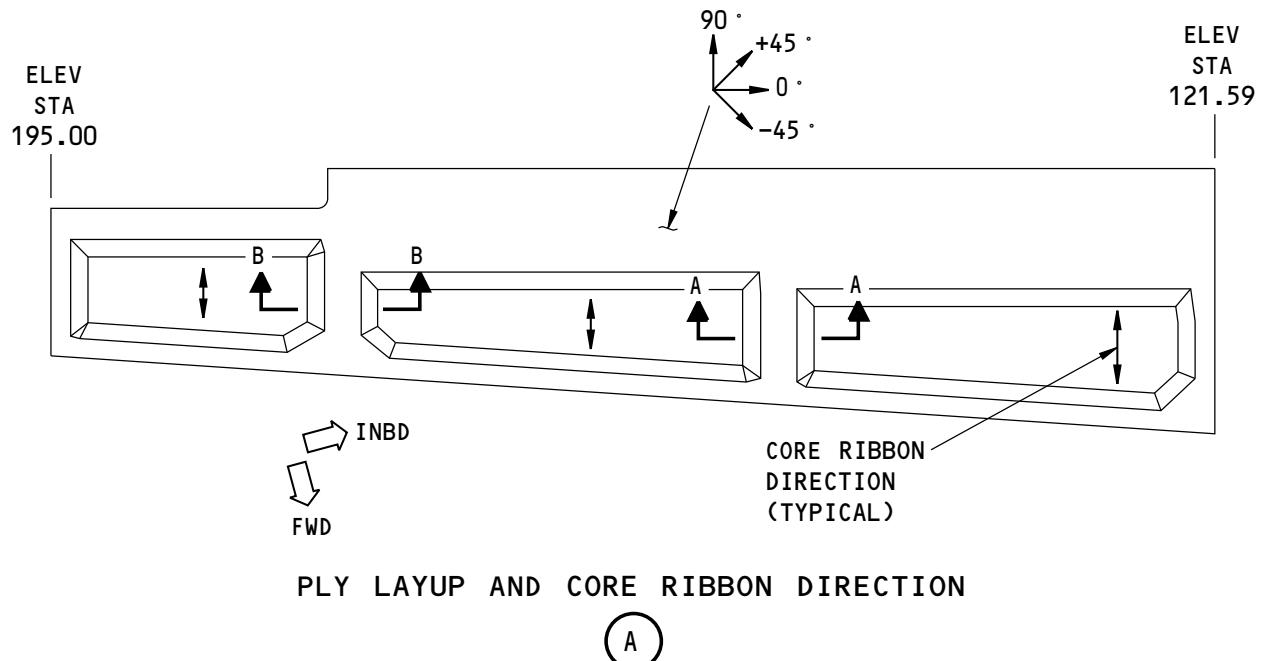
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

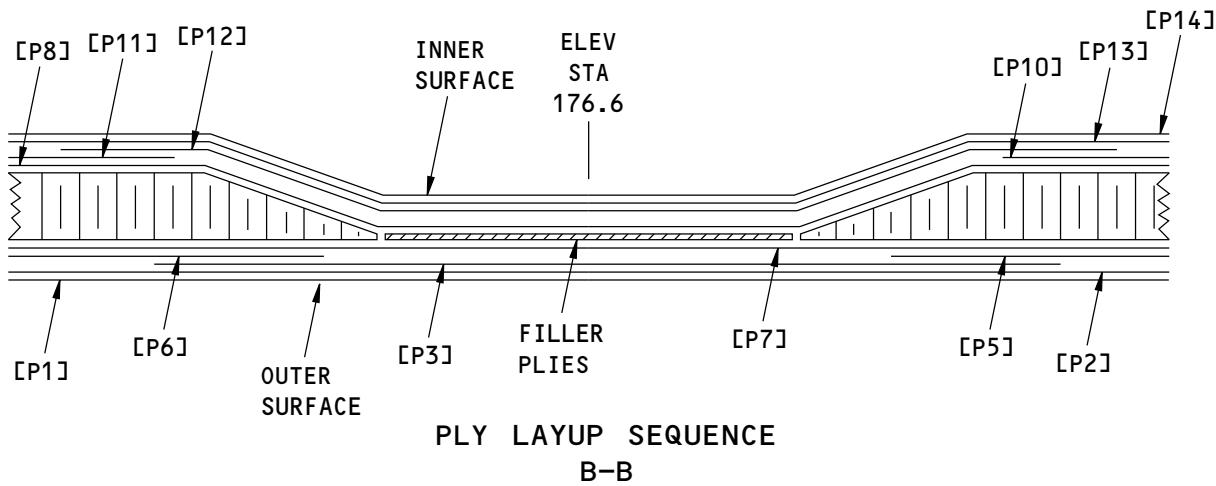
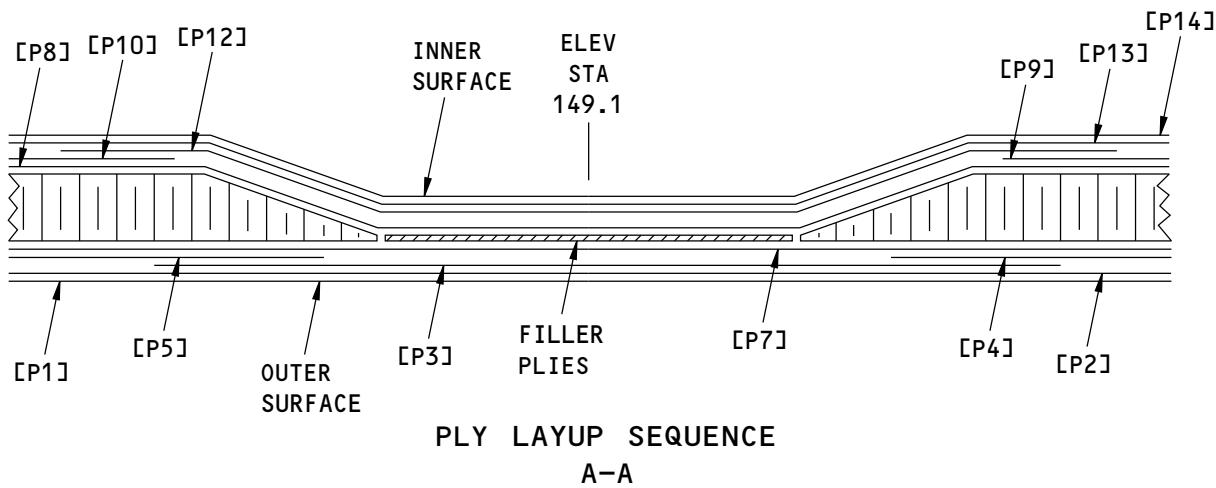
F58658 S0006592424_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [2]
Figure 4 (Sheet 1 of 2)

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F57993 S0006592425_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [2]
Figure 4 (Sheet 2 of 2)

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, Item [2]		
PLY	DIRECTION	MATERIAL
P1	-----	Surfacing film as given in BMS 8-341, Type II (METALBOND 1515-3M film adhesive) (Optional: Surfacing film as given in BMS 8-341, Type III (SYNSKIN HC9837.1 composite surfacing film)) (Optional: Toolside surface treatment)
P2, P13	+ or - 45 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P7, P8, P12	0 or 90 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P4, P5, P6, P9, P10, P11	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P14	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film

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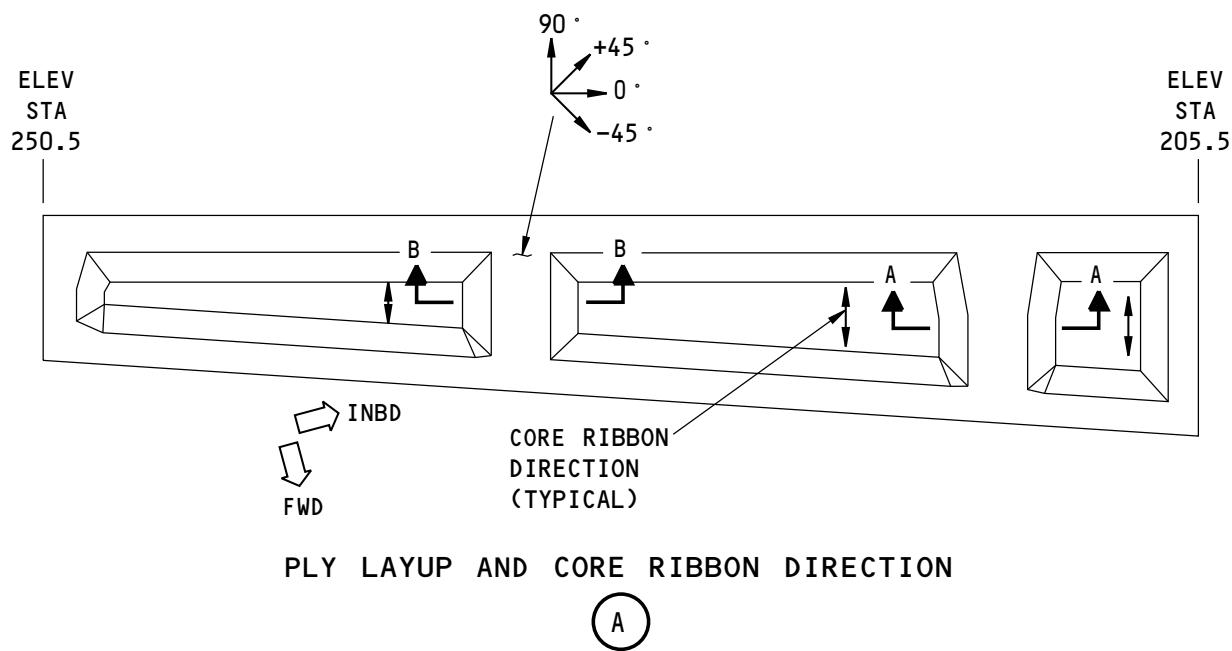
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F58690 S0006592427_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [3]
Figure 5 (Sheet 1 of 2)

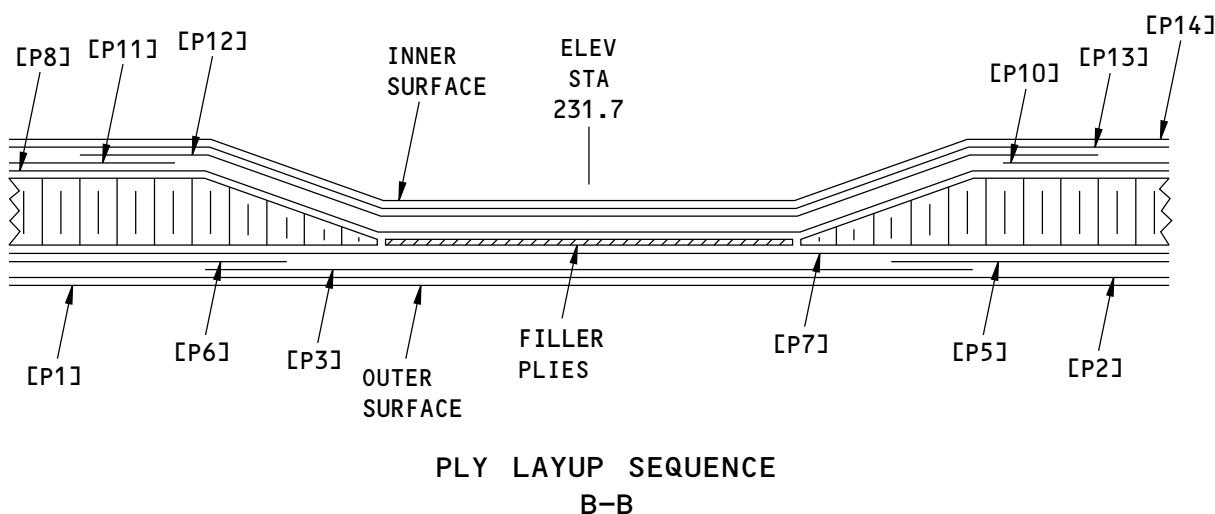
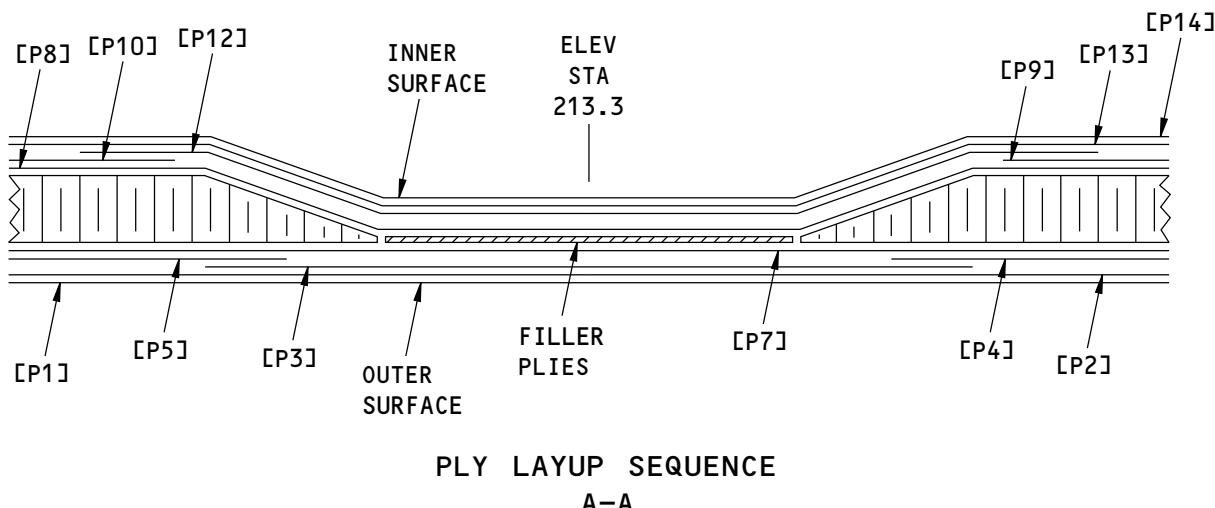
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F57729 S0006592428_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [3]
Figure 5 (Sheet 2 of 2)

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, Item [3]		
PLY	DIRECTION	MATERIAL
P1	-----	Surfacing film as given in BMS 8-341, Type II (METALBOND 1515-3M film adhesive) (Optional: Surfacing film as given in BMS 8-341, Type III (SYNSKIN HC9837.1 composite surfacing film)) (Optional: Toolside surface treatment)
P2, P13	+ or - 45 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P7, P8, P12	0 or 90 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P4, P5, P6, P9, P10, P11	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P14	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film

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IDENTIFICATION 3

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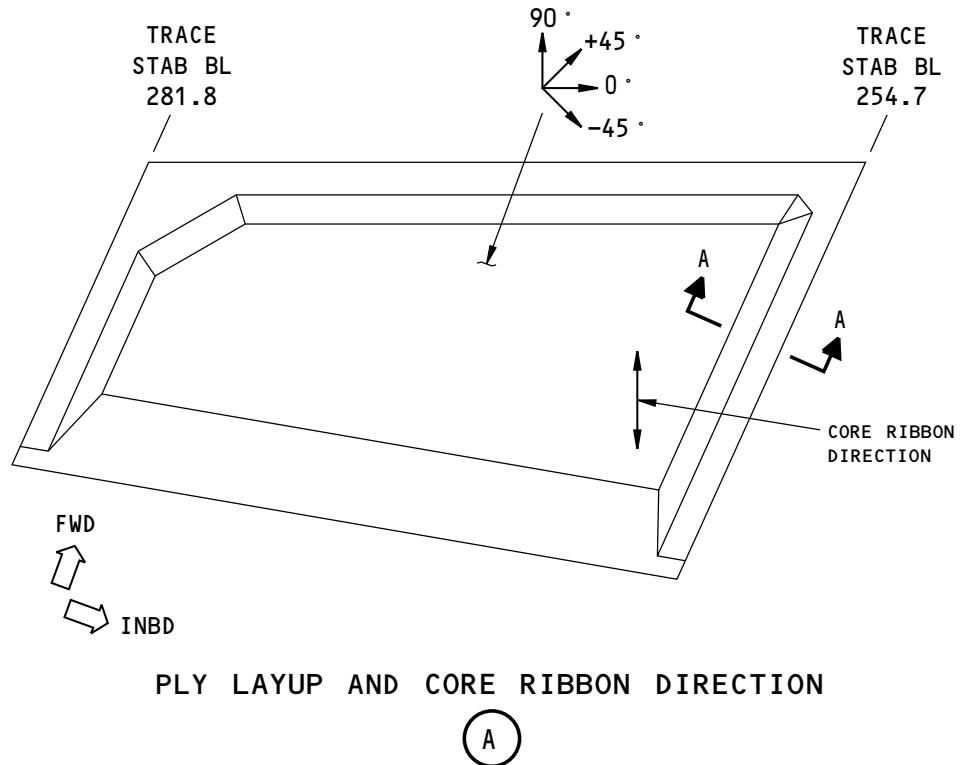
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F58838 S0006592430_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [4]
Figure 6 (Sheet 1 of 2)

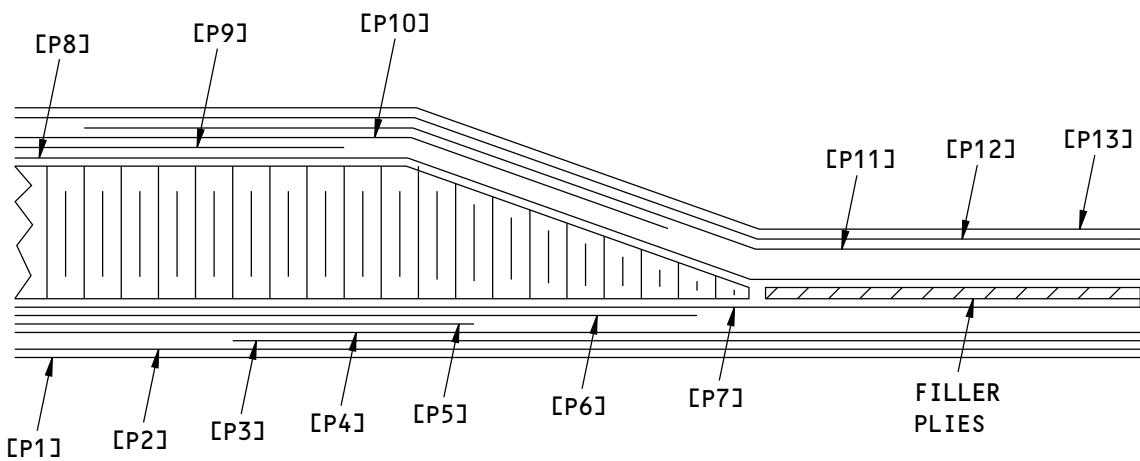
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PLY LAYUP SEQUENCE
A-A

F57669 S0006592431_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [4]
Figure 6 (Sheet 2 of 2)

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, Item [4]		
PLY	DIRECTION	MATERIAL
P1	-----	Surfacing film as given in BMS 8-341, Type II (METALBOND 1515-3M film adhesive) (Optional: Surfacing film as given in BMS 8-341, Type III (SYNSKIN HC9837.1 composite surfacing film)) (Optional: Toolside surface treatment)
P2, P12	+ or - 45 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P4, P7, P8, P11	0 or 90 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P5, P10	0 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P6, P9	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P13	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film

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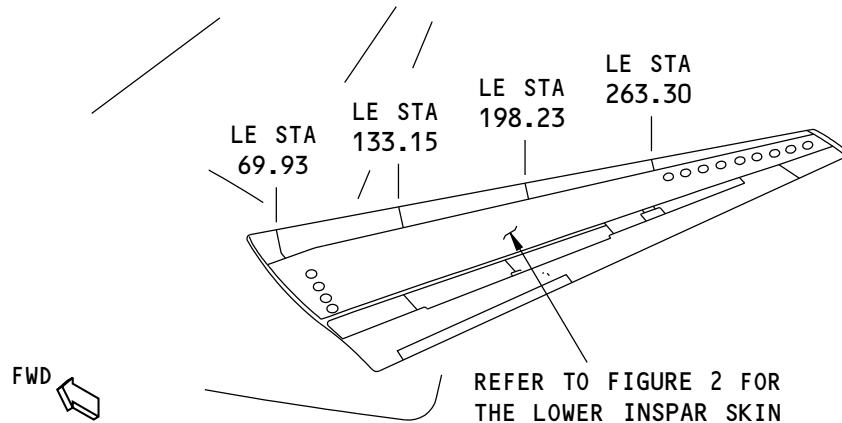
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IDENTIFICATION 4 - HORIZONTAL STABILIZER LOWER INSPAR SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

**LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN**

F58856 S0006592434_V1

Horizontal Stabilizer Lower Inspark Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
182A4001	Skin, Lower - Inspark, Horizontal Stabilizer Installation

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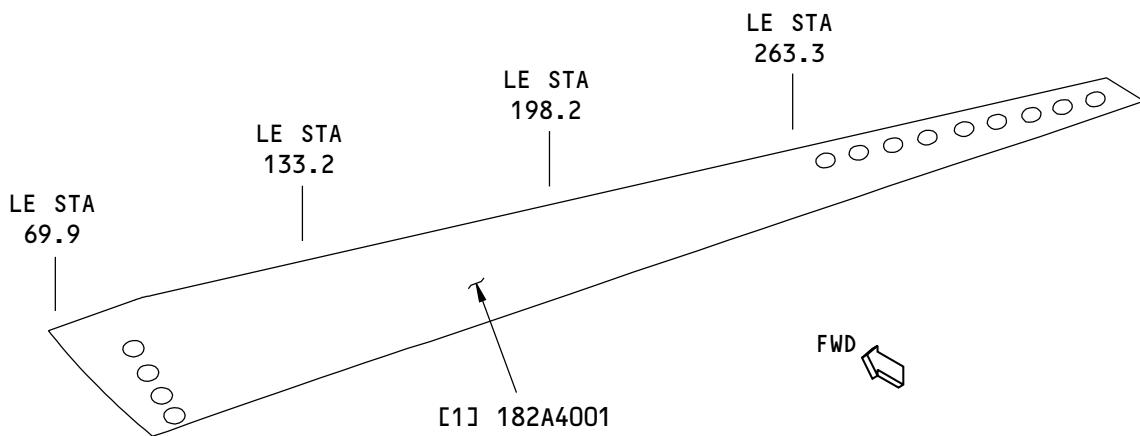
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE OF THE LOWER PANEL IS SHOWN

F58885 S0006592436_V3

Horizontal Stabilizer Lower Inspar Skin Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Lower Skin assembly Inspar Skin - Lower Panel	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the different chem-mill thicknesses	For airplane line numbers 1 through 3623, and airplanes without SB 737-55-1096 incorporated.
	Doubler (2)	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (2)	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (5)	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (3)	0.180 (4.57)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler	0.625 (15.88)	7075-T7351 plate as given in QQ-A-250/12	
[1]	Lower Skin assembly Inspar Skin - Lower Panel (Between STAB STA 57.9 and STAB STA 83.5 and between STAB STA 184.7 and STAB BL 281.8)	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the different chem-mill thicknesses	For airplane line numbers 1 through 3623 with SB 737-55-1096 incorporated
	Lower Skin assembly Inspar Skin - Lower Panel (Between STAB STA 83.5 and STAB STA 184.7)	0.112 (2.845)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the different chem-mill thicknesses	
	Doubler (2)	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (2)	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (5)	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (3)	0.180 (4.57)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler	0.625 (15.88)	7075-T7351 plate as given in QQ-A-250/12	
	Doubler, Splice (2)	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler, Spar (4)	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5	
	Filler (4)	0.040 (1.02)	2024-T3 clad sheet as given in QQ-A-250/5	
[1]	Lower Inspar - Skin Assembly			For airplane line numbers 3624 and on
	Lower and Doubler - Inspar, Skin	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the different chem-mill thicknesses	
	Doubler (2)	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (2)	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (5)	0.080 (2.03)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler (3)	0.180 (4.57)	2024-T3 clad sheet as given in QQ-A-250/5	
	Doubler	0.625 (15.88)	7075-T7351 plate as given in QQ-A-250/12	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 4

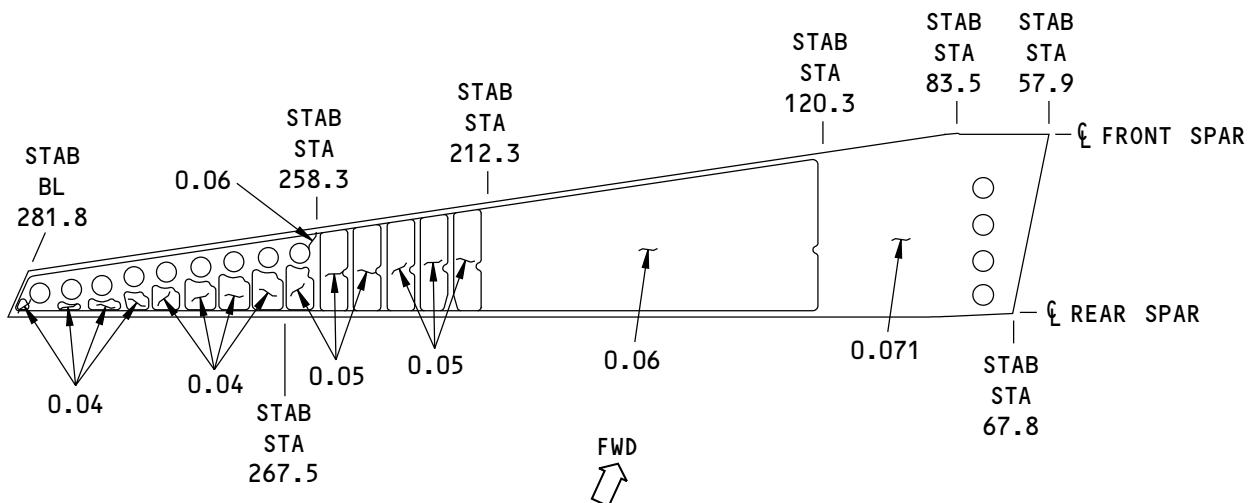
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)
(VIEW IN THE DOWN DIRECTION)
(FOR AIRPLANE LINE NUMBERS 1 THRU 3623)

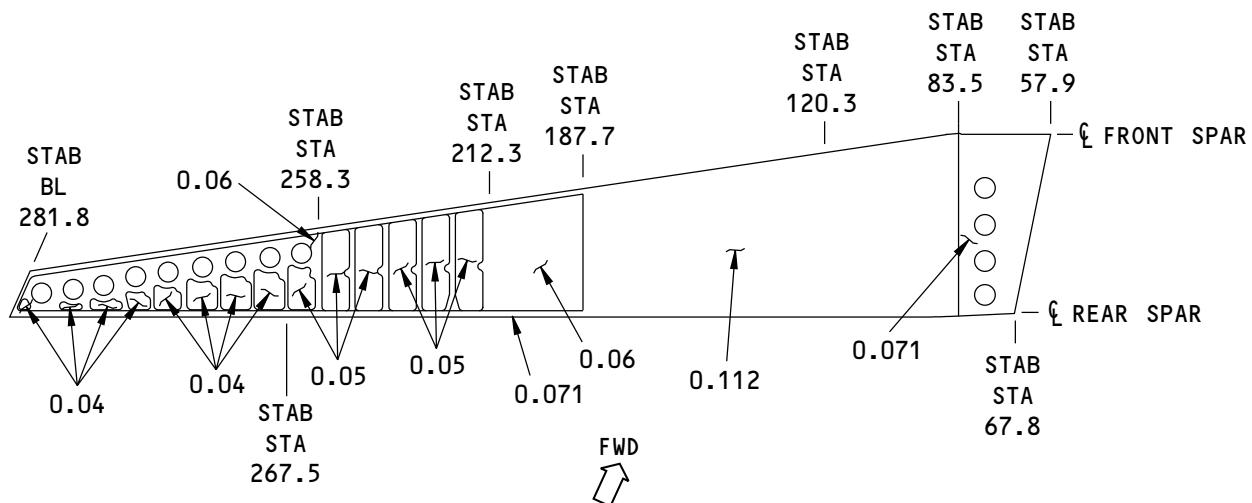
F58971 S0006592438_V3

Chem-Milled Areas of Figure 2, Item [1]
Figure 3 (Sheet 1 of 3)

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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)

(VIEW IN THE DOWN DIRECTION)

(FOR AIRPLANE LINE NUMBERS 1 THRU 3623
THAT HAVE INCORPORATED SB 737-55-1096)

(SOME STRUCTURES NOT SHOWN FOR CLARITY)

2428572 S0000561940_V1

Chem-Milled Areas of Figure 2, Item [1]
Figure 3 (Sheet 2 of 3)

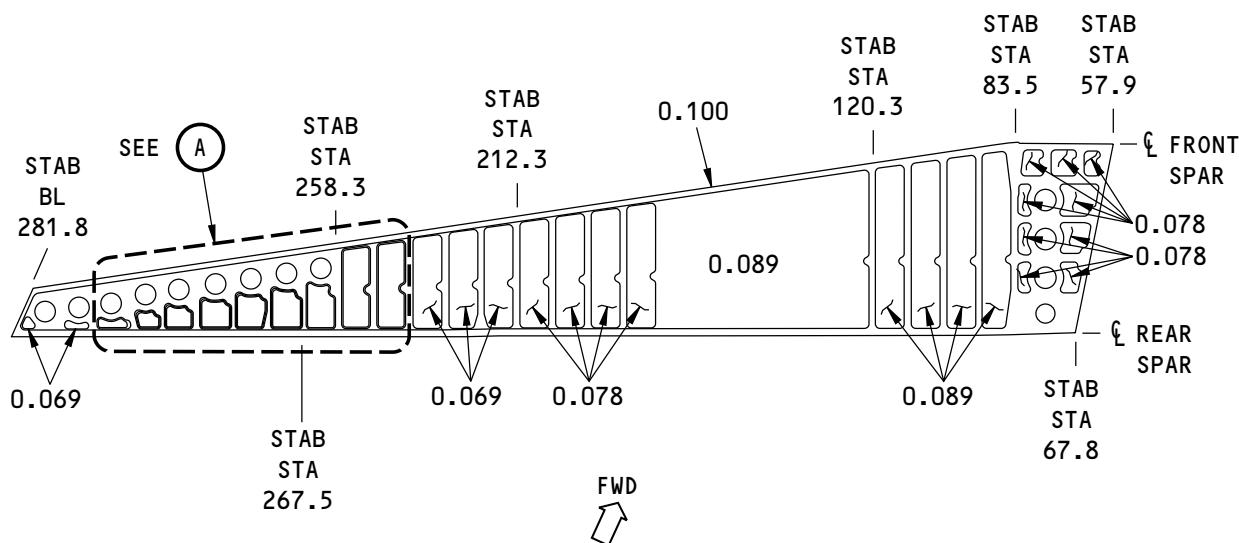
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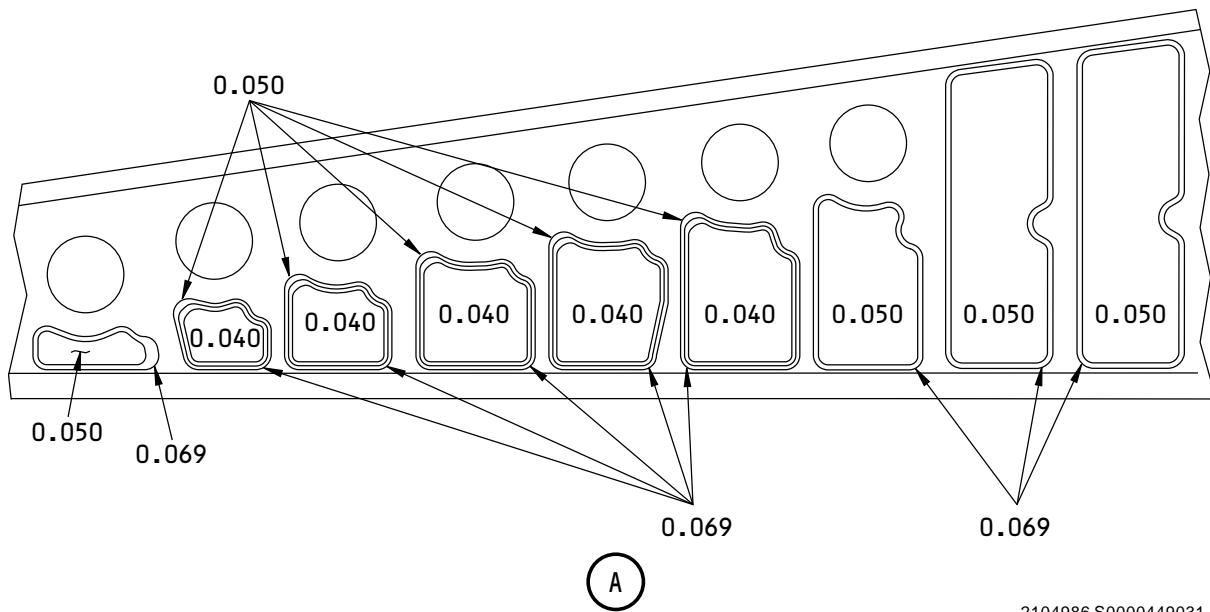
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)

(VIEW IS IN THE DOWN DIRECTION)

(FOR AIRPLANE LINE NUMBERS 3624 AND ON)



2104986 S0000449031_V1

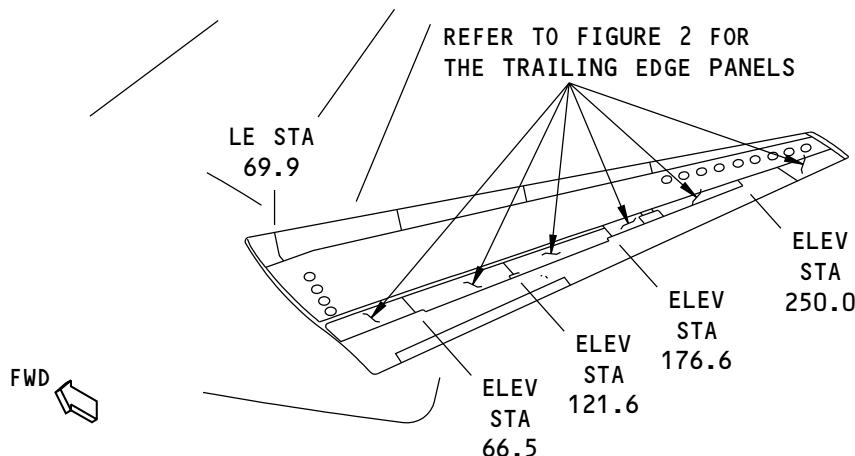
Chem-Milled Areas of Figure 2, Item [1]
Figure 3 (Sheet 3 of 3)

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IDENTIFICATION 5 - LOWER PANEL ASSEMBLY - HORIZONTAL STABILIZER TRAILING EDGE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

LOWER SURFACE IS SHOWN

Horizontal Stabilizer Lower Trailing Edge Panel Location

Figure 1

Table 1:

F59345 S0000132363_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
185A1700	Panel Installation - Trailing Edge, Horizontal Stabilizer
185A1711	Panel Installation - Trailing Edge, Horizontal Stabilizer Rework
185A1800	Panel Installation - Outboard Trailing Edge, Horizontal Stabilizer

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IDENTIFICATION 5

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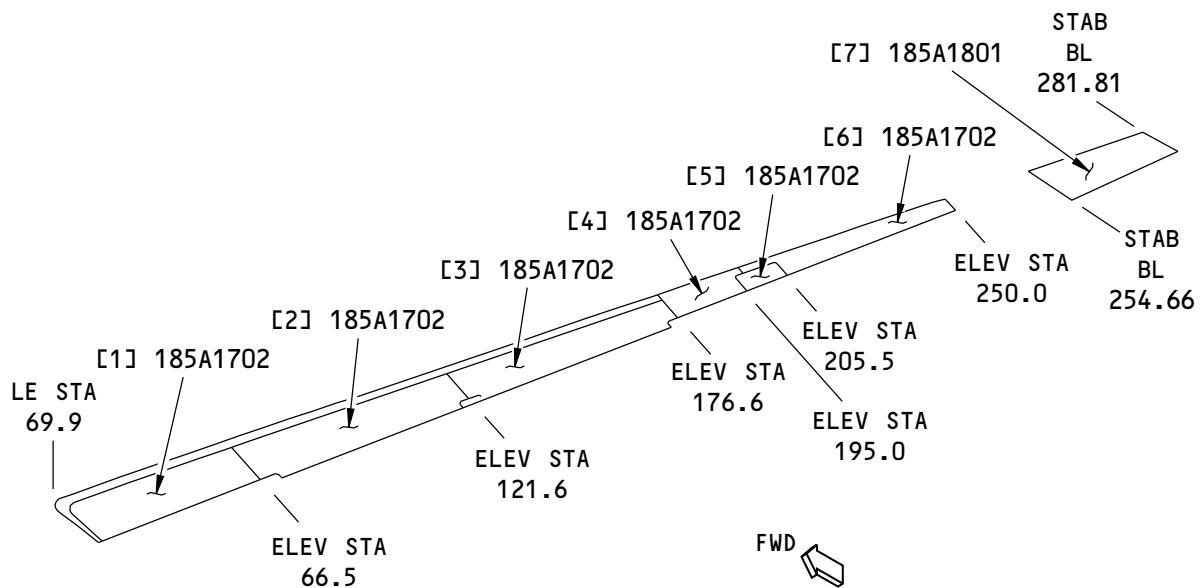
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN

F59359 S0006592442_V2

Horizontal Stabilizer Lower Trailing Edge Panel Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Lower Panel - Bonded Part	0.400 (10.16)	Glass Fiber Reinforced Plastic (GFRP) and Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich Refer to Figure 3	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[2]	Lower Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 4	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[3]	Lower Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 5	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[4]	Lower Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 6	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[5]	Lower Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 7	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[6]	Lower Panel - Bonded Part	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 8	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			
[7]	Lower Outboard Trailing Edge Panel - Bonded Assembly	0.400 (10.16)	GFRP and CFRP honeycomb sandwich Refer to Figure 9	
	Skin		Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
	Core			

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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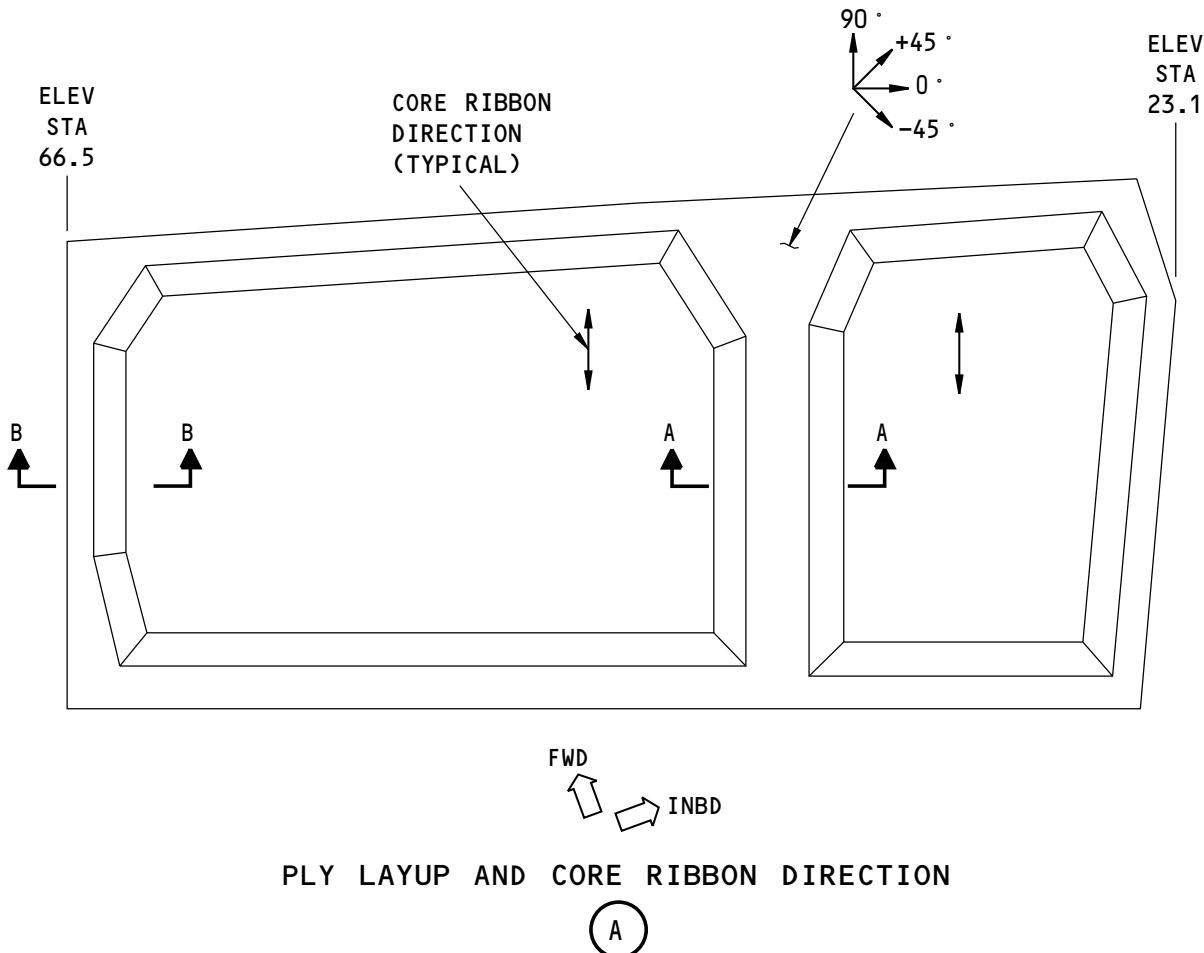
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

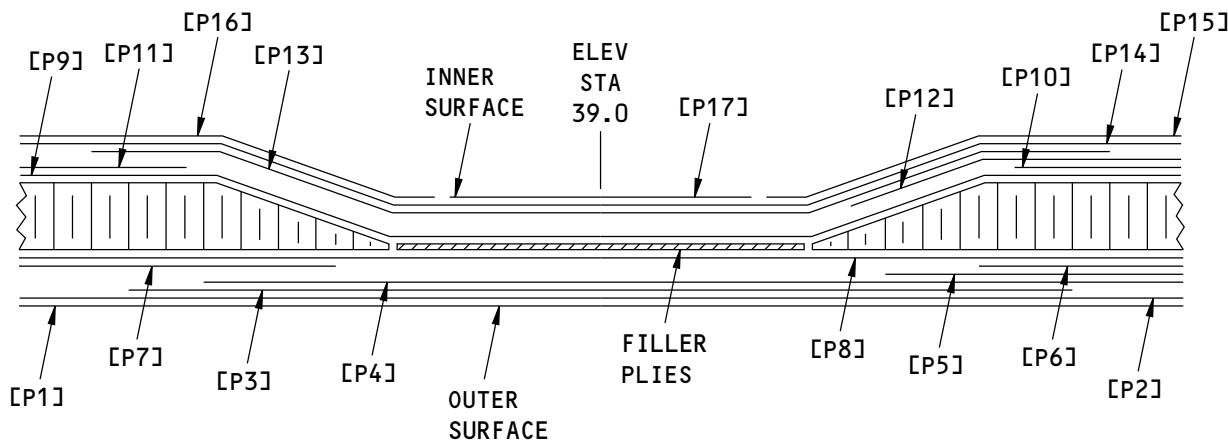
F60035 S0006592444_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Trailing Edge Panel, Figure 2,
Item [1]
Figure 3 (Sheet 1 of 2)

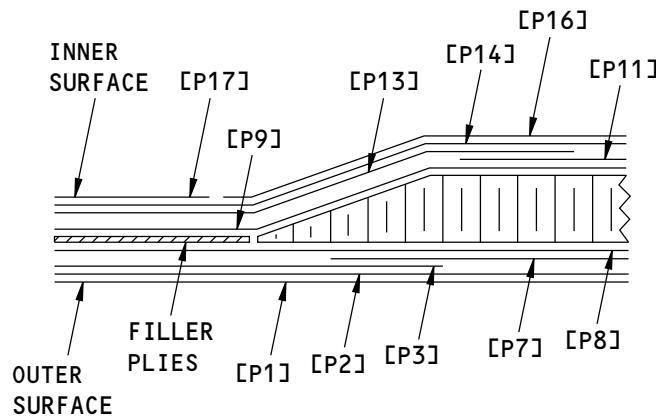
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PLY LAYUP SEQUENCE
A-A



PLY LAYUP SEQUENCE
B-B

F60096 S0006592445_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Trailing Edge Panel, Figure 2,
Item [1]
Figure 3 (Sheet 2 of 2)

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P14	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P4, P8, P9, P13	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P5, P12	0 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P6, P7, P10, P11	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P15, P16	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film
P17	-----	0.001 inch (0.025 mm) thick teflon film as given in BMS 10-86

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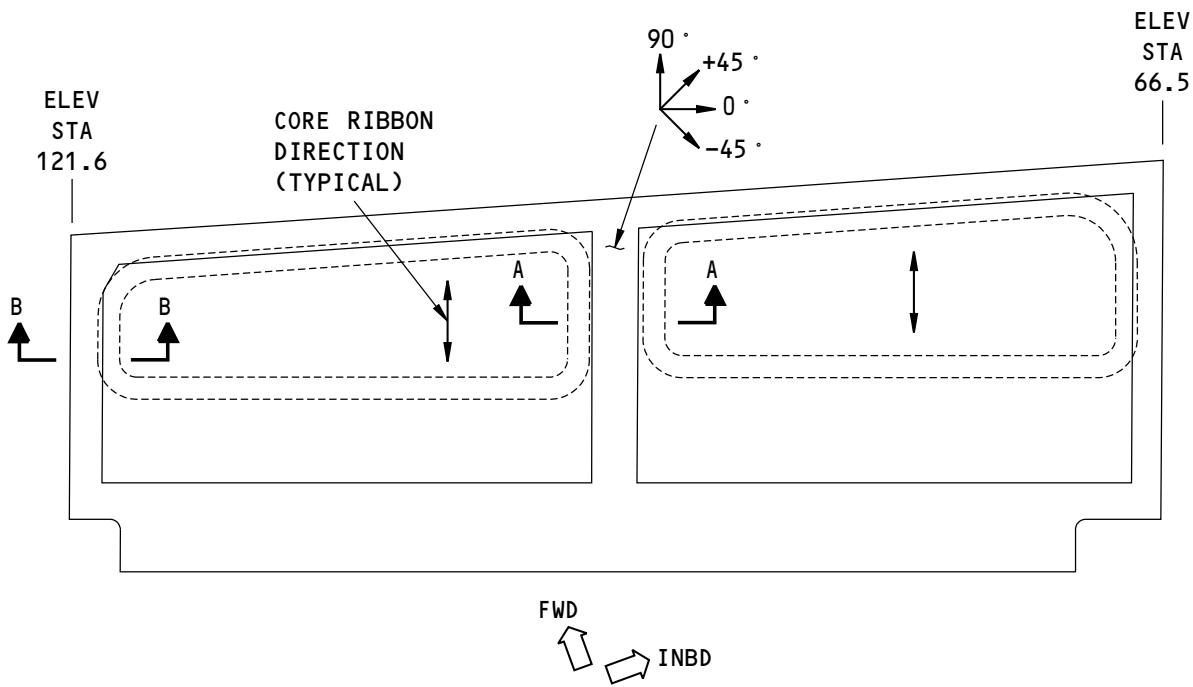
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PLY LAYUP AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F59094 S0006592447_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Trailing Edge Panel, Figure 2,
Item [2]
Figure 4 (Sheet 1 of 2)

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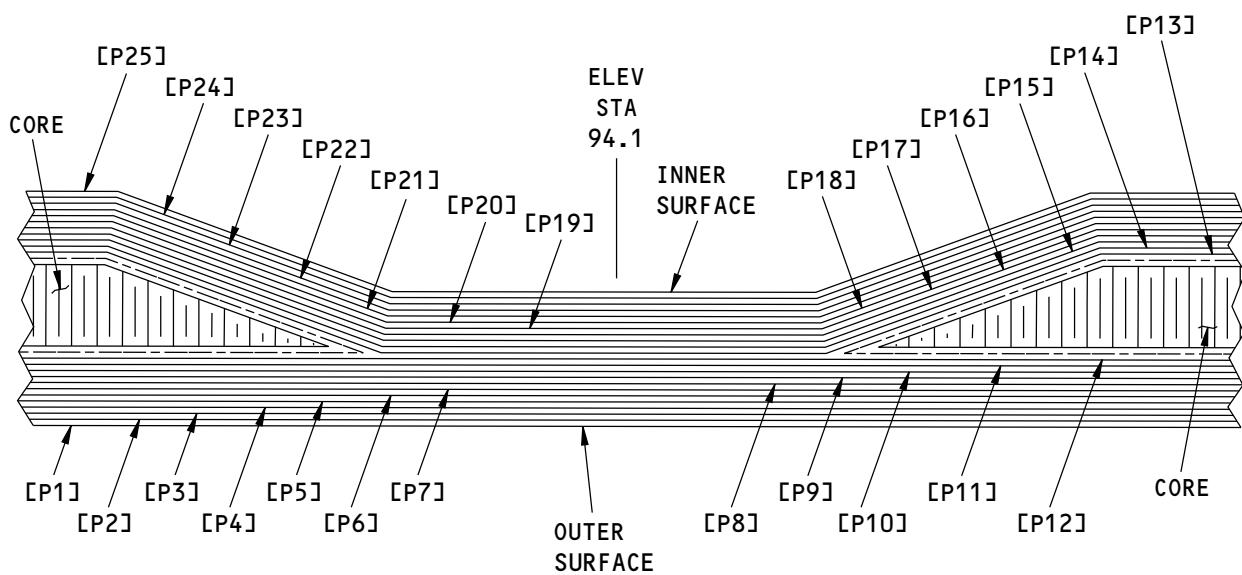
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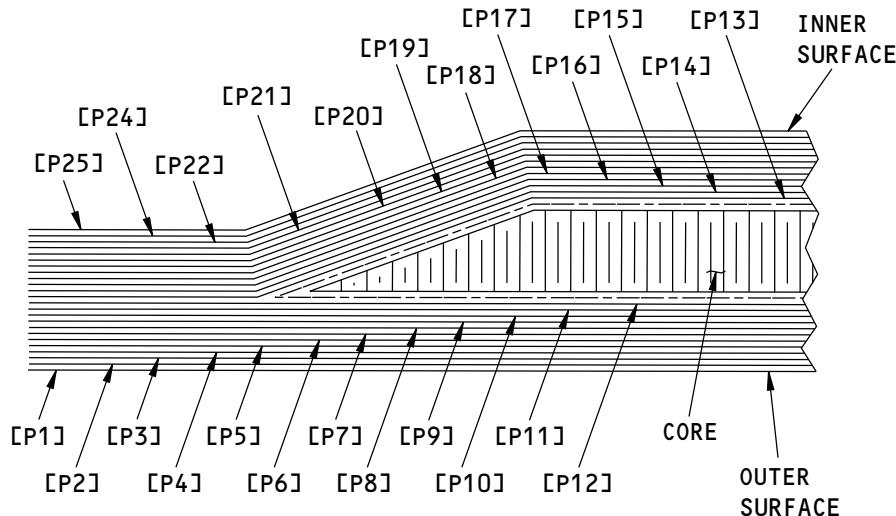
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**PLY LAYUP SEQUENCE
A-A**



**PLY LAYUP SEQUENCE
B-B**

F60108 S0006592448_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Trailing Edge Panel, Figure 2,
Item [2]
Figure 4 (Sheet 2 of 2)

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P23	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 120 or 1581
P3, P5, P6, P9, P10, P15, P16, P19, P20, P22	90 degrees	Unidirectional graphite tape as given in BMS 8-168, Type II, Class 1, Grade 190
P4, P7, P11, P14, P18, P21	0 or 90 degrees	Graphite fabric cloth as given in BMS 8-168, Type II, Class 2, Style 3K-70-PW
P8, P12, P13, P17	+ or - 45 degrees	Graphite fabric cloth as given in BMS 8-168, Type II, Class 2, Style 3K-70-PW
P24	-----	0.001 inch (0.025 mm) thick teflon film as given in BMS 10-86
P25	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film

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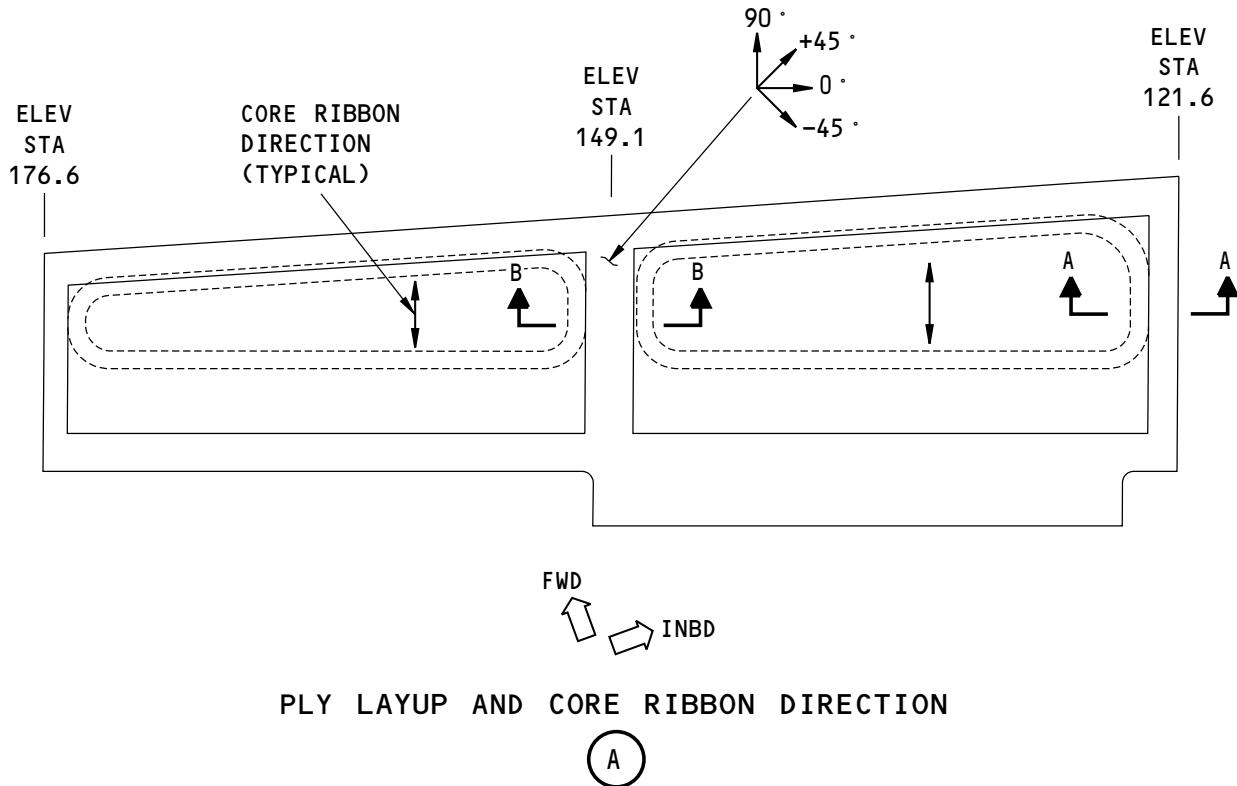
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

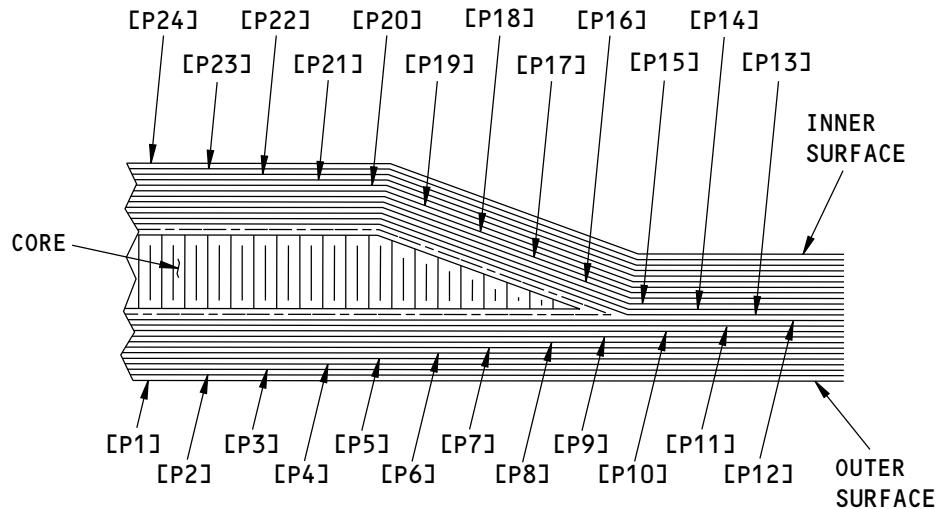
F59076 S0006592450_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Trailing Edge Panel, Figure 2,
Item [3]
Figure 5 (Sheet 1 of 2)

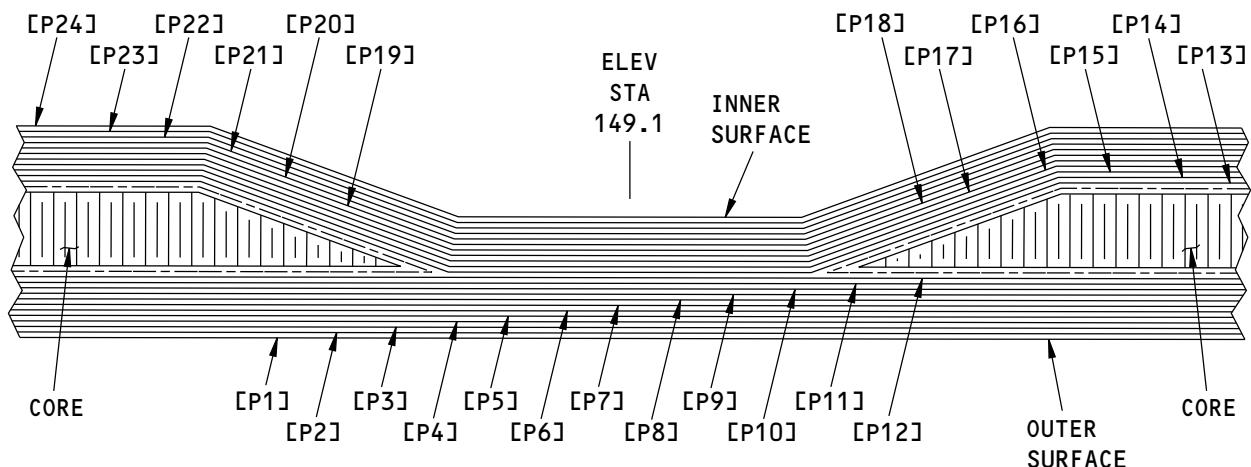
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PLY LAYUP SEQUENCE
A-A



PLY LAYUP SEQUENCE
B-B

F60111 S0006592451_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Trailing Edge Panel, Figure 2,
Item [3]
Figure 5 (Sheet 2 of 2)

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P23	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 120 or 1581
P3, P5, P6, P9, P10, P15, P16, P19, P20, P22	90 degrees	Unidirectional graphite tape as given in BMS 8-168, Type II, Class 1, Grade 190
P4, P7, P11, P14, P18, P21	0 or 90 degrees	Graphite fabric cloth as given in BMS 8-168, Type II, Class 2, Style 3K-70-PW
P8, P12, P13, P17	+ or - 45 degrees	Graphite fabric cloth as given in BMS 8-168, Type II, Class 2, Style 3K-70-PW
P24	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film
P25	-----	0.001 inch (0.025 mm) thick teflon film as given in BMS 10-86

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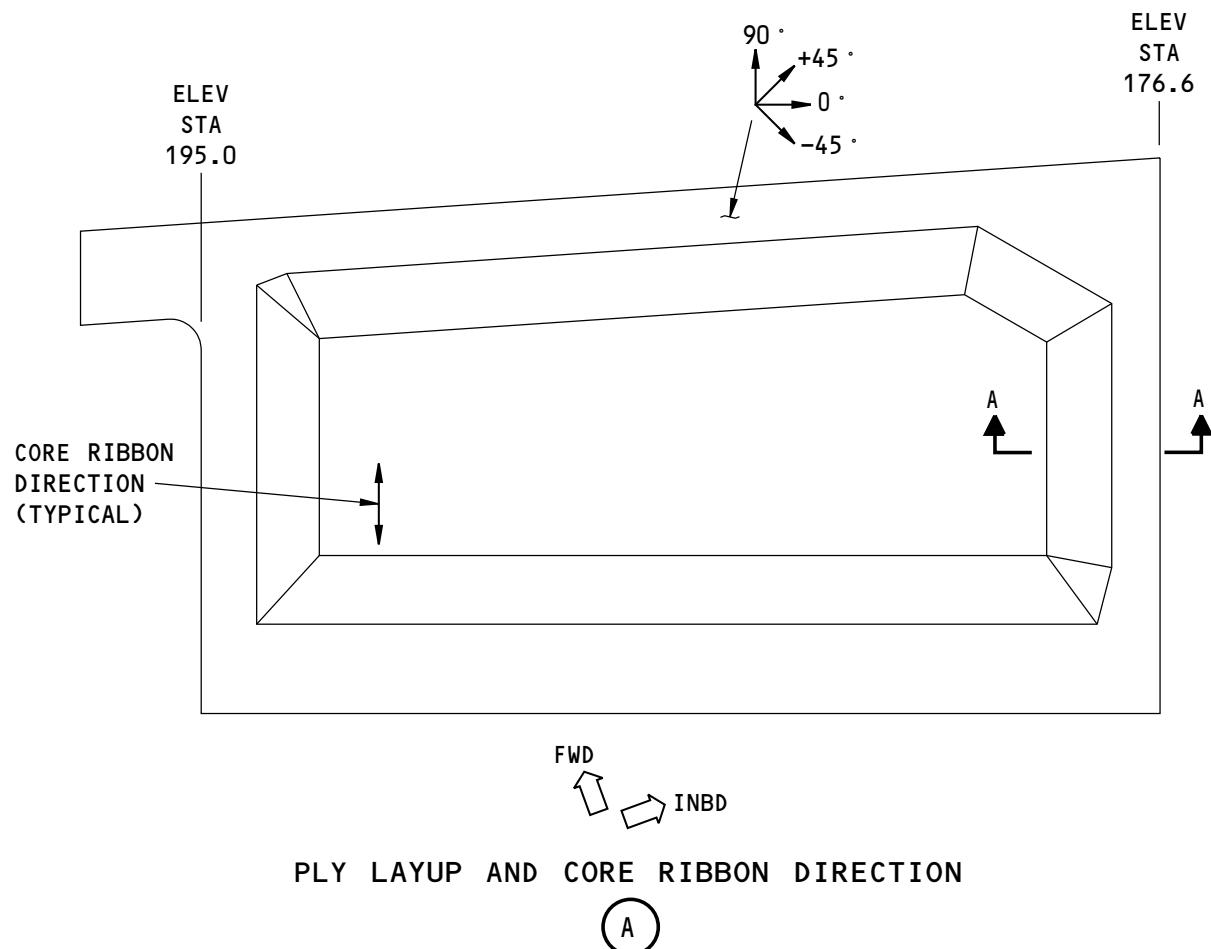
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

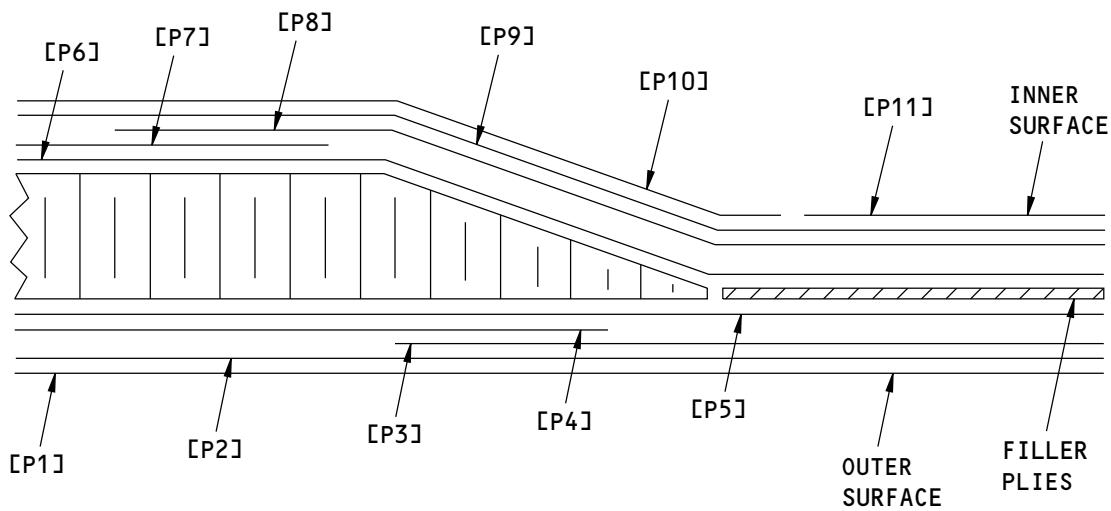
F60007 S0006592453_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [4]
Figure 6 (Sheet 1 of 2)

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PLY LAYUP SEQUENCE
A-A

F60180 S0006592454_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [4]
Figure 6 (Sheet 2 of 2)

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P9	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P5, P6, P8	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P4, P7	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P10	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film
P11	-----	0.001 inch (0.025 mm) thick teflon film as given in BMS 10-86

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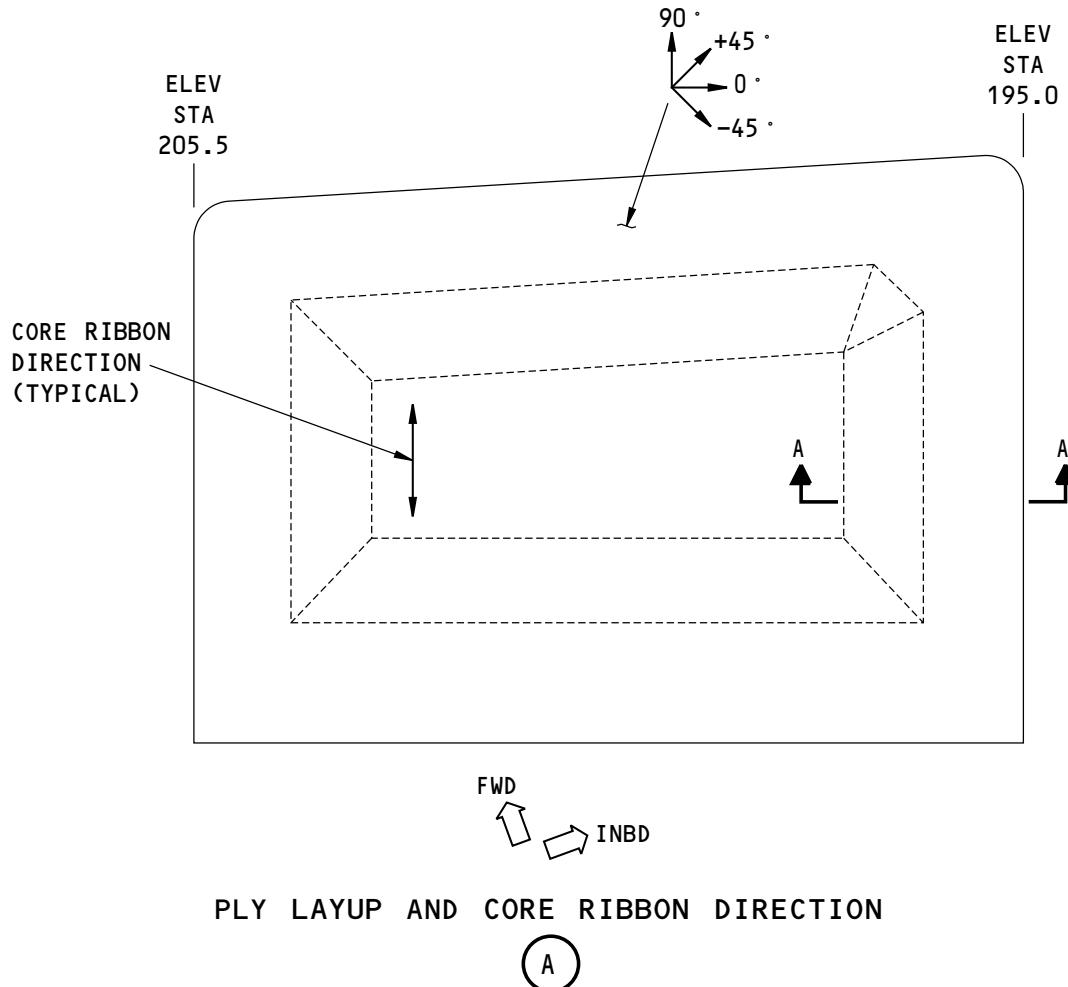
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

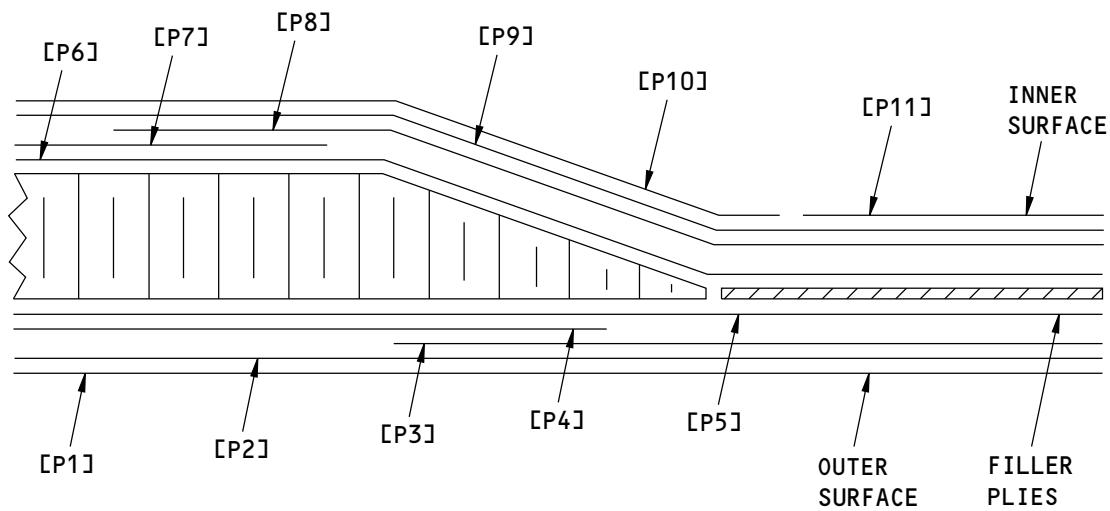
F59062 S0006592456_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [5]
Figure 7 (Sheet 1 of 2)

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PLY LAYUP SEQUENCE
A-A

F60184 S0006592457_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [5]
Figure 7 (Sheet 2 of 2)

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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 7		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P9	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P5, P6, P8	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P4, P7	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P10	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film
P11	-----	0.001 inch (0.025 mm) thick teflon film as given in BMS 10-86

55-10-01

IDENTIFICATION 5

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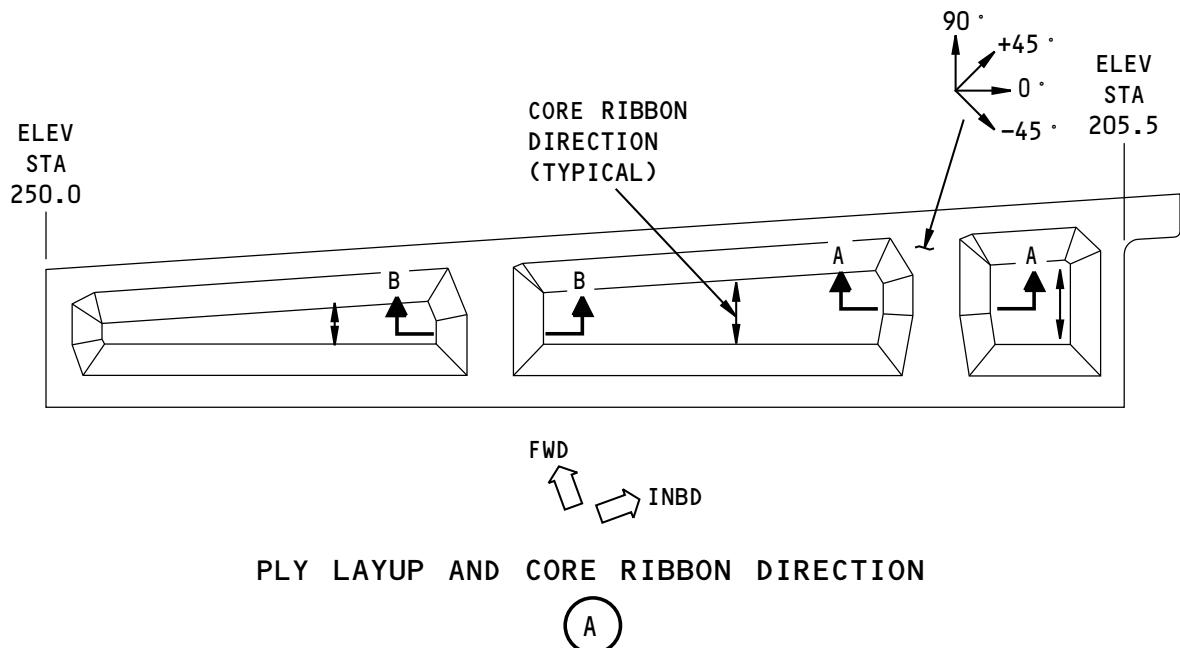
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STRUCTURAL REPAIR MANUAL



NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 8 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F60073 S0006592459_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [6]
Figure 8 (Sheet 1 of 2)

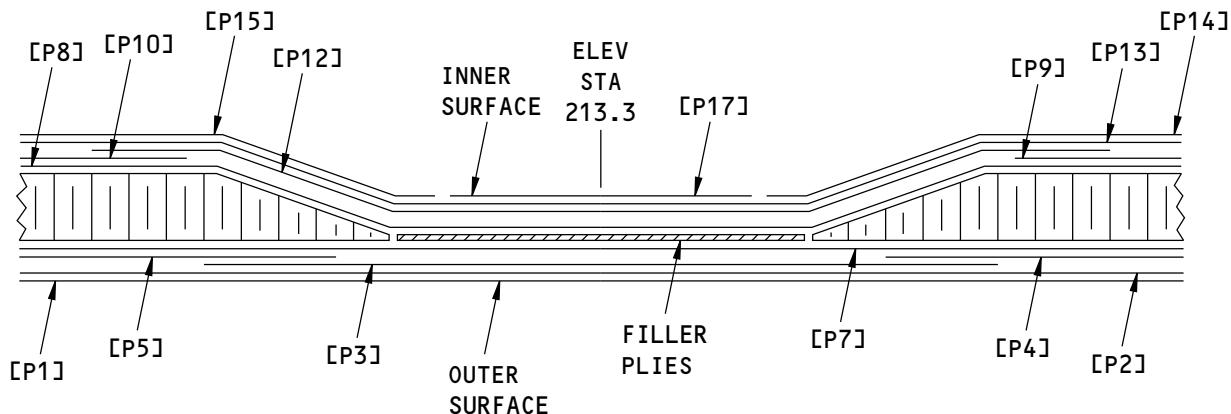
55-10-01
IDENTIFICATION 5
Page 19
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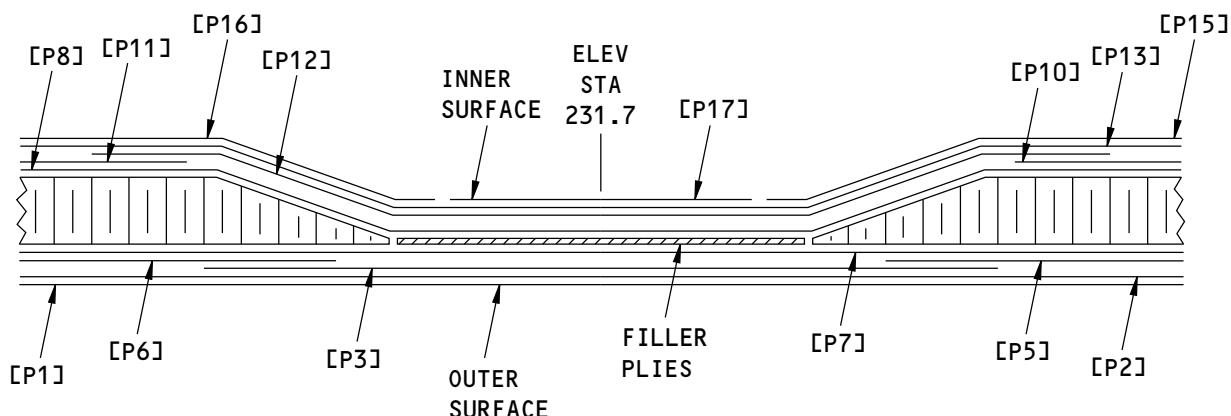
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PLY LAYUP SEQUENCE
A-A



PLY LAYUP SEQUENCE
B-B

F60122 S0006592460_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [6]
Figure 8 (Sheet 2 of 2)

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Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 8		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P13	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P7, P8, P12	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P4, P5, P6, P9, P10, P11	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P14, P15, P16	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film
P17	-----	0.001 inch (0.025 mm) thick teflon film as given in BMS 10-86

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IDENTIFICATION 5

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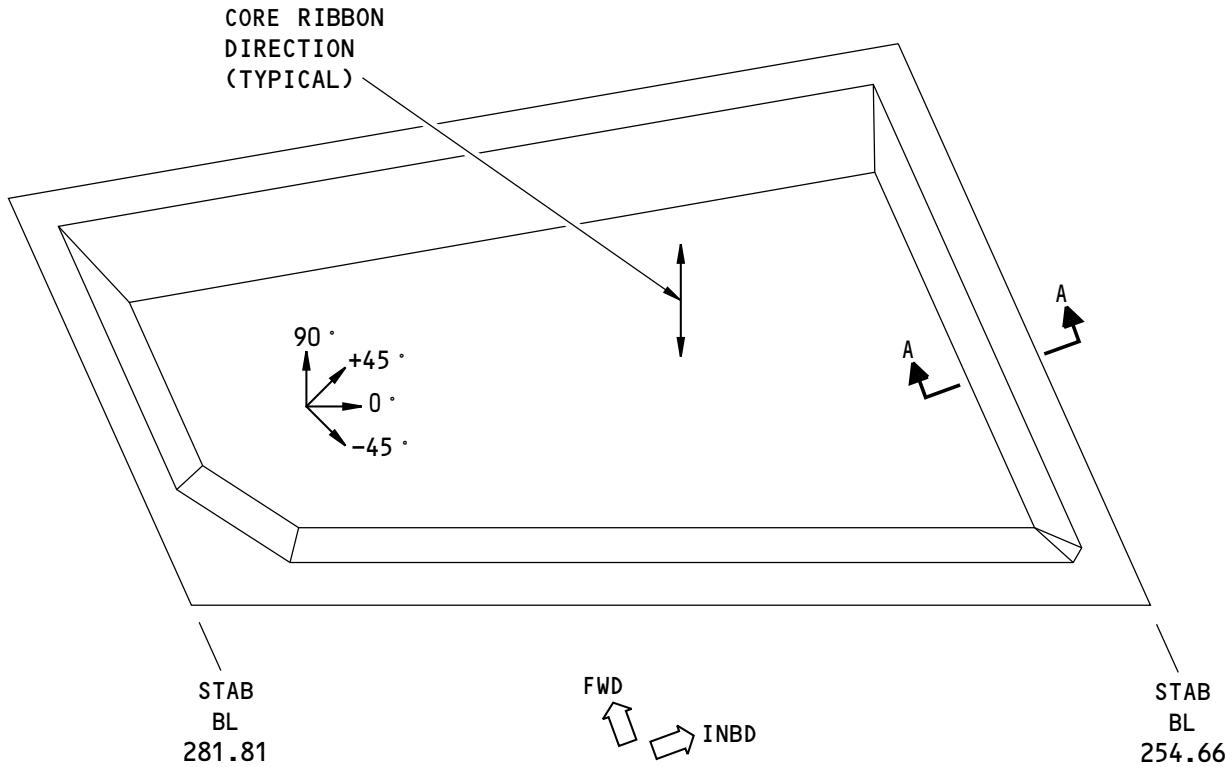
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PLY LAYUP AND CORE RIBBON DIRECTION



NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO THE ENGINEERING DRAWING FOR THE PLY LAYUP AT THE EDGES OF THE PANEL.
- REFER TO TABLE 9 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F60060 S0006592462_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [7]
Figure 9 (Sheet 1 of 2)

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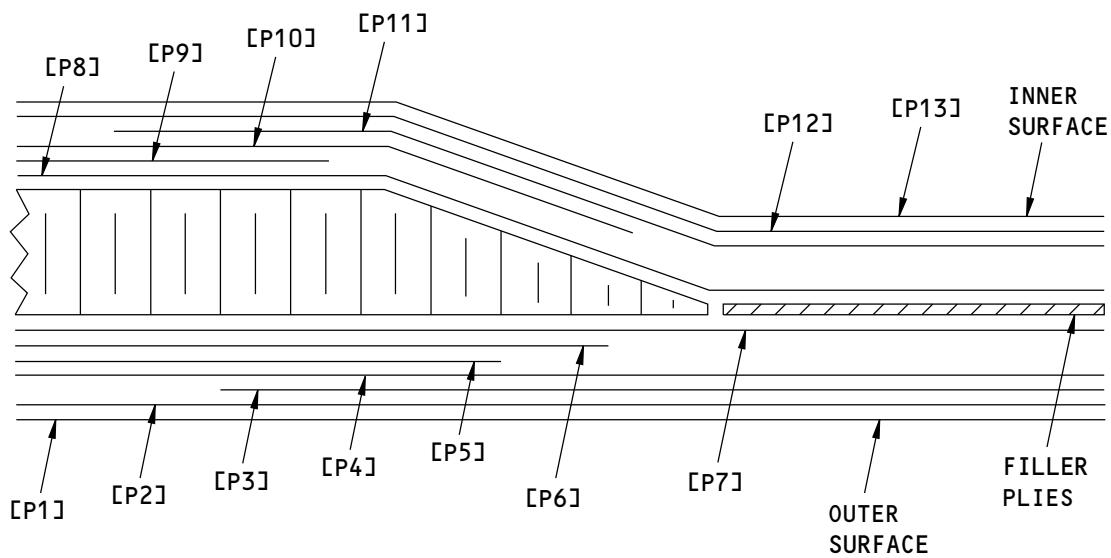
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F60190 S0006592463_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Trailing Edge Panel, Figure 2,
Item [7]
Figure 9 (Sheet 2 of 2)

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Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 9		
PLY	DIRECTION	MATERIAL
P1	-----	BMS 5-129, Type 2, Grade 5, is preferred. (Optional: BMS 8-341, Type II (METALBOND 1515-3M film adhesive) or Type III (SYNSKIN HC9837.1 composite surfacing film)). (Optional: Toolside surface treatment)
P2, P12	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P4, P7, P8, P11	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P5, P10	0 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P6, P9	90 degrees	CFRP unidirectional tape as given in BMS 8-168, Type II, Class I, Grade 145
P13	-----	0.001 inch (0.025 mm) thick white bondable Tedlar film

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ALLOWABLE DAMAGE 1 - HORIZONTAL STABILIZER LEADING EDGE SKINS

1. Applicability

- A. This subject gives the allowable damage limits for the horizontal stabilizer leading edge skins shown in Horizontal Stabilizer Leading Edge Skin Locations, Figure 101/ALLOWABLE DAMAGE 1.

55-10-01

ALLOWABLE DAMAGE 1

Page 101

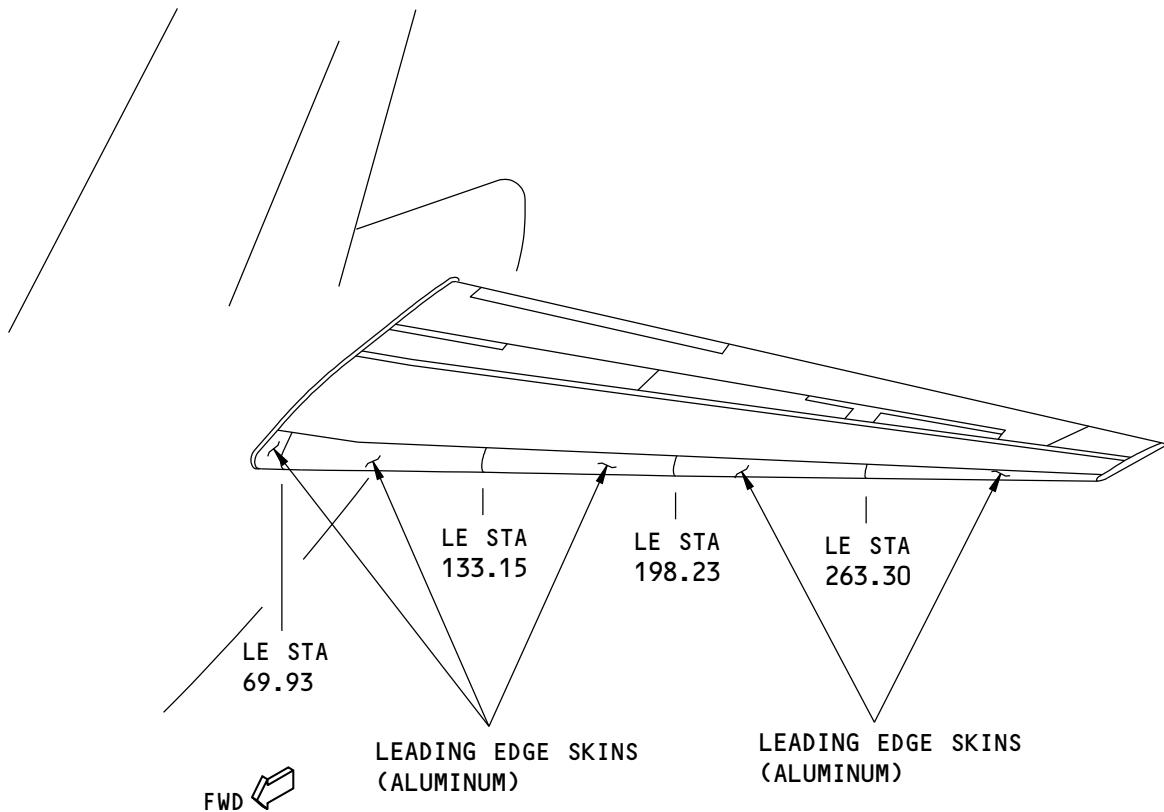
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

UPPER SURFACE IS SHOWN

F46809 S0006592467_V1

Horizontal Stabilizer Leading Edge Skin Locations
Figure 101 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 1

Page 102

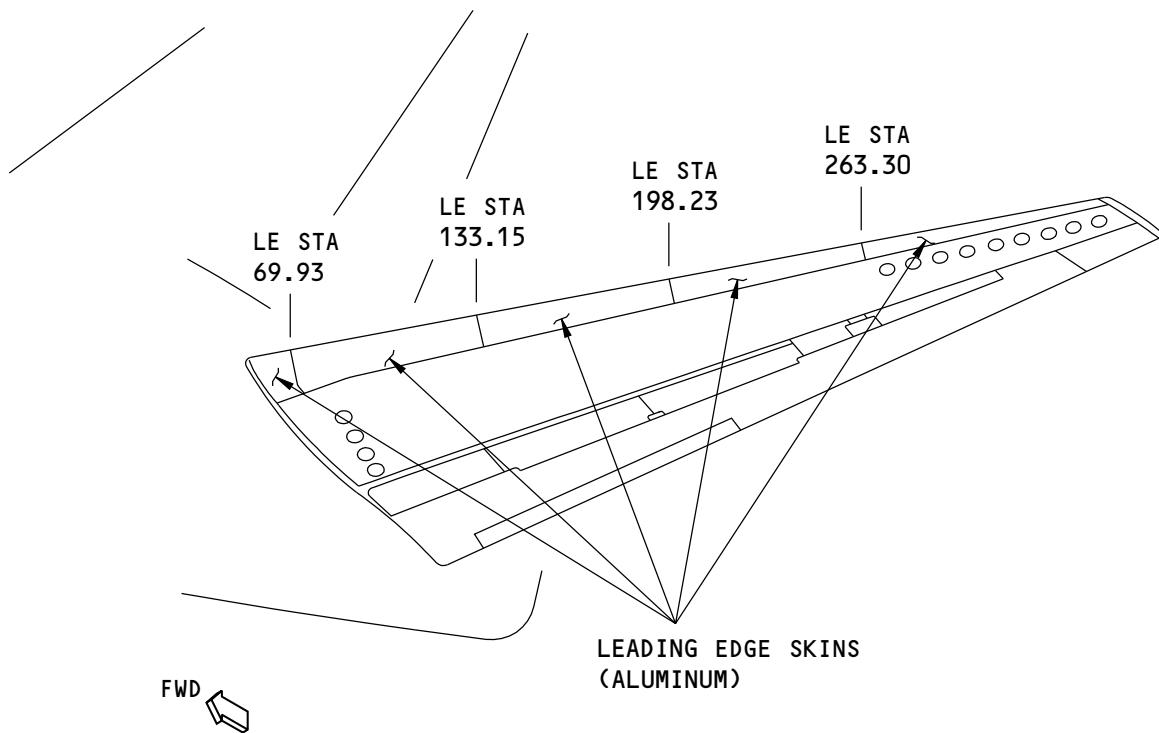
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN

F46759 S0006592468_V1

Horizontal Stabilizer Leading Edge Skin Locations
Figure 101 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 1

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2. General

- A. Remove the damaged material as necessary.
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) If countersink rivets are removed to clean up the damage, then do the steps that follow:
 - (a) Install new rivets that have the same material and diameter as the initial rivets. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
 - 1) It is permitted to rework holes to 1/32 inch oversize.
 - 2) It is optional to install NAS1399D blind rivets.
- B. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- C. Apply two layers of BMS 10-79, Type II or III, primer to the reworked areas. Refer to SOPM 20-44-04.
- D. Apply the decorative finish to the reworked areas as given in AMM PAGEBLOCK 51-21-99/701.
- E. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-01	REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS
55-10-01	HORIZONTAL STABILIZER SKIN
55-10-01, REPAIR 1	Horizontal Stabilizer Leading Edge Skin External Repair
55-10-01, REPAIR 2	Flush Repair of the Horizontal Stabilizer Leading Edge Skin
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

- A. Cracks:
 - (1) Damage is permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail A.
- B. Nicks, Gouges, Scratches, and Corrosion:
 - (1) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, D, and E.

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ALLOWABLE DAMAGE 1

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- (a) Only one area of damage removal, as shown in Detail D, is permitted for each 15.0 square inches of panel.
- C. Holes and Punctures are permitted if:
 - (1) They are a maximum of 0.25 inch in diameter
 - (2) There is not more than one hole or puncture for each 15.0 square inches of panel area
 - (3) The edge of the damage is a minimum of 1.00 inch away from the edge of a fastener hole, other damage, or the panel.
 - (4) They are filled with a 2117-T3 or 2117-T4 aluminum flush head rivet.
- D. For dents at a rib chord and within 1.0 in. (25.4 mm) of a fastener hole, you can operate the airplane for 20 flight cycles if you meet the conditions that follow:
 - (1) At the rib to spar chord attachment, dents must not be more than 0.020 in. (0.51 mm) deep. Refer to Figure 108/ALLOWABLE DAMAGE 1.
 - (2) At the rib to skin attachment, dents must not be more than 0.030 in. (0.76 mm) deep. Refer to Figure 108/ALLOWABLE DAMAGE 1.
 - (3) Specified Conditions:
 - (a) There are no pulled or loose fasteners or missing fastener locations.
 - (b) There are no sharp creases, gouges, or cracks.
 - (4) Do an external detailed visual inspection or 10x magnification inspection of the dent area at 10 flight cycles to make sure that there is no more damage.
 - (5) You must do the repair given in HORIZONTAL STABILIZER SKIN, 55-10-01 at or before 20 flight cycles.
- E. Dents not at a rib chord and a minimum 1.0 in. (25.4 mm) away from a fastener hole:
 - (1) Dents are permitted for the general conditions of Paragraph 4.E.(2)/ALLOWABLE DAMAGE 1 and for the specified conditions of Paragraph 4.E.(3)/ALLOWABLE DAMAGE 1
 - (a) Refer to Definition of Dent Dimensions, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the dimensions for a dent.
 - (b) Refer to Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1 for the relation of dent dimensions.
 - (c) Refer to Damage Size and Spacing Limits for Adjacent Dents, Figure 105/ALLOWABLE DAMAGE 1 for the definition of the dimensions for adjacent dents.
 - (d) Refer to Equivalent Length of Dents When the Depth is Large, Figure 106/ALLOWABLE DAMAGE 1 for the definition of the length if there is more than one dent in a bay.
 - (2) General Conditions:
 - (a) The edge of the damage is a minimum of 1.0 inch away from a hole.
 - (b) There are no pulled or loose fasteners or missing fastener locations.
 - (c) There are no sharp creases, gouges, or cracks.
 - (d) There is no damage to the structure that is below the skin panels.
 - (e) There are no dents at the rib chord locations.
 - (3) Specified Conditions:
 - (a) Dents are permitted in Area 1 as shown in Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1.

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ALLOWABLE DAMAGE 1

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- 1) For dents that are more than the limits shown in Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 1, fill the dents as given in 51-70-01.
 - (b) Dents are permitted in Area 2 if you make an inspection of the damage after no more than 5000 flight hours. Refer to Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1.

NOTE: It is recommended that you remove or repair the damage after no more than 5000 flight hours or 18 months, that which occurs first.

 - 1) For dents that are more than the limits shown in Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 1, fill the dents as given in 51-70-01.
 - (c) Dents are permitted in Area 3 as shown in Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1 if you do the steps that follow:
 - 1) Fill the dent as given in 51-70-01.
 - 2) Seal the damage with 3M-436 aluminum foil tape (speed tape) or the equivalent.
 - 3) Make a detailed visual inspection of the damage at each 400 flight hour interval. If there are cracks or the damage has become larger, repair the damage before the next flight.
 - 4) Install a permanent repair after no more than 5000 flight hours or 18 months, that which occurs first.
 - (d) Dents are permitted in Area 4 as shown in Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1 if you do the steps that follow:
 - 1) For dents with a depth less than 0.50 inch, fill the dent as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
 - 2) For dents with a depth equal to or greater than 0.50 inch, do the steps that follow:
 - a) Fill half of the depth of the dent with potting compound and permit it to fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01
 - b) Fill the remaining depth of the dent and permit the compound to fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01
- NOTE:** BMS 5-92 adhesive is the better alternative to the potting compounds given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
- 3) Seal the damage with 3M-436 aluminum foil tape (speed tape) or the equivalent.
 - 4) Remove tape for inspection of filler and skin around the dent every 10-days (do not remove the filler).
 - a) If the filler is cracked or disbonded remove the filler.
 - b) If there are cracks in the skin or the damage has become larger, repair the damage before the next flight.
 - c) If you removed the filler, you must replace the filler.
 - <1> Fill half of the depth of the dent with potting compound and permit it to fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01
 - <2> Fill the remaining depth of the dent and permit the compound to fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01

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ALLOWABLE DAMAGE 1

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- 5) Reseal the damage with 3M-436 aluminum foil tape (speed tape) or the equivalent.
- 6) Install an external repair as given in 55-10-01, REPAIR 1 or a flush repair as given in 55-10-01, REPAIR 2 within 90 days.

55-10-01

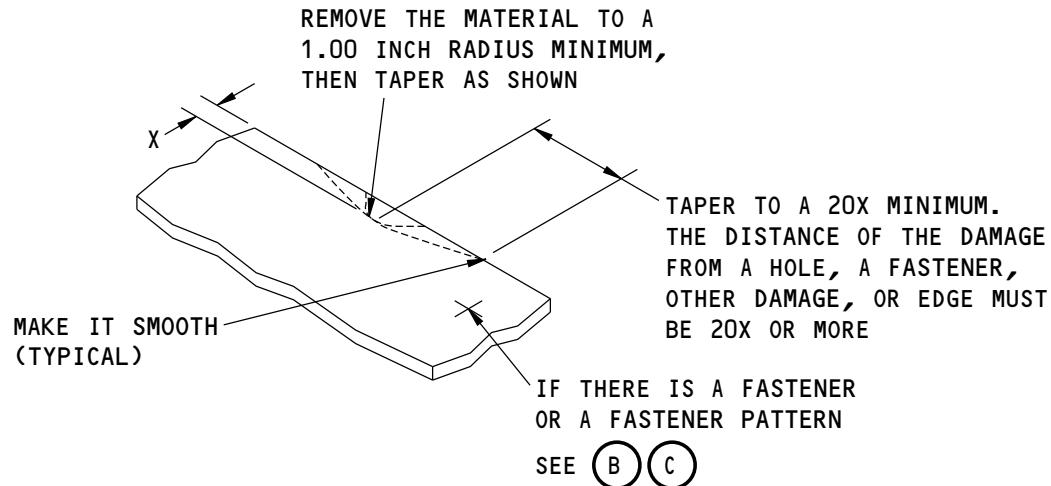
ALLOWABLE DAMAGE 1

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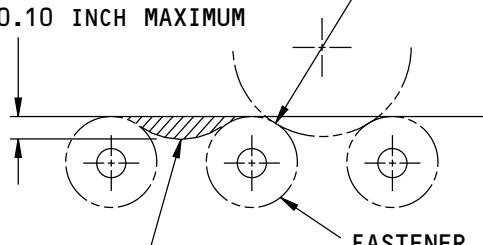
**737-800
STRUCTURAL REPAIR MANUAL**


X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

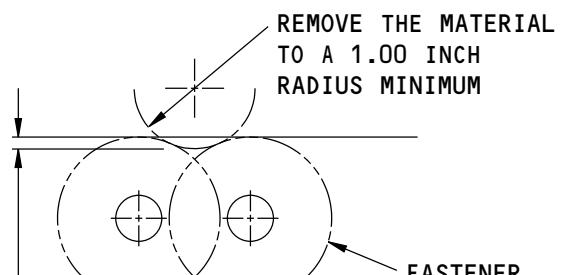
REMOVAL OF DAMAGED MATERIAL ON AN EDGE

A

X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM



REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM



X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

B

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

C

F45657 S0006592470_V1

Allowable Damage Limits
Figure 102 (Sheet 1 of 2)

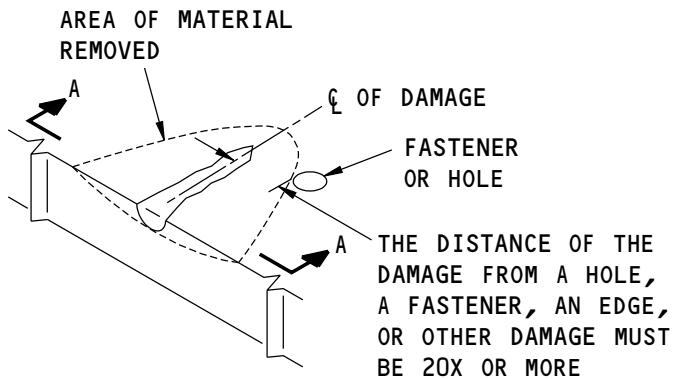
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ALLOWABLE DAMAGE 1

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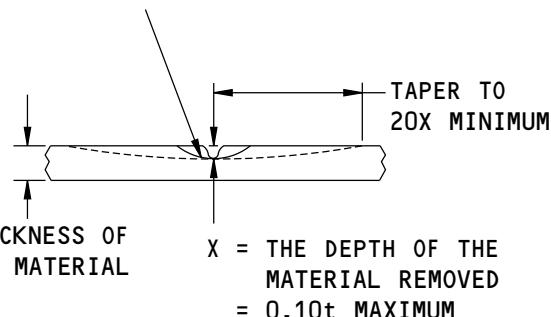
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**737-800
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**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

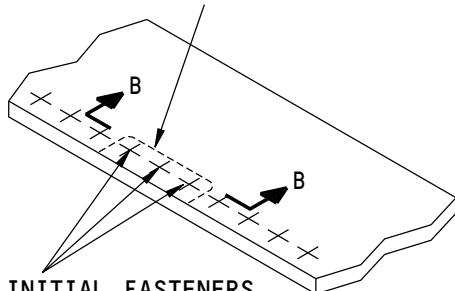
(D)

REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM, THEN TAPER AS SHOWN



A-A

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A DEPTH OF X MAXIMUM

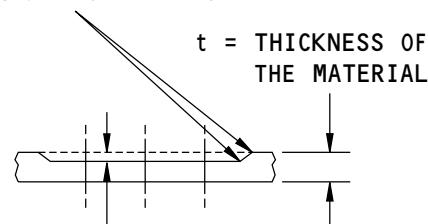


REMOVE THE INITIAL FASTENERS BEFORE THE DAMAGED MATERIAL IS REMOVED. INSTALL THE FASTENERS AFTER THE REWORK IS COMPLETED

**REMOVAL OF CORROSION
AROUND THE FASTENERS**

(E)

MAKE IT SMOOTH TO A MINIMUM RADIUS OF 0.5 INCH (TYPICAL)



X = THE DEPTH OF THE MATERIAL REMOVED
= $0.10t$ MAXIMUM

B-B

F47215 S0006592471_V2

**Allowable Damage Limits
Figure 102 (Sheet 2 of 2)**

55-10-01

ALLOWABLE DAMAGE 1

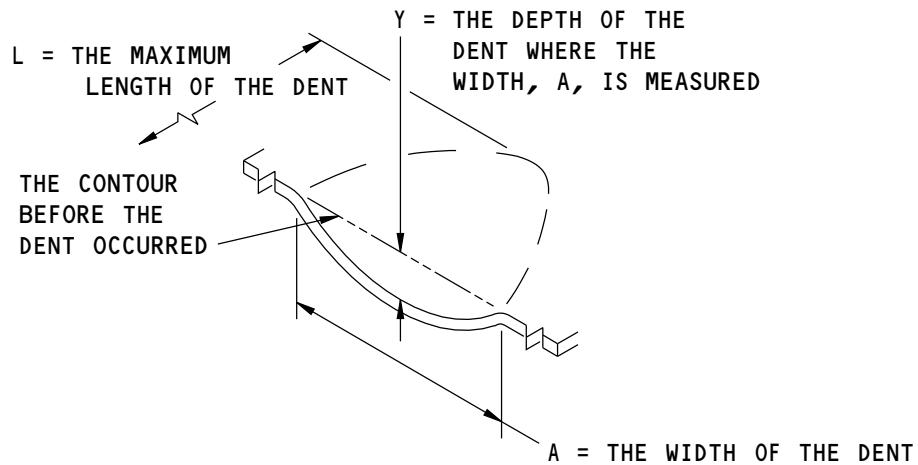
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F53352 S0006592472_V3

Definition of Dent Dimensions

Figure 103

55-10-01

ALLOWABLE DAMAGE 1

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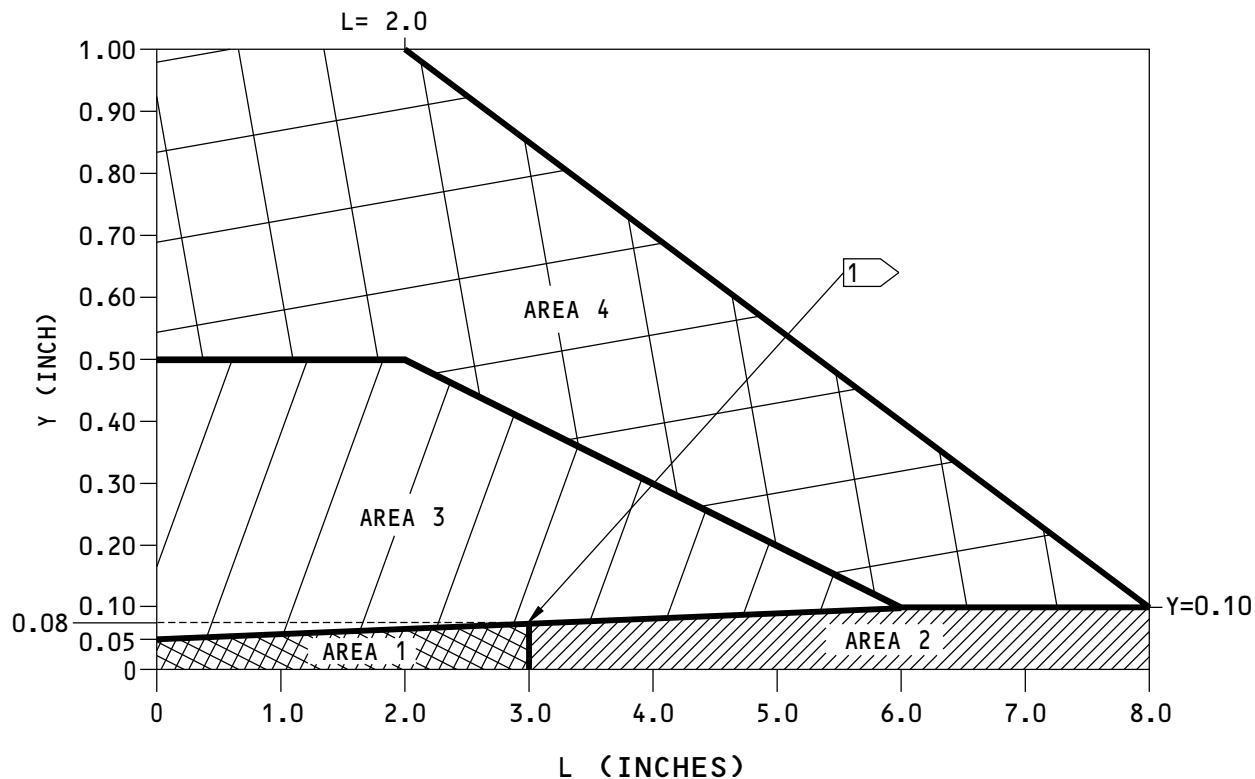
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NOTE

1 MAXIMUM LENGTH (L) AND DEPTH (Y) FOR AREA 1 IS Y=0.08 INCH AND L=3.00 INCHES

FOR AREA NUMBER	REFER TO ALLOWABLE DAMAGE PARAGRAPH
1	4. E. (3) (a)
2	4. E. (3) (b)
3	4. E. (3) (c)
4	4. E. (3) (d)

TABLE A

F48973 S0006592473_V3

Allowable Damage Limits for Leading Edge Skin Dents
Figure 104

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ALLOWABLE DAMAGE 1

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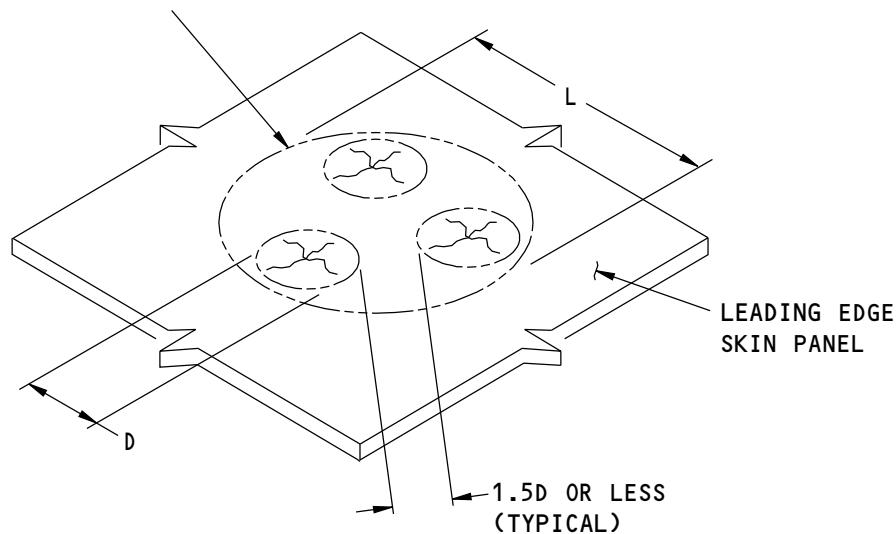
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A GROUP OF DENTS THAT ARE
NEAR EACH OTHER ARE SEEN
AS ONE DAMAGE AREA WITH
LENGTH (L)



NOTE: D IS THE LARGEST LENGTH OF THE ADJACENT DENTS.

F61111 S0006592474_V1

Damage Size and Spacing Limits for Adjacent Dents
Figure 105

55-10-01

ALLOWABLE DAMAGE 1

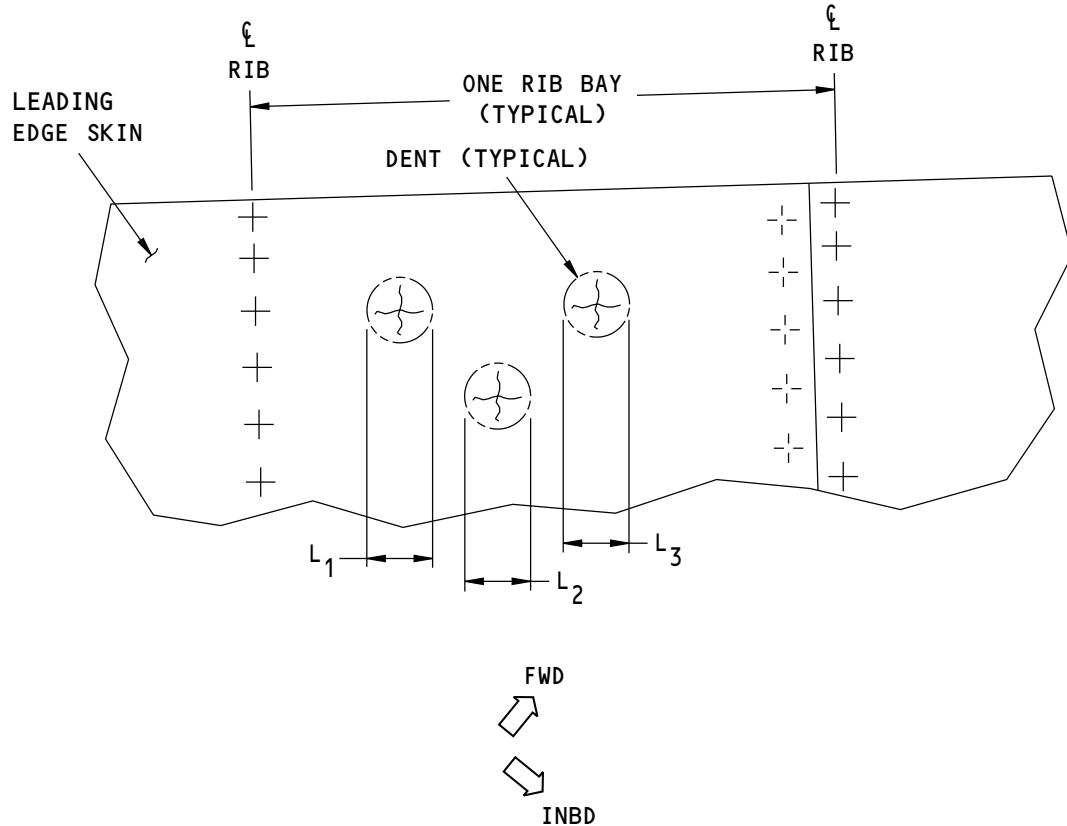
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NOTE: IF THE DEPTH OF THE DENT IS 0.050 INCH OR MORE, THEN

1) ADD THE LENGTH OF EACH DENT TO GET THE EQUIVALENT LENGTH (L) OF THE DENTS.

$$L = L_1 + L_2 + L_3$$

2) AND APPLY THE ALLOWABLE DAMAGE LIMITS FOR ONE DENT.

F61091 S0006592475_V1

Equivalent Length of Dents When the Depth is Large
Figure 106

55-10-01

ALLOWABLE DAMAGE 1
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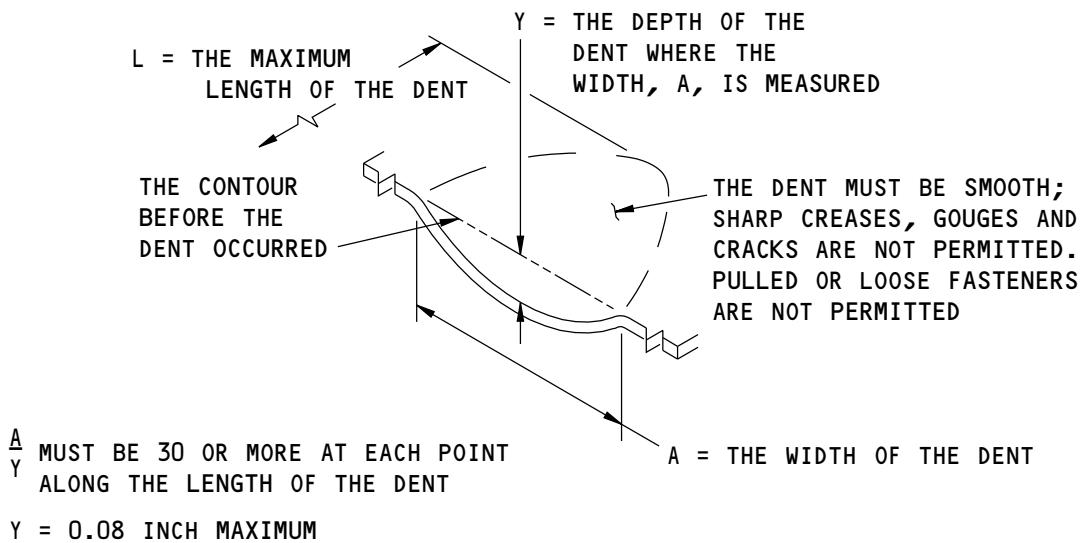
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DENT THAT IS PERMITTED



G89227 S0006592476_V3

Allowable Damage Limits
Figure 107

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ALLOWABLE DAMAGE 1

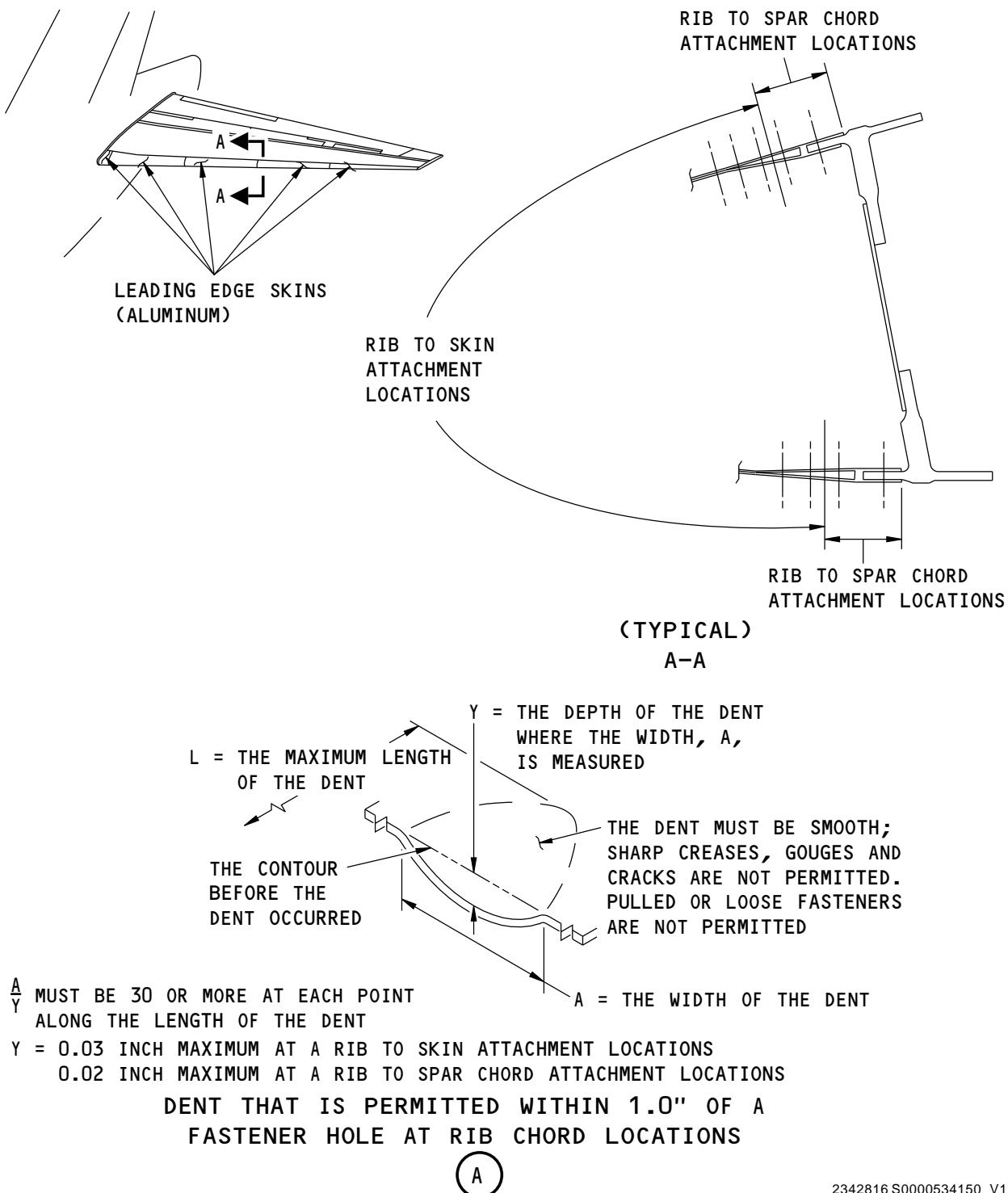
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Dents at a Rib Chord and Within 1.0 inch of a Fastener Hole
Figure 108

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ALLOWABLE DAMAGE 1

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ALLOWABLE DAMAGE 2 - HORIZONTAL STABILIZER INSPAR SKINS

1. Applicability

- A. This subject gives the allowable damage limits for the horizontal stabilizer inspar skins shown in Horizontal Stabilizer Upper Inspark Skin Location, Figure 101/ALLOWABLE DAMAGE 2 and Horizontal Stabilizer Lower Inspark Skin Location, Figure 102/ALLOWABLE DAMAGE 2.

2. General

- A. Remove the damaged material as necessary.
- (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) If countersink rivets are removed to clean up the damage, then do the steps that follow:
 - (a) Install new rivets that have the same material and diameter as the initial rivets.
 - 1) Use oversize rivets as necessary.
 - 2) It is optional to install solid protruding head rivets with countersink washers.
 - (b) Make sure the countersink depth is not more than 80 percent of the skin thickness.
 - (c) If the head is above the skin surface, remove the unwanted material with the microshave flush procedure as specified in 51-10-01.
 - 1) The maximum head height that is permitted above the skin is 0.006 inch.
- B. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- C. Apply two layers of BMS 10-79, Type II or III, primer to the reworked areas. Refer to SOPM 20-44-04.
- D. Apply the decorative finish to the reworked areas as given in AMM PAGEBLOCK 51-21-99/701.
- E. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.

55-10-01

ALLOWABLE DAMAGE 2

Page 101

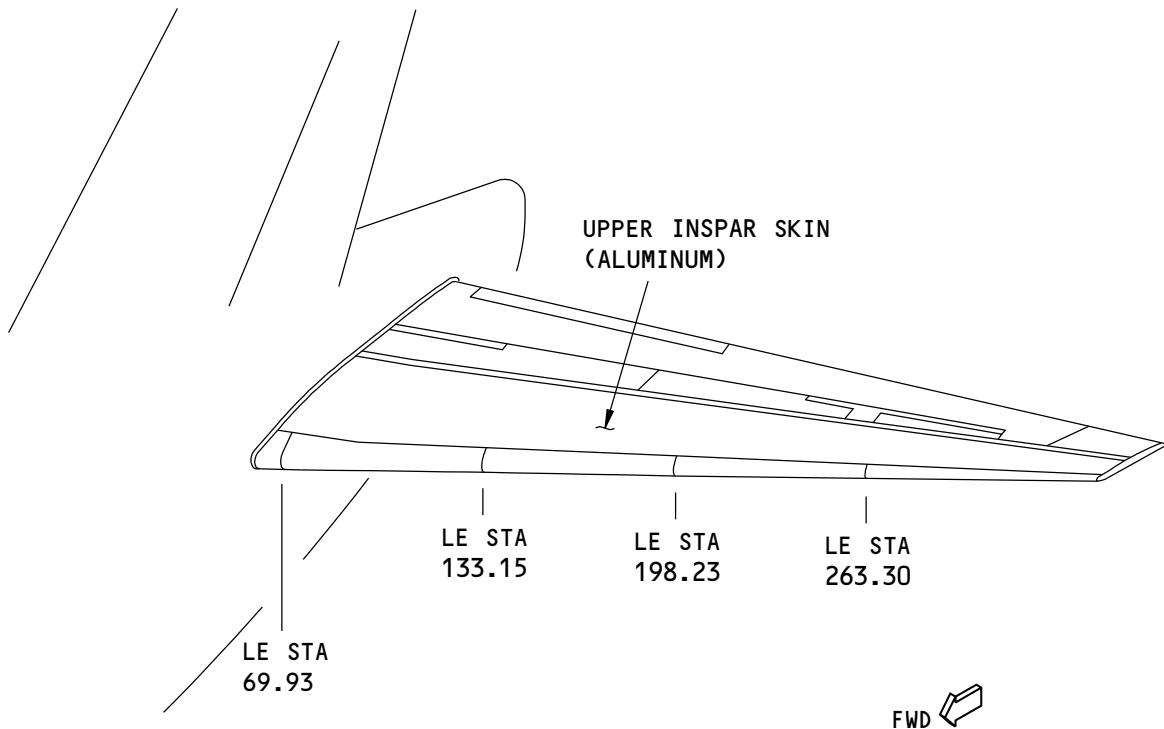
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

F48501 S0006592478_V1

Horizontal Stabilizer Upper Inspark Skin Location
Figure 101

55-10-01

ALLOWABLE DAMAGE 2

Page 102

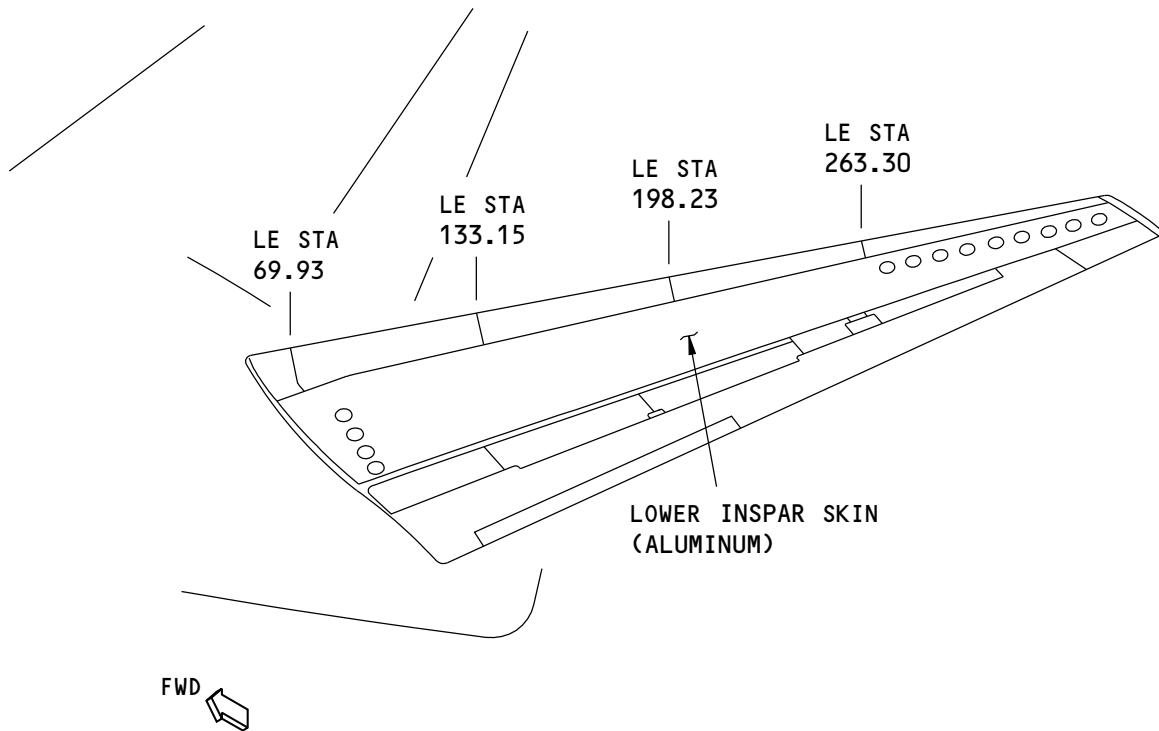
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN

F48504 S0006592479_V1

Horizontal Stabilizer Lower Inspark Skin Location
Figure 102

55-10-01

ALLOWABLE DAMAGE 2

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3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Cracks:

- (1) Damage is permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A.

B. Nicks, Gouges, Scratches, and Corrosion:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, D, F, G, H, and I.
(a) Only one area of damage removal, as shown in Detail D, is permitted for each 15.0 square inches of panel.

C. Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail E if:

- (1) The edge of the dent is a minimum 4D from the edge of any other damage. D is the maximum dimension of the largest damage.

Table 101:

PERCENT OF CROSS-SECTIONAL AREA REMOVED FROM THE UPPER AND LOWER INSPAR SKINS	
ZONE NUMBER AND SKIN	MAXIMUM PERCENTAGE OF THE INITIAL CROSS-SECTIONAL AREA (AS MANUFACTURED BY BOEING) PERMITTED
1, UPPER	15
2, UPPER	10
3, UPPER	NO DAMAGE PERMITTED
4, UPPER	10
5, UPPER	NO DAMAGE PERMITTED
6, LOWER	15
7, LOWER	10
8, LOWER	5
9, LOWER	10
10, LOWER	5
11, LOWER	NO DAMAGE PERMITTE

D. Holes and Punctures are permitted if:

- (1) They are a maximum of 0.25 inch in diameter
(2) There is not more than one hole or puncture for each 15.0 square inches of panel area

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ALLOWABLE DAMAGE 2

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- (3) They are not more than the limits shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details G, H, and I.
- (4) The edge of the damage is a minimum of 1.00 inch away from the edge of a fastener hole, other damage, or the panel.
- (5) They are filled with a 2117-T3 or 2117-T4 aluminum flush head rivet.
 - (a) The countersink depth must not be more than 80 percent of the skin thickness.
 - (b) If the head is above the skin surface, remove the unwanted material with the microshave flush procedure as specified in 51-10-01.
 - (c) It is optional to install a 2117-T3 or 2117-T4 aluminum protruding head rivet.

55-10-01

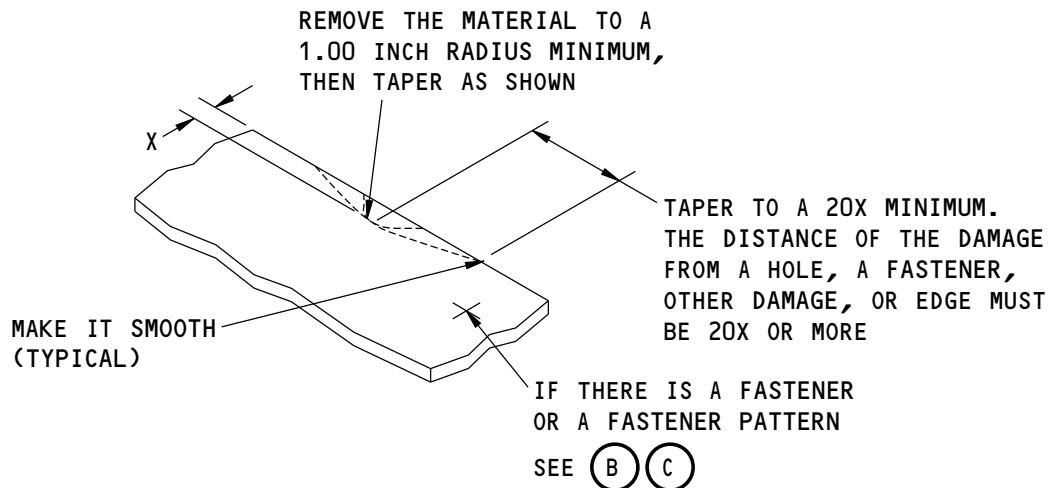
ALLOWABLE DAMAGE 2

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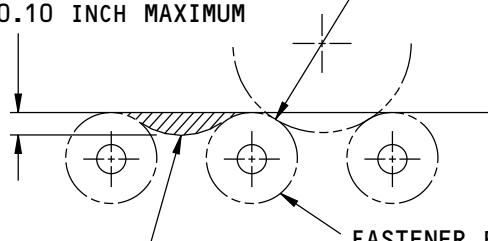
**737-800
STRUCTURAL REPAIR MANUAL**


X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

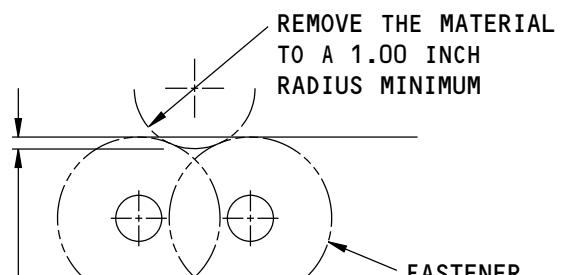
REMOVAL OF DAMAGED MATERIAL ON AN EDGE

A

X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM



REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM



X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

B

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

C

F47213 S0006592481_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 7)

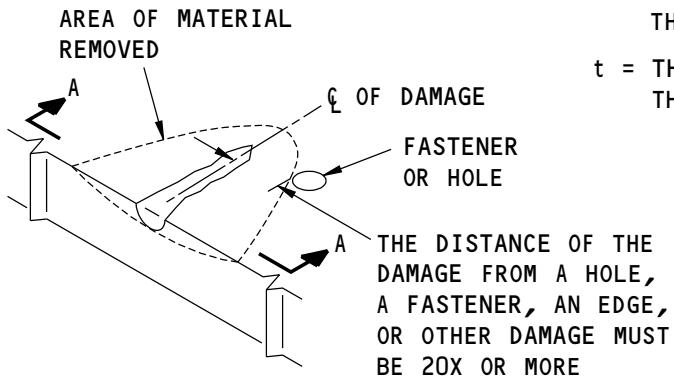
55-10-01

ALLOWABLE DAMAGE 2

Page 106

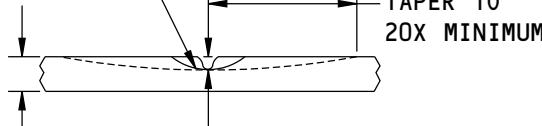
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REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM, THEN TAPER AS SHOWN

t = THICKNESS OF THE MATERIAL

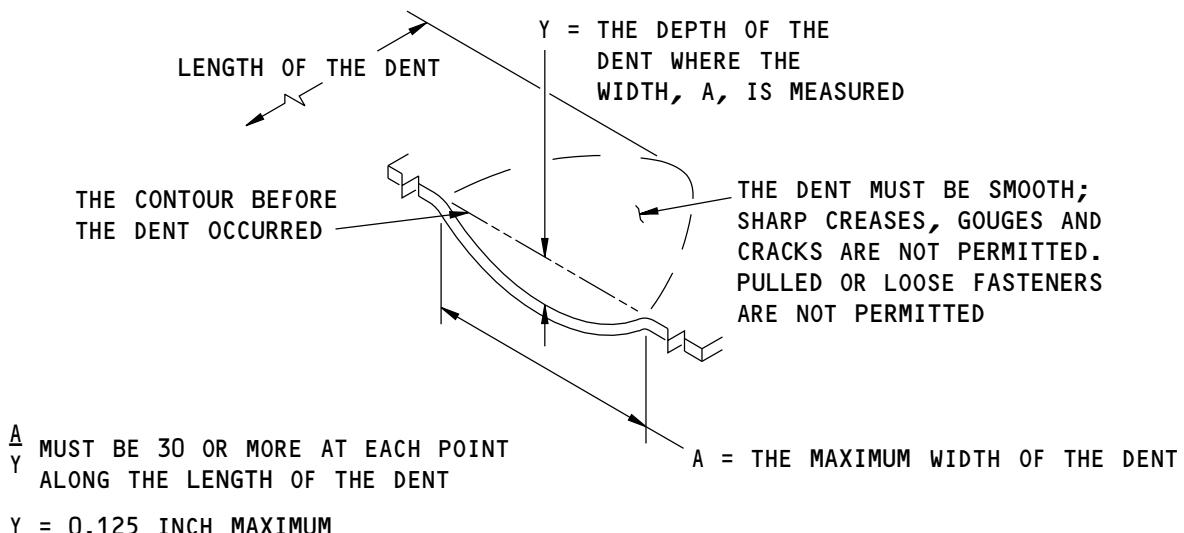


X = THE DEPTH OF THE MATERIAL REMOVED
= 0.25 t MAXIMUM

A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)


DENT THAT IS PERMITTED

(E)

F47214 S0006592482_V1

**Allowable Damage Limits
Figure 103 (Sheet 2 of 7)**

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ALLOWABLE DAMAGE 2

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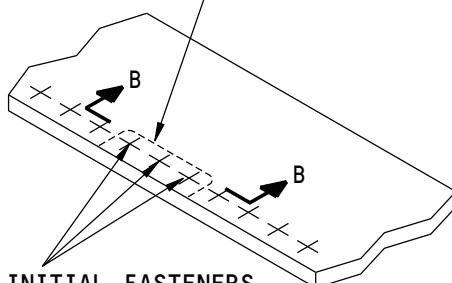
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THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN
A GROUP OF TEN IS PERMITTED
TO A DEPTH OF X MAXIMUM

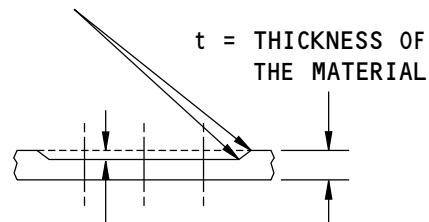


REMOVE THE INITIAL FASTENERS
BEFORE THE DAMAGED MATERIAL
IS REMOVED. INSTALL THE
FASTENERS AFTER THE REWORK
IS COMPLETED

REMOVAL OF CORROSION
AROUND THE FASTENERS

(F)

MAKE IT SMOOTH TO
A MINIMUM RADIUS
OF 0.5 INCH (TYPICAL)



X = THE DEPTH OF THE
MATERIAL REMOVED
= 0.10t MAXIMUM

B-B

F47218 S0006592483_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 7)

55-10-01

ALLOWABLE DAMAGE 2

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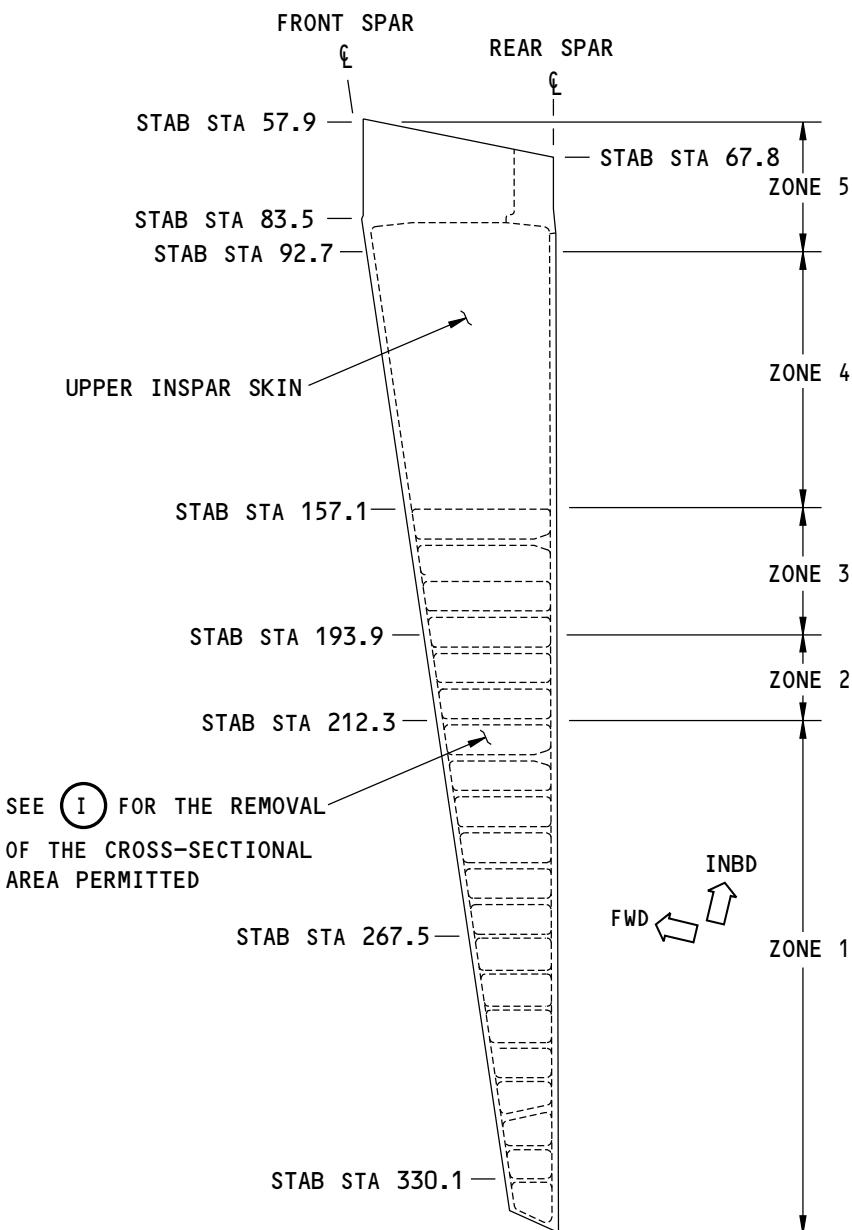
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STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 101 FOR THE REMOVAL OF DAMAGE FROM THE SKIN.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

(G)

G67191 S0006592484_V1

Allowable Damage Limits
Figure 103 (Sheet 4 of 7)

55-10-01

ALLOWABLE DAMAGE 2

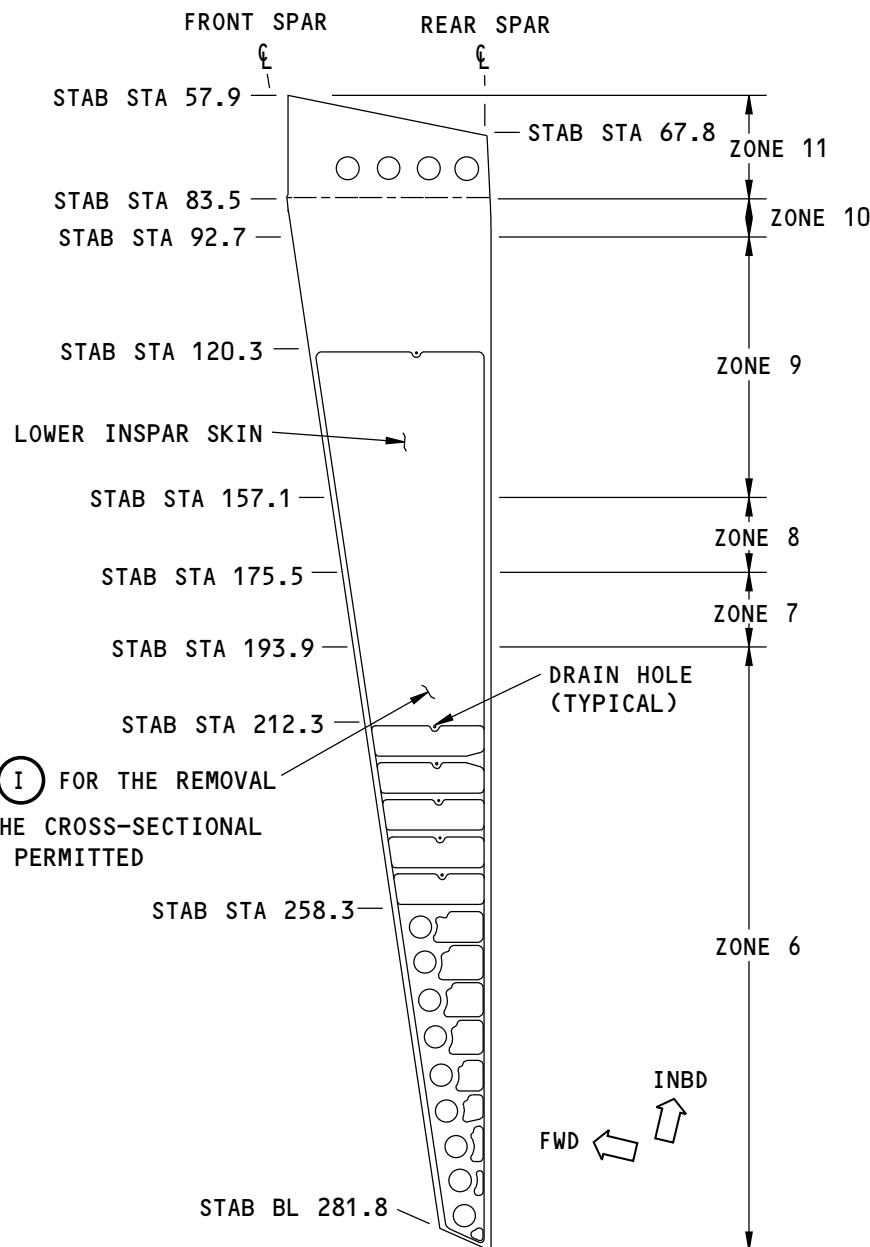
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NOTE: REFER TO TABLE 101 FOR THE REMOVAL OF DAMAGE FROM THE SKIN.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN



G67201 S0006592485_V2

Allowable Damage Limits
Figure 103 (Sheet 5 of 7)

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ALLOWABLE DAMAGE 2

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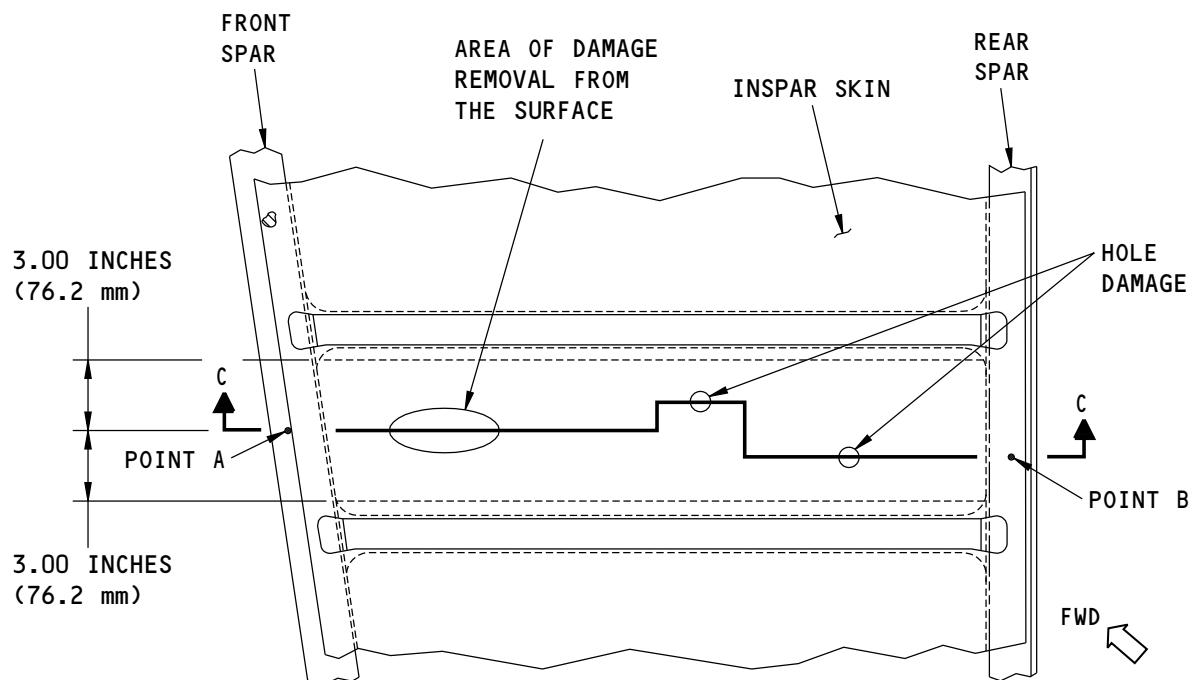
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STRUCTURAL REPAIR MANUAL



(I)

G78386 S0006592486_V1

Allowable Damage Limits
Figure 103 (Sheet 6 of 7)

55-10-01

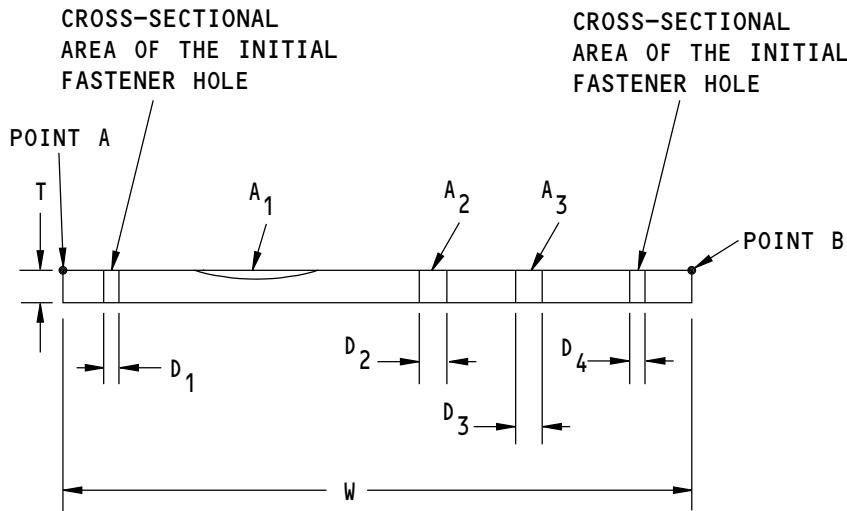
ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL**


D_1 , D_4 = DIAMETERS OF THE INITIAL FASTENER HOLES

D_2 , D_3 = DIAMETERS OF THE HOLES WHERE THERE IS DAMAGE

W = WIDTH OF THE SKIN AT THE CROSS-SECTION BETWEEN POINTS A AND B

T = THICKNESS OF THE SKIN AS GIVEN BY THE NOMINAL THICKNESS ON THE PRODUCTION DRAWING

A_i = INITIAL AREA OF THE SKIN

= THE TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL FASTENERS HOLES (AS MANUFACTURED BY BOEING)

= $WT - D_1T - D_4T$

A_1 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 1

A_2 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 2

A_3 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 3

$$\left(\frac{A_1 + A_2 + A_3}{A_i} \right) \times 100 = \text{PERCENT OF CROSS-SECTIONAL AREA REMOVED AS GIVEN IN TABLE 101}$$

THE TOTAL CROSS-SECTIONAL AREA REMOVED IN ALL ZONES A-B (3.00 INCH (76.2 mm) ON EACH SIDE OF A LINE A-B) MUST NOT BE MORE THAN THE LIMITS GIVEN IN TABLE 101

C-C

G78393 S0006592487_V1

**Allowable Damage Limits
Figure 103 (Sheet 7 of 7)**

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ALLOWABLE DAMAGE 2

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ALLOWABLE DAMAGE 3 - HORIZONTAL STABILIZER TRAILING EDGE PANELS

1. Applicability

- A. This subject gives the allowable damage limits for the parts that follow:
 - (1) Horizontal stabilizer trailing edge panels and the conductive strip shown in Horizontal Stabilizer Upper Trailing Edge Panel Locations, Figure 101/ALLOWABLE DAMAGE 3.
Horizontal stabilizer trailing edge panels shown in Horizontal Stabilizer Lower Trailing Edge Panel Locations, Figure 102/ALLOWABLE DAMAGE 3.

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ALLOWABLE DAMAGE 3

Page 101

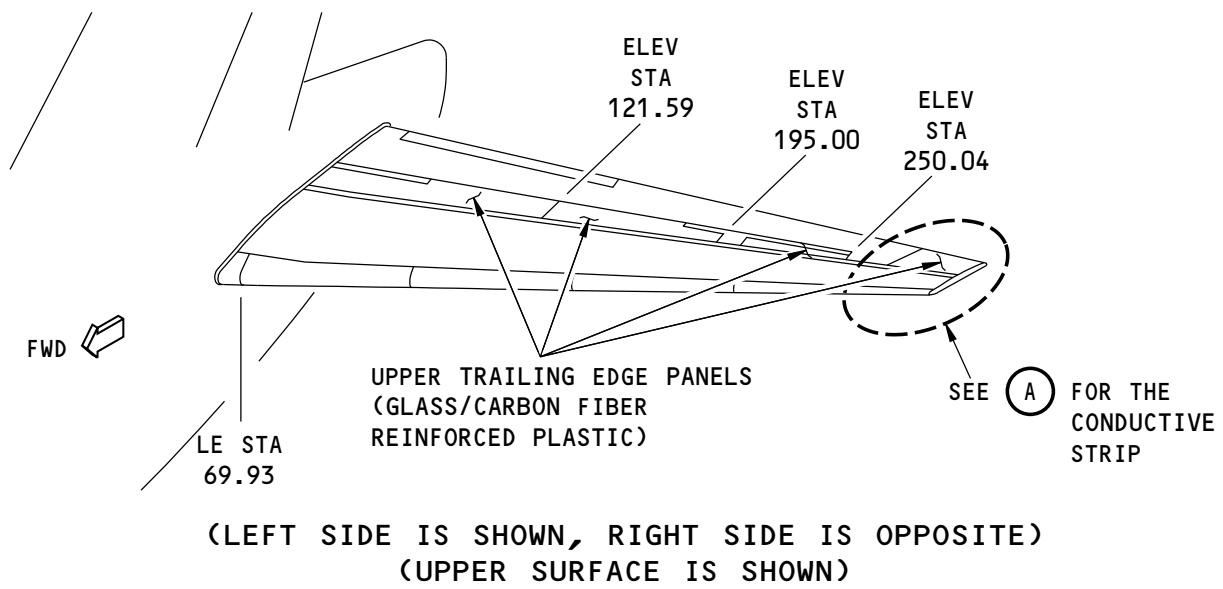
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F48528 S0006592489_V3

Horizontal Stabilizer Upper Trailing Edge Panel Locations
Figure 101 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 3

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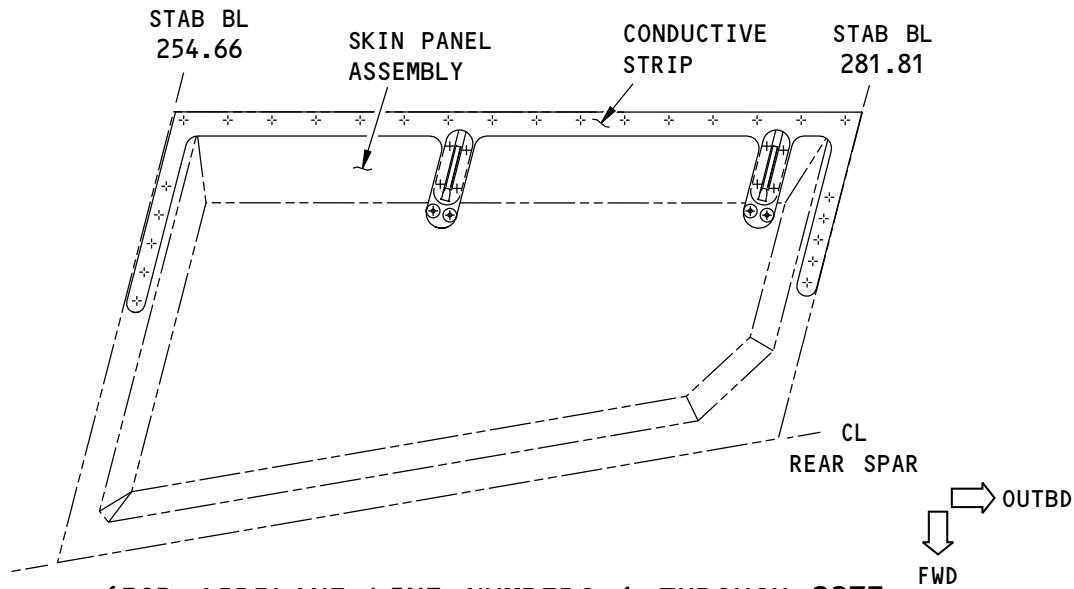
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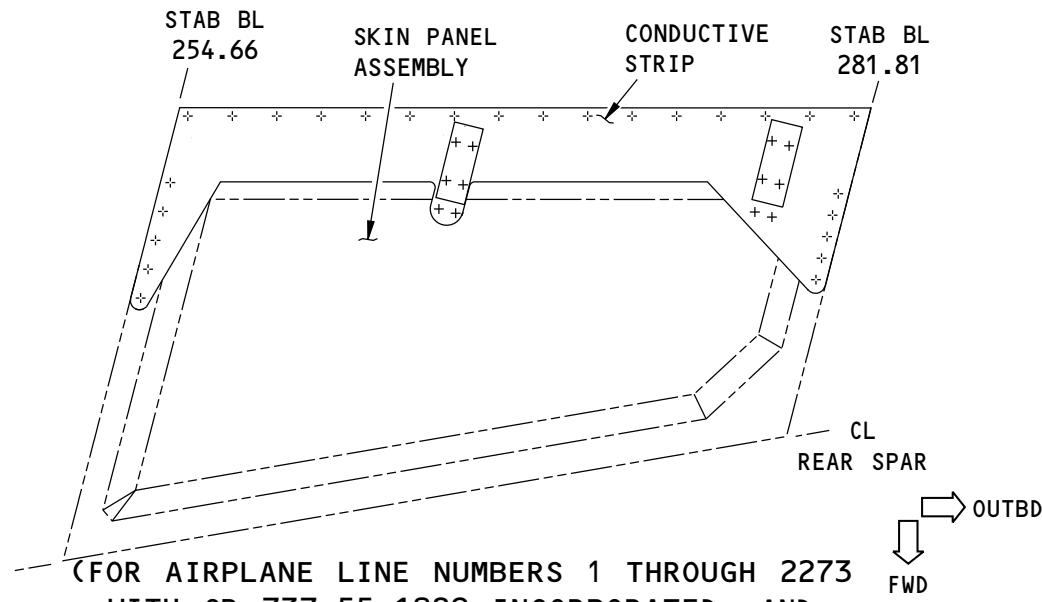
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 2273
WITHOUT SB 737-55-1089 INCORPORATED)



(FOR AIRPLANE LINE NUMBERS 1 THROUGH 2273
WITH SB 737-55-1089 INCORPORATED, AND
AIRPLANES WITH LINE NUMBERS 2274 AND ON.)

A

NOTE: REFER TO FIGURE 105 FOR THE DEFINITIONS OF THE ALLOWABLE
DAMAGE ZONES.

2455295 S0000571159_V1

Horizontal Stabilizer Upper Trailing Edge Panel Locations
Figure 101 (Sheet 2 of 2)

55-10-01

ALLOWABLE DAMAGE 3

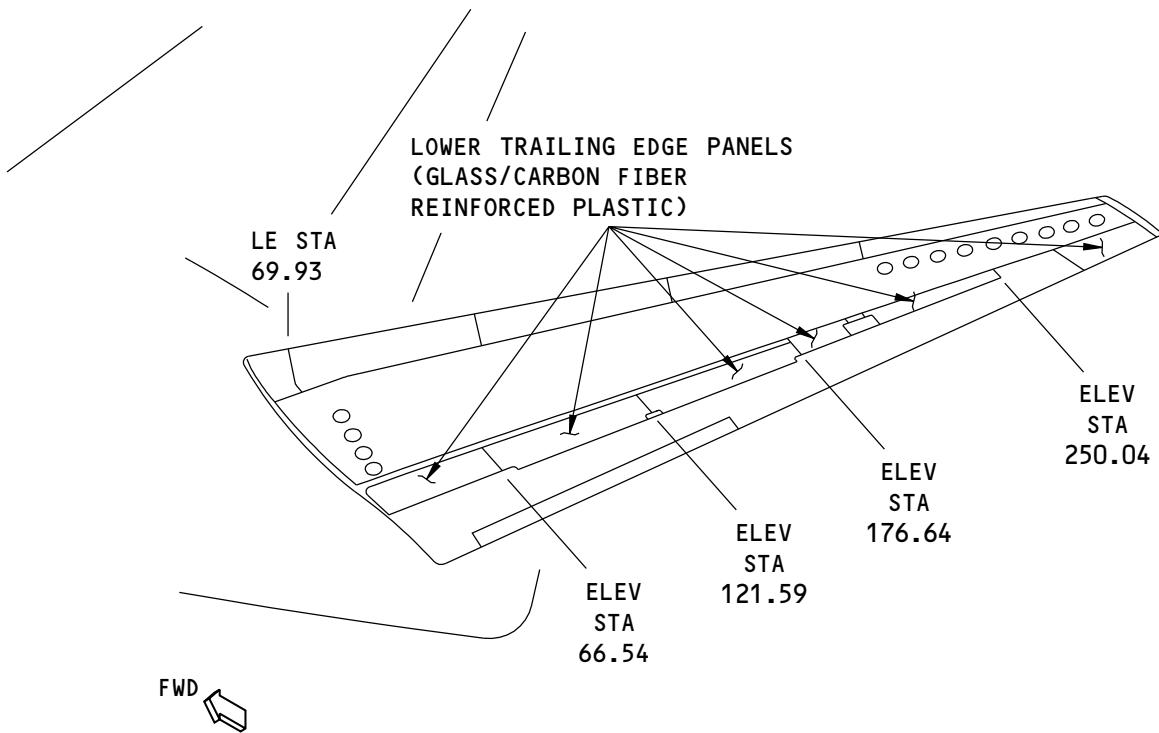
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NOTE: REFER TO FIGURE 105 FOR THE DEFINITIONS OF THE ALLOWABLE DAMAGE ZONES.

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LOWER SURFACE IS SHOWN

F48530 S0006592490_V1

Horizontal Stabilizer Lower Trailing Edge Panel Locations
Figure 102

55-10-01

ALLOWABLE DAMAGE 3
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2. General

- A. Paragraphs 2.B, 2.C, 2.D, and 2.E are applicable to the trailing edge panels only. Paragraph 2.F is applicable to the conductive strip only.
- B. Use a Non-Destructive Test (NDT) to find the length, width, and depth of damage.
 - (1) For the honeycomb core areas that have damage on a facesheet with 3 or less plies, Boeing recommends that you use an instrumented NDT procedure. The tap test procedure is optional. Refer to 737 NDT Part 1, 51-01-02, 737 NDT Part 1, 51-01-03, and 737 NDT Part 1, 51-05-01 for the inspection procedures.
 - (2) For the honeycomb core areas that have damage on a facesheet with 4 or more plies, Boeing recommends that you use an instrumented NDT procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.
- NOTE:** The tap test procedure as given in 737 NDT Part 1, 51-05-01 is optional only if it can be shown that the defects (that are less than or equal to the allowable damage limits) can be found.
- (3) For damage in the solid laminate areas, Boeing recommends that you use an instrumented NDT procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.
- (4) Refer to Definitions of Damage Size, Figure 103/ALLOWABLE DAMAGE 3, Details A, B, and C for the definitions of the length, width, and depth of damage.
- (5) Refer to Definitions of the Facesheets, Figure 104/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.
- (6) Refer to Horizontal Stabilizer Trailing Edge Panels Allowable Damage Zones, Figure 105/ALLOWABLE DAMAGE 3 for the locations of the allowable damage zones.
- C. Remove all contamination and water from the structure.
 - (1) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (2) Refer to 51-70-04 for the damage removal procedures.
- D. Seal all permitted damage areas that are not more than one ply deep. Refer to Paragraph 4./ ALLOWABLE DAMAGE 3 for the allowable damage limits. Seal the damage with one of the two methods that follow:
 - (1) Make a temporary seal.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location.
 - (c) Make sure that the tape is in satisfactory condition at each 400 flight hour interval.
 - (d) Repair the damage after no more than 5000 flight hours.
 - (2) Make a permanent seal.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - (b) Apply one layer of BMS 10-79, Type 3 primer. Refer to SOPM 20-44-04.
 - (c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
- E. Seal all permitted damage areas that are more than one ply deep. Refer to Paragraph 4./ ALLOWABLE DAMAGE 3 for the allowable damage limits. Seal the damage as follows:
 - (1) Use vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.

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ALLOWABLE DAMAGE 3

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- (2) Make a temporary seal with aluminum foil tape (speed tape).
 - (3) Keep a record of the location.
 - (4) Repair the damage after no more than 400 flight hours.
- F. Aluminum material damage removal.
- (1) Remove damage from the aluminum material as necessary.
 - (a) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the inspection and removal of damage.
 - (b) Refer to NON-METALLIC MATERIALS, 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (c) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (2) Make sure there is a 125 micro inches Ra or smoother surface finish. Refer to 51-20-13, GENERAL.
 - (3) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
 - (4) Apply two layers of BMS 10-11, Type I primer to the reworked areas. Refer to SOPM 20-41-02.
 - (5) Apply BMS 5-95 sealant at the damage location to make sure all gaps are filled. Refer to 51-20-05, GENERAL.
 - (6) Apply the decorative finish to the reworked areas as given in AMM PAGEBLOCK 51-21-99/701.
 - (7) Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in AERODYNAMIC SMOOTHNESS, 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - (8) After 30 days or less, make an initial visual inspection of the damaged Conductive Strip for signs of new damage or for loose or missing fasteners. Repeat the inspections at each 30 day interval. If any new damage is found to the conductive strip then replace the part.
- NOTE:** Replacement of the damaged part with a new part stops the repeat inspection intervals.
- (9) Replace the damaged Conductive Strip with a new part in 24 months or less.

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ALLOWABLE DAMAGE 3

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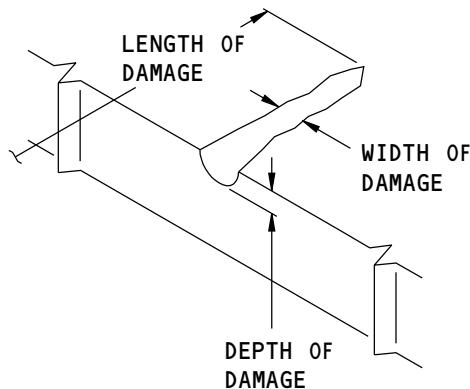
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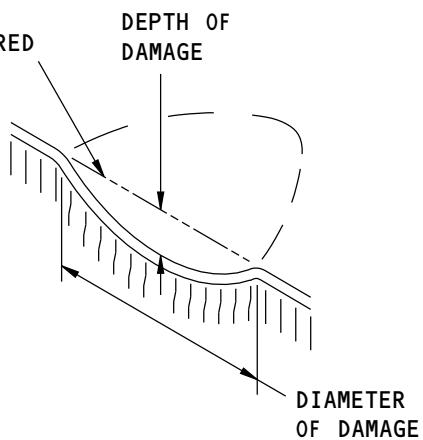
**737-800
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**SIZE DEFINITIONS FOR
NICK, GOUGE, OR SCRATCH DAMAGE**

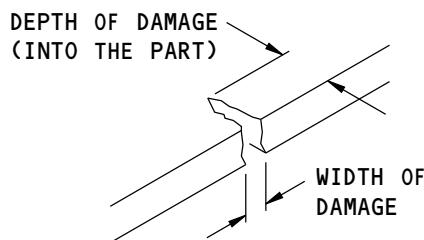
(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED



**SIZE DEFINITIONS FOR
DENT DAMAGE**

(B)



**SIZE DEFINITIONS FOR
EDGE DAMAGE**

(C)

F48639 S0006592491_V1

**Definitions of Damage Size
Figure 103**

55-10-01

ALLOWABLE DAMAGE 3

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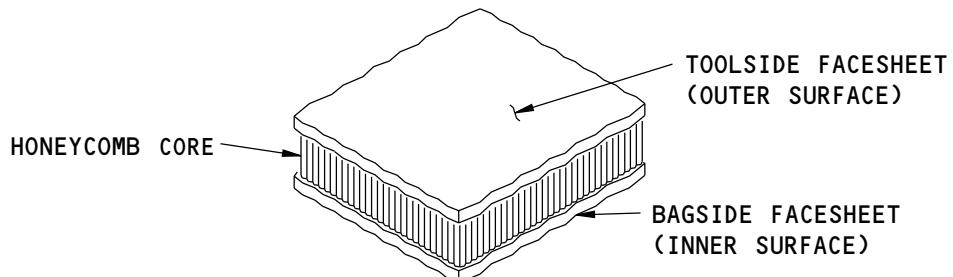
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F48638 S0006592492_V1

Definitions of the Facesheets
Figure 104

55-10-01

ALLOWABLE DAMAGE 3

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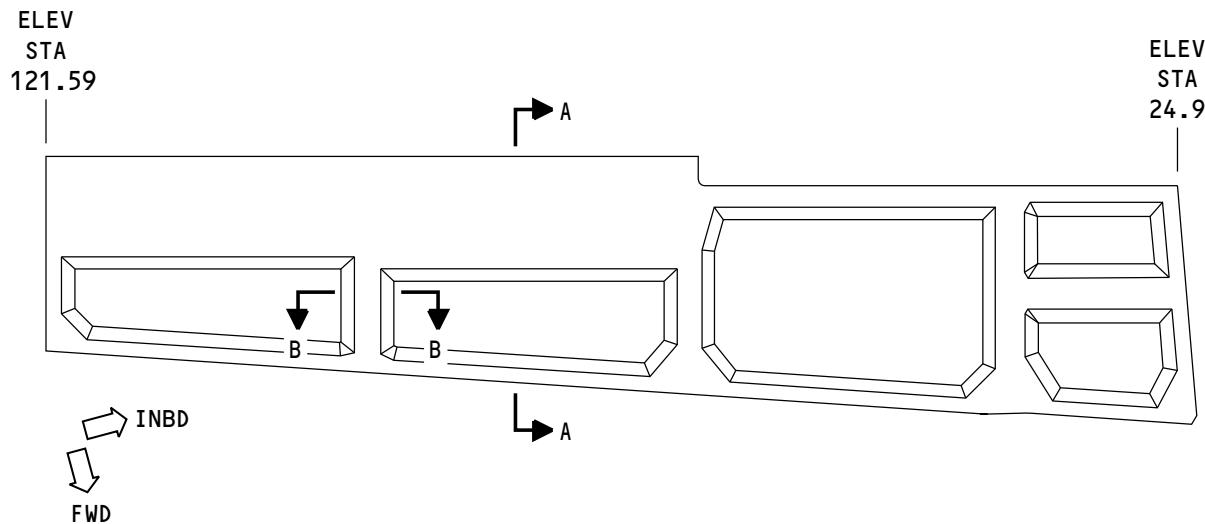
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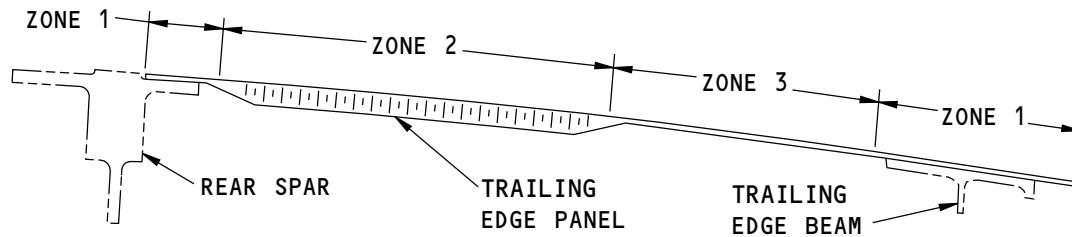
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TYPICAL UPPER PANEL IS SHOWN, LOWER PANELS ARE THE SAME



A-A

ZONE 1: SOLID LAMINATE AREA WITH FASTENERS, EDGE BAND

ZONE 2: HONEYCOMB CORE AREA

ZONE 3: SOLID LAMINATE AREA WITHOUT FASTENERS

G72247 S0006592493_V1

Horizontal Stabilizer Trailing Edge Panels Allowable Damage Zones
Figure 105 (Sheet 1 of 2)

55-10-01

ALLOWABLE DAMAGE 3

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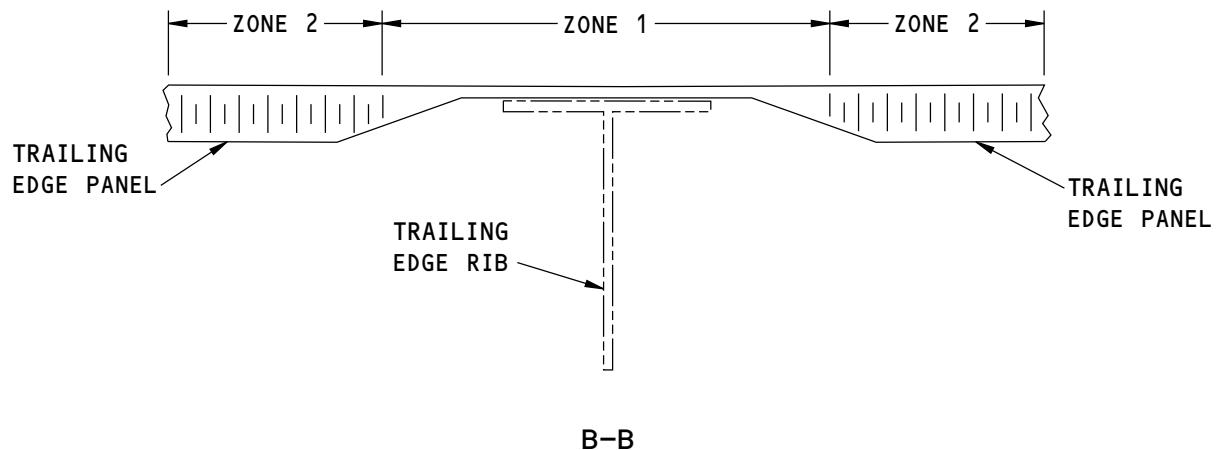
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B-B

ZONE 1: SOLID LAMINATE AREA WITH FASTENERS, EDGE BAND

ZONE 2: HONEYCOMB CORE AREA

G72272 S0006592494_V1

Horizontal Stabilizer Trailing Edge Panels Allowable Damage Zones
Figure 105 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 3

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3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05, GENERAL	Repair Sealing
51-20-13, GENERAL	Surface Roughness Finish Requirements
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

A. Zone 1 - Solid Laminate Areas With Fasteners

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted if:
 - (a) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- (2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if:
 - (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- (3) Dents are permitted if:
 - (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- (4) Holes and Punctures are permitted if:
 - (a) They are a maximum 0.25 inch in diameter
 - (b) Not more than one fastener hole in six is damaged
 - (c) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (d) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- (5) Delaminations are permitted if:
 - (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3

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- (6) Edge Erosion is permitted as shown in Edge Erosion Damage Removal, Figure 106/ALLOWABLE DAMAGE 3 if:
 - (a) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (b) It is sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (7) Edge damage is permitted if:
 - (a) It is a maximum 0.10 inch in depth
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) It is removed as shown in Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 3, Detail A
 - (d) It is sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- B. Zone 2 - Honeycomb Core Areas
- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted if:
 - (a) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum of one ply in depth
 - NOTE:** Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum length of 1.50 inches
 - (c) A maximum width of 1.50 inches
 - (d) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and
 - 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (e) Sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (3) Dents are permitted if:
 - (a) They are a maximum of one facesheet
 - (b) They are a maximum diameter of 1.50 inches
 - (c) They are a minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and
 - 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (d) There is no fiber damage or delamination
 - (e) The damage is sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of one facesheet and the core in depth
 - (b) A maximum diameter of 1.50 inches

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- (c) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and
 - 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (d) Sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- NOTE:** Do not remove the damage unless it is necessary to remove resin burrs that extend into the surface contour.
- (5) Delaminations are permitted if they are:
 - (a) On a maximum of one facesheet
 - (b) A maximum diameter of 1.50 inches
 - (c) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and
 - 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (d) Sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3

C. Zone 3 - Solid Laminate Areas Without Fasteners

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted if:
 - (a) They are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- (2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum length of 1.50 inches
 - (c) A maximum width of 1.50 inches
 - (d) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and
 - 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (e) Sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- (3) Dents are permitted if:
 - (a) They are a maximum diameter of 0.75 inch
 - (b) They are a minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and

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- 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (c) There is no fiber damage or delamination
 - (d) The damage is sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (4) Holes and Punctures are not permitted.
 - (5) Delaminations are permitted if they are:
 - (a) A maximum diameter of 0.75 inch
 - (b) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 108/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply, and
 - 2) Are sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
 - (c) Sealed as given in Paragraph 2.D./ALLOWABLE DAMAGE 3
- D. Conductive Strip
- NOTE:** This allowable damage section is approved only for conductive strip damage where none of the initial fasteners are loose or damaged. If there are initial fasteners loose or damaged, refer to 55-10-01, Repair 10 – CONDUCTIVE STRIP.
- (1) Remove the damage. Refer to Figure 109 for the permitted damage limits. Find the area removed from the initial cross-sectional area. If the area removed is less than or equal to 20% of the initial cross-sectional area, continue with Paragraph 4.D.(2). If the area removed is more than 20% of the initial cross-sectional area, refer to 55-10-01, Repair 10 – CONDUCTIVE STRIP.
 - (2) After 30 days or less, make an initial visual inspection of the damaged Conductive Strip for signs of new damage and for loose or missing fasteners. Repeat the inspections at each 30 day interval. If any new damage is found to the conductive strip then replace the part.

NOTE: Replacement of the damaged part with a new conductive strip stops the repeat inspection intervals.
 - (3) Replace the damaged Conductive Strip with a new part in 24 months or less.

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ALLOWABLE DAMAGE 3

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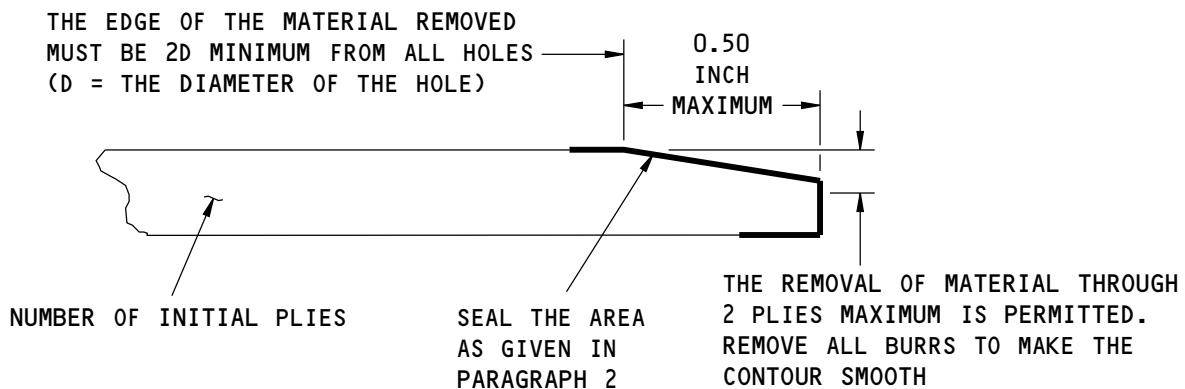
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Edge Erosion Damage Removal
Figure 106

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ALLOWABLE DAMAGE 3

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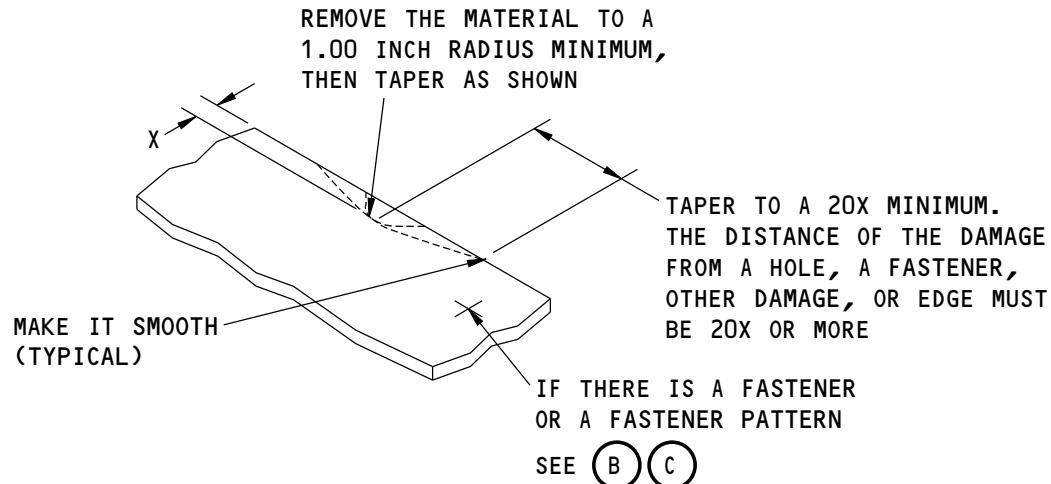
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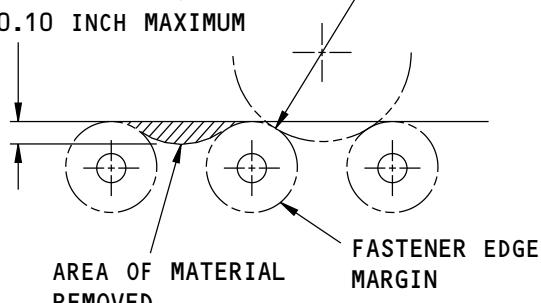


X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

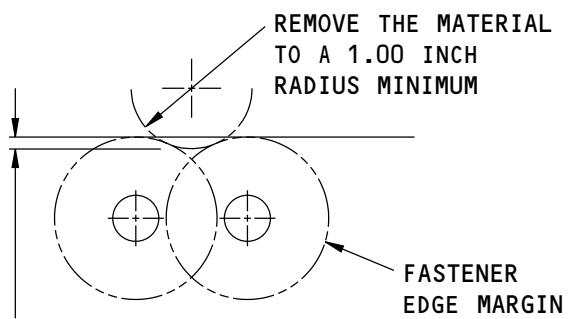
REMOVAL OF DAMAGED MATERIAL ON AN EDGE



X = THE DEPTH OF THE
MATERIAL REMOVED
= 0.10 INCH MAXIMUM



REMOVE THE MATERIAL
TO A 1.00 INCH
RADIUS MINIMUM



X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS DO NOT HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP



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Allowable Damage Limits

Figure 107

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ALLOWABLE DAMAGE 3

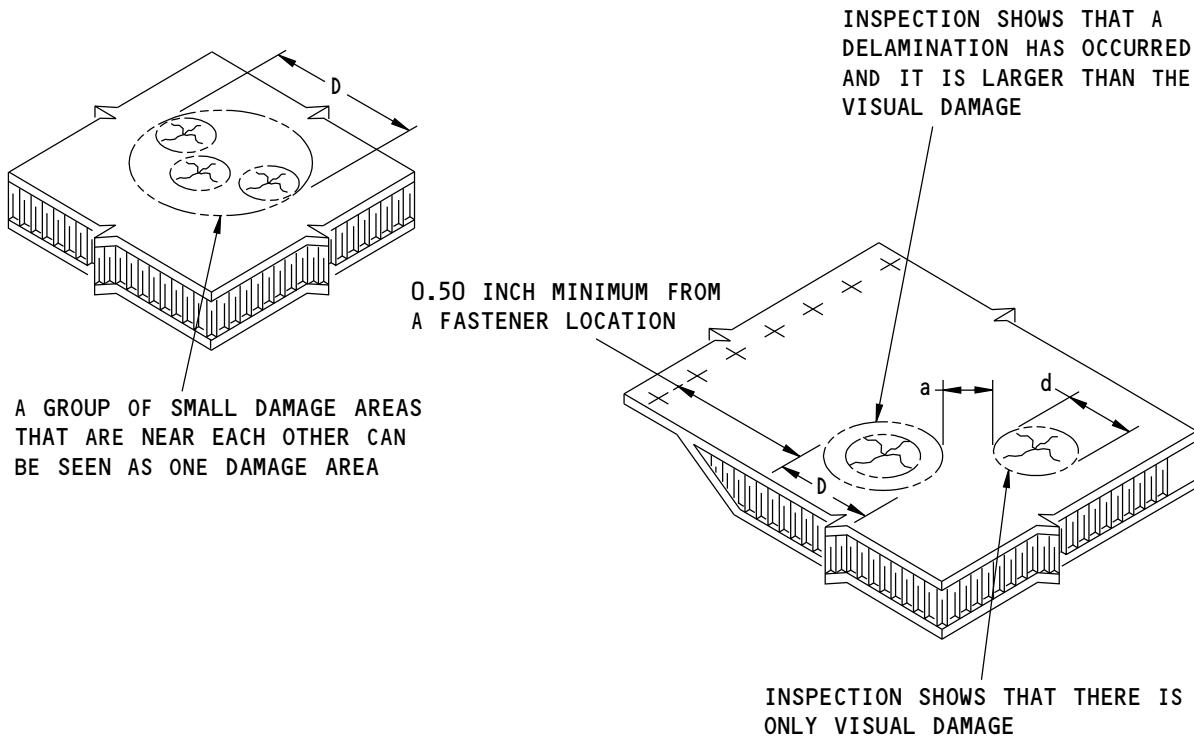
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NOTE: TO FIND DELAMINATION YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02).

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

A DAMAGE AREA DOES NOT INCLUDE NICKS, GOUGES, AND SCRATCHES THAT DO NOT CAUSE DAMAGE TO THE GLASS AND CARBON FIBER PLIES IF:

- YOU MAKE A TEMPORARY SEAL OF THE DAMAGE AS GIVEN IN PARAGRAPH 2 OR
- YOU MAKE A PERMANENT SEAL OF THE DAMAGE AS GIVEN IN PARAGRAPH 2

(D) IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND IS A MAXIMUM OF 1.50 INCHES

(d) IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

(a) IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS. THE MINIMUM (a) THAT IS PERMITTED IS (4D).

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Damage Size and Spacing Limits
Figure 108

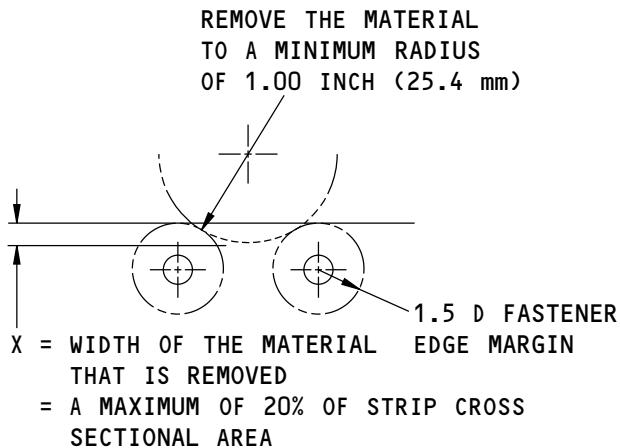
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ALLOWABLE DAMAGE 3

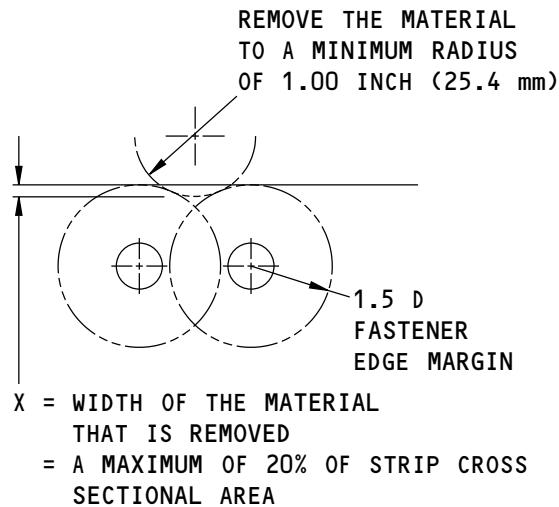
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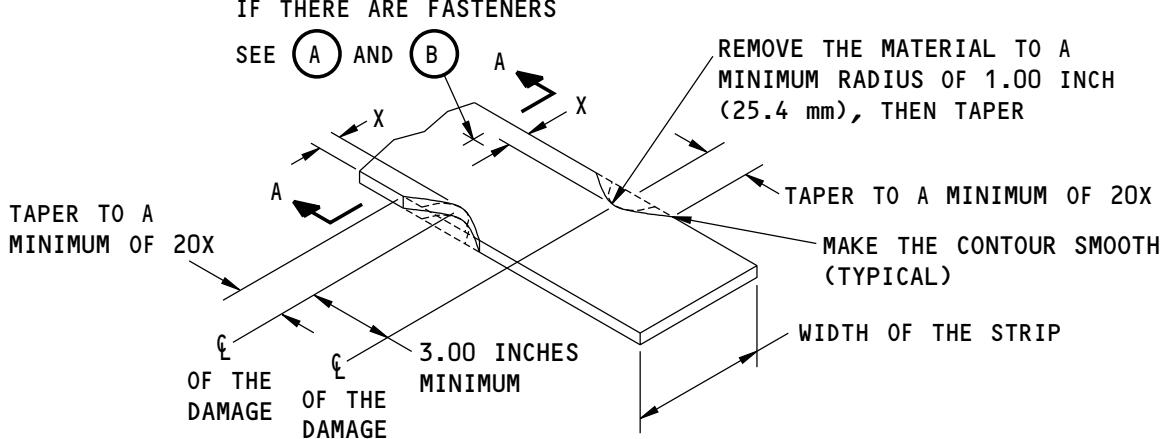
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REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL ON AN EDGE

J59021 S0000172480_V1

Conductive Strip Allowable Damage Limits
Figure 109 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 3

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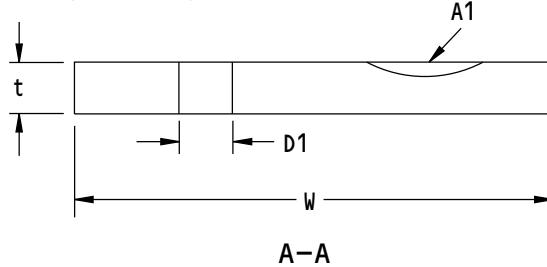
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CROSS-SECTIONAL AREA OF THE CONDUCTIVE STRIP AT A FASTENER HOLE



A-A

D_1 = DIAMETERS OF THE INITIAL FASTENER HOLES

t = MATERIAL THICKNESS

W = STRIP WIDTH

A_i = INITIAL AREA OF THE STRIP

= THE CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL HOLE (AS MANUFACTURED BY BOEING)

= $Wt - D_1 t$

A_1 = CROSS-SECTIONAL AREA OF THE DAMAGE REMOVED AT LOCATION 1

$\left(\frac{A_1}{A_i}\right) \times 100$ = PERCENT OF CROSS-SECTIONAL AREA REMOVED
= A MAXIMUM OF 20 PERCENT

(D)

J59037 S0000172481_V1

Conductive Strip Allowable Damage Limits
Figure 109 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 3

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ALLOWABLE DAMAGE 4 - HORIZONTAL STABILIZER LEADING EDGE SKINS, EROSION DAMAGE

1. Applicability

- A. This subject gives the allowable damage limits for the horizontal stabilizer leading edge skins that have erosion damage. These limits are for the removable skin panels shown in Horizontal Stabilizer Leading Edge Skin Locations, Figure 101/ALLOWABLE DAMAGE 4. Do not use the limits of this subject for the fixed leading edge skin or the outboard tip. Refer to Allowable Damage 1 for other types of damage limits permitted.

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ALLOWABLE DAMAGE 4

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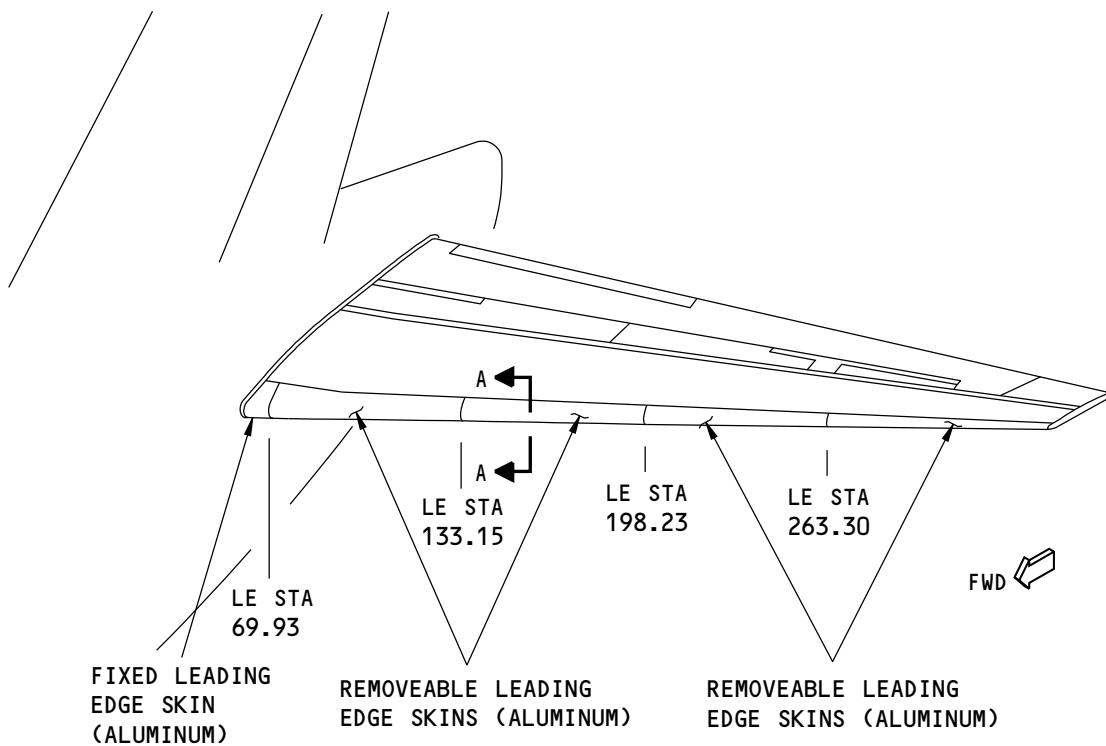
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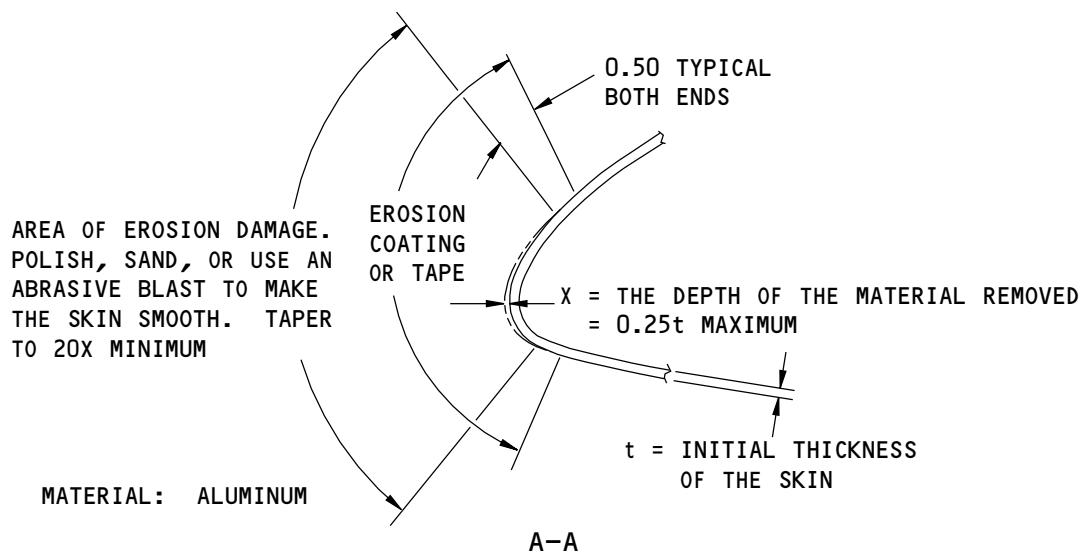


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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

UPPER SURFACE IS SHOWN



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Horizontal Stabilizer Leading Edge Skin Locations
Figure 101

55-10-01

ALLOWABLE DAMAGE 4

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2. General

A. Do what follows for the aluminum leading edge skins:

- (1) Remove the damaged material as given in Paragraph 4./ALLOWABLE DAMAGE 4 The maximum depth of material that can be removed is equal to 25% of the initial thickness of the skin.
 - (a) Refer to 51-10-02 for the inspection and removal of damage.
 - (b) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (c) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- (2) Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-08	EROSION PROTECTION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING

4. Allowable Damage Limits

WARNING: MATERIALS THAT ARE USED TO CLEAN AND COAT ARE TOXIC AND FLAMMABLE.
MAKE SURE THERE IS A GOOD FLOW OF AIR AND YOU OBEY ALL FIRE PRECAUTIONS.

A. Light Erosion Damage to the Aluminum Skin:

- (1) Make the metal contour smooth.
 - (a) Apply masking tape to the areas where there is no damage.
 - (b) Clean the surface with a moist cheesecloth. Use water to make the cheesecloth moist.
 - (c) Polish or sand the damaged area to make a smooth surface. The maximum depth of removal must not be more than 25% of the initial skin thickness.
- (d) Where the skin has been pushed in, make the skin contour smooth with the adjacent skin.
 - 1) Use powdered household cleanser or 400 grit aluminum oxide paper.
 - 2) Refer to Horizontal Stabilizer Leading Edge Skin Locations, Figure 101/ ALLOWABLE DAMAGE 4, Section A-A , for the surface contour limits.
- (e) Clean the surface with a moist new cheesecloth. Use MIBK to make the cheesecloth moist.
- (f) Find the depth of material that has been removed.

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- 1) Use a Vidigage, Branson digital caliper, dial gage, or a straight edge with feeler gages to find the depth.
 - 2) Repair the leading edge skin if the depth of material removed is more than 25% of the initial skin thickness.
 - 3) Apply a chemical conversion coating if the depth of material removed is less than 25% of the initial skin thickness. Apply the conversion coating to the bare surfaces of the skin as given in 51-20-01.
- (g) For more protection of leading edge skins, apply a new layer of erosion tape or an erosion coating. Refer to 51-20-08.
- 1) Replace the tape or erosion coating if there is too much wear.
 - 2) When the bare metal shows or the aerodynamic smoothness limits are not kept, there is too much wear. Refer to 51-10-01 for the aerodynamic smoothness limits.
- B. Moderately damaged to badly damaged areas of the aluminum skin:
- (1) Prepare the metal areas.
 - (a) Apply masking tape to the areas where there is no damage.
 - (b) Close and seal all openings to keep all material out of the structure.
 - (c) Static ground the airplane and the abrasive blast equipment.
 - (d) Use a spray gun with water or toluene to clean the eroded area of the skin.
- CAUTION:** DO NOT USE A CLOTH OR OTHER FABRIC TO CLEAN THE ABRASIVE BLASTED AREA. UNWANTED LINT ON THE CLEANED AREA WILL DECREASE THE LIFE OF THE EROSION COATING.
- (e) Use an abrasive blast to remove the erosion damage as given in 51-10-02.
 - 1) Make sure all of the oxide and corrosion has been removed from the eroded areas.
 - 2) Refer to Horizontal Stabilizer Leading Edge Skin Locations, Figure 101/ ALLOWABLE DAMAGE 4, Section A-A , for the limits of a good taper.
 - (f) Find the depth of material that has been removed.
 - 1) Use a Vidigage, Branson digital caliper, dial gage, or a straight edge with feeler gages to find the depth.
 - 2) Repair the leading edge skin if the depth of material removed is more than 25% of the initial skin thickness.
 - 3) Apply a chemical conversion coating if the depth of material removed is less than 25% of the initial skin thickness. Apply the conversion coating to the bare surfaces of the skin as given in 51-20-01.
 - (g) For more protection of leading edge skins, apply a new layer of erosion tape or an erosion coating. Refer to 51-20-08.
 - 1) Replace the tape or erosion coating if there is too much wear.
 - 2) When the bare metal shows or the aerodynamic smoothness limits are not kept, there is too much wear. Refer to 51-10-01 for the aerodynamic smoothness limits.
- C. Damage to the initial layer of erosion protection:
- (1) Areas of bare metal or unsatisfactory aerodynamic smoothness are caused by damage to the erosion protection. Refer to 51-10-01 for the aerodynamic smoothness limits and do what follows for these areas:
 - (a) Remove the erosion coating with MIBK.

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- 1) Soak the coating with MIBK with the use of cheesecloth.
 - 2) Keep the cheesecloth on the coating until it is soft.
 - 3) Use a plastic scraper to remove the erosion coating.
- (b) Remove the erosion tape.
- 1) Soak the tape edge sealer with MIBK with the use of cheesecloth.
 - 2) Keep the cheesecloth on the edge sealer until it is sufficiently soft to remove.
 - 3) Heat (150°F maximum temperature) can be used to make the tape soft.
 - 4) Use a plastic scraper, razor, or knife to start the removal of the tape at edges. Use your hand to pull the tape away from the metal skin.
- (c) For more protection of leading edge skins, apply a new layer of erosion tape or an erosion coating. Refer to 51-20-08.
- 1) Replace the tape or erosion coating if there is too much wear.
 - 2) When the bare metal shows or the aerodynamic smoothness limits are not kept, there is too much wear. Refer to 51-10-01 for the aerodynamic smoothness limits.

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REPAIR GENERAL - SERVICE BULLETIN REPAIR CHART

1. Service Bulletin Repair - Horizontal Stabilizer Skin

- A. The following Service Bulletin contain repairs which are available for use where specific damage has been encountered. Usually, the Service Bulletin also covers preventive change data which operators are encouraged to use to eliminate the need for repair.

DAMAGED AREA	CUM LINE NUMBER EFFECTIVITY	SB NUMBER
STABILIZERS - Horizontal Stabilizer - Lower Skin Cracking and Modification	1 THRU 3623	737-55-1096

55-10-01

REPAIR GENERAL

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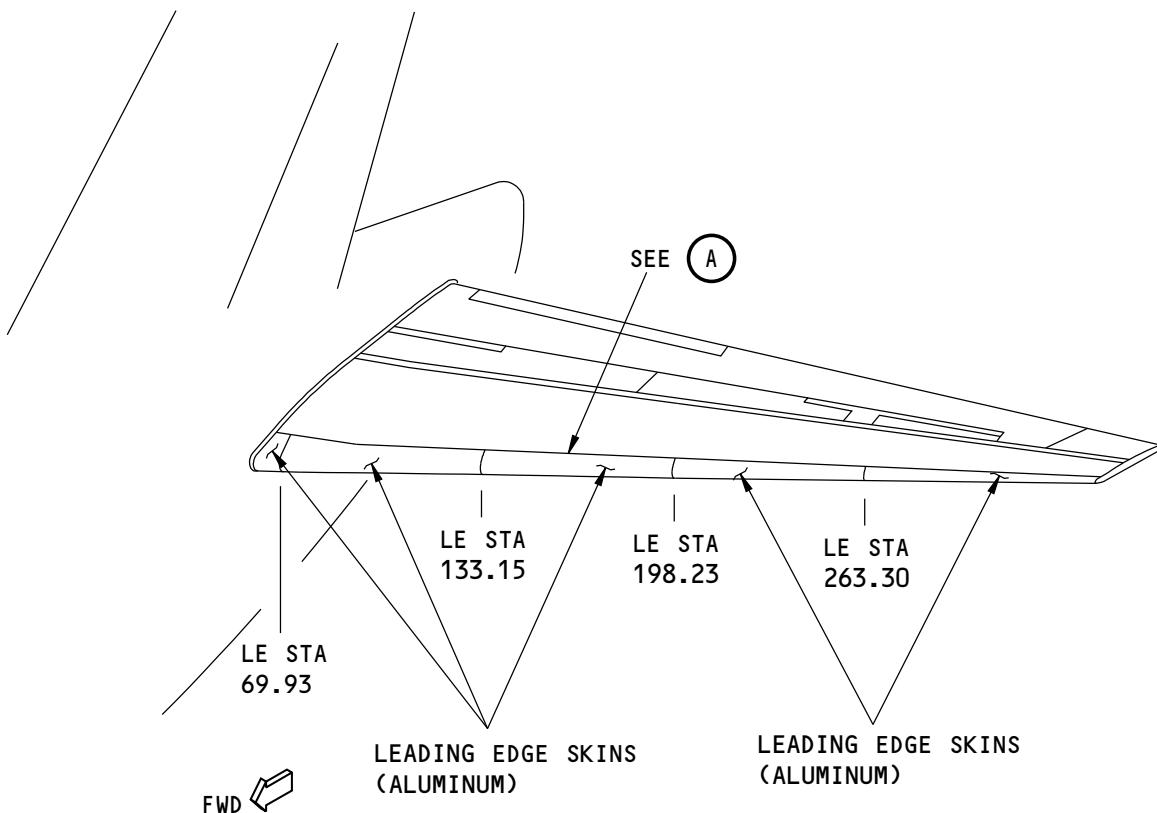


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REPAIR 1 - HORIZONTAL STABILIZER LEADING EDGE SKIN EXTERNAL REPAIR

1. Applicability

- A. REPAIR 1 is applicable to damage to the horizontal stabilizer leading edge skins shown in Figure 201/REPAIR 1.
- B. You are permitted to install a maximum of 3 leading edge skin repairs on each horizontal stabilizer. These 3 repairs can include REPAIR 1, REPAIR 2, or a repair that is not in the SRM. If it is necessary to install more than 3 repairs, contact The Boeing Company for repair instructions.
- C. The sum of the width of all doublers on the leading edge skin must not be more than 60 in. (1524 mm) on each horizontal stabilizer. If the sum of the width is more than 60 in. (1524 mm), contact The Boeing Company for repair instructions.



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

UPPER SURFACE IS SHOWN

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Horizontal Stabilizer Leading Edge Skin Locations
Figure 201 (Sheet 1 of 2)

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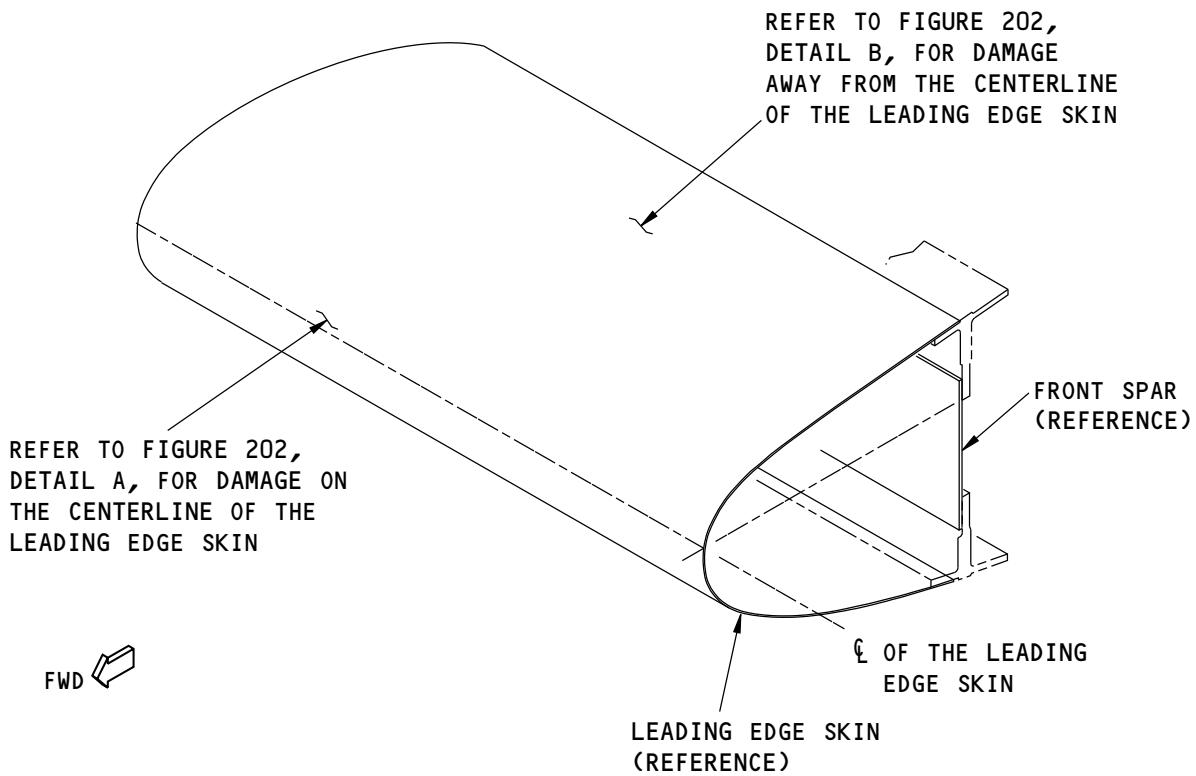
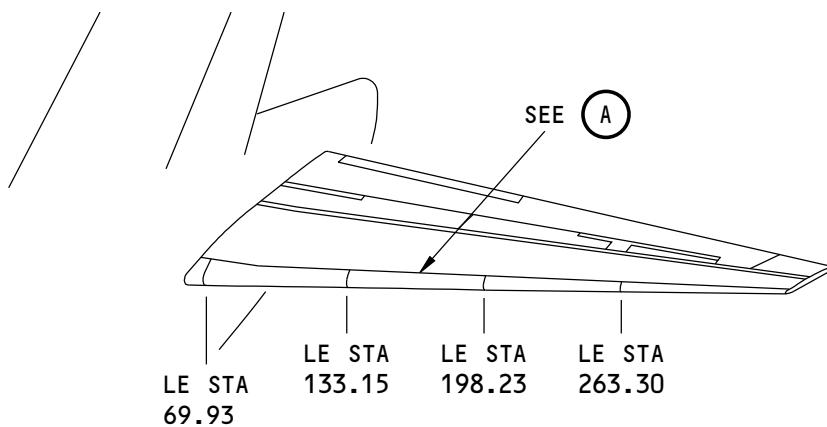
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A

2021399 S0000400881_V1

Horizontal Stabilizer Leading Edge Skin Locations
Figure 201 (Sheet 2 of 2)

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REPAIR 1
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2. General

- A. REPAIR 1 gives instructions for a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Make sure that the aerodynamic smoothness is satisfactory and not more than the limits given in AERODYNAMIC SMOOTHNESS, 51-10-01. If the aerodynamic smoothness is not satisfactory, then there will be a decrease in the performance of the airplane.
- C. You must keep a minimum distance of 3 in. (76 mm) between the edge of the repair doubler and the leading edge of the horizontal stabilizer. If the separation distance is less than 3 in. (76 mm) then you must make the doubler to extend past the leading edge of the horizontal stabilizer by a minimum of 3 in. (76 mm). Refer to Figure 202/REPAIR 1.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES

4. Repair Instructions

- A. Drill a stop hole at the ends of all skin cracks that do not end at fastener holes. Refer to Figure 202/REPAIR 1. Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the procedure to drill a stop hole. For other damage, do the steps that follow:
 - (1) Remove the damaged skin. Refer to Figure 202/REPAIR 1. Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the procedure to remove the damage.
 - (a) Make the cut in the shape of a rectangle with the chord-wise (vertical) sides parallel to the leading edge ribs.
 - (b) Make the corner radii of the cut a minimum of 0.50 in. (12.7 mm).
 - (c) Make sure that there is a minimum of two rows of repair fasteners around the edges of the cut.
- B. Put the skin around the damage back to the initial contour. Refer to AERODYNAMIC SMOOTHNESS, 51-10-01.
- C. Make the part [1] doubler as shown in Figure 202/REPAIR 1. Refer to Table 201/REPAIR 1 for the repair material.
 - (1) Make the contour of the part [1] doubler the same as the initial contour of the skin.

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REPAIR 1
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STRUCTURAL REPAIR MANUAL

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad 2024-T3 that is 0.063 in. (1.60 mm) thick when the initial skin is 0.040 in. (1.02 mm) thick. Use clad 2024-T3 that is one gage thicker than the initial skin when the thickness is more than 0.040 in. (1.02 mm). Do not install doublers that are more than 0.080 in. (2.03 mm) thick.

- D. Assemble the part [1] doubler with the leading edge skin. Refer to Figure 202/REPAIR 1.
- E. Drill and countersink the fastener holes. Make sure that there is sufficient edge margin from the edge of all chemmilled pockets.
- F. Remove the part [1] doubler.
- G. Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- H. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- I. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
- J. Install the rivets without sealant. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02 for rivet installation instructions.
- K. Apply BMS 5-95 sealant around the edges of the part [1] doubler as given in REPAIR SEALING, 51-20-05.
- L. Apply a finish to the repair area as necessary. Refer to AMM SECTION 51-21.

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STRUCTURAL REPAIR MANUAL**

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENERS. USE (D) TO CALCULATE EDGE MARGINS.
 - (L) IS THE MINIMUM DISTANCE BETWEEN THE LEADING EDGE OF THE HORIZONTAL STABILIZER AND THE EDGE OF THE DOUBLER.
 - YOU MUST KEEP A MINIMUM OF 2 FASTENER ROWS AROUND THE DAMAGE IN ALL DIRECTIONS.
- 1** YOU MUST KEEP A MINIMUM DISTANCE OF 3 INCHES (77 mm) BETWEEN THE EDGE OF THE REPAIR DOUBLER AND THE LEADING EDGE OF THE HORIZONTAL STABILIZER. YOU MUST KEEP THIS DISTANCE ON BOTH THE UPPER SURFACE AND ON THE LOWER SURFACE OF THE STABILIZER.

FASTENER SYMBOLS

- REPAIR FASTENER LOCATION. INSTALL A BACR15FP5E() OR A NAS1739E5 BLIND RIVET, OR INSTALL A BACR15GF5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

2021521 S0000400888_V1

**Horizontal Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 1 of 6)**

55-10-01

**REPAIR 1
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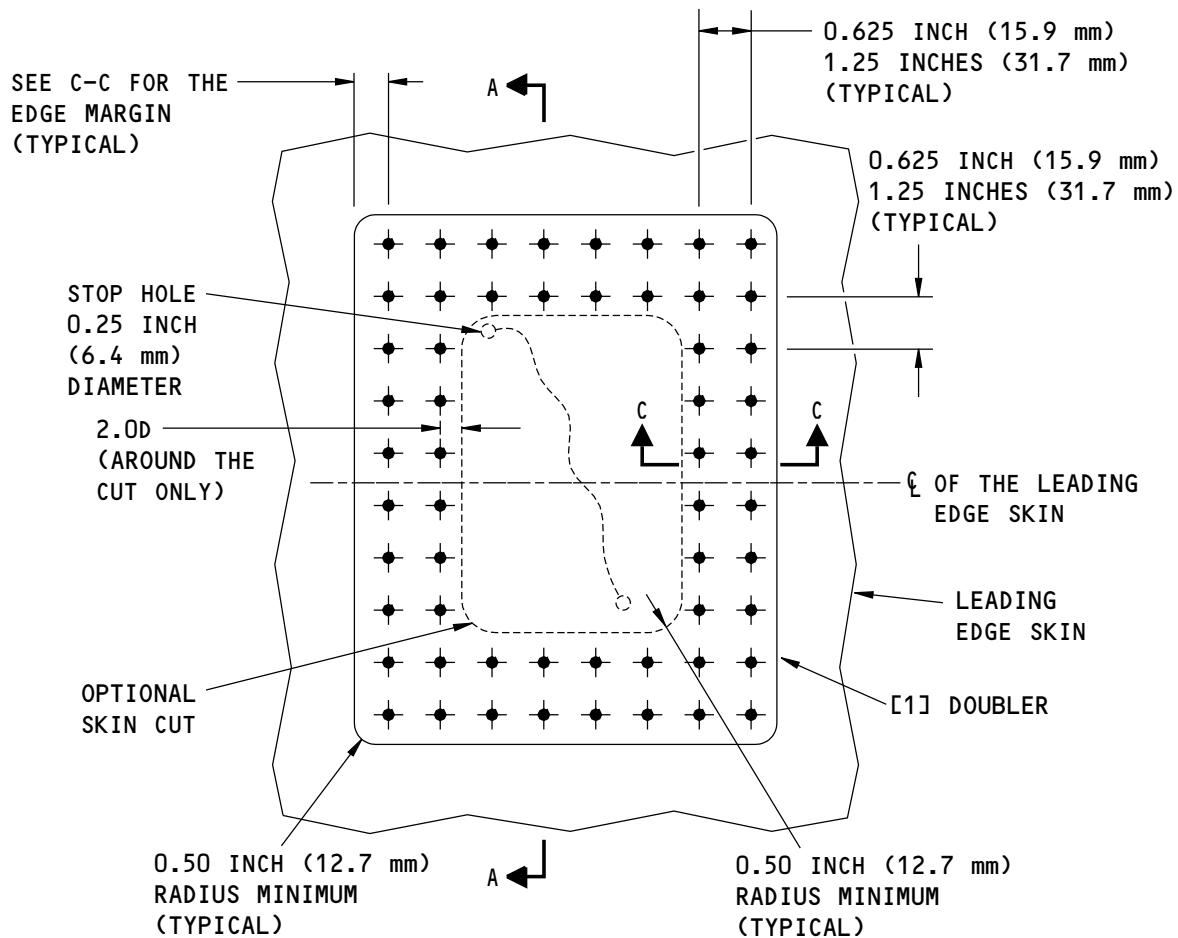
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STRUCTURAL REPAIR MANUAL



FLAT PATTERN OF THE REPAIR
DAMAGE ON THE CENTERLINE OF THE LEADING EDGE SKIN

(A)

F59399 S0006592504_V2

Horizontal Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 2 of 6)

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REPAIR 1
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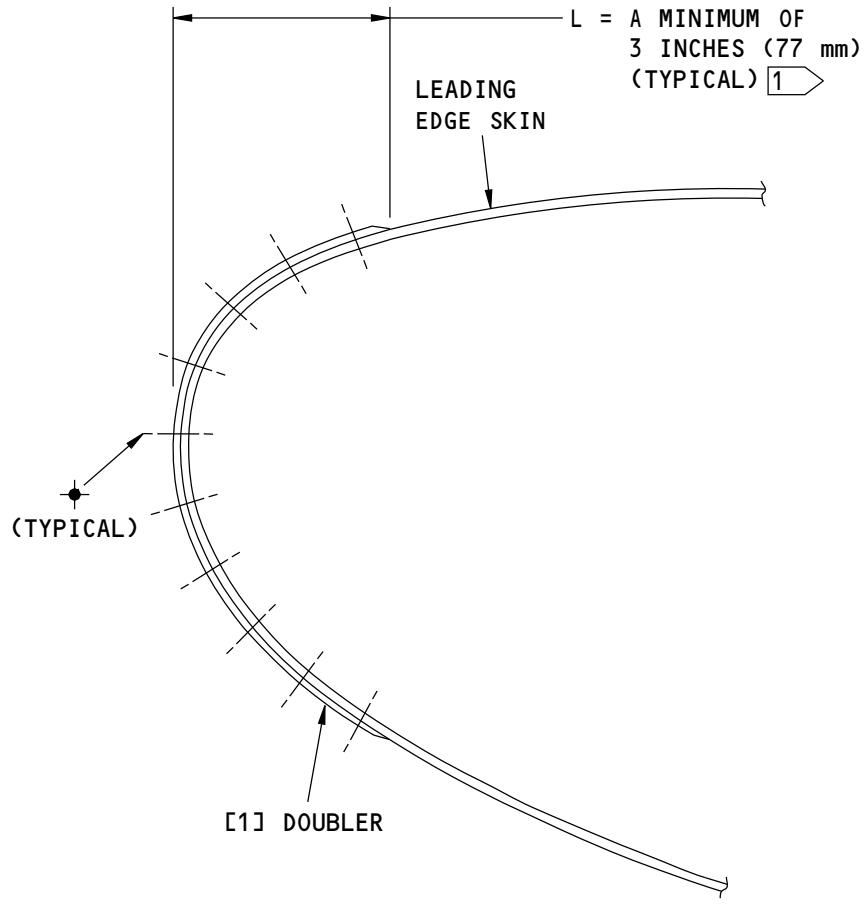
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A-A

F59415 S0006592505_V2

Horizontal Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 3 of 6)

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REPAIR 1
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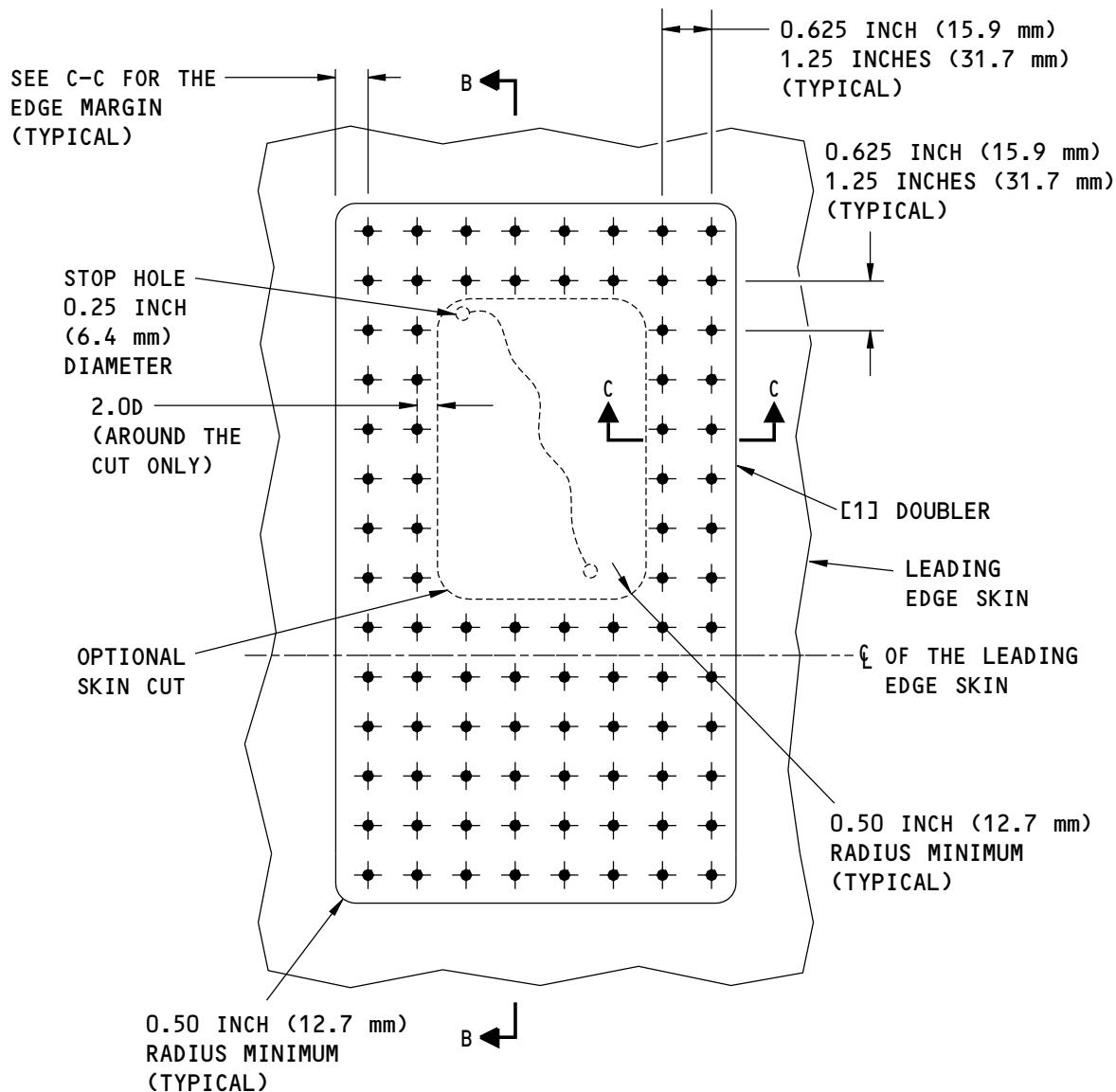
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FLAT PATTERN OF THE REPAIR
DAMAGE NEAR THE CENTERLINE OF THE LEADING EDGE SKIN

(B)

2021416 S0000401096_V1

Horizontal Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 4 of 6)

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REPAIR 1
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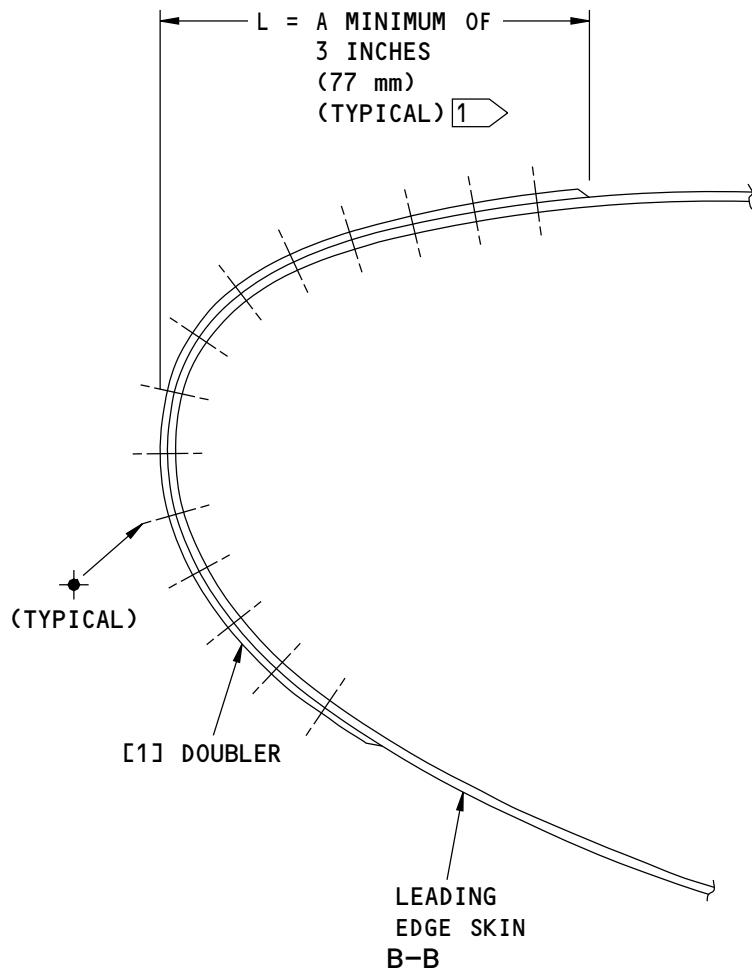
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2021456 S0000401097_V1

Horizontal Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 5 of 6)

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REPAIR 1
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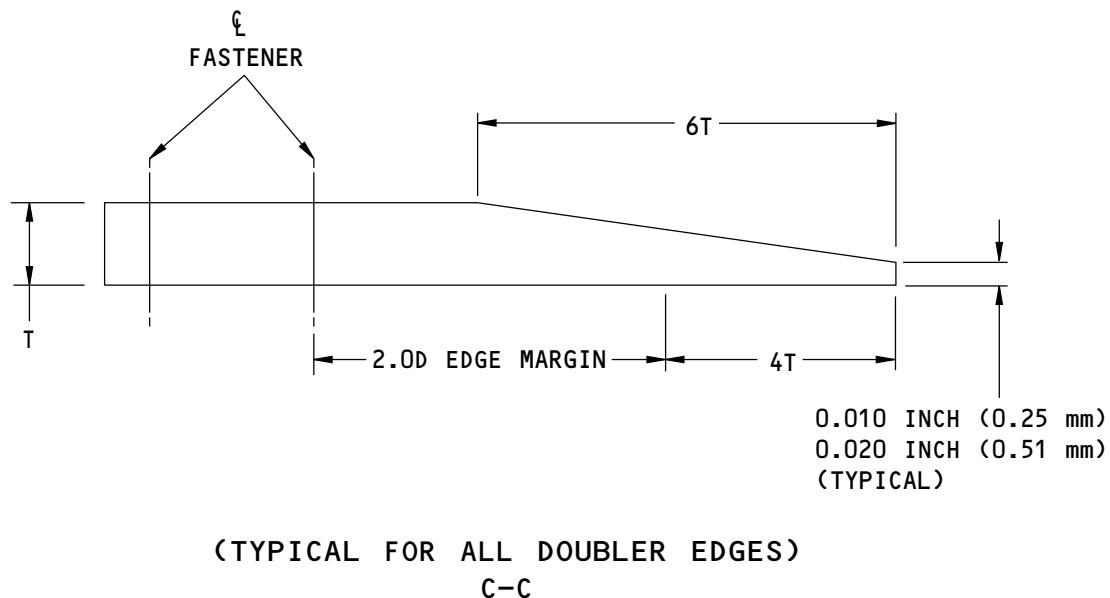
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2021424 S0000401100_V1

Horizontal Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 6 of 6)

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REPAIR 1
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REPAIR 2 - FLUSH REPAIR OF THE HORIZONTAL STABILIZER LEADING EDGE SKIN

1. Applicability

- A. REPAIR 2 is applicable to damage to the horizontal stabilizer leading edge skins shown in Figure 201/REPAIR 2. REPAIR 2 is also applicable as a replacement repair for REPAIR 1.
- B. You are permitted to install a maximum of 3 leading edge skin repairs on each horizontal stabilizer. These 3 repairs can include REPAIR 1, REPAIR 2, or a repair that is not in the SRM. If it is necessary to install more than 3 repairs, contact The Boeing Company for repair instructions.

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REPAIR 2
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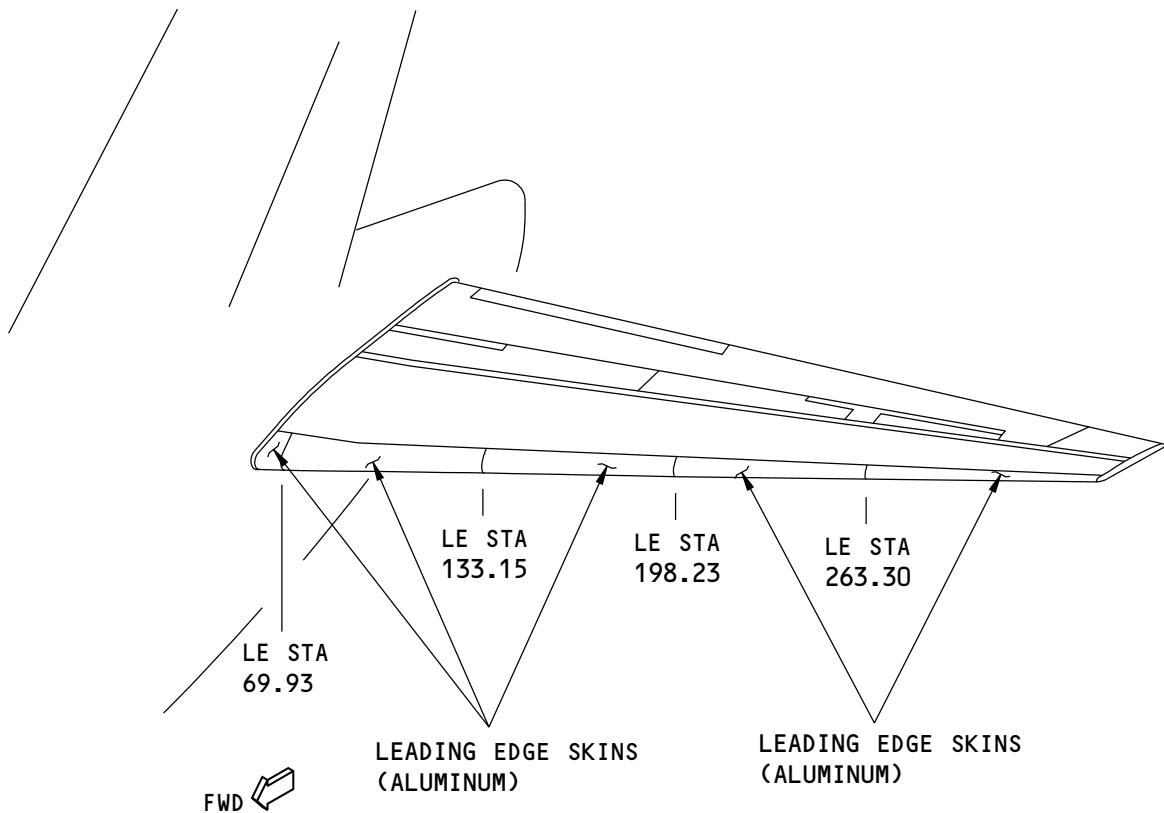
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UPPER SURFACE IS SHOWN

F59690 S0006592507_V1

Horizontal Stabilizer Leading Edge Skin Locations
Figure 201

2. General

- A. REPAIR 2 gives instructions for a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Make sure that the aerodynamic smoothness is satisfactory, and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, then there will be a decrease in the performance of the airplane.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE

55-10-01

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STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Remove the damaged leading edge section.
- B. If this repair replaces an external repair, then you must remove the repair fasteners, repair doubler, and sealant of the external repair. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02 for the procedure to remove the repair fasteners.
- C. Remove the damaged skin. Refer to Figure 202/REPAIR 2. Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the procedures to remove the damage.
 - (1) Make the cut in the shape of a rectangle with the chord-wise (vertical) sides parallel to the leading edge ribs.
 - (2) Make the corner radii of the cut a minimum of 0.50 in. (12.7 mm).
 - (3) Make the edges of the cut smooth to a surface finish of 125 microinches.
 - (4) Make sure that there is a minimum of two rows of repair fasteners around the edges of the cut.
- D. Put the skin around the damage back to the initial contour.
- E. Make the repair parts as shown in Figure 202/REPAIR 2. Refer to Table 201/REPAIR 2 for the repair materials.
 - (1) Make the contour of the repair parts the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad 2024-T3 that is 0.063 in. (1.60 mm) thick when the initial skin is 0.040 in. (1.02 mm) thick. Use clad 2024-T3 that is one gage thicker than the initial skin when the thickness is more than 0.040 in. (1.02 mm)
[2]	Filler	1	Use clad 2024-T3 that is the same thickness as the initial skin

- F. Assemble the repair parts. Refer to Figure 202/REPAIR 2.
- G. Drill and countersink the fastener holes.
 - (1) If this repair replaces an external repair, then align the fastener holes in the part [1] doubler with the holes in the skin made from the external repair.

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- H. Remove the repair parts.
- I. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- K. Apply one layer of BMS 10-79, Type II primer to the repair parts and to the bare surfaces of the skin. Refer to SOPM 20-44-04.
- L. Install the part [1] doubler to the leading edge skin with BMS 5-141 sealant. Refer to Figure 202/REPAIR 2. Refer to BONDED METAL STRUCTURE REPAIR PROCEDURES, 51-70-09 for the procedures to bond the doubler at room temperature.
NOTE: It is optional to make a mating surface seal with BMS 5-95 sealant when you install the part [1] doubler.
- M. Install the rivets without sealant in the part [1] doubler and skin.
- N. Install the part [2] filler to the part [1] doubler with BMS 5-141 sealant. Refer to BONDED METAL STRUCTURE REPAIR PROCEDURES, 51-70-09 for the procedures to bond the doubler at room temperature.
- O. Install the rivets without sealant in the part [2] filler.
- P. Apply BMS 5-95 or BMS 5-26 sealant in the gap between the filler and the edge of the skin cut. Refer to REPAIR SEALING, 51-20-05 for the procedure to apply the sealant.
- Q. Apply a finish to the repair area as necessary. Refer to AMM SECTION 51-21.

55-10-01

REPAIR 2
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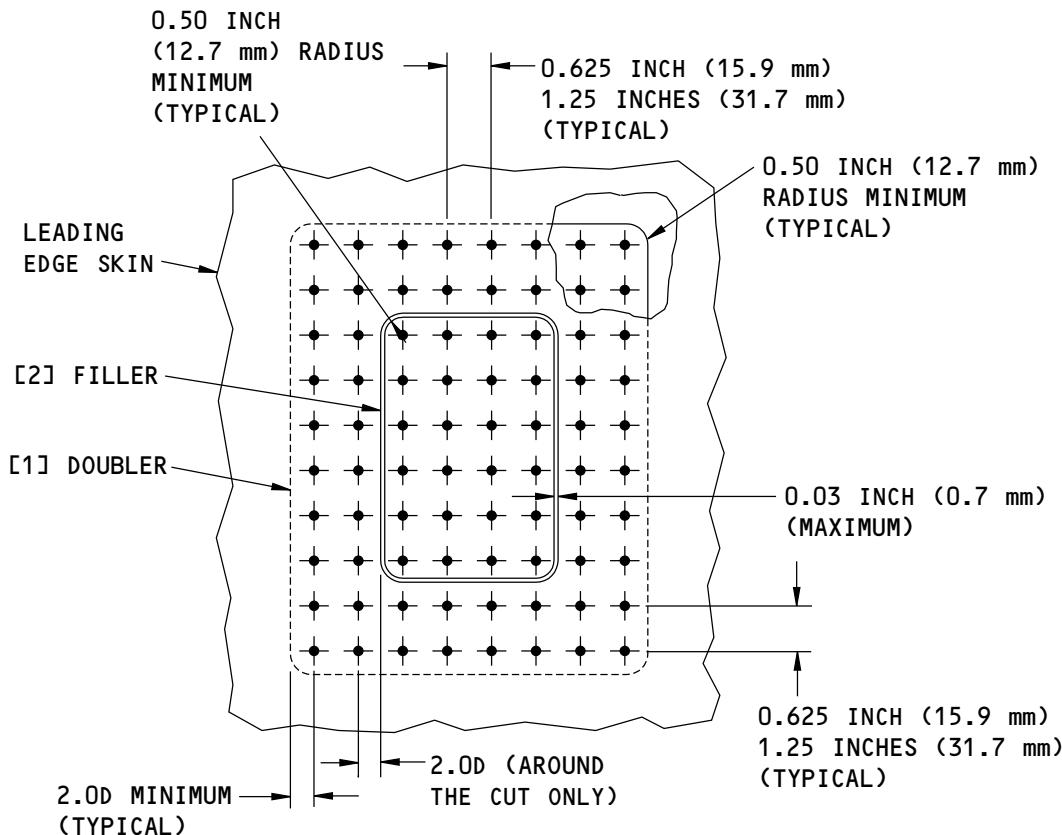
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STRUCTURAL REPAIR MANUAL



FLAT PATTERN OF THE REPAIR

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS.

FASTENER SYMBOLS

- ◆ REPAIR FASTENER LOCATION. INSTALL A BACR15GF5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

F59738 S0006592509_V2

Horizontal Stabilizer Leading Edge Skin Flush Repair
Figure 202 (Sheet 1 of 2)

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REPAIR 2
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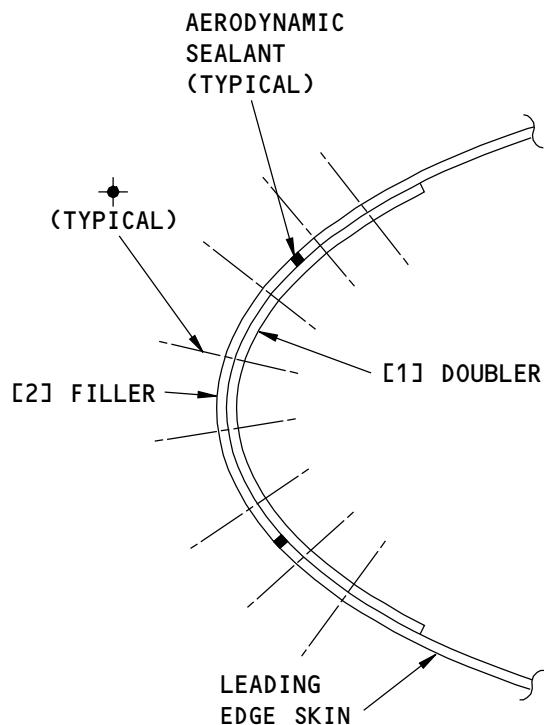
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SECTION THROUGH LEADING EDGE REPAIR

F59750 S0006592510_V2

Horizontal Stabilizer Leading Edge Skin Flush Repair
Figure 202 (Sheet 2 of 2)

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REPAIR 2
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REPAIR 3 - HORIZONTAL STABILIZER UPPER INSPAR SKIN EXTERNAL REPAIR

1. Applicability

- A. REPAIR 3 is applicable to damaged areas on the upper inspar skins between Stabilizer Station 83.50 and Stabilizer Station 184.70. Refer to Figure 201/REPAIR 3. Refer to REPAIR 11 for repairs to damaged areas on the lower inspar skins of the horizontal stabilizer.
- B. REPAIR 3 is applicable to airplanes with line numbers 1 through 3623 that have not incorporated SB 737-55-1096.
- C. REPAIR 3 is applicable to airplanes with line numbers 3624 and on, and airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096.
- D. If you install REPAIR 3, then all initial and subsequent repairs that you install outboard of Stabilizer Station 249.10 must not be more than 2.0 lb (0.9 kg) in total weight. This 2.0 lb (0.9 kg) weight limit is the total weight of all the repairs that are installed outboard of Stabilizer Station 249.10 on the horizontal stabilizer.

NOTE: You must find the weight of all internal and external repairs that are installed outboard of Stabilizer Station 249.10.

- E. You are not permitted to install this REPAIR 3 on the upper inspar skin if there is an access panel repair, REPAIR 7 or REPAIR 8, that is installed on the horizontal stabilizer.
- F. The total area of all repair doublers that are installed on the upper inspar skin must not be more than 300 in² (193,548 mm²).
- G. This repair has aerodynamic limits. You are permitted to install this repair with or without an Elevator Power-Off Flight Test. Refer to AMM SUBJECT 27-31-00 for the flight test procedure.
 - (1) If you install this repair with the conditions that follow, an Elevator Power-Off Flight Test is not necessary. Refer to Figure 202/REPAIR 3.

NOTE: The limits that follow are for repair doublers that are a maximum of 0.100 in. (2.54 mm) thick. If you have installed doublers that are more than 0.10 in. (2.5 mm) thick, you must contact The Boeing Company for the aerodynamic limits.

- (a) For the area of the inspar skin located in front of balance bays 2, 3, and 4 (located between ELEV STA 66.54 and ELEV STA 149.12), repairs are permitted as follows:
 - 1) The total outboard width across all repairs cannot be more than 25 in. (635 mm). The width of the airstream is the distance across the airstream measured in the outboard direction.
- (2) The total outboard width across all repairs is not restricted if you do an Elevator Power-Off Flight Test. Refer to Paragraph 4.P./REPAIR 3.

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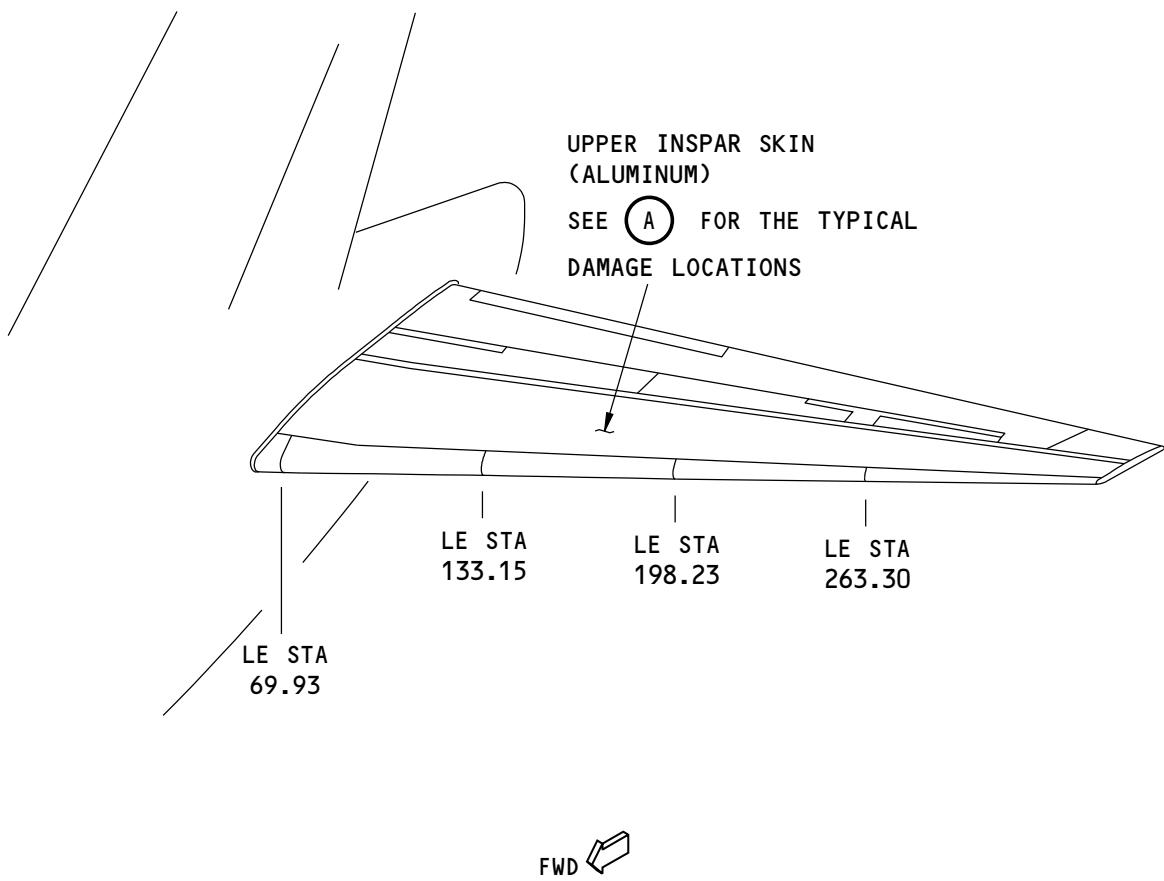
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

F62291 S0006592512_V2

Horizontal Stabilizer Upper Inspark Skin Location
Figure 201 (Sheet 1 of 2)

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REPAIR 3
Page 202

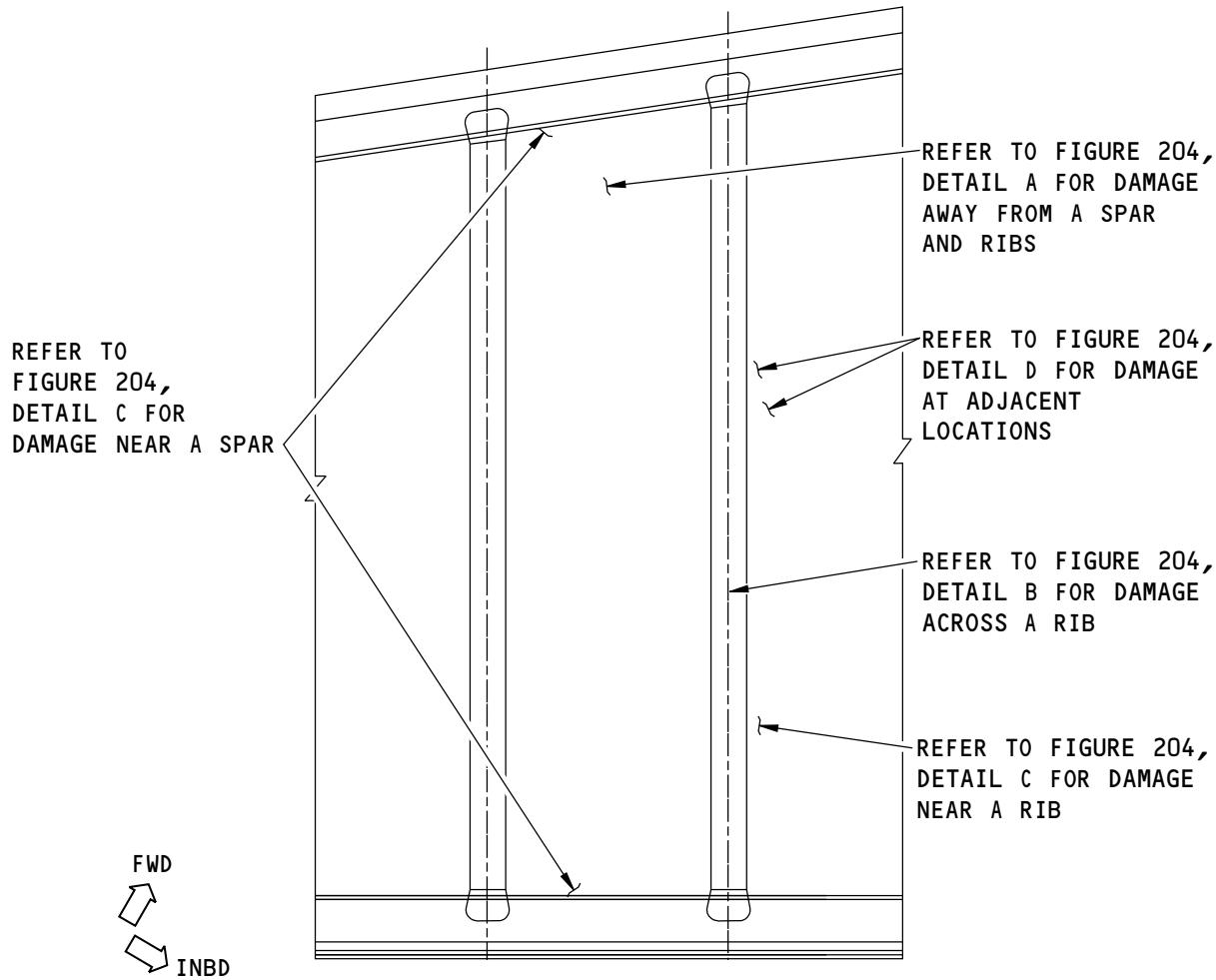
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TYPICAL DAMAGE LOCATIONS

(A)

2039260 S0000411107_V1

Horizontal Stabilizer Upper Inspar Skin Location
Figure 201 (Sheet 2 of 2)

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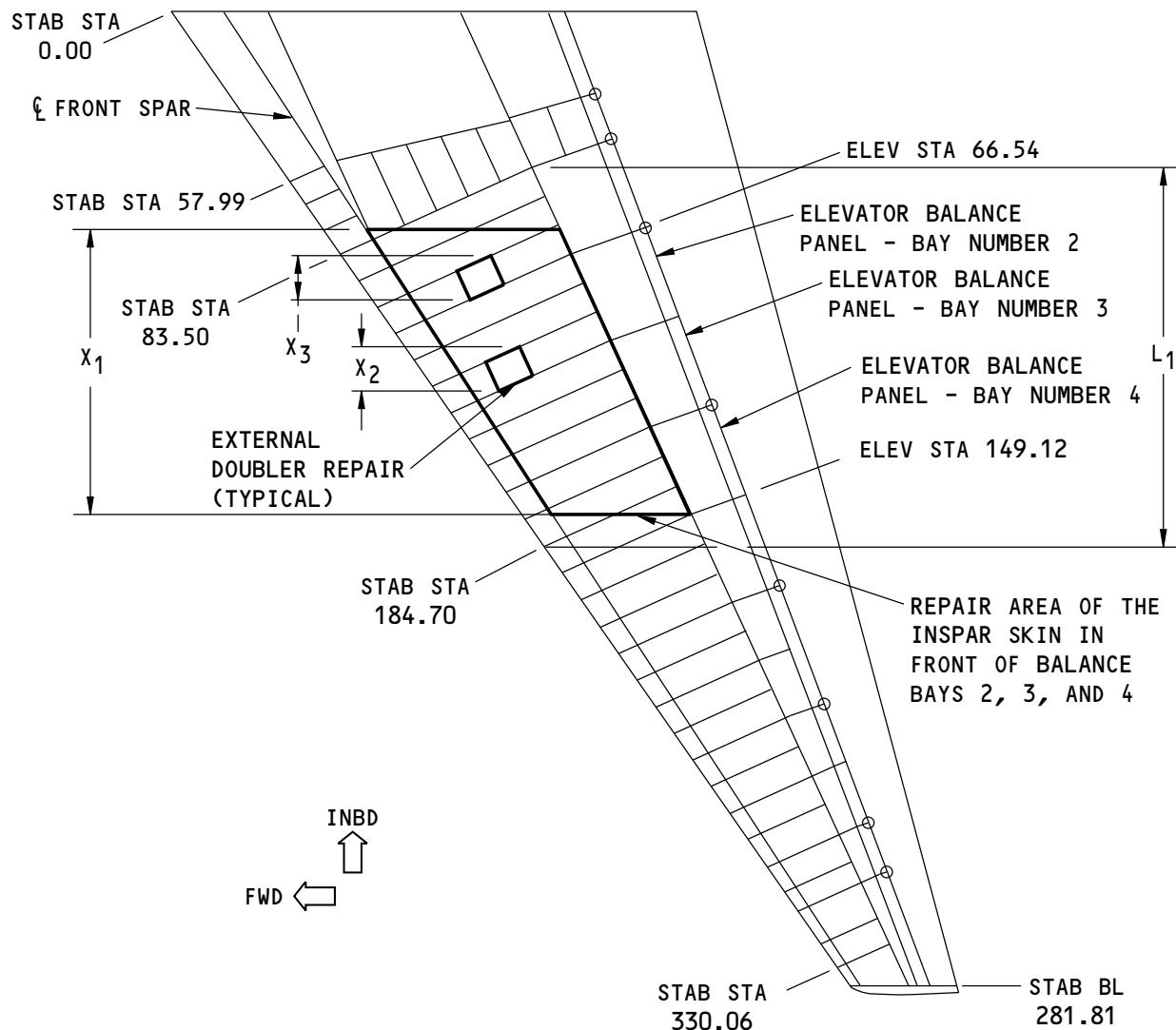
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$X_2 + X_3 = \text{A MAXIMUM OF 25 INCHES (635 mm)}$

$X_1 = \text{OUTBOARD WIDTH OF THE AIRSTREAM IN FRONT OF BALANCE BAYS 2, 3, AND 4}$

$L_1 = \text{OUTBOARD WIDTH OF THE INSPAR SKIN REPAIR AREA}$

**LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE**

F62292 S0006592513_V2

**Horizontal Stabilizer Inspark Skin - Aerodynamic Limits
Figure 202**

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**REPAIR 3
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2. General

- A. REPAIR 3 is a Category B Repair. This Category B repair has FAA approval if you do the supplemental inspections given in Paragraph 5./REPAIR 3. Incorporation of these inspection requirements into the airplane maintenance program satisfies the damage tolerance assessment of the repair. Refer to 51-00-06 for repair categories and definitions.
- B. Refer to Repair 4 for a flush repair to the horizontal stabilizer inspar skin.
- C. Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- D. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
- E. REPAIR 3 can be used only if you install the rivets flush against the internal structure.
- F. Get access to the inside of the stabilizer through openings in the front spar.
 - (1) Use these openings to make sure the repair fasteners are installed correctly.
- G. Make sure that all blind fasteners are correctly seated on the internal side of the skin. Make sure that there is sufficient edge margin from the edge of all chem-milled pockets.
- H. Maintain a 2D edge margin on all repair parts and initial parts.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-01	SHEET METAL MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-00	FASTENERS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
51-70-01	REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS
AMM 27-31-00	ELEVATOR AND TAB CONTROL SYSTEM
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 53-30-00, Procedure 5	Inspection of External Fuselage Repairs

4. Repair Instructions

- A. Get access to the damaged area.
- B. Do one of the steps that follow:

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- (1) For skin cracks, drill a stop hole at the ends of all skin cracks that do not end at a fastener hole. Refer to Figure 204/REPAIR 3 and INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the procedure to drill a stop hole.

NOTE: If the skin crack is across a rib, then you must remove the damage. Do not stop drill the crack.

CAUTION: DO NOT CUT INTO THE STRUCTURE BEHIND THE DAMAGED SKIN. USE CAUTION TO PREVENT NICKS, GOUGES OR OTHER DAMAGE TO THE STRUCTURE. IF YOU DO NOT OBEY, MORE REPAIR WORK WILL BE NECESSARY.

CAUTION: THE RIB FLANGE IS THIN. WHEN YOU REMOVE THE INITIAL FASTENERS, USE CARE SO YOU DO NOT CAUSE DAMAGE TO THE RIB FLANGE. IF YOU CAUSE DAMAGE TO THE RIB FLANGE, IT MAY BE NECESSARY TO REPLACE THE DAMAGED RIB.

- (2) For skin cracks or other damage, remove the damaged area of the skin. Refer to Figure 204/REPAIR 3 and INSPECTION AND REMOVAL OF DAMAGE, 51-10-02.
- Make the trim in the shape of a rectangle with the longest sides parallel to the inspar ribs.
 - Make the corner radii of the trim a minimum of 0.50 in. (12.7 mm).
- C. Put the skin around the damaged area back to the initial contour. Refer to REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
- D. Make the repair parts. Refer to Table 201/REPAIR 3 and Figure 204/REPAIR 3.
- Make the contour of the part [1] doubler the same as the initial contour of the skin.
 - Make the aerodynamic chamfer on the part [1] doubler. Refer to Figure 204/REPAIR 3
 - Make the countersink repair washers as given in COUNTERSINKING, 51-40-08.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202/REPAIR 3 or Table 203/REPAIR 3 for the necessary thickness of the material. The use of clad material is recommended
[2]	Filler	1 (as necessary)	Use clad or bare 2024-T3. The use of clad is recommended.

Table 202:

REPAIR WITH SOLID FASTENERS - REPAIR PART THICKNESSES AND SOLID REPAIR FASTENER FOR INITIAL SKIN THICKNESSES			
INITIAL SKIN THICKNESS	PART [1] DOUBLER THICKNESS	PART [2] FILLER THICKNESS (AS NECESSARY)	SOLID REPAIR FASTENERS *[1]
0.050 in. (1.27 mm)	0.063 in. (1.60 mm)	0.050 in. (1.27 mm)	BACR15CE6D
0.060 in. (1.52 mm)	0.080 in. (2.03 mm)	0.063 in. (1.60 mm)	BACR15CE6D
0.071 in. (1.80 mm)	0.090 in. (2.29 mm)	0.071 in. (1.80 mm)	BACR15CE6D

*[1] At rib and spar locations, hex-drive bolts are used at some locations. Replace the fastener with the same type and diameter as original. It is acceptable to oversize 1/32 inch if necessary.

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Table 203:

REPAIR WITH BLIND FASTENERS - REPAIR PART THICKNESSES AND BLIND REPAIR FASTENERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS	PART [1] DOUBLER THICKNESS	BLIND REPAIR FASTENERS
0.050 in. (1.27 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)
0.060 in. (1.52 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)
0.071 in. (1.80 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)

- E. Assemble the repair parts. Refer to Figure 204/REPAIR 3.
 - F. Drill the fastener holes. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
 - G. Countersink the fastener holes in the part [1] doubler. Refer to COUNTERSINKING, 51-40-08.
 - H. Disassemble the repair parts.
 - I. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
 - J. Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01 for the chemical conversion coating procedures.
 - K. Apply one layer of BMS 10-79, Type III, primer to the area of the repair. Refer to SOPM 20-44-04.
 - (1) Apply the primer to the part [1] doubler.
 - (2) Apply the primer to the bare surfaces of the initial skin.
 - L. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.
 - (1) Install the repair parts with 0.010 in. (0.25 mm) pull down or less. If the gap is more than 0.010 in. (0.25 mm), install a shim as necessary. Refer to SHEET METAL MATERIALS, 51-30-01. Shims are permitted to be a maximum of 0.020 in. (0.51 mm) thick.
 - M. Install the fasteners. Refer to Table 202/REPAIR 3 or Table 203/REPAIR 3.
- NOTE:** Do not install rivets or blind fasteners with sealant.
- (1) At initial fastener hole locations common to the part [1] doubler, install countersink repair washers as necessary. Refer to COUNTERSINKING, 51-40-08.
- N. Apply BMS 5-95 sealant around the edges of the part [1] doubler as given in 51-20-05.
 - O. Apply a finish to the repair area. Refer to AMM SECTION 51-21.
 - P. If you install this repair and you exceed the aerodynamic applicability requirements as given in Paragraph 1.G.(1)/REPAIR 3, you must do an Elevator Power-Off Flight Test. Refer to AMM SUBJECT 27-31-00.
- NOTE:** You must do the Elevator Power-Off Flight Test before the time limits in AMM SUBJECT 27-31-00.

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NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).
 - D = THE DIAMETER OF THE FASTENER.
- [1] RECOMMEND THAT THE FASTENER SPACING BE EQUAL TO THE FASTENER SPACING ON THE RIB NEAREST THE REPAIR. HOWEVER, YOU MUST MAINTAIN 4D - 6D SPACING.
- [2] YOU MUST KEEP A MINIMUM OF 3 FASTENER ROWS FORWARD AND AFT OF THE DAMAGED AREA, UNLESS SHOWN DIFFERENTLY.
- YOU MUST KEEP A MINIMUM OF 4 FASTENER ROWS INBOARD AND OUTBOARD OF THE DAMAGED AREA, UNLESS SHOWN DIFFERENTLY. IT IS ACCEPTABLE TO INCLUDE INITIAL RIB FASTENER ROWS (IF APPLICABLE) IN THE REQUIRED 4 ROWS. ADJUST THE SPANWISE POSITION OF THE EXTERNAL PART [1] DOUBLER SUCH THAT THERE ARE 4 FASTENER ROWS BEYOND THE DAMAGE TRIM LINE OR STOP HOLE.
- [3] IF YOU INSTALL THIS REPAIR NEAR A SPAR, YOU MUST KEEP A MINIMUM OF 2 FASTENER ROWS BETWEEN THE DAMAGE AREA AND THE EDGE OF THE INSPAR SKIN.

FASTENER SYMBOLS

- + REFERENCE FASTENER LOCATION.
- INITIAL FASTENER LOCATION. REFER TO TABLE 202 OR TABLE 203 FOR THE SIZE AND TYPE OF FASTENERS TO INSTALL.
- ◆ REPAIR FASTENER LOCATION. REFER TO TABLE 202 OR TABLE 203 FOR THE SIZE AND TYPE OF FASTENERS TO INSTALL.

2039263 S0000411141_V2

Notes and Fastener Symbols
Figure 203

55-10-01

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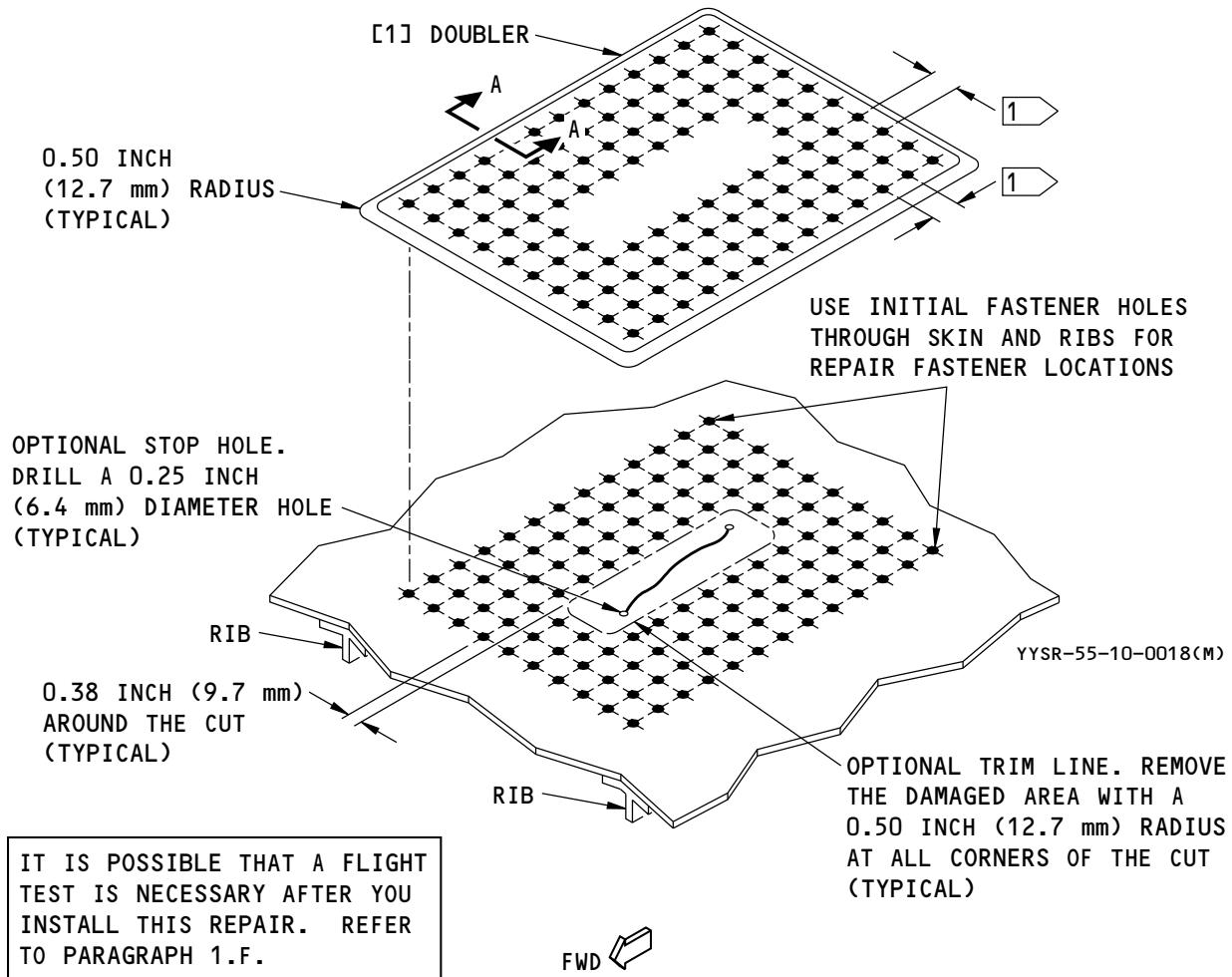
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STRUCTURAL REPAIR MANUAL



SKIN REPAIR FOR DAMAGED AREA AWAY FROM A SPAR
AND AWAY FROM A RIB

(A)

2041119 S0000412120_V1

Horizontal Stabilizer Upper Inspark Skin External Repair
Figure 204 (Sheet 1 of 5)

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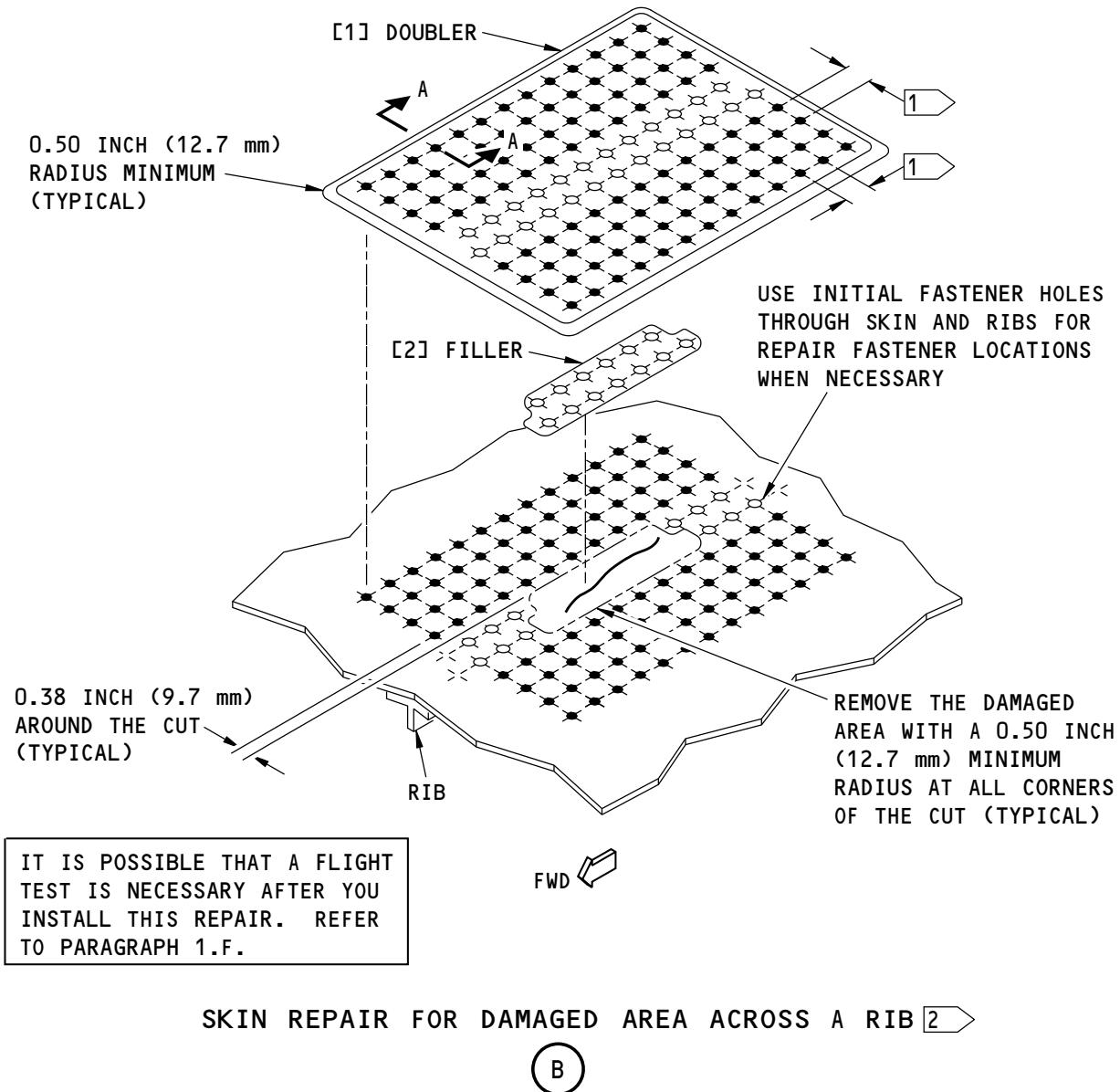
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2041121 S0000412121_V1

Horizontal Stabilizer Upper Inspar Skin External Repair
Figure 204 (Sheet 2 of 5)

55-10-01

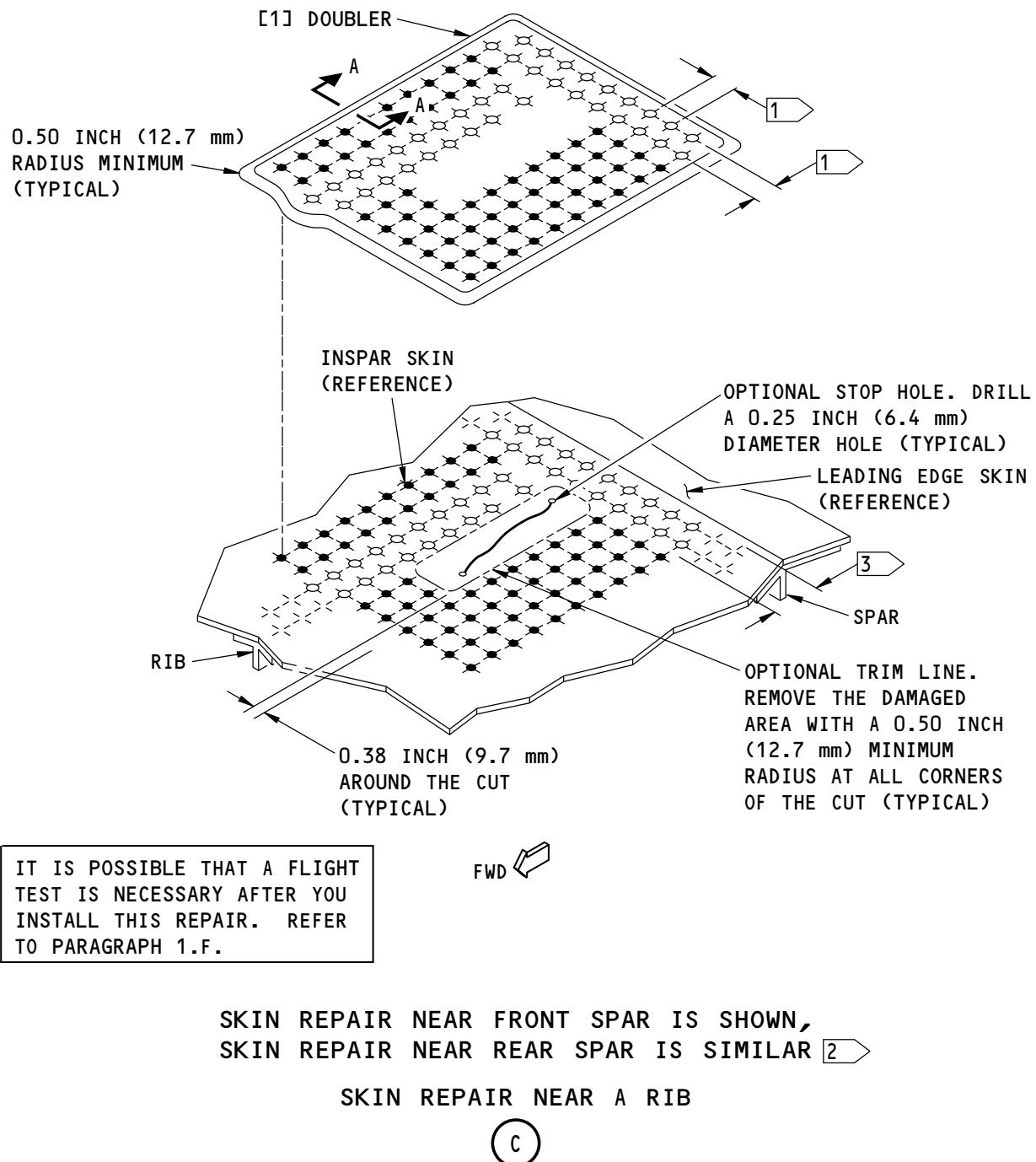
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STRUCTURAL REPAIR MANUAL**



2041123 S0000412122_V1

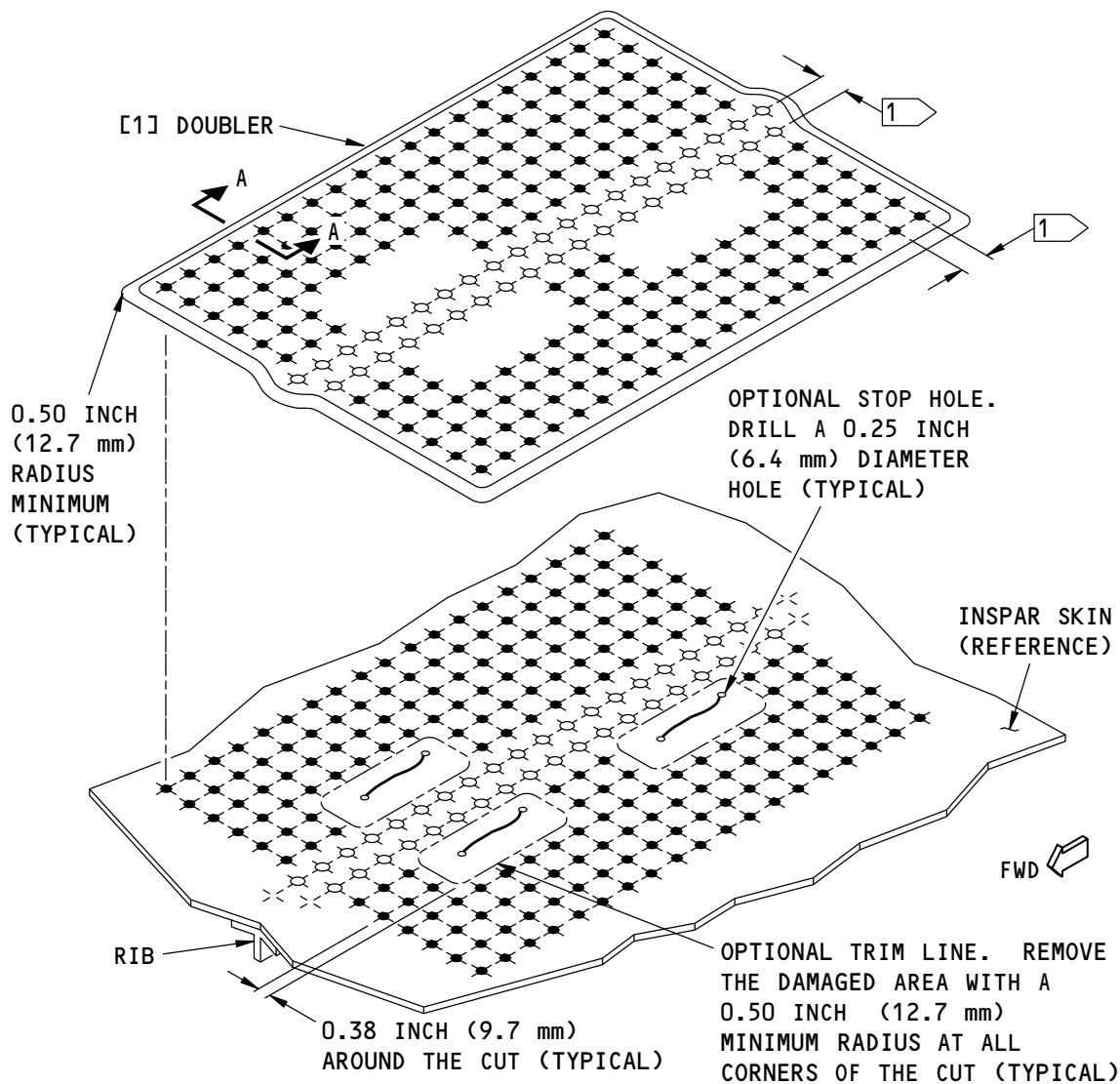
**Horizontal Stabilizer Upper Inspark Skin External Repair
Figure 204 (Sheet 3 of 5)**

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IT IS POSSIBLE THAT A FLIGHT TEST IS NECESSARY AFTER YOU INSTALL THIS REPAIR. REFER TO PARAGRAPH 1.F.

SKIN REPAIR OF ADJACENT DAMAGE LOCATIONS NEAR A RIB IS SHOWN,
SKIN REPAIR OF ADJACENT DAMAGE LOCATIONS AWAY FROM A RIB
IS SIMILAR [2]

D

2041124 S0000412123_V1

**Horizontal Stabilizer Upper Inspark Skin External Repair
Figure 204 (Sheet 4 of 5)**

55-10-01

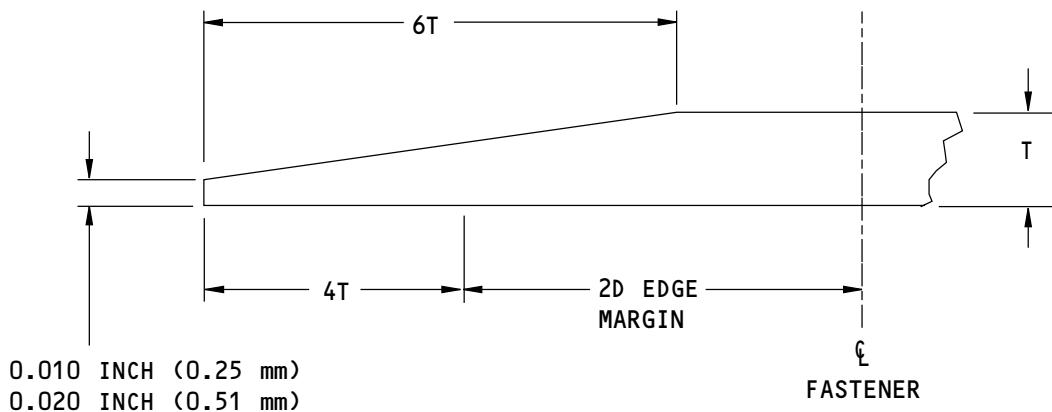
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SECTION OF DOUBLER EDGE
A-A

2039274 S0000411146_V1

Horizontal Stabilizer Upper Inspark Skin External Repair
Figure 204 (Sheet 5 of 5)

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STRUCTURAL REPAIR MANUAL

5. Inspection Requirement

A. For all repairs, do the inspections as given in Table 204/REPAIR 3 and Figure 205/REPAIR 3.

Table 204:

CATEGORY B REPAIR INSPECTION REQUIREMENTS			
INSPECTION THRESHOLD	REPEAT INSPECTIONS		
	METHOD	INTERVAL	REFERENCE
36,000 flight cycles after repair installation	Detailed Visual Inspection ^{*[1]}	9,000 flight cycles	-
	External Low Frequency Eddy Current (LFEC) Inspection ^{*[2]}	9,000 flight cycles	737 NDT Part 6, 53-30-00, Procedure 5

*[1] Inspect the external part [1] doubler.

*[2] Inspect the skin under the external part [1] doubler and inspect the spar chord under the external part [1] doubler.

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REPAIR 3

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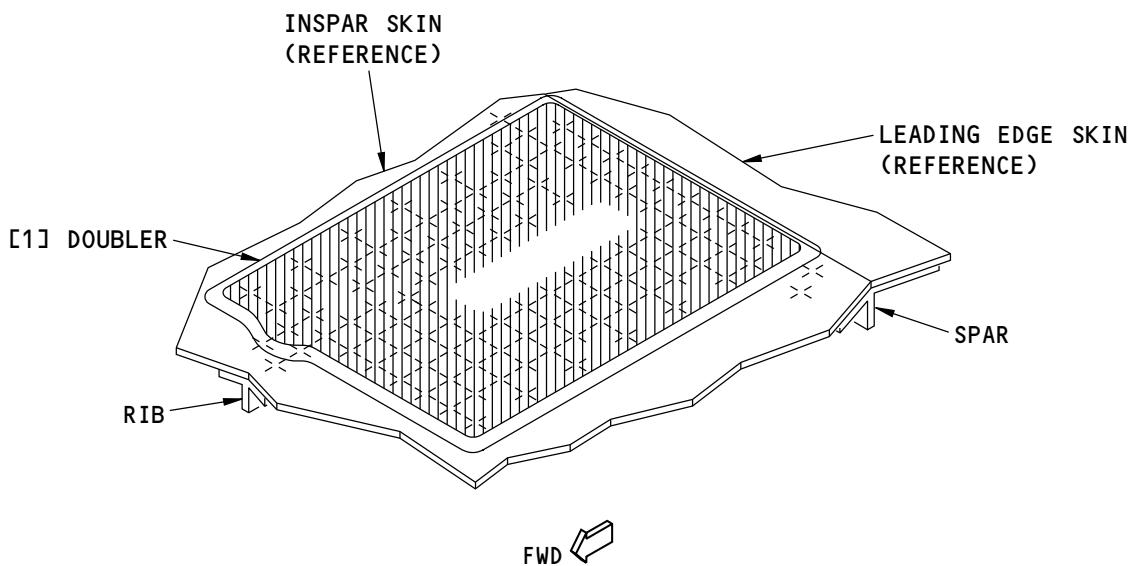
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STRUCTURAL REPAIR MANUAL



||||| DETAILED VISUAL INSPECTION AND LOW FREQUENCY EDDY CURRENT (LFEC) INSPECTION

EXTERNAL INSPECTION FOR NEAR A RIB OR SPAR IS SHOWN,
EXTERNAL INSPECTION FOR AWAY FROM A RIB OR SPAR IS SIMILAR
EXTERNAL INSPECTION FOR ACROSS A RIB IS SIMILAR

1894367 S0000347337_V2

Horizontal Stabilizer Upper Inspark Skin External Repair Inspection
Figure 205

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REPAIR 3
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REPAIR 4 - HORIZONTAL STABILIZER INSPAR SKIN FLUSH REPAIR

1. Applicability

- A. REPAIR 4 is applicable to damage to the horizontal stabilizer inspar skins shown in Figure 201/REPAIR 4 and Figure 202/REPAIR 4 between stabilizer station 83.5 and stabilizer station 184.7.
- B. REPAIR 4 is applicable to airplanes with line numbers 1 through 3623 that have not incorporated SB 737-55-1096.
- C. REPAIR 4 is applicable to airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096.
- D. REPAIR 4 is not applicable to airplanes with line numbers 3624 and on.
- E. You are not permitted to install this REPAIR 4 on the upper inspar skin if there is an access panel repair, REPAIR 7 or REPAIR 8, that is installed on the horizontal stabilizer.
- F. The total area of all repair doublers that are installed on the upper inspar skin must not be more than 300 in² (193,548 mm²).
- G. If you install this repair on the lower inspar skin, then the total area of all repair doublers that are installed on the lower inspar skin must not be more than:
 - (1) For airplanes with line numbers 1 through 3623:
 - (a) 500 in² (322,580 mm²) if you have installed REPAIR 7, REPAIR 8, or REPAIR 12.
 - (b) 2000 in² (1,290,320 mm²) if you have not installed REPAIR 7, REPAIR 8, REPAIR 12, or a repair that has a total area of doublers more than 300 in² (193,548 mm²) on the upper skin.
 - (2) For airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096:
 - (a) 100 in² (64,516 mm²)

NOTE: You must calculate the total area of doublers that are installed from REPAIR 4, REPAIR 11, or a repair that is not in the SRM.

- H. For airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096, you are not permitted to install repairs between stabilizer station 83.5 and stabilizer station 92.7 (bay 4), or between stabilizer station 175.5 and stabilizer station 184.7 (bay 14).

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REPAIR 4
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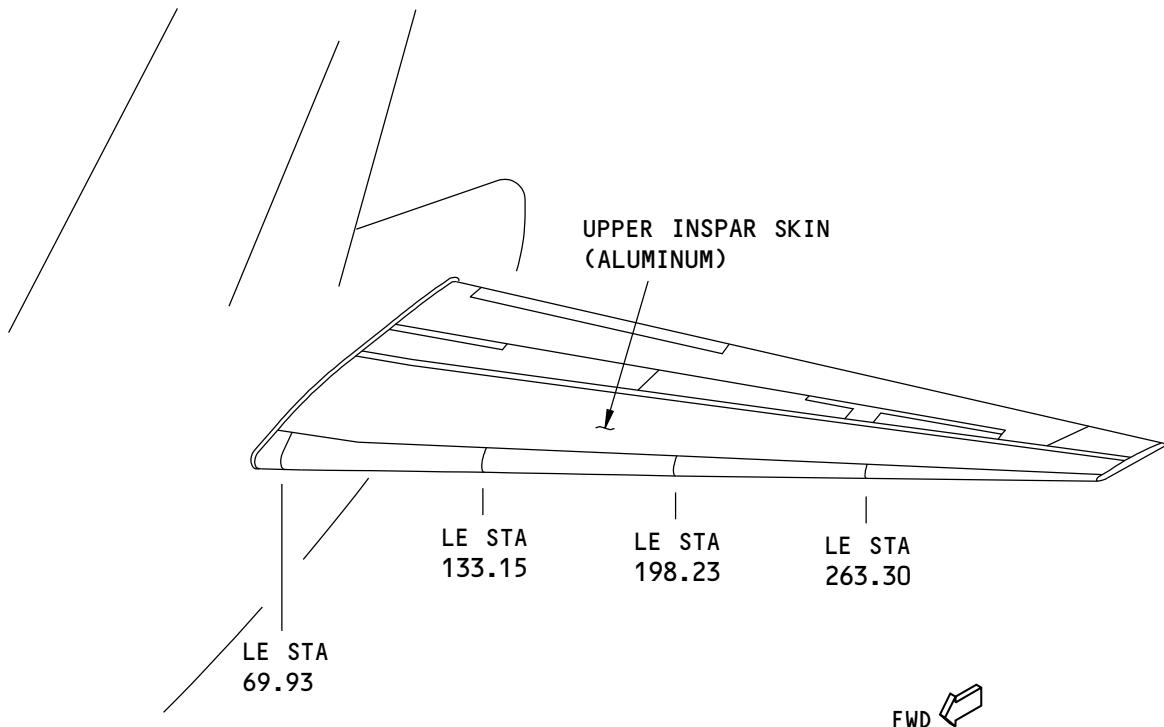
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SURFACE IS SHOWN

F72178 S0006592518_V1

Horizontal Stabilizer Upper Inspark Skin Location
Figure 201

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REPAIR 4
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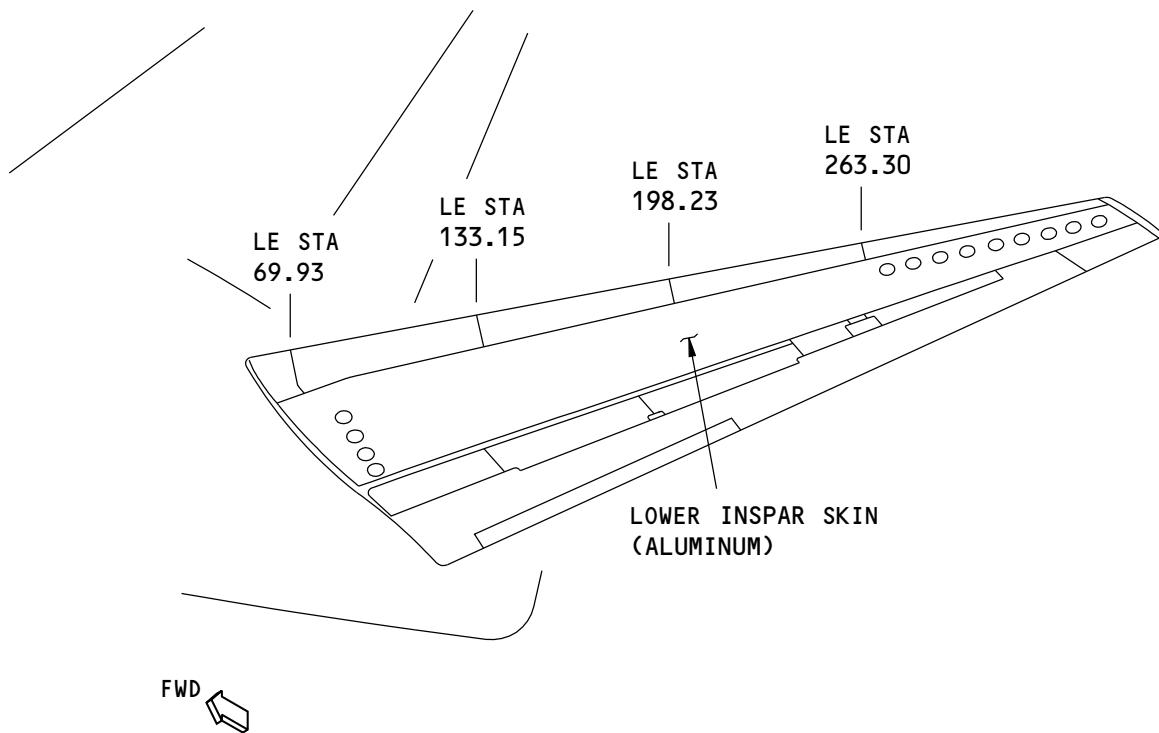
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN

F72180 S0006592519_V1

Horizontal Stabilizer Lower Inspark Skin Location
Figure 202

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REPAIR 4
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2. General

- A. Repair 4 is a Category B Repair. This category B repair has FAA approval if you do the supplemental inspections given in Paragraph 5./REPAIR 4. Incorporation of these inspection requirements into the airplane maintenance program satisfies the damage tolerance assessment of the repair. Refer to 51-00-06 for repair categories and definitions.
- B. Make sure that the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft. Repairs with protruding head fasteners are permitted as given in Paragraph 2.C./REPAIR 4.
- C. Repairs with protruding head fasteners are permitted as shown in Horizontal Stabilizer Inspark Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners, Figure 203/REPAIR 4 and as follows:
 - (1) For the area of each skin located in front of balance bays numbers 2, 3, and 4 (located between ELEV STA 66.54 and ELEV STA 149.12), repairs are permitted as follows:
 - (a) The total outboard width across all repairs cannot be more than 15 percent of the width of the airstream for each skin. The width of this airstream is the distance across the airstream measured in the outboard direction.
 - (2) For the area of each skin not located in front of balance bays numbers 2, 3, and 4 repairs are permitted as follows:
 - (a) The total outboard width across all repairs cannot be more than 25 percent of the width of the airstream for each skin. The width of this airstream is the distance across the airstream measured in the outboard direction. This width does not include the airstream in front of balance bays numbers 2, 3, and 4.
- D. Get access to the inside of the stabilizer through openings in the front spar.
 - (1) It is optional to make an access door in the inspar skin.
 - (2) Use these openings or doors to make sure the repair fasteners are installed correctly.
 - (3) Refer to Repair 7 and Repair 8 to make an access door.

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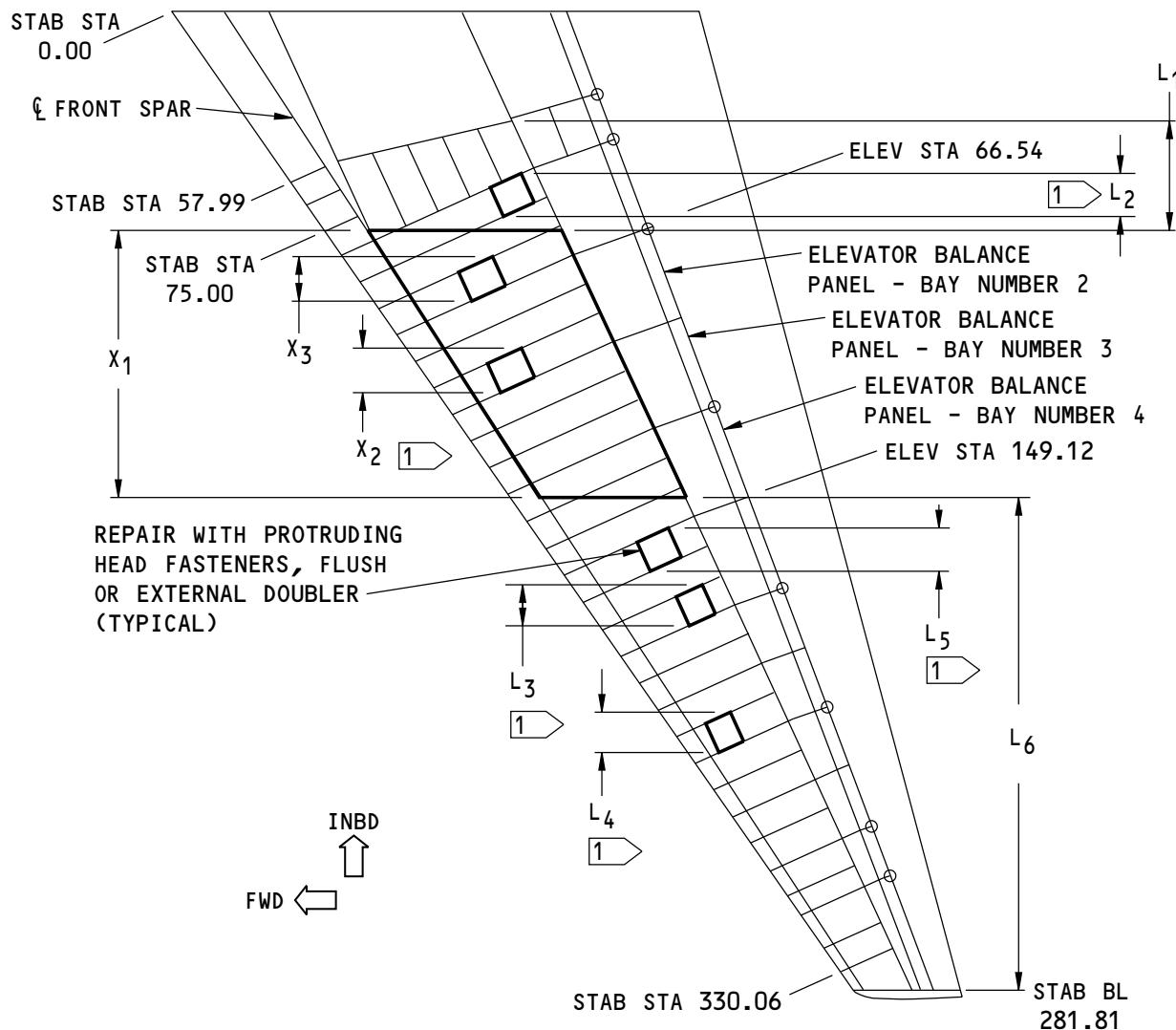
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L_2 = A MAXIMUM OF 0.25 L_1 FOR EACH SKIN

$X_2 + X_3$ = A MAXIMUM OF 0.15 X_1 FOR EACH SKIN

$L_3 + L_4 + L_5$ = A MAXIMUM OF 0.25 L_6 FOR EACH SKIN

NOTES

ONLY ONE REPAIR IS PERMITTED ACROSS THE AIRFLOW. A SECOND REPAIR DOWNSTREAM IS NOT PERMITTED.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

G95176 S0006592520_V1

Horizontal Stabilizer Inspar Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 203

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-00, GENERAL	Fasteners
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Cut and remove the damaged part of the skin as shown in Figure 204/REPAIR 4. Refer to 51-10-02 for the procedures to remove the damage.
 - (1) Make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - (2) Make the corner radii of the cut a minimum of 0.50 in. (12.70 mm).
 - (3) Make sure there is a minimum of three rows of repair fasteners around the edges of the cut.
- B. Put the skin that is around the damage back to the initial contour.
- C. Make the repair parts as shown in Figure 204/REPAIR 4. Refer to Table 201/REPAIR 4 for the repair material.
 - (1) Make the contour of the repair parts the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended
[2]	Filler	1	Use clad or bare 2024-T3 that is the same thickness as the initial skin (except when the initial skin is $t = 0.060$ inches; for this case use a $t = 0.063$ inch filler). The use of clad material is recommended

Table 202:

REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.040	0.063	3/16

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Table 202: (Continued)

REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.050	0.063	3/16
0.060	0.071	3/16
0.071	0.090	3/16

- D. Assemble the repair parts as shown in Figure 204/REPAIR 4.
 - E. Drill the fastener holes.
 - (1) Align fastener holes in the part [1] doubler with holes in the skin made from an external repair.
 - F. Remove the repair parts.
 - G. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
 - H. Apply a chemical conversion coating to the repair parts and bare surfaces of the skin. Refer to 51-20-01 for the chemical conversion coating procedures.
 - I. Apply one layer of BMS 10-79, Type II or III, primer to the area of the repair. Refer to SOPM 20-44-04 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the skin.
 - J. Bond the part [1] doubler to the inspar skin with BMS 5-101 as shown in Figure 204/REPAIR 4. Refer to 51-70-09 for the procedures to bond the doubler.
- NOTE:** It is optional to apply BMS 5-95 sealant to the mating surfaces when you install the repair parts.
- K. Install the rivets dry without sealant in the part [1] doubler and skin.
 - L. Bond the part [2] filler to the part [1] doubler with BMS 5-101 as given in 51-70-09.
 - M. Install the rivets dry without sealant in the part [2] filler.
 - N. Apply BMS 5-95 or BMS 5-26 sealant in the gap between the filler and the edge of the skin cut. Refer 51-20-05 for the procedures to apply the sealant.
 - O. Apply a finish to the repair area as given in AMM SECTION 51-21.

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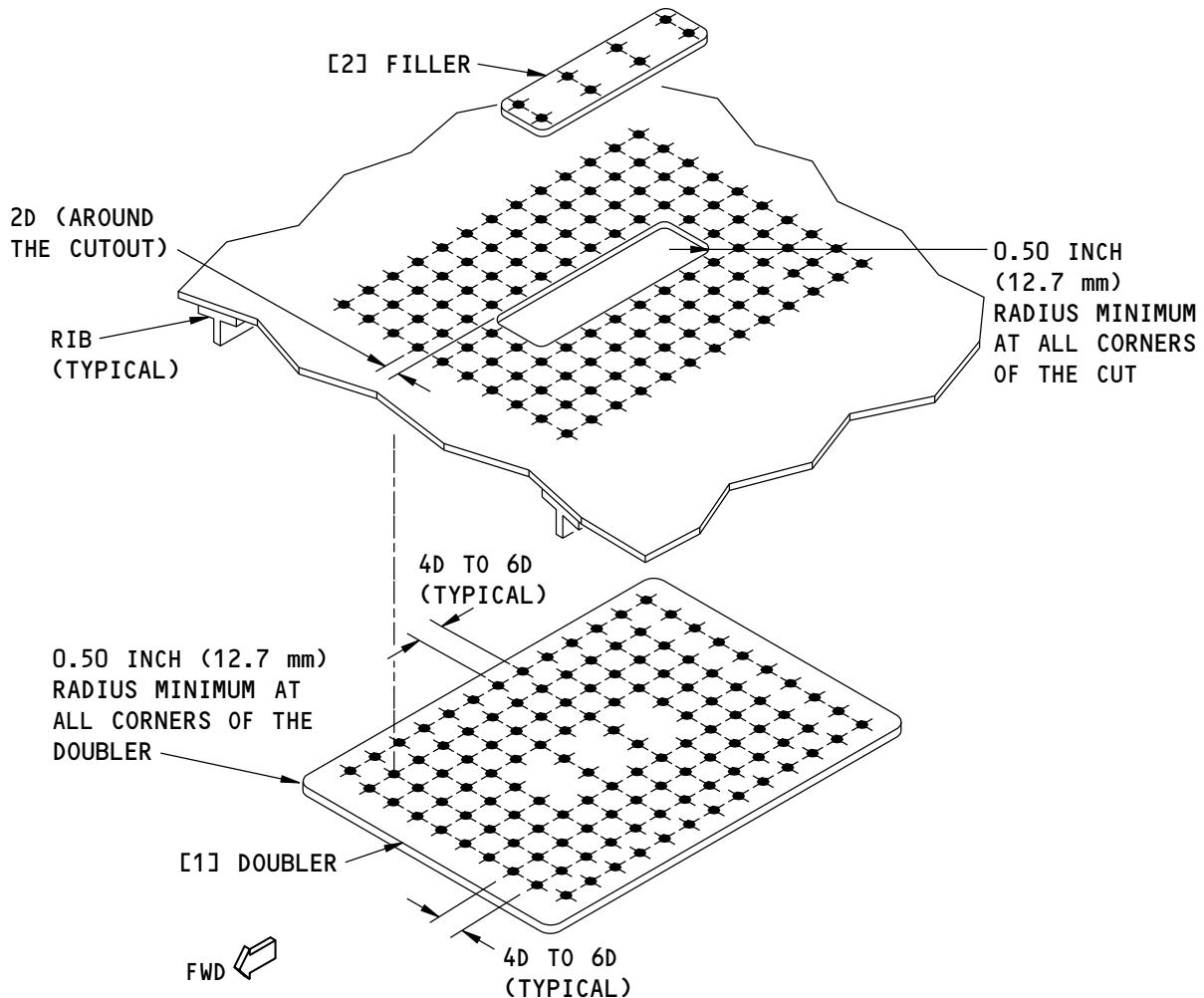
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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE CUTOUT IN THE FORWARD AND AFT DIRECTIONS.
- MAKE SURE THAT THERE IS A MINIMUM OF FOUR ROWS OF FASTENERS AROUND THE DAMAGE CUTOUT IN THE INBOARD AND THE OUTBOARD DIRECTIONS.

FASTENER SYMBOLS

- REPAIR FASTENER LOCATION. INSTALL A BACR15FT6D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-06 FOR THE FASTENER DATA.

F68191 S0006592523_V2

Horizontal Stabilizer Inspark Skin Flush Repair
Figure 204

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5. Inspection Requirement

- A. If you install this REPAIR 4 on the upper inspar skin, then do the inspection as given in Table 203/REPAIR 4 and Figure 205/REPAIR 4.

Table 203:

CATEGORY B REPAIR INSPECTION REQUIREMENTS		
INSPECTION THRESHOLD	REPEAT INSPECTIONS	
	METHOD	INTERVAL
36,000 flight cycles after repair installation	Detailed Visual Inspection ^{*[1]}	9,000 flight cycles

*[1] Inspect the skin and doubler at all fasteners common to the repair parts.

- B. If you install this REPAIR 4 on the lower inspar skin, then do the inspection as given in Table 204/REPAIR 4 and Figure 205/REPAIR 4.

Table 204:

CATEGORY B REPAIR INSPECTION REQUIREMENTS		
INSPECTION THRESHOLD	REPEAT INSPECTIONS	
	METHOD	INTERVAL
56,000 flight cycles after repair installation	Detailed Visual Inspection ^{*[1]}	9,000 flight cycles

*[1] Inspect the skin and doubler at all fasteners common to the repair parts.

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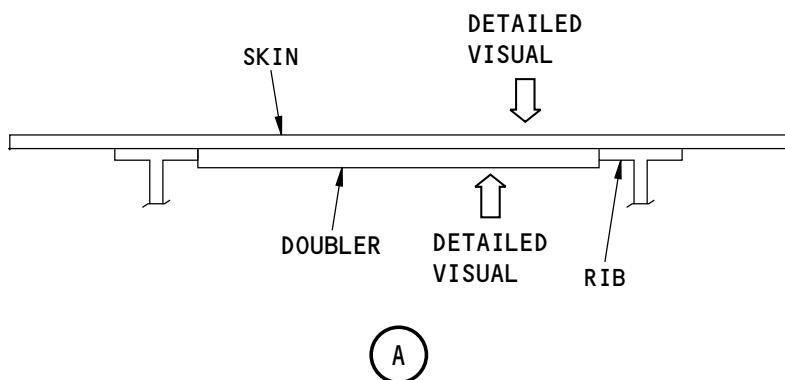
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Horizontal Stabilizer Inspark Skin Flush Repair Inspection
Figure 205

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REPAIR 7 - HORIZONTAL STABILIZER ACCESS PANEL INSTALLATION WITH A ONE-PIECE DOUBLER

1. Applicability

- A. REPAIR 7 is applicable to airplanes with line numbers 1 through 3623 that have not incorporated SB 737-55-1096.
- B. REPAIR 7 is not applicable to airplanes with line number 1 through 3623 that have incorporated SB 737-55-1096.
- C. REPAIR 7 is not applicable to airplanes with line number 3624 and on.
- D. If you install REPAIR 7, then the total area that you can repair on the upper and lower inspar skins will decrease. See Paragraph 1.I./REPAIR 7 and Paragraph 1.J./REPAIR 7.
 - (1) REPAIR 11 is applicable as a replacement repair for REPAIR 7.
- E. REPAIR 7 is applicable for damage to:
 - (1) The horizontal stabilizer lower skin from Stab Sta 83.5 to Stab Sta 184.7. Refer to Figure 201/REPAIR 7.
 - (2) Locations where there is sufficient clearance to install a one-piece part [2] doubler.

NOTE: An alternative to REPAIR 7 is REPAIR 8. REPAIR 8 is an access panel installation with a two-piece doubler for locations where there is not sufficient clearance to install a one-piece doubler.

- F. You are not permitted to install REPAIR 7 on the upper inspar skin of the horizontal stabilizer.
- G. You are not permitted to install REPAIR 7 if REPAIR 12 is installed on the airplane.
- H. You are not permitted to install REPAIR 7 if there is a repair installed on the upper inspar skin of the horizontal stabilizer.
- I. If you install REPAIR 7, then you are not permitted to install any repair doublers on the upper inspar skin of the horizontal stabilizer.
- J. If you install REPAIR 7, then the total area of all repair doublers that are installed on the lower inspar skin must not be more than 500 in² (322,580 mm²). These repair doublers can be installed from REPAIR 4, REPAIR 11, or a repair that is not in the SRM.
- K. You are permitted to install a maximum of one access panel repair on each horizontal stabilizer. This one repair can be either REPAIR 7 or REPAIR 8. If it is necessary to install more than one repair, then contact The Boeing Company for repair instructions.
- L. REPAIR 7 can be used to make an access hole in the lower skin of the horizontal stabilizer.

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REPAIR 7
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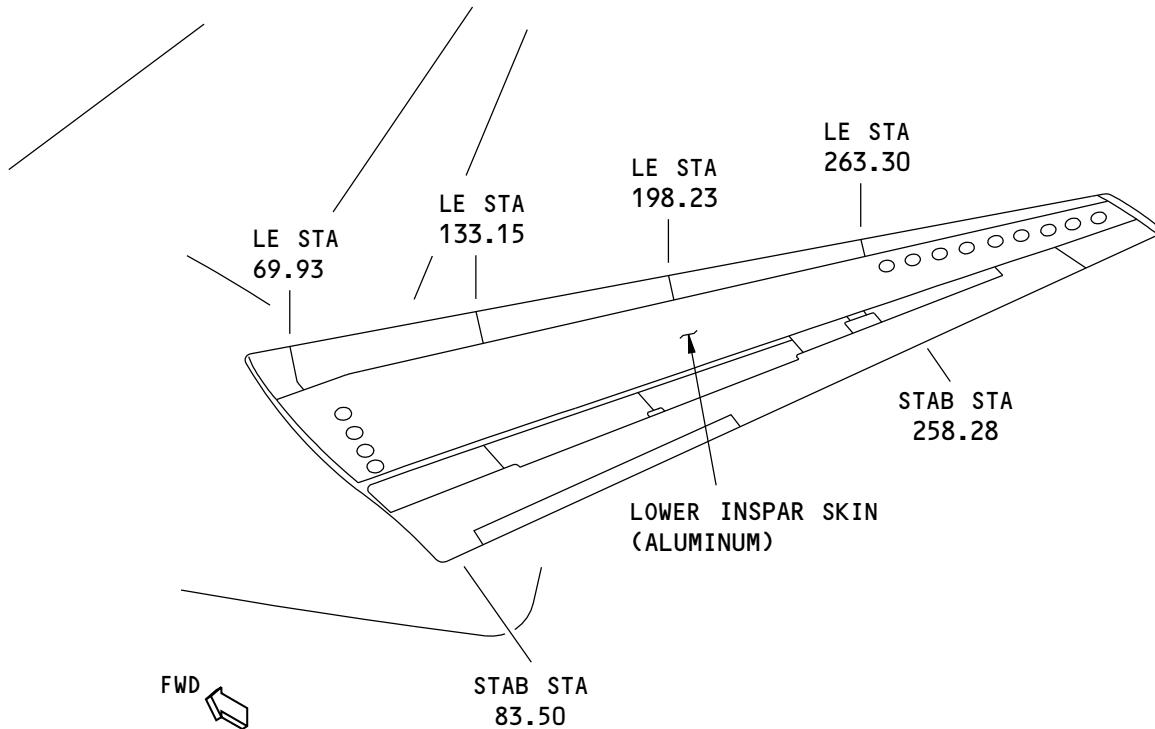
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN

Horizontal Stabilizer Lower Inspark Skin Location
Figure 201

2028210 S0000404120_V1

2. General

- A. REPAIR 7 is a Category B Repair. This Category B repair has FAA approval if you do the supplemental inspections given in Paragraph 5./REPAIR 7. Incorporation of these inspection requirements into the airplanes maintenance program satisfies the damage tolerance assessment of the repair. Refer to STRUCTURAL REPAIR DEFINITIONS, 51-00-06 for repair categories and definitions.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL

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(Continued)

Reference	Title
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Cut the hole in the skin to the shape shown in Horizontal Stabilizer Access Panel Installation, Figure 202/REPAIR 7.
 - (1) Make sure that you do not cover a drain hole with the repair parts.
 - (a) If you must do the repair in a drain hole area, then put the cutout in position so that you can drill a hole through the repair parts at the location of the initial drain hole.
- B. Remove the fasteners from the rib chords as necessary.
 - (1) Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
- C. Make the repair parts. Refer to Table 201/REPAIR 7 and Table 202/REPAIR 7.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Cover Plate	1	Use bare or clad 2024-T3 that is 0.070 in. (1.78 mm) thick
[2]	Doubler	1	Use bare or clad 2024-T351 that is 0.250 in. (6.35 mm) thick
[3]	Shim	1	Use bare or clad 2024-T3. Refer to Table 202/REPAIR 7 for the shim thickness.

Table 202:

NECESSARY SHIM THICKNESS	
SKIN THICKNESS ^{*[1]}	SHIM THICKNESS
0.050 in. (1.27 mm)	0.025 in. (0.64 mm) or 0.032 in. (0.81 mm)
0.060 in. (1.52 mm)	0.016 in. (0.41 mm) or 0.020 in. (0.51 mm)
0.071 in. (1.80 mm)	0.012 in. (0.30 mm)

*[1] You must use the typical skin thickness between the ribs of the bay.

- D. Assemble the part [2] doubler and the part [3] shim as shown in Figure 202/REPAIR 7.
- E. Drill the fastener holes that go through the skin, rib chords, the part [2] doubler, and the part [3] shim.
 - (1) Refer to FASTENER HOLE SIZES, 51-40-05 for the fastener hole dimensions.
 - (2) If you installed the repair parts at a drain hole location, then drill a hole through the repair parts and through the initial drain hole.
 - (a) Make the hole you drill the same diameter as the initial drain hole.
- F. Disassemble the repair parts.

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REPAIR 7

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- G. Remove the nicks, scratches, gouges, and burrs from the initial parts and from the part [2] doubler and the part [3] shim.
- H. Apply a chemical conversion coating to the part [2] doubler and the part [3] shim and the bare surfaces of the skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- I. Apply one layer of BMS 10-79, Type II primer to the part [2] doubler and the part [3] shim and the bare surfaces of the initial parts. Refer to SOPM 20-44-04.
- J. Install the part [2] doubler and the part [3] shim.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - (2) Install the rivets without sealant.
 - (3) Install the hex drive bolts wet with BMS 5-95 sealant.
- K. Assemble the part [1] cover plate as shown in Figure 202/REPAIR 7.
- L. Drill the 0.190 in. (4.83 mm) to 0.199 in. (5.05 mm) diameter holes for the nutplates as shown in Figure 202/REPAIR 7.
- M. Remove the part [1] cover plate.
- N. Put the nutplates in position on the part [2] doubler and drill the holes for the rivets.
- O. Remove all nicks, scratches, gouges, and burrs from the repair parts, and the bare surfaces of the initial skin.
- P. Apply a chemical conversion coating to the repair parts and the bare surfaces of the initial skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- Q. Apply one layer of BMS 10-79, Type II primer to the repair parts and the bare surfaces of the initial skin. Refer to SOPM 20-44-04.
- R. Install the nutplates on the part [2] doubler.
 - (1) Install the rivets without sealant.
- S. Apply BMS 10-86, Type I white abrasion resistant coating to the mating surfaces of the part [1] cover plate and the part [2] doubler. Refer to SOPM 20-44-01.
- T. Install the part [1] cover plate.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - (2) Install the fasteners wet with BMS 5-95 sealant.
 - (3) Put BMS 5-95 sealant into the space between the skin and the part [1] cover plate.
- U. Apply a finish to the repair area if necessary. Refer to AMM SECTION 51-21.

55-10-01

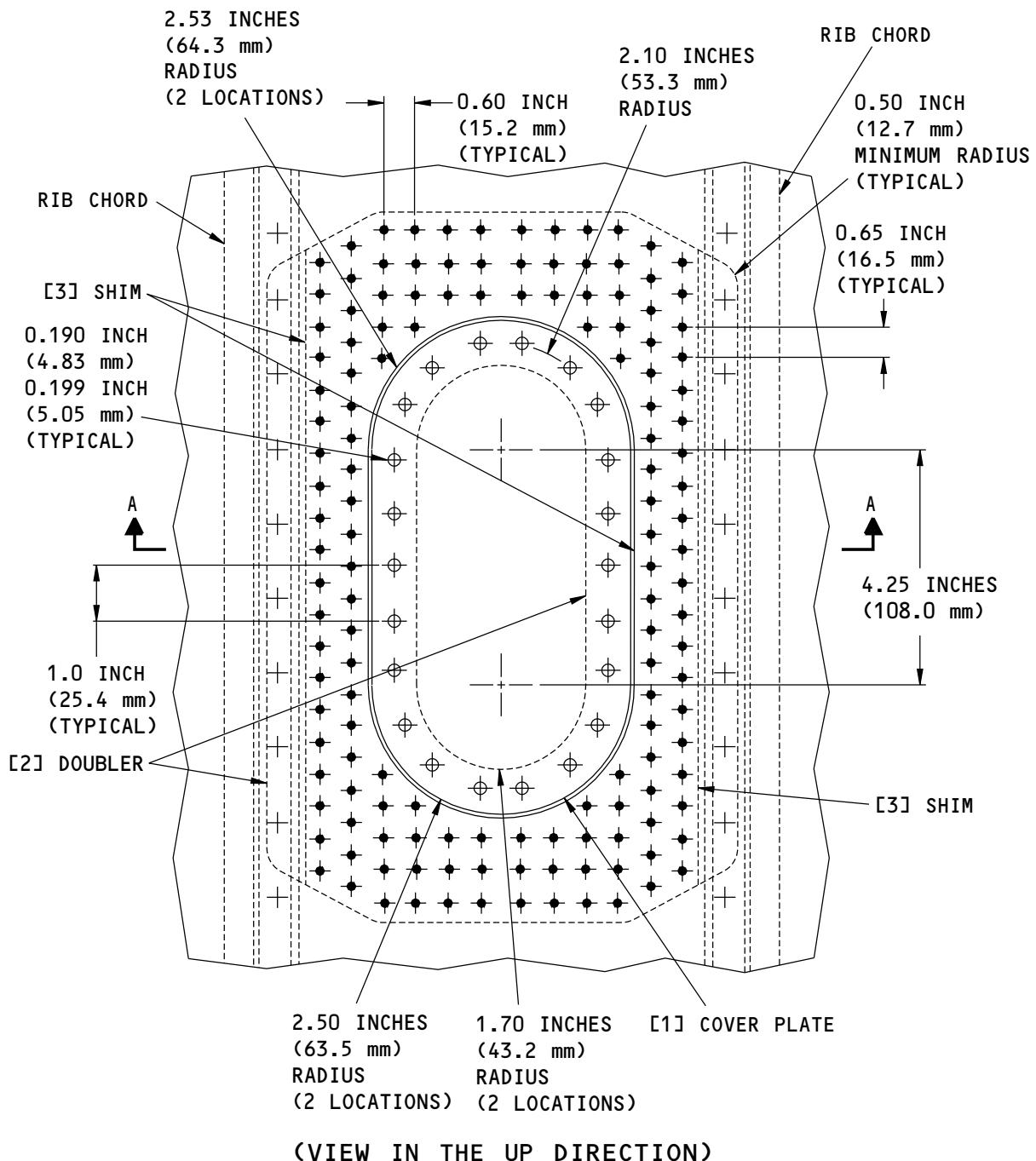
REPAIR 7
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Horizontal Stabilizer Access Panel Installation
Figure 202 (Sheet 1 of 2)

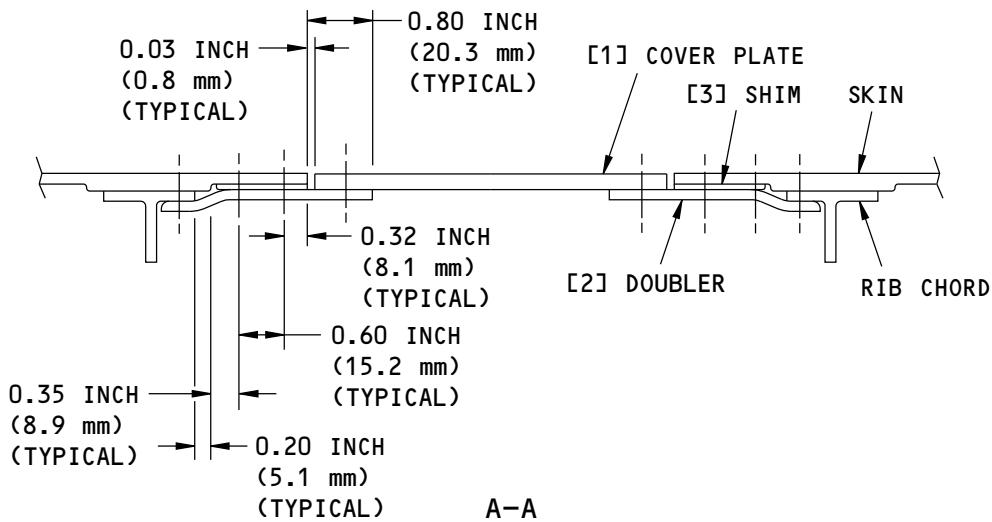
55-10-01**REPAIR 7**

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FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER AS THE INITIAL FASTENER. YOU CAN INSTALL A FASTENER THAT IS UP TO 1/32 INCH DIAMETER OVERSIZE.
- REPAIR FASTENER LOCATION. INSTALL A BACB30MY6K HEX DRIVE BOLT.
- ⊕ REPAIR FASTENER LOCATION. INSTALL A BACN10JR03CFM NUTPLATE WITH BACR15BA3D RIVETS. INSTALL A BACB30EL3-() BOLT TO ATTACH THE PART [1] COVER PLATE TO THE PART [2] DOUBLER.

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Horizontal Stabilizer Access Panel Installation
Figure 202 (Sheet 2 of 2)

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5. Inspection Requirements

- A. Do the inspection as given in Table 203/REPAIR 7 and Figure 203/REPAIR 7.

Table 203:

CATEGORY B REPAIR INSPECTION REQUIREMENTS		
INSPECTION THRESHOLD	REPEAT INSPECTIONS	
	METHOD	INTERVAL
56,000 flight cycles after repair installation	Detailed Visual Inspection ^{*[1]}	9,000 flight cycles

*[1] Inspect the skin and the part [2] doubler at all fasteners common to the repair parts. Remove the part [1] cover plate to inspect the part [2] doubler.

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**REPAIR 7
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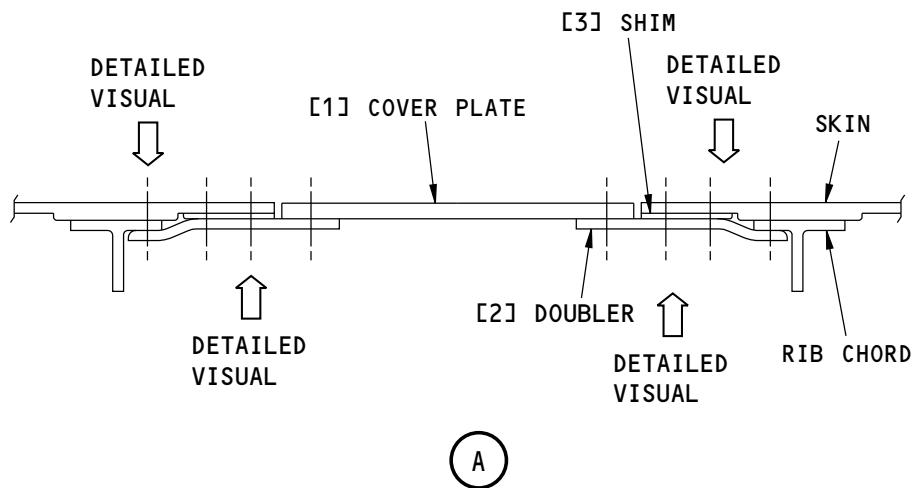
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Horizontal Stabilizer Access Panel Installation Inspection
Figure 203

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**REPAIR 8 - HORIZONTAL STABILIZER LOWER SKIN ACCESS PANEL INSTALLATION WITH A
TWO-PIECE DOUBLER**

1. Applicability

- A. REPAIR 8 is applicable to airplanes with line numbers 1 through 3623 that have not incorporated SB 737-55-1096.
 - B. REPAIR 8 is not applicable to airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096.
 - C. REPAIR 8 is not applicable to airplanes with line numbers 3624 and on.
 - D. If you install REPAIR 8, then the total area that you can repair on the upper and lower inspar skins will decrease. See Paragraph 1.I./REPAIR 8 and Paragraph 1.J./REPAIR 8.
 - (1) REPAIR 11 is applicable as a replacement repair for REPAIR 8.
 - E. REPAIR 8 is applicable for damage to:
 - (1) The horizontal stabilizer lower skin from Stab Sta 83.5 to Stab Sta 184.7. Refer to Figure 201/REPAIR 8.
 - (2) Locations where there is not sufficient clearance to install a one-piece part [2] doubler.
- NOTE:** An alternative to REPAIR 8 is REPAIR 7. REPAIR 7 is an access panel installation with a one-piece doubler for locations where there is sufficient clearance to install a one-piece doubler.
- F. You are not permitted to install REPAIR 8 on the upper inspar skin of the horizontal stabilizer.
 - G. You are not permitted to install REPAIR 8 if REPAIR 12 is installed on the airplane.
 - H. You are not permitted to install REPAIR 8 if there is a repair on the upper inspar skin of the horizontal stabilizer.
 - I. If you install REPAIR 8, then you are not permitted to install any repair doublers on the upper inspar skin of the horizontal stabilizer.
 - J. If you install REPAIR 8, then the total area of all repair doublers that are installed on the lower inspar skin must not be more than 500 in² (322,580 mm²). These repair doublers can be installed from REPAIR 4, REPAIR 11, or a repair that is not in the SRM.
 - K. You are permitted to install a maximum of one access panel repair on each horizontal stabilizer. This one repair be either REPAIR 7 or REPAIR 8. If it is necessary to install more than one repair, contact The Boeing Company for repair instructions.
 - L. REPAIR 8 can be used to make an access hole in the lower skin of the horizontal stabilizer.

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REPAIR 8
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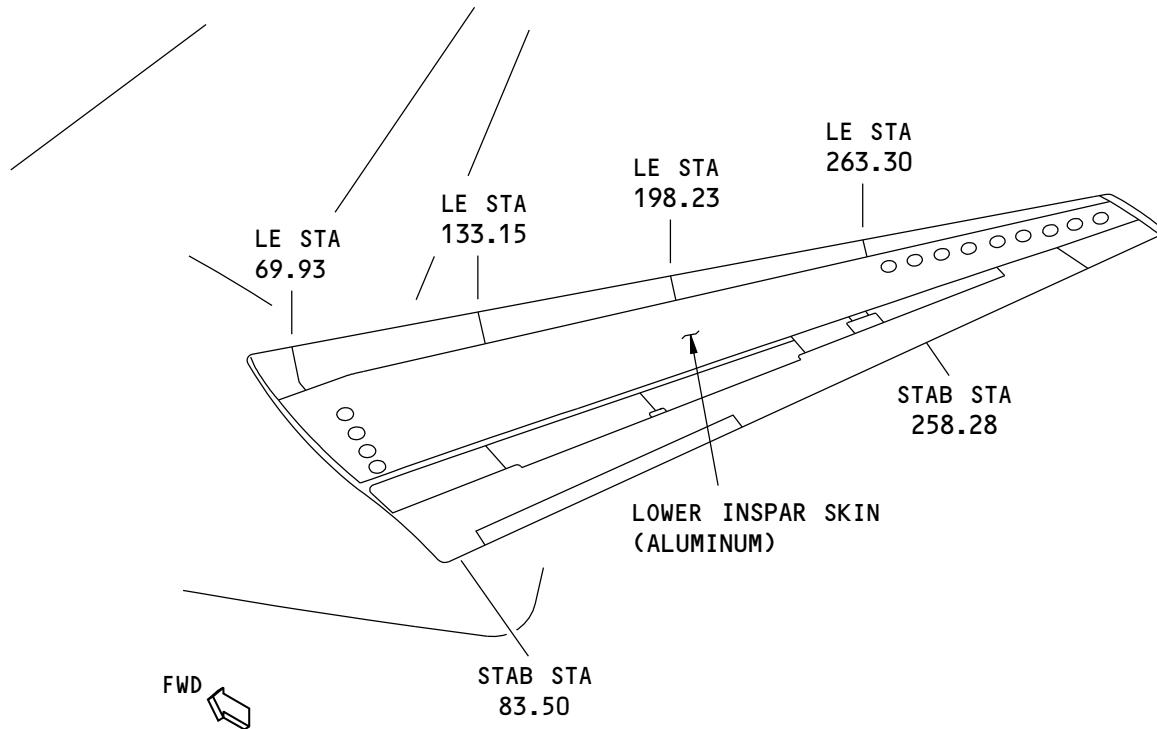
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)
LOWER SURFACE IS SHOWN

Horizontal Stabilizer Lower Inspark Skin Location
Figure 201

2028214 S0000404116_V1

2. General

- A. REPAIR 8 is a Category B Repair. This Category B repair has FAA approval if you do the supplemental inspections given in Paragraph 5./REPAIR 8. Incorporation of these inspection requirements into the airplane maintenance program satisfies the damage tolerance assessment of the repair. Refer to 51-00-06 for repair categories and definitions.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution

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(Continued)

Reference	Title
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Cut the hole in the skin to the shape shown in Figure 202/REPAIR 8.
 - (1) Make sure that you do not cover a drain hole with the repair parts.
 - (a) If you must do the repair in a drain hole area, then put the cutout in position so that you can drill a hole through the repair parts at the location of the initial drain hole.
- B. Remove the fasteners from the rib chords as necessary.
 - (1) Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
- C. Make the repair parts. Refer to Table 201/REPAIR 8 and Table 202/REPAIR 8.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Cover Plate	1	Use bare or clad 2024-T3 that is 0.070 in. (1.78 mm) thick
[2]	Doubler	2	Use bare or clad 2024-T351 that is 0.250 in. (6.35 mm) thick
[3]	Shim	2	Use bare or clad 2024-T3. Refer to Table 202/REPAIR 8 for the shim thickness.
[4]	Splice Plate	2	Use bare or clad 2024-T351 that is 0.250 in. (6.35 mm) thick

Table 202:

NECESSARY SHIM THICKNESS	
SKIN THICKNESS ^[1]	SHIM THICKNESS
0.050 in. (1.27 mm)	0.025 in. (0.64 mm) or 0.032 in. (0.81 mm)
0.060 in. (1.52 mm)	0.016 in. (0.41 mm) or 0.020 in. (0.51 mm)
0.071 in. (1.80 mm)	0.012 in. (0.30 mm)

*[1] You must use the typical skin thickness between the ribs of the bay.

- D. Assemble the part [2] doublers, the part [3] shims, and the part [4] splice plates as shown in Figure 202/REPAIR 8.
- E. Drill the fastener holes that go through the skin, the rib chords, the part [2] doublers, the part [3] shims, and the part [4] splice plates.
 - (1) Refer to FASTENER HOLE SIZES, 51-40-05 for the fastener hole dimensions.
 - (a) If you installed the repair parts at a drain hole location, then drill a hole through the repair parts and through the initial drain hole.
 - (b) Make the hole you drill the same diameter as the initial drain hole.
- F. Disassemble the repair parts.

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- G. Remove the nicks, scratches, gouges, and burrs from the initial parts and from the part [2] doublers, the part [3] shims, and the part [4] splice plates.
- H. Apply a chemical conversion coating to the bare surfaces of the initial parts and to the part [2] doublers, the part [3] shims, and the part [4] splice plates. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- I. Apply one layer of BMS 10-79, Type II primer to the bare surfaces of the initial parts and to the part [2] doublers, the part [3] shims, and the part [4] splice plates. Refer to SOPM 20-44-04.
- J. Install the part [2] doublers, the part [3] shims, and the part [4] splice plates.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - (2) Install the rivets without sealant.
 - (3) Install the hex drive bolts wet with BMS 5-95 sealant.
- K. Assemble the part [1] cover plate as shown in Figure 202/REPAIR 8.
- L. Drill the 0.190 to 0.199 inch diameter holes for the nutplates as shown in Figure 202/REPAIR 8.
- M. Remove the part [1] cover plate.
- N. Put the nutplates in position on the part [2] doublers and drill the holes for the rivets.
- O. Remove all nicks, scratches, gouges, and burrs from the repair parts, and the bare surfaces of the initial skin.
- P. Apply a chemical conversion coating to the repair parts and the bare surfaces of the initial skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- Q. Apply one layer of BMS 10-79, Type II primer to the rear parts and the bare surfaces of the initial skin. Refer to SOPM 20-44-04.
- R. Install the nutplates on the part [2] doublers.
 - (1) Install the rivets without sealant.
- S. Apply BMS 10-86, Type I white abrasion resistant coating to the mating surfaces of the part [1] cover plate and the part [2] doublers. Refer to SOPM 20-44-01.
- T. Install the part [1] cover plate.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - (2) Install the fasteners wet with BMS 5-95 sealant.
 - (3) Put BMS 5-95 sealant into the space between the skin and the part [1] cover plate.
- U. Apply a finish to the repair area if necessary. Refer to AMM SECTION 51-21.

55-10-01

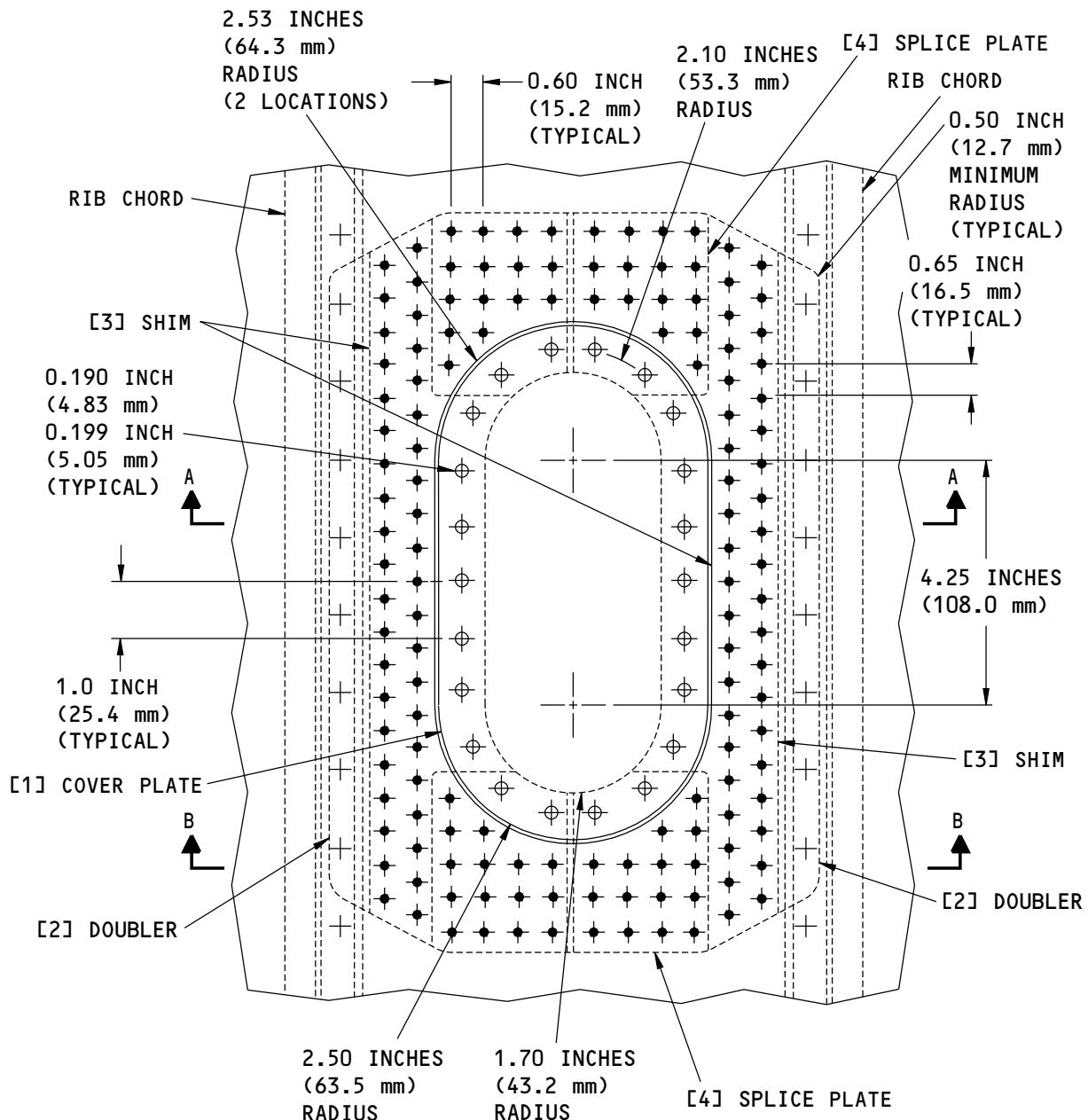
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Horizontal Stabilizer Access Panel Installation
Figure 202 (Sheet 1 of 2)

55-10-01

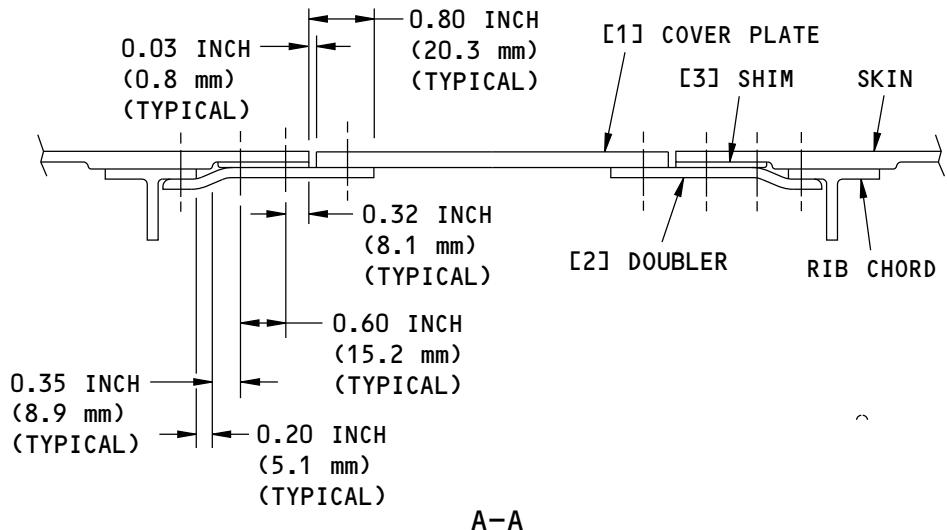
REPAIR 8
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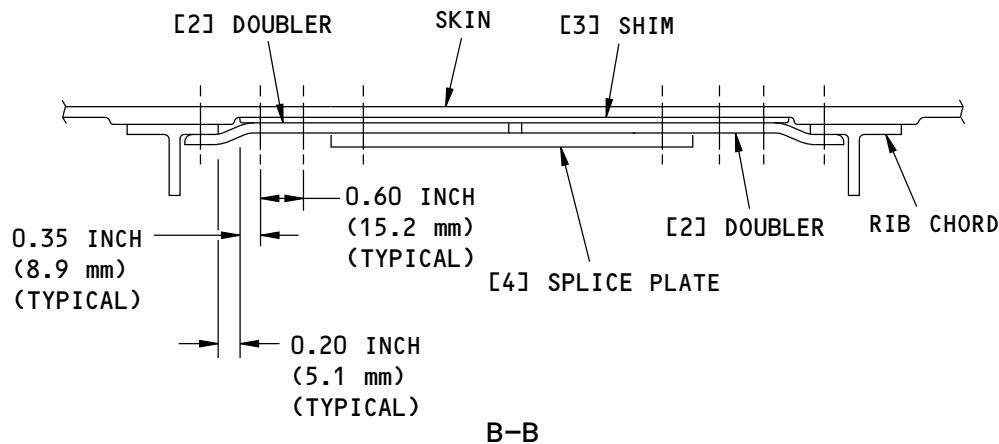
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A-A



B-B

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER AS THE INITIAL FASTENER. YOU CAN INSTALL A FASTENER THAT IS UP TO 1/32 INCH DIAMETER OVERSIZE.
- REPAIR FASTENER LOCATION. INSTALL A BACB30MY6K HEX DRIVE BOLT.
- REPAIR FASTENER LOCATION. INSTALL A BACN10JRO3CFM NUTPLATE WITH BACR15BA3D RIVETS. INSTALL A BACB30EL3-() BOLT TO ATTACH THE PART [1] COVER PLATE TO THE PART [2] DOUBLER.

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Horizontal Stabilizer Access Panel Installation
Figure 202 (Sheet 2 of 2)

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5. Inspection Requirements

- A. Do the inspection as given in Table 203/REPAIR 8 and Figure 203/REPAIR 8.

Table 203:

CATEGORY B REPAIR INSPECTION REQUIREMENTS		
INSPECTION THRESHOLD	REPEAT INSPECTIONS	
	METHOD	INTERVAL
56,000 flight cycles after repair installation	Detailed Visual Inspection ^{*[1]}	9,000 flight cycles

*[1] Inspect the skin, the part [2] doublers, and the part [4] splice plates at all fasteners common to the repair parts.
Remove the part [1] cover plate to inspect the part [2] doublers and the part [4] splice plates.

55-10-01

**REPAIR 8
Page 207**

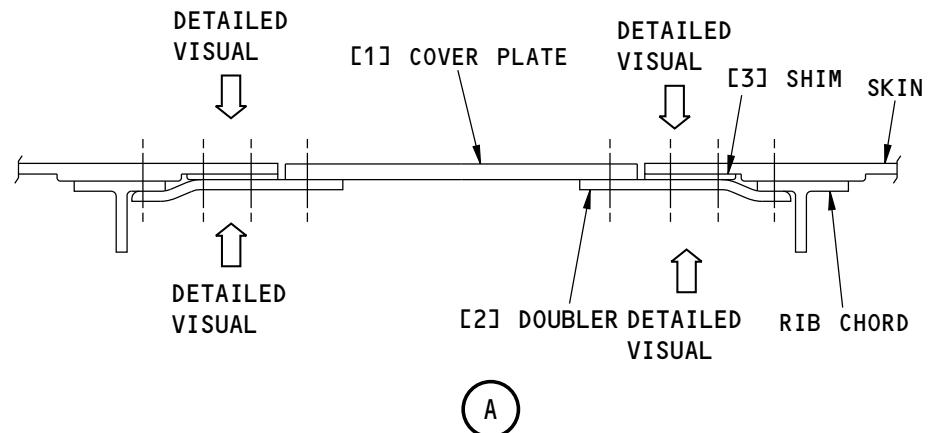
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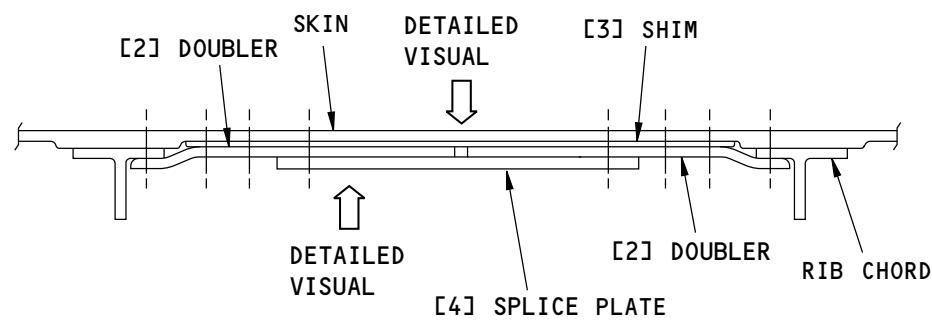
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A



B

1894324 S0000347340_V1

Horizontal Stabilizer Access Panel Installation Inspection
Figure 203

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REPAIR 9 - HORIZONTAL STABILIZER TRAILING EDGE PANELS

1. Applicability

- A. Repair 9 is applicable to damage on the horizontal stabilizer trailing edge panels shown in Horizontal Stabilizer Upper Trailing Edge Panel Locations, Figure 201/REPAIR 9. The trailing edge panels are made of Glass Fiber Reinforced Plastic (GFRP) and Carbon Fiber Reinforced Plastic (CFRP).
- B. Repair 9 is applicable to damage that is more than the limits permitted in Allowable Damage 3. Refer to Allowable Damage 3 for the type and size of damage that is permitted.

2. General

- A. Repair 9 gives instructions for Permanent Repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the trailing edge panels.
 - (2) Refer to 51-40-02 for information on fastener removal.
- C. Refer to Damage Definitions, Figure 202/REPAIR 9, Details A, B, and C for the definitions of the length, width, and depth of damage.
- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 9 for the definitions of the facesheets of a honeycomb core area.
- E. Some trailing edge panels have a protective layer of Teflon film. If damage occurs, refer to AMM 51-21-81/701 for the procedures to repair the Teflon film.
- F. The conditions that follow must be true for panel areas other than the edgeband:
 - (1) The edges of the 200°F (93°C) cure Permanent Repair must be 3 inches or more away from:
 - (a) The edge of other repairs
 - (b) The panel edge
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 3.
- G. Do the repair as given in Paragraph 4./REPAIR 9
- H. Put the trailing edge panels back to the initial condition, as applicable.
 - (1) Install the trailing edge panels, if they were removed.
 - (a) Refer to 51-40-02 for information on fastener installation.
 - (2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the performance of the airplane. Refer to 51-10-01.

55-10-01

REPAIR 9
Page 201

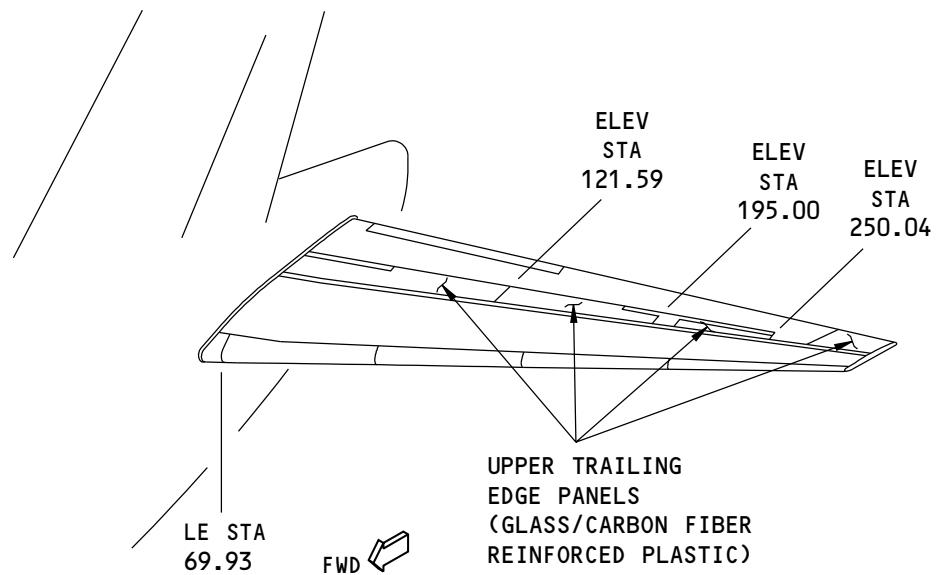
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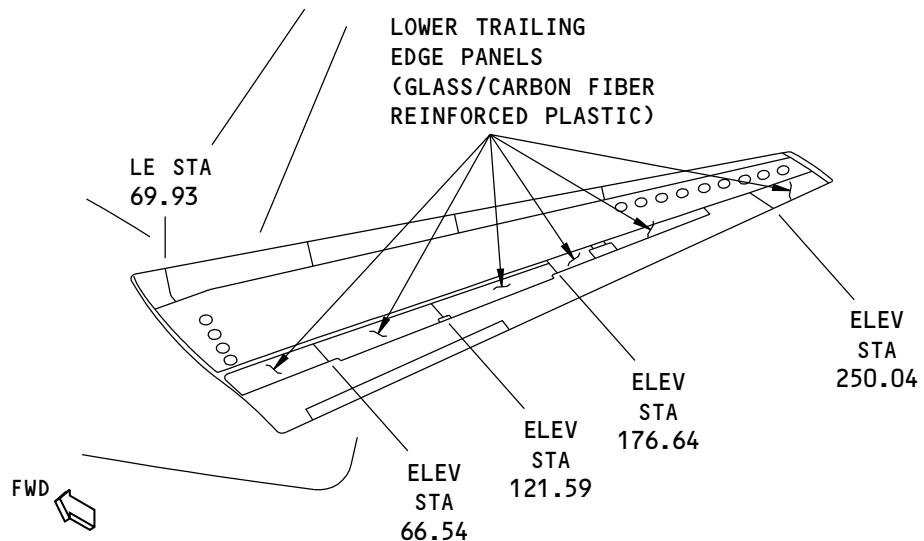


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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

UPPER SURFACE IS SHOWN



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

LOWER SURFACE IS SHOWN

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Horizontal Stabilizer Upper Trailing Edge Panel Locations
Figure 201

55-10-01

REPAIR 9
Page 202

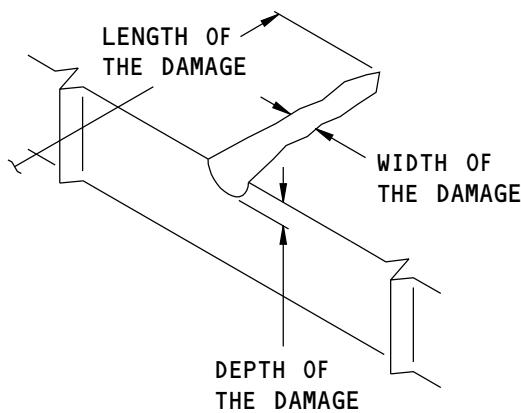
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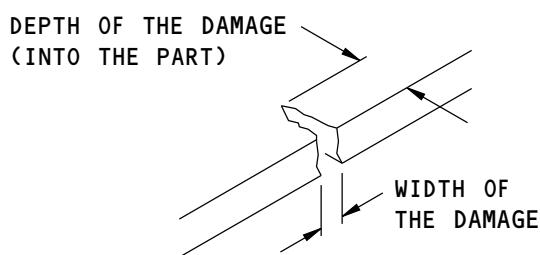


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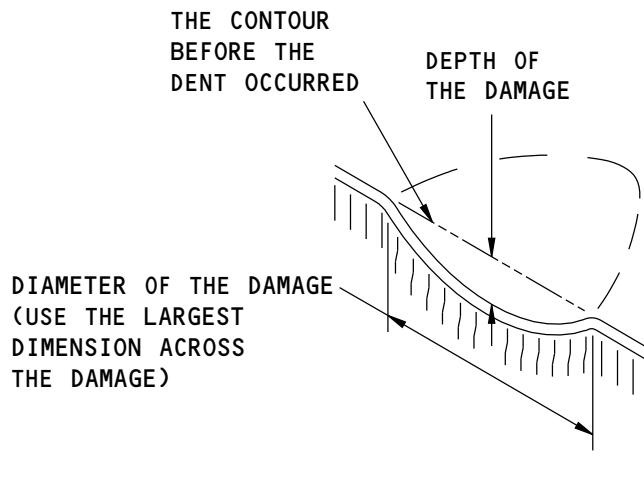
DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)



DEFINITIONS FOR EDGE DAMAGE

(C)



DEFINITIONS FOR DENT DAMAGE

(B)

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Damage Definitions
Figure 202

55-10-01

REPAIR 9
Page 203

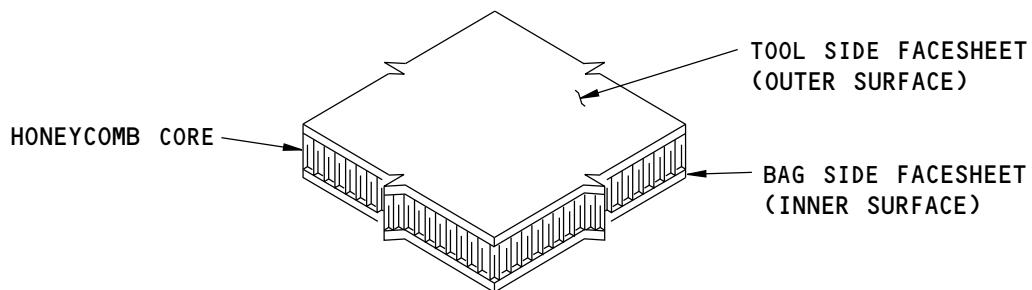
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F61217 S0006592554_V1

Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-14, REPAIR GENERAL	Structures With Aluminum Coatings and Foils
55-10-01, ALLOWABLE DAMAGE 3	Horizontal Stabilizer Trailing Edge Panels
AMM 51-21-81 P/B 701	ABRASION-RESISTANT TEFLON FINISH - CLEANING/PAINTING
AMM 51-21-81/701	Abrasion-resistant Teflon Finish - Cleaning/Painting

4. Repair Instructions

- A. For dents that are a maximum of 2 inches in diameter and have no fiber damage and delamination, do the steps that follow:
 - (1) Fill the dent with BMS 5-28, Type 7 potting compound.
 - (2) Apply a fiberglass patch over the potted area as given in 51-70-04.
- B. For dents that are not permitted by Paragraph 4.A./REPAIR 9 and for other damage that is not permitted by Allowable Damage 3, refer to:
 - (1) Table 201/REPAIR 9 for panel areas with honeycomb core
 - (2) Table 202/REPAIR 9 for solid laminate panel areas, except edgebands
 - (3) Table 203/REPAIR 9 for panel areas with edgebands.

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Table 201:

REPAIR DATA FOR THE 250°F (121°C) CURE TRAILING EDGE PANELS FOR PANEL AREAS WITH HONEY COMB CORE				
REPAIR TYPE	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-06	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT PREIMPREGNATED LAYUP REPAIR AS GIVEN IN SRM 51-70-05
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Contact The Boeing Company	Damage that is a maximum of: - 6.0 inches in diameter - 50 percent of the smallest dimension across the panel at the damage location	There are no limits on the size of the repair
REPAIR PROCEDURES	Refer to Paragraph 4.C	Refer to Paragraph 4.D	Refer to Paragraph 4.E	Refer to Paragraph 4.F

Table 202:

REPAIR DATA FOR THE 250°F (121°C) CURE TRAILING EDGE PANELS FOR SOLID LAMINATE PANEL AREAS, EXCEPT EDGEBANDS				
REPAIR TYPE	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-06	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT PREIMPREGNATED LAYUP REPAIR AS GIVEN IN SRM 51-70-05
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Contact The Boeing Company	Damage that is a maximum of: - 3.0 inches in diameter - 35 percent of the smallest dimension across the panel at the damage location	There are no limits on the size of the repair
REPAIR PROCEDURES	Refer to Paragraph 4.C	Refer to Paragraph 4.D	Refer to Paragraph 4.E	Refer to Paragraph 4.F

Table 203:

REPAIR DATA FOR THE EDGEBANDS OF 250°F (121°C) CURE TRAILING EDGE PANELS				
REPAIR TYPE	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-06	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT PREIMPREGNATED LAYUP REPAIR AS GIVEN IN SRM 51-70-05
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Contact The Boeing Company	There are no size limits on the dimensions of the repair	There are no limits on the size of the repair

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Table 203: (Continued)

REPAIR DATA FOR THE EDGEBANDS OF 250°F (121°C) CURE TRAILING EDGE PANELS				
REPAIR TYPE	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-06	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT PREIMPREGNATED LAYUP REPAIR AS GIVEN IN SRM 51-70-05
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR PROCEDURES	Refer to Paragraph 4.C	Refer to Paragraph 4.D	Refer to Paragraph 4.E	Refer to Paragraph 4.F

- C. Contact The Boeing Company for a repair made with Room Temperature Wet Layup Materials.
- D. Contact The Boeing Company for a repair made with Wet Layup Materials at 150°F (66°C) cure.
- E. Use the instructions that follow to do a Permanent Repair with wet layup materials at 200°F (93°C) cure.
 - (1) Repair the damage as given in 51-70-04, but for each facesheet or solid laminate area that is damaged, do the steps that follow:
 - (a) Use the same number of repair plies as the number of initial plies that were removed. Refer to Definitions of the Facesheets, Figure 203/REPAIR 9 for the definition of a facesheet.
 - (b) Add one ply (structural) of BMS 9-3, Type H-2, (or Type H-3) glass fabric that is ±45 degrees.
 - (c) Add a second ply (structural) of BMS 9-3, Type H-2 (or Type H-3) glass fabric that is 0 or 90 degrees.
- F. Use the instruction that follows to do a Permanent Repair with preimpregnated layup materials at 250°F (121°C) cure.
 - (1) Use the same number of repair plies as the number of initial plies that were removed.

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REPAIR 10 - HORIZONTAL STABILIZER TRAILING EDGE PANEL CONDUCTIVE STRIP

1. Applicability

- A. Repair 10 is applicable to damage on the horizontal stabilizer trailing edge panel conductive strip.
- B. Repair 10 is applicable to damage to the conductive strip that is more than the limits permitted in SRM 55-10-01, Allowable Damage 3.

2. General

- A. Repair 10 gives instructions for a Category C repair. Refer to STRUCTURAL REPAIR DEFINITIONS, 51-00-06 for definitions of the different categories of repairs.
- B. Gain access to the damaged area.
 - (1) If necessary, remove the trailing edge panels.
 - (2) Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02 for information on fastener removal.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-20-13	SURFACE ROUGHNESS FINISH REQUIREMENTS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-08	COUNTERSINKING
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Repair Instructions

- A. Remove fasteners as necessary to the conductive strip at the damaged location. Refer to the part [1] doubler given in Figure 201.
- B. Blend or completely remove the damaged area as shown in Figure 201. Maintain a minimum 125 micro inches Ra surface smoothness or smoother. Refer to SURFACE ROUGHNESS FINISH REQUIREMENTS, 51-20-13.
- C. Make the repair parts as shown in Figure 201/REPAIR 10. Refer to Table 201/REPAIR 10 for the repair material. Make the Part [1] Doubler to follow the skin panel contour. Make sure the Part [1] Doubler extends two fasteners minimum beyond damage in either direction. Make sure there is 1.5D minimum edge margin on all the fasteners. Make sure the corner radii are 0.5 inch minimum.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	0.04 inch (1.0 mm) 6061-T4. It is optional to use 2024-T3 sheet
[2]	Filler (if necessary)	1	Use 6061-T4 sheet with a thickness to limit all gaps to a maximum 0.01 inch (0.25 mm). It is optional to use 2024-T3 sheet.

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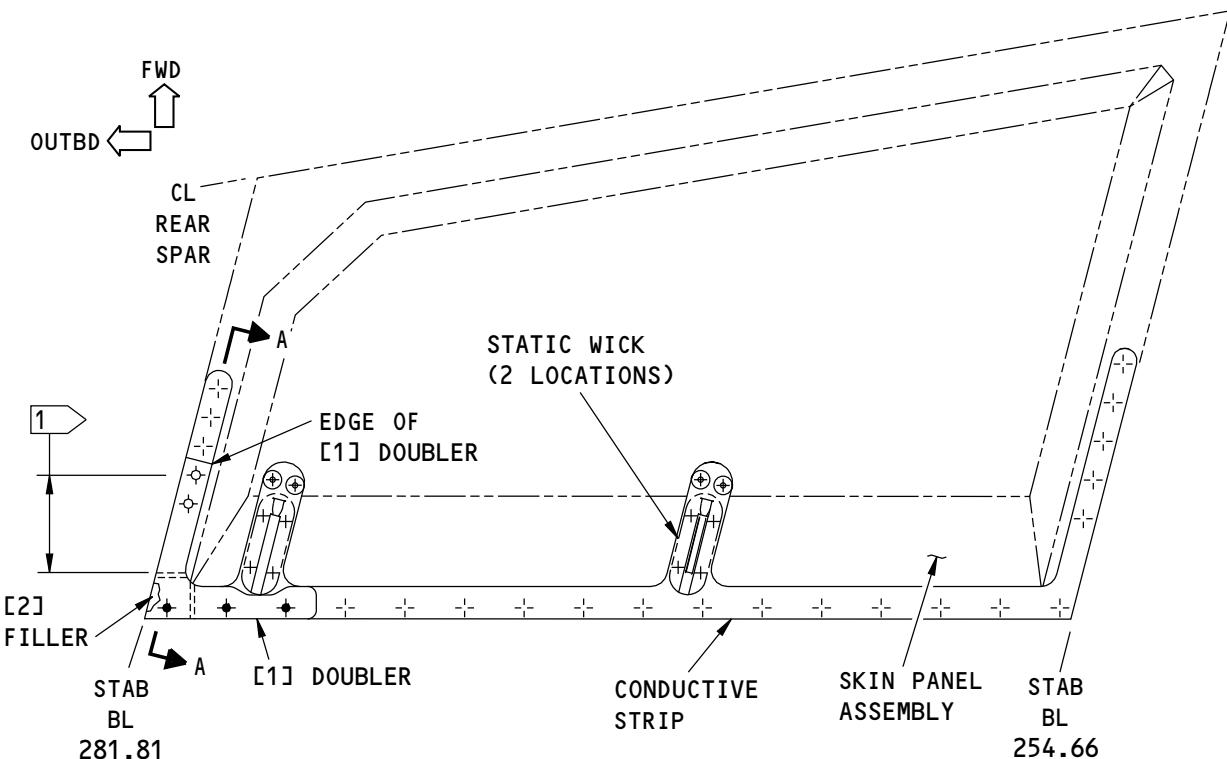
- D. Remove the finish from the initial conductive strip surface that is common to the part [1] doubler.
- E. Make the countersink washers for necessary initial fastener locations. Refer to COUNTERSINKING, 51-40-08.
- F. At necessary initial fastener locations, install countersink repair washers with BMS 5-95 sealant. Refer to COUNTERSINKING, 51-40-08. Perform a resistance check between the washers and the conductive strip as given in BAC 5117-6. The maximum resistance is to be 0.01 ohms.
- G. Assemble the repair parts as shown in Figure 201/REPAIR 10.
- H. Drill the fastener holes.
- I. Remove the repair parts.
- J. Remove all nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the initial parts.
- K. Install the repair parts dry.
- L. Install the fasteners without sealant. Do a resistance check between the fastener head and the initial structure as given in BAC 5117.
- M. Apply a chemical conversion coating to the repair parts and bare surfaces. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- N. Apply two layers of BMS 10-11, Type II primer to the bare surfaces except at areas common to the static wicks. Refer to SOPM 20-41-02.
- O. Fillet seal the repair parts and all gaps with BMS 5-95 sealant. Refer to REPAIR SEALING, 51-20-05.
- P. Do a resistance test between the Part [1] Doubler and conductive strip. Refer to STRUCTURES WITH ALUMINUM COATINGS AND FOILS, 51-70-14 for test procedures.
- Q. Apply all initial production drawing finishes as necessary.
- R. After 30 days or less, make an initial visual inspection of the repaired conductive strip for signs of new damage or for loose or missing fasteners. Repeat the inspections at each 30 day interval. If there is new damage found to the conductive strip then replace the conductive strip. Replacement of the damaged part with a new conductive strip stops the necessary inspection.
- S. Replace the damaged conductive strip with a new conductive strip in 24 months or less.

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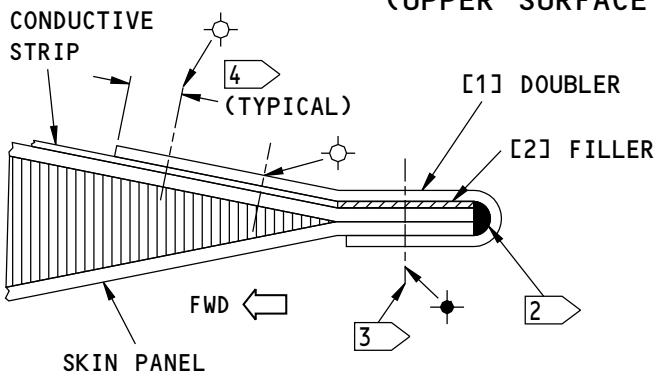
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)
(UPPER SURFACE IS SHOWN)



- A-A**
- [1] THE PART [1] REPAIR DOUBLER MUST EXTEND 2 FASTENERS BEYOND DAMAGE IN EITHER DIRECTIONS.
 - [2] FILL VOID WITH BMS 5-95 SEALANT.
 - [3] IF THIS FASTENER ROW IS INCLUDED IN THE REPAIR, EXTEND THE DOUBLER AS SHOWN. EXAMPLE DAMAGE LOCATION SHOWN, OTHER DAMAGE LOCATIONS SIMILAR.
 - [4] MAKE SURE THERE IS A MINIMUM OF 1.5D EDGE MARGIN.

FASTENER SYMBOLS

- + REFERENCE FASTENER LOCATION
- REFERENCE FASTENER LOCATION.
INSTALL A BACR15FR5MP() RIVET
(UP TO 1/32-INCH DIAMETER
OVERSIZE)
- REFERENCE FASTENER LOCATION.
A BACR15BB5AD() RIVET USING
SQUEEZE METHOD (UP TO 1/32-INCH
DIAMETER OVERSIZE)

J59709 S0000171974_V1

**Conductive Strip Repair
Figure 201**

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**REPAIR 10
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REPAIR 11 - HORIZONTAL STABILIZER LOWER INSPAR SKIN EXTERNAL REPAIR

1. Applicability

- A. REPAIR 11 is applicable to damaged areas on the lower inspar skin between Stabilizer Station 83.50 and Stabilizer Station 184.70. Refer to Figure 201/REPAIR 11. Refer to REPAIR 3 for repairs to damaged areas on the upper inspar skins of the horizontal stabilizer.
 - (1) REPAIR 11 is applicable as a replacement repair for REPAIR 7 and REPAIR 8.
- B. REPAIR 11 is applicable to airplanes with line numbers 1 through 3623 that have not incorporated SB 737-55-1096.
- C. REPAIR 11 is applicable to airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096.
- D. REPAIR 11 is applicable to airplanes with line numbers 3624 and on.
- E. If you install REPAIR 11, then all initial and subsequent repairs that you install outboard of Stabilizer Station 249.10 must not be more than 2.0 lb (0.9 kg) in total weight. This 2.0 lb (0.9 kg) weight limit is the total weight of all the repairs that are installed outboard of Stabilizer Station 249.10 on the horizontal stabilizer.

NOTE: You must find the weight of all internal and external repairs that are installed outboard of Stabilizer Station 249.10.

- F. The total area of all repair doublers that are installed on the lower inspar skin must not be more than:
 - (1) For airplanes with line numbers 1 through 3623:
 - (a) 500 in² (322,580 mm²) if you have installed REPAIR 7, REPAIR 8, or REPAIR 12.
 - (b) 2000 in² (1,290,320 mm²) if you have not installed REPAIR 7, REPAIR 8, REPAIR 12, or a repair that has a total area of doublers more than 300 in² (193,548 mm²) on the upper skin.
 - (2) For airplanes with line numbers 3624 and on, and airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096:
 - (a) 100 in² (64,516 mm²)

NOTE: You must calculate the total area of doublers that are installed from REPAIR 4, REPAIR 11, or a repair that is not in the SRM. Deviations to Service Bulletin 737-55-1096, where portions of the skin doubler are more than the profile given in Service Bulletin 737-55-1096, must also be included.

- G. For airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096, you are not permitted to install repairs between stabilizer station 83.5 and stabilizer station 92.7 (bay 4), or between stabilizer station 175.5 and stabilizer station 184.7 (bay 14).
- H. This repair has aerodynamic limits. You are permitted to install this repair with or without an Elevator Power-Off Flight Test. Refer to AMM SUBJECT 27-31-00 for the flight test procedure.
 - (1) If you install this repair with the conditions that follow, an Elevator Power-Off Flight Test is not necessary. Refer to Figure 202/REPAIR 11.

NOTE: The limits that follow are for repair doublers that are a maximum of 0.10 in. (2.5 mm) thick. If you have installed doublers that are more than 0.10 in. (2.5 mm) thick, you must contact The Boeing Company for the aerodynamic limits.

- (a) For the area of the inspar skin located in front of balance bays 2, 3, and 4 (located between ELEV STA 66.54 and ELEV STA 149.12), repairs are permitted as follows:

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- 1) The total outboard width across all repairs cannot be more than 66 in. (1676 mm).
The width of the airstream is the distance across the airstream measured in the outboard direction.
- (2) The total outboard width across all repairs is not restricted if you do an Elevator Power-Off Flight Test. Refer to Paragraph 4.P./REPAIR 11.

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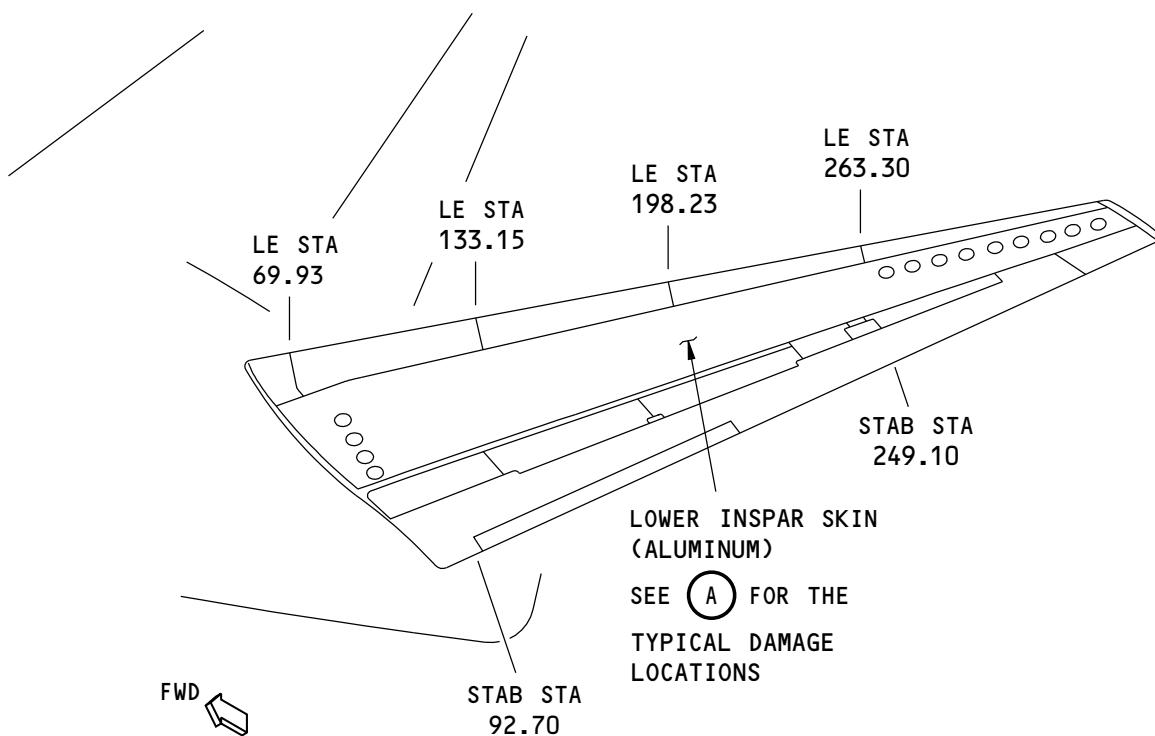
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
LOWER SURFACE IS SHOWN

1901046 S0000347559_V1

Horizontal Stabilizer Lower Inspark Skin Location
Figure 201 (Sheet 1 of 2)

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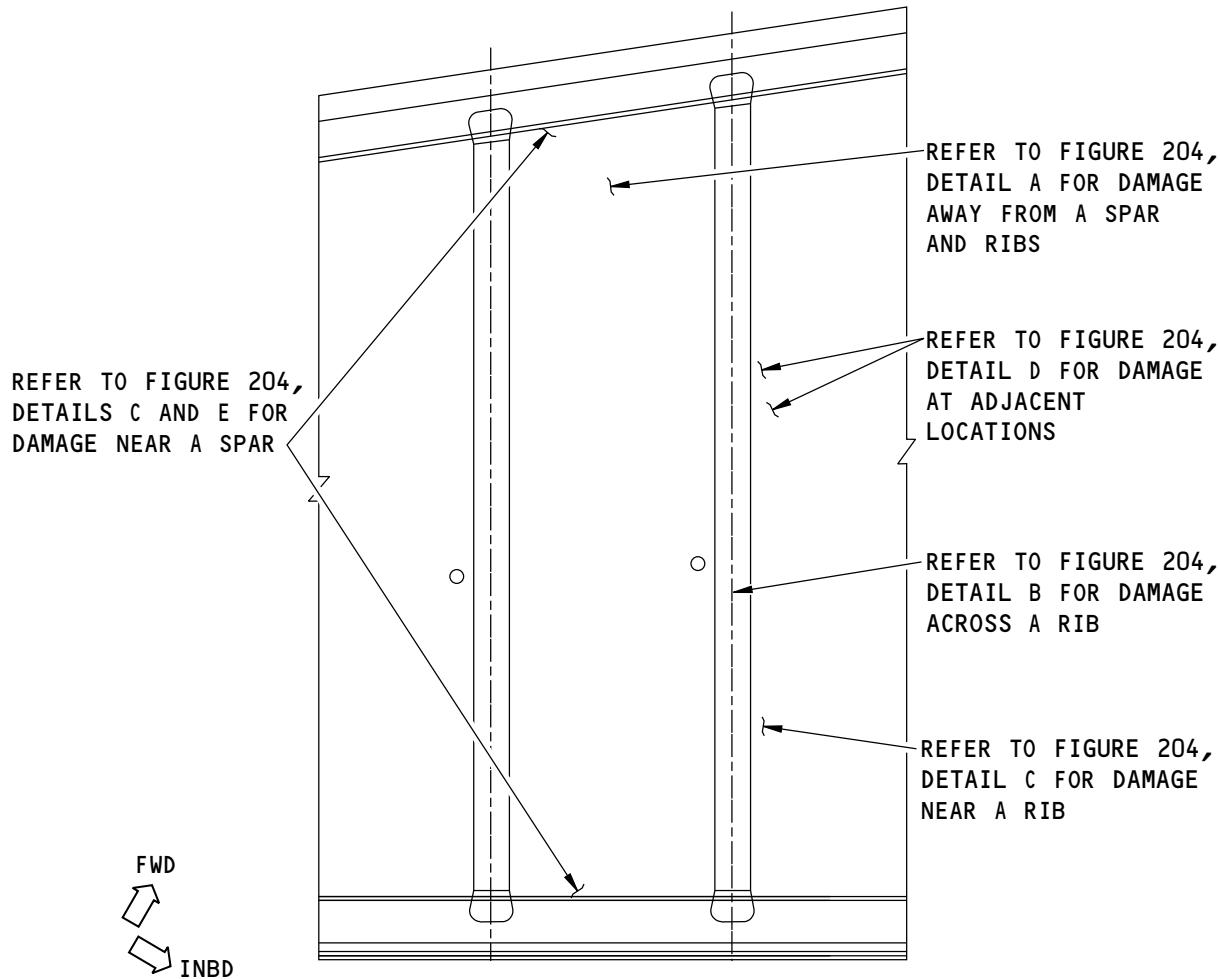
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TYPICAL DAMAGE LOCATIONS

(A)

1916084 S0000356949_V1

Horizontal Stabilizer Lower Inspar Skin Location
Figure 201 (Sheet 2 of 2)

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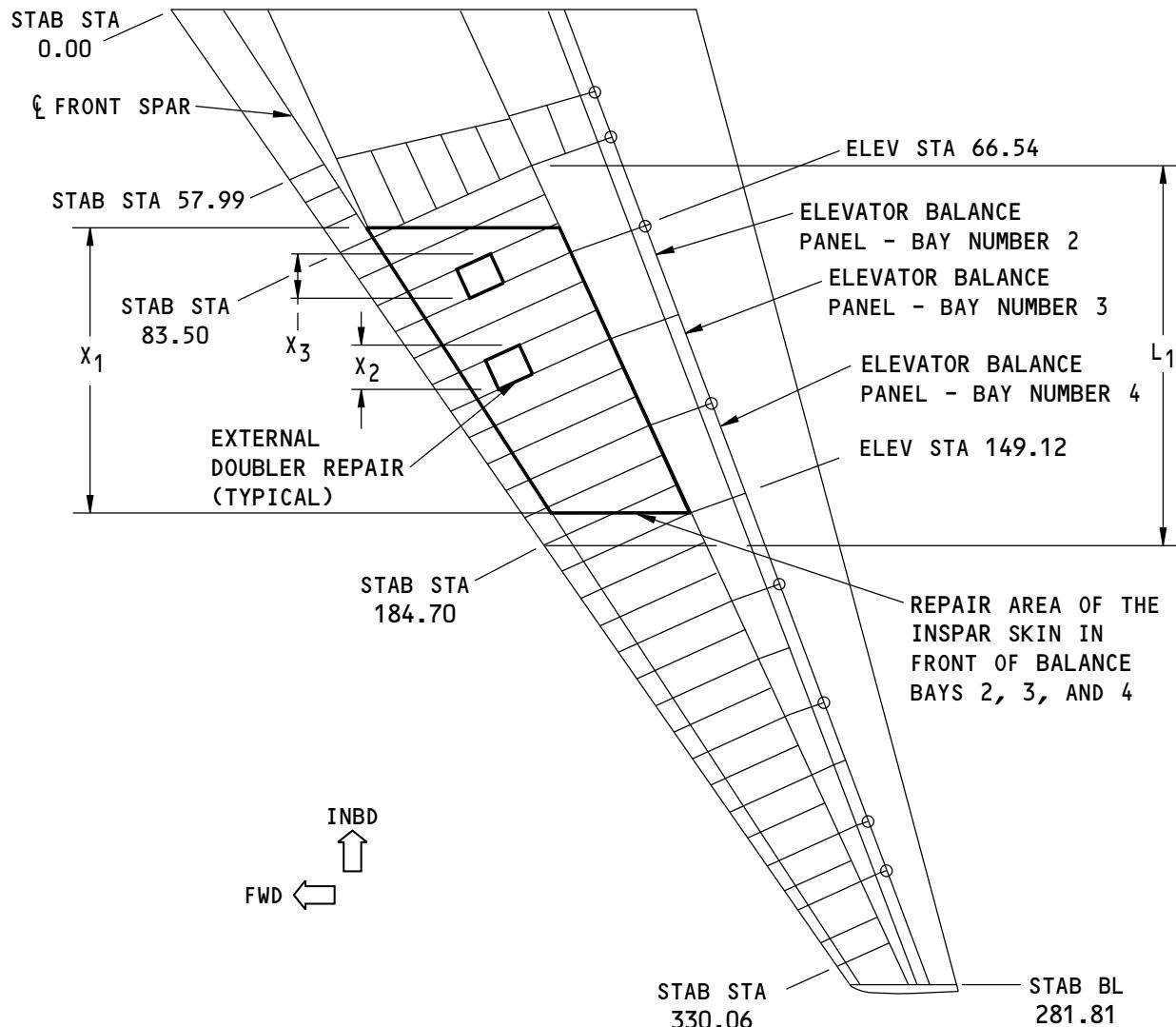
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$X_2 + X_3 = \text{A MAXIMUM OF 66 INCHES (1676 mm)}$

$X_1 = \text{OUTBOARD WIDTH OF THE AIRSTREAM IN FRONT OF BALANCE BAYS 2, 3, AND 4}$

$L_1 = \text{OUTBOARD WIDTH OF THE INSPAR SKIN REPAIR AREA}$

LEFT SIDE IS SHOWN,
RIGHT SIDE IS OPPOSITE

1961508 S0000376031_V1

Horizontal Stabilizer Inspark Skin - Aerodynamic Limits
Figure 202

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2. General

- A. REPAIR 11 is a Category B repair. This Category B repair has FAA approval if you do the supplemental inspections given in Paragraph 5./REPAIR 11. The use of these inspection requirements in the airplane's maintenance program satisfies the damage tolerance assessment of the repair. Refer to STRUCTURAL REPAIR DEFINITIONS, 51-00-06 for repair categories and definitions.
- B. The manager of the FAA Seattle ACO approves the incorporation of the inspection methods, compliance times and repeat intervals given in Paragraph 5./REPAIR 11, Inspection Requirements, as an Alternative Method of Compliance (AMOC) to the inspections in the area of PSE 55-10-10-1 covered by this repair only, required by paragraphs (g) and (h) of AD 2013-19-23. All provisions of AD 2013-19-23 that are not specifically referenced in the above statement remain fully applicable and must be complied with accordingly. If operators choose this AMOC, then they must revise their FAA approved maintenance or inspection program to incorporate these alternative inspections.
- C. Make sure that the aerodynamic smoothness is satisfactory and not more than the limits given in AERODYNAMIC SMOOTHNESS, 51-10-01. If the aerodynamic smoothness is not satisfactory, the performance of the aircraft will decrease.
- D. Make sure that all blind fasteners are correctly seated on the internal side of the skin. Make sure that there is sufficient edge margin from the edge of all chem-milled pockets.
- E. You can get access to the inside of the stabilizer through the openings in the front spar.
 - (1) It is optional to make an access door in the inspar skin to get access.
 - (a) Refer to REPAIR 7 or REPAIR 8 for instructions on how to make an access door.
 - (2) It is optional to make an access door in the inspar skin.
 - (3) Use these openings to make sure that the repair fasteners are installed correctly.
- F. Refer to REPAIR 4 for a flush repair to the horizontal stabilizer inspar skin.
- G. A long bucking bar can help you do this repair. The tooling drawing ST1000-A-8252 is an example of a long bucking bar.
- H. Maintain a 2D edge margin on all repair parts and initial parts. Maintain a minimum of 1.5D edge margin for fastener locations common to the rib lower chords.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-01	SHEET METAL MATERIALS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-08	COUNTERSINKING
51-70-01	REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS
AMM 27-31-00	ELEVATOR AND TAB CONTROL SYSTEM
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-26	Aluminum Part Subsurface Inspection - Multilayer

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4. Repair Instructions

A. Get access to the damaged area.

B. Do one of the steps that follow:

- (1) For skin cracks, drill a stop hole at the ends of all skin cracks that do not end at a fastener hole. Refer to Figure 204/REPAIR 11 and INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the procedure to drill a stop hole.

NOTE: If the skin crack is across a rib, then you must remove the damage. Do not stop drill the crack.

CAUTION: DO NOT CUT INTO THE STRUCTURE BEHIND THE DAMAGED SKIN. USE CAUTION TO PREVENT NICKS, GOUGES OR OTHER DAMAGE TO THE STRUCTURE. IF YOU DO NOT OBEY, MORE REPAIR WORK WILL BE NECESSARY.

CAUTION: THE RIB FLANGE IS THIN. WHEN YOU REMOVE THE INITIAL FASTENERS, USE CARE SO YOU DO NOT CAUSE DAMAGE TO THE RIB FLANGE. IF YOU CAUSE DAMAGE TO THE RIB FLANGE, IT MAY BE NECESSARY TO REPLACE THE DAMAGED RIB.

CAUTION: MAKE SURE THAT YOU DO NOT REMOVE OR CAUSE A BLOCKAGE OF THE DRAIN HOLES DURING THE REMOVAL OF THE DAMAGED AREA. KEEP THE DRAIN HOLE LOCATIONS IN THEIR INITIAL POSITION, IF POSSIBLE. KEEP THE CORRECT REPAIR FASTENER SPACING SO YOU CAN INSTALL DRAIN HOLES INTO THE REPAIR PARTS.

- (2) For skin cracks or other damage, remove the damaged area of the skin. Refer to Figure 204/REPAIR 11 and INSPECTION AND REMOVAL OF DAMAGE, 51-10-02.
- Make the trim in the shape of a rectangle with the longest sides parallel to the inspar ribs.
 - Make the corner radii of the trim a minimum of 0.50 in. (12.7 mm).
- C. Put the skin around the damaged area back to the initial contour. Refer to REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
- D. Make the repair parts. Refer to Table 201/REPAIR 11 and Figure 204/REPAIR 11.
- Make the contour of the part [1] doubler the same as the initial contour of the skin.
 - Make the aerodynamic chamfer on the part [1] doubler. Refer to Figure 204/REPAIR 11.
 - If the part [1] doubler causes a blockage of a drain hole, or if you removed a drain hole, make a drain hole in the doubler. Refer to Figure 205/REPAIR 11
 - Make the countersink repair washers as given in COUNTERSINKING, 51-40-08.

Table 201:

REPAIR MATERIALS			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202/REPAIR 11 or Table 203/REPAIR 11 for the necessary thickness of the material. The use of clad sheet is recommended.
[2]	Filler	1 (as necessary)	Use clad or bare 2024-T3. The use of clad sheet is recommended.

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Table 202:

REPAIR WITH SOLID FASTENERS - REPAIR PART THICKNESSES AND SOLID REPAIR FASTENER FOR INITIAL SKIN THICKNESSES			
INITIAL SKIN THICKNESS	PART [1] DOUBLER THICKNESS	PART [2] FILLER THICKNESS (AS NECESSARY)	SOLID REPAIR FASTENERS ^{*[1]}
0.050 in. (1.27 mm)	0.063 in. (1.60 mm)	0.050 in. (1.27 mm)	BACR15CE6D
0.060 in. (1.52 mm)	0.080 in. (2.03 mm)	0.063 in. (1.60 mm)	BACR15CE6D
0.071 in. (1.80 mm)	0.090 in. (2.29 mm)	0.071 in. (1.80 mm)	BACR15CE6D
0.090 in. (2.29 mm)	0.100 in. (2.54 mm)	0.090 in. (2.29 mm)	BACR15CE6D
0.112 in. (2.84 mm)	0.100 in. (2.54 mm)	0.112 in. (2.84 mm)	BACR15CE6D

*[1] At rib and spar locations, hex-drive bolts are used at some locations. Replace the fastener with the same type and diameter as original. It is acceptable to oversize 1/32 inch if necessary.

Table 203:

REPAIR WITH BLIND FASTENERS - REPAIR PART THICKNESSES AND BLIND REPAIR FASTENERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS	PART [1] DOUBLER THICKNESS	BLIND REPAIR FASTENERS
0.050 in. (1.27 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)
0.060 in. (1.52 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)
0.071 in. (1.80 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)
0.090 in. (2.29 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)
0.112 in. (2.84 mm)	0.100 in. (2.54 mm)	BACB30VX6P (optional: MS90353-06 or MS21140-06P)

- E. Assemble the repair parts. Refer to Figure 204/REPAIR 11.
- F. Make the fastener holes. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
- G. Countersink the fastener holes in the part [1] doubler. Refer to COUNTERSINKING, 51-40-08.
- H. Disassemble the parts.
- I. Remove all nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- J. Apply a chemical conversion coating to the part [1] doubler and the bare surfaces of the initial skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- K. Apply one layer of BMS 10-79, Type III primer to the area of the repair. Refer to SOPM 20-44-04.
 - (1) Apply the primer to the part [1] doubler.
 - (2) Apply the primer to the bare surfaces of the initial skin.
- L. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - (1) Install the repair parts with 0.010 in. (0.25 mm) pull down or less. If the gap is more than 0.010 in. (0.25 mm), install a shim as necessary. Refer to SHEET METAL MATERIALS, 51-30-01. Shims are permitted to be a maximum of 0.020 in. (0.51 mm) thick.
- M. Install the fasteners. Refer to Table 202/REPAIR 11 or Table 203/REPAIR 11.

NOTE: Do not install rivets or blind fasteners with sealant.

- (1) At initial fastener hole locations common to the part [1] doubler, install countersink repair washers as necessary. Refer to COUNTERSINKING, 51-40-08.

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- N. Apply BMS 5-95 sealant around the edges of the part [1] doubler as given in REPAIR SEALING, 51-20-05.
 - O. Apply a finish to the repair area. Refer to AMM SECTION 51-21.
 - P. If you install this repair and you exceed the aerodynamic applicability requirements as given in Paragraph 1.H./REPAIR 11, you must do an Elevator Power-Off Flight Test. Refer to AMM SUBJECT 27-31-00.
- NOTE:** You must do the Elevator Power-Off Flight Test before the time limits in AMM SUBJECT 27-31-00.

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NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).
 - D = THE DIAMETER OF THE FASTENER.
- [1] RECOMMEND THAT THE FASTENER SPACING BE EQUAL TO THE FASTENER SPACING ON THE RIB NEAREST THE REPAIR. HOWEVER, YOU MUST MAINTAIN 4D - 6D SPACING.
- [2] YOU MUST KEEP A MINIMUM OF 3 FASTENER ROWS FORWARD AND AFT OF THE DAMAGED AREA, UNLESS SHOWN DIFFERENTLY.
- YOU MUST KEEP A MINIMUM OF 4 FASTENER ROWS INBOARD AND OUTBOARD OF THE DAMAGED AREA, UNLESS SHOWN DIFFERENTLY. IT IS ACCEPTABLE TO INCLUDE INITIAL RIB FASTENER ROWS (IF APPLICABLE) IN THE REQUIRED 4 ROWS. ADJUST THE SPANWISE POSITION OF THE EXTERNAL PART [1] DOUBLER SUCH THAT THERE ARE 4 FASTENER ROWS BEYOND THE DAMAGE TRIM LINE OR STOP HOLE.
- [3] IF YOU INSTALL THIS REPAIR NEAR A SPAR, YOU MUST KEEP A MINIMUM OF 2 FASTENER ROWS BETWEEN THE DAMAGE AREA AND THE EDGE OF THE INSPAR SKIN.

FASTENER SYMBOLS

- + REFERENCE FASTENER LOCATION.
- INITIAL FASTENER LOCATION. REFER TO TABLE 202 OR TABLE 203 FOR THE SIZE AND TYPE OF FASTENERS TO INSTALL.
- ◆ REPAIR FASTENER LOCATION. REFER TO TABLE 202 OR TABLE 203 FOR THE SIZE AND TYPE OF FASTENERS TO INSTALL.

1901091 S0000348814_V2

Notes and Fastener Symbols
Figure 203

55-10-01

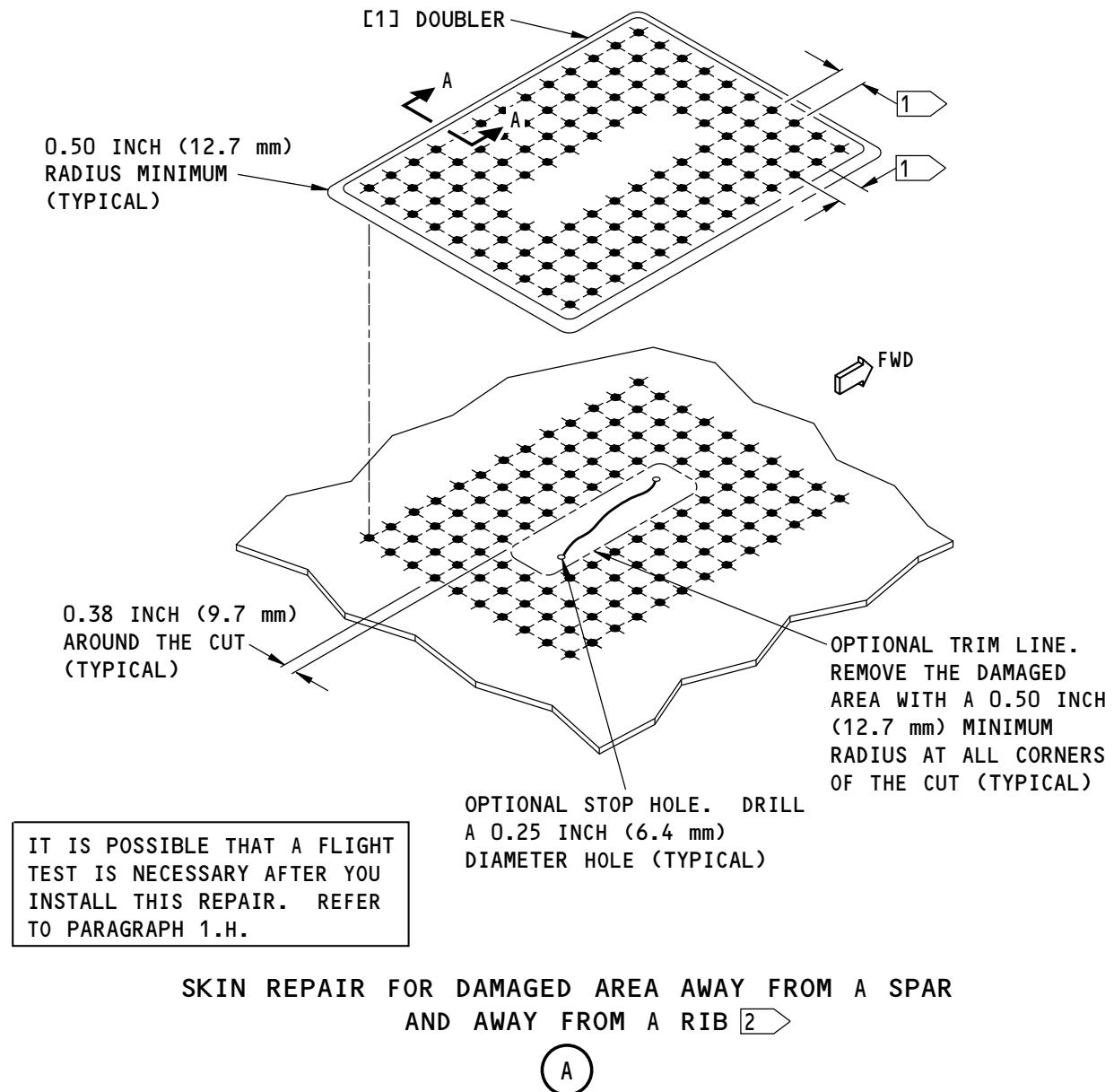
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SKIN REPAIR FOR DAMAGED AREA AWAY FROM A SPAR
AND AWAY FROM A RIB [2]

(A)

1901047 S0000347468_V2

Horizontal Stabilizer Lower Inspar Skin External Repair
Figure 204 (Sheet 1 of 6)

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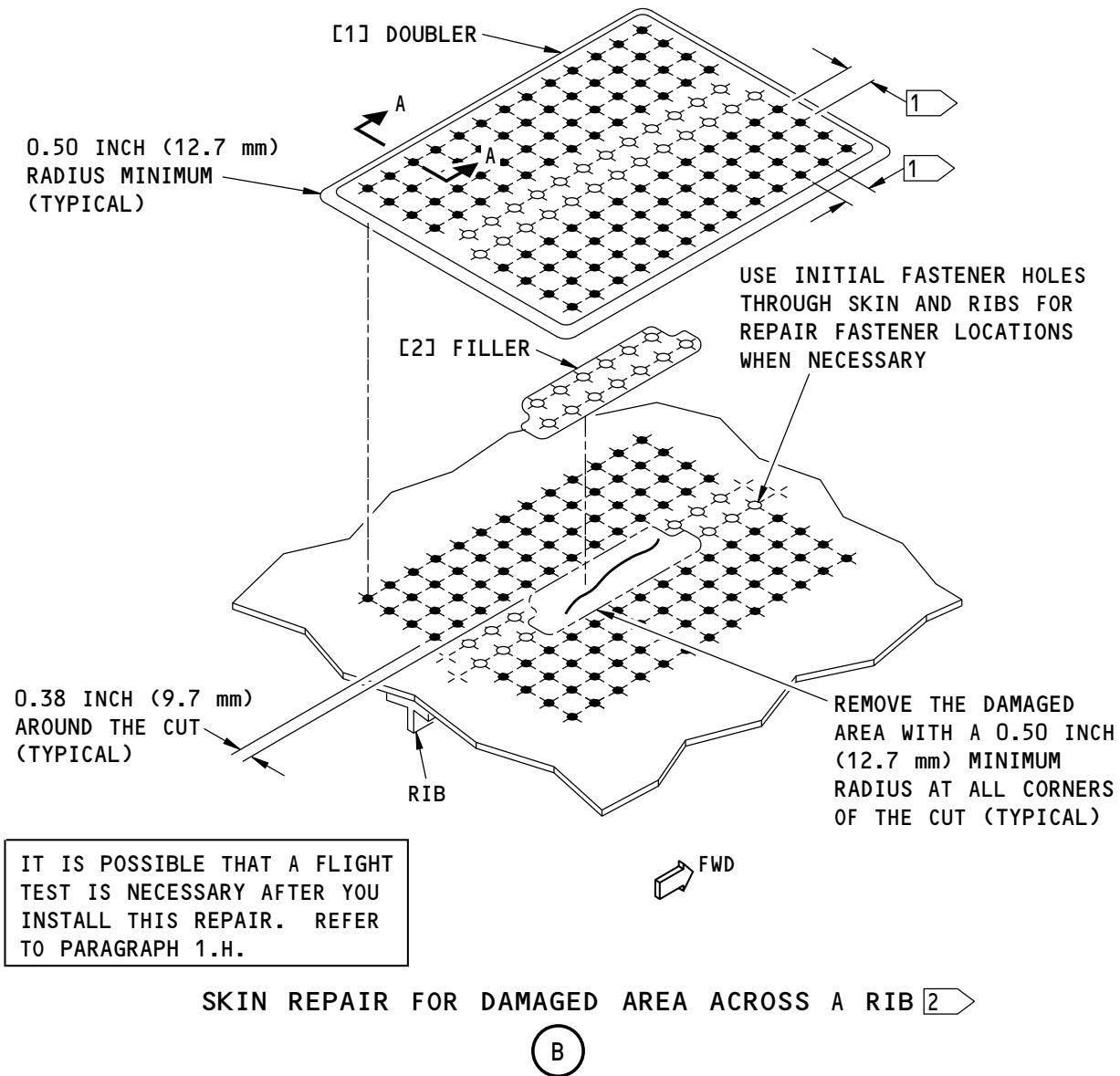
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1916115 S0000354973_V2

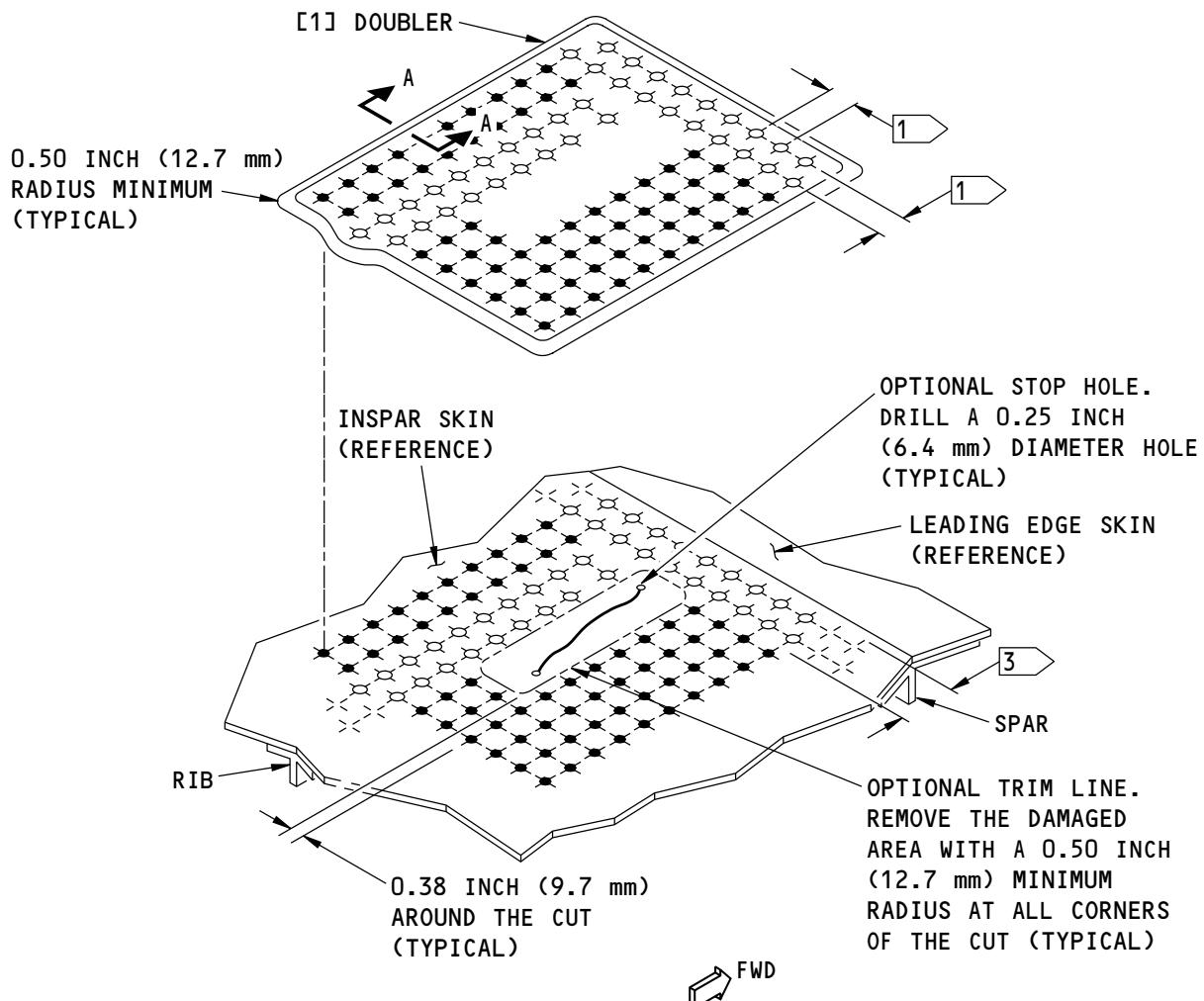
Horizontal Stabilizer Lower Inspar Skin External Repair
Figure 204 (Sheet 2 of 6)

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SKIN REPAIR NEAR FRONT SPAR IS SHOWN,
SKIN REPAIR NEAR REAR SPAR IS SIMILAR

SKIN REPAIR NEAR A RIB

C

1901076 S0000349089_V2

Horizontal Stabilizer Lower Inspark Skin External Repair
Figure 204 (Sheet 3 of 6)

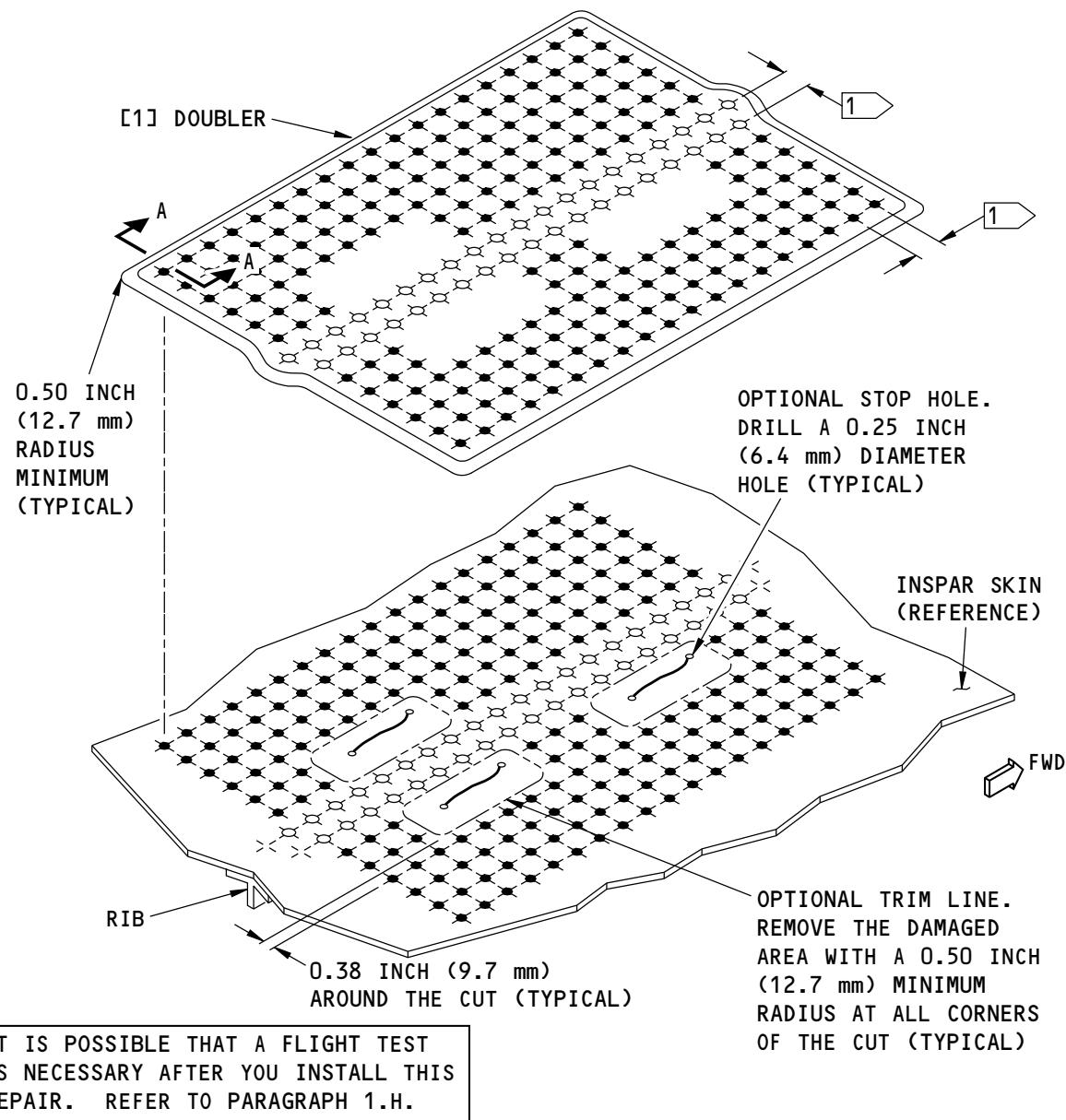
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SKIN REPAIR OF ADJACENT DAMAGE LOCATIONS NEAR A RIB IS SHOWN,
SKIN REPAIR OF ADJACENT DAMAGE LOCATIONS AWAY FROM A RIB
IS SIMILAR [2]

D

1954799 S0000373024_V2

Horizontal Stabilizer Lower Inspark Skin External Repair
Figure 204 (Sheet 4 of 6)

55-10-01

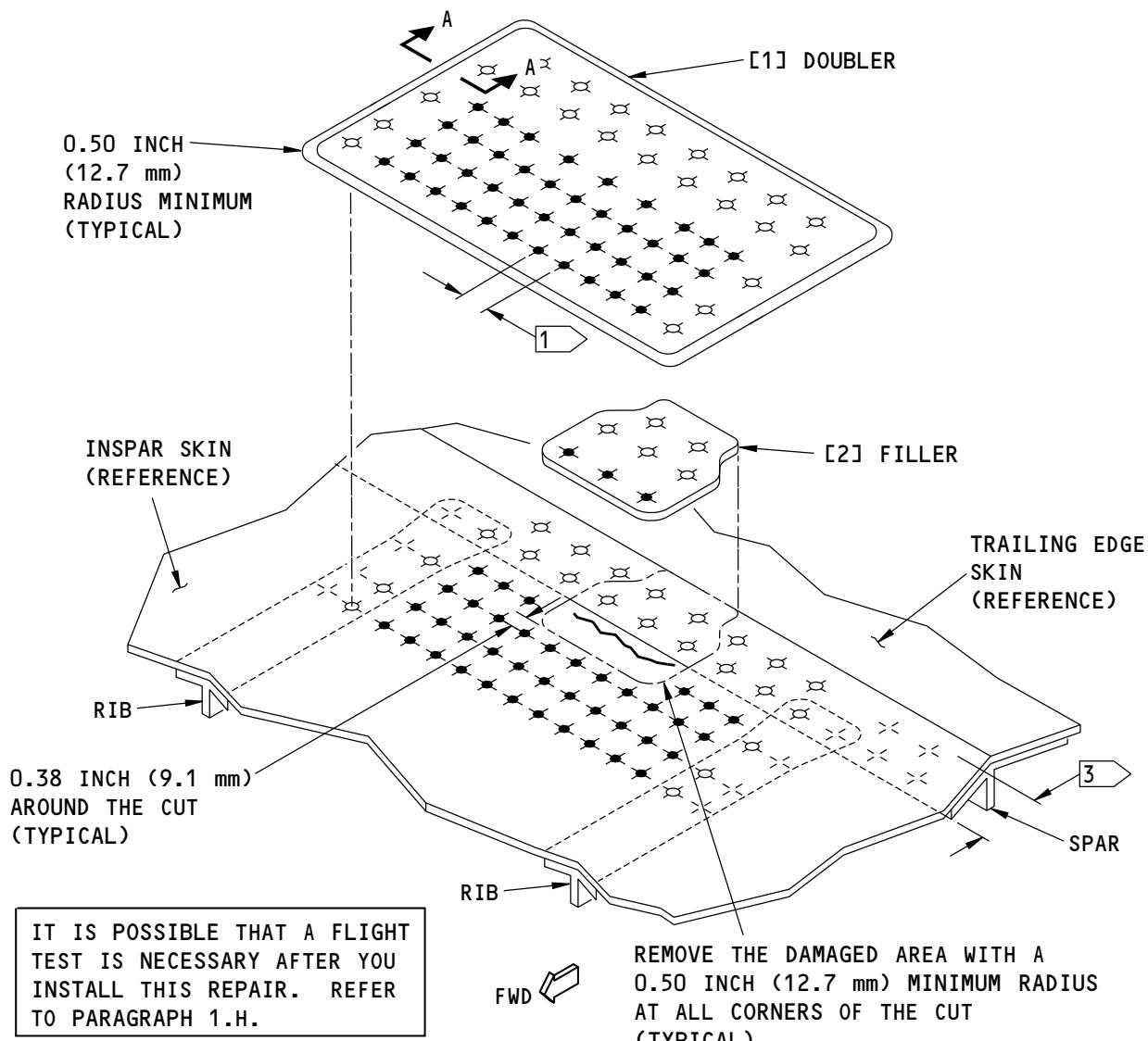
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SKIN REPAIR OF CRACK ADJACENT TO THE REAR SPAR CHORD EDGE IS SHOWN,
SKIN REPAIR OF CRACK ADJACENT TO THE FRONT SPAR CHORD EDGE IS SIMILAR [2]

2043057 S0000413058_V2

Horizontal Stabilizer Lower Inspark Skin External Repair
Figure 204 (Sheet 5 of 6)

55-10-01

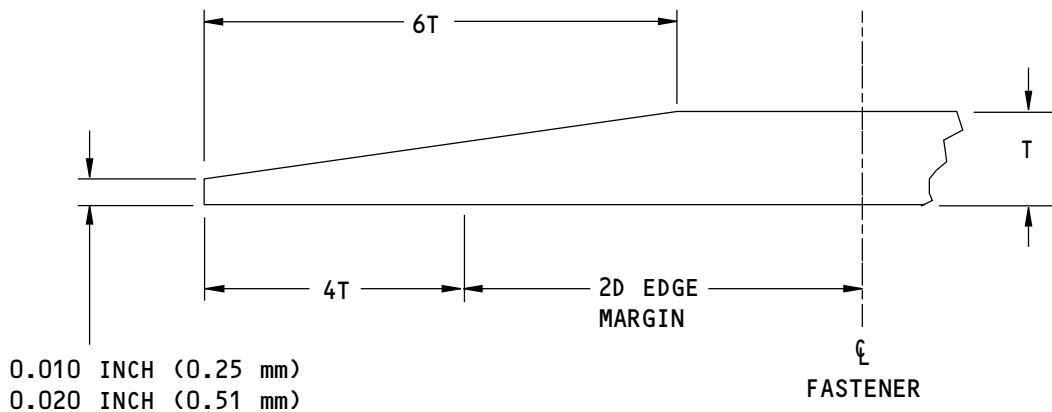
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SECTION OF DOUBLER EDGE
A-A

1954703 S0000373025_V1

Horizontal Stabilizer Lower Inspar Skin External Repair
Figure 204 (Sheet 6 of 6)

55-10-01

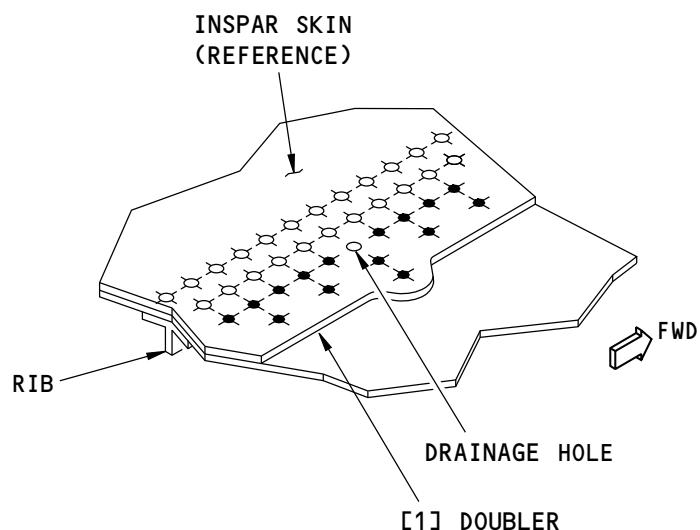
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FASTENER PATTERN FOR DAMAGE NEAR A DRAINAGE HOLE
(TYPICAL)

1954645 S0000373600_V1

Fastener Pattern for Damage Near a Drainage Hole
Figure 205

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5. Inspection Requirements

A. For all repairs, do the inspections as given in Table 204/REPAIR 11 and Figure 206/REPAIR 11.

Table 204:

CATEGORY B REPAIR INSPECTION REQUIREMENTS			
INSPECTION THRESHOLD	REPEAT INSPECTIONS		
	METHOD	INTERVAL	REFERENCE
56,000 total component flight cycles	Detailed Visual Inspection ^{*[1]}	9,000 flight cycles	-
	External Low Frequency Eddy Current (LFEC) Inspection ^{*[2]}	9,000 flight cycles	737 NDT Part 6, 51-00-26, FIGURE 1

*[1] Inspect the external part [1] doubler.

*[2] Inspect the skin under the external part [1] doubler and inspect the spar chord under the external part [1] doubler.

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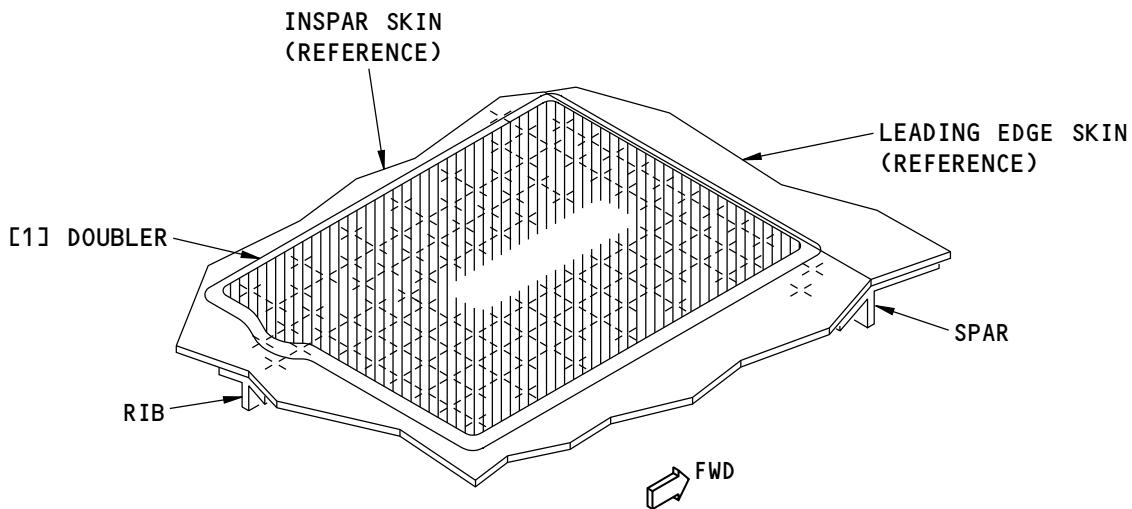
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DETAILED VISUAL INSPECTION AND LOW FREQUENCY EDDY CURRENT (LFEC) INSPECTION

EXTERNAL INSPECTION FOR NEAR A RIB OR SPAR IS SHOWN,
EXTERNAL INSPECTION FOR AWAY FROM A RIB OR SPAR IS SIMILAR
EXTERNAL INSPECTION FOR ACROSS A RIB IS SIMILAR

2018053 S0000349687_V1

Horizontal Stabilizer Lower Inspark Skin External Repair Inspection
Figure 206

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REPAIR 12 - HORIZONTAL STABILIZER LOWER INSPAR SKIN SPLICE REPAIR

1. Applicability

- A. REPAIR 12 is applicable to damaged areas on the lower inspar skin of the horizontal stabilizer. Refer to Figure 201/REPAIR 12.
- B. REPAIR 12 is applicable to airplanes with line numbers 1 through 3623 that have not incorporated SB 737-55-1096.
- C. REPAIR 12 is not applicable to airplanes with line numbers 1 through 3623 that have incorporated SB 737-55-1096.
- D. REPAIR 12 is not applicable to airplanes with line numbers 3624 and on.
- E. REPAIR 12 is applicable to damaged areas on the lower inspar skin between Stabilizer Station 89 and Stabilizer Station 179.
- F. You must contact The Boeing Company before you install this repair if there are existing repairs installed on the lower inspar skin:
 - (1) Inboard of Stabilizer Station 89.
 - (2) Outboard of Stabilizer Station 179.
- G. If you install REPAIR 12, then you are not permitted to install REPAIR 7 or REPAIR 8 on the lower inspar skin of the horizontal stabilizer.
- H. If you install REPAIR 12, then the total area of all repair doublers that are installed on the upper inspar skin must not be more than 300 in² (193,548 mm²). These repair doublers can be installed from REPAIR 3, REPAIR 4, or a repair that is not in the SRM.
- I. If you install REPAIR 12, then the total area of all repair doublers that are installed on the lower inspar skin must not be more than 500 in² (322,580 mm²). These repair doublers can be installed from REPAIR 4, REPAIR 11, or a repair that is not in the SRM.
- J. If you install REPAIR 12, then you are not permitted to install repairs on the lower inspar skin between:
 - (1) Stab Sta 83.5 and Stab Sta 92.7, at the location of the inner splice.
 - (2) Stab Sta 175.5 and Stab Sta 184.7, at the location of the outer splice.

2. General

- A. REPAIR 12 is a Category B repair. This Category B repair has FAA approval if you do the supplemental inspections given in Paragraph 5./REPAIR 12. Incorporation of these inspection requirements into the airplanes maintenance program satisfies the damage tolerance assessment of the repair. Refer to STRUCTURAL REPAIR DEFINITIONS, 51-00-06 for repair categories and definitions.
- B. Make sure that the aerodynamic smoothness is satisfactory and not more than the limits given in AERODYNAMIC SMOOTHNESS, 51-10-01. If the aerodynamic smoothness is not satisfactory, the performance of the aircraft will decrease.
- C. You can get access to the inside of the stabilizer through the openings in the front spar.
 - (1) Use these openings to make sure that the repair fasteners are installed correctly.
- D. You are permitted to install this repair with, or without, the elevator installed.
- E. A long bucking bar can help you do this repair. The tooling drawing ST1000-A-8252 is an example of a long bucking bar.

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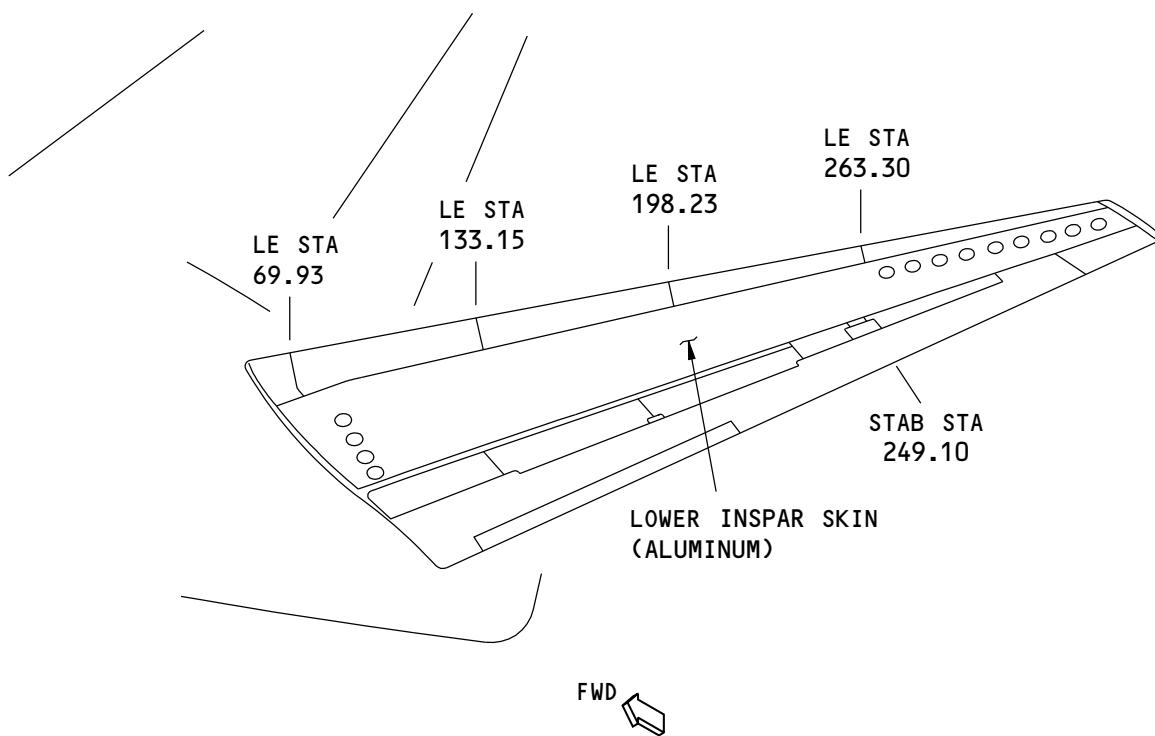
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

LOWER SURFACE IS SHOWN

1932108 S0000362026_V1

Horizontal Stabilizer Lower Inspark Skin Location
Figure 201

55-10-01

REPAIR 12

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-01	SHEET METAL MATERIALS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-08	COUNTERSINKING
AMM 27-31-00	ELEVATOR AND TAB CONTROL SYSTEM
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 53-30-00, Procedure 5	Inspection of External Fuselage Repairs

4. Repair Instructions

- A. Get access to the damaged area.

CAUTION: DO NOT CUT INTO THE STRUCTURE BEHIND THE DAMAGED SKIN. USE CAUTION TO PREVENT NICKS, GOUGES OR OTHER DAMAGE TO THE STRUCTURE. IF YOU DO NOT OBEY, MORE REPAIR WORK WILL BE NECESSARY.

CAUTION: THE RIB FLANGE IS THIN. WHEN YOU REMOVE THE INITIAL FASTENERS, USE CARE SO YOU DO NOT CAUSE DAMAGE TO THE RIB FLANGE. IF YOU CAUSE DAMAGE TO THE RIB FLANGE, IT MAY BE NECESSARY TO REPLACE THE DAMAGED RIB.

- B. Remove the damaged skin.

- (1) At the inboard splice location, cut the skin between Stabilizer Station 83.5 and Stabilizer Station 92.7. Refer to Figure 203/REPAIR 12. On the skin inboard from the cut, keep a minimum radius of 0.50 in. (12.7 mm).
- (2) At the outboard splice location, cut the skin between Stabilizer Station 175.5 and Stabilizer Station 184.7. Refer to Figure 203/REPAIR 12. On the skin outboard from the cut, keep a minimum radius of 0.50 in. (12.7 mm).

NOTE: Keep the damaged skin that you remove. You will use the initial skin to make the drainage holes and the fastener holes in the repair skin.

- C. Do a detailed visual inspection of the spar chords and the ribs in the area of the removed skin. Make sure that there are no cracks and other damage.

- D. Make the repair parts. Refer to Table 201/REPAIR 12 and Figure 203/REPAIR 12.

- (1) Keep a minimum radius of 0.50 in. (12.7 mm) at all corners.
- (2) The part [1] repair skin must be the same size and contour as the damaged skin that you removed.
- (3) Make the contour of each part [2] splice doubler the same as the adjacent ribs.

NOTE: You are permitted to use the contour of either the adjacent inboard rib or the adjacent outboard rib.

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Table 201:

REPAIR MATERIALS			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Skin	1	0.071 in. (1.80 mm) clad 2024-T3.
[2]	Splice Doubler	2	0.080 in. (2.03 mm) clad 2024-T3.
[3]	Spar Doubler	4	0.080 in. (2.03 mm) clad 2024-T3.

- E. Make sure that all cut surfaces have a surface smoothness of 63 microinches Ra or smoother.
- F. Assemble the repair parts and drill the fastener holes. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.

NOTE: Do not install fasteners on the chem mill radius.

- (1) Use the damaged skin that you removed to make the initial fastener holes in the part [1] repair skin.

NOTE: Make sure that the fastener holes that you make in the part [1] repair skin are in the same location as the initial holes in the ribs and spars.

CAUTION: MAKE SURE THAT YOU DO NOT REMOVE OR CAUSE A BLOCKAGE OF THE DRAIN HOLES DURING THE REMOVAL OF THE DAMAGED AREA. KEEP THE DRAIN HOLE LOCATIONS IN THEIR INITIAL POSITION, IF POSSIBLE. KEEP THE CORRECT REPAIR FASTENER SPACING SO YOU CAN INSTALL DRAIN HOLES INTO THE REPAIR PARTS.

- G. Make the drainage holes in the part [1] repair skin. The drainage holes must be in the same location as the drainage holes in the damaged skin that you removed.
 - H. Countersink the fastener holes in the part [1] repair skin. Refer to COUNTERSINKING, 51-40-08.
 - I. Disassemble the parts.
 - J. Remove all nicks, scratches, gouges, burrs, and sharp edges from the repair parts, and the bare surfaces of the skin.
 - K. Apply a chemical conversion coating to the repair parts and the bare surfaces of the initial skin. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
 - L. Apply one layer of BMS 10-79, Type III primer to the repair parts and to the bare surfaces of the skin. Refer to SOPM 20-44-04.
 - M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - (1) Install the repair parts with 0.010 in. (0.25 mm) pull down or less. If the gap is more than 0.010 in. (0.25 mm), install a shim as necessary. Refer to SHEET METAL MATERIALS, 51-30-01. Shims are permitted to be a maximum of 0.020 in. (0.51 mm) thick.
 - N. Install the fasteners. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
- NOTE:** Do not install rivets with sealant.
- (1) At initial fastener hole locations common to the part [3] spar doublers, install countersink repair washers as necessary. Refer to COUNTERSINKING, 51-40-08.
- O. Install a fillet seal around the repair parts with BMS 5-95 sealant. Refer to REPAIR SEALING, 51-20-05.
 - P. Apply a finish to the repair area. Refer to AMM SECTION 51-21.

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Q. Do an Elevator Power-Off Flight Test. Refer to AMM SUBJECT 27-31-00.

NOTE: You must do the Elevator Power-Off Flight Test before the time limits in AMM SUBJECT 27-31-00.

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NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).
- D = THE DIAMETER OF THE FASTENER.

FASTENER SYMBOLS

- |- REFERENCE FASTENER LOCATION.
- INITIAL FASTENER LOCATION. INSTALL THE SAME TYPE AND SIZE OF FASTENER AS THE FASTENER THAT YOU REMOVED (UP TO 1/32 INCH DIAMETER OVERSIZE).
- + REPAIR FASTENER LOCATION. INSTALL A BACR15CE6D SOLID RIVET OR A BACR15GF6D SOLID RIVET.

1931334 S0000362122_V1

**Notes and Fastener Symbols
Figure 202**

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REPAIR 12

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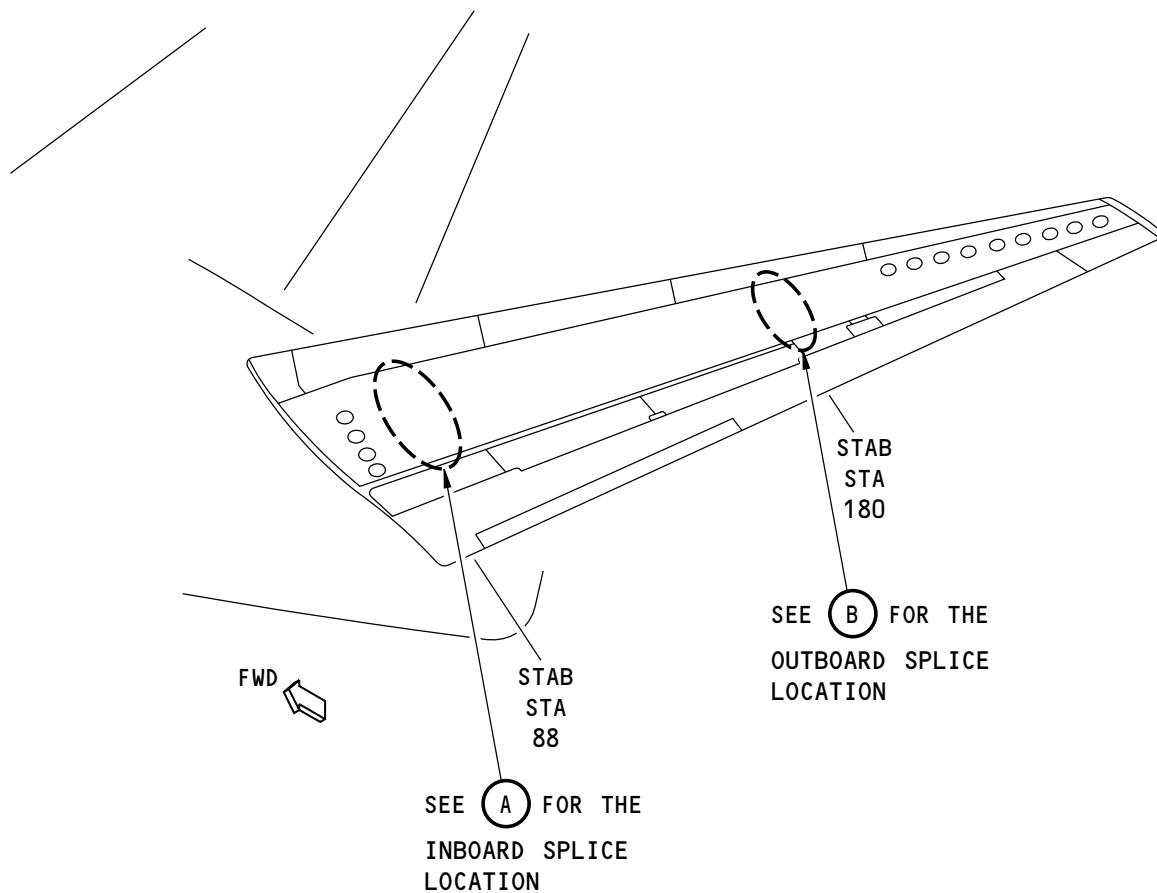
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LOWER SURFACE IS SHOWN

1932113 S0000363784_V2

Lower Inspar Skin Splice Repair
Figure 203 (Sheet 1 of 6)

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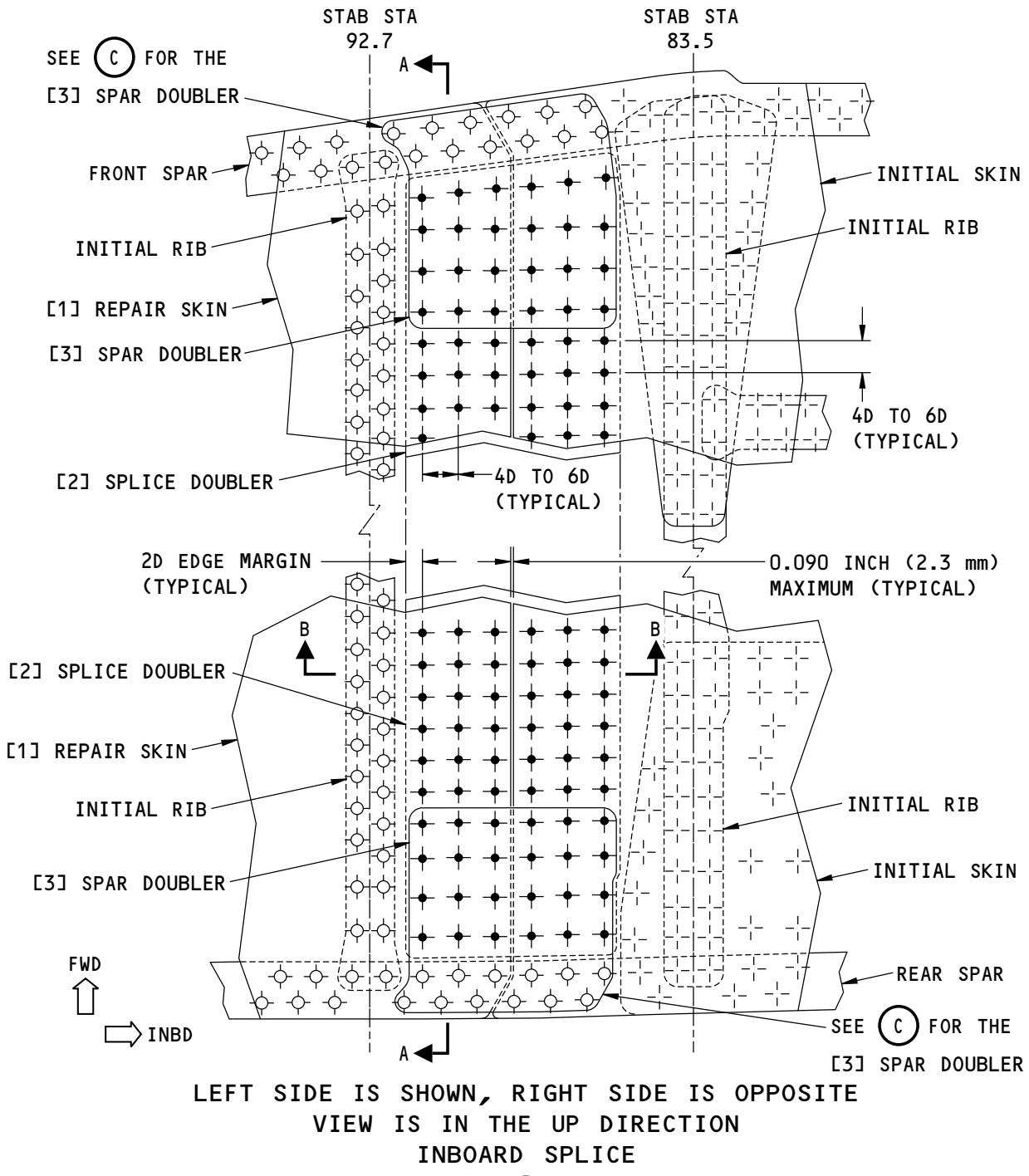
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A

1932140 S0000363793_V2

Lower Inspar Skin Splice Repair
Figure 203 (Sheet 2 of 6)

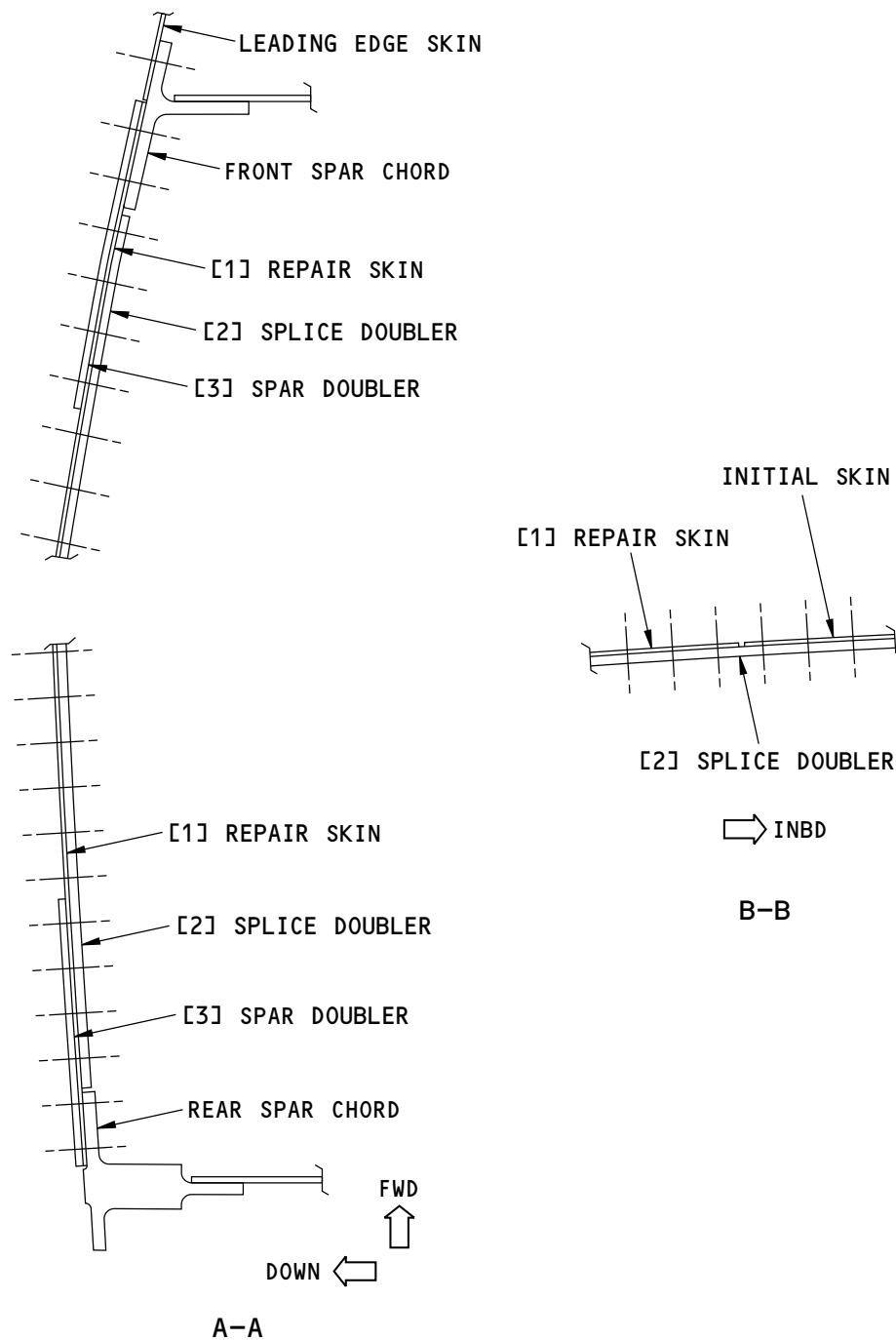
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1932286 S0000364763_V1

Lower Inspars Skin Splice Repair
Figure 203 (Sheet 3 of 6)

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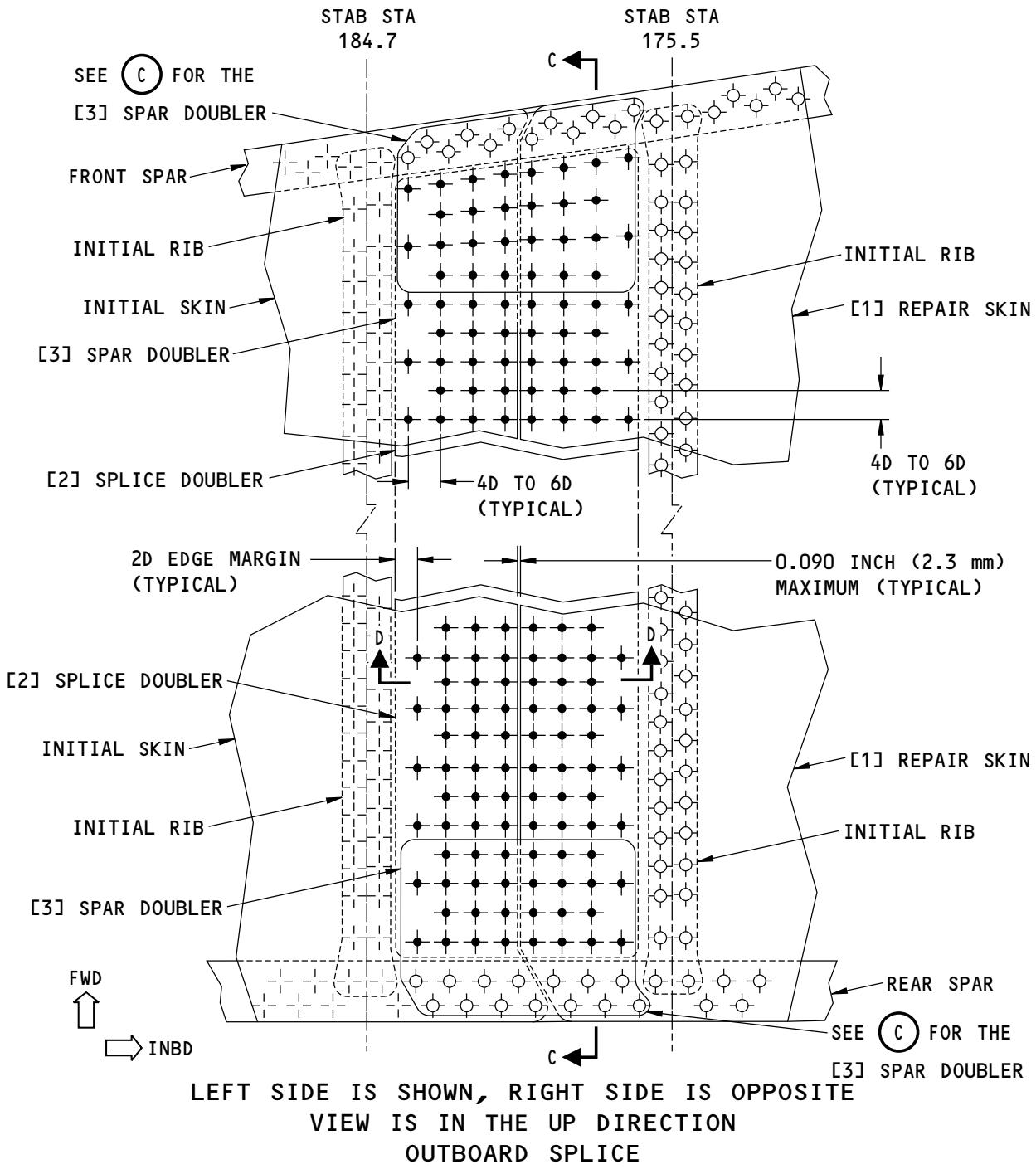
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1932622 S0000364139_V2

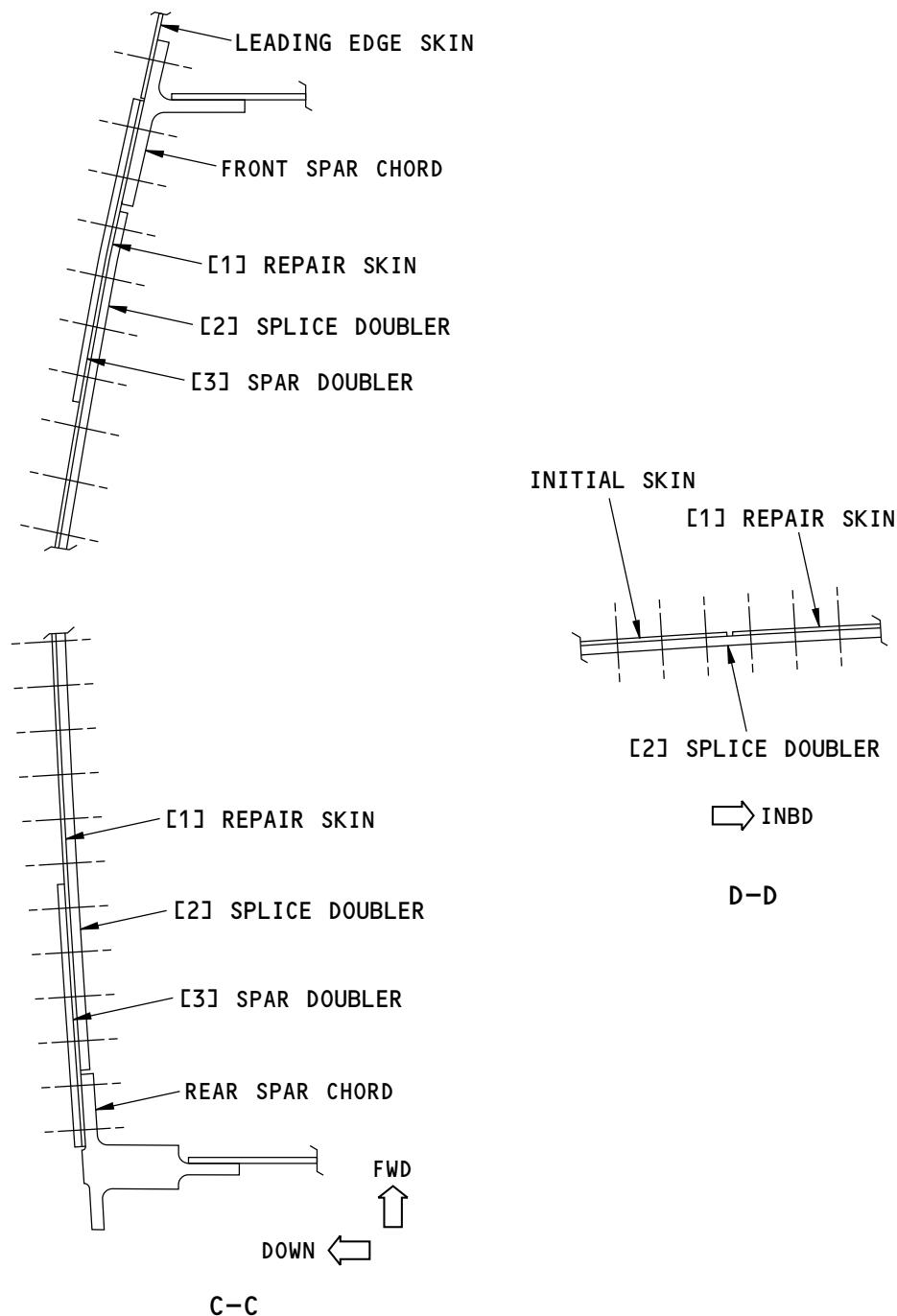
**Lower Inspar Skin Splice Repair
Figure 203 (Sheet 4 of 6)**

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1933214 S0000364771_V1

Lower Inspark Skin Splice Repair
Figure 203 (Sheet 5 of 6)

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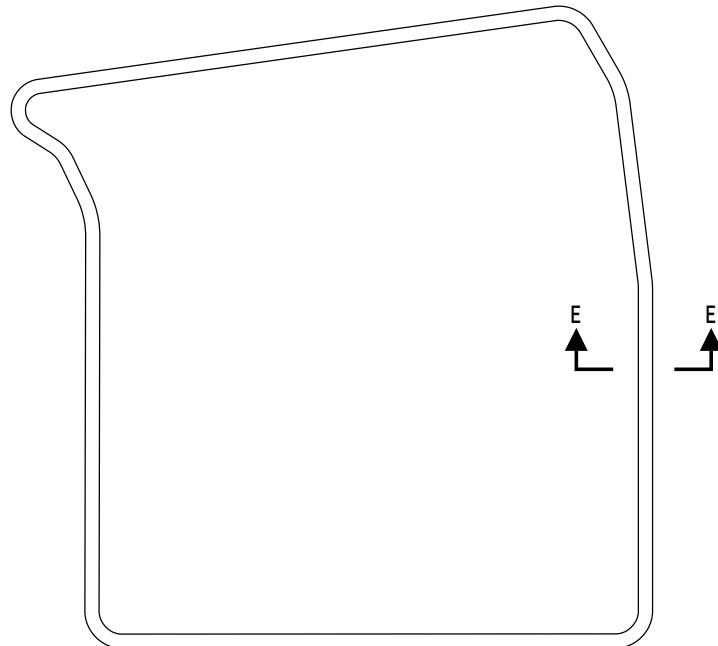
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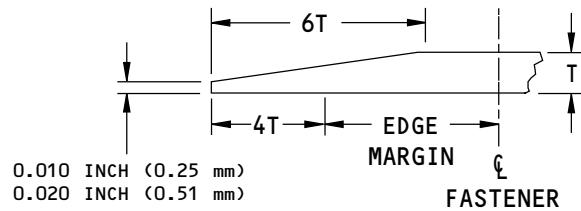


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[3] SPAR DOUBLER
(TYPICAL)

(C)



SECTION OF [3] SPAR DOUBLER
(TYPICAL)
E-E

1934462 S0000366373_V2

Lower Inspar Skin Splice Repair
Figure 203 (Sheet 6 of 6)

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5. Inspection Requirements

- A. Refer to Table 202/REPAIR 12 for the inspection requirements. Refer to Figure 204/REPAIR 12 for the inspection locations.

Table 202:

INSPECTION THRESHOLD	REPEAT INSPECTION REQUIREMENTS			
	LOCATION	METHOD	INTERVAL	REFERENCE
56,000 flight cycles after repair installation	Skin *[1]	Detailed Visual Inspection	9,000 flight cycles	-
	Part [2] Splice Doubler	External Low Frequency Eddy Current (LFEC) *[2]	9,000 flight cycles	Figure 204/REPAIR 12, Sheet 1
	Part [3] Spar Doubler	Detailed Visual Inspection	9,000 flight cycles	Figure 204/REPAIR 12, Sheet 2
	Skin under the Part [3] Spar Doubler *[1]	External Low Frequency Eddy Current (LFEC) *[2]	9,000 flight cycles	Figure 204/REPAIR 12, Sheet 2
	Spar Chord under the Part [3] Spar Doubler	External Low Frequency Eddy Current (LFEC) *[2]	9,000 flight cycles	Figure 204/REPAIR 12, Sheet 1

*[1] You must inspect the part [1] repair skin and the initial skin.

*[2] Refer to 737 NDT Part 6, 53-30-00, Procedure 5.

55-10-01

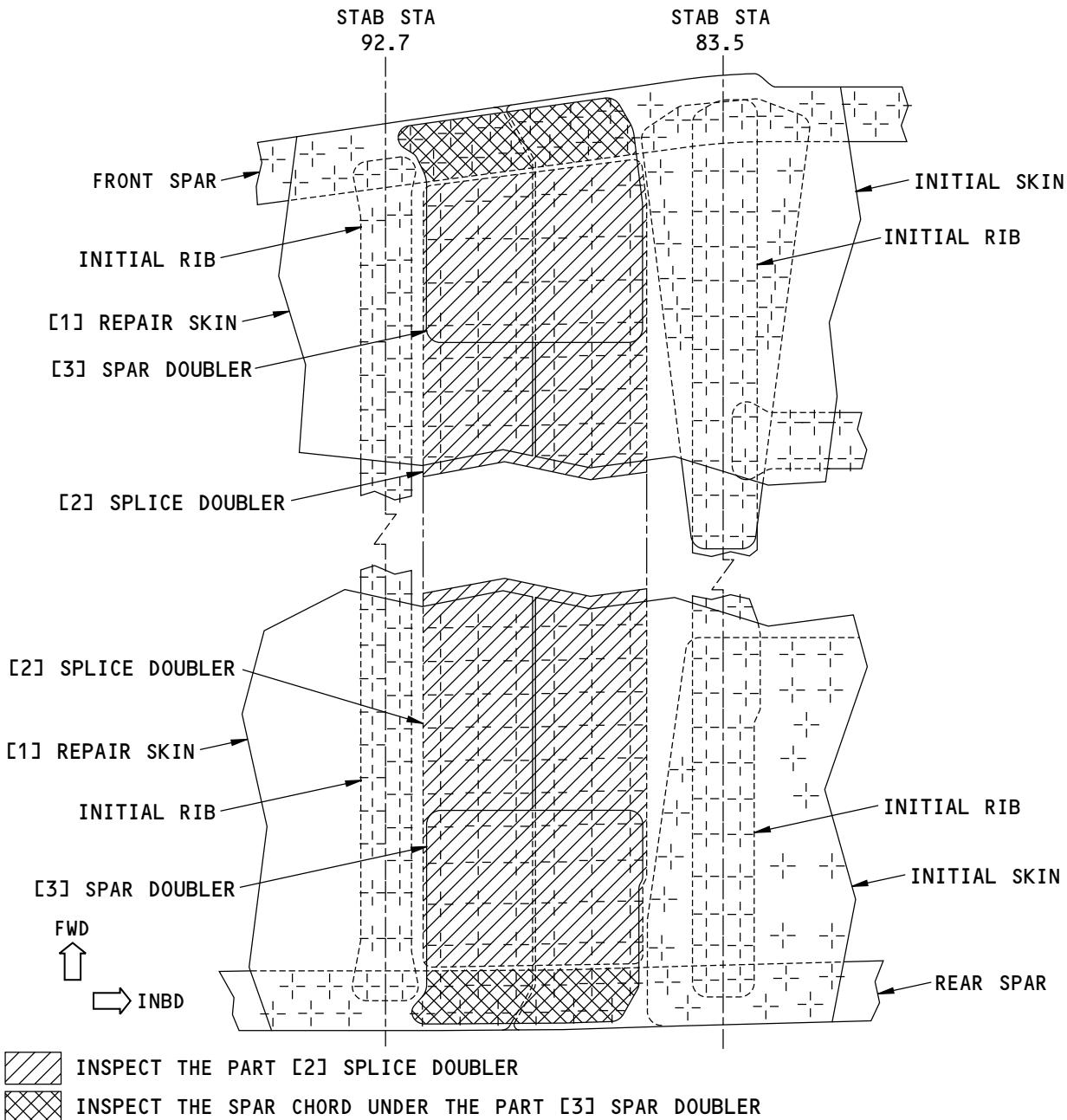
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
VIEW IS IN THE UP DIRECTION
INBOARD SPLICE IS SHOWN, OUTBOARD SPLICE IS SIMILAR

1935783 S0000367116_V2

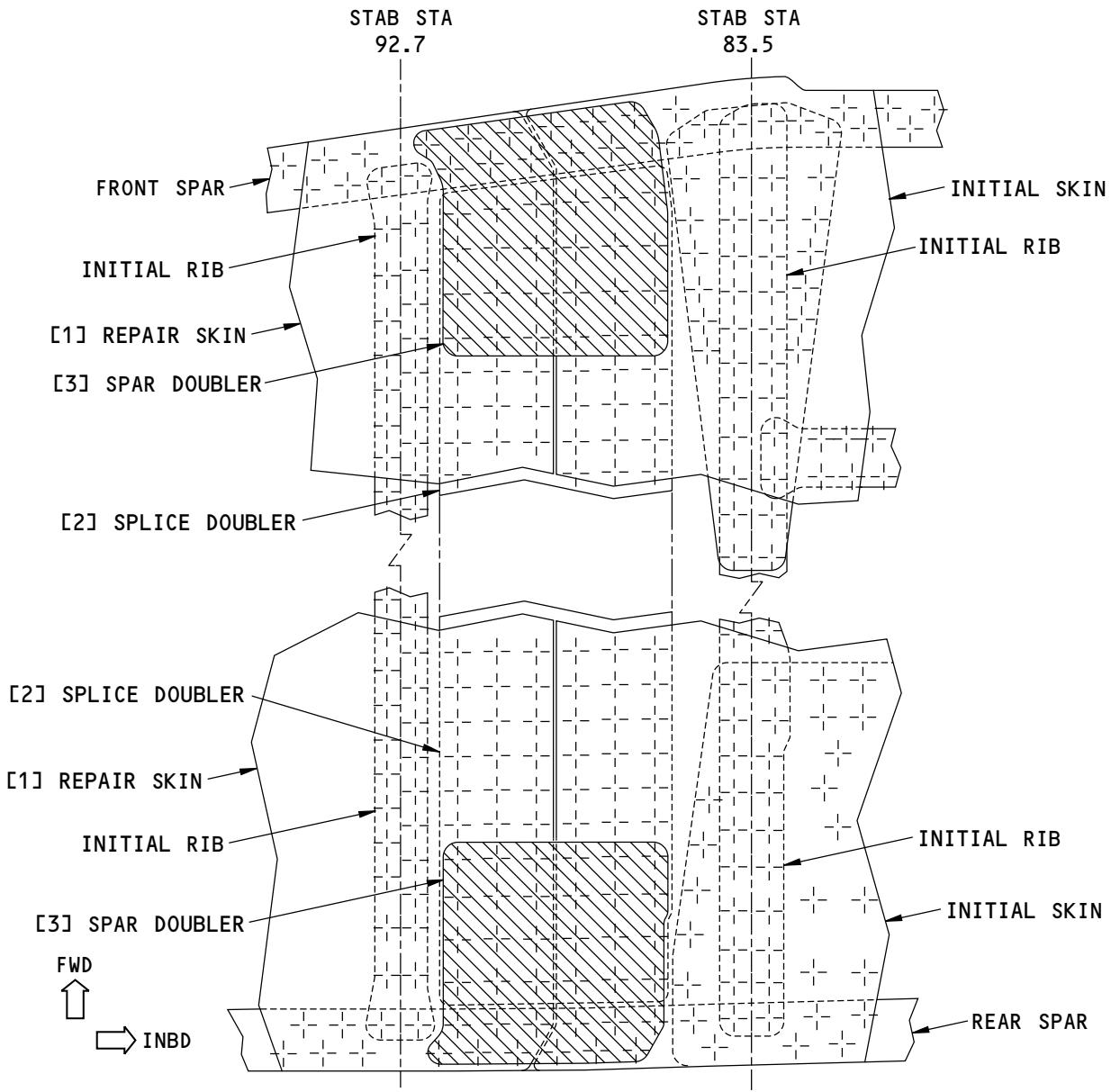
Inspection Area
Figure 204 (Sheet 1 of 2)

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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
VIEW IS IN THE UP DIRECTION
INBOARD SPLICE IS SHOWN, OUTBOARD SPLICE IS SIMILAR

1935729 S0000367118_V2

Inspection Area
Figure 204 (Sheet 2 of 2)

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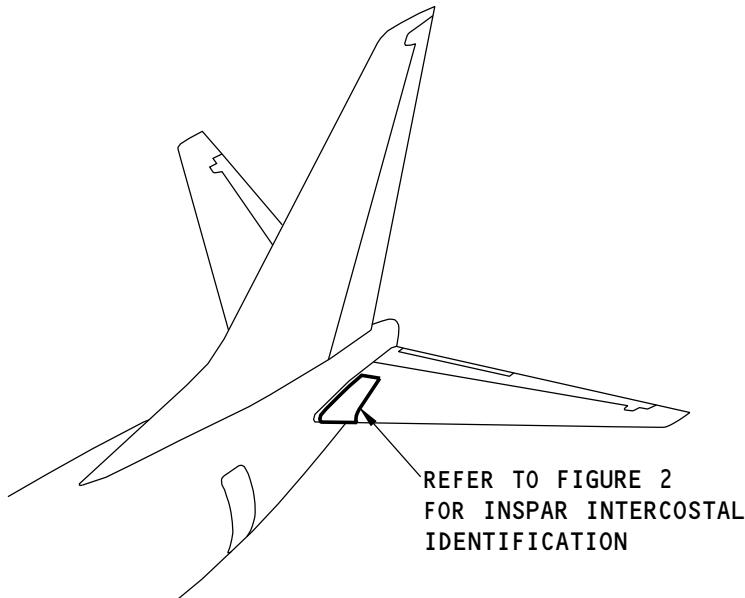
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IDENTIFICATION 1 - HORIZONTAL STABILIZER INSPAR INTERCOSTALS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G50031 S0006592561_V1

Horizontal Stabilizer Inspar Intercostal Location

Figure 1

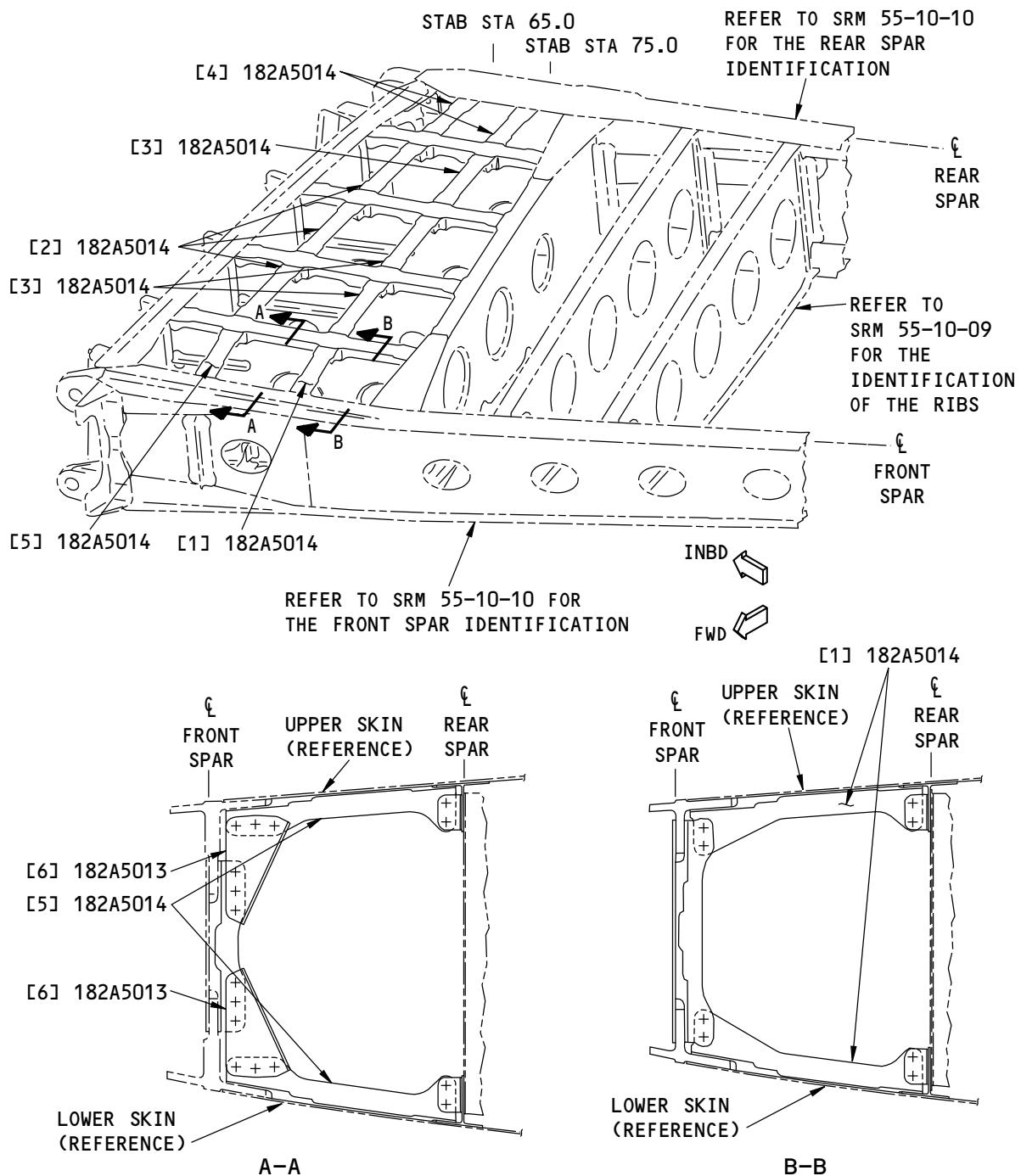
Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A8001	Section 82 Left Horizontal Stabilizer - Product Collector
001A8002	Section 82 Right Horizontal Stabilizer - Product Collector
182A0001	Torque Box Functional Collector - Left Horizontal Stabilizer
182A0002	Torque Box Functional Collector - Right Horizontal Stabilizer
182A5000	Intercostal Installation - Inboard Rib, Horizontal Stabilizer

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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

G50435 S0006592563_V1

**Horizontal Stabilizer Inspar Intercostal Identification
Figure 2**

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Intercostal (2)		BAC1506-4354 7075-T73511 extrusion as given in QQ-A-200/11	
[2]	Intercostal (3)		BAC1506-4381 7075-T73511 extrusion as given in QQ-A-200/11	
[3]	Intercostal (3)		BAC1506-4384 7075-T73511 extrusion as given in QQ-A-200/11	
[4]	Intercostal (2)		BAC1506-4352 7075-T73511 extrusion as given in QQ-A-200/11	
[5]	Intercostal (2)		BAC1506-4353 7075-T73511 extrusion as given in QQ-A-200/11	
[6]	Gusset (2)	0.063 (1.60)	2024-T42 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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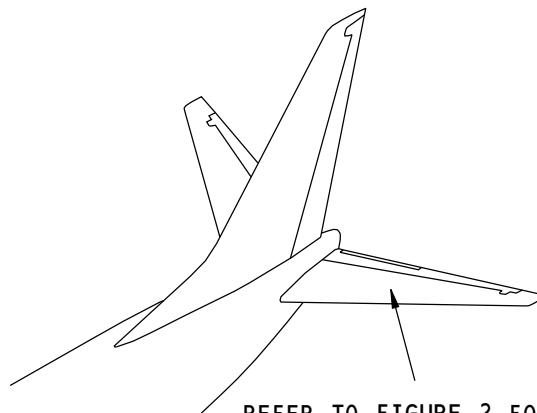
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IDENTIFICATION 1 - HORIZONTAL STABILIZER LEADING EDGE RIBS



REFER TO FIGURE 2 FOR THE
HORIZONTAL STABILIZER
LEADING EDGE RIB LOCATION

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Horizontal Stabilizer Leading Edge Rib
Figure 1
Table 1:

G06644 S0006592577_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
186A0001	Leading Edge and Miscellaneous Functional Collector - Left Horizontal Stabilizer
186A0002	Leading Edge and Miscellaneous Functional Collector - Right Horizontal Stabilizer
186A1001	Leading Edge Assembly/Installation-Removable, Horizontal Stabilizer
186A1301	Rib Assembly - Leading Edge Station 78.29
186A1302	Rib Assembly - Leading Edge Station 86.66
186A1303	Rib Assembly - Leading Edge Station 95.96
186A1304	Rib Assembly - Leading Edge Station 105.26

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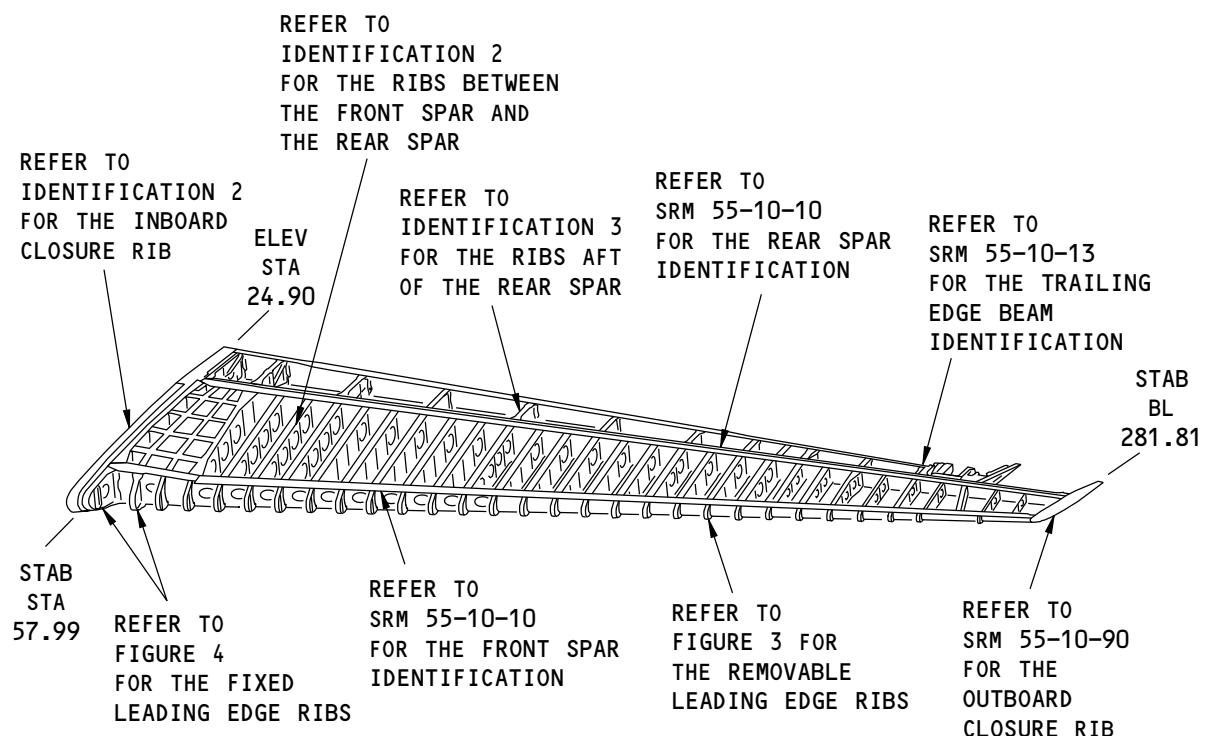
Table 1: (Continued)

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
186A1305	Rib Assembly - Leading Edge Station 114.55
186A1306	Rib Assembly - Leading Edge Station 123.85
186A1307	Rib Assembly - Leading Edge Station 133.15
186A1308	Rib Assembly - Leading Edge Station 142.45
186A2001	Leading Edge Installation, Fixed - Horizontal Stabilizer
186A2002	Rib Assembly - Leading Edge Station 56.01-61.81
186A2003	Rib Assembly - Leading Edge Station 69.93

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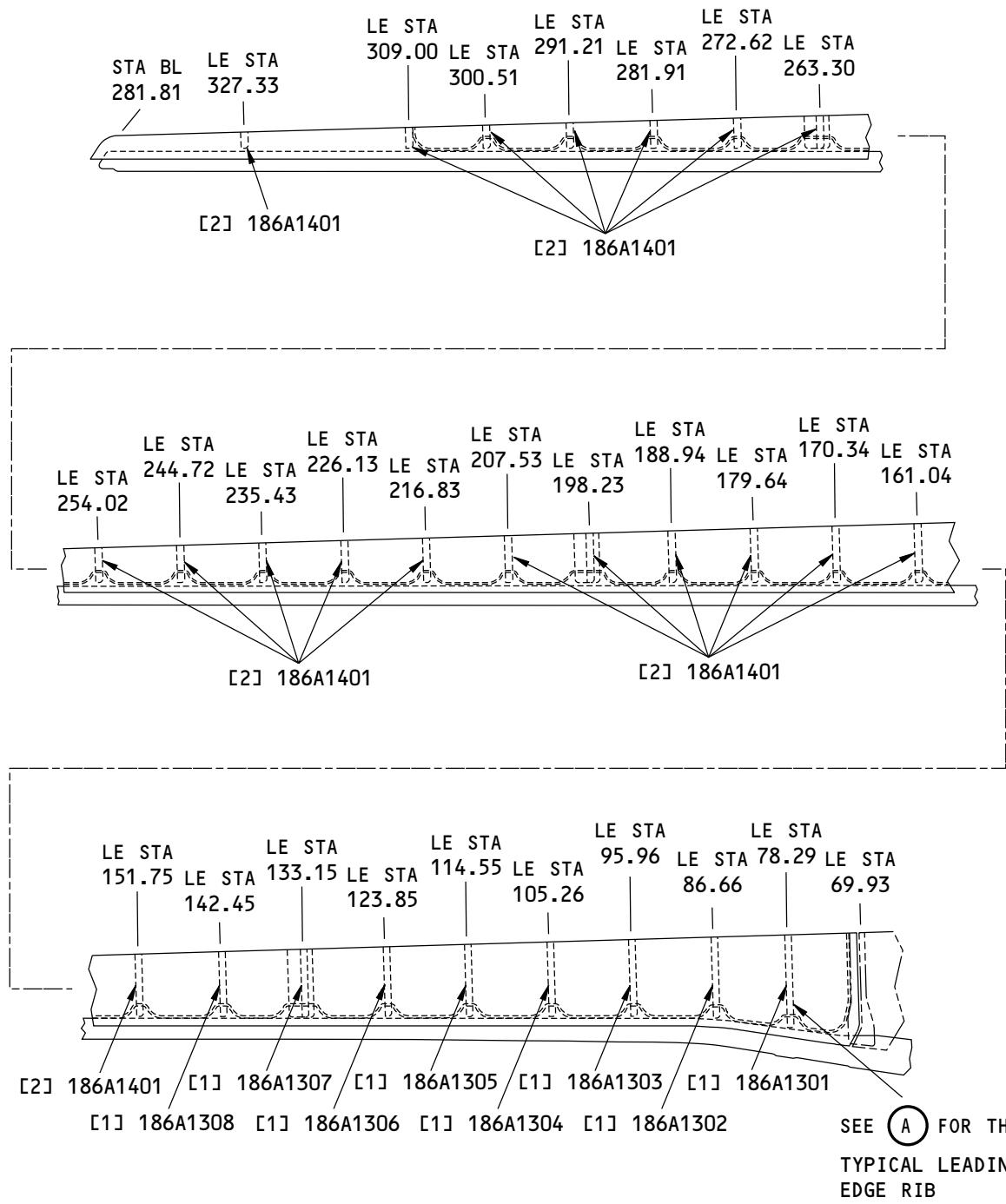
G06647 S0006592579_V1

Horizontal Stabilizer Leading Edge Rib Location
Figure 2

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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

G06580 S0006592580_V1

Removable Horizontal Stabilizer Leading Edge Rib Identification
Figure 3 (Sheet 1 of 2)

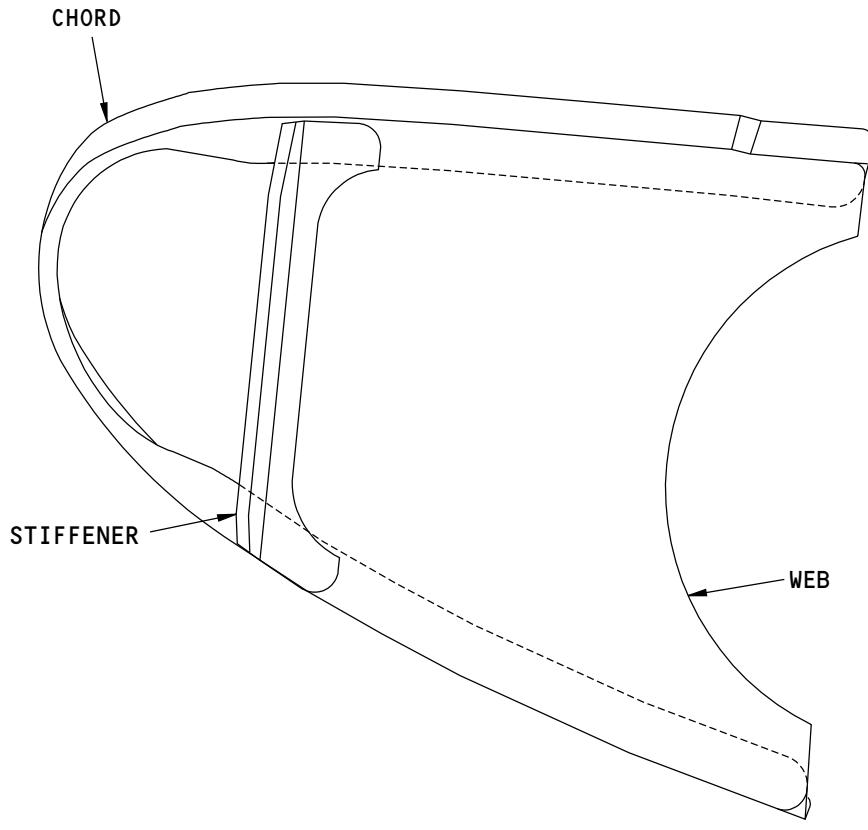
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TYPICAL LEADING EDGE RIB

(A)

G06593 S0006592581_V1

Removable Horizontal Stabilizer Leading Edge Rib Identification
Figure 3 (Sheet 2 of 2)

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Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Leading Edge Rib Assembly			
	Web	0.020 (0.51)	2024-T3 clad sheet as given in QQ-A-250/5 (Bonded 2 ply 0.010 + 0.010 (0.25 mm + 0.25 mm) as given in BAC5514-5101)	
	Chord		BAC1490-2655 2024-T42 clad rolled section as given in QQ-A-250/5	
	Stiffener		BAC1503-100235 2024-T3511 extrusion as given in QQ-A-200/3	
[2]	Rib, Removable Leading Edge	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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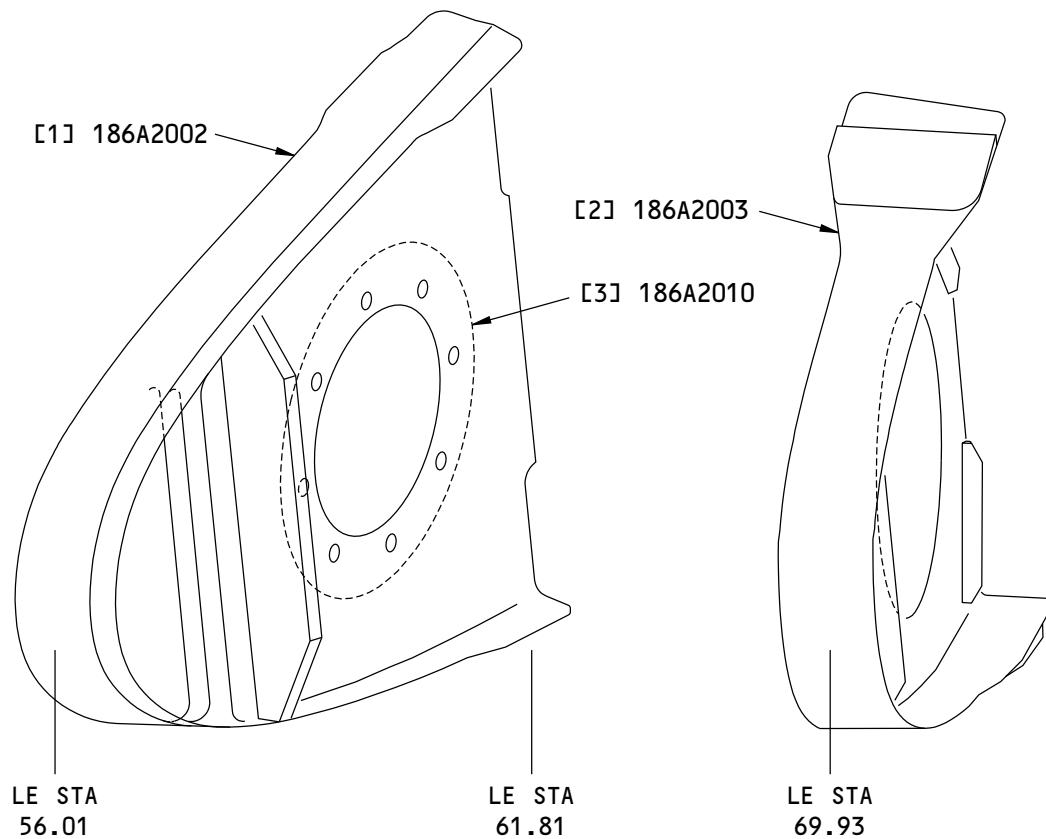
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NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

FIXED HORIZONTAL STABILIZER LEADING EDGE RIB

G06634 S0006592583_V1

Fixed Horizontal Stabilizer Leading Edge Rib Identification
Figure 4

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Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Leading Edge Rib Assembly Rib Stiffener		7075-T7351 plate as given in QQ-A-250/12. Grain direction controlled part BAC1503-100026 7075-T73511 extrusion as given in QQ-A-200/11	
[2]	Leading Edge Rib Assembly Web Chord Stiffener	0.020 (0.51)	2024-T3 clad sheet as given in QQ-A-250/5 (Bonded 2 ply 0.010 + 0.010 (0.25 mm + 0.25 mm) as given in BAC5514-5101) BAC1505-100624 2024-T42 extrusion as given in QQ-A-200/3 BAC1503-100235 2024-T3511 extrusion as given in QQ-A-200/3	
[3]	Door	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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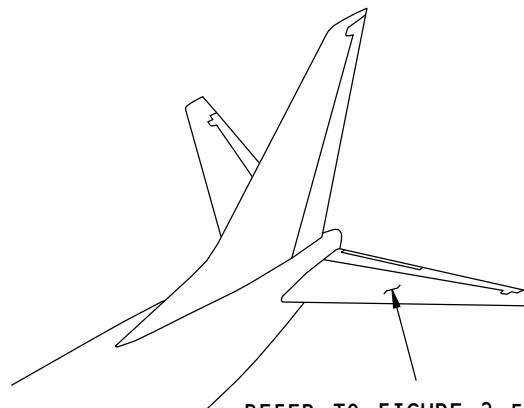
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IDENTIFICATION 2 - HORIZONTAL STABILIZER INSPAR RIBS



REFER TO FIGURE 2 FOR THE
HORIZONTAL STABILIZER
INSPAR RIB LOCATION

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Horizontal Stabilizer Inspar Rib
Figure 1
Table 1:

G08828 S0006592586_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
182A0001	Torque Box Functional Collector - Left Horizontal Stabilizer
182A0002	Torque Box Functional Collector - Right Horizontal Stabilizer
182A5001	Rib Assembly/Installation Inboard Closure, Horizontal Stabilizer
182A5002	Rib Assembly/Installation Stabilizer Station 83.50, Horizontal Stabilizer
182A5003	Rib Assembly/Installation Transverse No. 1, Horizontal Stabilizer
182A5004	Rib Assembly/Installation Transverse No. 2, Horizontal Stabilizer
182A5005	Rib Assembly/Installation Transverse No. 3, Horizontal Stabilizer

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Table 1: (Continued)

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
182A5006	Rib Assembly/Installation Transverse No. 4, Horizontal Stabilizer
182A5007	Stiffener Installation Lower Skin, Horizontal Stabilizer

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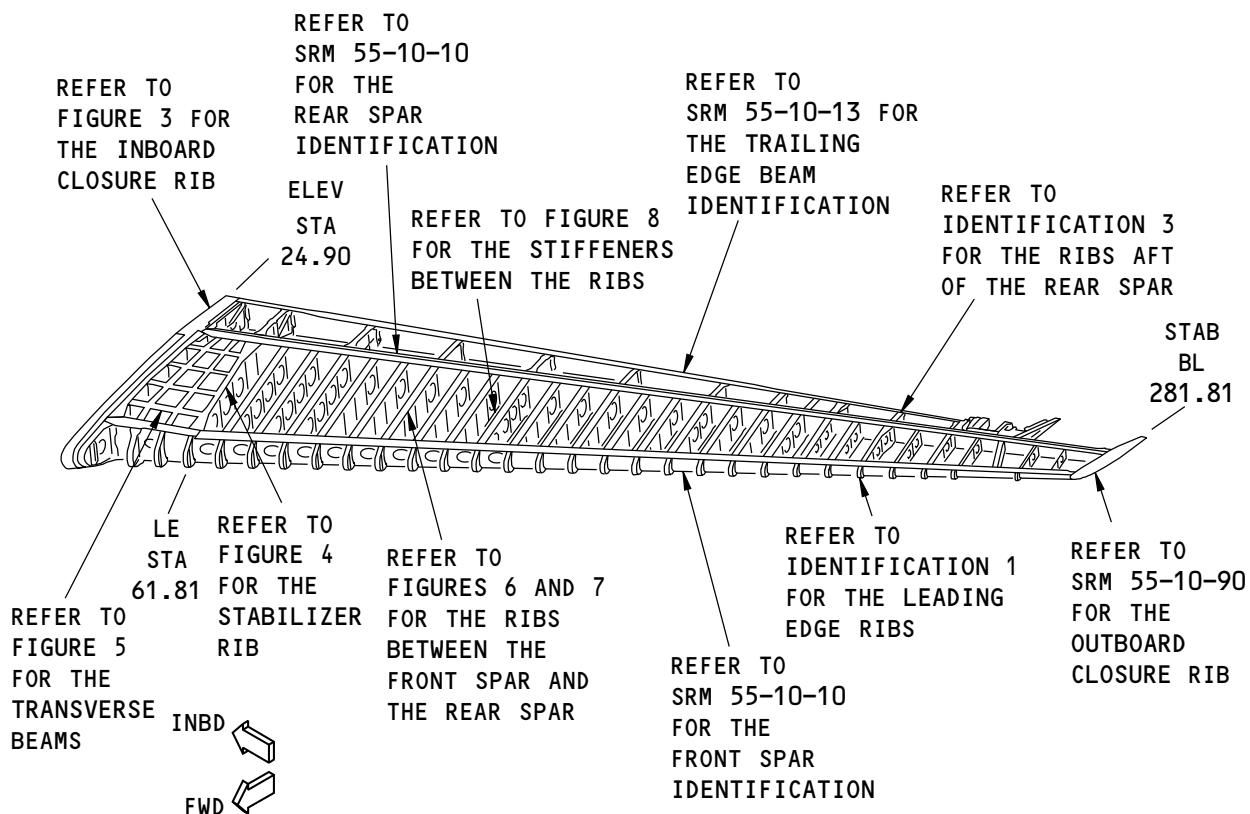
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

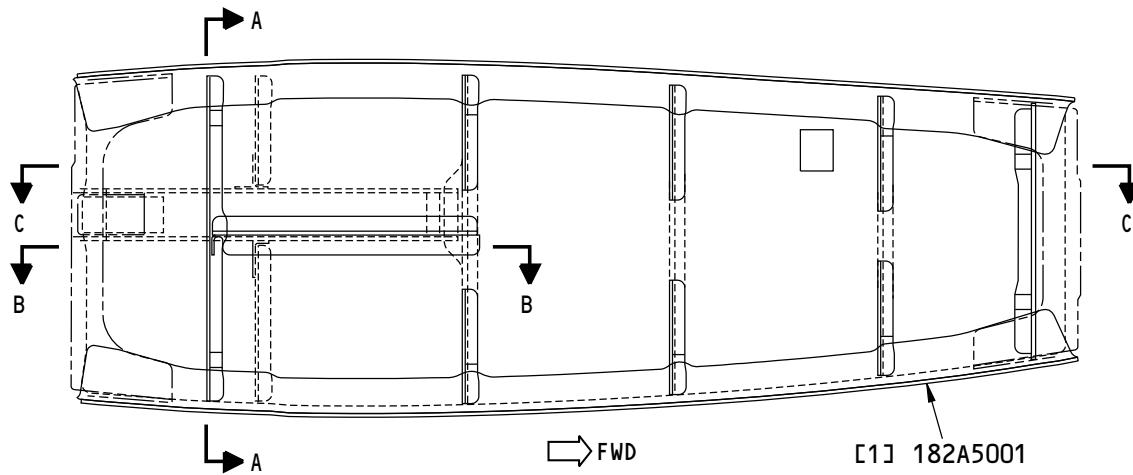
2108948 S0000450227_V1

Horizontal Stabilizer Inspar Rib Location
Figure 2

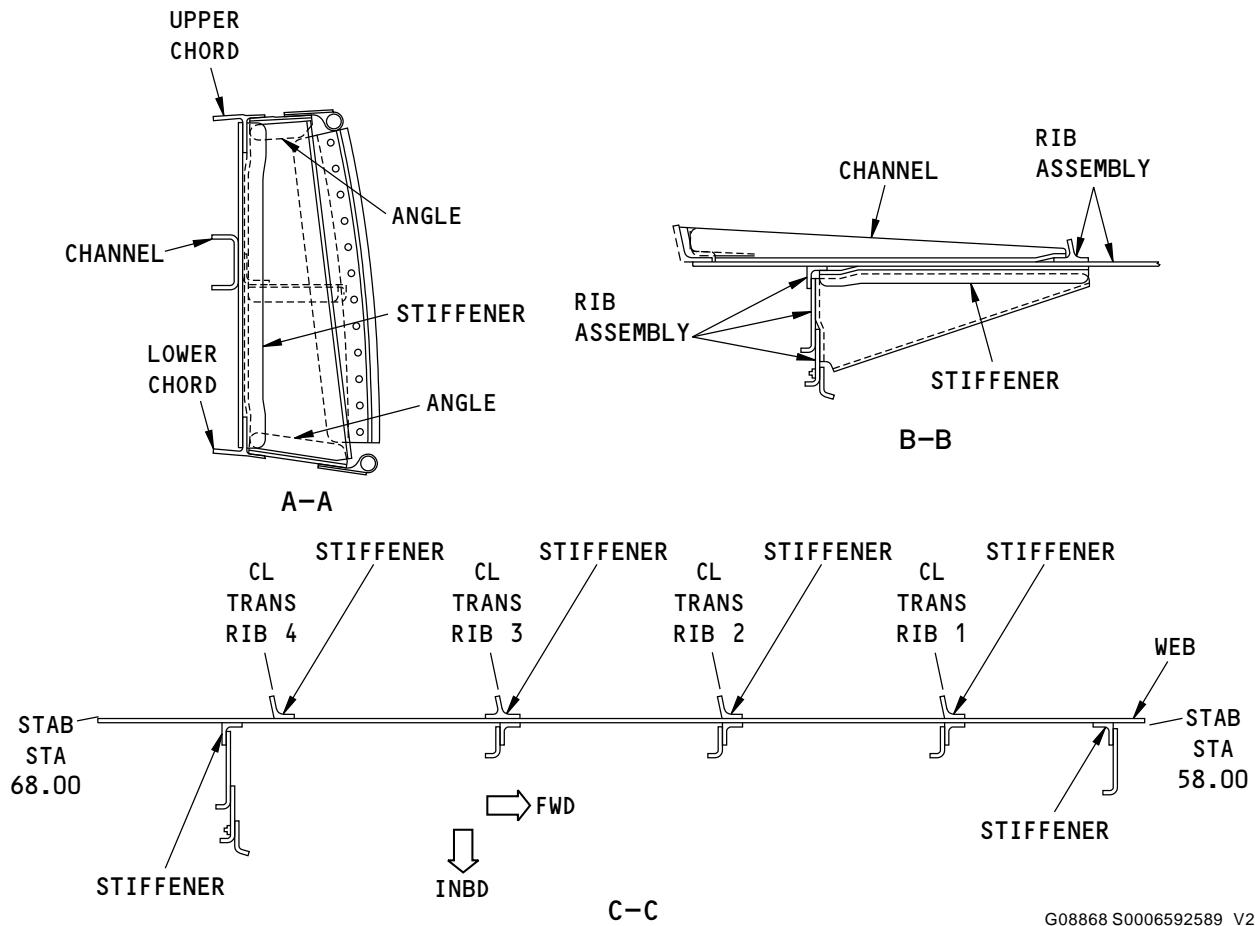
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.
INBOARD CLOSURE RIB



G08868 S0006592589_V2

**Horizontal Stabilizer Inspar Rib Identification
Figure 3**

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STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib, Inboard Closure	0.090 (2.23) 0.056 (1.42)	AND10134-1204 7075-T6511 extrusion as given in QQ-A-200/11	
	Stiffener		2024-T42 clad sheet as given in QQ-A-250/5 and BAC 5602	
	Channel		BAC1514-1681 7075-T6511 extrusion as given in QQ-A-200/11	
	Rib Assembly		BAC1503-100028 7075-T6511 extrusion as given in QQ-A-200/11	
	Stiffener (4)		2024-T3 clad sheet as given in QQ-A-250/5.	
	Stiffener (2)		BAC1514-1262 7075-T6511 extrusion as given in QQ-A-200/11	
	Web		BAC1506-4442 7075-T6511 extrusion as given in QQ-A-200/11	
	Angle (2)		BAC1506-4359 7075-T62 extrusion as given in QQ-A-200/11	
	Stiffener		BAC1506-4379 7075-T62 extrusion as given in QQ-A-200/11	
	Upper Chord			

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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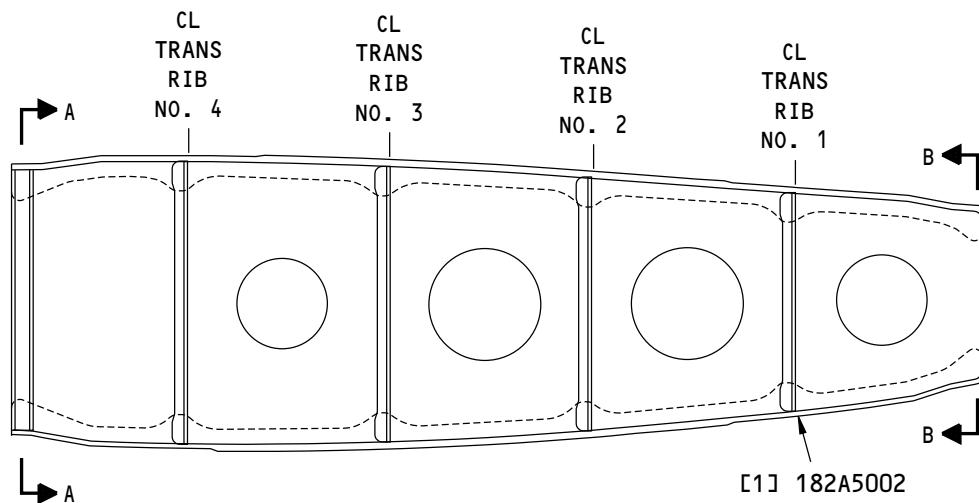
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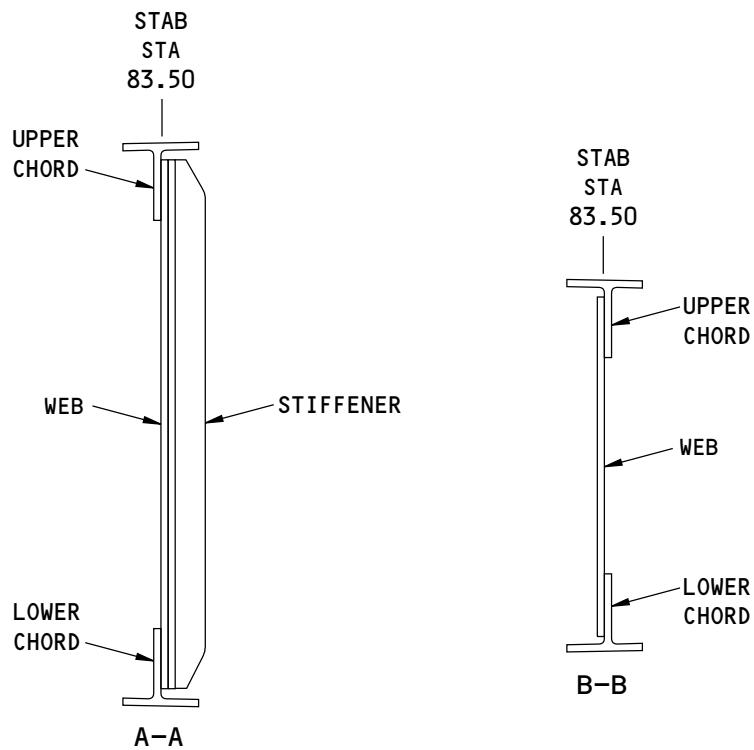


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NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

RIB ASSEMBLY - STABILIZER STATION 83.50



G08886 S0006592591_V1

Horizontal Stabilizer Rib Identification
Figure 4

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Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib Assembly, Stabilizer Station 83.50 Web Stiffener (4) Stiffener Upper Chord Lower Chord	0.050 (1.27)	2024-T3 clad sheet as given in QQ-A-250/5 BAC1503-100397 7075-T6511 extrusion as given in QQ-A-200/11 BAC1509-100673 7075-T6511 extrusion as given in QQ-A-200/11 BAC1505-101674 7075-T62 extrusion as given in QQ-A-200/11 BAC1505-101674 7075-T62 extrusion as given in QQ-A-200/11	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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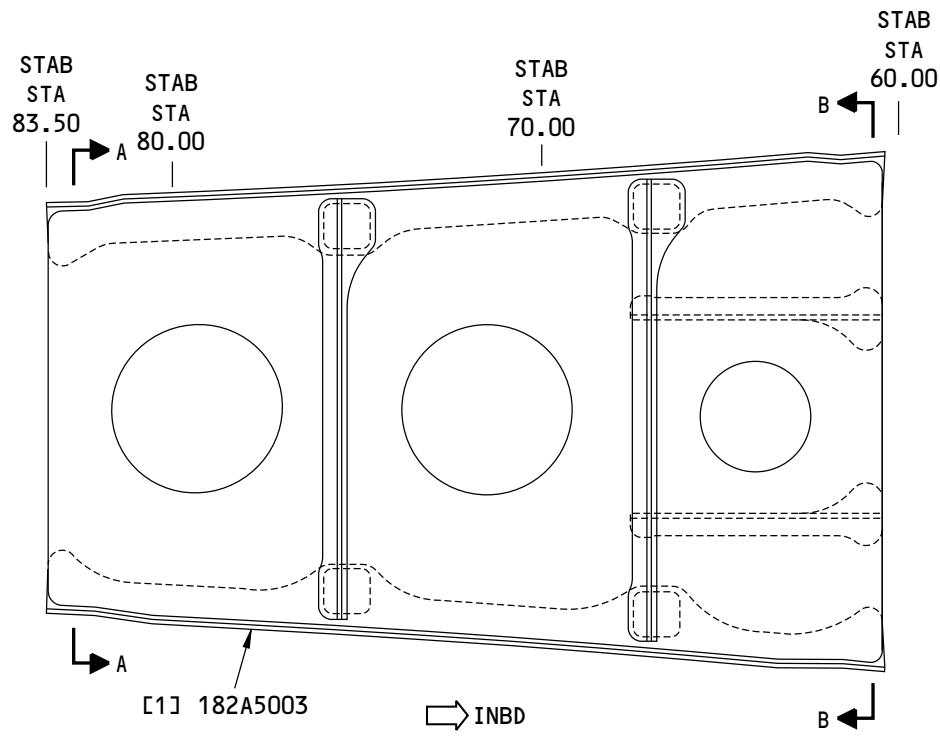
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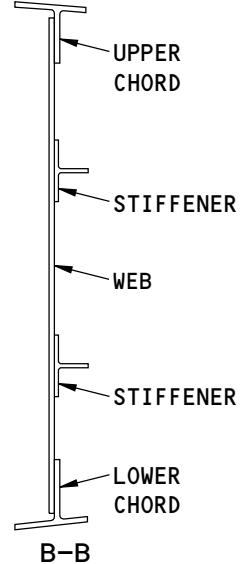
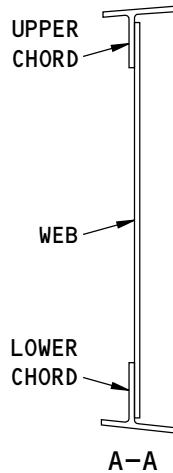


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RIB ASSEMBLY - TRANSVERSE NUMBER 1

(A)



NOTES

- REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

G09091 S0006592593_V1

Horizontal Stabilizer, Transverse Rib Assembly Identification
Figure 5 (Sheet 1 of 4)

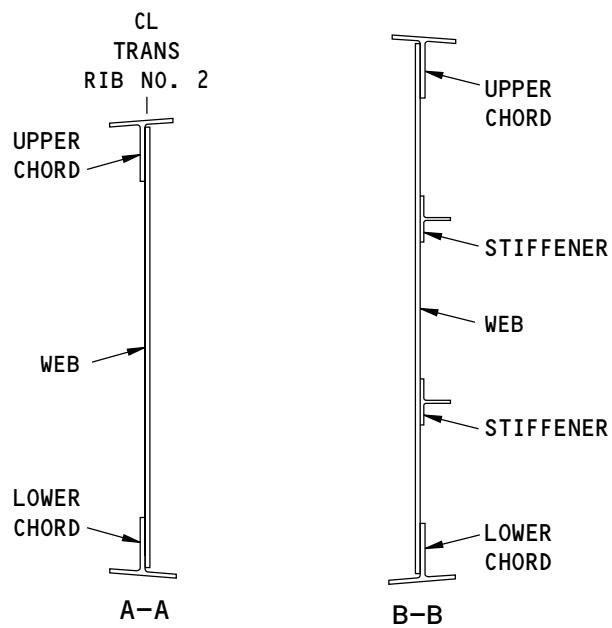
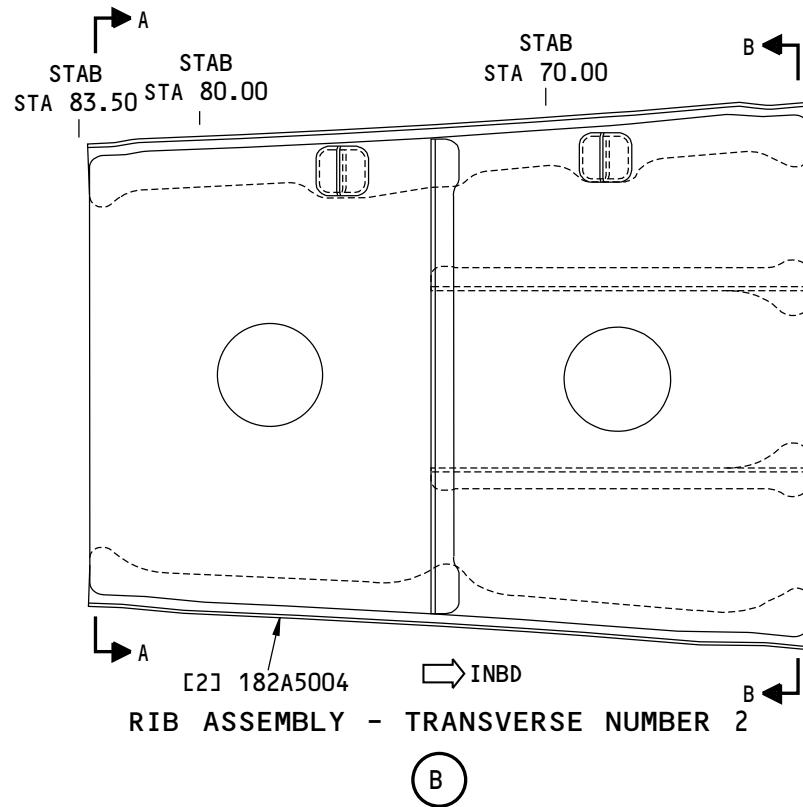
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G09043 S0006592594_V1

Horizontal Stabilizer, Transverse Rib Assembly Identification
Figure 5 (Sheet 2 of 4)

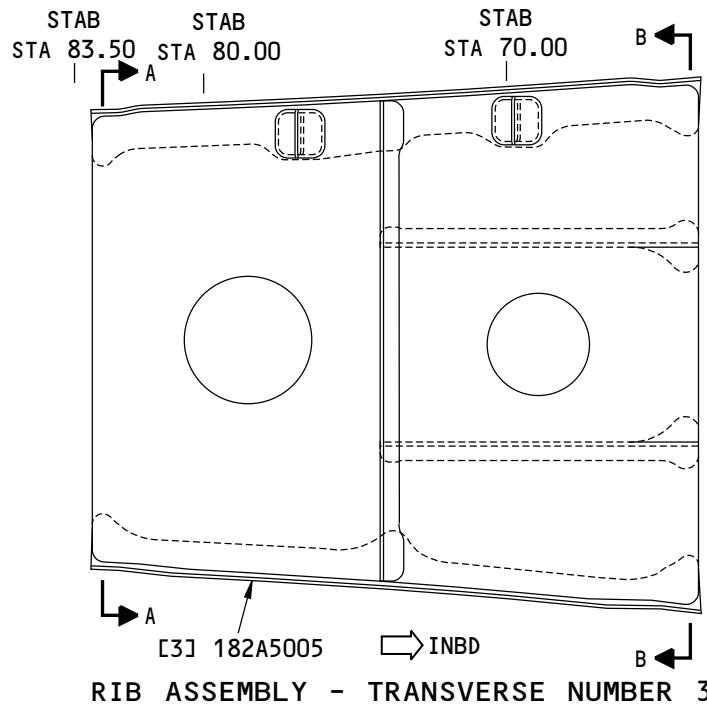
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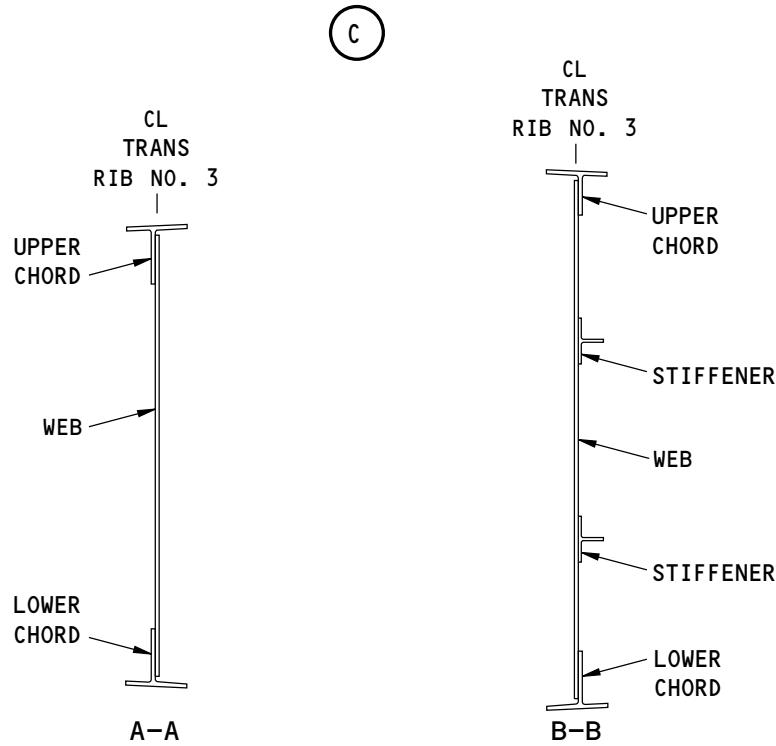
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RIB ASSEMBLY - TRANSVERSE NUMBER 3



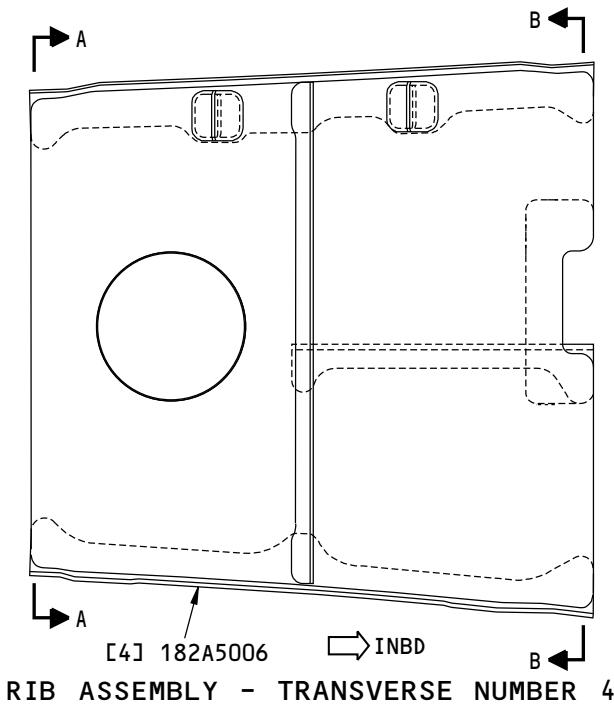
G08945 S0006592595_V1

Horizontal Stabilizer, Transverse Rib Assembly Identification
Figure 5 (Sheet 3 of 4)

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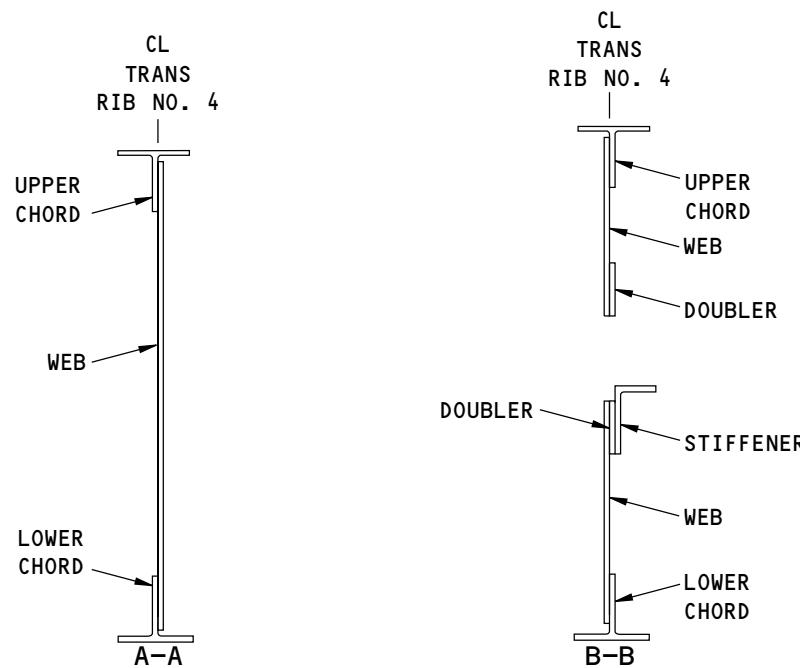


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RIB ASSEMBLY - TRANSVERSE NUMBER 4

(D)



G09095 S0006592596_V1

Horizontal Stabilizer, Transverse Rib Assembly Identification
Figure 5 (Sheet 4 of 4)

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Table 4:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib Assembly, Transverse No. 1	0.036 (0.91)		
	Stiffener (2)		BAC1505-23760 7075-T6511 extrusion as given in QQ-A-200/11	
	Web		2024-T3 clad sheet as given in QQ-A-250/5	
	Stiffener		BAC1506-4358 7075-T6511 extrusion as given in QQ-A-200/11	
	Stiffener		BAC1506-4357 7075-T6511 extrusion as given in QQ-A-200/11	
	Upper Chord		BAC1506-4359 7075-T62 extrusion as given in QQ-A-200/11	
[2]	Rib Assembly, Transverse No. 2	0.036 (0.91)		
	Stiffener		BAC1503-1430 7075-T6511 extrusion as given in QQ-A-200/11	
	Web		2024-T3 clad sheet as given in QQ-A-250/5.	
	Stiffener (2)		BAC1505-23760 7075-T6511 extrusion as given in QQ-A-200/11	
	Upper Chord		BAC1506-4359 7075-T62 extrusion as given in QQ-A-200/11	
	Lower Chord		BAC1506-4356 7075-T62 extrusion as given in QQ-A-200/11	
[3]	Rib Assembly, Transverse No. 3	0.036 (0.91)		
	Stiffener		BAC1503-1430 7075-T6511 extrusion as given in QQ-A-200/11	
	Web		2024-T3 clad sheet as given in QQ-A-250/5	
	Stiffener (2)		BAC1505-23760 7075-T6511 Extrusion as given in QQ-A-200/11	
	Upper Chord		BAC1506-4355 7075-T62 extrusion as given in QQ-A-200/11	
	Lower Chord		BAC1506-4356 7075-T62 extrusion as given in QQ-A-200/62	
[4]	Rib Assembly, Transverse No. 4	0.050 (1.27)		
	Stiffener		BAC1503-100277 7075-T6511 extrusion as given in QQ-A-200/11	
	Stiffener		BAC1503-1430 7075-T6511 extrusion as given in QQ-A-200/11	
	Doubler		2024-T3 clad sheet as given in QQ-A-250/5	
	Web		2024-T3 clad sheet as given in QQ-A-250/5	
	Upper Chord		BAC1505-101662 7075-T62 extrusion as given in QQ-A-200/11	
	Lower Chord		BAC1506-4355 7075-T62 extrusion as given in QQ-A-200/11	

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*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

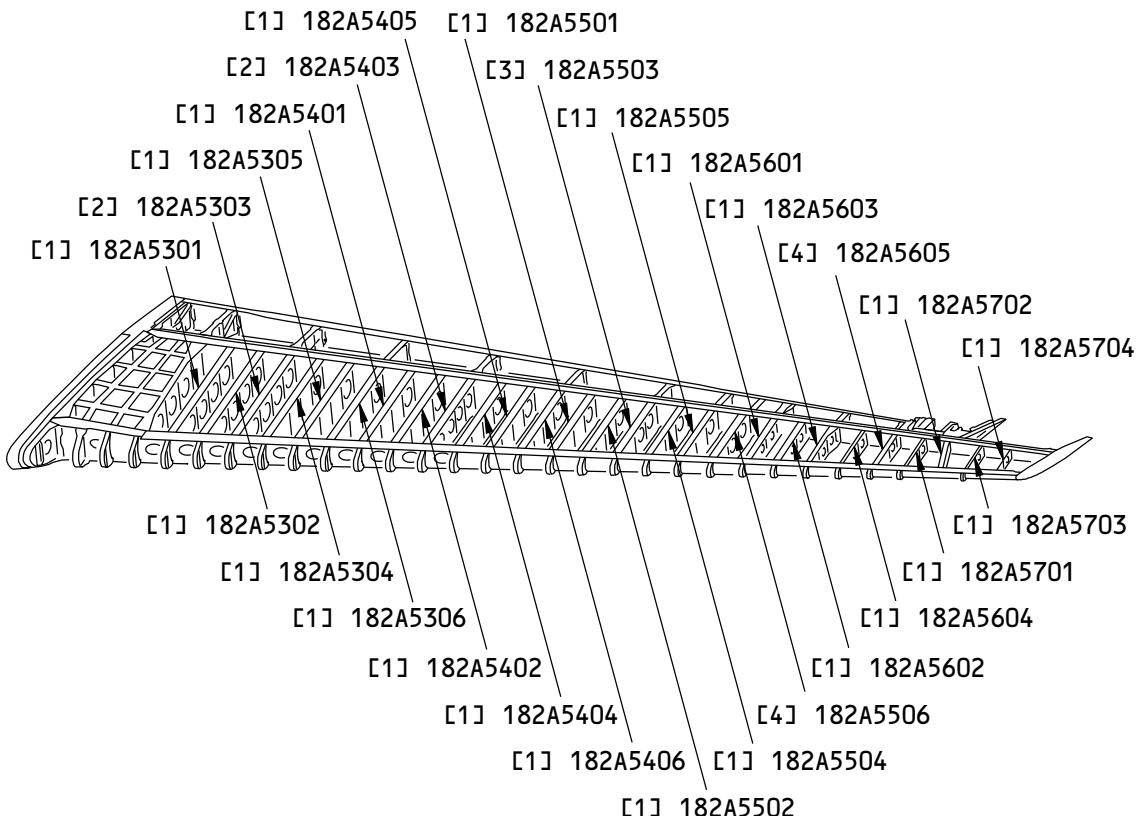
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NOTE: REFER TO TABLE 5 FOR THE LIST OF MATERIALS.

INSPAR RIB ASSEMBLIES

G06769 S0006592598_V2

Horizontal Stabilizer Inspark Rib Identification
Figure 6

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Table 5:

LIST OF MATERIALS FOR FIGURE 6				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib Fitting		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses (Optional: 7050-T7451 plate as given in AMS 4050)	For airplane line numbers 1 thru 3
[1]	Rib Fitting		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses	
[2]	Rib Fitting		7050-T7451 plate as given in AMS 4050. Refer to the production drawing for machined thicknesses. Refer to Figure 6 for an example of a typical machined rib	
[3]	Rib Fitting		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for machined thicknesses	
[4]	Rib Fitting		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses (Optional: 7050-T7451 plate as given in AMS 4050)	For airplane line numbers 1 thru 13
[4]	Rib Fitting		7075-T7351 plate bar as given in AMS-QQ-A-250/12. Refer to the production drawing for the machined thicknesses (Optional: 7075-T73511 extruded bar as given in AMS-QQ-A-200/11) (Optional: 7075-T7451 plate as given in AMS 4050) (Optional: 7050-T7452 as given in BMS 7-214, Type I)	For airplane line numbers 14 and on

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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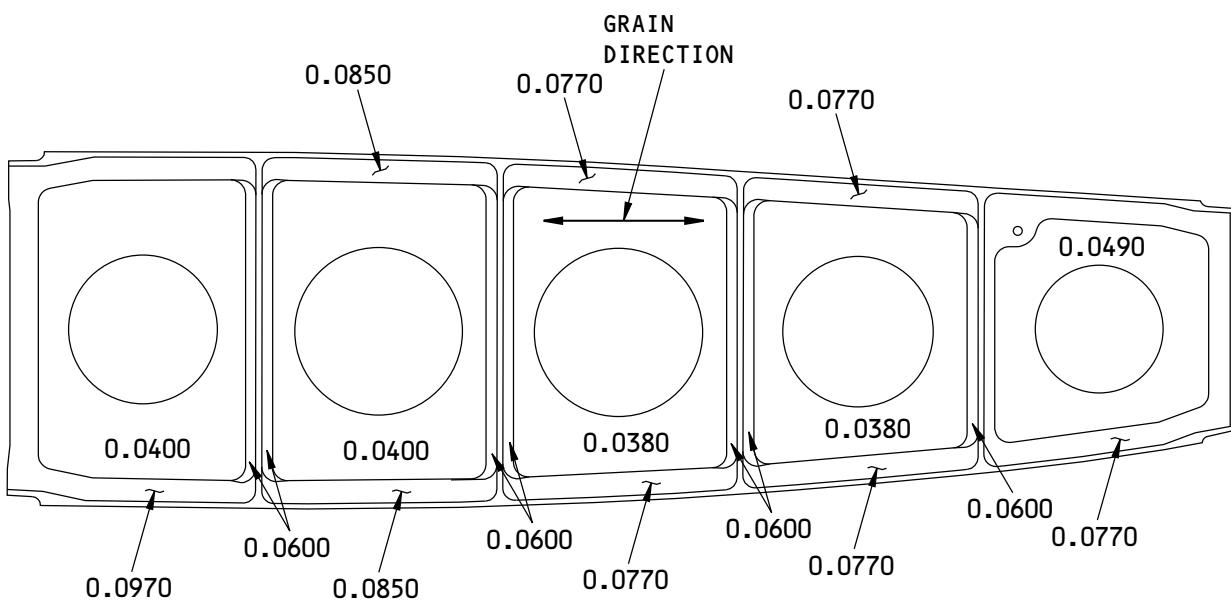
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TYPICAL INSPAR RIB

G06901 S0006592600_V1

Machined Thicknesses For Figure 6, Item [2]
Figure 7

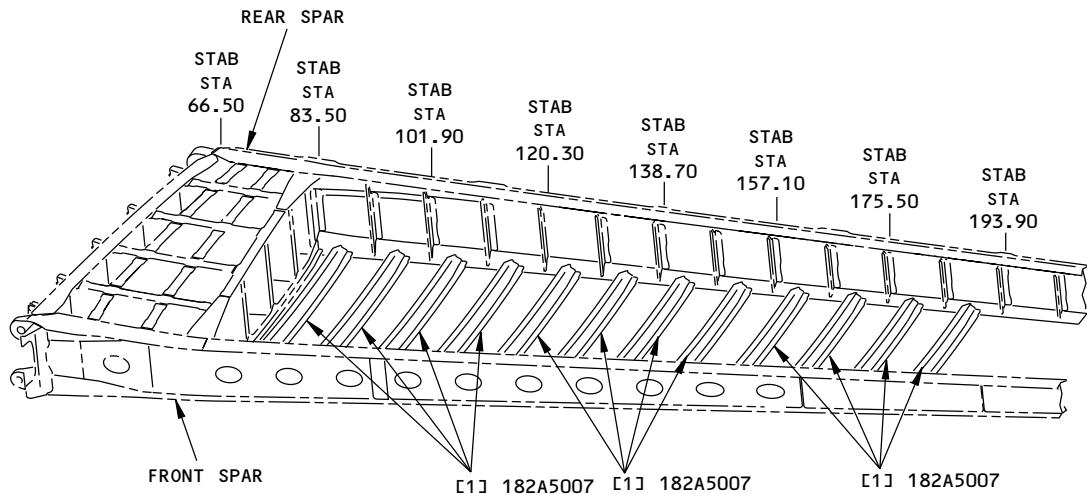
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NOTE: REFER TO TABLE 6 FOR THE LIST OF MATERIALS.

INSPAR STIFFENER ASSEMBLIES

2109303 S0000450228_V1

Horizontal Stabilizer, Stiffener Identification
Figure 8

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Table 6:

LIST OF MATERIALS FOR FIGURE 8				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	STIFFENER		7050-T7451 plate as given in AMS 4050	For airplane line numbers 3624 and on

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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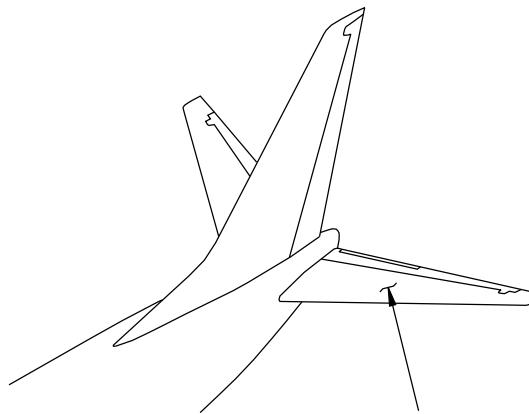
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 3 - HORIZONTAL STABILIZER TRAILING EDGE RIBS



REFER TO FIGURE 2 FOR THE
HORIZONTAL STABILIZER
TRAILING EDGE RIB LOCATIONS

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Horizontal Stabilizer Trailing Edge Rib
Figure 1
Table 1:

G08147 S0006592602_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
185A0001	Trailing Edge Functional Collector - Left, Horizontal Stabilizer
185A0002	Trailing Edge Functional Collector - Right, Horizontal Stabilizer
185A1200	Support Installation - Trim Tab Lock, Horizontal Stabilizer
185A1310	Rib Installation - Trailing Edge, Elevator Station 23.04 - 24.90
185A1320	Rib Installation - Trailing Edge, Elevator Station 39.02
185A1330	Rib Installation - Trailing Edge, Elevator Station 66.54
185A1340	Rib Installation - Trailing Edge, Elevator Station 94.07

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Table 1: (Continued)

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
185A1350	Rib Installation - Trailing Edge, Elevator Station 121.59
185A1360	Rib Installation - Trailing Edge, Elevator Station 149.12
185A1370	Rib Installation - Trailing Edge, Elevator Station 176.64
185A1410	Rib Installation - Trailing Edge, Elevator Station 195.00
185A1420	Rib Installation - Trailing Edge, Elevator Station 213.32
185A1430	Rib Installation - Trailing Edge, Elevator Station 231.70
185A1440	Rib Installation - Trailing Edge, Elevator Station 250.04
185A1450	Rib Installation - Trailing Edge, Elevator Station 265.45
185A1610	Chord Installation - Trailing Edge, Horizontal Stabilizer

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IDENTIFICATION 3

Page 2

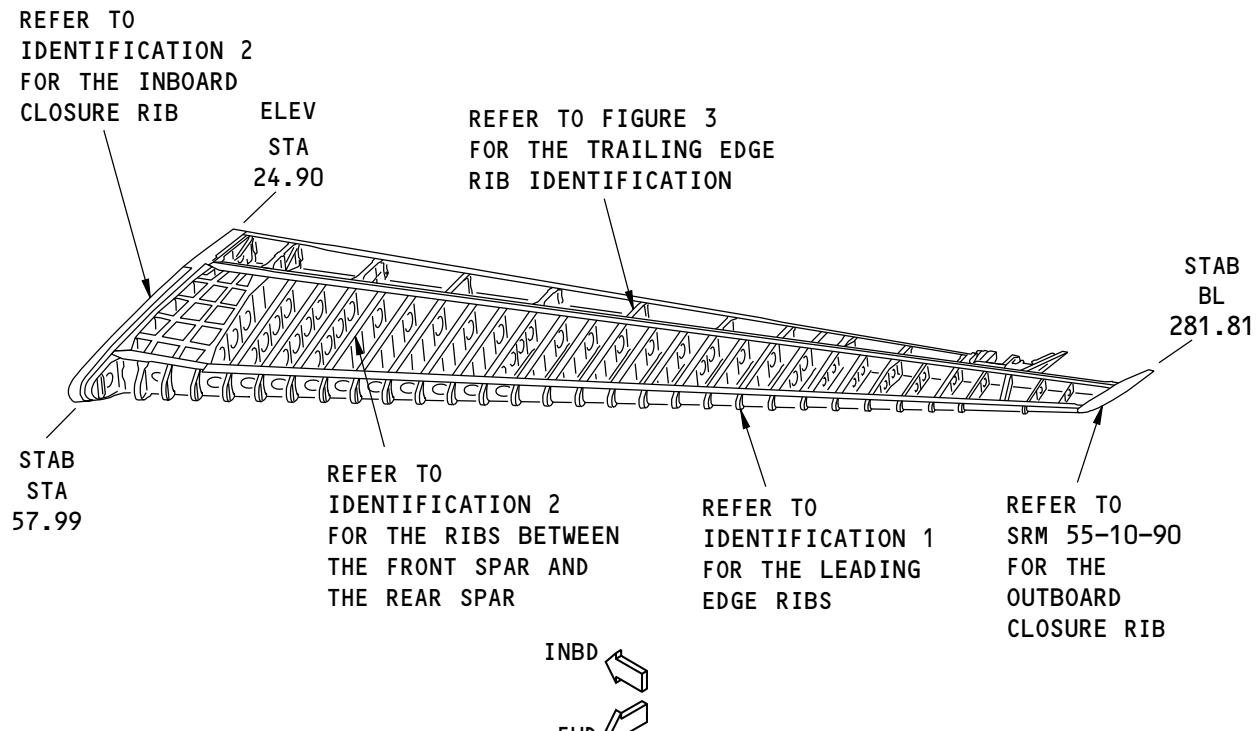
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

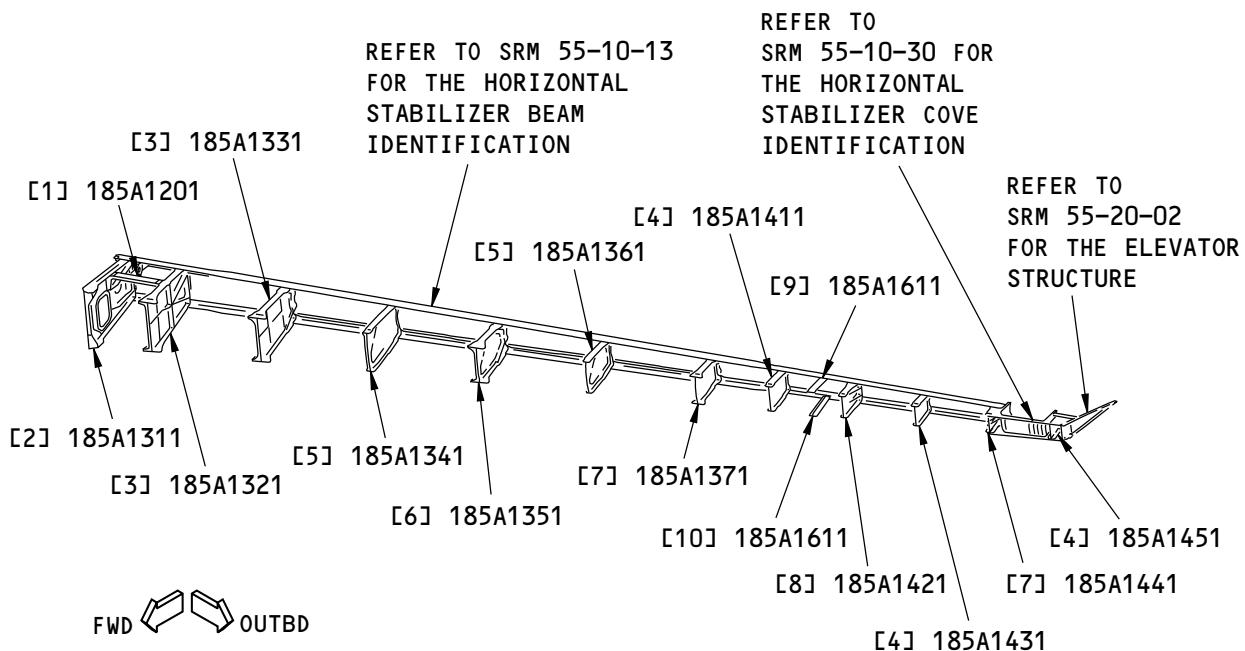
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Horizontal Stabilizer Trailing Edge Rib Location
Figure 2

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TRAILING EDGE RIBS

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Horizontal Stabilizer Trailing Edge Rib Identification
Figure 3

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IDENTIFICATION 3
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Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Support Chord, Trim Tab		BAC1506-4461 7075-T3511 extrusion as given in QQ-A-200/11	
[2]	Rib Assembly, Elevator Station 23.04 Access Door Rib Fitting	0.063 (1.60)	2024-T3 clad sheet as given in QQ-A-250/5 7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses. Refer to Figure 3 for an example of a typical machined rib	
[3]	Rib Fitting, Elevator Stations 39.02 and 66.54		7050-T7451 plate as given in BMS 7-323, Type I. (Grain direction controlled part) Refer to the production drawing for machined thicknesses	
[4]	Rib Fitting, Elevator Stations 195.00, 231.70 and 265.45		7050-T7451 plate as given in AMS 4050. (Grain direction controlled part) Refer to the production drawing for machined thicknesses	
[5]	Rib Assembly, Elevator Stations 94.07 and 149.12 Web Assembly Core Pan Doubler Face Panel Rib Fitting	0.200 (5.08)	Aluminum honeycomb core as given in BMS 4-4, Type 3-10ND, Grade 1, Form B 2024-T42 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5 7050-T7451 plate as given in AMS 4050. (Grain direction controlled part) Refer to the production drawing for machined thicknesses	
[6]	Rib Assembly, Elevator Station 121.59 Web Assembly Core Pan Doubler Face Panel Rib Fitting	0.200 (5.08)	Aluminum honeycomb core as given in BMS 4-4, Type 3-10ND, Grade 1, Form B 2024-T42 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5 7050-T7451 plate as given in BMS 7-323, Type I. (Grain direction controlled part) Refer to the production drawing for machined thicknesses	
[7]	Rib Assembly, Elevator Stations 176.64 and 250.04 Rib Fitting Clevis Fitting		7050-T7451 plate as given in BMS 7-323, Type I. (Grain direction controlled part) Refer to the production drawing for machined thicknesses BAC1507-48859 7075-T73511 extrusion as given in QQ-A-200/11	

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Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[8]	Rib Assembly, Elevator Station 213.32		7050-T7451 plate as given in AMS 4050. (Grain direction controlled part) Refer to the production drawing for machined thicknesses	
	Rib Fitting		BAC1507-48859 7075-T73511 extrusion as given in QQ-A-200/11	
	Clevis Fitting			
[9]	Upper Chord		BAC1505-101654 7075-T73511 extrusion as given in QQ-A-200/11	
[10]	Lower Chord		BAC1505-101654 7075-T73511 extrusion as given in QQ-A-200/11	

*[1] T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 3

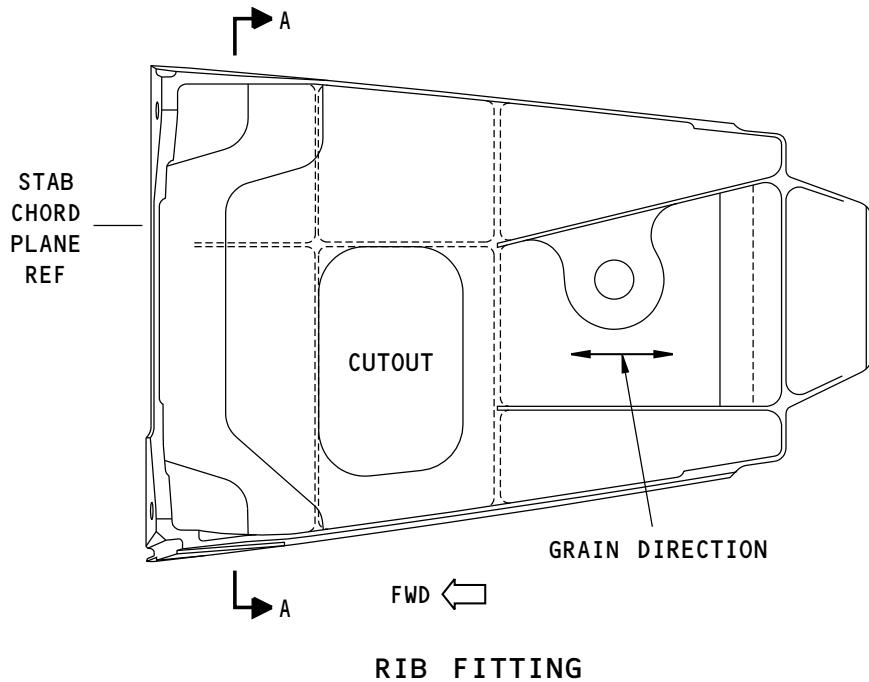
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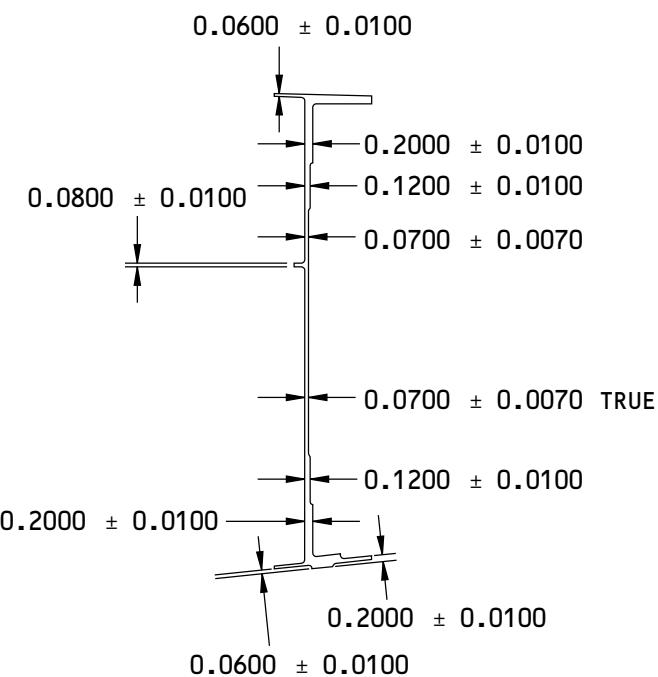
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RIB FITTING



A-A

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Machine Thicknesses and Grain Direction of Figure 3, Item [2]
Figure 4

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IDENTIFICATION 3
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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - HORIZONTAL STABILIZER INSPAR RIB LOWER CHORD

1. Applicability

- A. This procedure gives the allowable damage limits for the horizontal flanges of the horizontal stabilizer inspar rib lower chords from STAB STA 83.50 to STAB STA 330.06. Refer to Figure 101/ ALLOWABLE DAMAGE 1.

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ALLOWABLE DAMAGE 1

Page 101

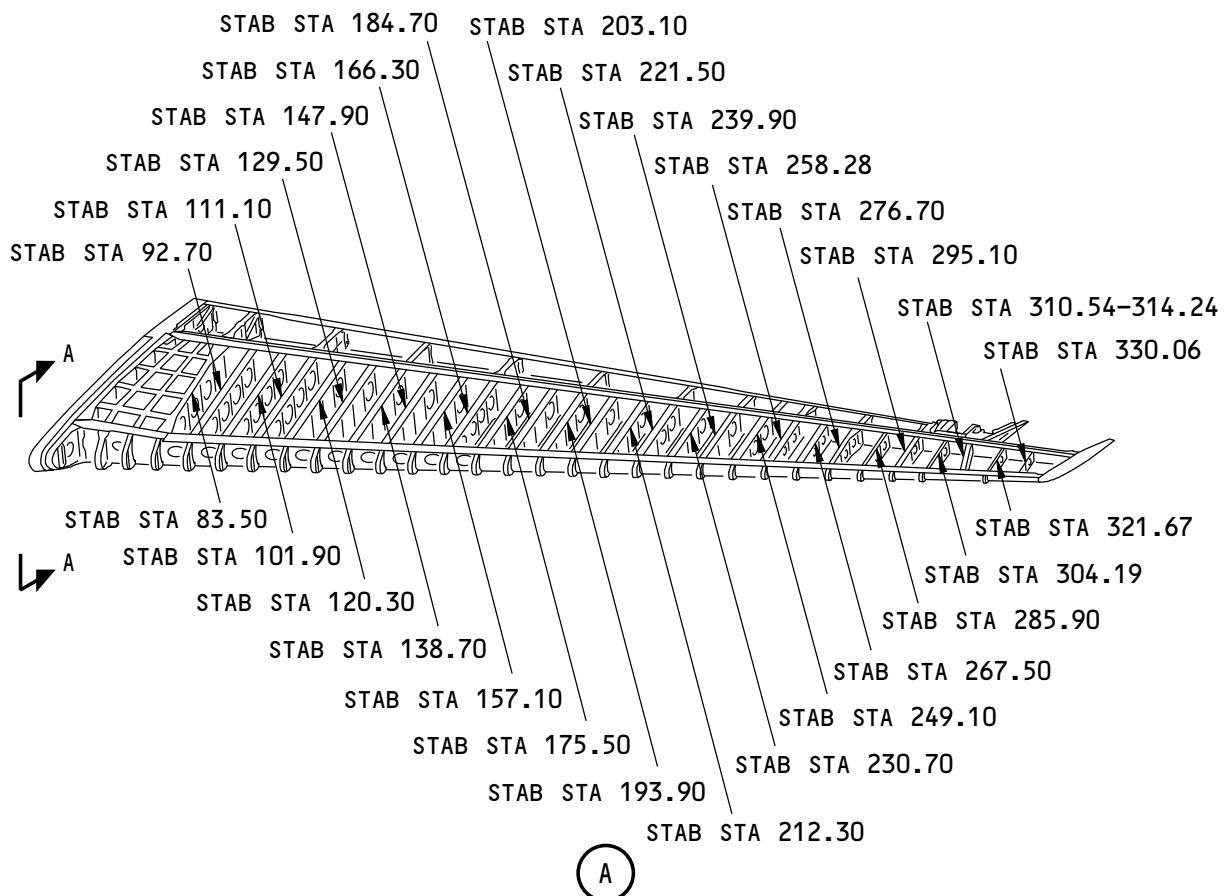
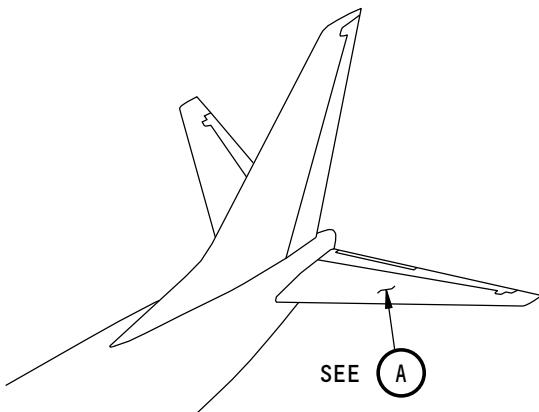
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Horizontal Stabilizer Inspar Ribs Location
Figure 101 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 1

Page 102

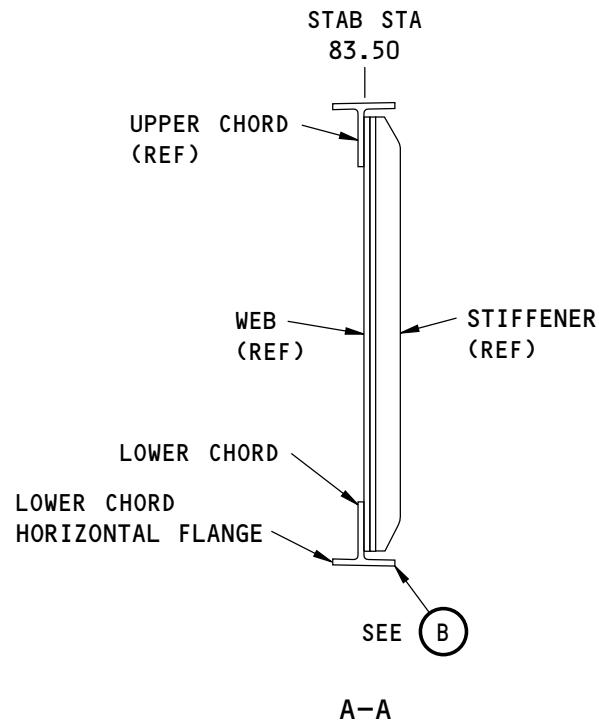
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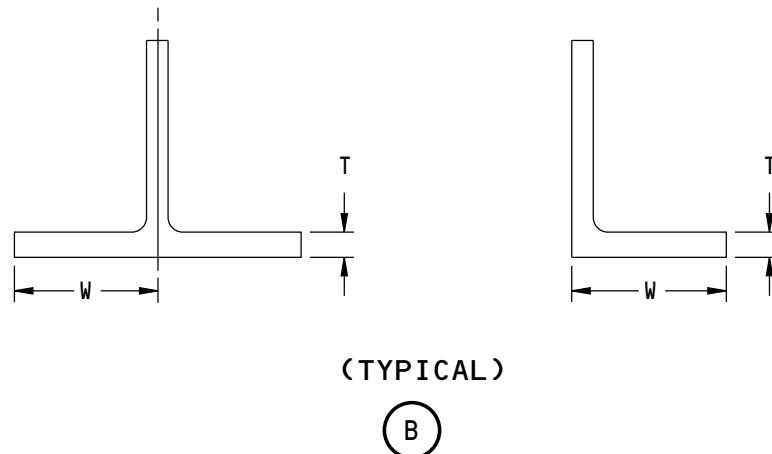
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STRUCTURAL REPAIR MANUAL



A-A



2307660 S0000524293_V1

Horizontal Stabilizer Inspark Ribs Location
Figure 101 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 1

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2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.
- B. Remove the damage as necessary.
 - (1) Refer to 51-10-02, GENERAL for the inspection and removal of damage.
 - (2) Refer to 51-30-03, GENERAL for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05, GENERAL for possible sources of the equipment and tools you can use to remove the damage.
- C. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01, GENERAL.
- D. Apply two layers of BMS 10-11, Type I primer to the reworked areas. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05, GENERAL	Equipment and Tools For Repairs
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

- A. Inspar Rib Lower Chord Horizontal Flanges
 - (1) Cracks are not permitted.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, D, and E, and Table 101/ALLOWABLE DAMAGE 1.

Table 101: Maximum Material Removed from the Lower Flange

RIB PART NUMBER	STAB STA	MAXIMUM MATERIAL REMOVED FROM THE FLANGE ^{*[1]}	COMMENTS
182A5002	83.50	0%	No allowable damage
182A5301	92.70	0%	No allowable damage
182A5302	101.90	8%	
182A5303	111.10	10%	
182A5304	120.30	10%	
182A5305	129.50	7%	
182A5306	138.70	0%	No allowable damage
182A5401	147.90	10%	
182A5402	157.10	10%	
182A5403	166.30	7%	
182A5404	175.50	10%	

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ALLOWABLE DAMAGE 1

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Table 101: Maximum Material Removed from the Lower Flange (Continued)

RIB PART NUMBER	STAB STA	MAXIMUM MATERIAL REMOVED FROM THE FLANGE ^{*[1]}	COMMENTS
182A5405	184.70	10%	
182A5406	193.90	10%	
182A5501	203.10	10%	
182A5502	212.30	10%	
182A5503	221.50	0%	No allowable damage
182A5504	230.70	10%	
182A5505	239.90	10%	
182A5506	249.10	10%	
182A5601	258.28	10%	
182A5602	267.50	10%	
182A5603	276.70	10%	
182A5604	285.90	10%	
182A5605	295.10	10%	
182A5701	304.19	10%	
182A5702	310.54-314.24	10%	
182A5703	321.67	10%	
182A5704	330.06	10%	

*[1] T = maximum thickness, W = maximum width. Refer to Figure 101 (Sheet 2) for T and W definitions.

- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

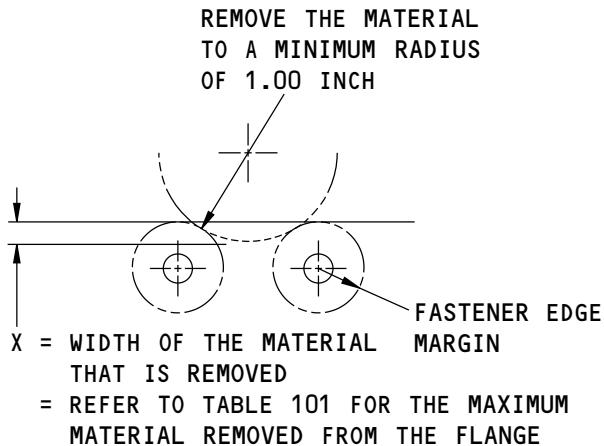
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ALLOWABLE DAMAGE 1

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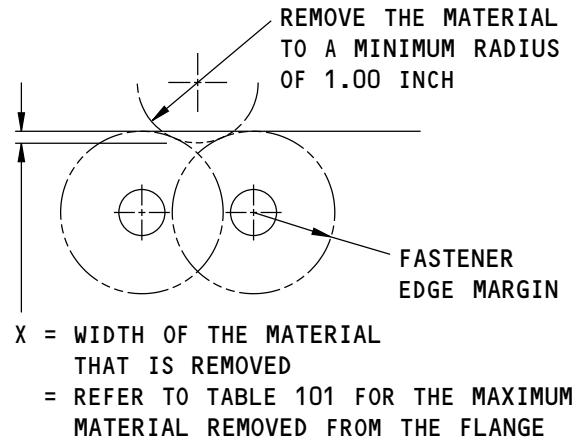
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**737-800
STRUCTURAL REPAIR MANUAL**


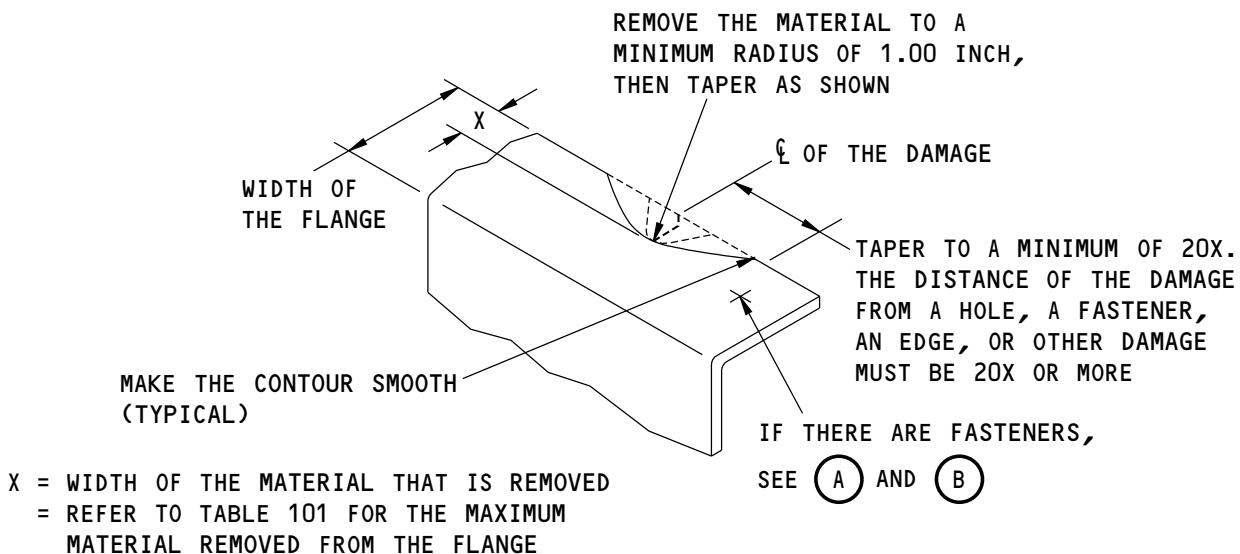
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(C)

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Allowable Damage Limits
Figure 102 (Sheet 1 of 2)

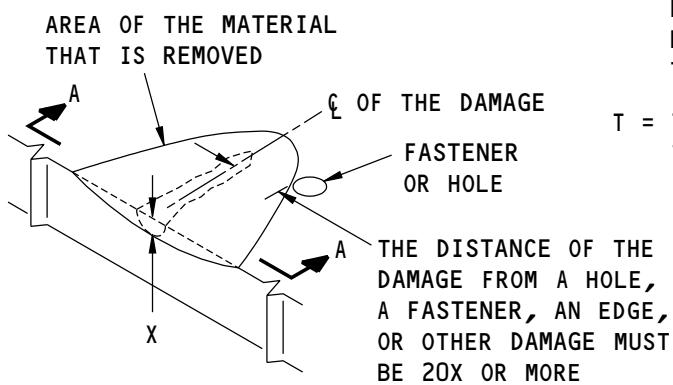
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ALLOWABLE DAMAGE 1

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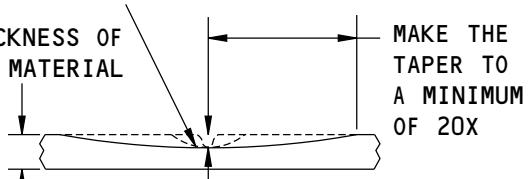
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REMOVAL OF DAMAGED MATERIAL ON A SURFACE
D

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER AS SHOWN

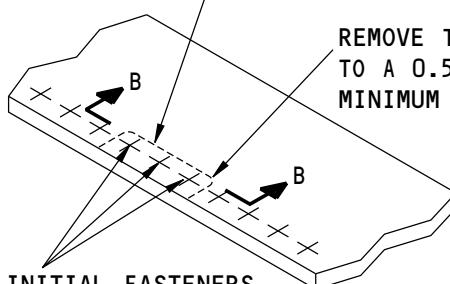
T = THICKNESS OF THE MATERIAL



X = DEPTH OF THE MATERIAL THAT IS REMOVED
= REFER TO TABLE 101 FOR THE MAXIMUM MATERIAL REMOVED FROM THE FLANGE

A-A

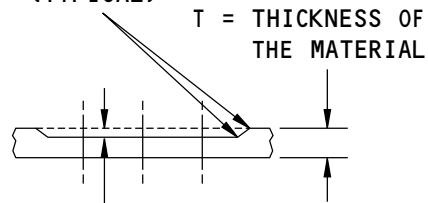
THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A DEPTH OF X MAXIMUM



REMOVE THE INITIAL FASTENERS BEFORE THE DAMAGED MATERIAL IS REMOVED. INSTALL THE SAME TYPE AND SIZE (UP TO THE FIRST OVERSIZE) FASTENERS AFTER THE REWORK IS COMPLETED

REMOVAL OF CORROSION AROUND THE FASTENERS
E

MAKE IT SMOOTH (TYPICAL)



X = DEPTH OF THE MATERIAL THAT IS REMOVED
= REFER TO TABLE 101 FOR THE MAXIMUM MATERIAL REMOVED FROM THE FLANGE.

B-B

G57372 S0006592629_V2

**Allowable Damage Limits
Figure 102 (Sheet 2 of 2)**

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ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

REPAIR 4 - HORIZONTAL STABILIZER MACHINED INSPAR RIB STIFFENER CRACK REPAIR

1. Applicability

- A. This repair is applicable to cracks on the vertical stiffeners that are integral to the horizontal stabilizer inspar rib between STAB STA 92.70 and 184.70 shown in Figure 201/REPAIR 4.

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REPAIR 4

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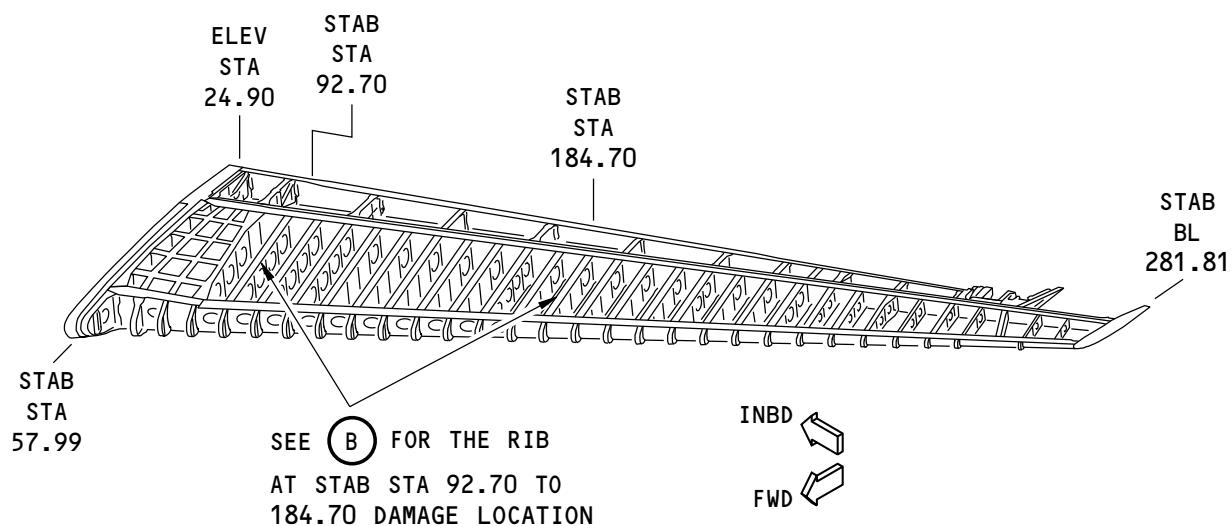
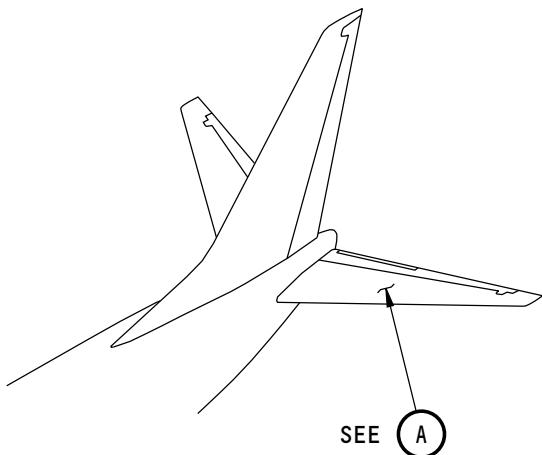
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(LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE)
INSPAR RIB AT STAB STA 92.70 TO 184.70 LOCATIONS



1998221 S0000389655_V3

Horizontal Stabilizer Inspark Rib Location
Figure 201 (Sheet 1 of 2)

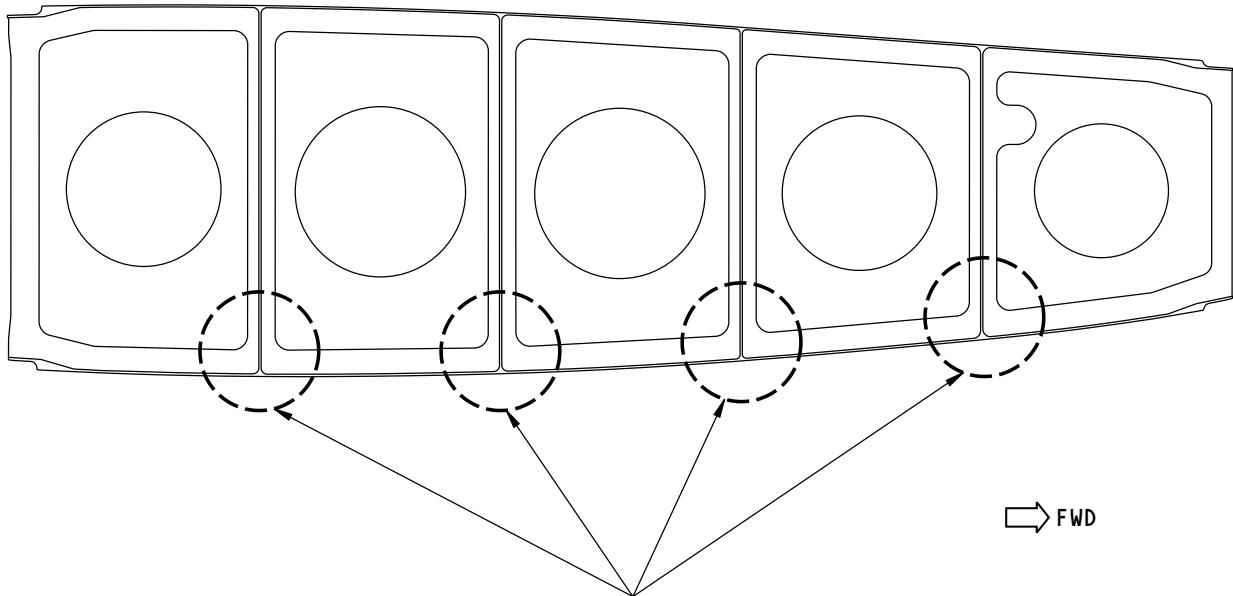
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REFER TO FIGURE 202
FOR THE TYPICAL
MACHINED INSPAR RIB
REPAIR

(VIEW IN THE OUTBOARD DIRECTION)
TYPICAL INSPAR RIB AT STAB STA 92.70 TO 184.70

B

1998229 S0000389673_V3

Horizontal Stabilizer Inspark Rib Location
Figure 201 (Sheet 2 of 2)

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STRUCTURAL REPAIR MANUAL

2. General

- A. Repair 4 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-01, GENERAL	Sheet Metal Materials
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
55-10-01, REPAIR 7	Horizontal Stabilizer Access Panel Installation With a One-Piece Doubler
55-10-01, REPAIR 8	Horizontal Stabilizer Lower Skin Access Panel Installation With a Two-Piece Doubler
AMM 51-21-99/701	Decorative Exterior Paint System - Cleaning and Painting
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Repair Instructions

- A. Get access to the damaged area. You may need to install an access panel in the lower inspar skin to get access. Refer to 55-10-01, REPAIR 7 or 55-10-01, REPAIR 8.
- B. Remove the damaged part of the rib as shown in Figure 202/REPAIR 4. Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02.
- (1) Cut and remove the damage from the vertical stiffener of the rib.
 - (2) If the crack extends into the web of the rib, cut and remove the damage from the web. Make the corner radii of the web cutout a minimum of 0.167 in. (4.24 mm).
- NOTE:** A 0.167 in. (4.24 mm) minimum corner radius is necessary to make sure all the repair parts maintain the correct edge margin. Increase the corner radius where you can keep the 2D fastener edge margin between the cutout and all the repair parts, except as noted on Figure 202/REPAIR 4.
- C. Do a High Frequency Eddy Current (HFEC) inspection of the cutout for cracks.
- D. Make the repair parts as shown in Figure 202/REPAIR 4. Refer to Table 201/REPAIR 4 for the repair material.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	T-section	1	Use 7075-T76511 extrusion as given in AMS-QQ-A-200/15 or 7075-T73/T73511 extrusion as given in AMS-QQ-A-200/11, 0.063 in. (1.60 mm) thick
[2]	Angle	1	Use BAC1490 clad 7075-T6 sheet as given in AMS-QQ-A-250/13, 0.063 in. (1.60 mm) thick
[3]	Shim	2	Use clad 7075-T6 sheet as given in AMS-QQ-A-250/13, not to exceed 0.020 in. (0.508 mm) thick

- E. Assemble the repair parts as shown in Figure 202/REPAIR 4.

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- F. Drill the fastener holes. Keep a minimum 2D edge margin and 4D to 6D fastener spacing, except as noted on Figure 202/REPAIR 4.
- G. Disassemble the repair parts.
- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces and edges of the rib.
- I. Apply a chemical conversion coating to the repair parts and the bare surfaces and edges of the rib. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- J. Apply one layer of BMS 10-11, Type I primer to the repair parts and the bare surfaces and edges of the rib. Refer to SOPM 20-41-02.
- K. Install the repair parts with BMS 5-95 sealant between the faying surfaces. Refer to REPAIR SEALING, 51-20-05.
- L. Install the repair parts with 0.010 in. (0.25 mm) pull down or less. If the gap is more than 0.010 in. (0.25 mm), install a shim as necessary. Refer to 51-30-01, GENERAL.
- M. Install the fasteners. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
- N. Apply a fillet seal to the repair parts with BMS 5-95 sealant. Refer to REPAIR SEALING, 51-20-05.
- O. Apply the finish if necessary. Refer to AMM 51-21-99/701.

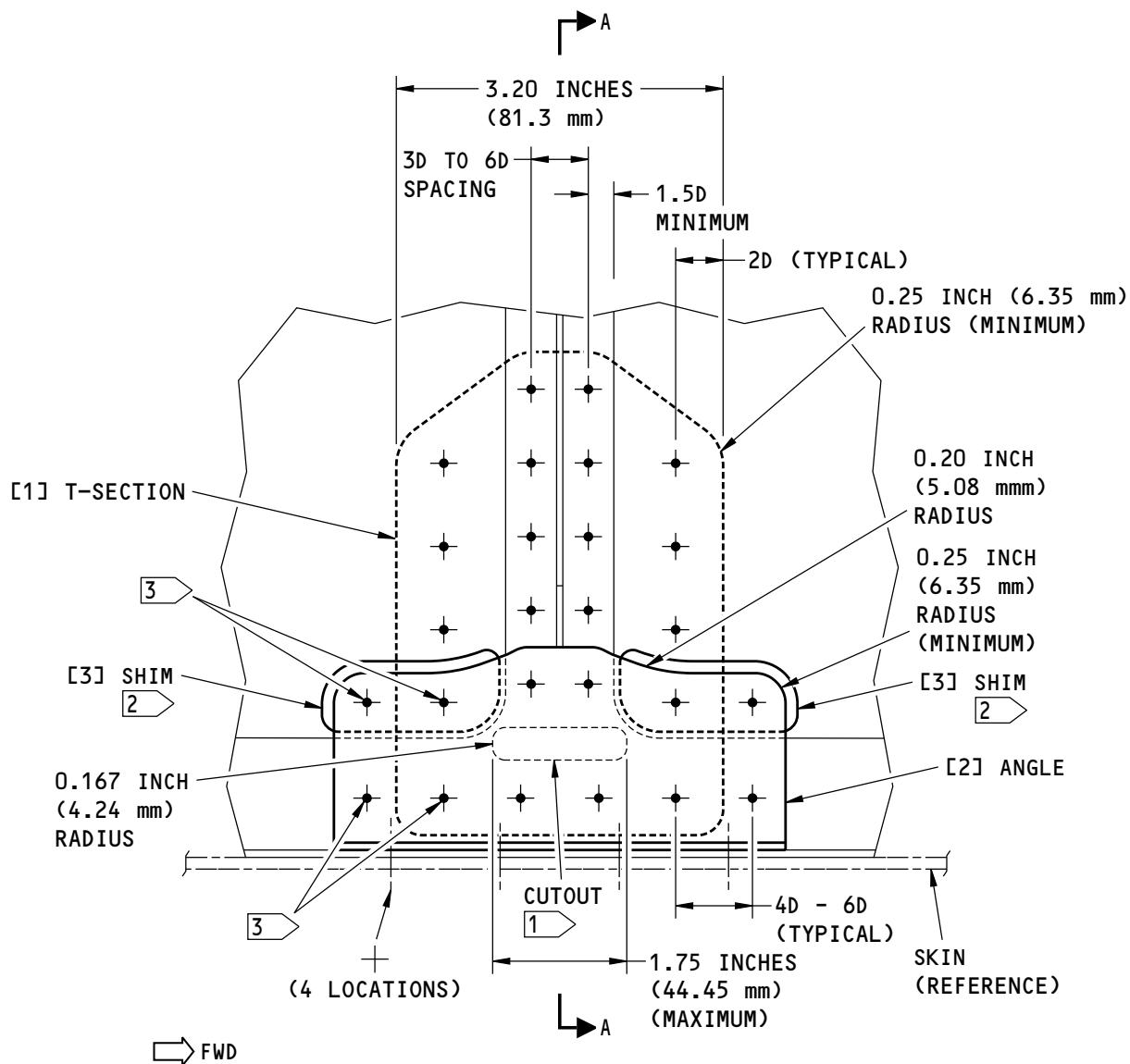
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TYPICAL HORIZONTAL STABILIZER INSPAR RIB CRACK REPAIR

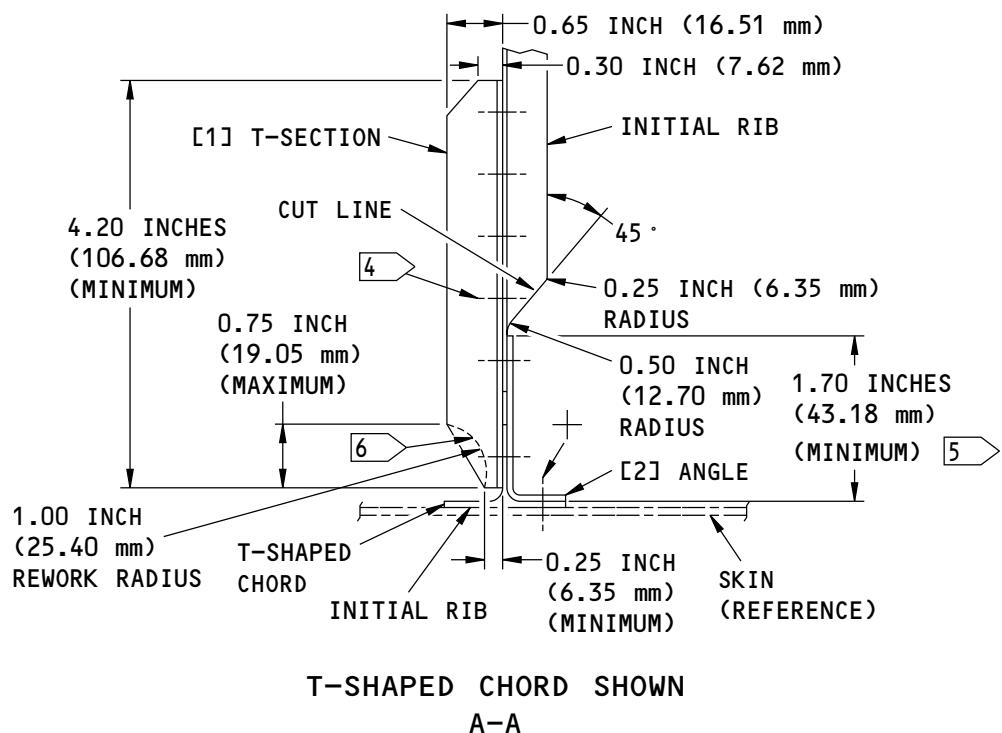
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Horizontal Stabilizer Rib Crack Repair
Figure 202 (Sheet 1 of 3)

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STRUCTURAL REPAIR MANUAL



T-SHAPED CHORD SHOWN
A-A

1998558 S0000389674_V4

Horizontal Stabilizer Rib Crack Repair
Figure 202 (Sheet 2 of 3)

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STRUCTURAL REPAIR MANUAL

NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).
- D = DIAMETER OF THE FASTENER.
- [1] MAKE THE CUTOUT IF THE CRACK EXTENDS INTO THE WEB.
- [2] SIZE SHIM TO FIT.
- [3] MAKE SURE THERE ARE FOUR REPAIR FASTENERS IN THE PART [2] ANGLE ON EACH SIDE OF THE CUTOUT.
- [4] MAKE SURE THERE IS A MINIMUM OF FOUR ROWS OF THE REPAIR FASTENERS IN THE PART [1] T-SECTION ABOVE THE CUT LINE.
- [5] MAKE THE VERTICAL LEG OF THE PART [2] ANGLE A MINIMUM OF 1.70 INCHES (43.18 mm), BUT LARGE ENOUGH TO CLEAR THE CUTOUT IN THE WEB AND KEEP THE 2D EDGE MARGIN.
- [6] IT IS PERMITTED TO TRIM OUT 0.100 INCH (2.54 mm) MAX FROM THE T-SECTION IF A REPAIR FASTENER INTERFERES WITH THE T-SECTION. REWORK RADIUS TO 1.00 INCH.

FASTENER SYMBOLS

- + INITIAL LOWER INSPAR SKIN FASTENER LOCATION. INSTALL A BACR15CE5D RIVET (UP TO 1/32 INCH DIAMETER OVERSIZE). OVERDRIVE ALL BACR15CED RIVETS TO 1.4 TIMES DIAMATER.
- * REPAIR FASTENER LOCATION. INSTALL A BACR15FT5D RIVET OR EQUIVALENT. REFER TO SRM 51-40-03 FOR FASTENER SUBSTITUTION.

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Horizontal Stabilizer Rib Crack Repair
Figure 202 (Sheet 3 of 3)

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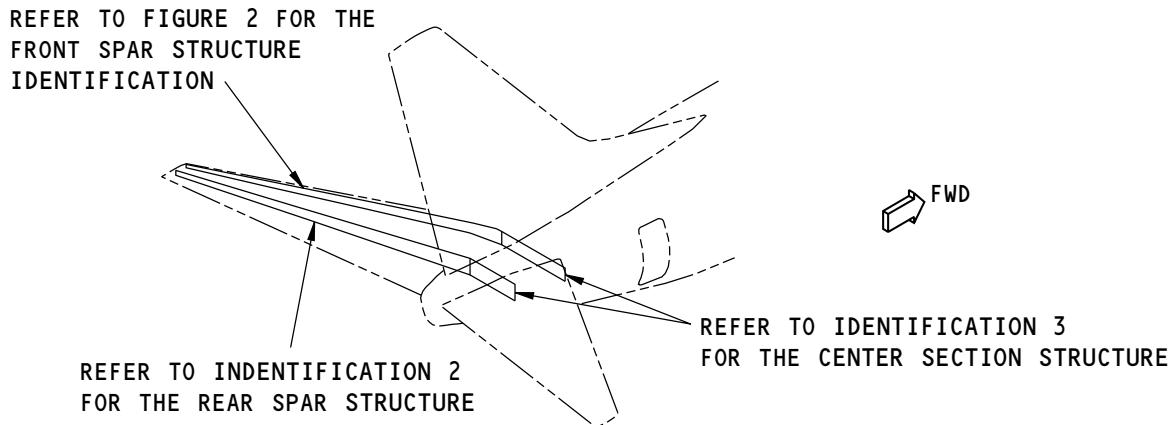
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IDENTIFICATION 1 - HORIZONTAL STABILIZER FRONT SPAR STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F87087 S0006592643_V1

Horizontal Stabilizer Front Spar Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
182A0001	Torque Box Functional Collector - Left Horizontal Stabilizer
182A0002	Torque Box Functional Collector - Right Horizontal Stabilizer
182A2401	Front Spar Assembly/Installation-Horizontal Stabilizer
001A8001	Section 82 Left Horizontal Stabilizer - Product Collector
001A8002	Section 82 Right Horizontal Stabilizer - Product Collector

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IDENTIFICATION 1

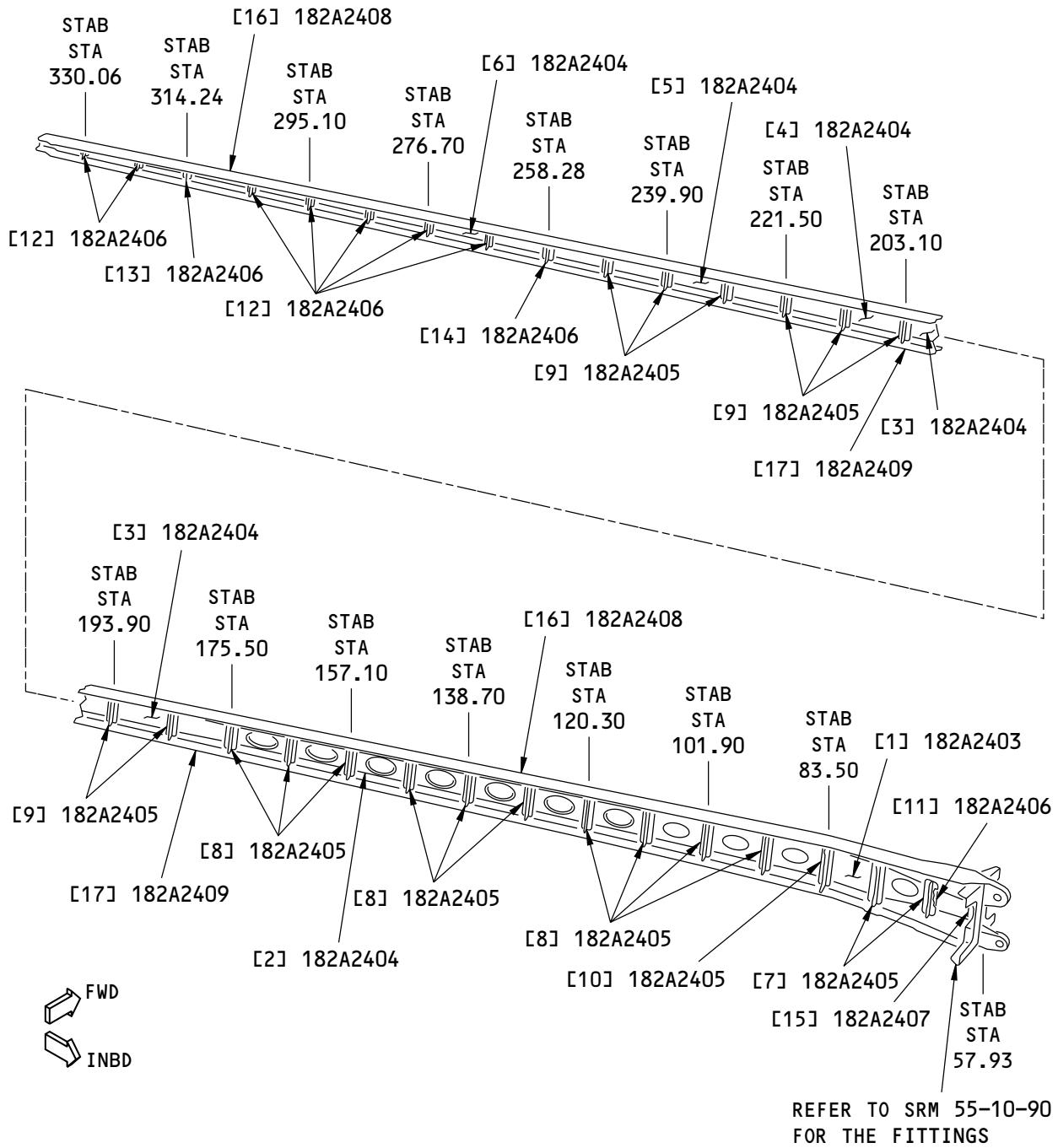
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F86970 S0006592645_V1

**Horizontal Stabilizer Front Spar Structure Identification
Figure 2**

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IDENTIFICATION 1

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Web		7075-T7351 plate as given in QQ-A-250/12. Refer to Figure 3 for the machined thicknesses	
[2]	Web	0.080 (2.03)	7075-T62 clad sheet as given in QQ-A-250/13	
[3]	Web	0.063 (1.60)	7075-T6 clad sheet as given in QQ-A-250/13	
[4]	Web	0.056 (1.42)	7075-T6 clad sheet as given in QQ-A-250/13	
[5]	Web	0.050 (1.27)	7075-T6 clad sheet as given in QQ-A-250/13	
[6]	Web	0.032 (0.81)	7075-T6 clad sheet as given in QQ-A-250/13	
[7]	Stiffener		BAC1506-4367 7075-T73511 extrusion as given in QQ-A-200/11	
[8]	Stiffener		BAC1506-4343 7075-T73511 extrusion as given in QQ-A-200/11	
[9]	Stiffener		BAC1506-4342 7075-T73511 extrusion as given in QQ-A-200/11	
[10]	Stiffener		BAC1506-4351 7075-T73511 extrusion as given in QQ-A-200/11	
[11]	Stiffener		BAC1506-4380 7075-T73511 extrusion as given in QQ-A-200/11	
[12]	Stiffener		BAC1506-4328 7075-T73511 extrusion as given in QQ-A-200/11	
[13]	Stiffener		BAC1506-4329 7075-T73511 extrusion as given in QQ-A-200/11	
[14]	Stiffener		BAC1506-4327 7075-T73511 extrusion as given in QQ-A-200/11	
[15]	Fitting		7050-T7451 plate as given in AMS 4050	
[16]	Upper Spar Chord		BAC1506-4432 7150-T77511 extrusion as given in BMS 7-306	
[17]	Lower Spar Chord		BAC1506-4431 7150-T77511 extrusion as given in BMS 7-306	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

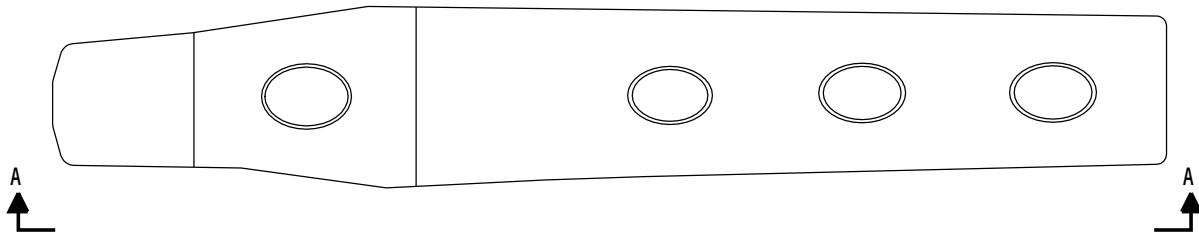
Page 3

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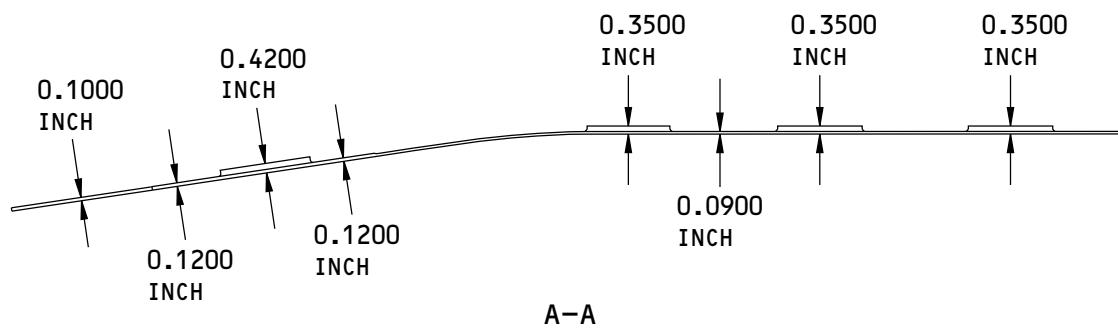
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INBOARD FRONT SPAR WEB



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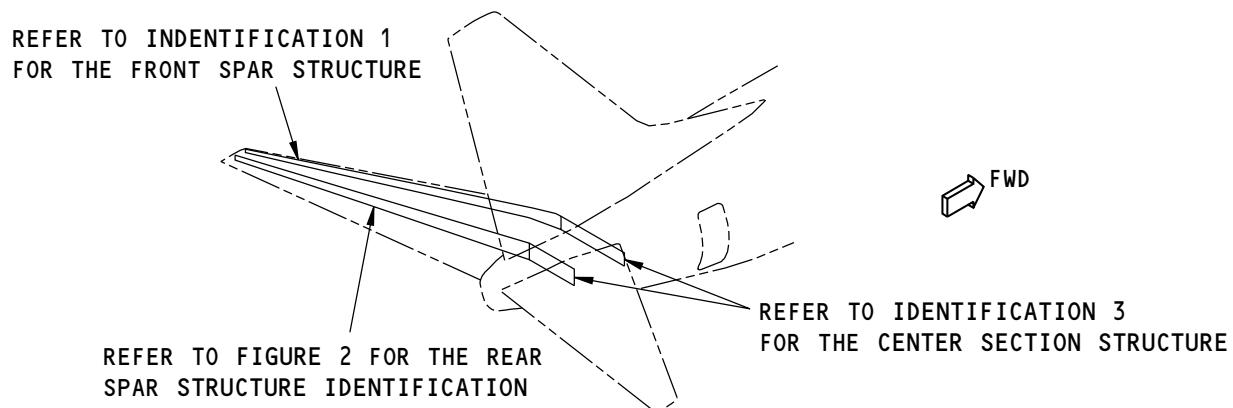
Machined Areas of Figure 2, Item [1]
Figure 3

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IDENTIFICATION 2 - HORIZONTAL STABILIZER REAR SPAR STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F87094 S0006592649_V1

Horizontal Stabilizer Rear Spar Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A8001	Section 82 Left Horizontal Stabilizer - Product Collector
001A8002	Section 82 Right Horizontal Stabilizer - Product Collector
182A1500	Rear Spar Assembly/Installation - Horizontal Stabilizer
185A0001	Trailing Edge Functional Collector - Left, Horizontal Stabilizer
185A0002	Trailing Edge Functional Collector - Right, Horizontal Stabilizer

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IDENTIFICATION 2

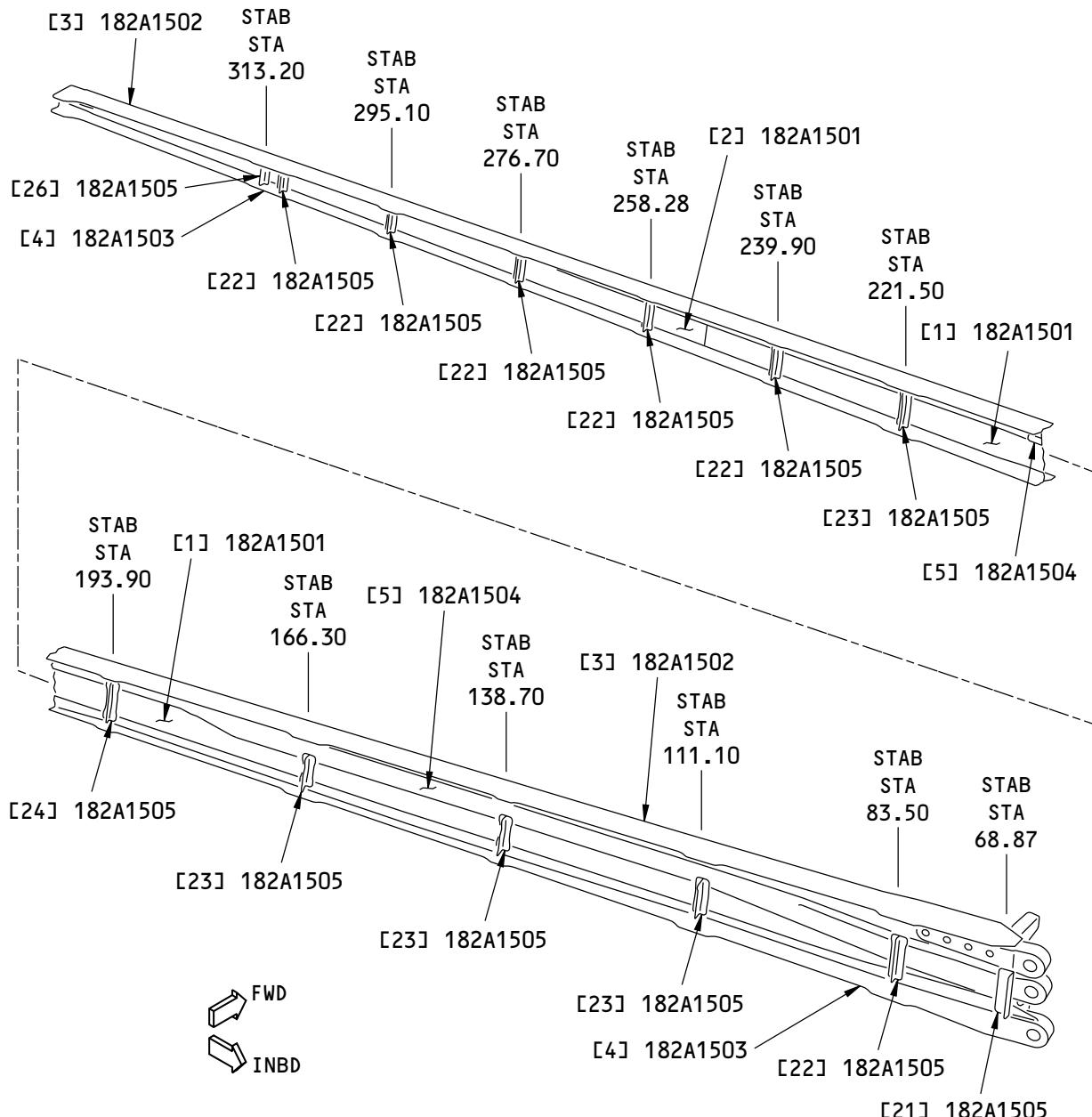
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VIEW LOOKING FORWARD

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F87702 S0006592651_V1

**Horizontal Stabilizer Rear Spar Structure Identification
Figure 2 (Sheet 1 of 2)**

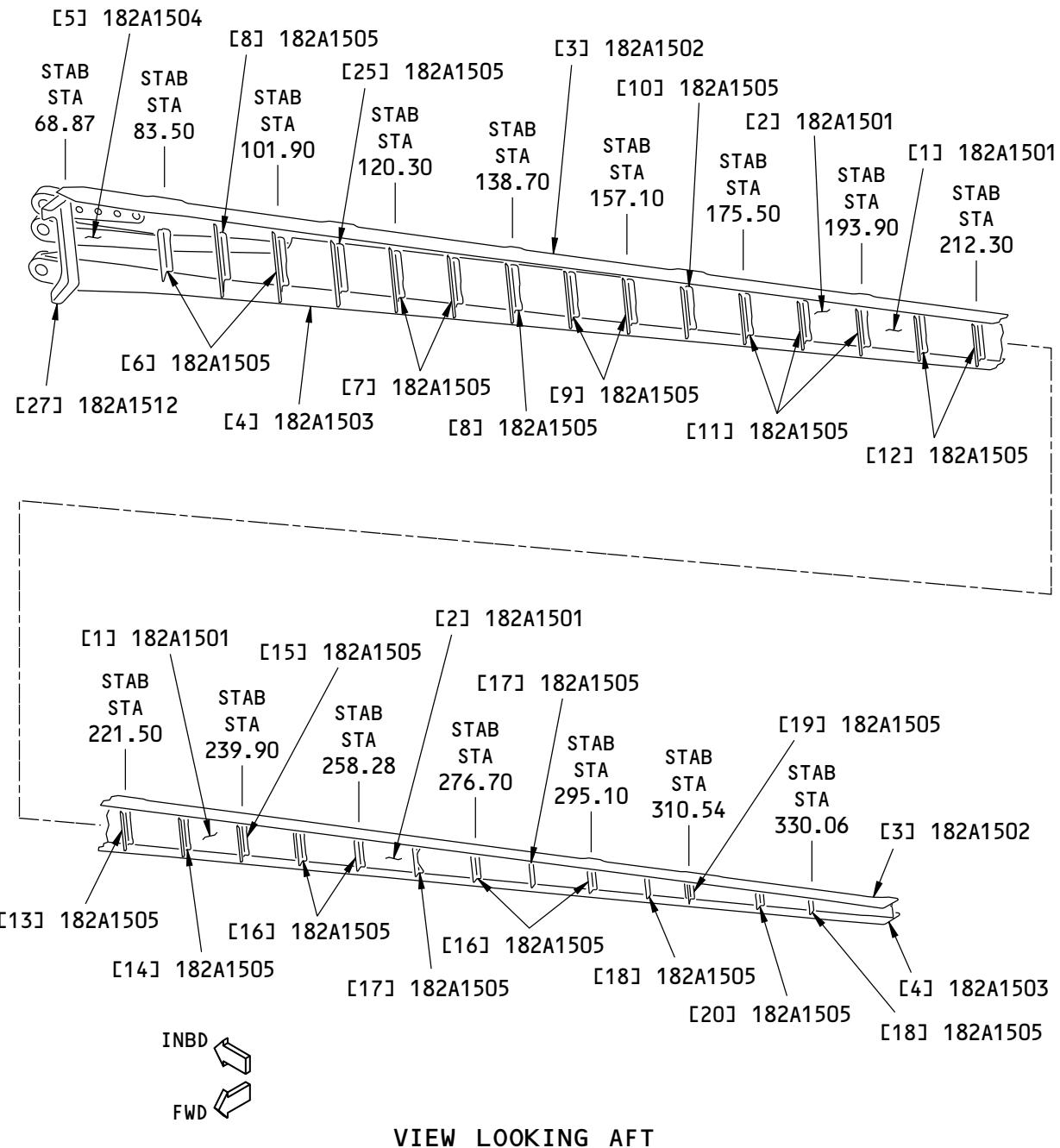
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IDENTIFICATION 2

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F87409 S0006592652_V1

**Horizontal Stabilizer Rear Spar Structure Identification
Figure 2 (Sheet 2 of 2)**

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Web - Inboard	0.125 (3.18)	7075-T6 sheet as given in QQ-A-250/12. Refer to Figure 3 for chem-mill thicknesses	
[2]	Web - Outboard	0.040 (1.02)	7075-T6 sheet as given in QQ-A-250/12. Refer to Figure 4 for chem-mill thicknesses	
[3]	Chord - Upper		BAC1506-4318 2024-T3511 extrusion as given in QQ-A-200/3	
[4]	Chord - Lower		BAC1506-4341 7150-T77511 extrusion as given in BMS7-306	
[5]	Chord - Failsafe		BAC1520-2787 7150-T77511 extrusion as given in BMS7-306	
[6]	Stiffener (2)		BAC1505-100416 7075-T6511 extrusion as given in QQ-A-200/11	
[7]	Stiffener (2)		BAC1506-4418 7075-T6511 extrusion as given in QQ-A-200/11	
[8]	Stiffener (2)		BAC1506-4415 7075-T6511 extrusion as given in QQ-A-200/11	
[9]	Stiffener (2)		BAC1506-4419 7075-T6511 extrusion as given in QQ-A-200/11	
[10]	Stiffener		BAC1506-4420 7075-T6511 extrusion as given in QQ-A-200/11	
[11]	Stiffener (3)		BAC1506-4421 7075-T6511 extrusion as given in QQ-A-200/11	
[12]	Stiffener (2)		BAC1506-4422 7075-T6511 extrusion as given in QQ-A-200/11	
[13]	Stiffener		BAC1506-4423 7075-T6511 extrusion as given in QQ-A-200/11	
[14]	Stiffener		BAC1506-4424 7075-T6511 extrusion as given in QQ-A-200/11	
[15]	Stiffener		BAC1506-4425 7075-T6511 extrusion as given in QQ-A-200/11	
[16]	Stiffener (4)		BAC1505-101672 7075-T6511 extrusion as given in QQ-A-200/11	
[17]	Stiffener (2)		BAC1503-101038 7075-T6511 extrusion as given in QQ-A-200/11	
[18]	Stiffener (2)		BAC1503-101039 7075-T6511 extrusion as given in QQ-A-200/11	
[19]	Stiffener		BAC1506-4426 7075-T6511 extrusion as given in QQ-A-200/11	
[20]	Stiffener		BAC1505-101673 7075-T6511 extrusion as given in QQ-A-200/11	
[21]	Stiffener		BAC1514-3284 7075-T6511 extrusion as given in QQ-A-200/11	
[22]	Stiffener (6)		BAC1506-4427 7075-T6511 extrusion as given in QQ-A-200/11	
[23]	Stiffener (4)		BAC1506-4428 7075-T6511 extrusion as given in QQ-A-200/11	

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Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[24]	Stiffener		BAC1506-4429 7075-T6511 extrusion as given in QQ-A-200/11	
[25]	Stiffener		BAC1506-4417 7075-T6511 extrusion as given in QQ-A-200/11	
[26]	Stiffener		BAC1506-4430 7075-T6511 extrusion as given in QQ-A-200/11	
[27]	Fitting (2)		7075-T7351 plate as given in QQ-A-250/12	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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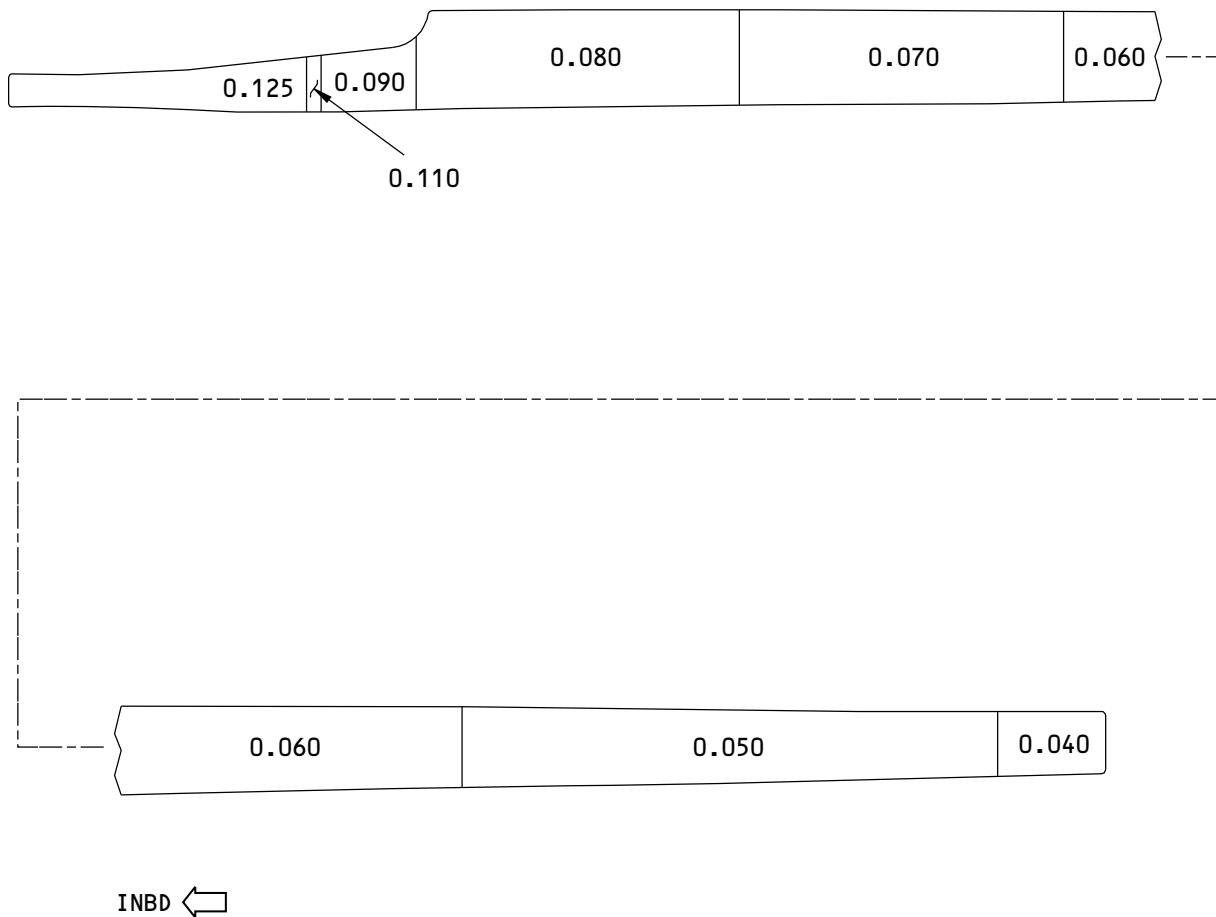
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F87817 S0006592654_V1

Chem-Milled Areas of Figure 2, Item [1]
Figure 3

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0.040	0.032
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INBD <input type="checkbox"/>

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**Chem-Milled Areas of Figure 2, Item [2]
Figure 4**

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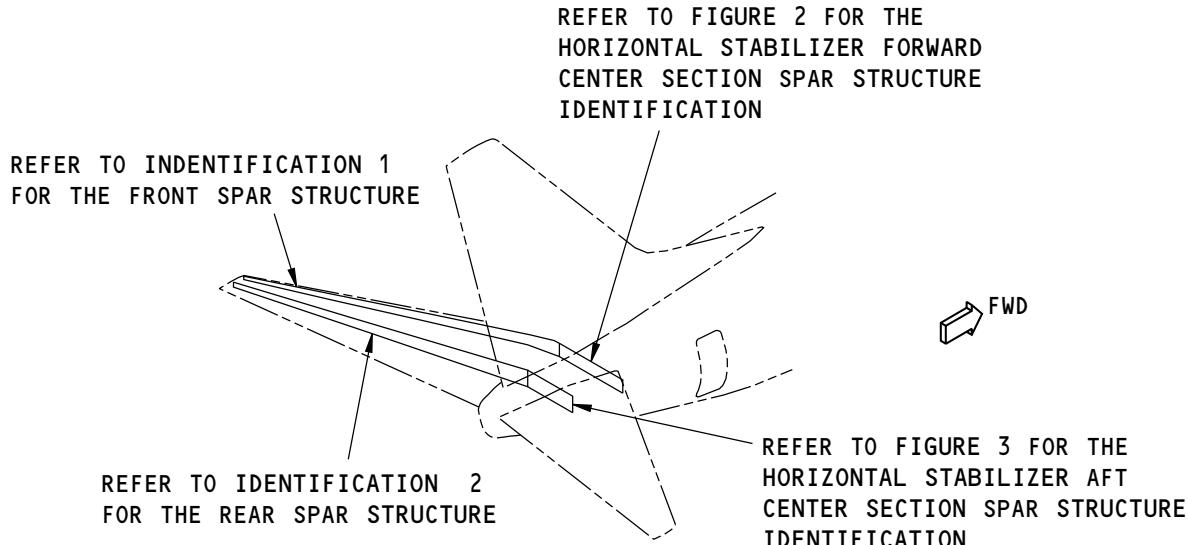
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IDENTIFICATION 3 - HORIZONTAL STABILIZER CENTER SECTION SPAR STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F88442 S0006592657_V1

Horizontal Stabilizer Center Section Spar Structure Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A4001	Fuselage Product Collector
140A0810	Center Section Functional Collector Horizontal Tail
181A1000	Rear Spar Installation, Center Section, Horizontal Stabilizer
181A1110	Rear Spar Fitting - Upper, Center Section Horizontal Tail
181A1120	Rear Spar Fitting - Center Section Horizontal Tail
181A2000	Front Spar Installation - Center Section Horizontal Tail

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IDENTIFICATION 3

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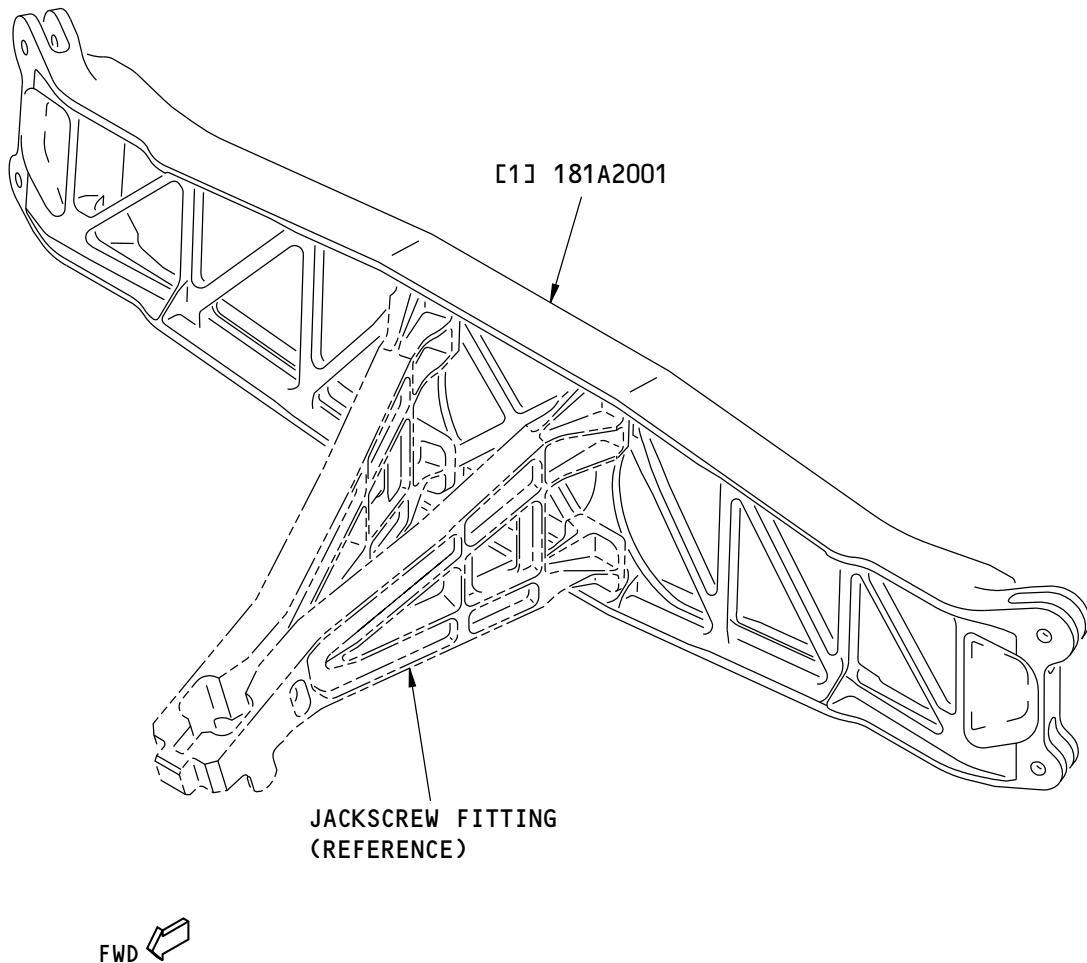
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F88695 S0006592659_V2

**Horizontal Stabilizer Forward Center Section Spar Structure Identification
Figure 2**

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Front Spar Fitting		7050-T74 die forging as given in BMS 7-214	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 3

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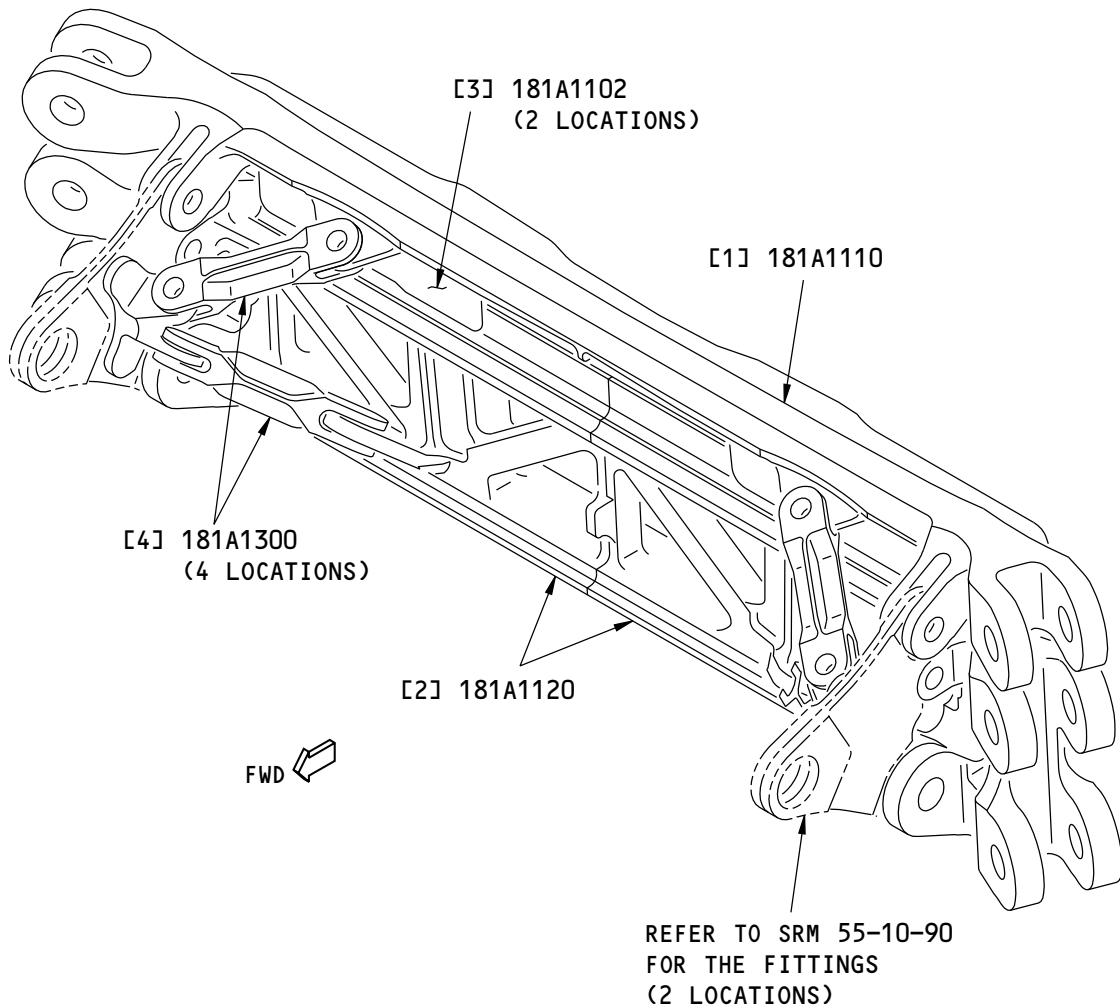
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NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

F88431 S0006592661_V1

Horizontal Stabilizer Aft Center Section Spar Structure Identification
Figure 3

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IDENTIFICATION 3
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Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rear Spar Fitting - Upper		Ti-6Al-4V titanium forging as given in BMS 7-247	
[2]	Rear Spar Fitting - Lower		7050-T74 forging as given in BMS 7-214	
[3]	Web-Splice	0.125 (3.18)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1, in the annealed condition	
[4]	Upper and Lower Brace Fitting (LH and RH)		7050-T7451 plate as given in BMS 7-323, Type I	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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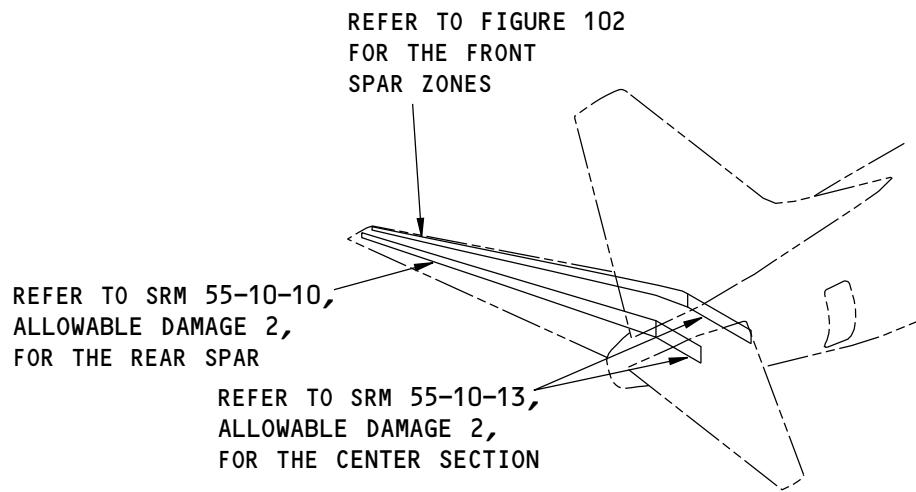


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ALLOWABLE DAMAGE 1 - HORIZONTAL STABILIZER FRONT SPAR

1. Applicability

- A. This subject gives the allowable damage limits for the horizontal stabilizer front spar shown in Horizontal Stabilizer Front Spar Location, Figure 101/ALLOWABLE DAMAGE 1 and Horizontal Stabilizer Front Spar Structure and Allowable Damage Zones , Figure 102/ALLOWABLE DAMAGE 1.



Horizontal Stabilizer Front Spar Location
Figure 101

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ALLOWABLE DAMAGE 1

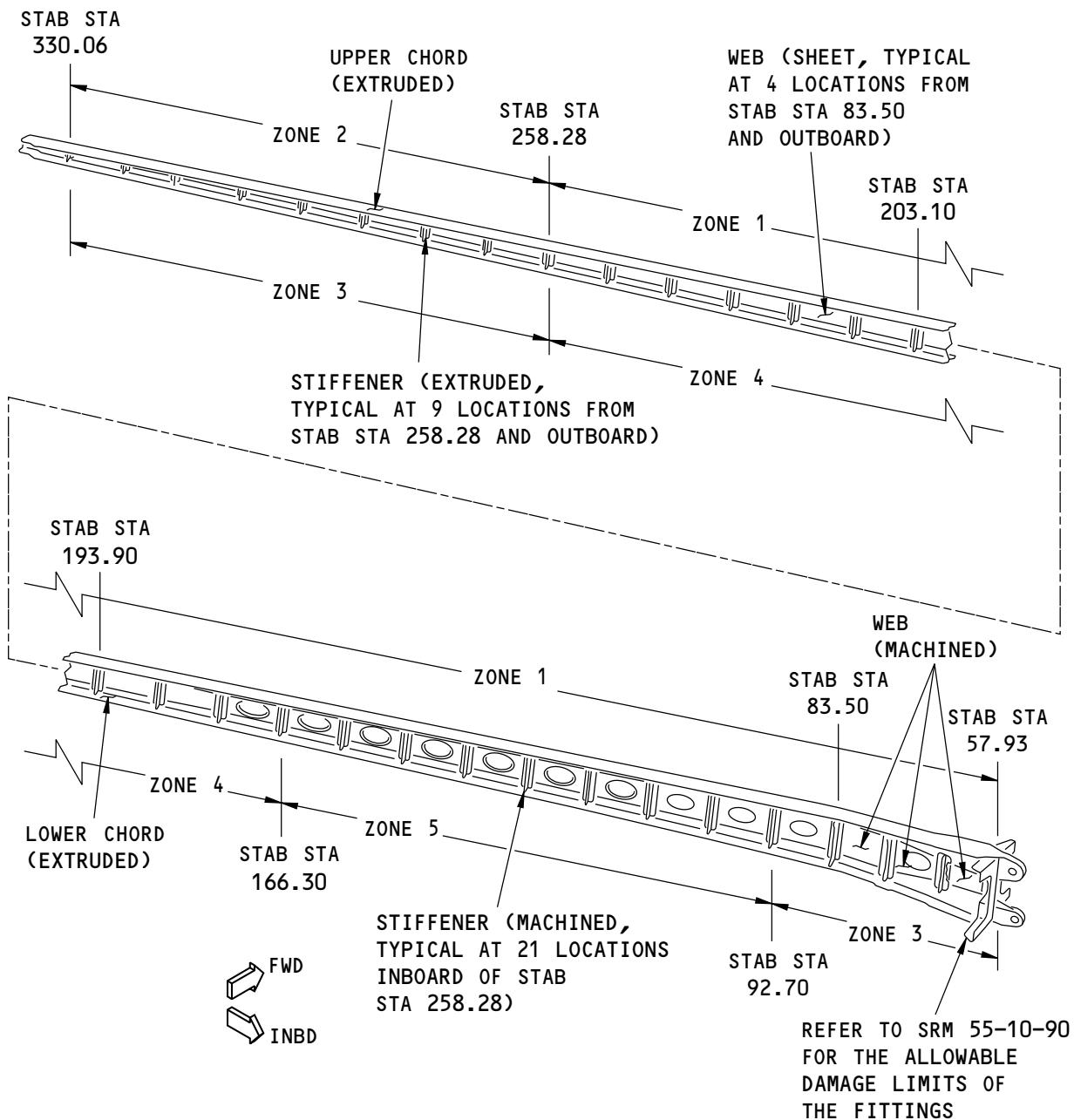
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NOTE: ALL PARTS IDENTIFIED ARE MADE OF ALUMINUM.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

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Horizontal Stabilizer Front Spar Structure and Allowable Damage Zones
Figure 102

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ALLOWABLE DAMAGE 1

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2. General

- A. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references of the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS			
TYPE OF STRUCTURE	ZONE	STABILIZER STATION	PARAGRAPH
Upper Chord	1	258.28 and inboard	4.A
	2	258.28 and outboard	4.
Lower Chord	3	92.70 and inboard 258.28 and outboard	4.C
	4	258.28 to 166.30	4.D
	5	166.30 to 92.70	4.E
Webs	----	All	4.F
Stiffeners	----	All	4.G

- B. Remove the damage as necessary.

- (1) Refer to 51-10-02 for the inspection and removal of damage.
- (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
- (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

- C. After you remove the damage, do the procedures that follow.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the surfaces of the upper and lower chords if you remove the damage.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- (3) Apply two layers of BMS 10-79, Type III, primer to the reworked areas of the upper and lower chords. Refer to SOPM 20-44-04.
- (4) Apply one layer of BMS 10-11, Type I, primer to the reworked areas of the stiffeners and the webs. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05, GENERAL	Repair Sealing
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
SOPM 20-10-03	SHOT PEENING

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ALLOWABLE DAMAGE 1

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(Continued)

Reference	Title
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Upper Chord - Zone 1

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Upper Chord - Zone 2

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Lower Chord - Zone 3

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

D. Lower Chord - Zone 4

- (1) Cracks are not permitted.
- (2) Nicks, Gouges, Scratches and Corrosion are not permitted.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

E. Lower Chord - Zone 5

- (1) Cracks are not permitted.

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ALLOWABLE DAMAGE 1

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- (2) Nicks, Gouges, Scratches and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

F. Webs

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and G.
- (2) Nicks, Gouges, Scratches and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, D, F, G, and I.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail H.
- (4) Holes and Punctures are permitted if:
 - (a) They are a maximum of 0.25 inch (6.4 mm) in diameter
 - (b) They are a minimum of 4D (D = the diameter of the damage) away from a hole, a part edge, or other damage
 - (c) They are filled with a 2117-T3 or 2117-T4 aluminum protruding head rivet.
 - 1) Install the rivet without sealant.
 - (d) There is not more than two holes or punctures in each bay between two stiffeners.

G. Stiffeners

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

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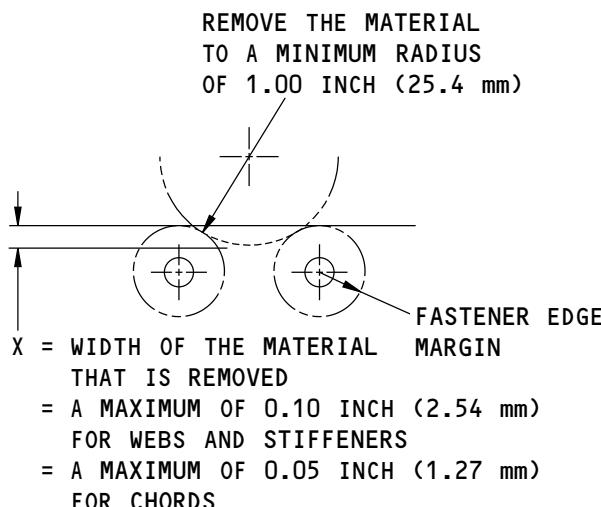
ALLOWABLE DAMAGE 1

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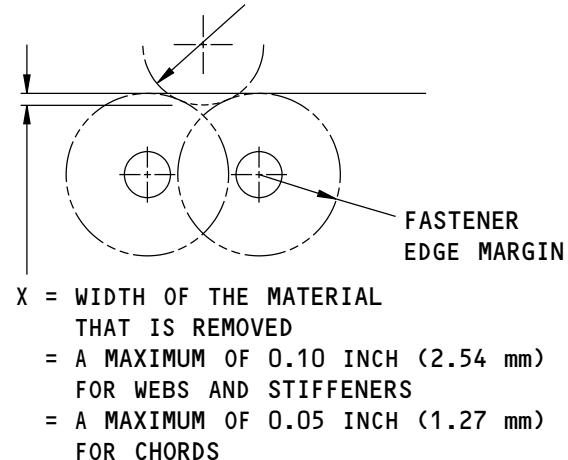
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REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

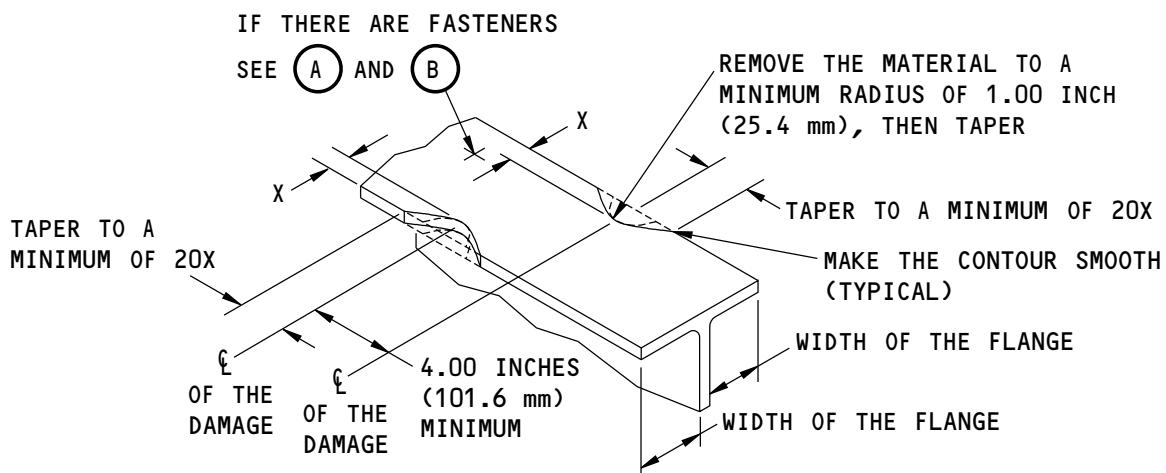
REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.4 mm)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(A)

(B)



REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(C)

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**Allowable Damage Limits
Figure 103 (Sheet 1 of 8)**

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ALLOWABLE DAMAGE 1

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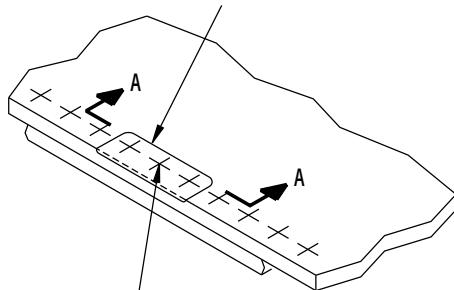
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THE REMOVAL OF MATERIAL AROUND THREE
FASTENERS IN ALL GROUPS OF TEN IS
PERMITTED TO A MAXIMUM DEPTH OF X



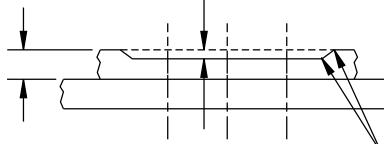
REMOVE THE FASTENERS BEFORE THE
DAMAGE IS REMOVED. INSTALL THE
FASTENERS AFTER THE DAMAGE IS REMOVED

REMOVAL OF DAMAGE AROUND THE
FASTENERS ON AN EDGE OR A SURFACE

(D)

X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10T FOR STIFFENERS
= A MAXIMUM OF 0.05T FOR WEBS
= A MAXIMUM DEPTH AS GIVEN IN TABLE 102
OF DETAIL F FOR CHORDS

T = THICKNESS OF
THE MATERIAL



MAKE THE CONTOUR SMOOTH
TO A MINIMUM RADIUS OF
0.50 INCH (12.7 mm) (TYPICAL)

A-A

G14424 S0006592669_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 8)

55-10-10

ALLOWABLE DAMAGE 1

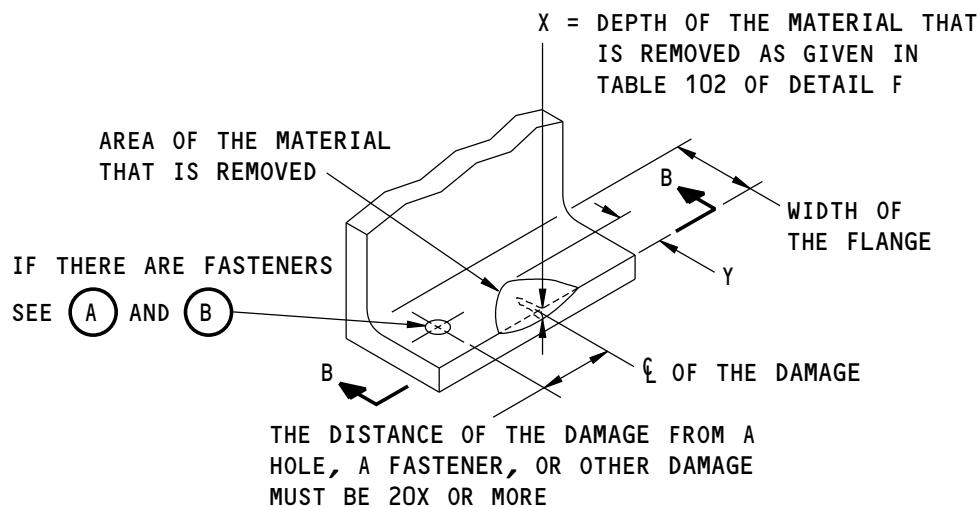
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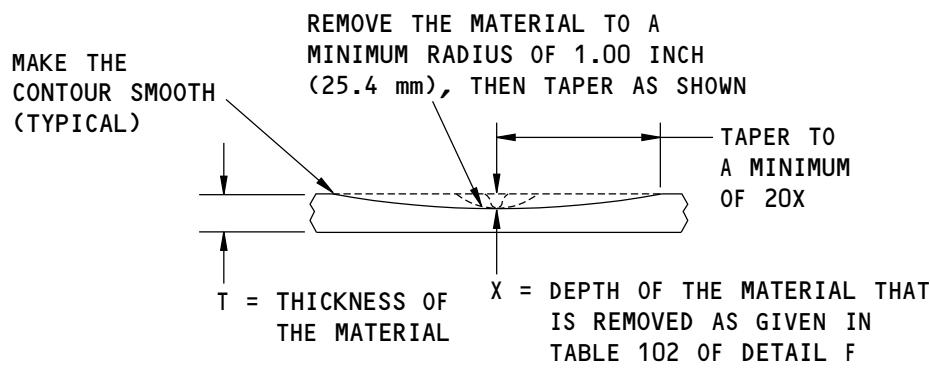
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Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(E)



B-B

G49282 S0006592670_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 8)

55-10-10

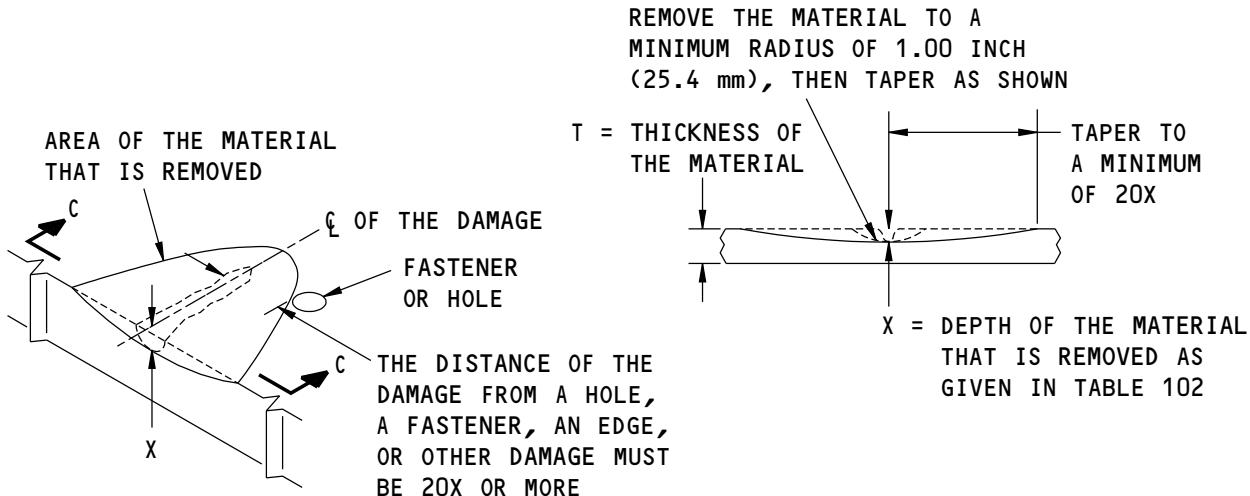
ALLOWABLE DAMAGE 1

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NOTE: REFER TO FIGURE 102 FOR THE ALLOWABLE DAMAGE ZONES.

**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

C-C

(F)

DEPTH OF THE REMOVED MATERIAL		
TYPE OF STRUCTURE	ZONE	MAXIMUM PERCENT OF THE INITIAL THICKNESS
UPPER CHORD	1	10
	2	10
LOWER CHORD	3	10
	4	NO DAMAGE PERMITTED
	5	5
WEB	-	15
STIFFENERS	-	10

TABLE 102

G39020 S0006592671_V1

**Allowable Damage Limits
Figure 103 (Sheet 4 of 8)**

55-10-10

ALLOWABLE DAMAGE 1

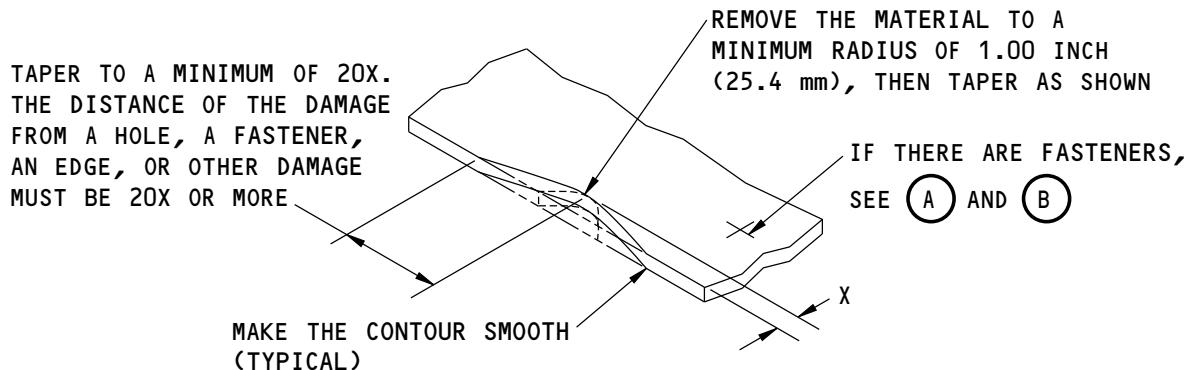
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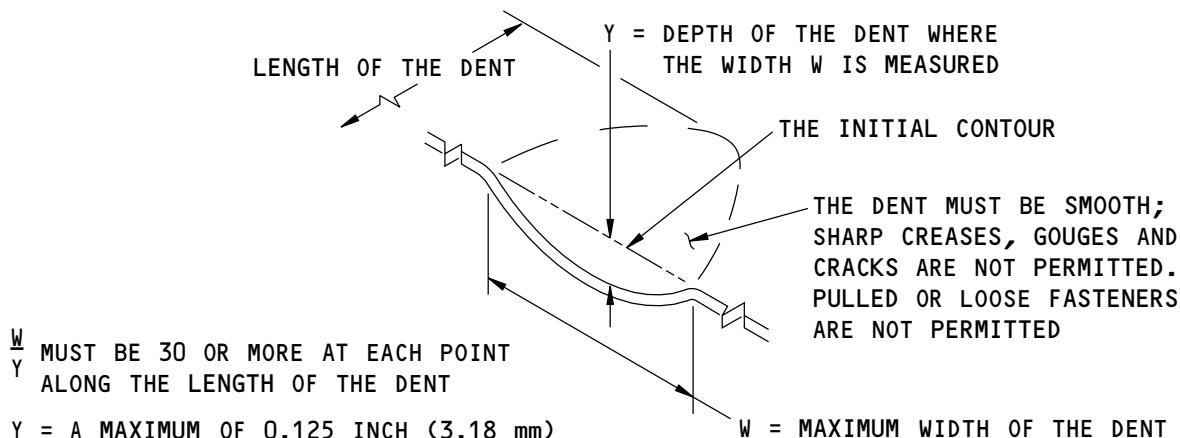
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X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL SKIN OR WEB

(G)



DENT THAT IS PERMITTED

(H)

G14420 S0006592672_V1

Allowable Damage Limits
Figure 103 (Sheet 5 of 8)

55-10-10

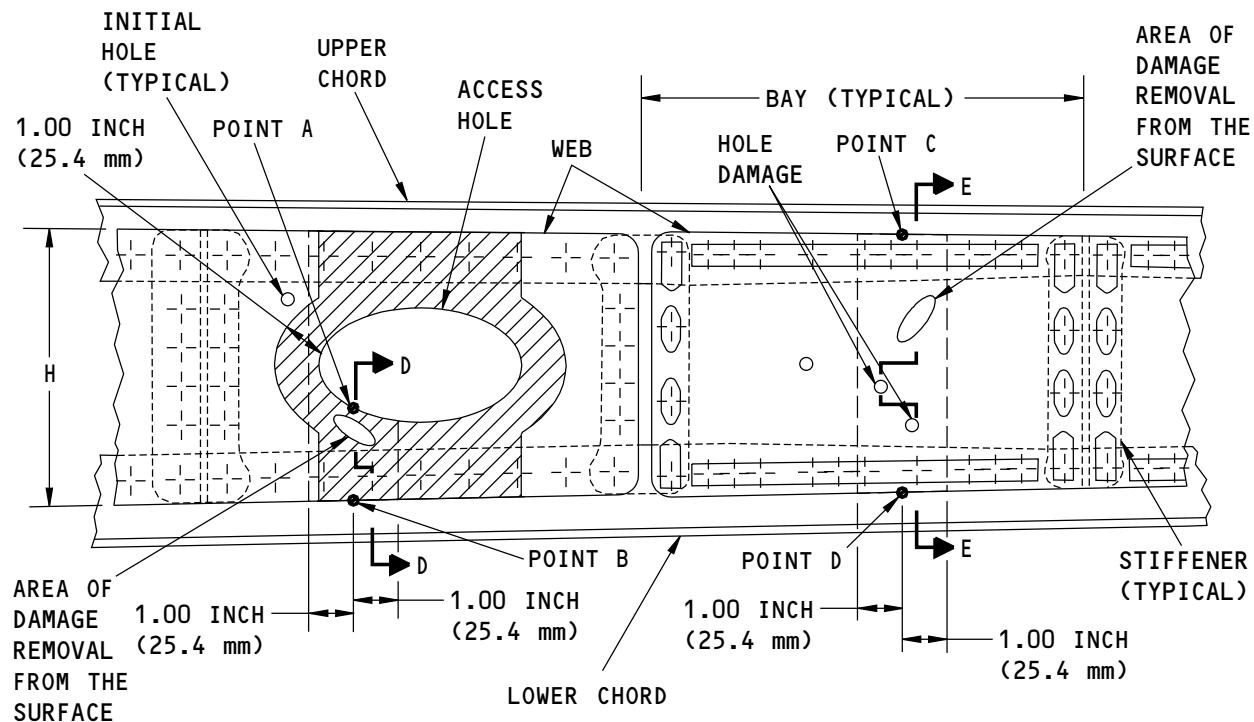
ALLOWABLE DAMAGE 1

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H = HEIGHT OF THE WEB

OUTBD

ZONE A: NO HOLE DAMAGE PERMITTED

REMOVAL OF DAMAGED MATERIAL FROM A WEB

(I)

G39018 S0006592673_V1

**Allowable Damage Limits
Figure 103 (Sheet 6 of 8)**

55-10-10

ALLOWABLE DAMAGE 1

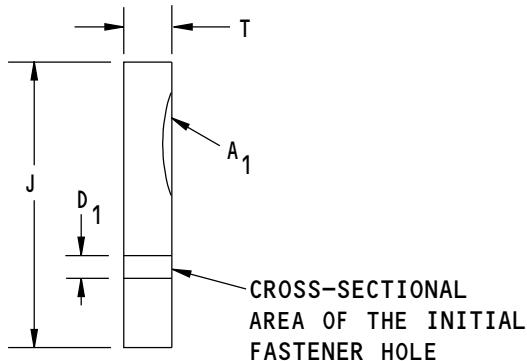
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D_1 = DIAMETER OF THE INITIAL FASTENER HOLE

J = HEIGHT OF THE WEB IN SECTION D-D

T = THICKNESS OF THE WEB

A_i = INITIAL AREA OF THE WEB

= THE TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL HOLES (AS MANUFACTURED BY BOEING)

$$= JT - D_1 T$$

A_1 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 1

$$\left(\frac{A_1}{A_i} \right) \times 100 = \text{PERCENT OF CROSS-SECTIONAL AREA REMOVED}$$

= A MAXIMUM OF 10 PERCENT

THE TOTAL CROSS-SECTIONAL AREA REMOVED IN ALL ZONES A-B (1.00 INCH (25.4 mm) ON EACH SIDE OF A LINE A-B) MUST NOT BE MORE THAN 10 PERCENT OF THE INITIAL AREA OF THE WEB.

D-D

G39012 S0006592674_V1

Allowable Damage Limits
Figure 103 (Sheet 7 of 8)

55-10-10

ALLOWABLE DAMAGE 1

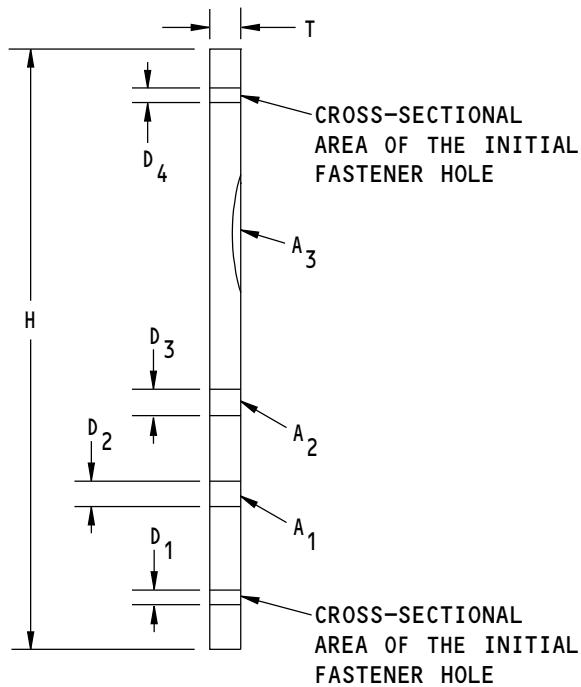
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D₁, D₄ = DIAMETERS OF THE INITIAL FASTENER HOLES

D₂, D₃ = DIAMETERS OF THE HOLES WHERE THERE IS DAMAGE

H = HEIGHT OF THE WEB AT THE CROSS-SECTION

T = THICKNESS OF THE WEB

A_i = INITIAL AREA OF THE WEB

= THE TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL
FASTENERS HOLES (AS MANUFACTURED BY BOEING)

$$= HT - D_1 T - D_4 T$$

A₁ = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 1

A₂ = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 2

A₃ = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 3

$$\left(\frac{A_1 + A_2 + A_3}{A_i} \right) \times 100 = \text{PERCENT OF CROSS-SECTIONAL AREA REMOVED}$$

= A MAXIMUM OF 15 PERCENT

THE TOTAL CROSS-SECTIONAL AREA REMOVED IN ALL ZONES C-D (1.00 INCH (25.4 mm) ON
EACH SIDE OF A LINE C-D) MUST NOT BE MORE THAN 15 PERCENT OF THE INITIAL AREA OF
THE WEB

E-E

G39009 S0006592675_V1

Allowable Damage Limits
Figure 103 (Sheet 8 of 8)

55-10-10

ALLOWABLE DAMAGE 1

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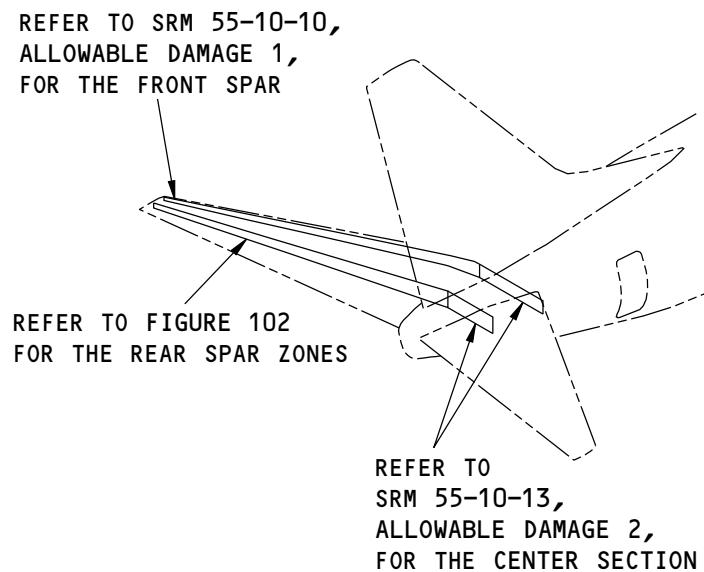


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ALLOWABLE DAMAGE 2 - HORIZONTAL STABILIZER REAR SPAR

1. Applicability

- A. This subject gives the allowable damage limits for the horizontal stabilizer rear spar shown in Horizontal Stabilizer Rear Spar Location, Figure 101/ALLOWABLE DAMAGE 2 and Horizontal Stabilizer Rear Spar Structure and Allowable Damage Zones , Figure 102/ALLOWABLE DAMAGE 2.



Horizontal Stabilizer Rear Spar Location
Figure 101

G30855 S0006592677_V1

55-10-10

ALLOWABLE DAMAGE 2

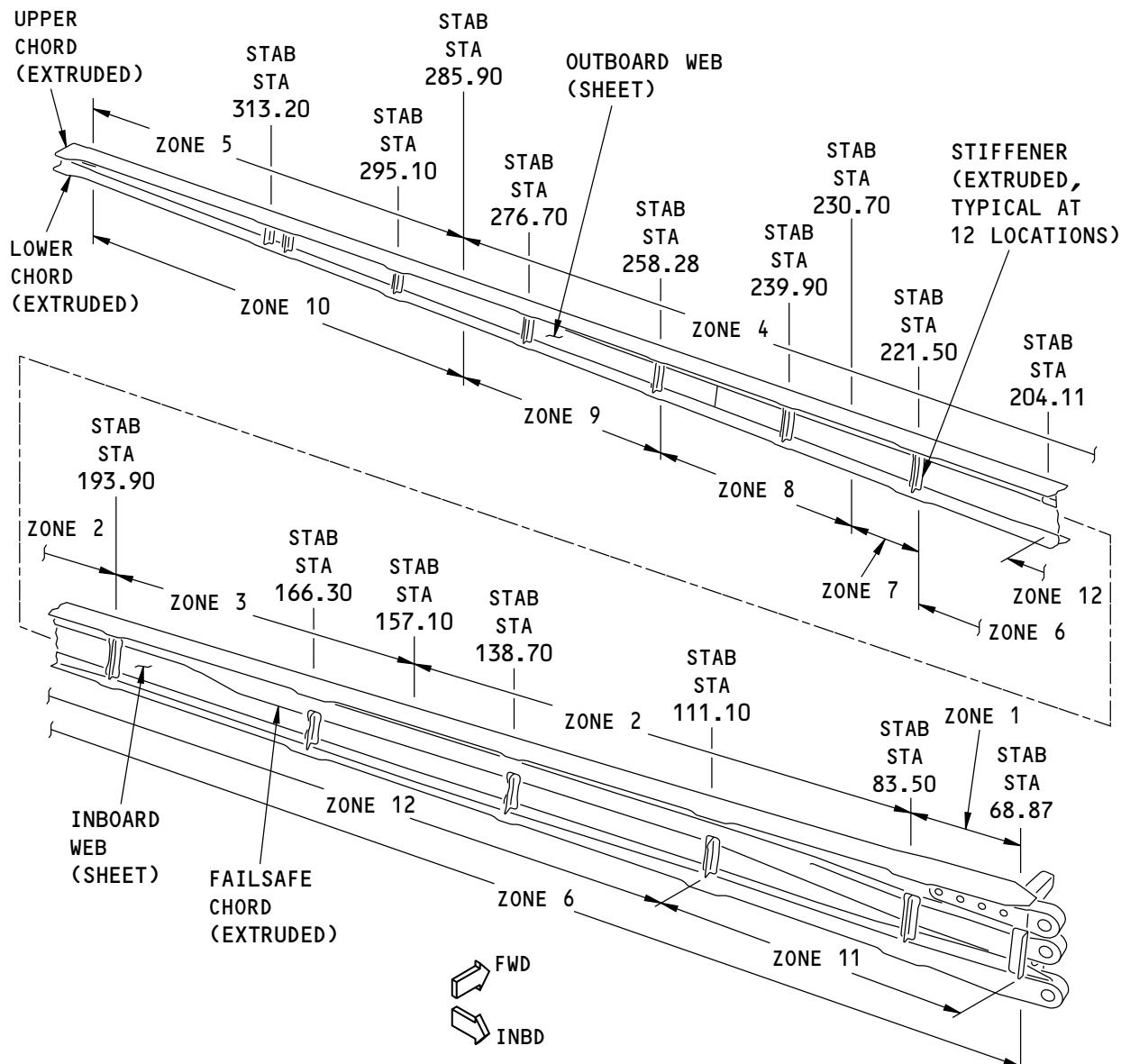
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

NOTES

- ALL PARTS IDENTIFIED ARE MADE OF ALUMINUM.
- ZONES 1, 2, 3, 4 AND 5 ARE APPLICABLE TO THE UPPER CHORD.
- ZONES 6,7,8,9, and 10 ARE APPLICABLE TO THE LOWER CHORD.
- ZONES 11 AND 12 ARE APPLICABLE TO THE FAILSAFE CHORD.

G31202 S0006592678_V1

Horizontal Stabilizer Rear Spar Structure and Allowable Damage Zones
Figure 102 (Sheet 1 of 2)

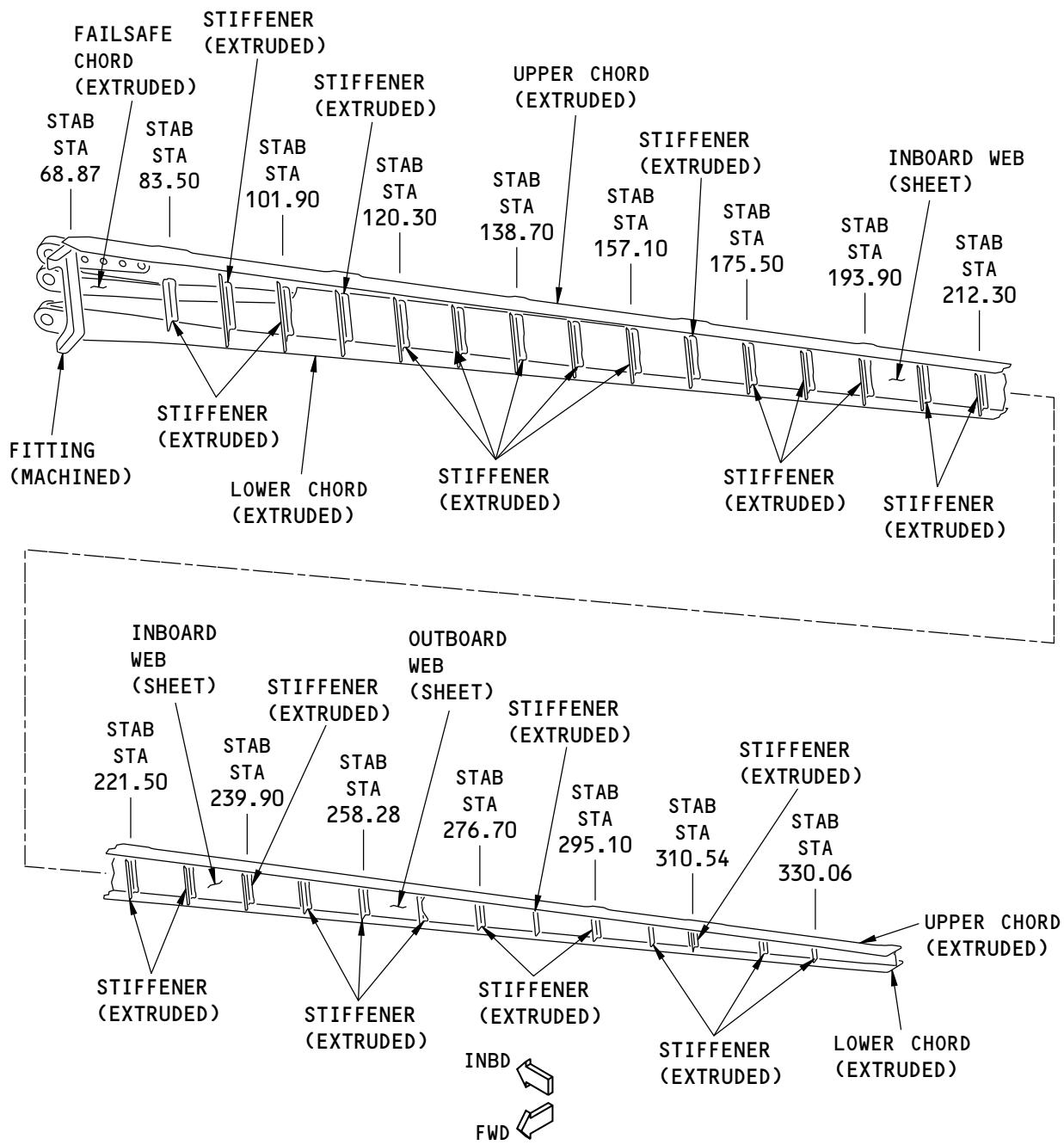
55-10-10

ALLOWABLE DAMAGE 2

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FORWARD SIDE OF SPAR

G59654 S0006592679_V1

Horizontal Stabilizer Rear Spar Structure and Allowable Damage Zones
Figure 102 (Sheet 2 of 2)

55-10-10

ALLOWABLE DAMAGE 2

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2. General

- A. Refer to Table 101/ALLOWABLE DAMAGE 2 for the references of the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS			
TYPE OF STRUCTURE	ZONE	STABILIZER STATION	PARAGRAPH
Upper Chord	1	68.87 thru 83.50	4.A
	2	83.50 thru 157.10	4.A
	3	157.10 thru 193.90	4.A
	4	193.90 thru 285.90	4.A
	5	285.90 and outboard	4.A
Lower Chord	6	68.87 thru 221.50	4.B
	7	221.50 thru 230.70	4.B
	8	230.70 thru 258.28	4.B
	9	258.28 thru 285.90	4.B
	10	285.90 and outboard	4.B
Failsafe Chord	11	68.87 thru 111.10	4.C
	12	111.10 thru 204.11	4.C
Webs	----	All	4.D
Stiffeners, Fitting	----	All	4.E

- B. Remove the damage as necessary.

- (1) Refer to 51-10-02 for the inspection and removal of damage.
- (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
- (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

- C. After you remove the damage, do the procedures that follow.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the surfaces of the upper and lower chords if you remove the damage.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- (3) Apply two layers of BMS 10-79, Type III, primer to the reworked areas of the upper and lower chords. Refer to SOPM 20-44-04.
- (4) Apply one layer of BMS 10-11, Type I, primer to the reworked areas of the stiffeners, fitting, and the webs. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE



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(Continued)

Reference	Title
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05, GENERAL	Repair Sealing
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Upper Chord - Zones 1 thru 5

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Lower Chord - Zones 6 thru 10

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Failsafe Chord - Zones 11 and 12

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

D. Webs

55-10-10

ALLOWABLE DAMAGE 2

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- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and G.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, D, F, G d I.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail H.
- (4) Holes and Punctures are permitted if:
 - (a) They are a maximum of 0.25 inch (6.4 mm) in diameter
 - (b) They are a minimum of 4D (D = the diameter of the damage) away from a hole, a part edge, or other damage
 - (c) They are filled with a 2117-T3 or 2117-T4 aluminum protruding head rivet
 - 1) Install the rivet without sealant.
 - (d) There is not more than two holes or punctures in each bay between two stiffeners.

E. Stiffeners and Fittings

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, C, D, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail J.

55-10-10

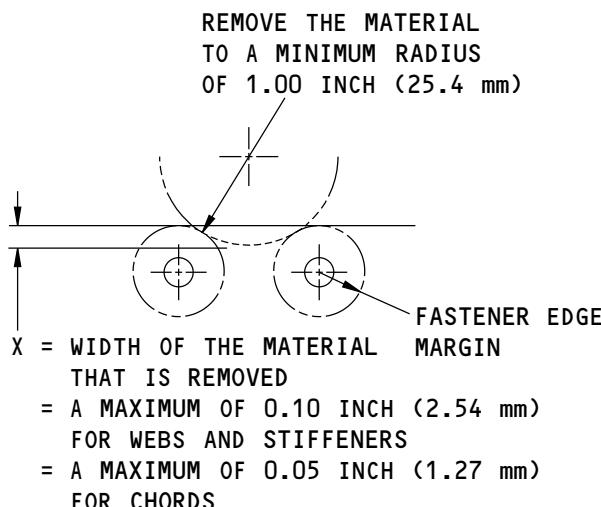
ALLOWABLE DAMAGE 2

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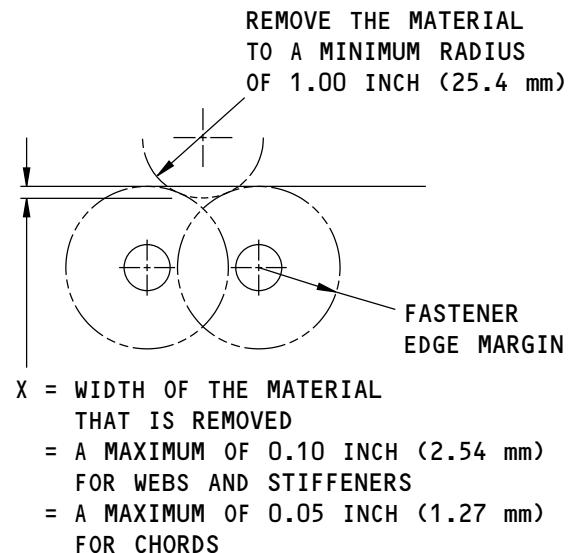
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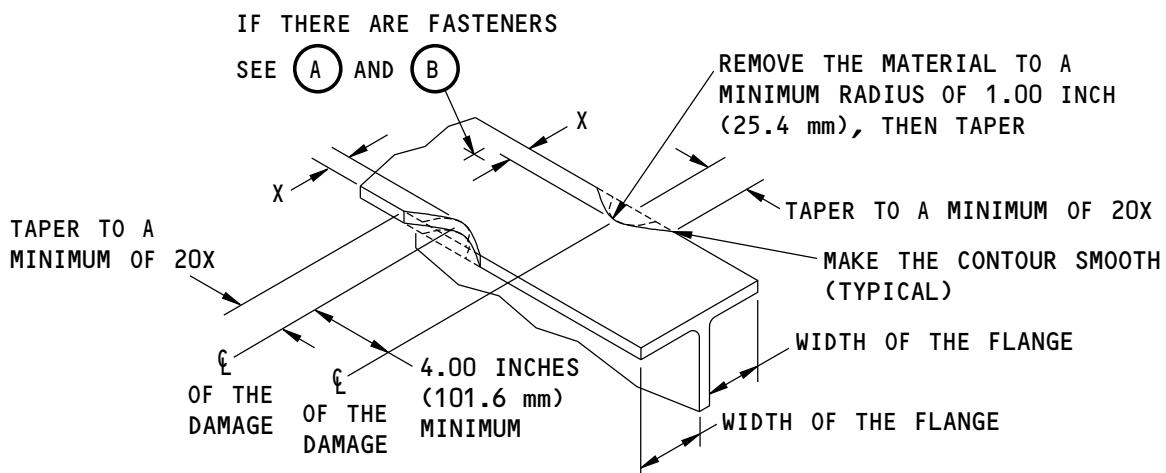
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(A)

(B)



REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(C)

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Allowable Damage Limits
Figure 103 (Sheet 1 of 10)

55-10-10

ALLOWABLE DAMAGE 2

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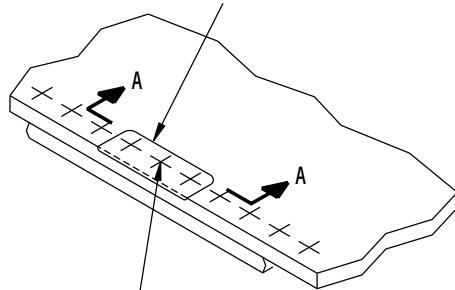
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THE REMOVAL OF MATERIAL AROUND THREE
FASTENERS IN ALL GROUPS OF TEN IS
PERMITTED TO A MAXIMUM DEPTH OF X

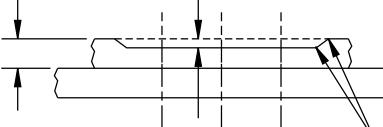


REMOVE THE FASTENERS BEFORE THE
DAMAGE IS REMOVED. INSTALL THE
FASTENERS AFTER THE DAMAGE IS REMOVED

REMOVAL OF DAMAGE AROUND THE
FASTENERS ON AN EDGE OR A SURFACE



T = THICKNESS OF THE
MATERIAL AS GIVEN
BY THE NOMINAL
THICKNESS ON THE
PRODUCTION DRAWING X = DEPTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.10T



MAKE THE CONTOUR SMOOTH
TO A MINIMUM RADIUS OF
0.50 INCH (12.7 mm) (TYPICAL)

A-A

G28567 S0006592682_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 10)

55-10-10

ALLOWABLE DAMAGE 2

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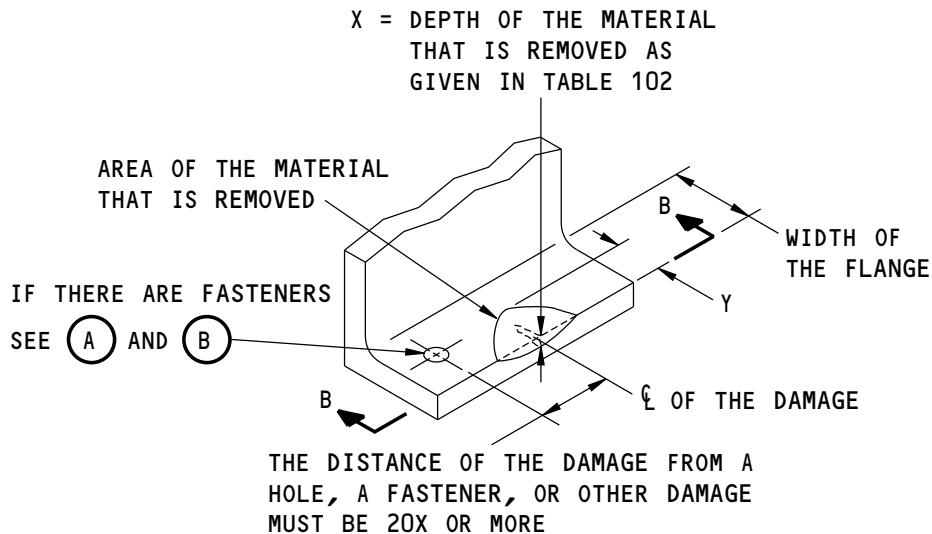
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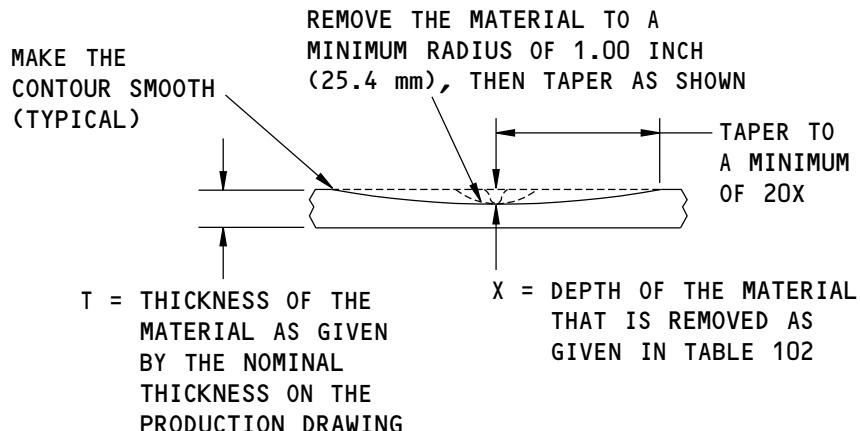


Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

NOTE: AN ANGLE IS SHOWN. THIS DETAIL ALSO APPLIES TO TEE SECTIONS.

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(E)



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Allowable Damage Limits
Figure 103 (Sheet 3 of 10)

55-10-10

ALLOWABLE DAMAGE 2

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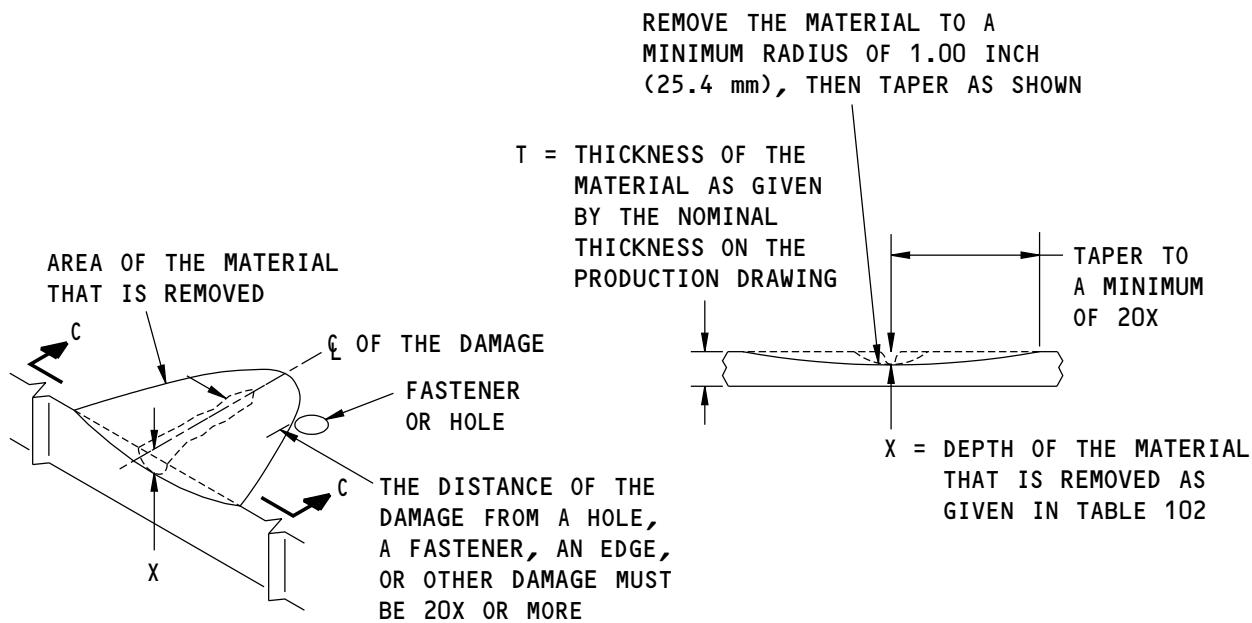
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REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(F)

NOTE: REFER TO FIGURE 102 FOR THE ALLOWABLE DAMAGE ZONES.

C-C

G28570 S0006592684_V1

Allowable Damage Limits
Figure 103 (Sheet 4 of 10)

55-10-10

ALLOWABLE DAMAGE 2

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DEPTH OF THE REMOVED MATERIAL		
TYPE OF STRUCTURE	ZONE	MAXIMUM PERCENT OF THE INITIAL THICKNESS AS GIVEN BY THE NOMINAL THICKNESS ON THE PRODUCTION DRAWING
UPPER CHORD	1	DAMAGE THAT CAN NOT BE MEASURED
	2	3
	3	5
	4	10
	5	20
LOWER CHORD	6	10
	7	5
	8	DAMAGE THAT CAN NOT BE MEASURED
	9	5
	10	20
FAILSAFE CHORD	11	20
	12	5
INBOARD WEB 	BAYS 1 THRU 6	20
	BAY 7	2
	BAY 8	4
	BAYS 9 THRU 21	20
OUTBOARD WEB	-	20
STIFFENERS	-	20
FITTING	-	10

TABLE 102

NOTES

-  WEB BAYS 1 THRU 6 ARE BETWEEN STAB STAS 68.87 AND 111.10
WEB BAY 7 IS BETWEEN STAB STAS 111.10 AND 120.30
WEB BAY 8 IS BETWEEN STAB STAS 120.30 AND 129.50
WEB BAYS 9 THRU 21 ARE BETWEEN STAB STAS 129.50 AND 249.10

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Allowable Damage Limits
Figure 103 (Sheet 5 of 10)

55-10-10

ALLOWABLE DAMAGE 2

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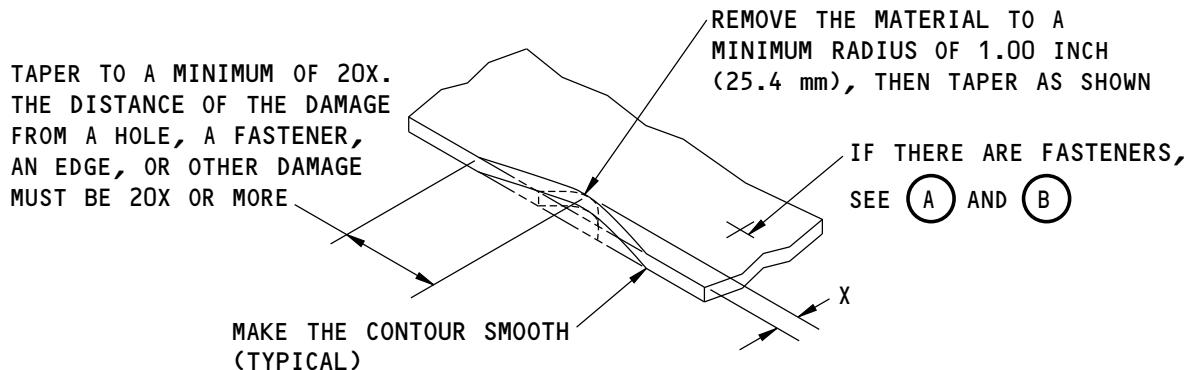
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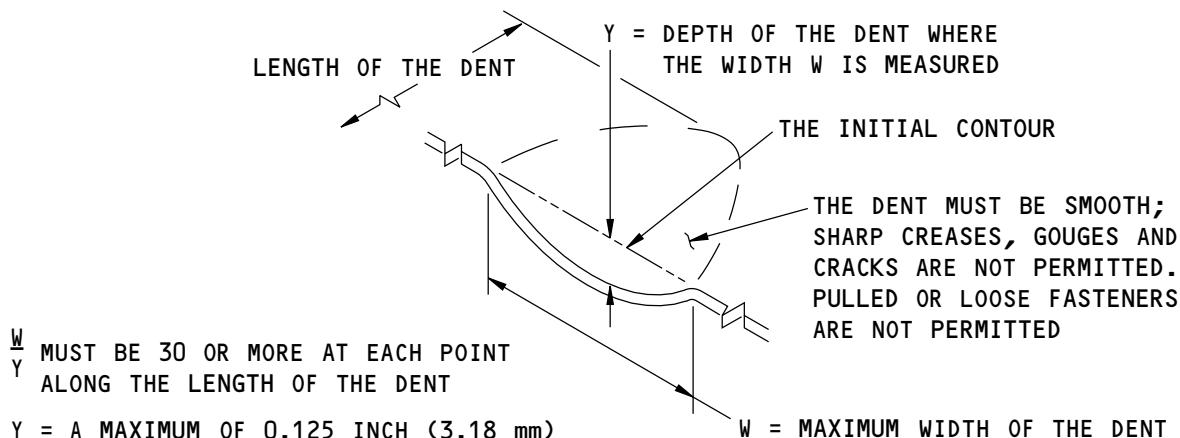
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X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL SKIN OR WEB

(G)



DENT THAT IS PERMITTED

(H)

G59665 S0006592686_V1

Allowable Damage Limits
Figure 103 (Sheet 6 of 10)

55-10-10

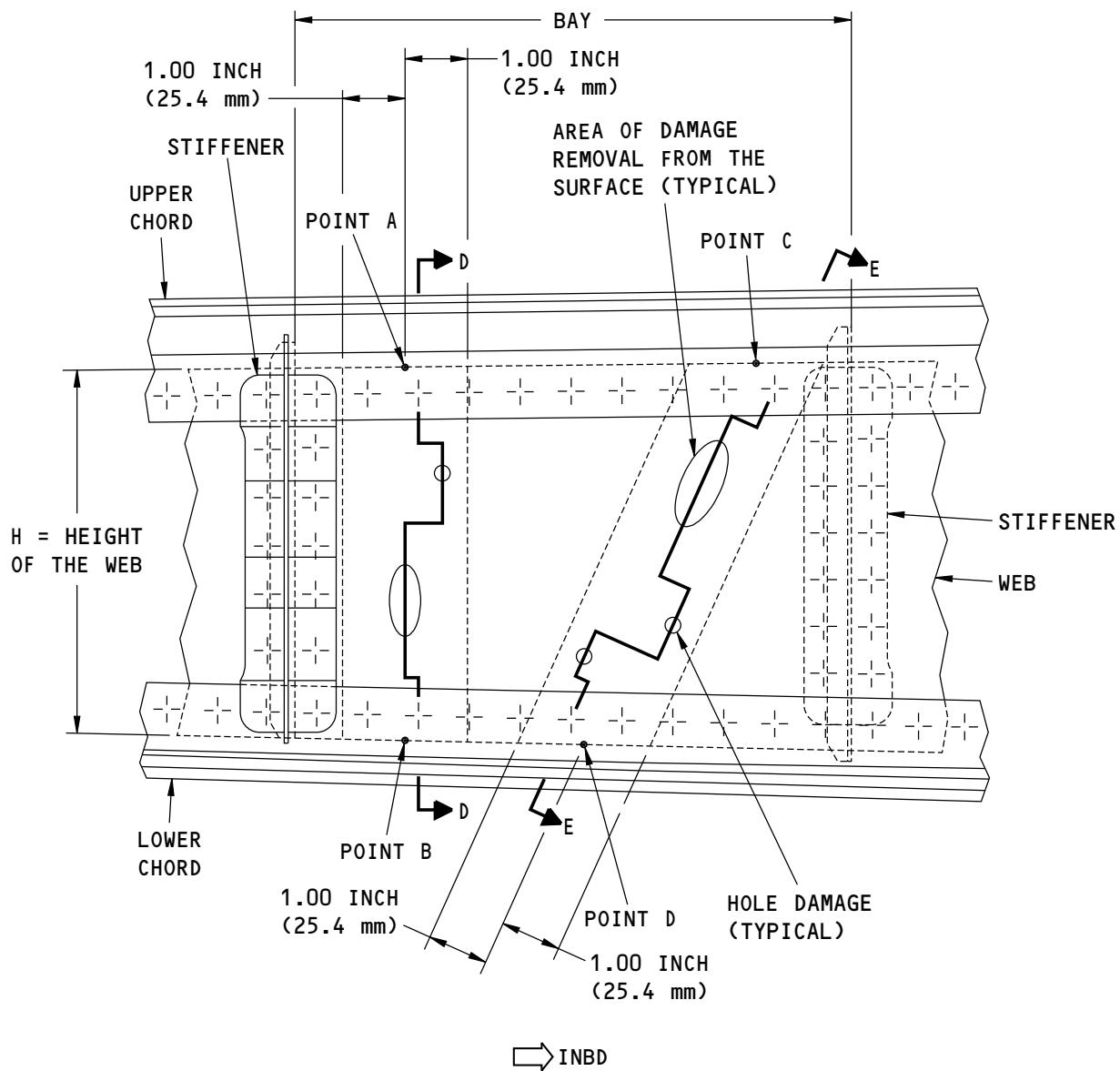
ALLOWABLE DAMAGE 2

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AFT SIDE OF REAR SPAR
REMOVAL OF DAMAGED MATERIAL FROM A WEB
I

G59731 S0006592687_V1

Allowable Damage Limits
Figure 103 (Sheet 7 of 10)

55-10-10
ALLOWABLE DAMAGE 2

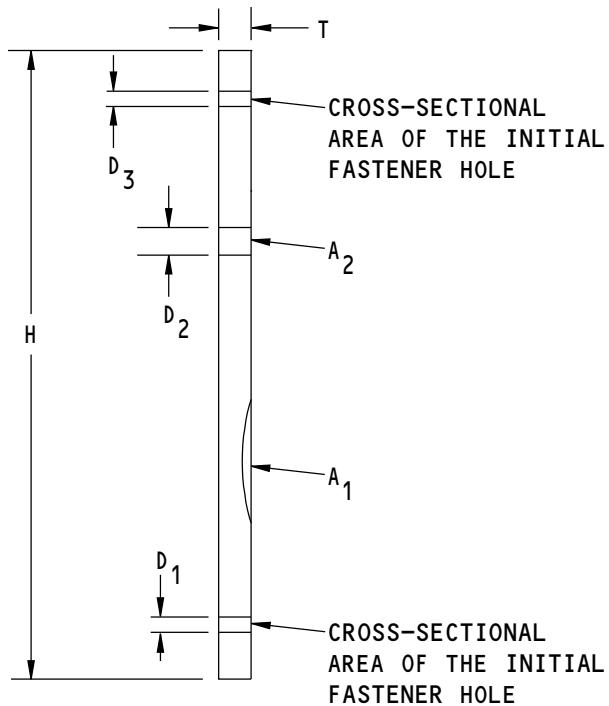
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D_1, D_3 = DIAMETERS OF THE INITIAL FASTENER HOLES

D_2 = DIAMETER OF THE HOLE WHERE THERE IS DAMAGE

H = HEIGHT OF THE WEB AT THE CROSS-SECTION

T = THICKNESS OF THE WEB AS GIVEN BY THE NOMINAL THICKNESS ON THE PRODUCTION DRAWING

A_i = INITIAL AREA OF THE WEB

= THE TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL FASTENERS HOLES (AS MANUFACTURED BY BOEING)

$$= HT - D_1 T - D_3 T$$

A_1 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 1

A_2 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 2

$$\left(\frac{A_1 + A_2}{A_i} \right) \times 100 = \text{PERCENT OF CROSS-SECTIONAL AREA REMOVED}$$

= A MAXIMUM OF 20 PERCENT

THE TOTAL CROSS-SECTIONAL AREA REMOVED IN ALL ZONES A-B (1.00 INCH (25.4 mm) ON EACH SIDE OF A LINE A-B) MUST NOT BE MORE THAN 20 PERCENT OF THE INITIAL AREA OF THE WEB

D-D

G59668 S0006592688_V1

Allowable Damage Limits
Figure 103 (Sheet 8 of 10)

55-10-10

ALLOWABLE DAMAGE 2

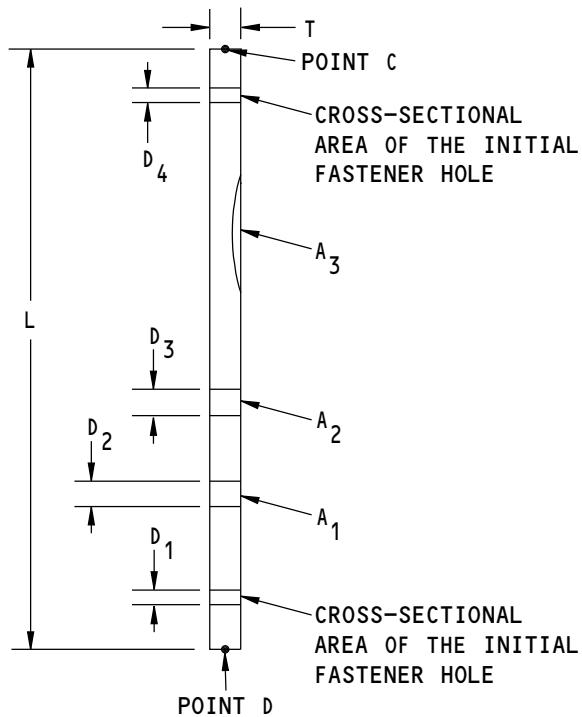
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D₁, D₄ = DIAMETERS OF THE INITIAL FASTENER HOLES

D₂, D₃ = DIAMETERS OF THE HOLES WHERE THERE IS DAMAGE

L = LENGTH OF THE WEB AT THE CROSS-SECTION BETWEEN POINTS C AND D

T = THICKNESS OF THE WEB AS GIVEN BY THE NOMINAL THICKNESS ON THE PRODUCTION DRAWING

A_i = INITIAL AREA OF THE WEB

= THE TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL FASTENERS HOLES (AS MANUFACTURED BY BOEING)

= HT - D₁T - D₄T

A₁ = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 1

A₂ = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 2

A₃ = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 3

$$\left(\frac{A_1 + A_2 + A_3}{A_i} \right) \times 100 = \text{PERCENT OF CROSS-SECTIONAL AREA REMOVED}$$

= A MAXIMUM OF 20 PERCENT

THE TOTAL CROSS-SECTIONAL AREA REMOVED IN ALL ZONES C-D (1.00 INCH (25.4 mm) ON EACH SIDE OF A LINE C-D) MUST NOT BE MORE THAN 20 PERCENT OF THE INITIAL AREA OF THE WEB

E-E

G59672 S0006592689_V1

Allowable Damage Limits
Figure 103 (Sheet 9 of 10)

55-10-10

ALLOWABLE DAMAGE 2

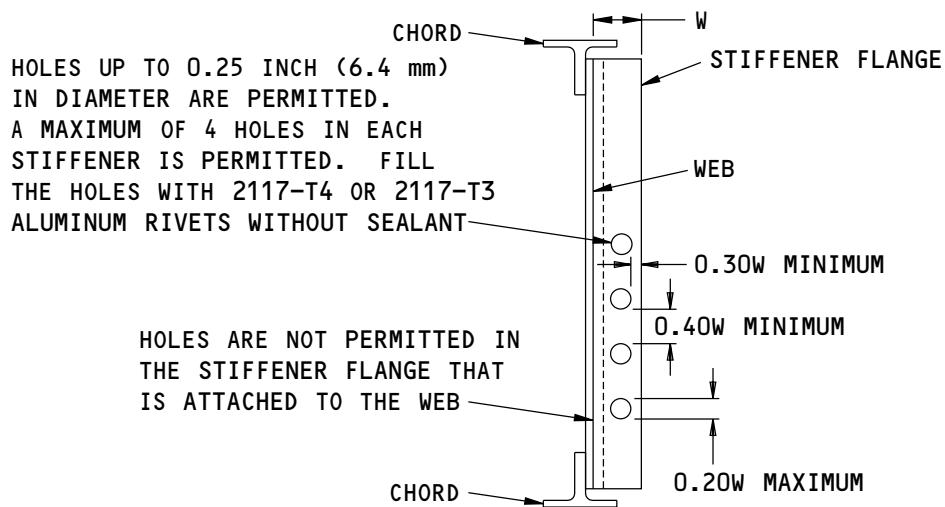
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W = THE WIDTH OF THE STIFFENER FLANGE

HOLES THAT ARE PERMITTED TO REMOVE
DAMAGED MATERIAL IN WEB STIFFENERS

(J)

G98428 S0006592690_V1

Allowable Damage Limits
Figure 103 (Sheet 10 of 10)

55-10-10

ALLOWABLE DAMAGE 2

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REPAIR 1 - HORIZONTAL STABILIZER FRONT SPAR WEB

1. Applicability

- A. Repair 1 is applicable to damage to the web of the horizontal stabilizer front spar shown in Horizontal Stabilizer Front Spar Location, Figure 201/REPAIR 1 if:
 - (1) The damage is between Stabilizer Stations 111.10 and 175.50.

55-10-10

REPAIR 1
Page 201

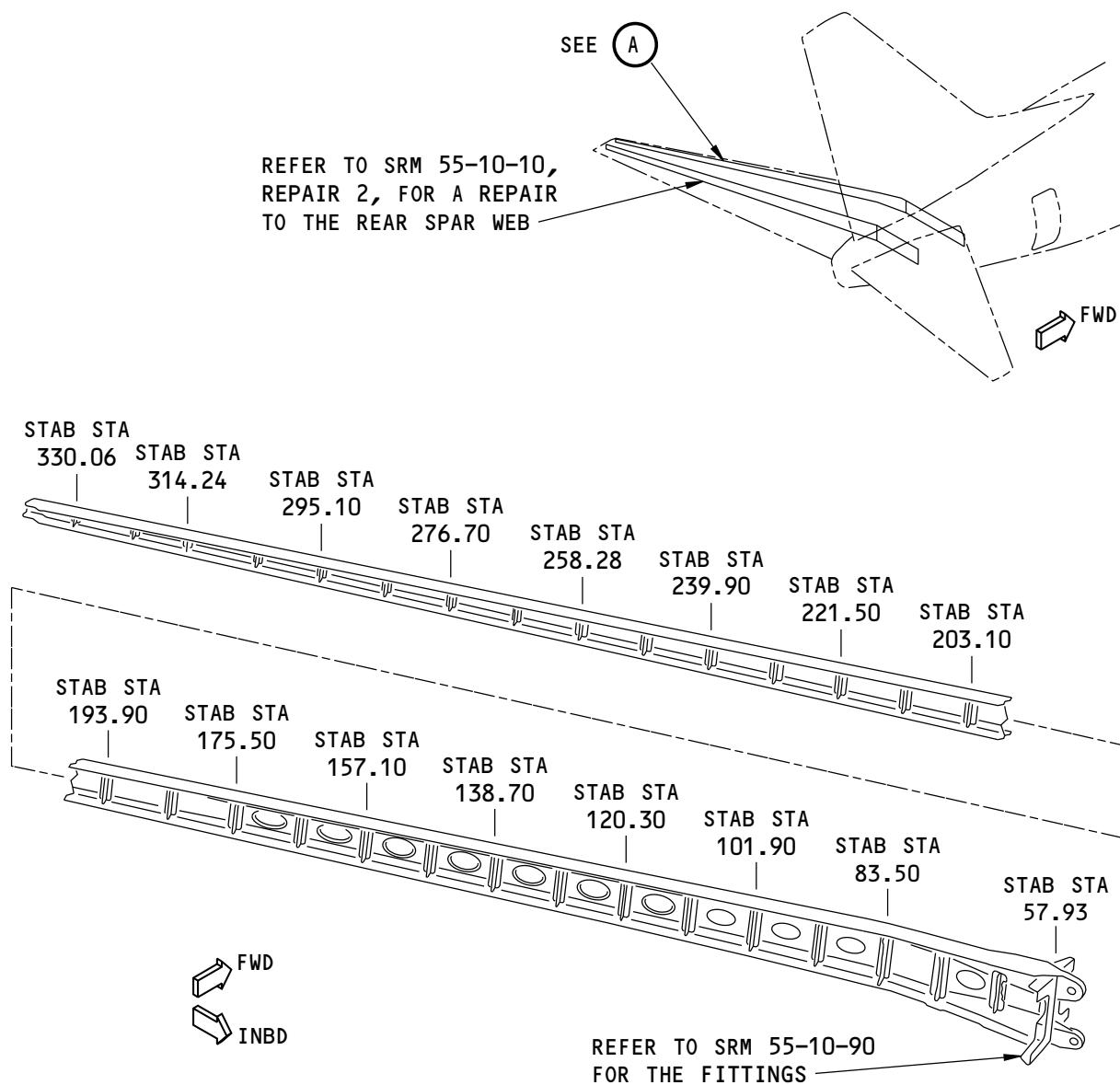
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

(A)

F93634 S0006592693_V1

Horizontal Stabilizer Front Spar Location
Figure 201

55-10-10

REPAIR 1
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2. General

- A. Repair 1 is a Category A Repair. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed. Refer to 51-00-06 for repair categories and definitions.
- B. Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Repair Instructions

- A. Remove initial fasteners from skin assemblies as necessary to get access to the damaged area of the web. Refer to 51-40-02.
- B. Drill a stop hole at the ends of all web cracks that do not end at fastener holes. Refer to Horizontal Stabilizer Front Spar Web Repair, Figure 202/REPAIR 1 and SRM 51-10-02 for the procedures to drill a stop hole. For other damage, do what follows:
 - (1) Cut and remove the damaged part of the web as shown in Horizontal Stabilizer Front Spar Web Repair, Figure 202/REPAIR 1. Refer to 51-10-02 for the procedures to remove the damage.
- C. Remove the initial web fasteners and stiffeners as necessary for the repair.
- D. Make the repair part as shown in Horizontal Stabilizer Front Spar Web Repair, Figure 202/REPAIR 1. Refer to Table 201/REPAIR 1 for the repair material.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 7075-T6 that is 0.100 inch thick. The use of clad material is recommended. It is permitted to make the repair part from 7075-T6 plate

- E. Assemble the repair part as shown in Horizontal Stabilizer Front Spar Web Repair, Figure 202/REPAIR 1.

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REPAIR 1
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- F. Drill the fastener holes. Refer to 51-40-05 for the fastener hole dimensions.
- G. Remove the repair part.
- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair part and the bare surfaces of the web.
- I. Apply a chemical conversion coating to the repair part and bare surfaces of the web. Refer to 51-20-01 for the chemical conversion coating procedures.
- J. Apply one layer of BMS 10-11, Type I, primer to the area of the repair. Refer to SOPM 20-41-02 for the procedures to apply the primer.
 - (1) Apply the primer to the repair part.
 - (2) Apply the primer to the bare surfaces of the web.
- K. Install the repair part with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
 - (1) It is optional to bond the repair part to the initial web as given in 51-70-09. This option will increase the fatigue life of the repair.
- L. Install the initial web stiffeners.
- M. Install the fasteners.
 - (1) Install the hex drive fasteners wet with BMS 5-95 sealant in transition fit holes.
 - (2) Install the rivets at the initial locations without sealant.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.
- O. Install the skin assemblies if they were removed.

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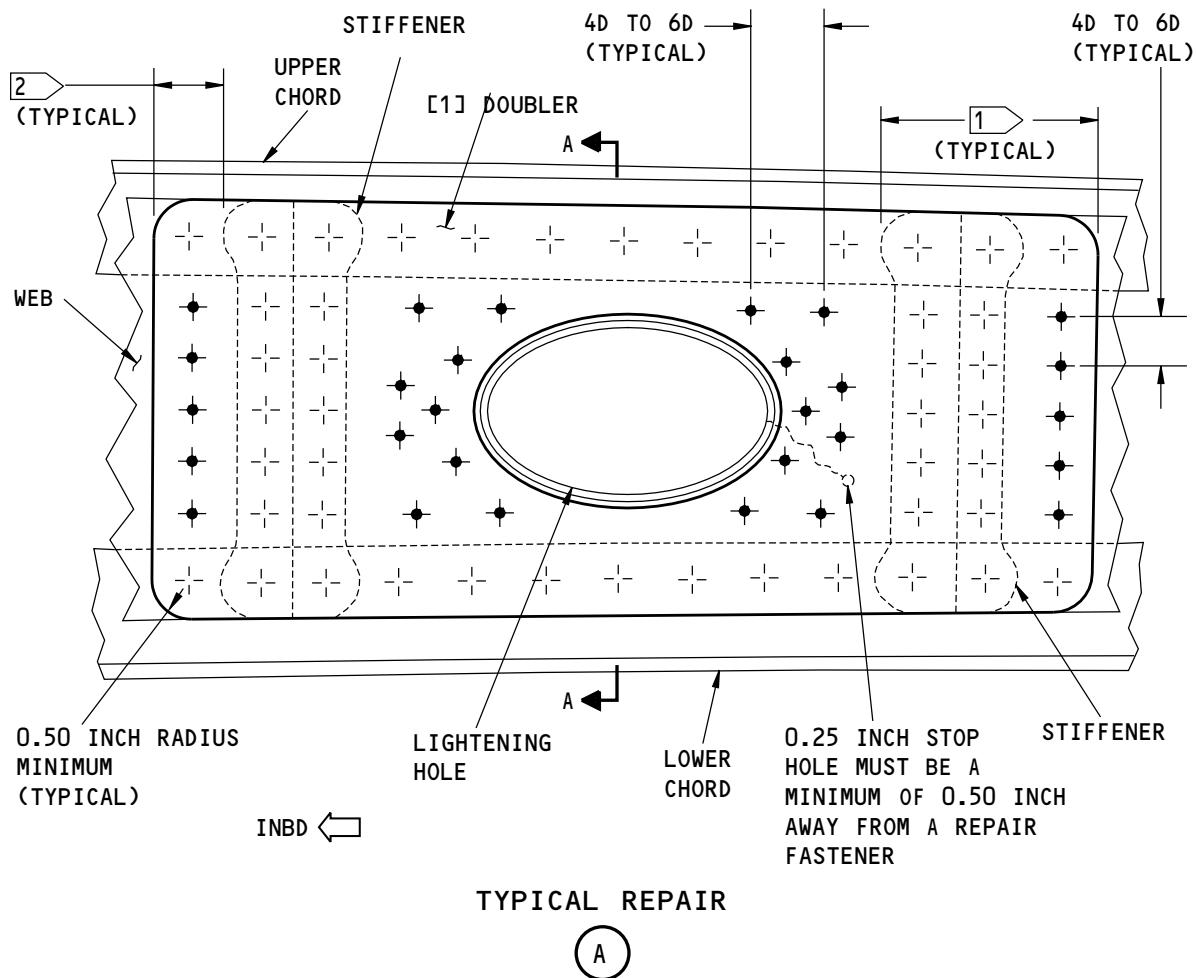
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**NOTES**

- (D) IS THE DIAMETER OF THE REPAIR FASTENER.
- [1]** MAKE SURE THAT THERE IS A MINIMUM OF THREE FULL VERTICAL ROWS OF FASTENERS ON EACH SIDE OF THE DAMAGED AREA.
- [2]** PUT THE LAST ROW OF FASTENERS AWAY FROM A STIFFENER.

FASTENER SYMBOLS

- - INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER.
- • REPAIR FASTENER LOCATION. INSTALL A BACB30VT8K() OR BACB30FM8A() HEX DRIVE BOLT. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

G77766 S0006592695_V1

**Horizontal Stabilizer Front Spar Web Repair
Figure 202 (Sheet 1 of 3)**

55-10-10**REPAIR 1**

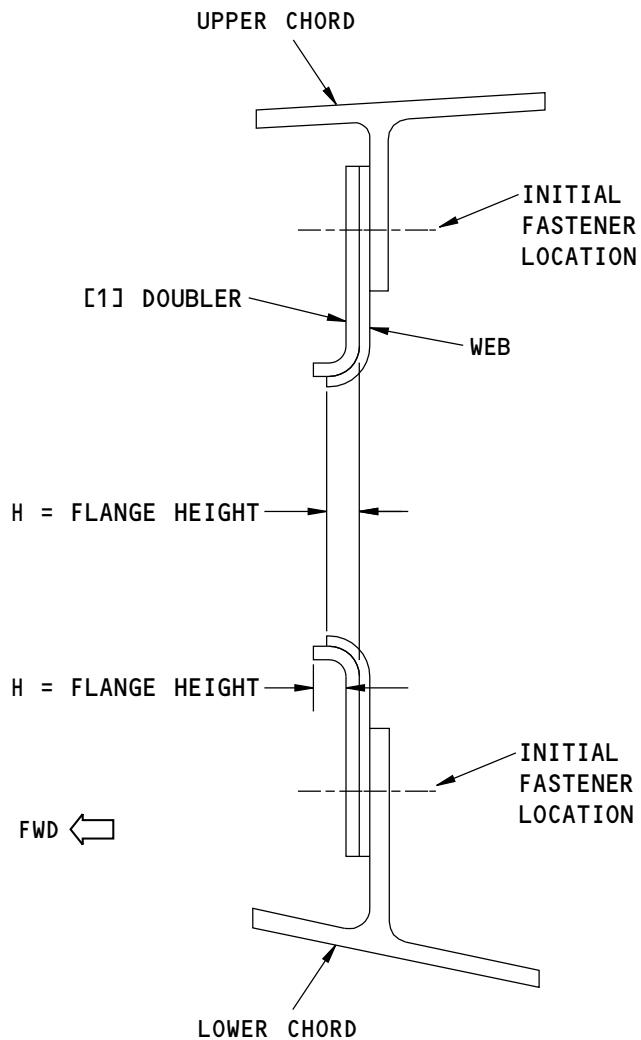
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REPAIR SHOWN WITH THE BEST FLANGE FOR THE DOUBLER
A-A

F93641 S0006592696_V1

Horizontal Stabilizer Front Spar Web Repair
Figure 202 (Sheet 2 of 3)

55-10-10

REPAIR 1
Page 206

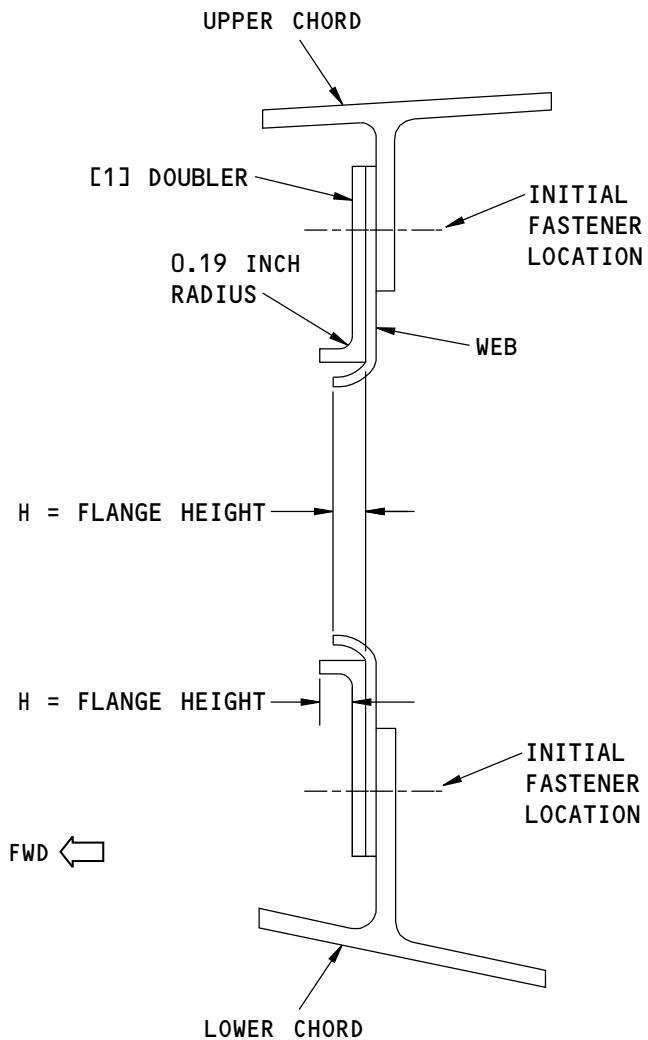
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REPAIR SHOWN WITH OPTIONAL MACHINED DOUBLER
A-A

G79020 S0006592697_V1

Horizontal Stabilizer Front Spar Web Repair
Figure 202 (Sheet 3 of 3)

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REPAIR 1
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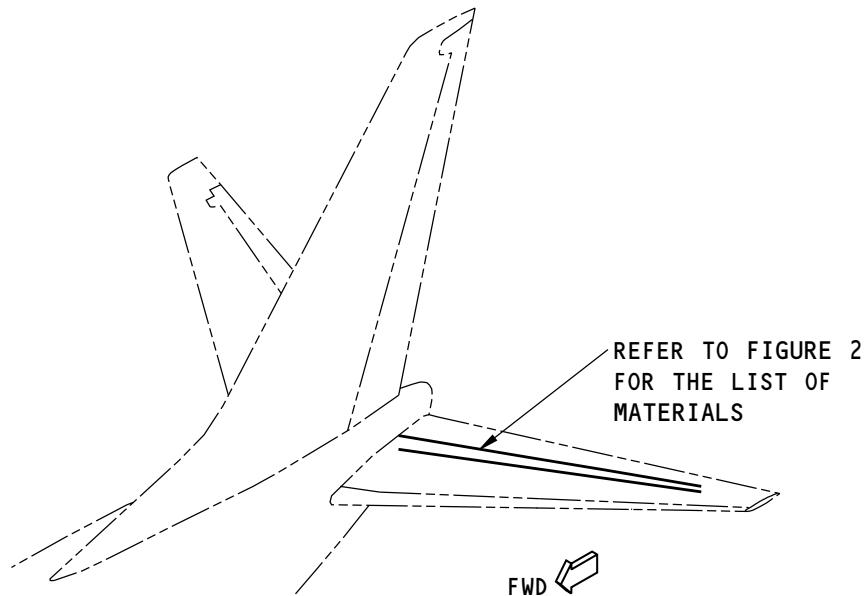
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IDENTIFICATION 1 - HORIZONTAL STABILIZER BEAM



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G04189 S0006592733_V1

Horizontal Stabilizer Beam Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
185A0001	Trailing Edge Functional Collector - Left, Horizontal Stabilizer
185A0002	Trailing Edge Functional Collector - Right, Horizontal Stabilizer
185A1600	Beam Installation - Trailing Edge, Horizontal Stabilizer

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IDENTIFICATION 1

Page 1

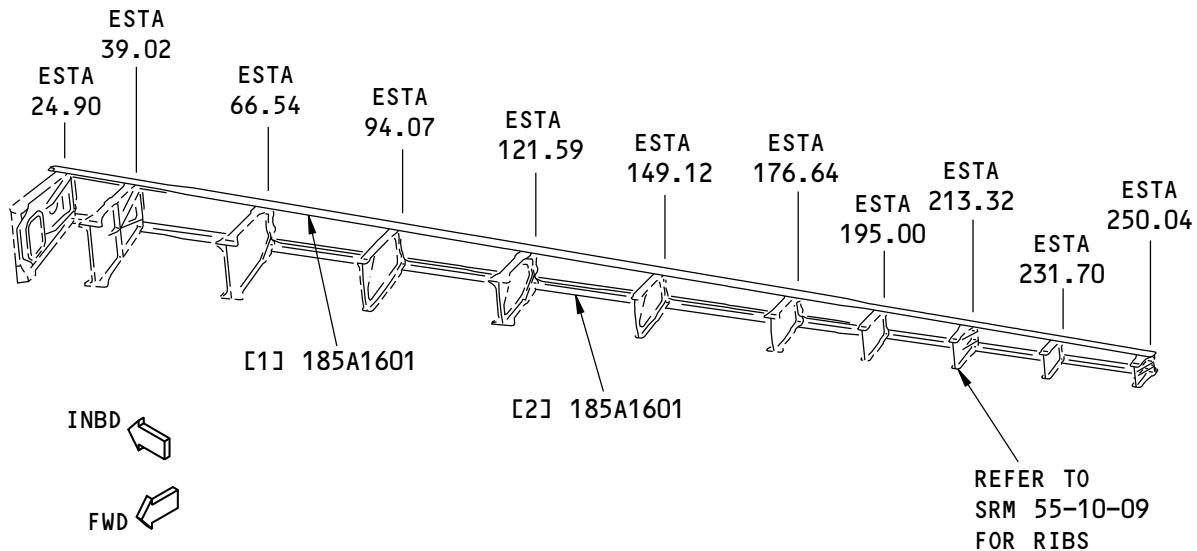
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THE LEFT HORIZONTAL STABILIZER BEAM IS SHOWN,
THE RIGHT HORIZONTAL STABILIZER BEAM IS OPPOSITE

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

G04303 S0006592735_V1

Horizontal Stabilizer Beam Identification
Figure 2

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IDENTIFICATION 1
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Beam Assembly		BAC1506-4398 7075-T73511 extrusion as given in QQ-A-200/11	Cum Line numbers 1 thru 215
	Upper Beam			
	Upper Beam (Angle)		7050-T7451 plate as given in AMS 4050	Cum Line numbers 216 and on
	Upper Beam Assembly		BAC1506-4398 7075-T73511 extrusion as given in QQ-A-200/11	
	Upper Beam		7050-T7451 plate as given in AMS 4050	
	Upper Beam (Angle)			
[2]	Lower Beam Assembly		BAC1506-4398 7075-T73511 extrusion as given in QQ-A-200/11	Cum Line numbers 1 thru 215
	Lower Beam			
	Lower Beam (Angle)		7050-T7451 plate as given in AMS 4050	Cum Line numbers 216 and on
	Lower Beam		7050-T7451 plate as given in BMS 7-323	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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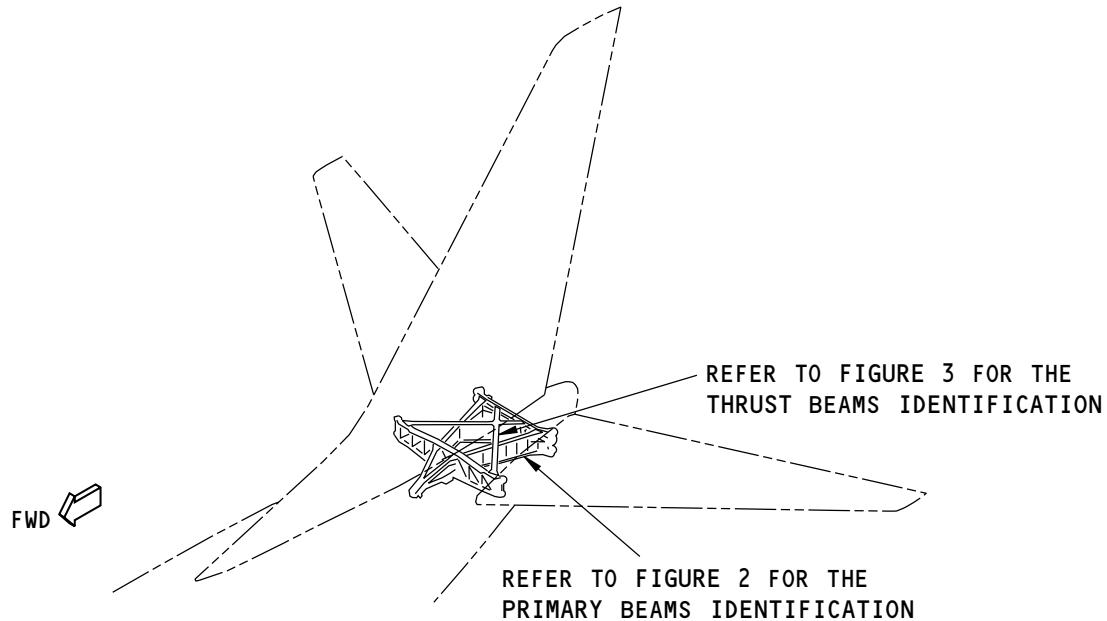
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IDENTIFICATION 2 - HORIZONTAL STABILIZER CENTER SECTION BEAMS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Horizontal Stabilizer Center Section Beam Locations

G17543 S0006592739_V1

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
181A3000	Beam Installation - Center Section Horizontal Tail
181A3101	Sheet Metal Details - Primary Beam, Center Section Horizontal Tail
181A3102	Extruded Details - Primary Beam, Center Section Horizontal Tail
181A3103	Upper Chord - Primary Beam, Center Section Horizontal Tail
181A3104	Lower Chord - Primary Beam, Center Section Horizontal Tail
181A3201	Sheet Metal Details - Thrust Beam Center Section Horizontal Tail
181A3202	Extruded Details - Thrust Beam, Center Section Horizontal Tail

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IDENTIFICATION 2
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Table 1: (Continued)

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
181A3203	Chords - Thrust Beam, Center Section Horizontal Tail

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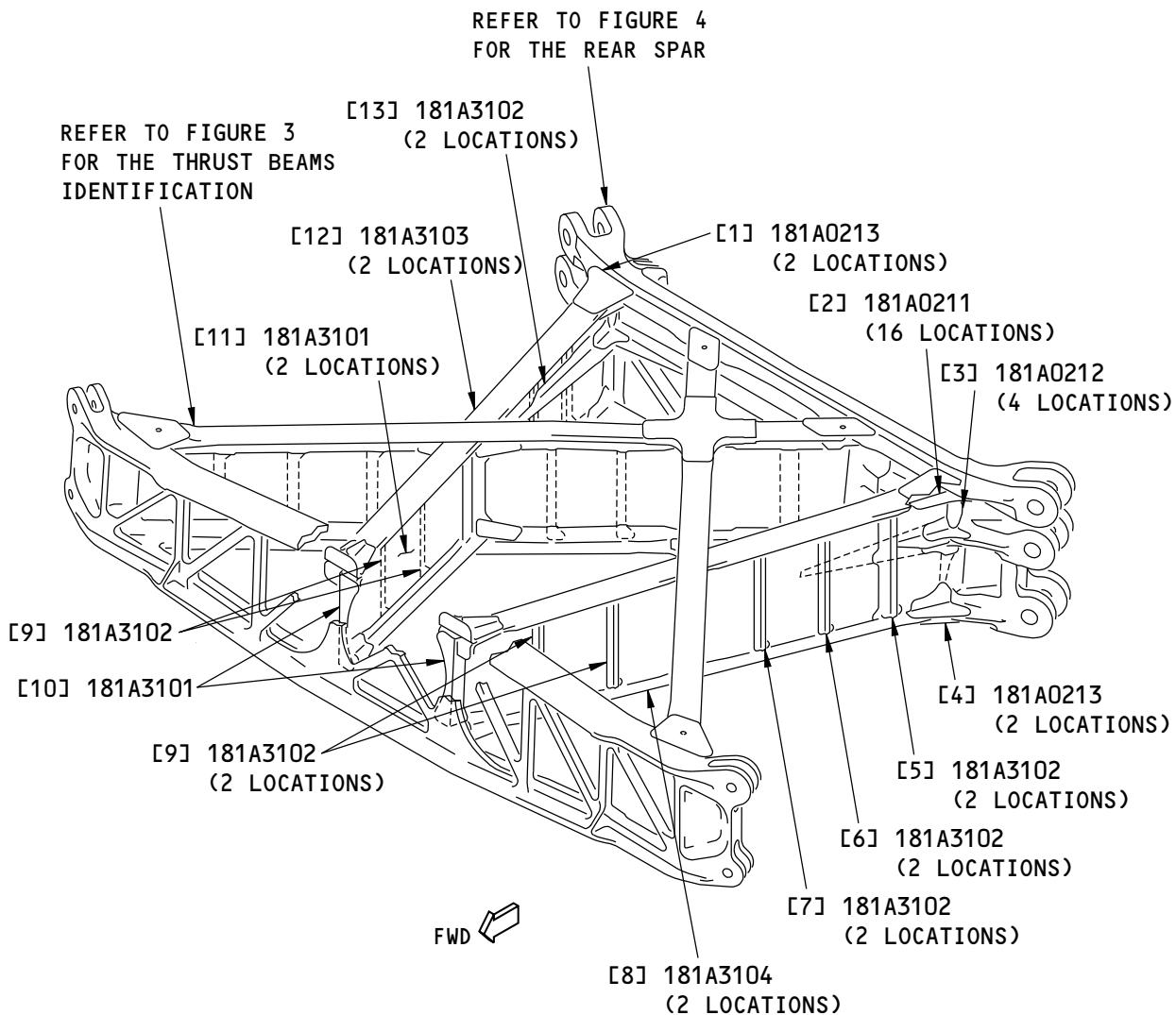
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

G17578 S0006592741_V2

Horizontal Stabilizer Center Section Primary Beams Identification
Figure 2

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IDENTIFICATION 2
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STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T*[1]	MATERIAL	EFFECTIVITY
[1]	Upper Gusset (2)	0.312 (7.92)	7075-T7351 machined plate as given in QQ-Q-250/12. Refer to the production drawing for the machined thicknesses	
[2]	Splice Angle (16)		BAC1514-3163 7075-T73511 extrusion, as given in QQ-A-200/11. Refer to the production drawing for machined thicknesses	
[3]	Splice Plate (4)	0.160 (4.64)	7075-T6 sheet as given in QQ-A-250/13	
[4]	Lower Gusset (2)	0.160 (4.64)	7075-T6 sheet as given in QQ-A-250/12	
[5]	Stiffener (2)		BAC1505-101411 7075-T6511 extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[6]	Stiffener (2)		BAC1505-100101 7075-T6511 extrusion as given in QQ-A-200/11. Refer to the production drawing for machined thicknesses	
[7]	Stiffener (2)		BAC1505-101579 7075-T6511 extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[8]	Lower Chord (2)		BAC1505-101216 7075-T73511 extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[9]	Stiffener (4)		BAC1505-1011184 7075-T6511 extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[10]	Attach Angle (2)	0.080 (2.03)	7075-T62 clad sheet as given in QQ-A-250/12	
[11]	Web (2)	0.090 (2.29)	7075-T6 sheet as given in QQ-A-250/12. Refer to the production drawing for the chem-milled thicknesses	
[12]	Upper Chord (2)		BAC1505-101216 7075-T73511 extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[13]	Splice Chord		7075-T73511 bar as given in QQ-A-200/11, Class A. Refer to the production drawing for the machined thicknesses	

*[1] Note: T = Pre-manufactured thicknesses in inches (millimeters).

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IDENTIFICATION 2

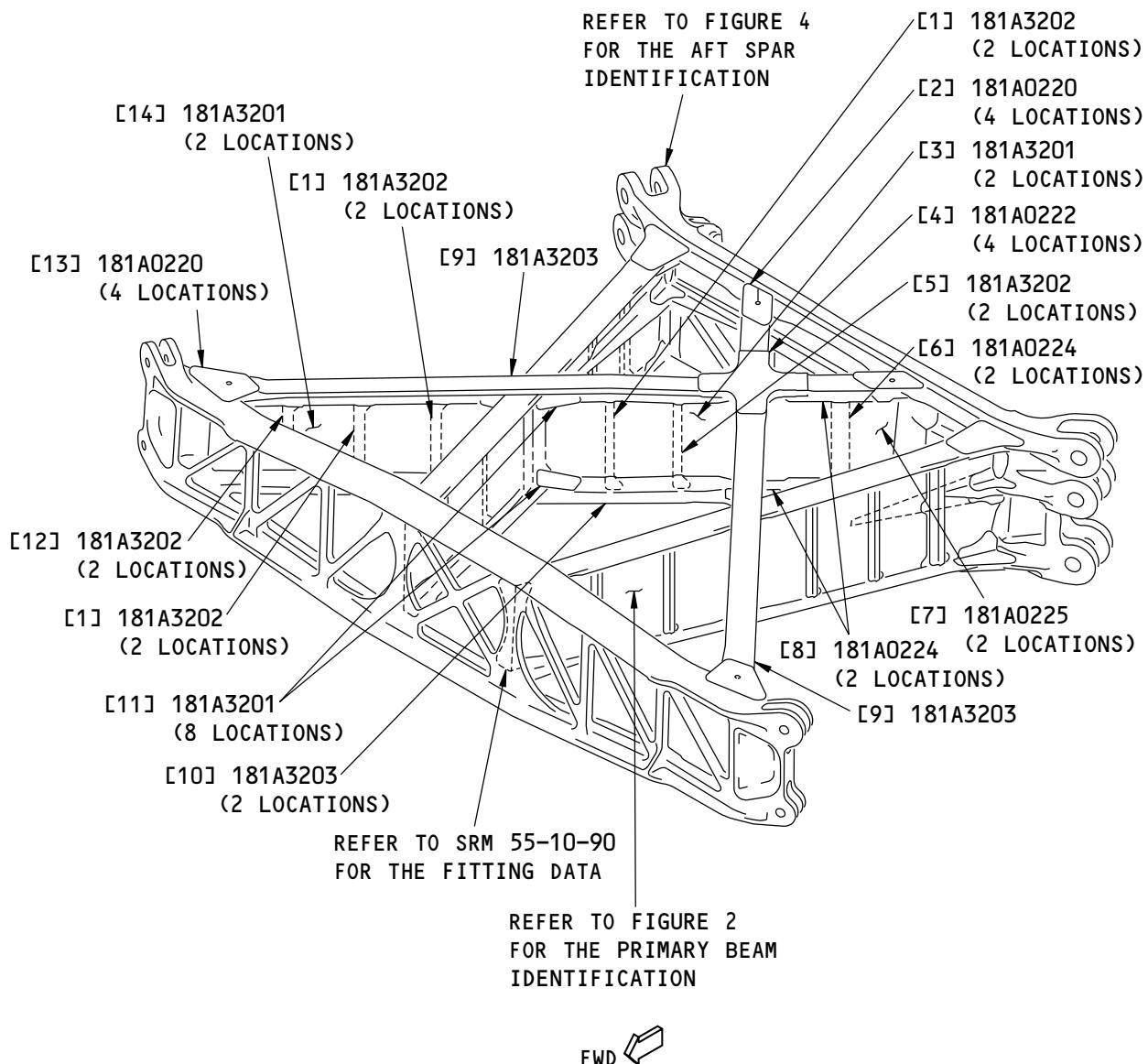
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NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

G17592 S0006592743_V2

**Horizontal Stabilizer Center Section Thrust Beams Identification
Figure 3**

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IDENTIFICATION 2

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Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T*[1]	MATERIAL	EFFECTIVITY
[1]	Stiffener (2)		BAC1505-100542 7075-T73511 extrusion as given in QQ-A-200/11	
[2]	Gusset, Upper/Lower (4)		7075-T6 machined sheet as given QQ-A-250/12. Refer to the production drawing for the machined thicknesses	
[3]	Web	0.050 (1.27)	7075-T6 clad sheet as given in QQ-A-250/13	
[4]	Splice Plate (16)		7075-T7351 machined plate as given in QQ-A-250/12. (Optional: 7075-T73511, Class A machined bar. Refer to the production drawing for the machined thicknesses)	
[5]	Stiffener		BAC1505-100027 7075-T73511 extrusion as given in QQ-A-200/11	
[6]	Stiffener		AND10136-1501 7075-T73511 extrusion as given in QQ-A-200/11	
[7]	Web	0.063 (1.60)	7075-T6 chem-milled sheet as given in QQ-A-250/12. Refer to the production drawing for the chem-milled thicknesses	
[8]	Chord, Upper/Lower (4)		BAC15005-100587 7075-T73511 as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[9]	Chord, Upper (2)		BAC1505-100694 7075-T73511 machined extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[10]	Chord, Lower (2)		BAC1506-3612 7075-T73511 machined extrusion as given in QQ-A-200/11. Refer to the production drawing for the machined thicknesses	
[11]	Gusset (3)	0.125 (3.18)	7075-T6 clad sheet as given in QQ-A-250/13	
[12]	Stiffener		AND10136-1608 7075-T73511 extrusion as given in QQ-A-200/11	
[13]	Forward Gusset (4)		7075-T6 machined sheet as given QQ-A-250/12. Refer to the production drawing for the machined thicknesses	
[14]	Web	0.080 (2.03)	7075-T6 chem-milled sheet as given in QQ-A-250/12. Refer to the production drawing for the chem-milled thicknesses	

*[1] Note: T = Pre-manufactured thicknesses in inches (millimeters).

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IDENTIFICATION 2

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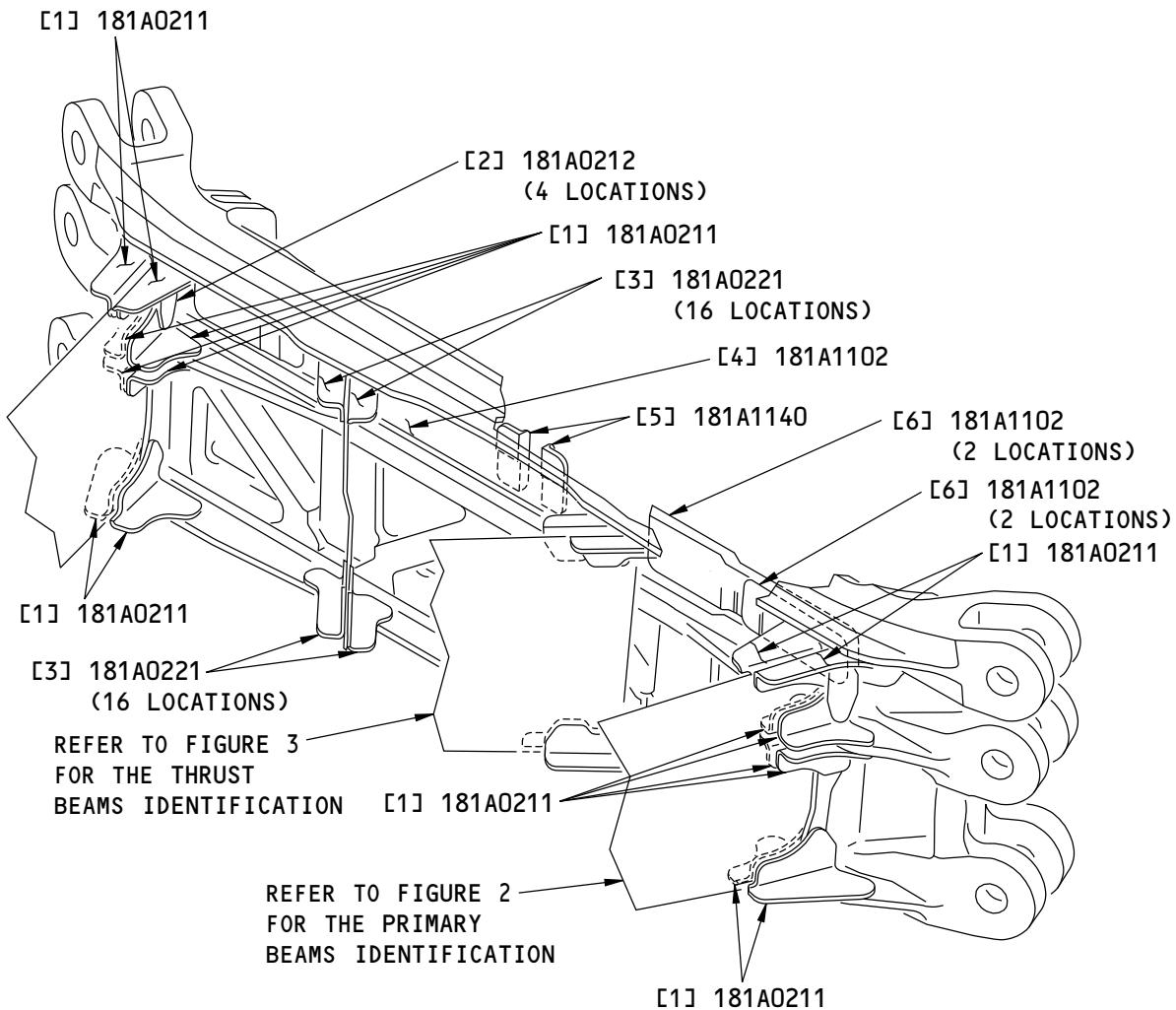
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G51888 S0006592745_V2

Horizontal Stabilizer Center Section Aft Spar Identification
Figure 4

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Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Splice Angle (16)		BAC1514-3163 7075-T73511 extrusion as given in QQ-A-200/11. Refer to the production drawing for machined thicknesses	
[2]	Splice Plate (4)	0.160 (4.64)	7075-T6 sheet as given in QQ-A-250/13	
[3]	Splice Plate (16)		7075-T7351 machined plate as given in QQ-A-250/12. (Optional: 7075-T73511, Class A machined bar. Refer to the production drawing for the machined thicknesses)	
[4]	Web Splice		Ti-6Al-4V machined titanium plate as given in MIL-T-9046, Code AB-1, annealed. Refer to the production drawing for the machined thicknesses	
[5]	Shear Tie		BAC1514-1081 7075-T73511 extrusion as given in QQ-A-200/11	
[6]	Reinforcing Plate LH/RH (4)		Ti-6Al-4V machined titanium plate as given in MIL-T-9046, Code AB-1, annealed. Refer to the production drawing for the machined thicknesses	

*[1] Note: T = Pre-manufactured thicknesses in inches (millimeters).

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ALLOWABLE DAMAGE 1 - HORIZONTAL STABILIZER TRAILING EDGE BEAMS

1. Applicability

- A. This subject gives the allowable damage limits for the horizontal stabilizer trailing edge beams shown in Horizontal Stabilizer Beam Location, Figure 101/ALLOWABLE DAMAGE 1 and Horizontal Stabilizer Beam Locations, Figure 102/ALLOWABLE DAMAGE 1.

2. General

- A. Remove the damage as necessary.
- (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- B. After you remove the damage, do the procedures that follow.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the surfaces of the beams if you remove the damage.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the bare surfaces of the reworked areas of the beams. Refer to 51-20-01.
- (3) Apply one layer of BMS 10-11, Type I, primer to the reworked areas of the beams. Refer to SOPM 20-41-02.

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ALLOWABLE DAMAGE 1

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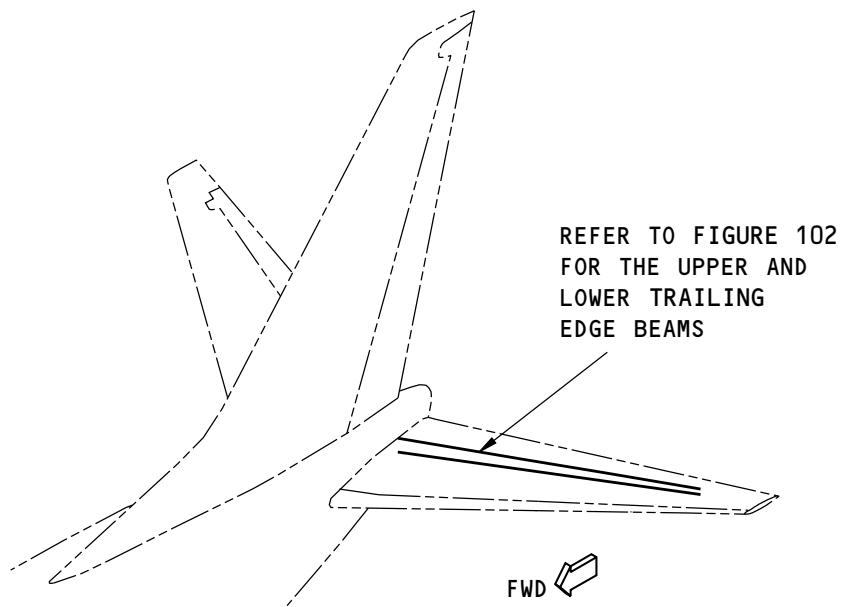
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**Horizontal Stabilizer Beam Location
Figure 101**

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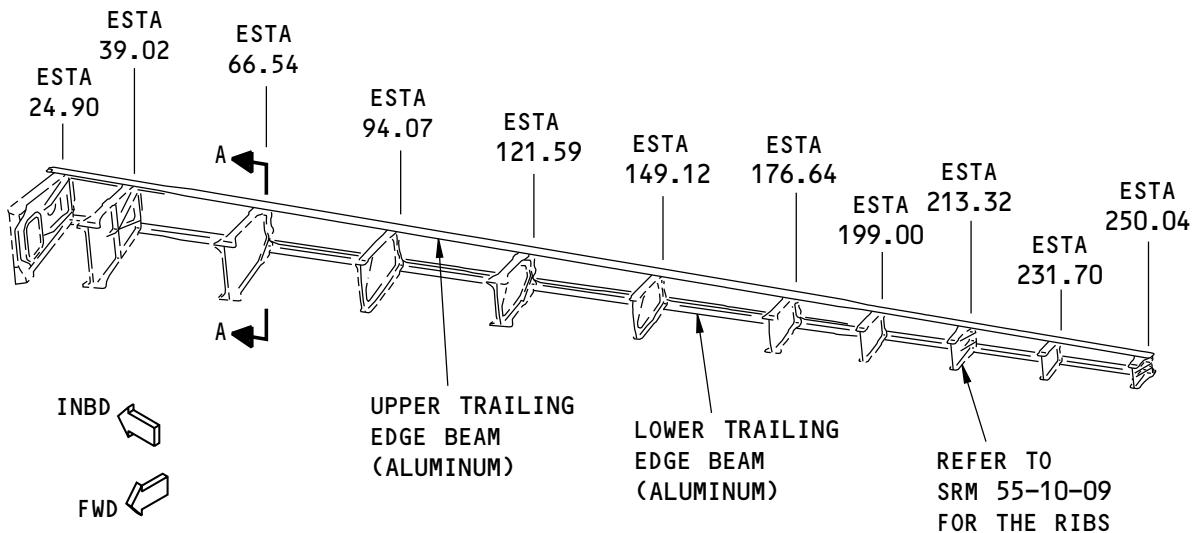
ALLOWABLE DAMAGE 1

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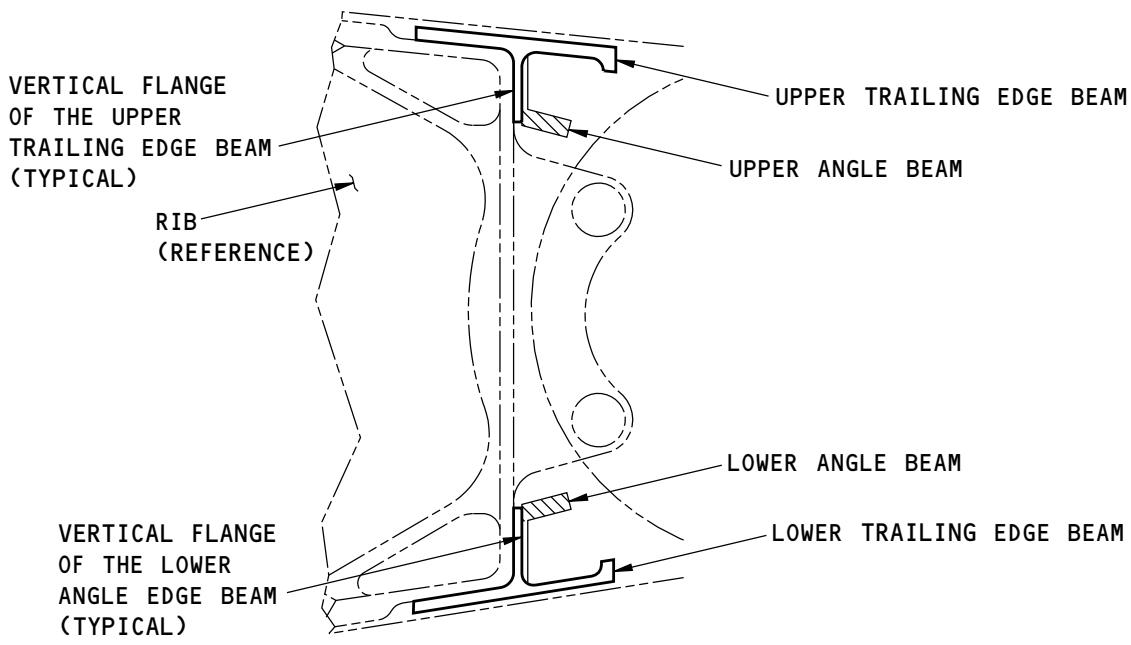
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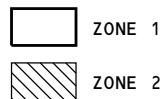
LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

HORIZONTAL STABILIZER BEAMS



NOTES

- [1] FOR CUM LINE NUMBERS 1 THRU 215
[2] FOR CUM LINE NUMBERS 216 AND ON



M61825 S0006592750_V1

Horizontal Stabilizer Beam Locations
Figure 102 (Sheet 1 of 2)

55-10-13

ALLOWABLE DAMAGE 1

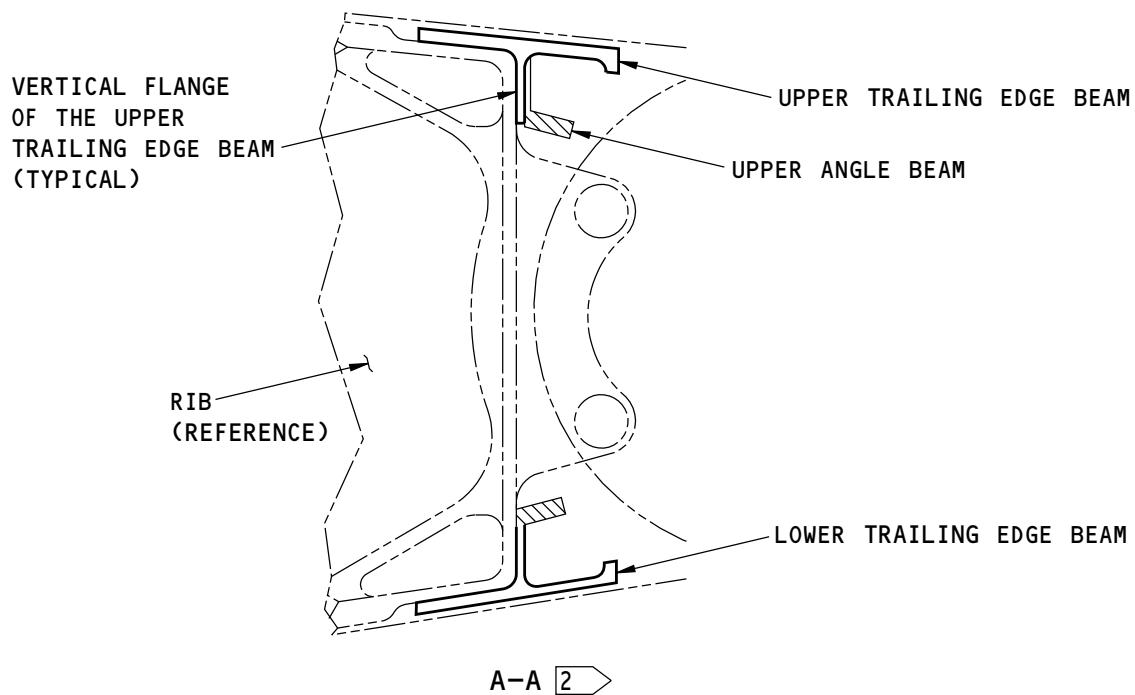
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M61845 S0006592751_V1

Horizontal Stabilizer Beam Locations
Figure 102 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Zone 1

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, C, E, and F.
 - 1) The removal of damage, as shown in Details C and F, is permitted for the vertical flange only if:
 - a) There is no removal of damage, as shown in Details C and F, from the aft or forward flange at the same section.
 - (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail D.
 - (4) Holes and Punctures are not permitted.

B. Zone 2

- (1) Damage is not permitted.

55-10-13

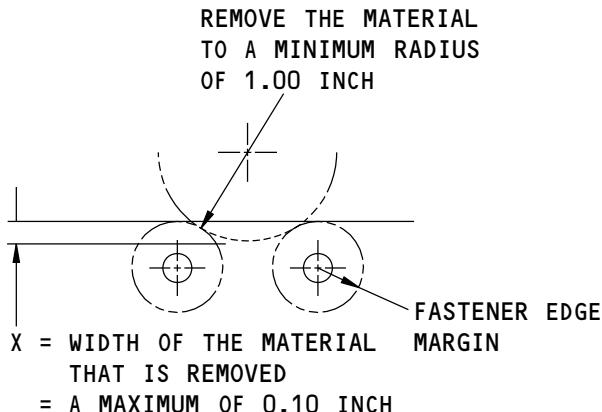
ALLOWABLE DAMAGE 1

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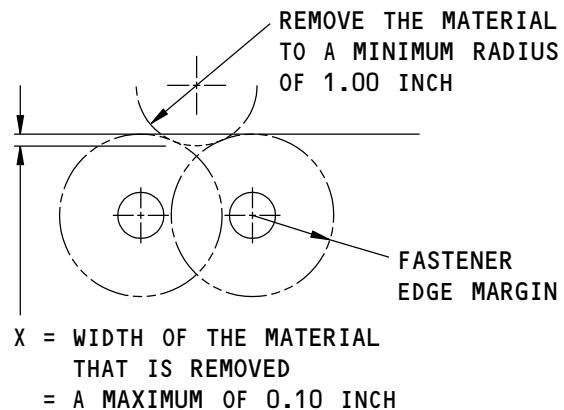
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STRUCTURAL REPAIR MANUAL**


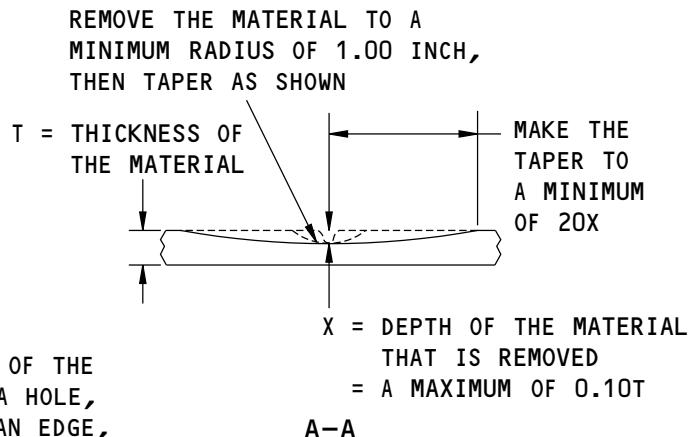
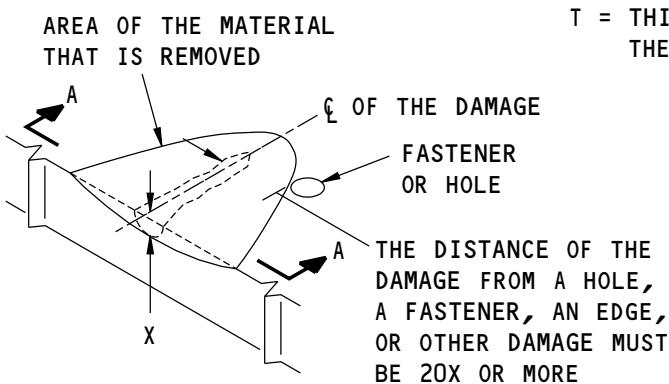
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

G08472 S0006592755_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)

55-10-13

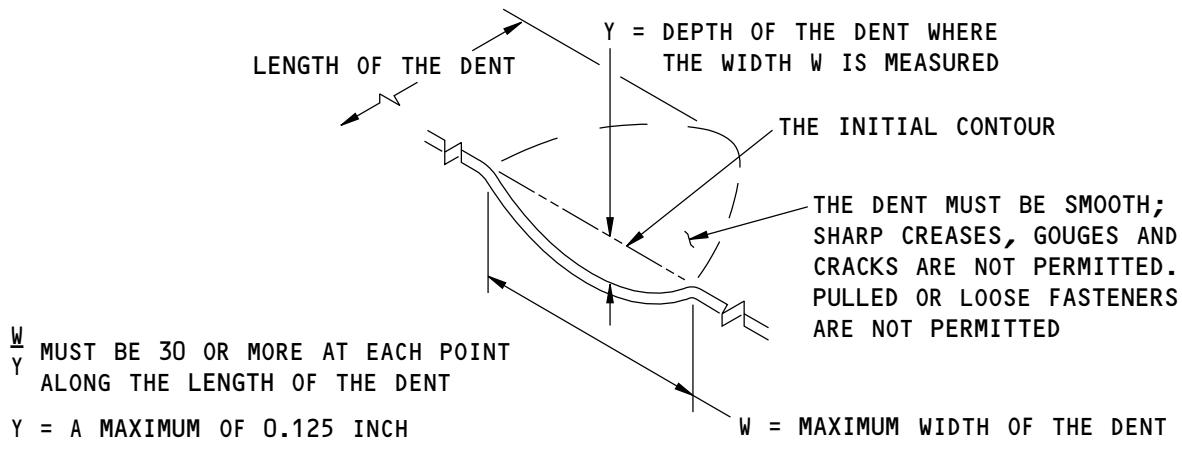
ALLOWABLE DAMAGE 1

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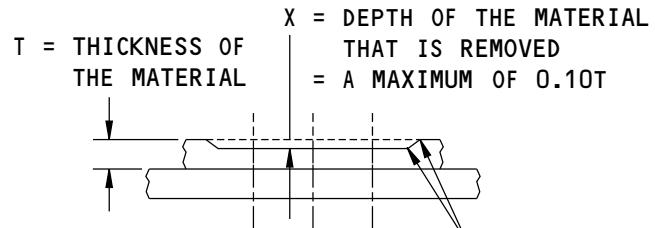
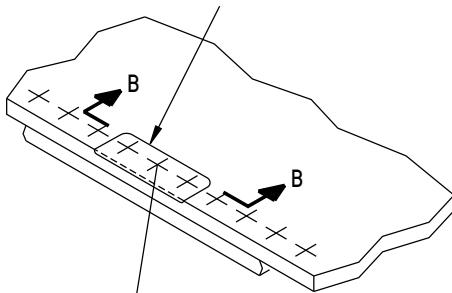
737-800
STRUCTURAL REPAIR MANUAL



DENT THAT IS PERMITTED

(D)

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN ALL GROUPS OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B

(E)

G08473 S0006592756_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 3)

55-10-13

ALLOWABLE DAMAGE 1

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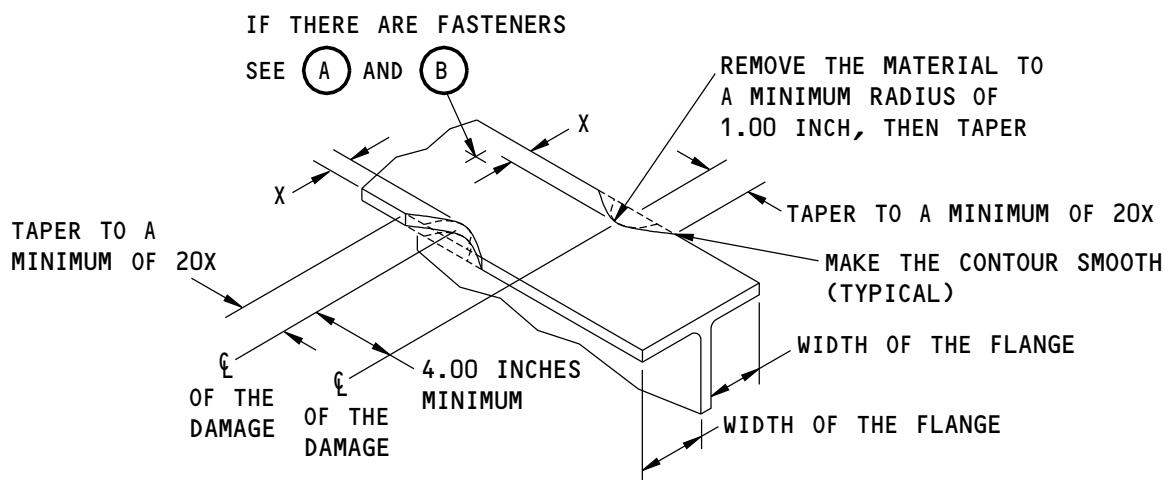
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STRUCTURAL REPAIR MANUAL



X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE



M61821 S0006592757_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

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ALLOWABLE DAMAGE 1

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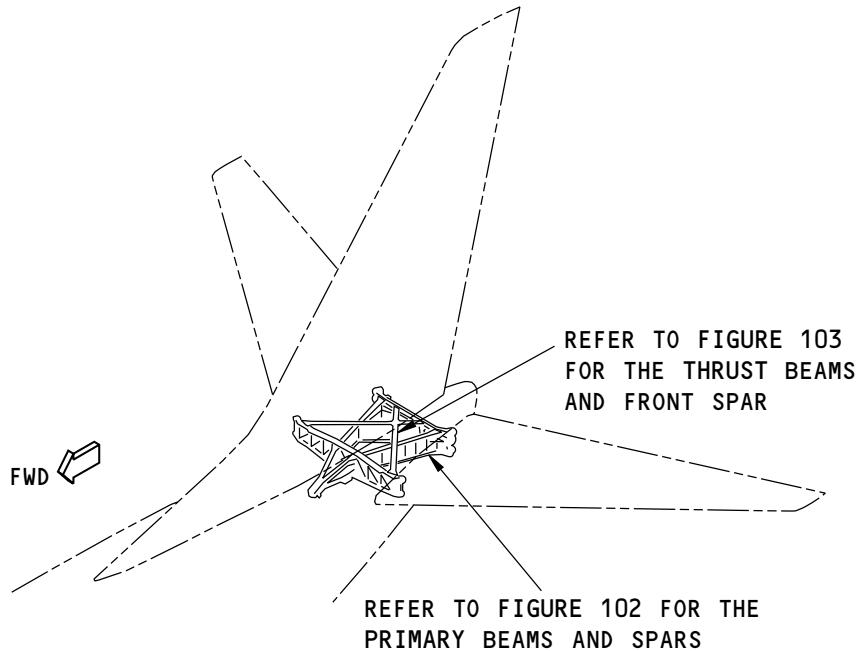


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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - HORIZONTAL STABILIZER CENTER SECTION

1. Applicability

- A. This subject gives the allowable damage limits for the center section beams and front spar shown in Horizontal Stabilizer Center Section Location, Figure 101/ALLOWABLE DAMAGE 2.
- B. Contact The Boeing Company for damage to the rear spar chord.



G16887 S0006592759_V1

**Horizontal Stabilizer Center Section Location
Figure 101**

55-10-13

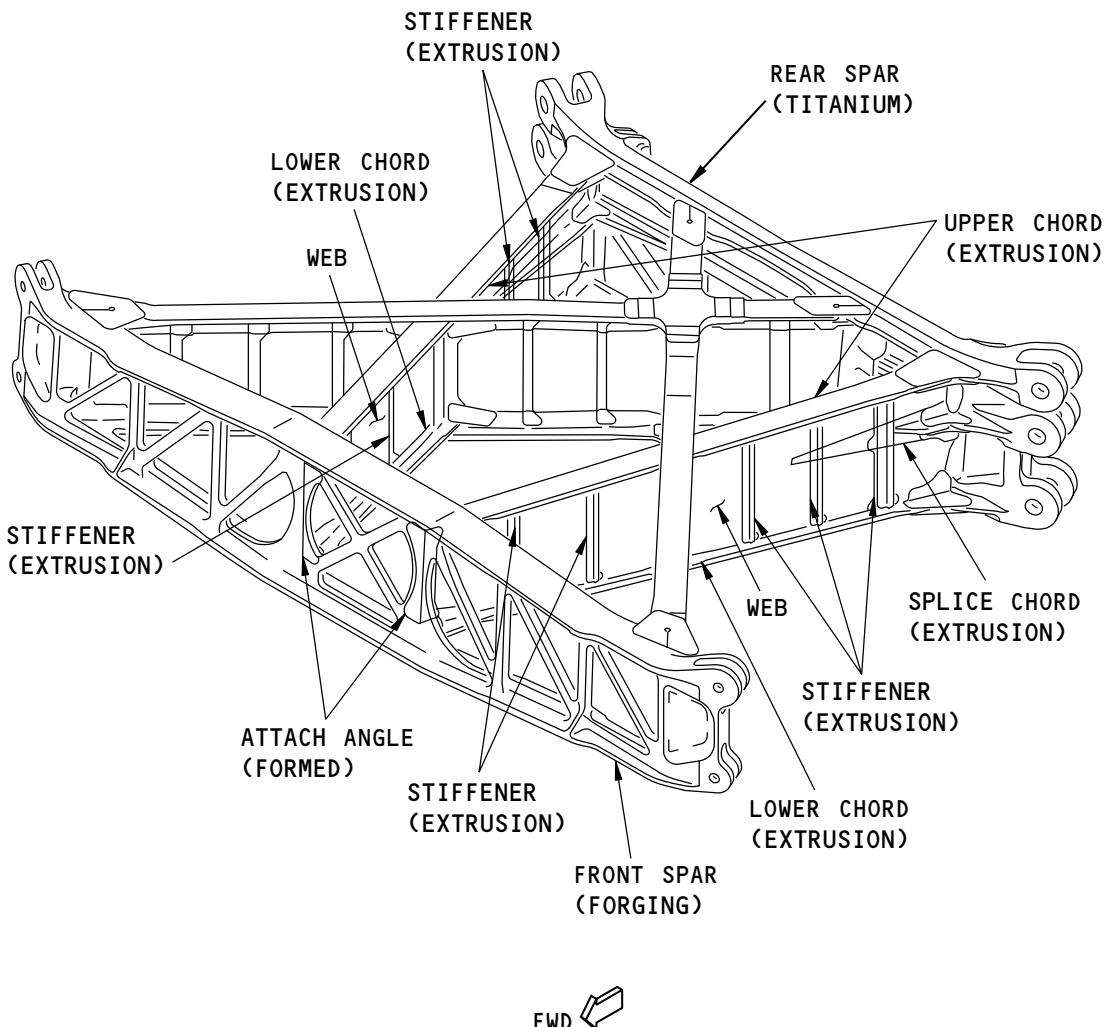
ALLOWABLE DAMAGE 2

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NOTE: ALL PARTS OTHER THAN THE REAR SPAR ARE MADE OF ALUMINUM.

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Horizontal Stabilizer Center Section - Primary Beams
Figure 102

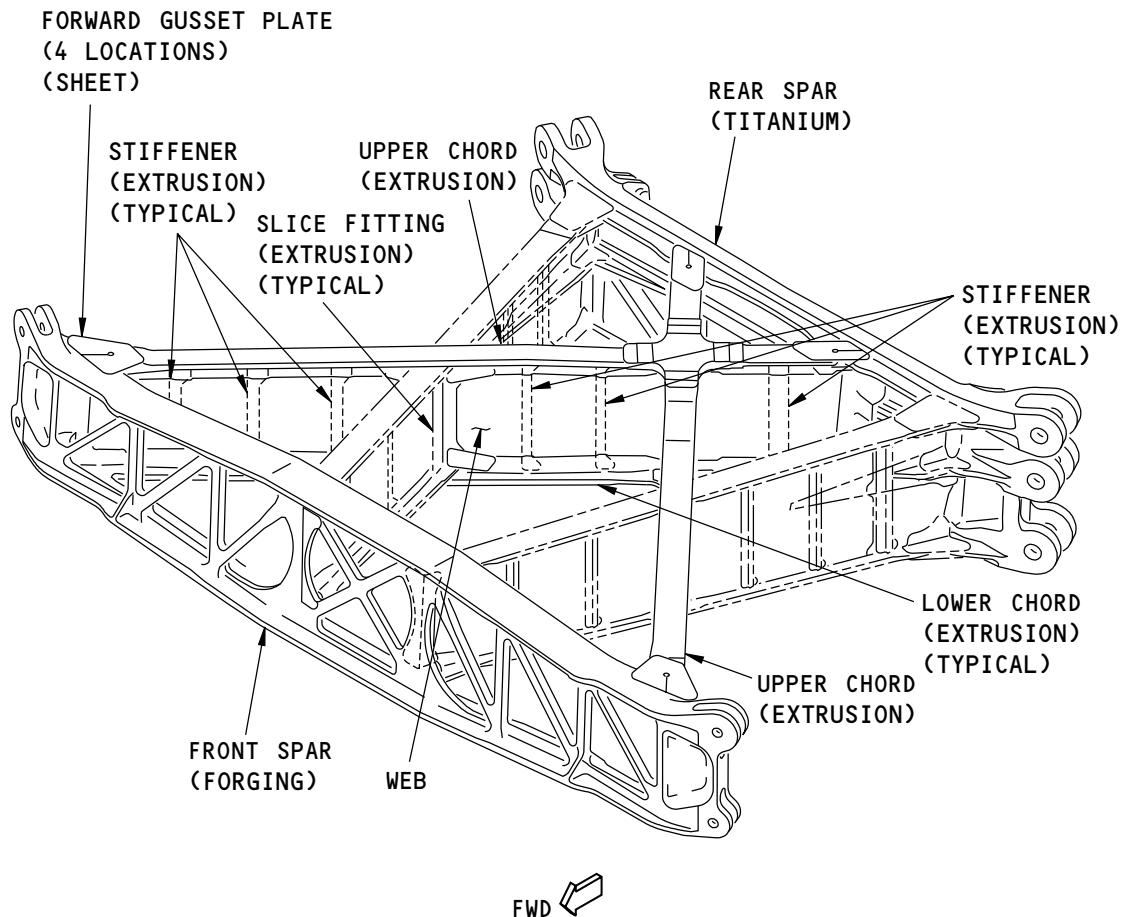
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ALLOWABLE DAMAGE 2

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NOTE: ALL PARTS OTHER THAN THE REAR SPAR ARE MADE OF ALUMINUM.

G16890 S0006592761_V1

Horizontal Stabilizer Center Section - Thrust Beams
Figure 103

55-10-13

ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

2. General

- A. Remove the damaged aluminum material as necessary.
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) Make sure there is a surface smoothness of 63 microinches Ra or better on the damaged parts.
- B. After you remove the damage, do the procedures that follow:
 - (1) Do a High Frequency Eddy Current (HFEC) or dye penetrant inspection to the damaged parts to make sure that all the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .
- C. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- D. Apply two layers of BMS 10-11, Type I, primer to the reworked areas. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General

4. Allowable Damage Limits

- A. Front Spar Chord
 - (1) Cracks are not permitted.
 - (2) Nicks, Gouges, and Scratches:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Detail G.

NOTE: This only applies to damage caused by the sliding seal (part number 181A8004). If the cause of damage cannot be determined then contact The Boeing Company.

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ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

- (3) Corrosion is not permitted.
- (4) Dents are not permitted.
- (5) Holes and Punctures are not permitted.

B. Attach Angles

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A, B, C, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Forward Gusset Plates and Splice Angles

- (1) Cracks are not permitted.
- (2) Nicks, Gouges, and Scratches:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Detail G.

NOTE: This only applies to damage caused by the sliding seal (part number 181A8004).
If the cause of damage cannot be determined then contact The Boeing Company.

- (3) Corrosion is not permitted.
- (4) Dents are not permitted.
- (5) Holes and Punctures are not permitted.

D. Stiffeners

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A, B, and E.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A, B, C, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Detail F.

E. Webs

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A, B, C, D, and E.

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ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

- (b) Damage that does not go through the clad surface is permitted.
- (3) Dents are not permitted.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of 0.25 inch in diameter.
 - (b) A minimum of 4D (D = the diameter of the damage) away from a hole, other damage, or the part edge.
 - (c) Filled with a 2117-T3 or 2117-T4 aluminum rivet installed without sealant.

55-10-13

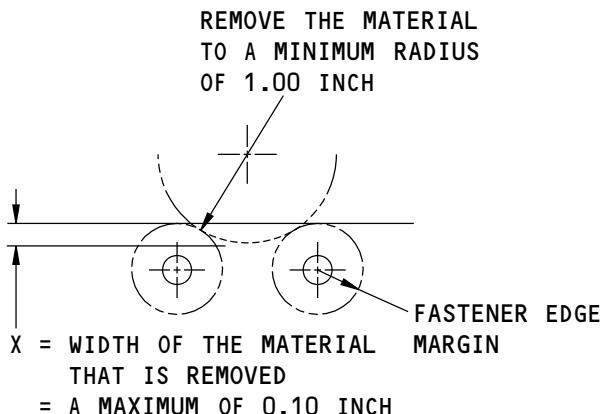
ALLOWABLE DAMAGE 2

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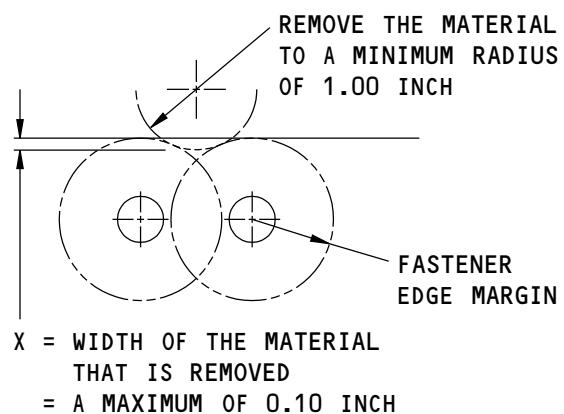
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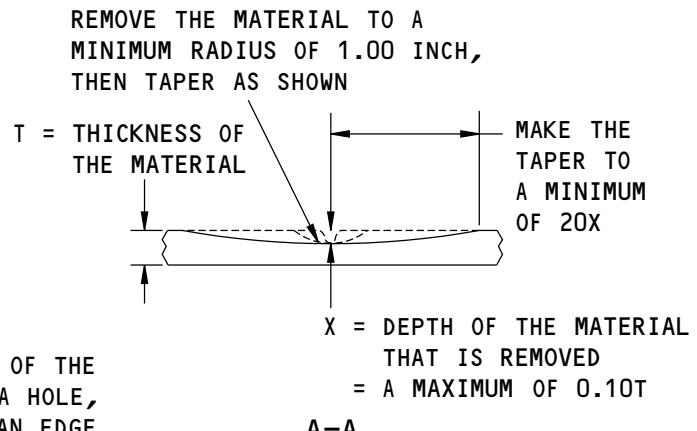
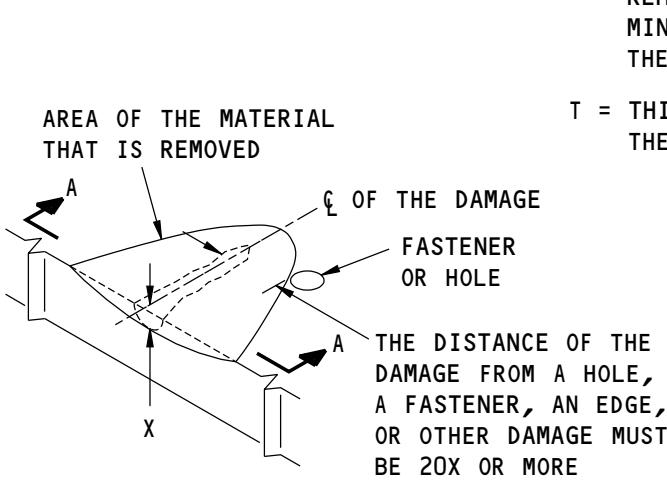
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STRUCTURAL REPAIR MANUAL**


REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

G16891 S0006592762_V1

Allowable Damage Limits
Figure 104 (Sheet 1 of 4)

55-10-13

ALLOWABLE DAMAGE 2

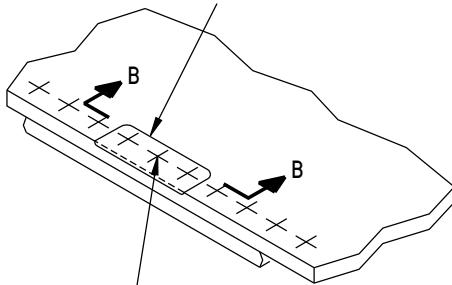
Page 107

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**737-800
STRUCTURAL REPAIR MANUAL**

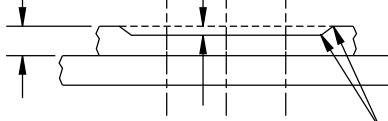
THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN ALL GROUPS OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVE THE FASTENERS BEFORE THE DAMAGE IS REMOVED. INSTALL THE FASTENERS AFTER THE DAMAGE IS REMOVED

T = THICKNESS OF THE MATERIAL

X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10T



MAKE THE CONTOUR SMOOTH TO A MINIMUM RADIUS OF 0.50 INCH (TYPICAL)

REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B

(D)

IF THERE ARE FASTENERS SEE (A) AND (B)

TAPER TO A MINIMUM OF 20X

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER

TAPER TO A MINIMUM OF 20X

MAKE THE CONTOUR SMOOTH (TYPICAL)

$\frac{1}{2}$ OF THE DAMAGE $\frac{1}{2}$ OF THE DAMAGE

4.00 INCHES MINIMUM

WIDTH OF THE FLANGE

WIDTH OF THE FLANGE

X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(E)

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**Allowable Damage Limits
Figure 104 (Sheet 2 of 4)**

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ALLOWABLE DAMAGE 2

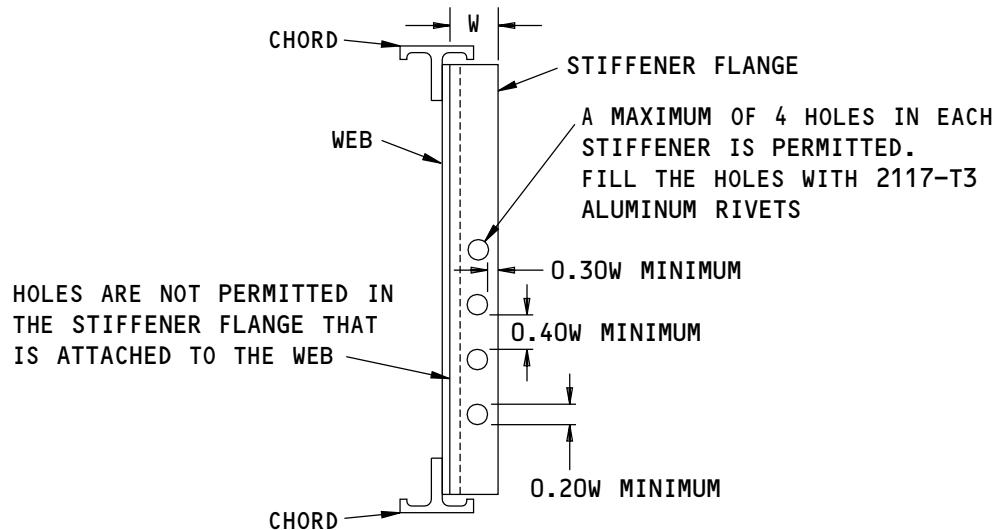
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W = THE WIDTH OF THE STIFFENER FLANGE

HOLES THAT ARE PERMITTED TO REMOVE DAMAGED MATERIAL IN WEB STIFFENERS

(F)

G16931 S0006592764_V1

Allowable Damage Limits
Figure 104 (Sheet 3 of 4)

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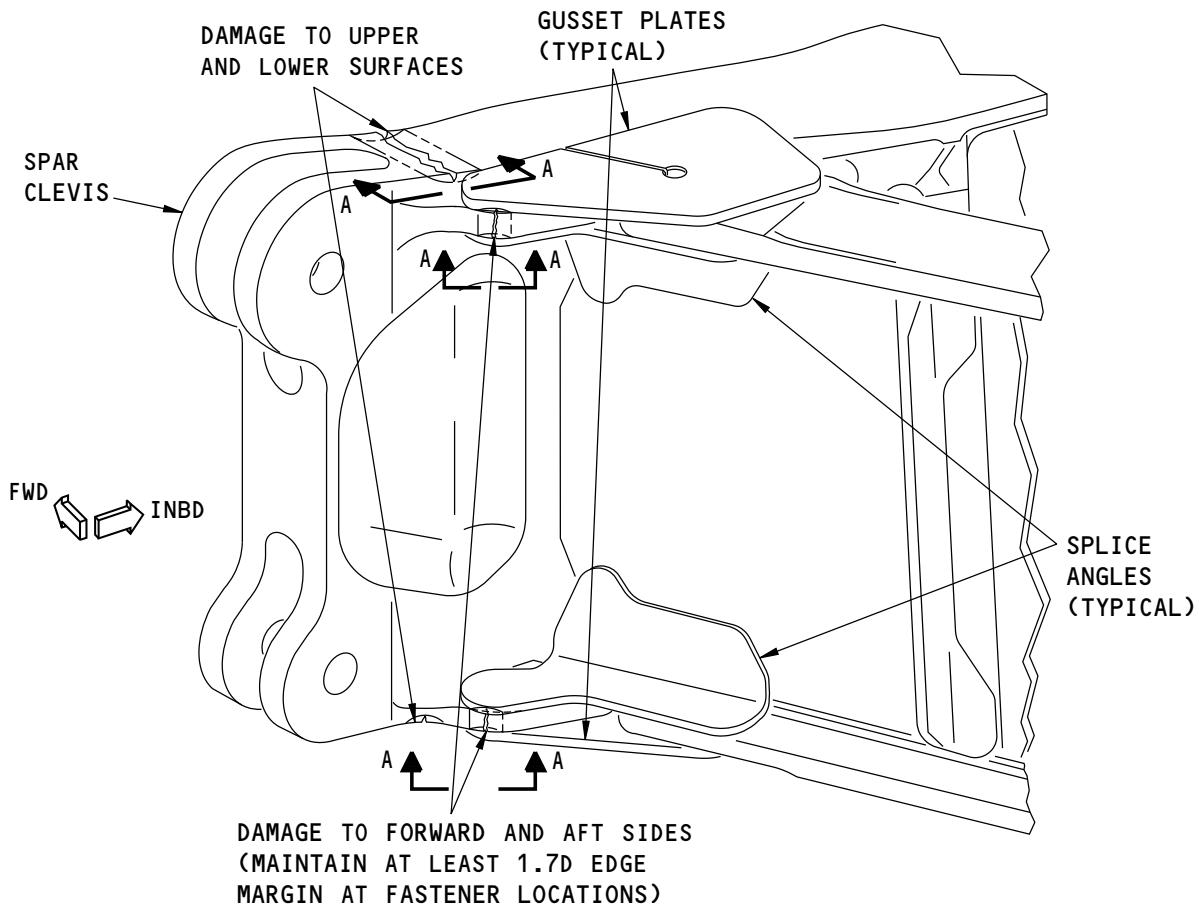
ALLOWABLE DAMAGE 2

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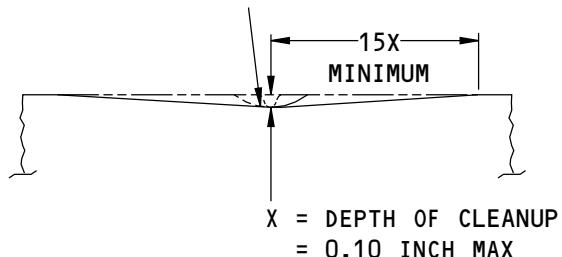
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DAMAGE CLEANUP OF THE SPAR, GUSSETS AND SPLICE ANGLES AS SHOWN

(G)

REMOVE THE DAMAGE TO A MINIMUM RADIUS
OF 1.0 INCH AND TAPER AS SHOWN



SECTION A-A

N64237 S0006592765_V1

**Allowable Damage Limits
Figure 104 (Sheet 4 of 4)**

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ALLOWABLE DAMAGE 2

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REPAIR 1 - HORIZONTAL STABILIZER TRAILING EDGE BEAMS

1. Applicability

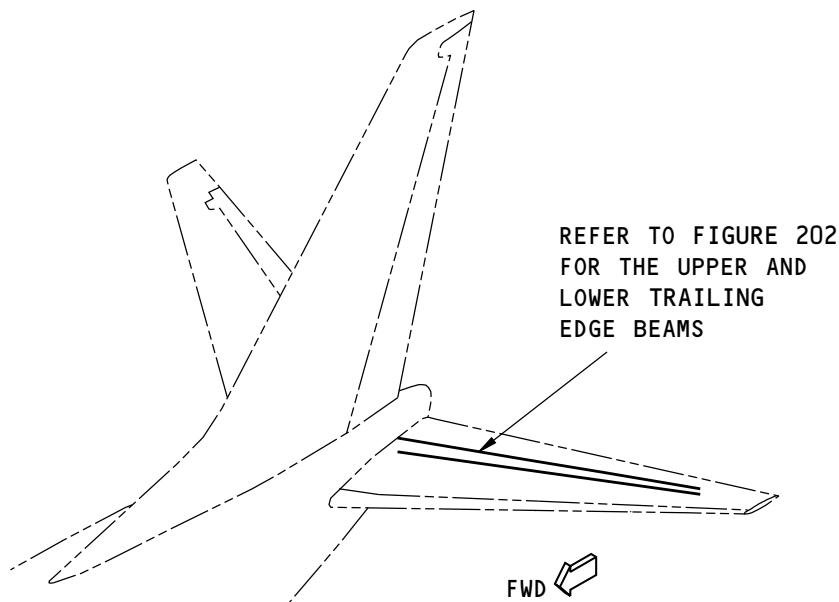
- A. Repair 1 is applicable to damage to the trailing edge beams outboard of Elevator Station 176.64 as shown in Horizontal Stabilizer Beam Location, Figure 201/REPAIR 1 and Horizontal Stabilizer Beam Locations, Figure 202/REPAIR 1.

2. References

Reference	Title
51-70-12	EXTRUDED SECTION REPAIRS

3. Repair Instructions

- A. Refer to 51-70-12 to repair the trailing edge beams outboard of Elevator Station 176.64.



**Horizontal Stabilizer Beam Location
Figure 201**

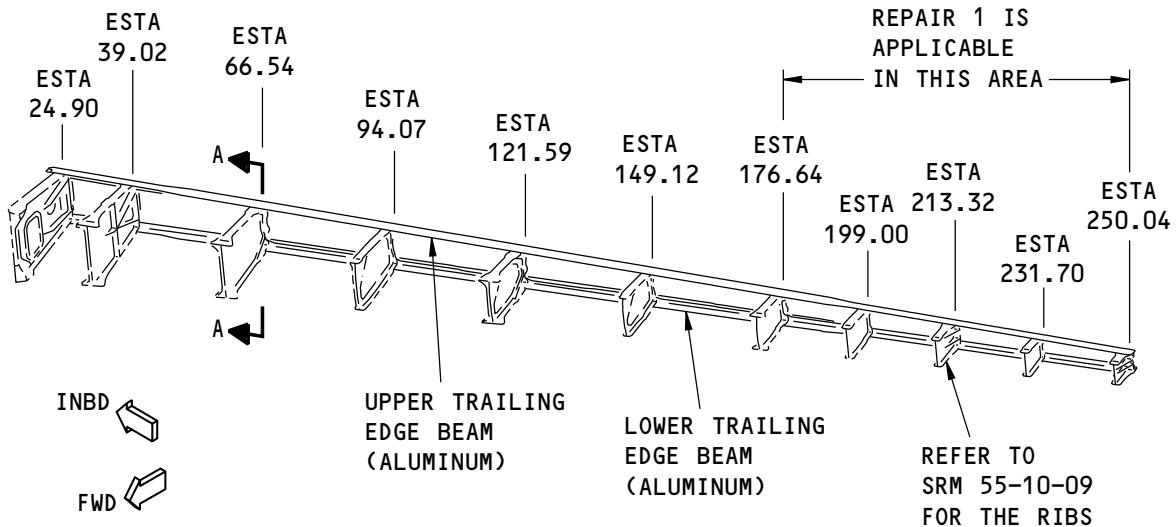
G09770 S0006592768_V1

55-10-13

REPAIR 1
Page 201

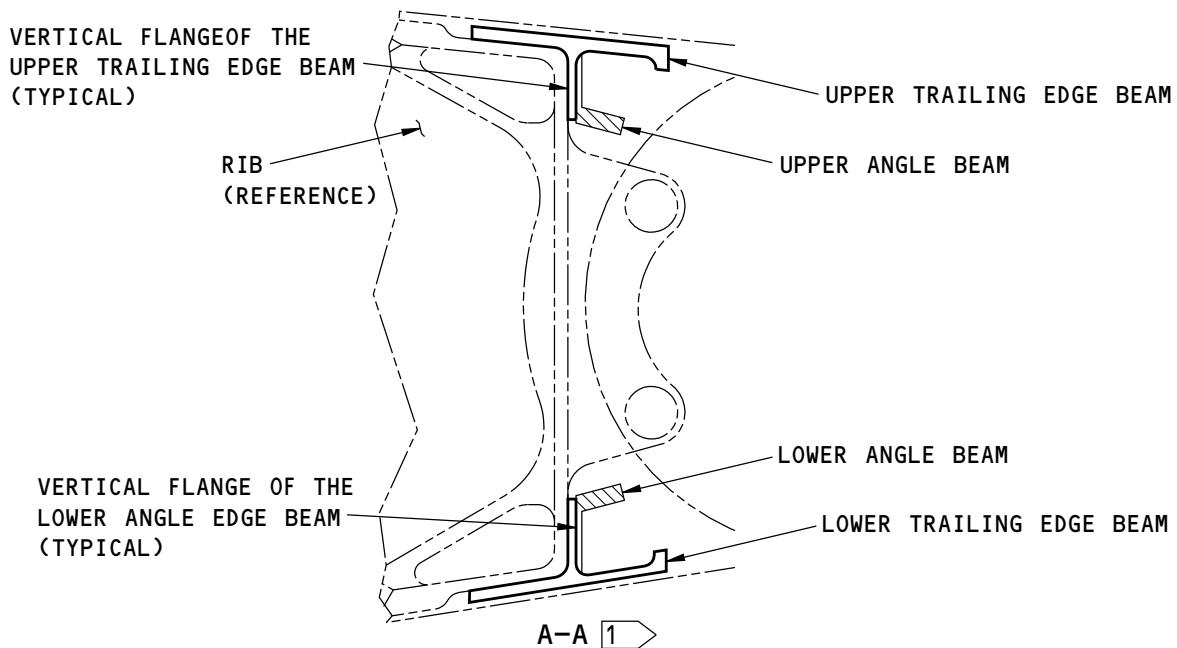
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STRUCTURAL REPAIR MANUAL**


LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

HORIZONTAL STABILIZER BEAMS



NOTES

[1] FOR CUM LINE NUMBERS 1 THRU 215

ZONE 1 - REPAIR IS PERMITTED OUTBOARD OF ELEVATOR STA 176.64

[2] FOR CUM LINE NUMBERS 216 AND ON

ZONE 2 - REPAIR IS NOT PERMITTED

M61751 S0006592769_V1

Horizontal Stabilizer Beam Locations
Figure 202 (Sheet 1 of 2)

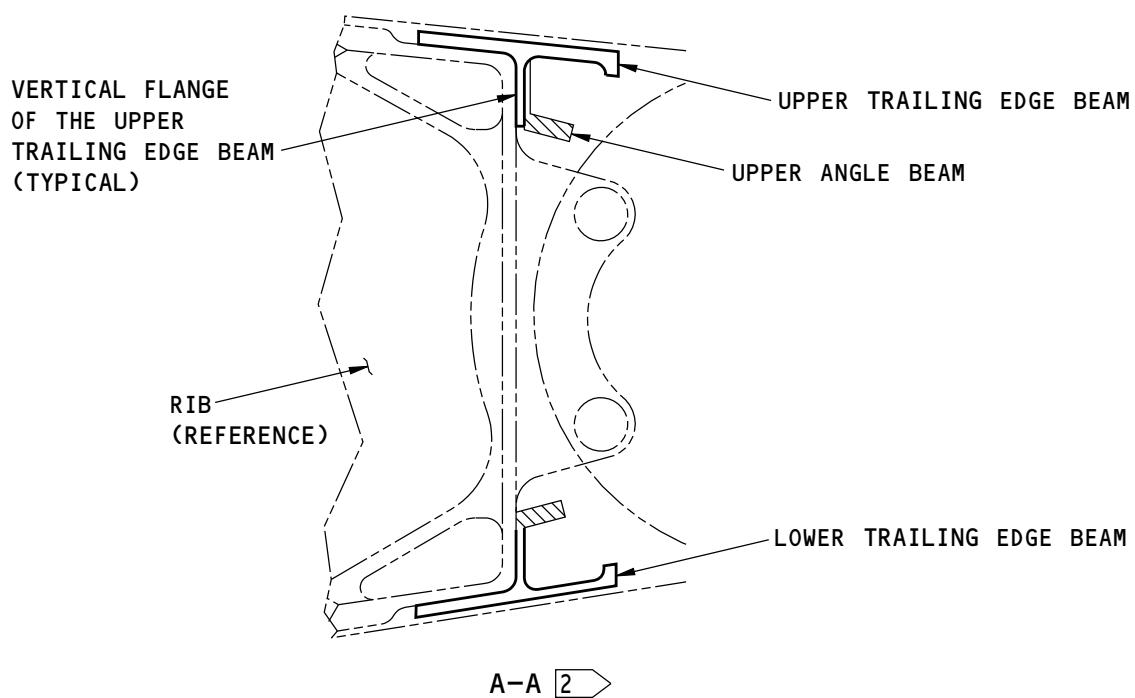
55-10-13

REPAIR 1
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M61752 S0006592770_V1

Horizontal Stabilizer Beam Locations
Figure 202 (Sheet 2 of 2)

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REPAIR 1
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REPAIR 2 - HORIZONTAL STABILIZER CENTER SECTION BEAMS

1. Applicability

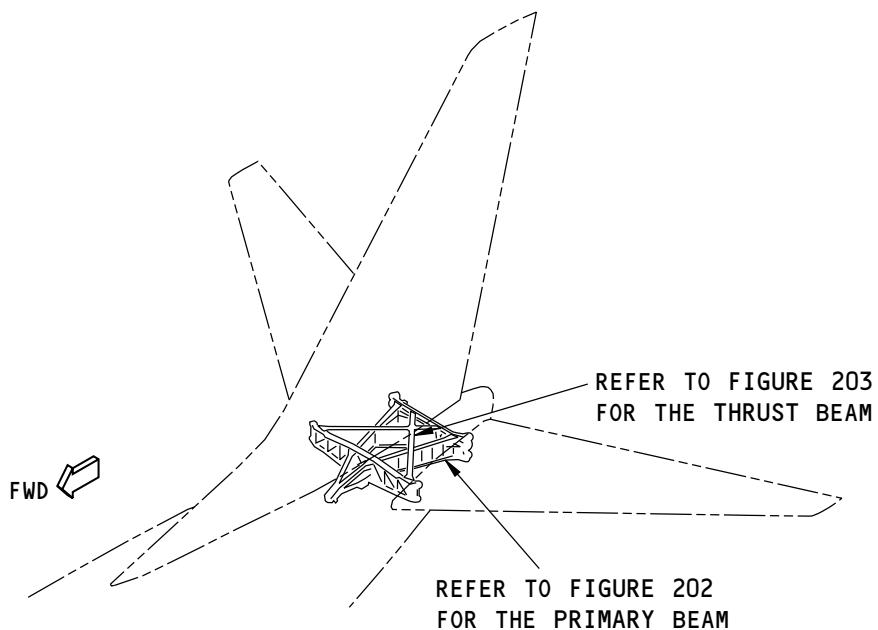
- A. Repair 2 is applicable to damage to the center section beams shown in Horizontal Stabilizer Center Section Beam Location, Figure 201/REPAIR 2.

2. References

Reference	Title
51-70-11	TYPICAL FORMED SECTION REPAIRS
51-70-12	EXTRUDED SECTION REPAIRS

3. Repair Instructions

- A. Refer to 51-70-11 to repair the formed parts.
B. Refer to 51-70-12 to repair the extruded parts.



G15001 S0006592773_V1

Horizontal Stabilizer Center Section Beam Location
Figure 201

55-10-13

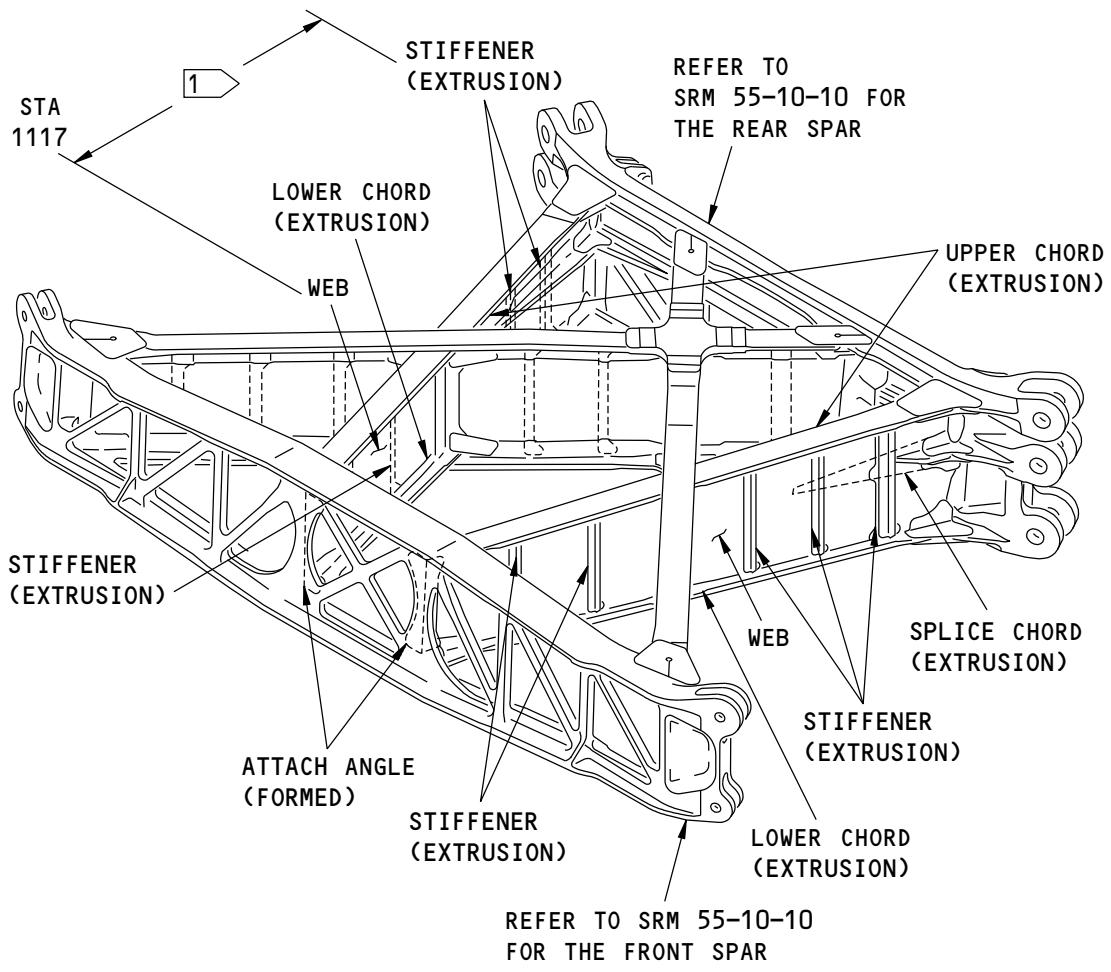
REPAIR 2
Page 201

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FWD ↗

NOTES

- ALL PARTS ARE MADE FROM ALUMINUM.
- 1 FOR THE PRIMARY BEAMS, NO REPAIRS ARE PERMITTED TO THE UPPER OR LOWER CHORDS AFT OF STA 1117.

G15026 S0006592774_V1

Horizontal Stabilizer Center Section - Primary Beams
Figure 202

55-10-13

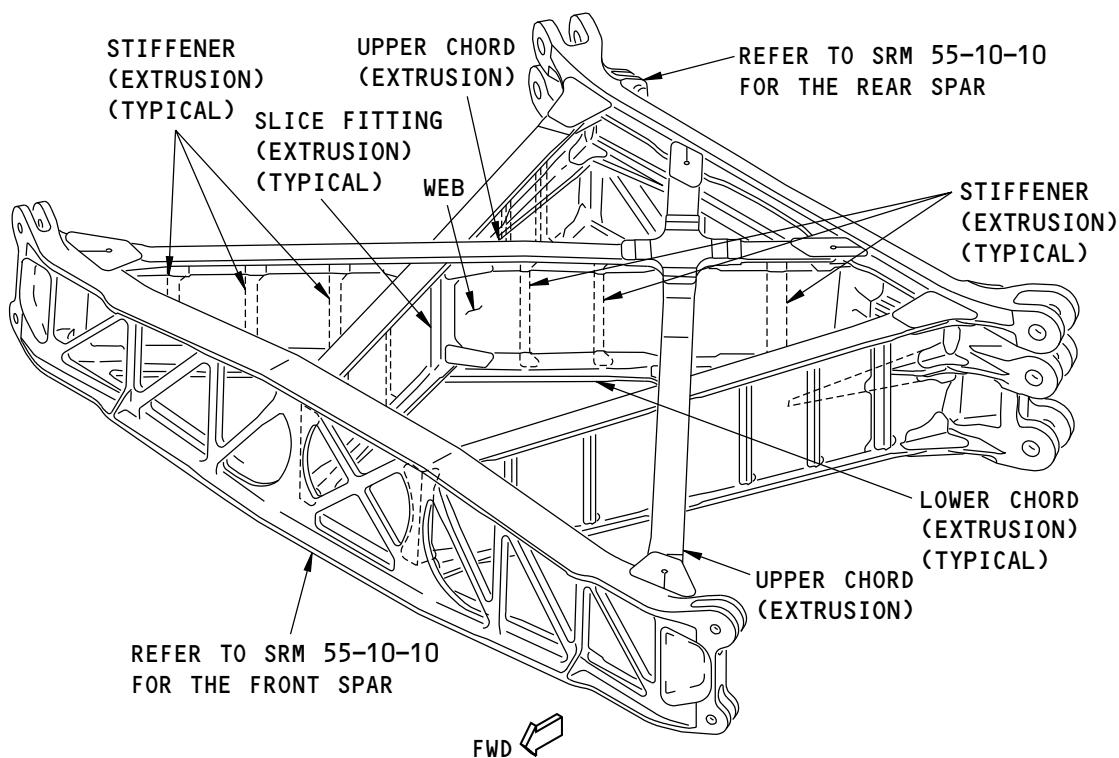
REPAIR 2
Page 202

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NOTE: ALL PARTS ARE MADE OF ALUMINUM.

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Horizontal Stabilizer Center Section - Thrust Beams
Figure 203

55-10-13

REPAIR 2
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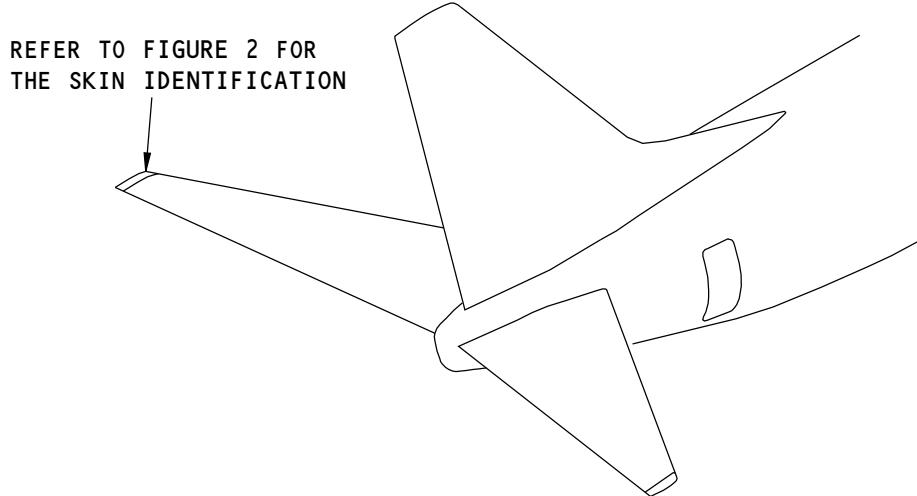
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IDENTIFICATION 1 - HORIZONTAL STABILIZER TIP



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F71197 S0006592779_V1

Horizontal Stabilizer Tip Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
186A0001	Left Horizontal Stabilizer Collector
186A0002	Right Horizontal Stabilizer Collector
189A1001	Tip Cap Installation/Assembly - Horizontal Stabilizer

55-10-30

IDENTIFICATION 1

Page 1

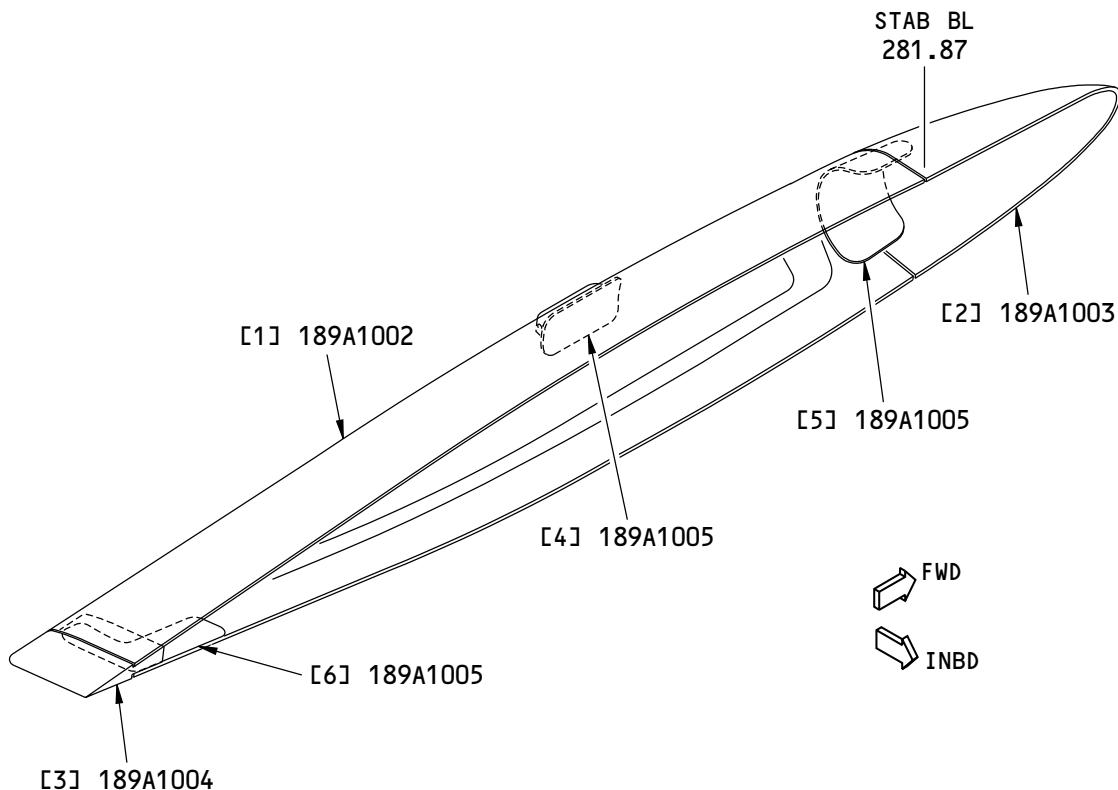
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F71212 S0006592781_V2

Horizontal Stabilizer Tip Identification
Figure 2

55-10-30
IDENTIFICATION 1
Page 2
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Composite Tip Cap		Refer to Figure 3	
[2]	Leading Edge Cap	0.090 (2.3)	2024-T42 clad sheet as given in QQ-A-250/5	
[3]	Trailing Edge Tip		A356.0-T6 aluminum casting as given in AMS 4218 with C30 cast roughness	
[4]	Ground Strap	0.020 (0.51)	2024-T3 clad sheet as given in QQ-A-250/5	
[5]	Splice Strap	0.063 (1.60)	2024-T3 clad sheet as given in QQ-A-250/5	
[6]	Ground Strap	0.020 (0.51)	2024-T3 clad sheet as given in QQ-A-250/5	For airplane Line Numbers 2274 and on, and airplanes with SB 737-55-1089 incorporated

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

Page 3

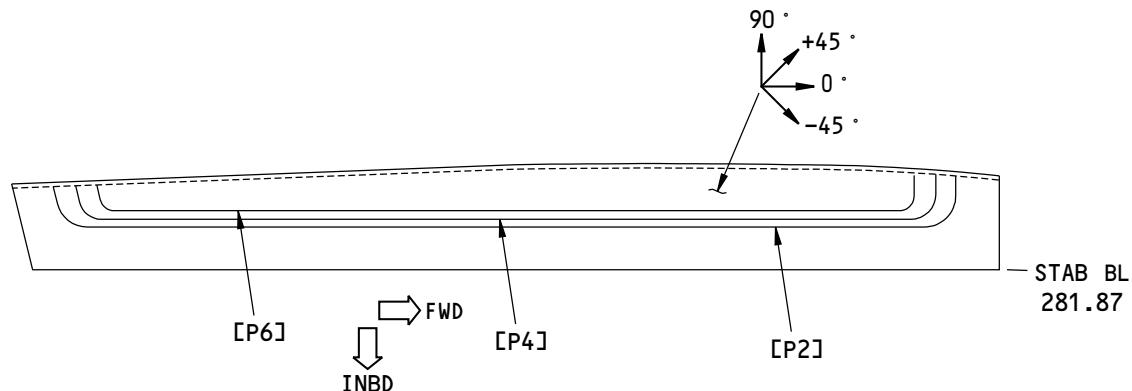
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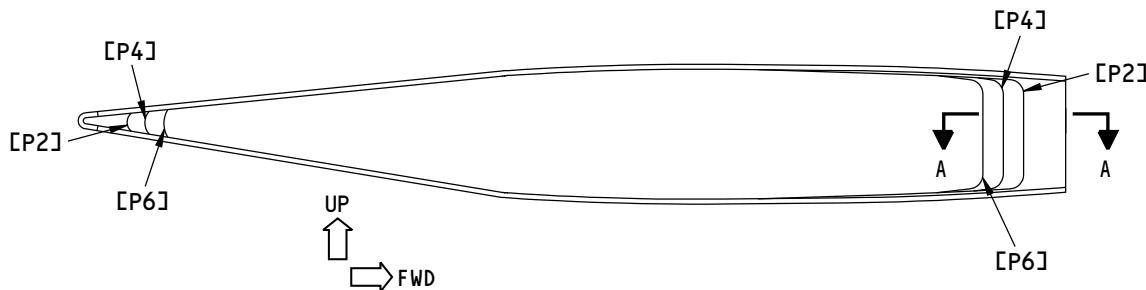


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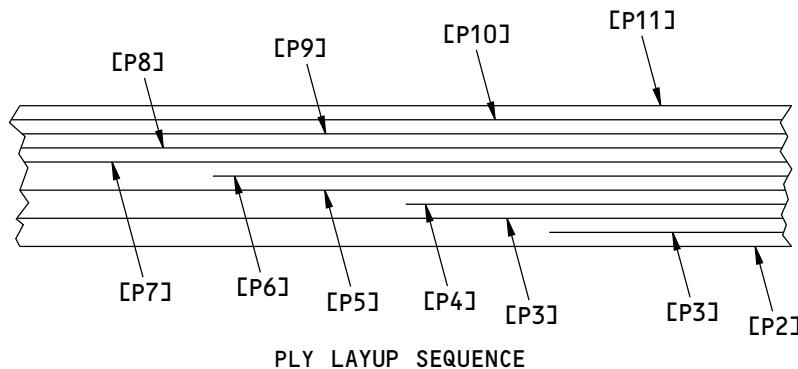
SIDE VIEW

(A)



PLAN VIEW

(B)



A-A

F71462 S0006592783_V1

Ply Sequence for Figure 2, Item [1]
Figure 3

55-10-30

IDENTIFICATION 1
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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1, P2, P5, P6, P7, P9	0 or 90 degrees	Glass Fiber Reinforced Plastic (GFRP) as given in BMS 8-79, Class III, Grade B, Style 1581. Style 7781 is optional
P3, P4, P8	+ or - 45 degrees	GFRP as given in BMS 8-79, Class III, Grade B, Style 1581. Style 7781 is optional
P10	0 or 90 degrees	Expanded metal foil as given in BMS 8-336, Type I, Class 1, Grade 016, Form A. Aluminum coated epoxy impregnated glass fiber cloth as given in BMS 8-278, Type I, Class 250 is an alternative.
P11	----	0.001 inch thick composite surfacing film as given in BMS 8-341, Type III

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IDENTIFICATION 1

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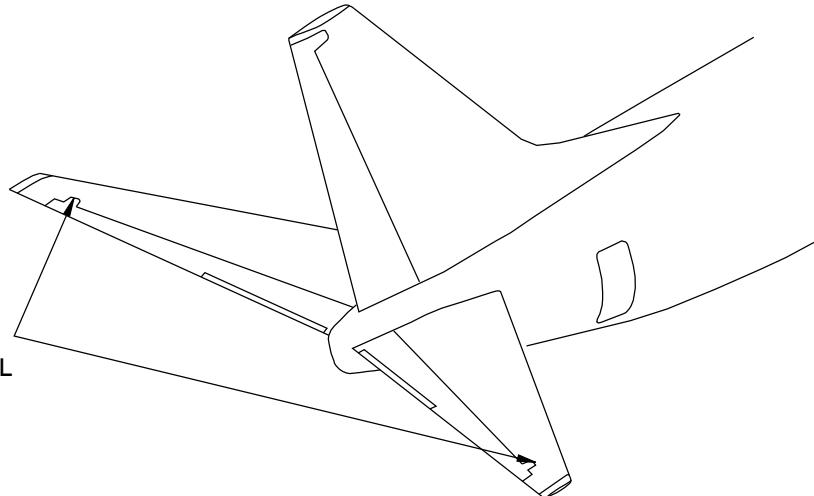
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - HORIZONTAL STABILIZER COVE

REFER TO FIGURE 2
FOR THE HORIZONTAL
STABILIZER COVE
IDENTIFICATION



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F78168 S0006592786_V1

Horizontal Stabilizer Cove Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
185A0001	Trailing Edge Functional Collector - Left, Horizontal Stabilizer
185A0002	Trailing Edge Functional Collector - Right, Horizontal Stabilizer
185A3100	Installation - Cove Horizontal Stabilizer

55-10-30

IDENTIFICATION 2

Page 1

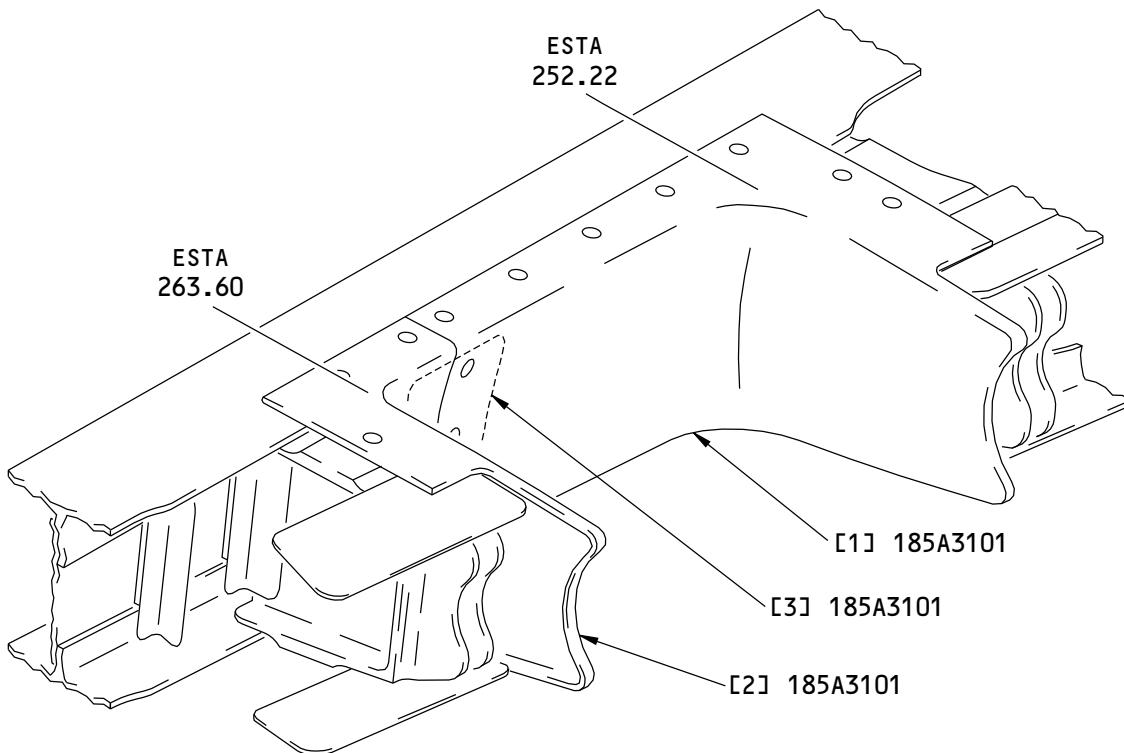
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LEFT SIDE SHOWN,
RIGHT SIDE OPPOSITE

F78352 S0006592788_V1

Horizontal Stabilizer Cove Identification
Figure 2

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IDENTIFICATION 2
Page 2
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Inboard Panel		Preimpregnated Glass Fabric Refer to Figure 3	
[2]	Outboard Panel		Preimpregnated Glass Fabric Refer to Figure 4	
[3]	Splice Plate	0.050	Clad 2024-T3 as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 2

Page 3

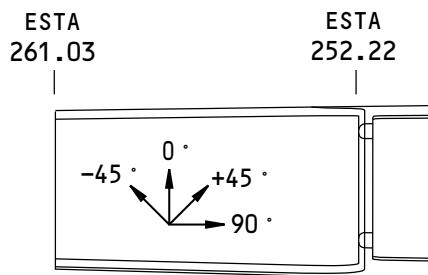
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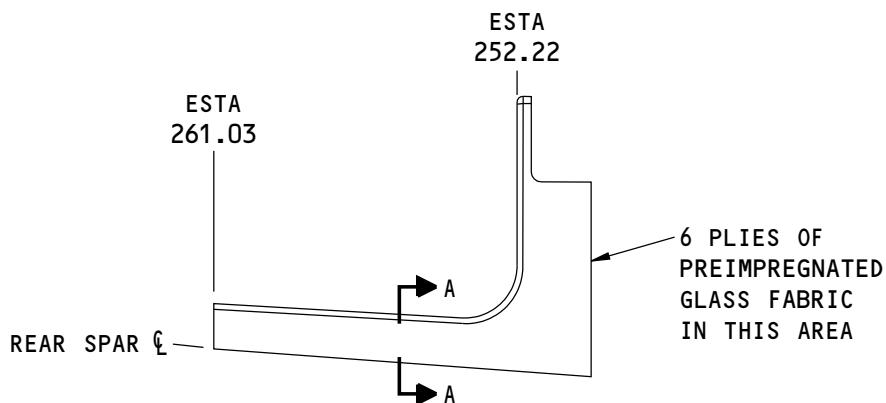


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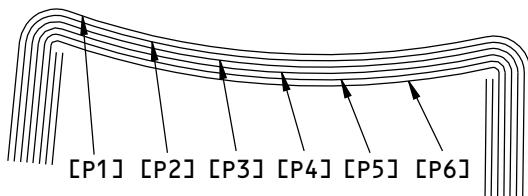
AFT VIEW

LEFT SIDE SHOWN,
RIGHT SIDE OPPOSITE



PLAN VIEW

LEFT SIDE SHOWN,
RIGHT SIDE OPPOSITE



A-A

F78412 S0006592790_V1

Ply Direction and Ply Sequence for Horizontal Stabilizer Cove, Figure 2, Item [1]
Figure 3

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IDENTIFICATION 2
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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1, P6	90 degrees	Preimpregnated Glass Fabric as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781
P2, P5	+ or - 45 degrees	Preimpregnated Glass Fabric as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781
P3, P4	0 degrees	Preimpregnated Glass Fabric as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781

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IDENTIFICATION 2

Page 5

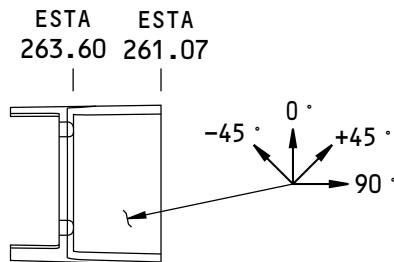
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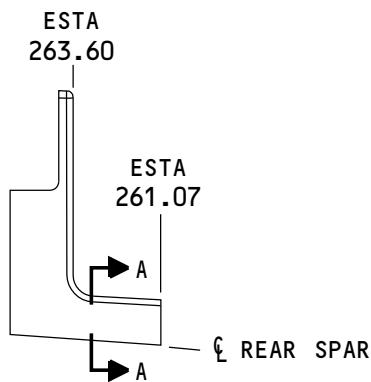


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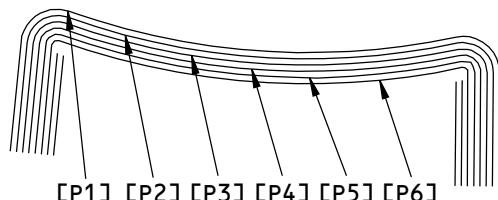
AFT VIEW

LEFT SIDE SHOWN,
RIGHT SIDE OPPOSITE



PLAN VIEW

LEFT SIDE SHOWN,
RIGHT SIDE OPPOSITE



A-A

F78486 S0006592792_V1

Ply Direction and Ply Sequence for Horizontal Stabilizer Cove, Figure 2, Item [2]
Figure 4

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IDENTIFICATION 2
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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [2]		
PLY	DIRECTION	MATERIAL
P1, P6	90 degrees	Preimpregnated Glass Fabric as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781
P2, P5	+ or - 45 degrees	Preimpregnated Glass Fabric as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781
P3, P4	0 degrees	Preimpregnated Glass Fabric as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781

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IDENTIFICATION 2

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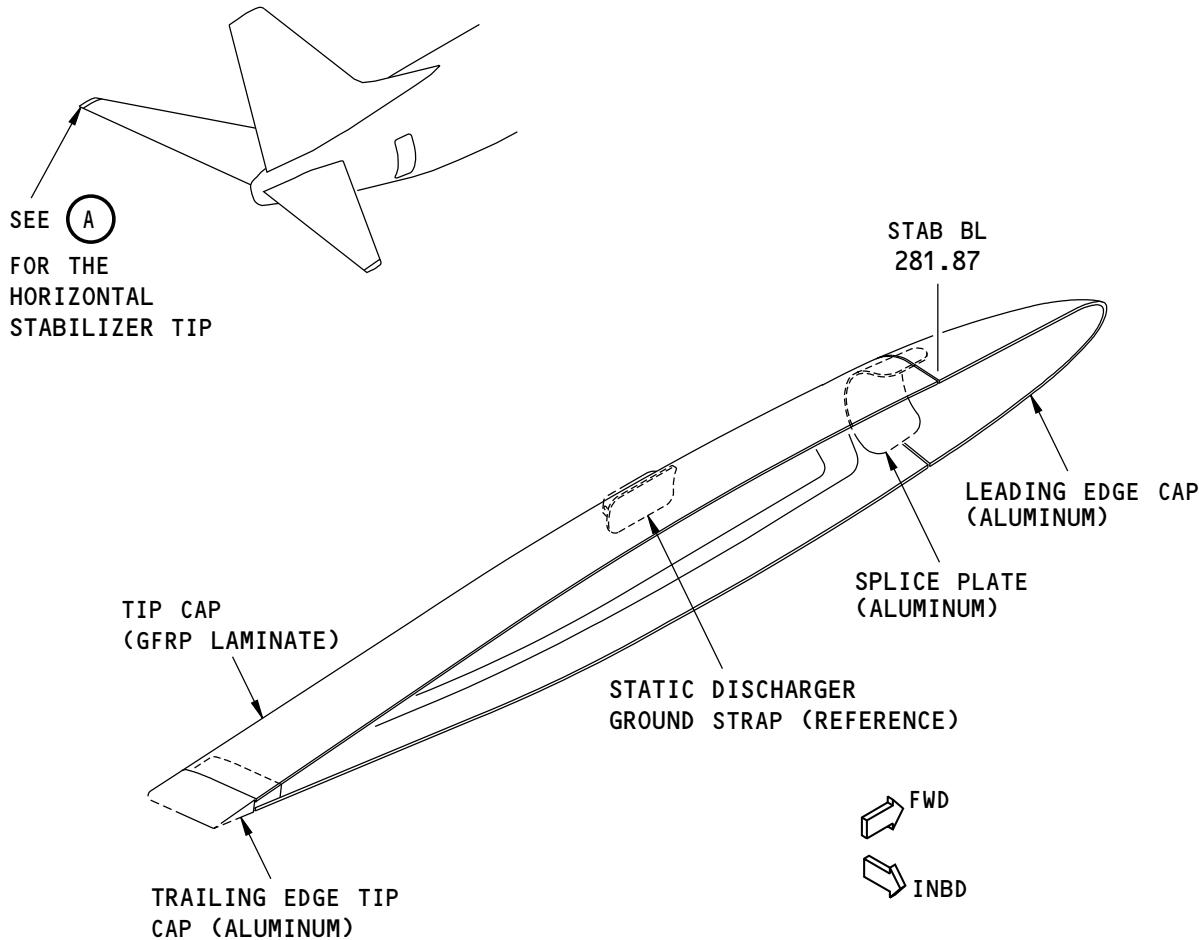
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STRUCTURAL REPAIR MANUAL**

ALLOWABLE DAMAGE 1 - HORIZONTAL STABILIZER TIP

1. Applicability

- A. Allowable Damage 1 is applicable to damage on the horizontal stabilizer tip as shown in Horizontal Stabilizer Tip, Figure 101/ALLOWABLE DAMAGE 1.



**Horizontal Stabilizer Tip
Figure 101**

2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of damage.

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ALLOWABLE DAMAGE 1

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- B. Do the steps that follow if you have damage to the tip cap made of Glass Fabric Reinforced Plastic (GFRP).
 - (1) Remove all the contamination and water from the structure.
 - (a) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (b) Refer to 51-70-04 for the damage removal procedures.
 - (2) The tip cap has a layer of BMS 8-336 expanded aluminum foil mesh. If damage occurs to the expanded aluminum foil mesh, do the steps that follow:
 - (a) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh.
 - (b) Seal the damaged area as given in 51-70-14.
- C. Do the steps that follow if you have damage to the leading edge cap or the trailing edge tip:
 - (1) Remove the damage.
 - (a) Refer to 51-10-02 for the investigation and cleanup procedures.
 - (b) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (c) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (d) Make the surface texture roughness for all cut surfaces 125 microinches Ra or smoother.
 - (2) After you remove the damage, do the steps that follow:
 - (a) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
 - (b) Apply one layer of BMS 10-79, Type III primer to the conversion coated, reworked areas. As an alternative, apply one coat of BMS 10-11, Type I primer. If you use BMS 10-79, Type III primer, refer to SOPM 20-44-04. If you use BMS 10-11, Type I primer, refer to SOPM 20-41-02.
 - (c) Apply a decorative finish if necessary. Refer to AMM PAGEBLOCK 51-21-99/701.
- D. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

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ALLOWABLE DAMAGE 1

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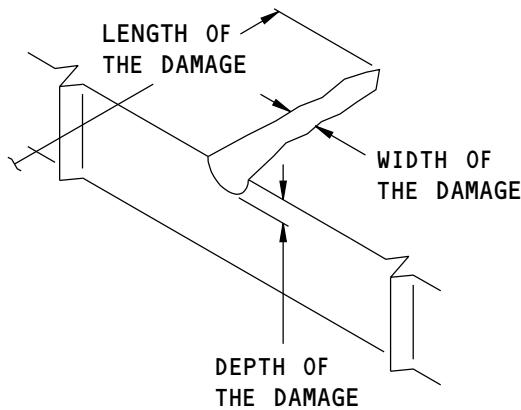
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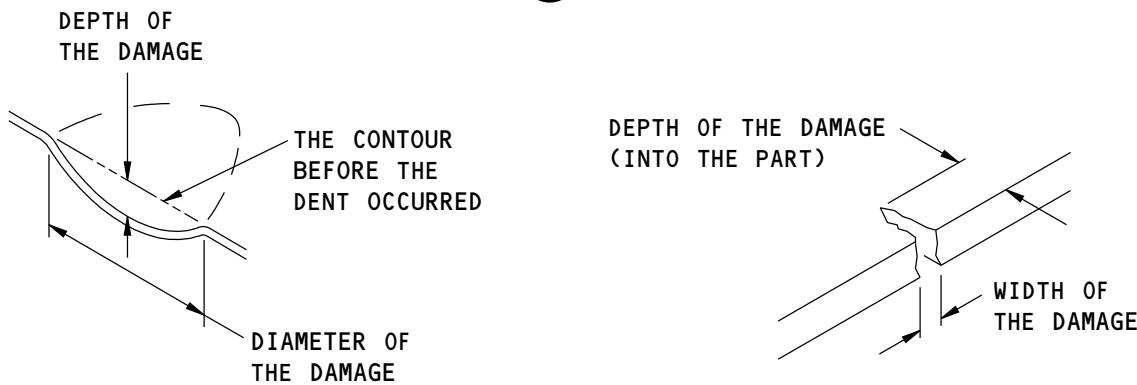


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SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR DENT DAMAGE

(B)

SIZE DEFINITIONS FOR EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 102

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-03	HEAT DAMAGE EVALUATION
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-01, REPAIR GENERAL	Procedures to Rework or Fill Allowable Dents on the External Aerodynamic Surfaces of Metallic Parts
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS

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ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
51-70-08, GENERAL	Resin Sweep-Fair Procedures
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Tip Cap (GFRP)

- (1) Nicks, Gouges and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum of one ply in depth
NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum of 5.0 inches in length
 - (c) A maximum of 0.25 inch in width
 - (d) A minimum of 0.50 inch away from the edge of a fastener hole
 - (e) A minimum of 0.50 inch away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.
- (3) Dents are permitted if:
 - (a) They are a maximum of 2.0 inch in diameter.
 - (b) The edge of the damage is a minimum of 4D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of 1.50 inch in diameter
 - (b) A minimum of 4D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.
- (5) Delamination is permitted if it is:
 - (a) A maximum of 1.5 inch in diameter
 - (b) A minimum of 4D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies

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ALLOWABLE DAMAGE 1

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- 2) Are sealed as given in Paragraph 2.
 - (6) Edge damage is permitted if it is:
 - (a) A maximum of 0.10 inch in depth
 - (b) A maximum of 0.50 inch in width
 - (c) A minimum of 2.5D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
 - (7) Edge Erosion is permitted as shown in Cleanup and Sealing of Edge Erosion, Figure 103/ALLOWABLE DAMAGE 1.
- B. Leading Edge Cap and Trailing Edge Tip
- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A, B, and C.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, D, and E.
 - (b) Damage that does not go through the clad surface is permitted.
 - (3) Dents:
 - (a) Dents are permitted if they agree with the conditions shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail F.
 - (4) Holes and Punctures are permitted if:
 - (a) They are 0.25 inch in diameter or less
 - (b) The edge of the damage is a minimum of 1.0 inch away from another hole, an edge, or other damage
 - (c) They are filled with a 2017-T3 or 2117-T4 aluminum protruding head rivet. Install the rivet dry.
 - (5) Lightning Strike
 - (a) For a temporary seal:
 - 1) Refer to Figure 105 (Sheet 2) for the damage limits.
 - 2) Seal the Trailing Edge with aluminum tape (speed tape).
 - 3) Do the permanent repair before 10 flight cycles.
 - (b) For a permanent seal:
 - 1) Refer to Figure 105 (Sheet 1) for the damage limits and blend limits.
 - 2) Remove the damage as given in Paragraph 2.C.(1)/ALLOWABLE DAMAGE 1
 - 3) Do a detailed visual inspection to make sure all damaged material is removed.
 - 4) Perform a heat damage analysis. Refer to HEAT DAMAGE EVALUATION, 51-20-03
 - 5) After you remove the damage, do the steps in Paragraph 2.C.(2)/ALLOWABLE DAMAGE 1

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ALLOWABLE DAMAGE 1

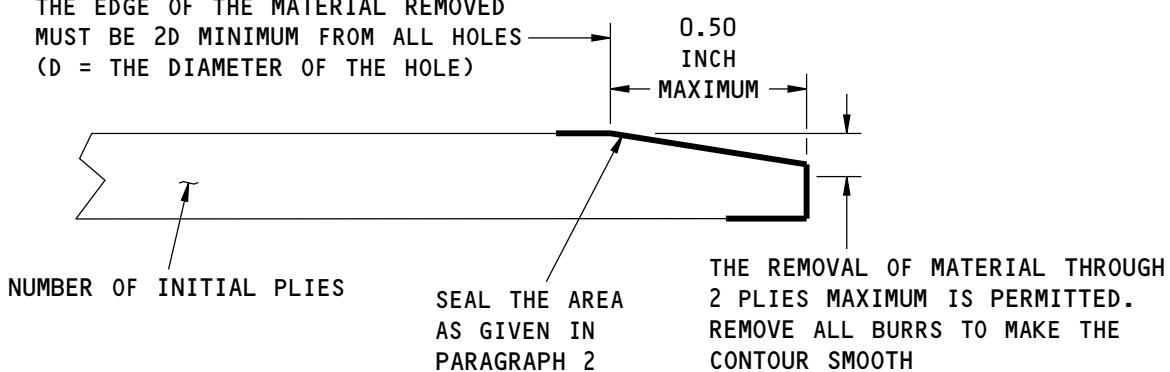
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THE EDGE OF THE MATERIAL REMOVED
MUST BE 2D MINIMUM FROM ALL HOLES
(D = THE DIAMETER OF THE HOLE)



F73108 S0006592798_V1

Cleanup and Sealing of Edge Erosion
Figure 103

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ALLOWABLE DAMAGE 1

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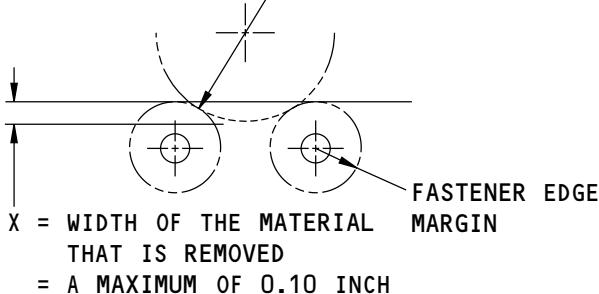
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**737-800
STRUCTURAL REPAIR MANUAL**

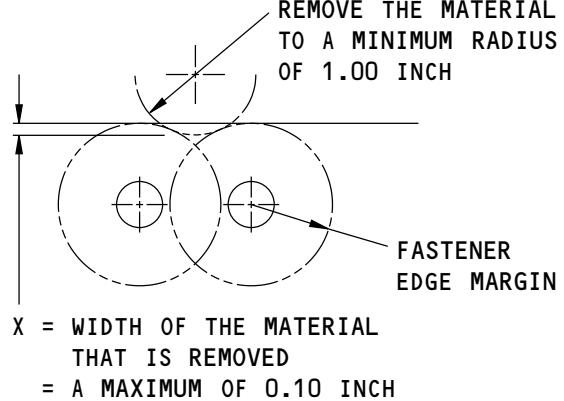
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH



REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS DO NOT HAVE AN OVERLAP

(A)

REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH



REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS HAVE AN OVERLAP

(B)

TAPER TO A MINIMUM OF $20X$.
THE DISTANCE OF THE DAMAGE
FROM A HOLE, A FASTENER,
AN EDGE, OR OTHER DAMAGE
MUST BE $20X$ OR MORE

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH,
THEN TAPER AS SHOWN

IF THERE ARE FASTENERS,
SEE (A) AND (B)

MAKE THE CONTOUR SMOOTH
(TYPICAL)

X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH

REMOVAL OF DAMAGED MATERIAL ON AN EDGE OF BONDED METAL
SKINS AND WEBS

(C)

F71688 S0006592799_V1

Allowable Damage Limits
Figure 104 (Sheet 1 of 3)

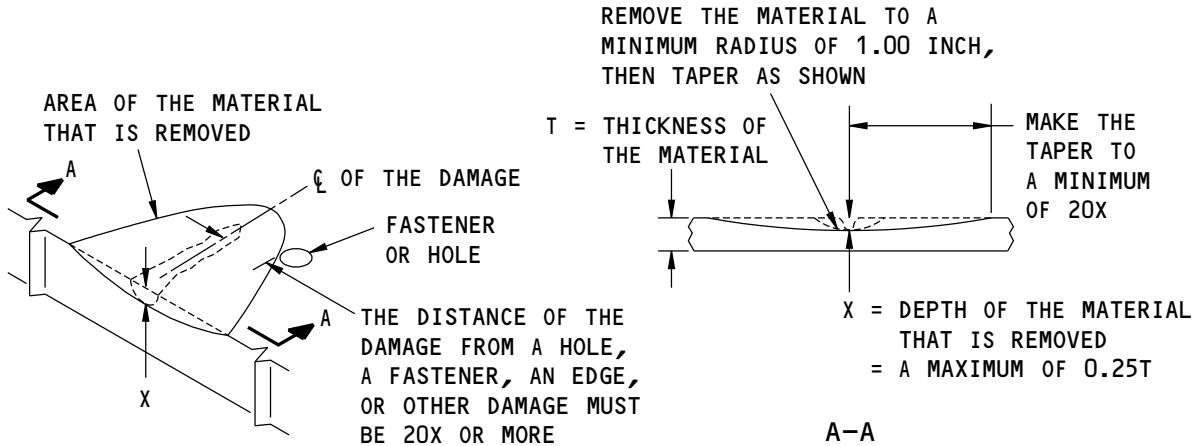
55-10-30

ALLOWABLE DAMAGE 1

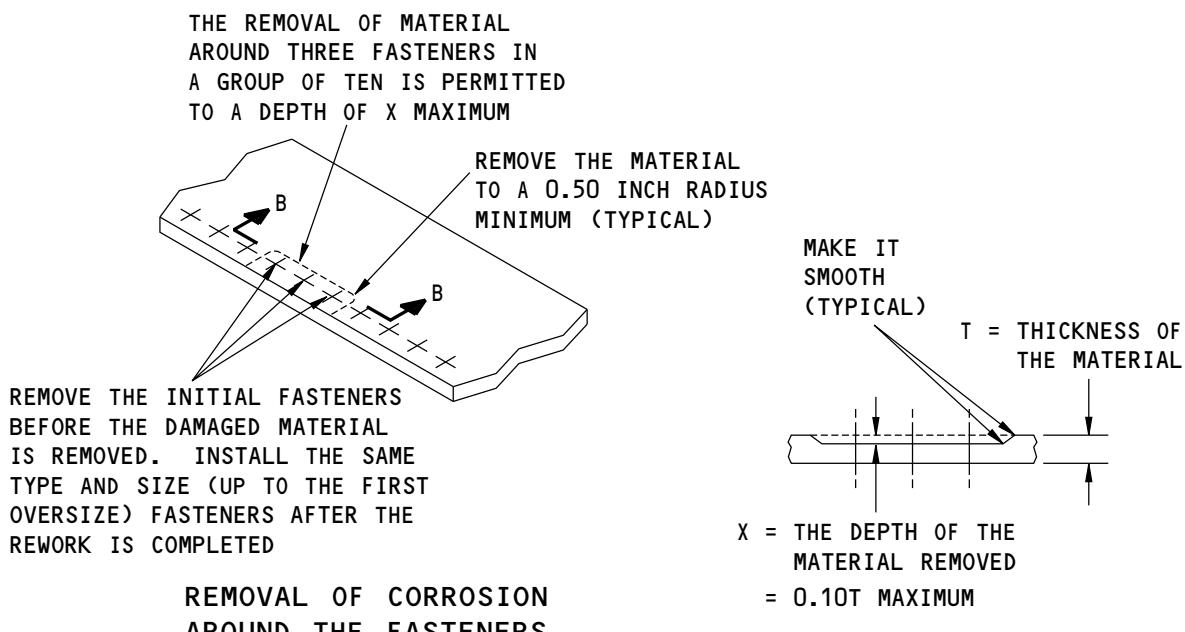
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REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)



F71697 S0006592800_V1

**Allowable Damage Limits
Figure 104 (Sheet 2 of 3)**

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ALLOWABLE DAMAGE 1

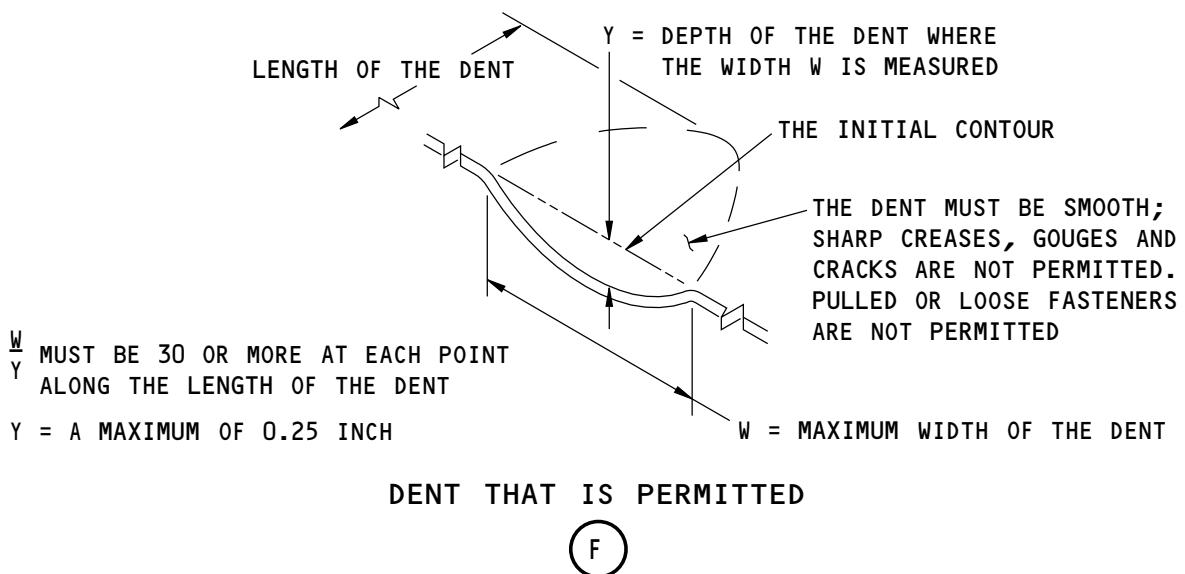
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F71757 S0006592801_V1

Allowable Damage Limits
Figure 104 (Sheet 3 of 3)

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ALLOWABLE DAMAGE 1

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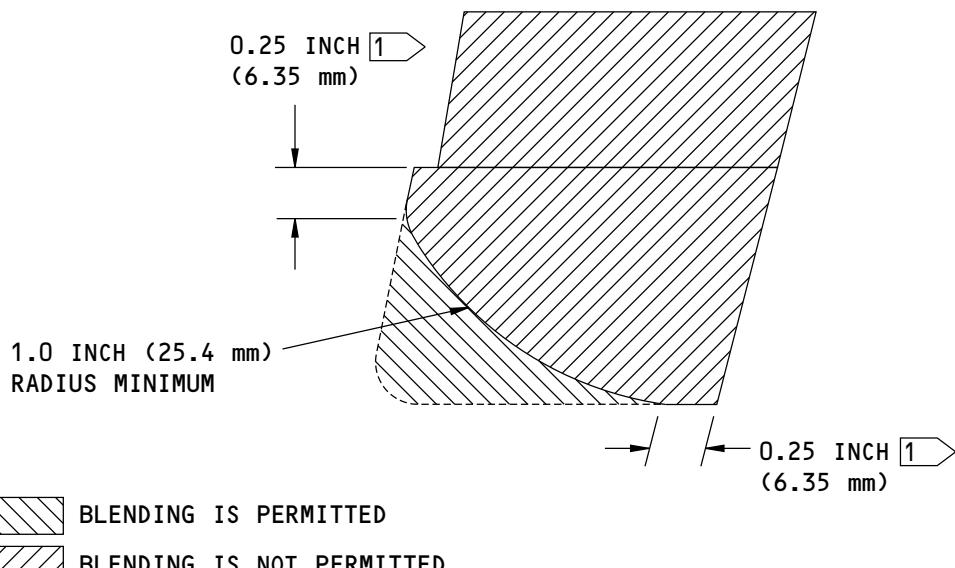
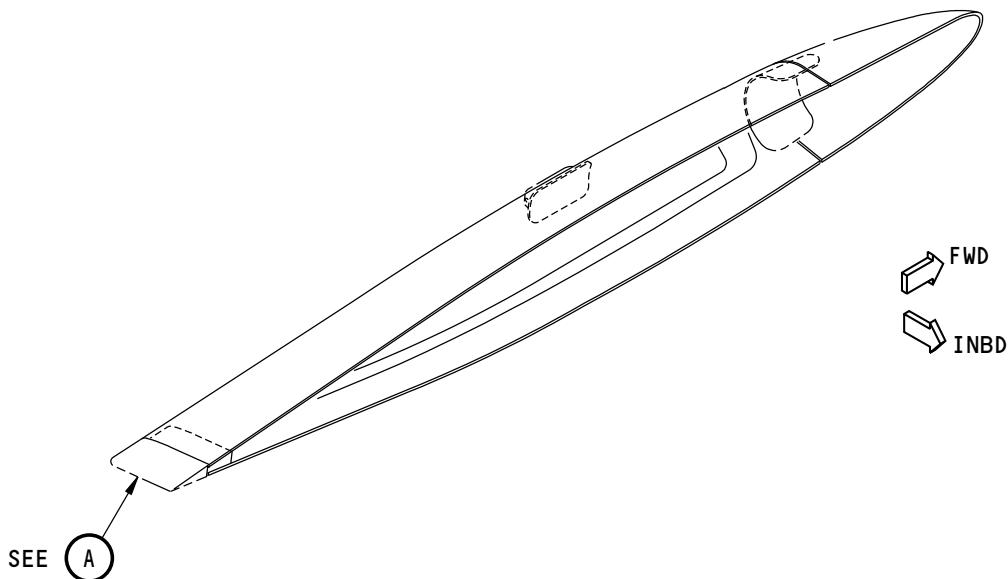
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NOTES

[1] DO NOT BLEND IN THE EDGE DIMENSION SHOWN.

LIGHTNING STRIKE DAMAGE BLEND LIMIT

(A)

2146255 S0000465604_V1

Lightning Strike Damage Limits
Figure 105 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 1

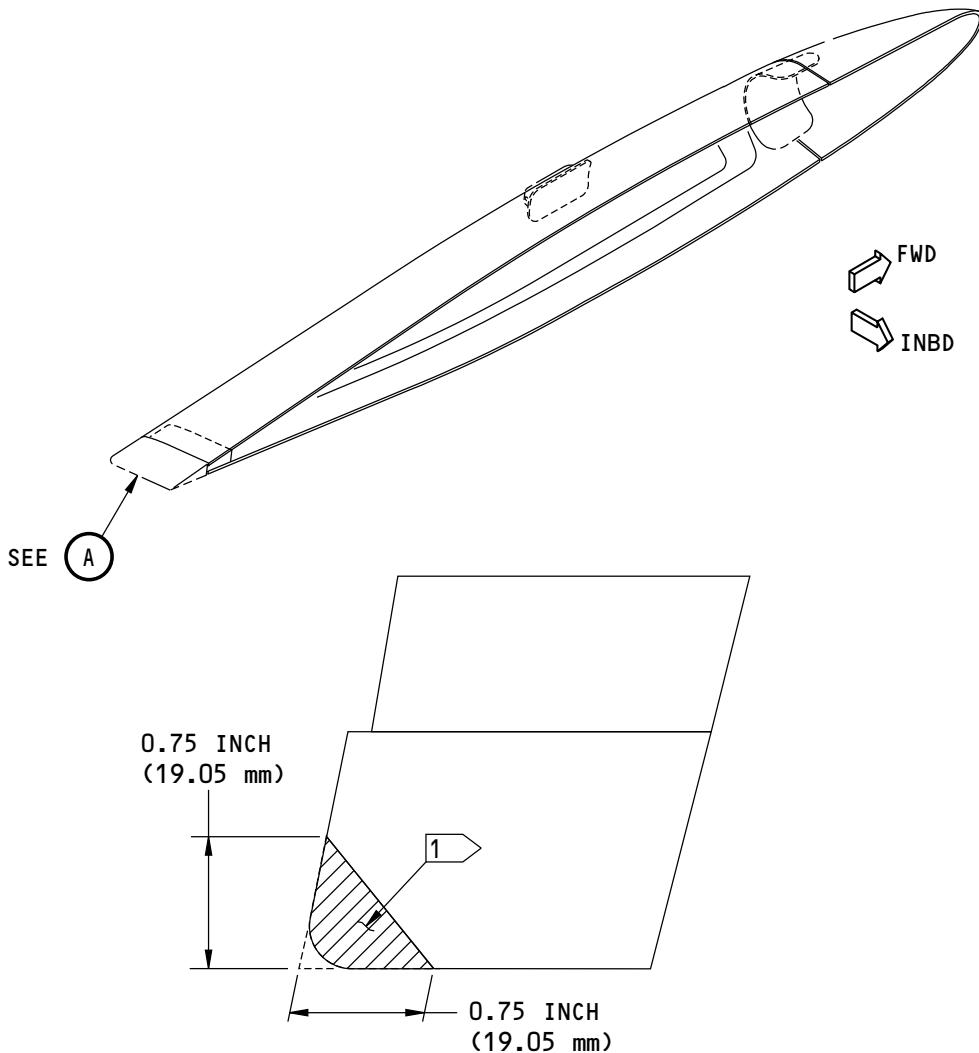
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1 ALL MISSING MATERIAL BECAUSE OF LIGHTNING STRIKE MUST BE IN THE BOUNDARY GIVEN

LIGHTNING STRIKE DAMAGE LIMIT

A

2146269 S0000465711_V1

Lightning Strike Damage Limits
Figure 105 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 1

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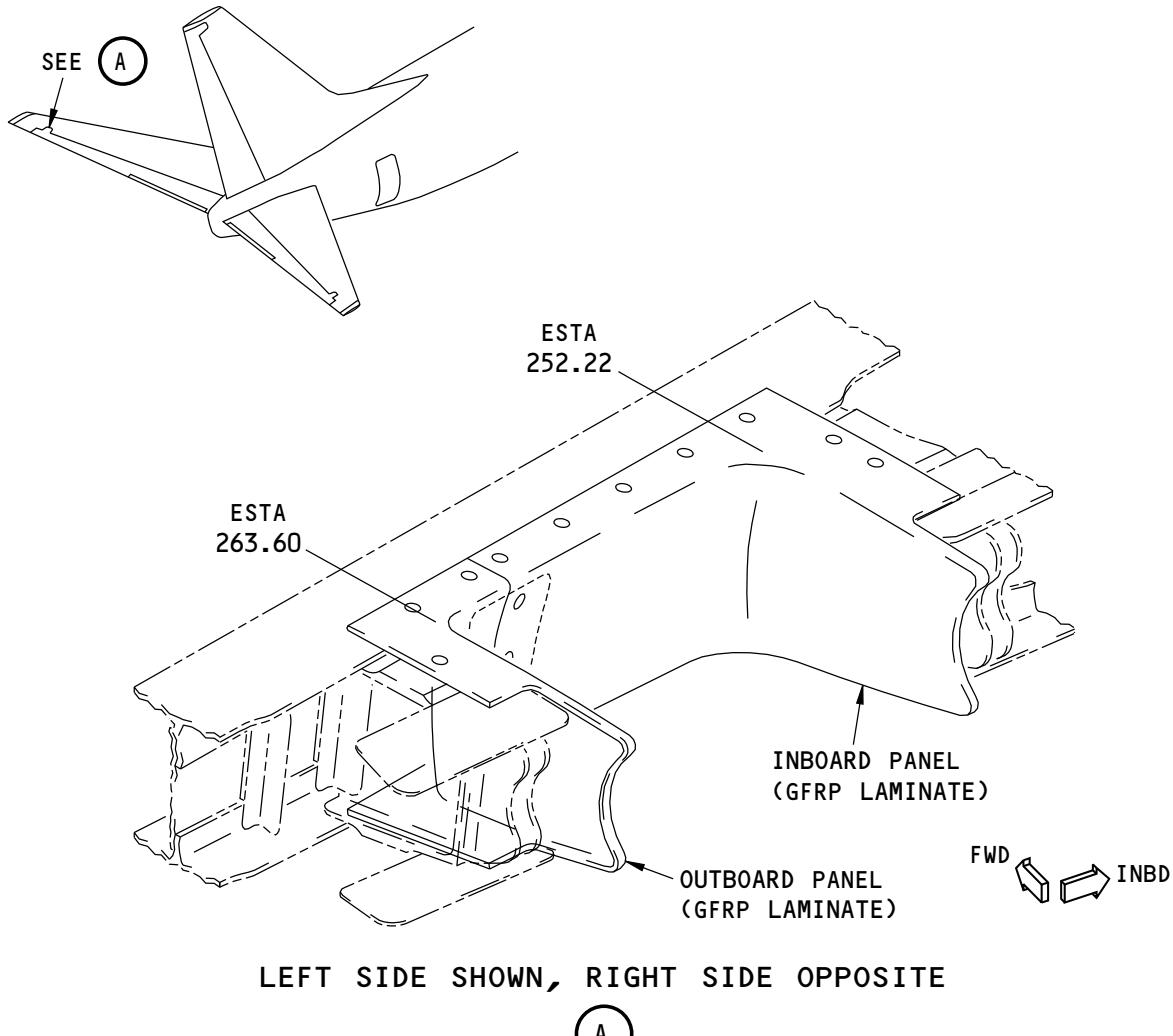
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ALLOWABLE DAMAGE 2 - HORIZONTAL STABILIZER COVE

1. Applicability

- A. Allowable Damage 2 is applicable to damage on the horizontal stabilizer cove panels shown in Horizontal Stabilizer Cove, Figure 101/ALLOWABLE DAMAGE 2.



Horizontal Stabilizer Cove
Figure 101

F78882 S0006592803_V1

2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and C for the definitions of the length, width, and depth of the damage.

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ALLOWABLE DAMAGE 2

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B. Do the steps that follow for the cove panels made of Glass Fabric Reinforced Plastic (GFRP).

- (1) Remove all the contamination and water from the structure.
 - (a) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (b) Refer to 51-70-04 for the damage removal procedures.
- (2) Seal the damaged areas with the steps that follow.
 - (a) Seal the damage that is not more than one ply deep and that agrees with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2
 - 1) Make a temporary seal.
 - a) Apply aluminum foil tape (speed tape).
 - b) Keep a record of the location.
 - c) Make sure the tape is in satisfactory condition every 400 flight hours.
 - d) Seal the damage permanently at or before 5000 flight hours.
 - 2) Make a permanent seal.
 - a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - b) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
 - (b) Seal the damaged areas that are more than one ply deep and that agree with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2
 - 1) Use a vacuum and heat to remove moisture from the solid laminate or the honeycomb cells. Refer to 51-70-04.
 - 2) Make a temporary seal with aluminum foil tape (speed tape).
 - 3) Keep a record of the location.
 - 4) Repair the damage at or before 400 flight hours.

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ALLOWABLE DAMAGE 2

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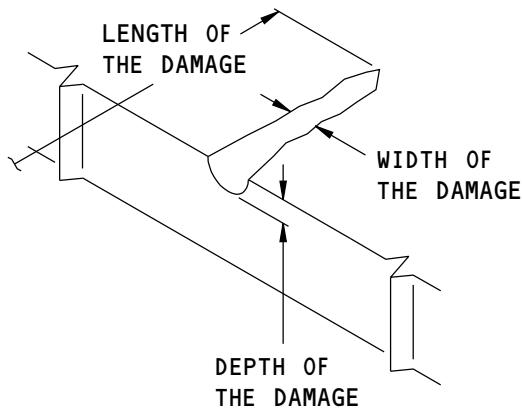
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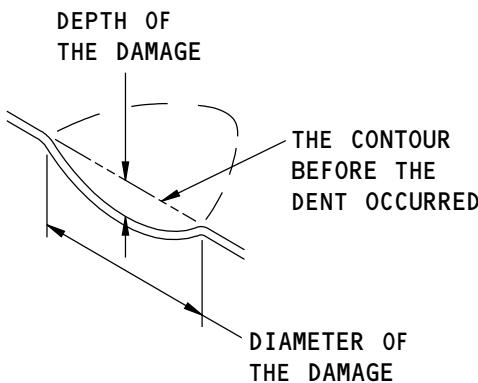


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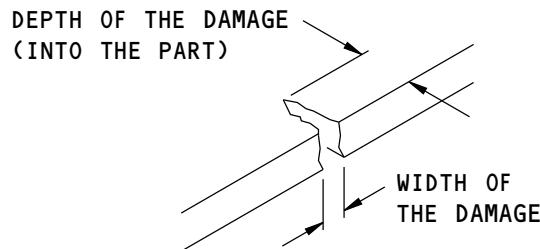
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

F78884 S0006592804_V1

Definitions of the Damage Size
Figure 102

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

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ALLOWABLE DAMAGE 2

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4. Allowable Damage Limits

A. Inboard and Outboard Panels (GFRP Laminate)

- (1) Nicks, Gouges and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 5.0 inches in length
- (c) A maximum of 0.25 inch in width
- (d) A minimum of 0.50 inch away from the edge of a fastener hole
- (e) A minimum of 0.50 inch away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in paragraph 2.

(3) Dents are permitted if:

- (a) They are a maximum of 2.0 inch in diameter.
- (b) The edge of the damage is a minimum of 2.5D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in paragraph 2.

(4) Holes and Punctures are permitted if they are:

- (a) A maximum of 2.0 inch in diameter
- (b) A minimum of 2.5D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in paragraph 2.

(5) Delaminations are permitted if they are:

- (a) A maximum of 2.0 inch in diameter
- (b) A minimum of 2.5D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in paragraph 2.

(6) Edge damage is permitted if it is:

- (a) A maximum of 0.25 in depth
- (b) A maximum of 1.00 inch in width
- (c) A minimum of 2.5D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies

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ALLOWABLE DAMAGE 2

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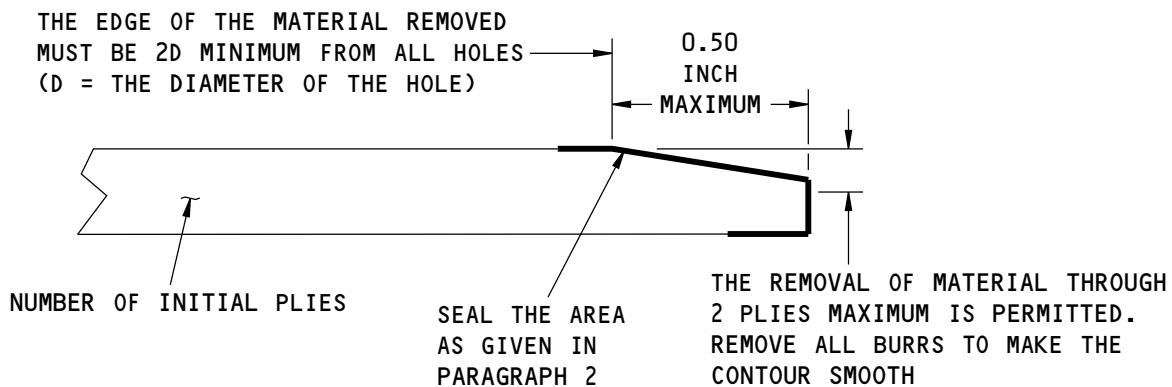
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STRUCTURAL REPAIR MANUAL**

- 2) Are sealed as given in paragraph 2.
- (7) Edge Erosion is permitted as shown in Cleanup and Sealing of Edge Erosion, Figure 103/ ALLOWABLE DAMAGE 2.



**Cleanup and Sealing of Edge Erosion
Figure 103**

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ALLOWABLE DAMAGE 2

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REPAIR 1 - HORIZONTAL STABILIZER TIP

1. Applicability

- A. Repair 1 is applicable to the horizontal stabilizer tip cap made of Glass Fiber Reinforced Plastic (GFRP) shown in Horizontal Stabilizer Tip Cap Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.

2. General

- A. Repair 1 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the tip cap.
 - (2) Refer to 51-40-02 for information on fastener removal.
- C. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- D. Refer to Definitions of the Damage Size, Figure 202/REPAIR 1, Details A, B, and C for the definitions of the length, width, and depth of damage.
- E. Do the repair as given in Paragraph 4./REPAIR 1
- F. Put the tip cap back to the initial condition, as applicable.
 - (1) Install the tip cap, if it was removed.
 - (a) Refer to 51-40-02 for information on fastener installation.
 - (2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the performance of the airplane. Refer to 51-10-01.

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REPAIR 1
Page 201

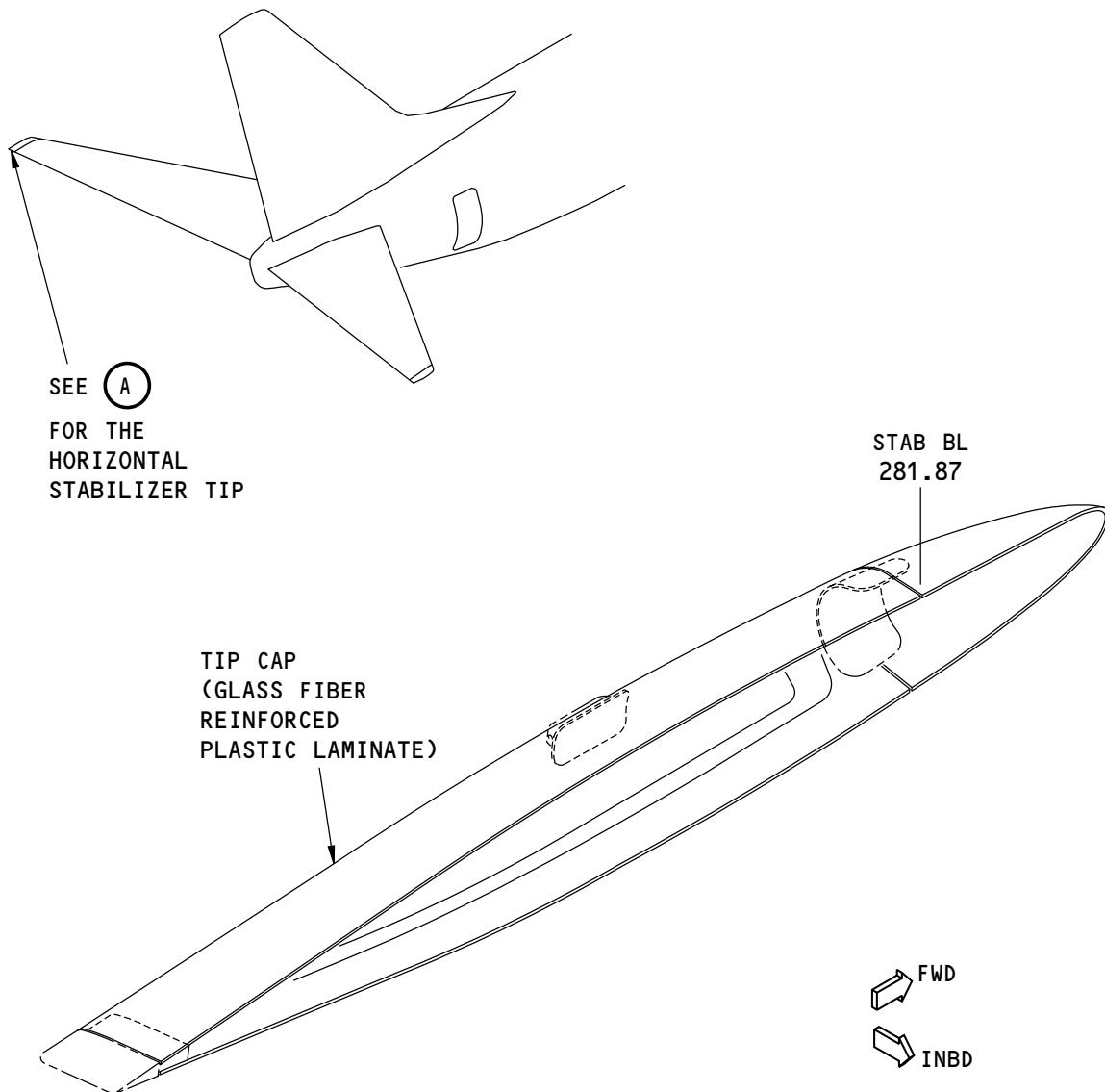
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Horizontal Stabilizer Tip Cap Location
Figure 201

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REPAIR 1
Page 202

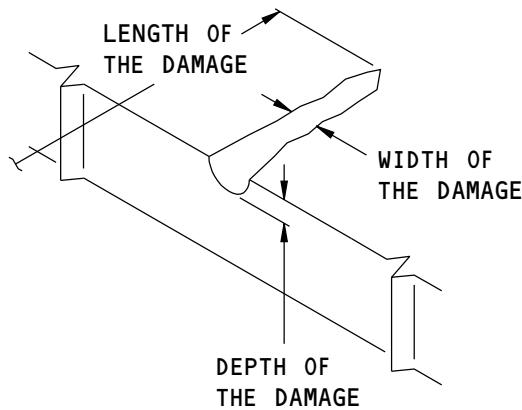
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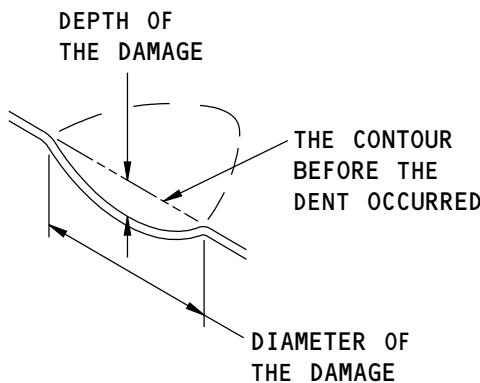


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STRUCTURAL REPAIR MANUAL



SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

F73283 S0006592809_V1

Definitions of the Damage Size
Figure 202

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-06	ROOM TEMPERATURE CURE REPAIRS
55-10-30, ALLOWABLE DAMAGE 1	Horizontal Stabilizer Tip

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REPAIR 1
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STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. For dents that are a maximum of 2 inches in diameter and have no fiber damage and delamination, do the steps that follow:
 - (1) Fill the dent with BMS 5-28, Type 7 potting compound
 - (2) Apply a fiberglass patch over the potted area as given in 51-70-04.
- B. For dents that are not permitted by Paragraph 4.A./REPAIR 1 and for other damage that is not permitted by Allowable Damage 1, refer to Table 201/REPAIR 1.
- C. Use the instructions that follow to do a Category B repair with wet layup materials at room temperature cure.
 - (1) The edges of the repair must be 3 inches or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 1.

Table 201:

REPAIR DATA FOR THE 250°F (121°C) CURE TIP CAP				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Damage that is a maximum of: - 1.5 inches in diameter - 30 percent of the smallest dimension across the panel at the damage location	Damage that is a maximum of: - 3.0 inches in diameter - 50 percent of the smallest dimension across the panel at the damage location	There are no limits on the dimension of the repair	There are no limits on the dimensions of the repair
REPAIR INSTRUCTIONS	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-04 and Paragraph 4.E	SRM 51-70-05 and Paragraph 4.F

- (2) Repair the damage as given in 51-70-06.
- (3) Use the same number of repair plies as the number of initial plies that were removed.
- (4) Do an inspection of the repair each 800 flight hour interval or more frequently.
 - (a) If deterioration is found, replace the repair with a Category A repair.
- D. Use the instructions that follow to do a Category A repair with wet layup materials at 150°F (66°C) cure.
 - (1) The edges of the repair must be 3 inches or more away from:
 - (a) The edge of other repairs

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REPAIR 1
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STRUCTURAL REPAIR MANUAL

- (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 1.
- (2) Repair the damage as given in 51-70-04.
- (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is ± 45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.
- E. Use the instructions that follow to do a Category A repair with wet layup materials at 200°F (93°C) cure.
- (1) Repair the damage as given in 51-70-04.
- (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is ± 45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.
- F. Use the instruction that follows to do a Category A repair with preimpregnated layup materials at 250°F (121°C) cure.
- (1) Use the same number of repair plies as the number of initial plies that were removed.

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REPAIR 1
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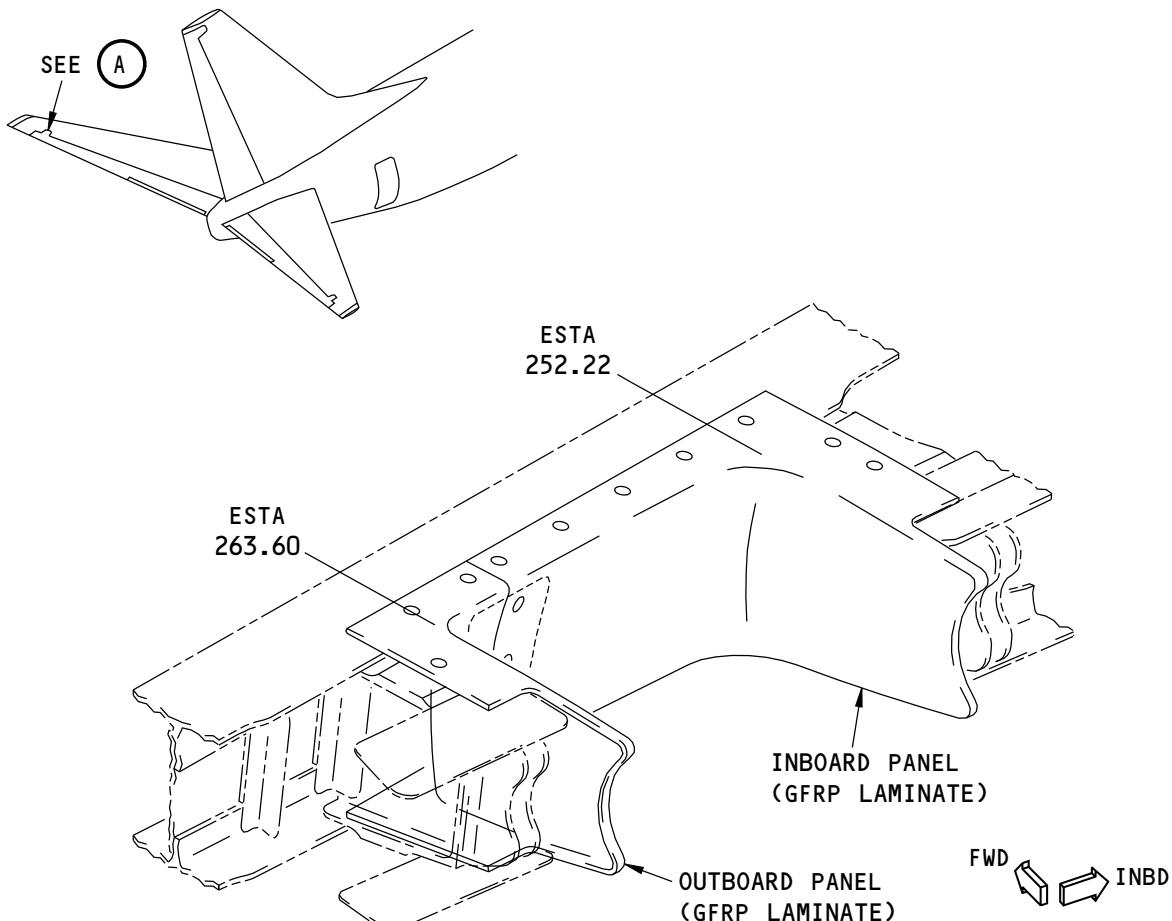
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REPAIR 2 - HORIZONTAL STABILIZER COVE

1. Applicability

- A. Repair 2 is applicable to the cove panels of the horizontal stabilizer made of Glass Fiber Reinforced Plastic (GFRP) shown in Horizontal Stabilizer Cove, Figure 201/REPAIR 2.
- B. Repair 2 is applicable to damage that is more than the limits permitted in Allowable Damage 2. Refer to Allowable Damage 2 for the type and size of damage that is permitted.



LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE

(A)

Horizontal Stabilizer Cove
Figure 201

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2. General

- A. Repair 2 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the cove panels

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REPAIR 2
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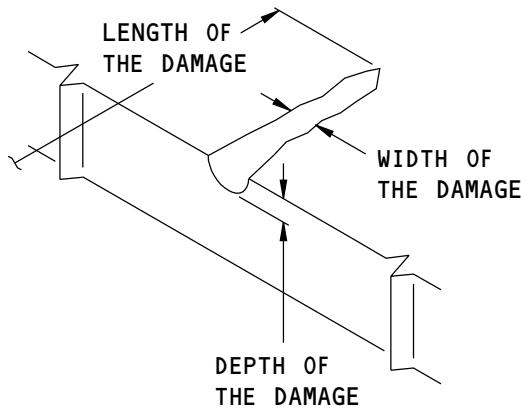
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STRUCTURAL REPAIR MANUAL

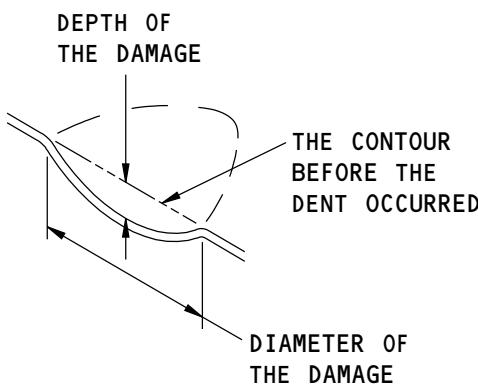
- (2) Refer to 51-40-02 for information on fastener removal.
- C. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.
- D. Refer to Definitions of the Damage Size, Figure 202/REPAIR 2, Details A, B, and C for the definitions of the length, width, and depth of damage.
- E. Do the repair as given in Paragraph 4./REPAIR 2
- F. Put the cove panels back to the initial condition, as applicable.
 - (1) Install the cove panels, if they were removed.
 - (a) Refer to 51-40-02 for information on fastener installation.



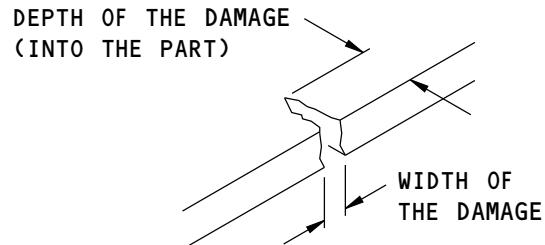
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR DENT DAMAGE

(B)



SIZE DEFINITIONS FOR EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 202

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REPAIR 2
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02, GENERAL	Inspection and Removal of Damage
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-06	ROOM TEMPERATURE CURE REPAIRS
55-10-30, ALLOWABLE DAMAGE 2	Horizontal Stabilizer Cove
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. For dents that are a maximum of 2 inches in diameter and have no fiber damage and delamination, do the steps that follow:
 - (1) Fill the dent with BMS 5-28, Type 7 potting compound
 - (2) Apply a fiberglass patch over the potted area as given in 51-70-04.
- B. For dents that are not permitted by Paragraph 4.A./REPAIR 2 and for other damage that is not permitted by Allowable Damage 1, refer to Table 201/REPAIR 2.
- C. Use the instructions that follow to do a Category B repair with wet layup materials at room temperature cure.
 - (1) The edges of the repair must be 3.0 inch or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 2.
 - (2) Repair the damage as given in 51-70-06.
 - (3) Use the same number of repair plies as the number of initial plies that were removed.
 - (4) Do an inspection of the repair each 800 flight hour interval or more frequently.
 - (a) If deterioration is found, replace the repair with a Category A repair.

Table 201:

REPAIR DATA FOR THE 250°F (121°C) CURE COVE PANELS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Damage that is a maximum of: - 1.5 inches in diameter	Damage that is a maximum of: - 3.0 inches in diameter	There are no limits on the dimensions of the repair	There are no limits on the dimensions of the repair

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REPAIR 2
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Table 201: (Continued)

REPAIR DATA FOR THE 250°F (121°C) CURE COVE PANELS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
	- 30 percent of the smallest dimension across the panel at the damage location One repair is permitted for each 144 square inches of panel area	- 50 percent of the smallest dimension across the panel at the damage location One repair is permitted for each 144 square inches of panel area		
REPAIR INSTRUCTIONS	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-04 and Paragraph 4.E	SRM 51-70-05 and Paragraph 4.F

- D. Use the instructions that follow to do a Category A repair with wet layup materials at 150°F (66°C) cure.
- (1) The edges of the repair must be 3.0 inch or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 2.
 - (2) Repair the damage as given in 51-70-04.
 - (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is ±45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.
- E. Use the instructions that follow to do a Category A repair with wet layup materials at 200°F (93°C) cure.
- (1) Repair the damage as given in 51-70-04.
 - (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is ±45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.
- F. Use the instruction that follows to do a Category A repair with preimpregnated layup materials at 250°F (121°C) cure.
- (1) Use the same number of repair plies as the number of initial plies that were removed.

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REPAIR 2
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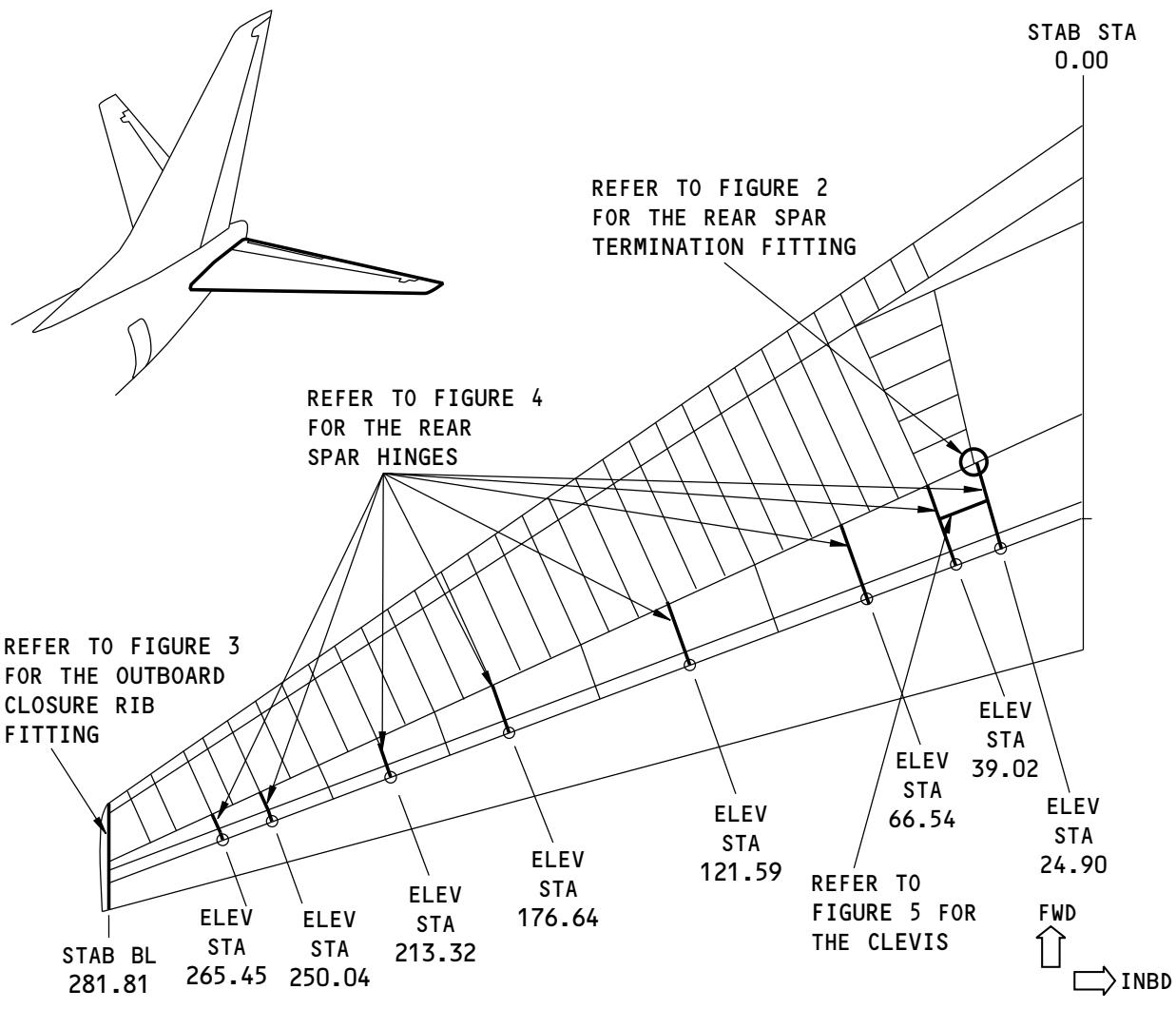
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IDENTIFICATION 1 - HORIZONTAL STABILIZER FITTINGS



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Horizontal Stabilizer Fitting Location

Figure 1 (Sheet 1 of 2)

55-10-90

IDENTIFICATION 1

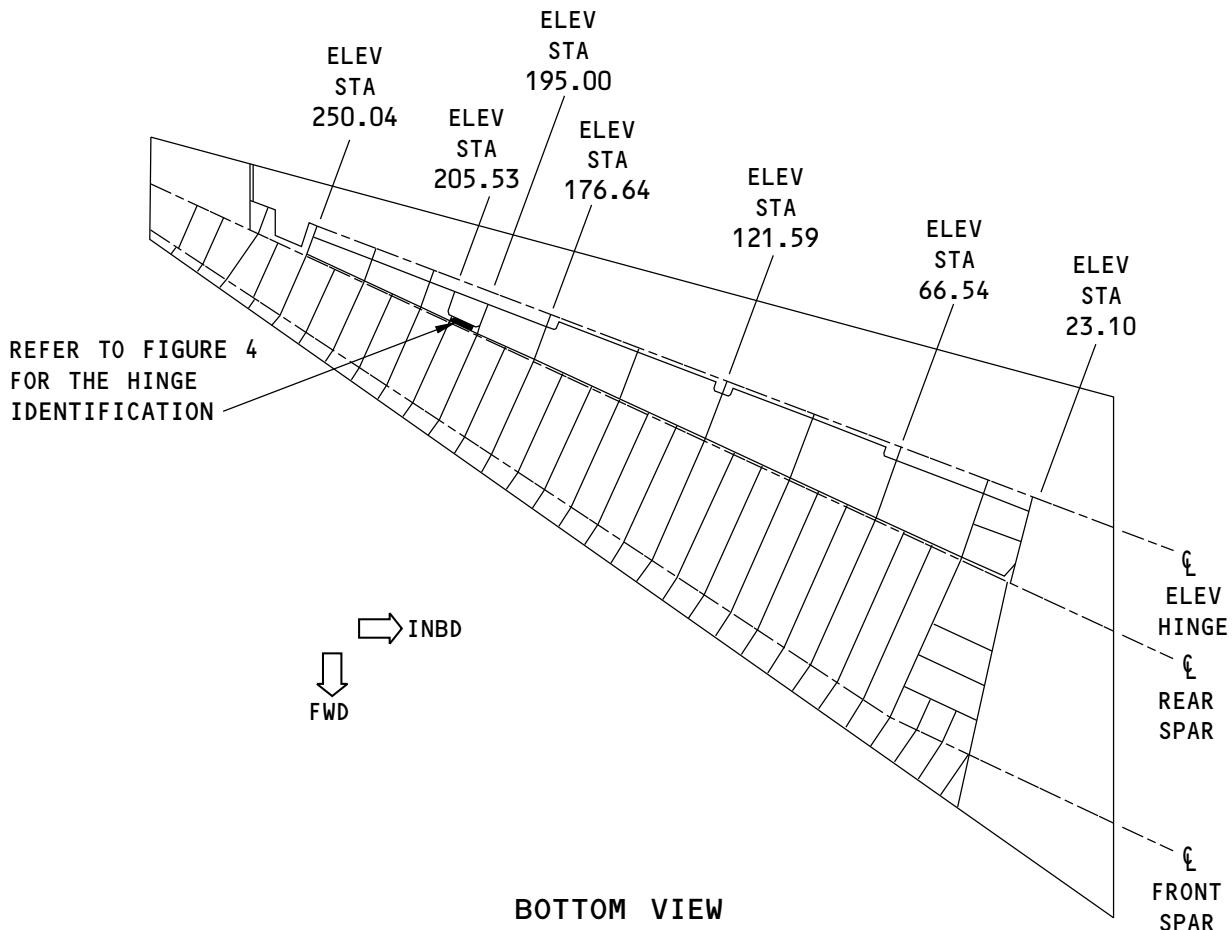
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Horizontal Stabilizer Fitting Location
Figure 1 (Sheet 2 of 2)

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IDENTIFICATION 1
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Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A8001	Section 82 Left Horizontal Stabilizer - Product Collector
182A1500	Rear Spar Assembly/Installation - Horizontal Stabilizer
185A0001	Trailing Edge Functional Collector - Left, Horizontal Stabilizer
185A0003	Horizontal Stabilizer Rework Collector - Left Side
185A1210	Clevis Installation - Trim Tab Lock, Horizontal Stabilizer
185A1335	Rib Installation - Trailing Edge, Elevator Station 66.54, Rework
185A1345	Rib Installation - Trailing Edge, Elevator Station 94.07, Rework
185A1355	Rib Installation - Trailing Edge, Elevator Station 121.59, Rework
185A1365	Rib Installation - Trailing Edge, Elevator Station 149.12, Rework
185A1415	Rib Installation - Trailing Edge, Elevator Station 195.00, Rework
185A1435	Rib Installation - Trailing Edge, Elevator Station 231.70, Rework
186A0001	Leading Edge and Miscellaneous Functional Collector - Left Horizontal Stabilizer
186A1000	Left Hand Horizontal - (Premodule)
186A3000	Left Hand Horizontal Stabilizer Assembly - I/R

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IDENTIFICATION 1

Page 3

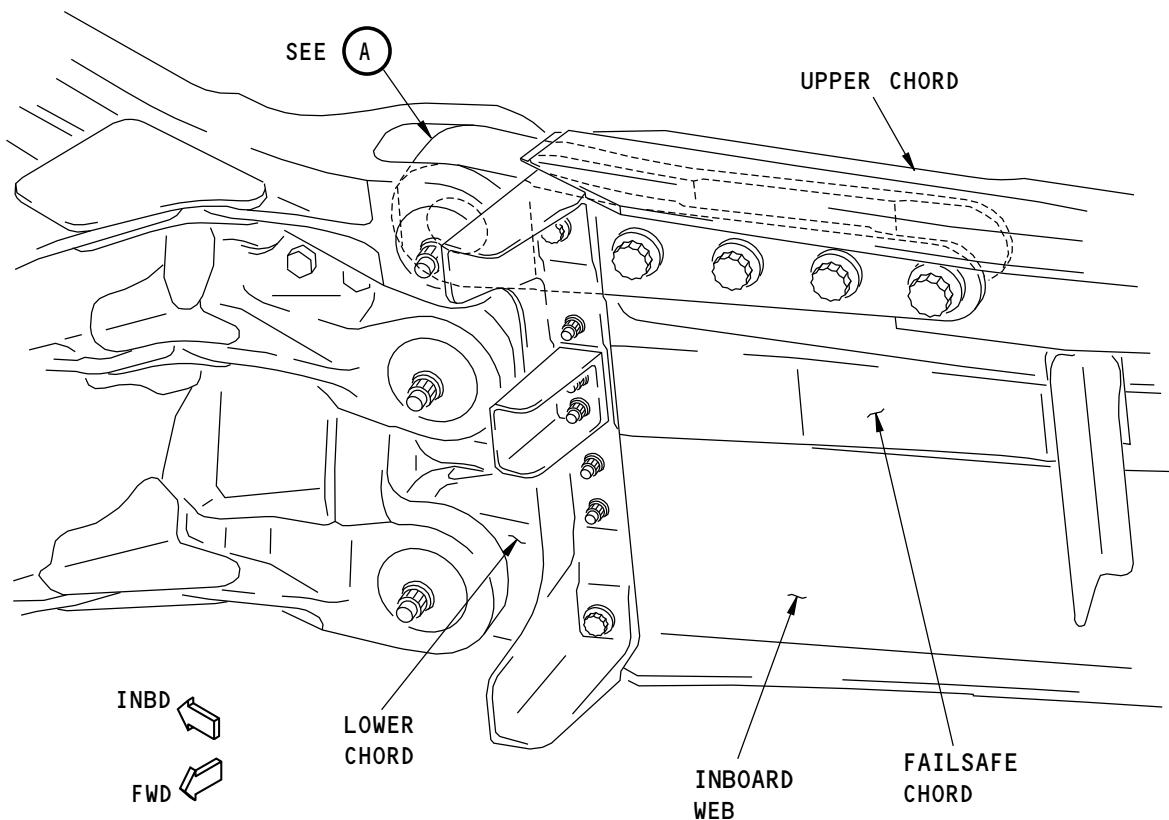
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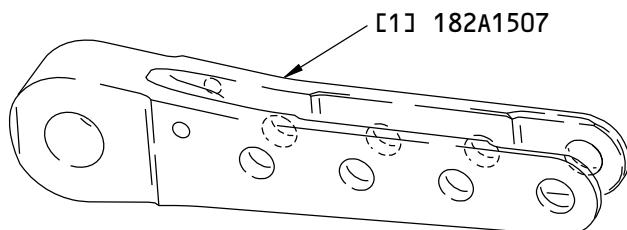
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Horizontal Stabilizer Rear Spar Termination Fitting Identification
Figure 2

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IDENTIFICATION 1
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Termination Fitting		Ti-6Al-4V machined titanium bar as given in MIL-T-9047, in the annealed condition. Refer to the production drawing for the machined thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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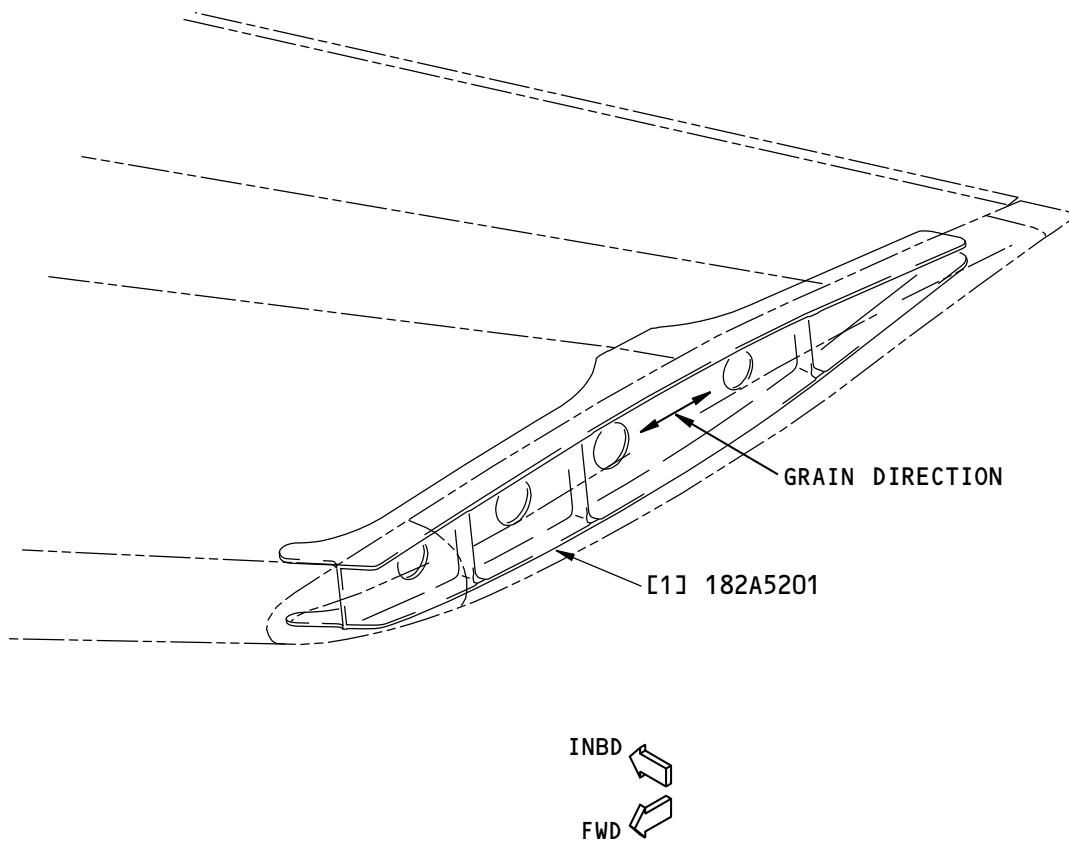
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Horizontal Stabilizer Outboard Closure Rib Fitting Identification
Figure 3

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IDENTIFICATION 1
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Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib Fitting		7075-T7351 plate as given in QQ-A-250/12 (Grain direction controlled part) Refer to the production drawing for the machined thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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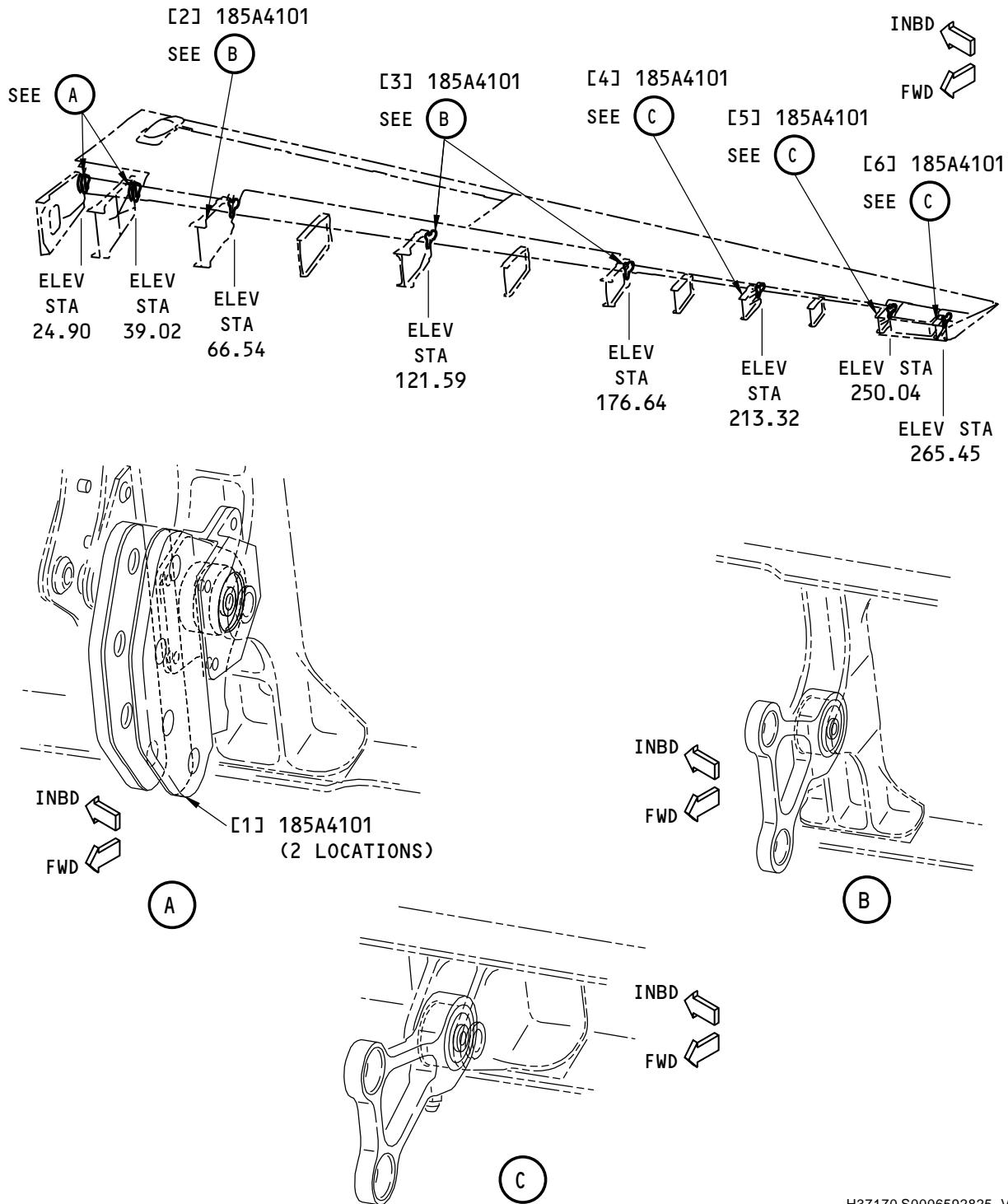
IDENTIFICATION 1

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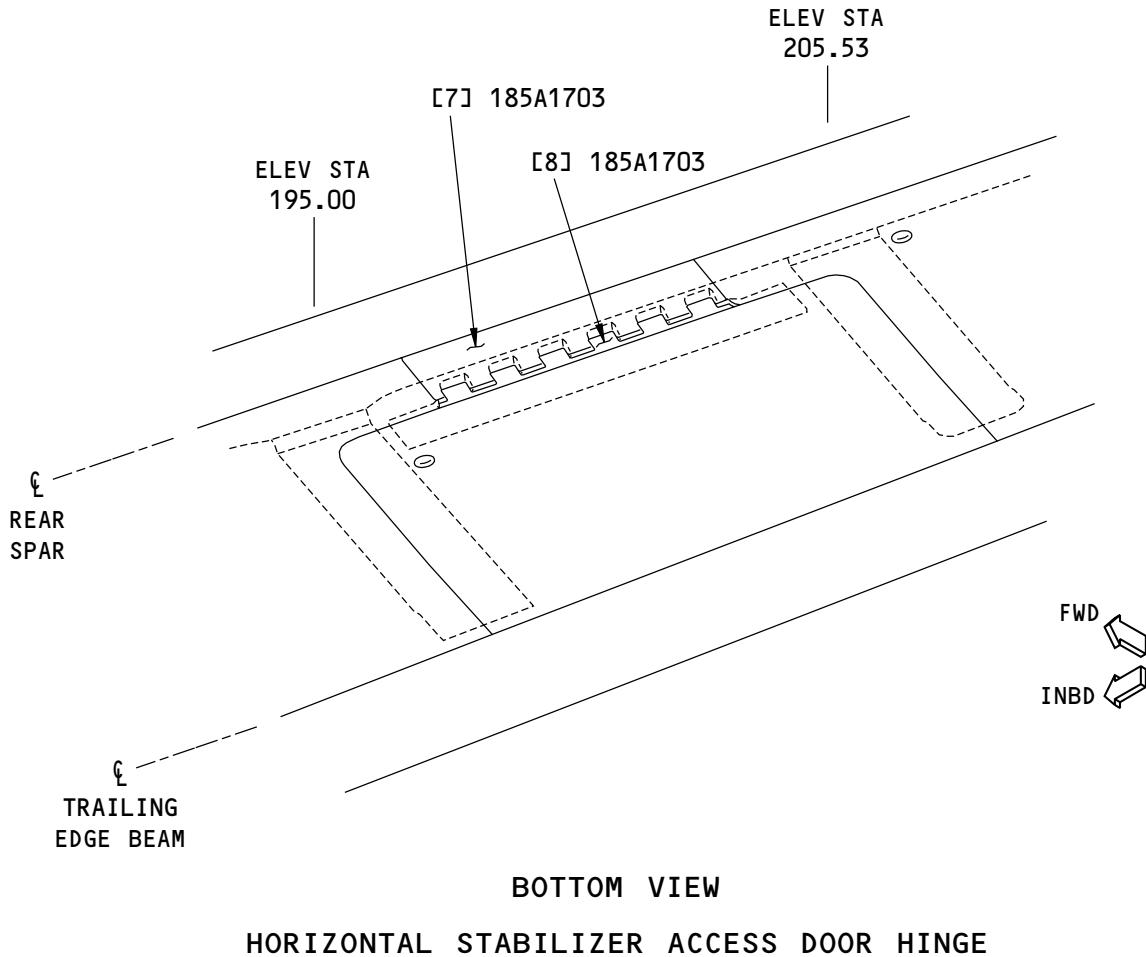
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STRUCTURAL REPAIR MANUAL**


**Horizontal Stabilizer Hinge Plate Identification
Figure 4 (Sheet 1 of 2)**

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IDENTIFICATION 1
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Horizontal Stabilizer Hinge Plate Identification
Figure 4 (Sheet 2 of 2)

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IDENTIFICATION 1
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Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Hinge Plate (2)		7075-T7351 rolled plate as given in QQ-A-250/12. Refer to the production drawing for the material thickness (Grain direction controlled part)	
[2]	Hinge Plate	0.70 (17.8) 0.70 (17.8)	7075-T7351 rolled plate as given in QQ-A-250/12 (Grain direction controlled part) 7050-T7451 rolled plate as given in BMS 7-323	Cum Line Numbers 1 thru 84 Cum Line Numbers 1 thru 84 with SB 1067 incorporated and Cum Line Number 85 and on
[3]	Hinge Plate (2)	0.70 (17.8) 0.70 (17.8)	7075-T7351 rolled plate as given in QQ-A-250/12 (Grain direction controlled part) 15-5PH CRES plate as given in BMS 7-240 Type I, heat treated to 150 to 170 KSI	Cum Line Numbers 1 thru 84 Cum Line Numbers 1 thru 84 with SB 1067 incorporated and Cum Line Number 85 and on
[4]	Hinge Plate	0.50 (12.7) 0.50 (12.7)	7075-T7351 plate hogout as given in QQ-A-250/12 (Optional: 2024-T3511 extrusion as given in QQ-A-200/3) 15-5PH CRES plate as given in BMS 7-240 Type I, Heat Treated to 150 to 170 KSI	Cum Line Numbers 1 thru 84 Cum Line Numbers 1 thru 84 with SB 1067 incorporated and Cum Line Number 85 and on
[5]	Hinge Plate	0.50 (12.7) 0.50 (12.7)	7075-T7351 rolled plate as given in QQ-A-250/12 (Grain direction controlled part) 15-5PH CRES plate as given in BMS 7-240 Type I, Heat Treated to 150 to 170 KSI	Cum Line Numbers 1 thru 84 Cum Line Numbers 1 thru 84 with SB 1067 incorporated and Cum Line Number 85 and on
[6]	Hinge Plate	0.50 (12.7) 0.50 (12.7)	7075-T7351 rolled plate as given in QQ-A-250/12 (Grain direction controlled part) 7050-T7451 rolled plate as given in BMS 7-323 (Grain direction controlled part)	Cum Line Numbers 1 thru 84 Cum Line Numbers 1 thru 84 with SB 1067 incorporated and Cum Line Number 85 and on
[7]	Hinge Half	0.50 (12.7)	7075-T7351 plate hogout as given in QQ-A-250/12 (Optional: 2024-T3511 extrusion as given in QQ-A-200/3)	
[8]	Hinge Half		BAC1520-2321 7075-T73511 extrusion as given in QQ-A-200/11 (Optional: 2024-T3511 extrusion as given in QQ-A-200/3 or 7075-T7351 plate as given in QQ-Q-250/12 that is 0.50 inch (12.7 mm) thick)	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

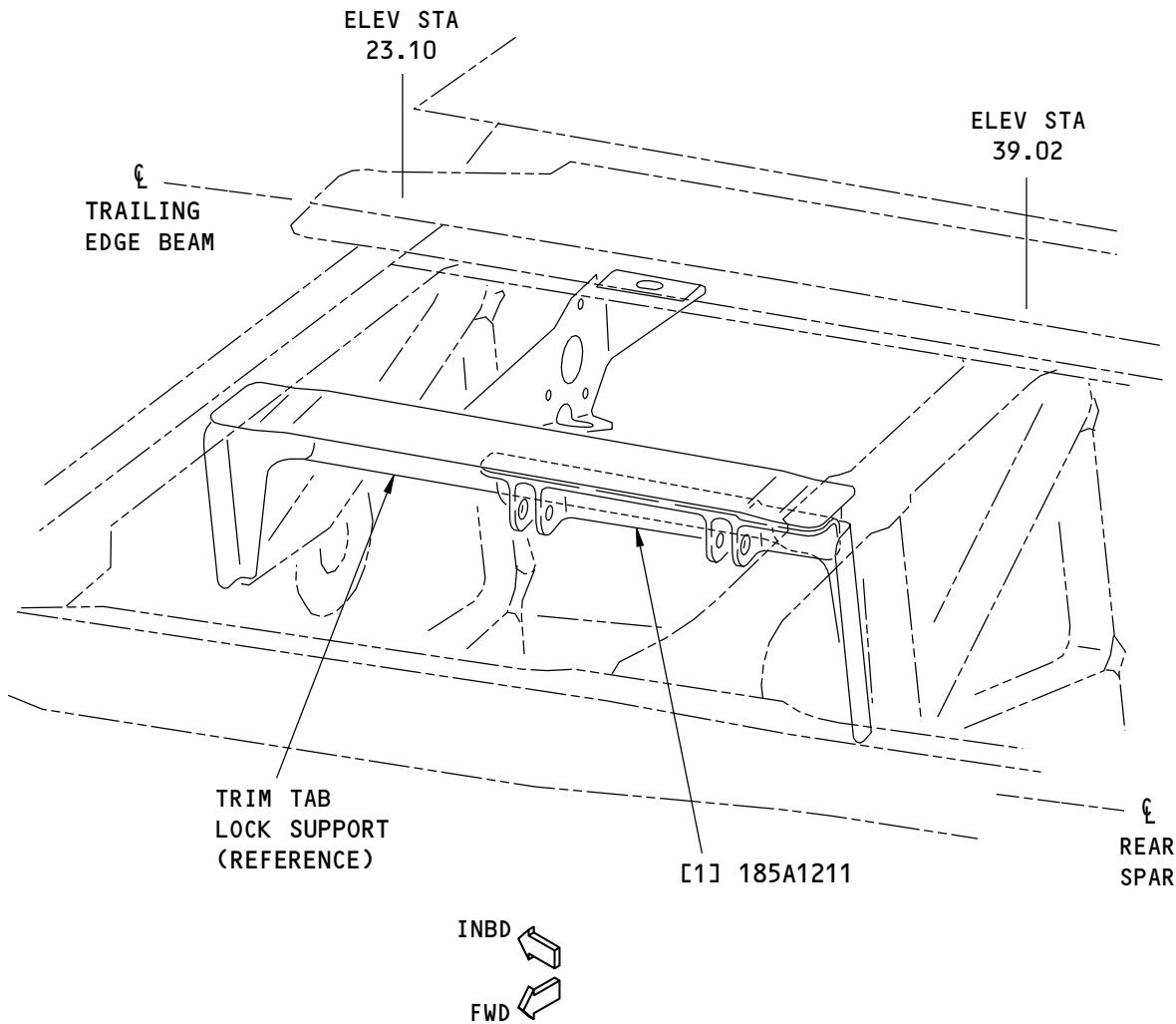
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H37449 S0006592828_V1

Trim Tab Lock Clevis Identification
Figure 5

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Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Clevis		7050-T7451 plate as given in AMS 4050	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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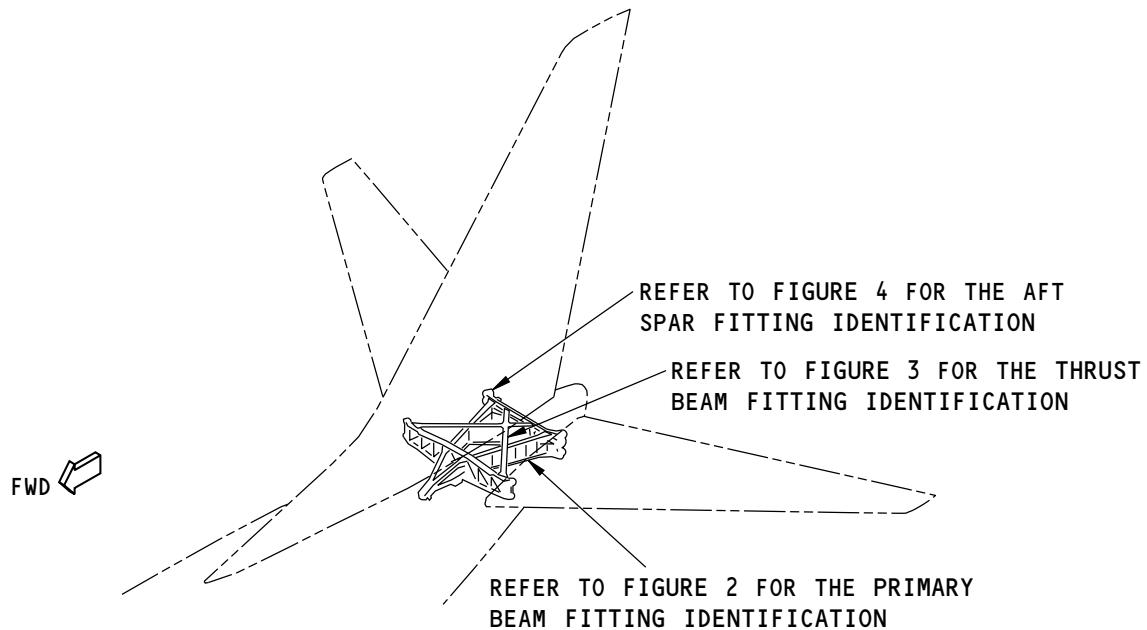
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IDENTIFICATION 2 - HORIZONTAL STABILIZER CENTER SECTION BEAM FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G17925 S0006592831_V1

Horizontal Stabilizer Center Section Beam Fitting Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
181A3000	Beam Installation - Center Section Horizontal Tail
181A3102	Extruded Details - Primary Beam, Center Section Horizontal Tail

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IDENTIFICATION 2

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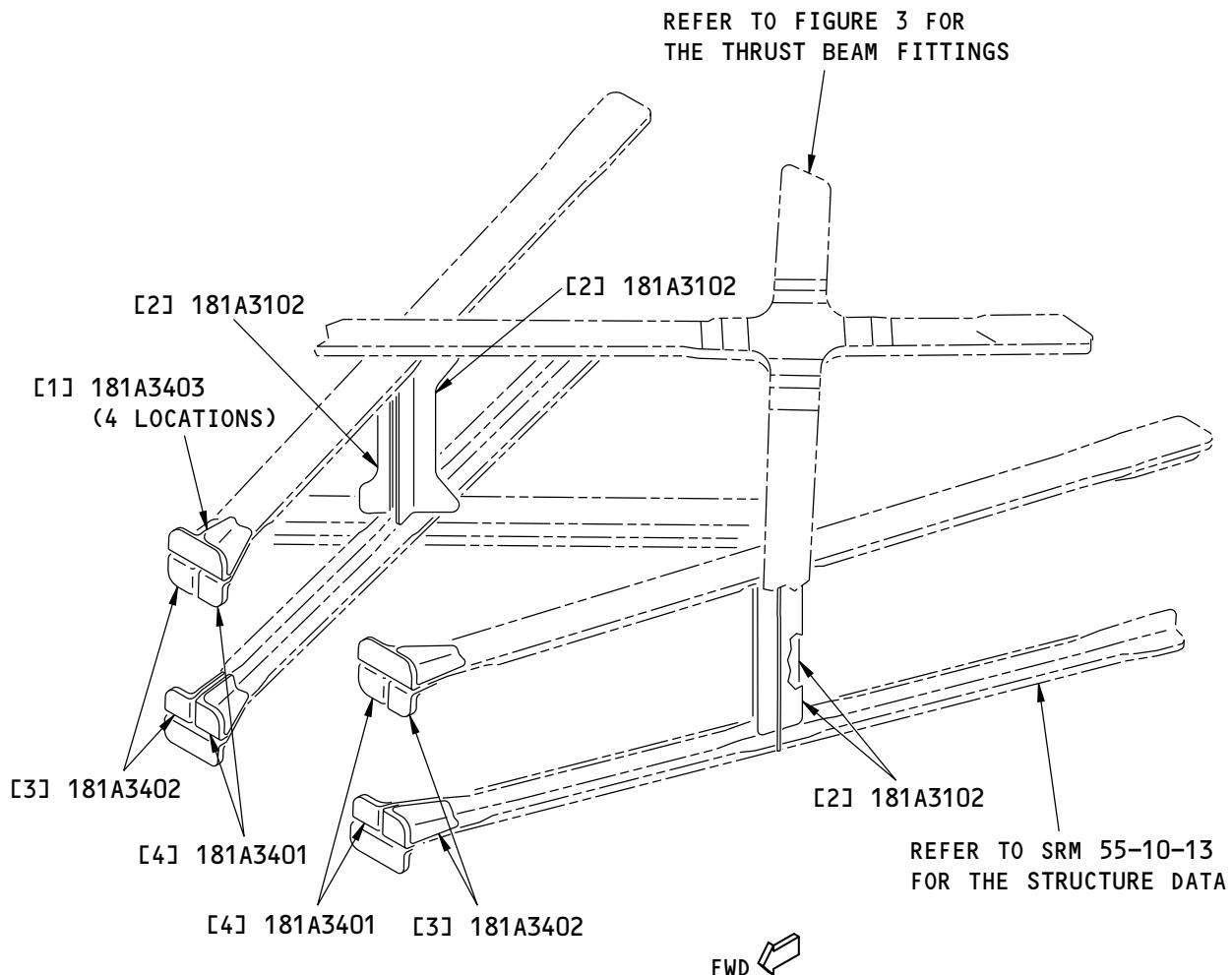
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

G17911 S0006592833_V1

Horizontal Stabilizer Center Section Primary Beam Fittings Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Attach Fitting (2)		Ti-6Al-4V machined titanium bar as given in MIL-T-9047, in the annealed condition. Refer to the production drawing for the machined thicknesses	
[2]	Splice Fitting (2)		7075-T73511 extruded bar, as given in QQ-A-200/11, Class A. Refer to the production drawing for the machined thicknesses	
[3]	Attach Fitting (2)		Ti-6Al-4V machined titanium bar as given in MIL-T-9047, in the annealed condition. Refer to the production drawing for the machined thicknesses	
[4]	Attach Fitting (2)		Ti-6Al-4V machined titanium bar as given in MIL-T-9047, in the annealed condition. Refer to the production drawing for the machined thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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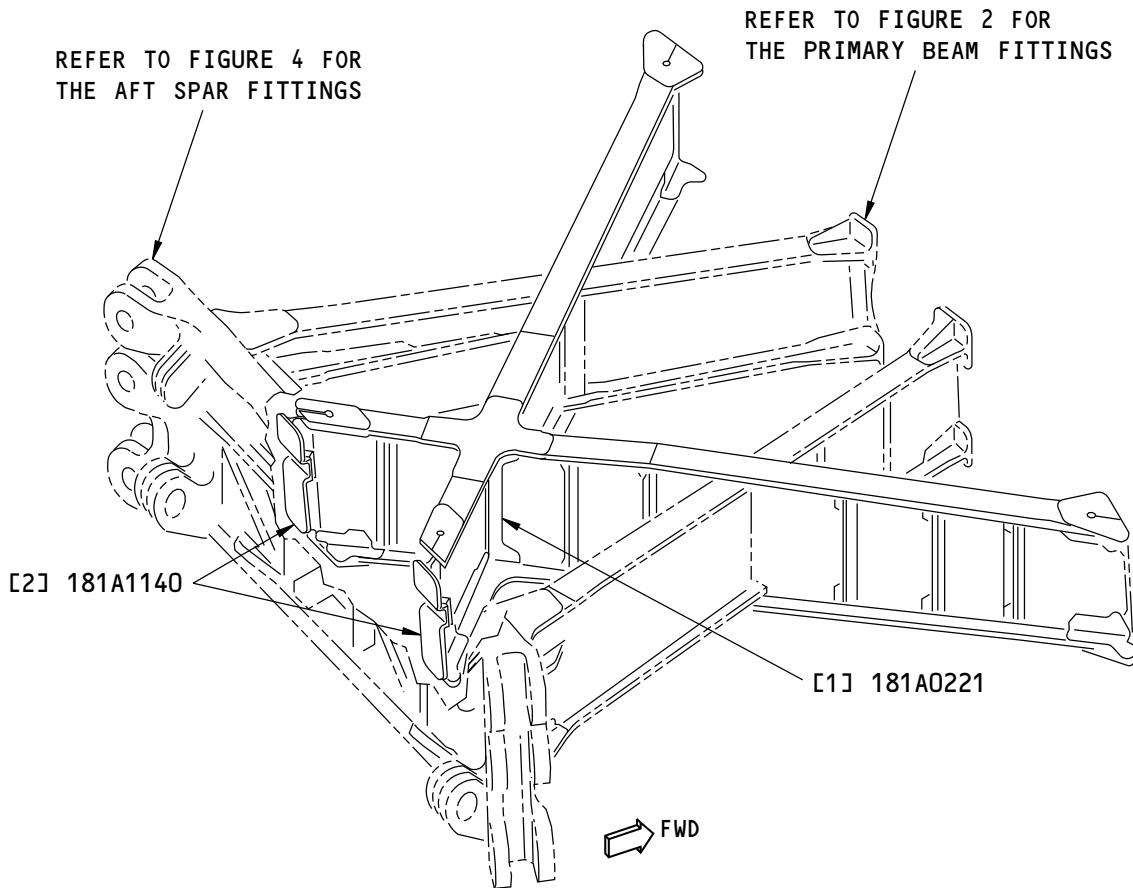
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NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

G47468 S0006592835_V1

Horizontal Stabilizer Center Section Thrust Beams Fittings Identification
Figure 3

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Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Splice Fitting		BAC1520-1387 7075-T73511 extrusion as given in QQ-A-200/11. (Optional: 7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses and grain direction)	
[2]	Shear Tie Fitting (2)		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses and grain direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

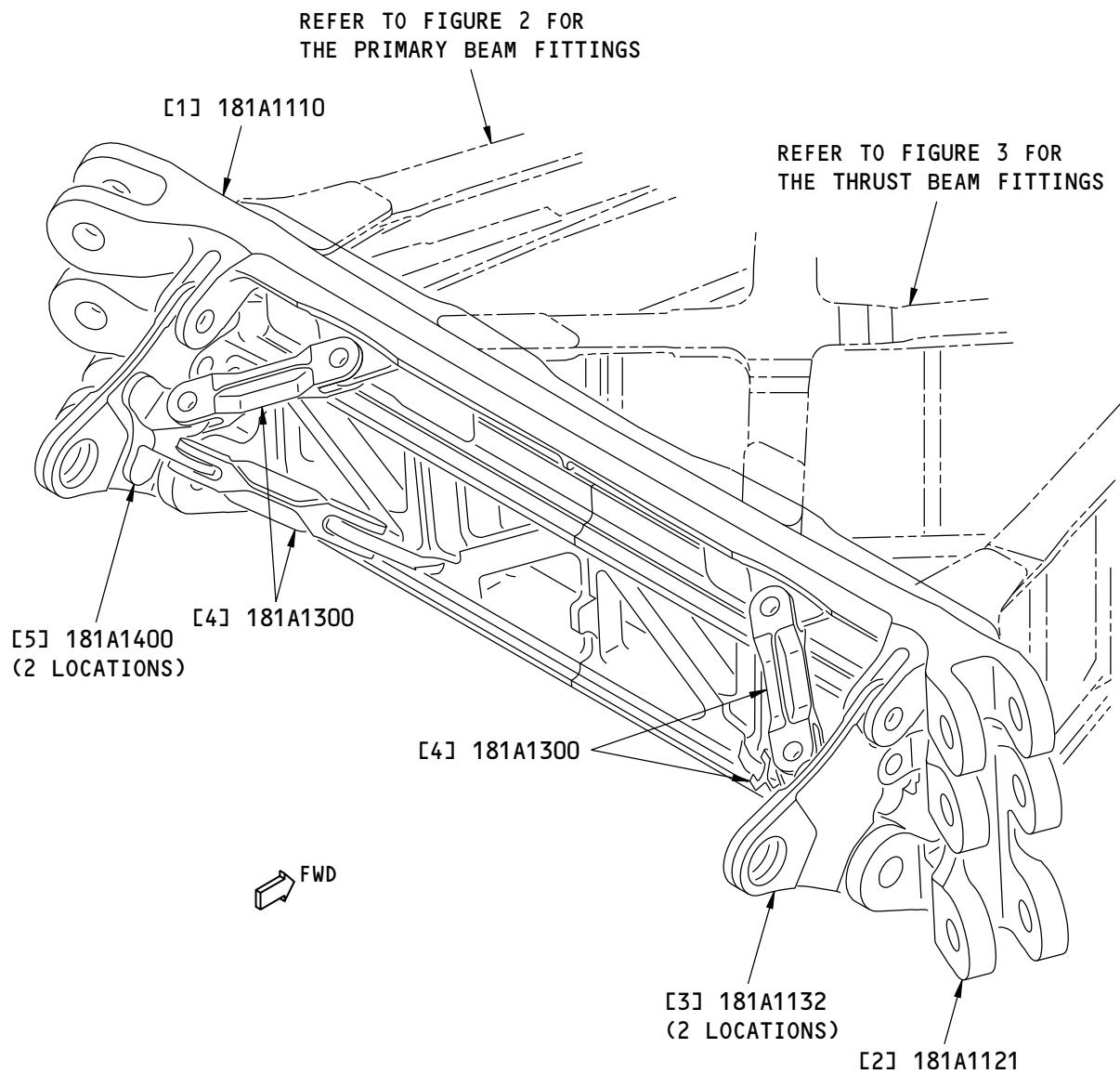
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G49156 S0006592837_V2

Horizontal Stabilizer Center Section Aft Spar Fittings Identification
Figure 4

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Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Fitting		Ti-6Al-4V titanium forging as given in BMS 7-247, in the annealed condition. Refer to the production drawing for the machined thicknesses and grain direction	
[2]	Lower Fitting		7050-T74 forging as given in BMS 7-214, Class A. Refer to the production drawing for the machined thicknesses and grain direction	
[3]	Hinge Housing (2) Fitting		Ti-6Al-4V titanium as given in MIL-T-9046, Composition AB-1. Refer to the production drawing for the machined thicknesses and grain direction	
[4]	Brace Fitting (4)		7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses and grain direction	
[5]	Attach Fitting (2)		Ti-6Al-4V machined titanium bar as given in MIL-T-9047, in the annealed condition. Refer to the production drawing for the machined thicknesses and grain direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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REPAIR 1 - HORIZONTAL STABILIZER OUTBOARD CLOSURE RIB LIGHTNING STRIKE REPAIR

1. Applicability

- A. Repair 1 is applicable to damage from a lightning strike to the aft end of the horizontal stabilizer outboard closure rib upper and lower flange and to the tip cap attachment fasteners and nutplates.

2. General

- A. Repair Categorization:

- (1) REPAIR 1 is a time-limited repair as given in Procedure I of this repair. Refer to 51-00-06, GENERAL for repair categories and definitions. You must replace this time-limited repair with a permanent repair within 50 flight cycles of installation.
- (2) REPAIR 1 is a permanent repair as given in Procedure II of this repair. Refer to 51-00-06, GENERAL for repair categories and definitions.
- (3) REPAIR 1 is a permanent repair as given in Procedure III that replaces the initial time-limited repair. Refer to 51-00-06, GENERAL for repair categories and definitions.

- B. REPAIR 1 has three alternative repair procedures.

- (1) Procedure I: This procedure uses blind fasteners. This procedure does not require flap or shot peening.
- (2) Procedure II: This procedure uses only solid fasteners.
- (3) Procedure III: This procedure replaces a time-limited repair with a permanent repair. This procedure uses only solid fasteners.

3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-20-06, GENERAL	Shot Peening
51-30-01, GENERAL	Sheet Metal Materials
51-30-03	NON-METALLIC MATERIALS
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-05, GENERAL	Fastener Hole Sizes
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00, Procedure 1	Fastener Holes in Aluminum Parts (Meter Display)
737 NDT Part 6, 51-00-00, Procedure 16	Aluminum Part Fastener Hole Inspection (Rotary Scanner)
737 NDT Part 6, 51-00-00, Procedure 3	Investigation of Fire Damage on Aircraft Structure
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

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Reference	Title
737 NDT Part 6, 51-00-00, Procedure 8	Inspection of Subsurface Cracks in Aluminum Structure
737 NDT Part 6, 51-00-00, Procedure 9	Inspection of Subsurface Cracks at Fastener Holes in Aluminum Structure

4. Repair Instructions

- A. Procedure I: Time-Limited Repair: (Replace this Procedure I Time-Limited Repair with a Permanent Repair within 50 flight cycles of installation.)
- (1) Get access to the damaged area.
 - (a) Remove the necessary fasteners in the area of the damaged rib. Refer to 51-40-02, GENERAL.
 - (b) Remove the horizontal stabilizer outboard closure rib tip cap, as necessary.
 - (c) Remove the upper and/or lower horizontal stabilizer outboard aft trailing edge skin panels, as necessary.
 - (d) Remove the nutplates, as necessary, to install the Part [1] Repair Channel, as shown in Figure 201/REPAIR 1.
 - (2) Cut and remove the damaged part of the horizontal stabilizer outboard closure rib upper and/or lower aft flange, if necessary, as shown in Figure 201/REPAIR 1. Refer to 51-10-02, GENERAL.
 - (a) Make the cut as shown in Figure 201/REPAIR 1.
 - 1) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the inspection and removal of damage.
 - 2) Refer to NON-METALLIC MATERIALS, 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - 3) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - 4) Make sure the surface smoothness for all cut surfaces is 63 microinches (Ra) or smoother.
 - (3) Do a High Frequency Eddy Current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Do a 0.040 in. (1.016 mm) insurance cut if no further damage is found. Refer to 737 NDT Part 6, 51-00-00, Procedure 3, 737 NDT Part 6, 51-00-00, Procedure 4, 737 NDT Part 6, 51-00-00, Procedure 8, and 737 NDT Part 6, 51-00-00, Procedure 9.
 - (4) Make the repair parts as given in Table 201/REPAIR 1.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Channel	1	7075-T7351 plate as given in AMS-QQ-A-250/12, machined to a final thickness of 0.080 in. (2.032 mm), as given in drawing 182A5201, or 7075-O sheet, 0.080 in. (2.032 mm) thick, heat treat to T73 after forming as given in AMS-QQ-A-250/12. Optional: 2024-T3 sheet as given in AMS-QQ-A-250/4, 0.080 in. (2.032 mm) thick
[2]	Filler	1	7075-T73 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick. Optional: 7075-T6 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick

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Table 201: (Continued)

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[3]	Filler	1	7075-T73 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick. Optional: 7075-T6 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick

- (5) Make the contour of the repair parts the same as the contour of the initial parts, as necessary. Refer to 51-30-01, GENERAL.
 - (6) Remove the horizontal stabilizer outboard closure rib finish that is common to the Part [1] Repair Channel.
 - (7) Assemble the repair parts as shown in Figure 201/REPAIR 1.
 - (8) Drill the necessary fastener holes in the repair parts. Use the initial fastener type, diameter and locations in the upper and lower flanges at the aft end of the horizontal stabilizer outboard closure rib. Refer to 51-40-05, GENERAL for the fastener hole dimensions.
 - (a) Do not countersink the fastener holes more than 76 percent of the initial flange thickness. This will prevent a knife-edge condition of the initial flange.
 - (9) Disassemble the repair parts.
 - (10) Remove all nicks, scratches, burrs, and sharp edges from the repair parts and bare surfaces of the initial parts.
 - (11) Install the repair parts and fasteners dry.
 - (12) Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial parts. Refer to 51-20-01, GENERAL.
 - (13) Apply two layers of BMS 10-11, Type I primer to the repair parts and to the bare surfaces of the initial parts, other than at areas common to the static wicks. Refer to SOPM 20-41-02.
 - (14) Attach the initial nutplates from Paragraph 4.A.(1)(d)/REPAIR 1 above to the repair parts as shown in Figure 201/REPAIR 1.
 - (a) The initial nutplate fasteners will go through the Part [1] Repair Channel and the initial horizontal stabilizer outboard closure rib or the repair fillers, as shown in Figure 201/REPAIR 1.
 - (15) Do a resistance check between the Part [1] Repair Channel and the initial horizontal stabilizer outboard closure rib as given in BAC 5117-6. Maximum resistance permitted is 0.010 ohms.
 - (16) Apply a layer of BMS 3-23, corrosion inhibiting compound, to all the interior structure of the repair area.
 - (17) Install the initial horizontal stabilizer outboard closure rib tip cap as given in drawing 189A1001.
 - (18) Install the initial upper and/or lower horizontal stabilizer outboard aft trailing edge skin panels as given in drawing 185A1800.
 - (19) Do a resistance check between the fastener head and the initial structure as given in BAC 5117-6. Maximum resistance permitted is 0.010 ohms.
 - (20) Apply a decorative finish if necessary. Refer to AMM PAGEBLOCK 51-21-99/701
- B. Procedure II: Permanent Repair
- (1) Get access to the damaged area.

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- (a) Remove the necessary fasteners in the area of the damaged rib. Refer to 51-40-02, GENERAL.
 - (b) Remove the horizontal stabilizer outboard closure rib tip cap, as necessary.
 - (c) Remove the upper and/or lower horizontal stabilizer outboard aft trailing edge skin panels, as necessary.
 - (d) Remove the nutplates, as necessary, to install the Part [1] Repair Channel, as shown in Figure 201/REPAIR 1.
- (2) Cut and remove the damaged part of the horizontal stabilizer outboard closure rib upper and/or lower aft flange, if necessary, as shown in Figure 201/REPAIR 1. Refer to 51-10-02, GENERAL.
- (a) Make the cut as shown in Figure 201/REPAIR 1.
 - 1) Refer to 51-10-02, GENERAL for the inspection and removal of damage.
 - 2) Refer to 51-30-03, GENERAL for possible sources of the abrasive and other materials you can use to remove the damage.
 - 3) Refer to 51-30-05, GENERAL for possible sources of the equipment and tools you can use to remove the damage.
 - 4) Make sure the surface smoothness for all cut surfaces is 63 microinches (Ra) or smoother.
- (3) Do a High Frequency Eddy Current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Do a 0.040 in. (1.016 mm) insurance cut if no further damage is found. Refer to 737 NDT Part 6, 51-00-00, Procedure 3, 737 NDT Part 6, 51-00-00, Procedure 4, 737 NDT Part 6, 51-00-00, Procedure 8, and 737 NDT Part 6, 51-00-00, Procedure 9.
- (4) Flap peen or shot peen the cut edges of the horizontal stabilizer outboard closure rib flange.
 - (a) Refer to 51-20-06, GENERAL for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.
- (5) Make the repair parts as given in Table 202/REPAIR 1.

Table 202:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Channel	1	7075-T7351 plate as given in AMS-QQ-A-250/12, machined to a final thickness of 0.080 in. (2.032 mm), as given in drawing 182A5201, or 7075-O sheet, 0.080 in. (2.032 mm) thick, heat treat to T73 after forming as given in AMS-QQ-A-250/12. Optional: 2024-T3 sheet as given in AMS-QQ-A-250/4, 0.080 in. (2.032 mm) thick
[2]	Filler	1	7075-T73 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick. Optional: 7075-T6 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick
[3]	Filler	1	7075-T73 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick. Optional: 7075-T6 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick

- (6) Make the contour of the repair parts the same as the contour of the initial parts, as necessary. Refer to 51-30-01, GENERAL.
- (7) Remove the horizontal stabilizer outboard closure rib finish that is common to the Part [1] Repair Channel.
- (8) Assemble the repair parts as shown in Figure 201/REPAIR 1.

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- (9) Drill the necessary fastener holes in the repair parts. Use the initial fastener type, diameter and locations in the upper and lower flanges at the aft end of the horizontal stabilizer outboard closure rib. Refer to 51-40-05, GENERAL for the fastener hole dimensions.
 - (a) Do not countersink the fastener holes more than 76 percent of the initial flange thickness. This will prevent a knife-edge condition of the initial flange.
 - (10) Disassemble the repair parts.
 - (11) Remove all nicks, scratches, burrs, and sharp edges from the repair parts and bare surfaces of the initial parts.
 - (12) Install the repair parts and fasteners dry.
 - (13) Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial parts. Refer to 51-20-01, GENERAL.
 - (14) Apply two layers of BMS 10-11, Type I primer to the repair parts and to the bare surfaces of the initial parts, other than at areas common to the static wicks. Refer to SOPM 20-41-02.
 - (15) Fillet seal the repair parts and fill all gaps with BMS 5-95 sealant. Refer to 51-20-05, GENERAL.
 - (16) Attach the initial nutplates from Paragraph 4.B.(1)(d)/REPAIR 1 to the repair parts as shown in Figure 201/REPAIR 1.
 - (a) The initial nutplate fasteners will go through the Part [1] Repair Channel and the initial horizontal stabilizer outboard closure rib or the repair fillers, as shown in Figure 201/REPAIR 1.
 - (17) Do a resistance check between the Part [1] Repair Channel and the initial horizontal stabilizer outboard closure rib as given in BAC 5117-6. Maximum resistance permitted is 0.010 ohms.
 - (18) Apply a layer of BMS 3-23, corrosion inhibiting compound, to all the interior structure of the repair area.
 - (19) Install the initial horizontal stabilizer outboard closure rib tip cap as given in drawing 189A1001.
 - (20) Install the initial upper and/or lower horizontal stabilizer outboard aft trailing edge skin panels as given in drawing 185A1800.
 - (21) Do a resistance check between the fastener head and the initial structure as given in BAC 5117-6. Maximum resistance permitted is 0.010 ohms.
 - (22) Apply a decorative finish if necessary. Refer to AMM PAGEBLOCK 51-21-99/701.
- C. Procedure III: Permanent Repair That Replaces Time-Limited Repair
- (1) Get access to the damaged area.
 - (a) Remove the necessary fasteners in the area of the damaged rib. Refer to 51-40-02, GENERAL.
 - (b) Remove the horizontal stabilizer outboard closure rib tip cap, as necessary.
 - (c) Remove the upper and/or lower horizontal stabilizer outboard aft trailing edge skin panels, as necessary.
 - (d) Remove the nutplates, as necessary, to install the Part [1] Repair Channel, as shown in Figure 201/REPAIR 1.
 - (e) Remove the necessary fasteners common to the Part [1] Repair Channel. Refer to 51-10-02, GENERAL and 51-40-05, GENERAL.

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- (f) Oversize the fastener holes by 1/64 inch. Refer to 51-10-02, GENERAL and 51-40-05, GENERAL. Do a High Frequency Eddy Current (HFEC) inspection of the fastener holes. Refer to 737 NDT Part 6, 51-00-00, Procedure 1 and 737 NDT Part 6, 51-00-00, Procedure 16.
- 1) If no cracks are found, make the holes larger to install the fasteners referenced in Figure 201/REPAIR 1 for Procedure III.
 - 2) If cracks are found, make the holes up to 3/16 inch in diameter as needed to remove all crack indications. Do a HFEC inspection of the fastener holes again. Refer to 737 NDT Part 6, 51-00-00, Procedure 1 and 737 NDT Part 6, 51-00-00, Procedure 16. Do a 1/16 inch insurance cut if no further damage is found.
 - 3) If there is a crack in the initial Part [1] Repair Channel, discard it and fabricate a new part.
 - 4) If there is a crack in the outboard closure rib, stop and contact The Boeing Company for further instruction.
- (2) Do a HFEC inspection of the previously cut repair areas to make sure that all of the damage has been removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 3, 737 NDT Part 6, 51-00-00, Procedure 4, 737 NDT Part 6, 51-00-00, Procedure 8, and 737 NDT Part 6, 51-00-00, Procedure 9.
- (3) If there is a crack in the previously cut repair areas, stop and contact The Boeing Company for further instruction.
- (4) Flap peen or shot peen the cut edges of the horizontal stabilizer outboard closure rib flange.
 - (a) Refer to 51-20-06, GENERAL for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.
- (5) Use the initial Part [1] Repair Channel, initial Part [2] Filler and initial Part [3] Filler from procedure I if the initial repair parts are not damaged. If the initial repair parts are damaged, make the repair parts as given in Table 203/REPAIR 1.

Table 203:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Channel	1	7075-T7351 plate as given in AMS-QQ-A-250/12, machined to a final thickness of 0.080 in. (2.032 mm), as given in drawing 182A5201, or 7075-O sheet, 0.080 in. (2.032 mm) thick, heat treat to T73 after forming as given in AMS-QQ-A-250/12. Optional: 2024-T3 sheet as given in AMS-QQ-A-250/4, 0.080 in. (2.032 mm) thick
[2]	Filler	1	7075-T73 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick. Optional: 7075-T6 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick
[3]	Filler	1	7075-T73 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick. Optional: 7075-T6 bare sheet as given in AMS-QQ-A-250/12, 0.050 in. (1.270 mm) thick

- (6) If you make the Part [1] Repair Channel, make the contour of the repair part the same as the contour of the initial part, as necessary. Refer to 51-30-01, GENERAL.
- (7) Assemble the repair parts as shown in Figure 201/REPAIR 1.
- (8) Drill the necessary fastener holes in the repair parts. Use the initial fastener type, diameter, and locations in the upper and lower flanges at the aft end of the horizontal stabilizer outboard closure rib. Refer to 51-40-05, GENERAL for the fastener hole dimensions.

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REPAIR 1
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- (a) Do not countersink the fastener holes more than 76 percent of the initial flange thickness. This will prevent a knife-edge condition of the initial flange.
- (9) Disassemble the repair parts.
- (10) Remove all nicks, scratches, burrs, and sharp edges from the repair parts and bare surfaces of the initial parts.
- (11) Install the repair parts and fasteners dry.
- (12) Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial parts as necessary. Refer to 51-20-01, GENERAL.
- (13) Apply two layers of BMS 10-11, Type I primer to the repair parts and to the bare surfaces of the initial parts as necessary, other than at areas common to the static wicks. Refer to SOPM 20-41-02.
- (14) Fillet seal the repair parts and fill all gaps with BMS 5-95 sealant. Refer to 51-20-05, GENERAL.
- (15) Attach the initial nutplates from Paragraph 4.C.(1)(d)/REPAIR 1 to the repair parts as shown in Figure 201/REPAIR 1.
 - (a) The initial nutplate fasteners will go through the Part [1] Repair Channel and the initial horizontal stabilizer outboard closure rib or the repair fillers, as shown in Figure 201/REPAIR 1.
- (16) Do a resistance check between the Part [1] Repair Channel and the initial horizontal stabilizer outboard closure rib as given in BAC 5117-6. Maximum resistance permitted is 0.010 ohms.
- (17) Apply a layer of BMS 3-23 corrosion inhibiting compound to all of the interior structure of the repair area.
- (18) Install the initial horizontal stabilizer outboard closure rib tip cap as given in drawing 189A1001.
- (19) Install the initial upper and/or lower horizontal stabilizer outboard aft trailing edge skin panels as given in drawing 185A1800.
- (20) Do a resistance check between the fastener head and the initial structure as given in BAC 5117-6. Maximum resistance permitted is 0.010 ohms.
- (21) Apply a decorative finish if necessary. Refer to AMM PAGEBLOCK 51-21-99/701.

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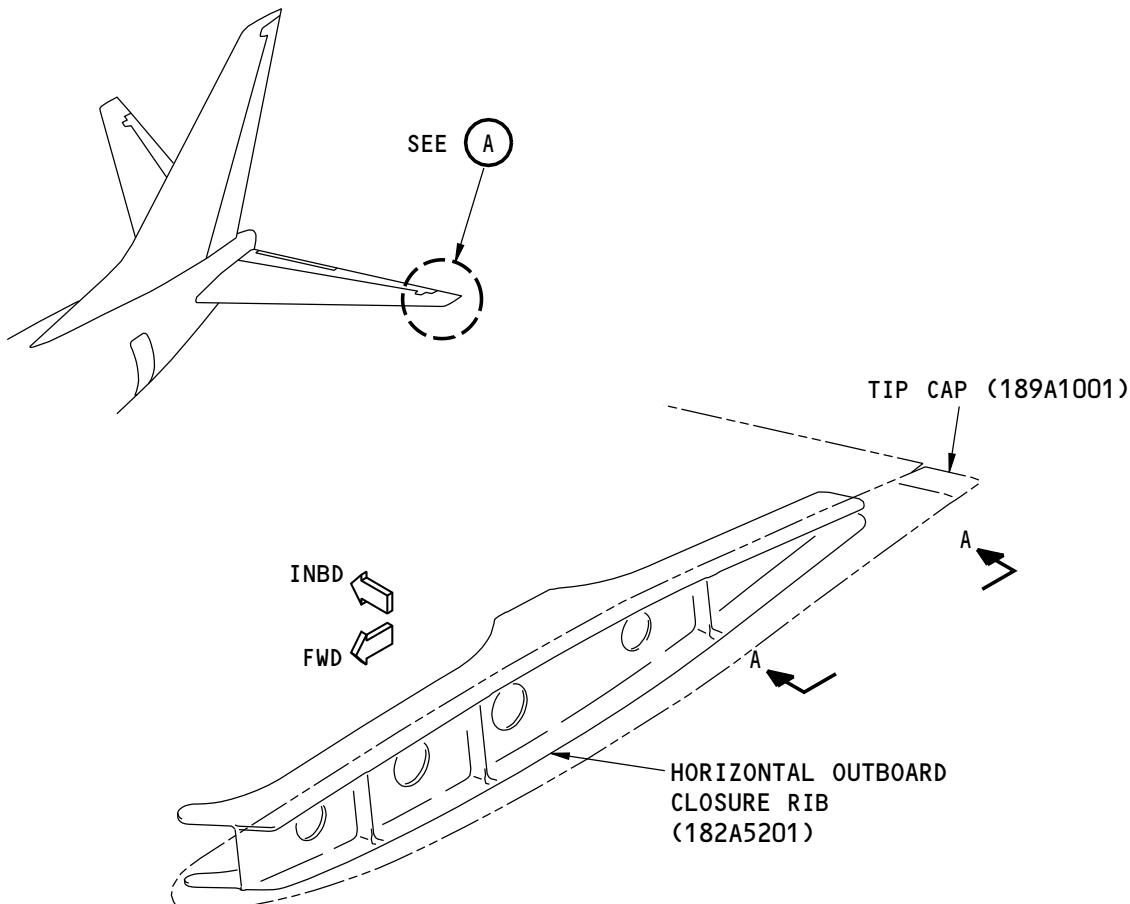
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

A

J72281 S0000175609_V1

Layout of the Repair Parts
Figure 201 (Sheet 1 of 3)

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REPAIR 1
Page 208

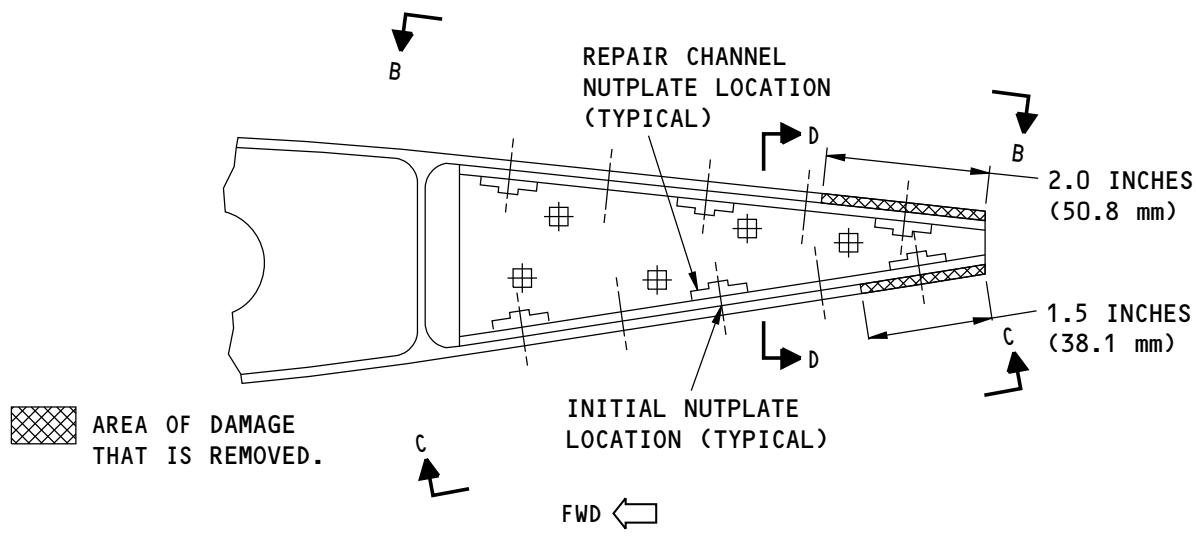
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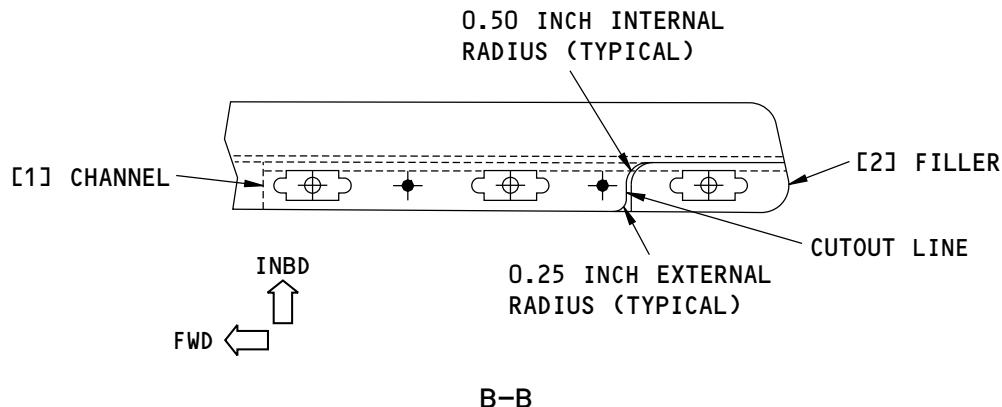


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STRUCTURAL REPAIR MANUAL

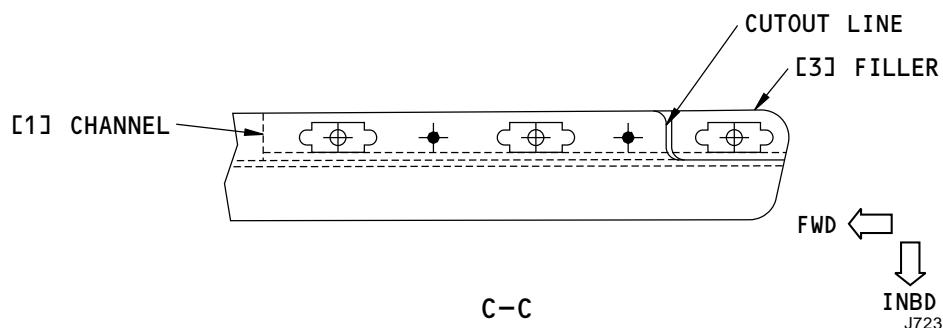


VIEW WHEN YOU LOOK INBOARD

A-A



B-B



J72311 S0000175610_V1

Layout of the Repair Parts
Figure 201 (Sheet 2 of 3)

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REPAIR 1
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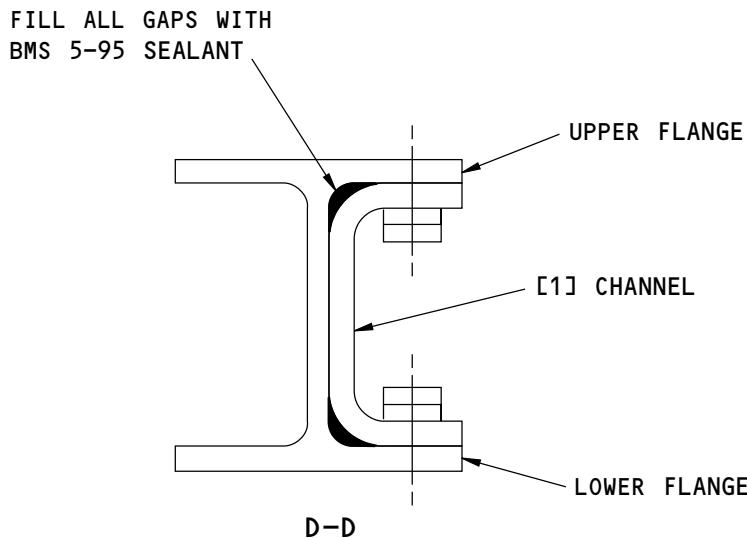
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NOTES

- [1] MAKE SURE THERE IS A MINIMUM OF 2D EDGE MARGIN.
- [2] MAKE SURE THERE IS A MINIMUM OF 3D TO 5D FASTENER SPACING FOR ALL NEW FASTENERS.
- [3] MAKE SURE THERE IS A MINIMUM OF 4D TO 6D FASTENER SPACING FOR ALL NEW FASTENERS.
- [4] MAKE SURE THERE IS A MAXIMUM OF 0.010 INCH GAP BETWEEN THE INITIAL PARTS AND THE REPAIR PARTS.

FASTENER SYMBOLS

- ⊕ INITIAL FASTENER LOCATION. INSTALL THE SAME TYPE AND SIZE AS THE INITIAL FASTENER. REPLACE ANY DAMAGED NUT PLATES OR FASTENERS.
- REFERENCE FASTENER LOCATION
- ‡ REPAIR FASTENER LOCATION. PROCEDURE I: INSTALL BACR15FR5B RIVETS. PROCEDURES II AND III: INSTALL A BACB30VT6 HEX-DRIVE BOLT AND A BACC30BL COLLAR WITH COLLAR OUTBOARD. [1] [3] [4]
- REPAIR FASTENER LOCATION. PROCEDURE I: INSTALL A BACR15CE5D RIVET. PROCEDURES II AND III: INSTALL A BACR15CE6 RIVET. [1] [2] [4]

J72288 S0000175611_V2

Layout of the Repair Parts
Figure 201 (Sheet 3 of 3)

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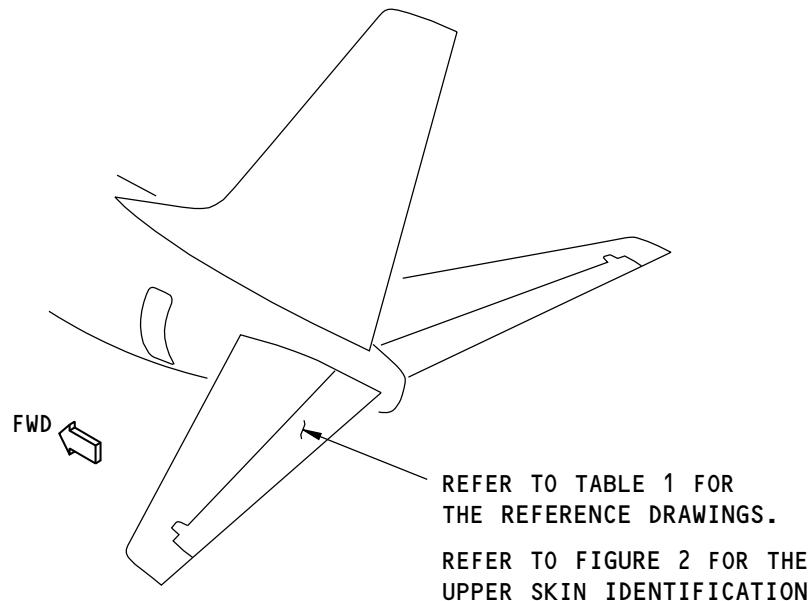
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ELEVATOR UPPER SKIN



F73572 S0006592854_V1

Elevator Upper Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A0000	Elevator Installation
183A0001	Elevator Integration Functional Product Collector
183A0101	Elevator Assembly Functional Product Collector
183A3000	Upper Skin Panel Installation - Elevator

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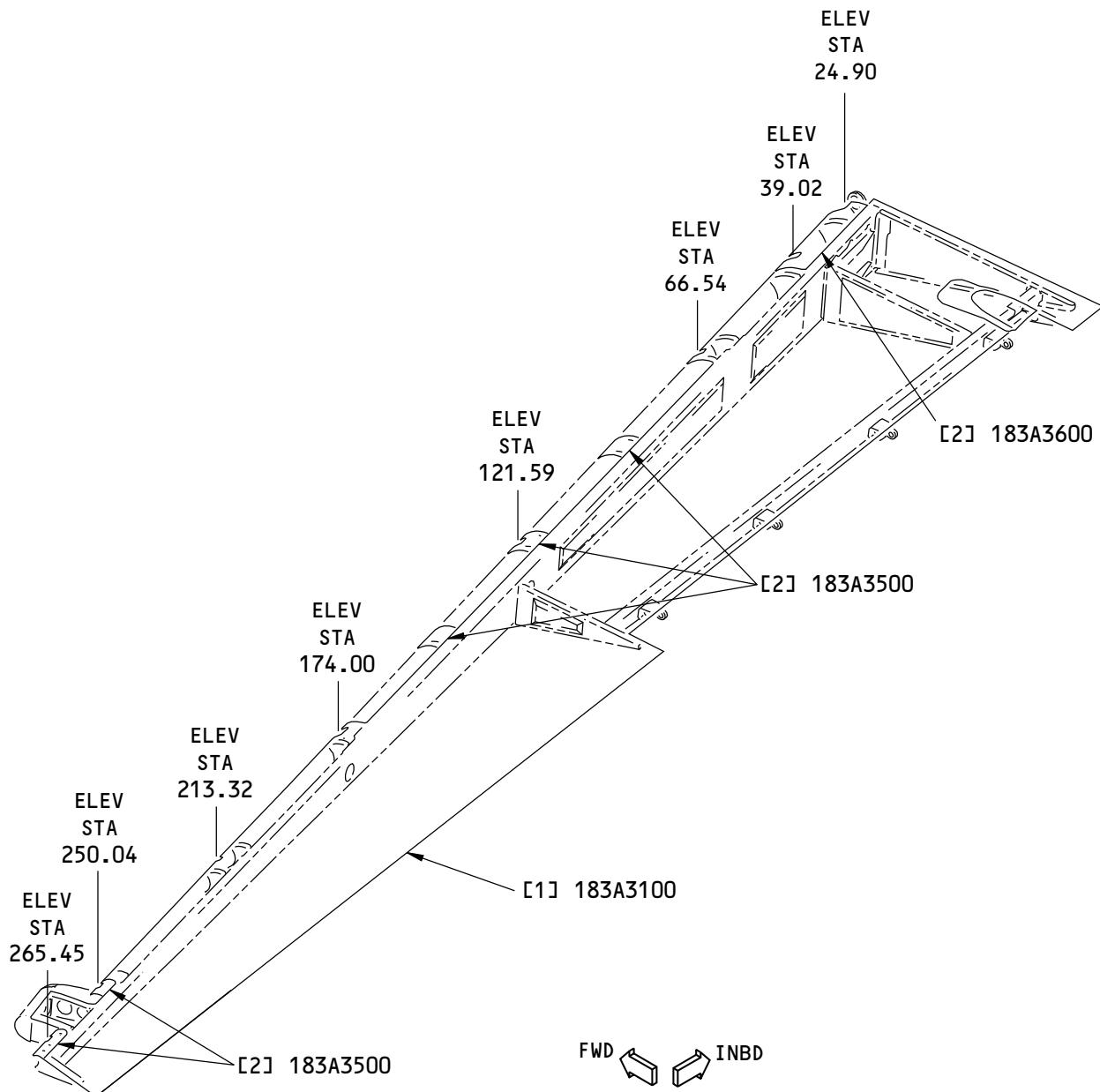
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F73596 S0006592856_V1

Elevator Upper Skin Identification
Figure 2 (Sheet 1 of 2)

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IDENTIFICATION 1

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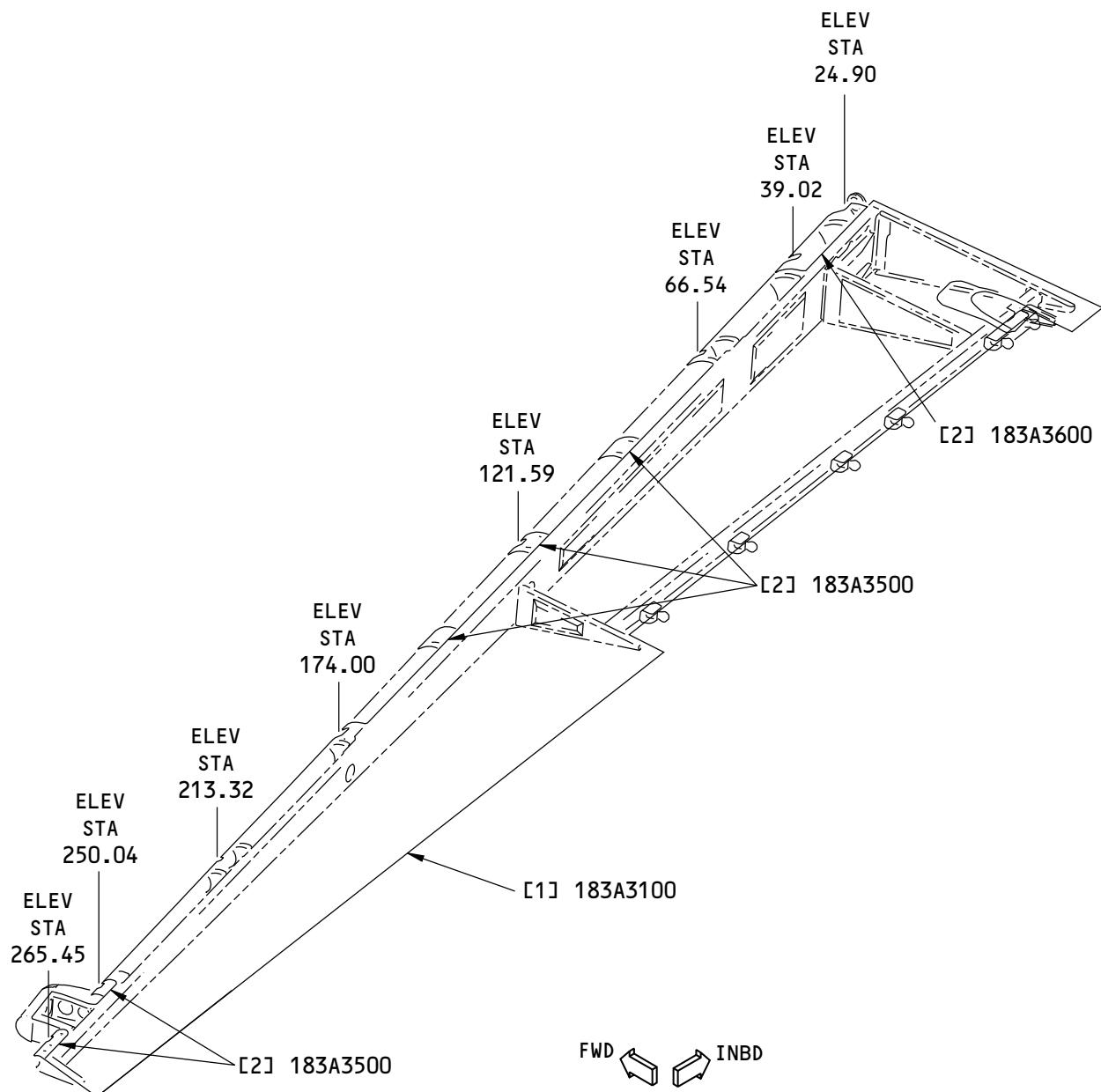
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LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

N60987 S0006592857_V1

Elevator Upper Skin Identification
Figure 2 (Sheet 2 of 2)

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Elevator Upper Skin - Bonded Part Skin Core (Inboard closure rib to ELEV STA 39.020) Core (ELEV STA 39.020 to ELEV STA 132.39) Core (Elev STA 132.39 to outboard closure rib)		Carbon Fiber Reinforced Plastic (CFRP) woven fabric as given in BMS 8-256, Type IV, Class II, Style 3K-70-PW Refer to Figure 3 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[2]	Hinge Cover		Epoxy sheet molding compound as given in BMS 8-327, Type I, Lytex 9063	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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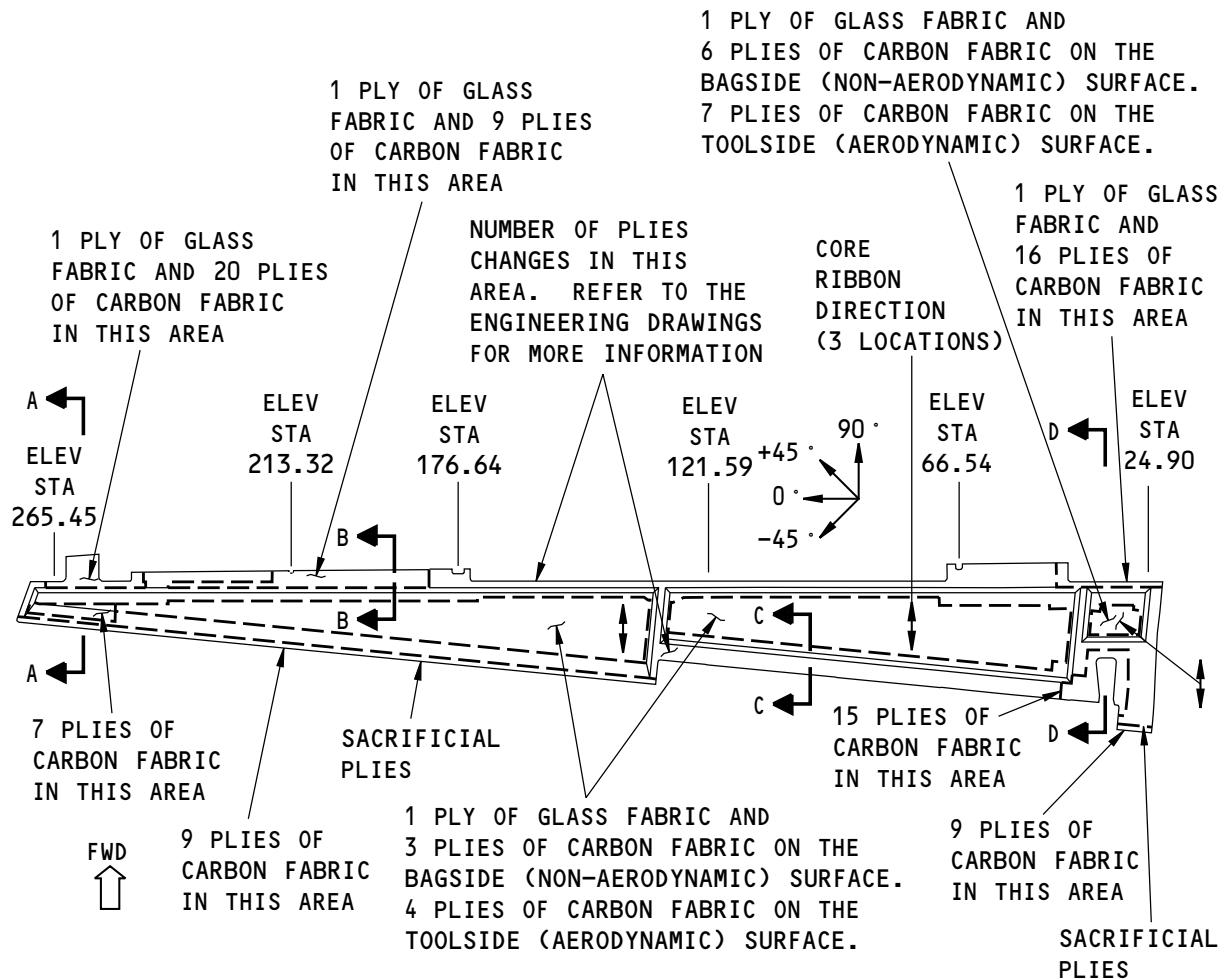
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(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.

REFER TO SECTION A-A, B-B, C-C, AND D-D FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE INFORMATION.

REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A, B-B, C-C, AND D-D.

G15024 S0006592860_V1

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Elevator Upper Skin Panel, Figure 2,
Item [1]**
Figure 3 (Sheet 1 of 2)

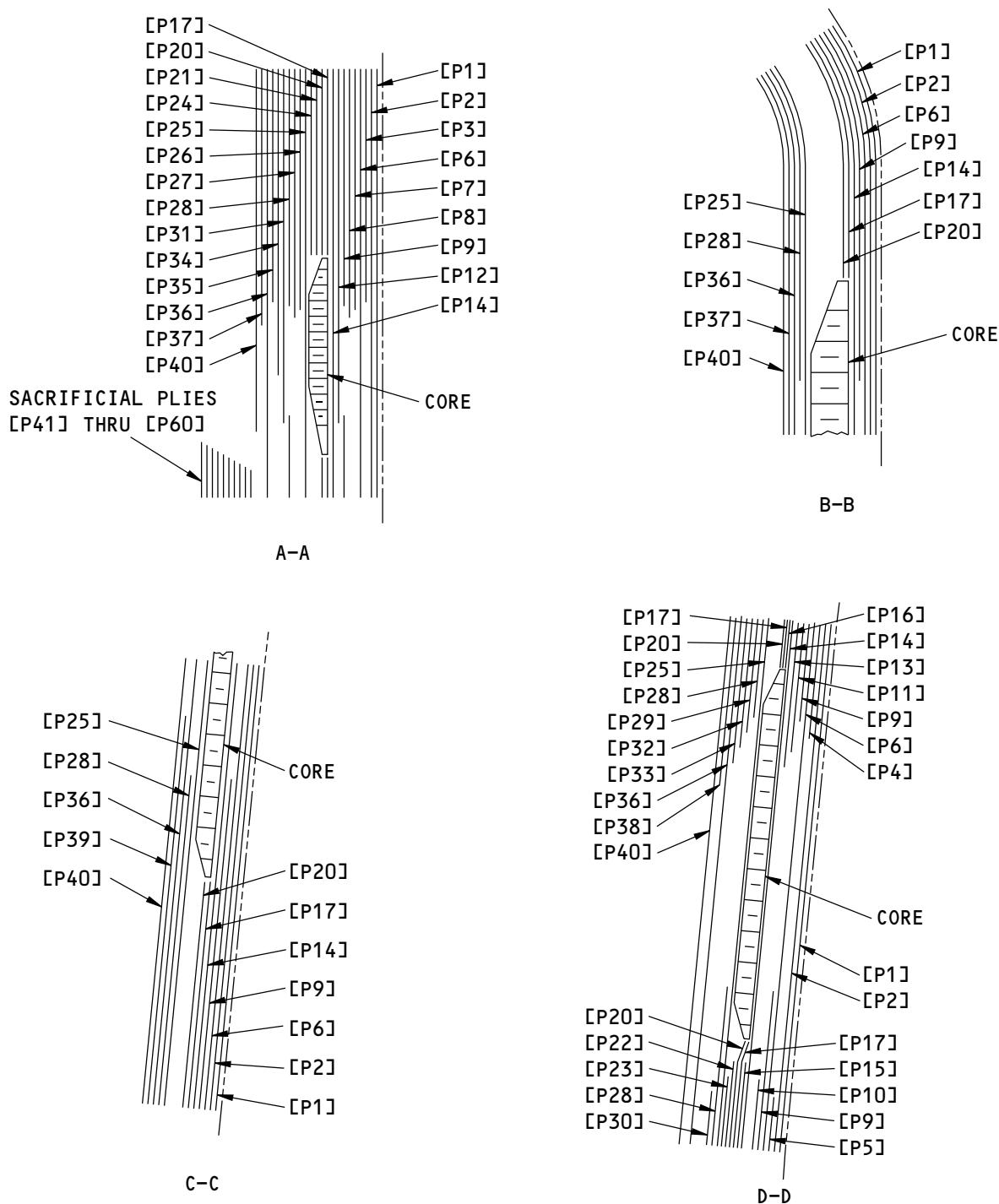
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F73891 S0006592861_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Elevator Upper Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 2 of 2)

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1	-----	Surface composite film as given in BMS 8-341 Type II
P2, P6, P8, P10, P11, P12, P16, P17, P18, P19, P23, P24, P26, P28, P32, P34, P36, P43, P44, P45, P46, P51, P52, P57, P58, P59, P60	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P4, P5, P7, P9, P13, P14, P15, P20, P21, P22, P25, P27, P29, P30, P31, P33, P35, P41, P42, P47, P48, P49, P50, P53, P54, P55, P56	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P37, P38, P39	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108
P40	-----	1 mil White Tedlar as given in BAC 5317-4

55-20-01

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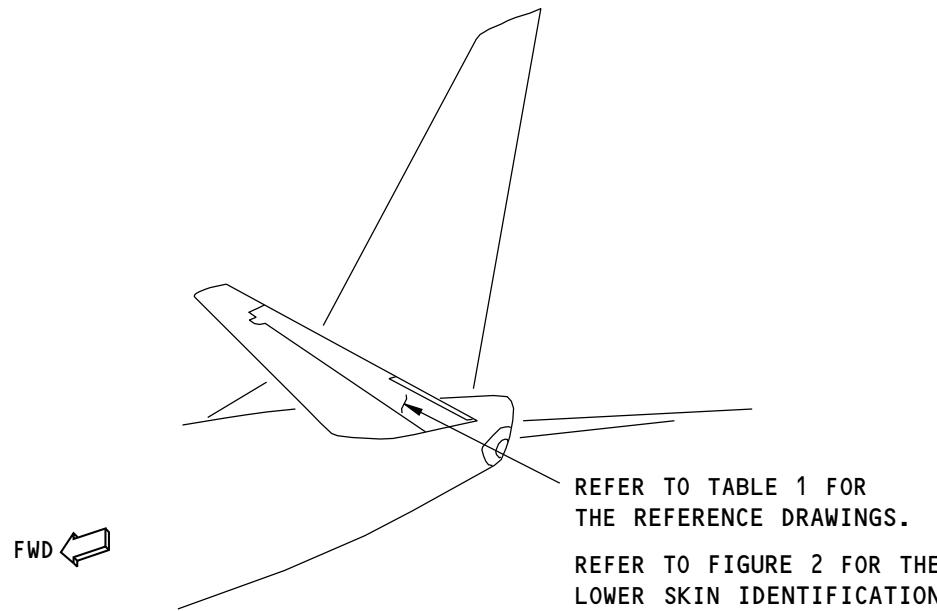
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - ELEVATOR LOWER SKIN



F73956 S0006592864_V1

Elevator Lower Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A0000	Elevator Installation
183A0001	Elevator Integration Functional Product Collector
183A0101	Elevator Assembly Functional Product Collector
183A3010	Lower Skin Panel Installation - Elevator

55-20-01

IDENTIFICATION 2

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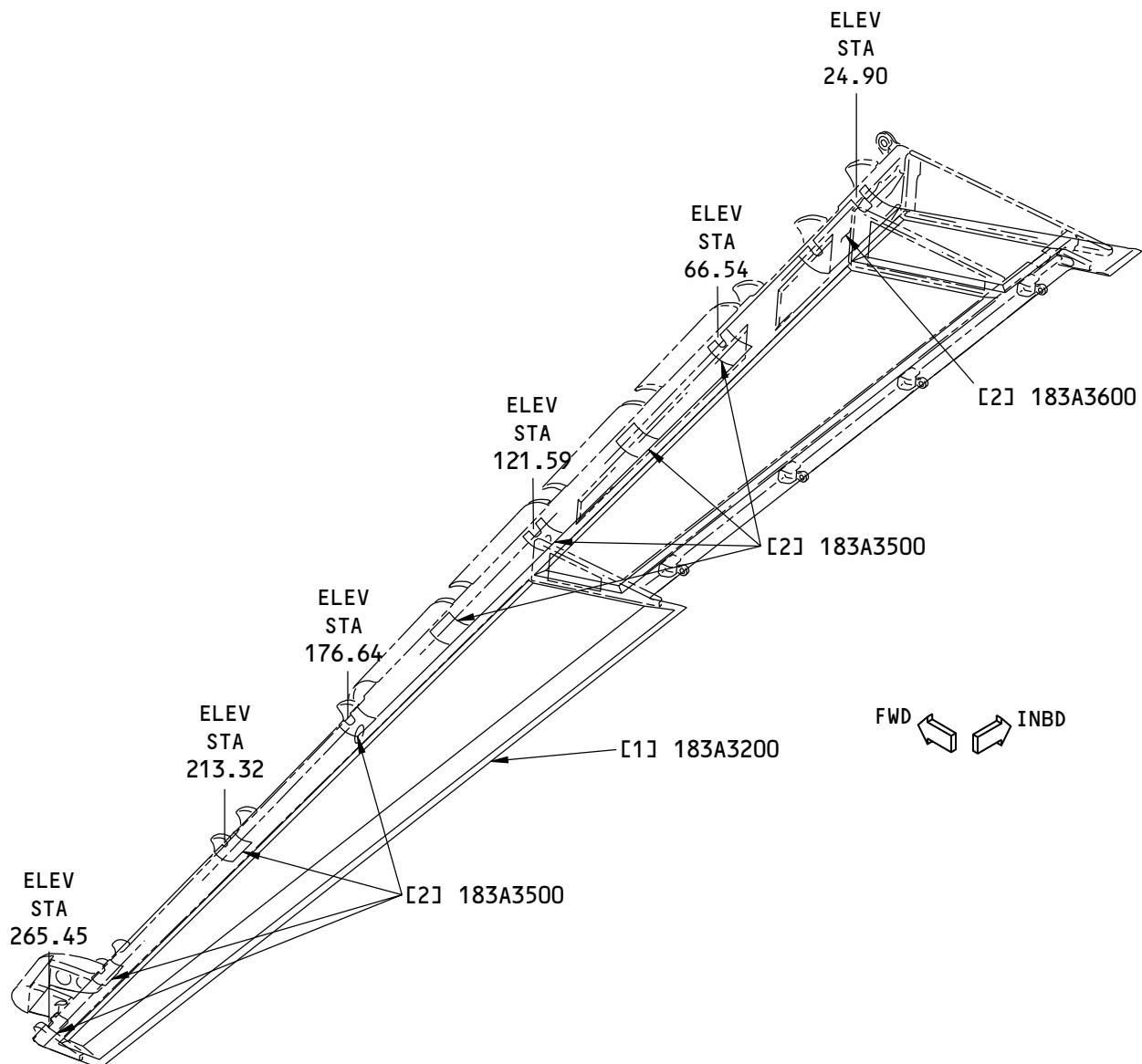
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

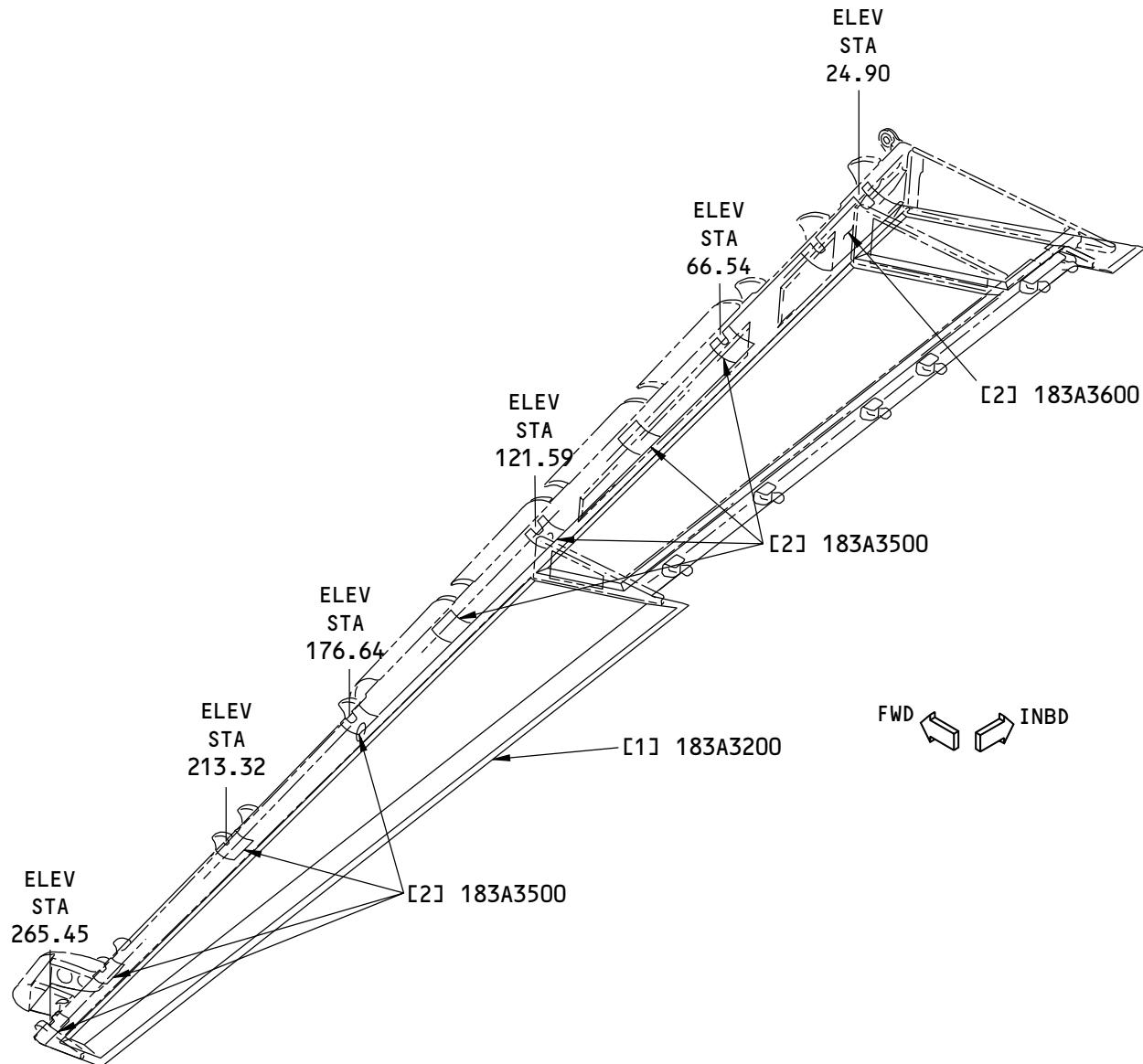
F74022 S0006592866_V1

Elevator Lower Skin Identification
Figure 2 (Sheet 1 of 2)

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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

N61030 S0006592867_V1

Elevator Lower Skin Identification
Figure 2 (Sheet 2 of 2)

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Elevator Lower Skin - Bonded Part Skin Core (Inboard closure rib to ELEV STA 39.02) Core (ELEV STA 39.02 to ELEV STA 132.39) Core (ELEV STA 132.39 to outboard closure rib)		Carbon Fiber Reinforced Plastic (CFRP) woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW Refer to Figure 3 Aramid honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Aramid honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Aramid honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[2]	Hinge Cover		Epoxy sheet molding compound as given in BMS 8-327, Type I, Lytex 9063	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

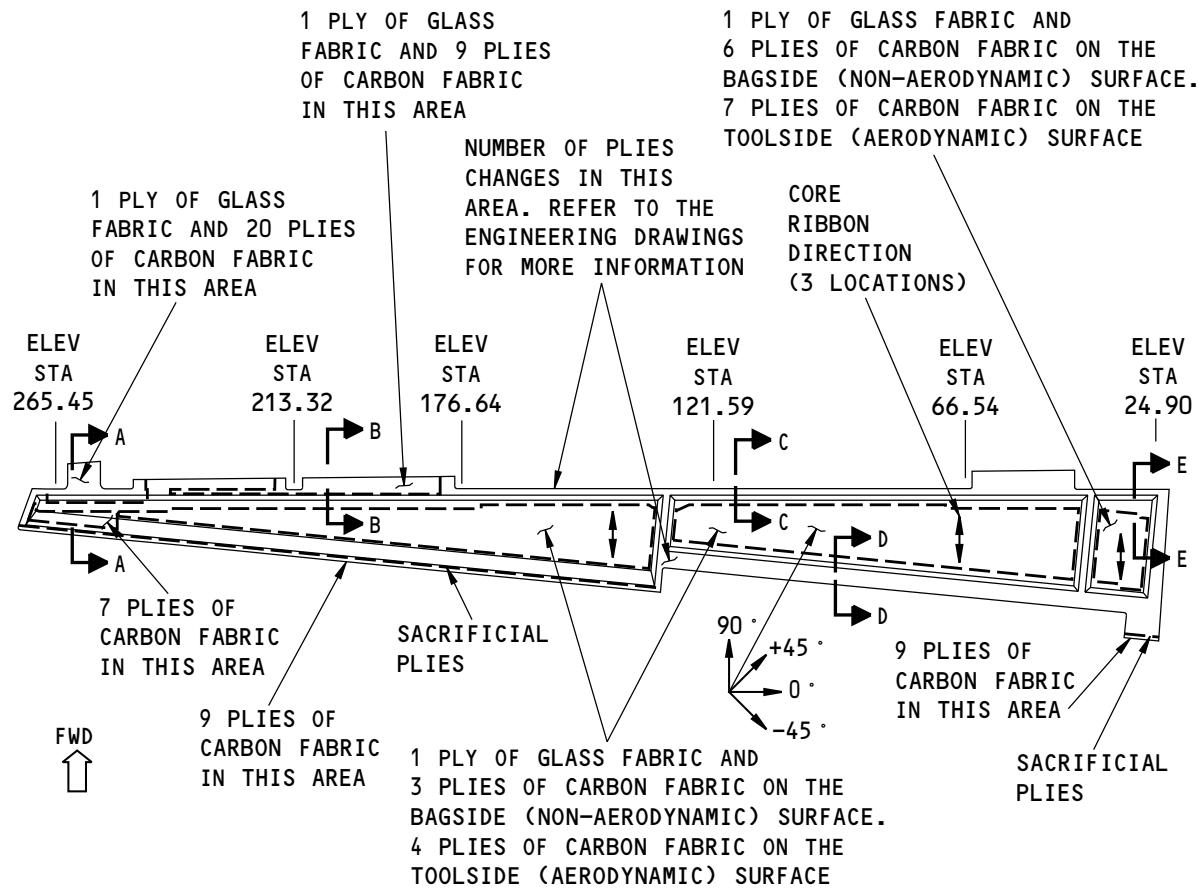
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LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE

VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

PLY LAYUP AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.
- REFER TO SECTIONS A-A, B-B, C-C, D-D, AND E-E FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE INFORMATION.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A, B-B, C-C, D-D, AND E-E.

F74097 S0006592870_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Elevator Lower Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 1 of 2)

55-20-01

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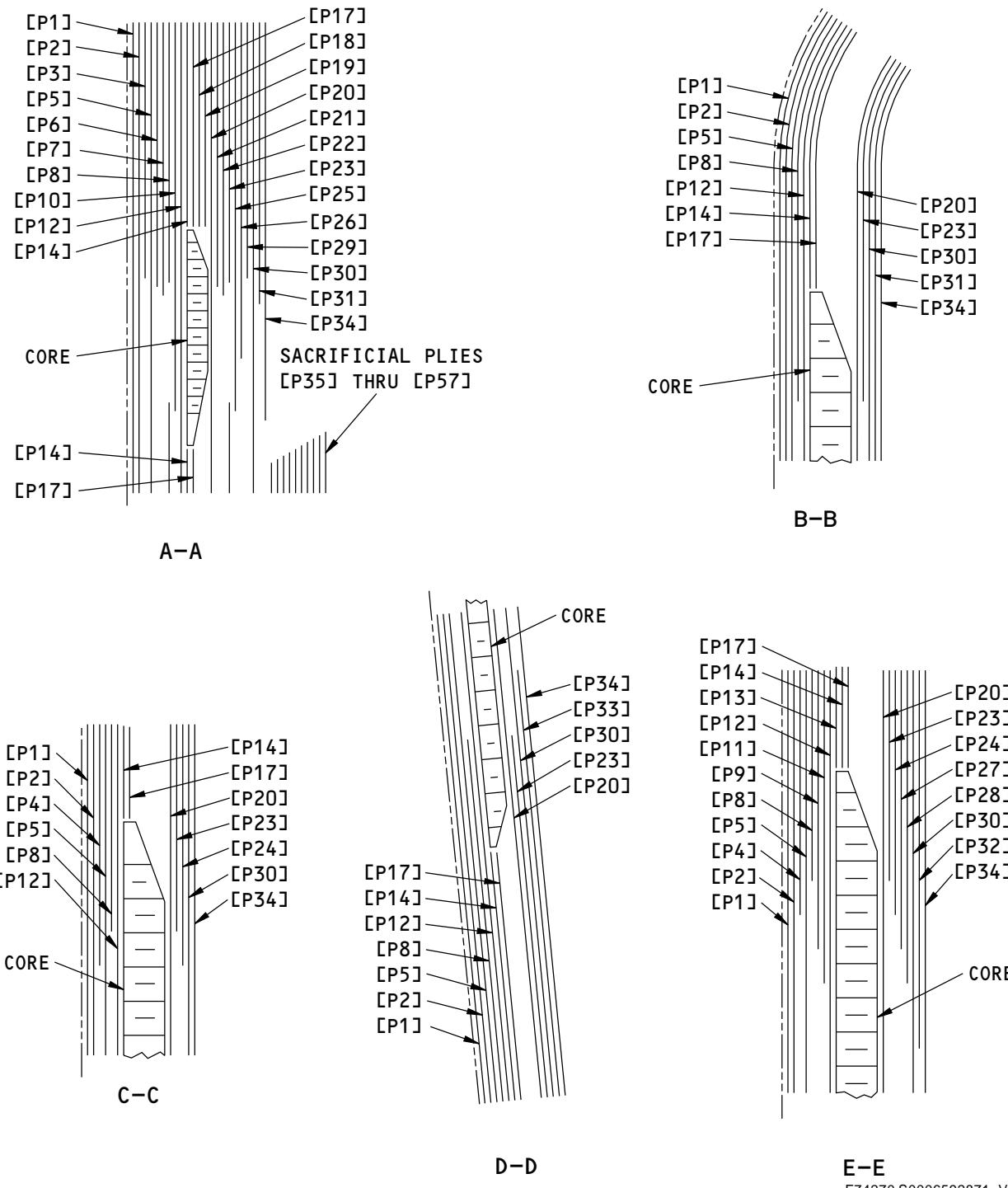
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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Elevator Lower Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 2 of 2)

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1	-----	Composite surfacing film as given in BMS 8-341, Type II
P2, P5, P7, P9, P10, P13, P14, P15, P16, P19, P21, P23, P26, P27, P30, P37, P38, P39, P40, P44, P45, P46, P51, P52, P53, P56, P57	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P4, P6, P8, P11, P12, P17, P18, P20, P22, P24, P25, P28, P29, P35, P36, P41, P42, P43, P47, P48, P49, P50, P54, P55	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P31, P32, P33	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108
P34	-----	1 mil White Tedlar as given in BAC5317-4

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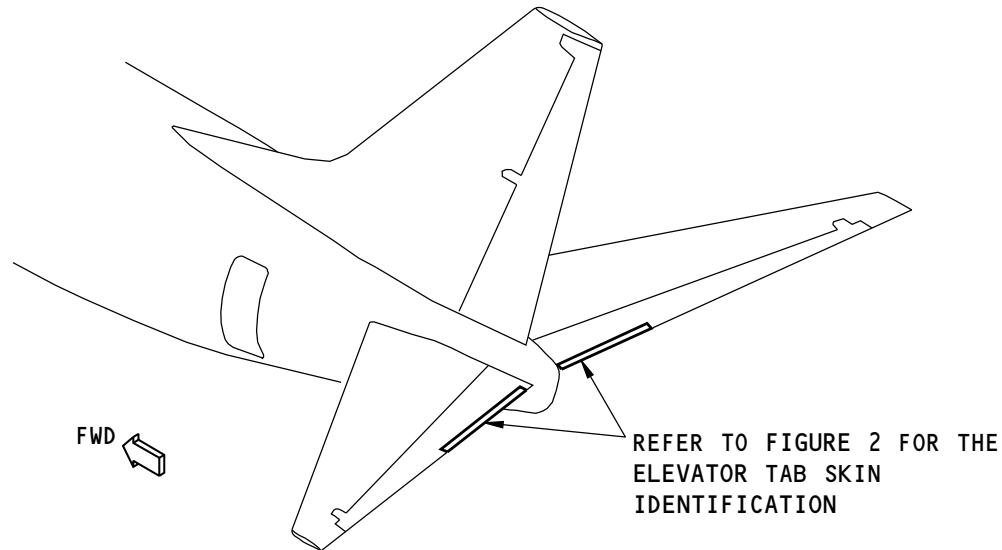
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IDENTIFICATION 3 - ELEVATOR TAB SKINS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G05739 S0006592874_V1

Elevator Tab Skin Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A8000	Elevator Tab Installation
183A8100	Elevator Tab Assembly
183A8200	Elevator Tab Bonded Part
183A8210	Elevator Tab Skins Bonded Part
183A8220	Elevator Tab Spar and Leading Edge Bonded Part
183A8230	Elevator Tab End Closures

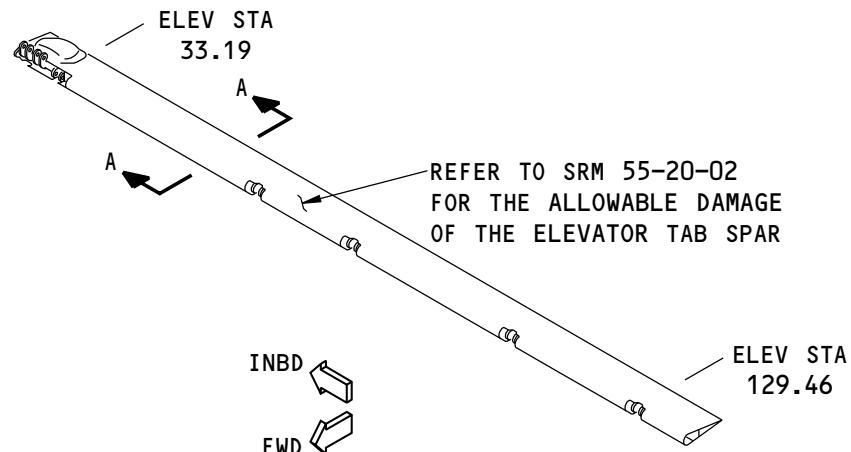
55-20-01
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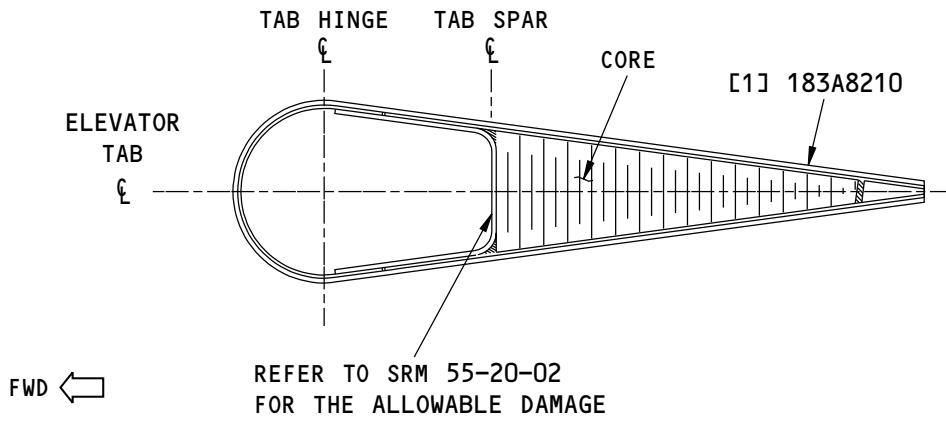


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ELEVATOR TAB SKIN
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

(A)



A-A

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

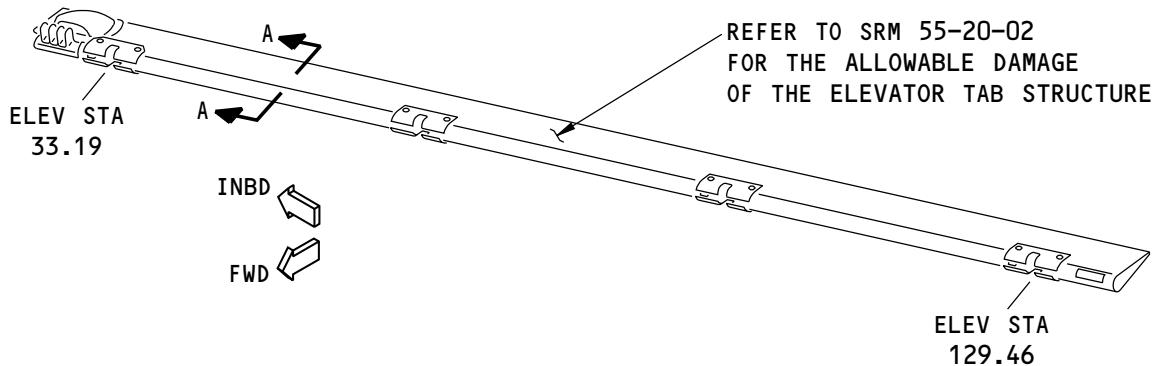
M93984 S0006592876_V1

Elevator Tab Skin Identification
Figure 2 (Sheet 1 of 2)

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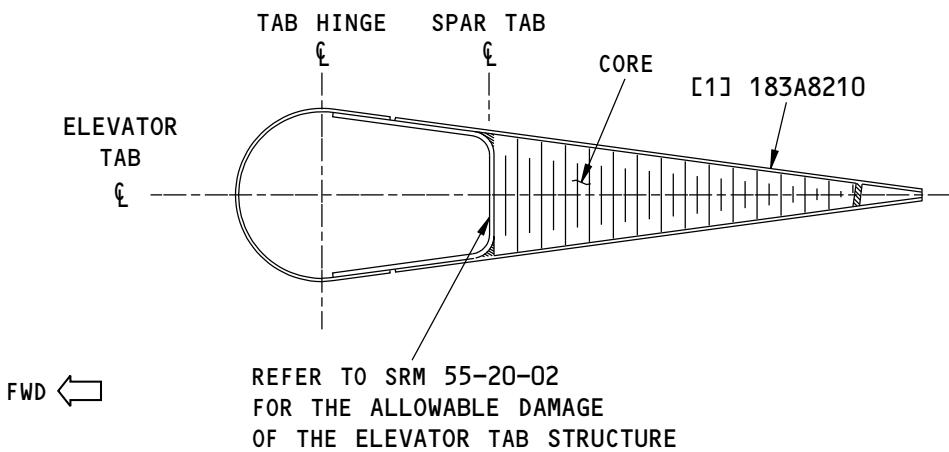


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ELEVATOR TAB SKIN
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

A



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

A-A

G08991 S0006592877_V1

Elevator Tab Skin Identification
Figure 2 (Sheet 2 of 2)

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Elevator Tab Skin Assembly - Bonded Part Upper Skin Lower Skin Leading Edge Skin Outer Skin Core		Carbon Fiber Reinforced Plastic (CFRP) woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW Refer to Figure 3 Refer to Figure 4 Refer to Figure 5 Refer to Figure 6 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	For airplane line numbers 1175 and on

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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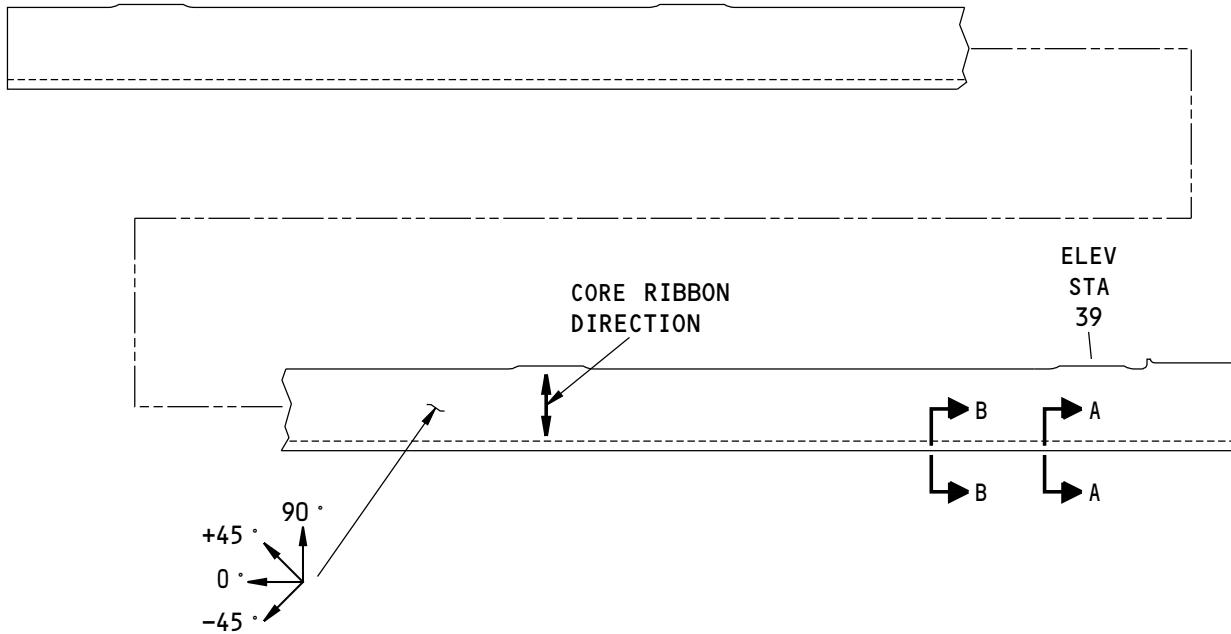
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE FOR THOSE LOCATIONS.
- REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

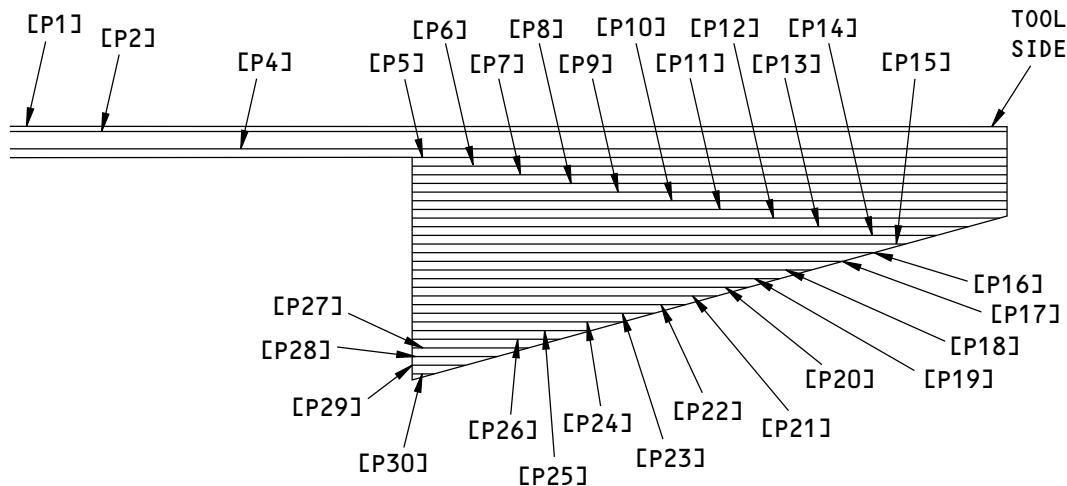
G06641 S0006592880_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Elevator Tab Upper Skin, Figure 2, Item [1]
Figure 3 (Sheet 1 of 2)

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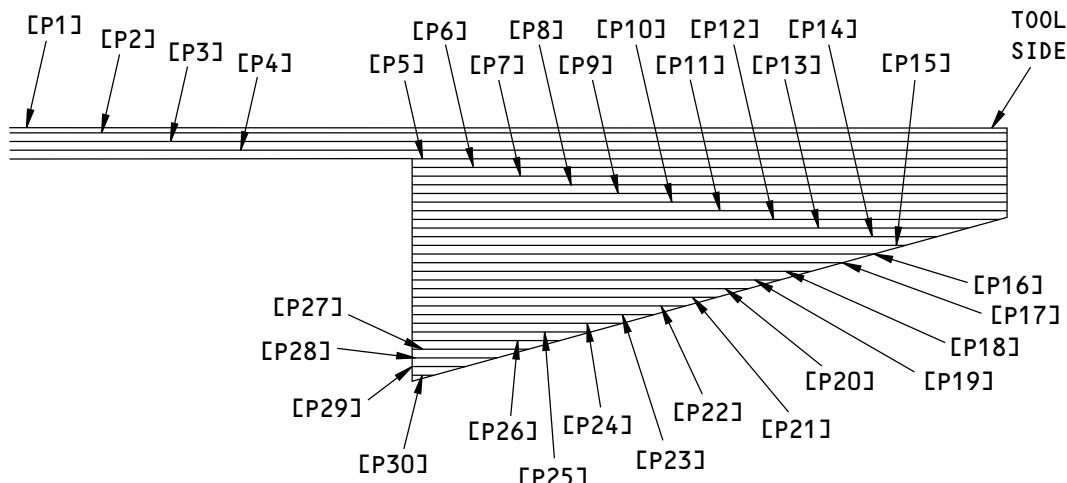


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VIEW IS ROTATED 90 ° COUNTERCLOCKWISE

PLY LAYUP SEQUENCE
A-A



VIEW IS ROTATED 90 ° COUNTERCLOCKWISE

PLY LAYUP SEQUENCE
B-B

G06690 S0006592881_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Elevator Tab Upper Skin, Figure 2, Item
[1]
Figure 3 (Sheet 2 of 2)

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1, P4	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW.
P2, P3	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW.
P5 through P30	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW.

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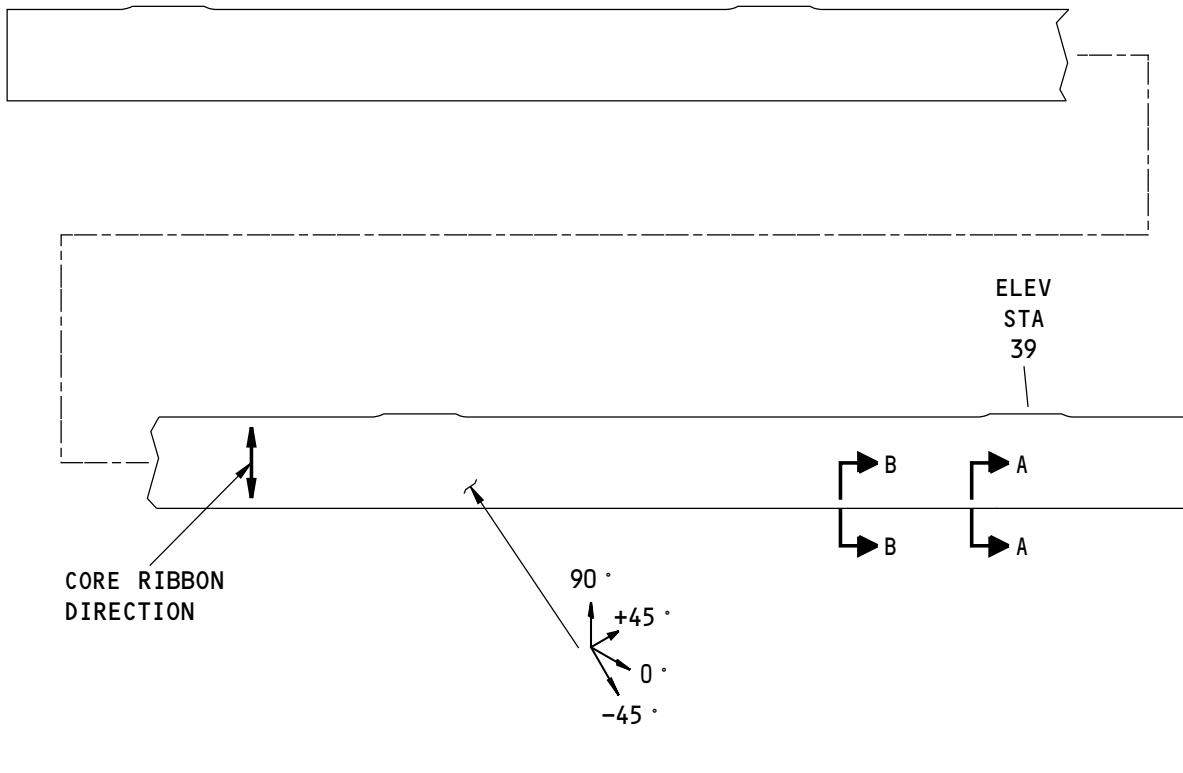
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE FOR THOSE LOCATIONS.
- REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

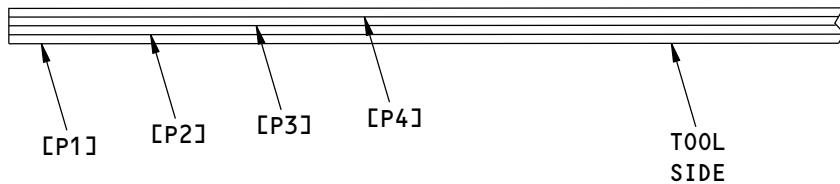
G07323 S0006592883_V1

Ply Direction, Core Ribbon Dirction and Ply Sequence for the Elevator Tab Lower Skin, Figure 2, Item [1]
Figure 4 (Sheet 1 of 2)

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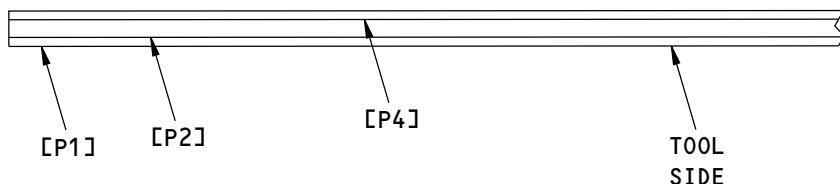


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VIEW IS ROTATED 90° COUNTERCLOCKWISE

PLY LAYUP SEQUENCE
A-A



VIEW IS ROTATED 90° COUNTERCLOCKWISE

PLY LAYUP SEQUENCE
B-B

G07335 S0006592884_V1

Ply Direction, Core Ribbon Dirction and Ply Sequence for the Elevator Tab Lower Skin, Figure 2, Item
[1]
Figure 4 (Sheet 2 of 2)

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P4	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW.
P2, P3	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW.

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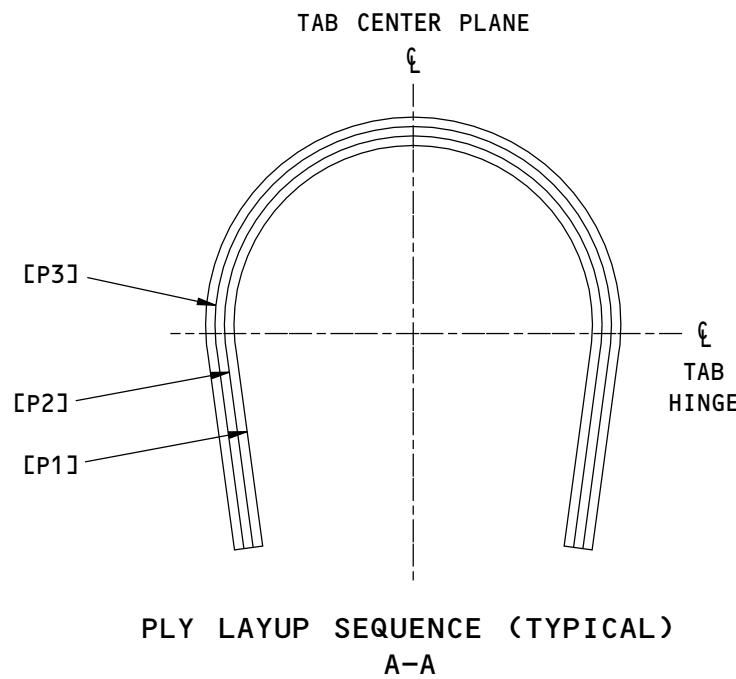
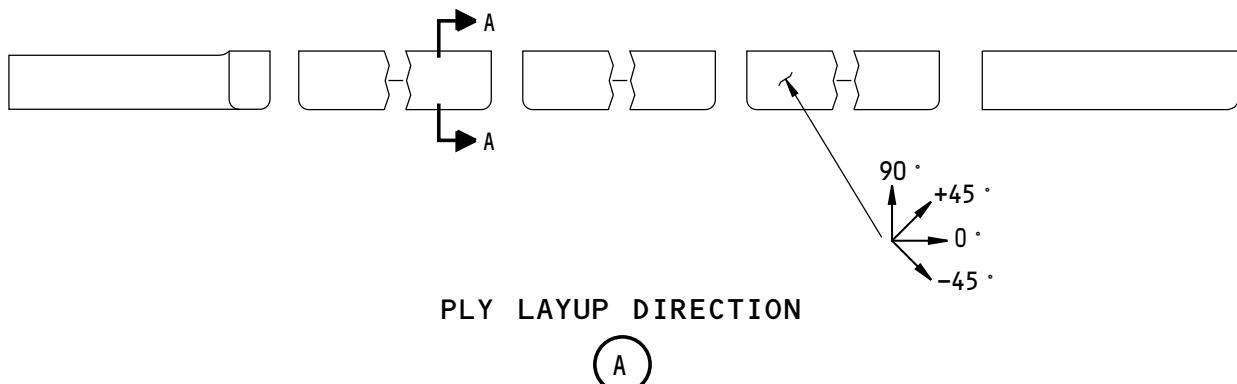
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STRUCTURAL REPAIR MANUAL



NOTES

- THE PLY DIRECTION IS THE WRAP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PANEL.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE FOR THAT LOCATION.
- REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 5 FOR THE DIRECTION AND THE MATERIAL OF EACH PLY.

G08411 S0006592886_V1

Ply Direction and Ply Sequence for the Elevator Tab Leading Edge Skin Figure 2, Item [1]
Figure 5

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STRUCTURAL REPAIR MANUAL

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P1, P3	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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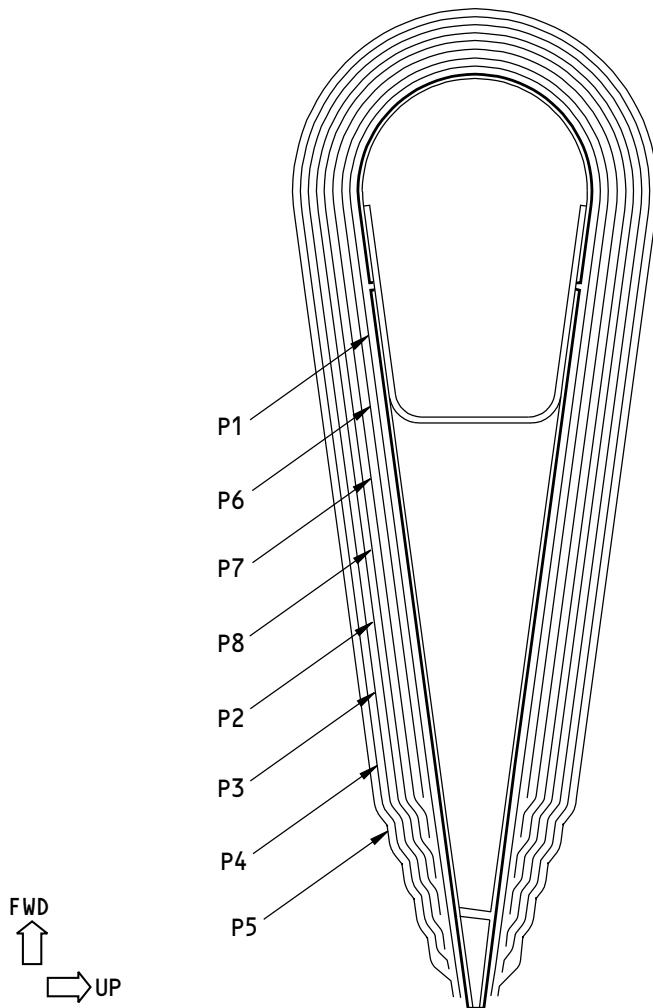
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PLY DIRECTION AND PLY SEQUENCE FOR THE ELEVATOR
TAB SKIN - FIGURE 2, ITEM 1
(TYPICAL SECTION AT HINGES 3 AND 4)
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

NOTES

- 11 PLIES AT HINGES 1 AND 2
- 10 PLIES AT HINGES 3 AND 4
- 7 PLIES AT HINGES 5 AND 6

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Ply Direction and Ply Sequence for the Elevator Tab Outer Skin
Figure 6

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6 (REFER TO THE PRODUCTION DRAWING FOR THE OTHER HINGE LOCATIONS)		
PLY	DIRECTION	MATERIAL
P1	-----	Structural Adhesive as given in BMS 5-129, Type 4, Grade 5
P4, P7, P10	+45 degrees	CFRP unidirectional tape as given in BMS 8-256, Type II, Class 1, Grade 190
P3, P8, P11	-45 degrees	CFRP unidirectional tape as given in BMS 8-256, Type II, Class 1, Grade 190
P2, P5, P6, P9	+/- 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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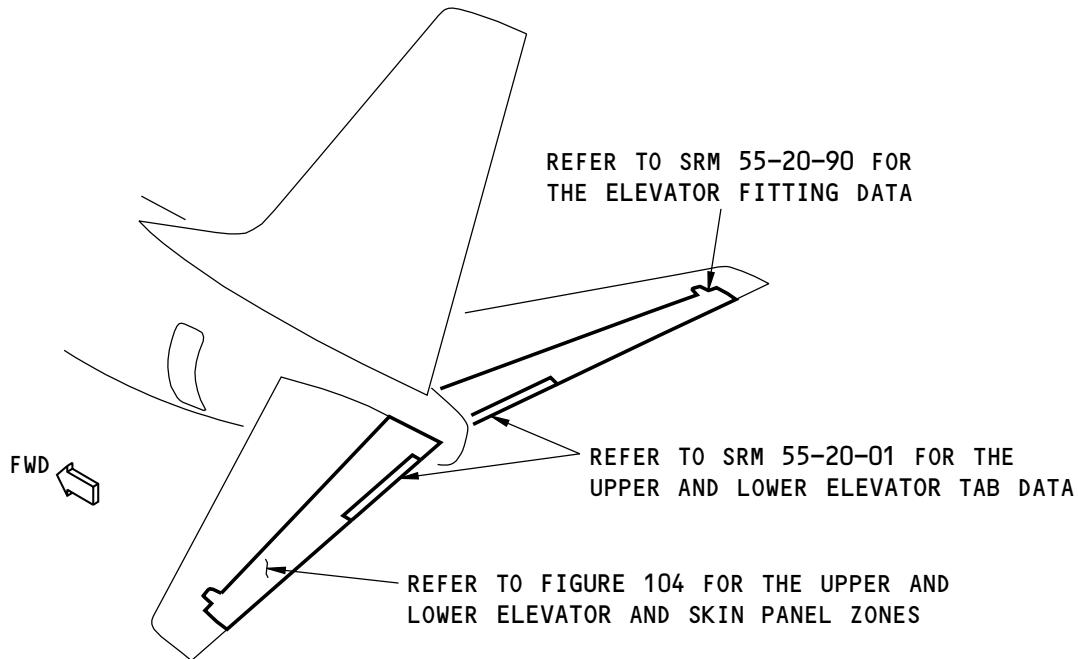
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ALLOWABLE DAMAGE 1 - UPPER AND LOWER ELEVATOR SKIN PANELS

1. Applicability

- A. Allowable Damage 1 is applicable to damage on the Upper and Lower Elevator Skin made of carbon fiber reinforced plastic (CFRP) shown in Upper and Lower Elevator Skin Location, Figure 101/ ALLOWABLE DAMAGE 1.



F98415 S0006592894_V1

Upper and Lower Elevator Skin Location
Figure 101

2. General

- A. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for the inspection procedures

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
- (2) Refer to Damage Definitions, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of the damage.
- (3) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the facesheets of a honeycomb core area.
- B. Remove all the contaminates and water from the structure. Refer to 51-30-05 and 51-70-04 for the tools and the cleanup procedures.
- C. Seal all damaged areas with the steps that follow.
 - (1) Seal the damage that is not more than one ply deep and that agrees with the allowable damage limits as given in Paragraph 4./ALLOWABLE DAMAGE 1

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ALLOWABLE DAMAGE 1

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- (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape).
 - 2) Keep a record of the location.
 - 3) Make sure the tape is in satisfactory condition at normal maintenance intervals.
- (b) Make a permanent seal.
 - 1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - 2) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - 3) Apply one layer of BMS 10-60, Type II enamel to the areas sealed with epoxy resin. Refer to AMM 51-21-00/701.
- (2) Seal all permitted damaged areas that are more than one ply deep. Refer to Paragraph 4./ ALLOWABLE DAMAGE 1 for the allowable damage limits. Seal the damage as follows:
 - (a) Use a vacuum and heat to remove moisture from the solid laminate and the honeycomb cells. Refer to 51-70-04.
 - (b) Make a temporary seal with aluminum foil tape (speed tape).
 - (c) Keep a record of the location.
 - (d) Repair the damage at or before 250 flight cycles from the time the seal was made.
- (3) Refer to Upper and Lower Elevator Skin Panel Zones, Figure 104/ALLOWABLE DAMAGE 1 for the location of the elevator skin panel zones.
- (4) The definition of the words "other damage" as used in the allowable damage limit, does not include nicks, gouges, and scratches that do not cause carbon fiber damage are sealed.
- (5) Make sure the elevator is balanced. Refer to 51-60-04 for the balance procedures.

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ALLOWABLE DAMAGE 1

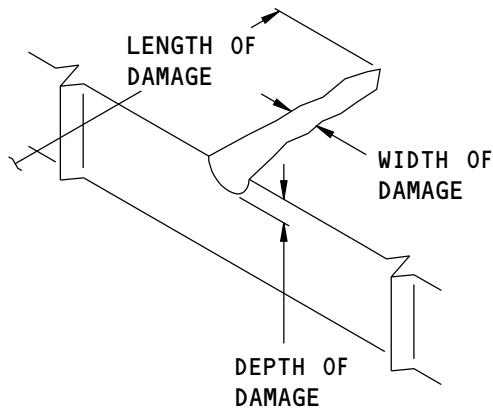
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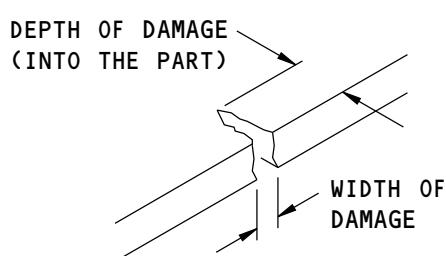


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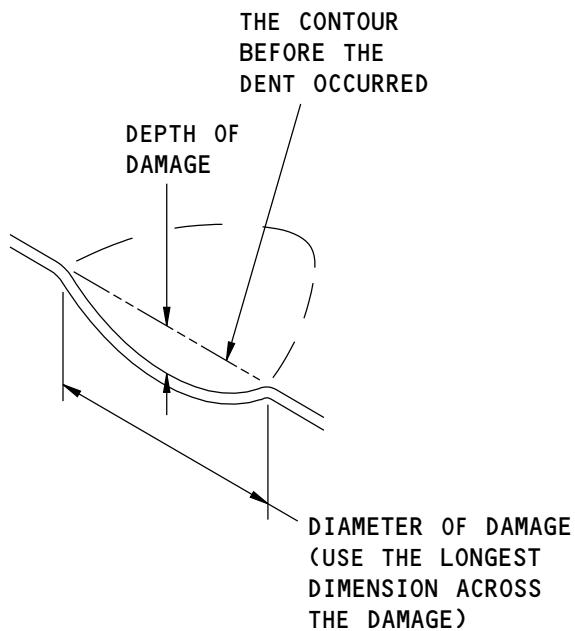
DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)



DEFINITIONS FOR
EDGE DAMAGE

(C)



DEFINITIONS FOR
DENT DAMAGE

(B)

F98417 S0006592895_V1

Damage Definitions
Figure 102

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ALLOWABLE DAMAGE 1

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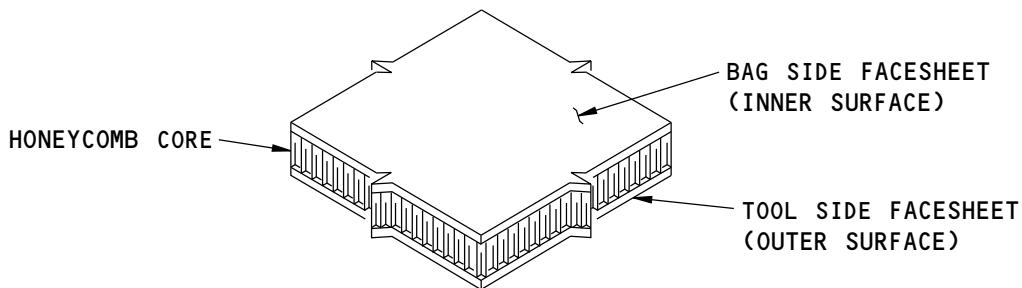
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F98418 S0006592896_V1

Definitions of the Facesheets
Figure 103

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ALLOWABLE DAMAGE 1

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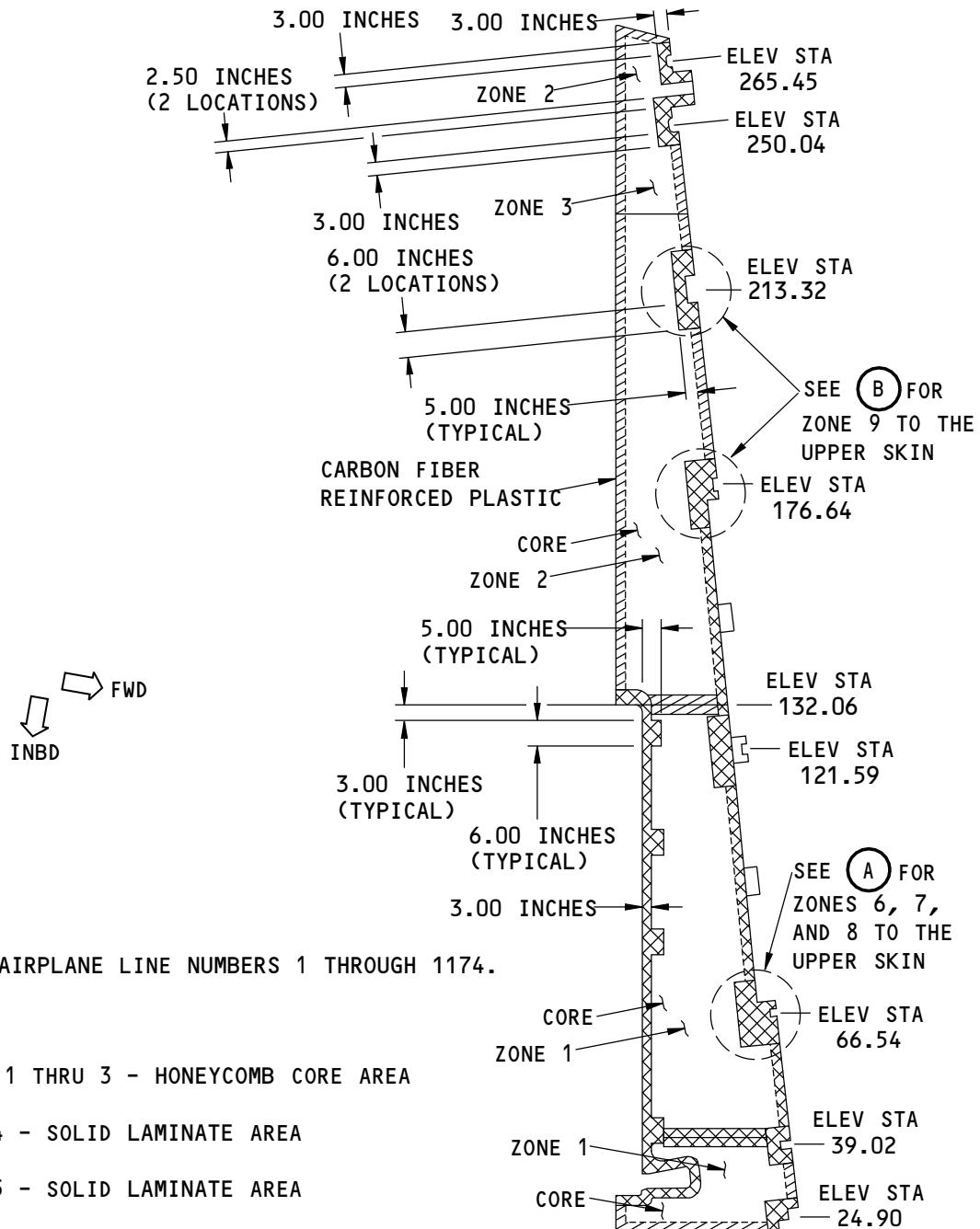
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SKIN PANEL IS SHOWN, LOWER SKIN PANEL IS ALMOST THE SAME

M63963 S0006592897_V2

Upper and Lower Elevator Skin Panel Zones
Figure 104 (Sheet 1 of 4)

55-20-01

ALLOWABLE DAMAGE 1

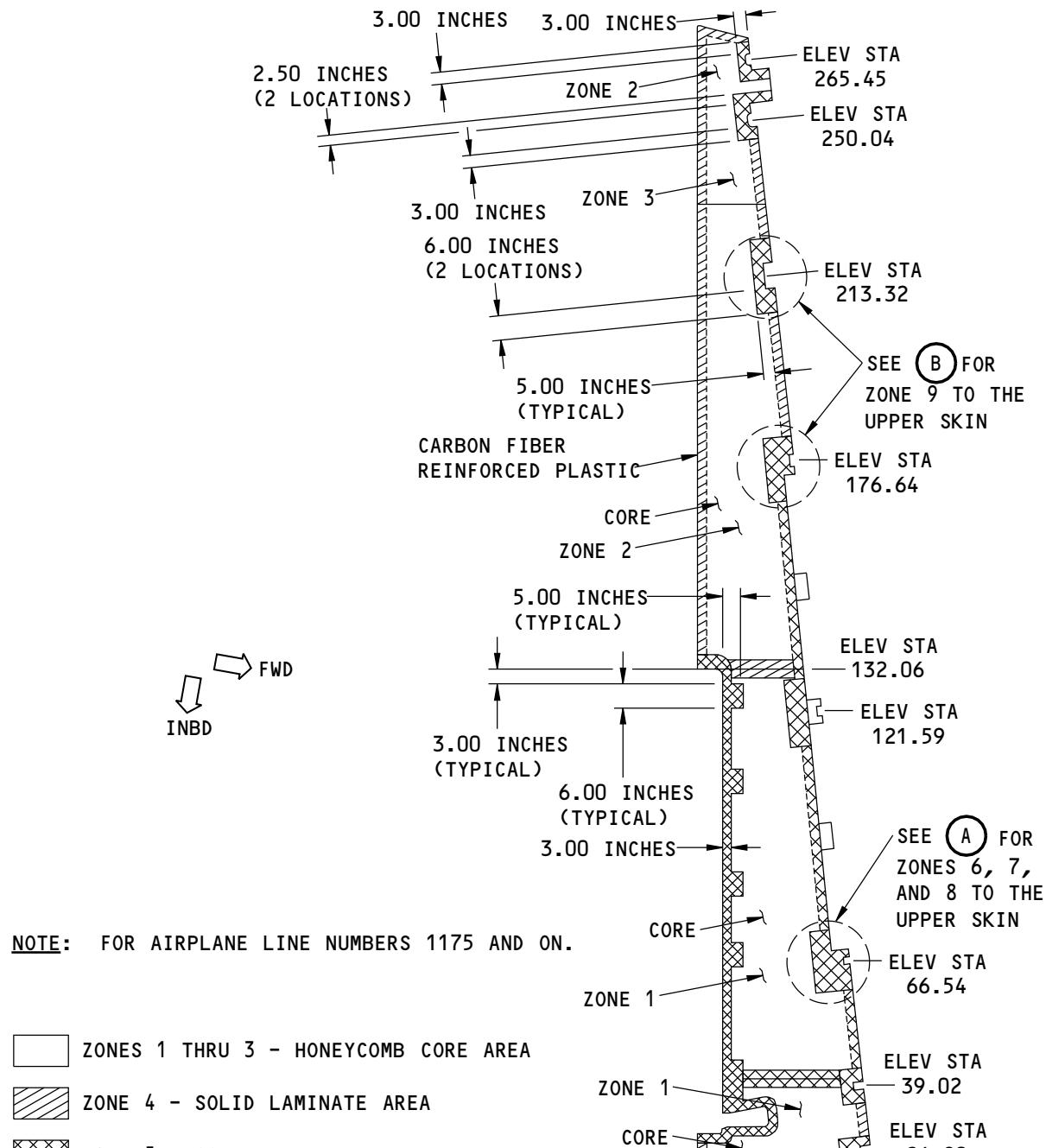
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
UPPER SKIN PANEL IS SHOWN, LOWER SKIN PANEL IS ALMOST THE SAME

M63964 S0000127532_V2

Upper and Lower Elevator Skin Panel Zones
Figure 104 (Sheet 2 of 4)

55-20-01

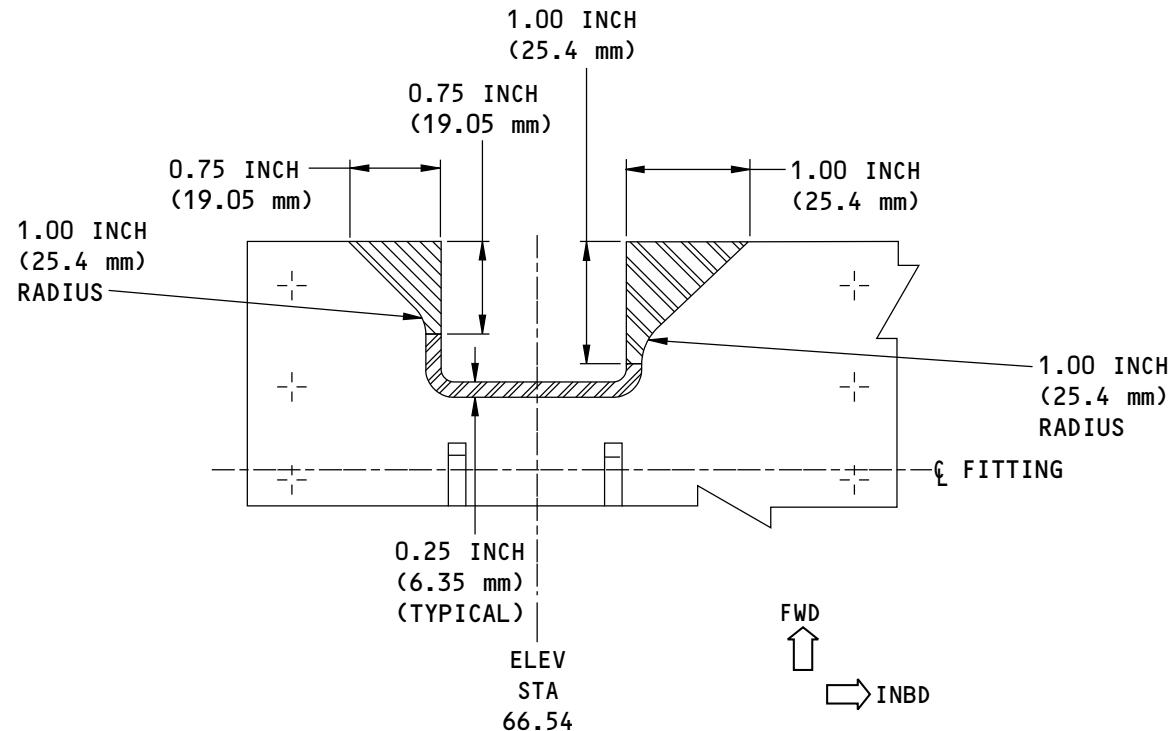
ALLOWABLE DAMAGE 1

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ZONE 6

ZONE 7

ZONE 8

ELEV STA 66.54 IS SHOWN

UPPER SKIN HINGE CUTOUT

(A)

W85470 S0000131495_V1

Upper and Lower Elevator Skin Panel Zones
Figure 104 (Sheet 3 of 4)

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ALLOWABLE DAMAGE 1

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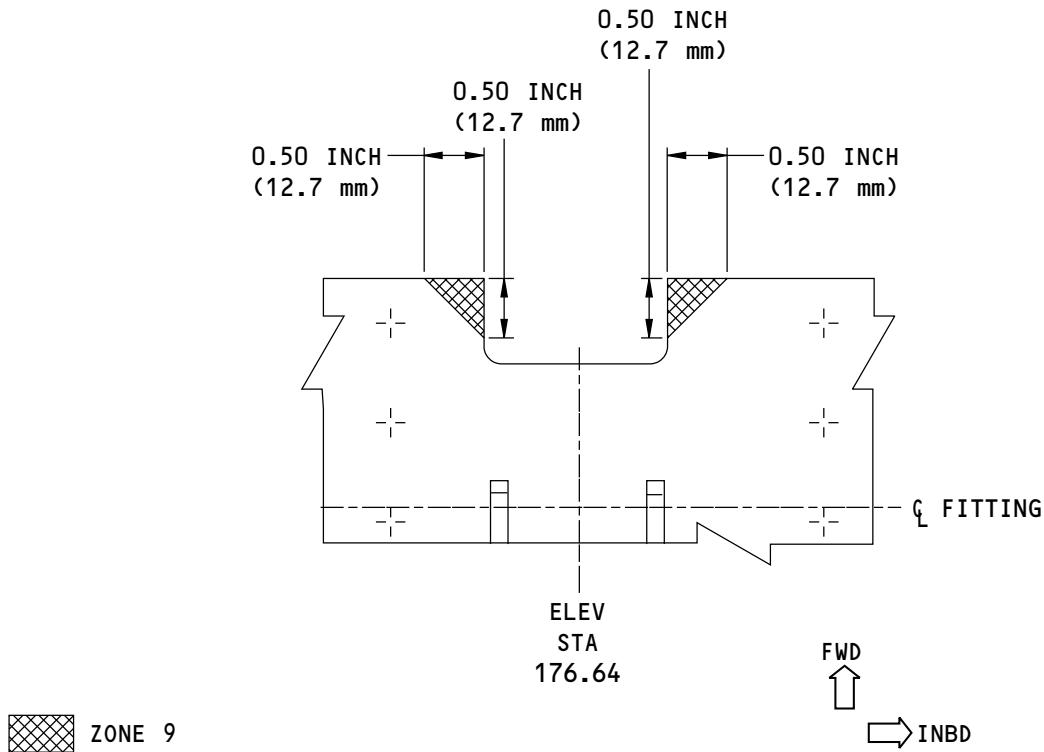
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ELEV STA 176.64 IS SHOWN, ELEV STA 213.32 IS SIMILAR
UPPER SKIN HINGE CUTOUT

W85471 S0000131496_V1

Upper and Lower Elevator Skin Panel Zones
Figure 104 (Sheet 4 of 4)

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-60-04	ELEVATOR BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-06, REPAIR GENERAL	Room Temperature Cure Repairs With Wet Layup Materials For Glass Fabric Reinforced Plastic Solid Laminates and Honeycomb Core Panels
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Zone 1, 2 and 3 - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 5.00 inches in length
- (c) A minimum of 5.00 inches away from the edge of any hole, part edge or other damage.
Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.

- (4) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one carbon ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one carbon ply in depth.

- (b) A maximum of 2.00 inches in diameter
- (c) A minimum of 5.00 inches away from the edge of any hole, part edge or other damage
Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.

- (5) Holes and Punctures are permitted if they are:

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- (a) A maximum of 2.00 inches in diameter
 - (b) A minimum of 5.00 inches away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.
 - (6) Delaminations are permitted if they are:
 - (a) A maximum of 2.00 inches in diameter of the carbon ply
 - (b) A minimum distance of 5.00 inches away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass or carbon fiber plies and
 - 2) Are sealed as given in Paragraph 2.
- B. Zone 4 and 5 - CFRP Solid Laminate Area
- (1) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted.
 - (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
 - (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if:
 - (a) The depth is a maximum of one ply.

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth
 - (b) The length is a maximum of 0.625 inch
 - (c) The width is a maximum of 0.25 inch
 - (d) Not more than one fastener or fastener hole in eight is damaged
 - (e) The edge of other damage is a minimum of 5.00 inches away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the fiber plies and
 - 2) Are sealed as given in Paragraph 2.
 - (4) Dents are permitted if:
 - (a) Not more than one fastener or fastener hole in eight is damaged
 - (b) They are a maximum of 1 ply in depth
 - (c) They are a maximum of 0.625 inch in diameter
 - (d) They are a minimum of 5.00 inches away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the fiber plies and
 - 2) Are sealed as given in Paragraph 2.
 - (5) Holes and Punctures are permitted if:
 - (a) Not more than one fastener or fastener hole in eight is damaged
 - (b) They are a maximum of 0.625 inch in diameter
 - (c) They are a minimum distance of 5.00 inches away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies and
 - 2) Are sealed as given in Paragraph 2.

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ALLOWABLE DAMAGE 1

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- (6) Delaminations are permitted if:
- (a) Not more than one fastener or fastener hole in eight is damaged
 - (b) They are a maximum of 0.625 inch in diameter
 - (c) They are a minimum of 5.00 inches away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
- (7) Edge Erosion is permitted as shown in Upper and Lower Elevator Skin Panel Allowable Damage, Figure 105/ALLOWABLE DAMAGE 1.
- (8) Edge damage is permitted if it is:
- (a) A maximum of one carbon ply in depth
 - (b) A maximum of 0.25 inch in width.
- C. Zone 6 - Solid Laminate Area (Upper Skin)
- (1) Damage is permitted provided:
- (a) The maximum cross sectional area loss is not more than 0.30 square inches
 - (b) It is sealed as given in Paragraph 2.
- D. Zone 7 - Solid Laminate Area (Upper Skin)
- (1) Damage is permitted for the entire thickness of the part provided:
- (a) The maximum length of damage away from the cutout is not more than 0.25 inch
 - (b) It is sealed as given in Paragraph 2.
- E. Zone 8 - Solid Laminate Area (Upper Skin)
- (1) Damage is permitted provided:
- (a) The maximum cross sectional area loss is not more than 0.50 square inches.
 - (b) It is sealed as given in Paragraph 2.
- F. Zone 9 - Solid Laminate Area (Upper Skin)
- (1) Damage is permitted provided:
- (a) The maximum cross sectional area loss is not more than 0.15 square inches.
 - (b) It is sealed as given in Paragraph 2.

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ALLOWABLE DAMAGE 1

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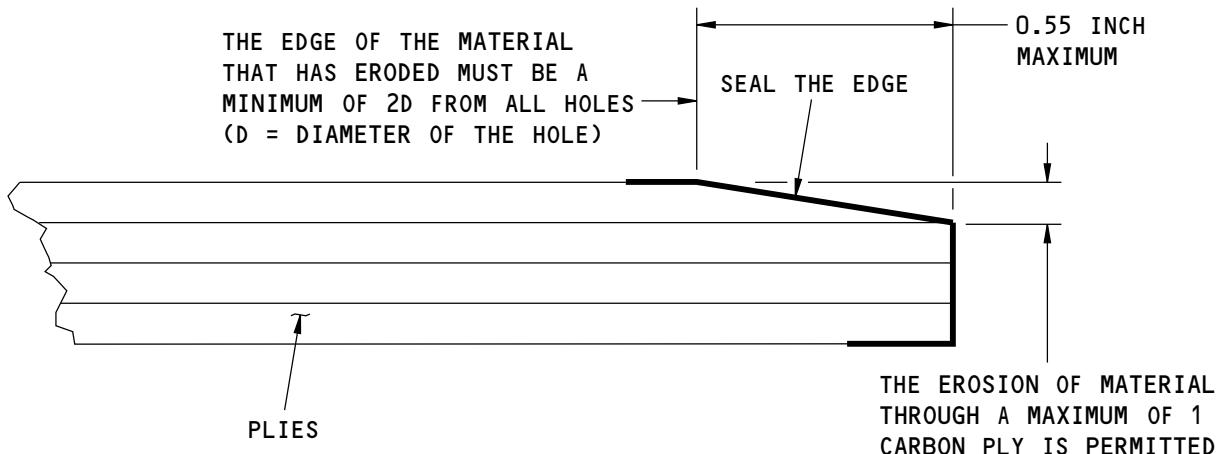
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SEALING OF EROSION DAMAGE AT AN EDGE OF COMPOSITE PARTS

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Upper and Lower Elevator Skin Panel Allowable Damage
Figure 105

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ALLOWABLE DAMAGE 1

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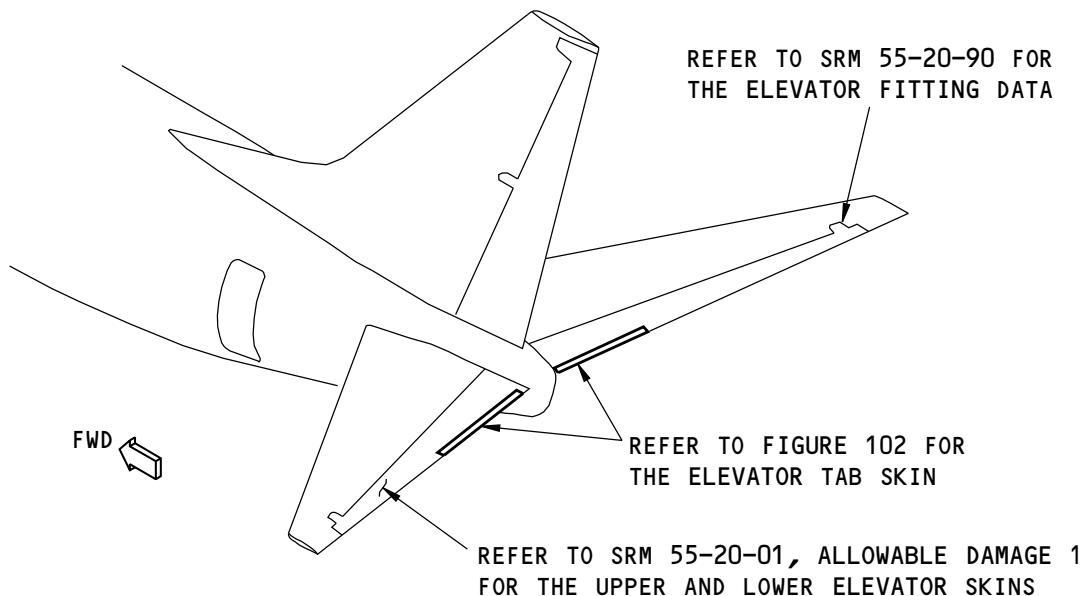
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ALLOWABLE DAMAGE 2 - ELEVATOR TAB SKINS

1. Applicability

- A. The allowable damage limits are only applicable if they are sealed as given in Paragraph 2.C.

NOTE: THIS ALLOWABLE DAMAGE IS APPLICABLE TO AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-01, ALLOWABLE DAMAGE 3 FOR AIRPLANE LINE NUMBERS EQUAL TO OR GREATER THAN 1175 AND FOR ALL LINE NUMBERS WITH COMPLETIONS OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082.



G10156 S0006592902_V1

Elevator Tab Skin Location
Figure 101

55-20-01

ALLOWABLE DAMAGE 2

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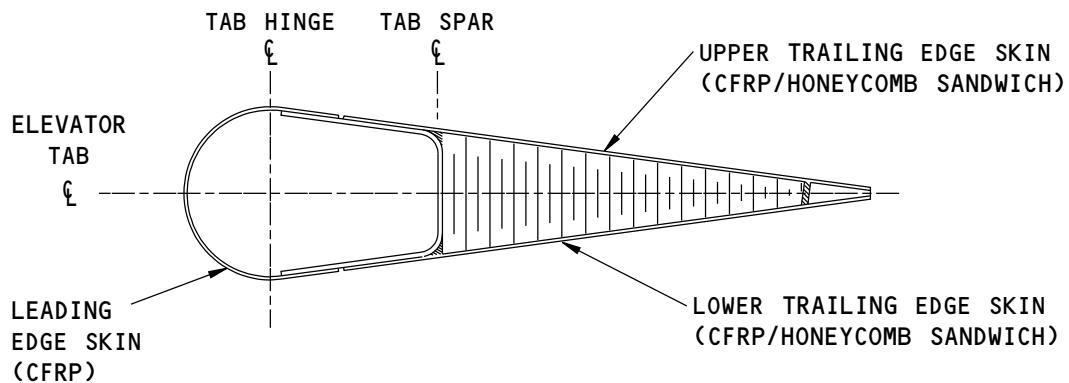
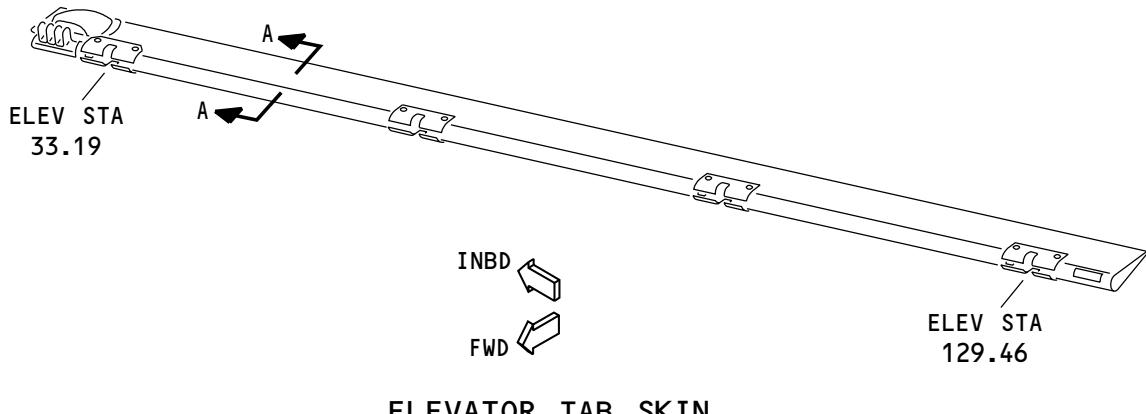
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(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)
A-A

G10158 S0006592904_V1

Elevator Tab Skin
Figure 102

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ALLOWABLE DAMAGE 2

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2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
- (2) Refer to Damage Definitions, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and C for the definitions of the length, width, and depth of damage.
- (3) Refer to Definitions of the Facesheets, Figure 104/ALLOWABLE DAMAGE 2 for the definitions of the facesheets of a honeycomb core area.

- B. Remove all the contamination and water from the structure.

- (1) Refer to 51-30-03 for possible sources of the abrasive and other materials.
- (2) Refer to 51-30-05 for possible sources of the equipment and tools.
- (3) Refer to 51-70-04 for the cleanup procedures.

CAUTION: DO NOT EXCEED A MAXIMUM OF FOUR PERMITTED DAMAGE LOCATIONS THAT ARE SEALED OR ONE REPAIR LOCATION AS GIVEN IN SRM 55-20-01, REPAIR 2. REPAIRS ARE NOT PERMITTED INBOARD OF ELEVATOR STA 45.0. FOR ANY REPAIRS INBOARD OF ELEVATOR STATION 45.0, CONTACT BOEING. IF YOU DO NOT OBEY, THEN DAMAGE TO STRUCTURE COULD OCCUR.

- C. Seal all damaged areas with the steps that follow.

- (1) Seal the damage that is not more than one ply deep and that agrees with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2
 - (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape).
 - 2) Keep a record of the location.
 - 3) Make sure the tape is in satisfactory condition at normal maintenance intervals.
 - (b) Make a permanent seal.
 - 1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - 2) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - 3) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
- (2) Seal all permitted damaged areas that are more than one ply deep. Refer to Paragraph 4./ALLOWABLE DAMAGE 2 for the allowable damage limits. Seal the damage as follows:
 - (a) Use a vacuum and heat to remove moisture from the solid laminate or the honeycomb cells. Refer to 51-70-04.
 - (b) Make a temporary seal with aluminum foil tape (speed tape).
 - (c) Keep a record of the location.
 - (d) Repair the damage before 250 flight cycles have occurred.
- D. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane.

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ALLOWABLE DAMAGE 2

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- E. Restore the aircraft exterior paint system in the area where damage has been removed, as applicable. Refer to AMM PAGEBLOCK 51-21-99/701.
NOTE: Wherever the elevator tab skins need to be refinished, the initial finishes including paint, primer, and/or surface filler, must be removed before application of new exterior paint system. Make sure the finish thicknesses are as given in AMM PAGEBLOCK 51-21-99/701.
- F. Sealing of damage as given in Allowable Damage 2 is an Alternate Method of Compliance (AMOC) to the Federal Aviation Administration (FAA) Airworthiness Directive (AD) 2001-08-09, Paragraph (d).

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ALLOWABLE DAMAGE 2

Page 104

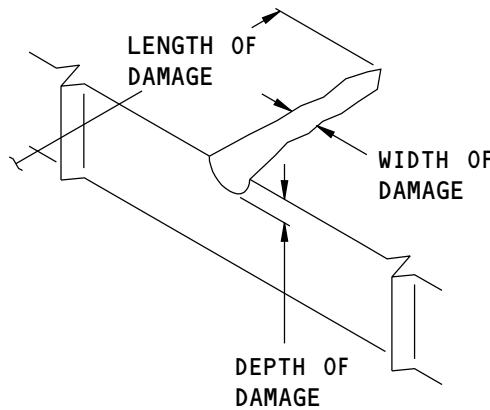
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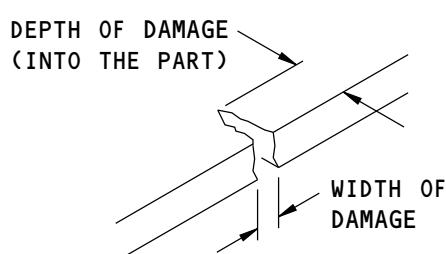


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STRUCTURAL REPAIR MANUAL



DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)



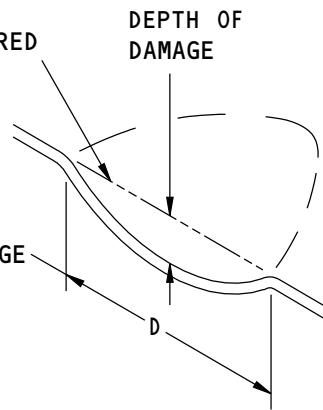
DEFINITIONS FOR
EDGE DAMAGE

(C)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DEPTH OF
DAMAGE

DIAMETER OF DAMAGE
(USE THE LARGEST
DIMENSION ACROSS
THE DAMAGE)



DEFINITIONS FOR
DENT DAMAGE

(B)

G10159 S0006592905_V1

Damage Definitions
Figure 103

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ALLOWABLE DAMAGE 2

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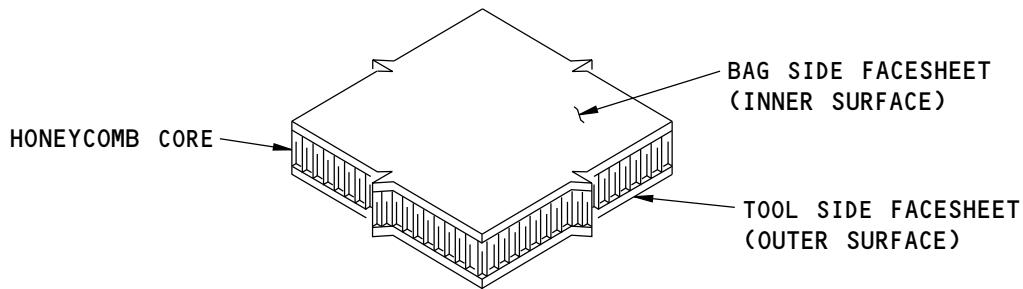
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G10163 S0006592906_V1

Definitions of the Facesheets
Figure 104

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ALLOWABLE DAMAGE 2

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3. References

Reference	Title
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
55-20-01	ELEVATOR SKIN
AMM 27-31-31 P/B 401	ELEVATOR TAB - REMOVAL/INSTALLATION
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Upper and Lower Trailing Edge Skins - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth.

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum diameter (D) of 1.0 inch
- (c) A minimum of 2.5 X (D) away from a fastener hole or part edge
- (d) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C.

- (e) Sealed as given in Paragraph 2.C.

- (3) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of 1.0 inch in diameter
- (b) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one ply.

- (c) A minimum of 2.5 X (D) away from a fastener hole or part edge
- (d) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.

NOTE: Other damage does not include nicks, gouges, and scratches that:

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STRUCTURAL REPAIR MANUAL

- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C.
- (e) Sealed as given in Paragraph 2.C.
- (4) Holes and Punctures are permitted if they are:
- (a) A maximum of 0.50 inch in diameter
 - (b) A minimum of 2.5 X (D) away from a fastener hole or part edge
 - (c) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.
- NOTE:** Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C.
- (d) Sealed as given in Paragraph 2.C.
- (5) Delaminations are permitted if they are:
- (a) A maximum of 0.50 inch in diameter
 - (b) A minimum of 2.5 X (D) away from a fastener hole or part edge
 - (c) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.
- NOTE:** Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C.
- (d) Sealed as given in Paragraph 2.C.

B. Leading Edge - Solid Laminate Areas

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
- (a) A maximum of one ply in depth.
- NOTE:** Use the limits for holes and punctures if the damage is more than one ply in depth.
- (b) A maximum of 1.00 inch in diameter
 - (c) A minimum of 2.5 X (D) away from a fastener hole or part edge
 - (d) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.
- NOTE:** Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C.
- (e) Sealed as given in Paragraph 2.C.
- (3) Dents that do not cause damage to the carbon fibers are permitted if they are:
- (a) A maximum of 1.00 inch in diameter

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ALLOWABLE DAMAGE 2

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- (b) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one ply in depth.

- (c) A minimum of 2.5 X (D) away from a fastener hole or part edge
(d) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C.

- (e) Sealed as given in Paragraph 2.C.

- (4) Holes and Punctures are permitted if they are:

- (a) A maximum of 0.50 inch in diameter
(b) A minimum of 2.5 X (D) away from a fastener hole or part edge
(c) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C.

- (d) Are sealed as given in Paragraph 2.C.

- (5) Delaminations are permitted if they are:

- (a) A maximum of 0.50 inch in diameter
(b) A minimum of 2.5 X (D) away from a fastener hole or part edge
(c) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C.

- (d) Sealed as given in Paragraph 2.C.

- (6) Edge Erosion is permitted as shown in Elevator Tab Skin Allowable Damage, Figure 105/ALLOWABLE DAMAGE 2, Detail A .

- (7) Edge damage not more than one ply in depth is permitted if it is:

- (a) A maximum of 2.00 inches in length in the spanwise direction
(b) A maximum of 0.50 inch in width
(c) A maximum of 2.0 X (D) edge to edge from any other damage, and no more than one damage site for each 15.0 square inches.
(d) Not more than the limits as shown in Elevator Tab Skin Allowable Damage, Figure 105/ALLOWABLE DAMAGE 2, Detail A .

- (8) Edge damage that is more than one ply in depth is permitted if:

- (a) It is not more than the limits as shown in Elevator Tab Skin Allowable Damage, Figure 105/ALLOWABLE DAMAGE 2, Details B, C, and D.

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- (b) You remove moisture and seal as given in Paragraph 2.B./ALLOWABLE DAMAGE 2 and Paragraph 2.C./ALLOWABLE DAMAGE 2

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ALLOWABLE DAMAGE 2

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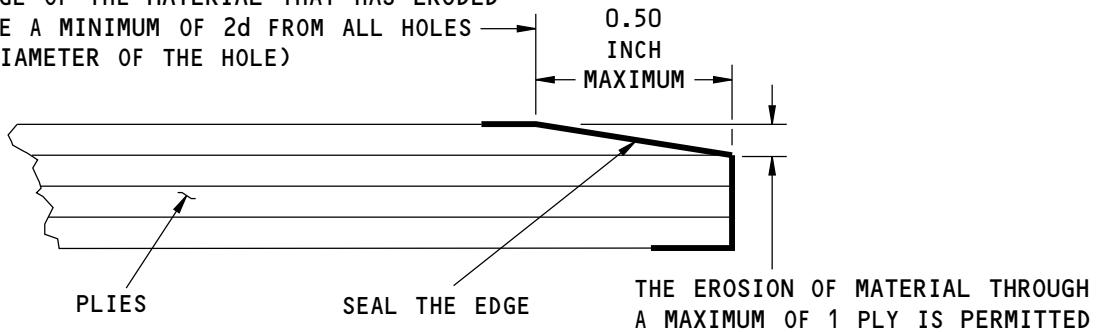
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THE EDGE OF THE MATERIAL THAT HAS ERODED
MUST BE A MINIMUM OF $2d$ FROM ALL HOLES
(d = DIAMETER OF THE HOLE)



SEALING OF EROSION DAMAGE AT AN EDGE OF COMPOSITE PARTS

(A)

G10164 S0006592908_V1

Elevator Tab Skin Allowable Damage
Figure 105 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 2

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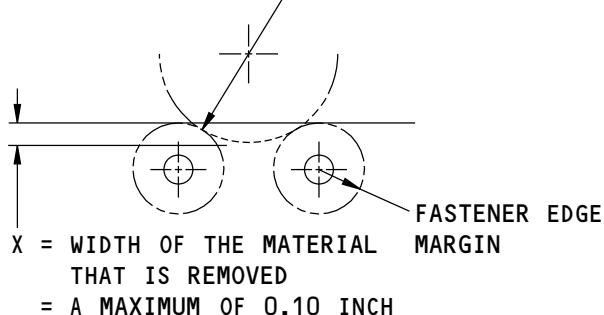
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**737-800
STRUCTURAL REPAIR MANUAL**

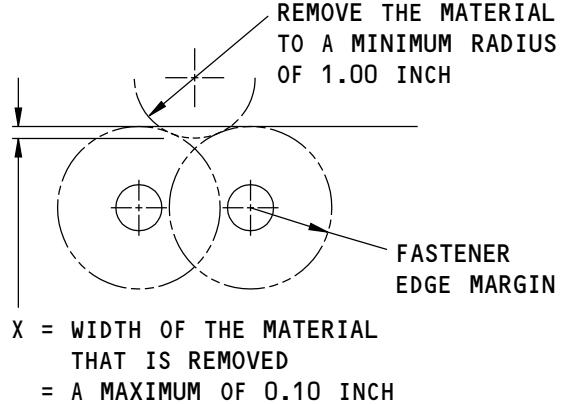
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH



**REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS DO NOT HAVE AN OVERLAP**

(B)

REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH



**REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS HAVE AN OVERLAP**

(C)

TAPER TO A MINIMUM OF 20X.
THE DISTANCE OF THE DAMAGE
FROM A HOLE, A FASTENER,
AN EDGE, OR OTHER DAMAGE
MUST BE 20X OR MORE

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH,
THEN TAPER AS SHOWN

IF THERE ARE FASTENERS,
SEE (B) AND (C)

MAKE THE CONTOUR SMOOTH
(TYPICAL)

X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(D)

L98441 S0006592909_V1

**Elevator Tab Skin Allowable Damage
Figure 105 (Sheet 2 of 2)**

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ALLOWABLE DAMAGE 2

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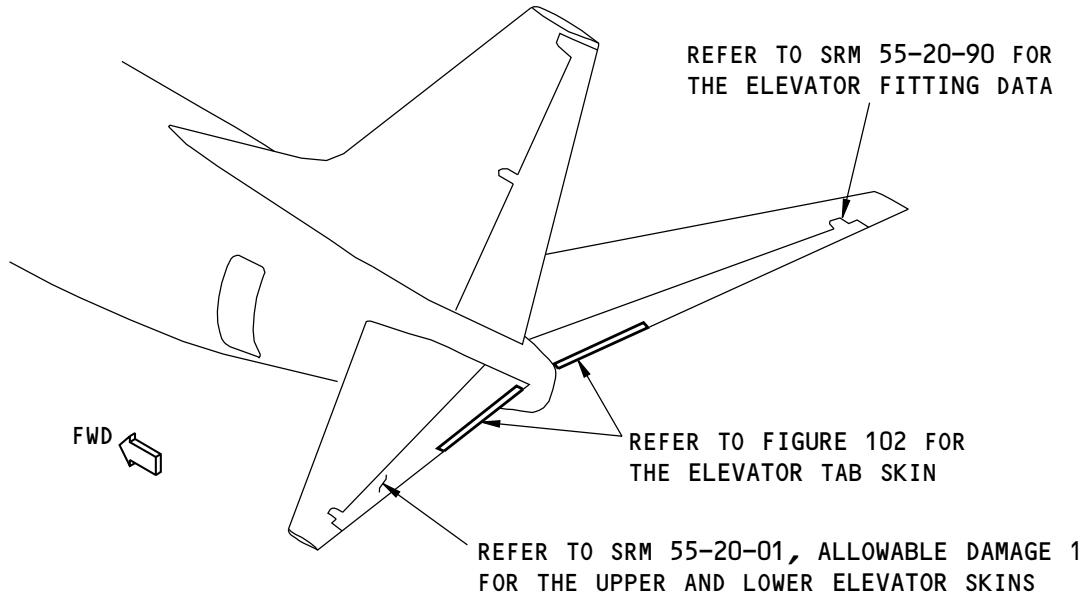
737-800
STRUCTURAL REPAIR MANUAL

**ALLOWABLE DAMAGE 3 - ELEVATOR TAB SKINS FOR AIRPLANE LINE NUMBERS 1175 AND ON
AND LINE NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080
AND 737-55-1082**

1. Applicability

- A. The allowable damage limits are only applicable if they are sealed as given in Paragraph 2.C./
ALLOWABLE DAMAGE 3

NOTE: THIS ALLOWABLE DAMAGE IS APPLICABLE TO AIRPLANE LINE NUMBERS 1175 AND
ON AND LINE NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE
BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-01, ALLOWABLE DAMAGE
2 FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF
SERVICE BULLETINS 737-55-1080 AND 737-55-1082.



Elevator Tab Skin Location
Figure 101

N57597 S0006592911_V1

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ALLOWABLE DAMAGE 3

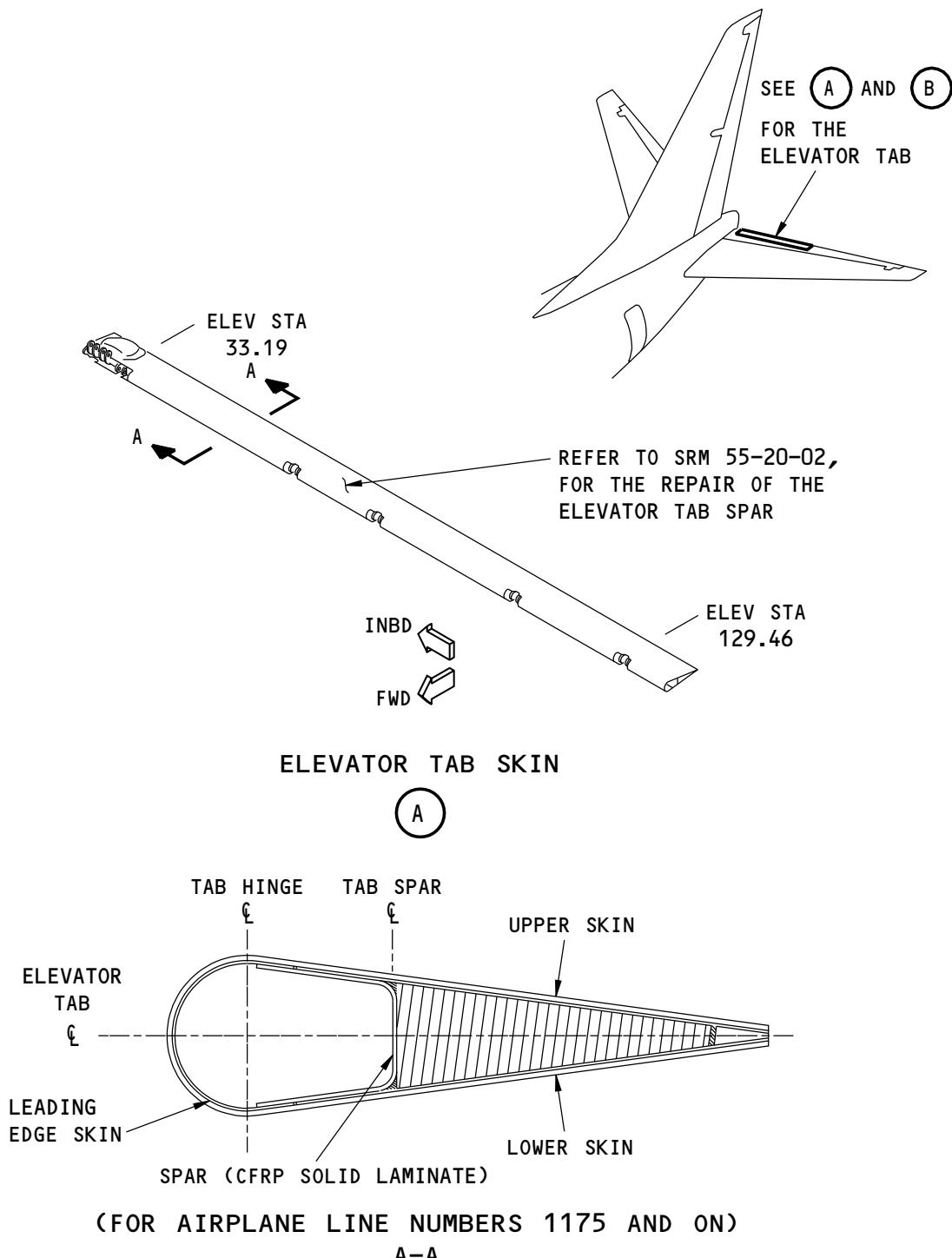
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M97138 S0006592912_V1

Elevator Tab Skin Allowable Damage
Figure 102 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 3

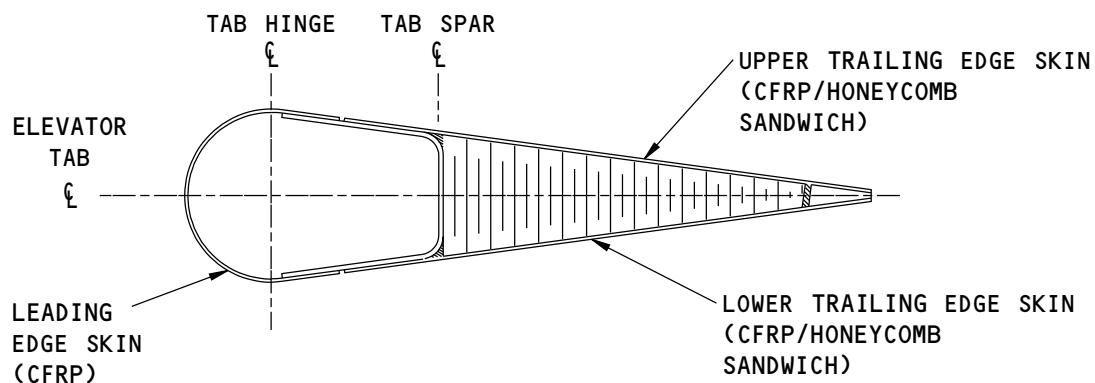
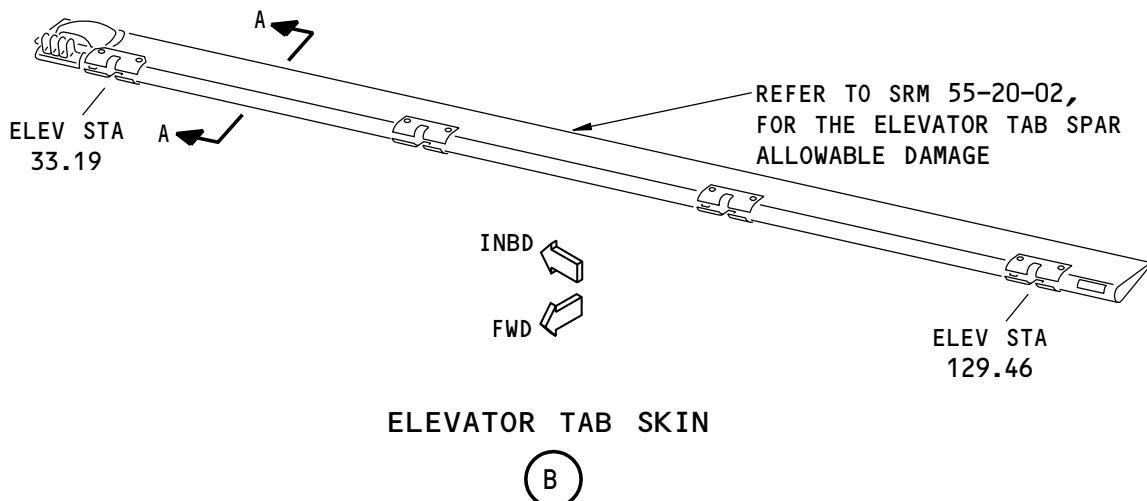
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(FOR AIRPLANE LINE NUMBERS 1 THRU 1174
WITH COMPLETION OF SERVICE BULLETINS 737-55-1080
AND 737-55-1082)

A-A

M97140 S0006592913_V1

Elevator Tab Skin Allowable Damage
Figure 102 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 3

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2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
- (2) Refer to Damage Definitions, Figure 103/ALLOWABLE DAMAGE 3, Details A, B, and C for the definitions of the length, width, and depth of damage.
- (3) Refer to Definitions of the Facesheets, Figure 104/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.

- B. Remove all the contamination and water from the structure.

- (1) Refer to 51-30-03 for possible sources of the abrasive and other materials.
- (2) Refer to 51-30-05 for possible sources of the equipment and tools.
- (3) Refer to 51-70-04 for the cleanup procedures.

- C. Seal all damaged areas with the steps that follow.

- (1) Seal the damage that is not more than one ply deep and that agrees with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 3
 - (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape).
 - 2) Keep a record of the location.
 - 3) Make sure the tape is in satisfactory condition at normal maintenance intervals.
 - (b) Make a permanent seal.
 - 1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given 51-70-08.
 - 2) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - 3) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
 - (2) Seal all permitted damaged areas that are more than one ply deep. Refer to Paragraph 4./ALLOWABLE DAMAGE 3 for the allowable damage limits. Seal the damage as follows:
 - (a) Use a vacuum and heat to remove moisture from the solid laminate or the honeycomb cells. Refer to 51-70-04.
 - (b) Make a temporary seal with aluminum foil tape (speed tape).
 - (c) Keep a record of the location.
 - (d) Repair the damage before 250 flight cycles have occurred.
- D. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane.
- E. Restore the aircraft exterior paint system in the area where damage has been removed, as applicable. Refer to AMM PAGEBLOCK 51-21-99/701.

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ALLOWABLE DAMAGE 3

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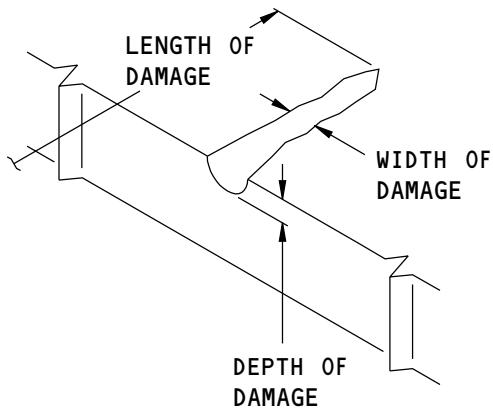
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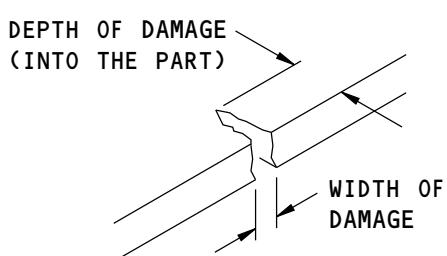


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STRUCTURAL REPAIR MANUAL



DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)



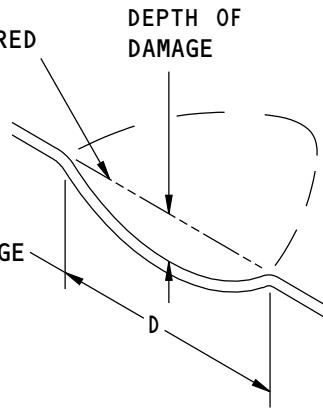
DEFINITIONS FOR
EDGE DAMAGE

(C)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DIAMETER OF DAMAGE
(USE THE LARGEST
DIMENSION ACROSS
THE DAMAGE)

DEPTH OF
DAMAGE



DEFINITIONS FOR
DENT DAMAGE

(B)

N57599 S0006592914_V1

Damage Definitions
Figure 103

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ALLOWABLE DAMAGE 3

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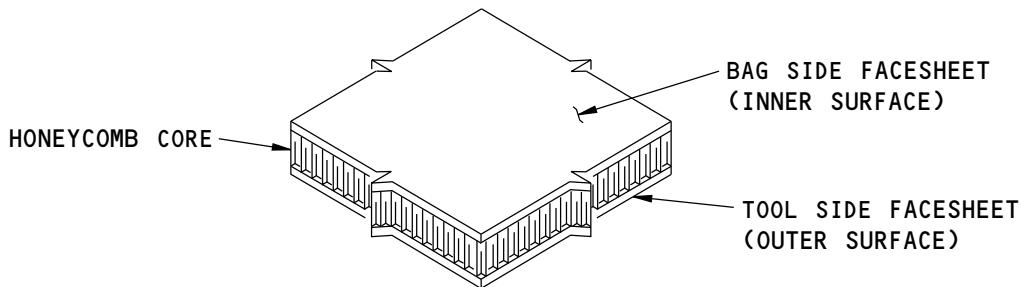
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N57600 S0006592915_V1

Definitions of the Facesheets
Figure 104

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3. References

Reference	Title
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
55-20-01	ELEVATOR SKIN
AMM 27-31-31 P/B 401	ELEVATOR TAB - REMOVAL/INSTALLATION
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Upper and Lower Trailing Edge Skins - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth.

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 0.50 inch in length
- (c) A minimum of 1.00 inch away from a fastener hole or part edge
- (d) A minimum of 3.00 inches away from any other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3

- (e) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3

- (3) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of 0.50 inch in diameter
- (b) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one ply.

- (c) A minimum of 1.00 inch away from a part edge
- (d) A minimum of 3.00 inches away from any other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies

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- Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (e) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of 0.30 inch in diameter
 - (b) A minimum of 3.00 inches away from the edge of other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (c) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (5) Delaminations are permitted if they are:
 - (a) A maximum of 0.50 inch in diameter for each square foot of total area
 - (b) A minimum distance of 1.00 inch away from a fastener hole or part edge
 - (c) A minimum distance of 3.00 inches away from the edge of other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
- Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (d) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3

B. Leading Edge - Solid Laminate Areas

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
 - (a) A maximum of one ply in depth.

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 0.50 inch in length
- (c) A minimum of 1.00 inch away from a part edge
- (d) A minimum of 3.00 inches away from any other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
 - (e) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
 - (3) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - (a) A maximum of 0.50 inch in diameter
 - (b) A maximum of one ply in depth
- NOTE:** Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one ply in depth.
- (c) A minimum of 1.00 inch away from a part edge
 - (d) A minimum of 3.00 inches away from any other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

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- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (e) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (4) Holes and Punctures are permitted if they are:
- (a) A maximum of 0.30 inch in diameter
 - (b) A minimum of 1.00 inch from the part edge
 - (c) A minimum of 3.00 inches away from the edge of other damage.
- NOTE:** Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (d) Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (5) Delaminations are permitted if they are:
- (a) A maximum of 0.50 inch in diameter
 - (b) A maximum of one damage area for each 144 square inches of skin area
 - (c) A minimum of 1.00 inch away from a part edge
 - (d) A minimum distance of 3.00 inches away from the edge of other damage.
- NOTE:** Other damage does not include nicks, gouges, and scratches that:
- Do not cause damage to the carbon fiber plies
 - Are sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (e) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3
- (6) Edge Erosion is permitted as shown in Elevator Tab Skin Allowable Damage, Figure 105/ALLOWABLE DAMAGE 3.
- (7) Edge damage is permitted if it is:
- (a) A maximum of 2.00 inches in length in the spanwise direction
 - (b) A maximum of one ply in depth
 - (c) A maximum of 0.25 inch in width
 - (d) A minimum of 3.0 inches away from other damage
 - (e) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3

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ALLOWABLE DAMAGE 3

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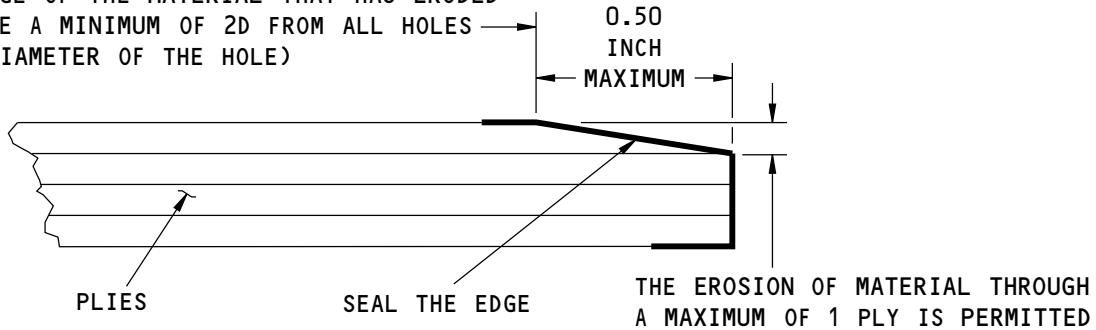
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STRUCTURAL REPAIR MANUAL

THE EDGE OF THE MATERIAL THAT HAS ERODED
MUST BE A MINIMUM OF $2D$ FROM ALL HOLES
(D = DIAMETER OF THE HOLE)



SEALING OF EROSION DAMAGE AT AN EDGE OF COMPOSITE PARTS

N57601 S0006592916_V1

Elevator Tab Skin Allowable Damage
Figure 105

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ALLOWABLE DAMAGE 3

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REPAIR 1 - ELEVATOR SKINS

1. Applicability

- A. Repair 1 is applicable to damage to elevator skin panels made of Carbon Fiber Reinforced Plastic (CFRP) as shown in Upper and Lower Elevator Skin Panel Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.

2. General

- A. Repair 1 gives repair instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the elevator, as necessary. Refer to AMM 27-31-31/401.
 - (1) Remove the necessary fasteners. Refer to 51-40-02 for information on fastener removal.
 - (2) If a fastener hole is damaged, refer to 51-70-04 or 51-70-05, as applicable.
- C. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 of the inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) Refer to Definitions of Damage Size, Figure 202/REPAIR 1 for the definitions of diameter and depth of damage.
- (2) Refer to Definitions of Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.
- D. Do the repair as given in Paragraph 4./REPAIR 1
- E. Make sure the aerodynamic smoothness is satisfactory or there can be a loss in the airplane safety performance. Refer to 51-10-01.
- F. Make sure that the elevator is balanced. Refer to 51-60-04 for the balance procedures.
- G. Install the elevator, as applicable. Refer to AMM 27-31-31/401.

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REPAIR 1
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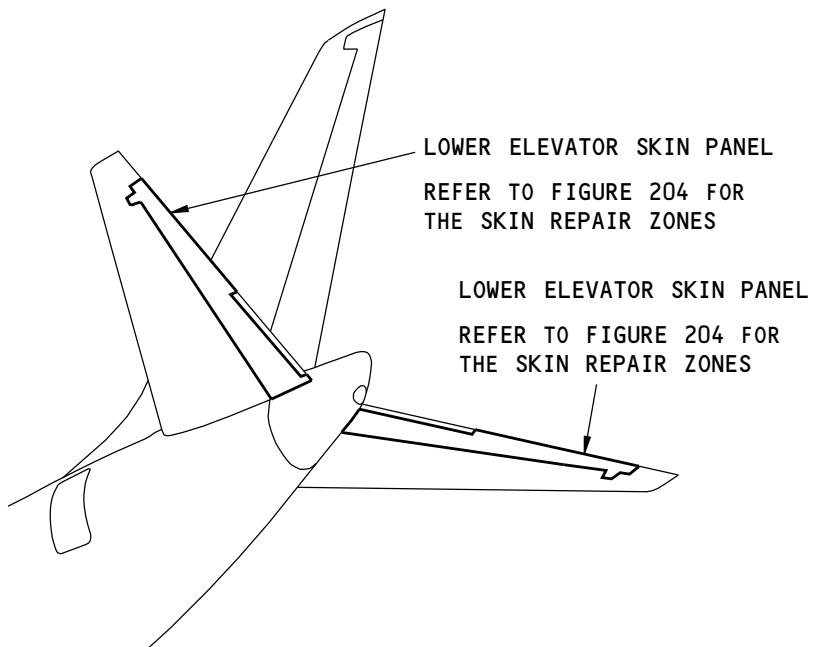
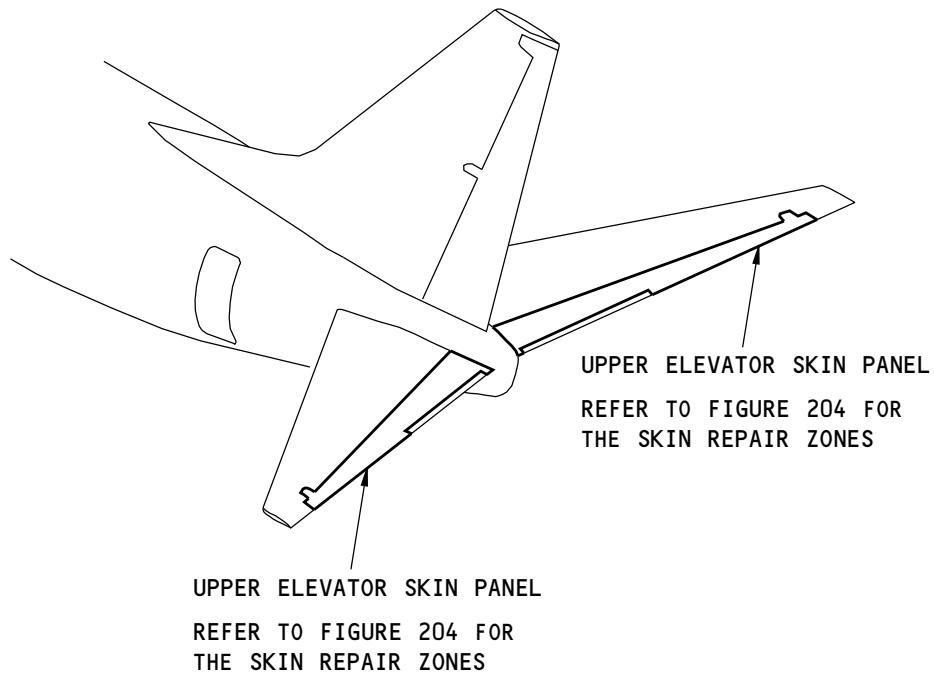
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STRUCTURAL REPAIR MANUAL



G03046 S0006592919_V1

Upper and Lower Elevator Skin Panel Location
Figure 201

55-20-01

REPAIR 1
Page 202

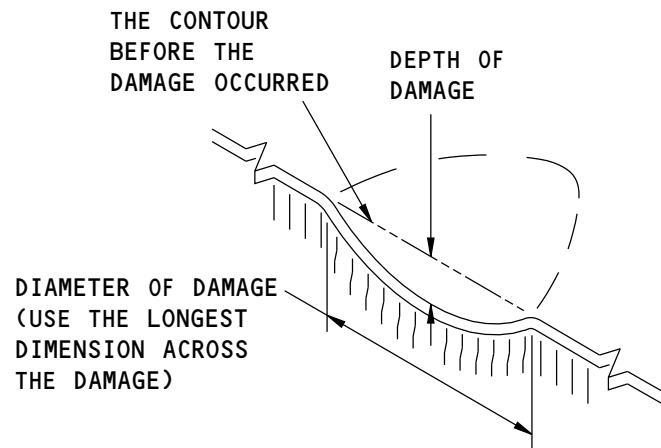
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STRUCTURAL REPAIR MANUAL



G03123 S0006592920_V1
Definitions of Damage Size

Figure 202

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REPAIR 1

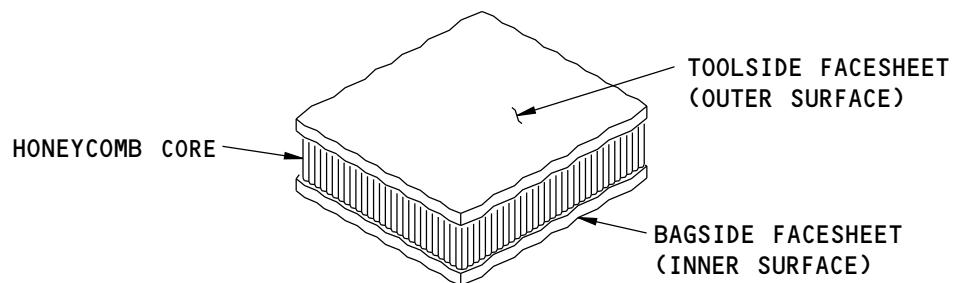
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Definitions of Facesheets
Figure 203

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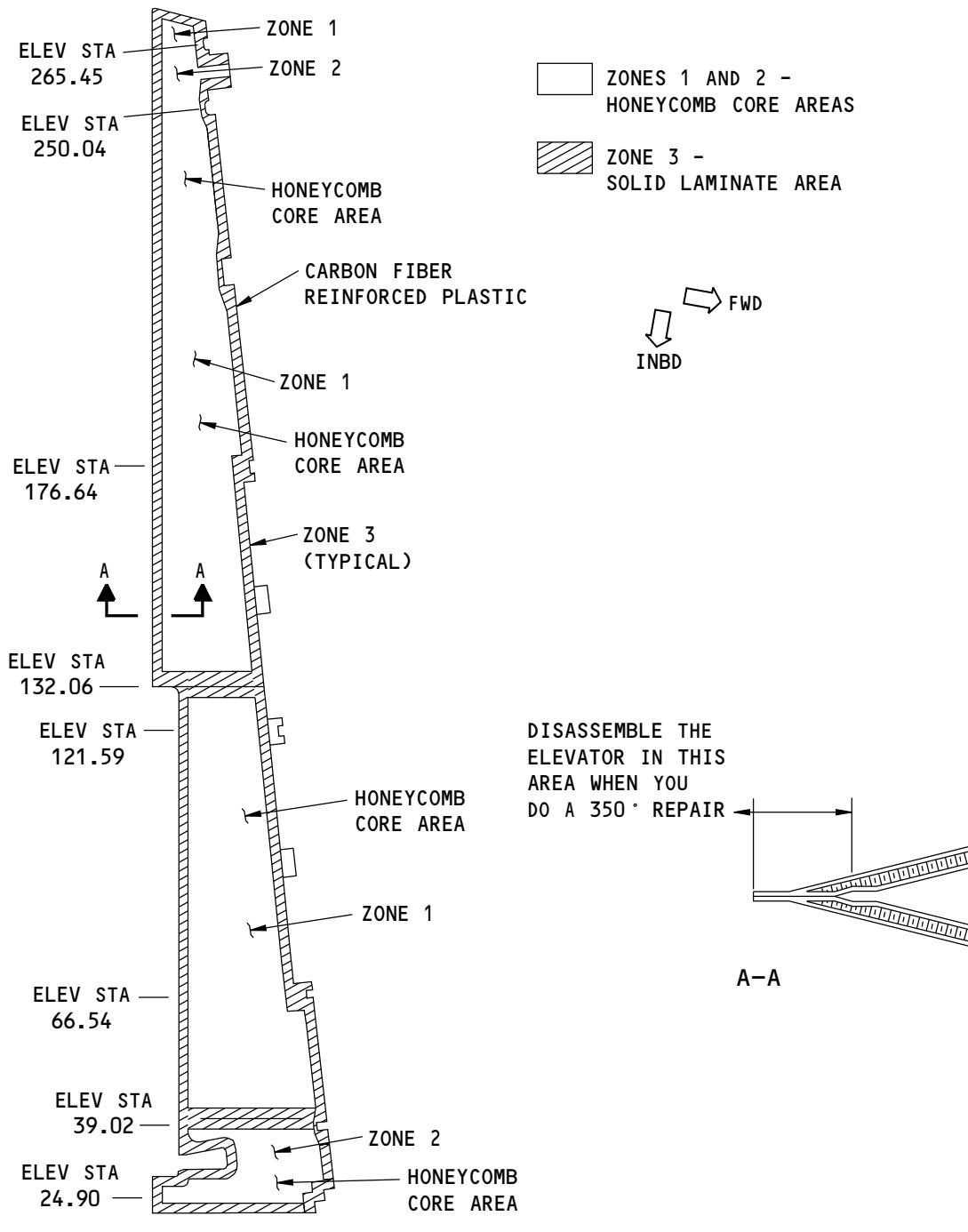
REPAIR 1
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**737-800
STRUCTURAL REPAIR MANUAL**



G03205 S0006592922_V1

**Upper and Lower Elevator Skin Zones
Figure 204**

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REPAIR 1
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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-60-04	ELEVATOR BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 27-31-31/401	Elevator Tab - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

A. If a dent is 1.50 inches in diameter or less, and has no fiber damage or delamination, then fill the dent with potting compound and apply a fiberglass patch as given in Repair 14 of 51-70-04.

B. If Paragraph 4.A./REPAIR 1 is not applicable, then refer to:

- (1) Table 201/REPAIR 1 for the repair data that is applicable to damage in Zones 1 and 2.
- (2) Table 202/REPAIR 1 for the repair data that is applicable to damage in Zone 3.

C. For repairs made with wet layup materials, do as follows:

- (1) Use one repair ply of fabric for each initial ply that was damaged. Table 201/REPAIR 1 for panel areas other than the edgebands.
- (2) Add two structural plies of fabric for each facesheet that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of delaminations at an edge if the delamination is a minimum of 6D (D = fastener diameter) away from a fastener hole and agrees with the allowable damage limits.

D. Use the instructions that follow to do a Category A repair with preimpregnated layup materials and 250°F (121°C) cure.

- (1) Use the same number of repair plies as the number of initial plies that were damaged.
- (2) Add two structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other a 0 or 90 degrees.

E. Use the instructions that follow to do a Category A repair with preimpregnated layup materials and 350°F (177°C) cure.

- (1) Use the same number of repair plies as the number of initial plies that were damaged.

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Table 201:

REPAIR DATA FOR ALL ZONES OF THE HONEYCOMB PANELS 350°F (177°C) CURE ELEVATOR SKINS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED IAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	- Contact the Boeing Company for this temperature repair	Damage that is a maximum of: - 5.00 inches in diameter One repair for each 144 square inches 3.0 inches minimum clearance from: - other repairs - fastener holes - panel edges	Damage that is a maximum of: - 5.00 inches in diameter One repair for each 144 square inches 3.0 inches minimum clearance from: - other repairs - fastener holes - panel edges	There are no size limits on the repair.
REPAIR PROCEDURES	-----	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.E

Table 202:

REPAIR DATA FOR ZONE 3 OF THE 350°F (177°C) CURE ELEVATOR SKIN PANELS			
REPAIR TYPE	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 3.00 inches across largest dimension of damage - 10 percent of the edgeband length on the side of the damage, as applicable	Damage that is a maximum of: - 3.00 inches across largest dimension of damage - 10 percent of the edgeband length on the side of the damage, as applicable	There are no size limits on the repair.
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.E

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REPAIR 1
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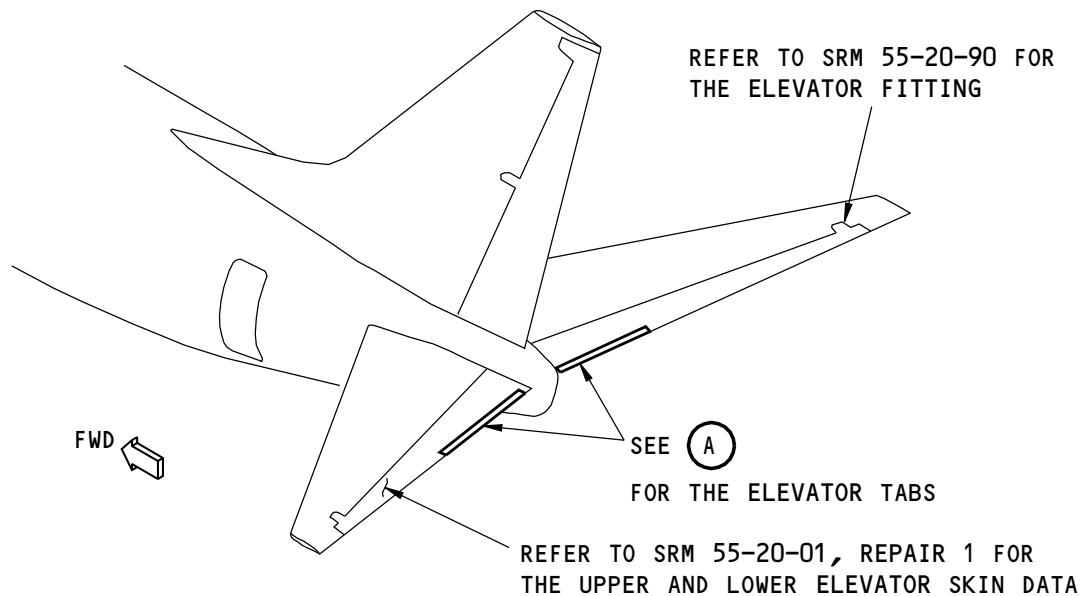
REPAIR 2 - ELEVATOR TAB SKINS

1. Applicability

- A. Repair 2 is applicable to the elevator tab skins made from Carbon Fiber Reinforced Plastic shown in Elevator Tab Skin, Figure 201/REPAIR 2.

NOTE: THIS REPAIR IS APPLICABLE TO AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-01, REPAIR 3 FOR ALL AIRPLANE LINE NUMBERS EQUAL TO OR GREATER THAN 1175 AND FOR ALL LINE NUMBERS WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082.

- B. Refer to Allowable Damage 2 for the type and dimensions of the damage that is permitted.



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Elevator Tab Skin
Figure 201 (Sheet 1 of 2)

55-20-01

REPAIR 2
Page 201

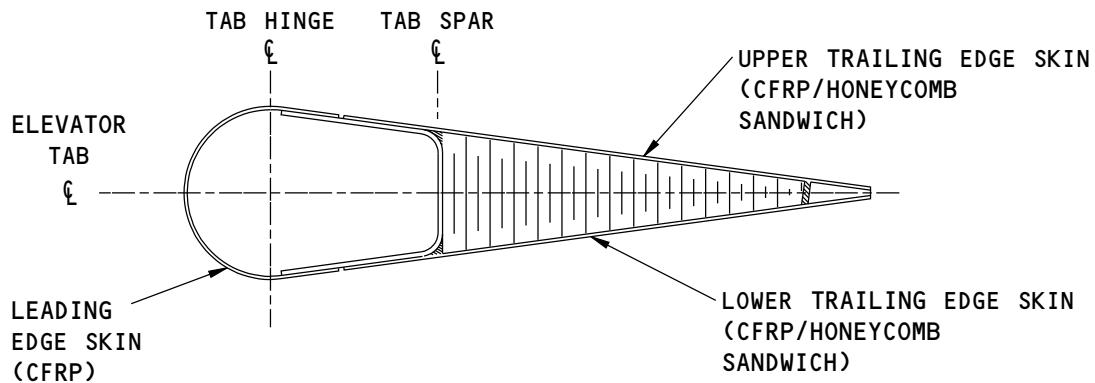
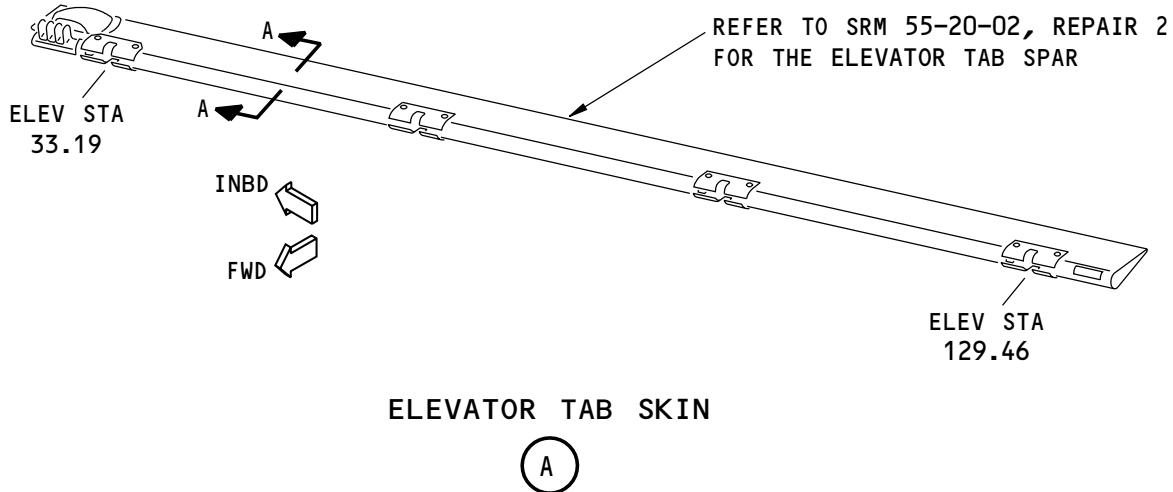
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STRUCTURAL REPAIR MANUAL



(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)
A-A

G11583 S0006592927_V1

Elevator Tab Skin
Figure 201 (Sheet 2 of 2)

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REPAIR 2
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2. General

- A. Repairs done as given in Repair 2 are an Alternate Method of Compliance (AMOC) to the Federal Aviation Administration (FAA) Airworthiness Directive (AD) 2001-08-09, Paragraph (d).
- B. Repair 2 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- C. Remove the elevator tab, as necessary. Refer to AMM 27-31-31/401.
- D. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
- (2) Refer to Figure 202, Details A, B, and C for the definitions of the length, width, and depth of damage.
- (3) Refer to Figure 203 for the definitions of the facesheets of a honeycomb core area.

CAUTION: DO NOT EXCEED A MAXIMUM OF FOUR PERMITTED DAMAGE LOCATIONS THAT ARE SEALED AS GIVEN IN SRM 55-20-01, ALLOWABLE DAMAGE 2 OR ONE REPAIR LOCATION. REPAIRS ARE NOT PERMITTED INBOARD OF ELEVATOR STA 45.0. FOR ANY REPAIRS INBOARD OF ELEVATOR STATION 45.0, CONTACT BOEING. IF YOU DO NOT OBEY, THEN DAMAGE TO THE STRUCTURE COULD OCCUR. A REPAIR OF A DAMAGED CORE BY USING POTTING COMPOUND IS NOT PERMITTED.

- E. Do the repair as given in Paragraph 4./REPAIR 2
- F. Make sure the elevator tab is balanced after all repairs are complete. Refer to 51-60-06.
- G. Install the elevator tab, if it was removed. Refer to AMM 27-31-31/401.
- H. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane.
- I. Restore the elevator tab exterior finish, as applicable. Refer to AMM PAGEBLOCK 51-21-99/701.

NOTE: Wherever the elevator tab skins need to be refinished, the initial finishes including paint, primer, and/or surface filler, must be removed before application of new exterior paint system. Make sure the finish thicknesses are as given in AMM PAGEBLOCK 51-21-99/701.

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REPAIR 2
Page 203

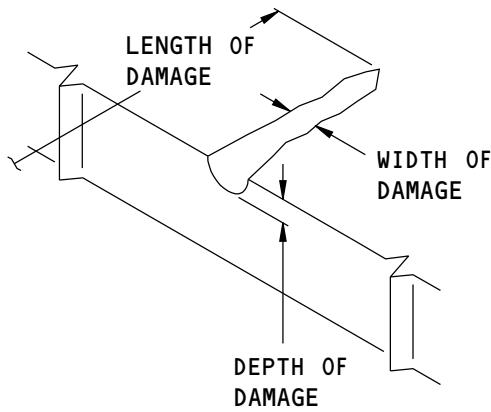
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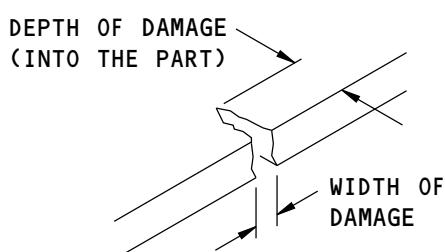


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STRUCTURAL REPAIR MANUAL



DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

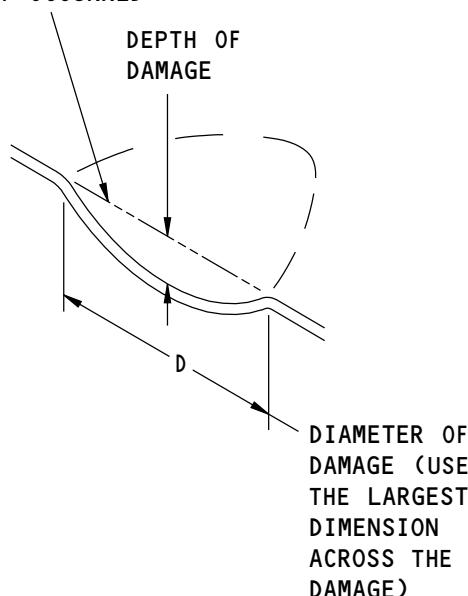
(A)



DEFINITIONS FOR
EDGE DAMAGE

(C)

THE CONTOUR
BEFORE THE
DENT OCCURRED



DEFINITIONS FOR
DENT DAMAGE

(B)

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Damage Definitions
Figure 202

55-20-01

REPAIR 2
Page 204

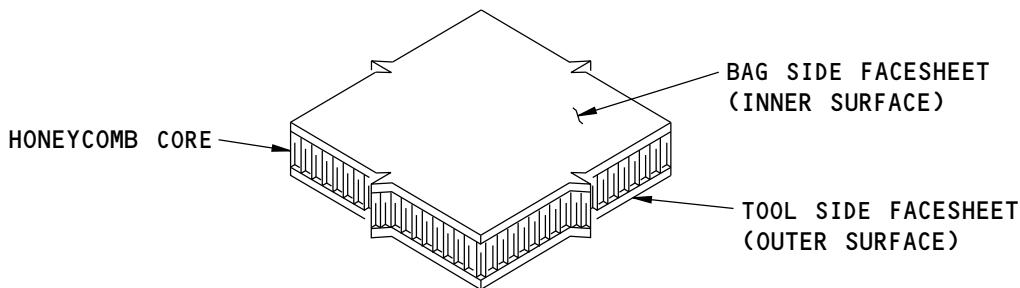
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G11588 S0006592933_V1

Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-60-06	ELEVATOR TAB BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPRregnATED MATERIALS
55-20-01	ELEVATOR SKIN
55-20-01, ALLOWABLE DAMAGE 2	Elevator Tab Skins
55-20-01, ALLOWABLE DAMAGE 3	Elevator Tab Skins For Airplane Line Numbers 1175 And On And Line Numbers 1 Through 1174 With Completion of Service Bulletins 737-55-1080 and 737-55-1082
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 27-31-31/401	Elevator Tab - Removal/Installation
SOPM 20-10-08	Removal of Faying Surface Sealed Metal Fittings from Composite Structures
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

NOTE: If necessary, refer to 55-20-01, Identification 3 to find the material and the build-up of the part of the elevator tab skins that you want to repair.

A. Do as follows when you make a repair:

- (1) For the tab honeycomb wedge, it is permitted to wrap the repair plies around the trailing edge to repair the upper and lower skins.
- (2) Make the size of the repair plies with overlap as given in 51-70-04 and 51-70-05 and with a tolerance of ± 0.1 inch.

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REPAIR 2
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- B. Refer to Table 201/REPAIR 2 for the repair data that is applicable to damage to the honeycomb core areas of the elevator tab trailing edge skins.
 - C. Refer to Table 202/REPAIR 2 for the repair data that is applicable to damage to the solid laminate areas of the elevator tab trailing and leading edge skins.
 - D. For repairs made with wet layup materials, do as follows:
 - (1) Use one repair ply of fabric for each initial ply that was damaged.
 - (2) Add two structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.
 - (3) Do an inspection of Category B repairs after each 400 flight hour interval or more frequently. Refer to 737 NDT Part 1, 51-01-01 for inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.
- NOTE:** Other equivalent inspection methods that have been examined and found to be satisfactory by the operator, can be used.
- E. Repairs with preimpregnated layup materials at 250°F (121°C) cure are not permitted.
 - F. Use the instructions that follow to do a Category A repair with preimpregnated layup materials at 350°F (177°C) cure.
 - (1) Use the same number of repair plies as the number of initial plies that were removed.

Table 201:

REPAIR DATA FOR THE HONEYCOMB CORE AREA ON THE 350°F (177°C) CURE, ELEVATOR TAB TRAILING EDGE SKINS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C) *[1]*[2]	200°F (93°C) *[1]*[2]	250°F (121°C)	350°F (177°C) *[1]*[2]
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 0.50 inch across the largest dimension of the damage Damage must be a minimum of 2.5 X (D) away from a fastener hole or part edge.	Damage that is a maximum of: - 0.50 inch across the largest dimension of the damage Damage must be a minimum of 2.5 X (D) away from a fastener hole or part edge.	Repair is not permitted.	Damage that is a maximum of: - 1.0 inch across the largest dimension of the damage
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-04 and Paragraph 4.D	----	SRM 51-70-05 and Paragraph 4.F

*[1] Only one repair is permitted for the upper or lower skin plus honeycomb core area on each elevator tab.

*[2] For damage that is more than the limits given in this table, contact The Boeing Company for repair data.

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REPAIR 2
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Table 202:

REPAIR DATA FOR THE SOLID LAMINATE AREA ON THE 350°F (177°C) CURE ELEVATOR TAB TRAILING EDGE AND LEADING EDGE SKINS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C) *[1] *[2]	200°F (93°C) *[1] *[2]	250°F (121°C)	350°F (177°C) *[1] *[2]
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 0.50 inch across the largest dimension of the damage Damage must be a minimum of 2.5 X (D) away from a fastener hole or part edge.	Damage that is a maximum of: - 0.50 inch across the largest dimension of the damage Damage must be a minimum of 2.5 X (D) away from a fastener hole or part edge.	Repair is not permitted.	Damage that is a maximum of: - 1.0 inch across the largest dimension of the damage
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-04 and Paragraph 4.D	----	SRM 51-70-05 and Paragraph 4.F

*[1] Only one repair is permitted for the upper or lower skin plus honeycomb core area on each elevator tab.

*[2] For damage that is more than the limits given in this table, contact The Boeing Company for repair data.

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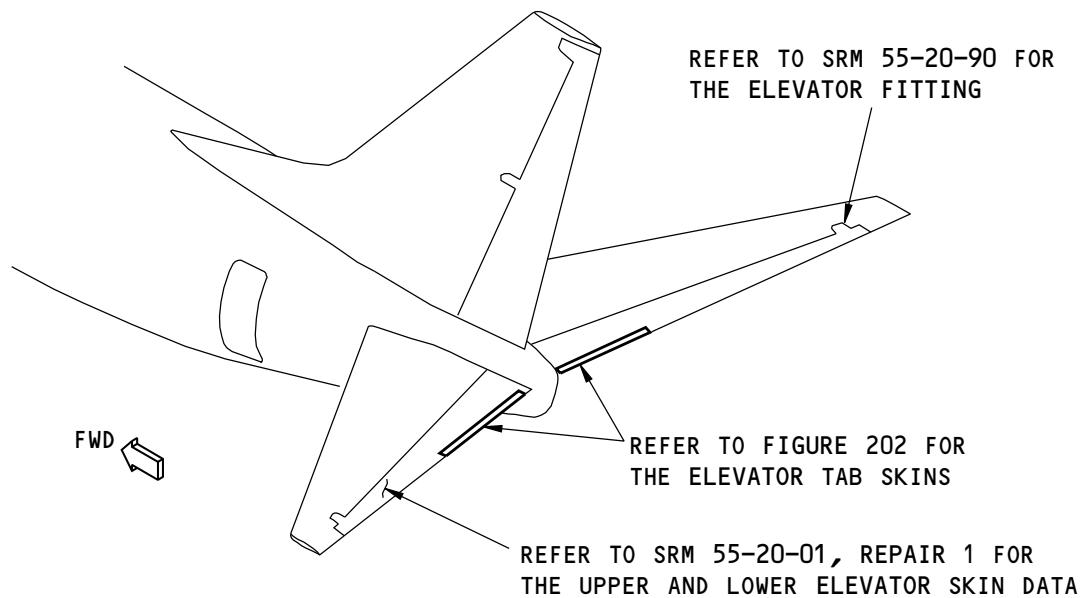
**REPAIR 3 - ELEVATOR TAB SKINS FOR AIRPLANE LINE NUMBERS 1175 AND ON AND LINE
NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND
737-55-1082**

1. Applicability

- A. Repair 3 is applicable to the elevator tab skins made from Carbon Fiber Reinforced Plastic shown in Elevator Tab Skin, Figure 201/REPAIR 3.

NOTE: THIS REPAIR IS APPLICABLE TO AIRPLANE LINE NUMBERS 1175 AND ON AND LINE NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-01, REPAIR 2 FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082.

- B. Refer to Allowable Damage 3 for the type and dimensions of the damage that is permitted.



**Elevator Tab Skin
Figure 201**

M97132 S0006592941_V1

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**REPAIR 3
Page 201**

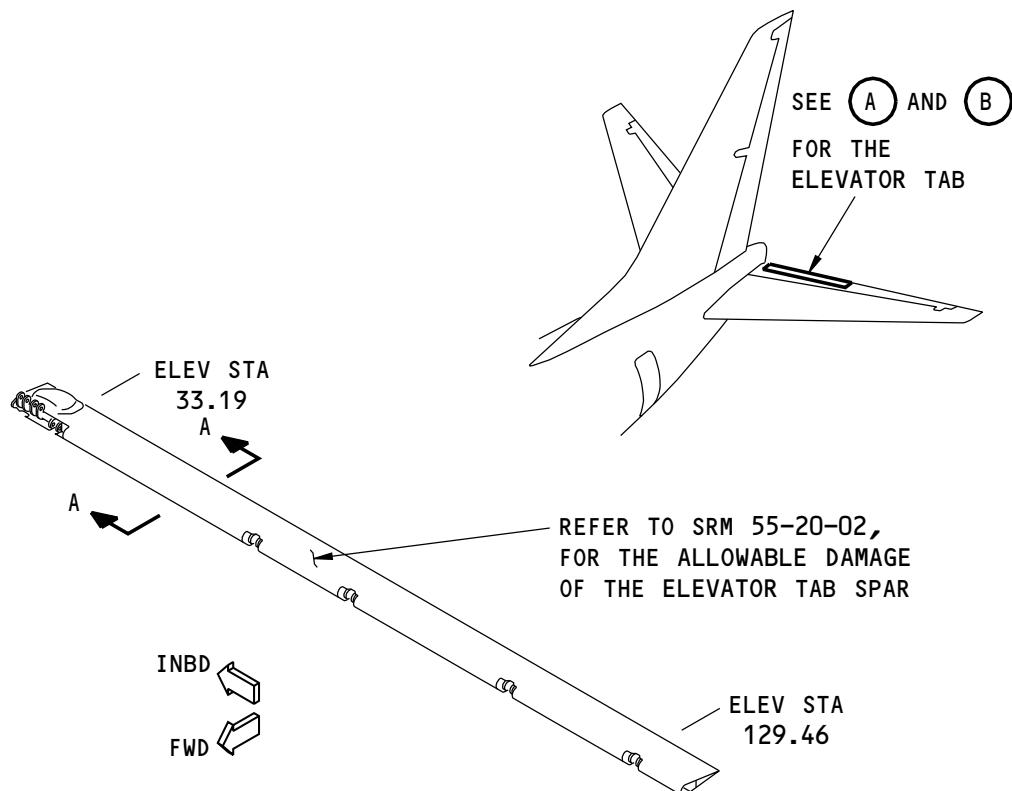
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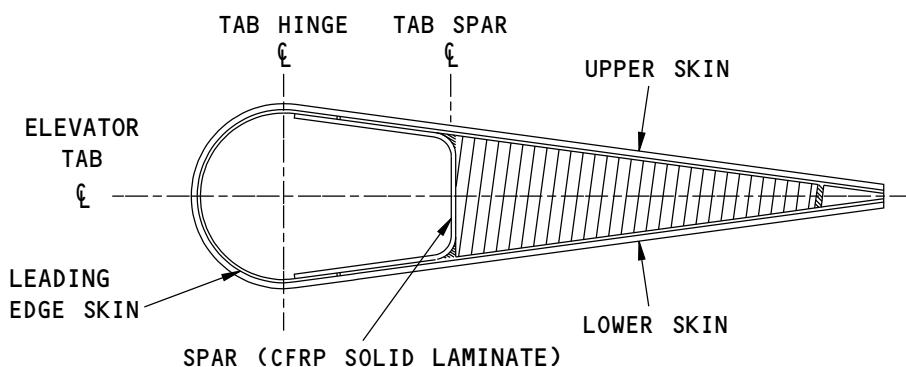


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ELEVATOR TAB SKIN

(A)



(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

A-A

M97168 S0006592942_V1

Elevator Tab Skin Repairs
Figure 202 (Sheet 1 of 2)

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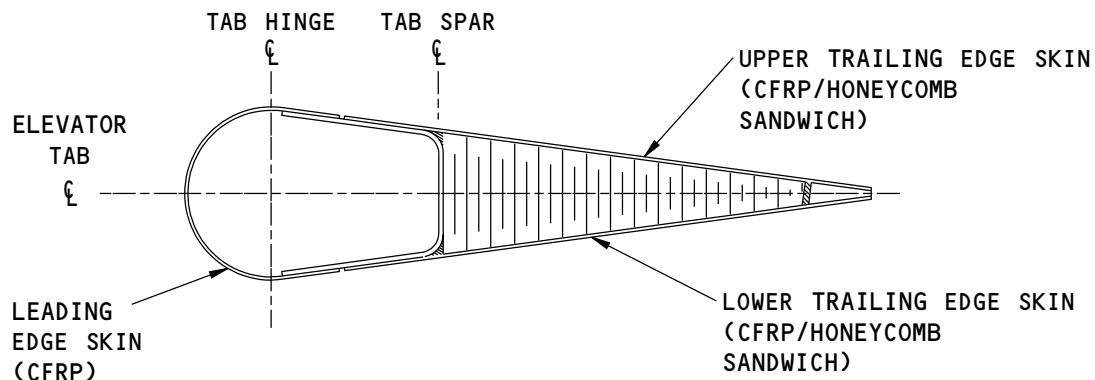
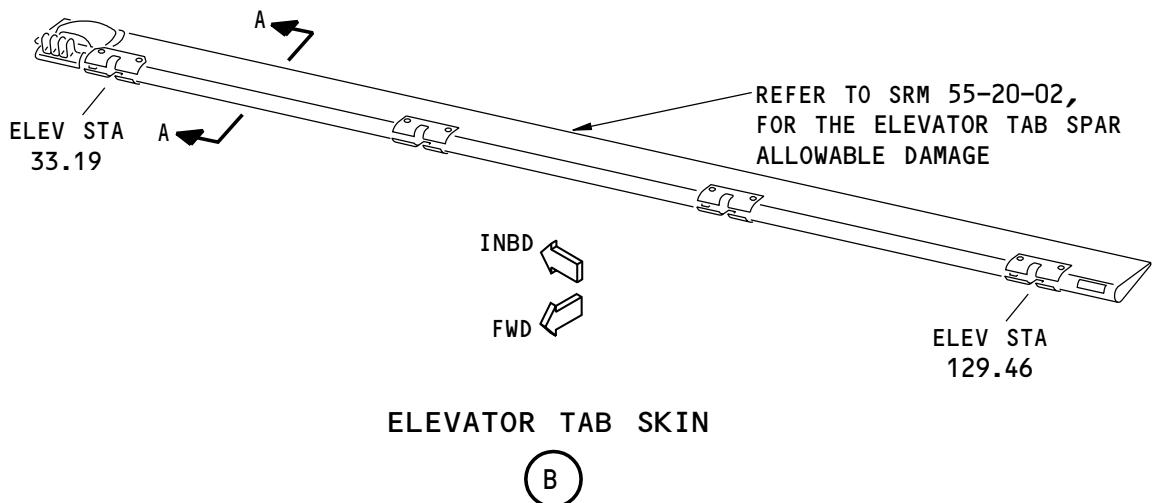
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(FOR AIRPLANE LINE NUMBERS 1 THRU 1174
WITH COMPLETION OF SERVICE BULLETINS 737-55-1080
AND 737-55-1082)

A-A

M97128 S0006592943_V1

Elevator Tab Skin Repairs
Figure 202 (Sheet 2 of 2)

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REPAIR 3
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2. General

- A. Repair 3 gives instructions for Category A repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the elevator tab, as necessary. Refer to AMM 27-31-31/401.
- C. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.
NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.
 - (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
 - (2) Refer to Damage Definitions, Figure 203/REPAIR 3, Details A, B, and C for the definitions of the length, width, and depth of damage.
 - (3) Refer to Definitions of the Facesheets, Figure 204/REPAIR 3 for the definitions of the facesheets of a honeycomb core area.
- D. Do the repair as given in Paragraph 4./REPAIR 3
- E. Restore the elevator tab exterior finish, as applicable. Refer to AMM PAGEBLOCK 51-21-99/701.
- F. Make sure the elevator tab is balanced after all repairs are complete. Refer to ELEVATOR TAB BALANCE PROCEDURE, 51-61-06.
- G. Install the elevator tab, if it was removed. Refer to AMM 27-31-31/401
- H. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane.

55-20-01

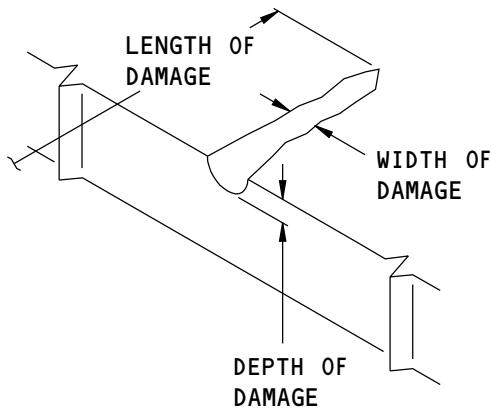
REPAIR 3
Page 204
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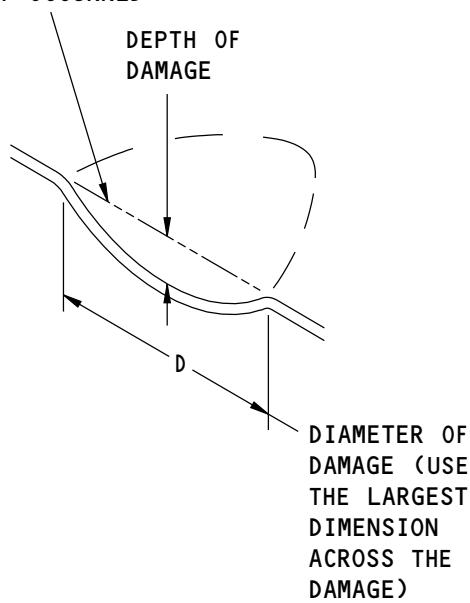
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STRUCTURAL REPAIR MANUAL



DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

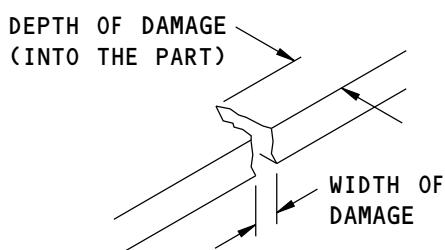
(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED



DEFINITIONS FOR
DENT DAMAGE

(B)



DEFINITIONS FOR
EDGE DAMAGE

(C)

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Damage Definitions
Figure 203

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REPAIR 3
Page 205

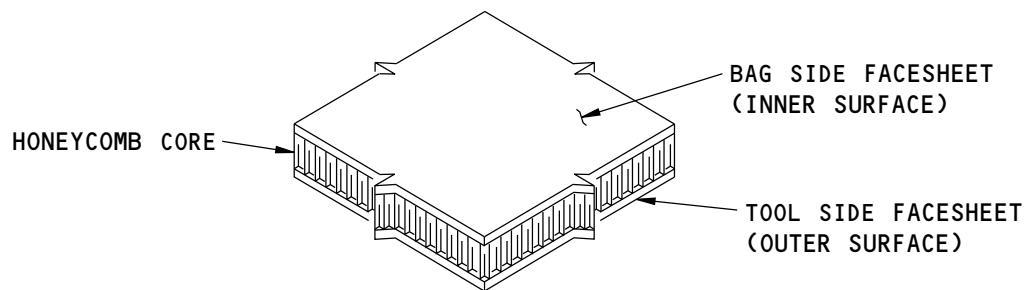
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STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 204

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-61-06	ELEVATOR TAB BALANCE PROCEDURE
51-70-04, REPAIR GENERAL	Repair Procedures for Wet Layup Materials
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
55-20-01	ELEVATOR SKIN
55-20-01, ALLOWABLE DAMAGE 2	Elevator Tab Skins
55-20-01, ALLOWABLE DAMAGE 3	Elevator Tab Skins For Airplane Line Numbers 1175 And On And Line Numbers 1 Through 1174 With Completion of Service Bulletins 737-55-1080 and 737-55-1082
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 27-31-31/401	Elevator Tab - Removal/Installation
SOPM 20-10-08	Removal of Faying Surface Sealed Metal Fittings from Composite Structures
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

NOTE: If necessary, refer to 55-20-01, Identification 3 to find the material and the build-up of the part of the elevator tab skins that you want to repair.

- A. Do as follows when you make a repair:
 - (1) When you remove the damage, do not cut or make an abrasion into the radius of the structure.
 - (2) If the repair plies make an overlap of a hole or cutout, do the steps that follow:
 - (a) Cure the repair.
 - (b) Drill or cut the plies to the initial diameter of the hole of the cutout.
 - (3) If you need clearance with adjacent structure, install a tapered shim on each side of the repair.
 - (4) It is permitted to put the repair plies around the full width of the structure.
 - (a) Do not make an overlap of the edges of the structure.
- B. Refer to Table 201/REPAIR 3 for the repair data that is applicable to damage to the honeycomb core areas of the elevator tab skin.
- C. Refer to Table 202/REPAIR 3 for the repair data that is applicable to damage to the solid laminate areas of the elevator tab skin.
- D. For repairs made with wet layup materials, do as follows:
 - (1) Use one repair ply of fabric for each initial ply that was damaged.

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- (2) Add two structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.
- E. Use the instructions that follow to do a Category A repair with preimpregnated layup materials at 250°F (121°C) cure.
 - (1) Use the same number of repair plies as the number of initial plies that were removed.
 - (2) Add two structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.
- F. Use the instructions that follow to do a Category A repair with preimpregnated layup materials at 350°F (177°C) cure.
 - (1) Use the same number of repair plies as the number of initial plies that were removed.

Table 201:

REPAIR DATA FOR THE HONEYCOMB AREA ON THE 350°F (177°C) CURE, ELEVATOR TAB SKIN			
REPAIR TYPE	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 1.5 inches across the largest dimension of the damage - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches 1.0 inch minimum clearance from: - fastener holes - panel edges 3.0 inches minimum clearance from other repairs	Damage that is a maximum of: - 1.5 inches across the largest dimension of the damage - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches 1.0 inch minimum clearance from: - fastener holes - panel edges 3.0 inches minimum clearance from other repairs	Damage that is a maximum of: - 1.5 inches across the largest dimension of the damage - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches 1.0 inch minimum clearance from: - fastener holes - panel edges 3.0 inches minimum clearance from other repairs
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.E	SRM 51-70-05 and Paragraph 4.F

Table 202:

REPAIR DATA FOR THE SOLID LAMINATE AREA ON THE 350°F (177°C) CURE, ELEVATOR TAB SKIN			
REPAIR TYPE	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 1.5 inches across the largest dimension of the damage - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches	Damage that is a maximum of: - 1.5 inches across the largest dimension of the damage - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches	Damage that is a maximum of: - 1.5 inches across the largest dimension of the damage - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches

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STRUCTURAL REPAIR MANUAL

Table 202: (Continued)

REPAIR DATA FOR THE SOLID LAMINATE AREA ON THE 350°F (177°C) CURE, ELEVATOR TAB SKIN			
REPAIR TYPE	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	200°F (93°C)	250°F (121°C)	350°F (177°C)
	1.0 inch minimum clearance from: - fastener holes - panel edges 3.0 inches minimum clearance from other repairs	1.0 inch minimum clearance from: - fastener holes - panel edges 3.0 inches minimum clearance from other repairs	1.0 inch minimum clearance from: - fastener holes - panel edges 3.0 inches minimum clearance from other repairs
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.E	SRM 51-70-05 and Paragraph 4.F

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REPAIR 4 - ELEVATOR HINGE COVER CRACK

1. Applicability

- A. Repair 4 is applicable to damage to elevator hinge cover panels made of Epoxy Sheet Molding as shown in Elevator Hinge Cover Panel Location, Figure 201/REPAIR 4 and Elevator Hinge Covers, Figure 202/REPAIR 4.

2. General

- A. Repair 4 gives repair instructions for a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the elevator hinge covers, as necessary. Refer to AMM 06-42-00.
 - (1) Remove the necessary fasteners. Refer to 51-40-02 for information on fastener removal.
 - (2) If a fastener hole is damaged, refer to 51-70-04 as applicable.
- C. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 of the inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) Refer to Damage Definitions, Figure 203/REPAIR 4 for the definitions of width and depth of damage.
- D. Do the repair as given in Paragraph 4./REPAIR 4
- E. Make sure the aerodynamic smoothness is satisfactory or there can be a loss in the airplane safety performance. Refer to 51-10-01.
- F. Make sure that the elevator is balanced. Refer to 51-60-04 for the balance procedures.
- G. Install the elevator hinge cover, as applicable. Refer to AMM 06-42-00.

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REPAIR 4
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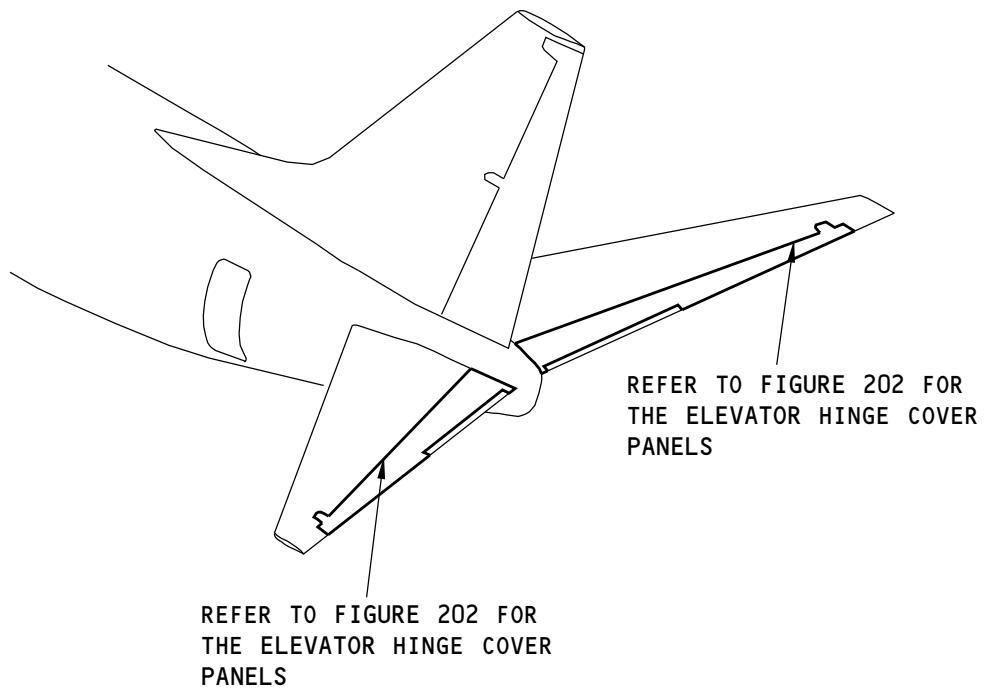
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Elevator Hinge Cover Panel Location
Figure 201

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REPAIR 4
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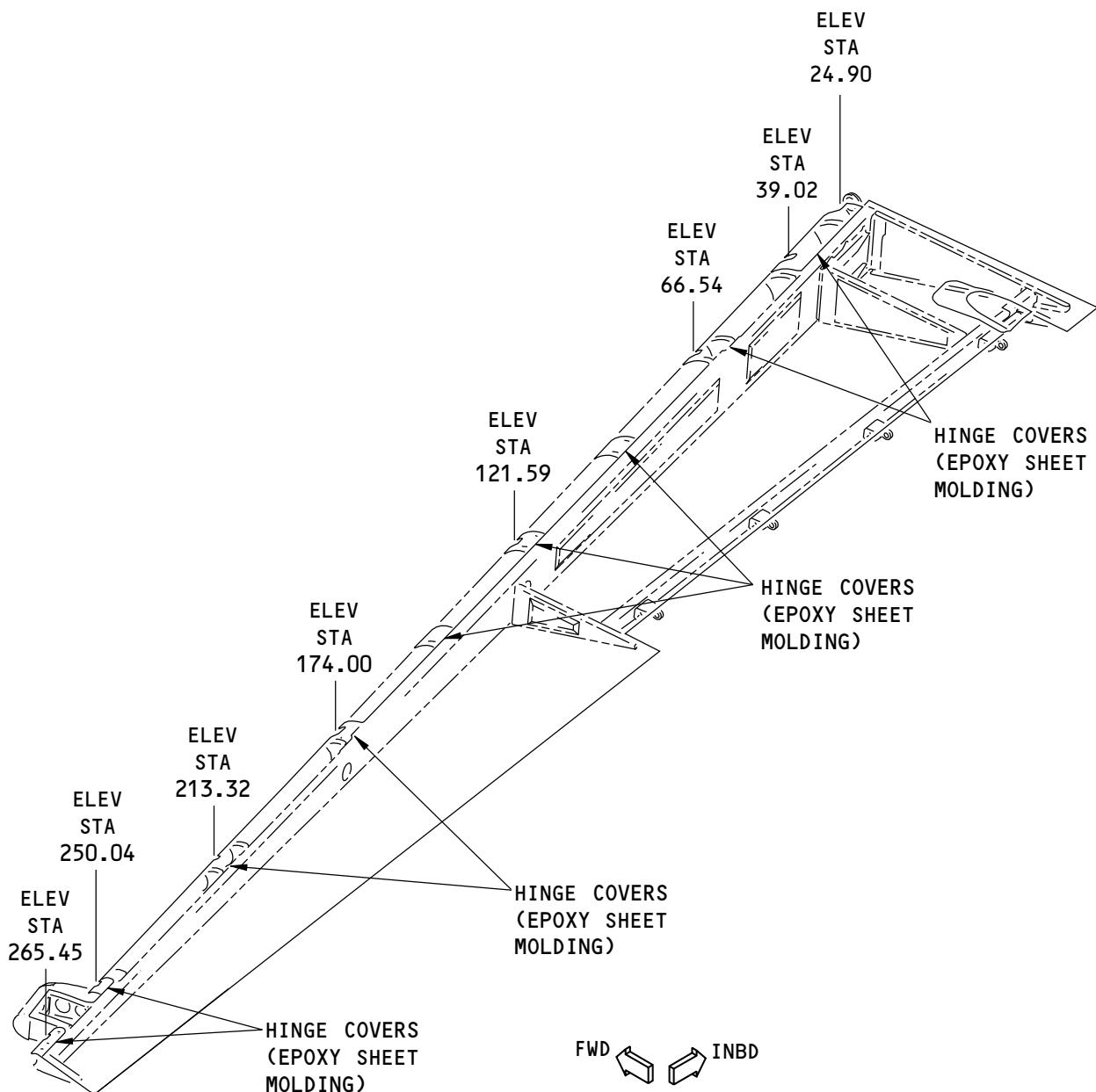
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)

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Elevator Hinge Covers
Figure 202 (Sheet 1 of 2)

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REPAIR 4
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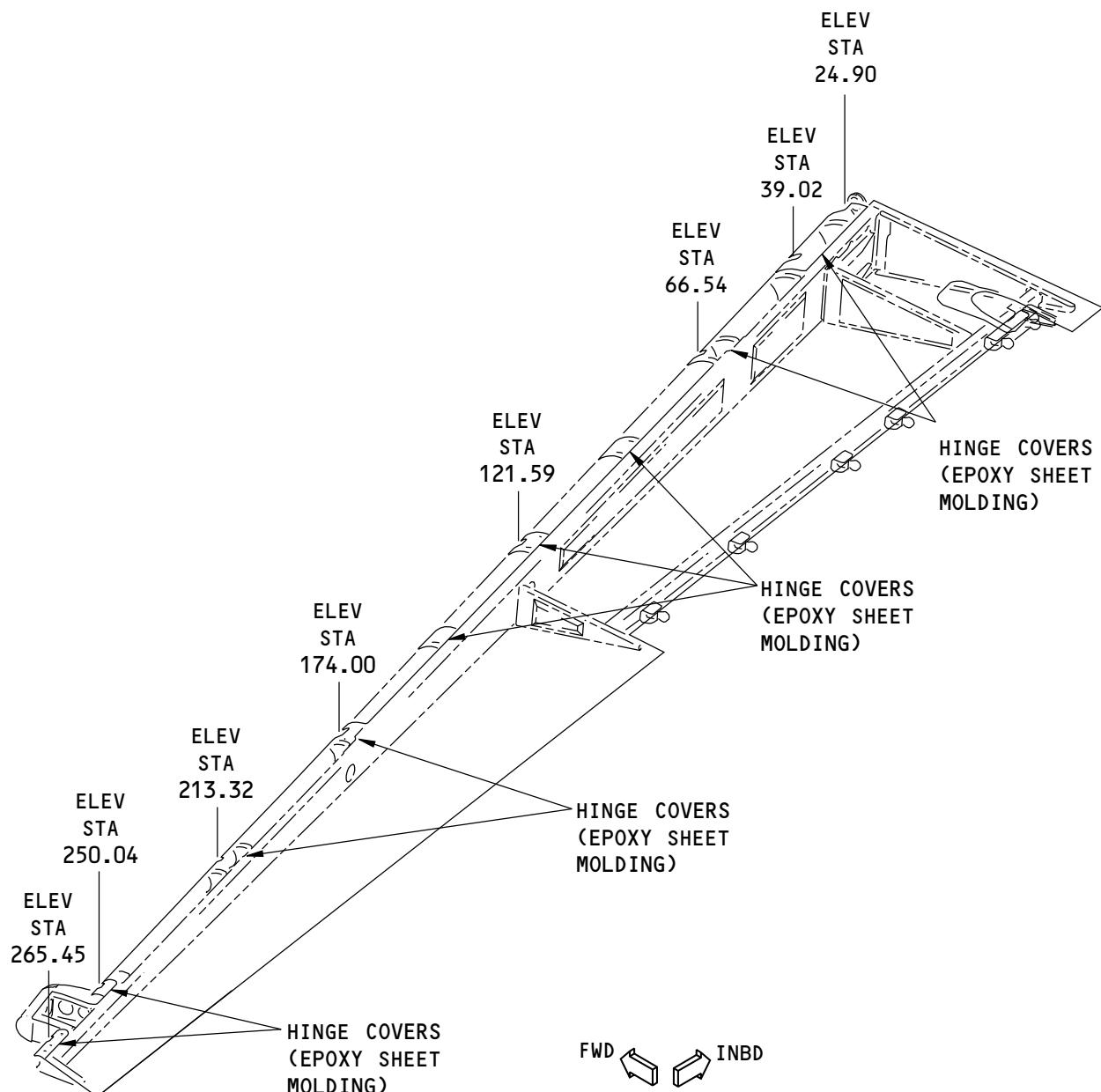
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LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

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Elevator Hinge Covers
Figure 202 (Sheet 2 of 2)

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REPAIR 4
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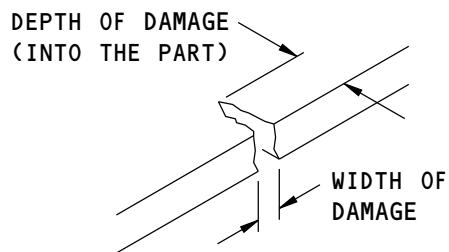
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DEFINITIONS FOR
EDGE DAMAGE

(A)

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Damage Definitions
Figure 203

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-60-04	ELEVATOR BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 06-42-00	Aircraft Maintenance Manual
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. Completely remove the crack damage and blend smooth with the initial edges.
- B. Refer to Table 201/REPAIR 4 for the repair data that is applicable to the damage.
- C. For repairs made with wet layup materials, do as follows:
 - (1) Use two repair plies of BMS 9-3, Type H2 or H3 fabric with BMS 8-301, Class 1, Grade 1 resin as given in 51-70-04 to the damaged areas. Put one repair ply at 0 degrees along the long edge of the panel. Extend this ply a minimum of 0.50 inch beyond the damage. Put the next ply at ±45 degrees to the edge of the panel and extend the ply 0.50 inch beyond the first ply end.
 - (2) On the opposite side, fill the blended area with BMS 8-301, Class 1, Grade 1 resin and milled glass fibers. Add two repair plies of BMS 9-3, Type H2 or H3 fabric with BMS 8-301, Class 1, Grade 1 resin as given in 51-70-04 to the damage area. Put one repair ply at 0 degrees along the long edge of the panel. Extend this ply a minimum of 0.50 inch beyond the damage. Put the next ply at ±45 degrees to the edge of the panel and extend the ply 0.50 inch beyond the first ply end.
 - (3) Refinish as given in 51-70-04.

Table 201:

REPAIR DATA FOR THE ELEVATOR HINGE COVERS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS FOR EDGE CRACKS	- Contact the Boeing Company for this temperature repair.	Damage that is a maximum of: - 1.5 inches in length - 2 edge cracks for each panel. The crack must be a minimum of 1.5 inches away from another crack.	This temperature repair is not permitted.	This temperature repair is not permitted.

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Table 201: (Continued)

REPAIR DATA FOR THE ELEVATOR HINGE COVERS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS FOR CRACKS FROM FASTENER HOLES	- Contact The Boeing Company for this temperature repair.	Damage that is a maximum of: - 0.5 inch in length away from a fastener hole edge. - 2 fastener cracks for each panel.	This temperature repair is not permitted.	This temperature repair is not permitted.
REPAIR PROCEDURES	----	SRM 51-70-04 AND PARAGRAPH 4.C	-----	-----

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REPAIR 4
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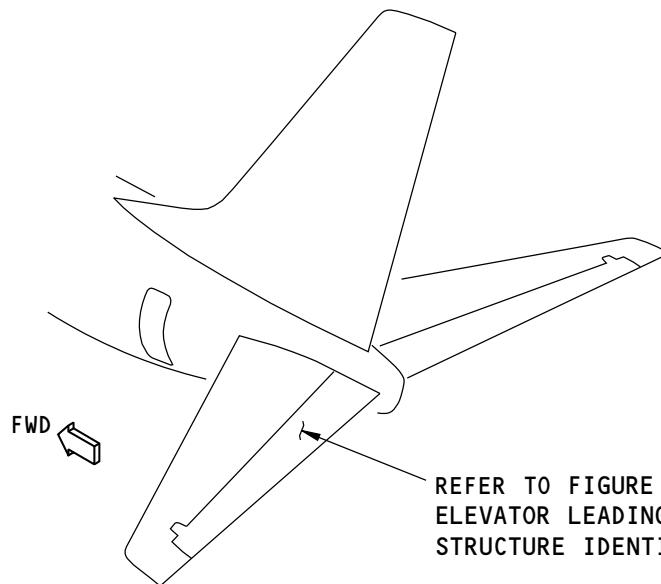
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ELEVATOR LEADING EDGE STRUCTURE



REFER TO FIGURE 2 FOR THE
ELEVATOR LEADING EDGE
STRUCTURE IDENTIFICATION.

REFER TO IDENTIFICATION 2
FOR THE RIB STRUCTURE.

REFER TO IDENTIFICATION 3
FOR THE REAR SPAR STRUCTURE

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Elevator Leading Edge Structure Location

Figure 1

Table 1:

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REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A1000	Front Spar Assembly - Elevator
183A2020	Balance Panel Assembly - Bay No. 2, Elevator
183A2030	Balance Panel Assembly - Bay No. 3, Elevator
183A2040	Balance Panel Assembly - Bay No. 4, Elevator
183A2050	Balance Panel Assembly - Bay No. 5, Elevator
183A6000	Leading Edge Installation - Elevator
183A7000	Balance Horn Assembly - Elevator

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IDENTIFICATION 1

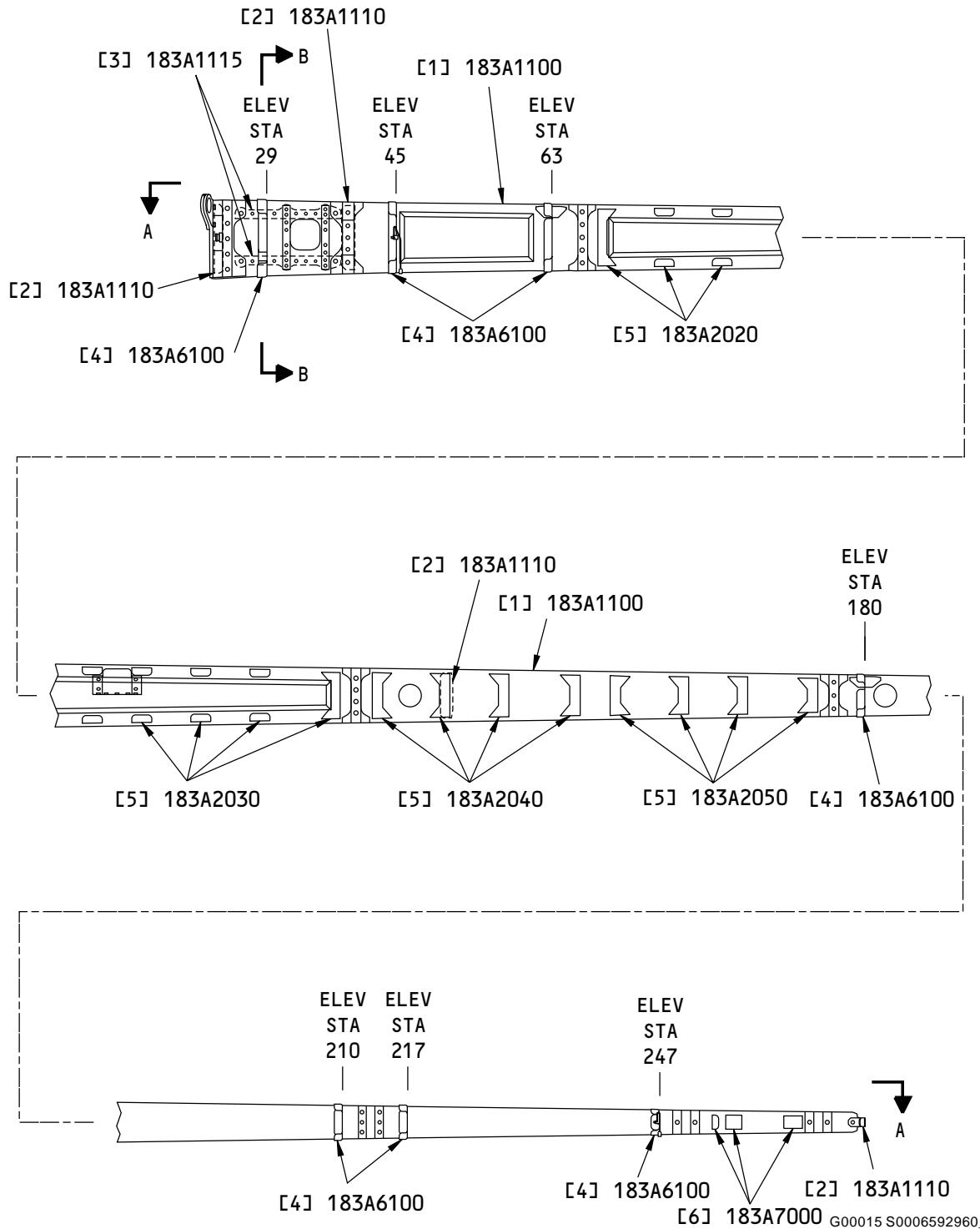
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Leading Edge Structure Identification
Figure 2 (Sheet 1 of 2)

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IDENTIFICATION 1

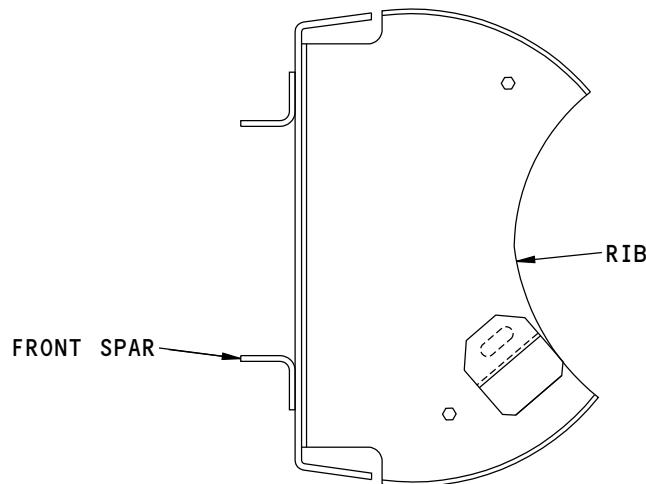
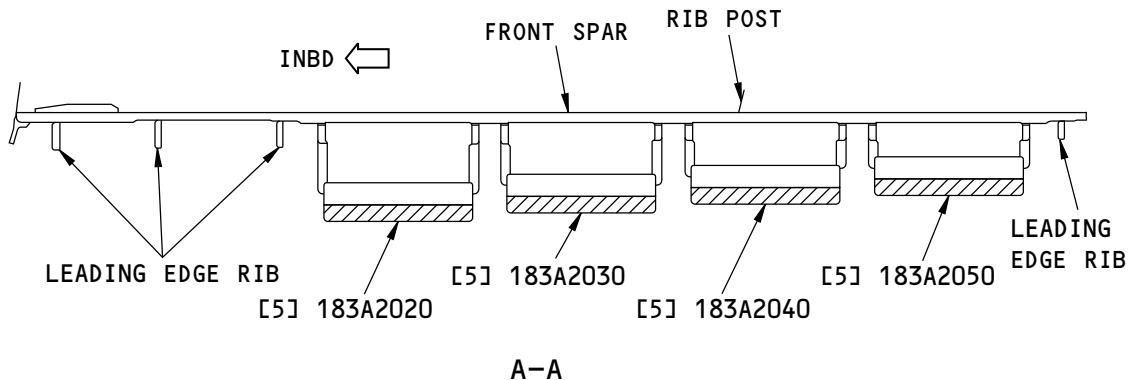
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Leading Edge Structure Identification
Figure 2 (Sheet 2 of 2)

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IDENTIFICATION 1
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Front Spar - Bonded Part Skin Core ELEV STA 39 to 66.5 ELEV STA 66.5 to 121.5		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich with a Glass Fiber Reinforced Plastic (GFRP) isolation ply Refer to Figure 3 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[2]	Rib Post (3) Skin		CFRP solid laminate Refer to Figure 4 for a typical rib post	
[3]	Stiffener (2) Skin		CFRP solid laminate Refer to Figure 5 for a typical stiffener	
[4]	Rib, Leading Edge	0.050 (1.27)	2024-T42 clad	
[5]	Balance Panel Assembly Rib, Inboard End Rib, Outboard End Rib, Inboard Center Rib, Outboard Center Hinge Plate Stiffener (2)	0.025 (0.64) 0.032 (0.81)	Refer to Figure 6 for a typical Balance Panel 7075-T7351 plate 7075-T7351 plate 7075-T7351 plate 7075-T7351 Type V, Grade 3.0 7075-T651 plate as given in QQ-A-250/12 2024-T42 clad sheet	
[6]	Balance Horn Assembly Rib, Inboard End Rib, Outboard End		Refer to Figure 7 for the Balance Horn 7075-T7351 plate 7075-T7351 plate	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

Page 4

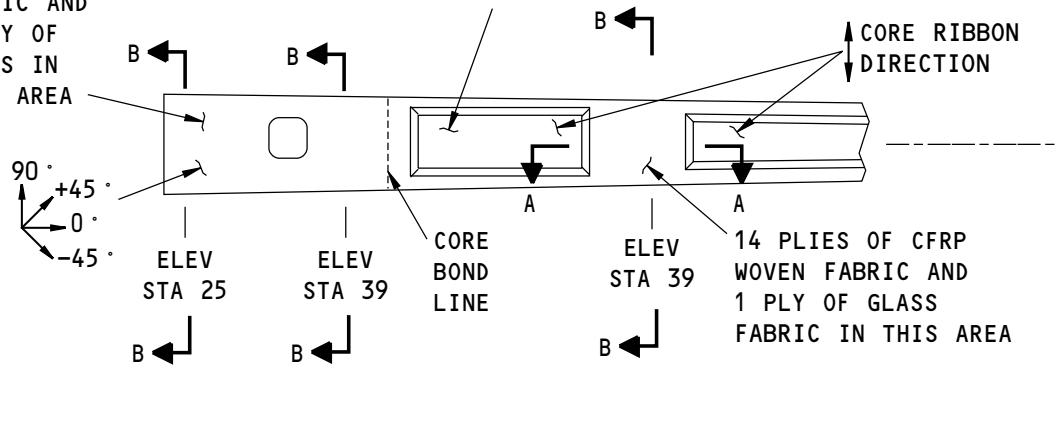
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14 PLIES OF CFRP WOVEN FABRIC AND 1 PLY OF GLASS FABRIC IN THIS AREA

3 PLIES OF CFRP WOVEN FABRIC ON THE BAG SIDE (NON-AERODYNAMIC) SURFACE AND 3 PLIES OF CFRP WOVEN FABRIC AND 1 PLY OF GLASS FABRIC ON THE TOOL SIDE (AERODYNAMIC) SURFACE



3 PLIES OF CFRP WOVEN FABRIC ON THE BAG SIDE (NON-AERODYNAMIC) SURFACE AND 3 PLIES OF CFRP WOVEN FABRIC AND 1 PLY OF GLASS FABRIC ON THE TOOL SIDE (AERODYNAMIC) SURFACE

ELEV STA 122

14 PLIES OF CFRP WOVEN FABRIC AND 1 PLY OF GLASS IN THIS AREA

FOR CONTINUATION SEE SHEET 2

CORE BOND LINE

12 PLIES OF CFRP WOVEN FABRIC AND 1 PLY OF GLASS FABRIC IN THIS AREA

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

VIEW IS ON THE BAG SIDE (NON-AERODYNAMIC) SURFACE

VIEW IS OF THE SPAR LOOKING AFT

PLY LAYUP AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC, REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, C-C, AND D-D FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

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**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Front Spar, Figure 2, Item [1]
Figure 3 (Sheet 1 of 4)**

55-20-02

IDENTIFICATION 1

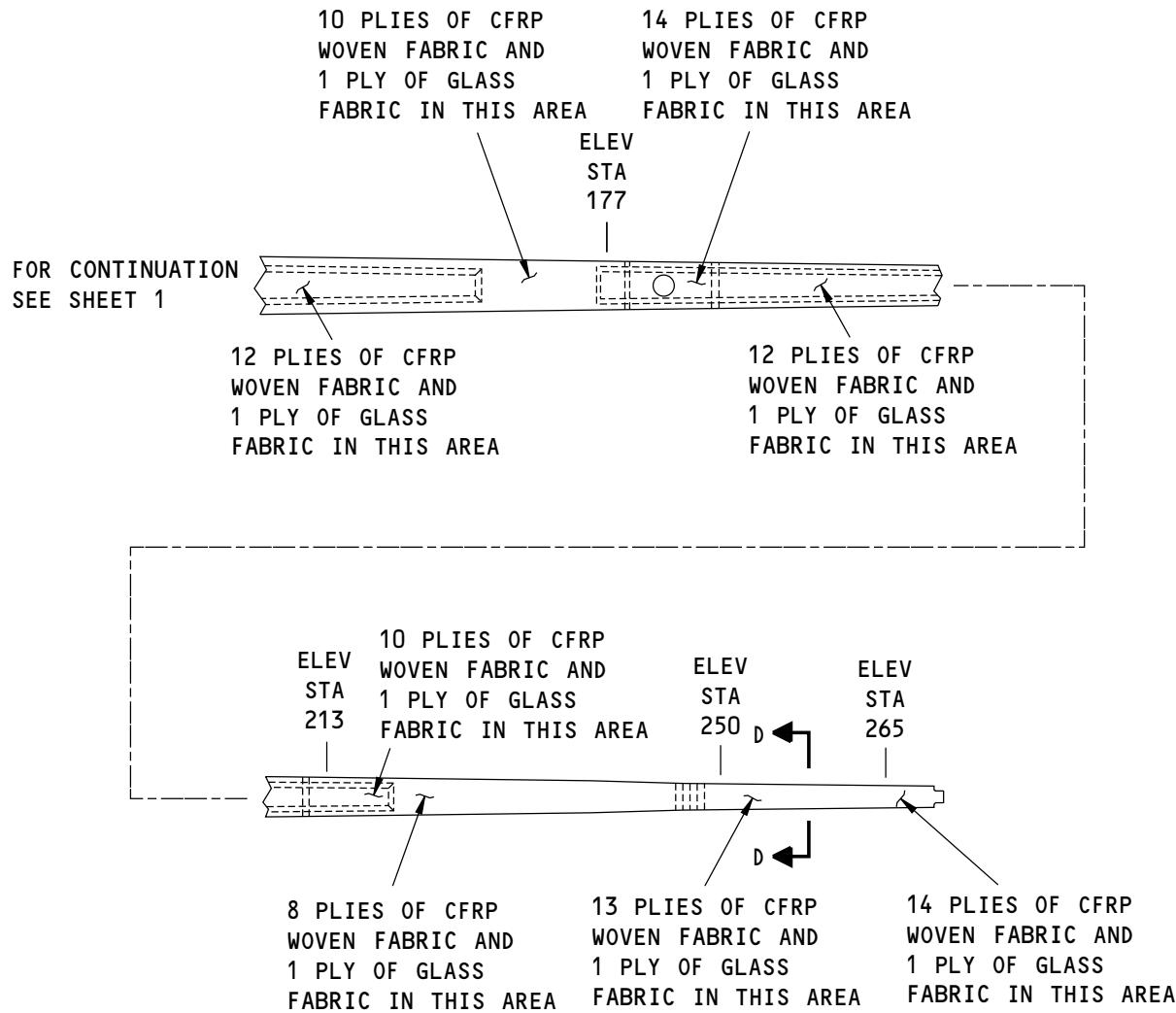
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
VIEW IS ON THE BAG SIDE (NON-AERODYNAMIC) SURFACE
VIEW IS OF SPAR LOOKING AFT
PLY LAYUP AND CORE RIBBON DIRECTION

(A)

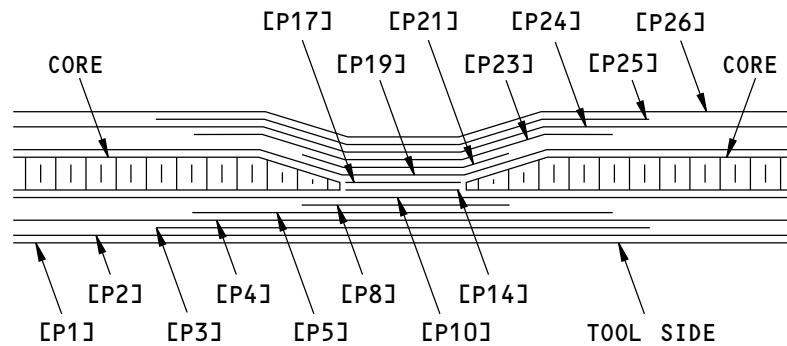
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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Front Spar, Figure 2, Item [1]
Figure 3 (Sheet 2 of 4)

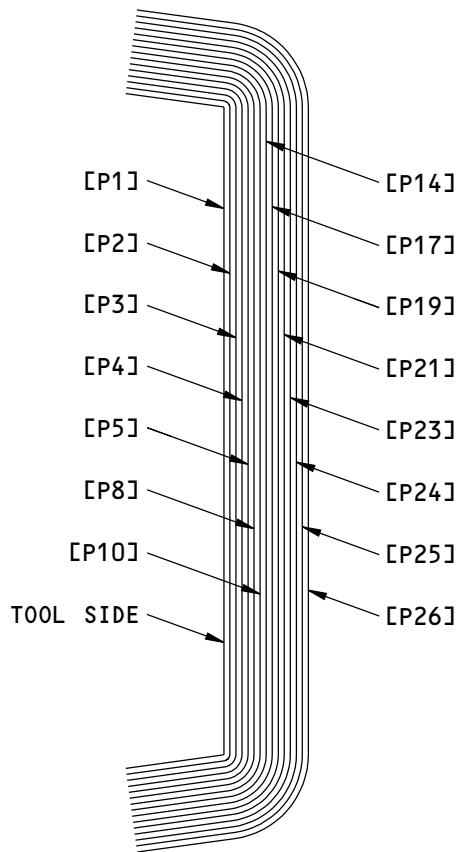
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IDENTIFICATION 1
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A-A



B-B

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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Front Spar, Figure 2, Item [1]
Figure 3 (Sheet 3 of 4)

55-20-02

IDENTIFICATION 1

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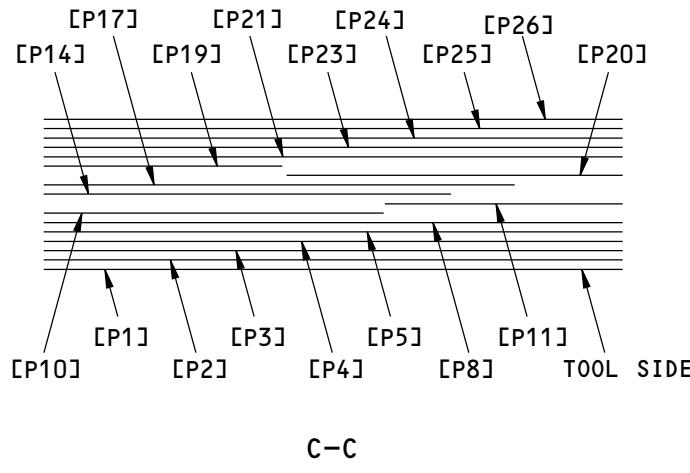
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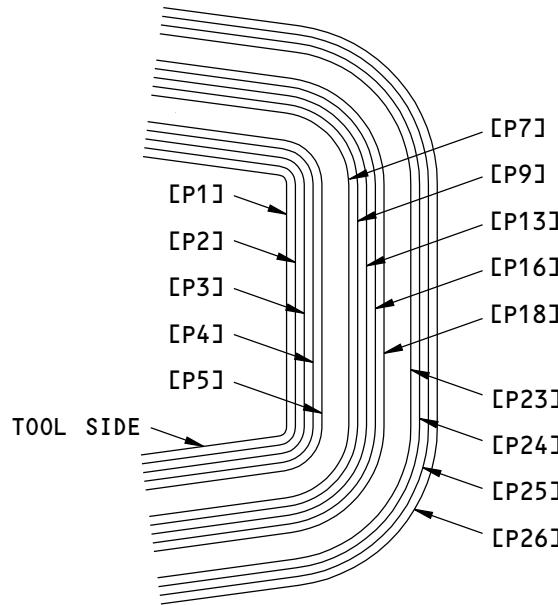
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C-C



D-D

G00222 S0006592968_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Front Spar, Figure 2, Item [1]
Figure 3 (Sheet 4 of 4)

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108
P2, P4, P6 thru P8, P13, P14, P17, P18, P21, P22, P24, P26	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P5, P9 thru P12, P15, P16, P19, P20, P23, P25	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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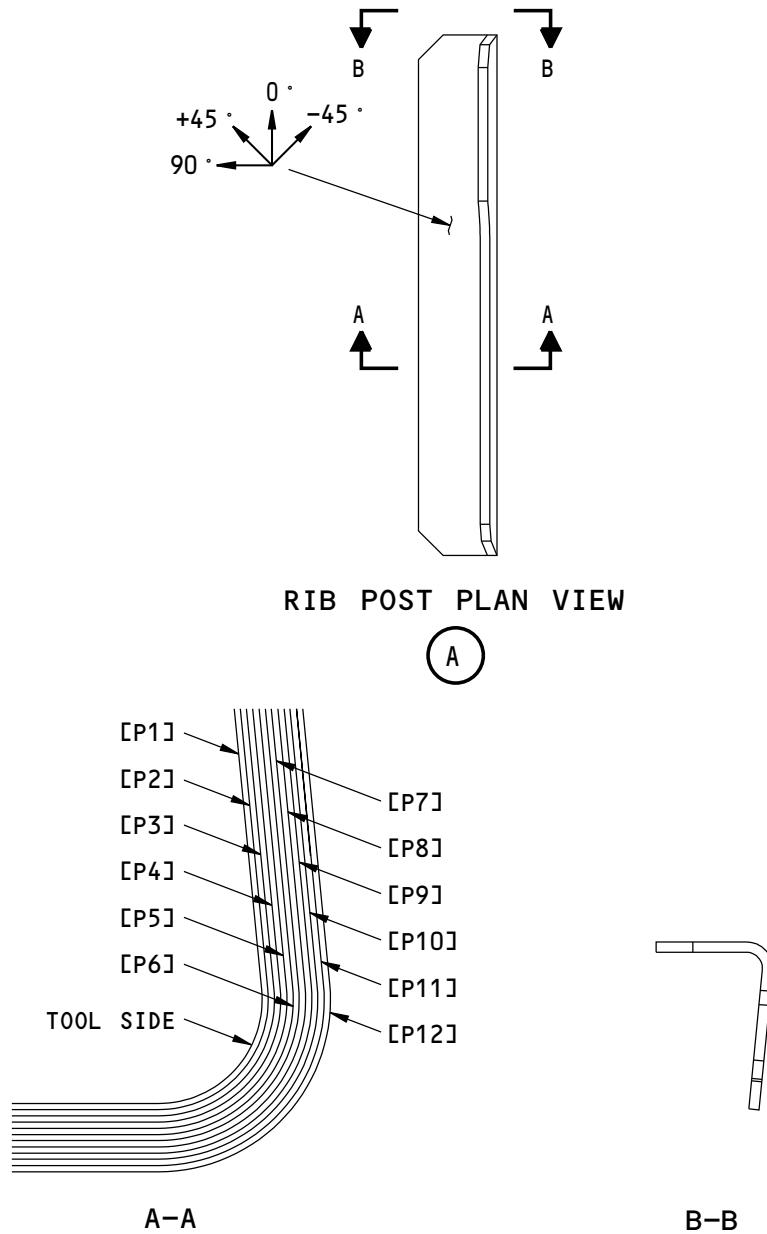
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC, REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F99301 S0006592970_V1

Ply Direction and Ply Sequence for Rib Post, Figure 2, Item [2]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [2]		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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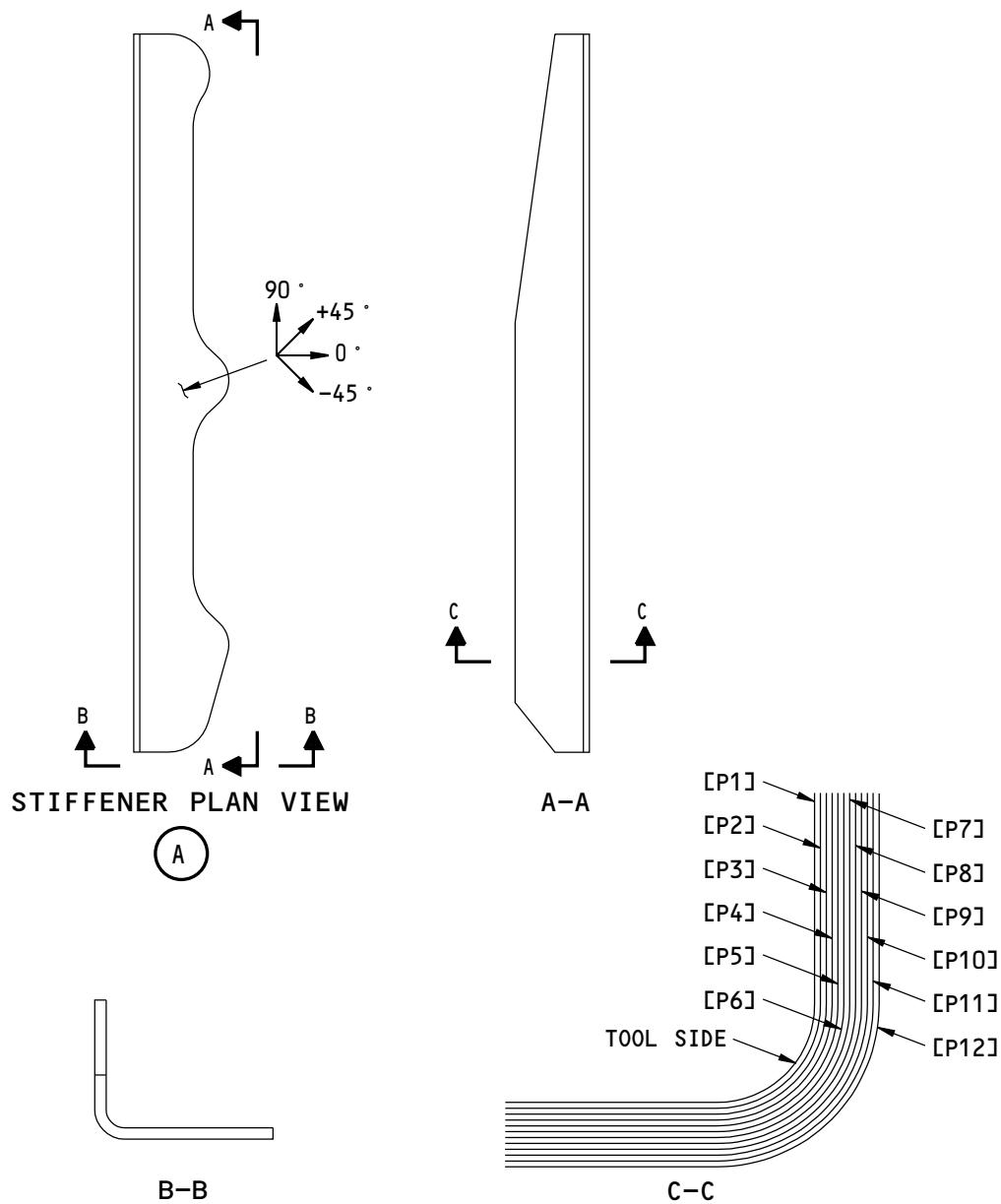
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC, REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTIONS A-A THRU C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F99304 S0006592972_V1

Ply Direction and Ply Sequence for Stiffener, Figure 2, Item [3]
Figure 5

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [3]		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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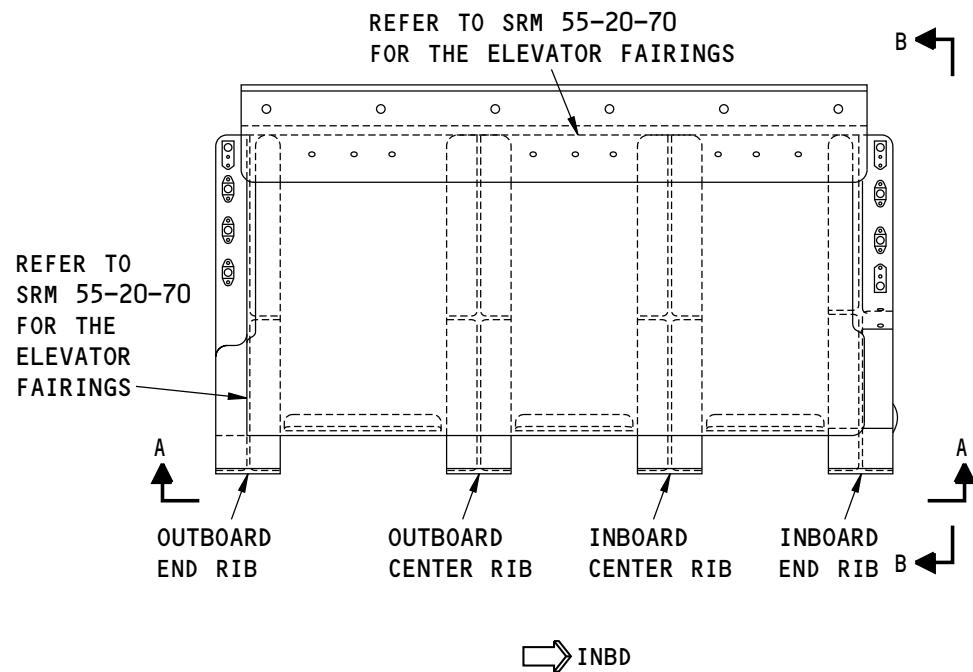
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

G00532 S0006592974_V1

Balance Panel Assembly for Figure 2, Item [5]
Figure 6 (Sheet 1 of 2)

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IDENTIFICATION 1

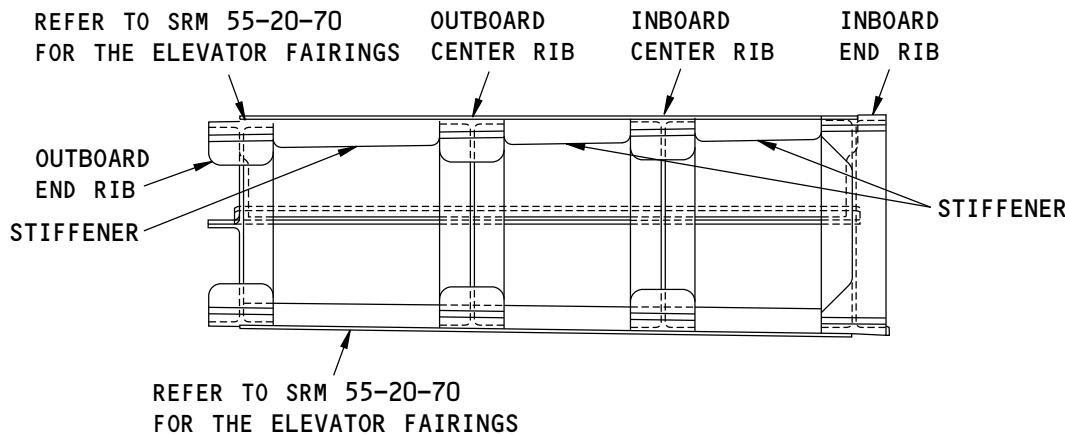
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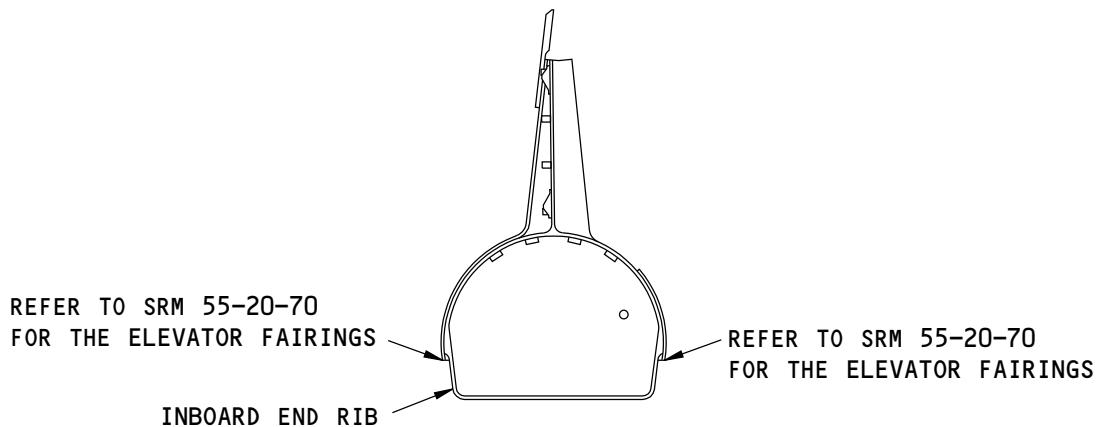
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A-A



B-B

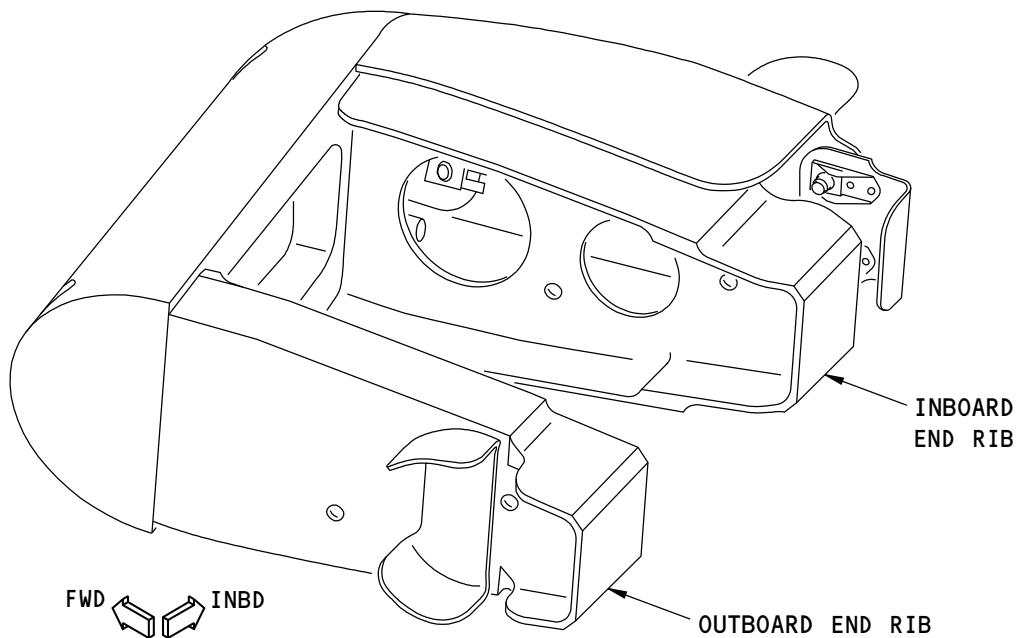
G02994 S0006592975_V1

Balance Panel Assembly for Figure 2, Item [5]
Figure 6 (Sheet 2 of 2)

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G02658 S0006592976_V1

Balance Horn for Figure 2, Item [2]
Figure 7

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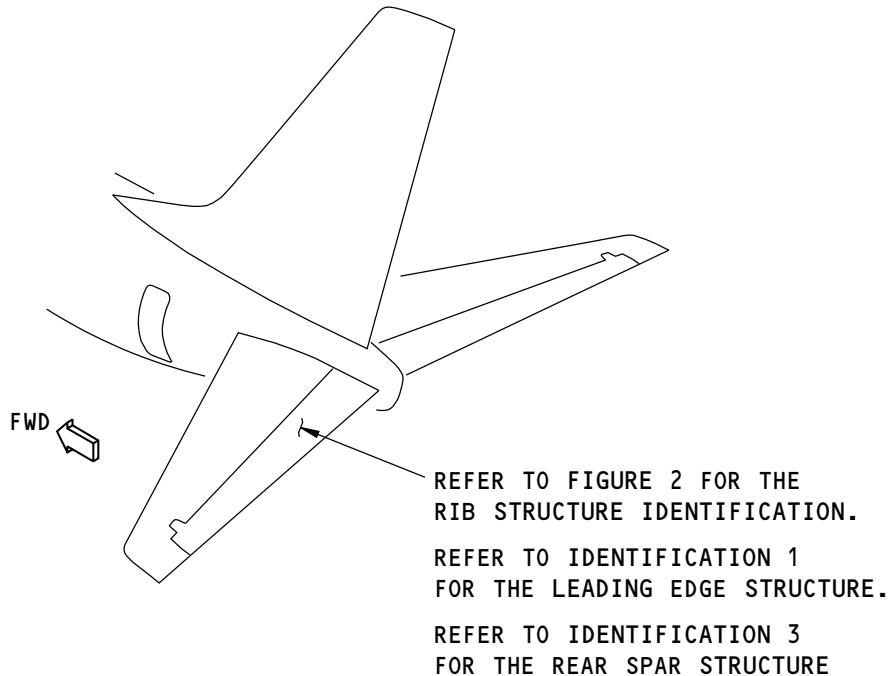
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IDENTIFICATION 2 - ELEVATOR RIB STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Elevator Rib Structure Location

Figure 1

Table 1:

F98478 S0006592978_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A0101	Elevator Assembly Functional Product Collector
183A5000	Rib Installation - Station 39.6 - 42.6, Elevator
183A5020	Rib Installation - Station 132.39 - 134.51, Elevator
183A5030	Rib Installation - Outboard Closure, Elevator
183A5040	Rib Installation - Inboard Closure, Elevator
183A5050	Rib Installation - Tab Cutout Closure, Elevator

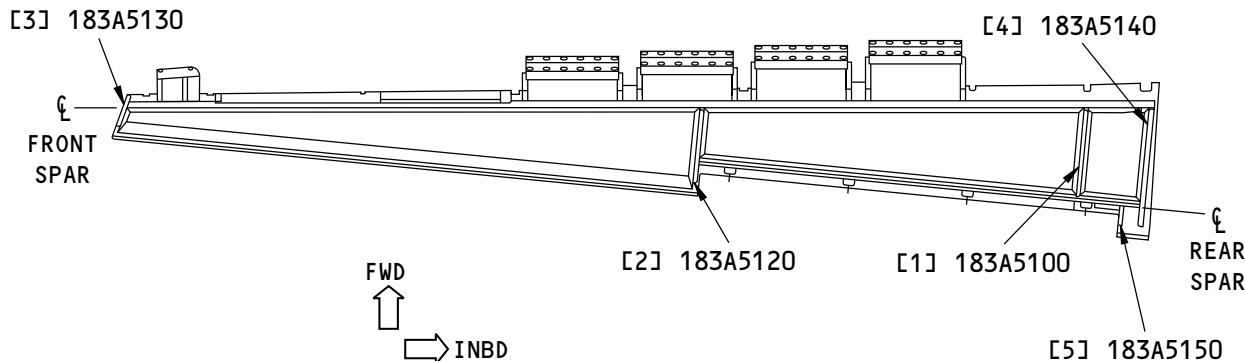
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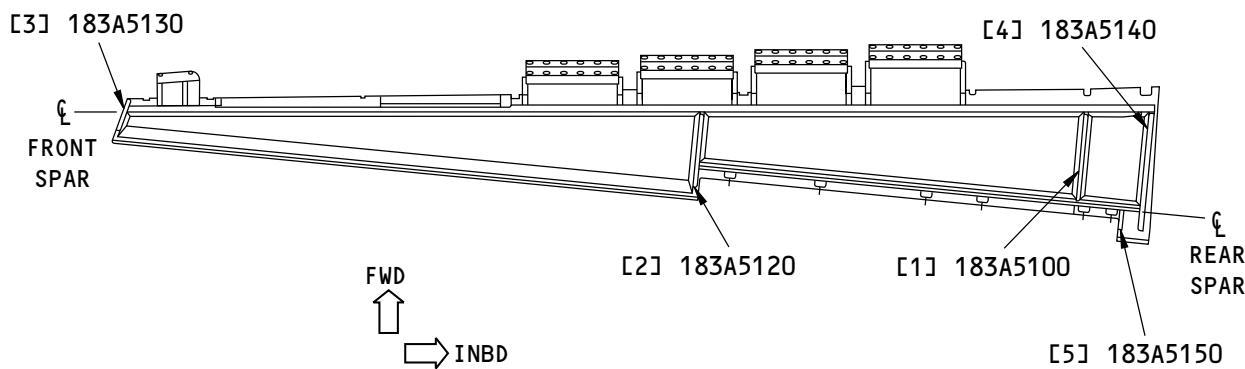
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(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)



(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
ELEVATOR RIBS

F98595 S0006592980_V1

Elevator Rib Structure Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Station 41 Rib - Bonded Part Skin Core		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich Refer to Figure 3 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 3	
[2]	Station 133 Rib - Bonded Part Skin Core		CFRP honeycomb sandwich Refer to Figure 4 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 4	
[3]	Outboard Closure Rib - Bonded Part Skin		CFRP solid laminate Refer to Figure 5	
[4]	Inboard Closure Rib - Bonded Part Skin Core		CFRP honeycomb sandwich Refer to Figure 6 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 6	
[5]	Tab Cutout Closure Rib - Bonded Part Skin		CFRP solid laminate Refer to Figure 7	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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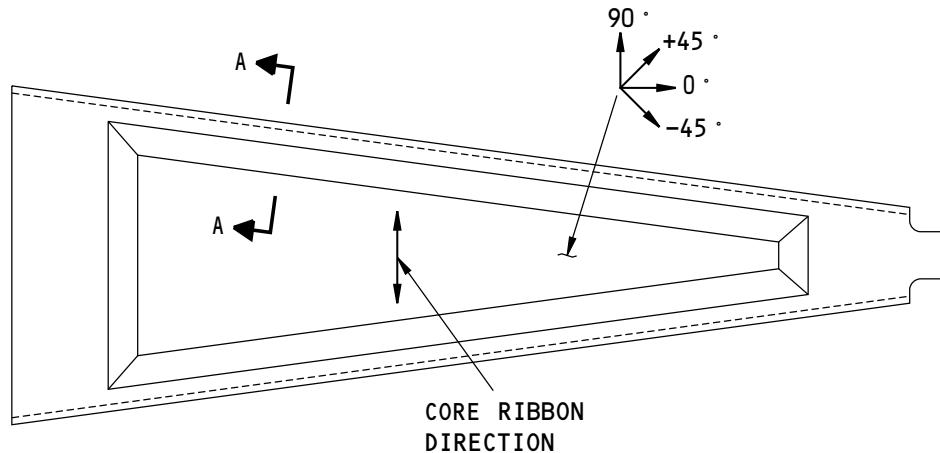
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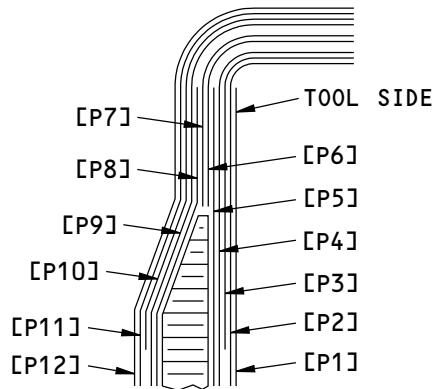


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STRUCTURAL REPAIR MANUAL



PLY LAYUP AND CORE RIBBON DIRECTION

(A)



PLY LAYUP SEQUENCE

A-A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F98725 S0006592983_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for Figure 2, Item [1]
Figure 3

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1, P12	Optional	1 Mil White Tedlar as given in BAC 5317-4
P2, P6, P7, P11	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P4, P9, P10	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P5, P8	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A

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IDENTIFICATION 2

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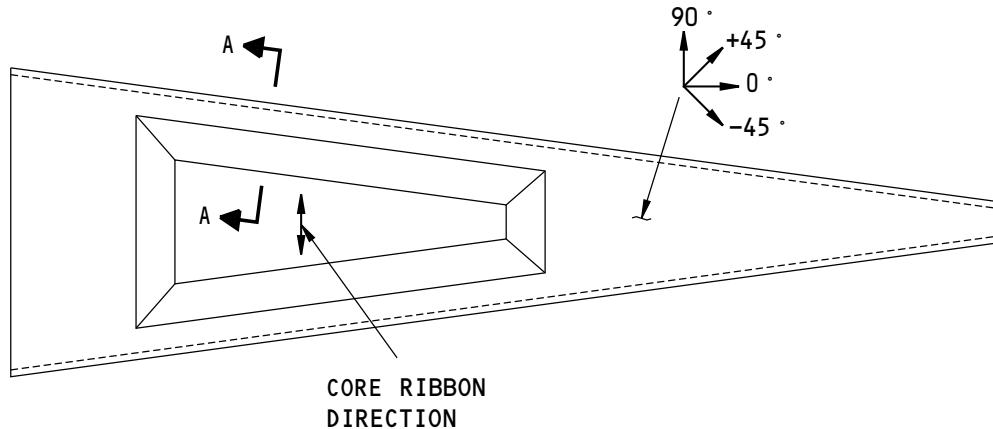
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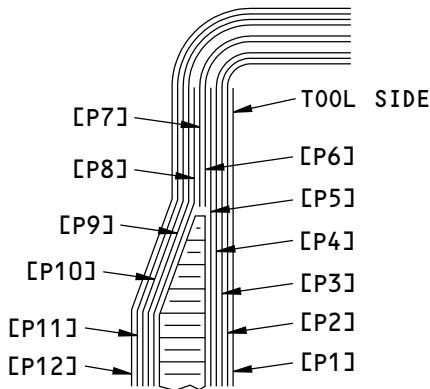


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PLY LAYUP AND CORE RIBBON DIRECTION

(A)



PLY LAYUP SEQUENCE

A-A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F98722 S0006592985_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for Figure 2, Item [2]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [2]		
PLY	DIRECTION	MATERIAL
P1, P12	Optional	1 Mil White Tedlar as given in BAC 5317-4
P2, P6, P7, P11	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P4, P9, P10	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P5, P8	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A

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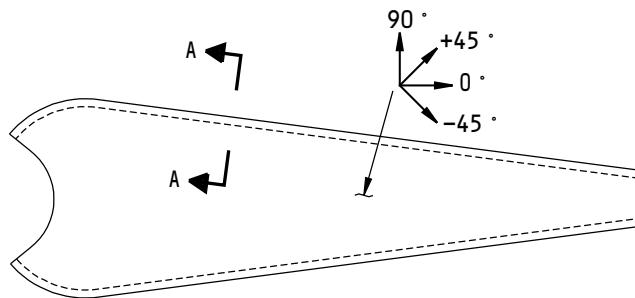
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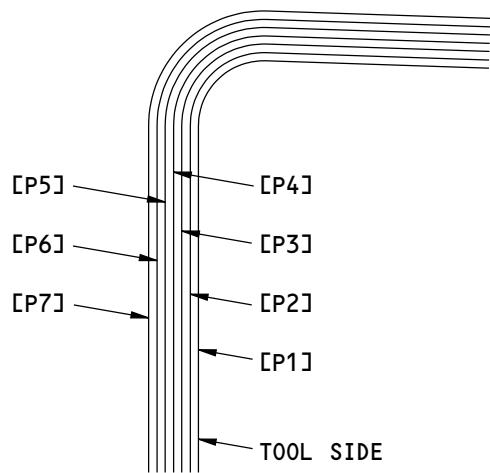
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PLY LAYUP DIRECTION



PLY LAYUP SEQUENCE

A-A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F98674 S0006592987_V1

Ply Direction, and Ply Sequence for Figure 2, Item [3]
Figure 5

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [3]		
PLY	DIRECTION	MATERIAL
P1, P3, P4, P6	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P5	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P7	Optional	1 Mil white Tedlar as given in BAC 5317-4

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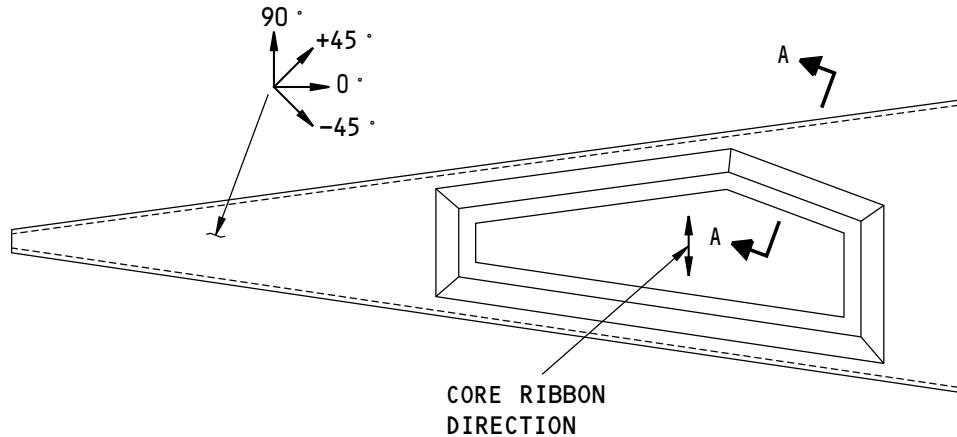
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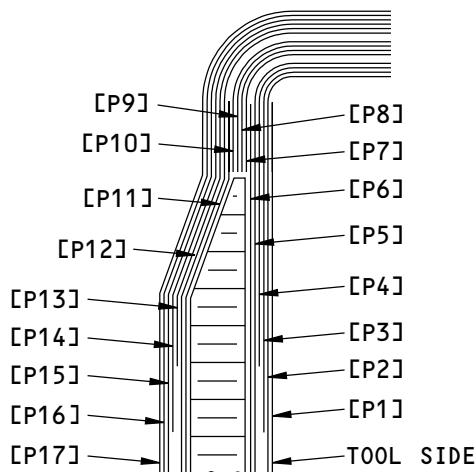
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PLY LAYUP AND CORE RIBBON DIRECTION



PLY LAYUP SEQUENCE

A-A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F98655 S0006592989_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for Figure 2, Item [4]
Figure 6

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [4]		
PLY	DIRECTION	MATERIAL
P1, P17	Optional	1 Mil white Tedlar as given in BAC 5317-4
P2, P4, P8, P9, P13, P15	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P5, P7, P10, P12, P14	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P6, P11	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A
P16	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Class 3, Style 108

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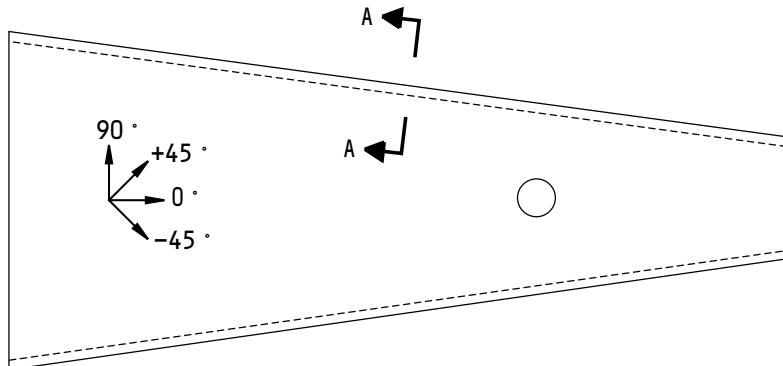
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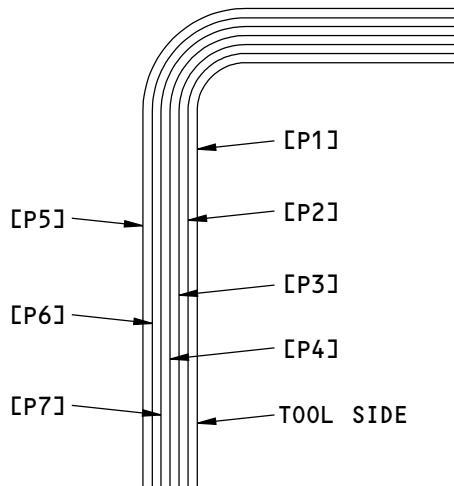
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PLY LAYUP DIRECTION



PLY LAYUP SEQUENCE

A-A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE BONDED PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F98611 S0006592991_V1

Ply Direction and Ply Sequence
Figure 7

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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [5]		
PLY	DIRECTION	MATERIAL
P1, P3, P4, P6	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P5	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P7	Optional	1 MIL white Tedlar as given in BAC 5317-4

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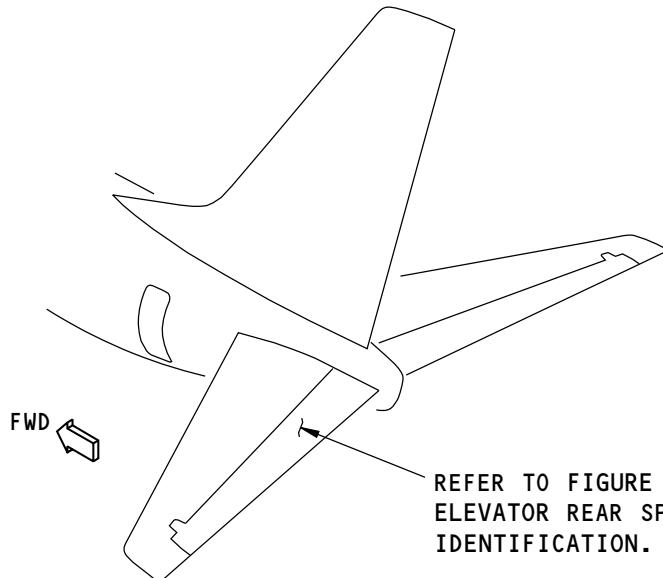
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IDENTIFICATION 3 - ELEVATOR REAR SPAR STRUCTURE



REFER TO FIGURE 2 FOR THE
ELEVATOR REAR SPAR STRUCTURE
IDENTIFICATION.

REFER TO IDENTIFICATION 1
FOR THE LEADING EDGE STRUCTURE.

REFER TO IDENTIFICATION 2
FOR THE RIB STRUCTURE

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Elevator Rear Spar Structure Location

Figure 1

Table 1:

F98816 S0006592995_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A0009	Elevator Installation - Rework
183A0109	Elevator Assembly - Rework
183A4000	Rear Spar Installation - Elevator

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IDENTIFICATION 3

Page 1

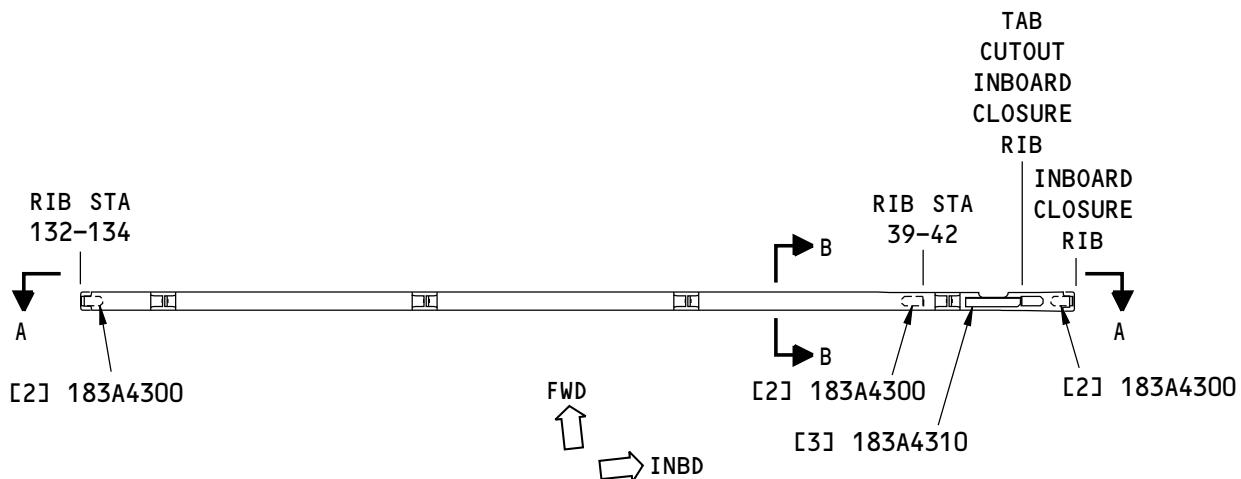
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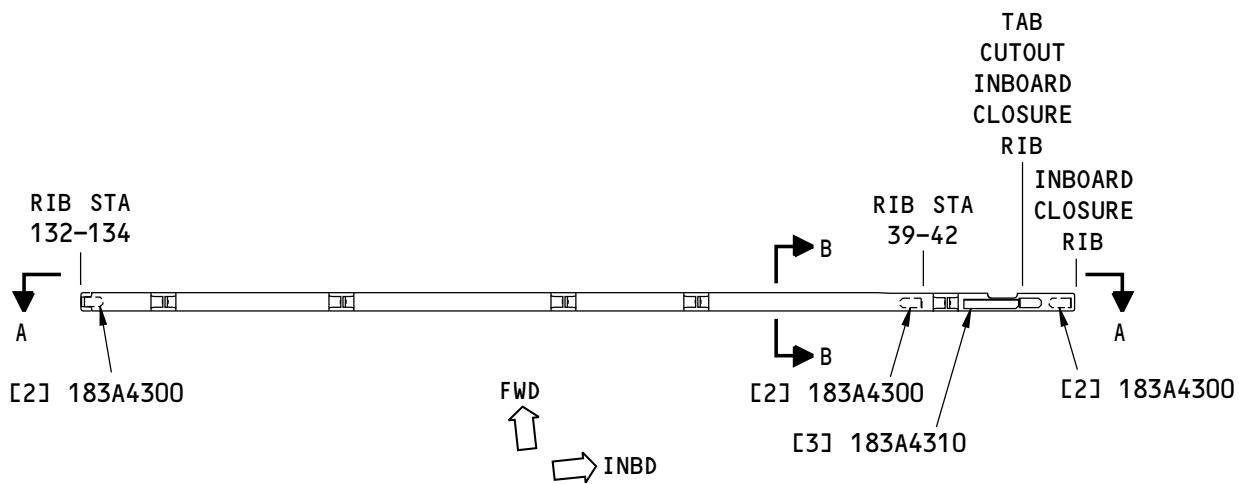
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(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)



(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

REAR VIEW



NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F99261 S0006592997_V1

Elevator Rear Spar Structure Identification
Figure 2 (Sheet 1 of 2)

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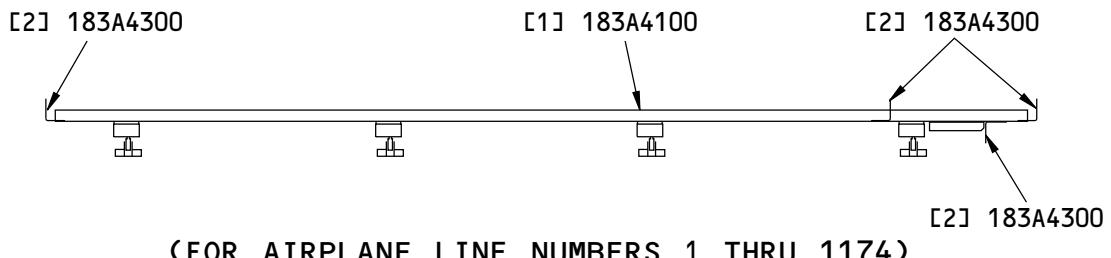
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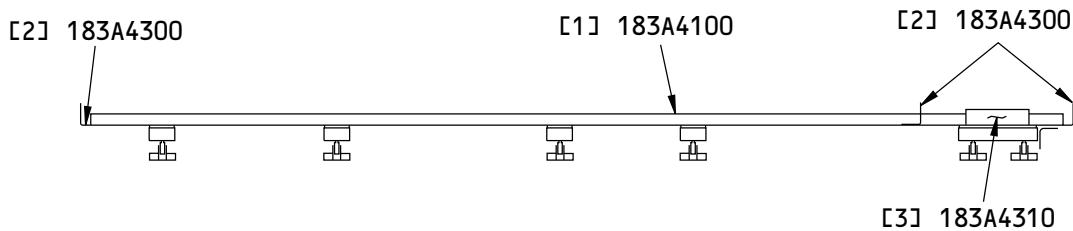
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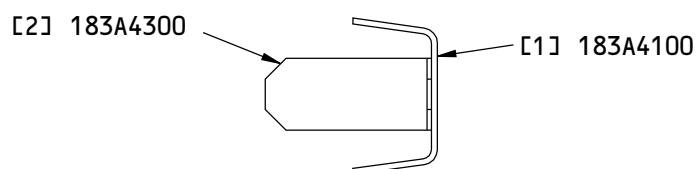


(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)



(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

A-A



B-B

N61575 S0006592998_V1

Elevator Rear Spar Structure Identification
Figure 2 (Sheet 2 of 2)

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rear Spar Assembly		Carbon Fiber Reinforced Plastic (CFRP) solid laminate. Refer to Figure 3	
[2]	Rib Post		CFRP solid laminate. Refer to Figure 4	
[3]	Angle		CFRP solid laminate. Refer to Figure 5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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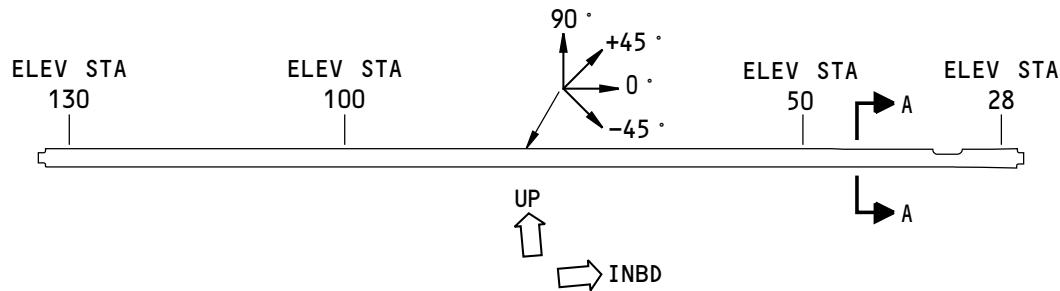
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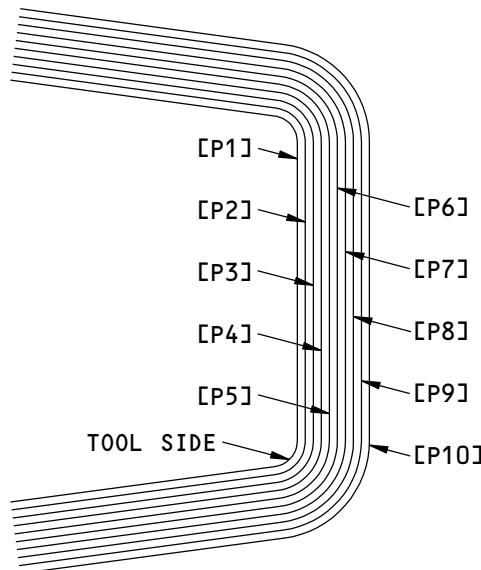
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REAR VIEW

PLY LAYUP FOR THE REAR SPAR

(A)



A-A

NOTES

- THE PLY DIRECTION IS THE WRAP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

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Ply Direction and Ply Sequence for Figure 2, Item [1]
Figure 3

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7, P9	+ or - 45 degrees	CFRP as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8	0 or 90 degrees	CFRP as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P10	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108

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IDENTIFICATION 3

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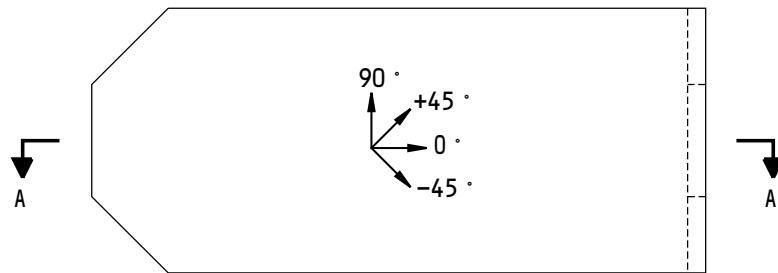
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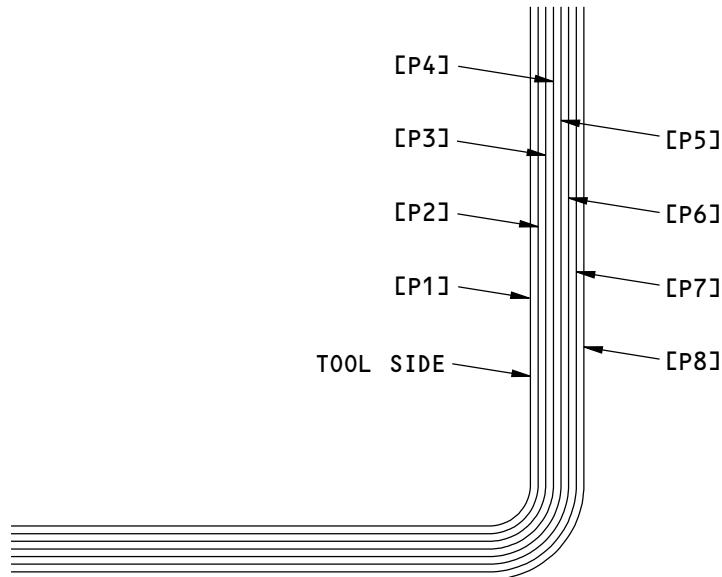


737-800
STRUCTURAL REPAIR MANUAL



PLAN VIEW
PLY LAYUP FOR THE RIB POSTS

(A)



A-A

NOTES

- THE PLY DIRECTION IS THE WRAP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F99225 S0006593003_V1

Ply Direction And Ply Sequence for Figure 2, Item [2]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [2]		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	CFRP solid laminate as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P5, P7	0 or 90 degrees	CFRP solid laminate as given in BMS 8-256, Type I IV, Class 2, Style 3K-70-PW

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IDENTIFICATION 3

Page 8

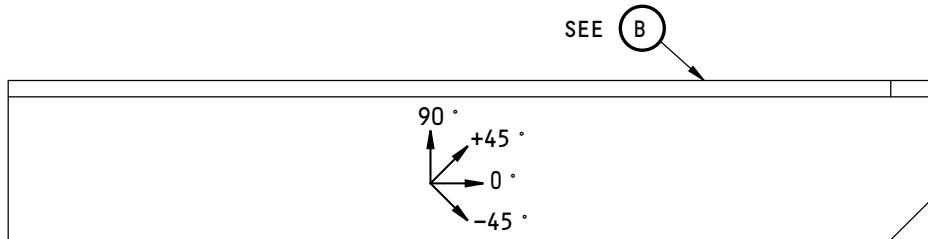
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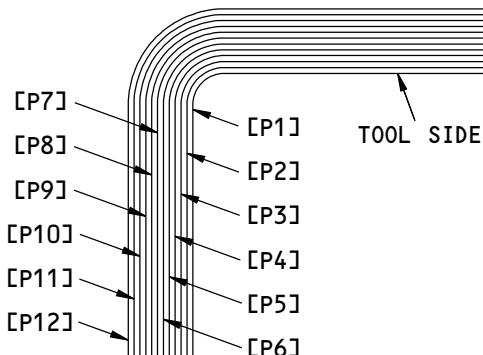
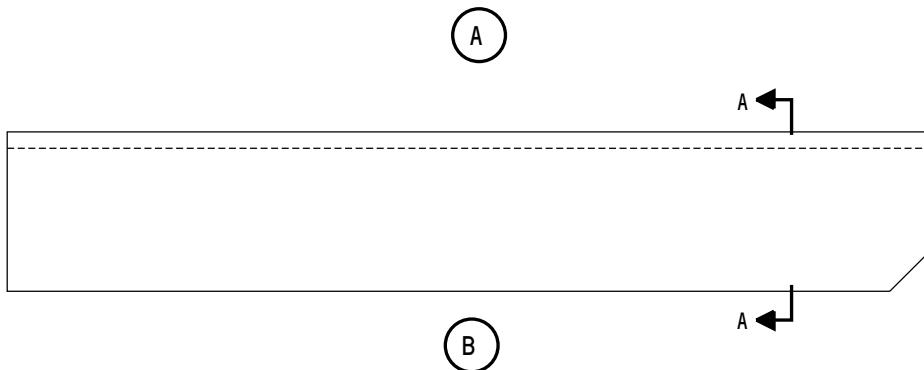


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STRUCTURAL REPAIR MANUAL



PLAN VIEW

PLY LAYUP FOR THE ANGLE



A-A

NOTES

- THE PLY DIRECTION IS THE WRAP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION OF THE PART.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THAT LOCATION. REFER TO THE ENGINEERING DRAWING FOR MORE INFORMATION.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F99219 S0006593005_V1

Ply Direction and Ply Sequence for Figure 2, Item [3]
Figure 5

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IDENTIFICATION 3
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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [3]		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP solid laminate as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP solid laminate as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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ALLOWABLE DAMAGE 1 - ELEVATOR STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the elevator structure shown in Elevator Location, Figure 101/ALLOWABLE DAMAGE 1 and Elevator Structure Allowable Damage, Figure 104/ALLOWABLE DAMAGE 1.

2. General

- A. Remove the damaged material from the aluminum parts as necessary.
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - B. After you remove the damage, do the procedures that follow for the aluminum parts:
 - (1) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
 - (2) Apply one layer of BMS 10-79, Type III, primer to the reworked areas. Refer to SOPM 20-44-04
 - C. Do an inspection of the damaged composite area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 and NDT, Part 1, 51-01-03 for inspection procedures.
- NOTE:** Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.
- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT. Refer to NDT, Part 1, 51-05-01 for the inspection procedures.
 - (2) Refer to Damage Definitions, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of the damage.
- D. Remove all contamination and water from the structure.
 - (1) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (2) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (3) Refer to 51-70-04 for the damage removal procedures.
 - E. Seal all permitted damage areas that are not more than one ply deep and agree with the allowable damage limits. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 Seal the damage with one of the two methods that follows:
 - (1) Make a temporary seal.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location.
 - (c) Make sure that the tape is in satisfactory condition at normal maintenance intervals.
 - (2) Make a permanent seal.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

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ALLOWABLE DAMAGE 1

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- (b) Apply one layer of BMS 10-79, Type III or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.
 - (c) Apply one layer of BMS 10-60, Type II enamel to the exterior surfaces of the areas sealed with epoxy resin. Refer to AMM 51-21-00/701.
- F. Seal all permitted damage areas that are more than one ply deep and agree with the allowable damage limits as follows:
- (1) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
 - (2) Make a temporary seal with aluminum foil tape (speed tape).
 - (3) Keep a record of the location.
 - (4) Repair the damage at or before 250 flight cycles from the time the seal was made.
- G. The definition of the words "other damage" as used in the allowable damage limits, does not include nicks, gouges, and scratches that do not cause carbon fiber damage and are sealed.
- H. Make sure that the elevator is balanced. Refer to 51-60-04 for the balance procedures.
- I. Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the facesheets of a honeycomb core area.
- J. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits.
- K. Refer to Elevator Structure Allowable Damage, Figure 104/ALLOWABLE DAMAGE 1 for the locations of the allowable damage zones.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
TYPE OF STRUCTURE	ZONE LOCATION	PARAGRAPH
LEADING EDGE RIBS, BALANCE HORN RIBS, BALANCE PANEL RIBS (ALUMINUM)	-----	4.A.
SOLID LAMINATE AREAS OF THE FRONT SPAR, REAR SPAR, RIBS, AND CLOSURE RIBS	ZONE 1 ZONE 2 ZONE 3 ZONE 4 ZONE 5 ZONE 6	4.B.
HONEYCOMB CORE AREAS OF THE FRONT SPAR, RIBS, AND INBOARD CLOSURE RIB	ZONE 1 ZONE 2 ZONE 3 ZONE 4 ZONE 5 ZONE 6	4.C.

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ALLOWABLE DAMAGE 1

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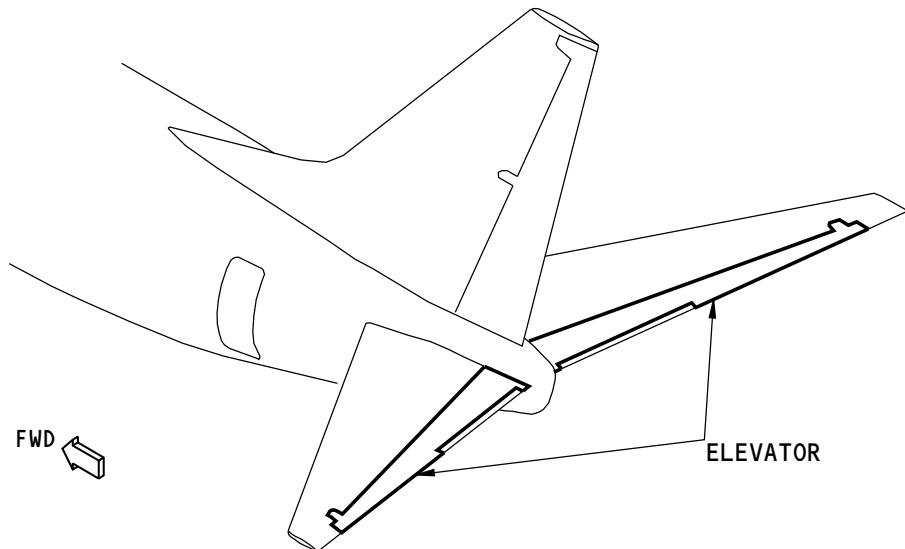
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Elevator Location
Figure 101

55-20-02

ALLOWABLE DAMAGE 1

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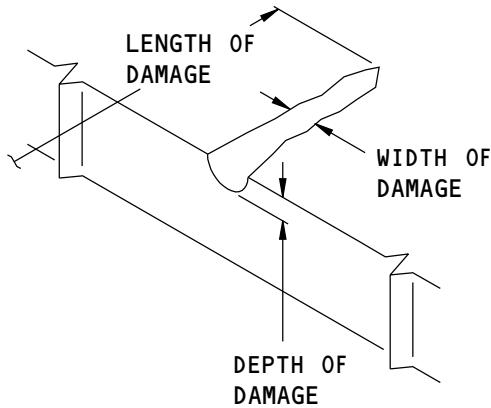
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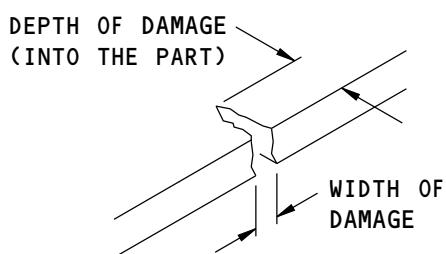
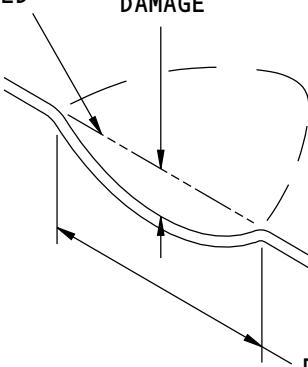


DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DEPTH OF
DAMAGE



DEFINITIONS FOR
EDGE DAMAGE

(C)

DEFINITIONS FOR
DENT DAMAGE

(B)

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Damage Definitions
Figure 102

55-20-02

ALLOWABLE DAMAGE 1

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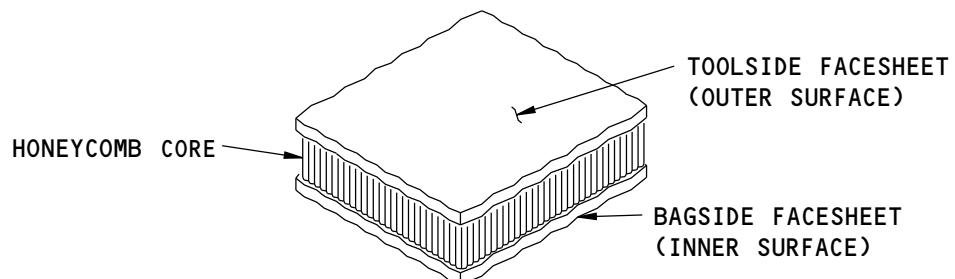
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Definitions of the Facesheets

Figure 103

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ALLOWABLE DAMAGE 1

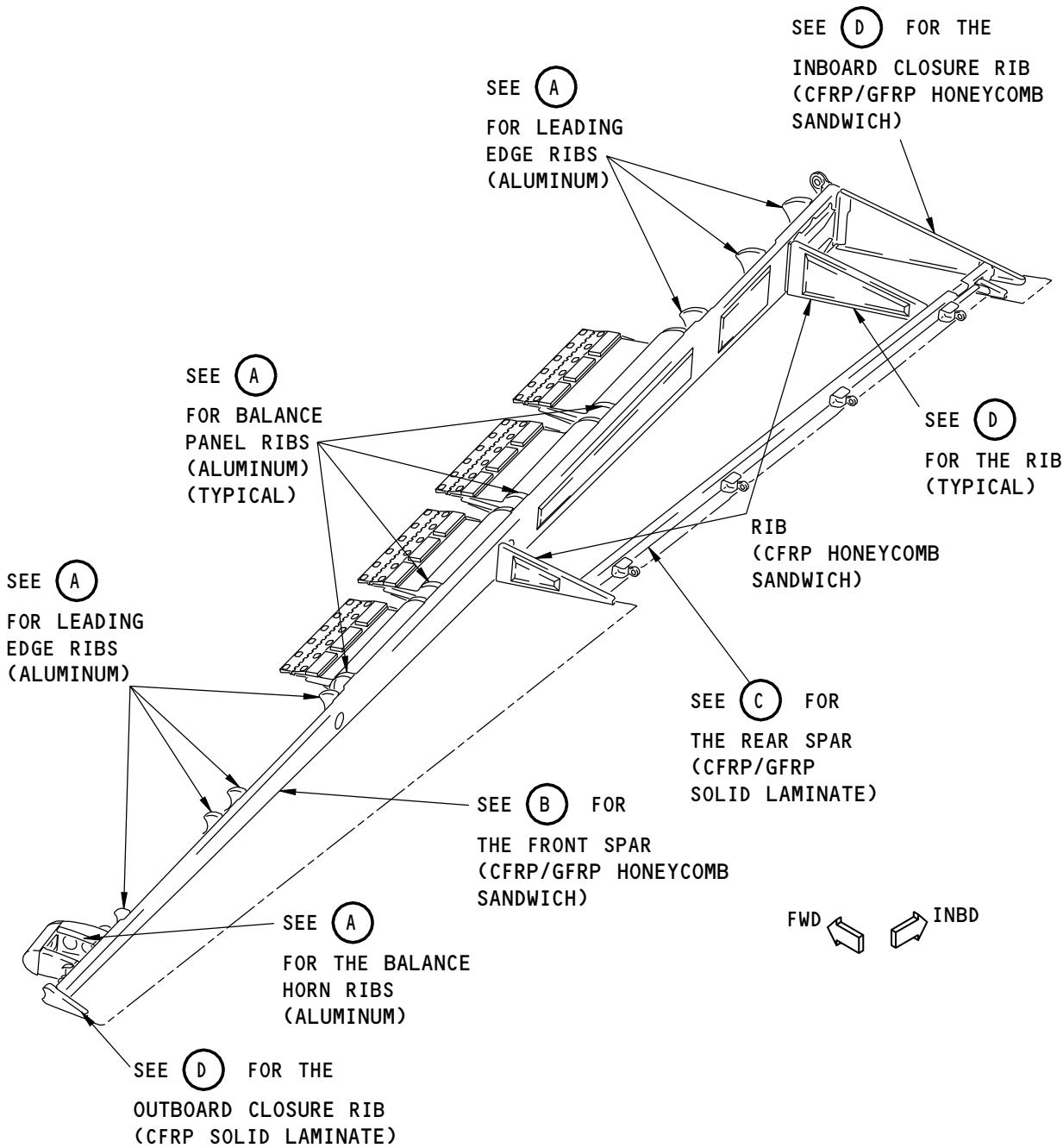
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

NOTE: REFER TO TABLE 101 FOR THE ALLOWABLE DAMAGE REFERENCES.

M63956 S0006593014_V1

**Elevator Structure Allowable Damage
Figure 104 (Sheet 1 of 9)**

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ALLOWABLE DAMAGE 1

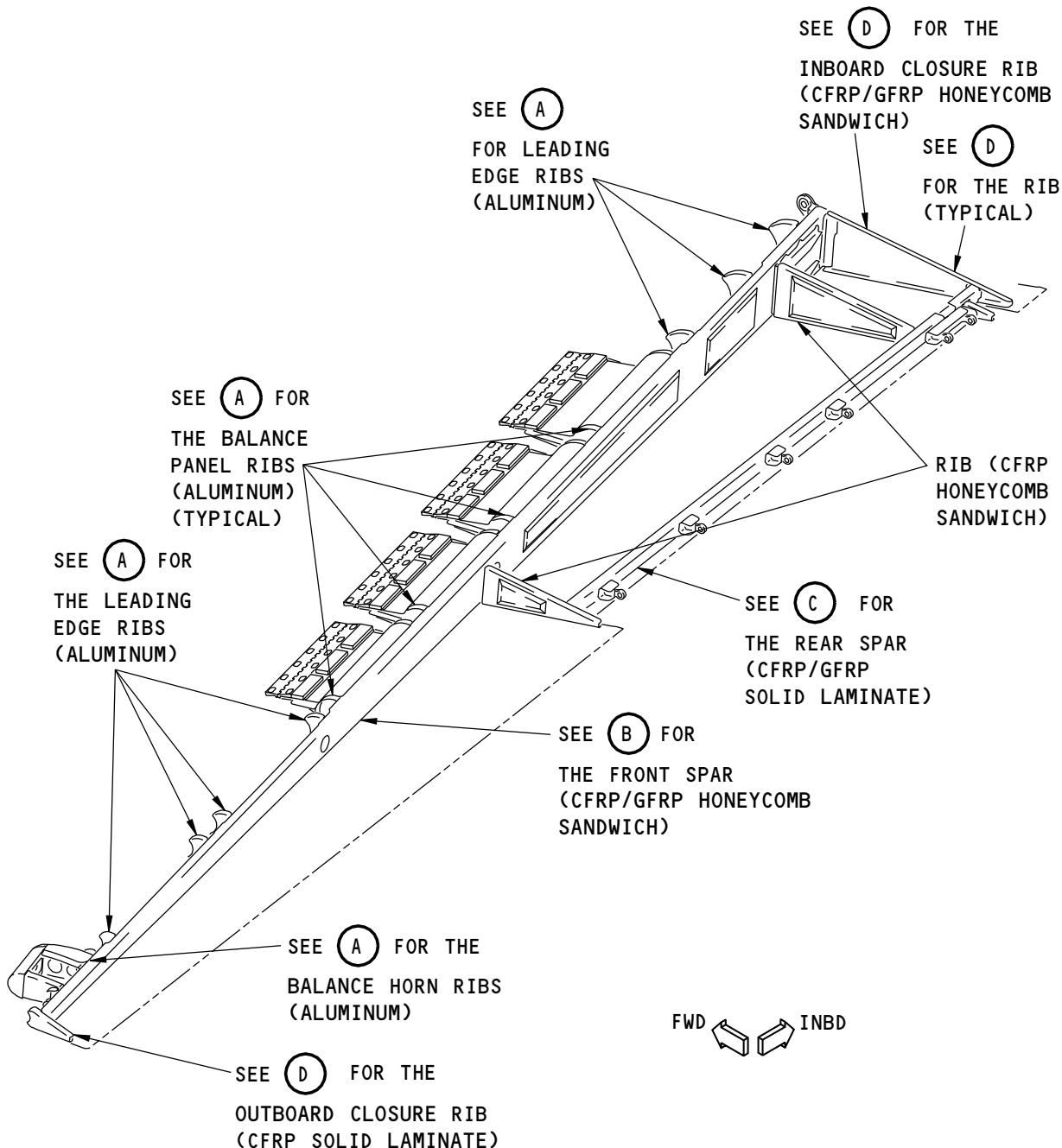
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(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

NOTE: REFER TO TABLE 101 FOR THE ALLOWABLE DAMAGE REFERENCES.

M63958 S0006593016_V1

Elevator Structure Allowable Damage
Figure 104 (Sheet 2 of 9)

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ALLOWABLE DAMAGE 1

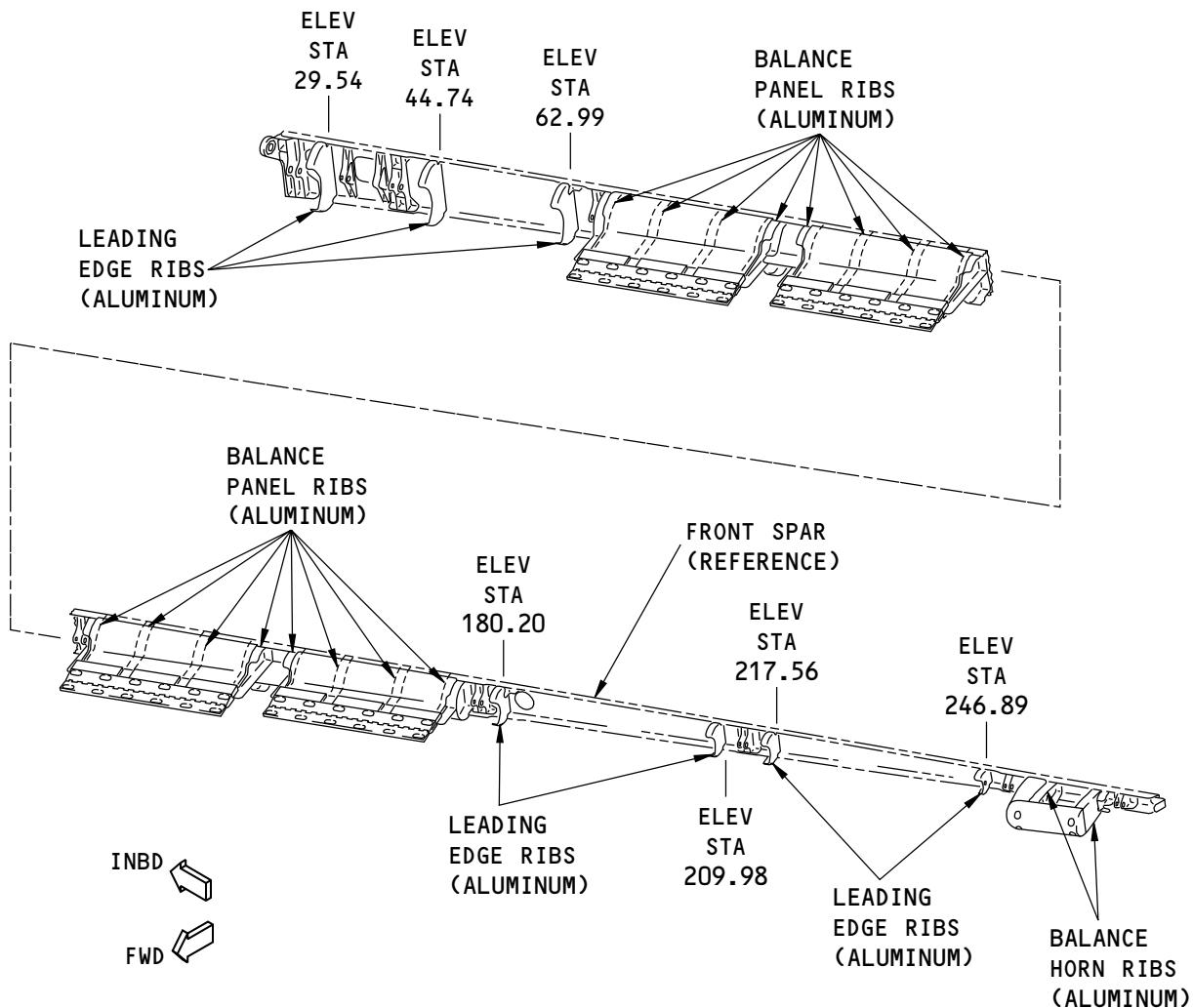
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LEADING EDGE ASSEMBLY

A

F99354 S0006593018_V1

Elevator Structure Allowable Damage
Figure 104 (Sheet 3 of 9)

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ALLOWABLE DAMAGE 1

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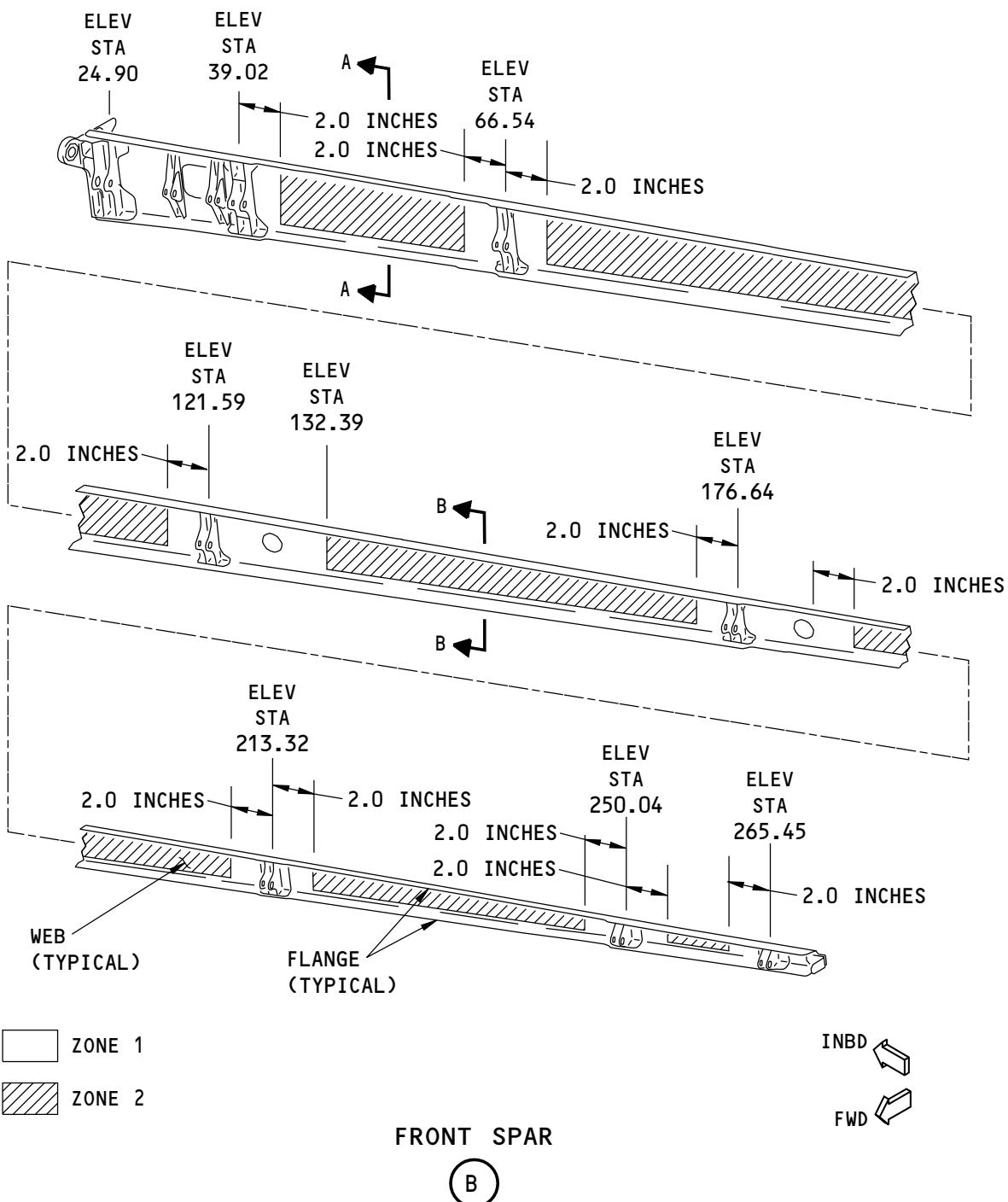
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Elevator Structure Allowable Damage
Figure 104 (Sheet 4 of 9)

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ALLOWABLE DAMAGE 1

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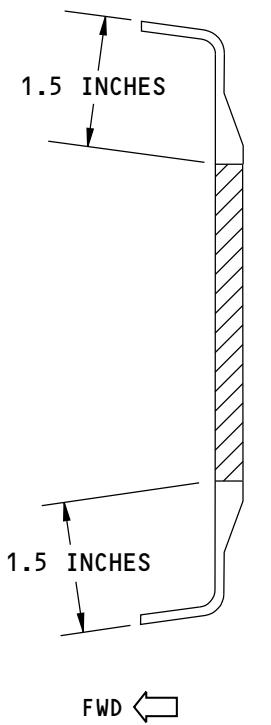
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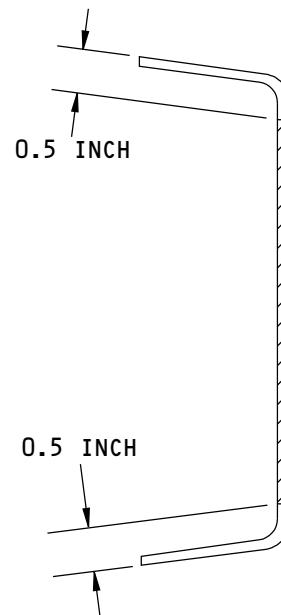


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CROSS-SECTION OF THE FRONT SPAR WHERE HONEYCOMB CORE IS LOCATED IN THE WEB

A-A



CROSS-SECTION OF THE FRONT SPAR WHERE THE WEB IS SOLID LAMINATE

B-B



ZONE 1



ZONE 2

G43643 S0006593022_V1

Elevator Structure Allowable Damage
Figure 104 (Sheet 5 of 9)

55-20-02

ALLOWABLE DAMAGE 1

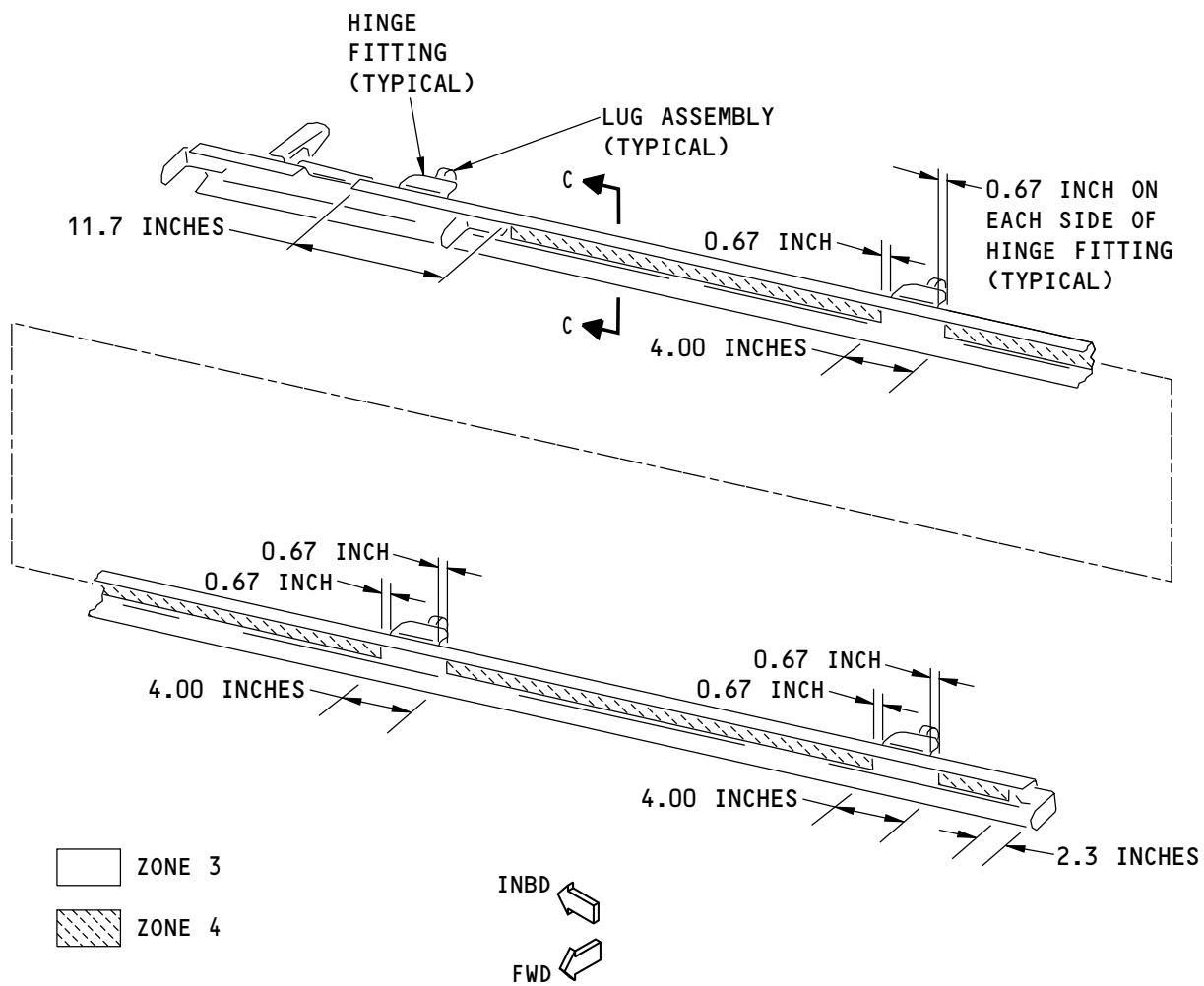
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

REAR SPAR

C

F99659 S0006593024_V1

Elevator Structure Allowable Damage
Figure 104 (Sheet 6 of 9)

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ALLOWABLE DAMAGE 1

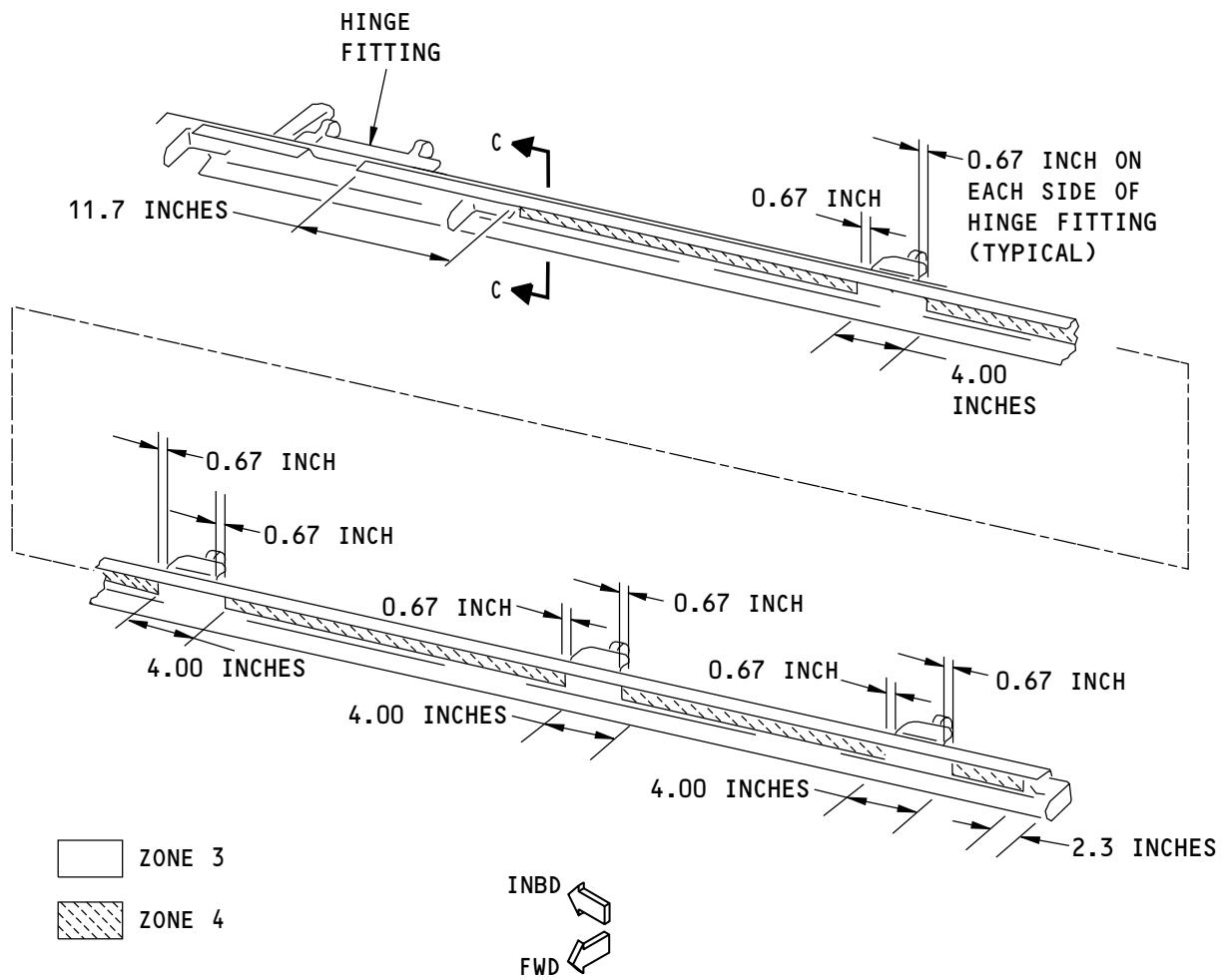
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(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

REAR SPAR

C

N55457 S0006593026_V1

Elevator Structure Allowable Damage
Figure 104 (Sheet 7 of 9)

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ALLOWABLE DAMAGE 1

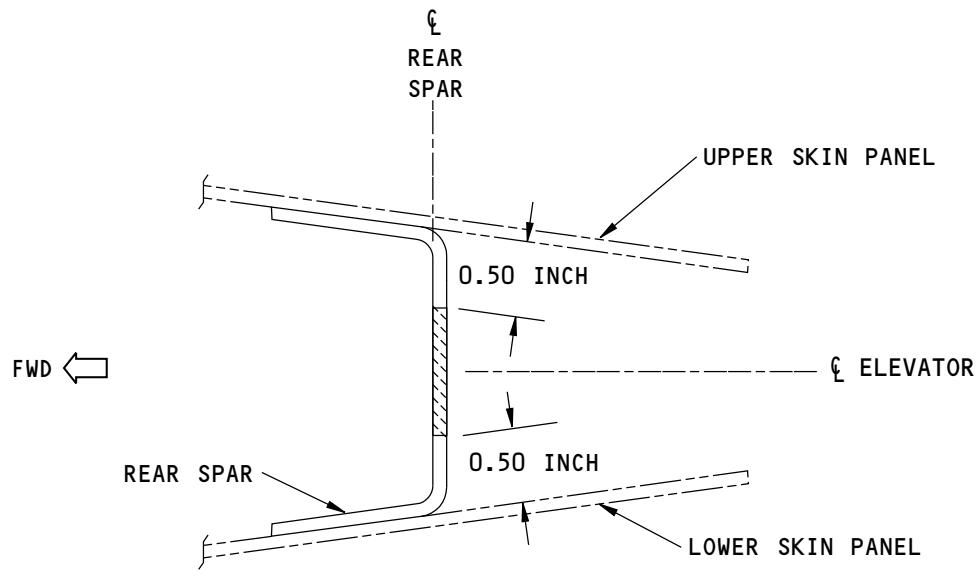
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ZONE 3

ZONE 4

C-C

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Elevator Structure Allowable Damage
Figure 104 (Sheet 8 of 9)

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ALLOWABLE DAMAGE 1

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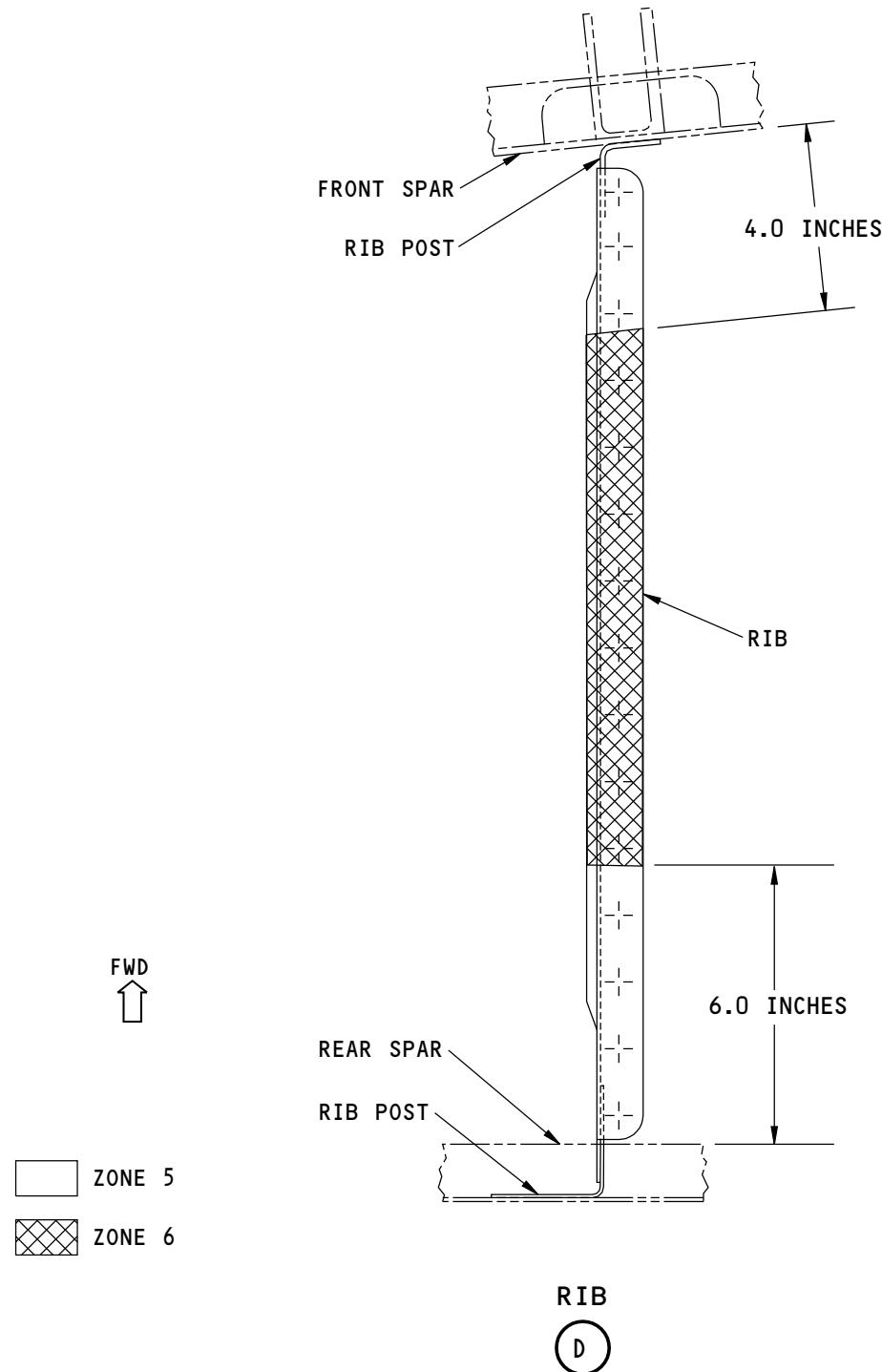
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Elevator Structure Allowable Damage
Figure 104 (Sheet 9 of 9)

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-60-04	ELEVATOR BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

A. Leading Edge Ribs, Balance Horn Ribs, Balance Panel Ribs - Aluminum

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A, B, and F .
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A, B, C, E, and F.
 - (b) Damage that does not go through the clad surface is permitted.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Detail D.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum diameter of 0.25 inch
 - (b) A minimum of 4D away from the edge of a hole or other damage. D is equal to the maximum dimension of the damage
 - (c) A minimum of 2D away from the edge of the part
 - (d) Filled with a 2117-T3 or 2117-T4 aluminum rivet.
 - 1) Install the rivet without sealant.

B. Front Spar, Rear Spar, Ribs, and Closure Ribs - Solid Laminate Areas - All Zones

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum of 0.50 inch in length

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ALLOWABLE DAMAGE 1

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- (c) A maximum of 0.25 inch in width
 - (d) A minimum of 3.0 inches away from a hole
 - (e) A minimum of 1.5 inches away from the edge of the part
 - (f) A minimum of 6.0 inches away from other damage.
- (3) Dents that do not cause damage to the carbon fibers are permitted if they are:
- (a) A maximum diameter of 0.50 inch
 - (b) A maximum of one ply in depth
- NOTE:** Use the limits for holes and punctures if there is fiber damage or the dent depth is more than one ply.
- (c) A minimum of 3.0 inches away from a hole
 - (d) A minimum of 1.5 inch away from the edge of the part
 - (e) A minimum of 6.0 inches away from other damage.
- (4) Holes and Punctures are permitted if they are:
- (a) A maximum diameter of 0.25 inch
 - (b) A minimum of 6D away from the edge of a hole or other damage. D is equal to the maximum dimension of the damage
 - (c) A minimum of 2D away from the edge of the part.
- (5) Delaminations are permitted as shown in Allowable Damage Limits for the Front Spar, Rear Spar, Ribs, and Closure Ribs - Solid Laminate Areas - Zones 2, 4, and 6, Figure 106/ ALLOWABLE DAMAGE 1, if they are:
- (a) A maximum diameter of 0.50 inch
 - (b) A maximum of one ply in depth
- NOTE:** Use the limits for holes and punctures if the damage is more than one ply in depth.
- (c) A minimum of 6D away from the edge of a hole or other damage. D is equal to the maximum dimension of the damage
 - (d) A minimum of 2D away from the edge of the part.
- (6) Edge damage is permitted if it is:
- (a) A maximum of one ply in depth
 - (b) A maximum of 0.25 inch in width
 - (c) A minimum of 0.50 inch away from the edge of a fastener hole.
- C. Front Spar, Ribs, and Inboard Closure Rib - Honeycomb Core Areas - All Zones
- (1) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
- (a) A maximum of one ply in depth
- NOTE:** Use the limits for holes and punctures if the damage is more than one ply in depth.
- (b) A maximum length of 0.5 inch
 - (c) A maximum width of 0.25 inch

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ALLOWABLE DAMAGE 1

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- (d) A minimum distance away from the edge of a hole, part edge, or other damage of 3.0 inches.
- (3) Dents are permitted if they are:
 - (a) A maximum diameter of 0.5 inch
 - (b) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if there is fiber damage or the dent depth is more than one ply.
- (c) A minimum distance away from the edge of a hole, part edge, or other damage of 6D. Refer to Allowable Damage Limits for the Front Spar, Ribs, and Inboard Closure Rib - Honeycomb Core Areas - Zones 1, 3, and 5, Figure 107/ALLOWABLE DAMAGE 1 for the permitted damage and the value of D.
- (4) Holes and Punctures are not permitted.
- (5) Delaminations are not permitted.

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ALLOWABLE DAMAGE 1

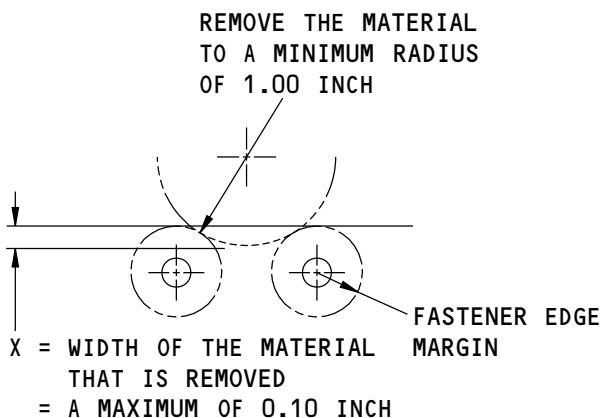
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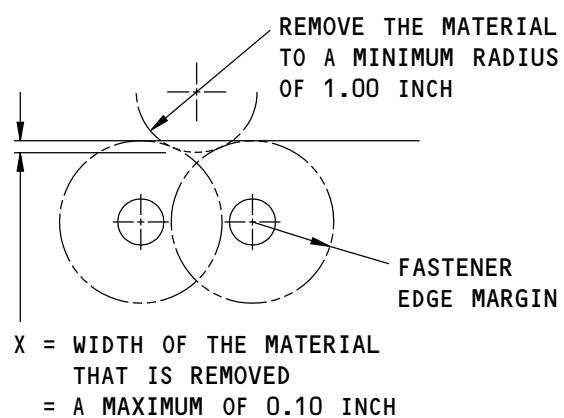
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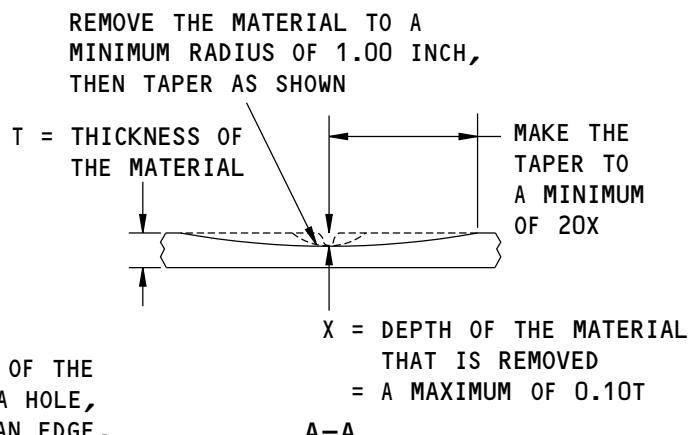
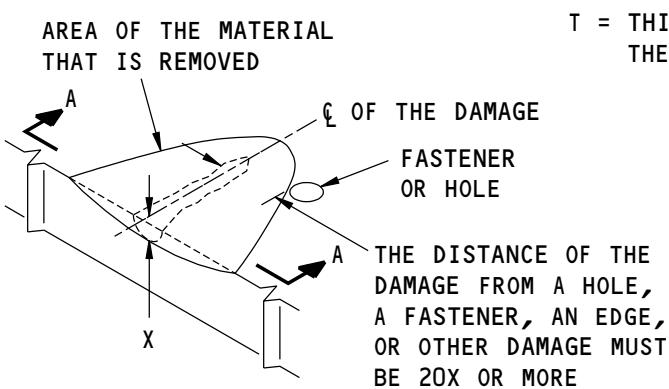
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

A



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

C

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**Allowable Damage Limits
Figure 105 (Sheet 1 of 3)**

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ALLOWABLE DAMAGE 1

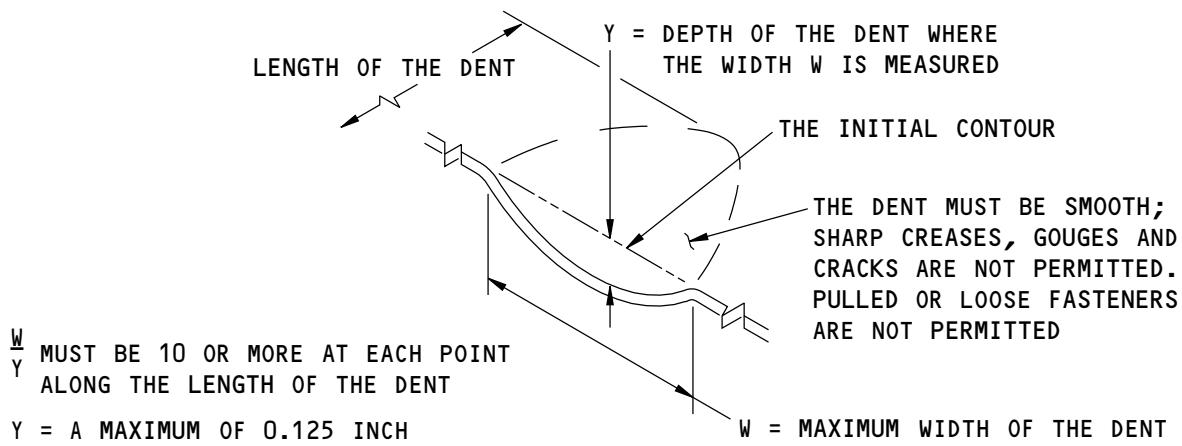
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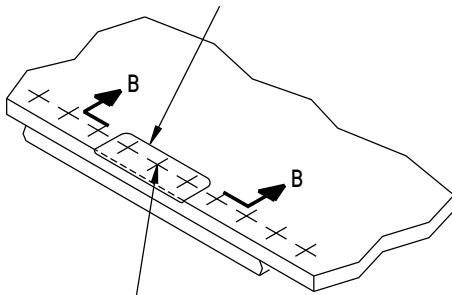
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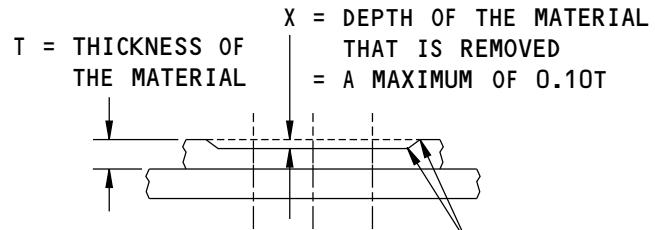
DENT THAT IS PERMITTED

(D)

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN ALL GROUPS OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVE THE FASTENERS BEFORE THE DAMAGE IS REMOVED. INSTALL THE FASTENERS AFTER THE DAMAGE IS REMOVED



MAKE THE CONTOUR SMOOTH TO A MINIMUM RADIUS OF 0.50 INCH (TYPICAL)

REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B

(E)

F99771 S0006593030_V1

Allowable Damage Limits
Figure 105 (Sheet 2 of 3)

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ALLOWABLE DAMAGE 1

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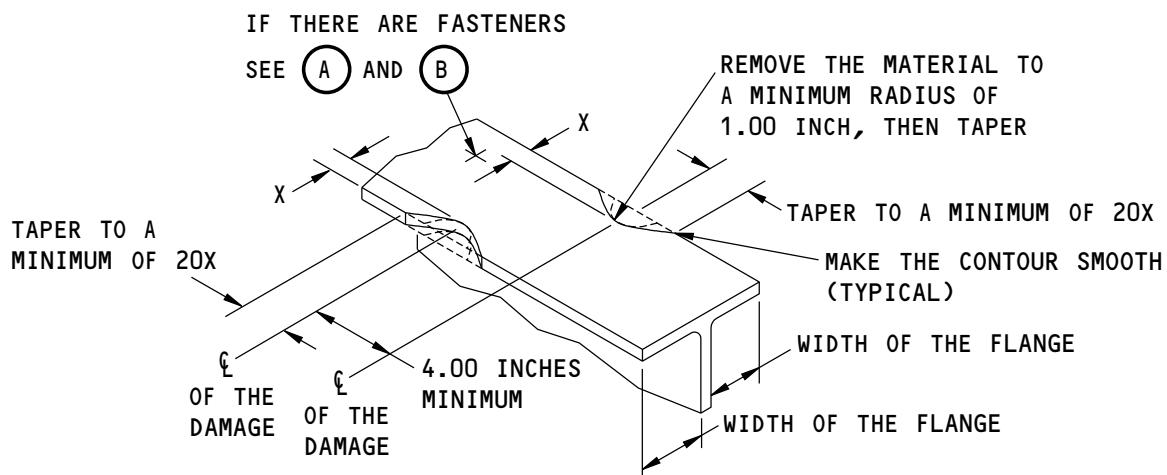
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STRUCTURAL REPAIR MANUAL



X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE



F99774 S0006593031_V1

Allowable Damage Limits
Figure 105 (Sheet 3 of 3)

55-20-02

ALLOWABLE DAMAGE 1

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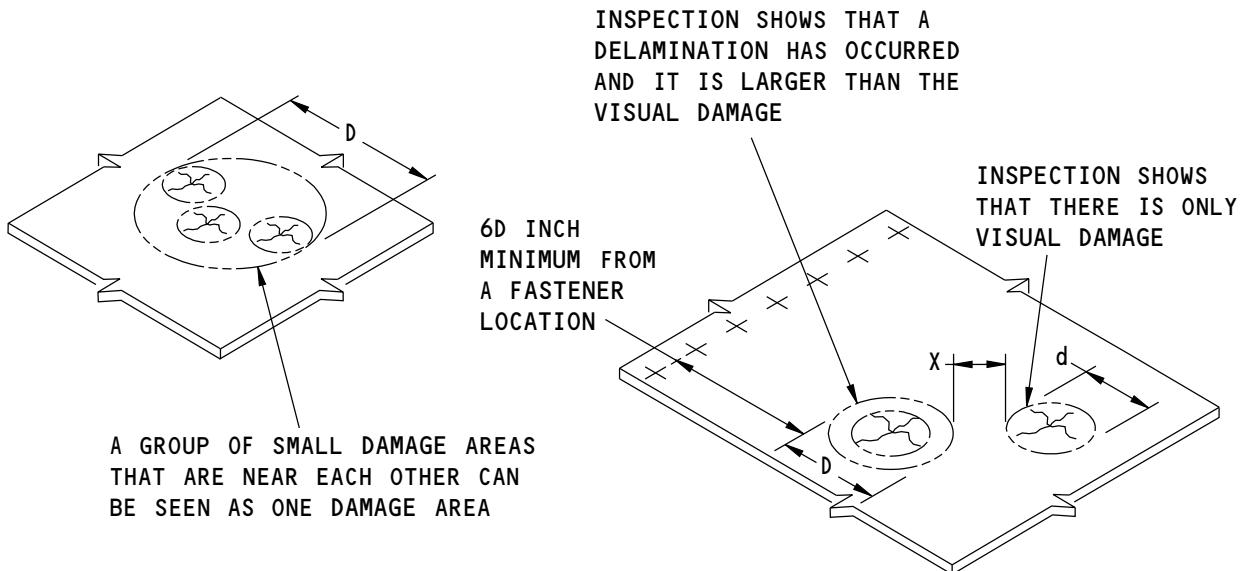
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STRUCTURAL REPAIR MANUAL



NOTE: TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES.
REFER TO NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND CAN BE A MAXIMUM OF 0.50 INCH.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

X IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

THE MINIMUM X THAT IS PERMITTED IS 6D.

DAMAGE THAT IS PERMITTED TO COMPOSITE PANELS

F99787 S0006593032_V1

Allowable Damage Limits for the Front Spar, Rear Spar, Ribs, and Closure Ribs - Solid Laminate Areas -
Zones 2, 4, and 6
Figure 106

55-20-02

ALLOWABLE DAMAGE 1

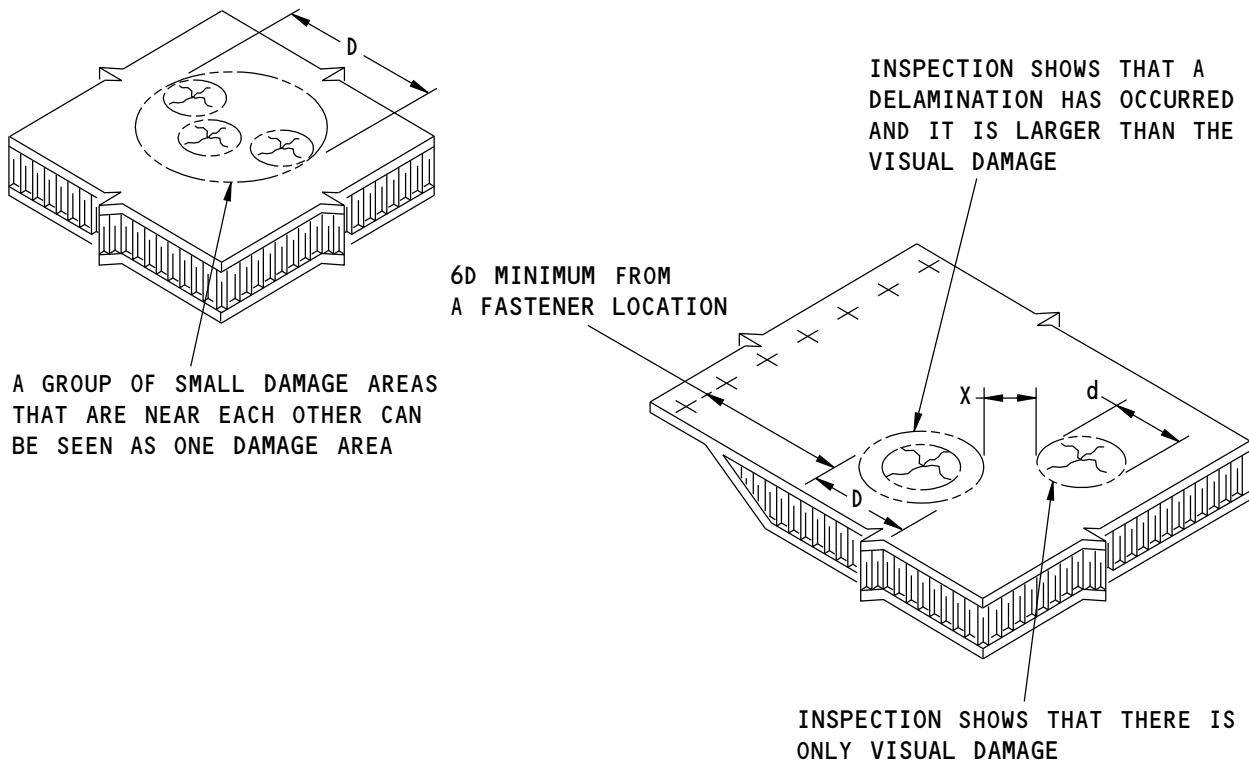
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STRUCTURAL REPAIR MANUAL



NOTE: TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES.
REFER TO NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND CAN BE A MAXIMUM OF 0.5 INCH.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

X IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

THE MINIMUM X THAT IS PERMITTED IS 6D.

DAMAGE THAT IS PERMITTED TO COMPOSITE PANELS

F99794 S0006593033_V1

**Allowable Damage Limits for the Front Spar, Ribs, and Inboard Closure Rib - Honeycomb Core Areas -
Zones 1, 3, and 5**
Figure 107

55-20-02

ALLOWABLE DAMAGE 1

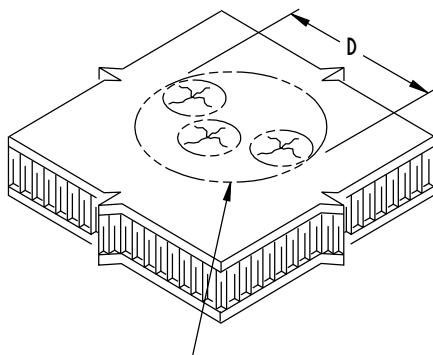
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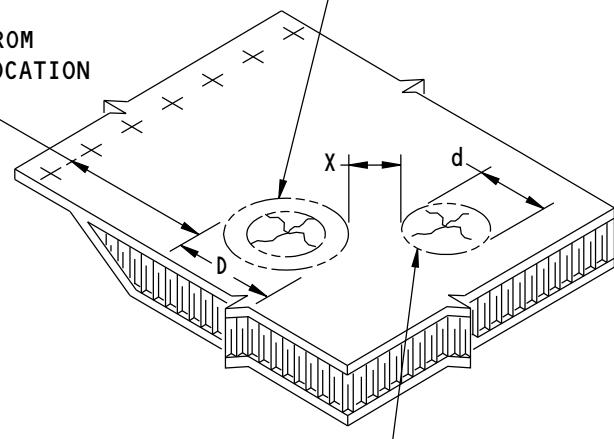


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STRUCTURAL REPAIR MANUAL



A GROUP OF SMALL DAMAGE AREAS THAT ARE NEAR EACH OTHER CAN BE SEEN AS ONE DAMAGE AREA

6D MINIMUM FROM A FASTENER LOCATION



INSPECTION SHOWS THAT A DELAMINATION HAS OCCURRED AND IT IS LARGER THAN THE VISUAL DAMAGE

INSPECTION SHOWS THAT THERE IS ONLY VISUAL DAMAGE

NOTE: TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES.
REFER TO NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND CAN BE A MAXIMUM OF 0.50 INCHES.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

X IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

THE MINIMUM X THAT IS PERMITTED IS 6D.

DAMAGE THAT IS PERMITTED TO COMPOSITE PANELS

F99797 S0006593034_V1

**Allowable Damage Limits for the Front Spar, Ribs, and Inboard Closure Rib - Honeycomb Core Areas -
Zones 2, 4, and 6**
Figure 108

55-20-02

ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - ELEVATOR TAB SPAR

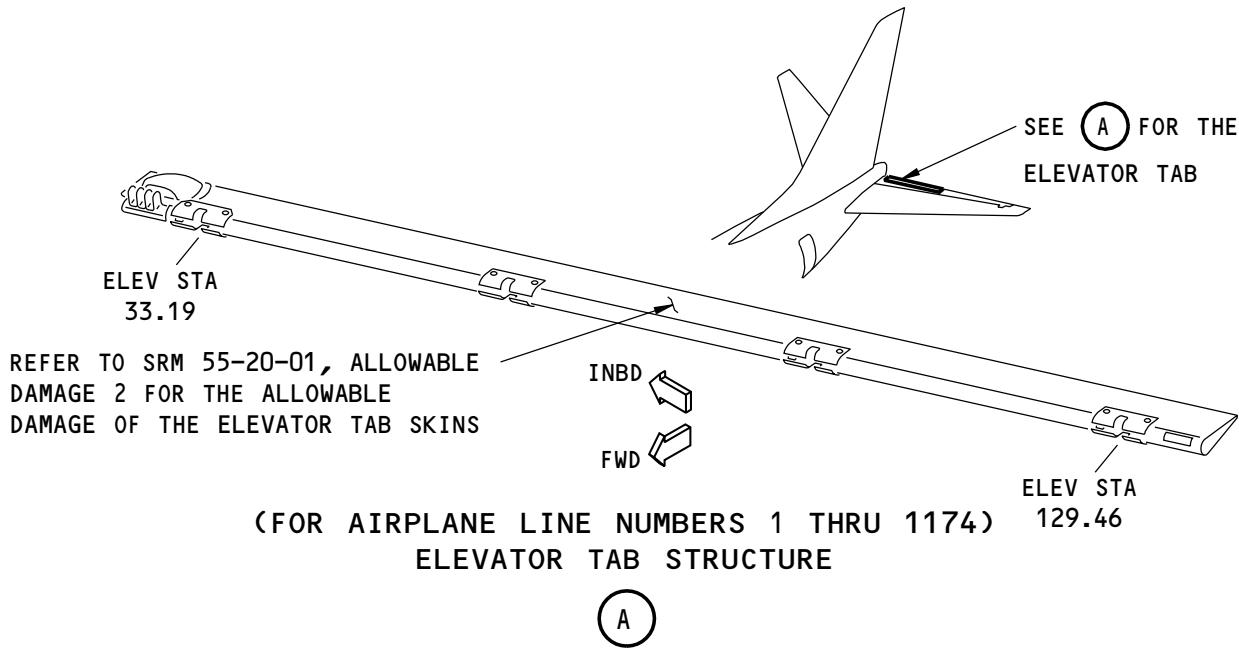
1. Applicability

- A. This subject is applicable for damage to the elevator tab spar shown in Elevator Tab Spar Allowable Damage, Figure 101/ALLOWABLE DAMAGE 2.

NOTE: This Allowable Damage Subject is applicable to airplane line numbers 1 through 1174 that have not been modified as given in Service Bulletins 737-55-1080 and 737-55-1082. Refer to ALLOWABLE DAMAGE 3 for the airplanes with line numbers equal to or greater than 1175 and for all the other airplanes that have been modified as given in Service Bulletins 737-55-1080 and 737-55-1082.

2. General

- A. Damage is not permitted. Refer to 55-20-02, REPAIR 2, for repairs to the elevator tab spar.



G00083 S0006593036_V1

**Elevator Tab Spar Allowable Damage
Figure 101**

3. References

Reference	Title
55-20-02, REPAIR 2	Elevator Tab Spar

4. Allowable Damage Limits

- A. Damage is not permitted. Refer to 55-20-02, REPAIR 2, for repairs to the elevator tab spar.

55-20-02

ALLOWABLE DAMAGE 2

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**ALLOWABLE DAMAGE 3 - ELEVATOR TAB SPAR FOR AIRPLANE LINE NUMBERS 1175 AND ON
AND LINE NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080
AND 737-55-1082**

1. Applicability

- A. This subject gives the allowable damage limits for the elevator tab spar shown in Elevator Tab Spar Allowable Damage, Figure 101/ALLOWABLE DAMAGE 3.

NOTE: THIS ALLOWABLE DAMAGE IS APPLICABLE TO AIRPLANE LINE NUMBERS 1175 AND ON AND LINE NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-02, ALLOWABLE DAMAGE 2 FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082.

2. General

- A. Do an inspection of the damaged composite area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Nondestructive Inspection (NDI) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) Refer to Damage Definitions, Figure 102/ALLOWABLE DAMAGE 3, Details A, B, and C for the definitions of the length, width, and depth of damage.

- B. Remove all the contamination and water from the structure.

- (1) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

- (2) Refer to 51-70-04 for the removal procedures.

- C. Seal all permitted damage areas that are not more than one ply deep. Refer to the allowable damage limits. Seal the damage with one of the two methods that follows:

- (1) Make a temporary seal.

- (a) Apply aluminum foil tape (speed tape).
(b) Keep a record of the location.
(c) Make sure the tape is in satisfactory condition at normal maintenance intervals.

- (2) Make a permanent seal.

- (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given 51-70-08.
(b) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.
1) Apply one layer of BMS 10-60, Type II enamel to the exterior surfaces of the areas sealed with epoxy resin. Refer to AMM 51-21-00/701.

- D. Seal all permitted damaged areas that are more than one ply deep. Refer to the allowable damage limits. Seal the damage as follows:

- (1) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
(2) Make a temporary seal with aluminum foil tape (speed tape).
(3) Keep a record of the location.
(4) Repair the damage before 250 flight cycles has occurred.

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ALLOWABLE DAMAGE 3

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- E. The definition of the words "other damage" as used in the allowable damage limits, does not include nicks, gouges, and scratches that do not cause carbon fiber damage and are sealed.
- F. Make sure the elevator tab is balanced. Refer to 51-61-06 for the balance procedures.

55-20-02

ALLOWABLE DAMAGE 3

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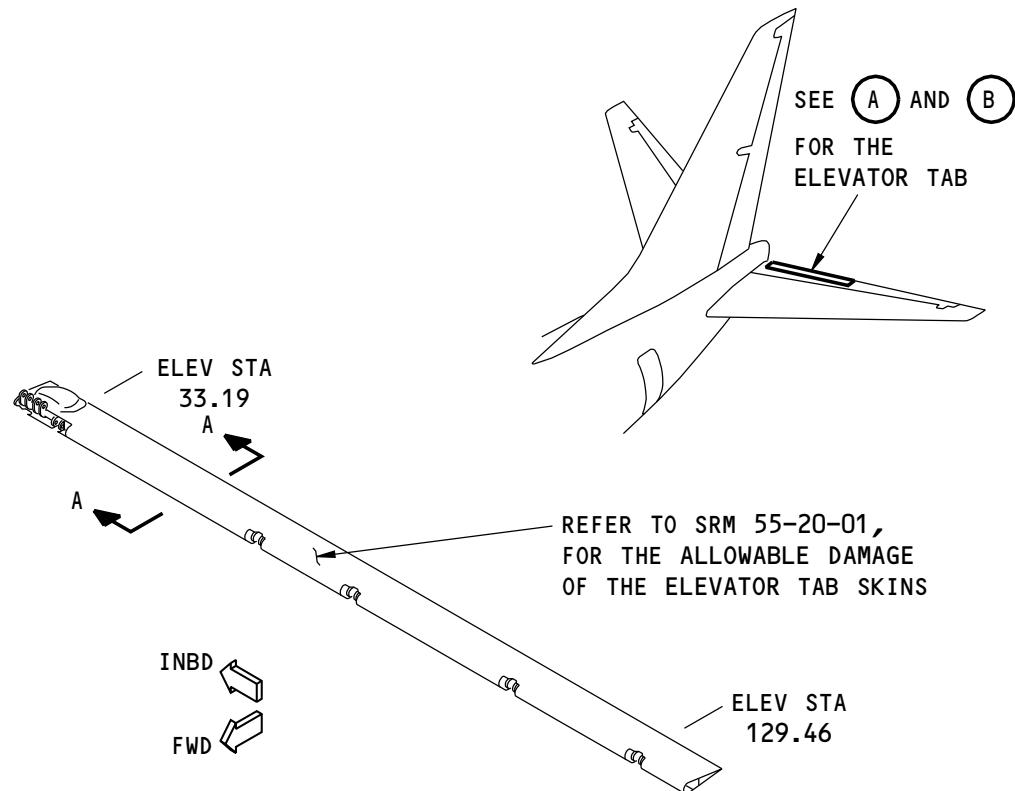
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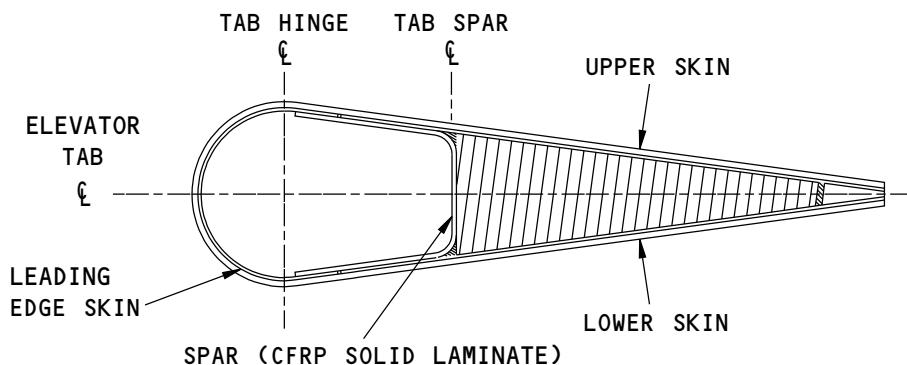


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ELEVATOR TAB STRUCTURE

(A)



(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

A-A

M97116 S0006593040_V1

Elevator Tab Spar Allowable Damage
Figure 101 (Sheet 1 of 2)

55-20-02

ALLOWABLE DAMAGE 3

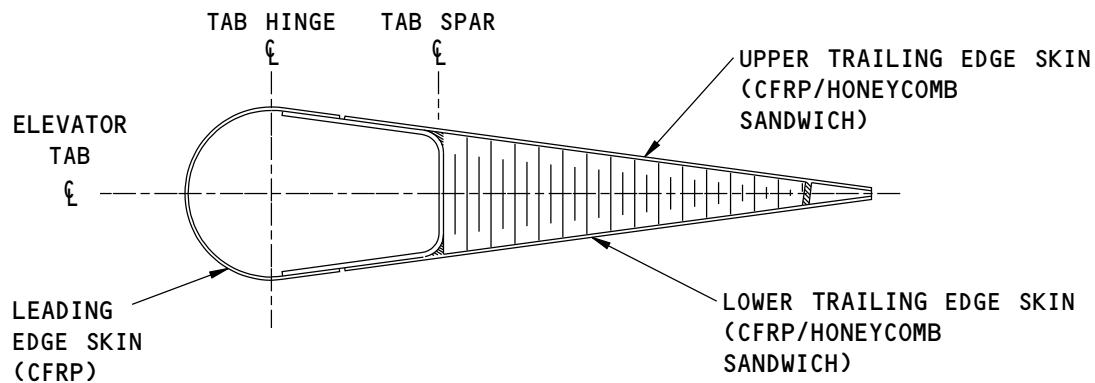
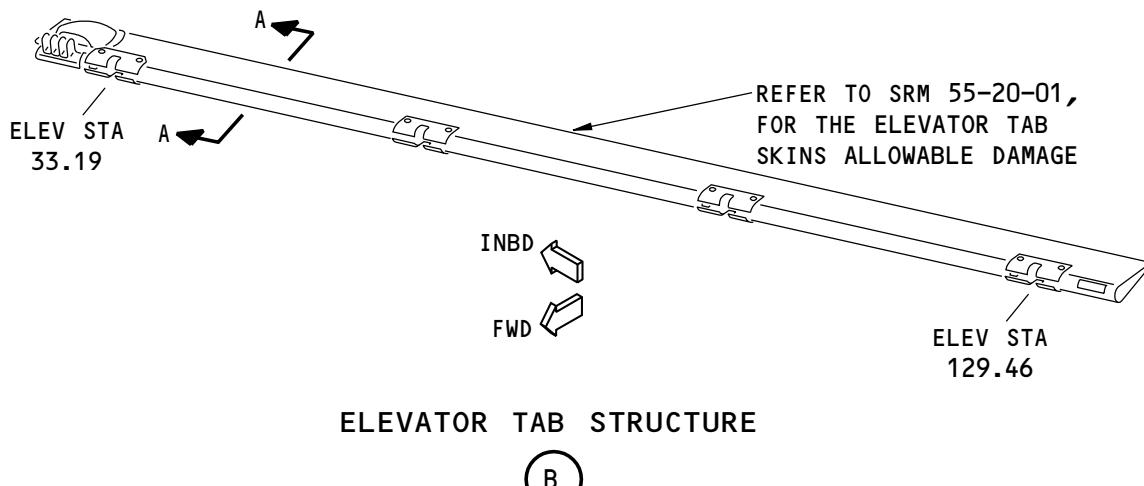
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(FOR AIRPLANE LINE NUMBERS 1 THRU 1174
WITH COMPLETION OF SERVICE BULLETINS 737-55-1080
AND 737-55-1082)

A-A

M97126 S0006593041_V1

Elevator Tab Spar Allowable Damage
Figure 101 (Sheet 2 of 2)

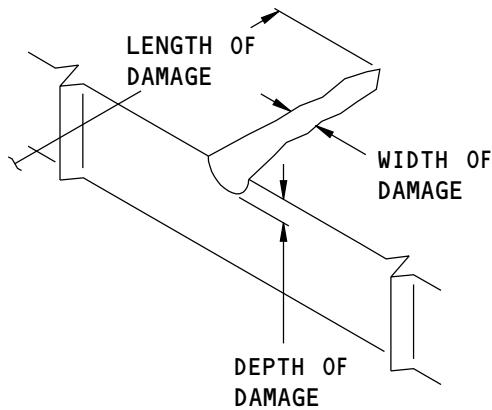
55-20-02

ALLOWABLE DAMAGE 3

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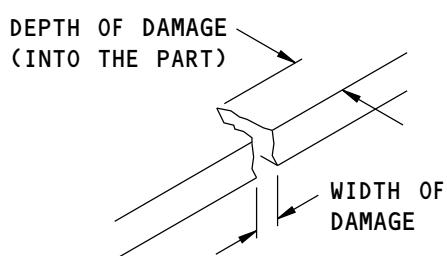
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**DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE**

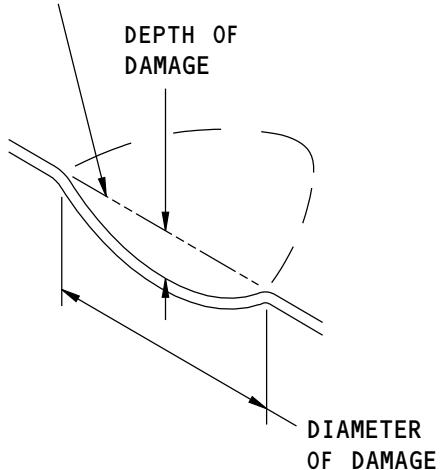
(A)



**DEFINITIONS FOR
EDGE DAMAGE**

(C)

THE CONTOUR
BEFORE THE
DENT OCCURRED



**DEFINITIONS FOR
DENT DAMAGE**

(B)

N57606 S0006593042_V1

**Damage Definitions
Figure 102**

55-20-02

ALLOWABLE DAMAGE 3

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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-61-06	ELEVATOR TAB BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
55-20-02	ELEVATOR STRUCTURE
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Allowable Damage Limits

- A. Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- B. Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
 - (1) A maximum of one ply in depth.
NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (2) A maximum of 0.50 inch in length
 - (3) A minimum of 1.00 inch away from a hole
 - (4) A minimum of 1.0 inch away from the edge of a part
 - (5) A minimum of 3.0 inches away from other damage
 - (6) A minimum of 1.0 inch away from a hinge or actuator location.
- C. Dents are permitted if they are:
 - (1) A maximum diameter of 0.50 inch
 - (2) A minimum of 1.0 inch away from the edge of a hole.
 - (3) A minimum of 1.0 inch away from the edge of the part.
 - (4) A minimum of 3.0 inches away from the edge of other damage.
- D. Holes and Punctures are permitted if they are:
 - (1) A maximum diameter of 0.30 inch
 - (2) A minimum of 3.0 inches away from other damage.
 - (3) A minimum of 1.0 inch away from the edge of the part
 - (4) A minimum of 1.0 inch away from a hinge or actuator location.
- E. Delaminations are permitted if they are:
 - (1) A maximum of 0.50 inch in diameter
 - (2) A maximum of 1 damage area for each 144 square inches of skin area
 - (3) A minimum of 1.0 inch away from a hinge or actuator location or part edge.

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ALLOWABLE DAMAGE 3

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- (4) A minimum of 3.0 inches away from the edge of other damage.
- F. Edge damage is permitted if it is:
- (1) A maximum of 2.0 inches in length
 - (2) A maximum of 1 ply in depth
 - (3) A maximum of 0.25 inch in width
 - (4) A minimum of 3.0 inches away from other damage.
 - (5) Sealed as given in Paragraph 2.C./ALLOWABLE DAMAGE 3

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ALLOWABLE DAMAGE 3

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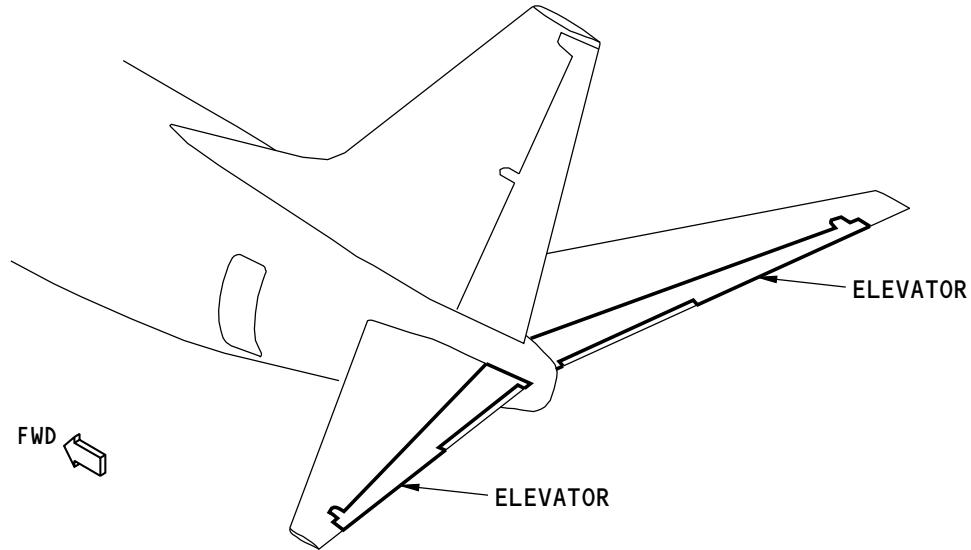


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REPAIR 1 - ELEVATOR STRUCTURE

1. Applicability

- A. Repair 1 is applicable to the composite parts of the elevator structure shown in Elevator Location, Figure 201/REPAIR 1.



G03334 S0006593045_V1

Elevator Location
Figure 201

2. General

- A. Repair 1 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the elevator, as necessary. Refer to AMM 27-31-11/401.
- C. Remove the skin panels, as necessary, to get access to the spars and ribs.
- D. Remove the fittings or leading edge ribs from the spars, as necessary, to get access to the spars. Refer to SOPM 20-10-08.
- E. Refer to Definitions of the Facesheets, Figure 202/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.
- F. Do an inspection of the damaged composite area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 and NDT, Part 1, 51-01-03 for inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT. Refer to NDT, Part 1, 51-05-01 for the inspection procedures.
- (2) Refer to Damage Definitions, Figure 203/REPAIR 1, Details A, B, and C, f for the definitions of the length, width, and depth of the damage.

55-20-02

REPAIR 1
Page 201

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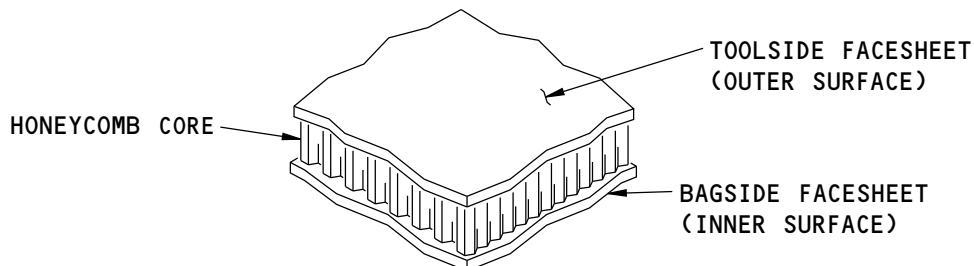
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- G. Do the repair as given in Paragraph 4./REPAIR 1
- H. Install the fittings or leading edge ribs on the spars if they were removed.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Apply BMS 5-95 sealant to all parts that connect the fittings. Refer to 51-20-05.
- I. Refer to Elevator Structure Repairs, Figure 204/REPAIR 1 for the locations of the repair zones.
- J. Install the skin panels, as applicable. Refer to 51-40-02 for the fastener installation procedures.
- K. Make sure the elevator is balanced after all repairs are complete. Refer to 51-60-04.
- L. Install the elevator, as applicable. Refer to AMM 27-31-11/401.



G03351 S0006593046_V1

Definitions of the Facesheets
Figure 202

55-20-02

REPAIR 1
Page 202

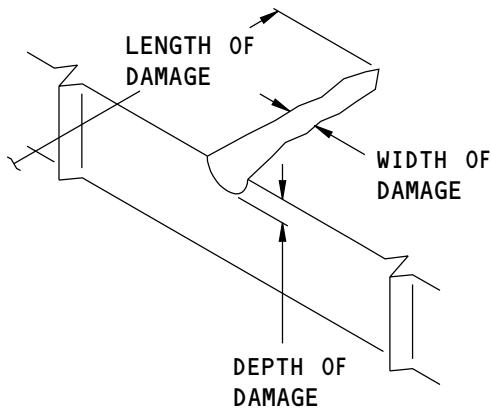
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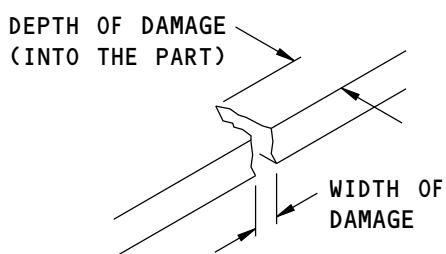
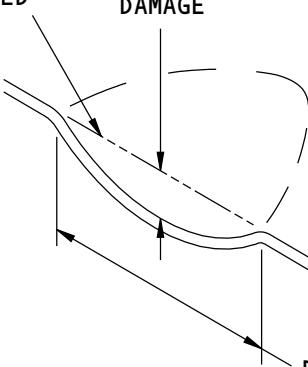


DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DEPTH OF
DAMAGE



DEFINITIONS FOR
EDGE DAMAGE

(C)

G03042 S0006593047_V1

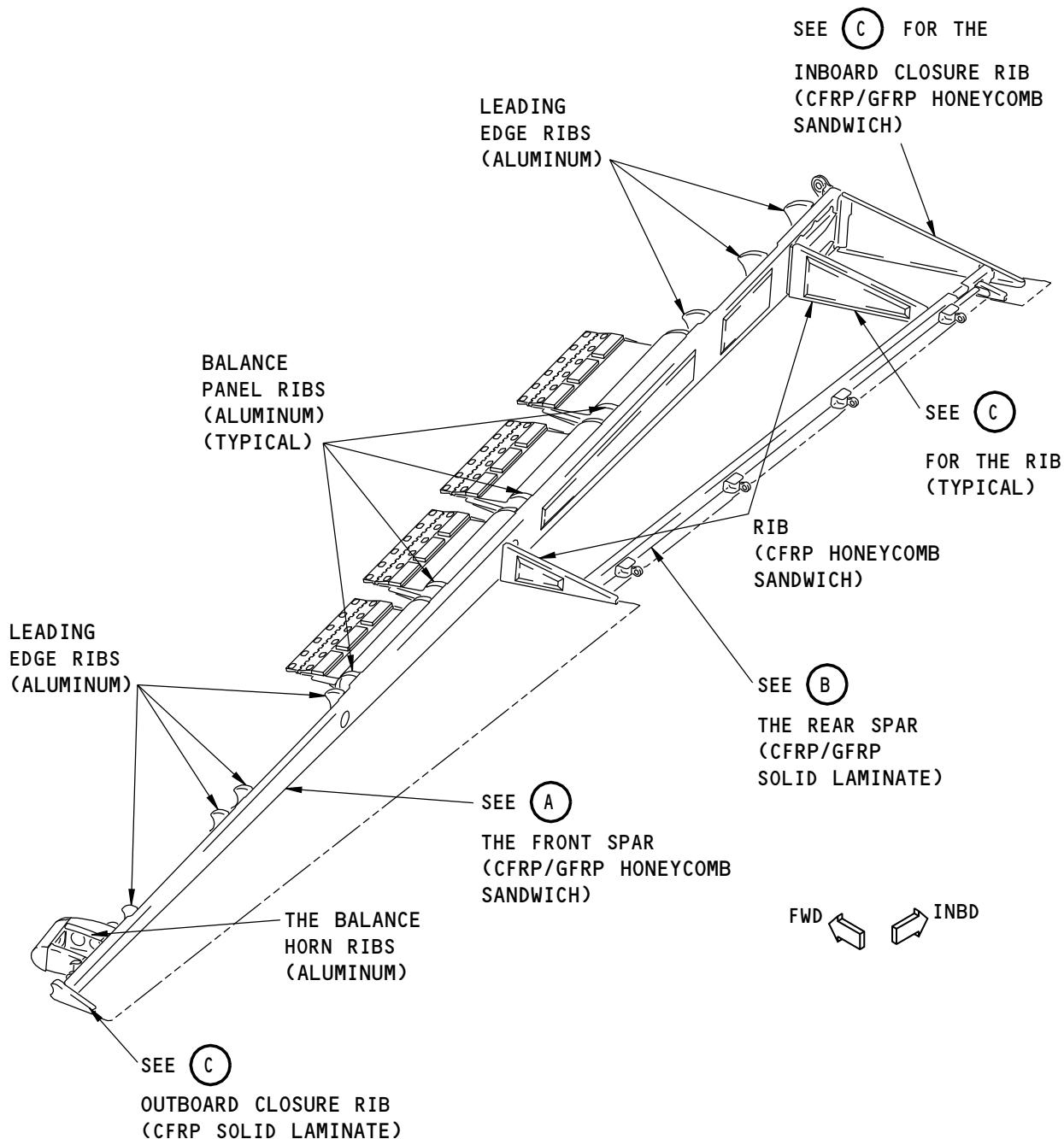
Damage Definitions
Figure 203

55-20-02

REPAIR 1
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

NOTE: REFER TO TABLE 201 FOR THE REPAIR REFERENCES.

M63959 S0006593049_V1

Elevator Structure Repairs
Figure 204 (Sheet 1 of 8)

55-20-02

REPAIR 1

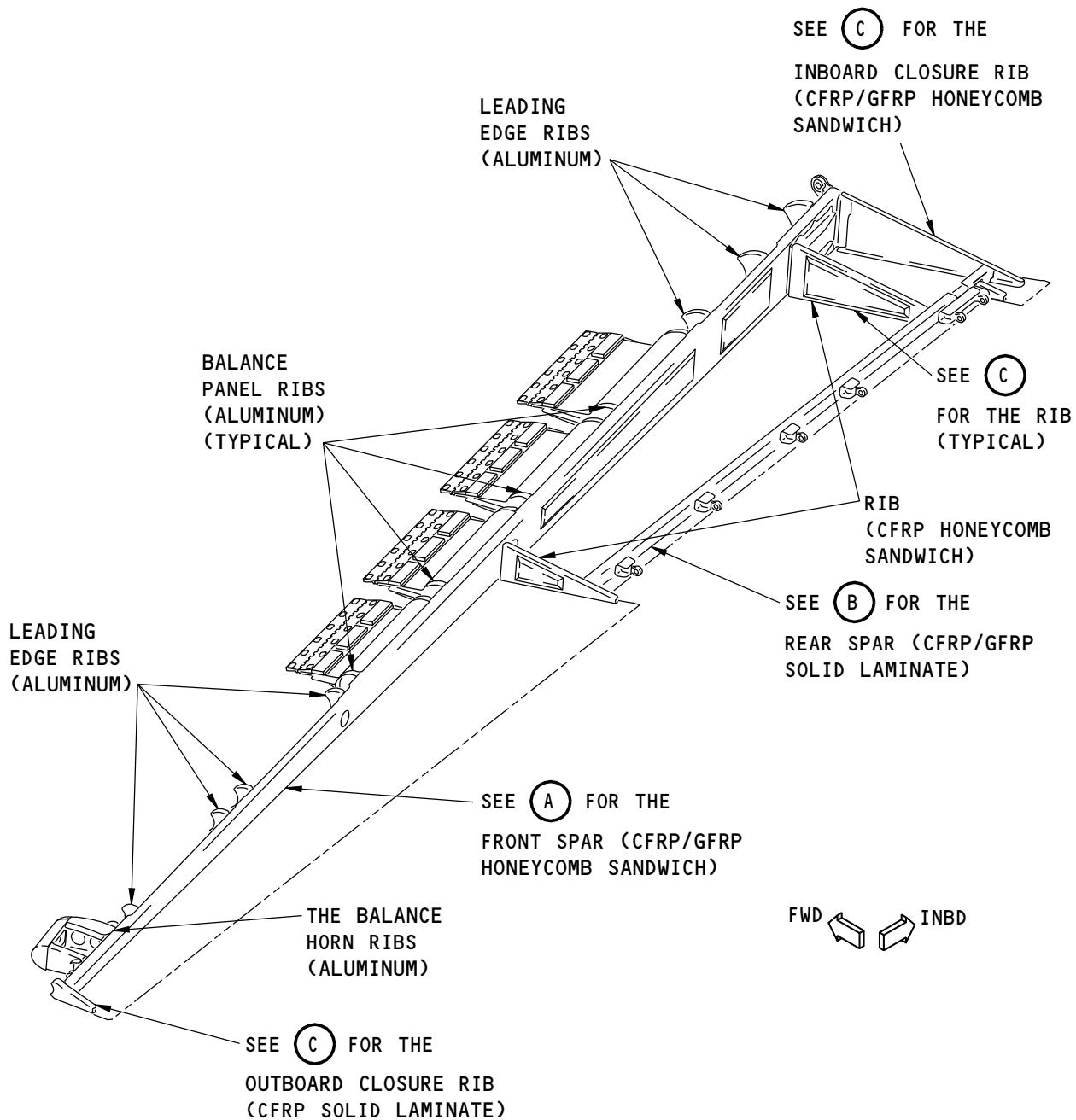
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(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

NOTE: REFER TO TABLE 201 FOR THE REPAIR REFERENCES.

M63960 S0006593051_V1

Elevator Structure Repairs
Figure 204 (Sheet 2 of 8)

55-20-02

REPAIR 1
Page 205

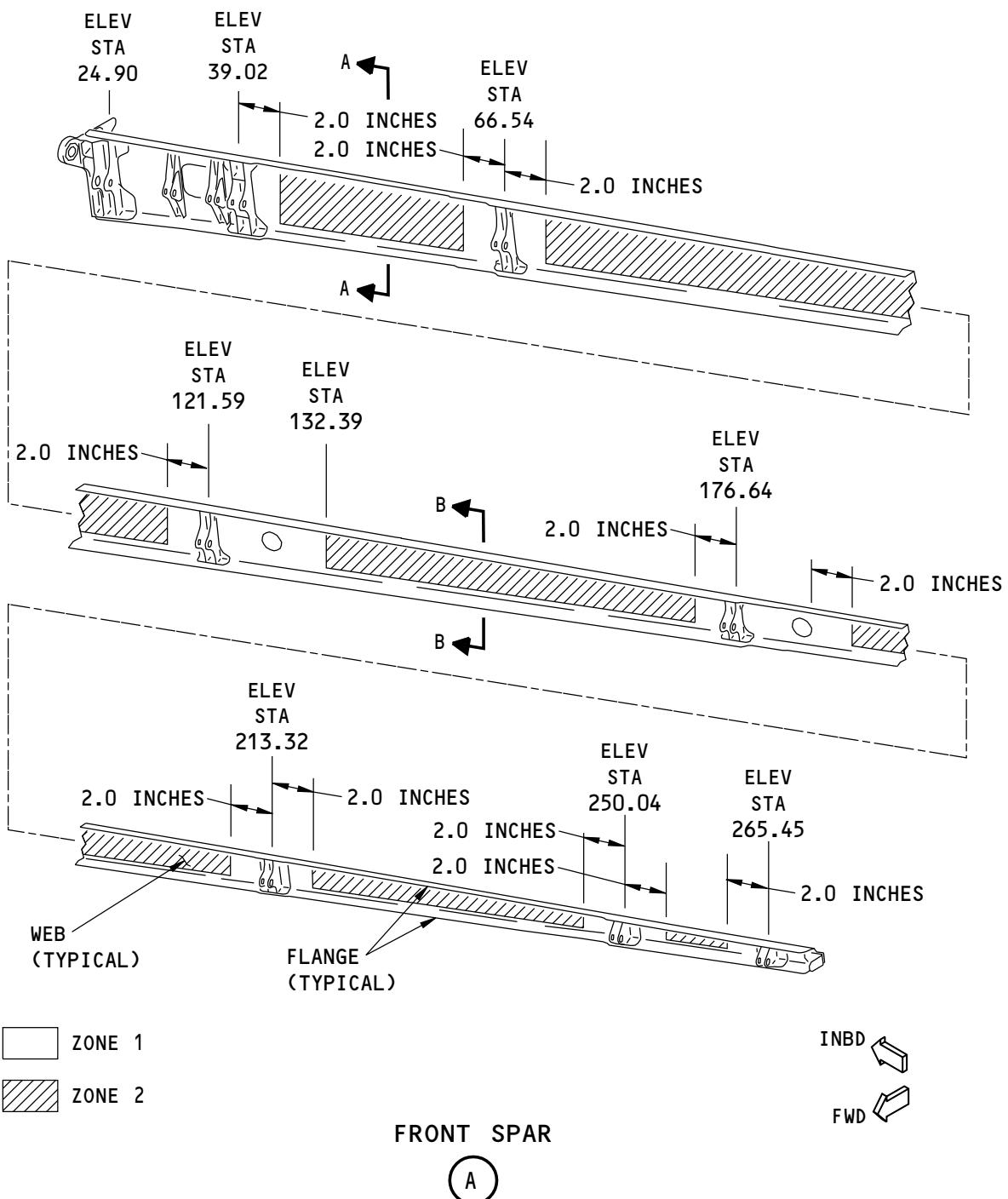
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G03360 S0006593053_V1

Elevator Structure Repairs
Figure 204 (Sheet 3 of 8)

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REPAIR 1
Page 206

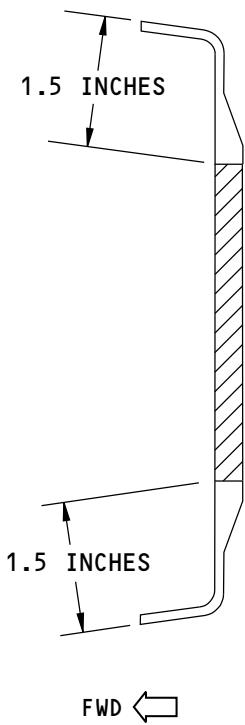
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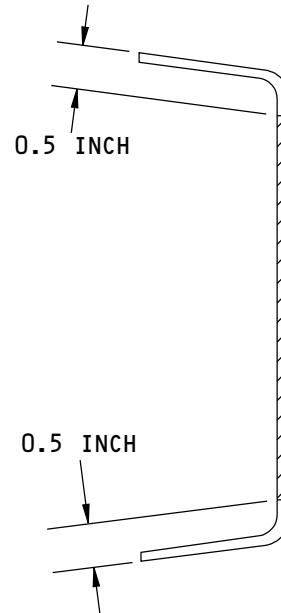


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CROSS-SECTION OF THE FRONT SPAR WHERE HONEYCOMB CORE IS LOCATED IN THE WEB

A-A



CROSS-SECTION OF THE FRONT SPAR WHERE THE WEB IS SOLID LAMINATE

B-B

ZONE 1

ZONE 2

G45773 S0006593055_V1

Elevator Structure Repairs
Figure 204 (Sheet 4 of 8)

55-20-02

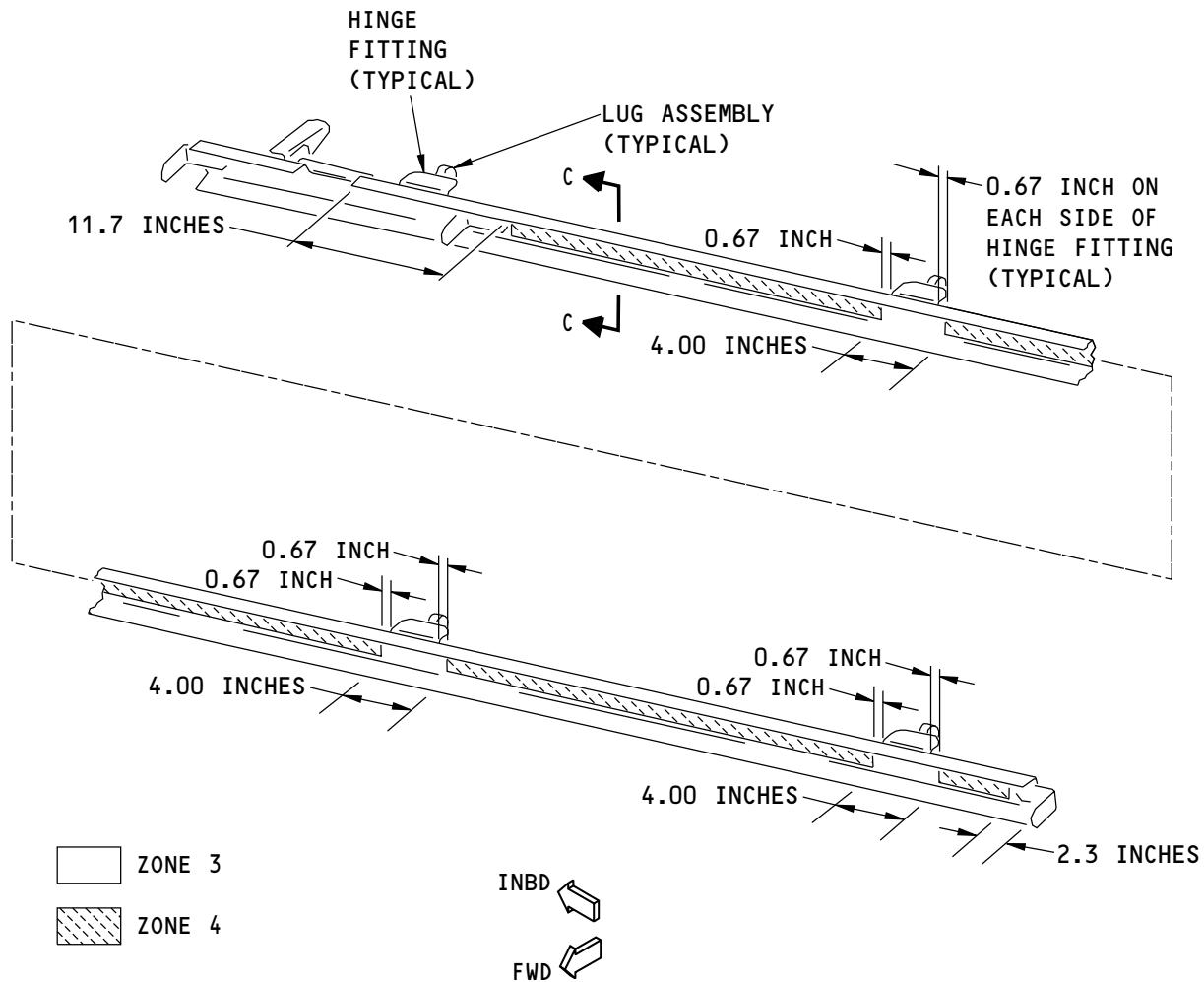
REPAIR 1
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)
REAR SPAR

B

M63961 S0006593057_V1

Elevator Structure Repairs
Figure 204 (Sheet 5 of 8)

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REPAIR 1
Page 208

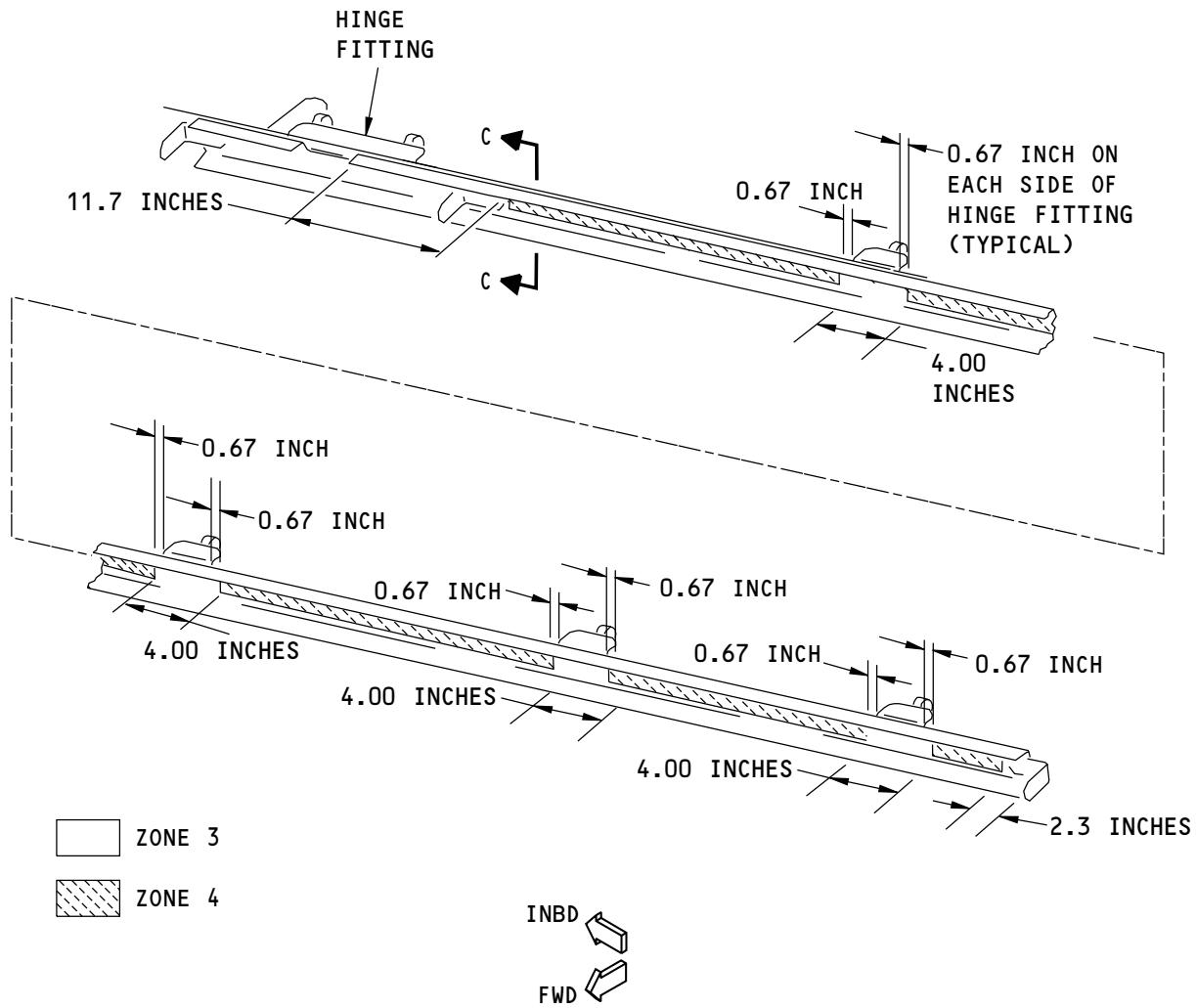
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(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

REAR SPAR

B

M63962 S0006593059_V1

Elevator Structure Repairs
Figure 204 (Sheet 6 of 8)

55-20-02

REPAIR 1
Page 209

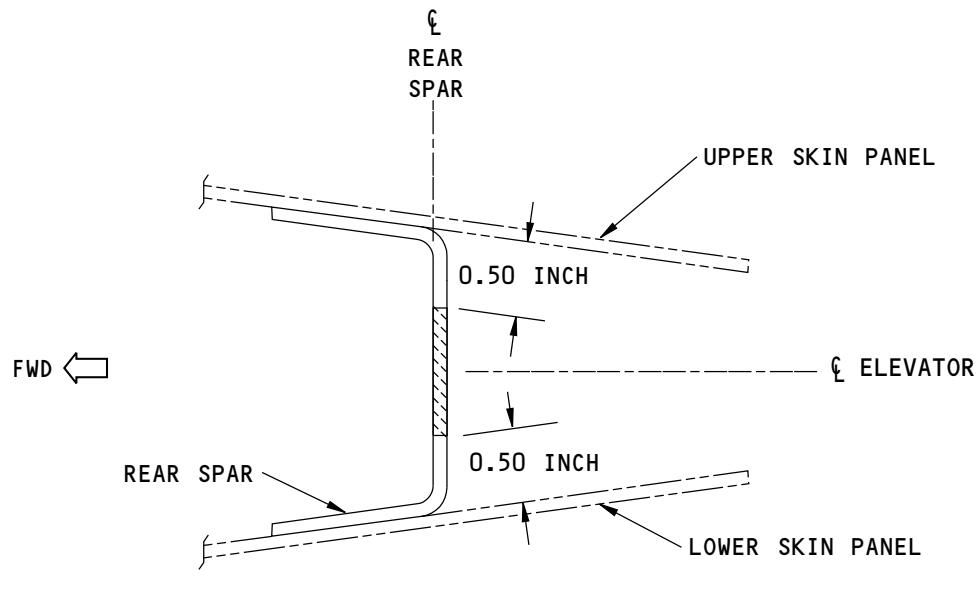
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ZONE 3

ZONE 4

C-C

G45771 S0006593060_V1

Elevator Structure Repairs
Figure 204 (Sheet 7 of 8)

55-20-02

REPAIR 1
Page 210

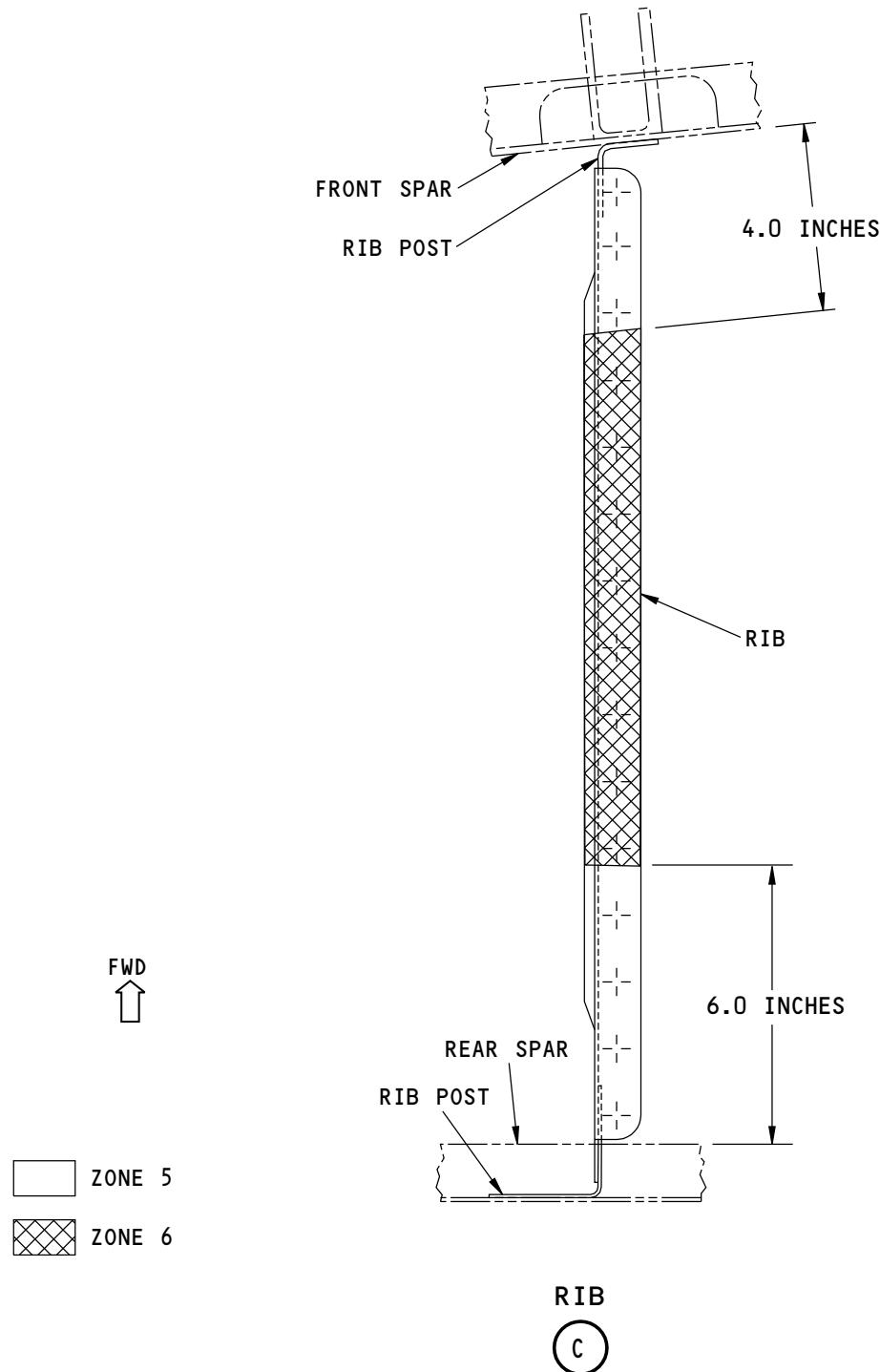
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G03355 S0006593061_V1

Elevator Structure Repairs
Figure 204 (Sheet 8 of 8)

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REPAIR 1
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05	REPAIR SEALING
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-60-04	ELEVATOR BALANCE PROCEDURE
51-70-04, REPAIR P/B REPAIR	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
55-20-02, ALLOWABLE DAMAGE 1	Elevator Structure
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 27-31-11/401	Elevator - Removal/Installation
SOPM 20-10-08	Removal of Faying Surface Sealed Metal Fittings from Composite Structures
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Repair Instructions

A. Do as follows when you make a repair:

- (1) When you remove the damage, do not cut or make an abrasion into the radius of the structure.
- (2) If the repair plies make an overlap of a hole or cutout, do the steps that follow:
 - (a) Cure the repair.
 - (b) Drill or cut the plies to the initial diameter of the hole or cutout.
- (3) If you need clearance with adjacent structure, install a tapered shim on each side of the repair.
- (4) It is permitted to put the repair plies around the full width of the structure.
 - (a) Do not make an overlap of the edges of the structure.

B. For repairs made with wet layup materials, do as follows, as applicable:

- (1) Use one repair ply of fabric for each initial ply that was damaged.
- (2) Add two structural plies of fabric for each facesheet or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

C. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged. Include a filler ply as applicable.

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STRUCTURAL REPAIR MANUAL

Table 201:

TABLE REFERENCES FOR THE REPAIR ZONES		
TYPE OF STRUCTURE	ZONE LOCATION	TABLE
LEADING EDGE RIBS, BALANCE HORN RIBS, BALANCE PANEL RIBS, (ALUMINUM)	----- ----- -----	THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME
SOLID LAMINATE AREAS OF THE FRONT SPAR, REAR SPAR, RIBS, AND CLOSURE RIBS	ZONE 1 ZONE 3 ZONE 5	202
SOLID LAMINATE AREAS OF THE FRONT SPAR, REAR SPAR, RIBS, AND CLOSURE RIBS	ZONE 2 ZONE 4 ZONE 6	202
HONEYCOMB CORE AREAS OF THE FRONT SPAR, RIBS, AND INBOARD CLOSURE RIB	ZONE 1 ZONE 3 ZONE 5	203
HONEYCOMB CORE AREAS OF THE FRONT SPAR, RIBS, AND INBOARD CLOSURE RIB	ZONE 2 ZONE 4 ZONE 6	203

Table 202:

REPAIR DATA FOR THE SOLID LAMINATE AREA OF ALL ZONES ON THE 350°F (177°C) CURE - ELEVATOR STRUCTURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED IAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	This repair is not permitted in these zones	Damage that is a maximum of: - 3.00 inches across largest dimension of damage - 10 percent of the smallest dimension across the part at the damage location 3.0 inches minimum clearance from: - other repairs - fastener holes - other holes - part edges	Damage that is a maximum of: - 3.00 inches across largest dimension of damage - 10 percent of the smallest dimension across the part at the damage location 3.0 inches minimum clearance from: - other repairs - fastener holes - other holes - part edges	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	Not permitted	SRM 51-70-05 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.C

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Table 203:

REPAIR DATA FOR THE HONEYCOMB CORE AREA OF ALL ZONES ON THE 350°F (177°C) CURE - ELEVATOR STRUCTURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Contact Boeing for repair instructions	Damage that is a maximum of: - 3.0 inches in diameter - 30 percent of the smallest dimension across the part at the damage location 3.0 inches minimum clearance from: - other repairs - fastener holes - other holes - part edges	Damage that is a maximum of: - 3.0 inches in diameter - 30 percent of the smallest dimension across the part at the damage location 3.0 inches minimum clearance from: - other repairs - fastener holes - other holes - part edges	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	Not Permitted	SRM 51-70-04 and Paragraph 4.B	SRM 51-70-05 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.C

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REPAIR 2 - ELEVATOR TAB SPAR

1. Applicability

- A. Repair 2 is applicable to the elevator tab spar shown in Elevator Tab Spar Repairs, Figure 201/REPAIR 2.

NOTE: THIS REPAIR IS APPLICABLE TO AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-02, REPAIR 3 FOR AIRPLANE LINE NUMBERS EQUAL TO OR GREATER THAN LINE NUMBER 1175 AND FOR ALL LINE NUMBERS WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082.

2. General

- A. Repairs done as given in Repair 2 are an Alternate Method of Compliance (AMOC) to the Federal Aviation Administration (FAA) Airworthiness Directive (AD) 2001-08-09, Paragraph (d).
- B. Repair 2 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- C. Remove the elevator tab, as necessary. Refer to AMM 27-31-31/401.
- D. Remove the skin panels, as necessary, to get access to the spar.
- E. Remove the fittings, as necessary, to get access to the spar. Refer to SOPM 20-10-08.
- F. Do an inspection of the damaged composite area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) Refer to Damage Definitions, Figure 202/REPAIR 2, Details A, B, and C the definitions of the length, width, and depth of the damage.

CAUTION: DO NOT EXCEED ONE REPAIR LOCATION. REPAIRS ARE NOT PERMITTED INBOARD OF ELEVATOR STA 45.0. FOR ANY REPAIRS INBOARD OF ELEVATOR STATION 45.0, CONTACT BOEING. IF YOU DO NOT OBEY, THEN DAMAGE TO STRUCTURE COULD OCCUR.

- G. Do the repair as given in Paragraph 4./REPAIR 2 and Table 201/REPAIR 2.
- H. Install the fittings on the spar, if they were removed.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Apply BMS 5-95 sealant to all parts that connect the fittings. Refer to 51-20-05.
- I. Install the skin panels, if they were removed.
- J. Make sure the elevator tab is balanced after all repairs are complete. Refer to 51-60-06.
- K. Install the elevator tab, as applicable. Refer to AMM 27-31-31/401.

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REPAIR 2
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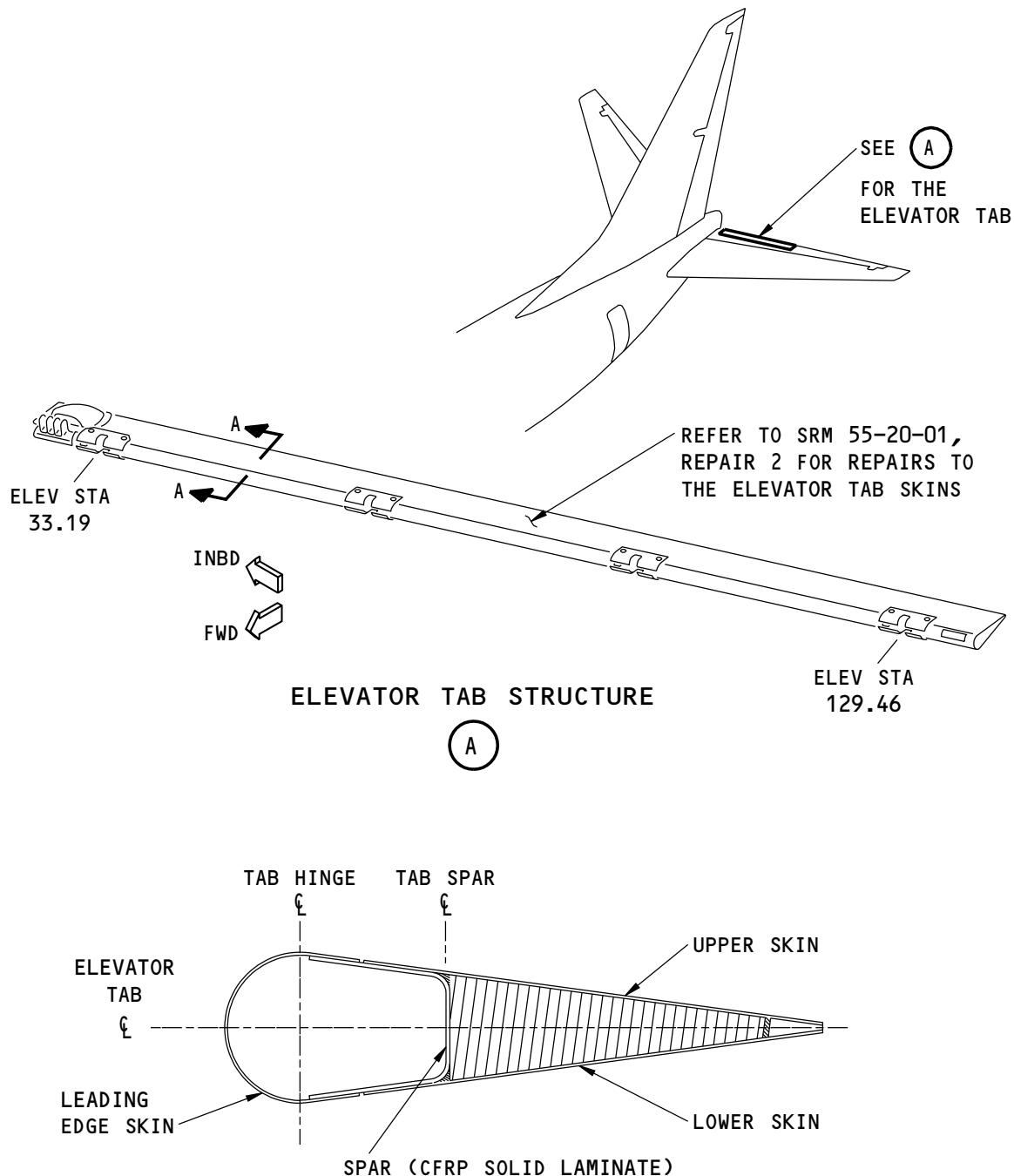
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STRUCTURAL REPAIR MANUAL



(FOR AIRPLANE LINE NUMBERS 1 THRU 1174)

A-A

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Elevator Tab Spar Repairs
Figure 201

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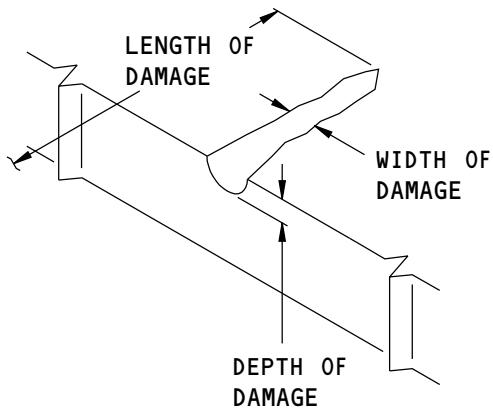
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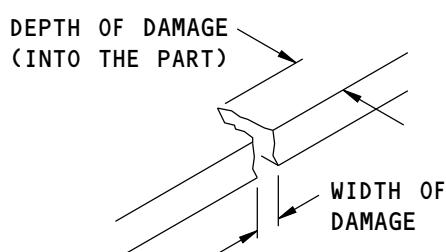


DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)

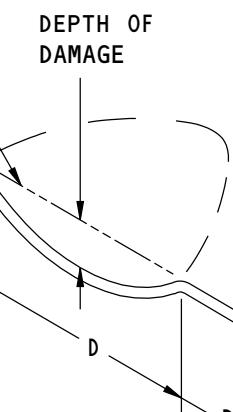
THE CONTOUR
BEFORE THE
DENT OCCURRED

DEPTH OF
DAMAGE



DEFINITIONS FOR
DENT DAMAGE

(B)



DEFINITIONS FOR
EDGE DAMAGE

(C)

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Damage Definitions
Figure 202

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05	REPAIR SEALING
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-60-06	ELEVATOR TAB BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
55-20-02	ELEVATOR STRUCTURE
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 27-31-31/401	Elevator Tab - Removal/Installation
SOPM 20-10-08	Removal of Faying Surface Sealed Metal Fittings from Composite Structures
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. Do as follows when you make a repair:

- (1) It is permitted to put the repair plies around the full width of the structure.
- (2) Make the size of the repair plies with overlap as given in 51-70-04 and 51-70-05 and with a tolerance of +/- 0.10 inch.

B. Refer to Table 201/REPAIR 2 for the repair data that is applicable to damage to the solid laminate areas for the elevator tab spar.

C. For repairs made with wet layup materials, do as follows, as applicable:

- (1) Use one repair ply of fabric for each initial ply that was damaged.
- (2) Add two structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ±45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of delamination at an edge if the delamination is a minimum of $2d$ (d = fastener diameter) away from a fastener hole.

- (3) Do an inspection of Category B repairs after each 800 flight hour interval or more frequently. Refer to 737 NDT Part 1, 51-01-01 for inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator, can be used.

D. Use the instructions that follow to do a Category A repair with preimpregnated layup materials at 350°F (177°C) cure.

- (1) Use the same number of repair plies as the number of initial plies that were removed.

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E. Repairs with preimpregnated layup materials at 250°F (121°C) cure are not permitted.

Table 201:

REPAIR DATA FOR THE TAB SPAR MADE OF SOLID LAMINATE ON THE 350°F (177°C) CURE, ELEVATOR TAB SPAR				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C) *[1]*[2]	200°F (93°C) *[1]*[2]	250°F (121°C)	350°F (177°C) *[1]*[2]
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 0.50 inch across the largest dimension of the damage Damage must be a minimum of 2.5 X (D) away from a fastener hole or part edge.	Damage that is a maximum of: - 0.50 inch across the largest dimension of the damage Damage must be a minimum of 2.5 X (D) away from a fastener hole or part edge.	Damage is not permitted.	Damage that is a maximum of: - 1.0 inch across the largest dimension of the damage
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	----	SRM 51-70-05 and Paragraph 4.D

*[1] Only one repair is permitted for each elevator tab spar.

*[2] For damage that is more than the limits given in this table, ask The Boeing Company for repair data.

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**REPAIR 3 - ELEVATOR TAB SPAR FOR AIRPLANE LINE NUMBERS 1175 AND ON AND LINE
NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND
737-55-1082**

1. Applicability

- A. Repair 3 is applicable to the elevator tab spar shown in Elevator Tab Spar Repairs, Figure 201/REPAIR 3.

NOTE: THIS REPAIR IS APPLICABLE TO AIRPLANE LINE NUMBERS 1175 AND ON AND LINE NUMBERS 1 THROUGH 1174 WITH COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082. REFER TO 55-20-02, REPAIR 2 FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174 PRIOR TO COMPLETION OF SERVICE BULLETINS 737-55-1080 AND 737-55-1082.

2. General

- A. Repair 3 gives instructions for Category A repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the elevator tab, as necessary. Refer to AMM 27-31-31/401.
- C. Remove the skin panels, as necessary, to get access to the spar.
- D. Remove the fittings, as necessary, to get access to the spar. Refer to SOPM 20-10-08.
- E. Do an inspection of the damaged composite area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) Refer to Damage Definitions, Figure 202/REPAIR 3, Details A, B, and C, for the definitions of the length, width, and depth of the damage.
- F. Do the repair as given in Paragraph 4./REPAIR 3 and Table 201/REPAIR 3.
- G. Install the fittings on the spar, if they were removed.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Apply BMS 5-95 sealant to all parts that connect the fittings. Refer to 51-20-05.
- H. Install the skin panels, if they were removed.
- I. Make sure the elevator tab is balanced after all repairs are complete. Refer to 51-61-06.
- J. Install the elevator tab, as applicable. Refer to AMM 27-31-31/401.

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REPAIR 3
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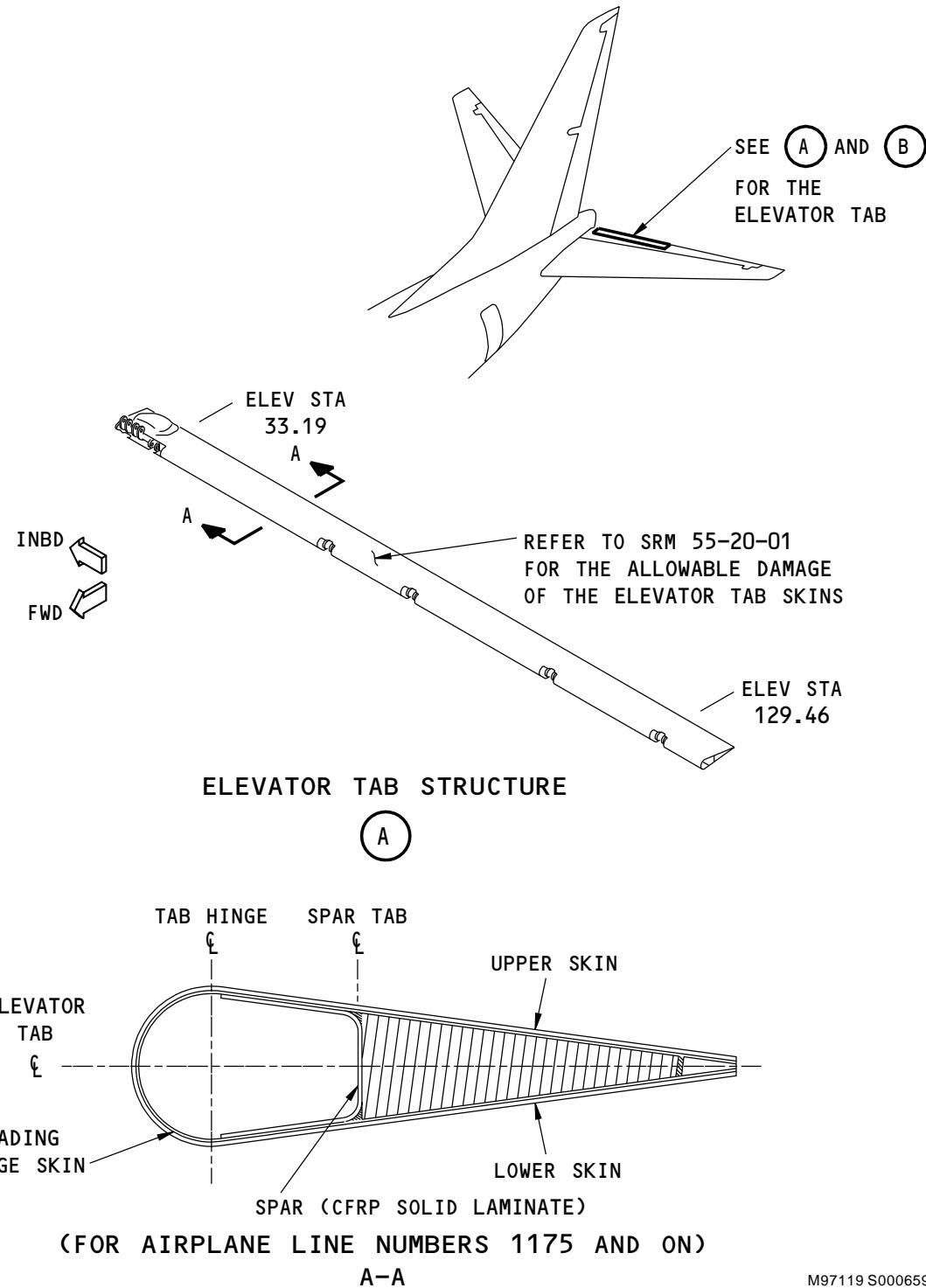
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Elevator Tab Spar Repairs
Figure 201 (Sheet 1 of 2)

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REPAIR 3
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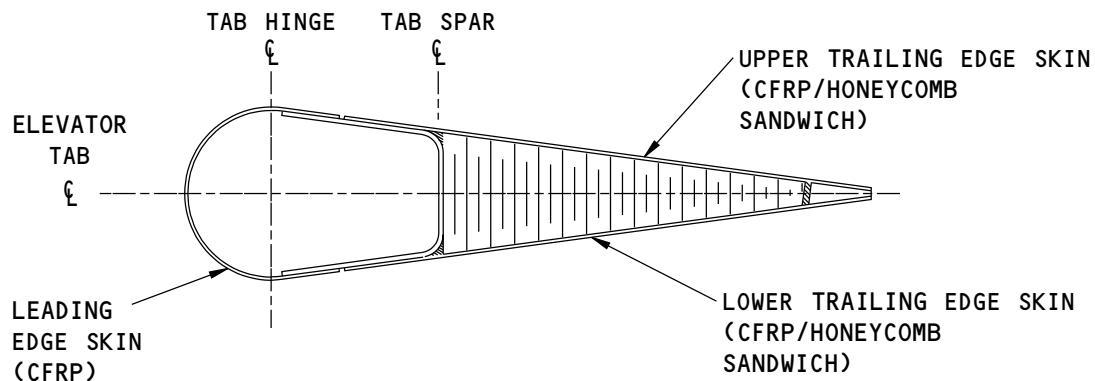
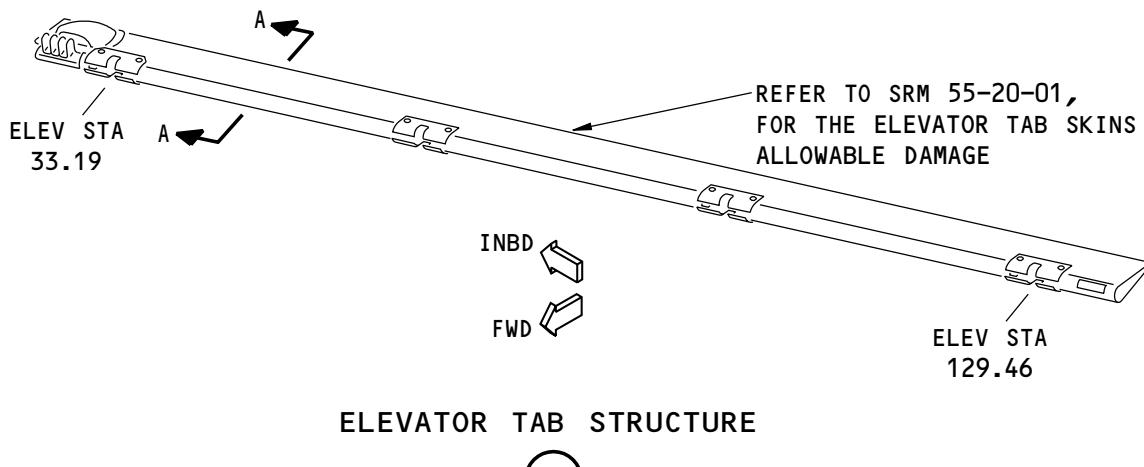
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STRUCTURAL REPAIR MANUAL



(FOR AIRPLANE LINE NUMBERS 1 THRU 1174
WITH COMPLETION OF SERVICE BULLETINS 737-55-1080
AND 737-55-1082)

A-A

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Elevator Tab Spar Repairs
Figure 201 (Sheet 2 of 2)

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Page 203

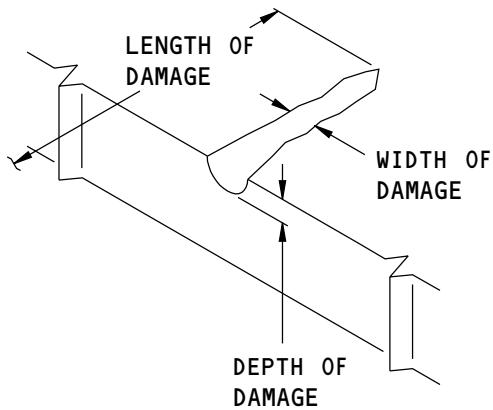
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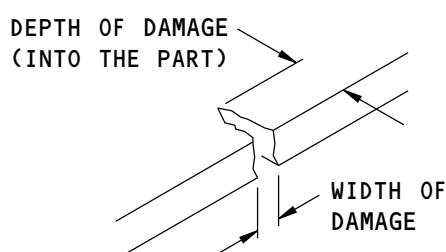


DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DEPTH OF
DAMAGE

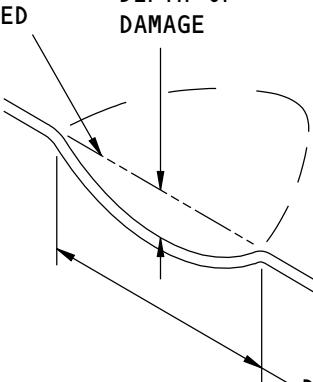


DEFINITIONS FOR
EDGE DAMAGE

(C)

DEFINITIONS FOR
DENT DAMAGE

(B)



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Damage Definitions
Figure 202

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05	REPAIR SEALING
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-61-06	ELEVATOR TAB BALANCE PROCEDURE
51-70-04, REPAIR GENERAL	Repair Procedures for Wet Layup Materials
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
55-20-02	ELEVATOR STRUCTURE
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 27-31-31/401	Elevator Tab - Removal/Installation
SOPM 20-10-08	Removal of Faying Surface Sealed Metal Fittings from Composite Structures
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

A. Do as follows when you make a repair:

- (1) When you remove the damage, do not cut or make an abrasion into the radius of the structure.
- (2) If the repair plies make an overlap of a hole or cutout, do the steps that follow:
 - (a) Cure the repair.
 - (b) Drill or cut the plies to the initial diameter of the hole or cutout.
- (3) If you need clearance with adjacent structure, install a tapered shim on each side of the repair.
- (4) It is permitted to put the repair plies around the full width of the structure.
 - (a) Do not make an overlap of the edges of the structure.

B. For repairs made with wet layup materials, do as follows, as applicable:

- (1) Use one repair ply of fabric for each initial ply that was damaged.
- (2) Add two structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

C. For repairs made with preimpregnated materials, use the same number of repair plies as the number of initial plies that were damaged.

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Table 201:

REPAIR DATA FOR THE TAB SPAR MADE OF SOLID LAMINATE ON THE 350°F (177°C) CURE, ELEVATOR TAB STRUCTURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	- Contact The Boeing Company for this temperature repair	Damage that is a maximum of: - 1.5 inches in diameter - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches 3.0 inches minimum clearance from other repairs 1.0 inch minimum clearance from: - part edges - fastener holes	Damage that is a maximum of: - 1.5 inches in diameter - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches 3.0 inches minimum clearance from other repairs 1.0 inch minimum clearance from: - part edges - fastener holes	Damage that is a maximum of: - 1.5 inches in diameter - 50 percent of the smallest dimension across the part at the damage location One repair for each 144 square inches 3.0 inches minimum clearance from other repairs 1.0 inch minimum clearance from: - part edges - fastener holes
REPAIR PROCEDURES	-----	SRM 51-70-04 and Paragraph 4.B	SRM 51-70-05 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.C

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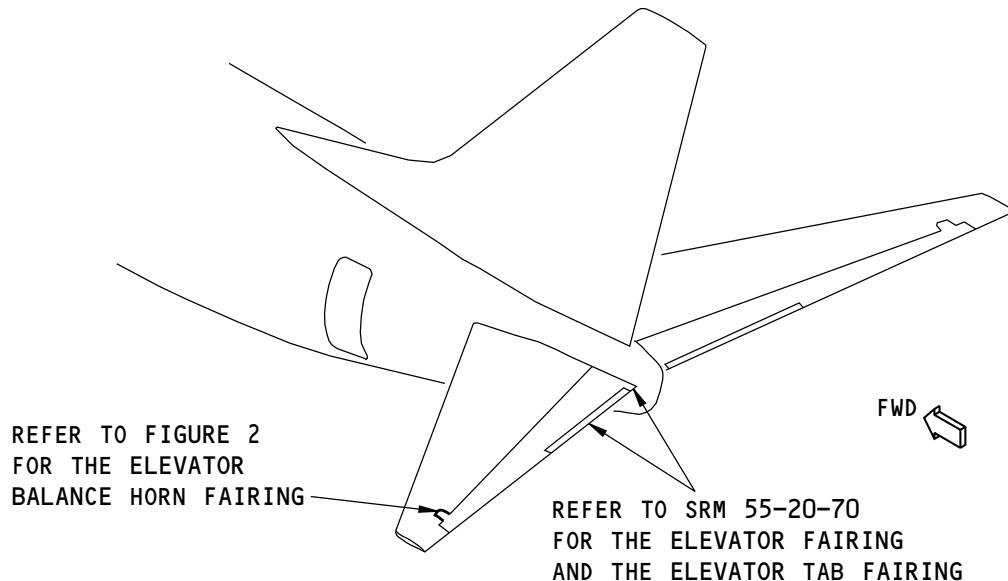
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ELEVATOR BALANCE HORN FAIRING



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Elevator Balance Horn Fairing Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A0101	Elevator Assembly - Functional Product Collector
183A6000	Elevator Leading Edge Installation
183A7000	Elevator Balance Horn Assembly
183A7400	Elevator Balance Horn Fairing

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IDENTIFICATION 1

Page 1

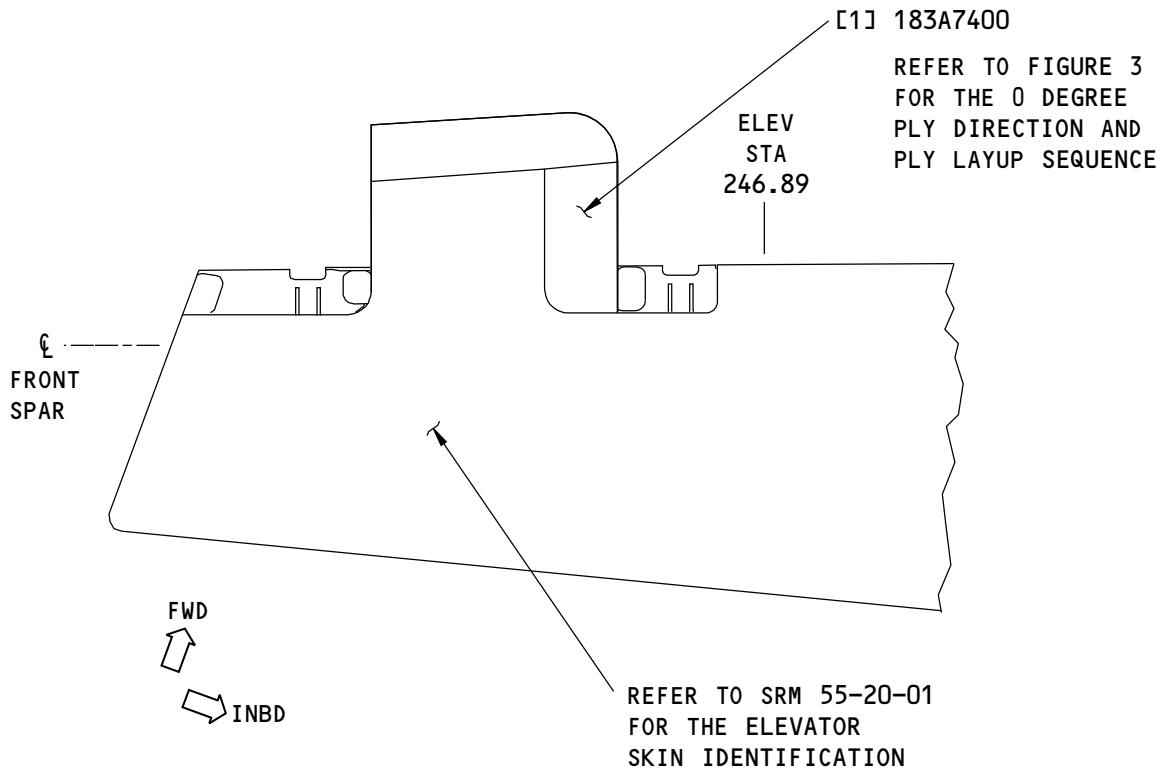
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THE LEFT ELEVATOR BALANCE HORN FAIRING IS SHOWN,
THE RIGHT ELEVATOR BALANCE HORN FAIRING IS OPPOSITE

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Elevator Balance Horn Fairing Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Fairing		Refer to Figure 3	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

Page 2

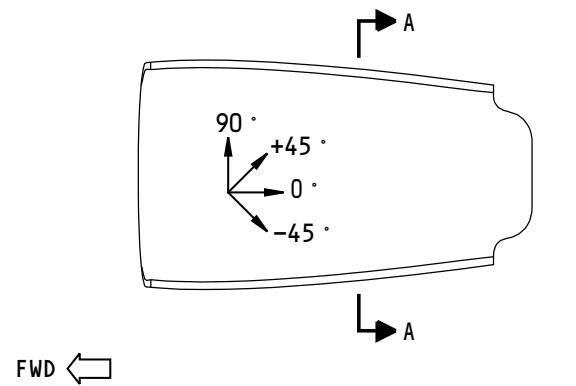
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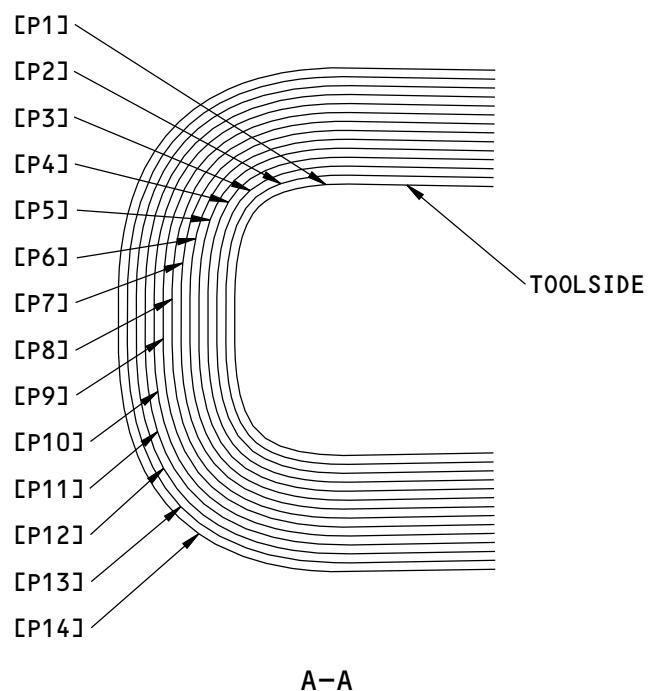
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ELEVATOR BALANCE HORN FAIRING



NOTE: REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES.

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Ply Direction and Ply Layup Sequence for the Elevator Balance Horn Fairing
Figure 3

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IDENTIFICATION 1

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STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1, P14	0 or 90 degrees	Glass Fiber Reinforced Plastic (GFRP) as given in BMS 8-79, Class 3, Grade B, Style 120
P2, P13	+ or - 45 degrees	GFRP as given in BMS 8-79, Class 3, Grade B, Style 120
P3, P5, P7, P8, P10, P12	0 or 90 degrees	GFRP as given in BMS 8-79, Class 3, Grade B, Style 1581
P4, P6, P9, P11	+ or - 45 degrees	GFRP as given in BMS 8-79, Class 3, Grade B, Style 1581

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IDENTIFICATION 1
Page 4

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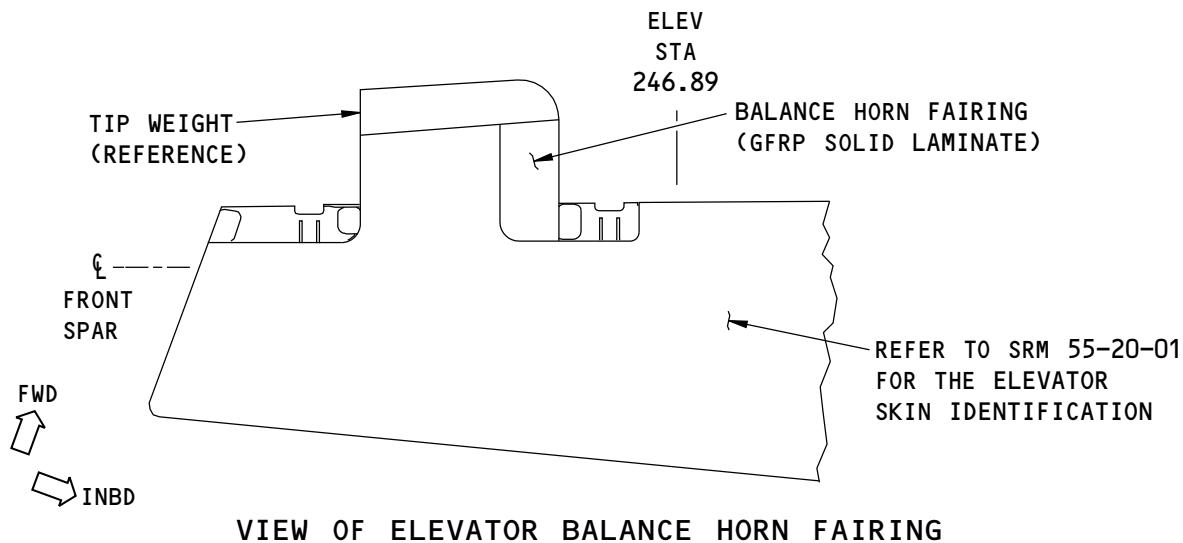
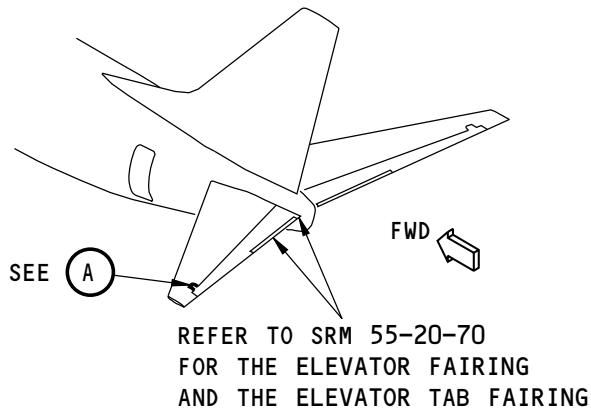
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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ELEVATOR BALANCE HORN FAIRING

1. Applicability

- A. Allowable Damage 1 is applicable to damage on the elevator balance horn fairing skin as shown in Elevator Balance Horn Fairing Location, Figure 101/ALLOWABLE DAMAGE 1.



Elevator Balance Horn Fairing Location
Figure 101

G03037 S0006593089_V1

2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) Refer to Damage Definitions, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of the damage.

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ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

- B. Remove all the contamination and water from the fairing.
 - (1) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.
 - (2) Refer to 51-70-04 for the cleanup procedures.
- C. Seal all the permitted damage areas that are not more than one ply in depth. Refer to the allowable damage limits in Paragraph 4./ALLOWABLE DAMAGE 1 Use one of the two methods that follow:
 - (1) Make a temporary seal.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location of the damage.
 - (c) If the tape is on the external surface of the fairing, then make sure that it is in satisfactory condition at normal maintenance intervals.
 - (2) Make a permanent seal.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - (b) Apply one layer of BMS 10-79, Type III or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.
 - (c) Apply one layer of BMS 10-60, Type II enamel to the external surfaces of the fairing that area sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
- D. Seal all of the damage areas that are more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1
 - (1) Use a vacuum and heat to remove moisture from the solid laminate. Refer to 51-70-04.
 - (2) Make a temporary seal with aluminum foil tape (speed tape).
 - (3) Keep a record of the location of the damage.
 - (4) Repair the damage at or before 250 flight cycless from the time the seal was made.
- E. The definition of the words "other damage", as used in the allowable damage limits, does not include nicks, gouges, and scratches that do not cause damage to the glass fibers and are sealed.

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ALLOWABLE DAMAGE 1

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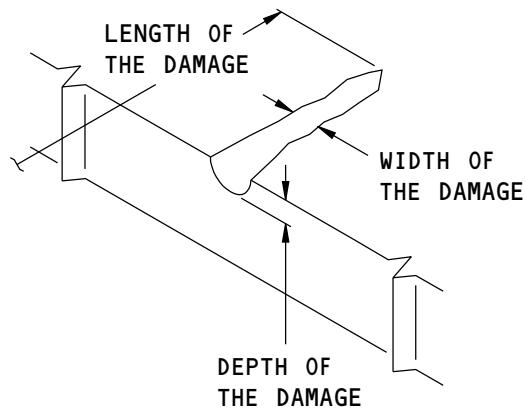
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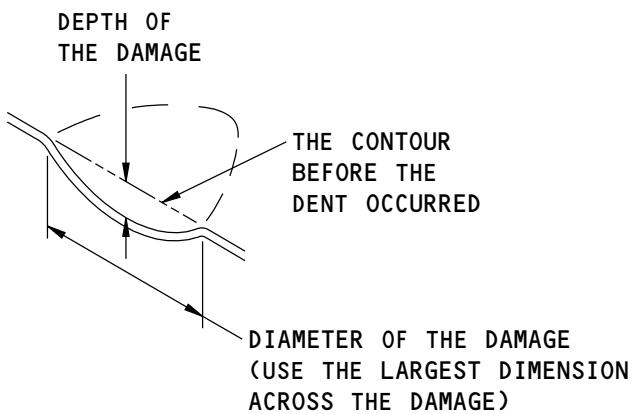


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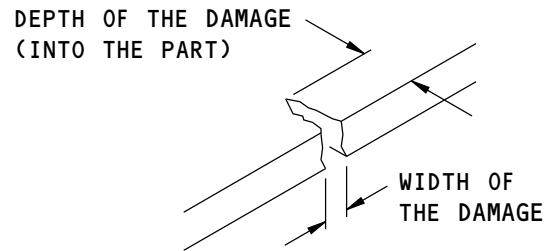
DEFINITIONS OF THE SIZES FOR NICK, GOUGE, AND SCRATCH DAMAGE

(A)



DEFINITIONS OF THE SIZES
FOR DENT DAMAGE

(B)



DEFINITIONS OF THE SIZES
FOR EDGE DAMAGE

(C)

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Damage Definitions
Figure 102

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ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-60-04, GENERAL	Elevator Balance Procedure For Airplane Line Numbers 1 Through 1174 Prior To Completion of Service Bulletins 737-55-1080, 737-55-1081, and 737-55-1082
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

- A. Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- B. Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if:
 - (1) The depth is a maximum of one ply.
NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (2) The length is a maximum of 5.0 inches (127.0 mm)
 - (3) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage.
- C. Dents that do not cause damage to the glass fibers are permitted if:
 - (1) The depth is a maximum of 0.05 inch (1.27 mm)
NOTE: Use the limits for holes and punctures if the damage is more than 0.05 inch (1.27 mm) in depth.
 - (2) The diameter is a maximum of 2.0 inches (50.80 mm)
 - (3) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage, a hole, or the edge of the part.
- D. Holes and Punctures are permitted if:
 - (1) The diameter is a maximum of 2.0 inch (50.80 mm)
 - (2) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage, a hole, or the edge of the part.
- E. Delaminations are permitted if:
 - (1) The diameter is a maximum of 2.0 inch (50.8 mm)
 - (2) The damage is a minimum of 2D (D = the diameter of the damage) away from the edge of other damage, a hole, or the edge of the part.
 - (3) Edge damage is permitted if:
 - (a) The depth is a maximum of 0.10 inch (2.54 mm)
 - (b) The width is a maximum of 0.50 inch (12.70 mm)

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ALLOWABLE DAMAGE 1

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- (4) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage.

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ALLOWABLE DAMAGE 1

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REPAIR 1 - ELEVATOR BALANCE HORN FAIRING

1. Applicability

- A. Repair 1 is applicable to the elevator balance horn fairing made of Glass Fiber Reinforced Plastic (GFRP) as shown in Elevator Balance Horn Fairing Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.

2. General

- A. Repair 1 gives the instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the elevator balance horn fairing.
 - (2) Refer to 51-40-02 for information on fastener removal.
- C. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.
- D. Refer to Damage Definitions, Figure 202/REPAIR 1, Details A, B, and C for the definitions of the length, width, and depth of damage.
- E. Do the repair as given in Paragraph 4./REPAIR 1
- F. Put the balance horn fairing back to the initial condition, as applicable.
 - (1) Install the fairing if it was removed. Refer to 51-40-02 for the data about fastener installation.
- G. Do a check of the elevator balance. Refer to 51-60-04

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REPAIR 1
Page 201

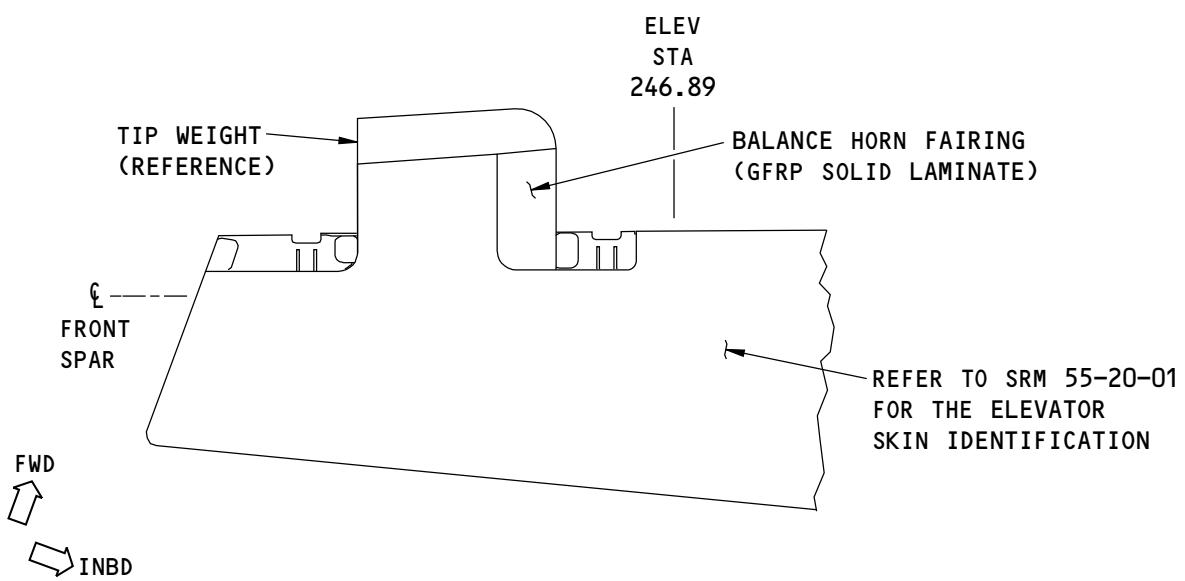
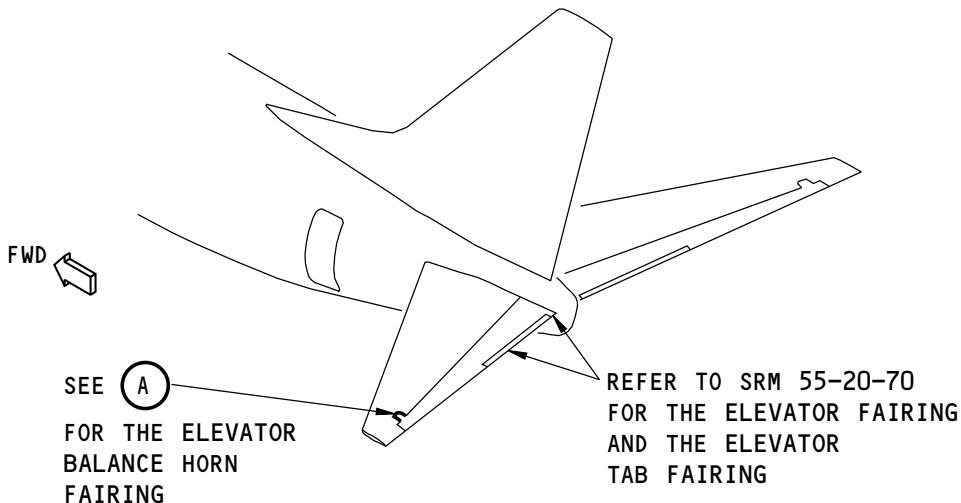
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STRUCTURAL REPAIR MANUAL



VIEW OF ELEVATOR BALANCE HORN FAIRING

(A)

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Elevator Balance Horn Fairing Location
Figure 201

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REPAIR 1
Page 202

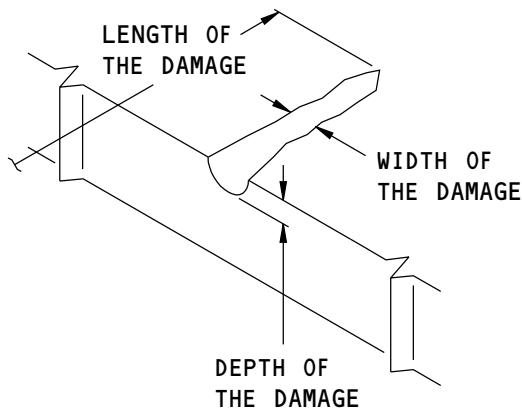
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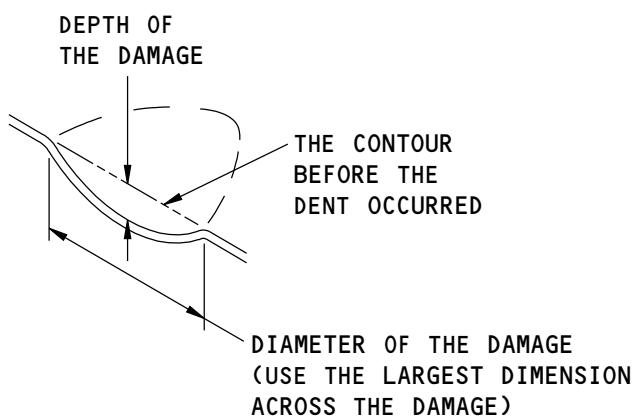


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STRUCTURAL REPAIR MANUAL



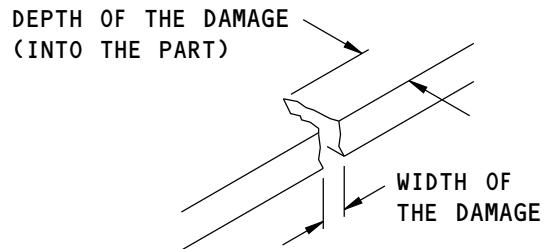
DEFINITIONS OF THE SIZES FOR NICK, GOUGE, AND SCRATCH DAMAGE

(A)



DEFINITIONS OF THE SIZES
FOR DENT DAMAGE

(B)



DEFINITIONS OF THE SIZES
FOR EDGE DAMAGE

(C)

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Damage Definitions
Figure 202

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REPAIR 1
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-60-04	ELEVATOR BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-06, REPAIR GENERAL	Room Temperature Cure Repairs With Wet Layup Materials For Glass Fabric Reinforced Plastic Solid Laminates and Honeycomb Core Panels
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. If a dent is 2 inches (50.80 mm) in diameter or less, and has no fiber damage or delamination, then fill the dent with potting compound and apply a fiberglass patch as given in Repair 14 of 51-70-04.
- B. If Paragraph 4.A./REPAIR 1 is not applicable, then refer to Table 201/REPAIR 1 for the repair data that is applicable to damage to the elevator balance horn fairing.
- C. For repairs made with wet layup materials, do the steps that follow, as applicable:
 - (1) Use one repair ply of fabric for each initial ply that was damaged.
 - (2) Add two structural plies of fabric for each facesheet that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.
 - (3) Examine Category B repairs after each interval of 800 flight hours or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.
- D. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged.

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REPAIR 1
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Table 201:

REPAIR DATA FOR THE ELEVATOR BALANCE HORN FAIRING - 250°F (121°C) CURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE AND LIMITS	Contact Boeing for repair instructions	Damage that is a maximum of: -5.0 in. (127 mm) in diameter - 2.0 inches (50.80 mm) minimum clearance from: - other repairs - fastener holes - panel edges	Damage that is a maximum of: - 5 in. (127 mm) in diameter -2.0 inches (50.80 mm) minimum clearance from: - other repairs - fastener holes - panel edges	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	Not permitted	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D

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REPAIR 1
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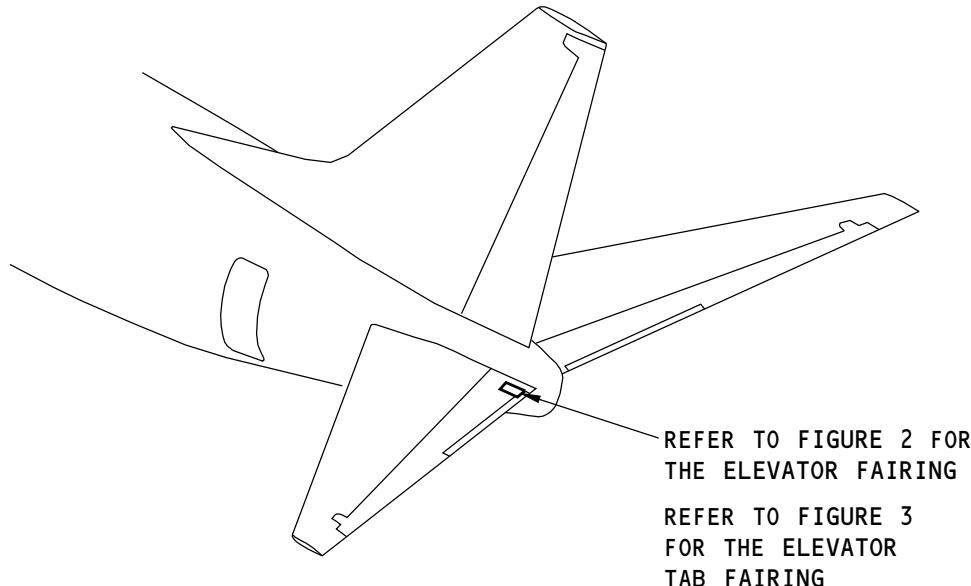
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IDENTIFICATION 1 - ELEVATOR FAIRING AND ELEVATOR TAB FAIRING SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G69712 S0006593099_V1

Elevator Fairing Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A0001	Final Assembly - Product Collector
183A0001	Elevator Integration Functional Product Collector
183A0002	Elevator Integration Functional Product Collector
183A0101	Elevator Assembly Functional Product Collector
183A3000	Upper Skin Panel Installation - Elevator
183A3300	Fairing - Tab Control Rod, Elevator
183A8000	Tab Installation - Elevator
183A8100	Tab Assembly - Elevator
183A8500	Mast Arm Fairing - Tab, Elevator

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IDENTIFICATION 1

Page 1

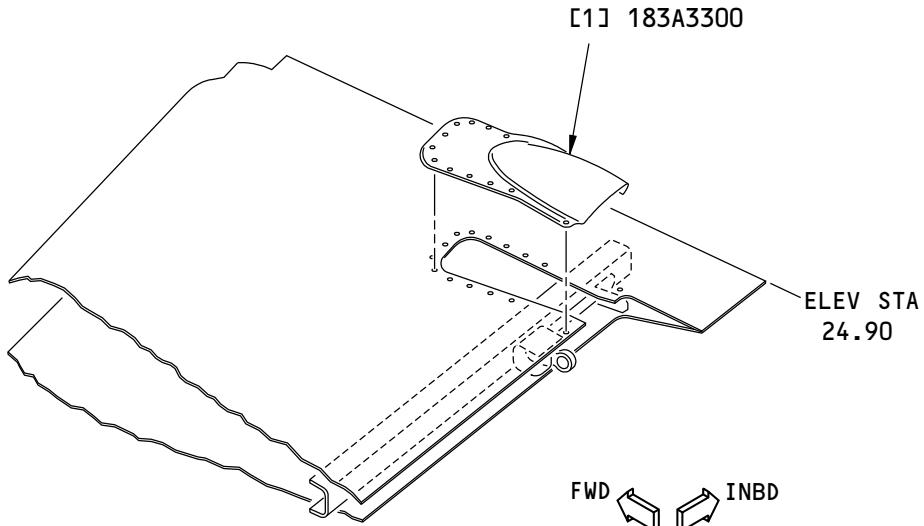
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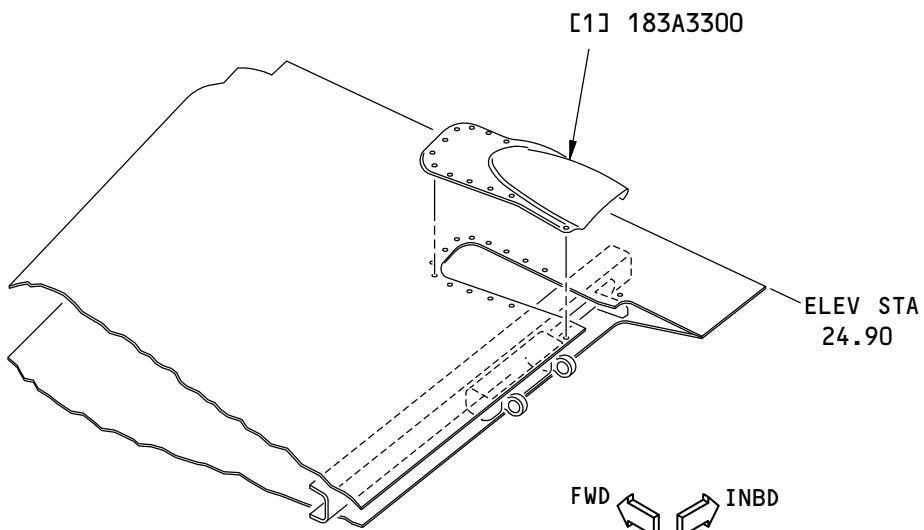
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

G69717 S0006593101_V1

Elevator Fairing Skin Identification
Figure 2

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IDENTIFICATION 1

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STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Fairing - Tab Control Rod		Epoxy sheet molding compound as given in BMS 8-327, Type I-Lytex 9063	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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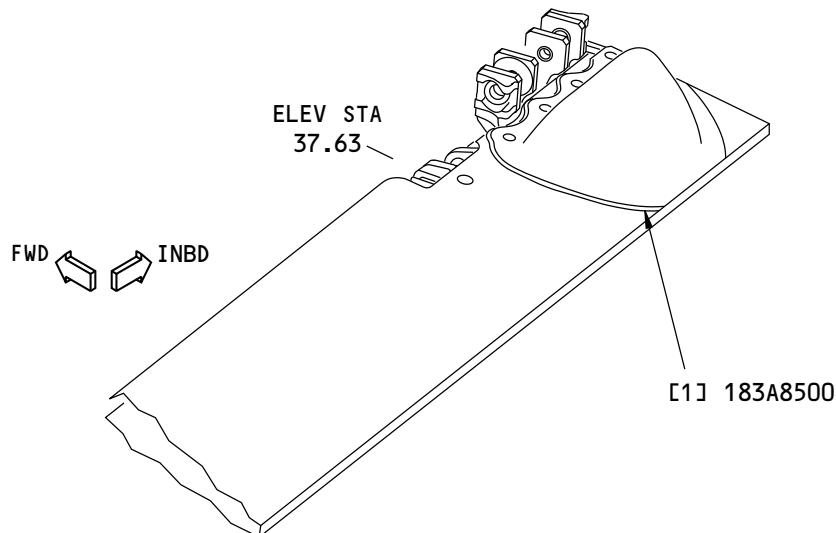
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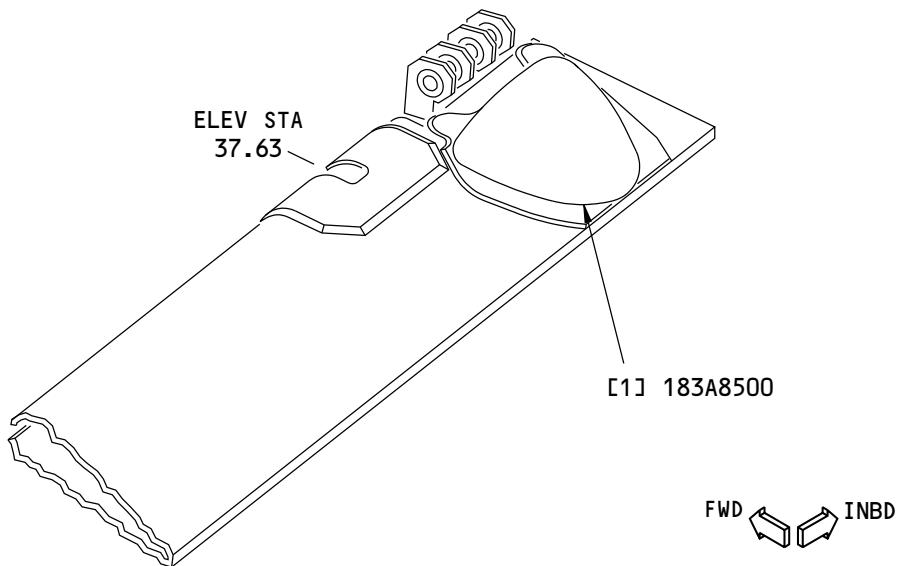
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**LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)**



NOTE: REFER TO TABLE 3 FOR THE LIST OF MATERIALS.

**LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)**

G69720 S0006593104_V1

**Elevator Tab Fairing Skin Identification
Figure 3**

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**IDENTIFICATION 1
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Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Fairing - Mast Arm		Epoxy sheet molding compound as given in BMS 8-327, Type I-Lytex 9063	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ELEVATOR FAIRING SKIN AND ELEVATOR TAB FAIRING SKIN

1. Applicability

- A. This subject gives the allowable damage limits for the elevator tab control rod fairing and the elevator tab mast arm fairing as shown in Elevator Fairing Skin Allowable Damage, Figure 101/ALLOWABLE DAMAGE 1. Refer to Elevator Fairing Skin Allowable Damage, Figure 102/ALLOWABLE DAMAGE 1 for the elevator tab control rod fairing details. Refer to Elevator Tab Fairing Skin Allowable Damage, Figure 103/ALLOWABLE DAMAGE 1 for the elevator tab mast arm fairing details.

2. General

- A. Do an inspection of the damaged area to find the length, width and depth of the damage. Boeing recommends that you do an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection procedures that are satisfactory to the operator can be used.

- B. Refer to Definitions of the Damage Size, Figure 104/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of damage.

- C. Remove contamination and water from the structure surface.

- (1) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.
(2) Refer to 51-70-04 for the damage removal procedures.

- D. Seal all permitted damage areas. Refer to the allowable damage limits. Seal the damage with one of the two methods that follow:

- (1) Make a temporary seal.

- (a) Apply aluminum foil tape (speed tape).
(b) Keep a record of the location.
(c) Monitor and re-apply the tape as necessary at normal maintenance intervals.

- (2) Make a permanent seal.

- (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given 51-70-08.
(b) Apply one layer of BMS 10-79, Type 3 primer. Refer to SOPM 20-44-04.
(c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.

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ALLOWABLE DAMAGE 1

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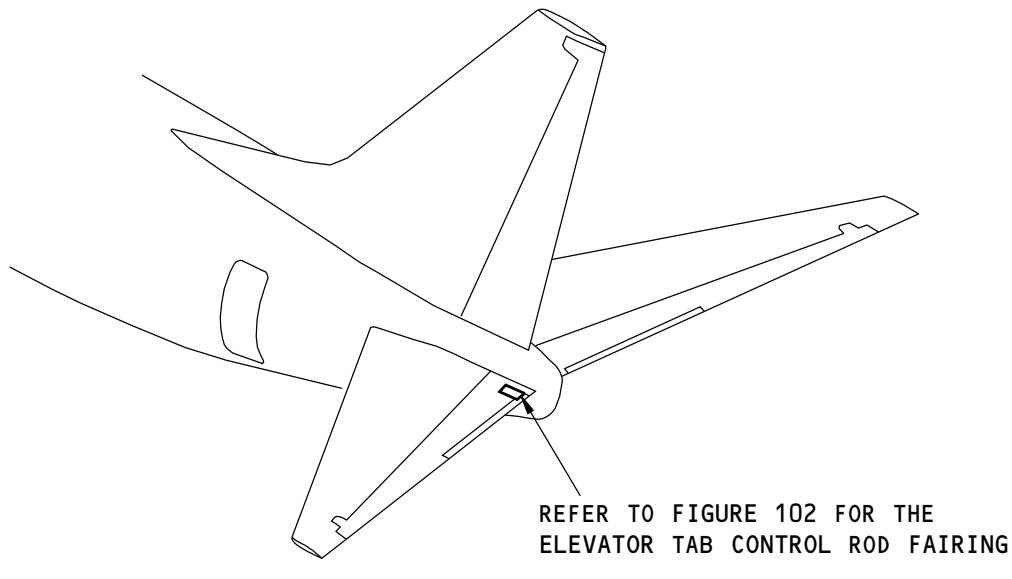
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REFER TO FIGURE 102 FOR THE
ELEVATOR TAB CONTROL ROD FAIRING

REFER TO FIGURE 103 FOR THE
ELEVATOR TAB MAST ARM FAIRING

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**Elevator Fairing Skin Allowable Damage
Figure 101**

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ALLOWABLE DAMAGE 1

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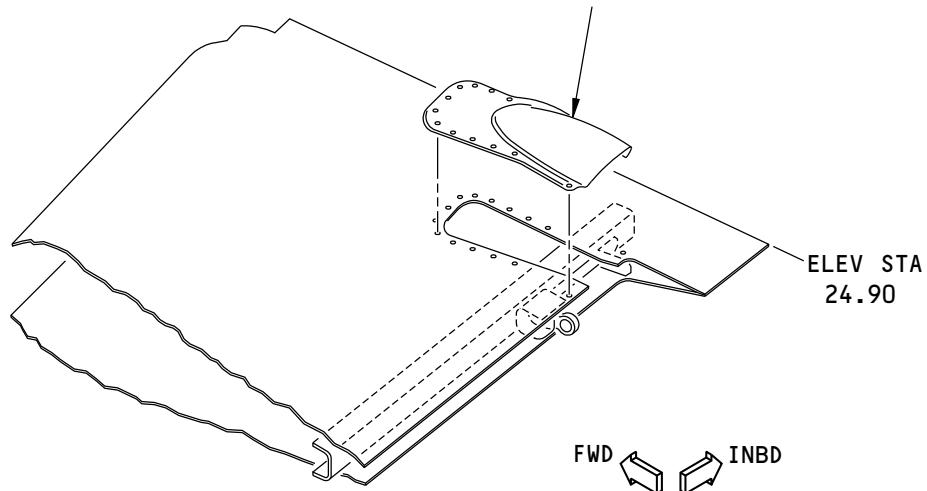
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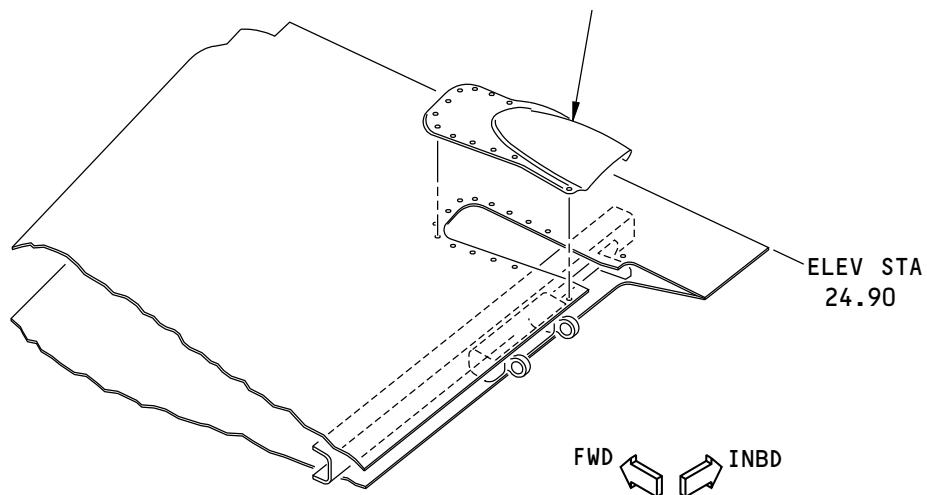
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REFER TO FIGURE 104, PARAGRAPH 4, FOR
THE ELEVATOR FAIRING SKIN ALLOWABLE DAMAGE



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

REFER TO FIGURE 104, PARAGRAPH 4, FOR
THE ELEVATOR FAIRING SKIN ALLOWABLE DAMAGE



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

M61002 S0006593111_V1

**Elevator Fairing Skin Allowable Damage
Figure 102**

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ALLOWABLE DAMAGE 1

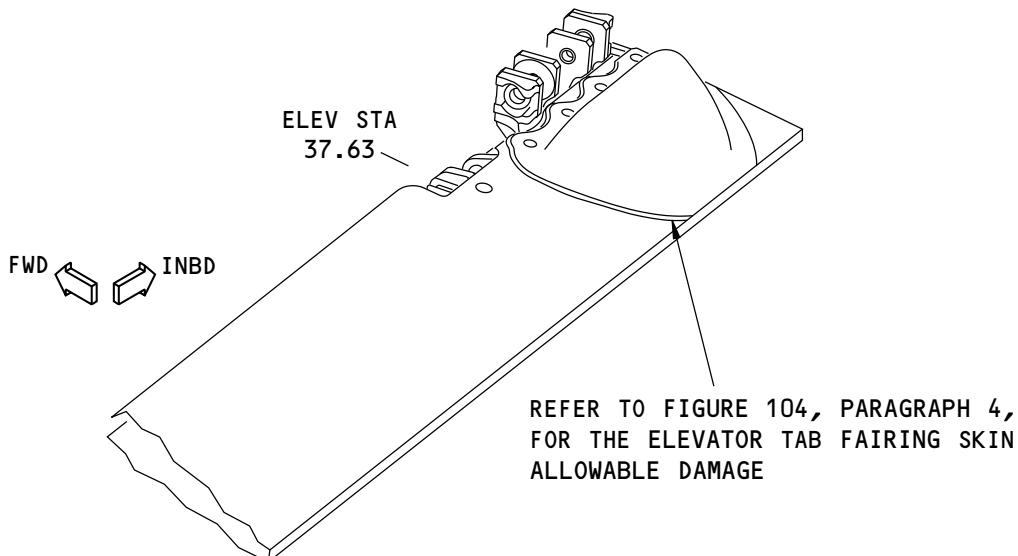
Page 103

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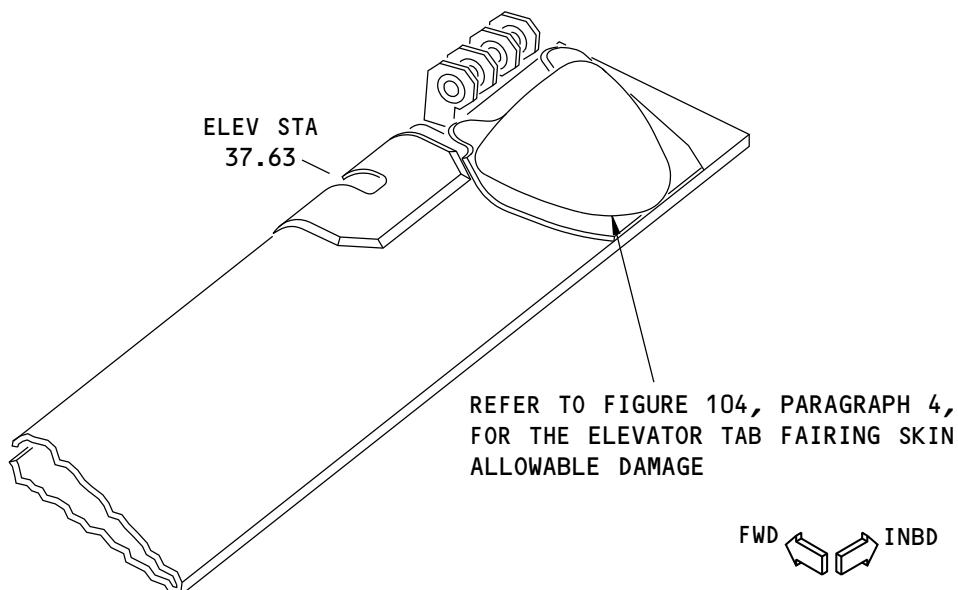
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STRUCTURAL REPAIR MANUAL**



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

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**Elevator Tab Fairing Skin Allowable Damage
Figure 103**

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ALLOWABLE DAMAGE 1

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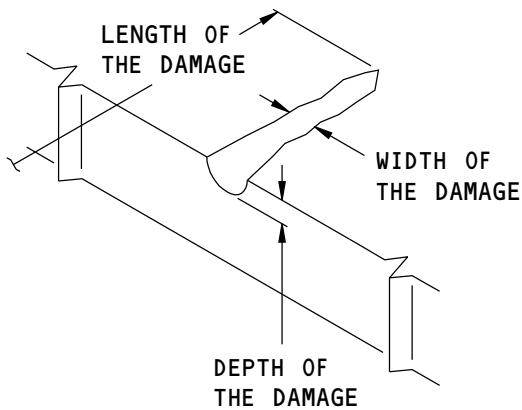
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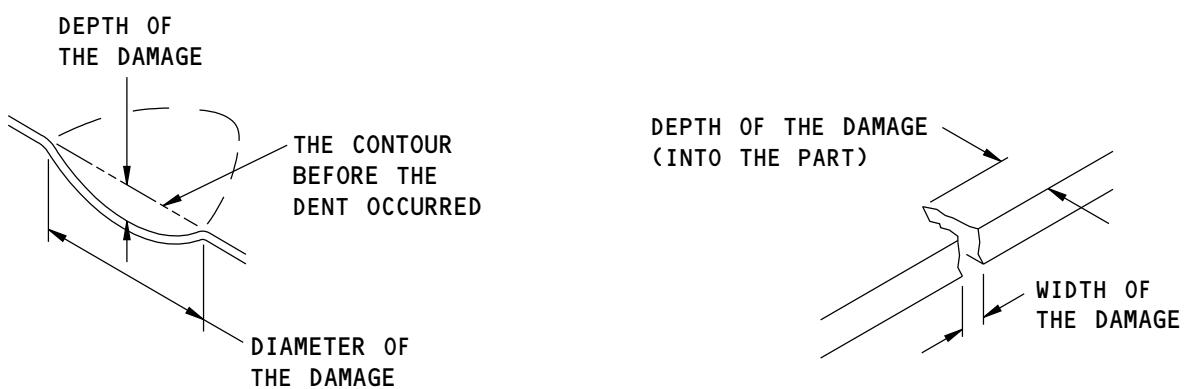


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STRUCTURAL REPAIR MANUAL



SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)

SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 104

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

- A. Nicks, Gouges, and Scratches are permitted if they are:
 - (1) A maximum of 0.01 inch in depth.
 - (2) A maximum of 3.00 inches in length for the elevator fairing skin.
 - (3) A maximum of 2.50 inches in length for the elevator tab fairing skin.
 - (4) A minimum of 1.00 inches (edge to edge) from other damage, a hole or part edge.
- B. Dents are permitted if they are:
 - (1) A maximum of 0.50 inch diameter.
 - (2) A maximum of 0.025 inch in depth.
NOTE: Use the limits for holes and punctures if the dent damage is more than 0.025 inch in depth.
 - (3) A minimum (edge to edge) of 4D (D= dimension of the damage) from other damage, a hole or part edge.
- C. Holes and Punctures are permitted if they are:
 - (1) A maximum diameter of 0.50 inch.
 - (2) A minimum (edge to edge) of 4D (D= dimension of the damage) from other damage, from a hole or part edge.
- D. Edge damage is permitted if it is:
 - (1) A maximum of 0.10 inch depth.
 - (2) A maximum of 0.25 inch width.
 - (3) A minimum of 1.00 inch (edge to edge) away from other damage, a fastener hole or part edge.

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ALLOWABLE DAMAGE 1

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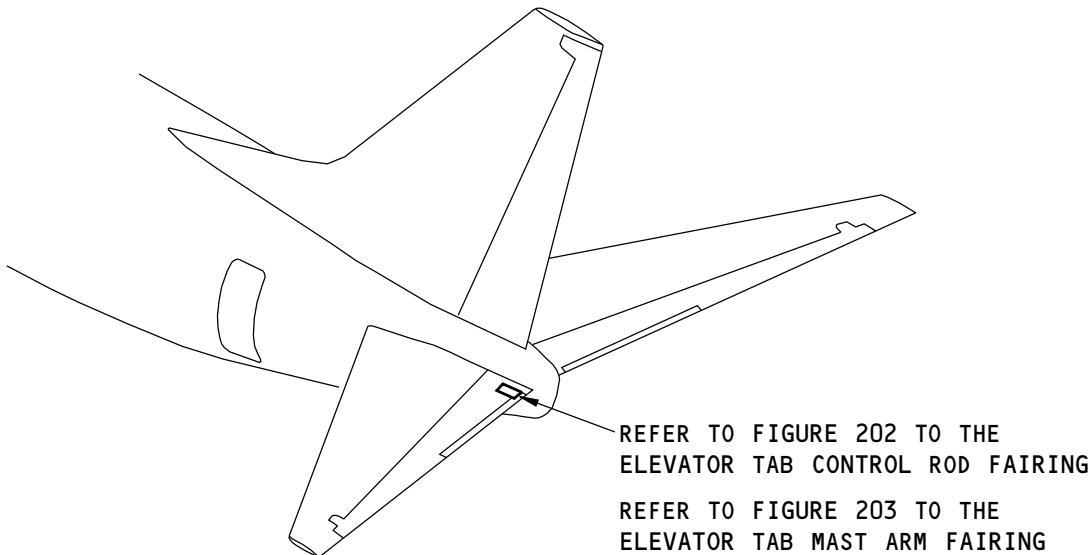
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STRUCTURAL REPAIR MANUAL

REPAIR 1 - ELEVATOR FAIRING AND ELEVATOR TAB FAIRING SKIN



M61161 S0006593117_V1

Elevator Fairing Skin Repair
Figure 201

55-20-70

REPAIR 1
Page 201

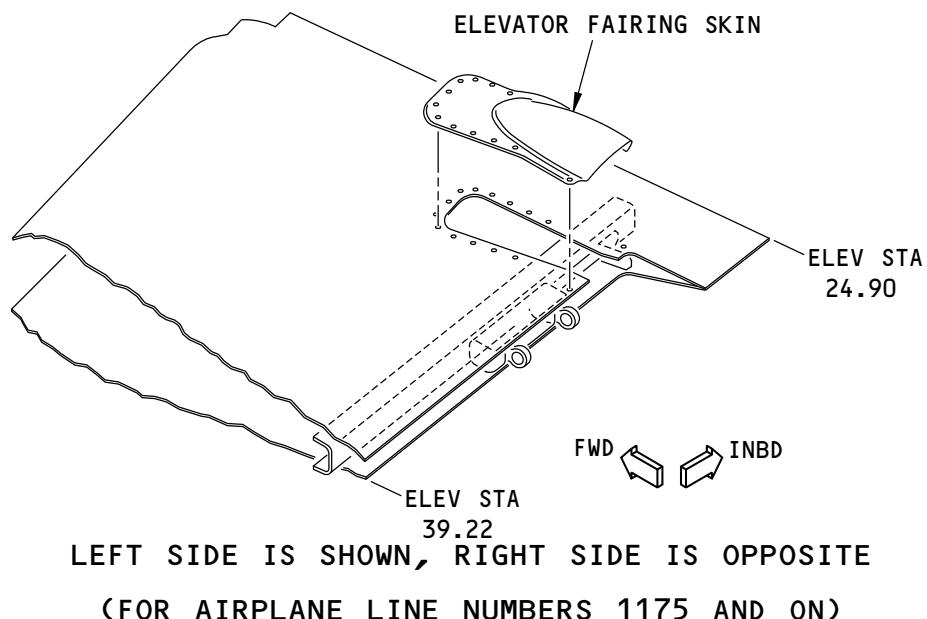
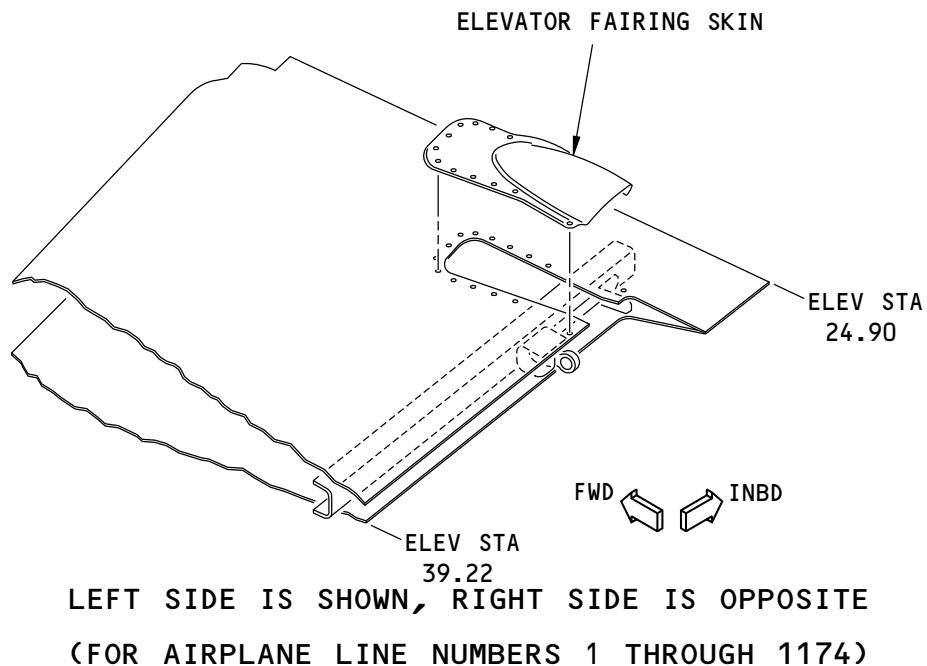
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

M61168 S0006593119_V2

Elevator Fairing Skin Repair
Figure 202

55-20-70

REPAIR 1
Page 202

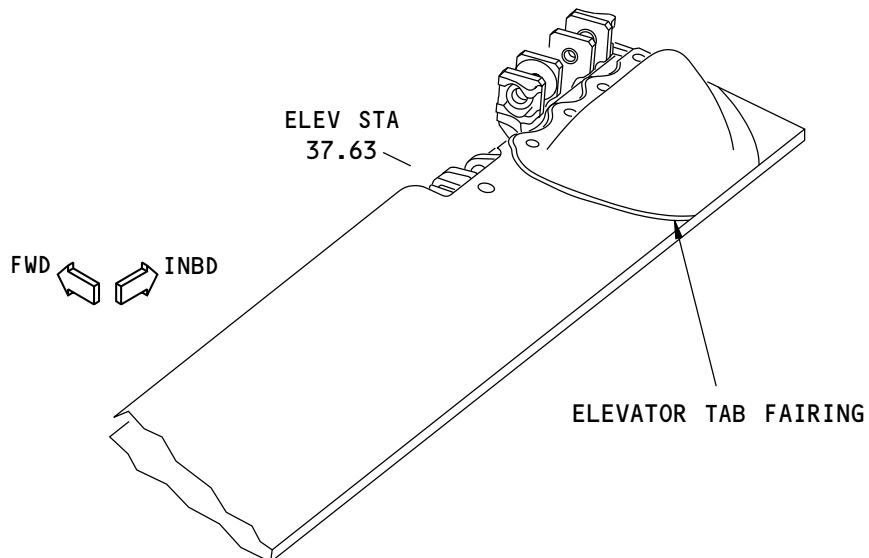
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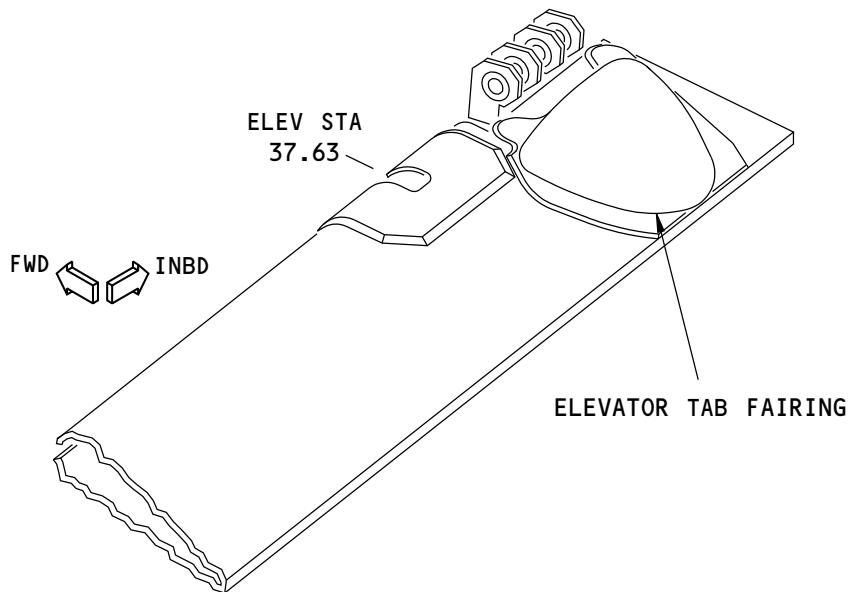
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

M61171 S0006593121_V2

Elevator Tab Fairing Skin Repair
Figure 203

55-20-70

REPAIR 1
Page 203

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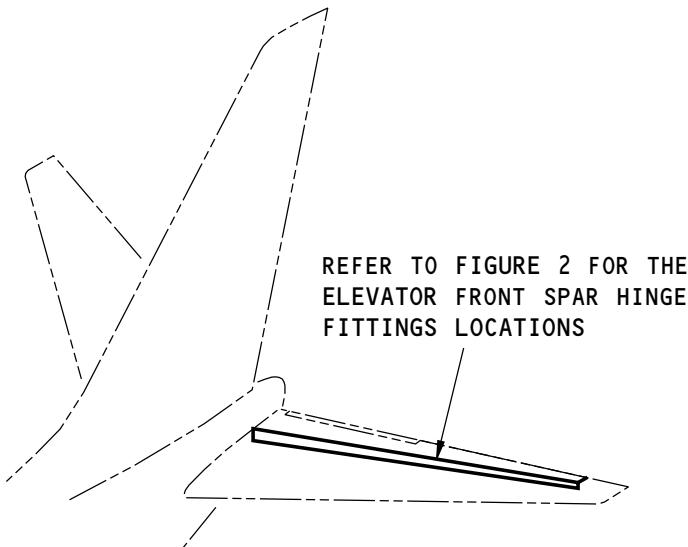
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ELEVATOR FRONT SPAR HINGE FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

G92241 S0006593125_V1

Elevator Front Spar Hinge Fittings

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A1000	Elevator Front Spar Assembly
183A1310	Elevator Hinge Fitting Assembly
183A1320	Elevator Hinge Fitting Assembly
183A1330	Elevator Hinge Fitting Assembly
183A1340	Elevator Hinge Fitting Assembly
183A1350	Elevator Hinge Fitting Assembly
183A1360	Elevator Hinge Fitting Assembly
183A1370	Elevator Hinge Fitting Assembly

55-20-90

IDENTIFICATION 1

Page 1

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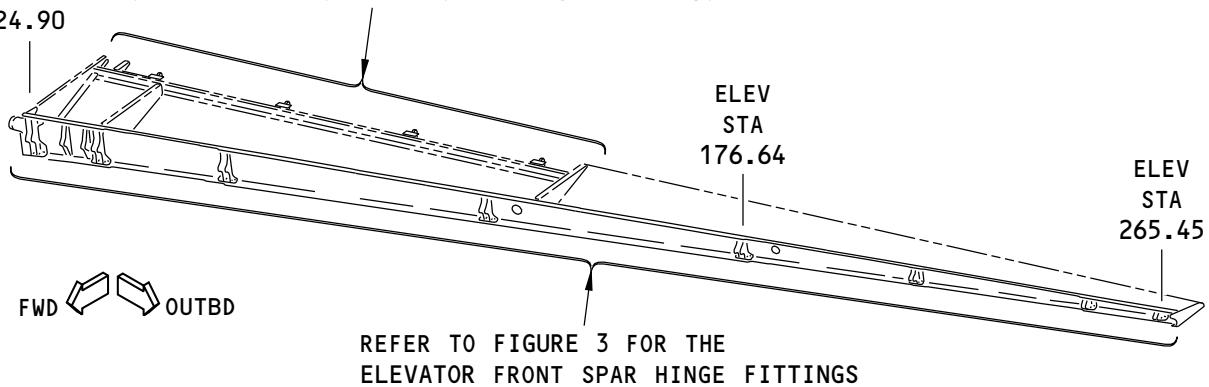
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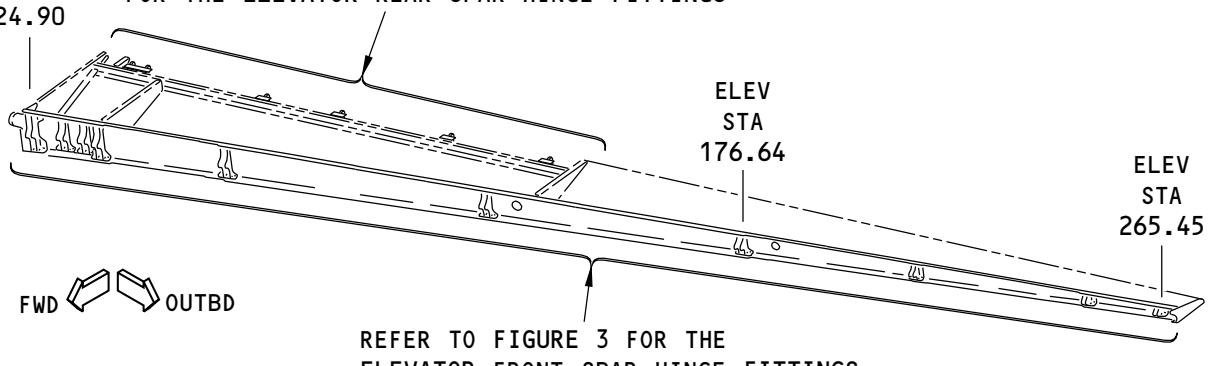
737-800
STRUCTURAL REPAIR MANUAL

ELEV
STA
24.90 REFER TO SRM 55-20-90, IDENTIFICATION 2,
FOR THE ELEVATOR REAR SPAR HINGE FITTINGS



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

ELEV
STA
24.90 REFER TO SRM 55-20-90, IDENTIFICATION 2,
FOR THE ELEVATOR REAR SPAR HINGE FITTINGS



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

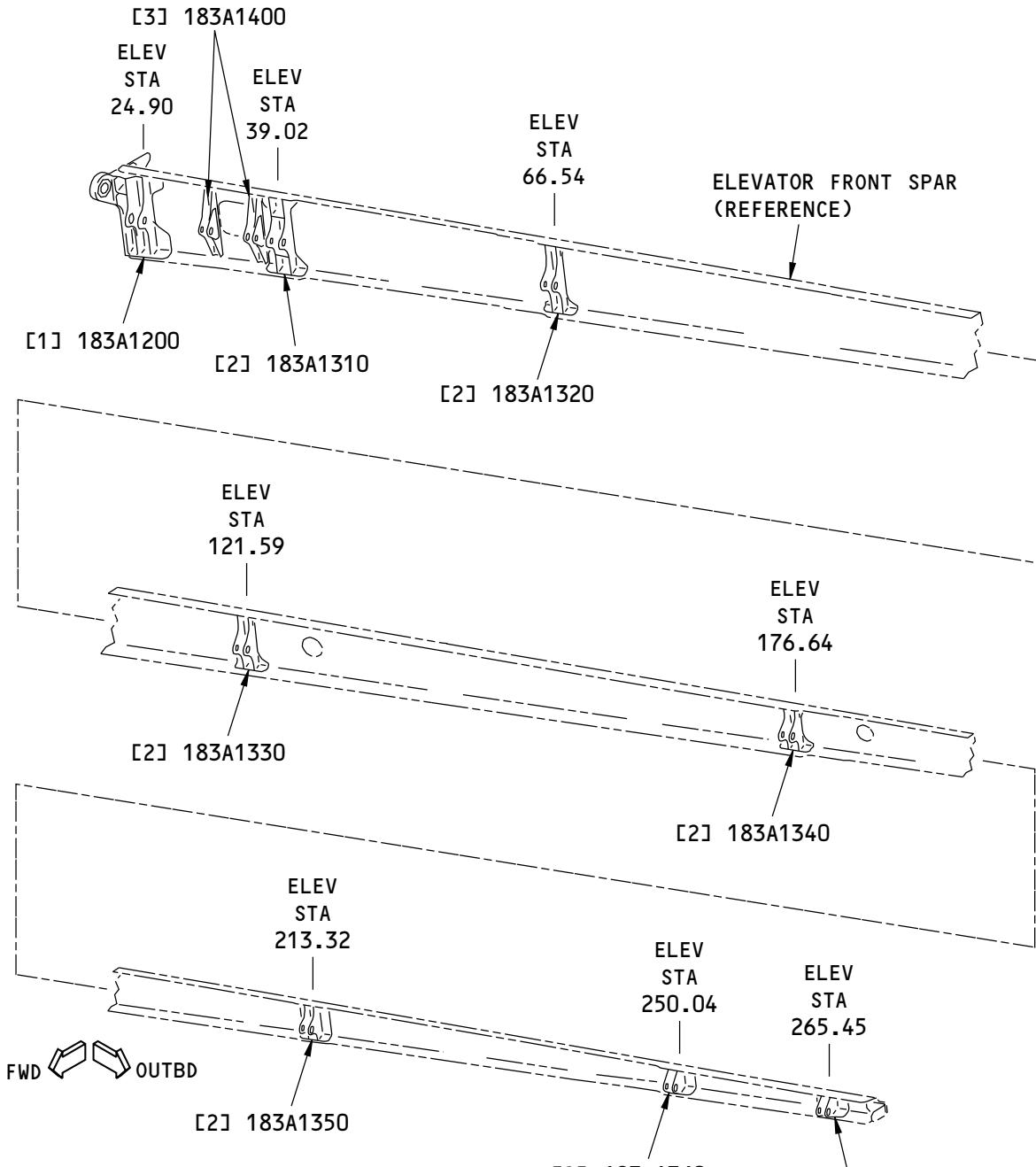
G92239 S0006593127_V1

Elevator Front Spar Hinge Fittings Location
Figure 2

55-20-90
IDENTIFICATION 1
Page 2
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STRUCTURAL REPAIR MANUAL**


(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

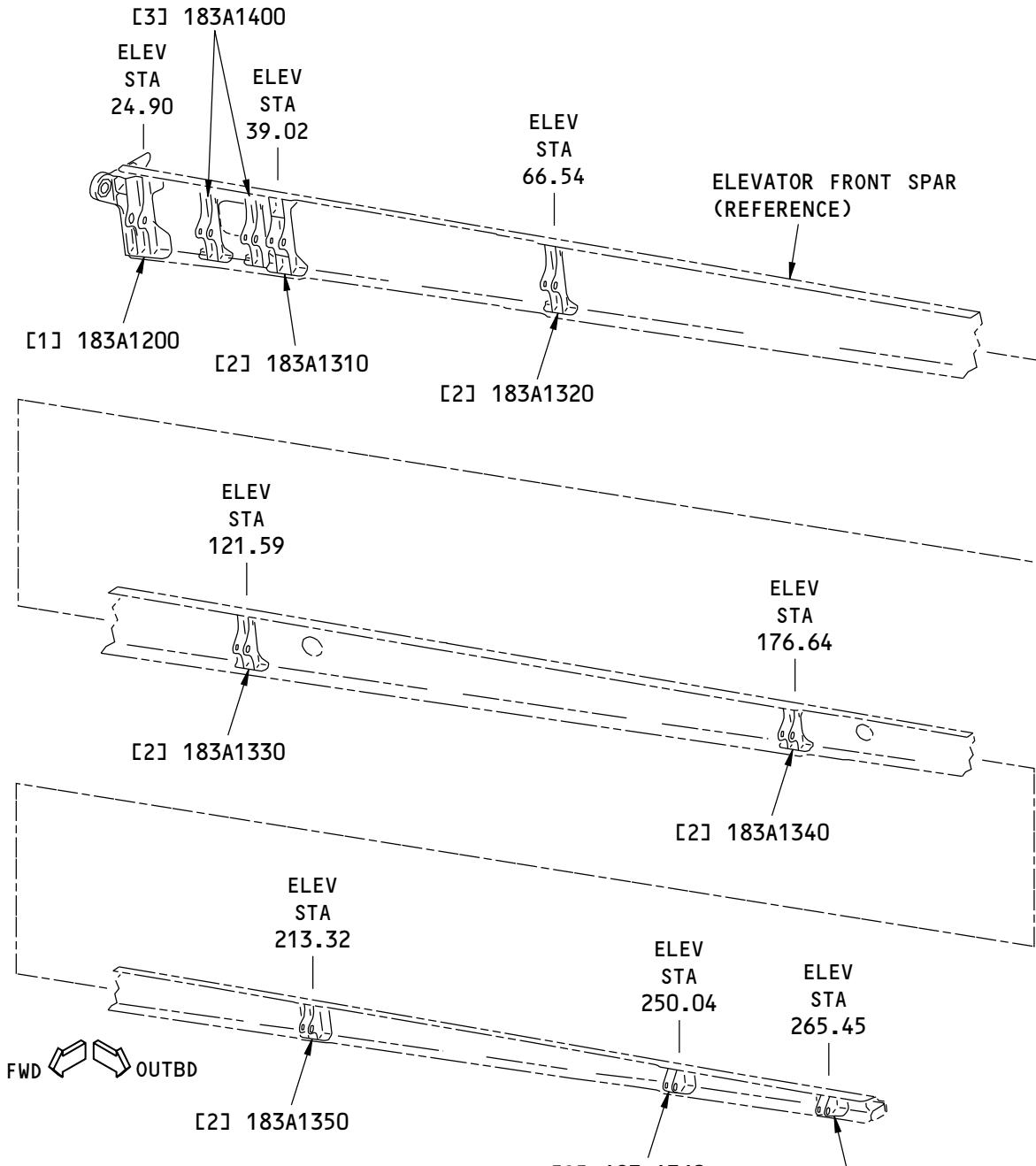
G92281 S0006593128_V1

**Elevator Front Spar Hinge Fittings Identification
Figure 3 (Sheet 1 of 2)**

55-20-90
IDENTIFICATION 1
Page 3
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STRUCTURAL REPAIR MANUAL**


(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

M94985 S0006593129_V1

**Elevator Front Spar Hinge Fittings Identification
Figure 3 (Sheet 2 of 2)**

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IDENTIFICATION 1
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STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Mast Arm Fitting Assembly			
	Mast Arm Fitting		7050-T7451 plate as given in BMS 7-323	
	Failsafe Strap		7075-T7351 plate	
[2]	Elevator Hinge Fitting Assembly		7050-T7451 plate as given in BMS 7-323	
[3]	Tab Control Bracket Assembly			
	Bracket		7075-T7351 plate	
	Bracket Doubler	0.09 (2.29)	7075-T6 sheet	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

55-20-90

IDENTIFICATION 1

Page 5

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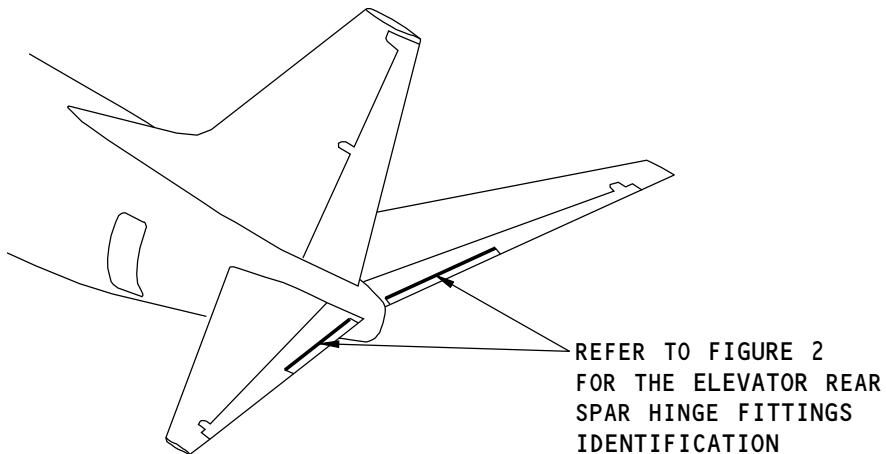
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - ELEVATOR REAR SPAR HINGE FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

G92318 S0006593132_V1

Elevator Rear Spar Hinge Fittings Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A4000	Elevator Rear Spar Assembly
183A4210	Elevator Rear Spar Hinge Fitting

55-20-90

IDENTIFICATION 2

Page 1

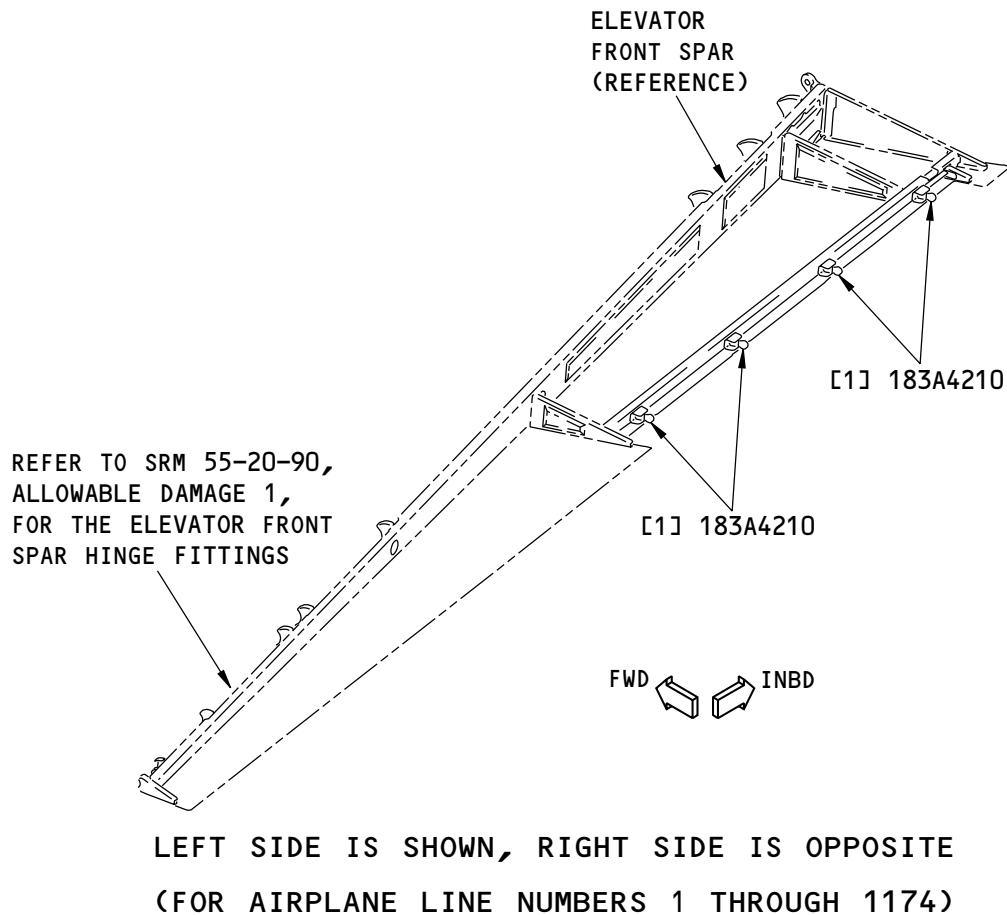
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STRUCTURAL REPAIR MANUAL



(A)

G92292 S0006593134_V1

Elevator Rear Spar Hinge Fitting Locations
Figure 2 (Sheet 1 of 2)

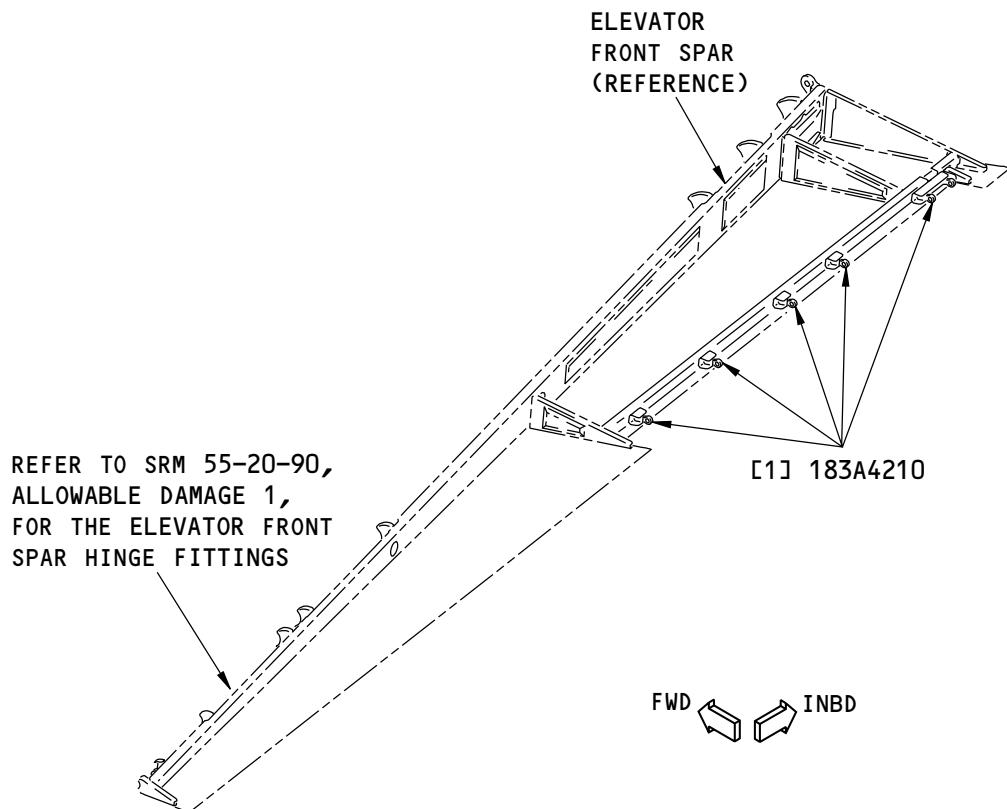
55-20-90
IDENTIFICATION 2
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STRUCTURAL REPAIR MANUAL



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(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

B

M77941 S0006593135_V1

Elevator Rear Spar Hinge Fitting Locations
Figure 2 (Sheet 2 of 2)

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IDENTIFICATION 2
Page 3
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STRUCTURAL REPAIR MANUAL**

Table 2:

LIST OF MATERIALS FOR FIGURE 2			
ITEM	DESCRIPTION	MATERIAL	EFFECTIVITY
[1]	Hinge Fitting	7075-T7351 plate as given in QQ-A-250/12 7050-T7451 plate as given in BMS 7-323, Type III	For airplane line numbers 1 though 1174 For airplane line numbers 1175 and on

55-20-90

IDENTIFICATION 2

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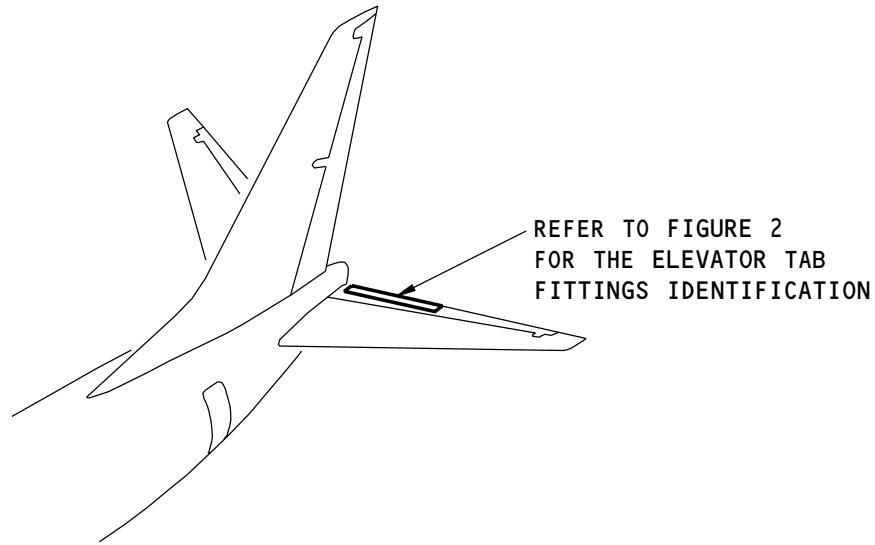
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 3 - ELEVATOR TAB FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

G92326 S0006593139_V1

Elevator Tab Fittings Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
183A8000	Elevator Tab Installation
183A8100	Elevator Tab Assembly

55-20-90

IDENTIFICATION 3

Page 1

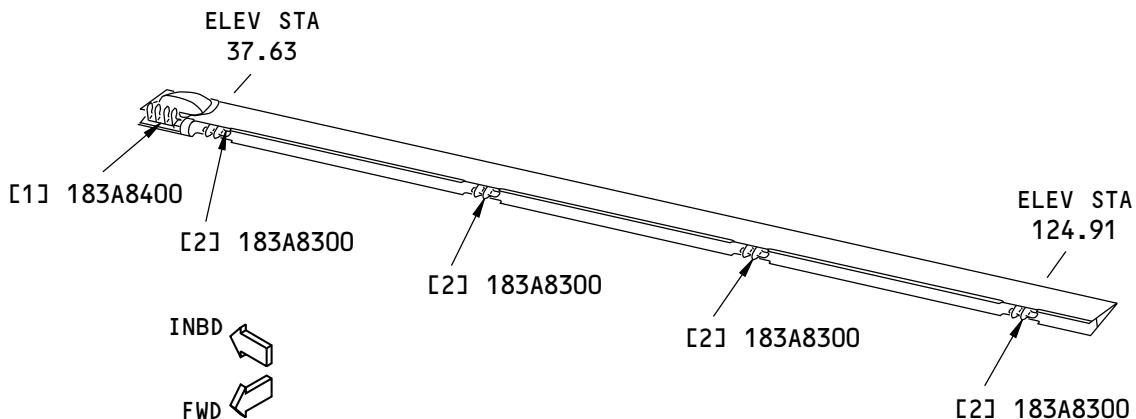
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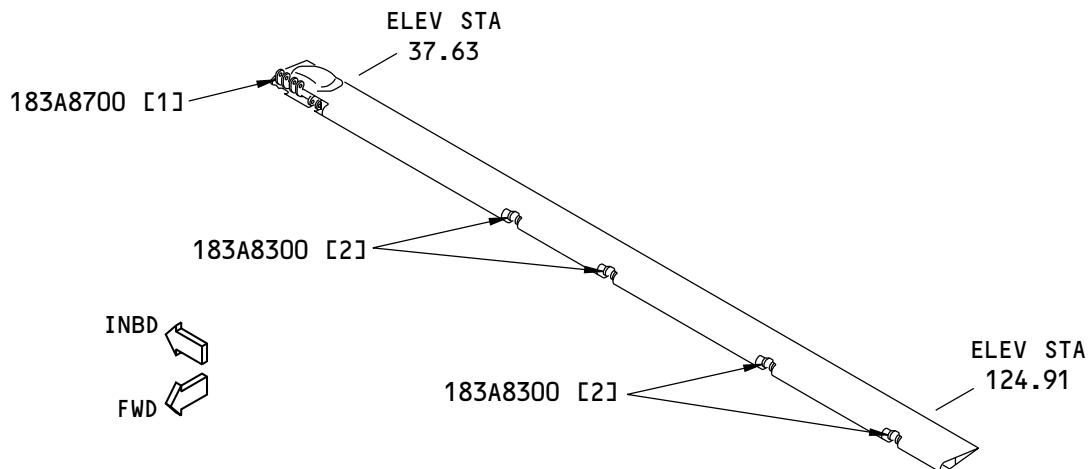


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STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

G92322 S0006593141_V1

Elevator Tab Fittings Identification
Figure 2

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IDENTIFICATION 3
Page 2
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STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T	MATERIAL	EFFECTIVITY
[1]	Hinge/Mast Arm		7050-T7451 plate as given in BMS 7-323, Type III	
[2]	Hinge Fitting		7075-T7351 plate as given in QQ-A-250/12 7050-T7451 plate as given in BMS 7-323, Type III	For cum lines 1 through 1174 For cum lines 1175 and on

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IDENTIFICATION 3

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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ELEVATOR FRONT SPAR HINGE FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the elevator front spar hinge fittings shown in Elevator Front Spar Hinge Fittings Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.
- B. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the investigation and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of non-metallic materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) Put a surface finish of 125 microinches Ra or better on the reworked areas.
- C. After you remove the damage, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the reworked areas of the parts, but not the inner surfaces of the lug bores.
 - (a) Refer to 51-20-06 for the shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
- (3) Apply a layer of BMS 10-79, Type III primer to the reworked areas. Refer to SOPM 20-44-04.

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ALLOWABLE DAMAGE 1

Page 101

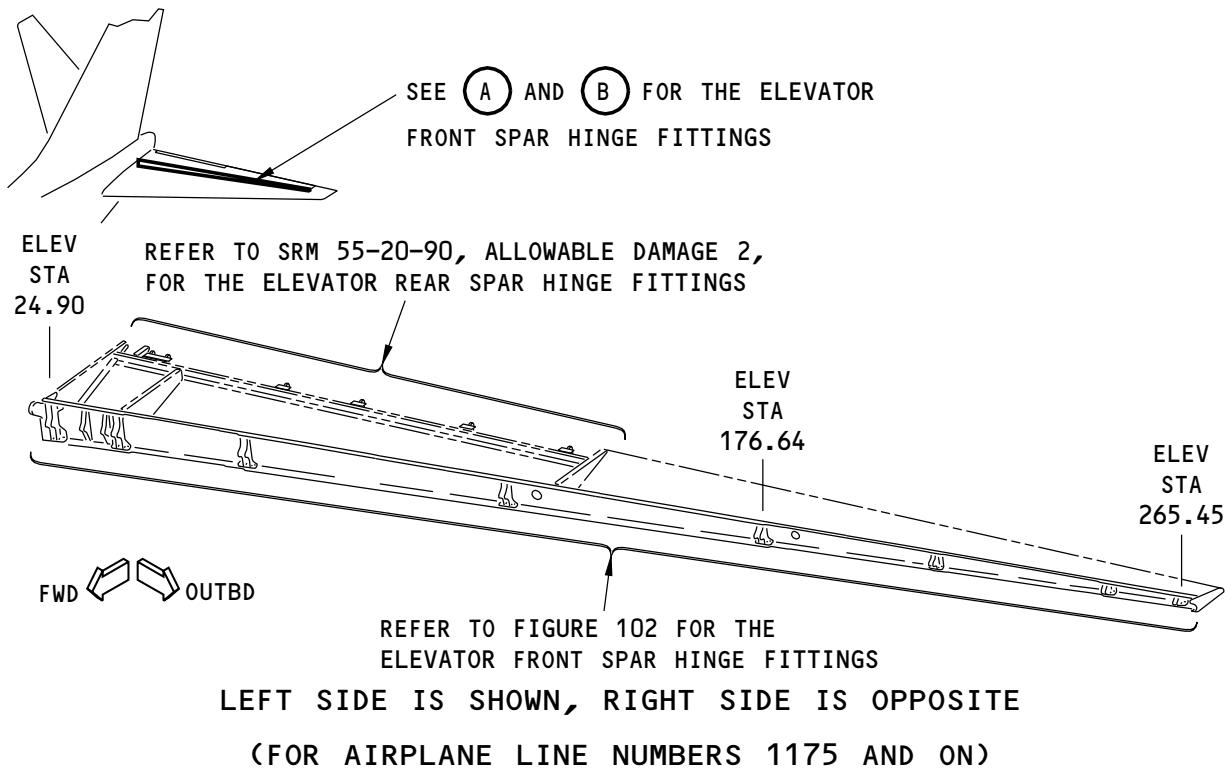
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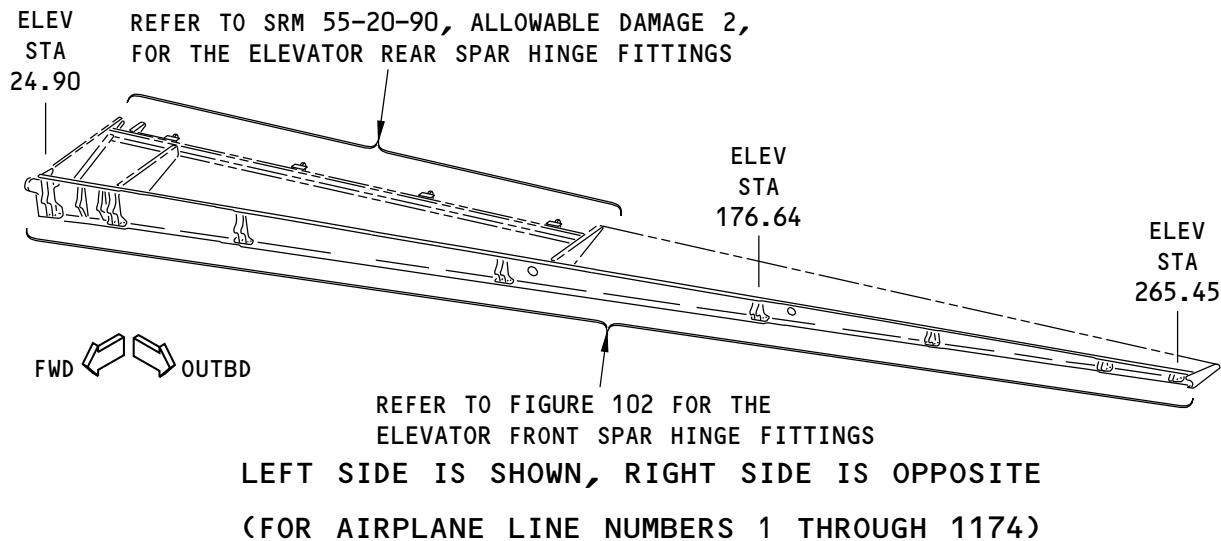
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STRUCTURAL REPAIR MANUAL



A



B

M62110 S0006593146_V1

Elevator Front Spar Hinge Fittings Location
Figure 101

55-20-90

ALLOWABLE DAMAGE 1

Page 102

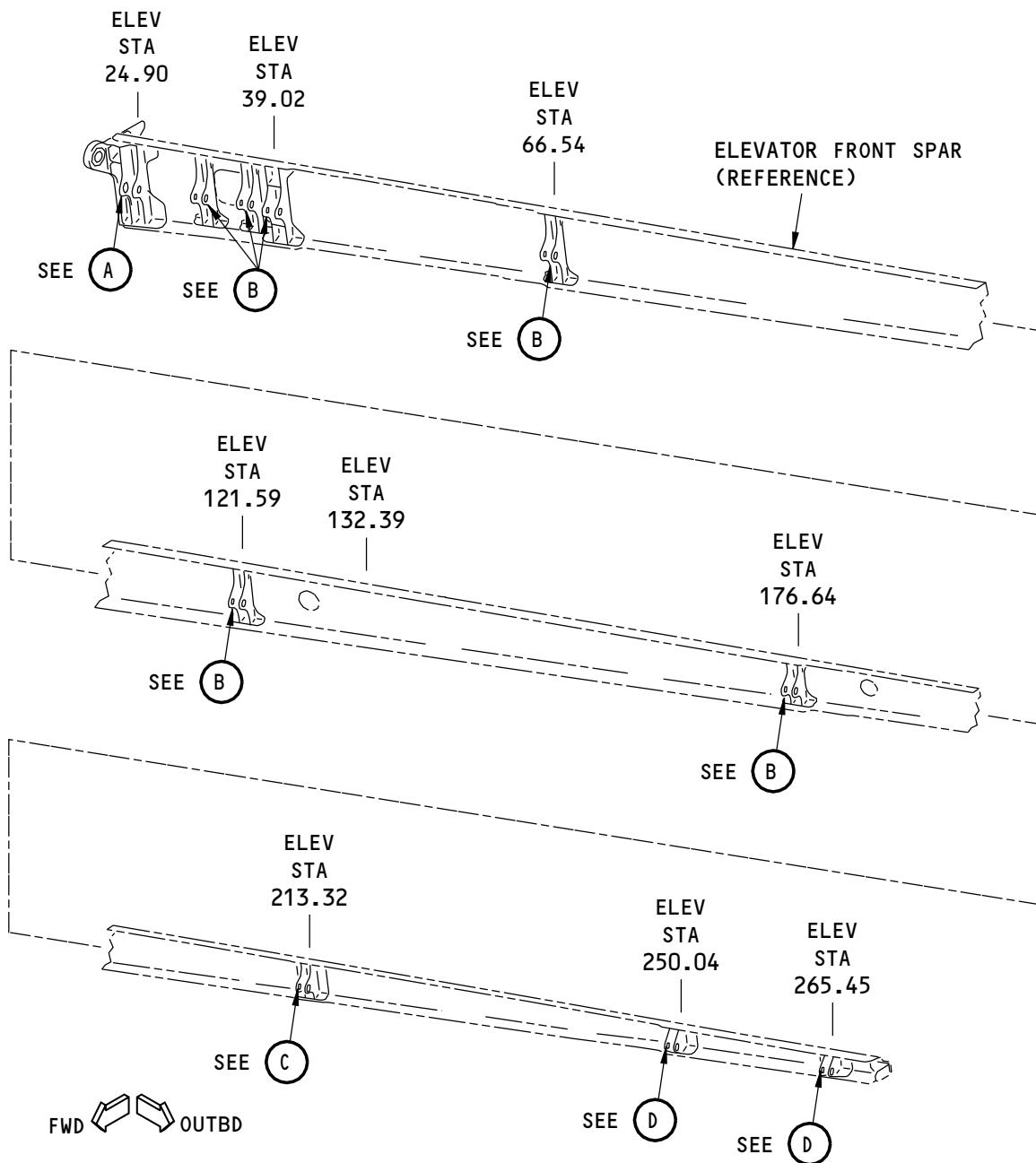
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STRUCTURAL REPAIR MANUAL



(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

G07208 S0006593147_V1

Elevator Front Spar Hinge Fittings
Figure 102 (Sheet 1 of 5)

55-20-90

ALLOWABLE DAMAGE 1

Page 103

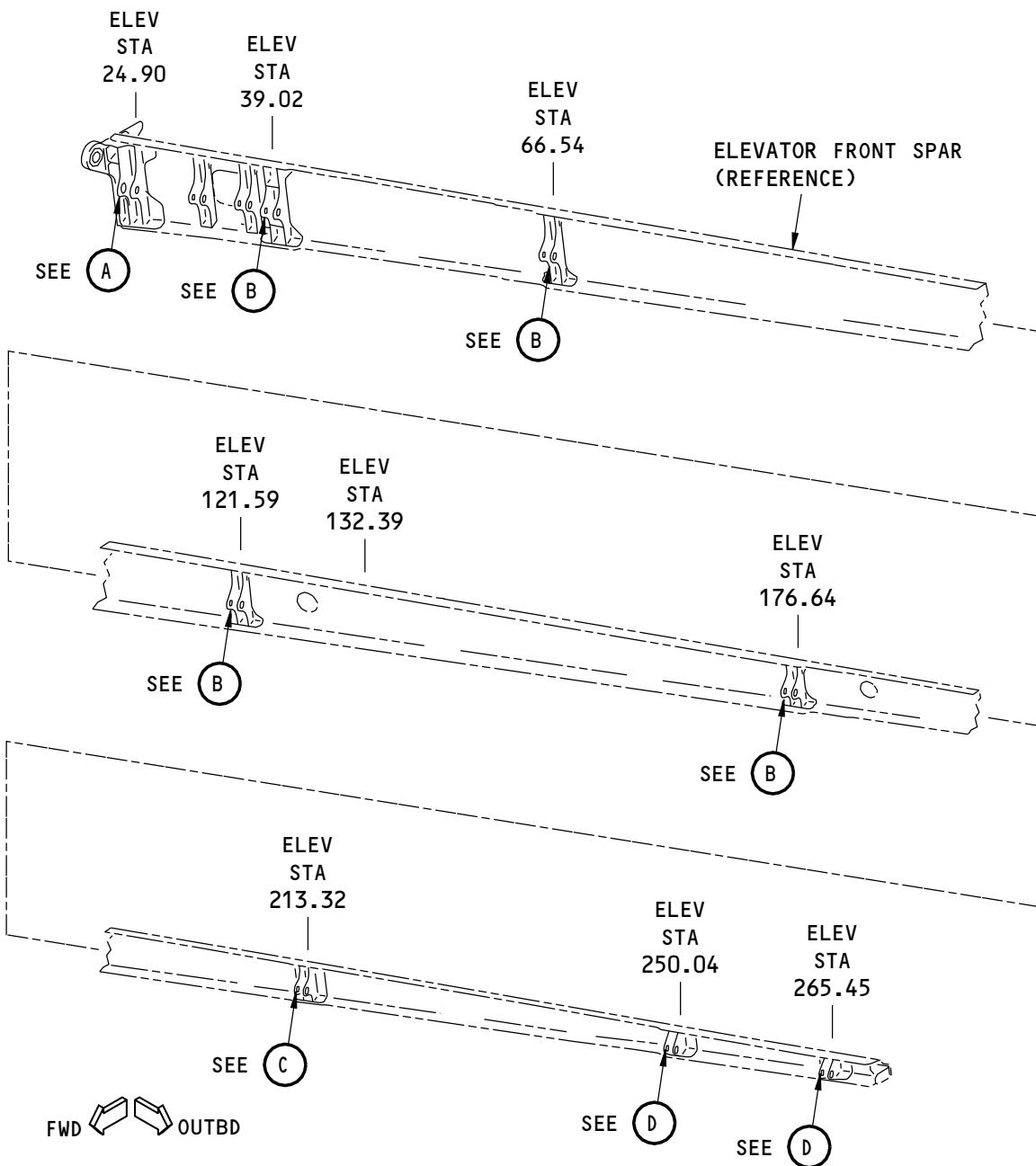
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

M94839 S0006593148_V1

Elevator Front Spar Hinge Fittings
Figure 102 (Sheet 2 of 5)

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ALLOWABLE DAMAGE 1

Page 104

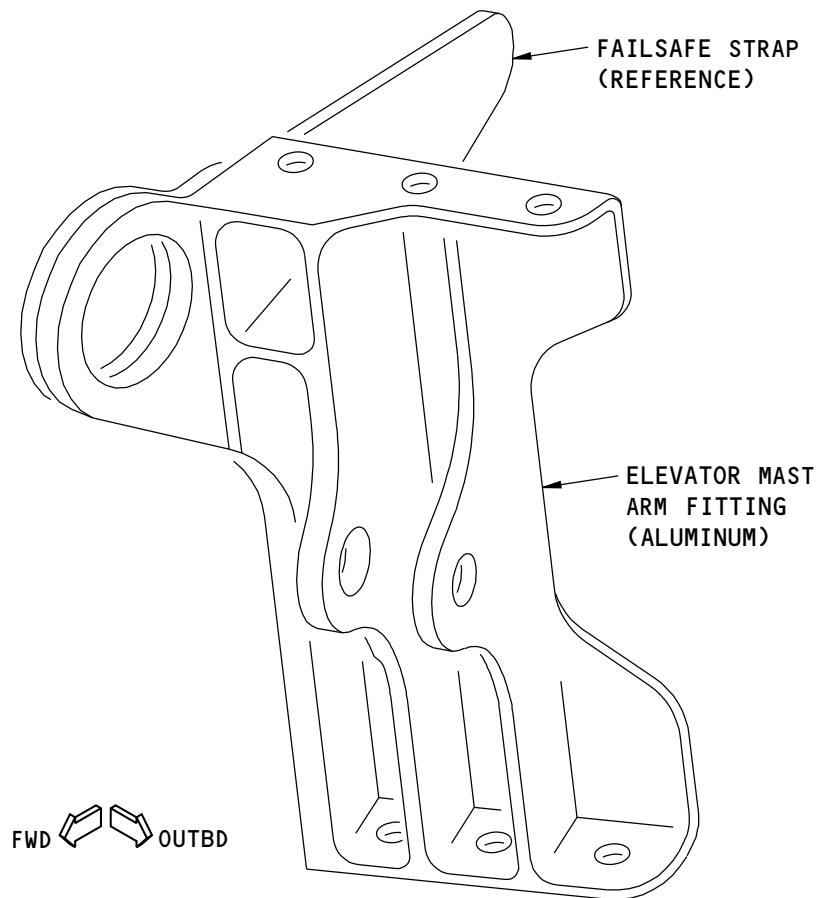
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A

G07321 S0006593149_V1

Elevator Front Spar Hinge Fittings
Figure 102 (Sheet 3 of 5)

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ALLOWABLE DAMAGE 1

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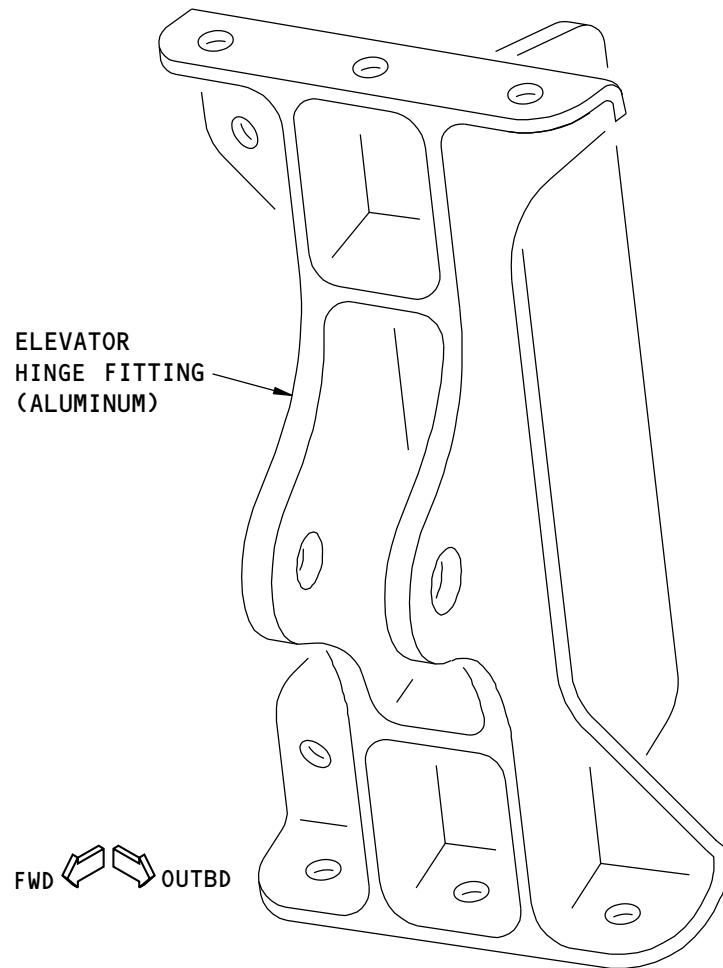
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B

G08062 S0006593150_V1

Elevator Front Spar Hinge Fittings
Figure 102 (Sheet 4 of 5)

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ALLOWABLE DAMAGE 1

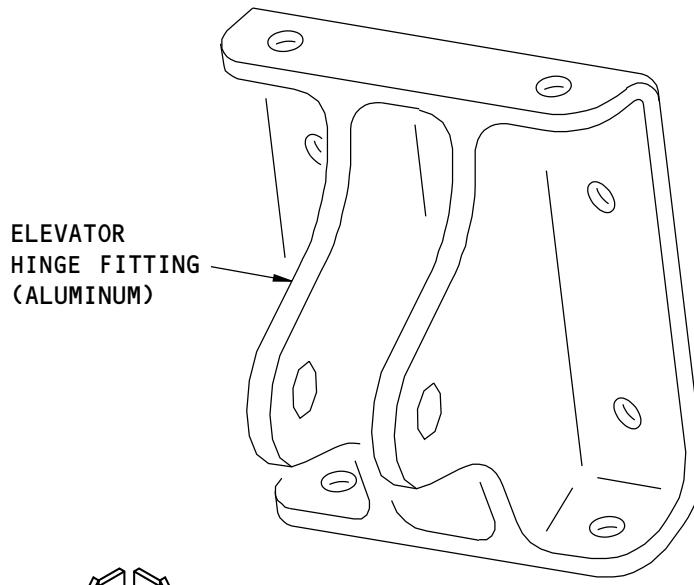
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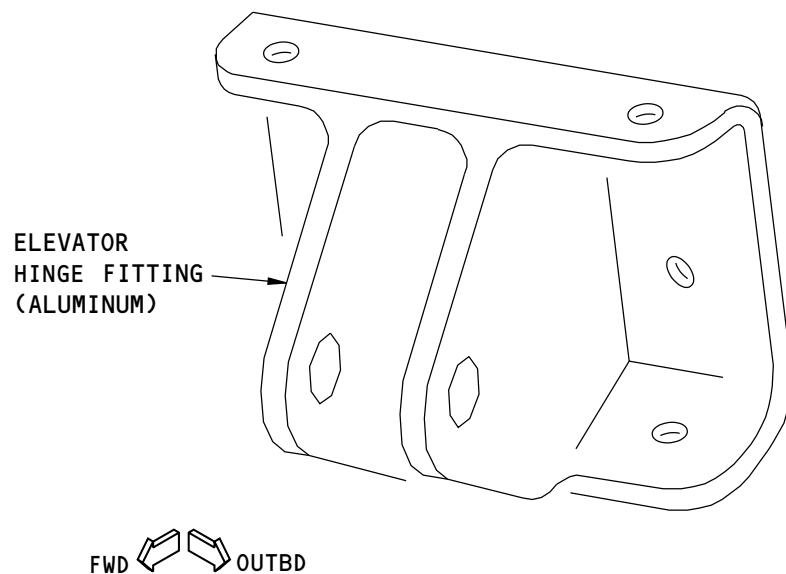
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(C)



(D)

G08065 S0006593151_V1

Elevator Front Spar Hinge Fittings
Figure 102 (Sheet 5 of 5)

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Mast Arm Fitting and Elevator Hinge Fittings (Except at ELEV STA 39.02 and ELEV STA 66.54)

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, C, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Elevator Hinge Fittings (ELEV STA 39.02 and ELEV STA 66.54)

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A, B, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

55-20-90

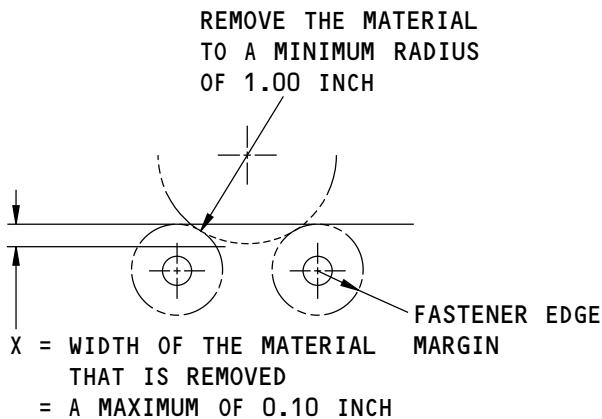
ALLOWABLE DAMAGE 1

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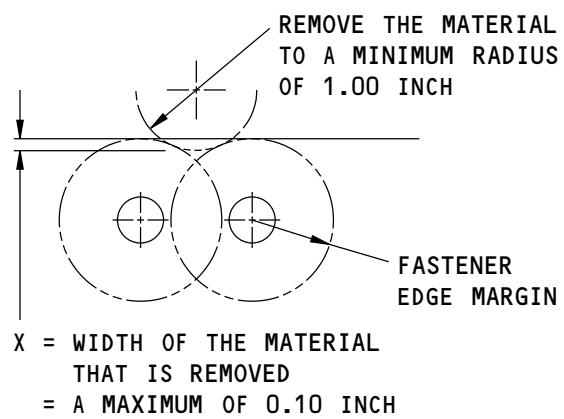
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STRUCTURAL REPAIR MANUAL**


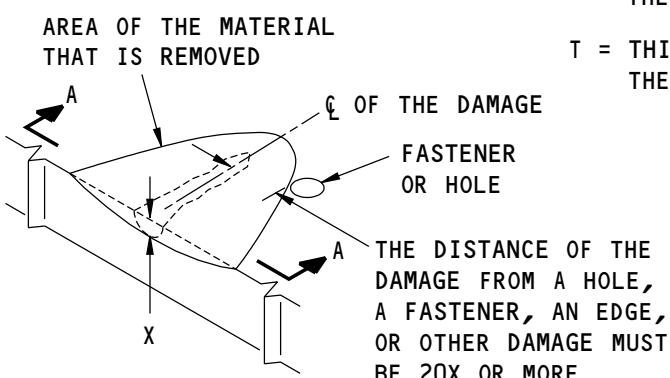
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



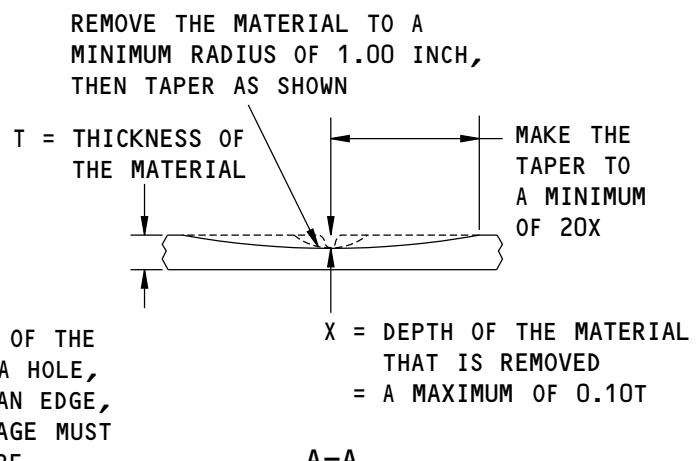
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)



G08573 S0006593152_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)

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ALLOWABLE DAMAGE 1

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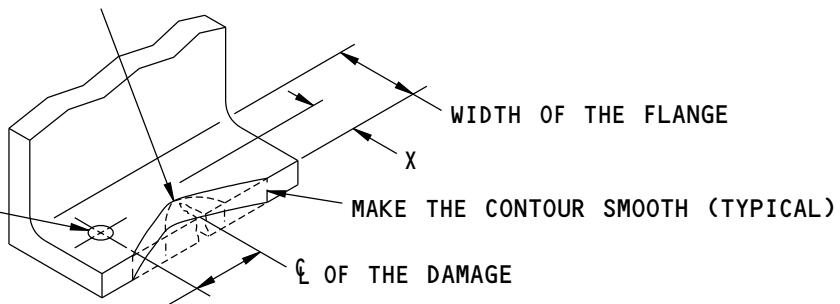
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REMOVE THE MATERIAL TO A MINIMUM RADIUS
OF 1.00 INCH, THEN TAPER AS SHOWN

IF THERE ARE FASTENERS,
SEE (A) AND (B)



TAPER TO A MINIMUM OF $20X$.
THE DISTANCE OF THE DAMAGE FROM A HOLE,
A FASTENER, AN EDGE, OR OTHER DAMAGE
MUST BE $20X$ OR MORE

X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE



G08574 S0006593153_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 3)

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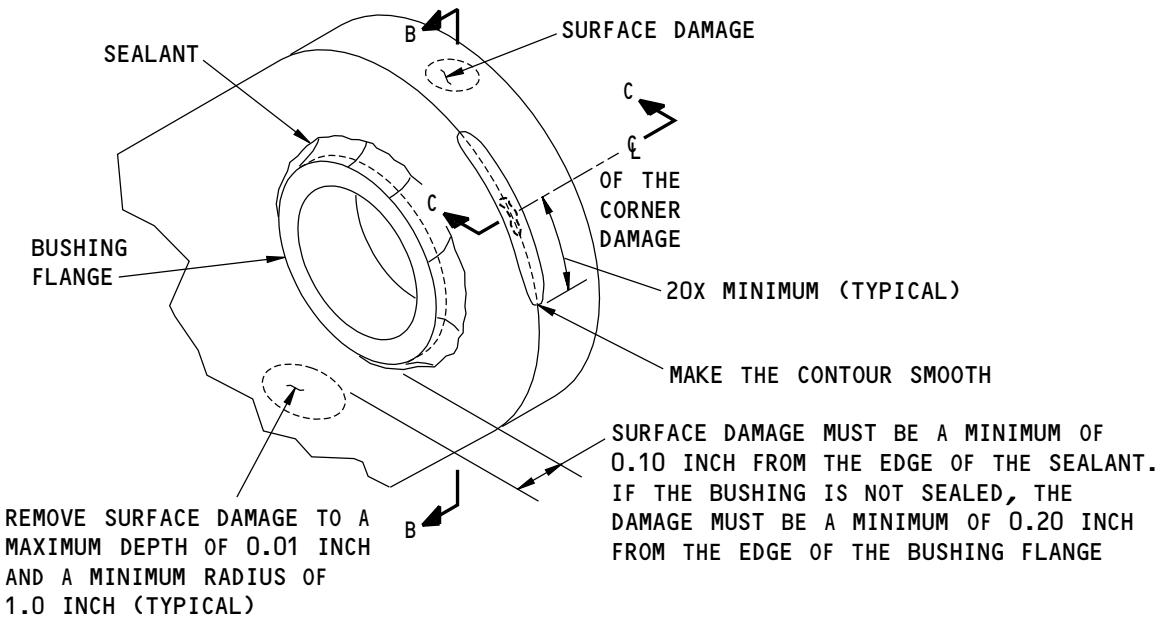
ALLOWABLE DAMAGE 1

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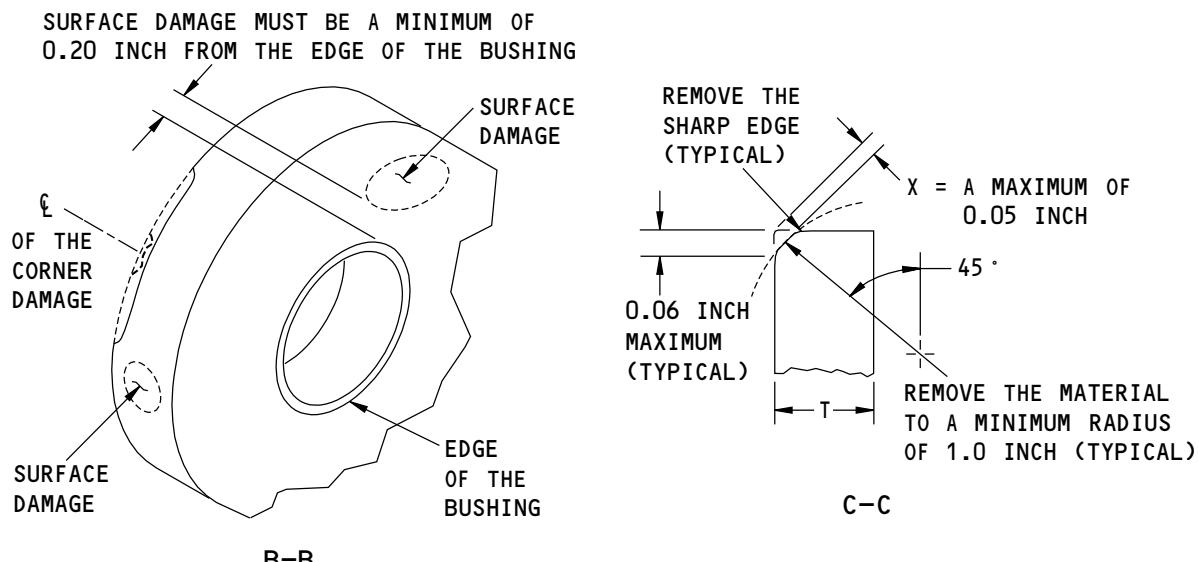
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NOTE: DAMAGED SEALANT IS NOT PERMITTED. IF THE SEALANT IS DAMAGED, LOOK FOR MIGRATION OR ROTATION OF THE BUSHING. IF THERE IS NO MIGRATION, ROTATION, OR CORROSION, REMOVE THE DAMAGED SEALANT AND APPLY A NEW FILLET SEAL.

REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING

(E)



G08585 S0006593154_V1

**Allowable Damage Limits
Figure 103 (Sheet 3 of 3)**

55-20-90

ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - ELEVATOR REAR SPAR HINGE FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the elevator rear spar hinge fittings shown in Figure 101.

2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 2 for the allowable damage limits.
- B. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the investigation and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of non-metallic materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) Put a surface finish of 125 microinches Ra or better on the reworked areas.
- C. After you remove the damage, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the reworked areas of the parts, but not the inner surfaces of the lug bores.
 - (a) Refer to 51-20-06 for the shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
- (3) Apply a layer of BMS 10-79, Type III primer to the reworked areas. Refer to SOPM 20-44-04.

55-20-90

ALLOWABLE DAMAGE 2

Page 101

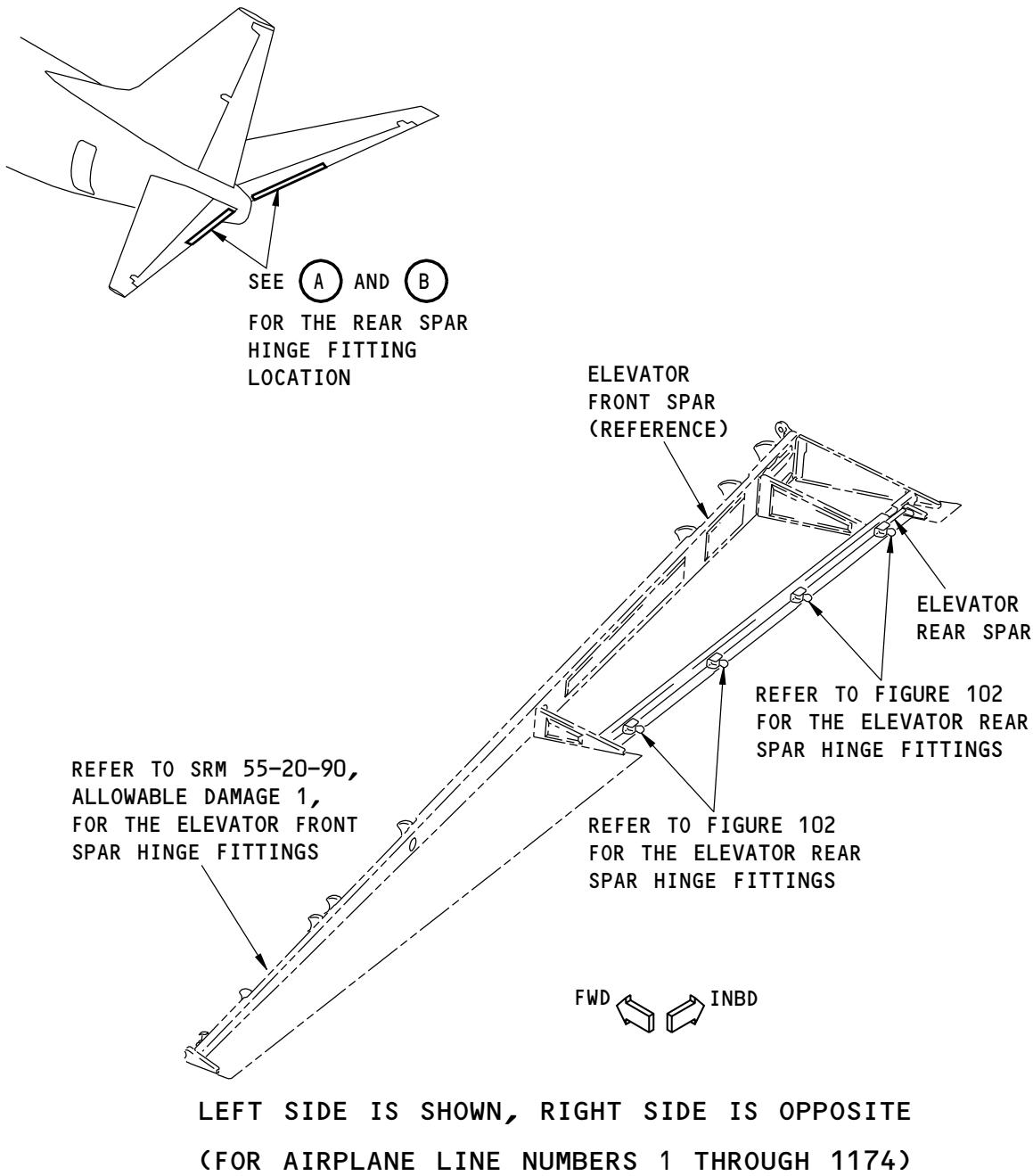
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737-800
STRUCTURAL REPAIR MANUAL



(A)

M62262 S0006593159_V1

Elevator Rear Spar Hinge Fitting Locations
Figure 101 (Sheet 1 of 2)

55-20-90

ALLOWABLE DAMAGE 2

Page 102

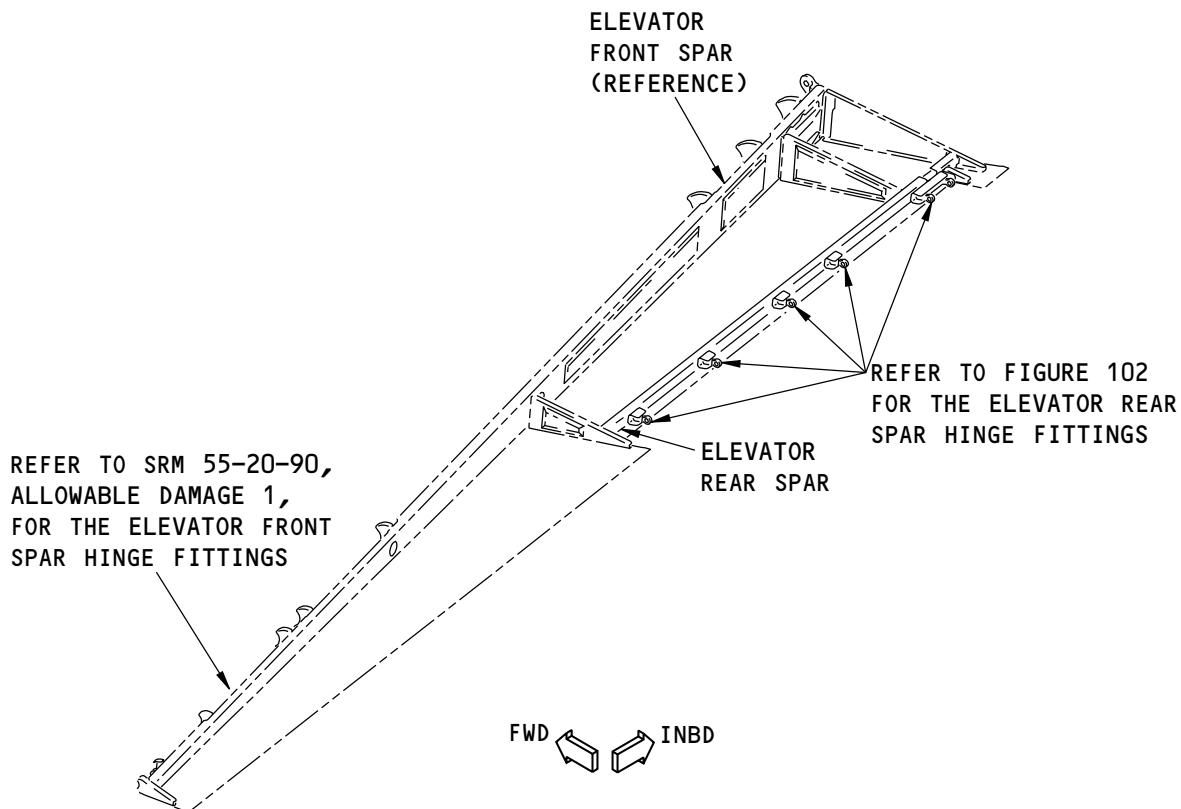
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

B

M62337 S0006593160_V1

Elevator Rear Spar Hinge Fitting Locations
Figure 101 (Sheet 2 of 2)

55-20-90

ALLOWABLE DAMAGE 2

Page 103

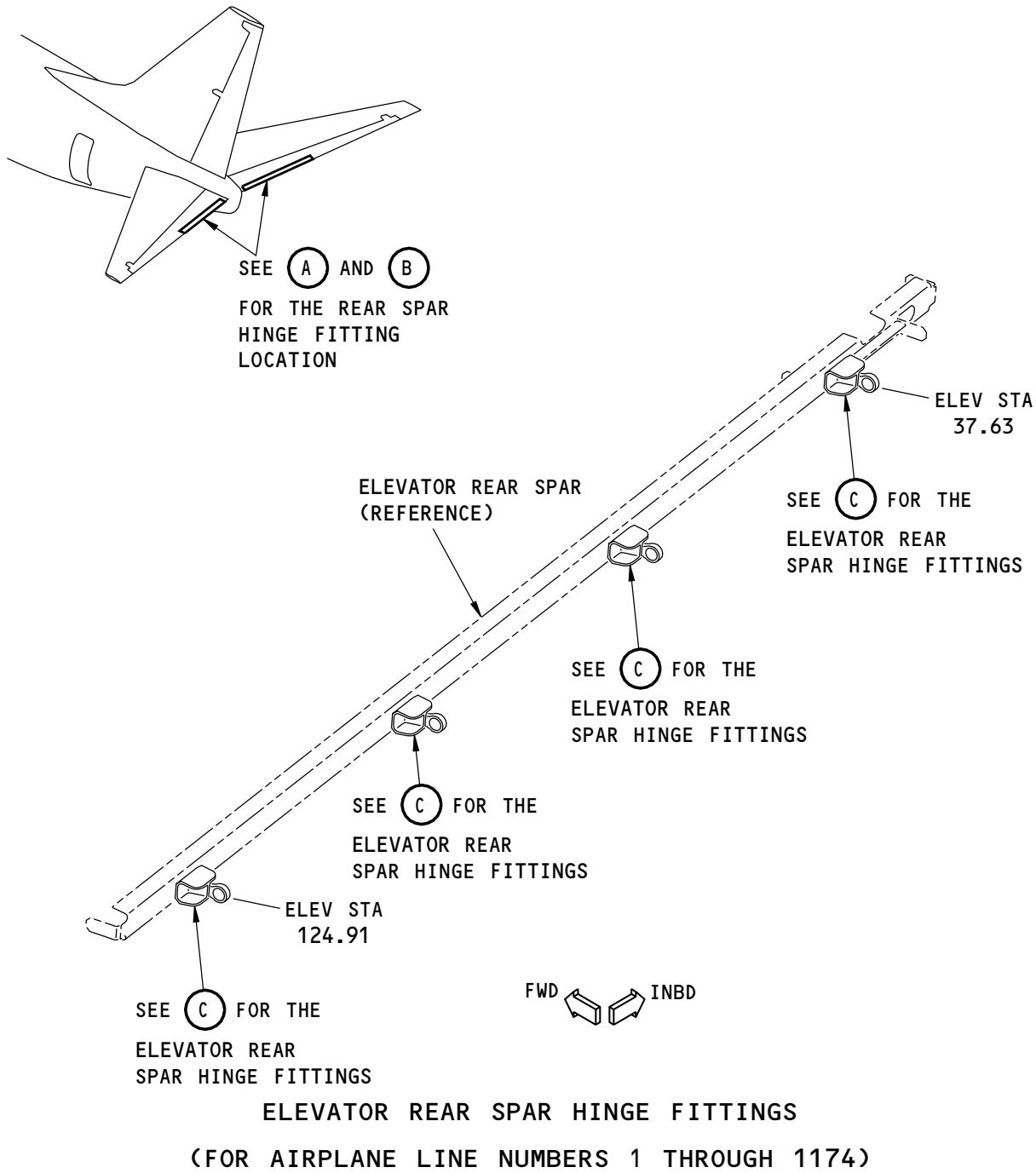
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737-800
STRUCTURAL REPAIR MANUAL



(A)

M62411 S0006593161_V1

Elevator Rear Spar Hinge Fittings
Figure 102 (Sheet 1 of 3)

55-20-90

ALLOWABLE DAMAGE 2

Page 104

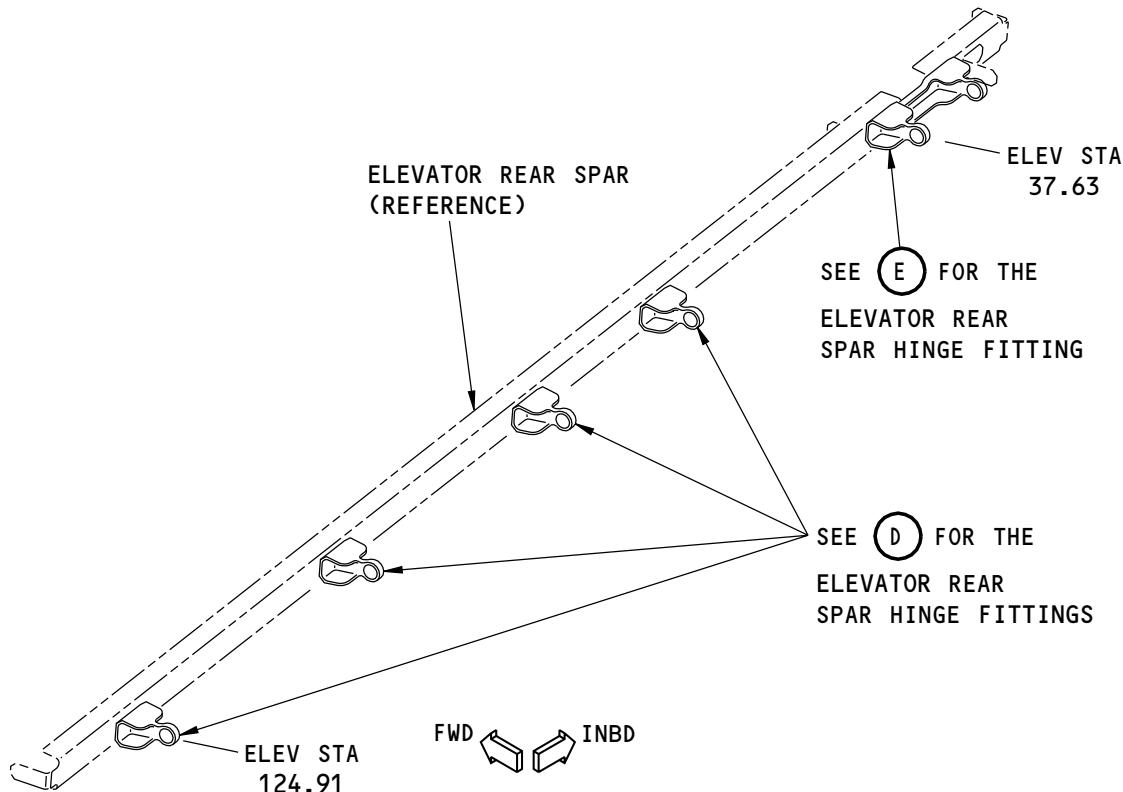
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STRUCTURAL REPAIR MANUAL



ELEVATOR REAR SPAR HINGE FITTINGS
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

B

M62419 S0006593162_V1

Elevator Rear Spar Hinge Fittings
Figure 102 (Sheet 2 of 3)

55-20-90

ALLOWABLE DAMAGE 2

Page 105

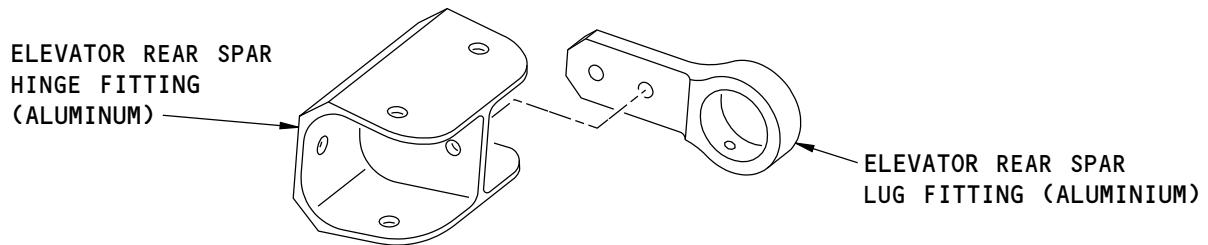
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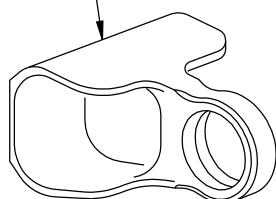
737-800
STRUCTURAL REPAIR MANUAL



ELEVATOR REAR SPAR HINGE FITTINGS

(C)

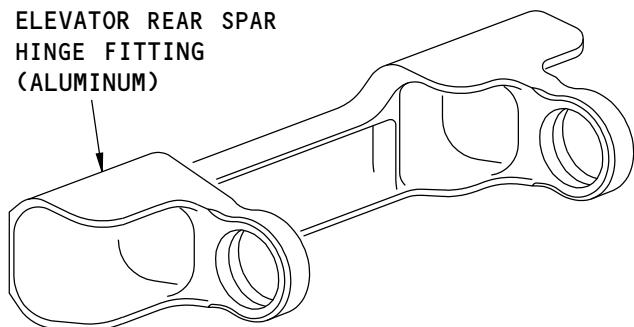
ELEVATOR REAR SPAR
HINGE FITTING
(ALUMINUM)



ELEVATOR REAR SPAR HINGE FITTING

(D)

ELEVATOR REAR SPAR
HINGE FITTING
(ALUMINUM)



ELEVATOR REAR SPAR HINGE FITTING

(E)

M62434 S0006593163_V1

Elevator Rear Spar Hinge Fittings
Figure 102 (Sheet 3 of 3)

55-20-90

ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Hinge Fittings (Except at ELEV STA 37.63)

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A, B, C, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Hinge Fitting at ELEV STA 37.63

- (1) Damage is not permitted.

55-20-90

ALLOWABLE DAMAGE 2

Page 107

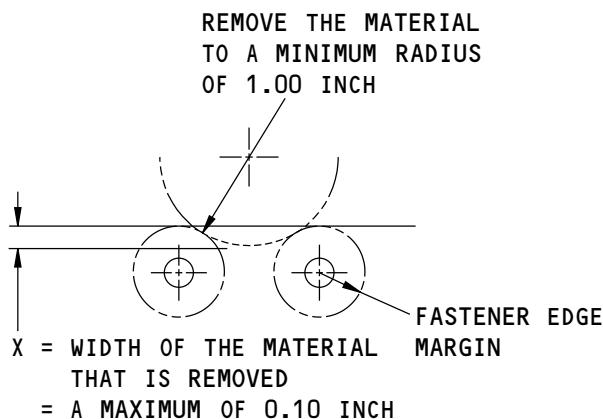
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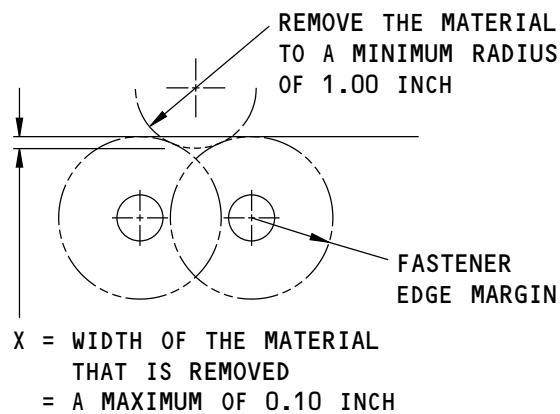


737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)

G08490 S0006593164_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)

55-20-90

ALLOWABLE DAMAGE 2

Page 108

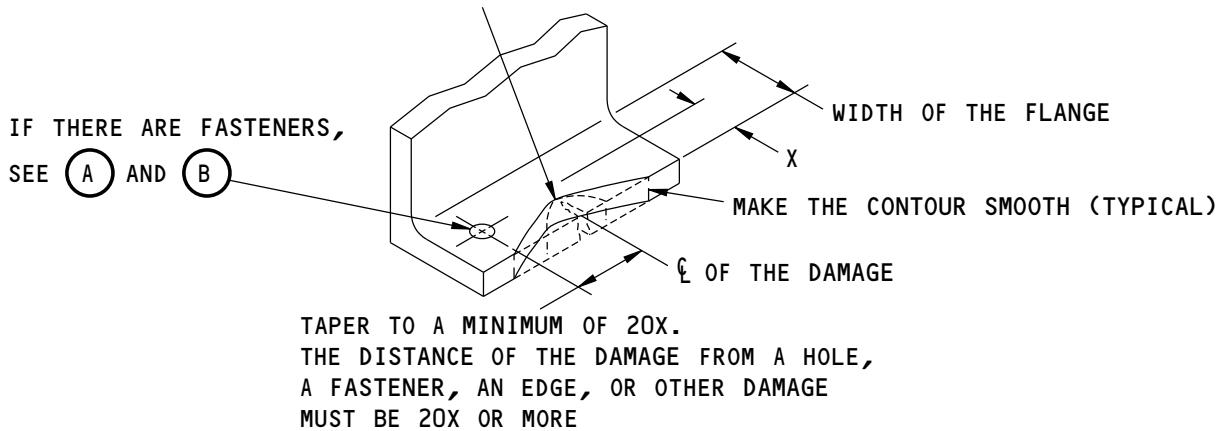
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**737-800
STRUCTURAL REPAIR MANUAL**

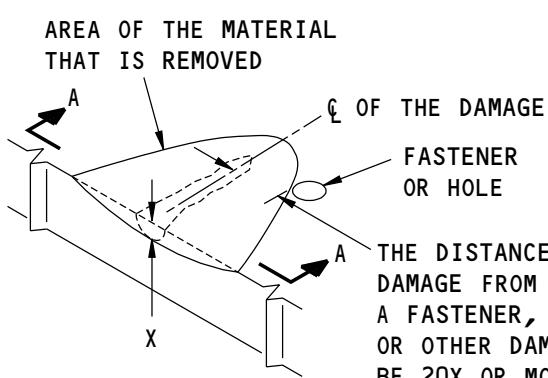
REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER AS SHOWN



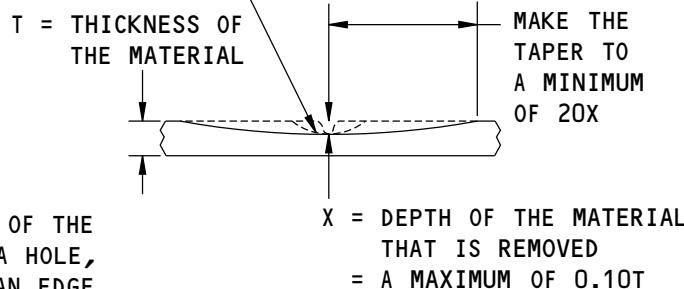
X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)



REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER AS SHOWN



A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)

G08495 S0006593165_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 3)

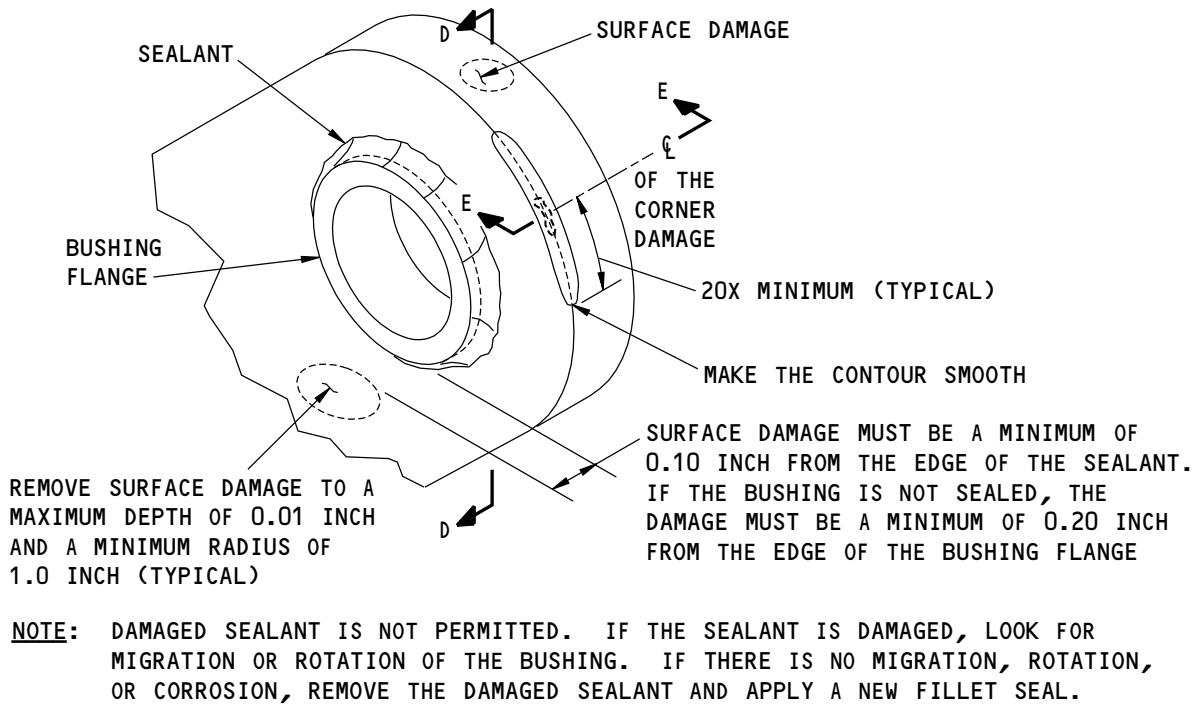
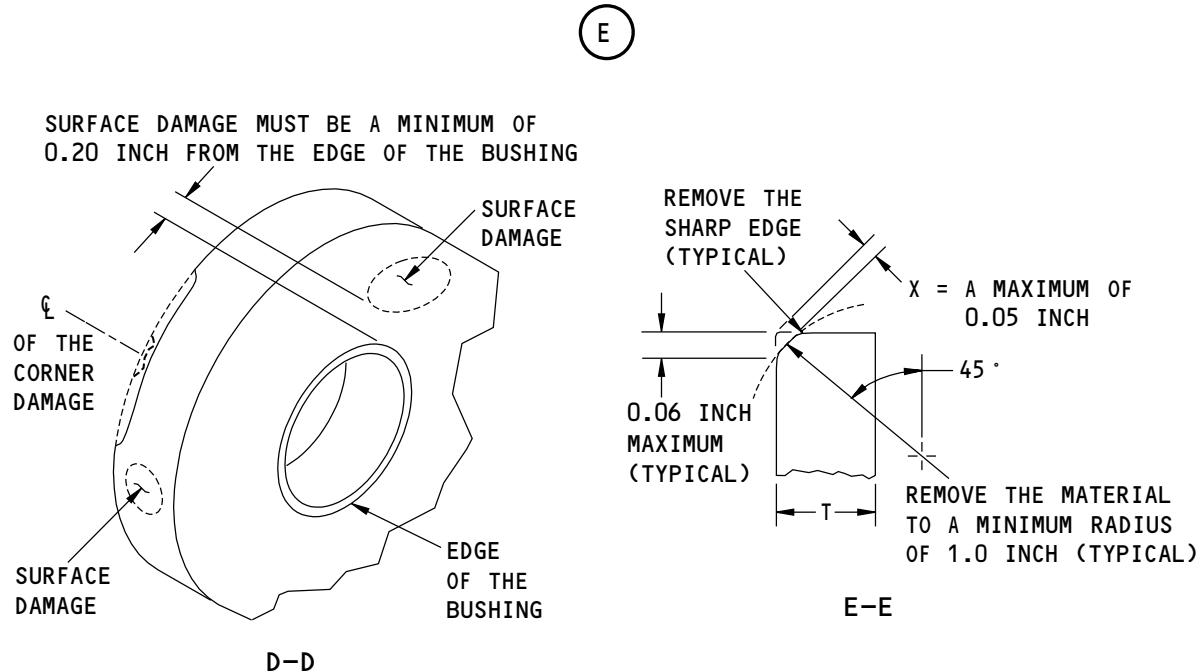
55-20-90

ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL**

REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING


G08497 S0006593166_V1

**Allowable Damage Limits
Figure 103 (Sheet 3 of 3)**
55-20-90
ALLOWABLE DAMAGE 2

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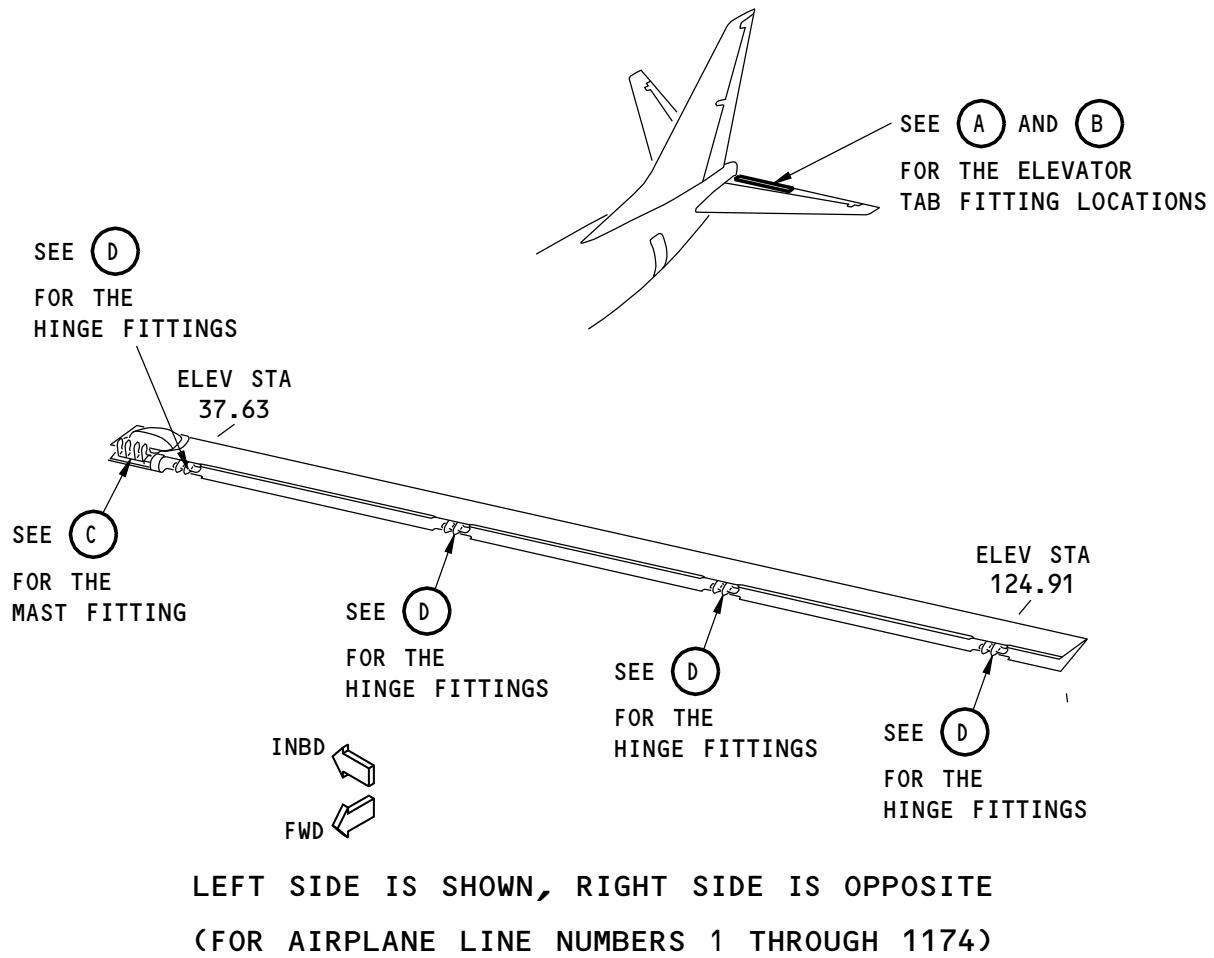
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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 3 - ELEVATOR TAB FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the elevator tab fittings shown in Elevator Tab Fitting Location, Figure 101/ALLOWABLE DAMAGE 3.



(A)

M62462 S0006593170_V1

Elevator Tab Fitting Location
Figure 101 (Sheet 1 of 4)

55-20-90

ALLOWABLE DAMAGE 3

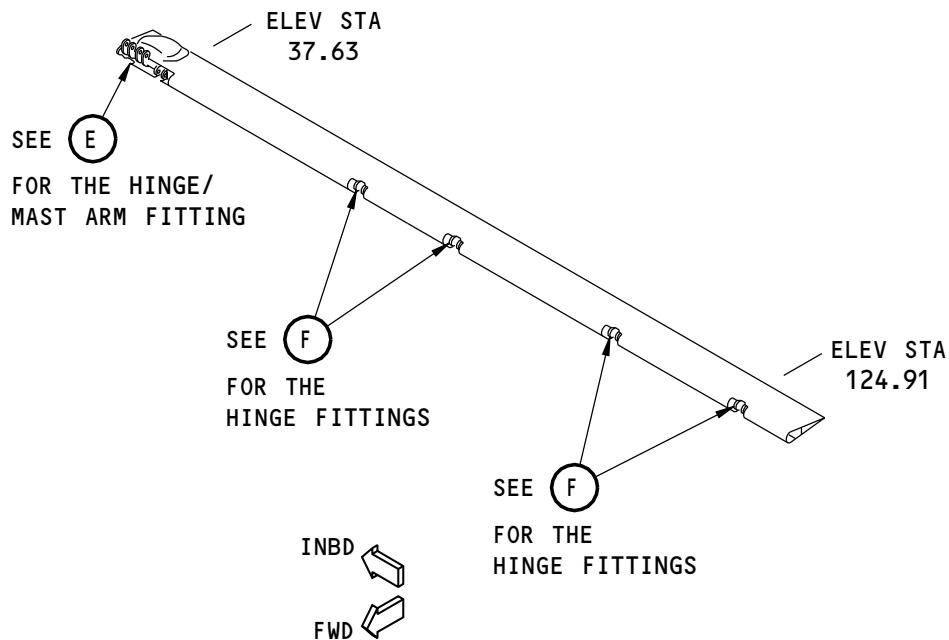
Page 101

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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

B

M62463 S0006593171_V1

Elevator Tab Fitting Location
Figure 101 (Sheet 2 of 4)

55-20-90

ALLOWABLE DAMAGE 3

Page 102

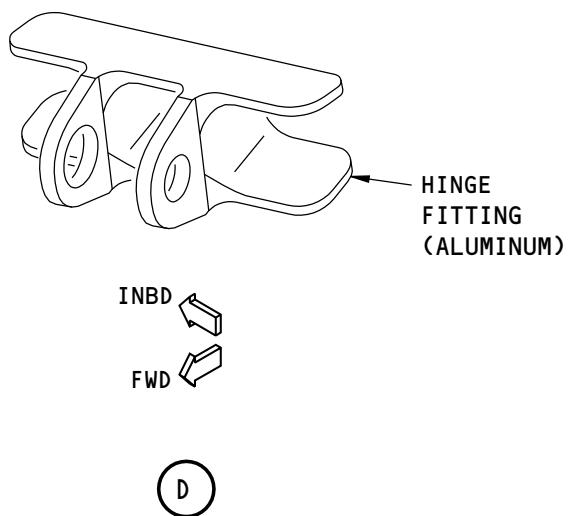
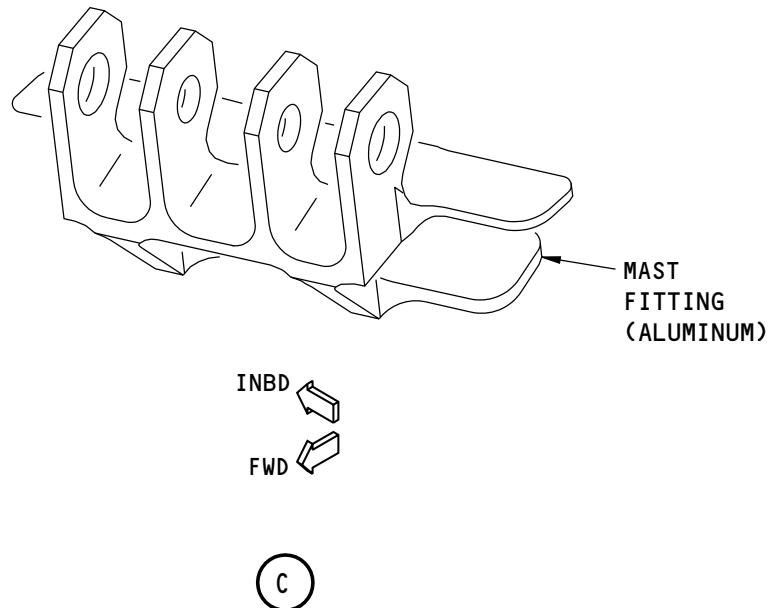
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STRUCTURAL REPAIR MANUAL



M62469 S0006593172_V1

Elevator Tab Fitting Location
Figure 101 (Sheet 3 of 4)

55-20-90

ALLOWABLE DAMAGE 3

Page 103

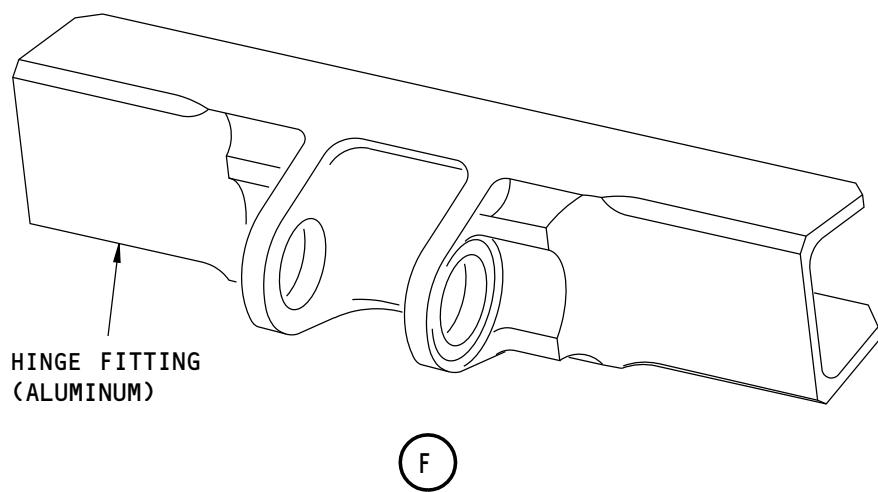
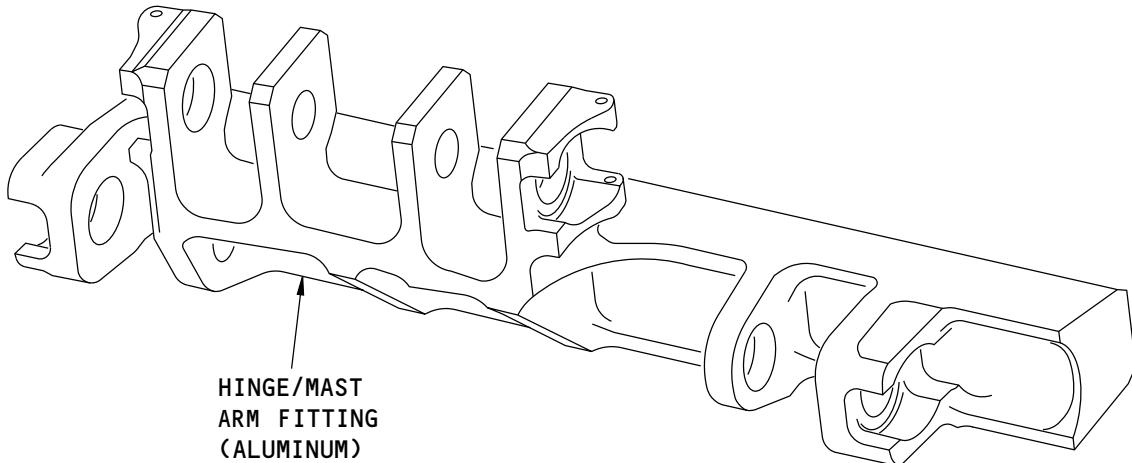
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STRUCTURAL REPAIR MANUAL



M62932 S0006593173_V1

Elevator Tab Fitting Location
Figure 101 (Sheet 4 of 4)

55-20-90

ALLOWABLE DAMAGE 3

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STRUCTURAL REPAIR MANUAL

2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 3 for the allowable damage limits.
- B. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the investigation and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of non-metallic materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) Put a surface finish of 125 microinches Ra or better on the reworked areas.
- C. After you remove the damage, do the steps that follow:

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the reworked areas of the parts, but not the inner surfaces of the lug bores.
 - (a) Refer to 51-20-06 for the shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
- (3) Apply a layer of BMS 10-79, Type III primer to the reworked areas. Refer to SOPM 20-44-04.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Hinge Fittings

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 3, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 3, Details A, B, C, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Mast Fitting

- (1) Damage is not permitted.

55-20-90

ALLOWABLE DAMAGE 3

Page 105

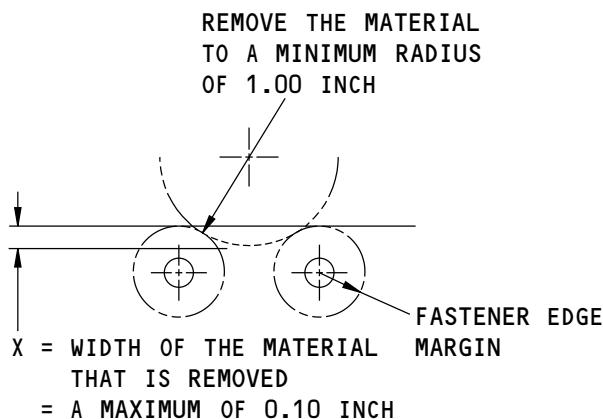
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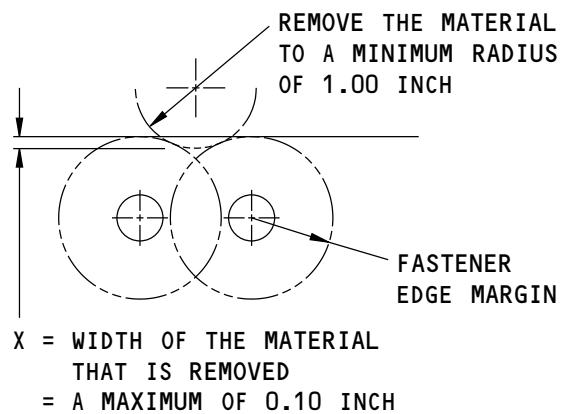


737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)

G09385 S0006593174_V1

Allowable Damage Limits
Figure 102 (Sheet 1 of 3)

55-20-90

ALLOWABLE DAMAGE 3

Page 106

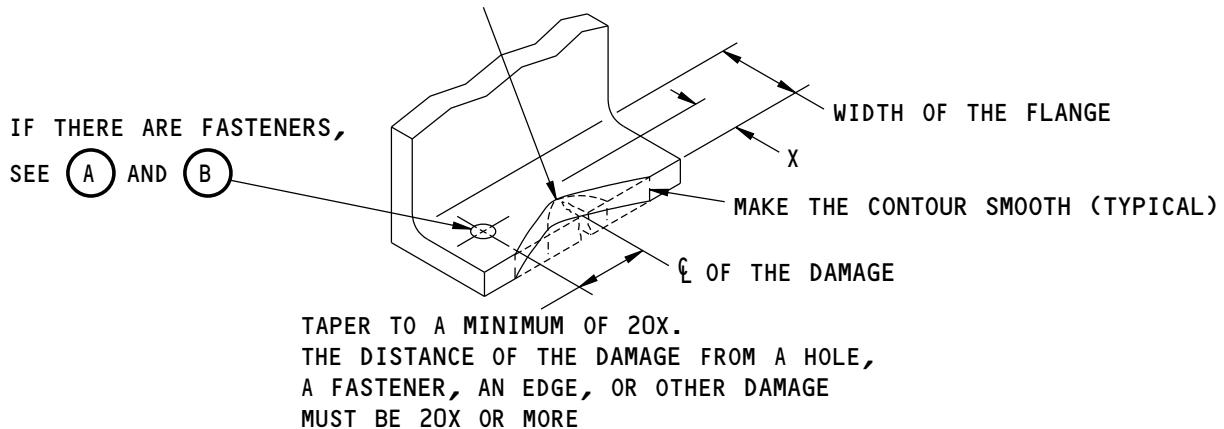
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**737-800
STRUCTURAL REPAIR MANUAL**

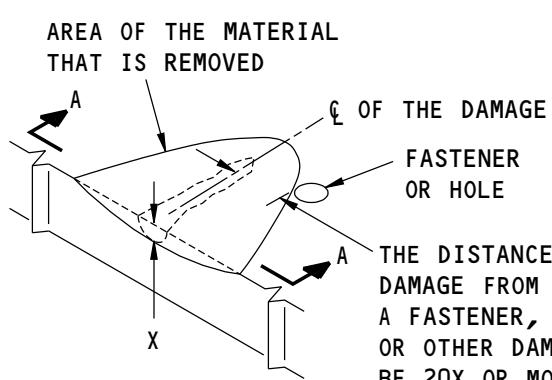
REMOVE THE MATERIAL TO A MINIMUM RADIUS
OF 1.00 INCH, THEN TAPER AS SHOWN



X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

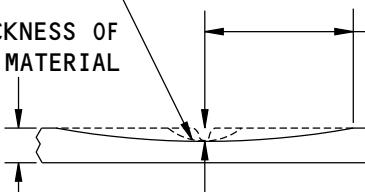
REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH,
THEN TAPER AS SHOWN

T = THICKNESS OF
THE MATERIAL



X = DEPTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.10T

A-A

**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(D)

G09386 S0006593175_V1

**Allowable Damage Limits
Figure 102 (Sheet 2 of 3)**

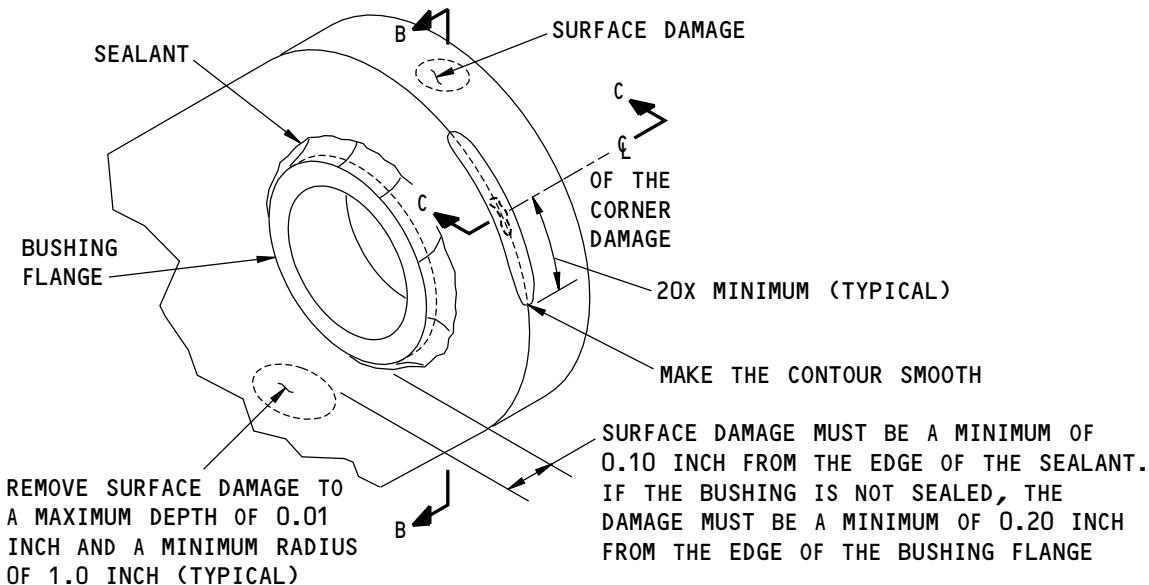
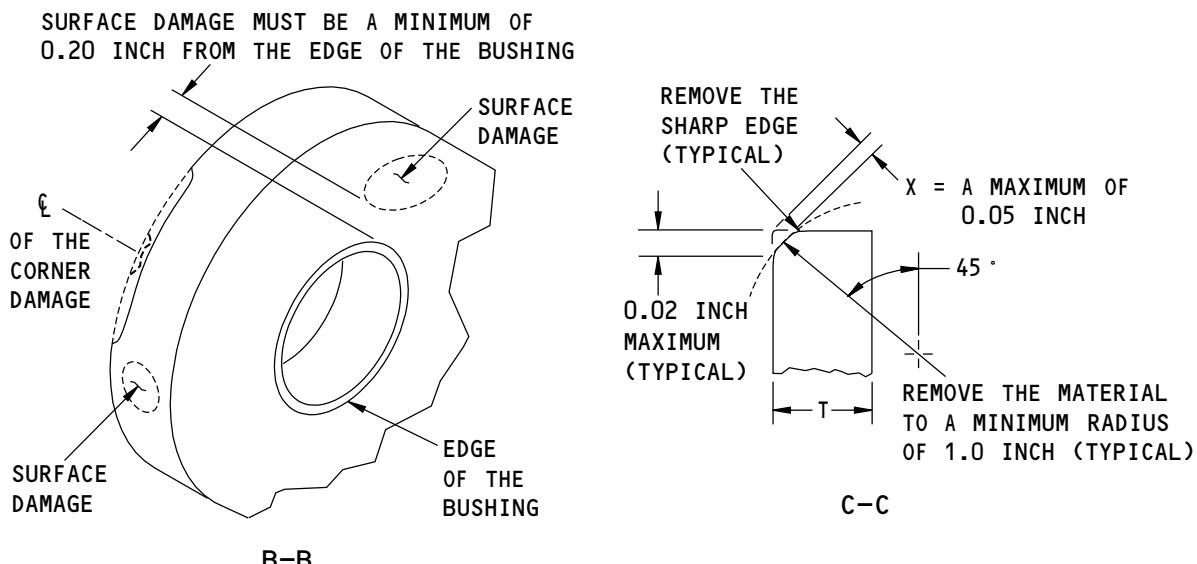
55-20-90

ALLOWABLE DAMAGE 3

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**737-800
STRUCTURAL REPAIR MANUAL**

REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING
E


G09387 S0006593176_V1

**Allowable Damage Limits
Figure 102 (Sheet 3 of 3)**

55-20-90
ALLOWABLE DAMAGE 3

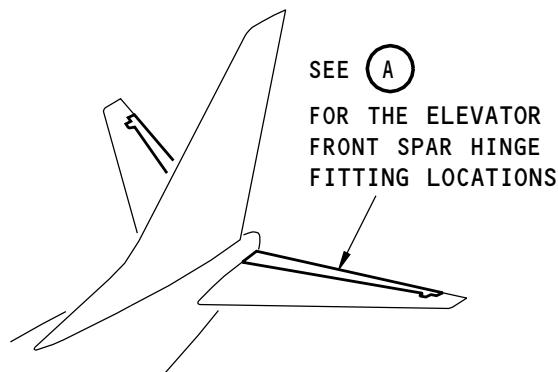
Page 108

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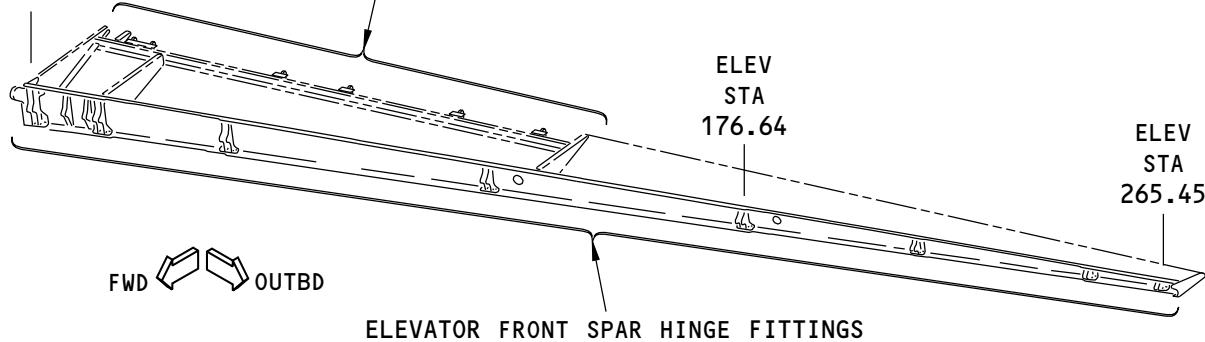


737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - ELEVATOR FRONT SPAR HINGE FITTINGS



ELEV STA 24.90 REFER TO SRM 55-20-90,
REPAIR 2 FOR THE ELEVATOR REAR SPAR HINGE FITTINGS



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE



NOTE: BOEING HAS NOT FOUND IT NECESSARY TO SUPPLY REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

M64326 S0006593179_V1

Elevator Front Spar Hinge Fitting Locations
Figure 201

55-20-90

REPAIR 1
Page 201

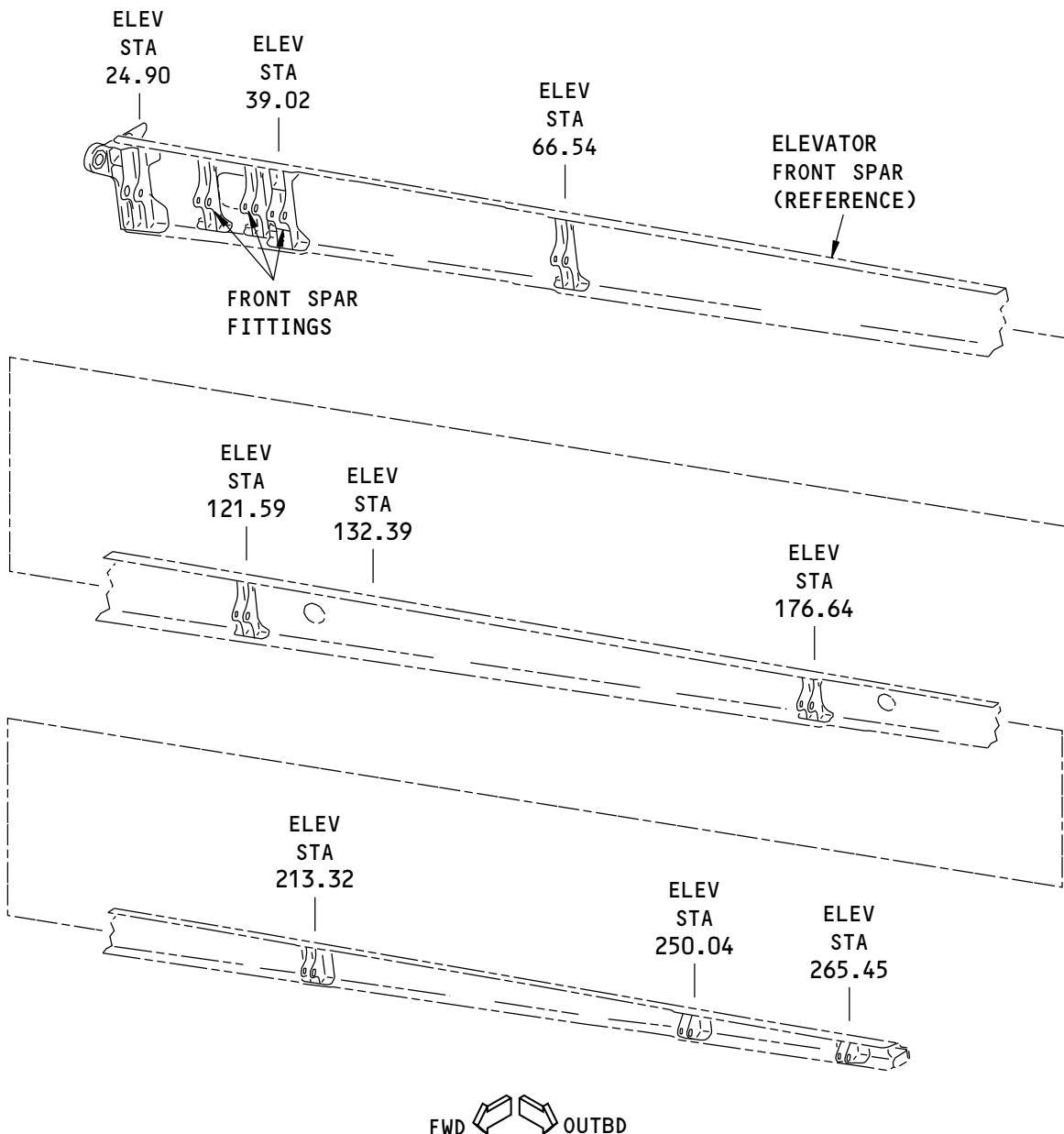
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NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

G09248 S0006593180_V2

Elevator Front Spar Hinge Fitting Repair
Figure 202 (Sheet 1 of 2)

55-20-90

REPAIR 1
Page 202

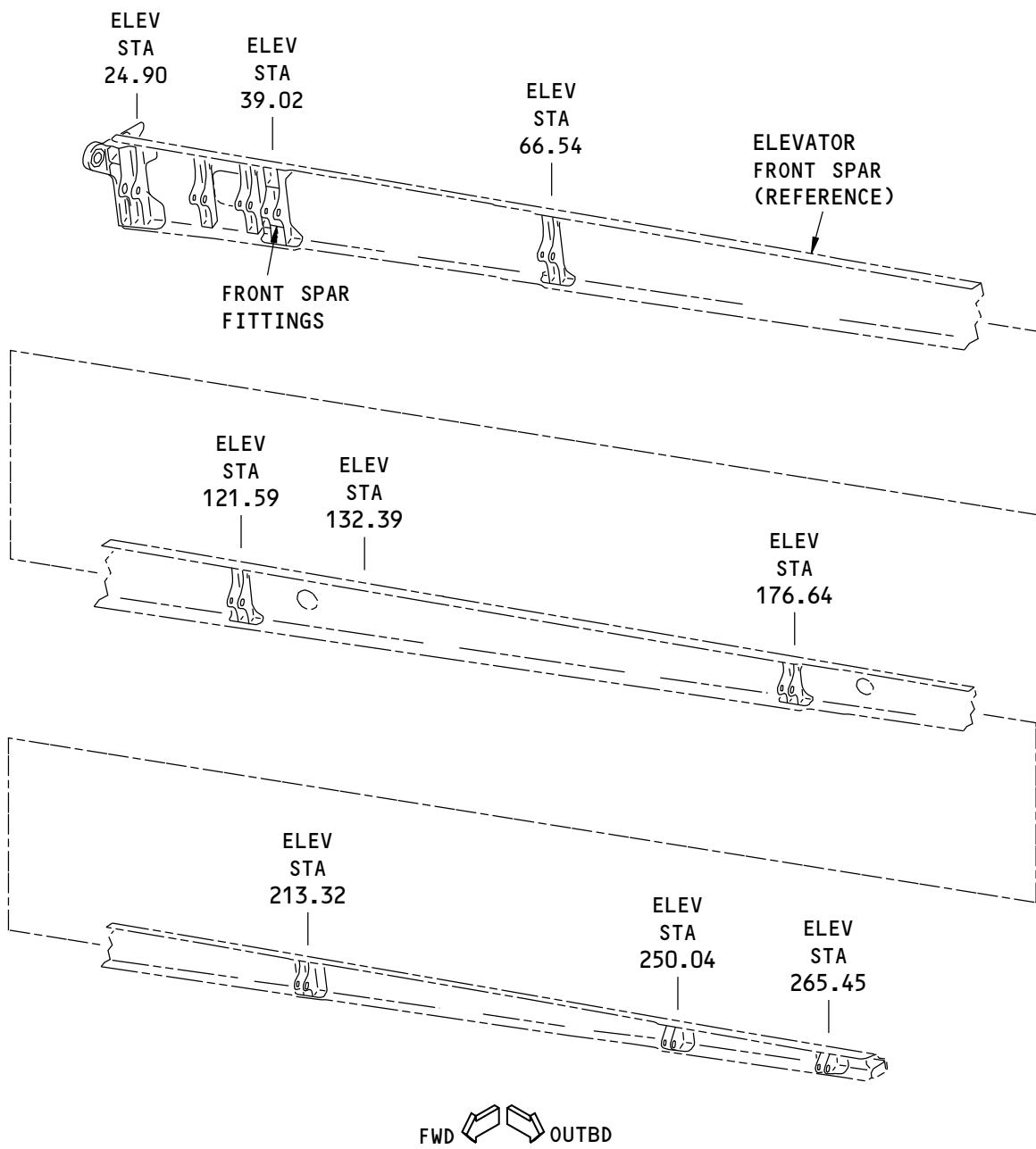
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(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

M94847 S0006593181_V2

Elevator Front Spar Hinge Fitting Repair
Figure 202 (Sheet 2 of 2)

55-20-90

REPAIR 1
Page 203

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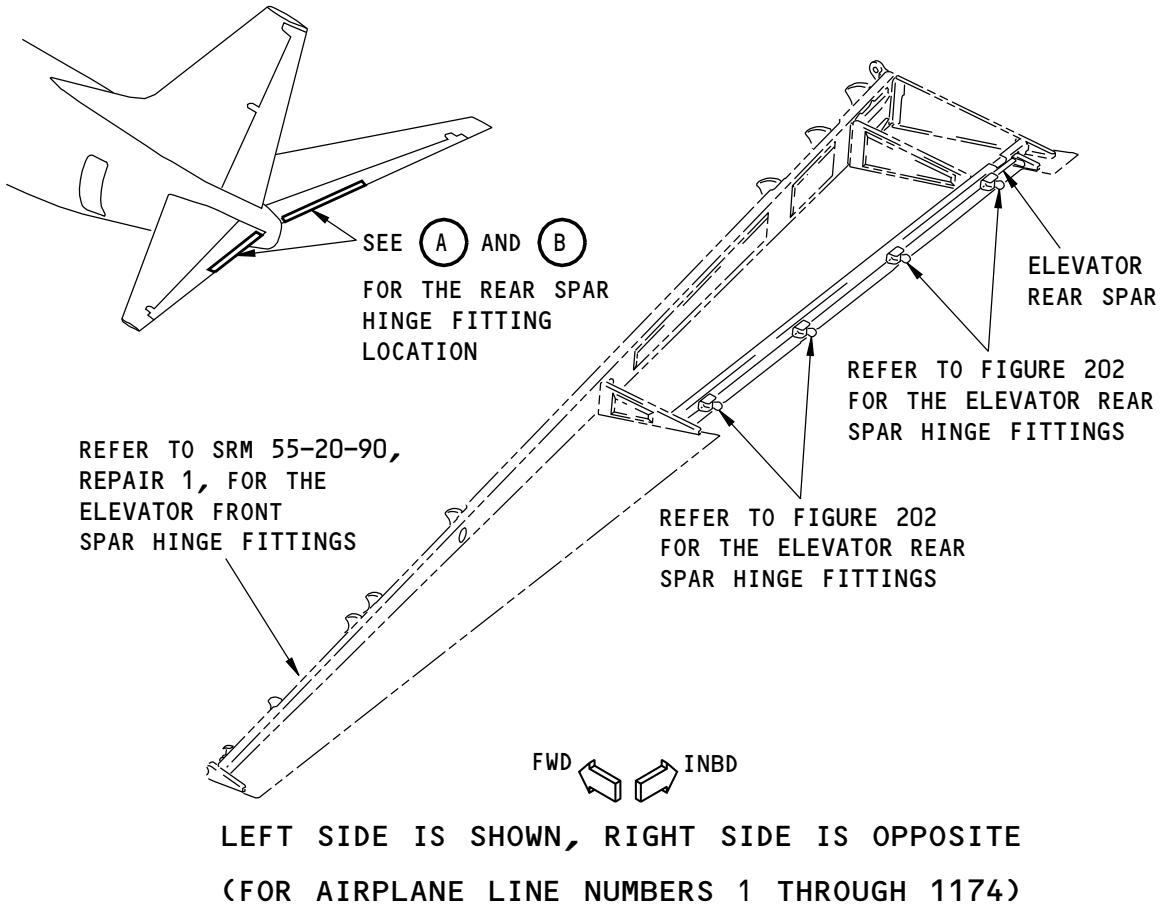
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STRUCTURAL REPAIR MANUAL

REPAIR 2 - ELEVATOR REAR SPAR HINGE FITTINGS



NOTE: BOEING HAS NOT FOUND IT NECESSARY TO SUPPLY REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

M62455 S0006593185_V1

Elevator Rear Spar Hinge Fitting Locations
Figure 201 (Sheet 1 of 2)

55-20-90

REPAIR 2
Page 201

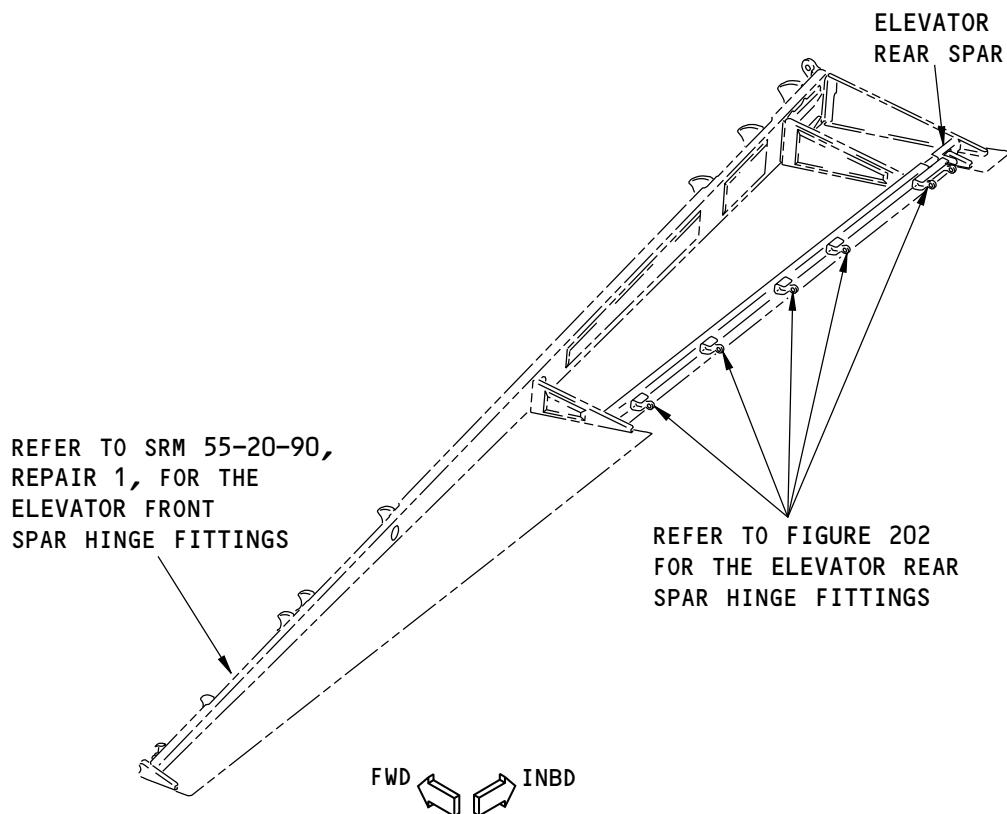
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STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

B

M62456 S0006593186_V1

Elevator Rear Spar Hinge Fitting Locations
Figure 201 (Sheet 2 of 2)

55-20-90

REPAIR 2
Page 202

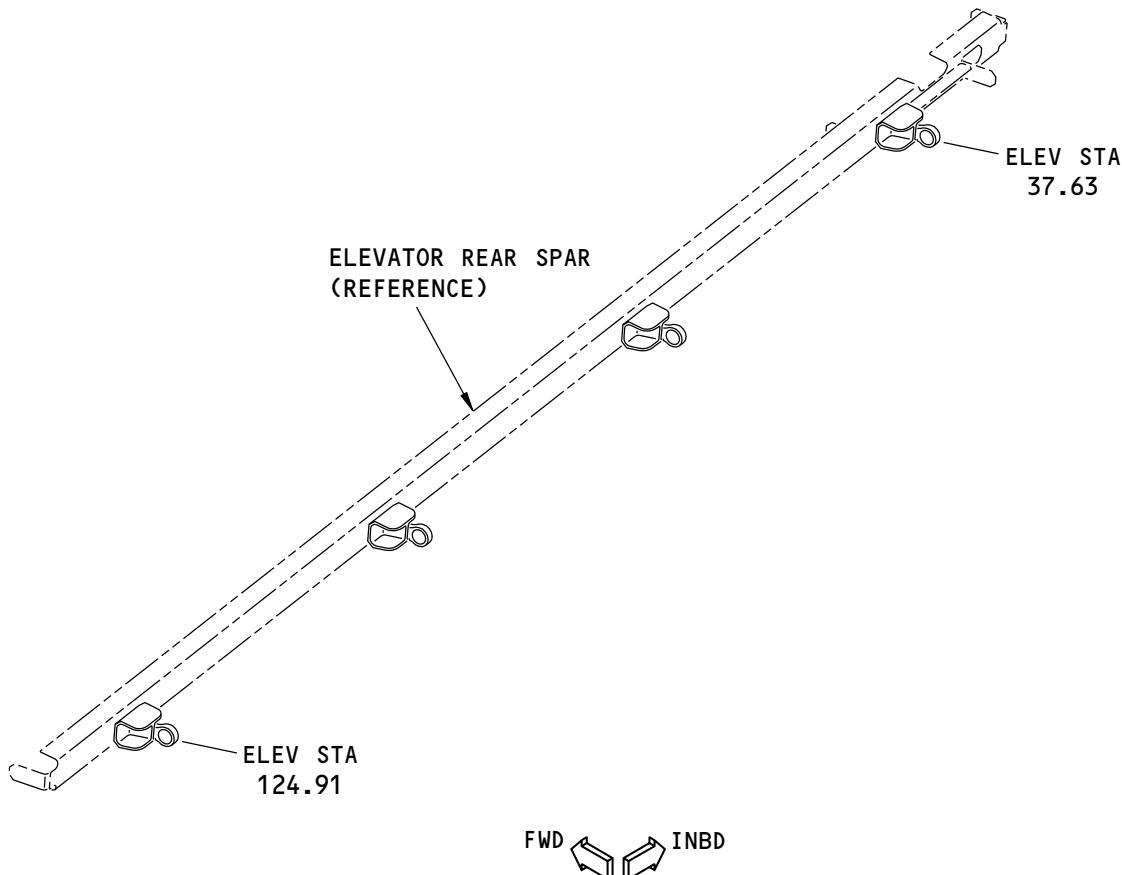
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STRUCTURAL REPAIR MANUAL



NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

ELEVATOR REAR SPAR HINGE FITTINGS
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

M62457 S0006593187_V2

Elevator Rear Spar Hinge Fitting Repair
Figure 202 (Sheet 1 of 2)

55-20-90

REPAIR 2
Page 203

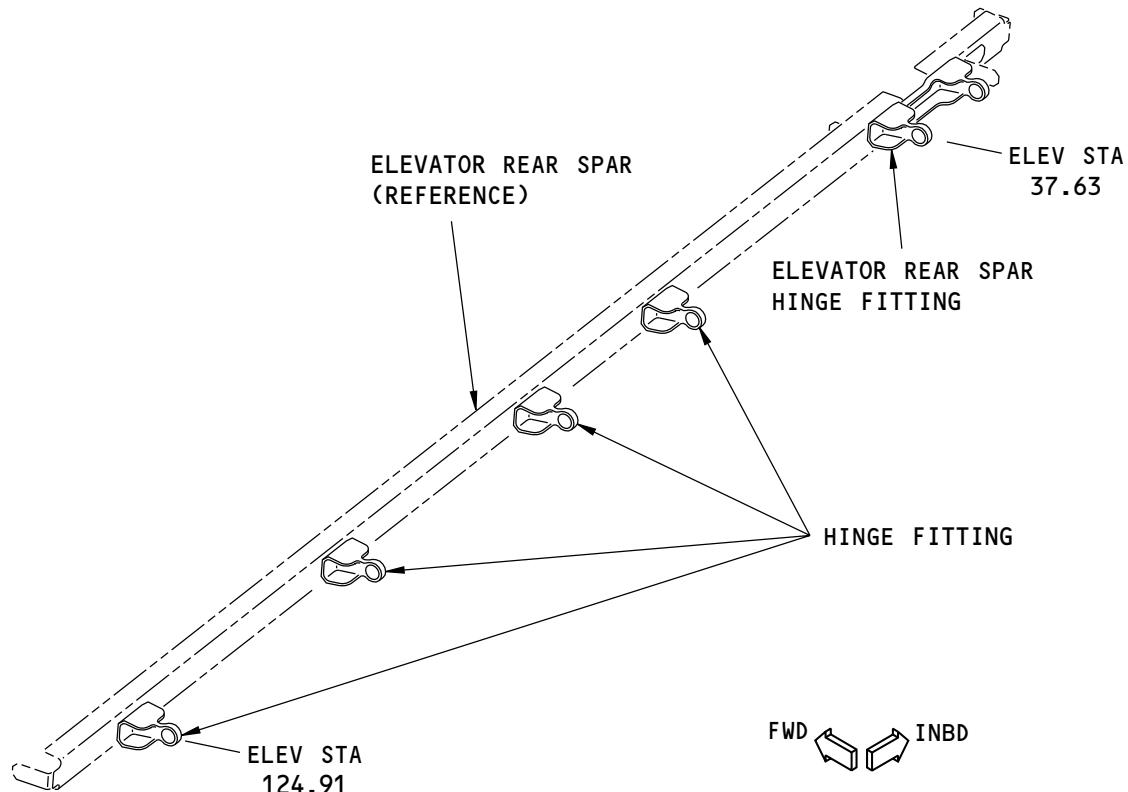
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NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

M62458 S0006593188_V2

Elevator Rear Spar Hinge Fitting Repair
Figure 202 (Sheet 2 of 2)

55-20-90

REPAIR 2
Page 204

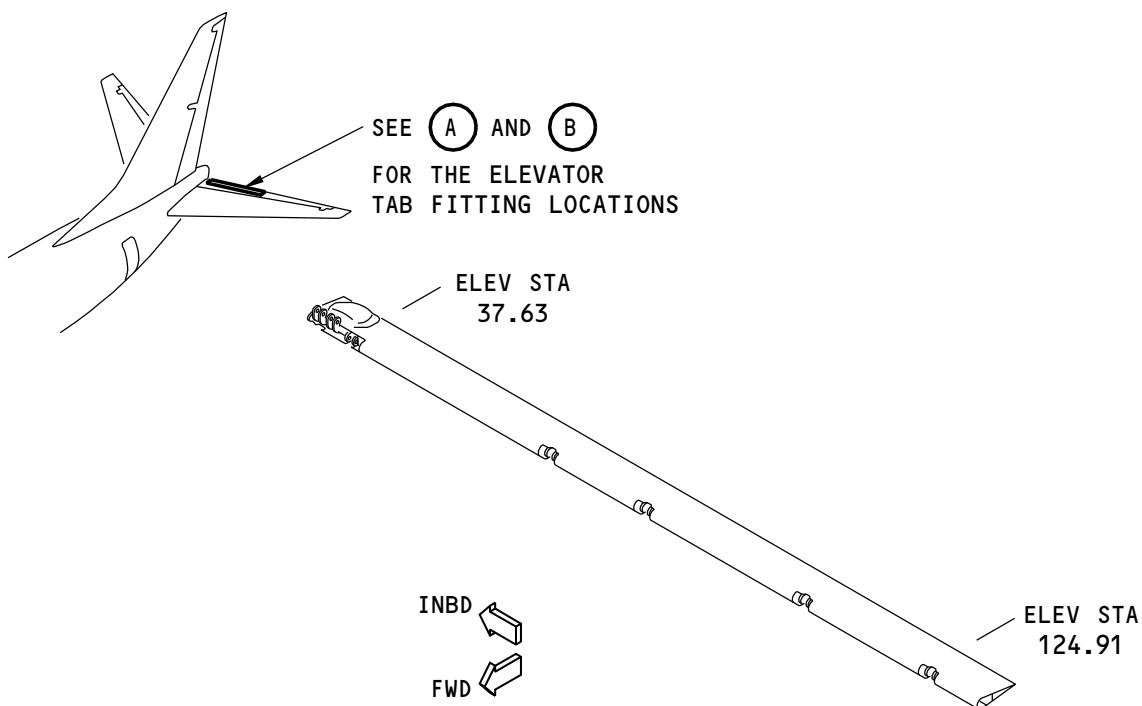
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STRUCTURAL REPAIR MANUAL
REPAIR 3 - ELEVATOR TAB FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1175 AND ON)

A

Elevator Tab Fitting Repair
Figure 201 (Sheet 1 of 2)

M62466 S0006593191_V2

55-20-90

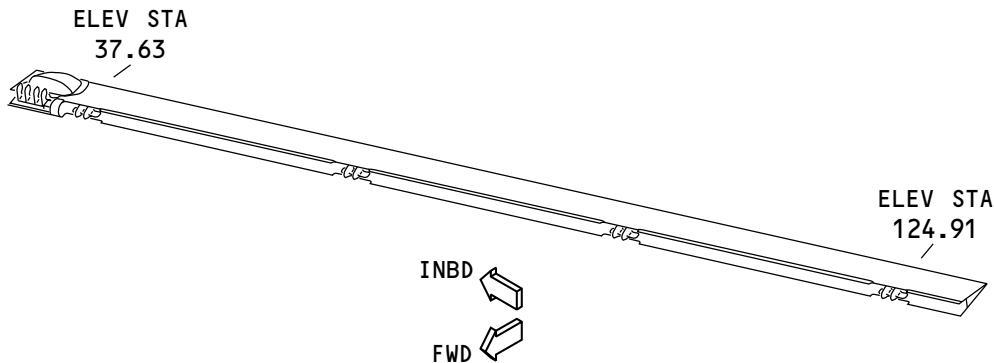
REPAIR 3
Page 201
Jul 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



NOTE: THERE ARE NO REPAIRS FOR THIS PART IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(FOR AIRPLANE LINE NUMBERS 1 THROUGH 1174)

B

Elevator Tab Fitting Repair
Figure 201 (Sheet 2 of 2)

M62468 S0006593192_V2

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REPAIR 3
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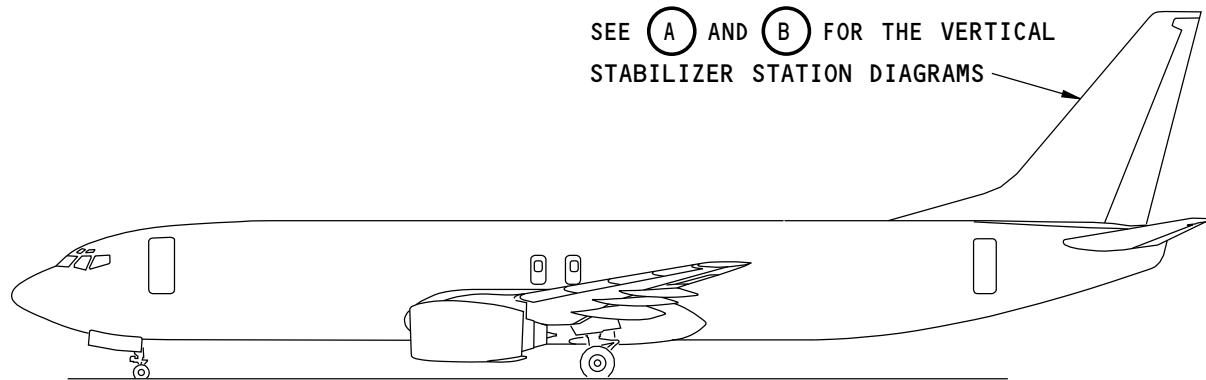


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IDENTIFICATION GENERAL - VERTICAL STABILIZER AND RUDDER STATION DIAGRAM

1. General

- A. The vertical stabilizer and rudder station diagram gives the locations of the structural components on the vertical stabilizer and rudder (Refer to Vertical Stabilizer Station Diagram, Figure 1/IDENTIFICATION GENERAL).



**Vertical Stabilizer Station Diagram
Figure 1 (Sheet 1 of 3)**

K19465 S0006593198_V1

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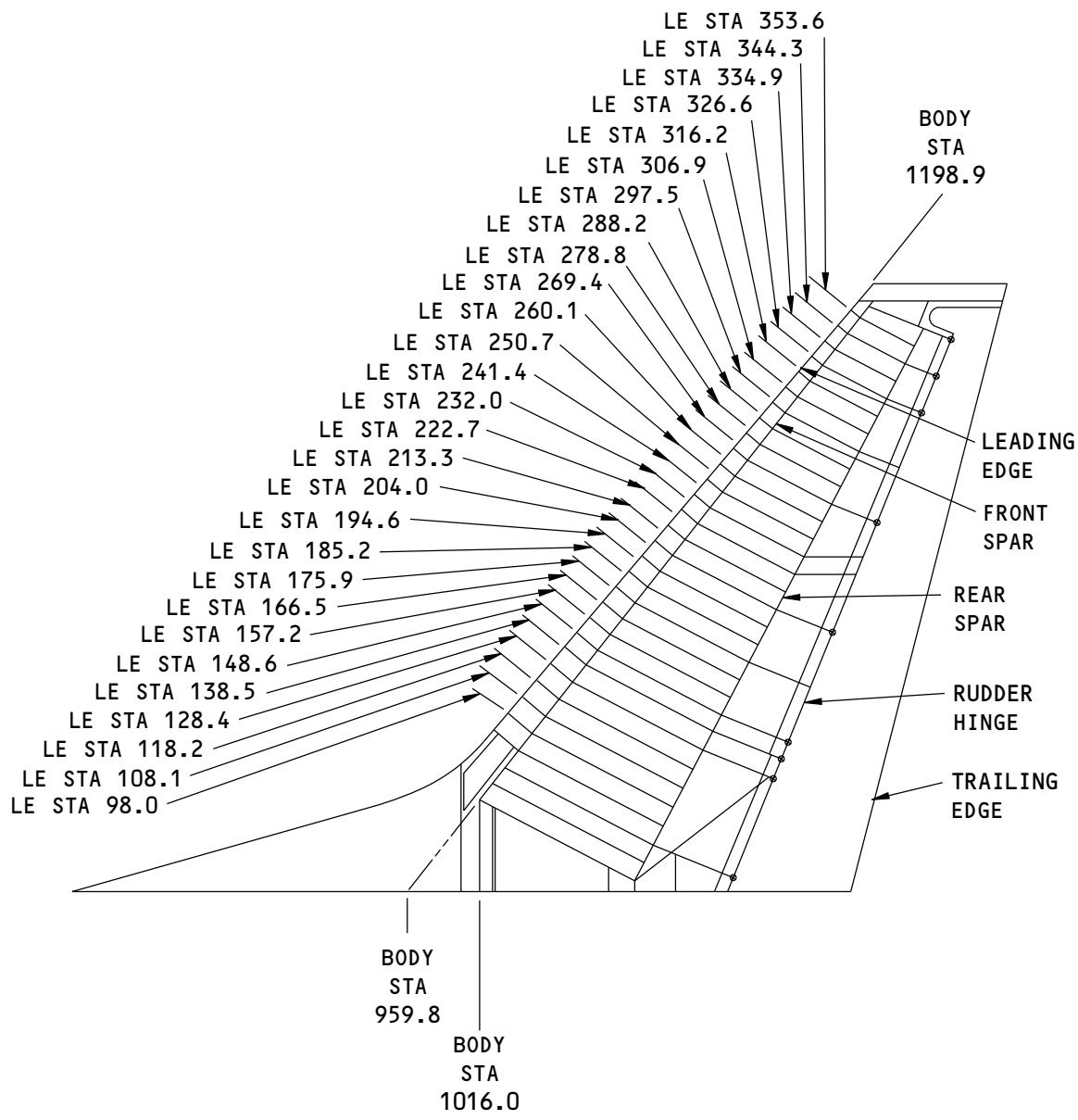
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(A)

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Vertical Stabilizer Station Diagram
Figure 1 (Sheet 2 of 3)

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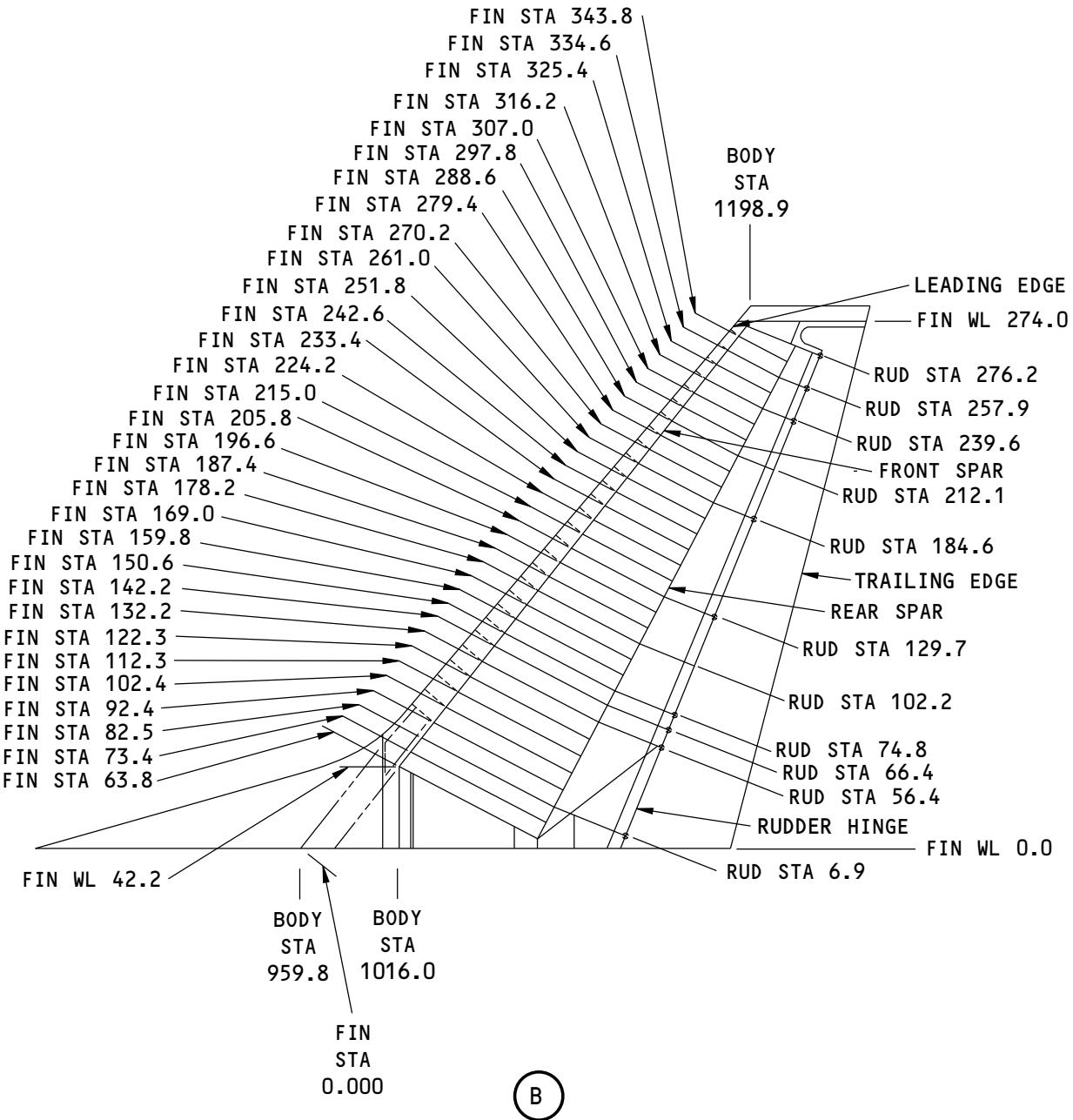
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Vertical Stabilizer Station Diagram
Figure 1 (Sheet 3 of 3)

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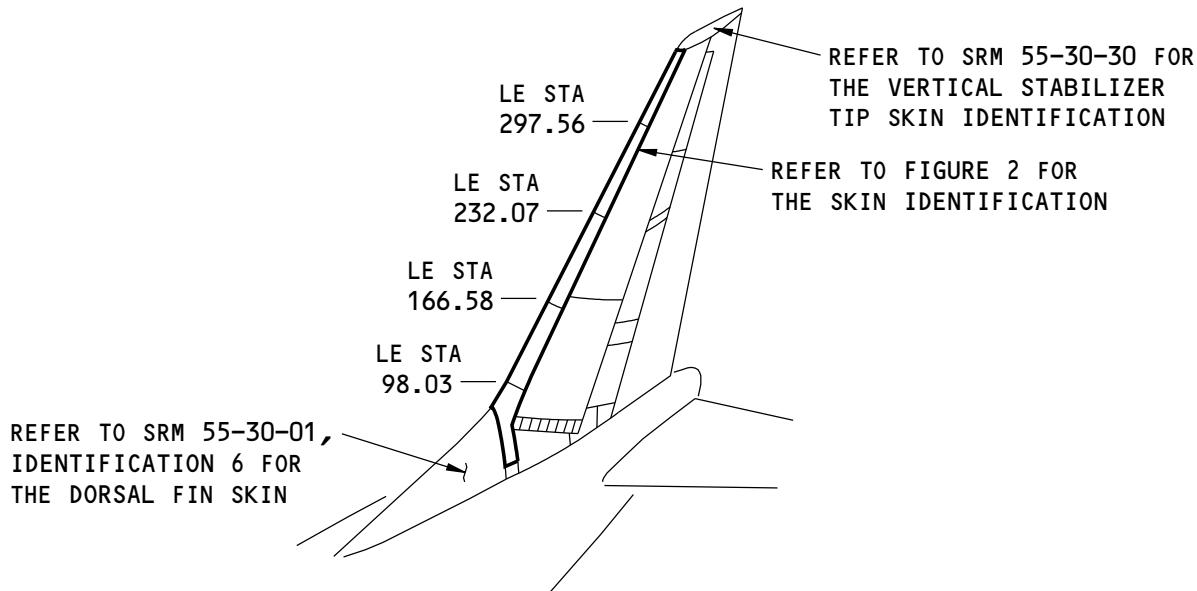
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IDENTIFICATION 1 - VERTICAL STABILIZER LEADING EDGE SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F69598 S0006593204_V1

Vertical Stabilizer Leading Edge Skin Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
176A0001	Leading Edge and Miscellaneous Functional Collector - Vertical Fin
176A1001	Removable Leading Edge Assembly/Installation - Vertical Fin
176A1100	Skin Assembly - Removable Leading Edge Vertical Fin
176A3001	Fixed Leading Edge Installation - Vertical Fin
176A3009	Skin Assembly - Fixed Leading Edge, Vertical Fin

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IDENTIFICATION 1

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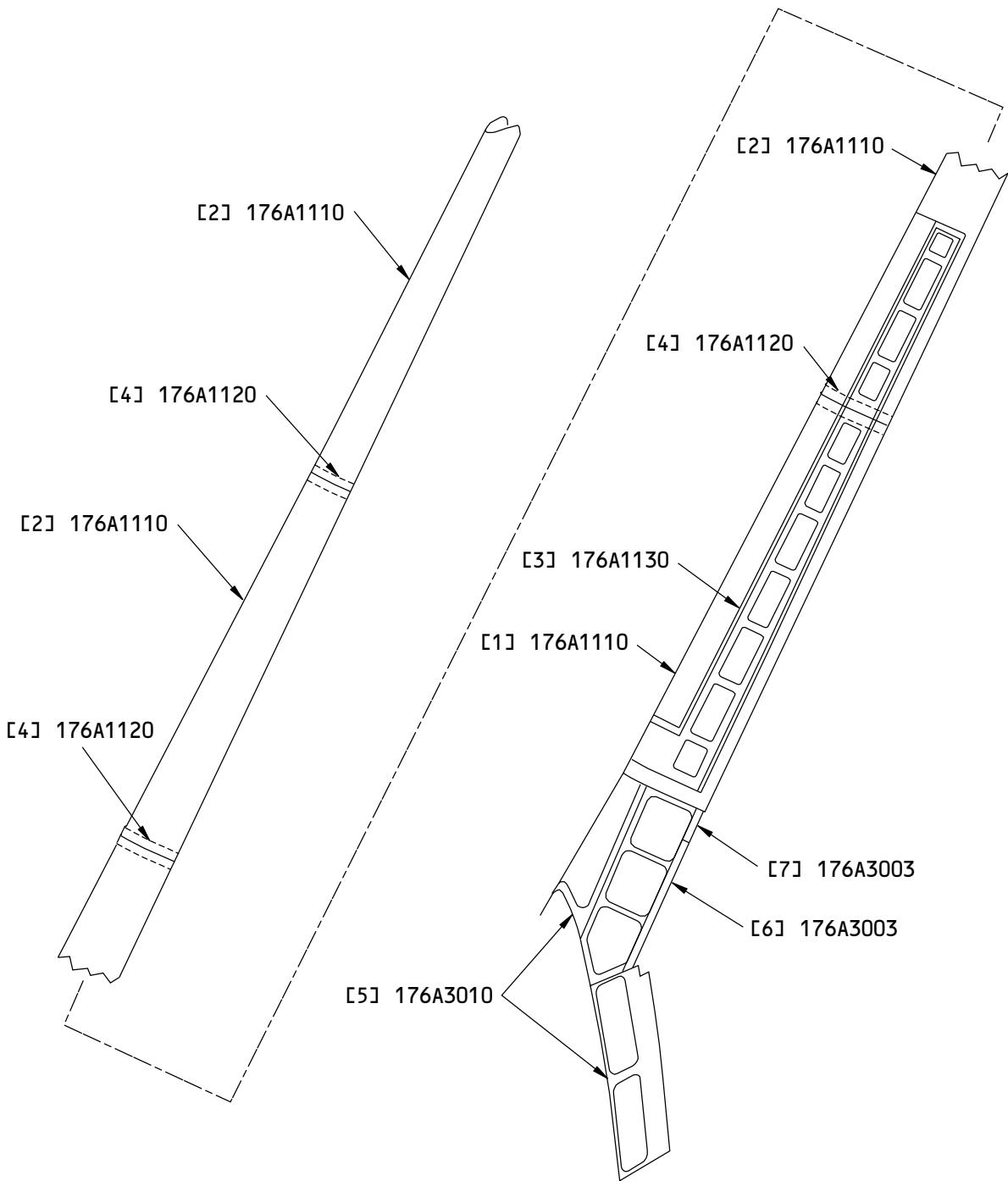
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F71229 S0006593206_V1

Vertical Fin Leading Edge Panel Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Skin	0.040 (1.02)	2024-T3 clad sheet as given in QQ-A-250/5	
[2]	Skin	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the chem-mill areas	
[3]	Fiberglass Strap		Glass Fabric Reinforced Plastic (GFRP) as given in BMS 8-79, Class III, Grade B, Style 1581	
[4]	Splice	0.050 (1.27)	2024-T3 clad sheet as given in QQ-A-250/5	
[5]	Skin	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 4 for the chem-mill areas	
[6]	Lower Strap	0.312 (7.92)	7050-T7451 machined plate as given in AMS 4050	
[7]	Upper Strap	0.500 (12.70)	7050-T7451 machined plate as given in AMS 4050	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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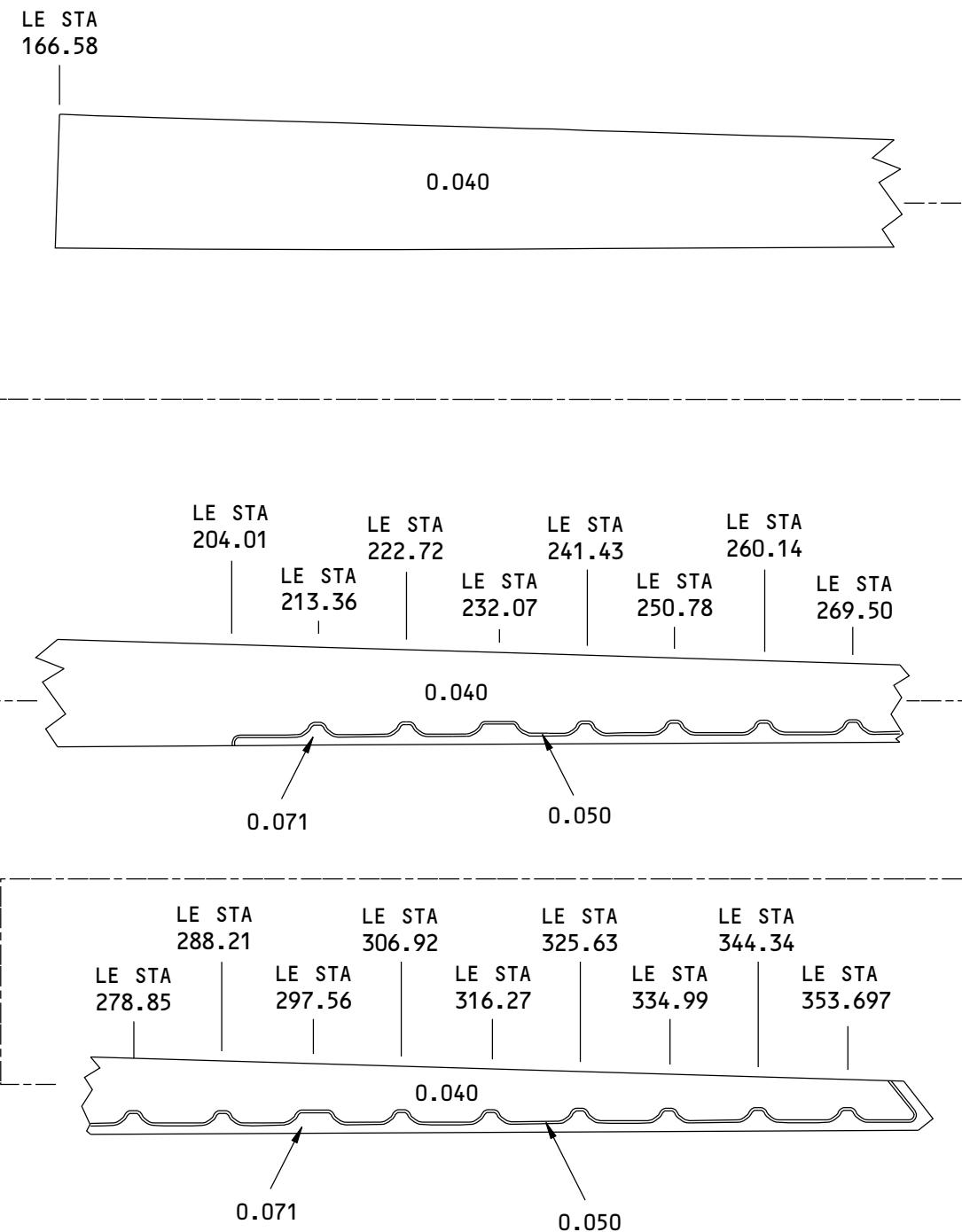
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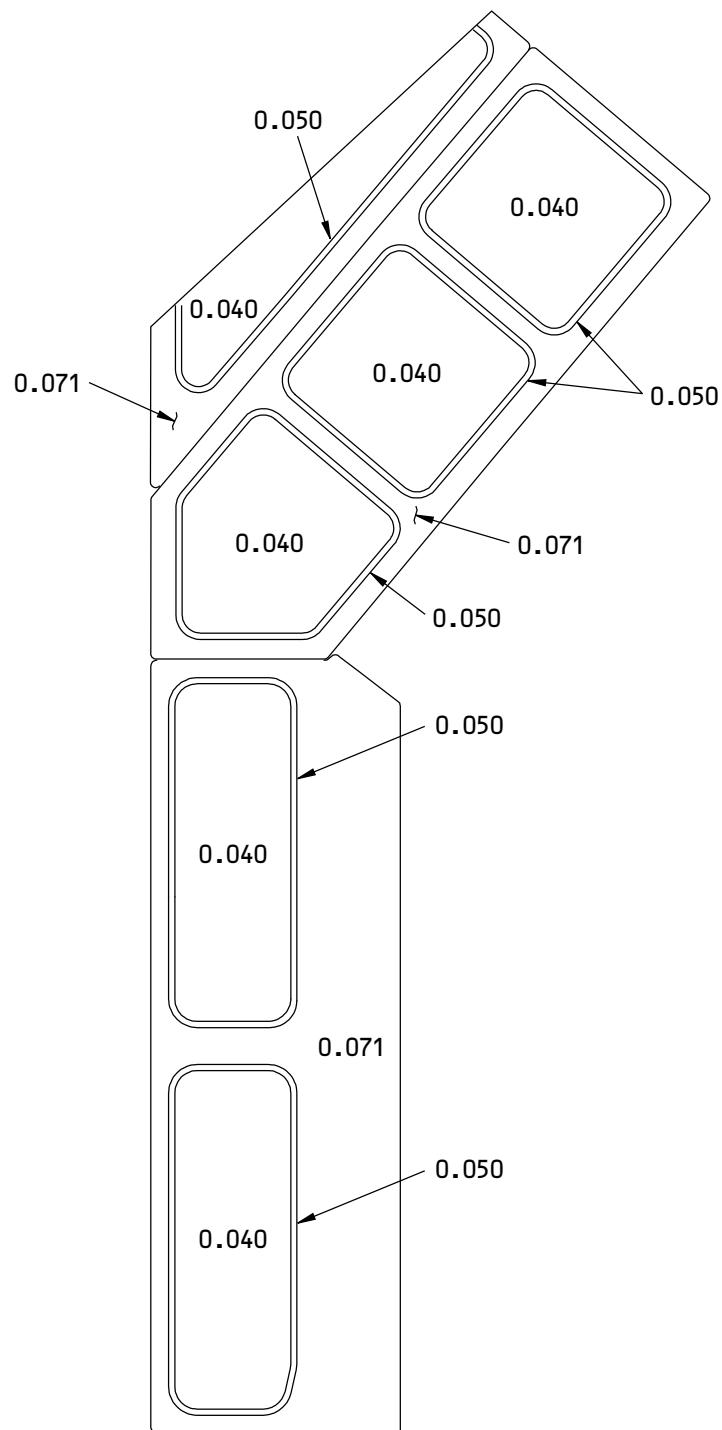
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Chem-Milled Areas for Figure 2, Item [2]
Figure 3

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Chem-Milled Areas for Figure 2, Item [5]
Figure 4

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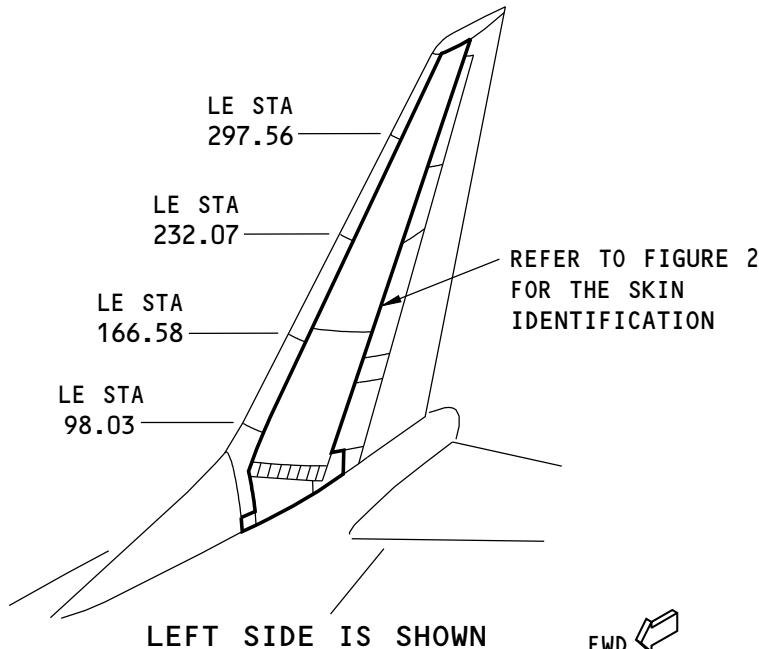
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IDENTIFICATION 2 - VERTICAL STABILIZER LEFT INSPAR SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F69301 S0006593211_V1

Vertical Stabilizer Inspark Skin Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
172A0001	Torque Box Functional Collector - Vertical Fin
172A4001	Skin Installation - Inspark, Vertical Fin
172A6120	Panel Installation - Fin to Body, Vertical Fin
172A6121	Panel Assembly, Closeout - Vertical Fin
172A6122	Door Assembly, Access - Vertical Fin

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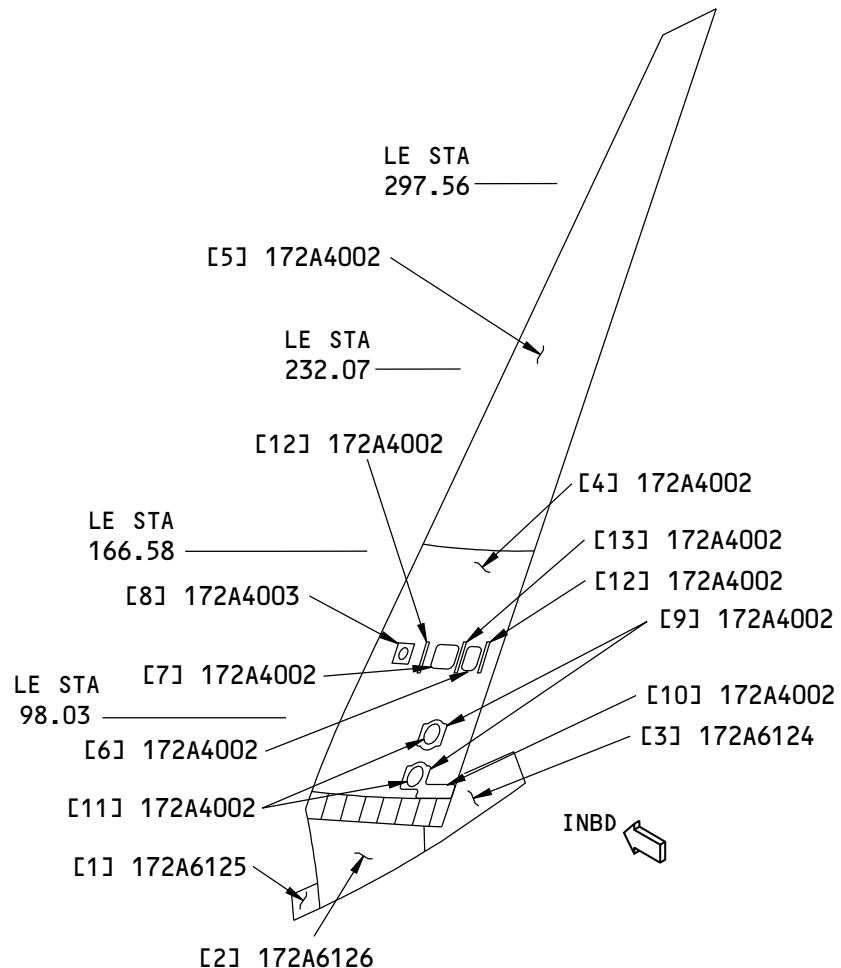
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Vertical Stabilizer Inspar Skin Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Access Door	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the chem-mill areas	
[2]	Inspair Closeout Panel - Bonded Assembly Skin Core		Glass Fabric Reinforced Plastic (GFRP) honeycomb sandwich Refer to Figure 4 for the 0 degree ply direction, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 4 for the core ribbon direction	
[3]	Aft Closeout Panel	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 5 for the chem-mill areas	
[4]	Skin Panel - Lower Left Hand	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 6 for the chem-mill areas	
[5]	Skin Panel - Upper Left Hand	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 7 for the chem-mill areas	
[6]	Door	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 8 for the chem-mill areas	
[7]	Door	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 9 for the chem-mill areas	
[8]	Doubler	0.250 (6.35)	7075-T7351 plate as given in QQ-A-250/12	
[9]	Doubler	0.063 (1.60)	2024-T3 clad sheet as given in QQ-A-250/5	
[10]	Doubler	0.025 (0.64)	2024-T3 clad sheet as given in QQ-A-250/5	
[11]	Door	0.071 (1.80)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 10 for the chem-mill areas	
[12]	Strap	0.090 (2.29)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Boeing production drawings for the chem-mill thicknesses	
[13]	Strap	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Boeing production drawings for the chem-mill thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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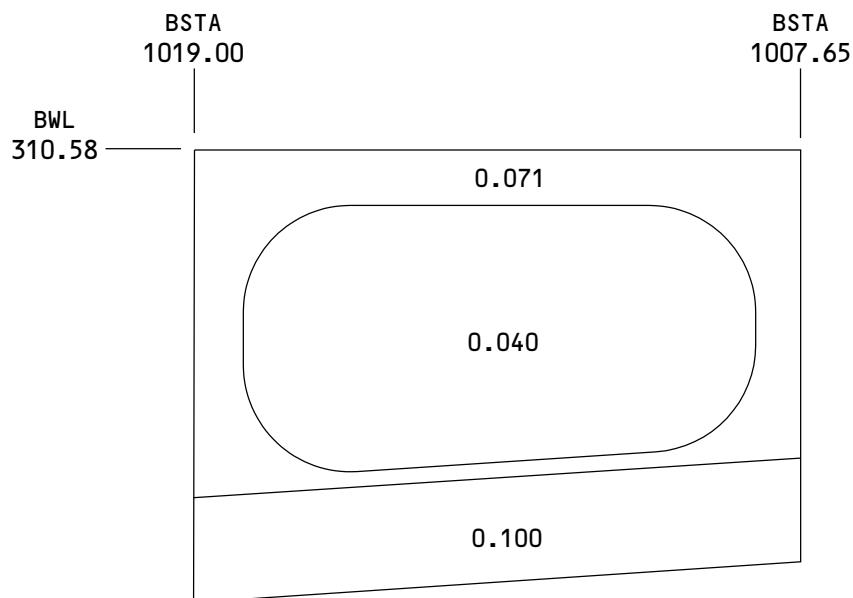
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Chem-milled Areas for Figure 2, Item [1]
Figure 3

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P2, P5, P6	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P4	90 degrees	Epoxy/Graphite tape as given in BMS 8-168, Type II, Class I, Grade 145
P7	-----	0.001 inch (0.025 mm) thick white bondable tedlar film
P8	-----	Bondable teflon

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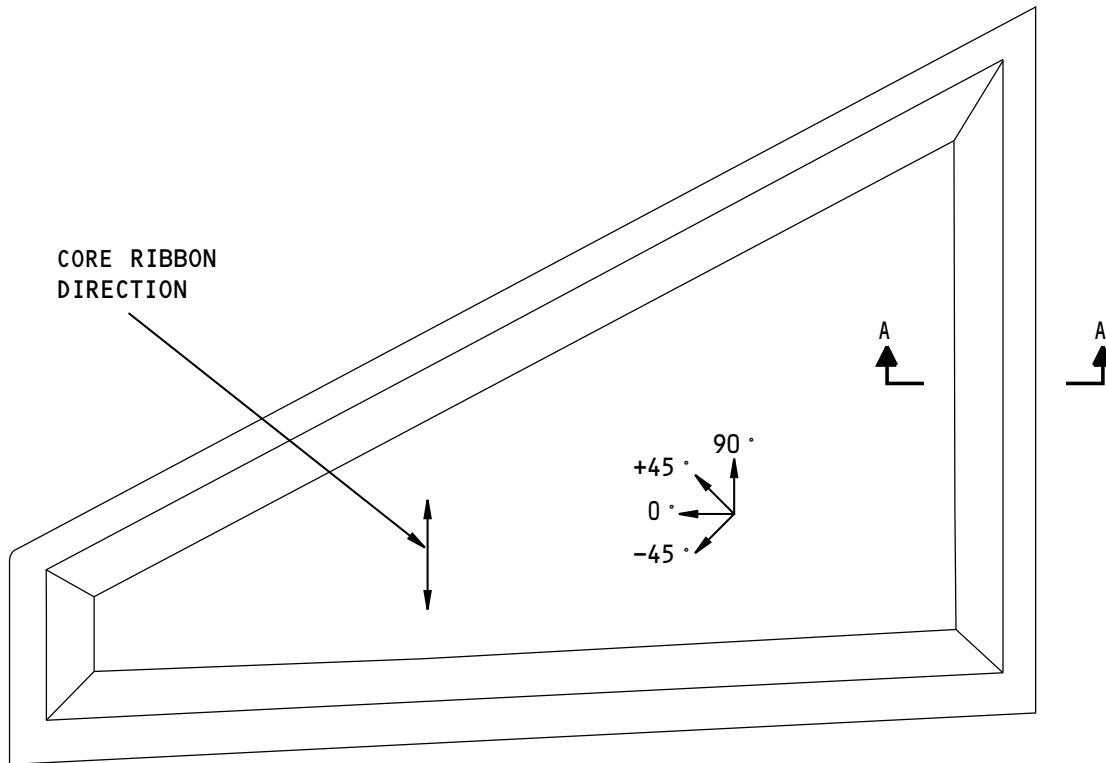
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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Inspark Closeout Panel, Figure 2, Item [2]
Figure 4 (Sheet 1 of 2)

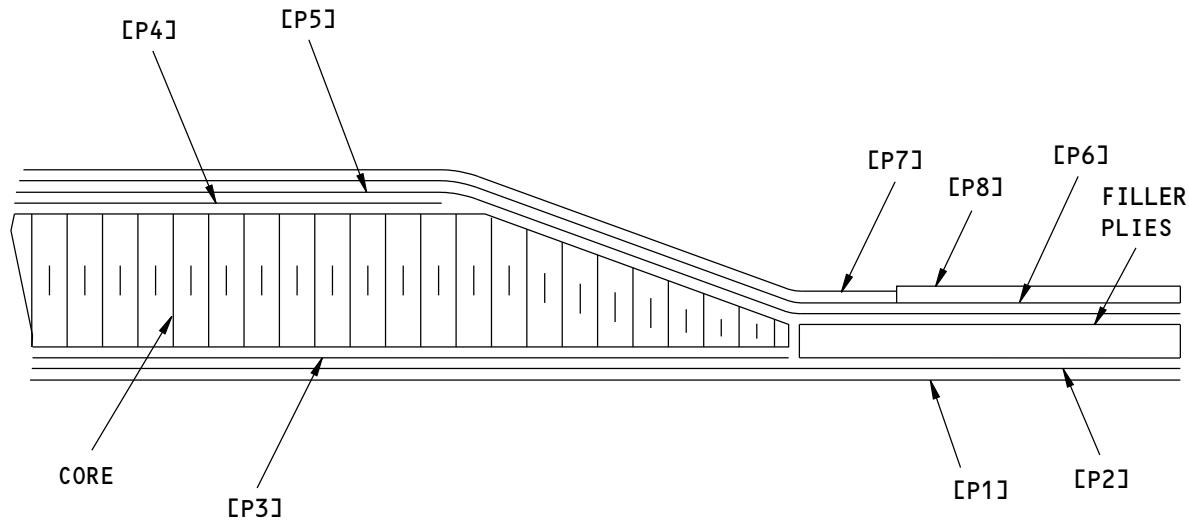
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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Inspark Closeout Panel, Figure 2, Item [2]
Figure 4 (Sheet 2 of 2)

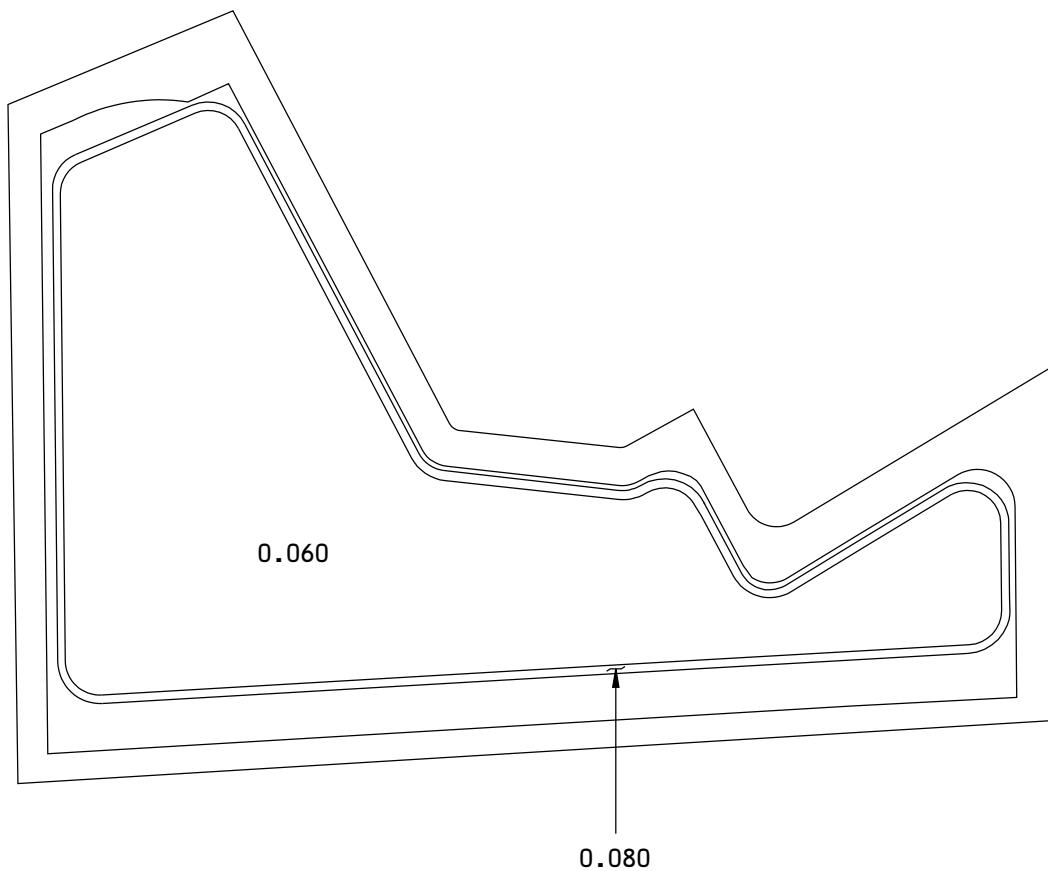
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Chem-milled Areas for Figure 2, Item [3]
Figure 5

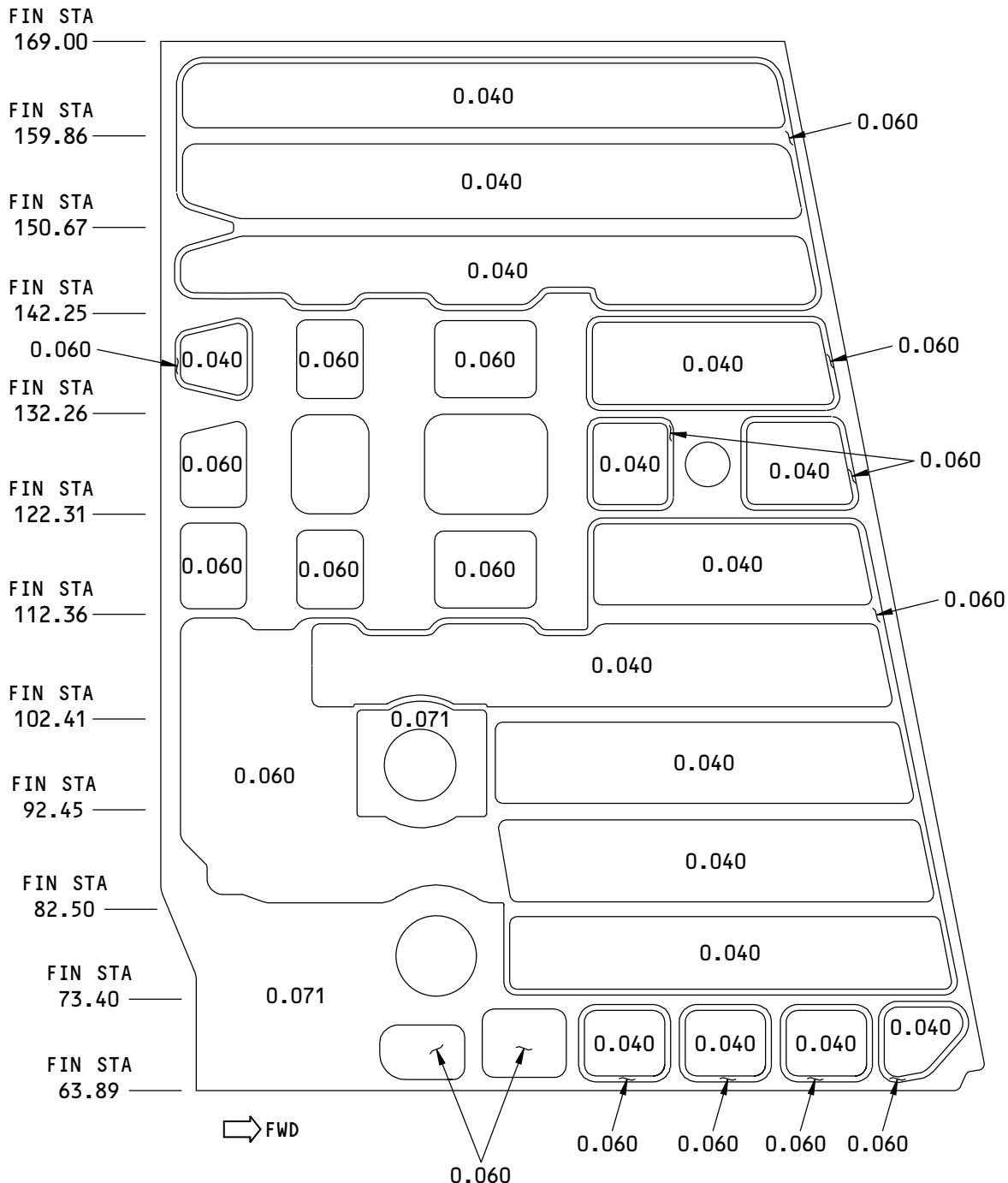
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NOTE: ALL DIMENSIONS SHOWN ARE THICKNESSES IN INCHES.

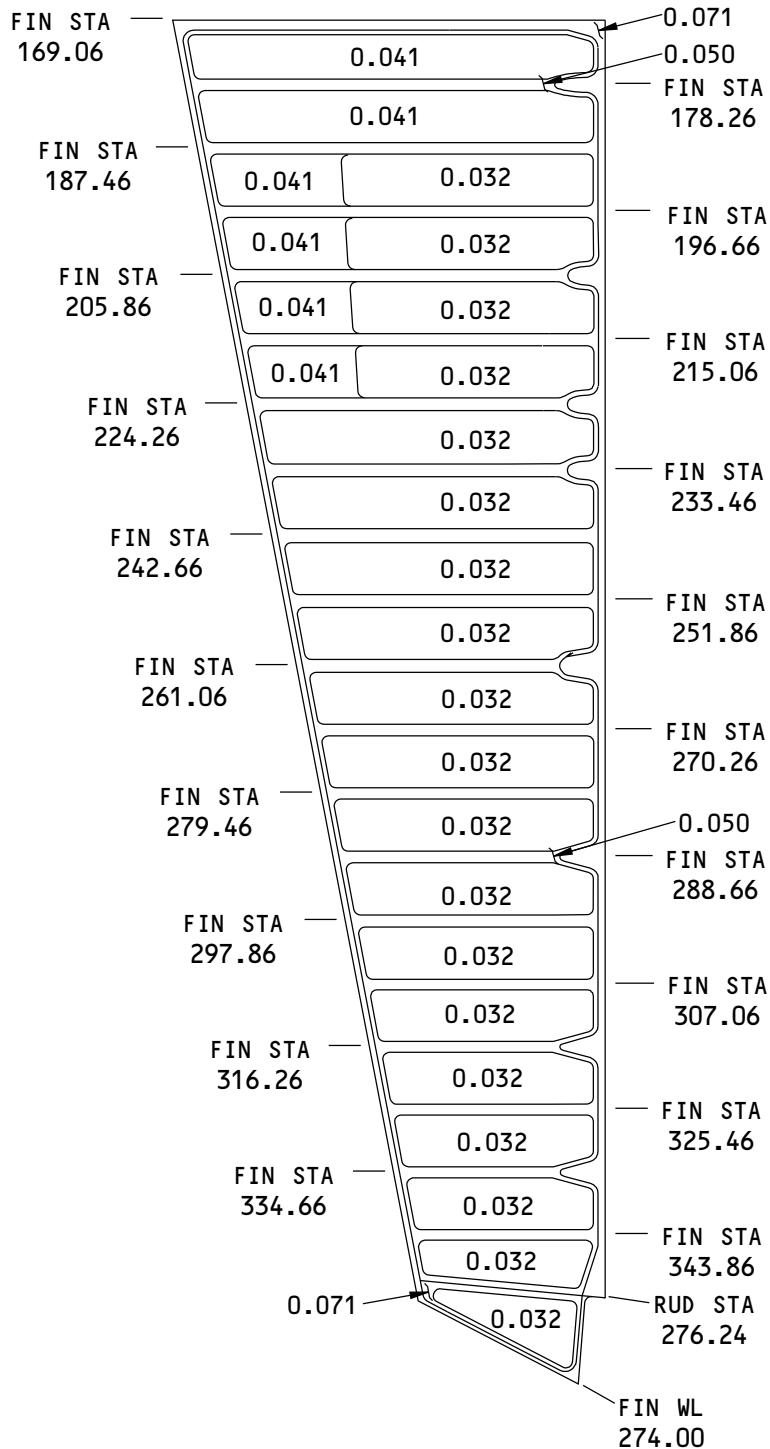
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Chem-milled Areas for Figure 2, Item [4] Figure 6

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F70102 S0006593221_V2

Chem-milled Areas of Figure 2, Item [5]
Figure 7

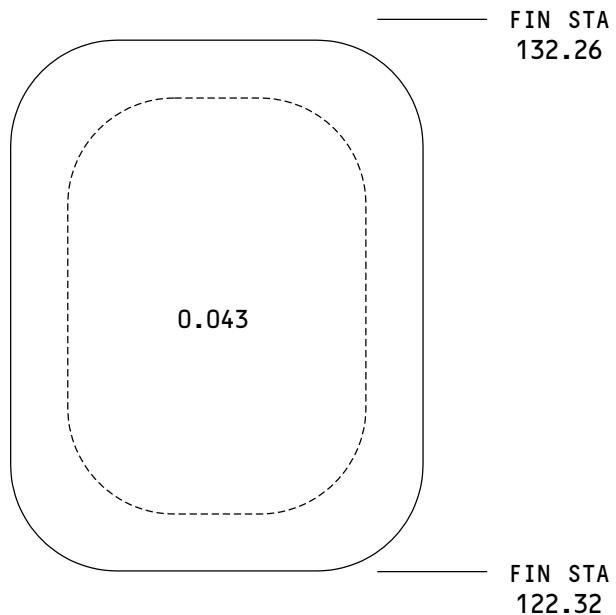
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Chem-milled Areas of Figure 2, Item [6]
Figure 8

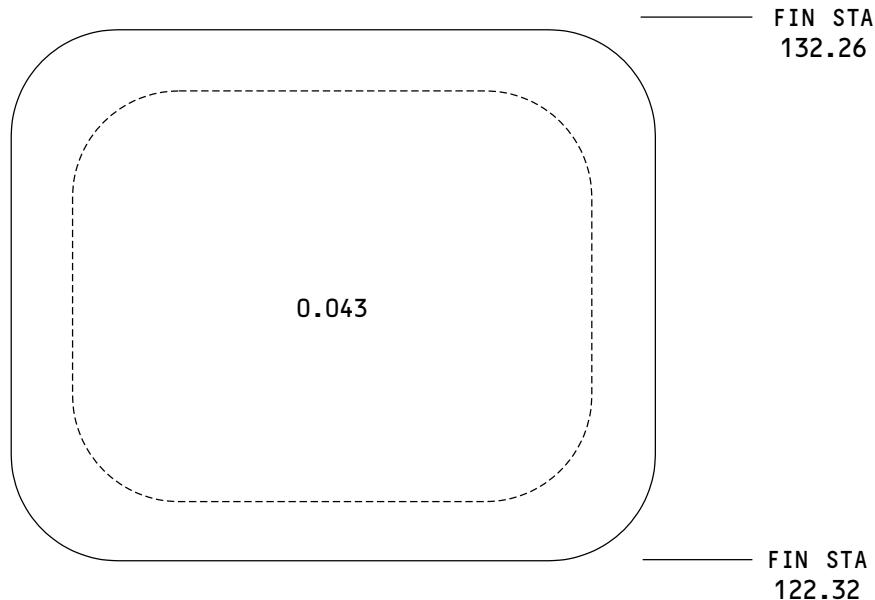
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Chem-milled Areas of Figure 2, Item [7]
Figure 9

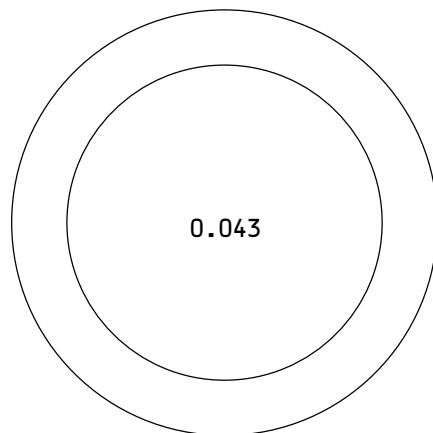
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**Chem-milled Areas of Figure 2, Item [11]
Figure 10**

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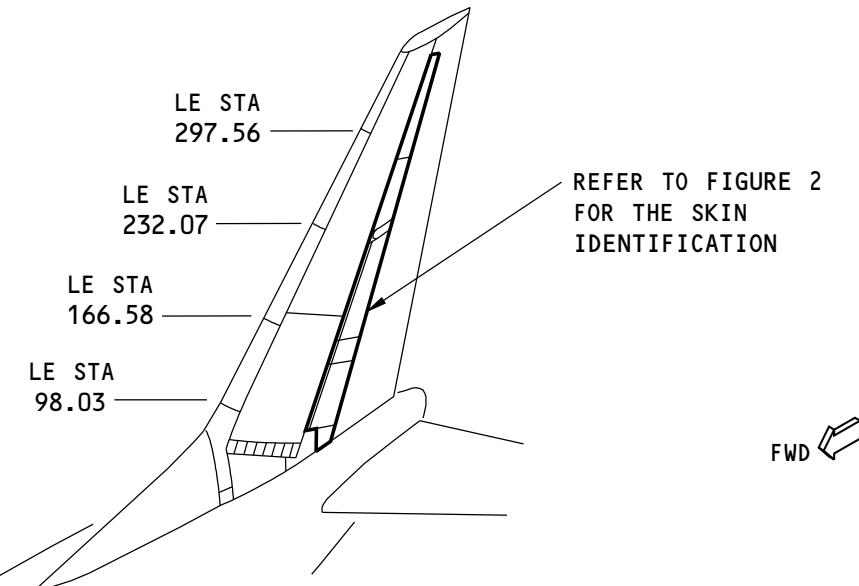
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IDENTIFICATION 3 - VERTICAL STABILIZER LEFT TRAILING EDGE PANELS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN

F70778 S0006593226_V1

Vertical Stabilizer Trailing Edge and Closeout Panel Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
172A0001	Torque Box Functional Collector - Vertical Fin
172A6123	Panel Assembly - Trailing Edge Closeout, Vertical Fin
175A0001	Trailing Edge Functional Collector - Vertical Fin
175A1701	Panel Installation - Trailing Edge, Vertical Fin
175A1703	Door Assembly - Trailing Edge, Vertical Fin
175A1801	Seal Installation - Mass Balance Cavity, Fin WL 151.17, Vertical Fin

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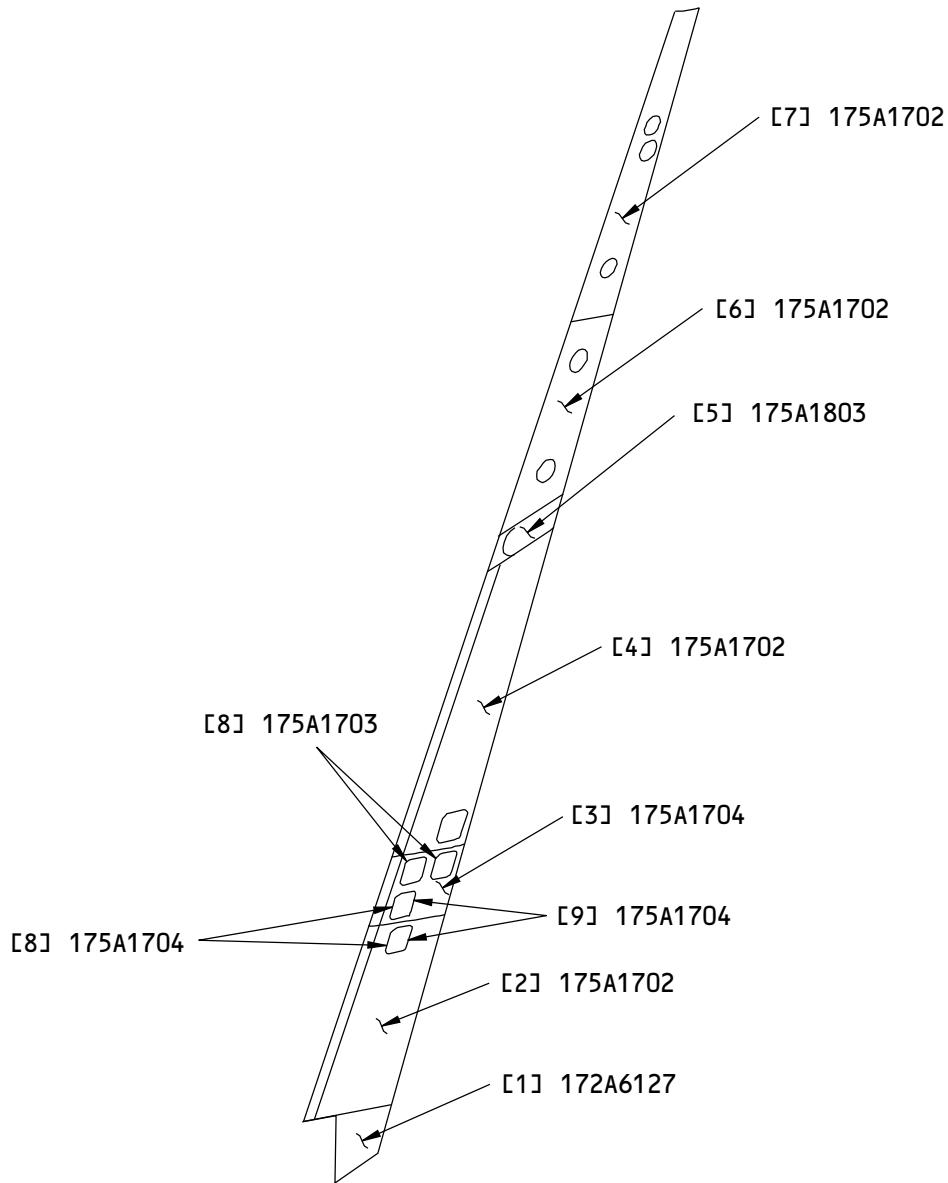
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN

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Vertical Stabilizer Trailing Edge and Closeout Panel Skin Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Closeout Panel Assembly - Skin Core		Glass Fabric Reinforced Plastic (GFRP) honeycomb sandwich Refer to Figure 3 for the 0 degree ply direction, material, and ply sequence Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 3 for the core ribbon direction	
[2]	Trailing Edge Panel Assembly - Bonded Panel Skin Core		GFRP honeycomb sandwich Refer to Figure 4 for the 0 degree ply direction, material, and ply sequence Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 4 for the core ribbon direction	
[3]	Trailing Edge Skin Panel	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 5 for the chem-mill areas	
[4]	Trailing Edge Panel Assembly - Bonded panel Skin Core (3) Door	0.050 (1.27)	GFRP honeycomb sandwich Refer to Figure 6 for the 0 degree ply direction, material, and ply sequence Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 6 for the core ribbon direction 2024-T3 clad sheet as given in QQ-A-250/5	
[5]	Mass Balance Cavity Panel - Bonded Panel Skin Core		GFRP honeycomb sandwich Refer to Figure 7 for the 0 degree ply direction, material, and ply sequence Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 7 for the core ribbon direction	
[6]	Trailing Edge Panel Assembly - Bonded Panel Skin Core (2) Cover	0.050 (1.27)	GFRP honeycomb sandwich Refer to Figure 8 for the 0 degree ply direction, material, and ply sequence Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 8 for the core ribbon 2024-T3 clad sheet as given in QQ-A-250/5	
[7]	Trailing Edge Panel Assembly - Bonded Panel Skin Core (3)		GFRP honeycomb sandwich Refer to Figure 9 for the 0 degree ply direction, material, and ply sequence Nonmetallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 9 for the core ribbon	

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Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
	Cover	0.050 (1.27)	2024-T3 clad sheet as given in QQ-A-250/5	
[8]	Door	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5	
[9]	Doubler	0.050 (1.27)	2024-T3 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

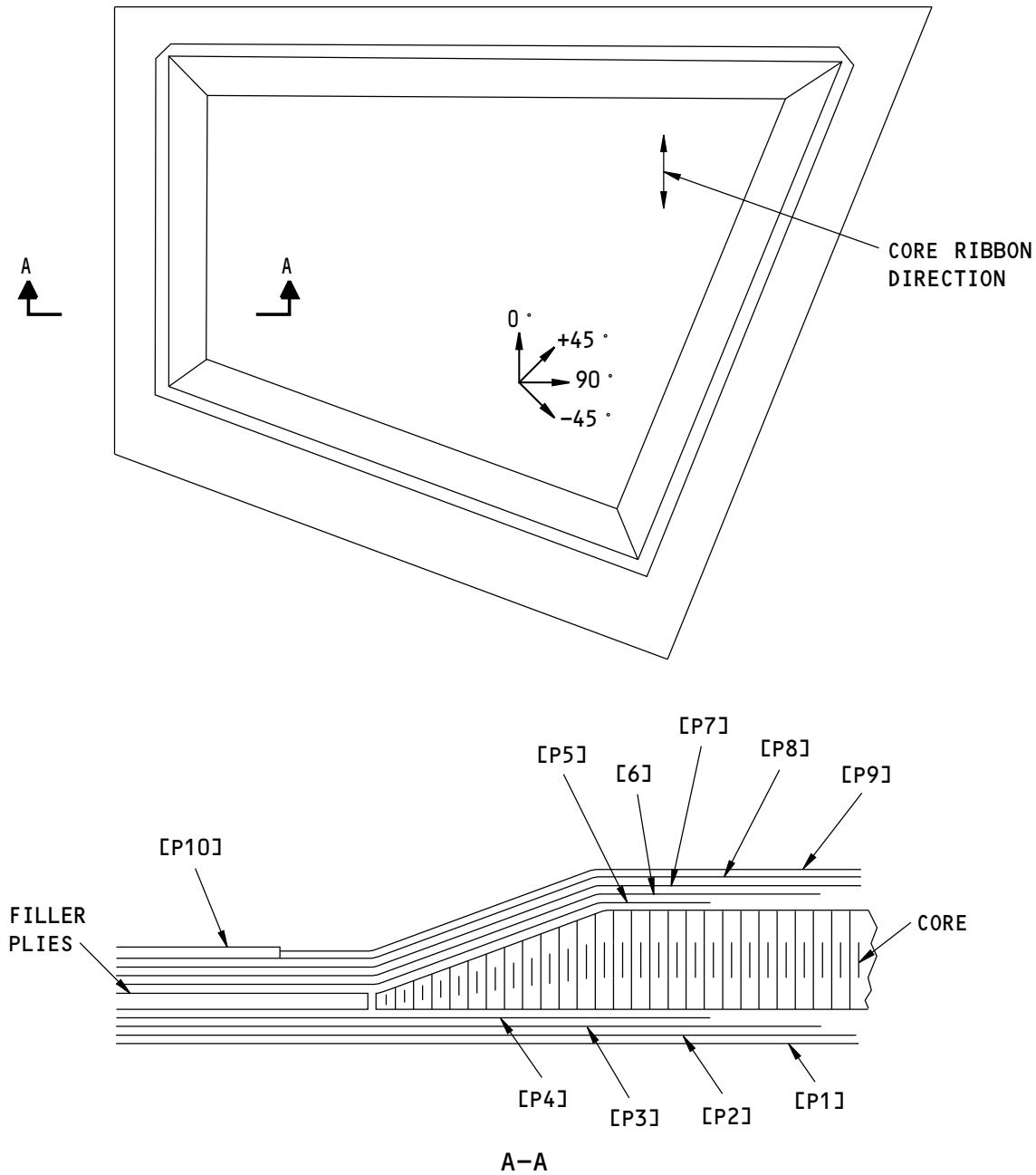
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Ply Configuration for Figure 2, Item [1]
Figure 3

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79 Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	0.001 inch (0.025 mm) thick white bondable tedlar film
P10	-----	Bondable teflon

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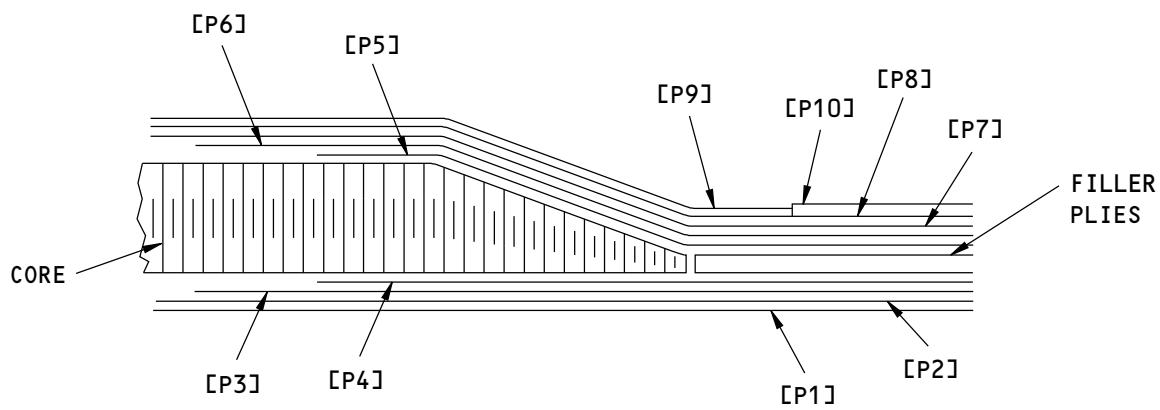
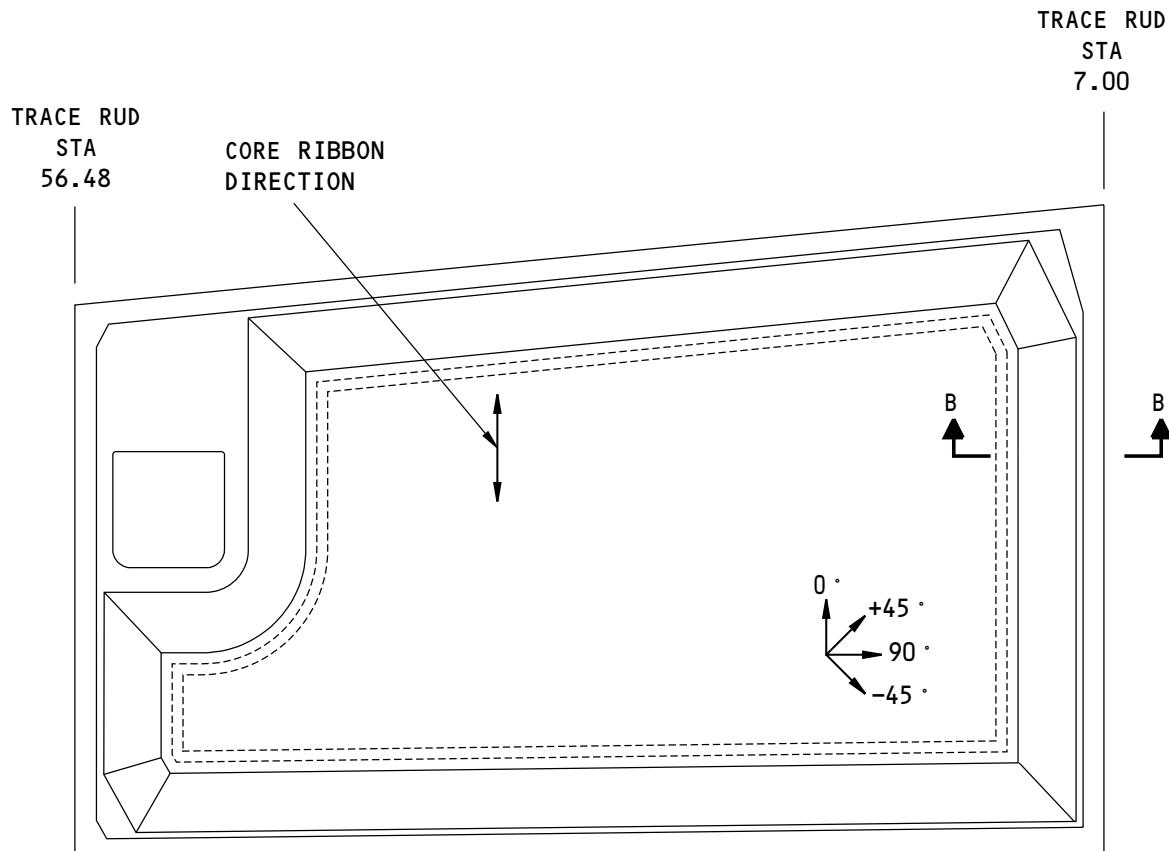
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Ply Configuration for Figure 2, Item [2]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	0.001 inch (0.025 mm) thick white bondable tedlar film
P10	-----	Bondable teflon

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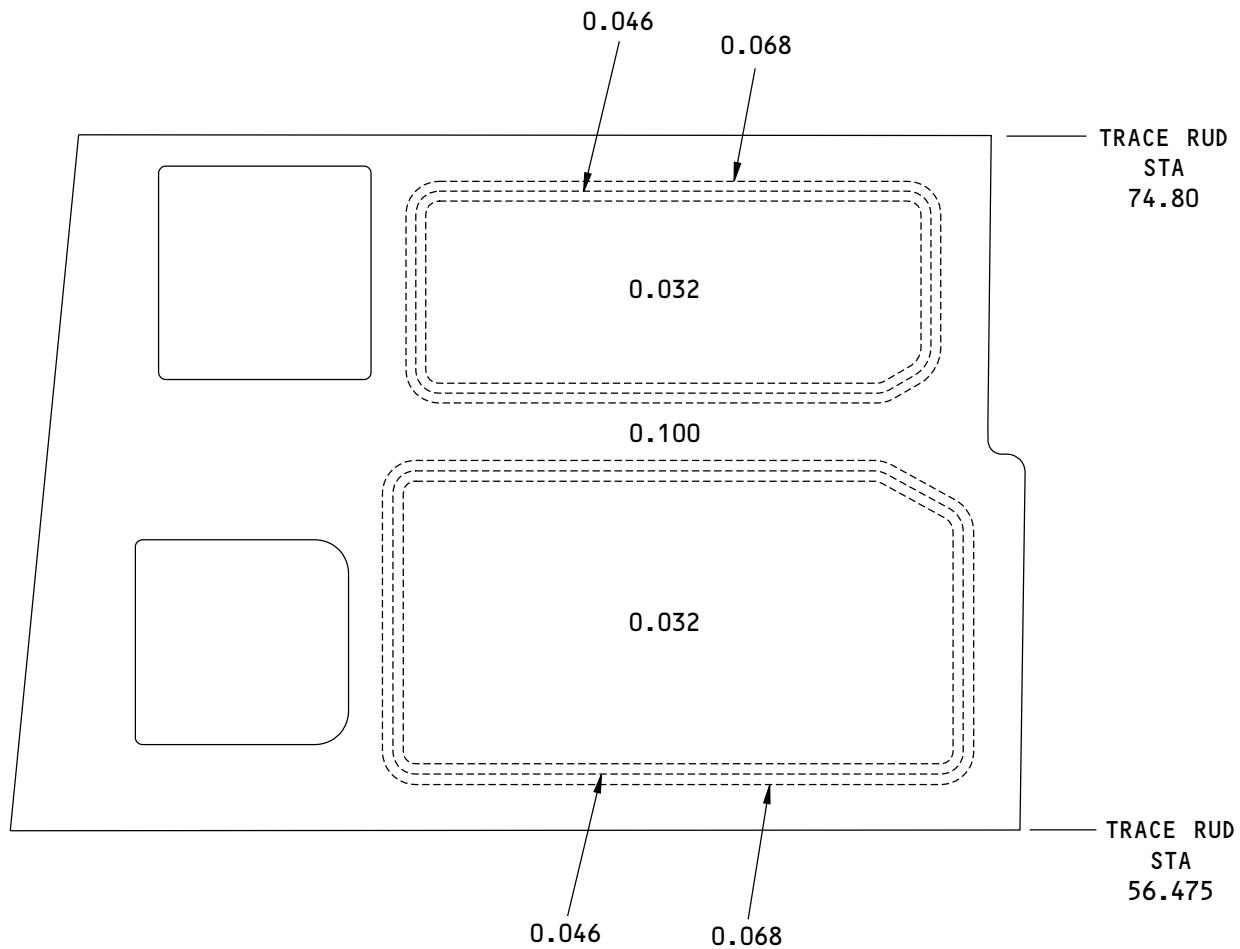
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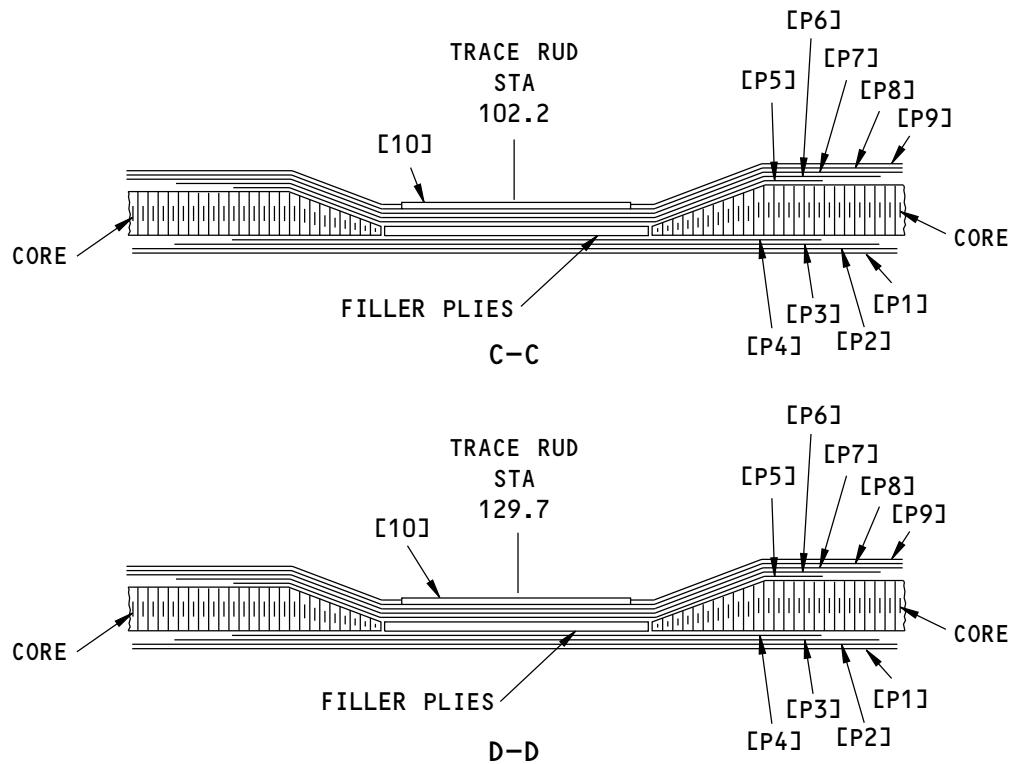
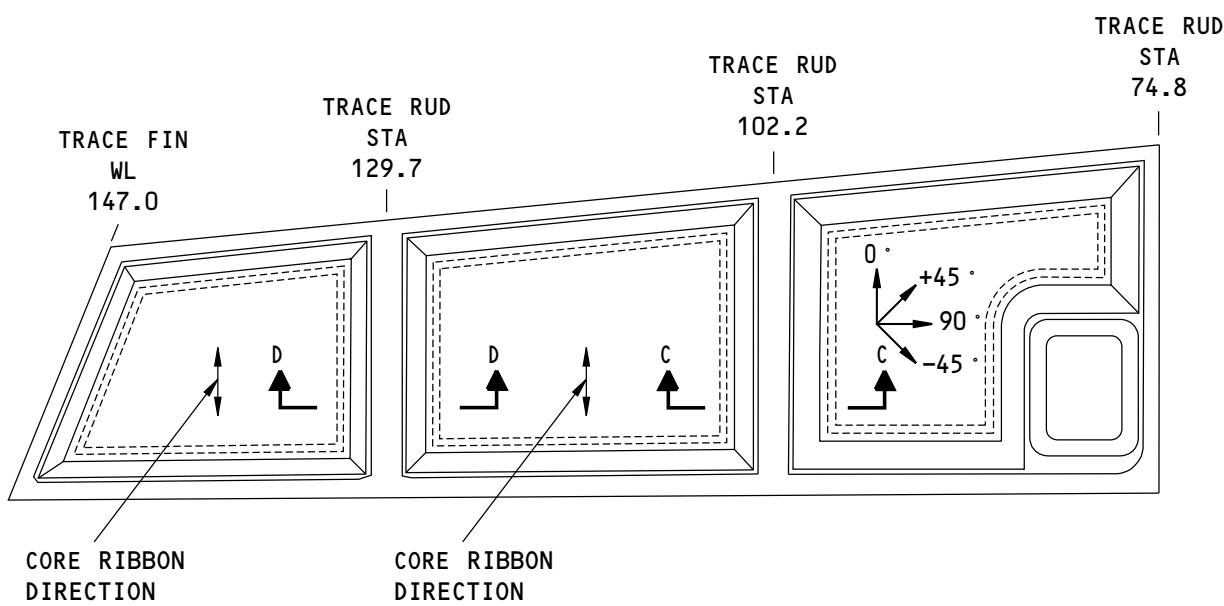
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Chem-milled Areas for Figure 2, Item [3]
Figure 5

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F71501 S0006593235_V1

**Ply Configuration of Figure 2, Item [4]
Figure 6**

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	0.001 inch (0.025 mm) thick white bondable tedlar film
P10	-----	Bondable teflon

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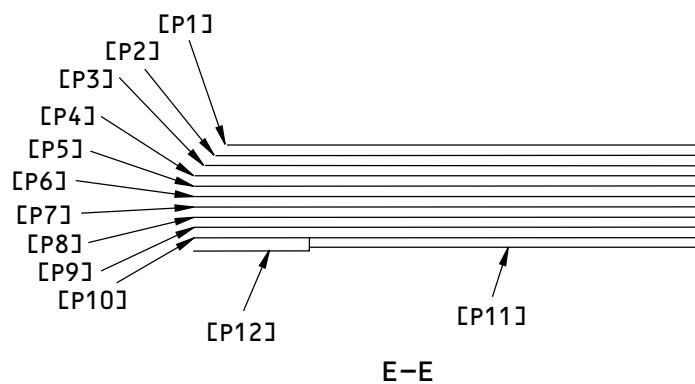
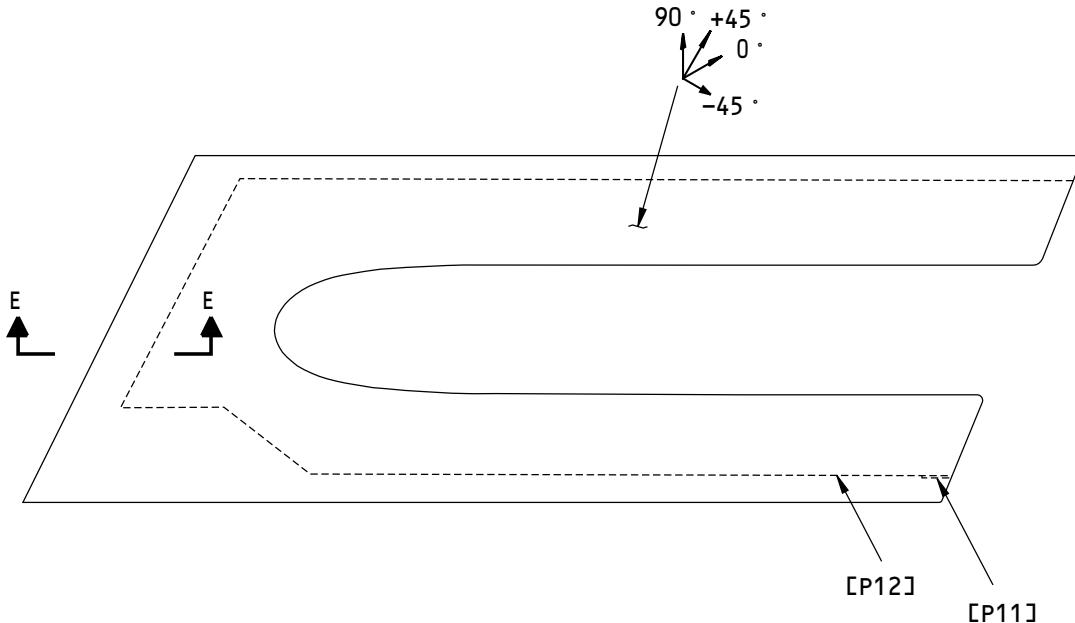
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F71506 S0006593237_V1

Ply Configuration for Figure 2, Item [5]
Figure 7

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 7		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P6, P8, P10	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P7, P9	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P11	-----	0.001 inch (0.025 mm) thick white bondable tedlar film
P11	-----	0.001 inch thick white bondable tedlar film
P12	-----	Bondable teflon

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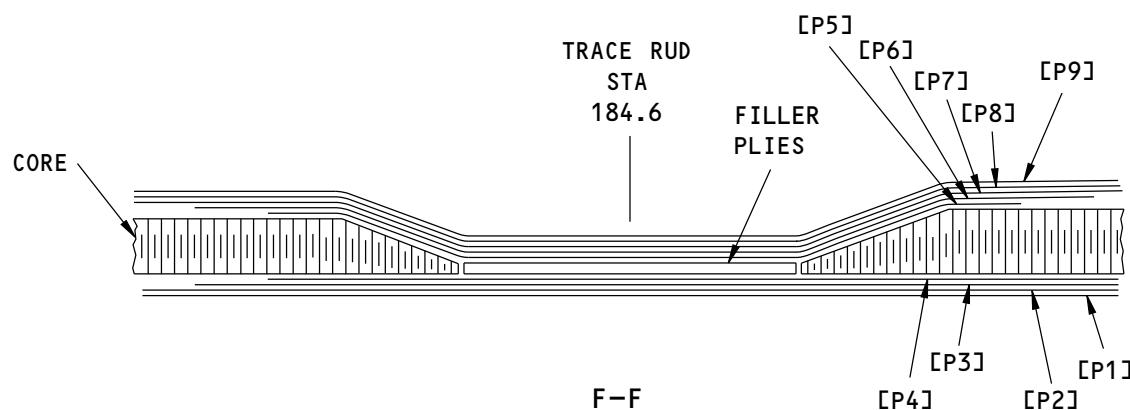
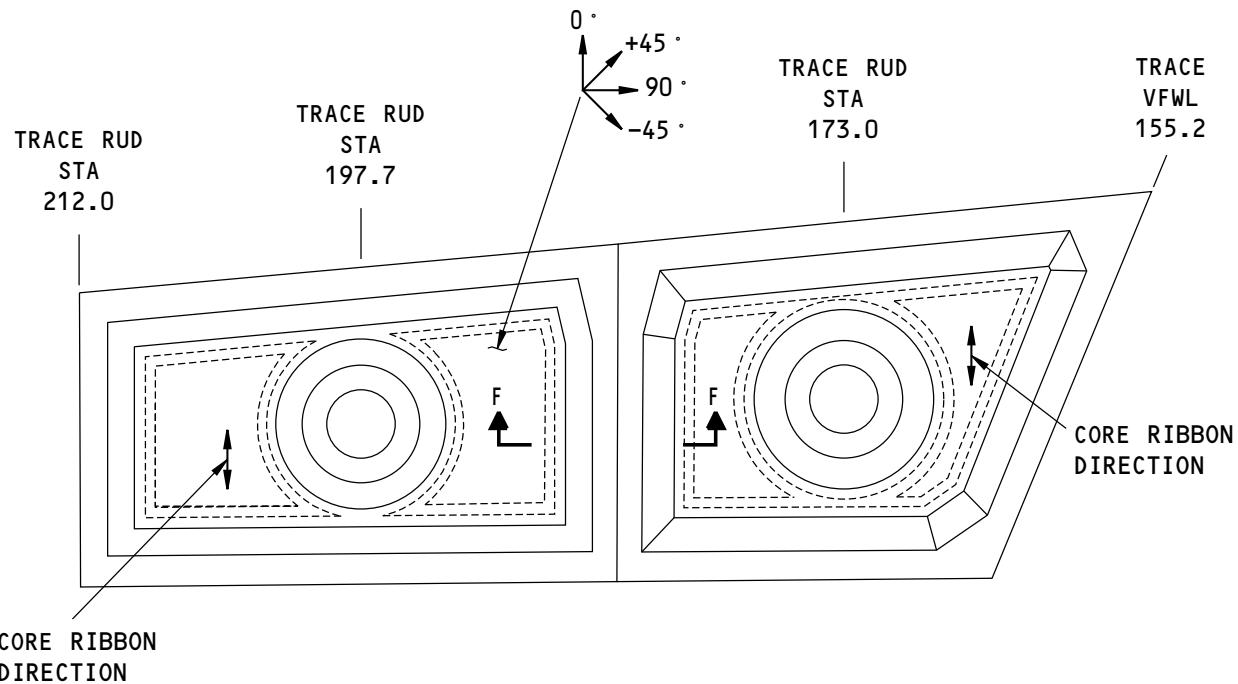
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**Ply Configuration for Figure 2, Item [6]
Figure 8**

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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 8		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	0.001 inch (0.025 mm) thick white bondable tedlar film

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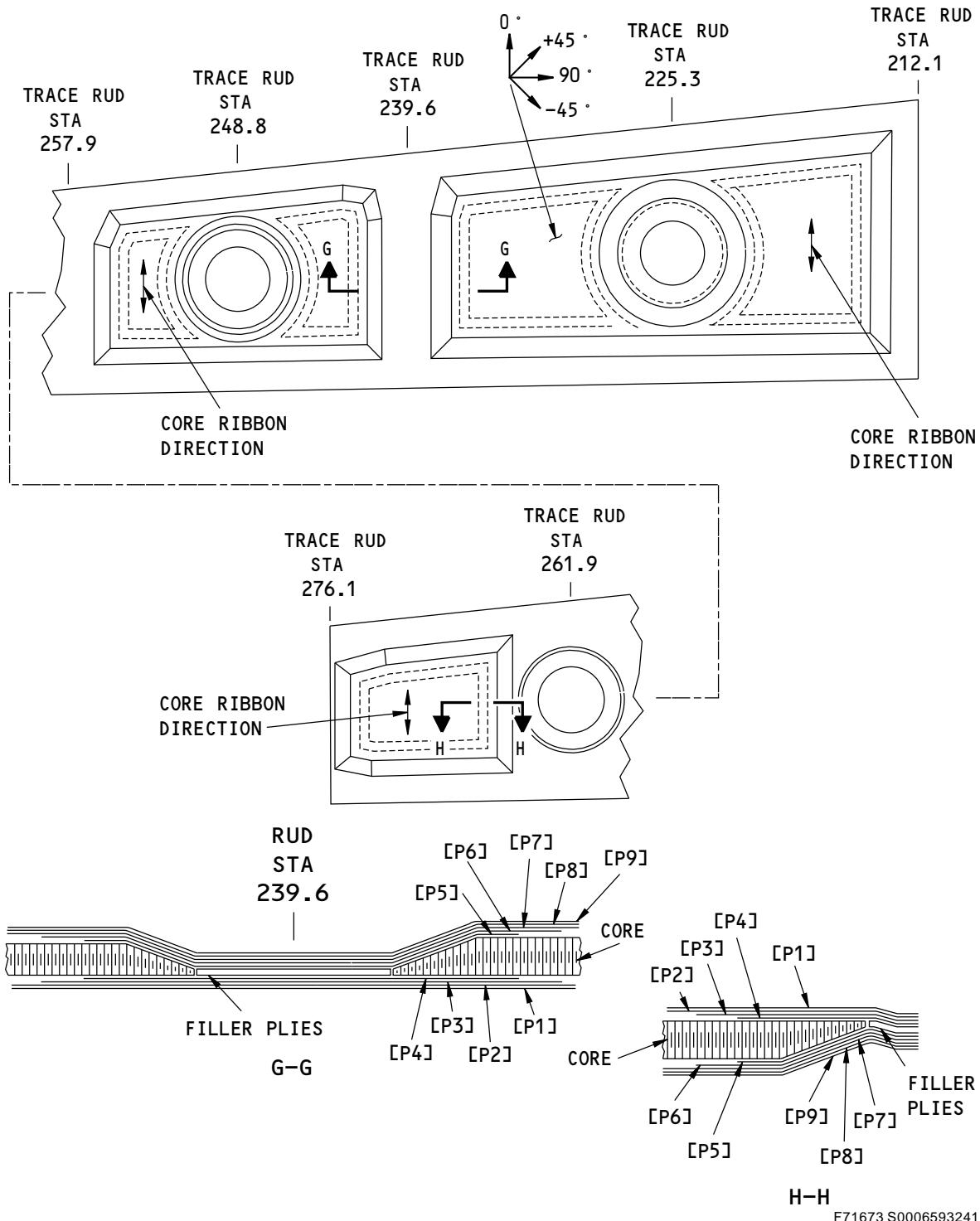
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**Ply Configuration for Figure 2, Item [7]
Figure 9**

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Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 9		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	0.001 inch (0.025 mm) thick white bondable tedlar film

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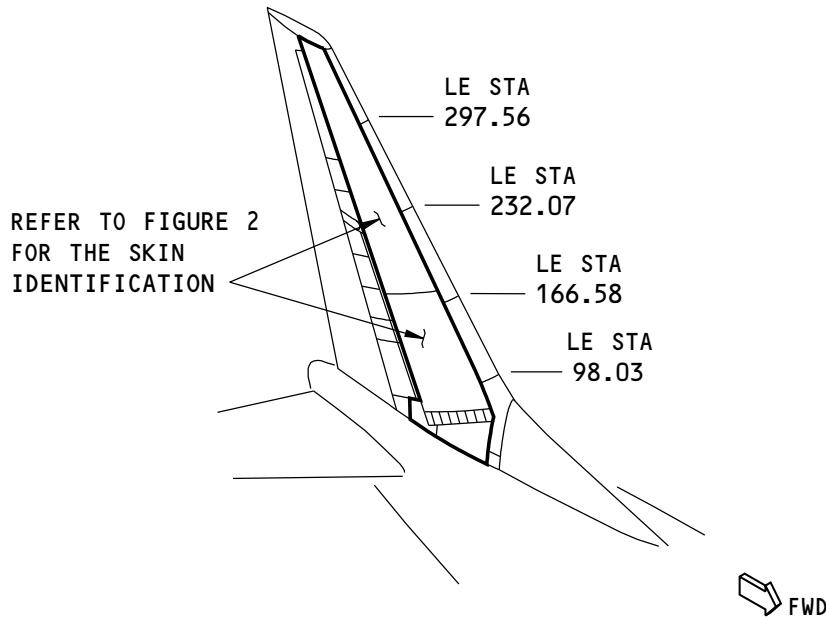
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IDENTIFICATION 4 - VERTICAL STABILIZER RIGHT INSPAR SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

RIGHT SIDE IS SHOWN

F71689 S0006593244_V1

Vertical Stabilizer Inspark Skin Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
172A0001	Torque Box Functional Collector - Vertical Fin
172A4001	Skin Installation - Inspark, Vertical Fin
172A6120	Panel Installation - Fin to Body, Vertical Fin
172A6121	Panel Assembly, Closeout - Vertical Fin
172A6122	Door Assembly, Access - Vertical Fin

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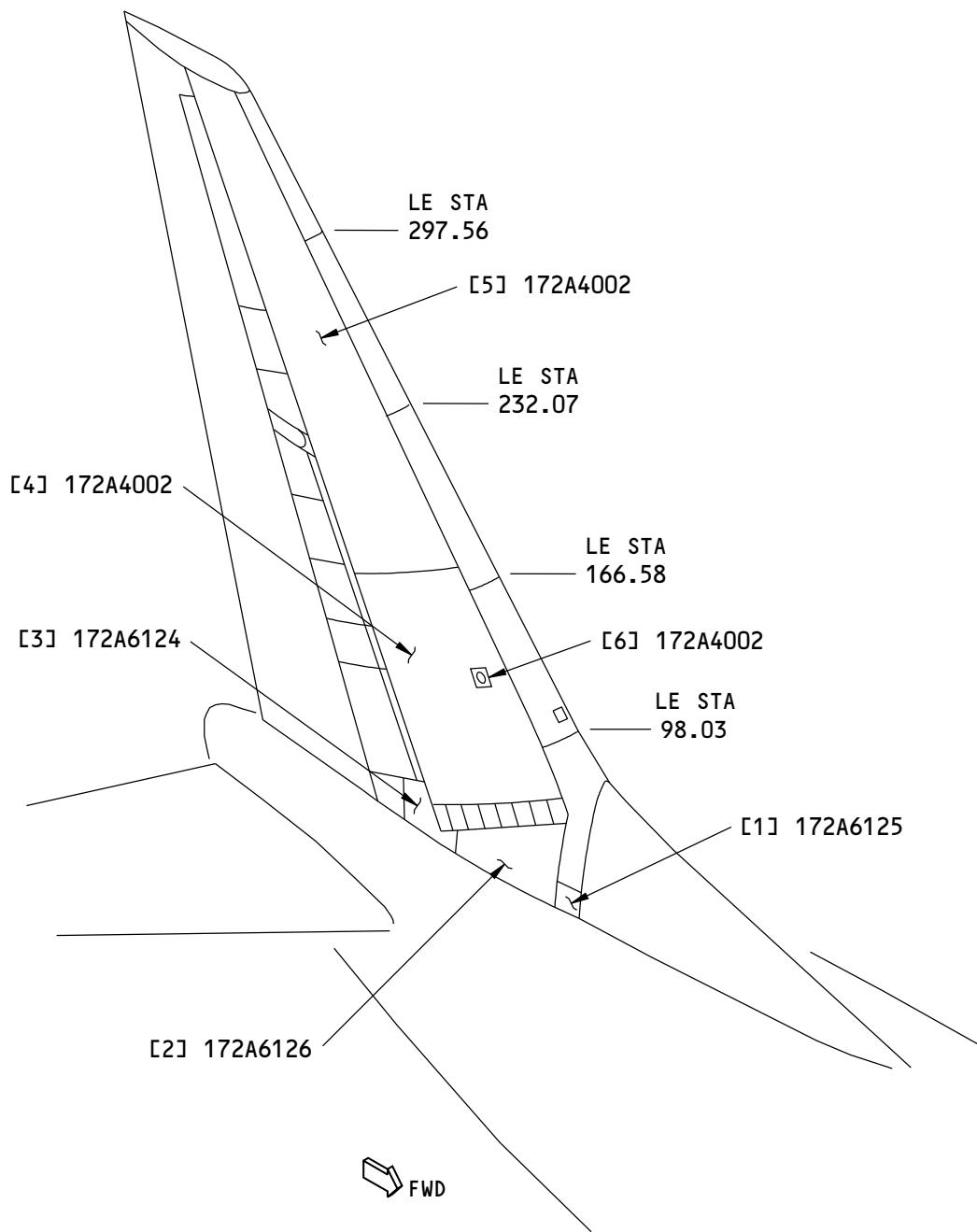
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F71792 S0006593246_V1

Vertical Stabilizer Inspar Skin Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Access Door	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 3 for the chem-mill areas	
[2]	Inspair Closeout Panel - Bonded Assembly Skin Core		Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich Refer to Figure 4 for the 0 degree ply direction, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 3 for the core ribbon direction	
[3]	Aft Closeout Panel	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 5 for the chem-mill areas	
[4]	Skin Panel - Lower Left Hand	0.071 (1.80)	2024-T3 clad sheet as shown in QQ-A-250/5. Refer to Figure 6 for the chem-mill areas	
[5]	Skin Panel - Upper Left Hand	0.071 (1.80)	2024-T3 clad sheet as shown in QQ-A-250/5. Refer to Figure 7 for the chem-mill areas	
[6]	Doubler	0.025 (0.64)	2024-T3 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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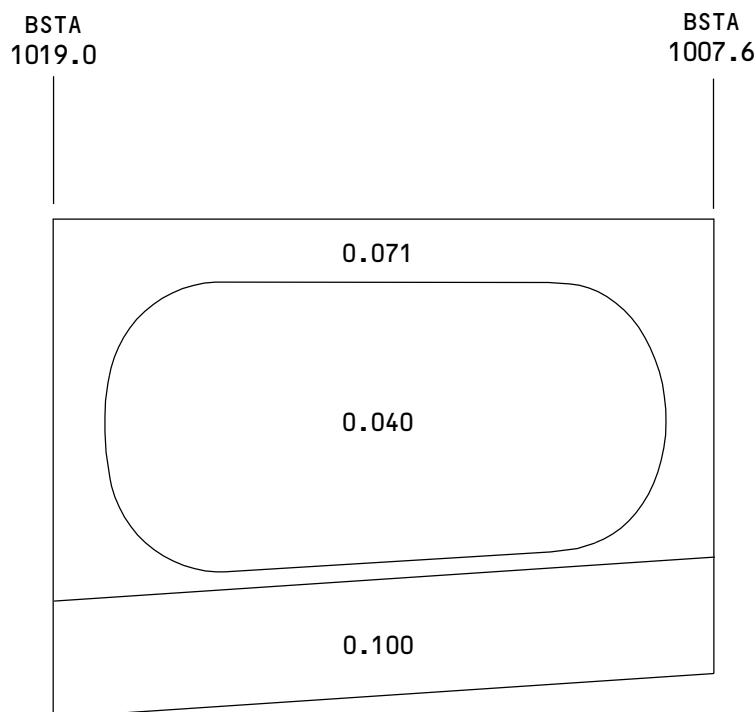
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Chem-milled Areas for Figure 2, Item [1]
Figure 3

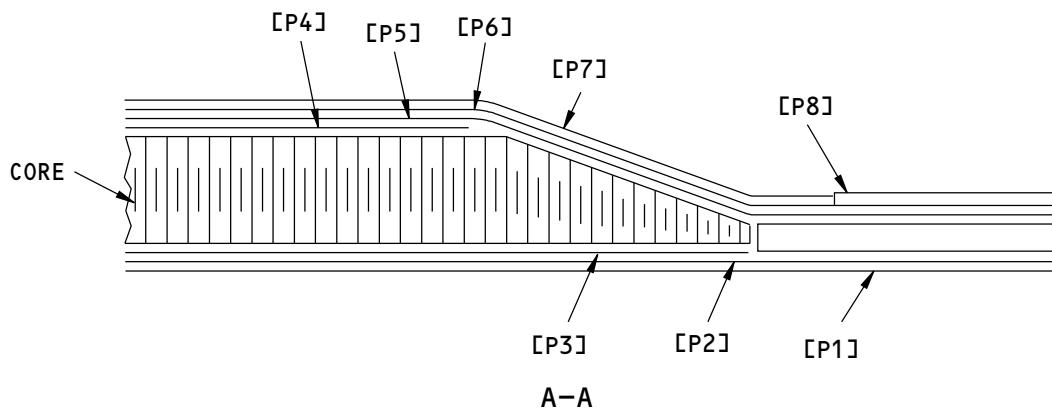
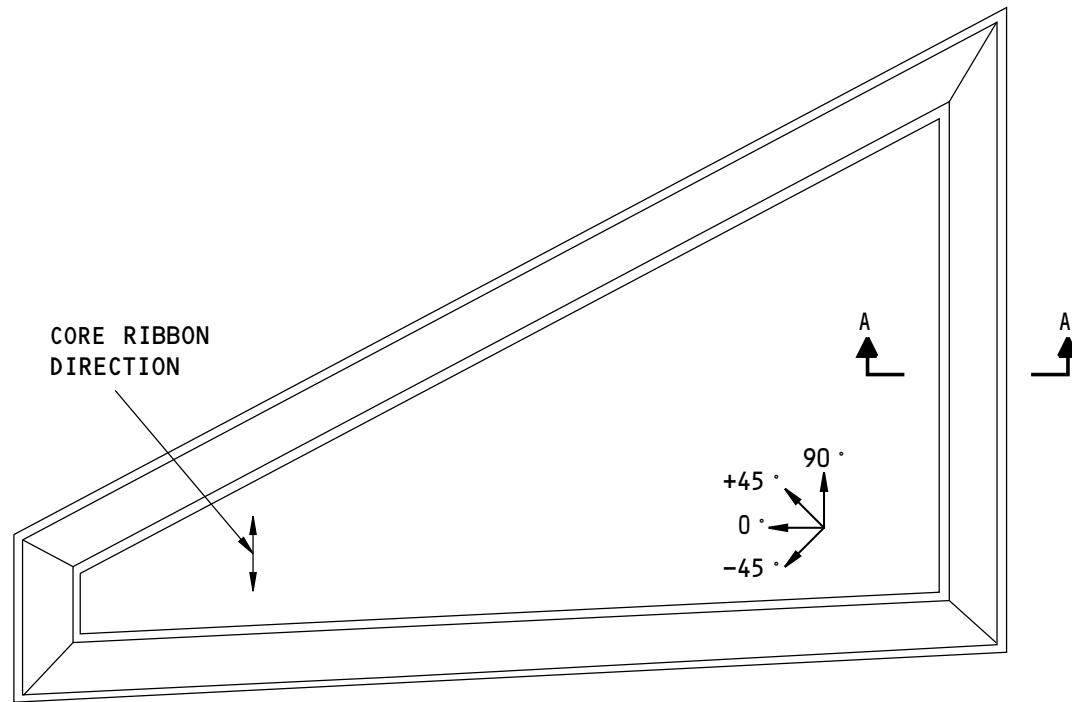
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Ply Configuration for Figure 2, Item [2]
Figure 4

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P2, P5, P6	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P3, P4	90 degrees	Epoxy/Graphite tape as given in BMS 8-168, Type II, Class I, Grade 145
P7	-----	0.001 inch (0.025 mm) thick white bondable tedlar film
P8	-----	Bondable teflon

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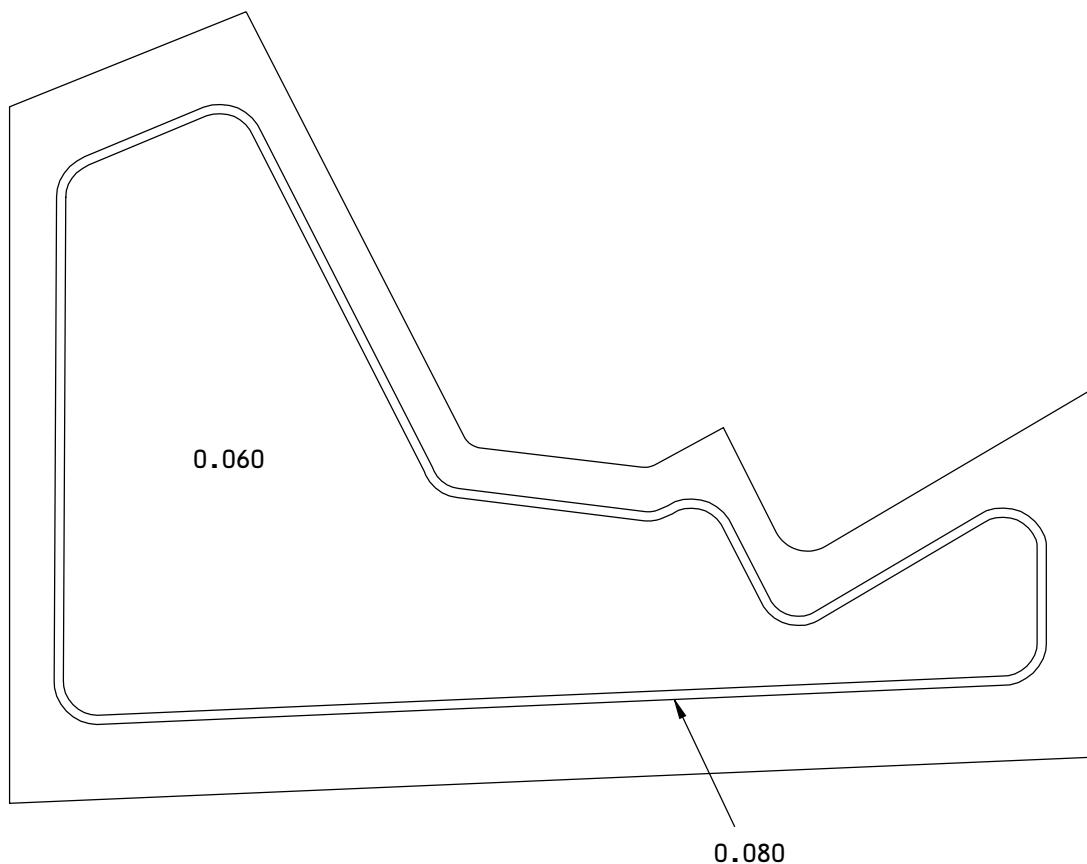
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Chem-milled Areas for Figure 2, Item [3]
Figure 5

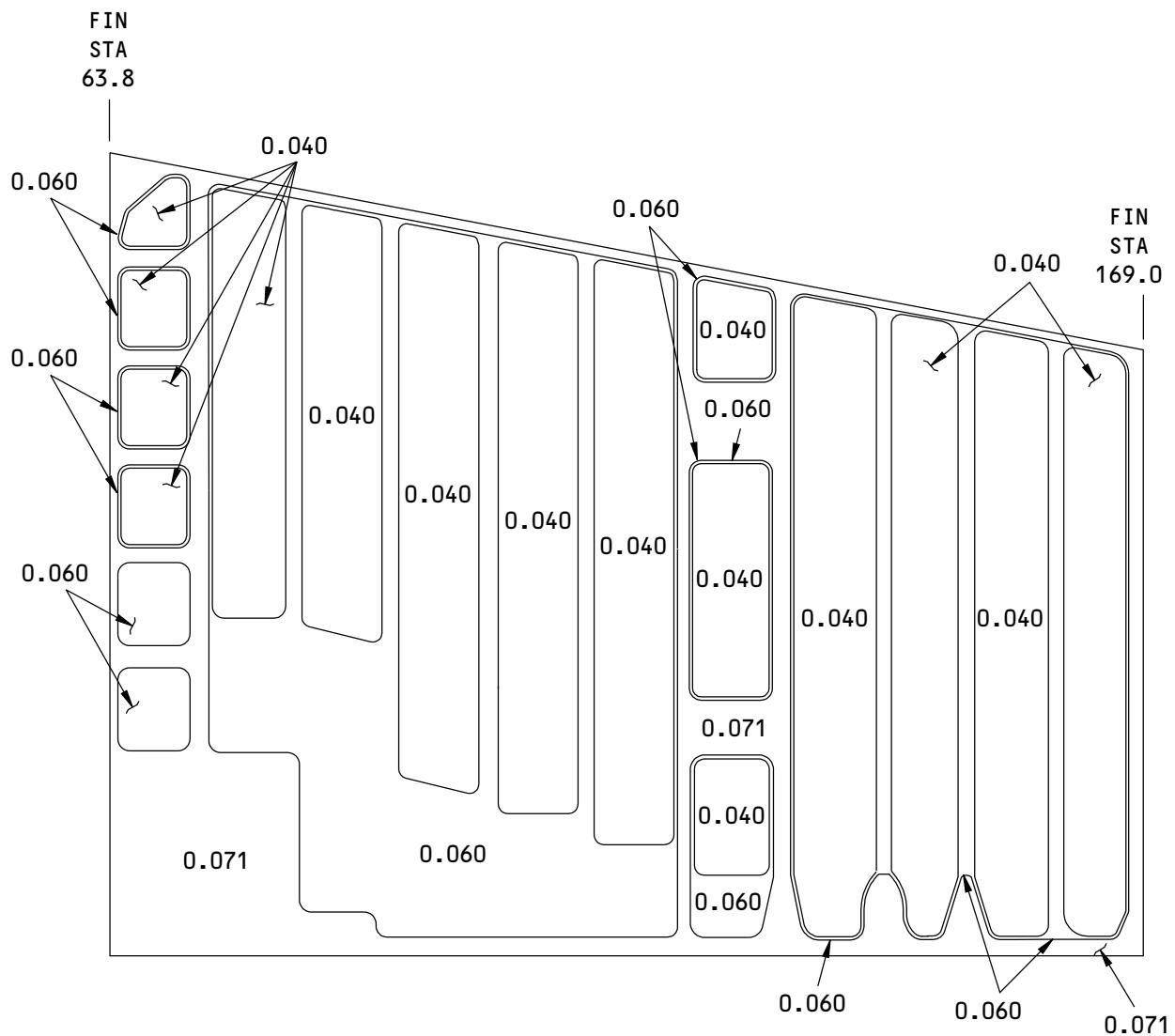
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Chem-milled Areas for Figure 2, Item [4]

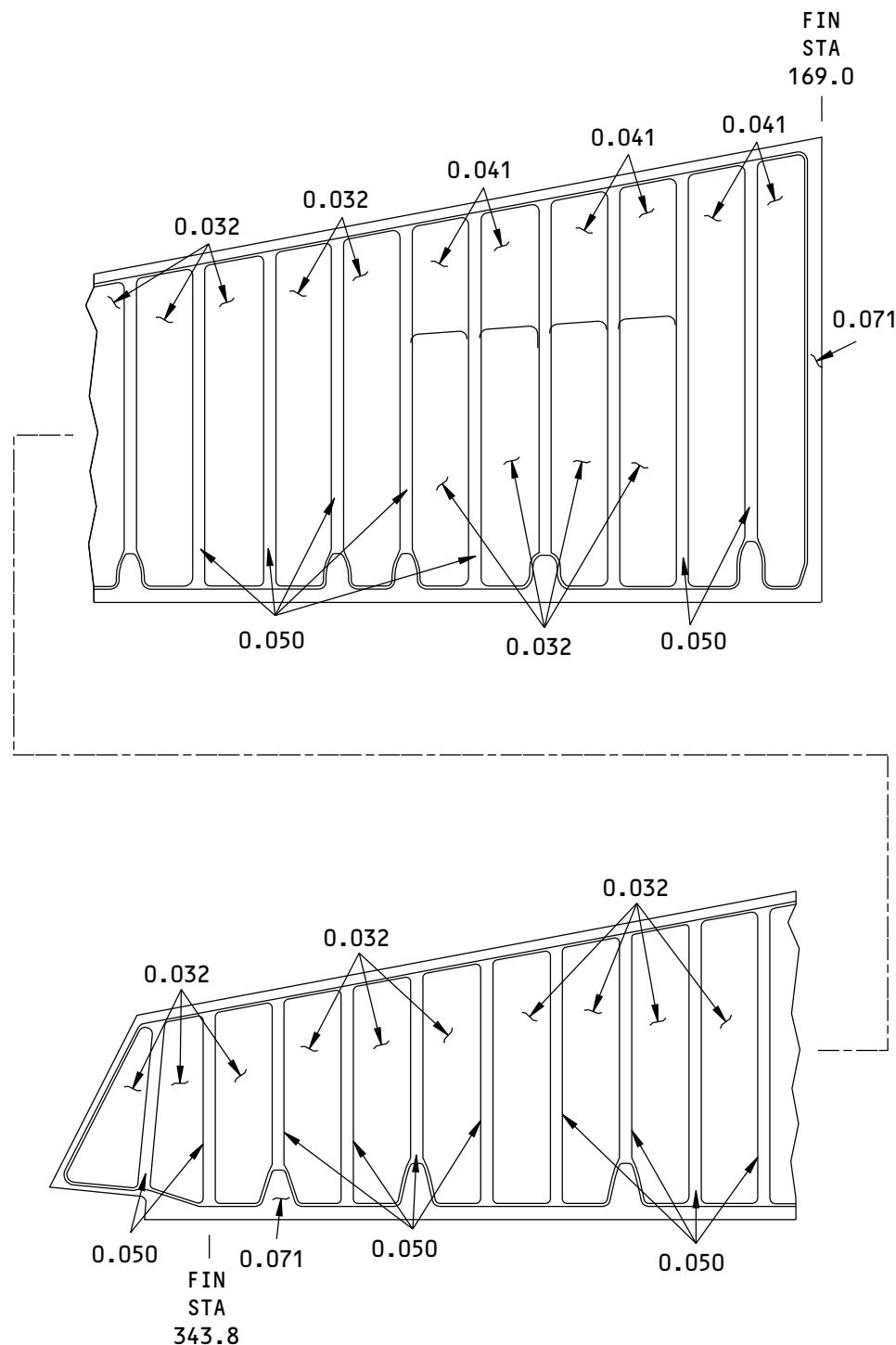
Figure 6

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Chem-milled Areas for Figure 2, Item [5]
Figure 7

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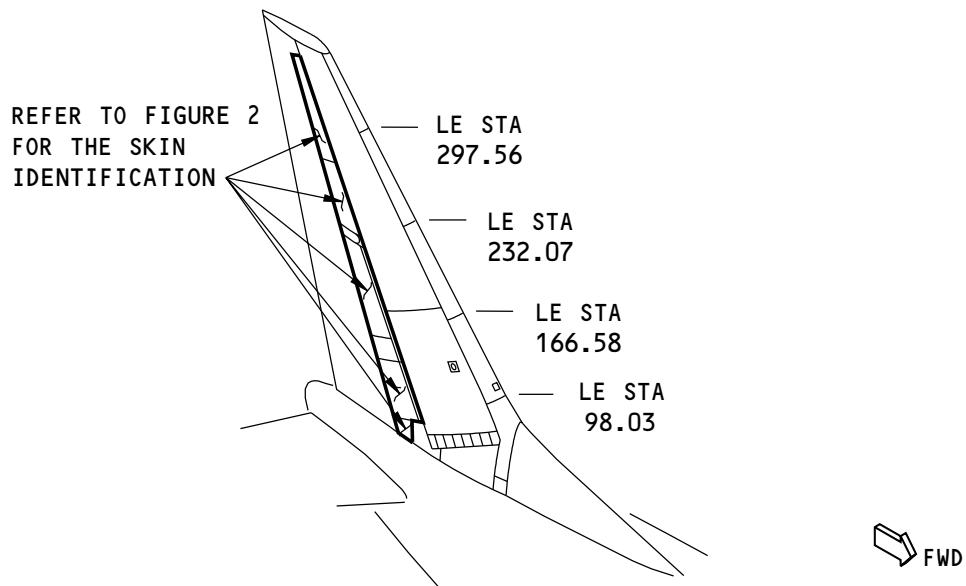
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IDENTIFICATION 5 - VERTICAL STABILIZER RIGHT TRAILING EDGE PANELS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

RIGHT SIDE IS SHOWN

F72582 S0006593255_V1

Vertical Stabilizer Trailing Edge and Closeout Panel Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
172A0001	Torque Box Functional Collector - Vertical Fin
172A6123	Panel Assembly - Trailing Edge Closeout, Vertical Fin
175A0001	Trailing Edge Functional Collector - Vertical Fin
175A1701	Panel Installation - Trailing Edge, Vertical Fin
175A1703	Door Assembly - Trailing Edge, Vertical Fin
175A1801	Seal Installation - Mass Balance Cavity, Fin WL 151.17, Vertical Fin

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IDENTIFICATION 5

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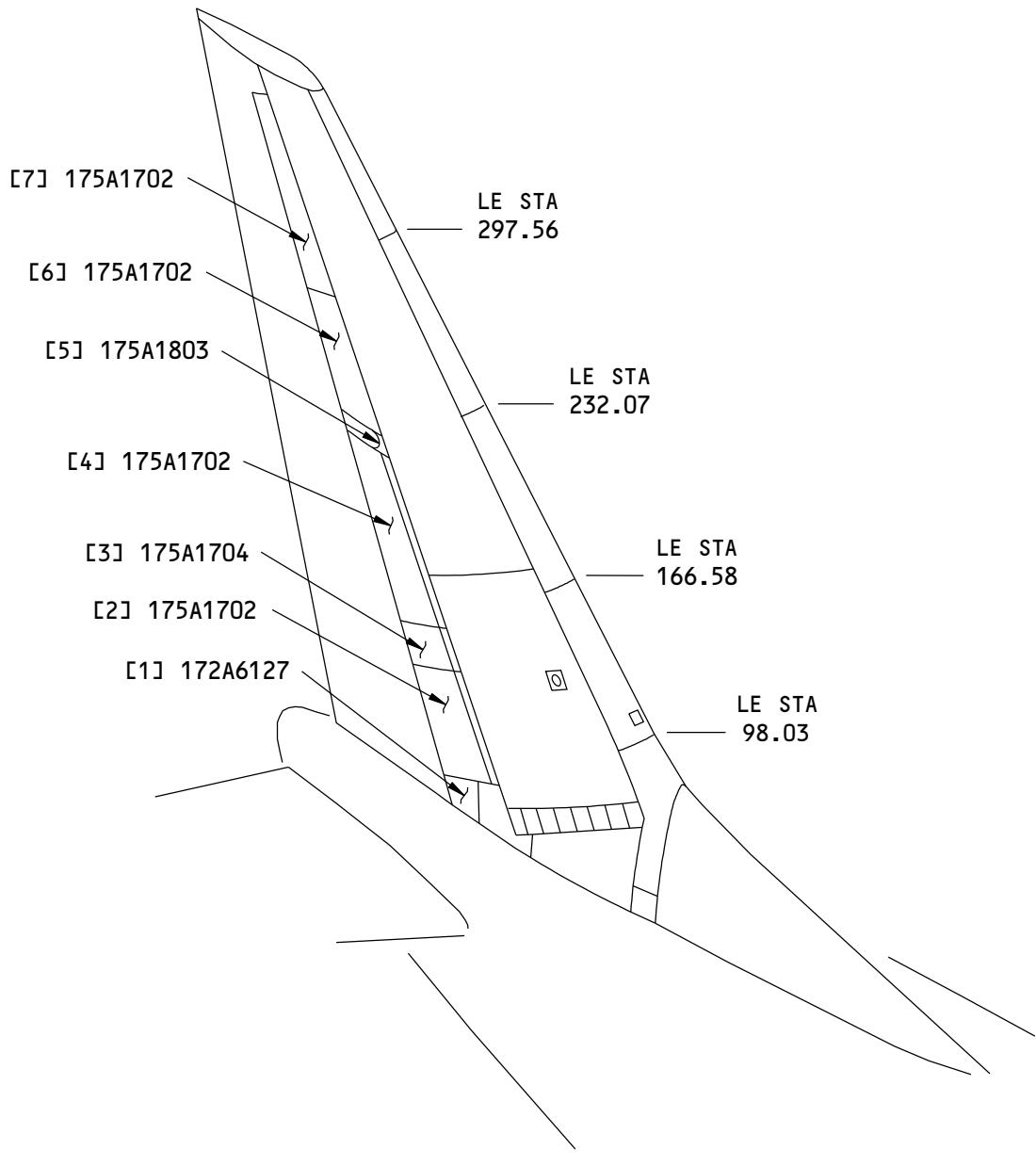
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F72593 S0006593257_V2

Vertical Stabilizer Trailing Edge and Closeout Panel Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Closeout Panel Assembly - Bonded Panel Skin Core		Glass Fabric Reinforced Plastic (GFRP) honeycomb sandwich Refer to Figure 3 for the 0 degree ply, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 3 for the core ribbon direction	
[2]	Trailing Edge Panel Assembly - Bonded Panel Skin Core		GFRP honeycomb sandwich Refer to Figure 4 for the 0 degree ply, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 4 for the core ribbon direction	
[3]	Trailing Edge Skin Panel	0.100 (2.54)	2024-T3 clad sheet as given in QQ-A-250/5. Refer to Figure 5 for the chem-mill areas	
[4]	Trailing Edge Panel Assembly - Bonded Panel Skin Core (3)		GFRP honeycomb sandwich Refer to Figure 6 for the 0 degree ply, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 6 for the core ribbon direction	
[5]	Mass Balance Cavity Panel - Bonded Panel Skin Core		GFRP honeycomb sandwich Refer to Figure 7 for the 0 degree ply, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 7 for the core ribbon direction	
[6]	Trailing Edge Panel Assembly - Bonded Panel Skin Core (2)		GFRP honeycomb sandwich Refer to Figure 8 for the 0 degree ply, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 8 for the core ribbon direction	
[7]	Trailing Edge Panel Assembly - Bonded Panel Skin Core (3)		GFRP honeycomb sandwich Refer to Figure 9 for the 0 degree ply, material, and ply sequence Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 9 for the core ribbon direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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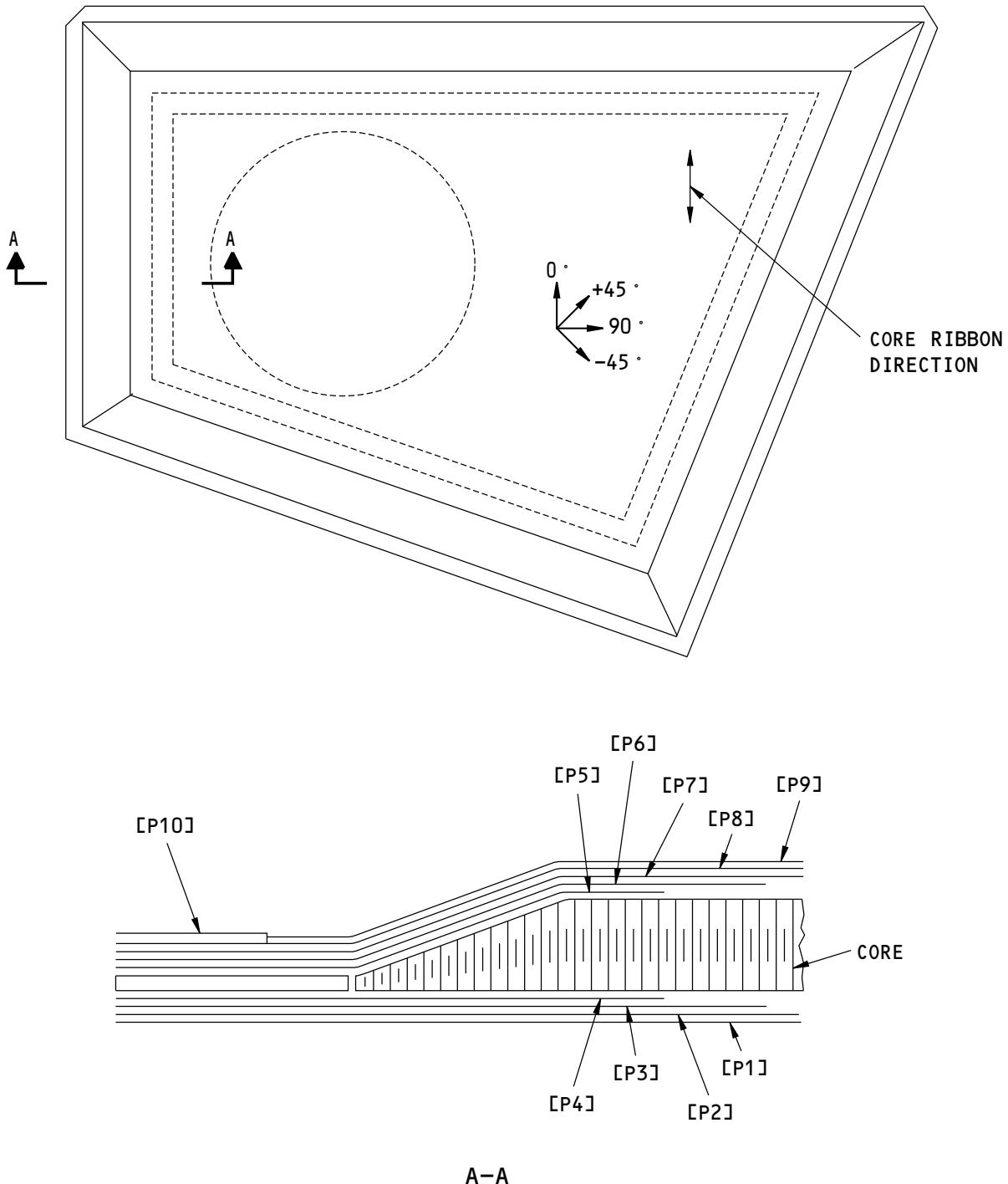
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Ply Configuration for Figure 2, Item [1]
Figure 3

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79 Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	White bondable tedlar film 0.001 inch (0.025 mm) thick
P10	-----	Bondable teflon

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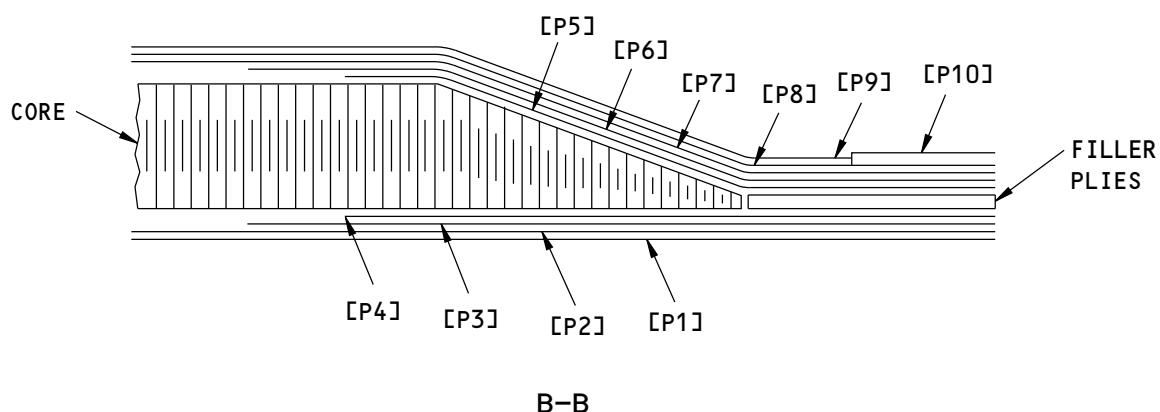
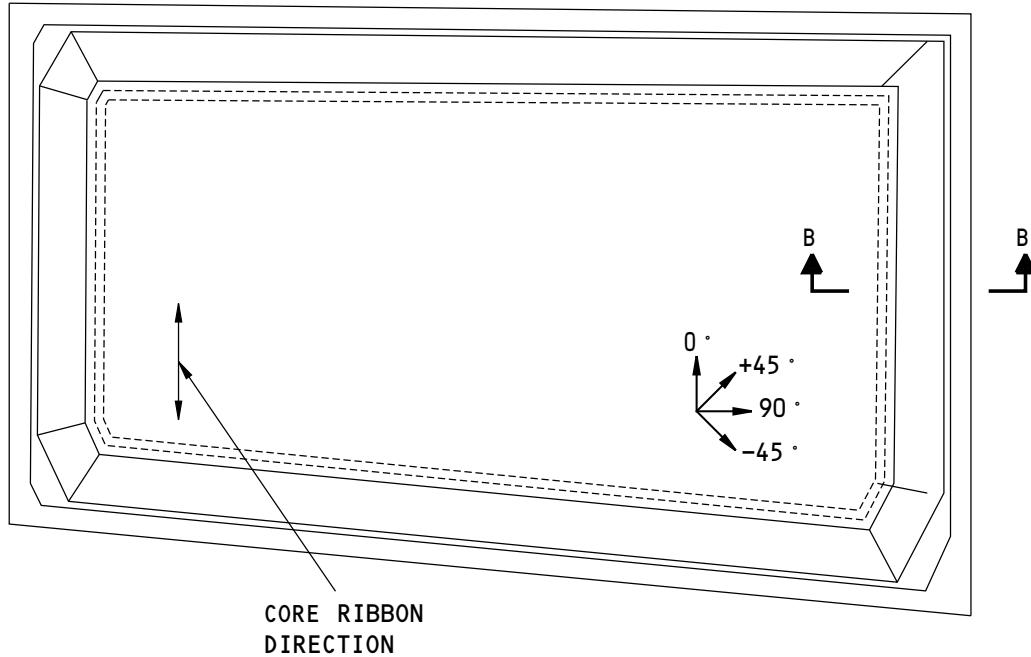
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B-B

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Ply Configuration for Figure 2, Item [2]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	White bondable tedlar film 0.001 inch (0.025 mm) thick
P10	-----	Bondable teflon

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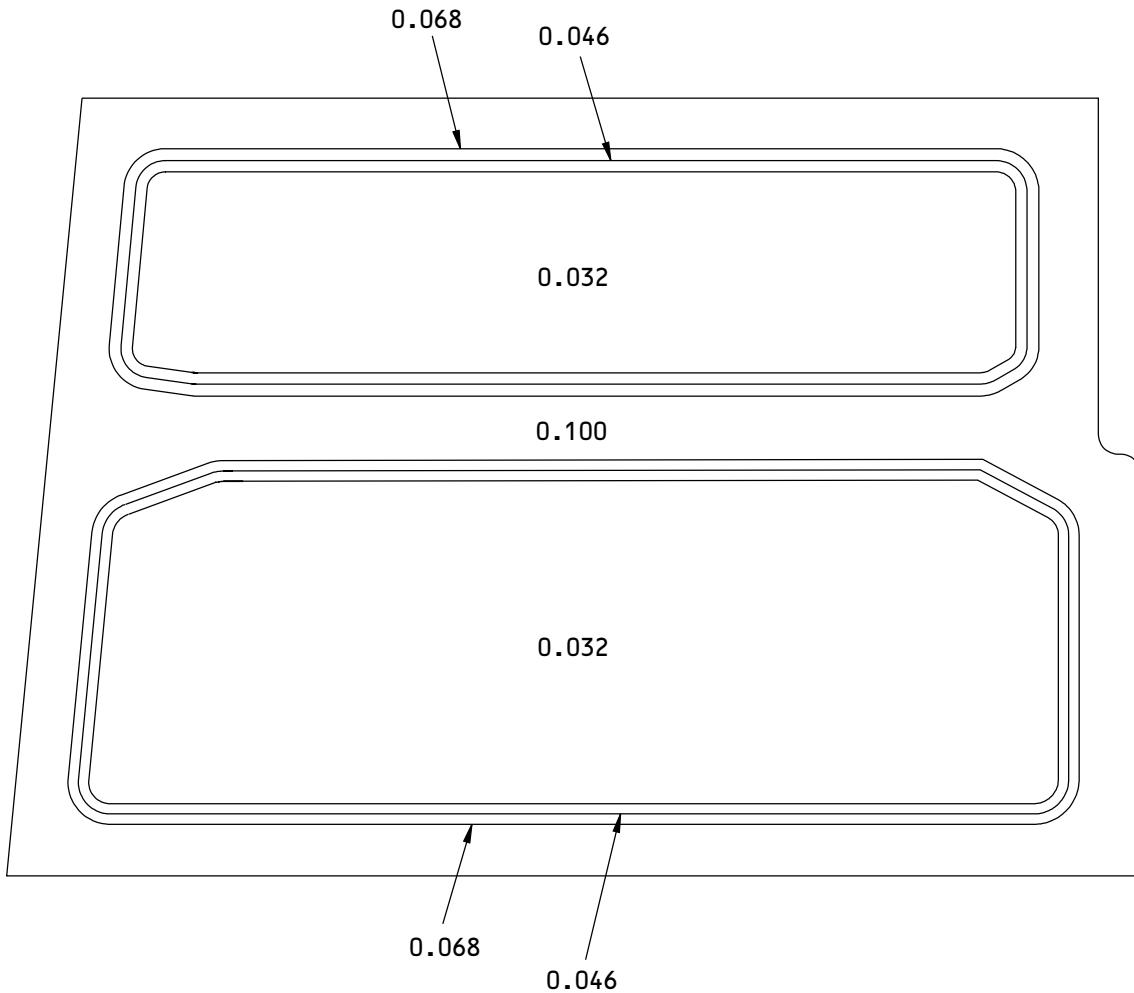
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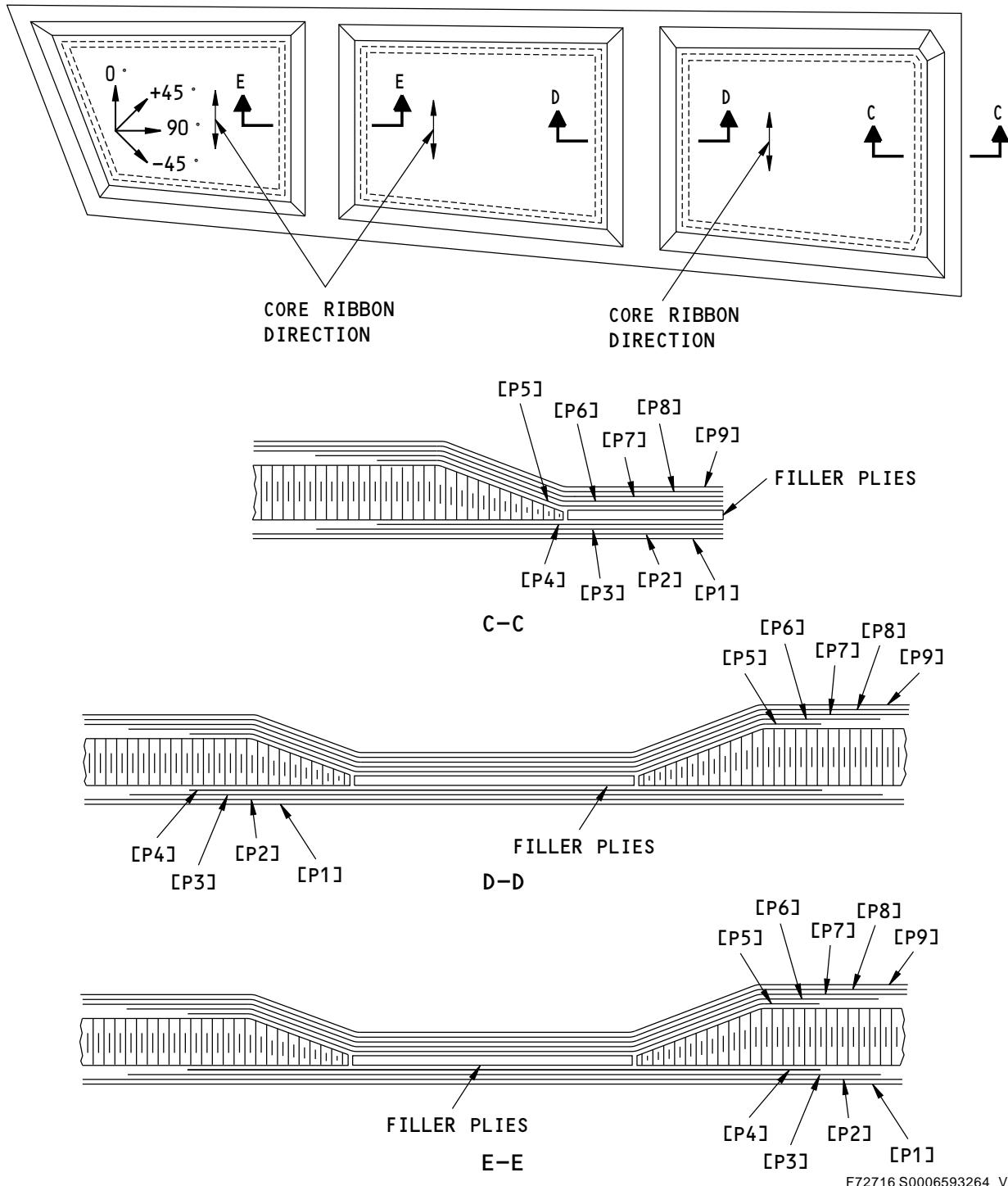
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Chem-milled Areas for Figure 2, Item [3]
Figure 5

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**Ply Configuration for Figure 2, Item [4]
Figure 6**

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	White bondable tedlar film 0.001 inch (0.025 mm) thick

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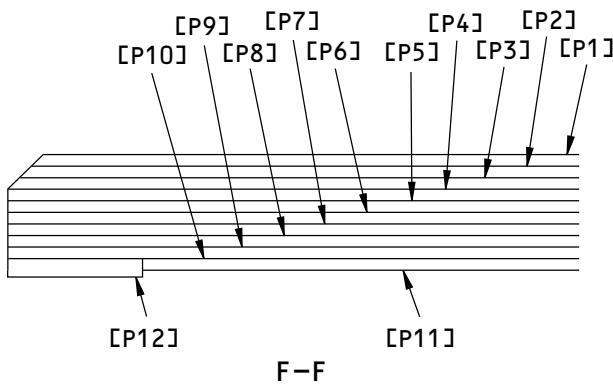
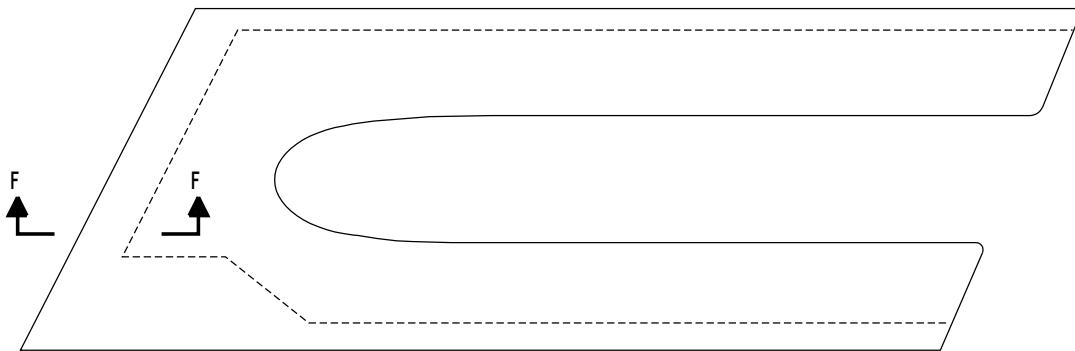
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Ply Configuration for Figure 2, Item [5]
Figure 7

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 7		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P6, P8, P10	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P7, P9	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P11	-----	White bondable tedlar film 0.001 inch (0.025 mm) thick
P12	-----	Bondable teflon

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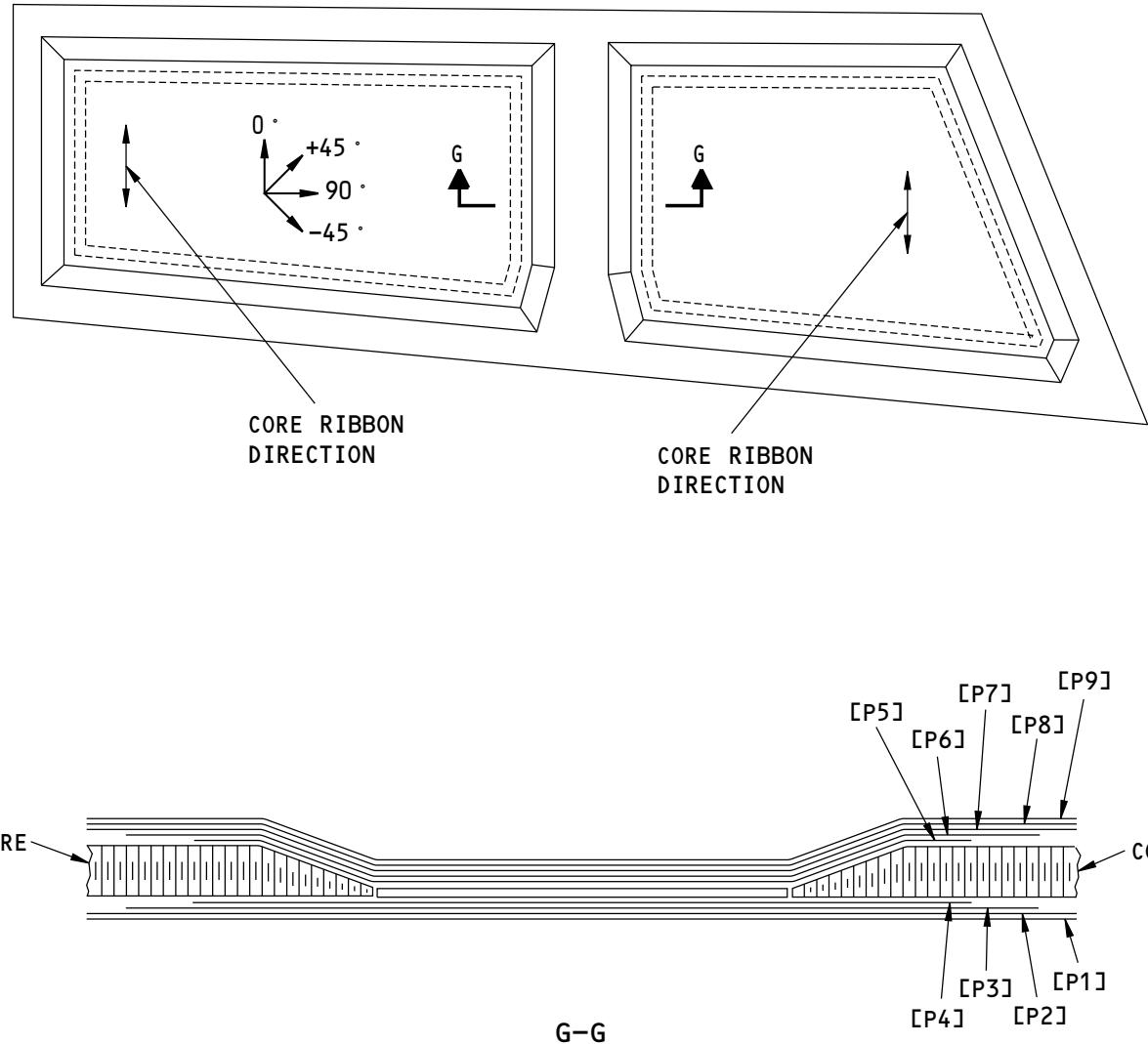
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Ply Configuration of Figure 2, Item [6]
Figure 8

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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 8		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	White bondable tedlar film 0.001 inch (0.025 mm) thick

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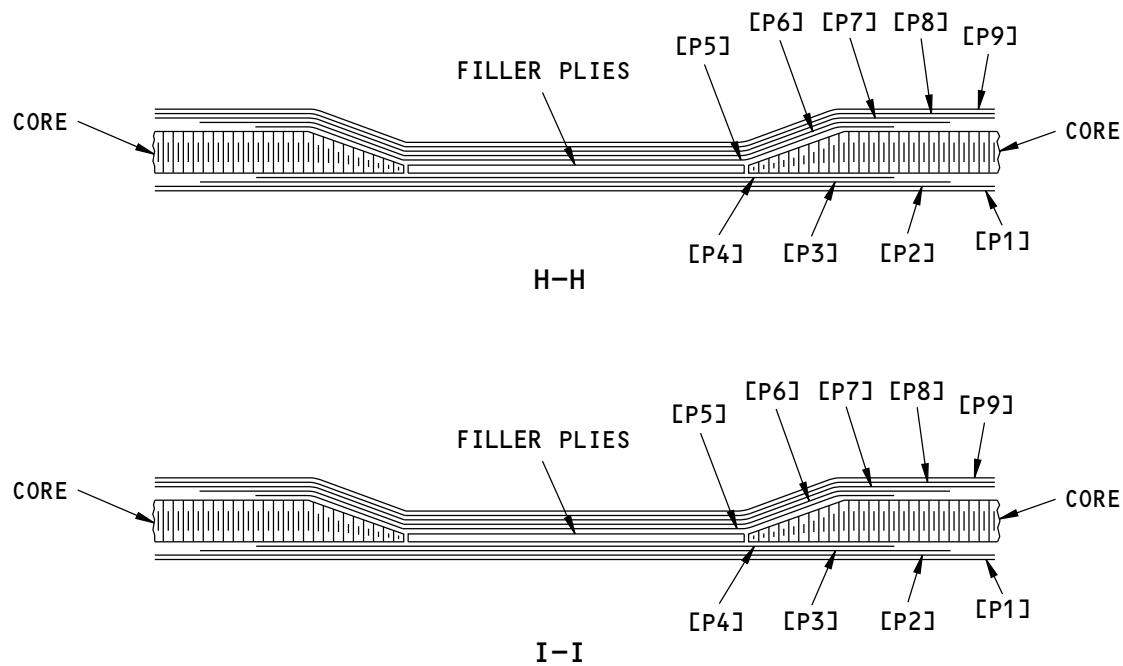
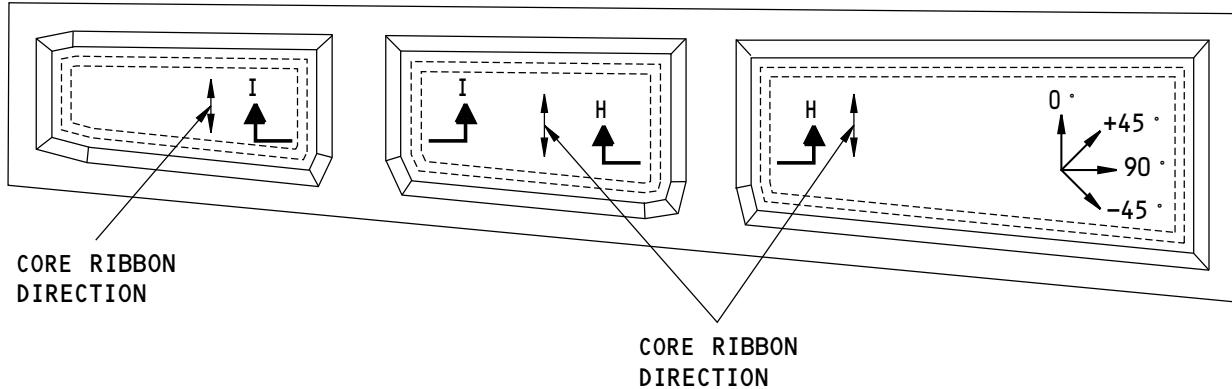
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Ply Configuration for Figure 2, Item [7]
Figure 9

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Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 9		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	0 or 90 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P2, P4, P5, P7	+ or - 45 degrees	GFRP honeycomb sandwich as given in BMS 8-79, Class III, Grade B, Style 1581 or 7781
P9	-----	White bondable tedlar film 0.001 inch (0.025 mm) thick

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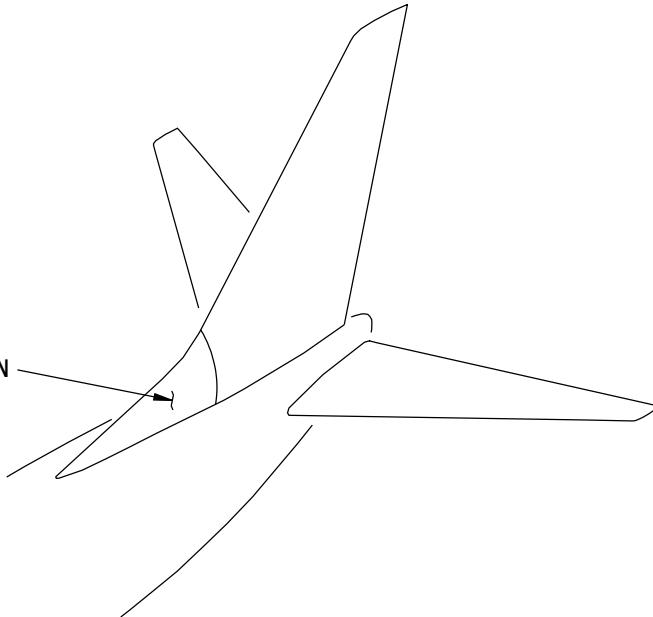
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IDENTIFICATION 6 - DORSAL FIN SKIN

REFER TO FIGURE 2
FOR THE DORSAL FIN
SKIN IDENTIFICATION



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G22518 S0006593273_V1

Dorsal Fin Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
174A0101	Dorsal Fin Installation
174A2100	Dorsal Fin Panel - Bonded Part

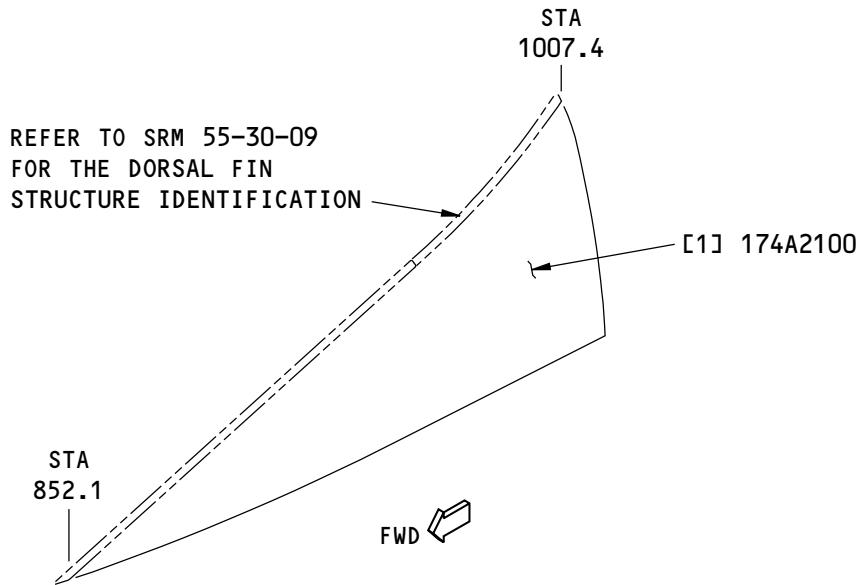
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE PANEL IS SHOWN, RIGHT SIDE PANEL IS OPPOSITE

G22519 S0006593275_V1

Dorsal Fin Skin Panel Identification

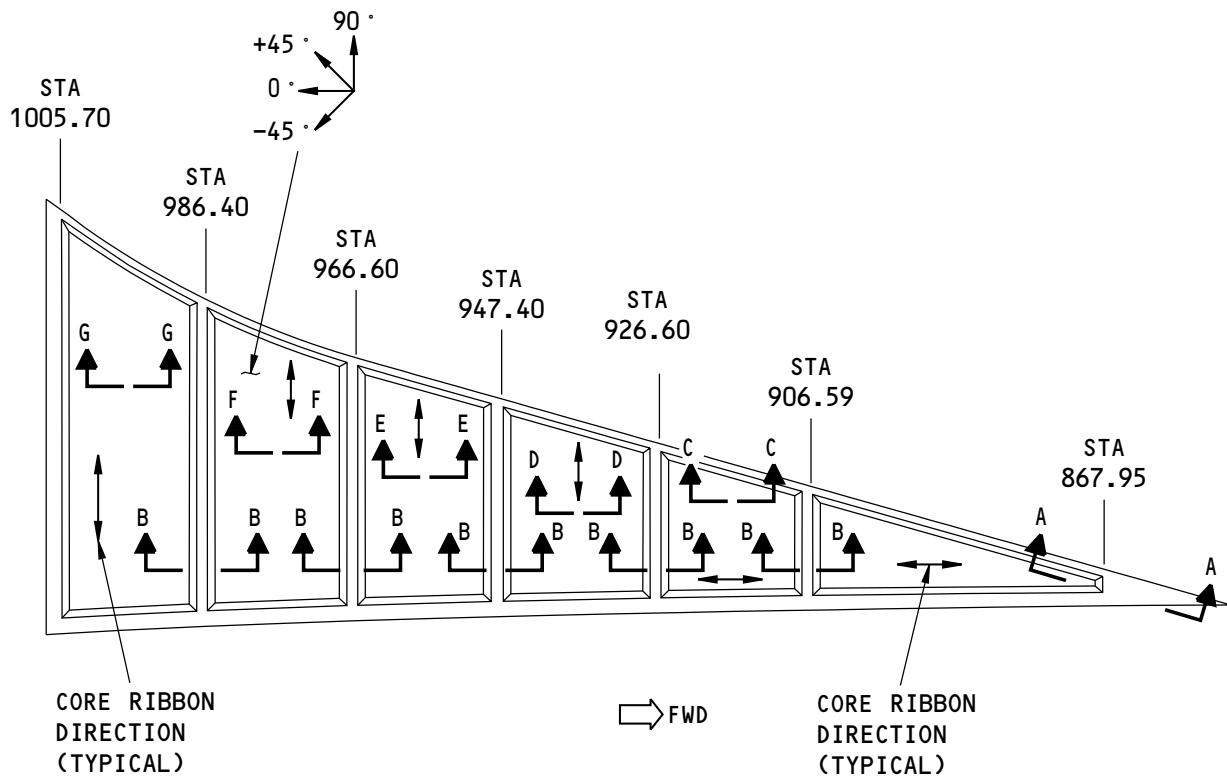
Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Skin Panel - Dorsal Fin - Bonded Part Skin Core	0.35 (8.89)	Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich Refer to Figure 3 for the zero degree ply direction and ply layup sequence Aramid honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0. Refer to Figure 3 for the core ribbon direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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LEFT SIDE DORSAL FIN SKIN PANEL IS SHOWN,
RIGHT SIDE DORSAL FIN SKIN PANEL IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, C-C, D-D, E-E, F-F, AND G-G FOR THE PLY SEQUENCE OVER EACH CORE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

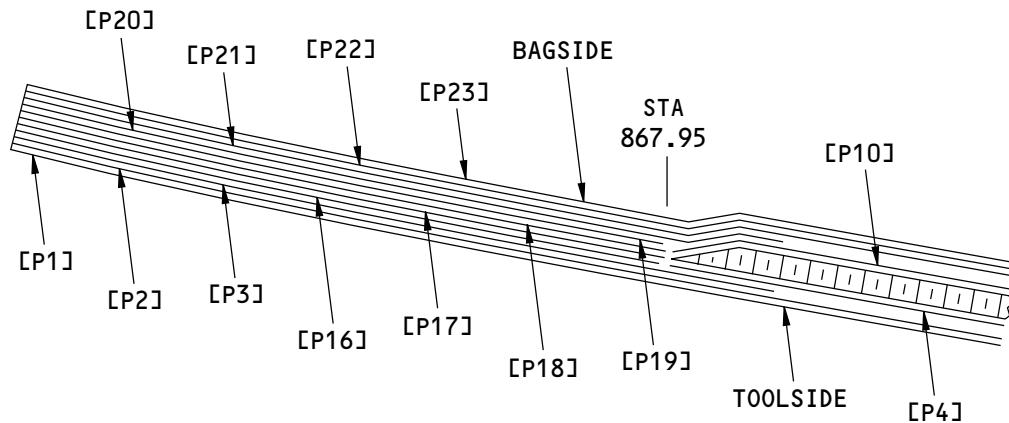
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**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Dorsal Fin Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 1 of 4)**

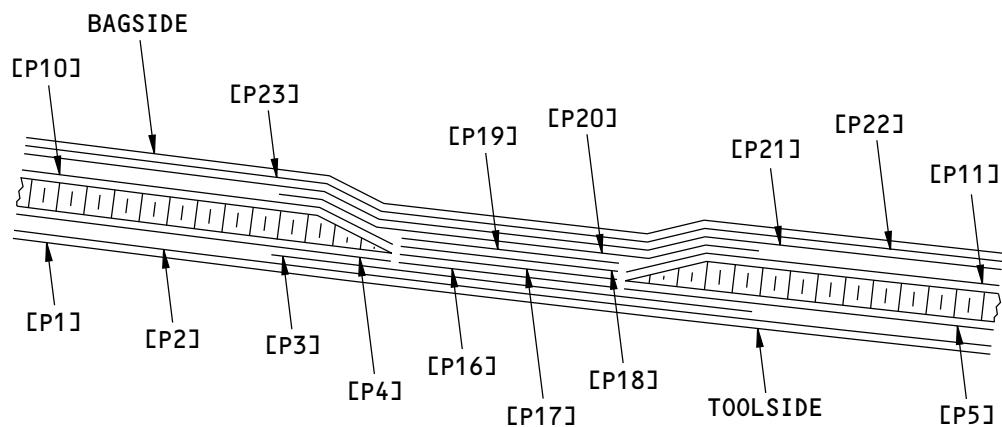
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PLY LAYUP SEQUENCE
A-A



PLY LAYUP SEQUENCE (TYPICAL)
B-B

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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Dorsal Fin Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 2 of 4)

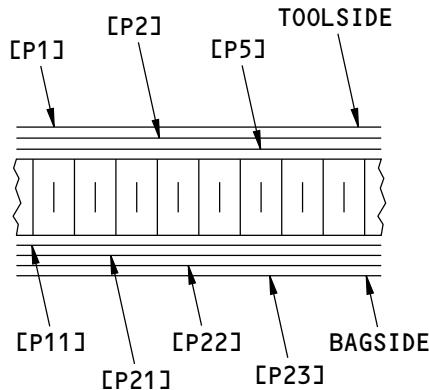
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IDENTIFICATION 6
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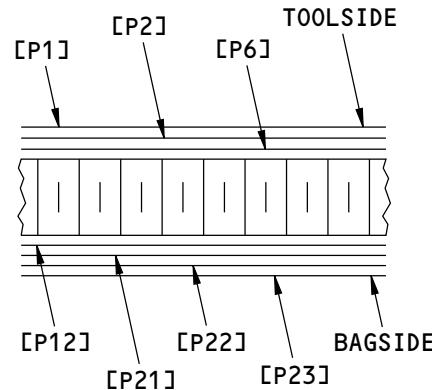
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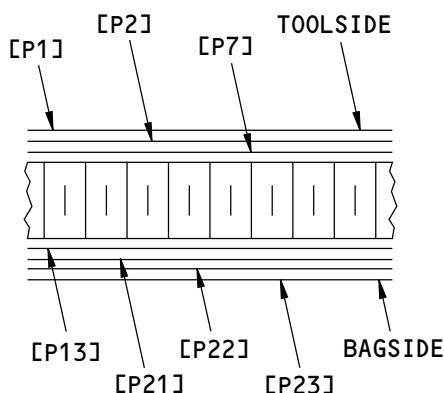
737-800
STRUCTURAL REPAIR MANUAL



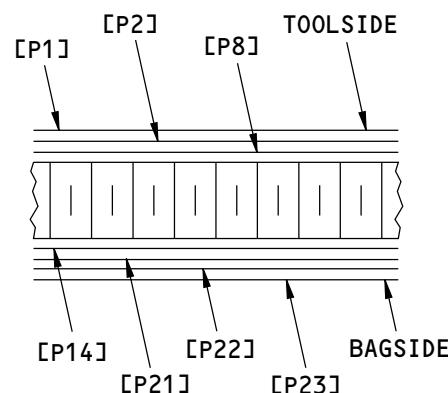
PLY LAYUP SEQUENCE
C-C



PLY LAYUP SEQUENCE
D-D



PLY LAYUP SEQUENCE
E-E



PLY LAYUP SEQUENCE
F-F

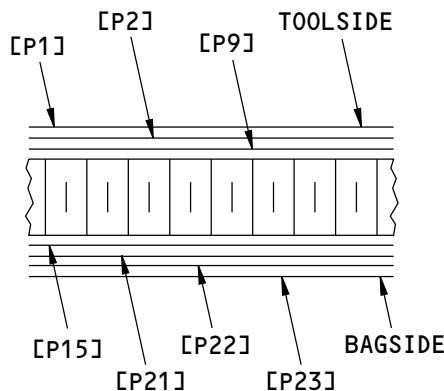
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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Dorsal Fin Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 3 of 4)

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PLY LAYUP SEQUENCE
G-G

G22586 S0006593280_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Dorsal Fin Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 4 of 4)

Table 3:

TYPICAL PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1, P3, P16, P19, P20, P22	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III. (Optional: A ply of BMS 8-79, Style 120 in place of a ply of Style 1581 or add Style 120 plies to agree with the thickness range)
P2, P17, P18, P21	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III. (Optional: A ply of BMS 8-79, Style 120 in place of a ply of Style 1581 or add Style 120 plies to agree with the thickness range)
P4 through P15	-----	Adhesive film as given in BMS 5-129, Type 4, Grade 5
P23	Optional	1 mil white Tedlar film

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ALLOWABLE DAMAGE 1 - VERTICAL STABILIZER LEADING EDGE SKINS

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer leading edge skins shown in Vertical Stabilizer Leading Edge Skin Locations, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Remove the damaged material as necessary.
- (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) If countersink rivets are removed to clean up the damage, then do the steps that follow:
 - (a) Install new rivets that have the same material and diameter as the initial rivets.
 - 1) It is permitted to rework the holes to 1/32 in. (0.79 mm) oversize. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
 - 2) It is optional to install NAS1399D blind rivets.
 - (b) If the head is above the skin surface, remove the unwanted material with the microshave flush procedure as specified in 51-10-01.
 - 1) The maximum head height that is permitted above the skin is 0.006 in. (0.152 mm).
- B. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- C. Apply two layers of BMS 10-79, Type II or III, primer to the reworked areas. Refer to SOPM 20-44-04.
- D. Apply the decorative finish to the reworked areas as given in AMM PAGEBLOCK 51-21-99/701.
- E. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
- (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes.

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ALLOWABLE DAMAGE 1

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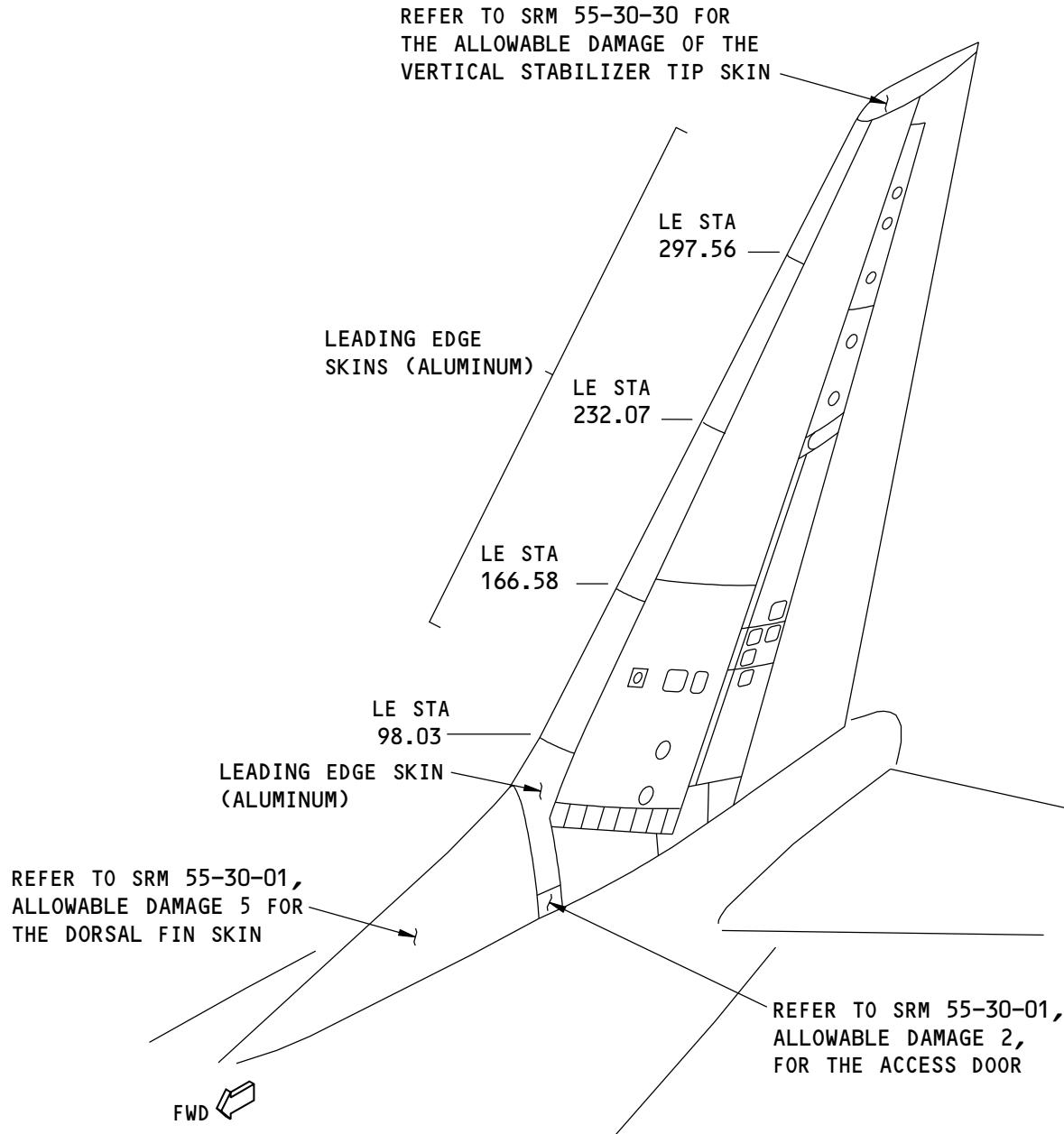
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

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Vertical Stabilizer Leading Edge Skin Locations
Figure 101

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-01	REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS
55-30-01, REPAIR 1	Vertical Stabilizer Leading Edge Skin External Repair
55-30-01, REPAIR 2	Flush Repair of the Vertical Stabilizer Leading Edge Skin
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Cracks:

- (1) Damage is permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail A.

B. Nicks, Gouges, Scratches, and Corrosion:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, D, and E.
(a) Only one area of damage removal, as shown in Detail D, is permitted for each 15.0 in² (96.8 cm²) of panel.

C. Holes and Punctures are permitted if:

- (1) They are a maximum of 0.25 in. (6.35 mm) in diameter.
(2) There is not more than one hole or puncture for each 15.0 in² (96.8 cm²) of panel area.
(3) The edge of the damage is a minimum of 1.00 in. (25.40 mm) away from the edge of a fastener hole, other damage, or the panel.
(4) They are filled with a 2117-T3 or 2117-T4 aluminum flush head rivet.
(a) If the head is above the skin, use the microshave flush procedure as specified in 51-10-01.
(b) It is optional to install a 2117-T3 or 2117-T4 aluminum protruding head rivet, or a NAS1399D blind rivet.

D. Dents above Leading Edge (LE) STA 204 away from the High Frequency (HF) Flush Antenna:

- (1) Dents are permitted for the general conditions of Paragraph 4.D.(2)/ALLOWABLE DAMAGE 1 and for the specified conditions of Paragraph 4.D.(3)/ALLOWABLE DAMAGE 1. For dents that are permitted in the area of the HF antenna, refer to Paragraph 4.E./ALLOWABLE DAMAGE 1.
(a) Refer to Definition of Dent Dimensions, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the dimensions for a dent.
(b) Refer to Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1 for the relation of dent dimensions.
(c) Refer to Damage Size and Spacing Limits for Adjacent Dents, Figure 105/ALLOWABLE DAMAGE 1 for the definition of the dimensions for adjacent dents.

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ALLOWABLE DAMAGE 1

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- (d) Refer to Equivalent Length of Dents When the Depth is Large, Figure 106/ALLOWABLE DAMAGE 1 for the definition of the length if there is more than one dent in a bay.
- (2) General Conditions:
- (a) The edge of the damage is a minimum of 1.0 in. (25.4 mm) away from a hole.
 - (b) There are no pulled or loose fasteners or missing fastener locations.
 - (c) There are no sharp creases, gouges, or cracks.
 - (d) There is no damage to the structure that is below the skin panels.
 - (e) There are no dents at the rib chord locations.
 - (f) The conditions of Table 101/ALLOWABLE DAMAGE 1 are kept.

Table 101:

CONDITIONS FOR THE LOCATIONS AND QUANTITY OF DENTS	
DEPTH OF DENT (Y)	LIMITS FOR PERMITTED DENTS
If (Y) is more than or equal to 0.50 in. (12.70 mm) but less than 1.0 in. (25.4 mm).	There must be 5 bays that are not damaged on each side of the damaged bay. There must be no other damage in the damaged bay.
If (Y) is more than or equal to 0.40 in. (10.16 mm) but less than 0.50 in. (12.70 mm).	There must be 3 bays that are not damaged on each side of the damaged bay. There must be no other damage in the damaged bay.
If (Y) is more than or equal to 0.30 in. (7.62 mm) but less than 0.40 in. (10.16 mm).	There must be 2 bays that are not damaged on each side of the damaged bay.
If (Y) is more than or equal to 0.20 in. (5.08 mm) but less than 0.30 in. (7.62 mm).	There must be 1 bay that is not damaged on each side of the damaged bay.

(3) Specified Conditions:

- (a) Dents are permitted in Area 1 as shown in Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1.
 - 1) For dents that are more than the limits shown in Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 1, fill the dents as given in 51-70-01.

- (b) Dents are permitted in Area 2 if you make an inspection of the damage after no more than 5000 flight hours. Refer to Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1.

NOTE: It is recommended that you remove or repair the damage after no more than 5000 flight hours or 18 months, that which occurs first.

- 1) For dents that are more than the limits shown in Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 1, fill the dents as given in 51-70-01.

- (c) Dents are permitted in Area 3 as shown in Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1 if you do the steps that follow:
 - 1) Fill the dent as given in 51-70-01.
 - 2) Seal the damage with 3M-436 aluminum foil tape (speed tape) or the equivalent.
 - 3) Make a detailed visual inspection of the damage at each 400 flight hour interval. If there are cracks or the damage has become larger, repair the damage immediately.
 - 4) Install a permanent repair after no more than 5000 flight hours or 18 months, that which occurs first.

- (d) Dents are permitted in Area 4 as shown in Allowable Damage Limits for Leading Edge Skin Dents, Figure 104/ALLOWABLE DAMAGE 1 if you do the steps that follow:

- 1) For dents with a depth less than 0.50 in. (12.70 mm), fill the dent as given in 51-70-01.

55-30-01

ALLOWABLE DAMAGE 1

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- 2) For dents with a depth equal to or greater than 0.50 in. (12.70 mm), do the steps that follow:
 - a) Fill half of the depth of the dent with potting compound and let it fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
 - b) Fill the remaining depth of the dent and let the compound fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
NOTE: BMS 5-92 adhesive is the better alternative to the potting compounds given in 51-70-01.
- 3) Seal the damage with 3M-436 aluminum foil tape (speed tape) or the equivalent.
- 4) Remove tape for inspection of filler and skin around the dent every 10-days (do not remove the filler).
 - a) If the filler is cracked or disbonded remove the filler.
 - b) If there are cracks in the skin or the damage has become larger, repair the damage before the next flight.
 - c) If you removed the filler, you must replace the filler.
 - <1> Fill half of the depth of the dent with potting compound and let it fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
 - <2> Fill the remaining depth of the dent and let the compound fully cure as given in REPAIRS FOR MINOR DENTS IN METALLIC SHEET MATERIALS, 51-70-01.
- 5) Reseal the damage with 3M-436 aluminum foil tape (speed tape) or the equivalent.
- 6) Install an external repair as given in 55-30-01, REPAIR 1 or a flush repair as given in 55-30-01, REPAIR 2 within 90 days.

E. Dents below LE STA 204:

- (1) Refer to Damage Size and Spacing Limits for Adjacent Dents, Figure 105/ALLOWABLE DAMAGE 1 for the definition of the dimensions for adjacent dents.
- (2) Refer to Equivalent Length of Dents When the Depth is Large, Figure 106/ALLOWABLE DAMAGE 1 for the definition of the length if there is more than one dent in a bay.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 1, Detail A if:
 - (a) The edge of the damage is a minimum of 1.0 in. (25.4 mm) away from a hole.
 - (b) There are no pulled or loose fasteners or missing fastener locations.
 - (c) There are no sharp creases, gouges, or cracks.
 - (d) There is no damage to the structure that is below the skin panels.
 - (e) There are no dents at the rib chord locations.
 - (f) The edge of the dent is a minimum 4D from the edge of any other damage. D is the maximum dimension of the largest damage.

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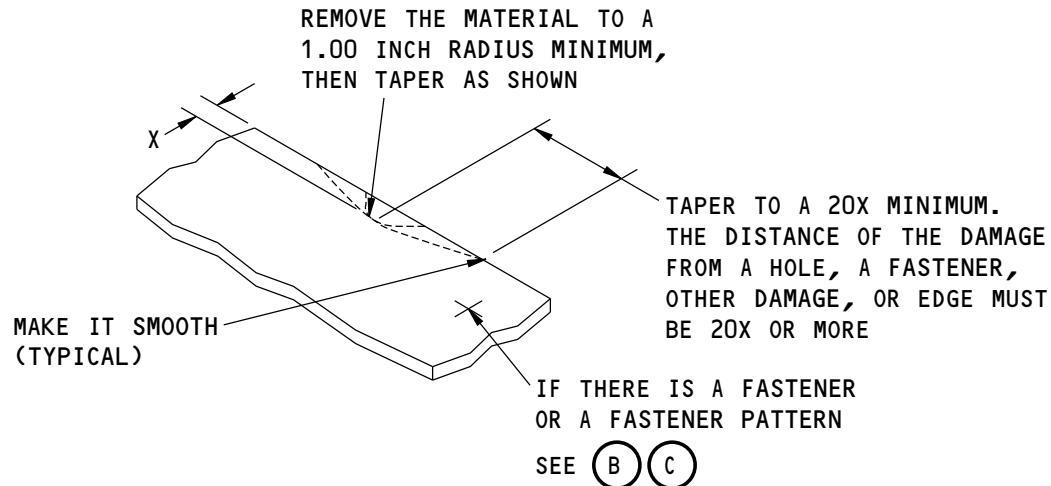
ALLOWABLE DAMAGE 1

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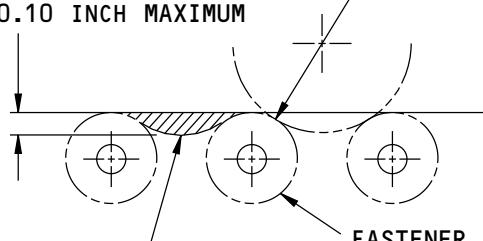
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X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

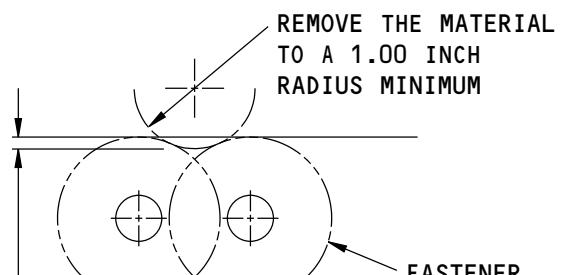
REMOVAL OF DAMAGED MATERIAL ON AN EDGE

A

X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM



REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM



X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

B

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

C

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Allowable Damage Limits
Figure 102 (Sheet 1 of 2)

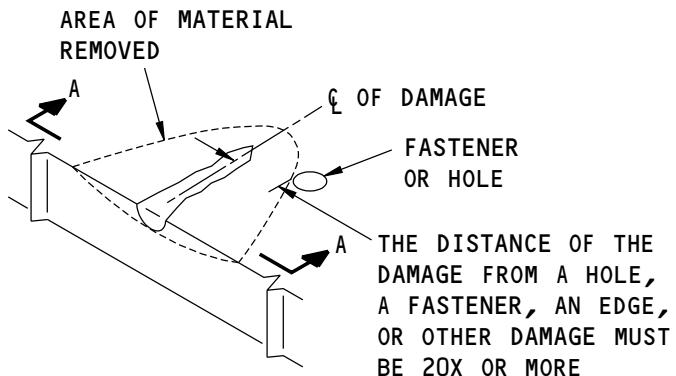
55-30-01

ALLOWABLE DAMAGE 1

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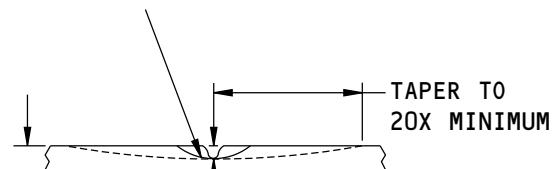
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**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(D)

REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM, THEN TAPER AS SHOWN

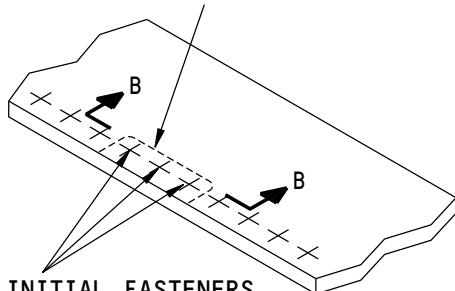


t = THICKNESS OF THE MATERIAL

X = THE DEPTH OF THE MATERIAL REMOVED
= $0.10t$ MAXIMUM

A-A

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A DEPTH OF X MAXIMUM

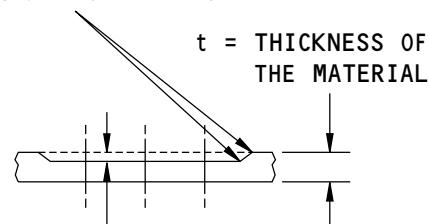


REMOVE THE INITIAL FASTENERS BEFORE THE DAMAGED MATERIAL IS REMOVED. INSTALL THE FASTENERS AFTER THE REWORK IS COMPLETED

**REMOVAL OF CORROSION
AROUND THE FASTENERS**

(E)

MAKE IT SMOOTH TO A MINIMUM RADIUS OF 0.5 INCH (TYPICAL)



X = THE DEPTH OF THE MATERIAL REMOVED
= $0.10t$ MAXIMUM

B-B

F61158 S0006593287_V2

**Allowable Damage Limits
Figure 102 (Sheet 2 of 2)**

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ALLOWABLE DAMAGE 1

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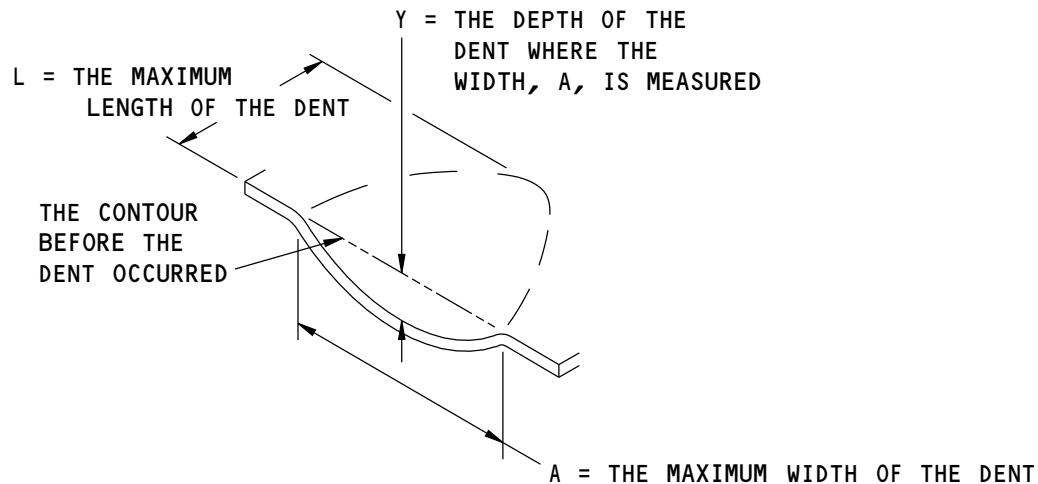
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Definition of Dent Dimensions
Figure 103

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ALLOWABLE DAMAGE 1

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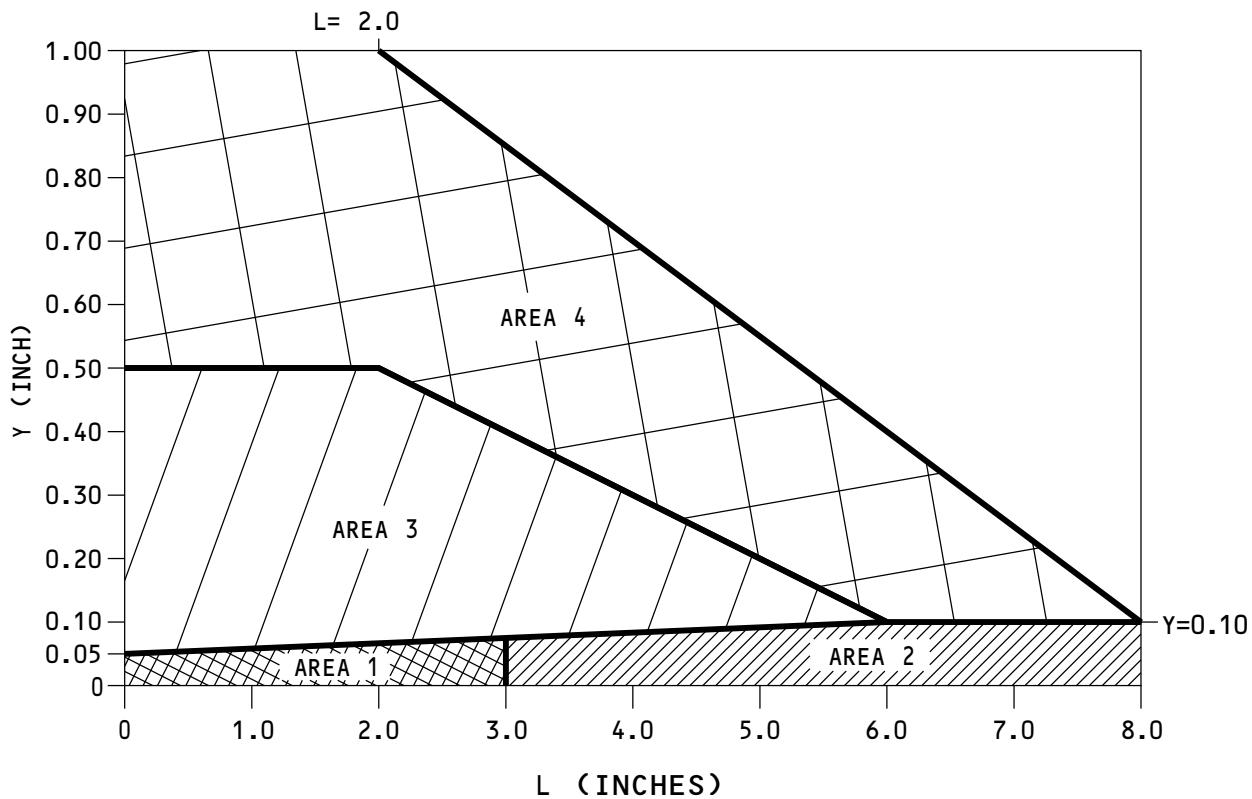
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FOR AREA NUMBER	SEE ALLOWABLE DAMAGE PARAGRAPH
1	4. D. (3) (a)
2	4. D. (3) (b)
3	4. D. (3) (c)
4	4. D. (3) (d)

TABLE A

F61160 S0006593289_V1

Allowable Damage Limits for Leading Edge Skin Dents
Figure 104

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ALLOWABLE DAMAGE 1

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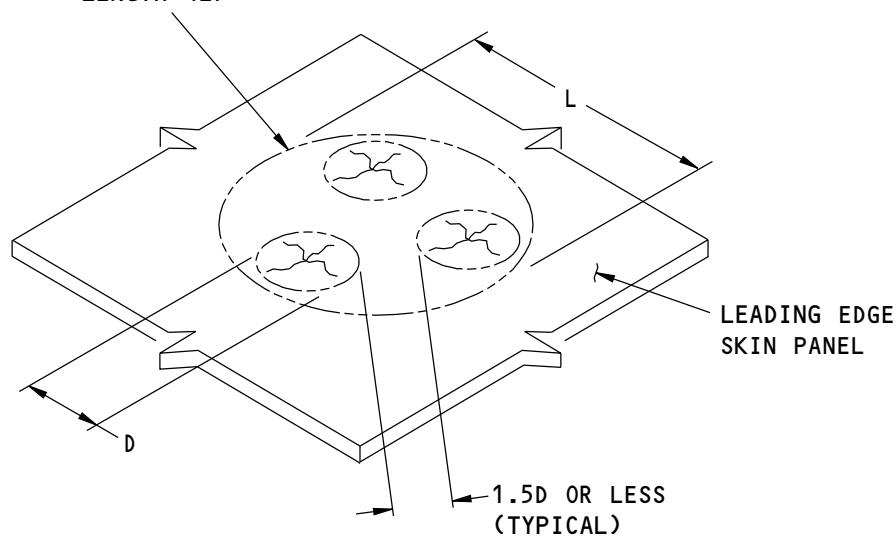
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A GROUP OF DENTS THAT ARE
NEAR EACH OTHER ARE SEEN
AS ONE DAMAGE AREA WITH
LENGTH (L)



NOTE: D IS THE LARGEST LENGTH OF THE ADJACENT DENTS.

F61161 S0006593290_V1

Damage Size and Spacing Limits for Adjacent Dents
Figure 105

55-30-01

ALLOWABLE DAMAGE 1

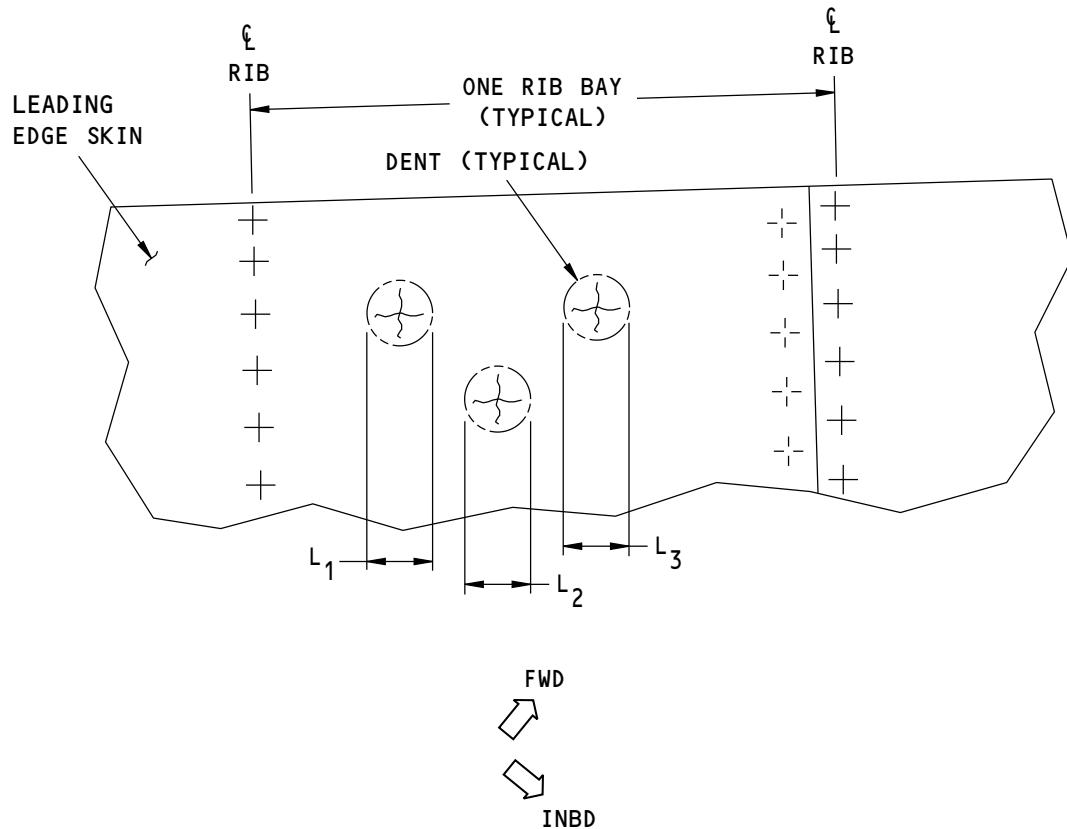
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NOTE: IF THE DEPTH OF THE DENT IS 0.050 INCH OR MORE, THEN

1) ADD THE LENGTH OF EACH DENT TO GET THE EQUIVALENT LENGTH (L) OF THE DENTS.

$$L = L_1 + L_2 + L_3$$

2) AND APPLY THE ALLOWABLE DAMAGE LIMITS FOR ONE DENT.

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Equivalent Length of Dents When the Depth is Large
Figure 106

55-30-01

ALLOWABLE DAMAGE 1

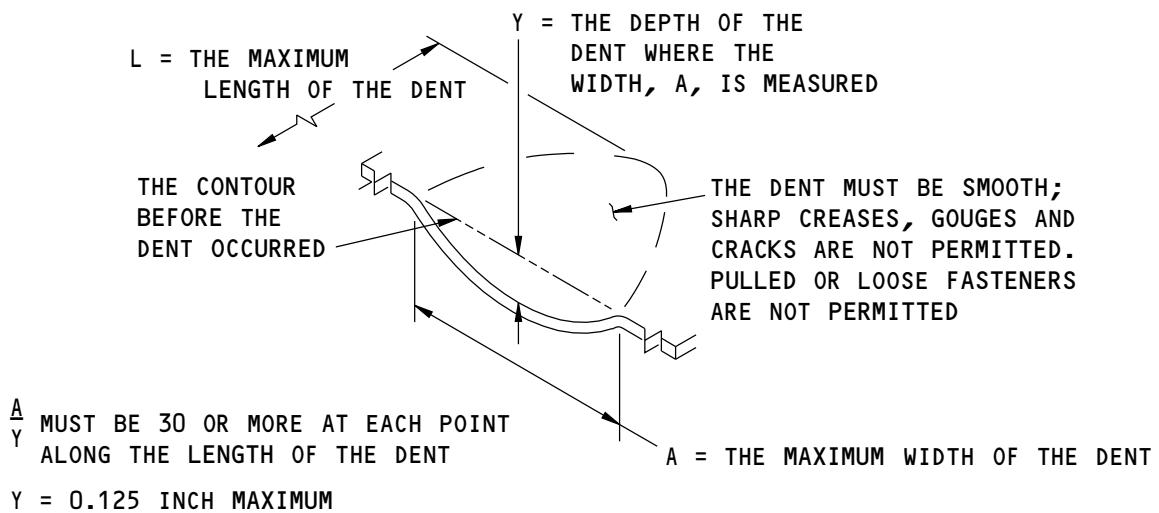
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DENT THAT IS PERMITTED



F61163 S0006593292_V1

Allowable Damage Limits
Figure 107

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ALLOWABLE DAMAGE 1

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ALLOWABLE DAMAGE 2 - VERTICAL STABILIZER INSPAR SKINS

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer inspar skins, door skins, and the AFT closeout panel. Refer to Vertical Stabilizer Inspark Skin Locations, Figure 101/ALLOWABLE DAMAGE 2 and Vertical Stabilizer Inspark Skin Locations, Figure 102/ALLOWABLE DAMAGE 2.

2. General

- A. Remove the damaged material as necessary.
- (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) If countersink rivets are removed to clean up the damage, then do the steps that follow:
 - (a) Install the same type, material and size rivets as the initial rivets.
 - 1) Use oversize rivets as necessary.
 - 2) It is optional to install solid protruding head rivets with countersink washers or NAS1399D blind rivets. Refer to Vertical Stabilizer Inspark Skins - Permitted Locations of Blind Rivets, Figure 103/ALLOWABLE DAMAGE 2 to install blind rivets.
 - 3) If you install the NAS1399D blind rivets, make an inspection at each 400 flight hour interval.
 - 4) Replace the blind rivets with solid rivets after no more than 5000 flight hours.
 - (b) Make sure the countersink depth is not more than 80 percent of the skin thickness.
 - (c) If the head is above the skin surface, remove the unwanted material with the microshave flush procedure as specified in 51-10-01.
 - 1) The maximum head height that is permitted above the skin is 0.006 inch.
- B. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- C. Apply two layers of BMS 10-79, Type II or III, primer to the reworked areas. Refer to SOPM 20-44-04.
- D. Apply the decorative finish to the reworked areas as given in AMM PAGEBLOCK 51-21-99/701.
- E. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.

55-30-01

ALLOWABLE DAMAGE 2

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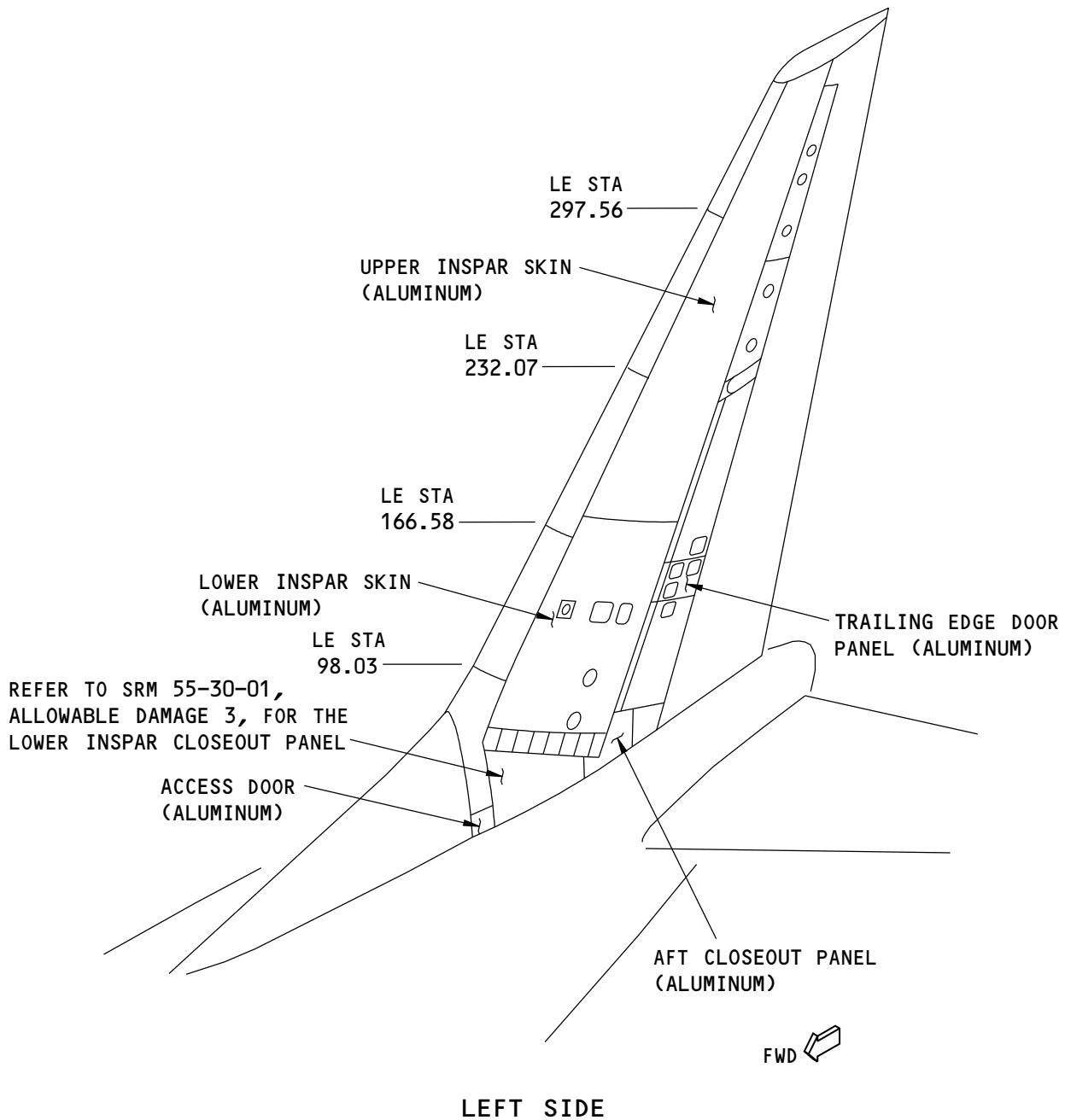
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Vertical Stabilizer Inspark Skin Locations
Figure 101

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ALLOWABLE DAMAGE 2

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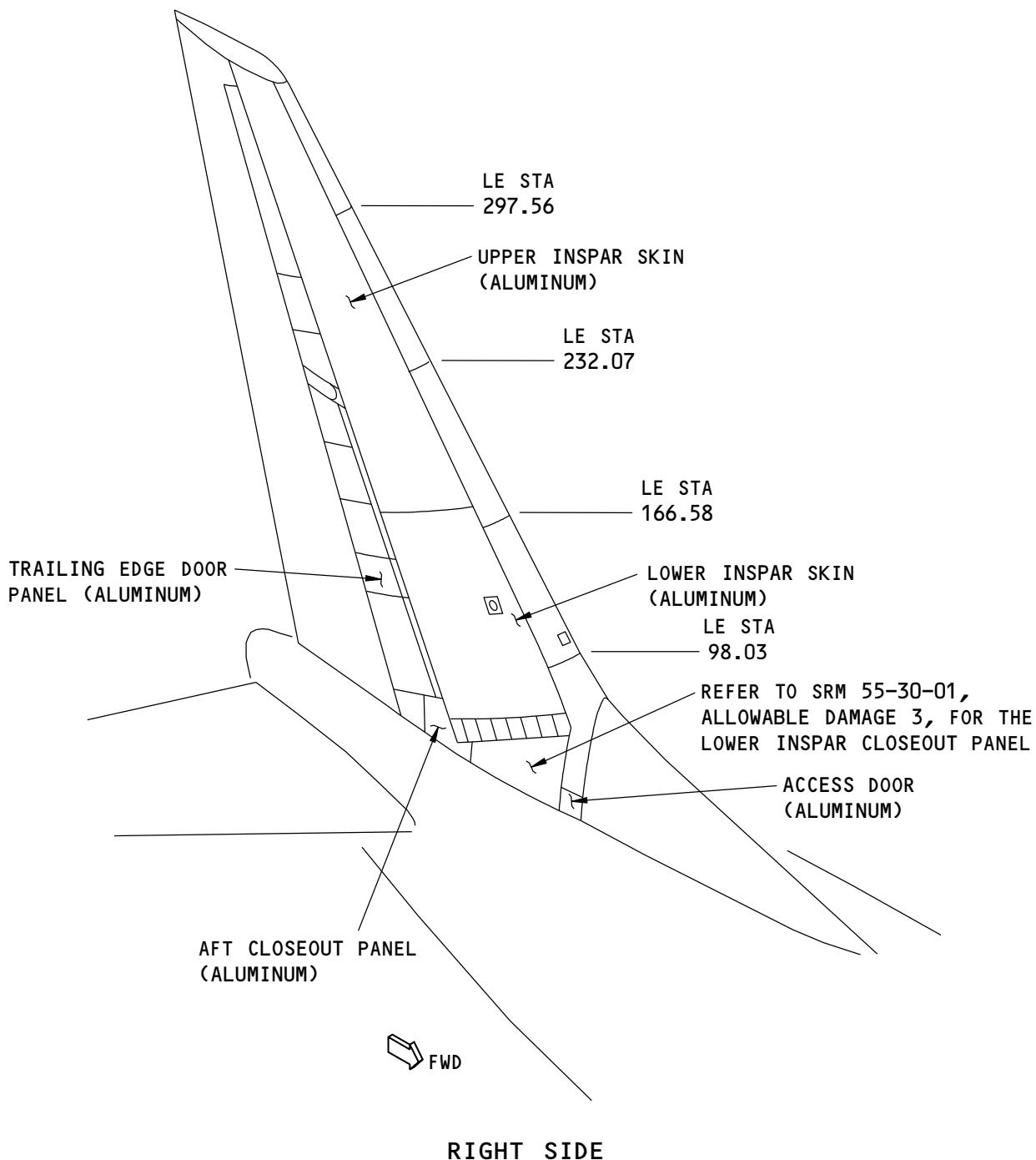
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Vertical Stabilizer Inspark Skin Locations
Figure 102

55-30-01

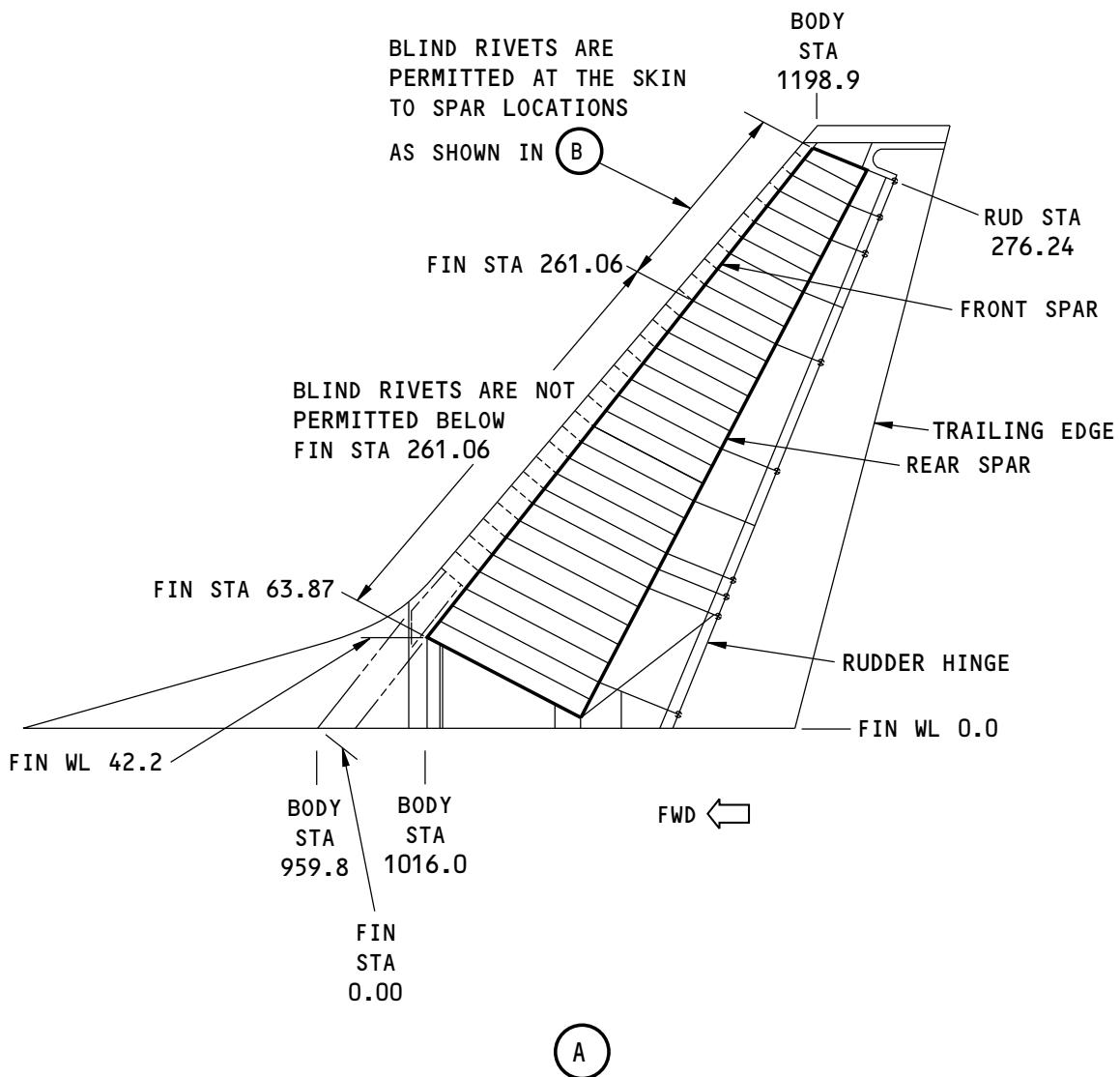
ALLOWABLE DAMAGE 2
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G55875 S0006593296_V1

Vertical Stabilizer Inspar Skins - Permitted Locations of Blind Rivets
Figure 103 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 2

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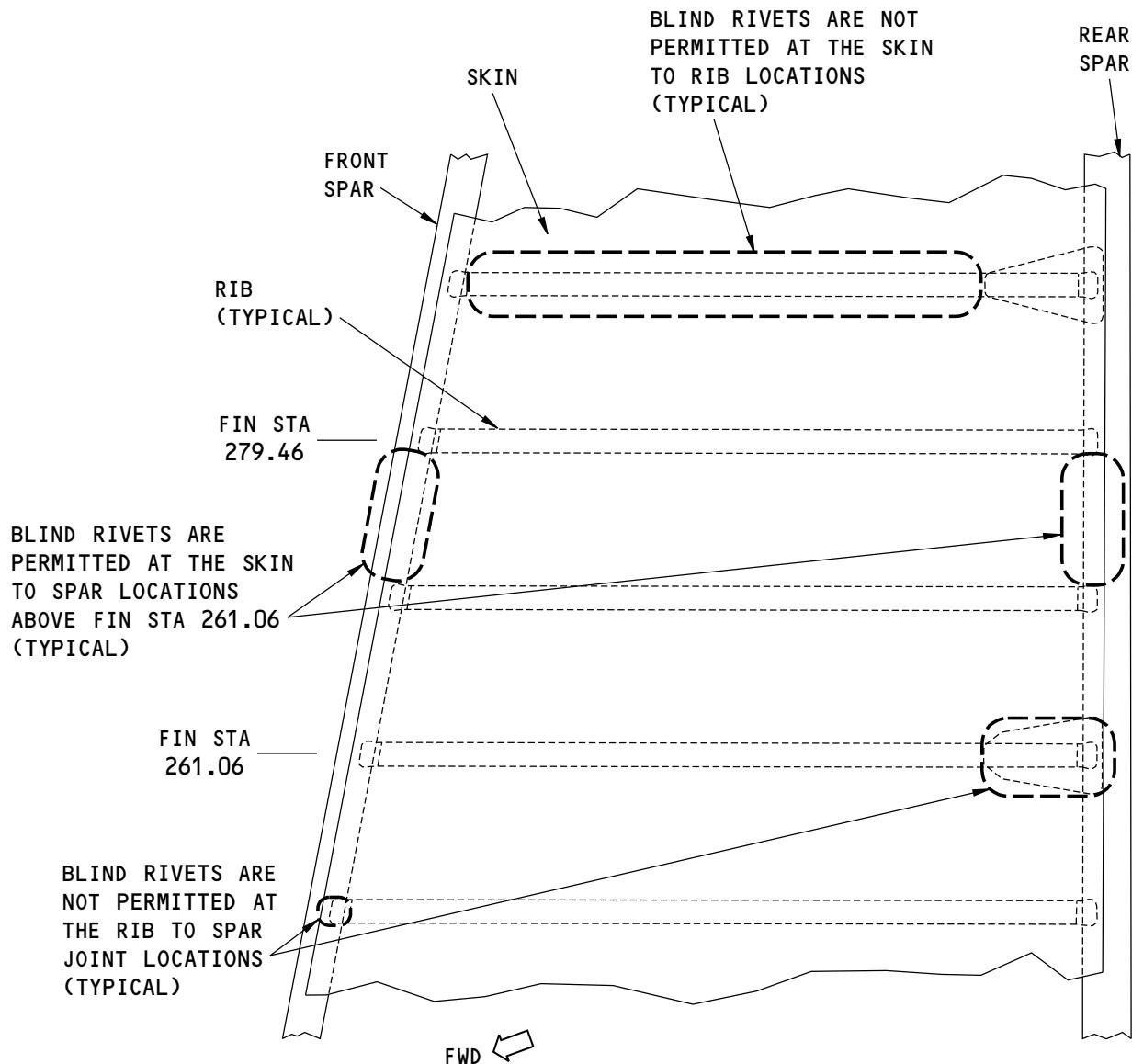
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STRUCTURAL REPAIR MANUAL



B

G55994 S0006593297_V1

Vertical Stabilizer Inspar Skins - Permitted Locations of Blind Rivets
Figure 103 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 2

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3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Cracks:

- (1) Damage is permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Detail A.

B. Nicks, Gouges, Scratches, and Corrosion:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A, D, F, G, and H.
 - (a) Only one area of damage removal, as shown in Detail D, is permitted for each 15.0 square inches of panel.

C. Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Detail E if:

- (1) The edge of the dent is a minimum 4D from the edge of any other damage. D is the maximum dimension of the largest damage.

D. Holes and Punctures are permitted if:

- (1) They are a maximum of 0.25 inch in diameter
- (2) There is not more than one hole or puncture for each 15.0 square inches of panel area
- (3) They are not more than the limits shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details G and H
- (4) The edge of the damage is a minimum of 1.00 inch away from the edge of a fastener hole, other damage, or the panel
- (5) They are filled with a 2117-T3 or 2117-T4 aluminum flush head rivet.
 - (a) The countersink depth must not be more than 80 percent of the skin thickness.
 - (b) If the head is above the skin surface, remove the unwanted material with the microshave flush procedure as specified in 51-10-01.
 - (c) It is optional to install a 2117-T3 or 2117-T4 aluminum protruding head rivet or a NAS1399D blind rivet. Refer to Vertical Stabilizer Inspar Skins - Permitted Locations of Blind Rivets, Figure 103/ALLOWABLE DAMAGE 2 to install blind rivets. Do the steps that follow when you install the blind rivets:
 - 1) Make an inspection of blind rivets at each 400 flight hour interval.
 - 2) Replace the blind rivets with solid rivets before 5000 flight hours.

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ALLOWABLE DAMAGE 2

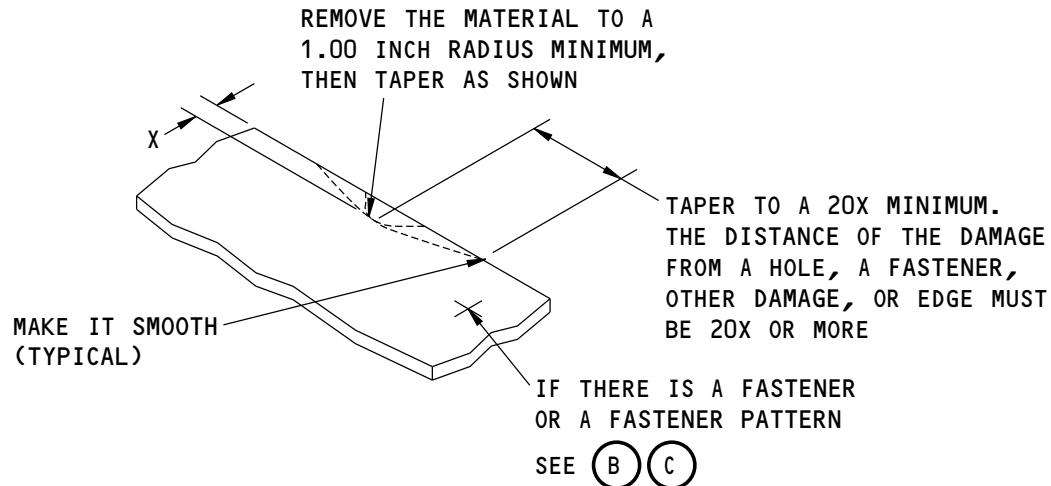
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STRUCTURAL REPAIR MANUAL**

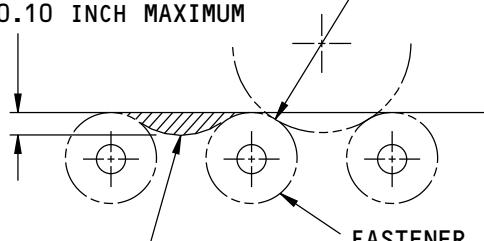


X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

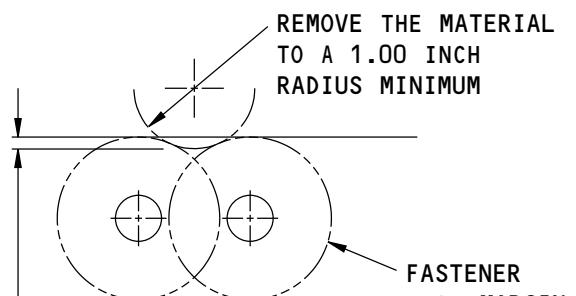
REMOVAL OF DAMAGED MATERIAL ON AN EDGE

A

X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM



REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM



X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

B

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

C

F61166 S0006593298_V1

**Allowable Damage Limits
Figure 104 (Sheet 1 of 6)**

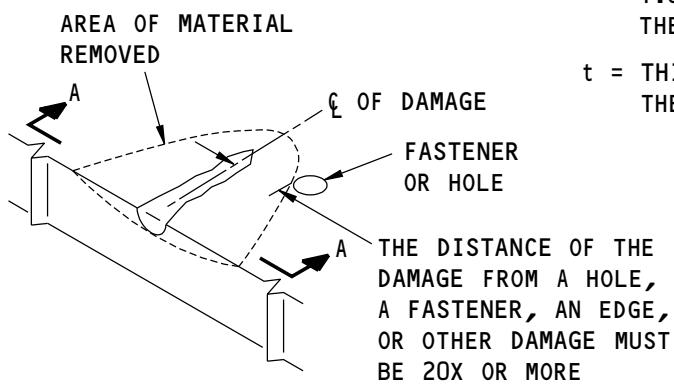
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ALLOWABLE DAMAGE 2

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REMOVE THE MATERIAL TO A 1.00 INCH RADIUS MINIMUM, THEN TAPER AS SHOWN

t = THICKNESS OF THE MATERIAL

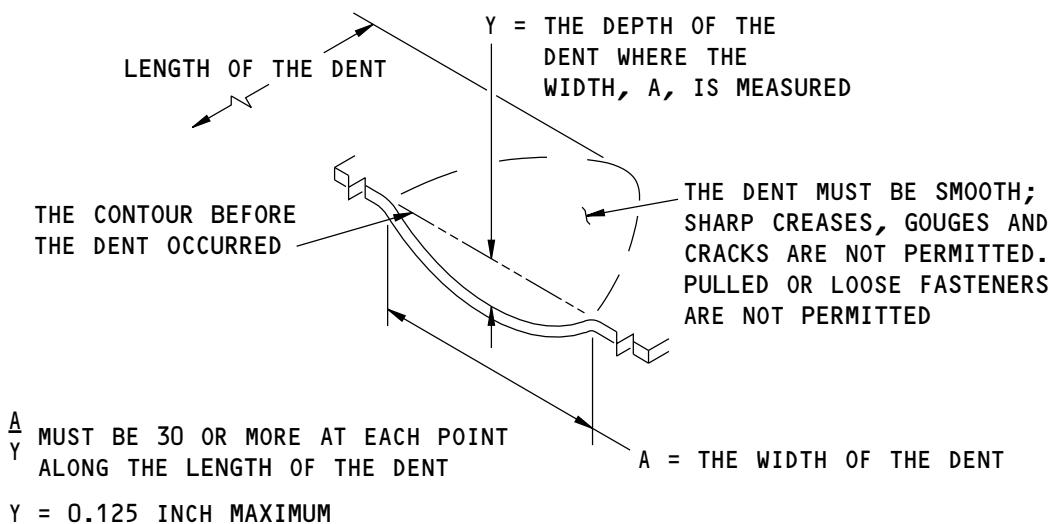
X = THE DEPTH OF THE MATERIAL REMOVED = 0.25t MAXIMUM

TAPER TO 20X MINIMUM

A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)


DENT THAT IS PERMITTED

(E)

F61167 S0006593299_V2

**Allowable Damage Limits
Figure 104 (Sheet 2 of 6)**

55-30-01

ALLOWABLE DAMAGE 2

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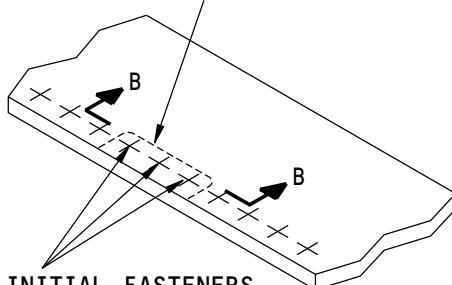
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STRUCTURAL REPAIR MANUAL

THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN
A GROUP OF TEN IS PERMITTED
TO A DEPTH OF X MAXIMUM

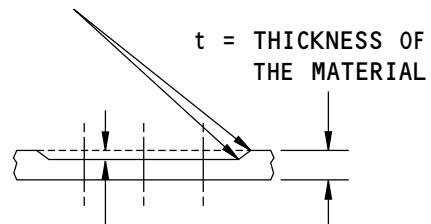


REMOVE THE INITIAL FASTENERS
BEFORE THE DAMAGED MATERIAL
IS REMOVED. INSTALL THE
FASTENERS AFTER THE REWORK
IS COMPLETED

REMOVAL OF CORROSION
AROUND THE FASTENERS

(F)

MAKE IT SMOOTH TO
A MINIMUM RADIUS
OF 0.5 INCH (TYPICAL)



X = THE DEPTH OF THE
MATERIAL REMOVED
= 0.10t MAXIMUM

B-B

F61168 S0006593300_V1

Allowable Damage Limits
Figure 104 (Sheet 3 of 6)

55-30-01

ALLOWABLE DAMAGE 2

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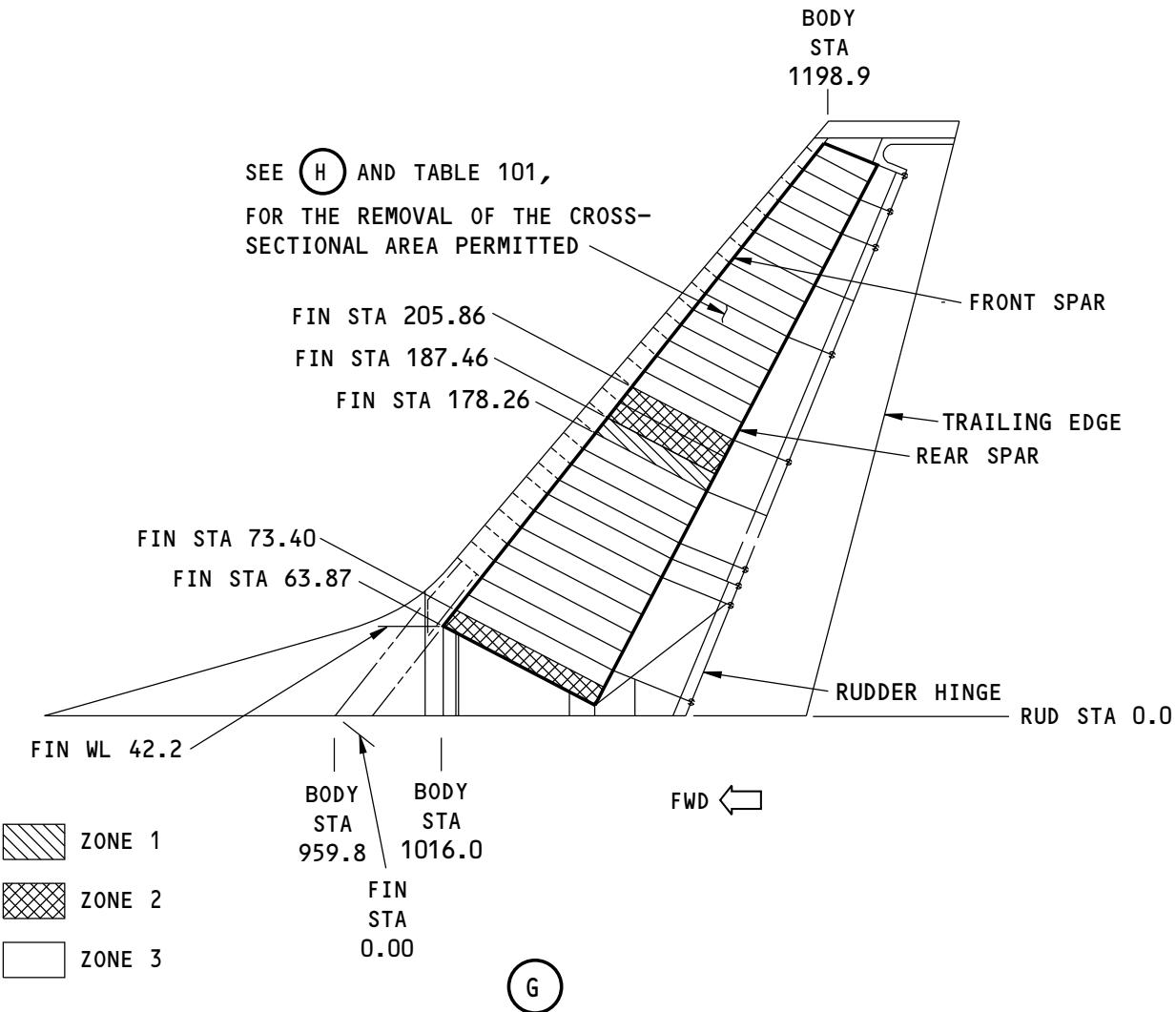
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PERCENT OF CROSS-SECTIONAL AREA REMOVED	
ZONE	MAXIMUM PERCENTAGE OF THE INITIAL (AS MANUFACTURED BY BOEING) CROSS-SECTIONAL AREA PERMITTED
1	5
2	10
3	15

TABLE 101

G55859 S0006593301_V1

Allowable Damage Limits
Figure 104 (Sheet 4 of 6)

55-30-01

ALLOWABLE DAMAGE 2

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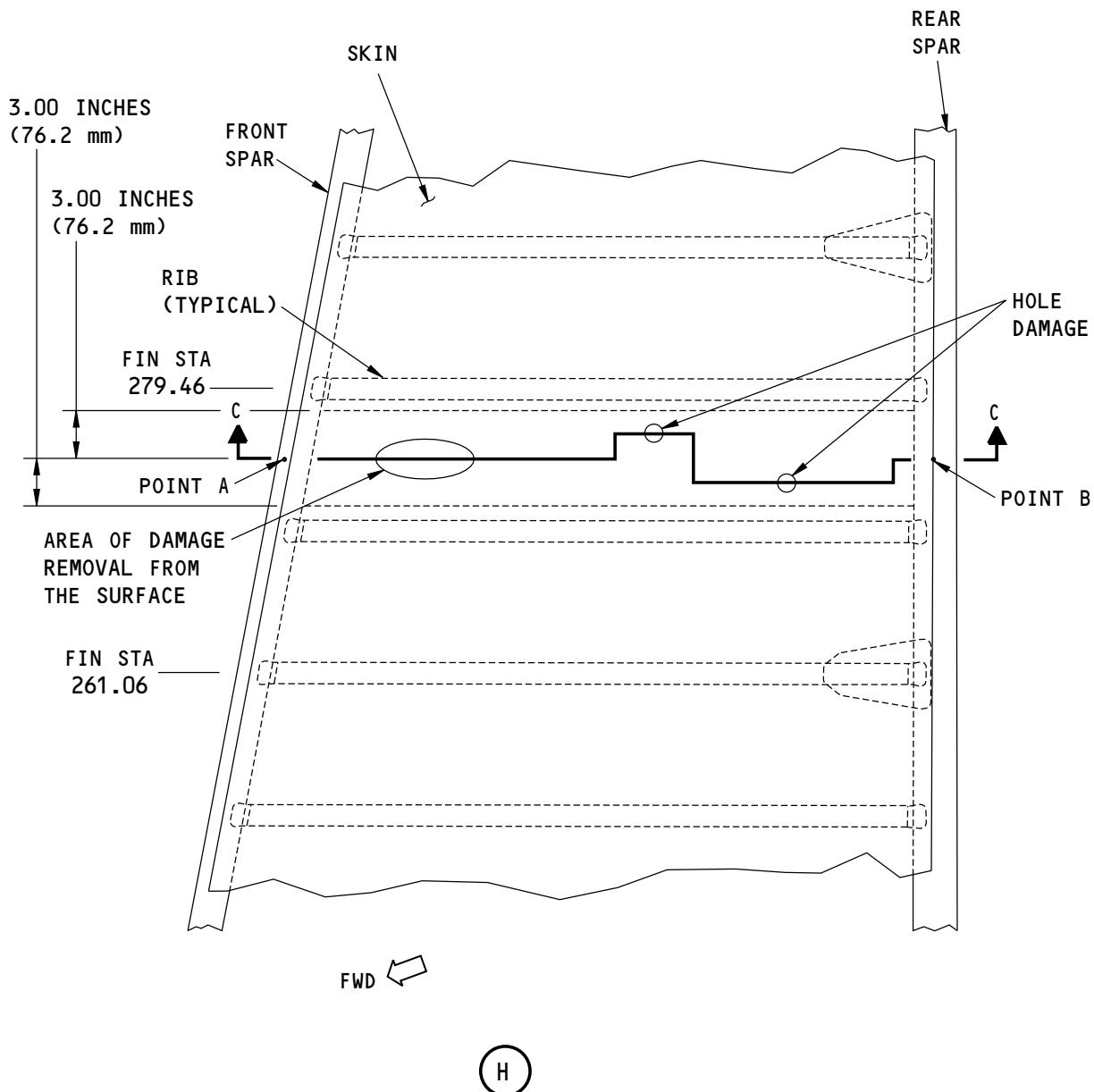
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Allowable Damage Limits
Figure 104 (Sheet 5 of 6)

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ALLOWABLE DAMAGE 2

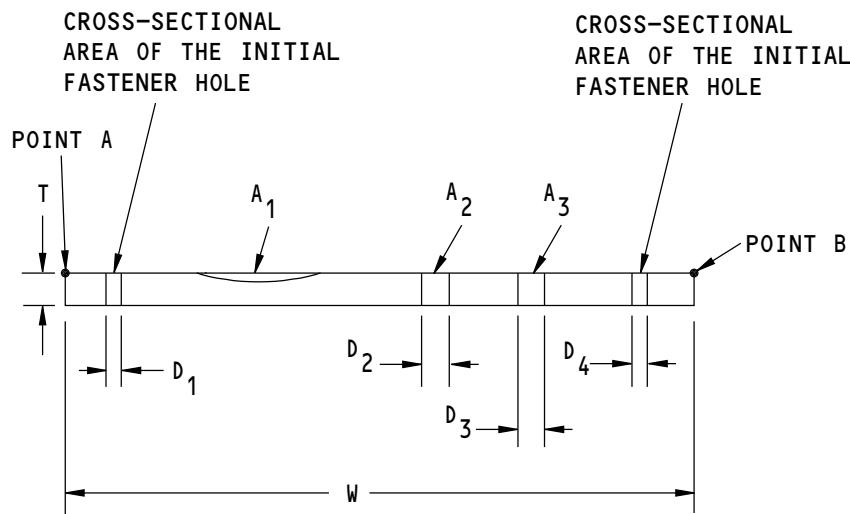
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D_1, D_4 = DIAMETERS OF THE INITIAL FASTENER HOLES

D_2, D_3 = DIAMETERS OF THE HOLES WHERE THERE IS DAMAGE

W = WIDTH OF THE SKIN AT THE CROSS-SECTION BETWEEN POINTS A AND B

T = THICKNESS OF THE SKIN AS GIVEN BY THE NOMINAL THICKNESS ON THE PRODUCTION DRAWING

A_i = INITIAL AREA OF THE SKIN

= THE TOTAL CROSS-SECTIONAL AREA MINUS THE CROSS-SECTIONAL AREA OF THE INITIAL FASTENERS HOLES (AS MANUFACTURED BY BOEING)

$$= WT - D_1 T - D_4 T$$

A_1 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 1

A_2 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 2

A_3 = CROSS-SECTIONAL AREA OF THE DAMAGE THAT IS REMOVED AT LOCATION 3

$$\left(\frac{A_1 + A_2 + A_3}{A_i} \right) \times 100 = \text{PERCENT OF CROSS-SECTIONAL AREA REMOVED AS GIVEN IN TABLE 101}$$

THE TOTAL CROSS-SECTIONAL AREA REMOVED IN ALL ZONES A-B (3.00 INCH (76.2 mm) ON EACH SIDE OF A LINE A-B) MUST NOT BE MORE THAN THE LIMITS GIVEN IN TABLE 101

C-C

G75190 S0006593303_V1

Allowable Damage Limits
Figure 104 (Sheet 6 of 6)

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ALLOWABLE DAMAGE 2

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ALLOWABLE DAMAGE 3 - VERTICAL STABILIZER TRAILING EDGE PANELS

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer trailing edge panels shown in Vertical Stabilizer Trailing Edge and Closeout Panel Locations, Figure 101/ALLOWABLE DAMAGE 3 and Vertical Stabilizer Trailing Edge and Closeout Panel Locations, Figure 102/ALLOWABLE DAMAGE 3. Limits are also given for the closeout panels and the balance weight cover panels shown in Vertical Stabilizer Trailing Edge and Closeout Panel Locations, Figure 101/ALLOWABLE DAMAGE 3 and Vertical Stabilizer Trailing Edge and Closeout Panel Locations, Figure 102/ALLOWABLE DAMAGE 3.

2. General

- A. Use a Non-Destructive Test (NDT) to find the length, width, and depth of damage.
- (1) For the honeycomb core areas that have damage on a facesheet with 3 or less plies, Boeing recommends that you use an instrumented NDT procedure. The tap test procedure is optional. Refer to 737 NDT Part 1, 51-01-02, 737 NDT Part 1, 51-01-03, and 737 NDT Part 1, 51-05-01 for the inspection procedures.
 - (2) For the honeycomb core areas that have damage on a facesheet with 4 or more plies, Boeing recommends that you use an instrumented NDT procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.
- NOTE:** The tap test procedure as given in 737 NDT Part 1, 51-05-01 is optional only if it can be shown that the defects (that are less than or equal to the allowable damage limits) can be found.
- (3) For damage in the solid laminate areas, Boeing recommends that you use an instrumented NDT procedure. Refer to 737 NDT Part 1, 51-01-02 and 737 NDT Part 1, 51-01-03 for the inspection procedures.
 - (4) Refer to Definitions of Damage Size, Figure 103/ALLOWABLE DAMAGE 3, Details A, B, and C for the definitions of the length, width, and depth of damage.
 - (5) Refer to Definitions of the Facesheets, Figure 104/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.
- B. Remove all contamination and water from the structure.
- (1) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (2) Refer to 51-70-04 for the damage removal procedures.
- C. Seal all permitted damage areas that are not more than one ply deep. Refer to Paragraph 4./ALLOWABLE DAMAGE 3 for the allowable damage limits. Seal the damage with one of the two methods that follow:
- (1) Make a temporary seal.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location.
 - (c) Make sure that the tape is in satisfactory condition at each 400 flight hour interval.
 - (d) Repair the damage after no more than 5000 flight hours.
 - (2) Make a permanent seal.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - (b) Apply one layer of BMS 10-79, Type 3 primer. Refer to SOPM 20-44-04.

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ALLOWABLE DAMAGE 3

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- (c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
- D. Seal all permitted damage areas that are more than one ply deep. Refer to Paragraph 4./ ALLOWABLE DAMAGE 3 for the allowable damage limits. Seal the damage as follows:
 - (1) Use vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
 - (2) Make a temporary seal with aluminum foil tape (speed tape).
 - (3) Keep a record of the location.
 - (4) Repair the damage after no more than 400 flight hours.

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ALLOWABLE DAMAGE 3

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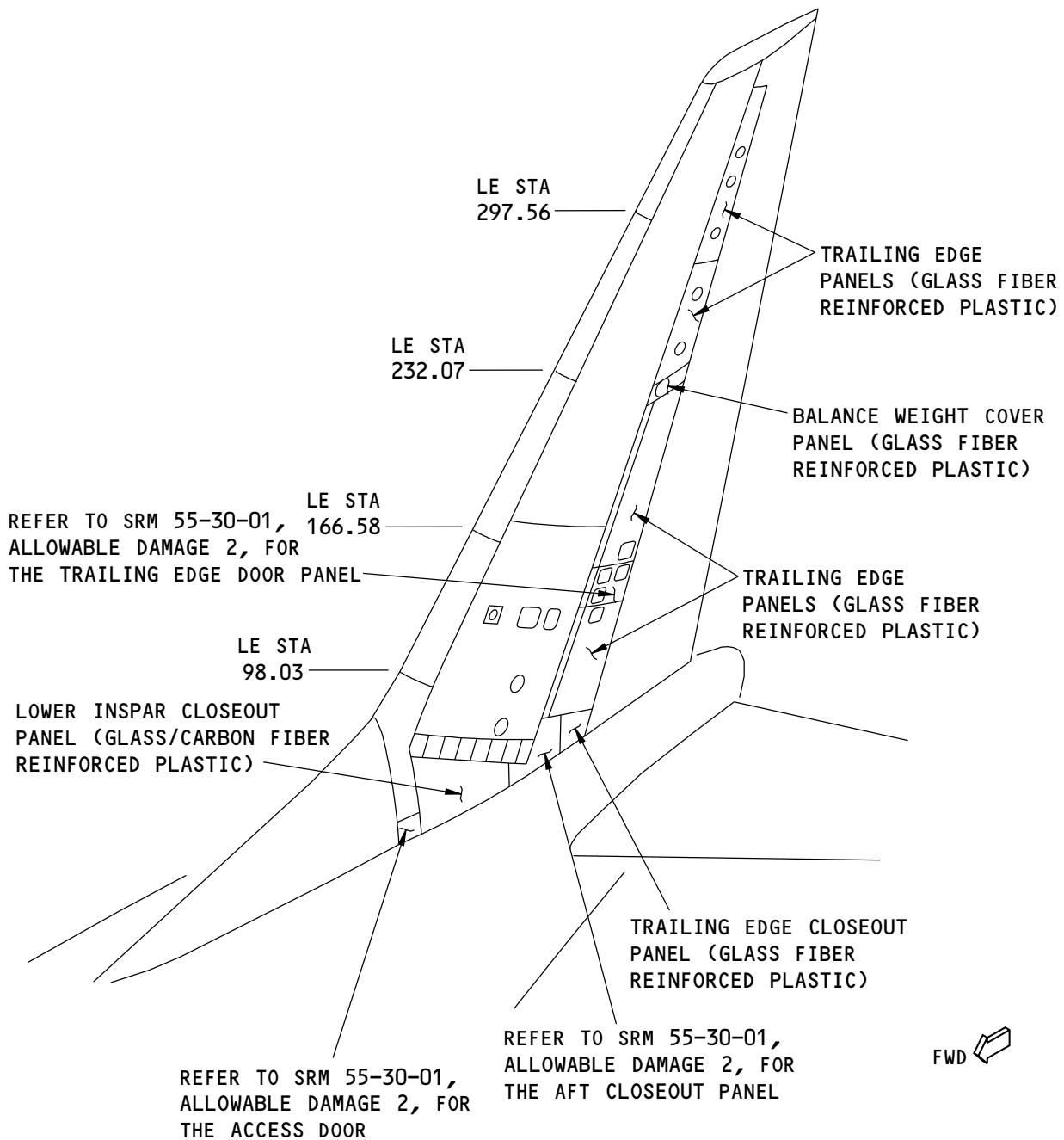
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LEFT SIDE

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Vertical Stabilizer Trailing Edge and Closeout Panel Locations
Figure 101

55-30-01

ALLOWABLE DAMAGE 3

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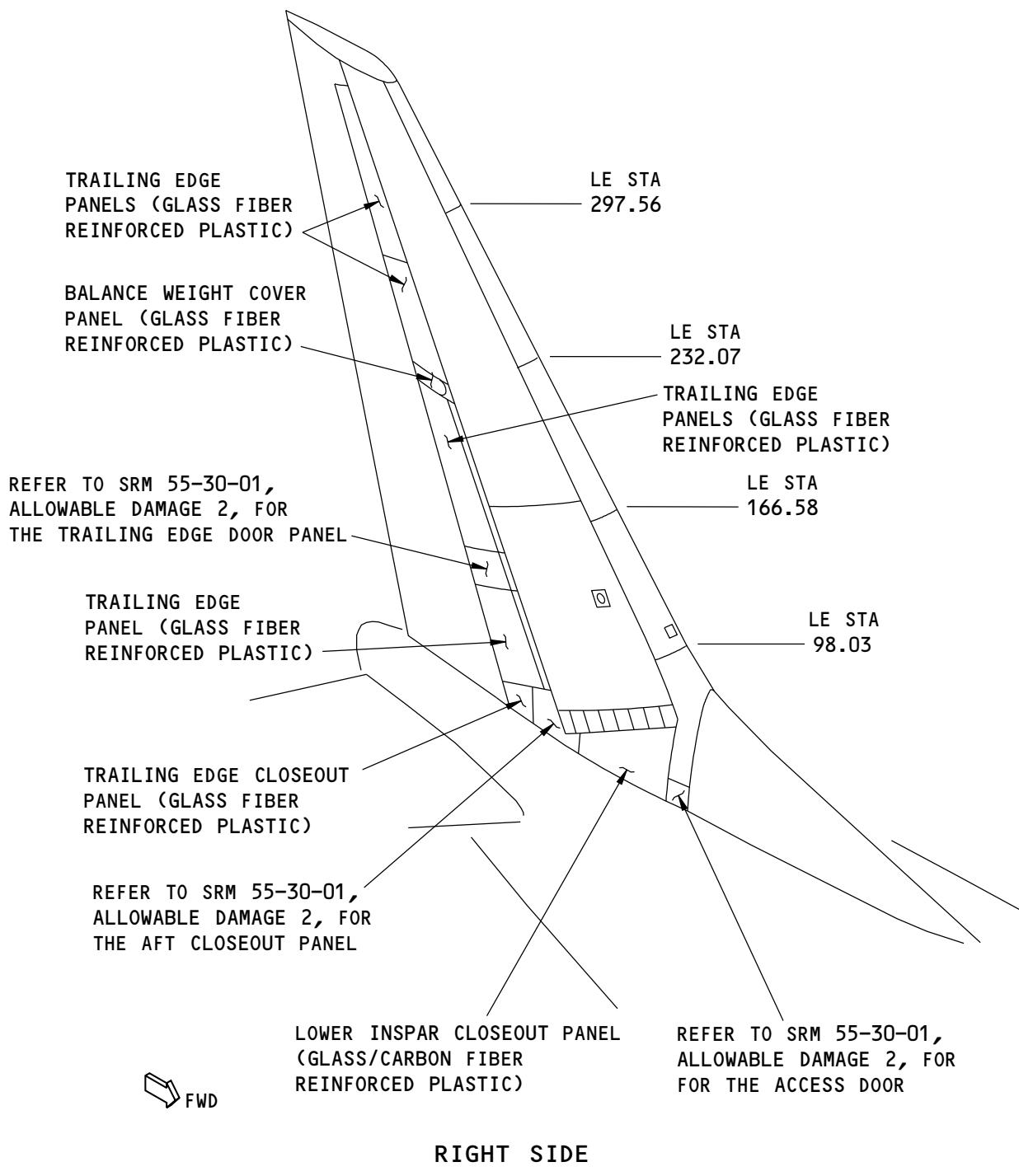
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RIGHT SIDE

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Vertical Stabilizer Trailing Edge and Closeout Panel Locations
Figure 102

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ALLOWABLE DAMAGE 3

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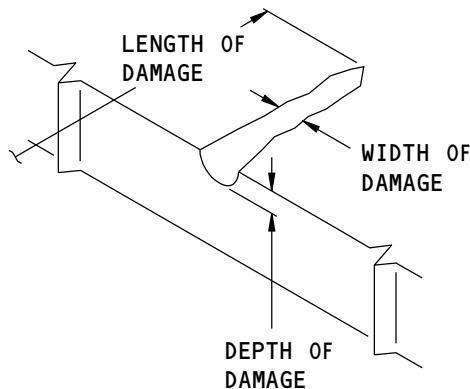
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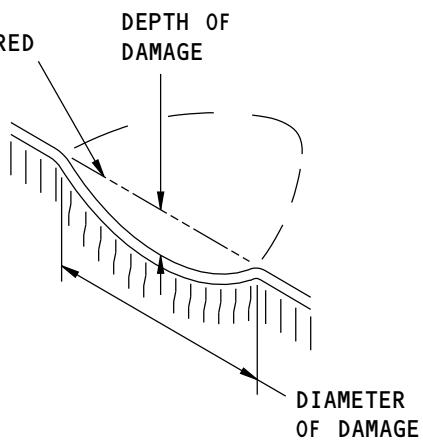
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**SIZE DEFINITIONS FOR
NICK, GOUGE, OR SCRATCH DAMAGE**

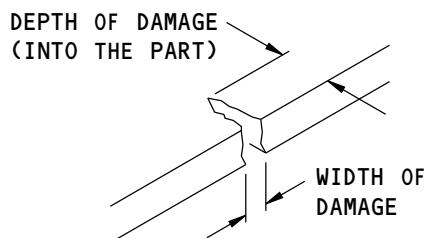
(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED



**SIZE DEFINITIONS FOR
DENT DAMAGE**

(B)



**SIZE DEFINITIONS FOR
EDGE DAMAGE**

(C)

F61192 S0006593307_V1

**Definitions of Damage Size
Figure 103**

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ALLOWABLE DAMAGE 3

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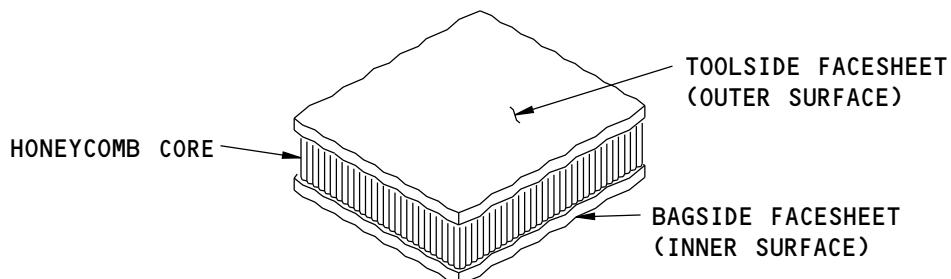
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Definitions of the Facesheets
Figure 104

3. References

Reference	Title
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

A. Trailing Edge and Closeout Panels - Solid Laminate Areas

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted if:
 - (a) They are sealed as given in Paragraph 2.
- (2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if:
 - (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.
- (3) Dents are permitted if:
 - (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.
- (4) Holes and Punctures are permitted if:
 - (a) They are a maximum 0.25 inch in diameter
 - (b) Not more than one fastener hole in six is damaged
 - (c) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (d) They are sealed as given in Paragraph 2.
- (5) Delaminations are permitted if:

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- (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.
- (6) Edge Erosion is permitted as shown in Edge Erosion Damage Removal, Figure 105/ALLOWABLE DAMAGE 3 if:
- (a) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (b) It is sealed as given in Paragraph 2.
- (7) Edge damage is permitted if:
- (a) It is a maximum 0.10 inch in depth
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) It is removed as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 3, Detail A
 - (d) It is sealed as given in Paragraph 2.
- B. Trailing Edge and Closeout Panels - Honeycomb Core Area
- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted if:
- (a) They are sealed as given in Paragraph 2.
- (2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if they are:
- (a) A maximum of one ply in depth
 - NOTE:** Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum length of 1.50 inches
 - (c) A maximum width of 1.50 inches
 - (d) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 107/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply and
 - 2) Are sealed as given in Paragraph 2.
 - (e) Sealed as given in Paragraph 2.
- (3) Dents are permitted if:
- (a) They are a maximum of one facesheet
 - (b) They are a maximum diameter of 1.50 inches
 - (c) They are a minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 107/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply and
 - 2) Are sealed as given in Paragraph 2.
 - (d) There is no fiber damage or delamination
 - (e) The damage is sealed as given in Paragraph 2.
- (4) Holes and Punctures are permitted if they are:

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- (a) A maximum of one facesheet and the core in depth
- (b) A maximum diameter of 1.50 inches
- (c) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 107/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply and
 - 2) Are sealed as given in Paragraph 2.
- (d) Sealed as given in Paragraph 2.

NOTE: Do not remove the damage unless it is necessary to remove resin burrs that extend into the surface contour.

- (5) Delaminations are permitted if they are:
 - (a) On a maximum of one facesheet
 - (b) A maximum diameter of 1.50 inches
 - (c) A minimum distance away from the edge of any hole, part edge, or other damage of 4D. Refer to Damage Size and Spacing Limits, Figure 107/ALLOWABLE DAMAGE 3 for damage and spacing limits and the value of D. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass ply and
 - 2) Are sealed as given in Paragraph 2.
 - (d) Sealed as given in Paragraph 2.

C. Balance Weight Cover Panel - Solid Laminate Areas

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted if:
 - (a) They are sealed as given in Paragraph 2.
- (2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if:
 - (a) Not more than one fastener hole in six is damaged
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) They are sealed as given in Paragraph 2.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.
- (5) Delaminations are not permitted.
- (6) Edge Erosion is permitted as shown in Edge Erosion Damage Removal, Figure 105/ALLOWABLE DAMAGE 3 if:
 - (a) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (b) It is sealed as given in Paragraph 2.
- (7) Edge damage is permitted if:
 - (a) It is a maximum 0.10 inch in depth
 - (b) Not more than 10 percent of the edgeband for each side of panel is damaged
 - (c) It is removed as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 3, Detail A
 - (d) It is sealed as given in Paragraph 2.

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ALLOWABLE DAMAGE 3

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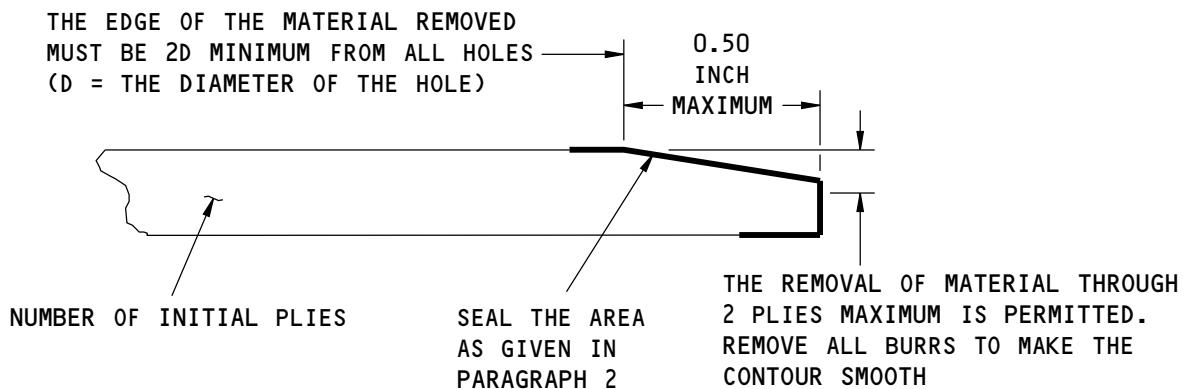
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Edge Erosion Damage Removal
Figure 105

55-30-01

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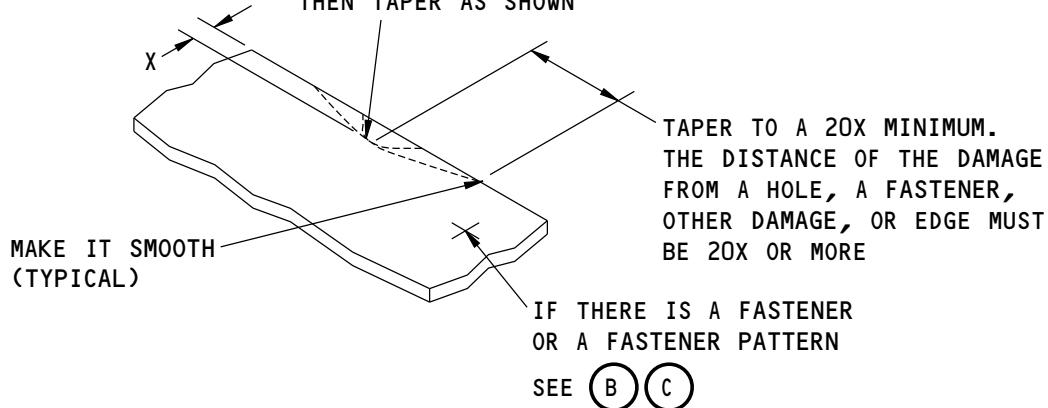
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REMOVE THE MATERIAL TO A
1.00 INCH RADIUS MINIMUM,
THEN TAPER AS SHOWN

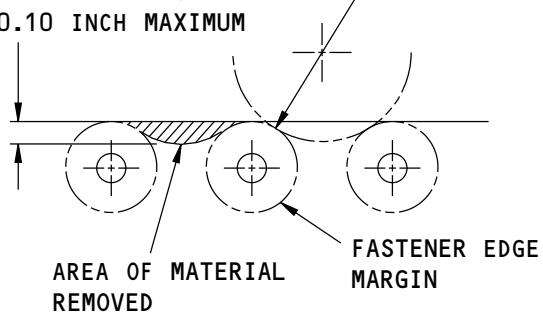


X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM

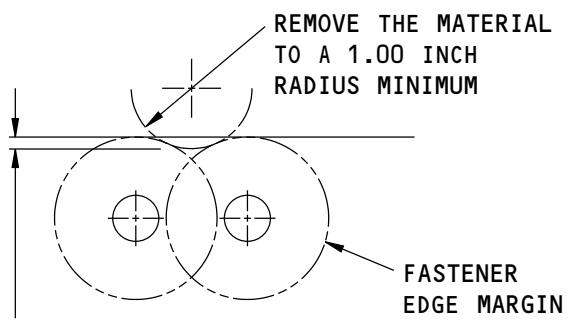
REMOVAL OF DAMAGED MATERIAL ON AN EDGE

A

X = THE DEPTH OF THE MATERIAL REMOVED
= 0.10 INCH MAXIMUM



REMOVE THE MATERIAL
TO A 1.00 INCH
RADIUS MINIMUM



X = THE DEPTH OF THE
MATERIAL REMOVED
= 0.10 INCH MAXIMUM

REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS DO NOT HAVE AN OVERLAP

REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS HAVE AN OVERLAP

B

c

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Allowable Damage Limits

Figure 106

55-30-01

ALLOWABLE DAMAGE 3

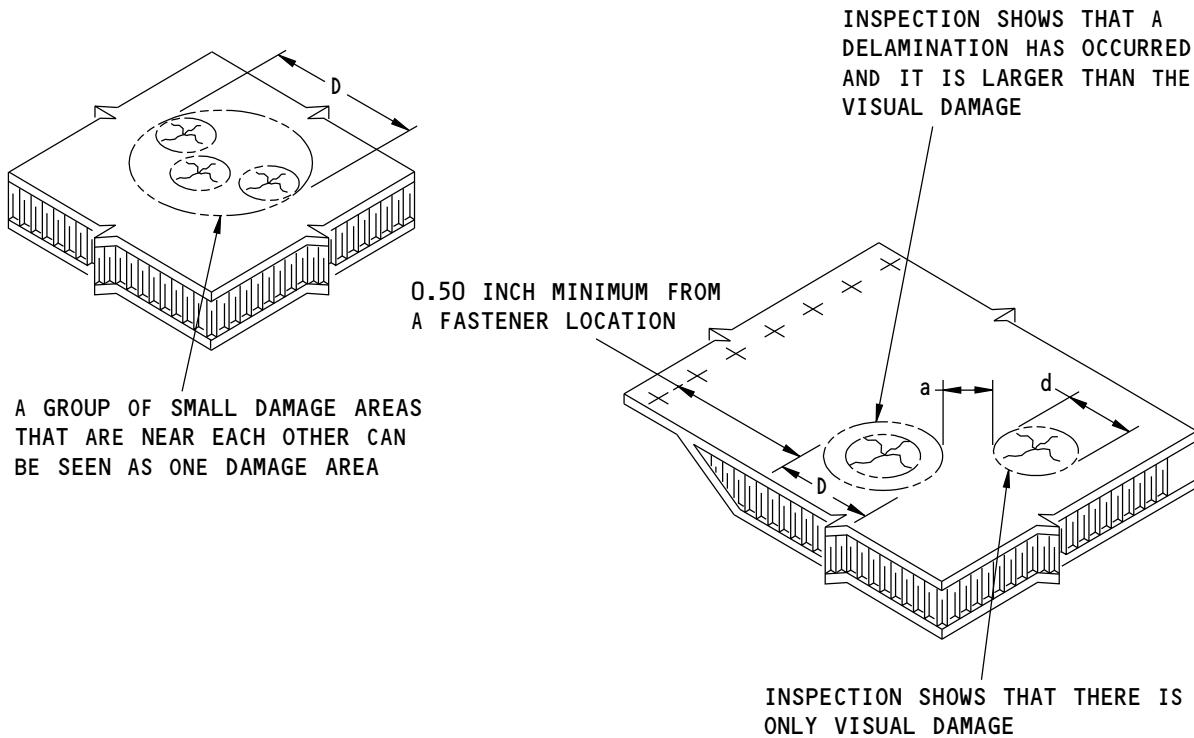
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NOTE: TO FIND DELAMINATION YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES (REFER TO NDT PART 1, 51-01-02).

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

A DAMAGE AREA DOES NOT INCLUDE NICKS, GOUGES, AND SCRATCHES THAT DO NOT CAUSE DAMAGE TO THE GLASS AND CARBON FIBER PLIES IF:

- YOU MAKE A TEMPORARY SEAL OF THE DAMAGE AS GIVEN IN PARAGRAPH 2 OR
- YOU MAKE A PERMANENT SEAL OF THE DAMAGE AS GIVEN IN PARAGRAPH 2

(D) IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND IS A MAXIMUM OF 1.50 INCHES

(d) IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

(a) IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS. THE MINIMUM (a) THAT IS PERMITTED IS (4D).

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Damage Size and Spacing Limits
Figure 107

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ALLOWABLE DAMAGE 3

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ALLOWABLE DAMAGE 4 - VERTICAL STABILIZER LEADING EDGE SKINS, EROSION DAMAGE

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer leading edge skins that have erosion damage. These limits are for the skin panels shown in Vertical Stabilizer Leading Edge Skin Locations, Figure 101/ALLOWABLE DAMAGE 4. Do not use the limits of this subject for the fin tip. Refer to Allowable Damage 1 for other types of damage limits permitted.

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ALLOWABLE DAMAGE 4

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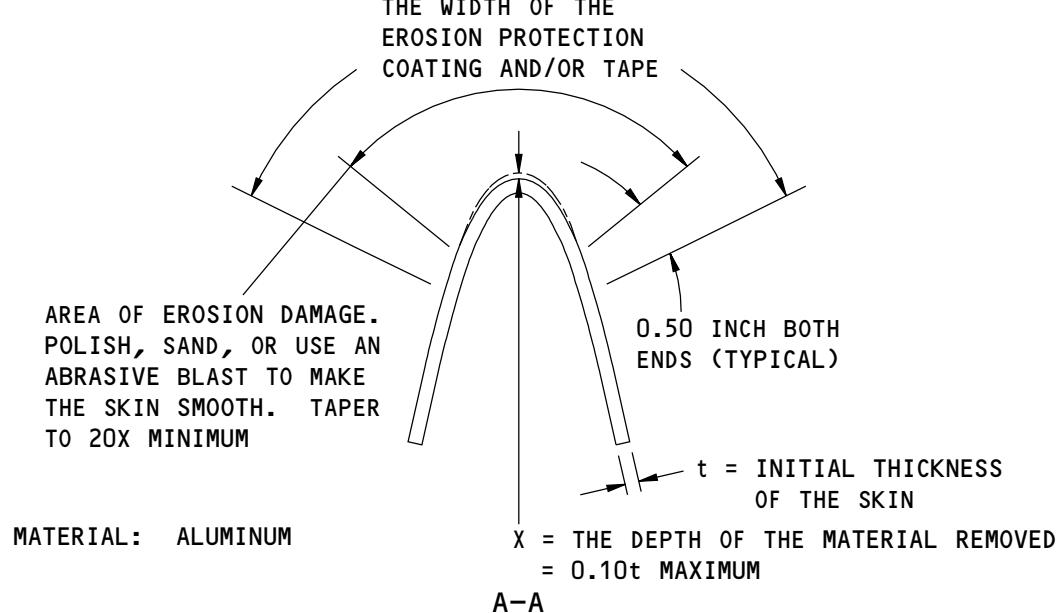
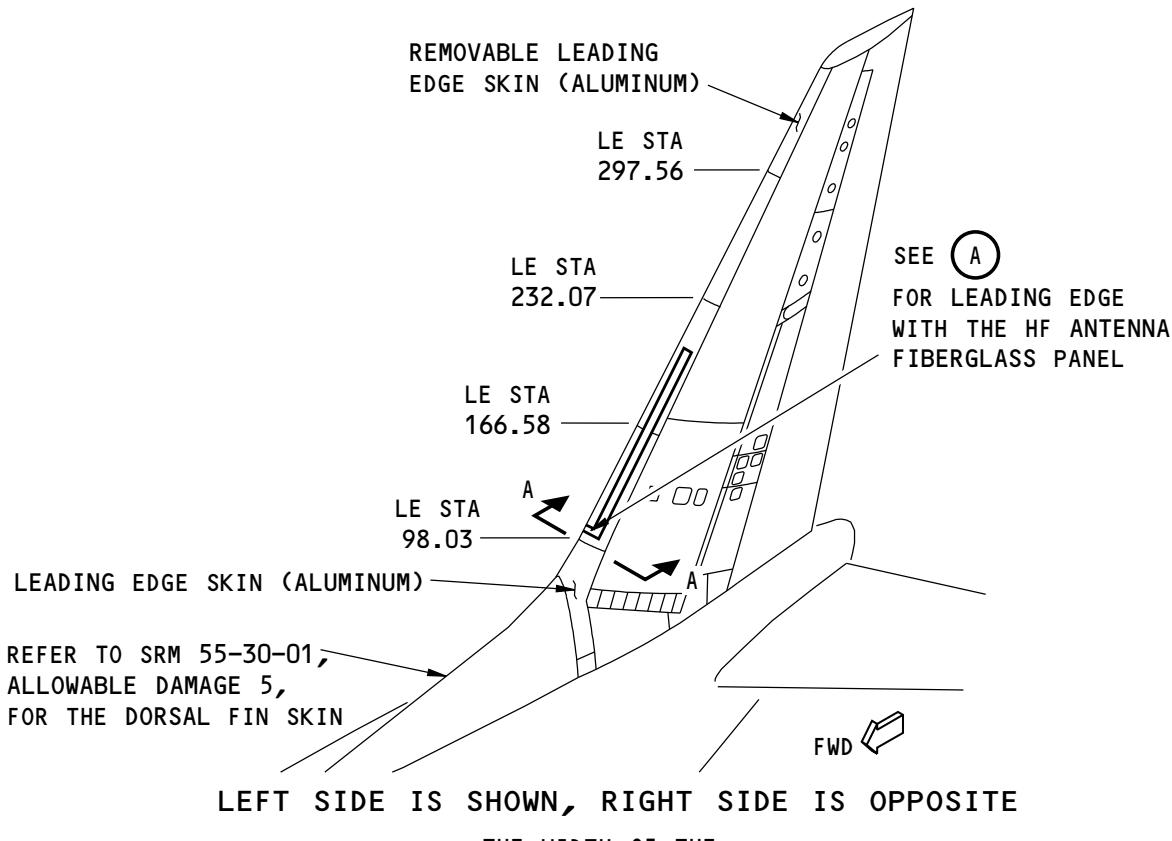
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Vertical Stabilizer Leading Edge Skin Locations
Figure 101 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 4

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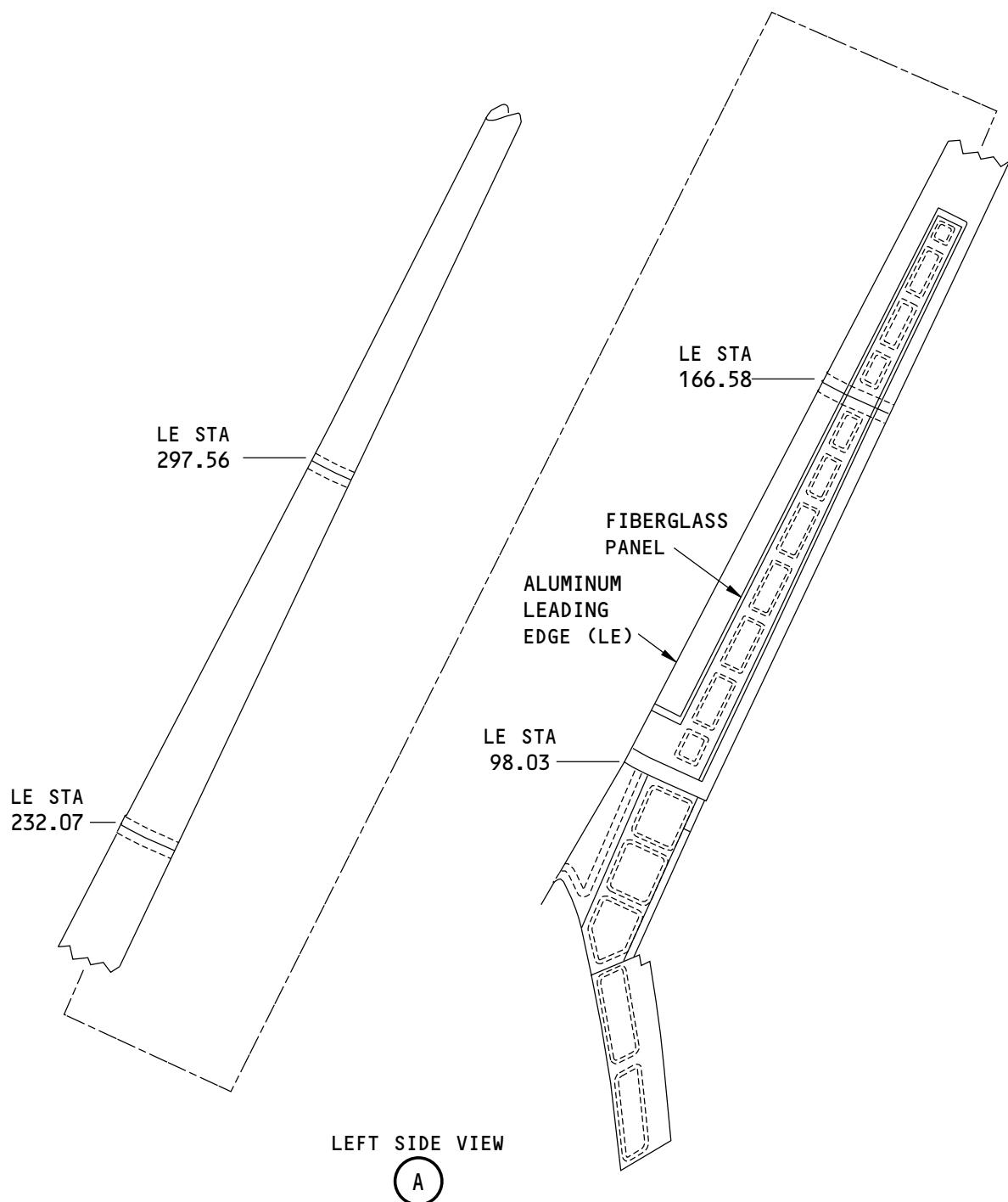
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Vertical Stabilizer Leading Edge Skin Locations
Figure 101 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 4

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2. General

A. Do what follows for the aluminum leading edge skins:

- (1) Remove the damaged material as given in Paragraph 4./ALLOWABLE DAMAGE 4 The maximum depth of material that can be removed is equal to 10% of the initial thickness of the skin.
 - (a) Refer to 51-10-02 for the inspection and removal of damage.
 - (b) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (c) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- (2) Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-08	EROSION PROTECTION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 55-35-01	VERTICAL STABILIZER LEADING EDGE

4. Allowable Damage Limits

WARNING: MATERIALS THAT ARE USED TO CLEAN AND COAT ARE TOXIC AND FLAMMABLE.
MAKE SURE THERE IS A GOOD FLOW OF AIR AND YOU OBEY ALL FIRE
PRECAUTIONS.

A. Light Erosion Damage to the Aluminum Skin:

- (1) Make the metal contour smooth.
 - (a) Apply masking tape to the areas where there is no damage.
 - (b) Clean the surface with a moist cheesecloth. Use water to make the cheesecloth moist.
 - (c) Polish or sand the damaged area to make a smooth surface. The maximum depth of removal must not be more than 10% of the initial skin thickness.
- (d) Where the skin has been pushed in, make the skin contour smooth with the adjacent skin.
 - 1) Use powdered household cleanser or 400-grit aluminum oxide paper.
 - 2) Refer to Vertical Stabilizer Leading Edge Skin Locations, Figure 101/ALLOWABLE DAMAGE 4, Section A-A, for surface contour limits.

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ALLOWABLE DAMAGE 4

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- (e) Clean the surface with a moist new cheesecloth. Use MIBK to make the cheesecloth moist.
- (f) Find the depth of material that has been removed.
 - 1) Use a Vidigage, Branson digital caliper, dial gage, or a straight edge with feeler gages to find the depth.
 - 2) Repair the leading edge skin if the depth of material removed is more than 10% of the initial skin thickness.
 - 3) Apply a chemical conversion coating if the depth of material removed is less than 10% of the initial skin thickness. Apply the conversion coating to the bare surfaces of the skin as given in 51-20-01.

CAUTION: EROSION PROTECTION CAN CAUSE P-STATIC. DO NOT APPLY EROSION PROTECTION TO THE AREA OF THE ALUMINUM LEADING EDGE SKIN FORWARD OF THE HF FIBERGLASS PANEL. THE RESULT CAN BE AN UNWANTED EFFECT TO THE PERFORMANCE OF THE HF SYSTEM. ONLY APPLY EROSION PROTECTION MATERIAL IF PERMITTED ON THE DECORATIVE LIVERY DRAWING(S).

- (g) If necessary, for more protection of leading edge skins, apply a new layer of erosion tape or an erosion coating. Refer to 51-20-08.
 - 1) Replace the tape or erosion coating if there is too much wear.
 - 2) When the bare metal shows or the aerodynamic smoothness limits are not kept, there is too much wear. Refer to 51-10-01 for the aerodynamic smoothness limits.

B. Moderately damaged to badly damaged areas of the aluminum skin:

- (1) Prepare the metal areas.
 - (a) Apply masking tape to the areas where there is no damage.
 - (b) Close and seal all openings to keep all material out of the structure.
 - (c) Static ground the airplane and the abrasive blast equipment.
 - (d) Use a spray gun with water or toluene to clean the eroded area of the skin.

CAUTION: DO NOT USE A CLOTH OR OTHER FABRIC TO CLEAN THE ABRASIVE BLASTED AREA. UNWANTED LINT ON THE CLEANED AREA WILL DECREASE THE LIFE OF THE EROSION COATING.

- (e) Use an abrasive blast to remove the erosion damage as given in 51-10-02.
 - 1) Make sure all of the oxide and corrosion has been removed from the eroded areas.
 - 2) Refer to Vertical Stabilizer Leading Edge Skin Locations, Figure 101/ALLOWABLE DAMAGE 4, Section A-A, for the limits of a good taper.
- (f) Find the depth of material that has been removed.
 - 1) Use a Vidigage, Branson digital caliper, dial gage, or a straight edge with feeler gages to find the depth.
 - 2) Repair the leading edge skin if the depth of material removed is more than 10% of the initial skin thickness.
 - 3) Apply a chemical conversion coating if the depth of material removed is less than 10% of the initial skin thickness. Apply the conversion coating to the bare surfaces of the skin as given in 51-20-01.

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ALLOWABLE DAMAGE 4

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CAUTION: EROSION PROTECTION CAN CAUSE P-STATIC. DO NOT APPLY EROSION PROTECTION TO THE AREA OF THE ALUMINUM LEADING EDGE SKIN FORWARD OF THE HF FIBERGLASS PANEL. THE RESULT CAN BE AN UNWANTED EFFECT TO THE PERFORMANCE OF THE HF SYSTEM. ONLY APPLY EROSION PROTECTION MATERIAL IF PERMITTED ON THE DECORATIVE LIVERY DRAWING(S).

- (g) For more protection of leading edge skins, apply a new layer of erosion tape or an erosion coating. Refer to 51-20-08.
- 1) Replace the tape or erosion coating if there is too much wear.
 - 2) When the bare metal shows or the aerodynamic smoothness limits are not kept, there is too much wear. Refer to 51-10-01 for the aerodynamic smoothness limits.

C. Damage to the erosion coating on the Fiberglass Strap for the HF antenna:

CAUTION: EROSION OF THE FIBERGLASS SURFACE THAT IS BENEATH THE EROSION COAT FINISH IS NOT PERMITTED. MAKE SURE THERE IS ALWAYS A LAYER OF EROSION TAPE OR AN EROSION COATING ON THE FIBERGLASS SURFACE. STRUCTURAL DAMAGE TO THE FIBERGLASS STRAP WILL OCCUR IF YOU DO NOT OBEY.

- (1) Make an inspection of the fiberglass strap at intervals for damage to the erosion protection.
- (2) Repair or remove and replace the erosion protection coating or erosion tape as given in AMM SUBJECT 55-35-01 if:
 - (a) The erosion protection finish is damaged, the black anti-static paint shows, or the fiberglass surface shows.
 - (b) The aerodynamic smoothness limits are not kept as given 51-10-01.

D. Damage to the initial layer of erosion protection:

- (1) Areas of bare metal or unsatisfactory aerodynamic smoothness are caused by damage to the erosion protection. Refer to 51-10-01 for the aerodynamic smoothness limits and do what follows for these areas:
 - (a) Remove the erosion coating with MIBK.
 - 1) Soak the coating with MIBK with the use of cheesecloth.
 - 2) Keep the cheesecloth on the coating until it is soft.
 - 3) Use a plastic scraper to remove the erosion coating.
 - (b) Remove the erosion tape.
 - 1) Soak the tape edge sealer with MIBK with the use of cheesecloth.
 - 2) Keep the cheesecloth on the edge sealer until it is sufficiently soft to remove.
 - 3) Heat (150°F maximum temperature) can be used to make the tape soft.
 - 4) Use a plastic scraper, razor, or knife to start the removal of the tape at edges. Use your hand to pull the tape away from the metal skin.
 - (c) For more protection of leading edge skins, apply a new layer of erosion tape or an erosion coating. Refer to 51-20-08.
 - 1) Replace the tape or erosion coating if there is too much wear.
 - 2) When the bare metal shows or the aerodynamic smoothness limits are not kept, there is too much wear. Refer to 51-10-01 for the aerodynamic smoothness limits.

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ALLOWABLE DAMAGE 4

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ALLOWABLE DAMAGE 5 - DORSAL FIN SKIN

1. Applicability

- A. This subject gives the allowable damage limits for the dorsal fin skin made of Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich material. Refer to Dorsal Fin Skin Location, Figure 101/ ALLOWABLE DAMAGE 5.
- B. The composite structure allowable damage limits are applicable only if they are sealed as given in Paragraph 2.

2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT procedure.
 - (2) Refer to Definitions of the Dimensions of the Different Types of Damage, Figure 102/ ALLOWABLE DAMAGE 5 for the definitions of the length, width, and depth of the damage.
 - (3) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 5 for the definitions of the facesheets of a honeycomb core area.
- B. Remove all of the contamination and water from the fairing.
 - (1) Refer to 51-70-04 for the damage removal procedures.
 - (2) Refer to 51-30-03 for possible sources of the non-metallic materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment you can use to remove the damage.
 - (4) Seal all the permitted damage areas that are not more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 5 Seal the damage with one of the two methods that follow:
 - (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape).
 - 2) Keep a record of the location.
 - 3) Make sure that the tape is in satisfactory condition at normal maintenance intervals.
 - (b) Make a permanent seal.
 - 1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - 2) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - 3) Apply one layer of BMS 10-60, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
 - (5) Seal all of the damage areas that are more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 5 Seal the damage as follows:
 - (a) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
 - (b) Make a temporary seal with aluminum foil tape (speed tape).
 - (c) Keep a record of the location.

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ALLOWABLE DAMAGE 5

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- (d) Repair the damage at or before 24 months from the time the seal was made.
- (6) The definition of the words "other damage", as used in the allowable damage limits, does not include nicks, gouges, and scratches that do not cause damage to the glass fibers and is sealed.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
TYPE OF STRUCTURE	AREA LOCATION	PARAGRAPH
DORSAL FIN SKIN GFRP HONEYCOMB SANDWICH	HONEYCOMB CORE AREA	4.A
	SOLID LAMINATE AREA	4.B

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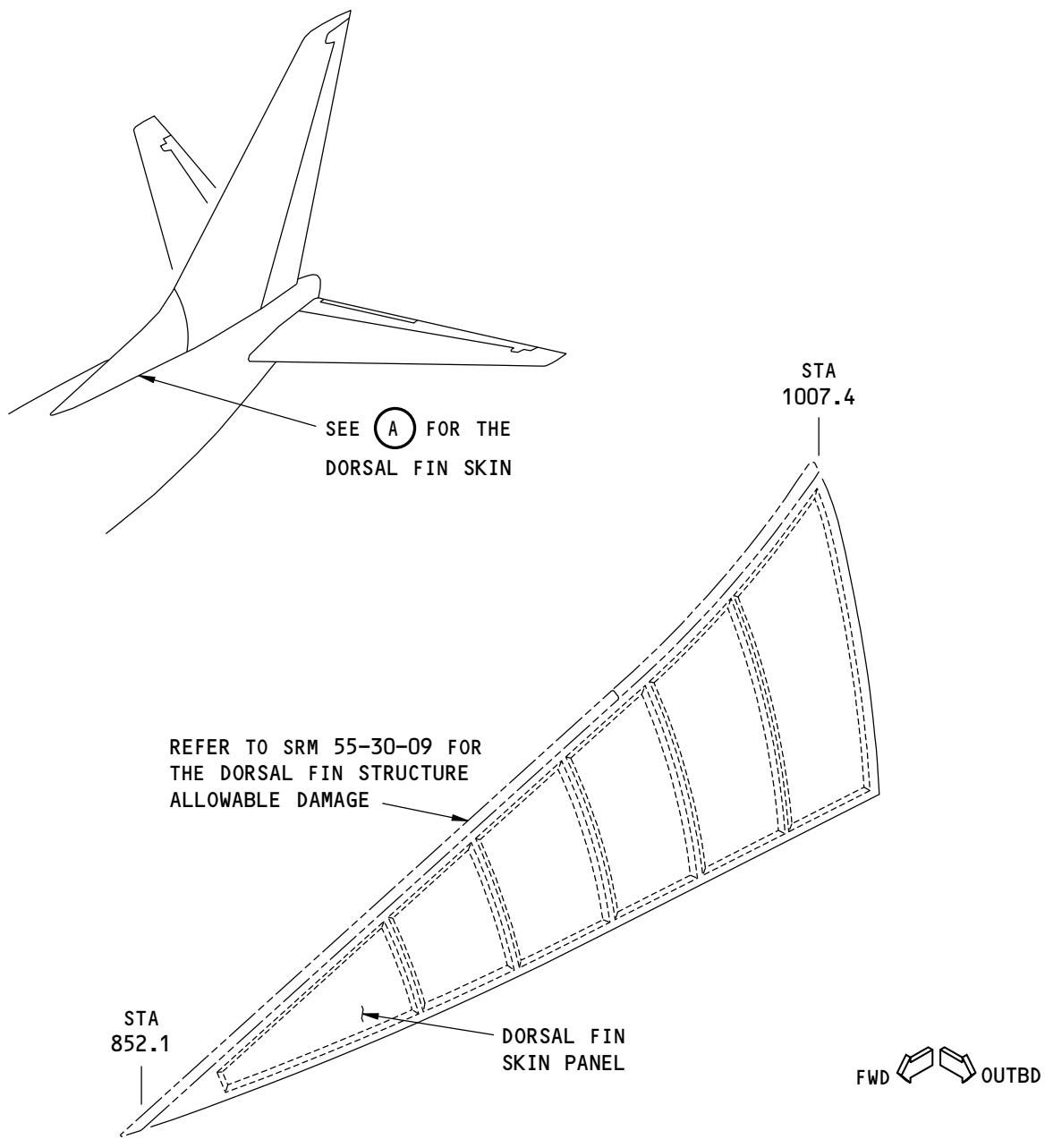
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(A)

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Dorsal Fin Skin Location
Figure 101

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ALLOWABLE DAMAGE 5

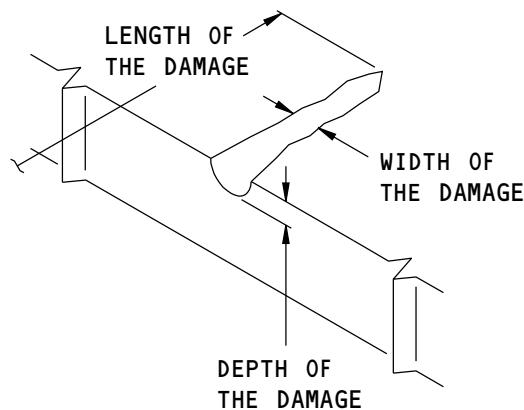
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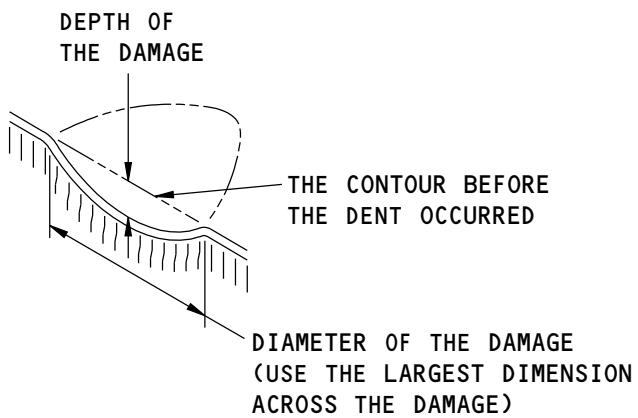


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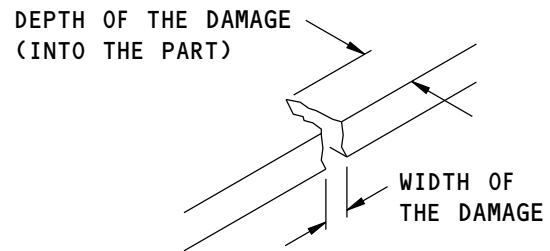
DEFINITIONS OF THE SIZES FOR NICK, GOUGE, AND SCRATCH DAMAGE

(A)



DEFINITIONS OF THE SIZES
FOR DENT DAMAGE

(B)



DEFINITIONS OF THE SIZES
FOR EDGE DAMAGE

(C)

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Definitions of the Dimensions of the Different Types of Damage
Figure 102

55-30-01

ALLOWABLE DAMAGE 5

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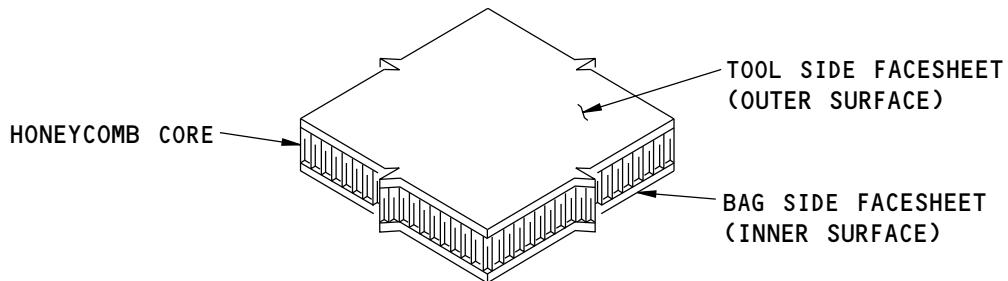
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Definitions of the Facesheets
Figure 103

3. References

Reference	Title
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Honeycomb Core Areas

- (1) Nicks, Gouges and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum depth of one ply
NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.
 - (b) A maximum length of 5.0 inches (127.00 mm)
 - (c) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (d) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Honeycomb Core Areas, Figure 104/ALLOWABLE DAMAGE 5, Detail A.
- (3) Dents that do not cause damage to the glass fibers are permitted if they are:
 - (a) A maximum depth of 2 plies
 - (b) A maximum diameter of 2.0 inches (50. 80 mm)
 - (c) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (d) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Honeycomb Core Areas, Figure 104/ALLOWABLE DAMAGE 5, Detail A.

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ALLOWABLE DAMAGE 5

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- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum diameter of 2.0 inches (50.8 mm)
 - (b) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (c) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Honeycomb Core Areas, Figure 104/ALLOWABLE DAMAGE 5, Detail A.
- (5) Delaminations are permitted if they are:
 - (a) A maximum length of 2.0 inches (50.80 mm)
 - (b) A maximum width of 2.0 inches (50.80 mm)
 - (c) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (d) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Honeycomb Core Areas, Figure 104/ALLOWABLE DAMAGE 5, Detail A.

B. Solid Laminate Areas

- (1) Nicks, Gouges and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum depth of one ply

NOTE: Use the limits for holes and punctures if the depth of the damage is more than one ply.
 - (b) A maximum length of 1.0 inch (25.4 mm)
 - (c) A maximum width of 0.25 inch (6.35 mm)
 - (d) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (e) A minimum distance from the edge of other damage as shown in Allowable Damage Limits for the Solid Laminate Areas, Figure 105/ALLOWABLE DAMAGE 5, Detail A.
- (3) Dents that do not cause damage to the glass fibers are permitted if they are:
 - (a) A maximum depth of 2 plies
 - (b) A maximum diameter of 0.625 inch (15.88 mm)
 - (c) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (d) A minimum distance from the edge of other damage as shown in Allowable Damage Limits for the Solid Laminate Areas, Figure 105/ALLOWABLE DAMAGE 5, Detail A.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum diameter of 0.625 inch (15.88 mm)
 - (b) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (c) A minimum distance from the edge of other damage as shown in Allowable Damage Limits for the Solid Laminate Areas, Figure 105/ALLOWABLE DAMAGE 5, Detail A.
- (5) Delaminations are permitted if they agree with all of the conditions that follow:
 - (a) A maximum length of 0.625 inch (15.88 mm) in length
 - (b) A maximum width of 0.625 inch (15.88 mm)
 - (c) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
 - (d) A minimum distance from the edge of other damage as shown in Allowable Damage Limits for the Solid Laminate Areas, Figure 105/ALLOWABLE DAMAGE 5, Detail A.
- (6) Edge damage is permitted as shown in Allowable Damage Limits for the Solid Laminate Areas, Figure 105/ALLOWABLE DAMAGE 5, Detail A, if it is:

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- (a) A maximum of 2 plies in depth
 - (b) A minimum of 0.50 inch (12.70 mm) away from the edge of a fastener hole
- (7) Edge erosion damage is permitted as shown in Allowable Damage Limits for the Solid Laminate Areas, Figure 105/ALLOWABLE DAMAGE 5, Detail B.

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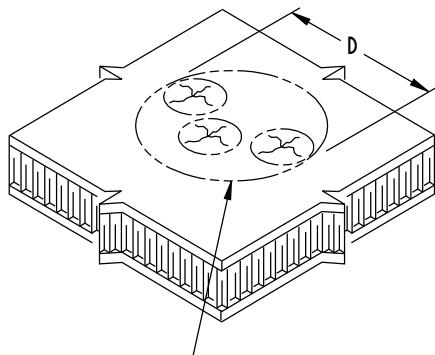
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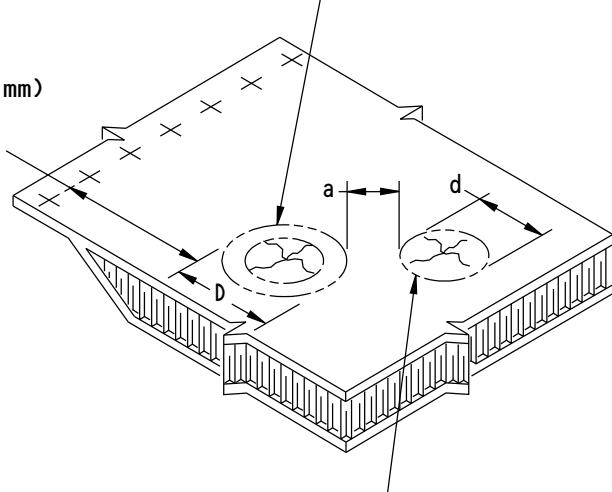


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A GROUP OF SMALL
ADJACENT DAMAGED
AREAS IS ONE
DAMAGE AREA

0.50 INCH (12.70 mm)
MINIMUM FROM A
FASTENER LOCATION



INSPECTION SHOWS THAT A
DELAMINATION HAS OCCURRED
AND IT IS LARGER THAN THE
VISUAL DAMAGE

INSPECTION SHOWS THAT THERE
IS ONLY VISUAL DAMAGE

AREAS OF ADJACENT DAMAGE THAT ARE LESS THAN
3 INCHES (76.2 mm) APART

(A)

NOTE: TO FIND DELAMINATION USE NONDESTRUCTIVE INSPECTION PROCEDURES AS GIVEN IN NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS THE LARGER OF THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

THE MINIMUM a THAT IS PERMITTED IS 2.5d.

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Allowable Damage Details for Honeycomb Core Areas
Figure 104

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ALLOWABLE DAMAGE 5

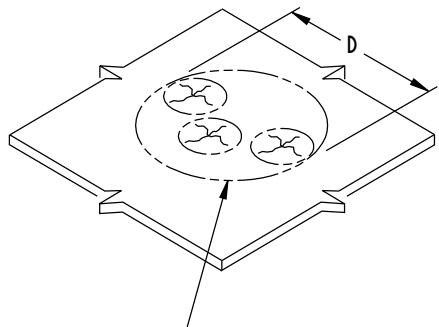
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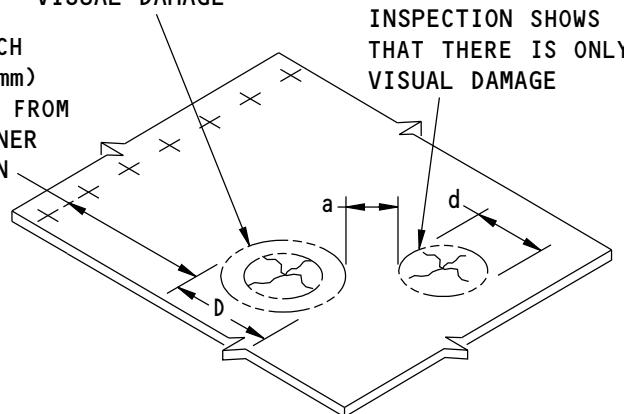
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A GROUP OF SMALL DAMAGE AREAS THAT ARE NEAR EACH OTHER CAN BE SEEN AS ONE DAMAGE AREA

INSPECTION SHOWS THAT A DELAMINATION HAS OCCURRED AND IT IS LARGER THAN THE VISUAL DAMAGE

0.50 INCH
(12.70 mm)
MINIMUM FROM
A FASTENER
LOCATION



NOTE: TO FIND DELAMINATION, YOU CAN USE NONDESTRUCTIVE INSPECTION PROCEDURES.
REFER TO NDT PART 1, 51-01-02.

THE DIAMETER OF A DAMAGE AREA IS EITHER THE DIAMETER OF THE VISUAL DAMAGE OR THE DIAMETER OF THE DELAMINATION. USE THE DIAMETER OF THE LARGER DAMAGE.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND CAN BE A MAXIMUM OF 1.0 INCH.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS.

THE MINIMUM a THAT IS PERMITTED IS 4D.

DAMAGE THAT IS PERMITTED TO COMPOSITE PANELS

(A)

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Allowable Damage Limits for the Solid Laminate Areas
Figure 105 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 5

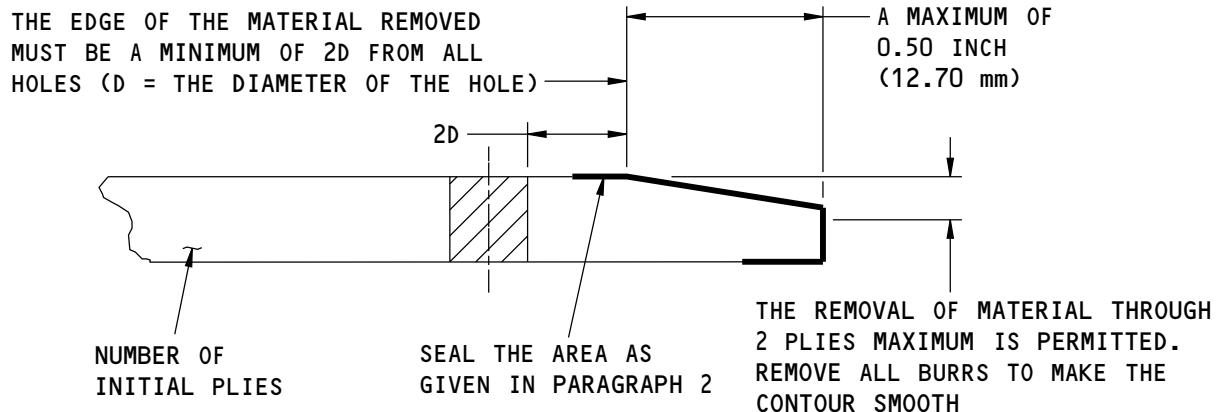
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CLEANUP AND SEALING OF EDGE EROSION DAMAGE

B

G22649 S0006593321_V1

Allowable Damage Limits for the Solid Laminate Areas
Figure 105 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 5

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STRUCTURAL REPAIR MANUAL

REPAIR 1 - VERTICAL STABILIZER LEADING EDGE SKIN EXTERNAL REPAIR

1. Applicability

- A. Repair 1 is applicable to damage to the vertical stabilizer leading edge skins shown in Vertical Stabilizer Leading Edge Skin Locations, Figure 201/REPAIR 1.

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REPAIR 1
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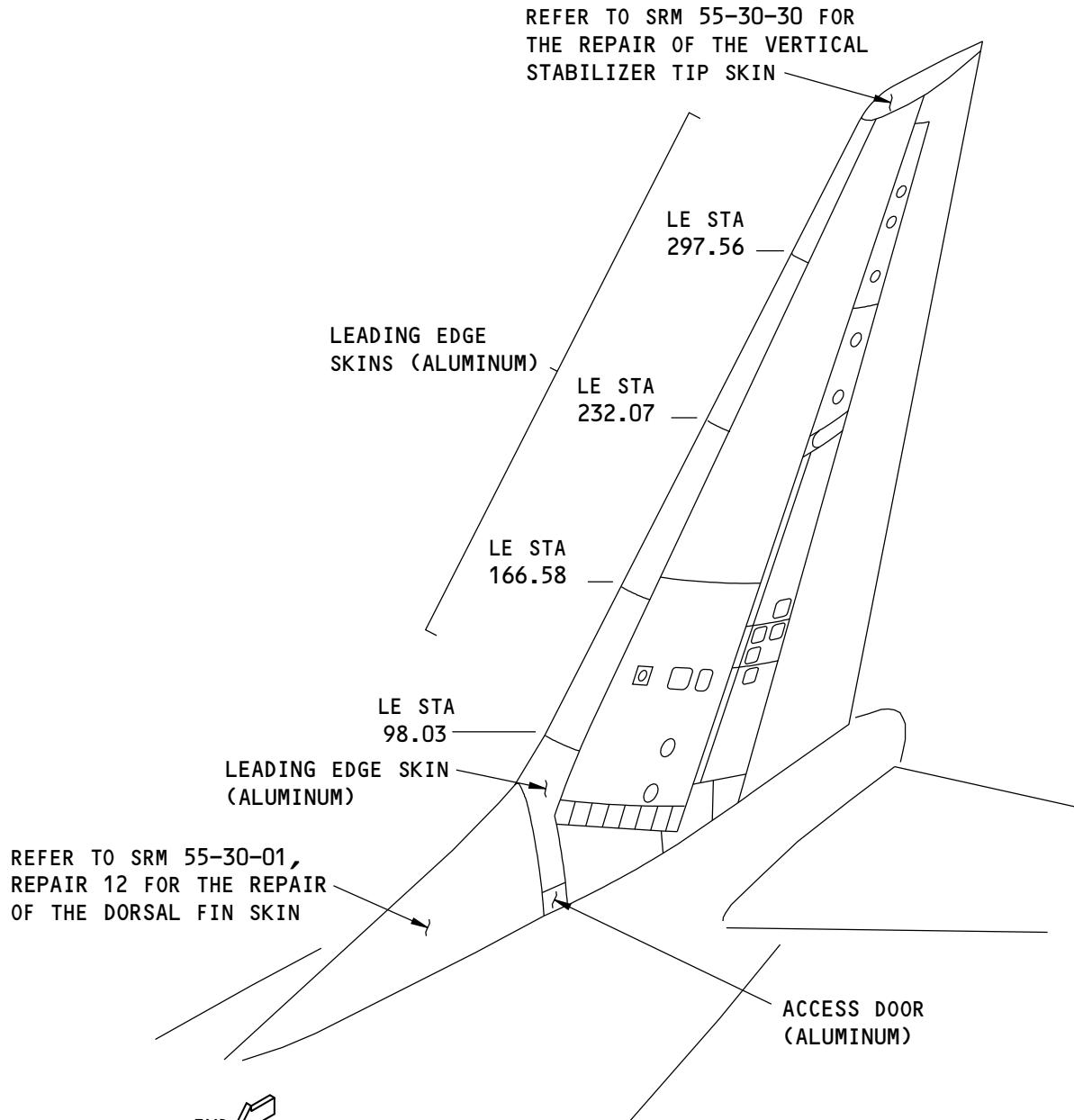
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F68431 S0006593324_V1

Vertical Stabilizer Leading Edge Skin Locations
Figure 201

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REPAIR 1
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2. General

- A. Repair 1 gives instructions for a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES

4. Repair Instructions

- A. Drill a stop hole at the ends of all skin cracks that do not end at fastener holes. Refer to Vertical Stabilizer Leading Edge Skin External Repair, Figure 202/REPAIR 1 and SRM 51-10-02 for the procedures to drill a stop hole. For other damage, do what follows:
 - (1) Cut and remove the damaged part of the skin as shown in Vertical Stabilizer Leading Edge Skin External Repair, Figure 202/REPAIR 1. Refer to 51-10-02 for the procedures to remove the damage.
 - (a) Make the cut in the shape of a rectangle with the longest sides parallel to the leading edge ribs.
 - (b) Make the corner radii of the cut a minimum of 0.50 inch.
 - (c) Make sure there is a minimum of two rows of repair fasteners around the edges of the cut.
- B. Put the skin that is around the damage back to the initial contour.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01.
- C. Make the part [1] doubler as shown in Vertical Stabilizer Leading Edge Skin External Repair, Figure 202/REPAIR 1. Refer to Table 201/REPAIR 1 for the repair material.

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REPAIR 1
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- (1) Make the contour of the part [1] doubler the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad 2024-T3 that is 0.063 inch thick when the initial skin is 0.040 inch thick. Use clad 2024-T3 that is one gage thicker than the initial skin when the thickness is more than 0.040 inch

- D. Assemble the part [1] doubler as shown in Vertical Stabilizer Leading Edge Skin External Repair, Figure 202/REPAIR 1.
- E. Drill and countersink the fastener holes.
- F. Remove the part [1] doubler.
- G. Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- H. Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01 for the chemical conversion coating procedures.
- I. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
- J. Install the fasteners without sealant. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02 for rivet installation instructions.
- K. Apply BMS 5-95 sealant around the edges of the part [1] doubler as given in 51-20-05.
- L. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.

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REPAIR 1
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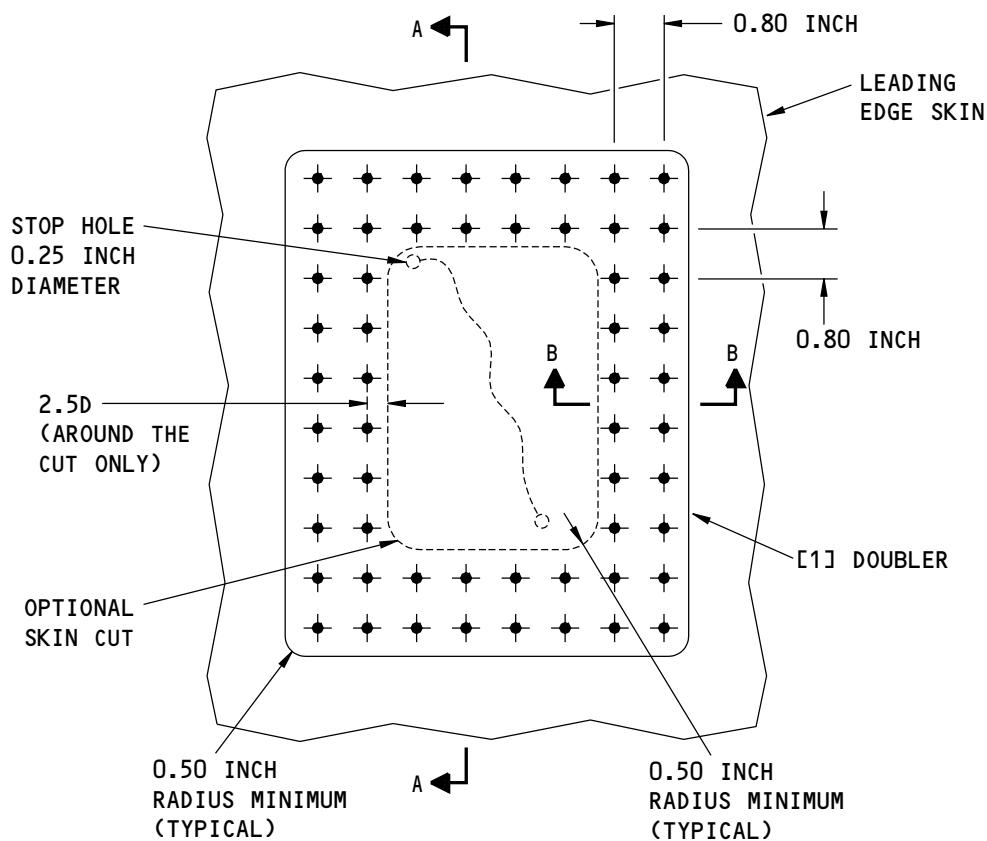
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STRUCTURAL REPAIR MANUAL



FLAT PATTERN OF THE REPAIR

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENERS. USE (D) TO CALCULATE EDGE MARGINS.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- REPAIR FASTENER LOCATION. INSTALL A BACR15FP5E() OR A NAS 1739E5 BLIND RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

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Vertical Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 1 of 2)

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REPAIR 1
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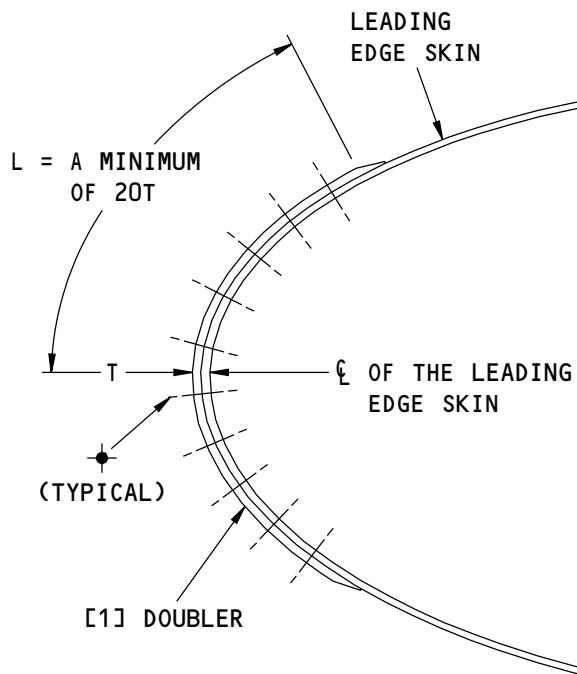
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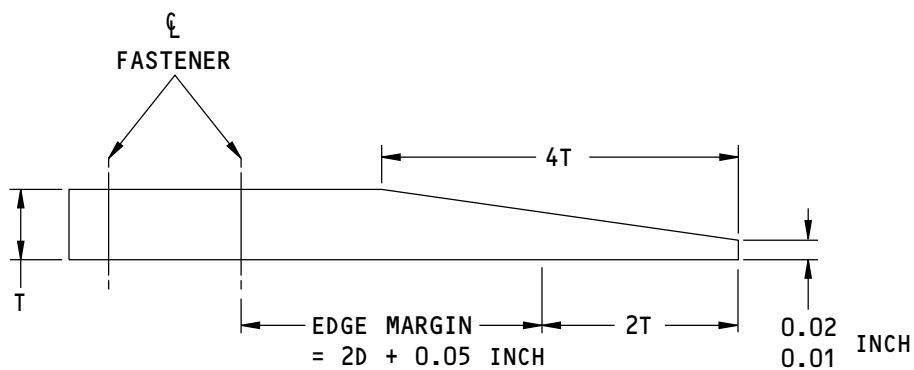
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STRUCTURAL REPAIR MANUAL



A-A



(TYPICAL FOR ALL DOUBLER EDGES)

B-B

F68435 S0006593327_V1

Vertical Stabilizer Leading Edge Skin External Repair
Figure 202 (Sheet 2 of 2)

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REPAIR 1
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STRUCTURAL REPAIR MANUAL

REPAIR 2 - FLUSH REPAIR OF THE VERTICAL STABILIZER LEADING EDGE SKIN

1. Applicability

- A. Repair 2 is applicable to damage to the vertical stabilizer leading edge skins shown in Vertical Stabilizer Leading Edge Skin Locations, Figure 201/REPAIR 2. Repair 2 is also applicable as a replacement repair for Repair 1.

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REPAIR 2
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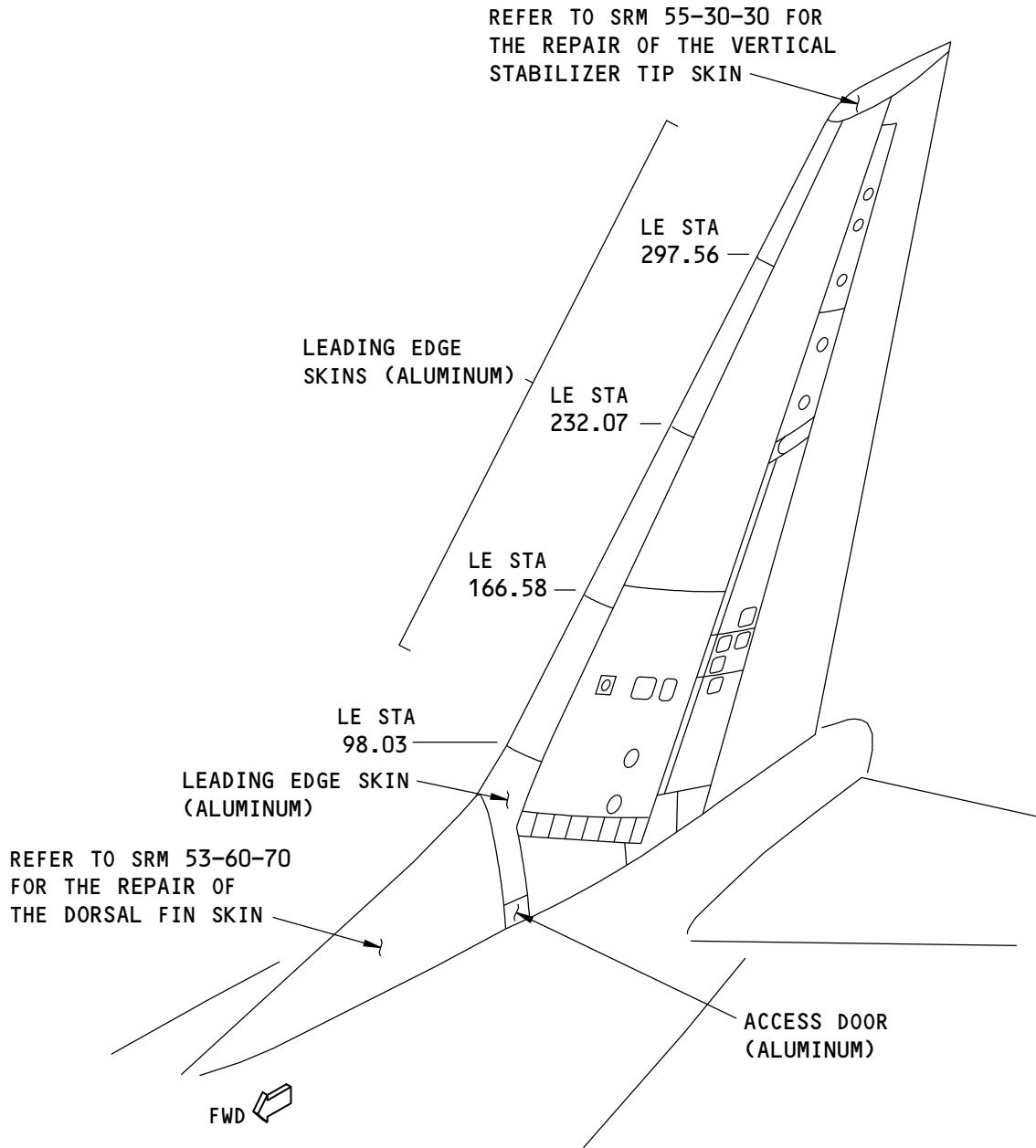
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F68422 S0006593329_V1

Vertical Stabilizer Leading Edge Skin Locations
Figure 201

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REPAIR 2
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2. General

- A. Repair 2 gives instructions for a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the performance of the aircraft. Refer to 51-10-01.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Remove the damaged leading edge section.
- B. If this repair replaces an external repair, remove the repair fasteners, repair doubler, and sealant of the external repair. Refer to 51-40-02 for the procedures to remove the repair fasteners.
- C. Cut and remove the damaged part of the skin as shown in Vertical Stabilizer Leading Edge Skin Flush Repair, Figure 202/REPAIR 2. Refer to 51-10-02 for the procedures to remove the damage.
 - (1) Make the cut in the shape of a rectangle with the longest sides parallel to the leading edge ribs.
 - (2) Make the corner radii of the cut a minimum of 0.50 inch.
 - (3) Make the edges of the cut smooth to a surface finish of 125 microinches.
 - (4) Make sure there is a minimum of two rows of repair fasteners around the edges of the cut.
- D. Put the skin that is around the damage back to the initial contour.
- E. Make the repair parts as shown in Vertical Stabilizer Leading Edge Skin Flush Repair, Figure 202/REPAIR 2. Refer to Table 201/REPAIR 2 for the repair material.
 - (1) Make the contour of the repair parts the same as the initial contour of the skin.

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REPAIR 2
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Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad 2024-T3 that is 0.063 inch thick when the initial skin is 0.040 inch thick. Use clad 2024-T3 that is one gage thicker than the initial skin when the thickness is more than 0.040 inch
[2]	Filler	1	Use clad 2024-T3 that is the same thickness as the initial skin

- F. Assemble the repair parts as shown in Vertical Stabilizer Leading Edge Skin Flush Repair, Figure 202/REPAIR 2.
- G. Drill and countersink the fastener holes.
 - (1) Align fastener holes in the part [1] doubler with holes in the skin made from an external repair.
- H. Remove the repair parts.
- I. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- J. Install the repair parts with BMS 5-95 or BMS 5-26 sealant between the mating surfaces as shown in Vertical Stabilizer Leading Edge Skin Flush Repair, Figure 202/REPAIR 2. Refer to 51-20-05 for the procedures to apply the sealant.
- K. Install the rivets without sealant.
- L. Apply BMS 5-95 or BMS 5-26 sealant in the gap between the filler and the edge of the skin cut. Refer 51-20-05 for the procedures to apply the sealant.
- M. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.

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REPAIR 2
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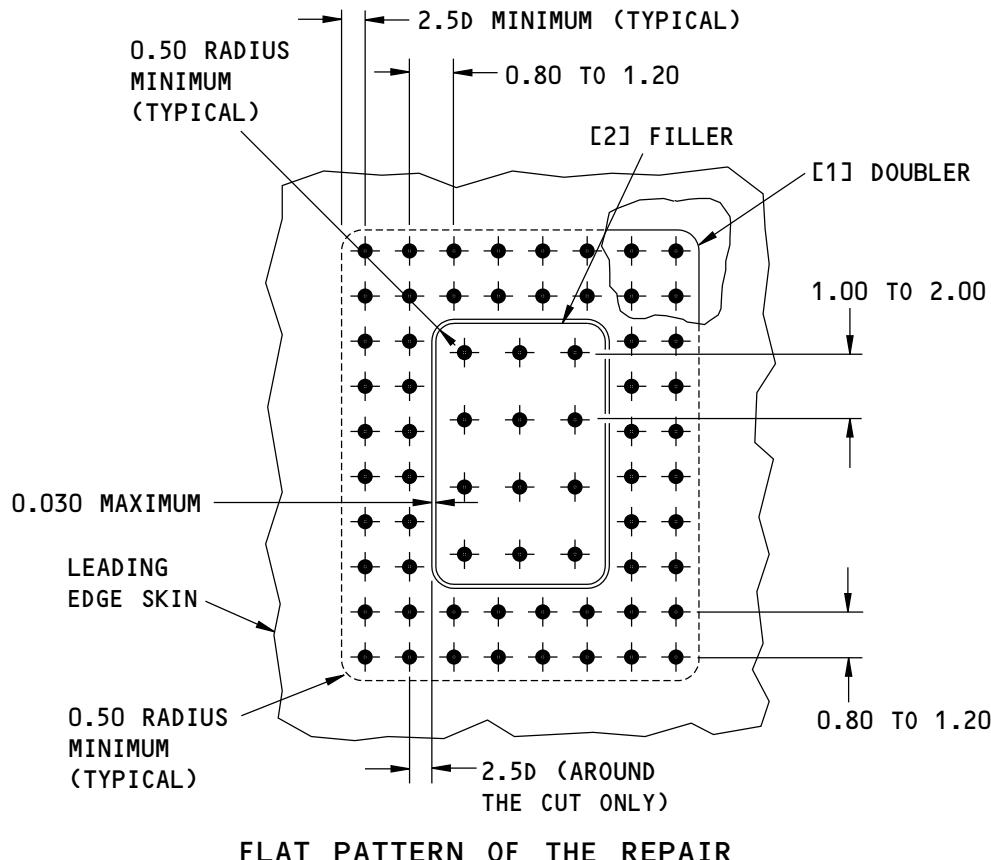
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STRUCTURAL REPAIR MANUAL



NOTES

- ALL DIMENSIONS ARE IN INCHES
- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS.

FASTENER SYMBOLS

- ◆ REPAIR FASTENER LOCATION. INSTALL A BACR15GF5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

F68426 S0006593331_V1

Vertical Stabilizer Leading Edge Skin Flush Repair
Figure 202 (Sheet 1 of 2)

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REPAIR 2
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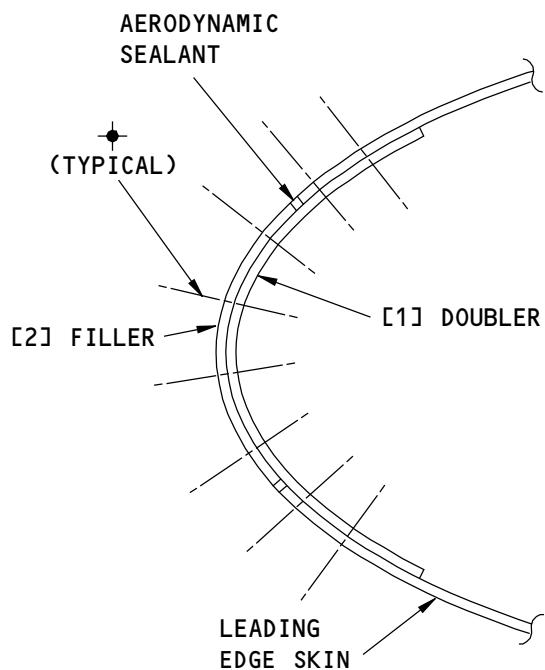
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SECTION THROUGH LEADING EDGE REPAIR

F68437 S0006593332_V1

Vertical Stabilizer Leading Edge Skin Flush Repair
Figure 202 (Sheet 2 of 2)

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REPAIR 2
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STRUCTURAL REPAIR MANUAL

REPAIR 3 - VERTICAL STABILIZER INSPAR SKIN EXTERNAL REPAIR BETWEEN RIBS - FIN
STATIONS 73.400 THRU 196.663

1. Applicability

- A. Repair 3 is applicable to damage to the vertical stabilizer inspar skins shown in Figure 202/REPAIR 3.
- B. Applicable to the repair type chosen from the process flow chart as given in Figure 201/REPAIR 3.

2. General

- A. Repair Categorization:
 - (1) Repair 3 is a Category C temporary repair for the Procedure I repair. Refer to 51-00-06, GENERAL for repair categories and definitions. This Category C repair has FAA approval if you do the inspection as given in Paragraph 5./REPAIR 3. You must replace this Category C repair with Category A permanent repair within 24 months of installation.
 - (2) Repair 3 is a Category A permanent repair for the Procedure II repair and Procedure III repair. Refer to 51-00-06, GENERAL for repair categories and definitions. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
 - (3) Category A permanent repair that replaces the initial Category C temporary repair. Refer to 51-00-06, GENERAL for repair categories and definitions. Refer to Procedure III.
- B. Repair 3 has three alternative repair procedures.
 - (1) Procedure I: This procedure uses only blind fasteners.
 - (2) Procedure II: This procedure uses only solid fasteners.
 - (3) Procedure III: Use this procedure to replace Category C temporary repair with Category A permanent repair. This procedure uses only solid fasteners.
- C. Make sure the aerodynamic smoothness is satisfactory and in the limits as given below:
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
 - (2) The conditions for aerodynamic smoothness shown in 51-10-01, GENERAL Figure 5 must be kept.

NOTE: If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
- D. It is optional to make an access door in the inspar skin. Use this opening to make sure the repair fasteners are installed correctly. Refer to REPAIR 11 to make an access door. Only one access door installation is permitted in one rib bay area. The access door should be placed on opposite side of skin and staggered to the repair area.

NOTE: One access door installation is permitted. If you need more than one access door installation contact The Boeing Company for stress and weight increase analysis.

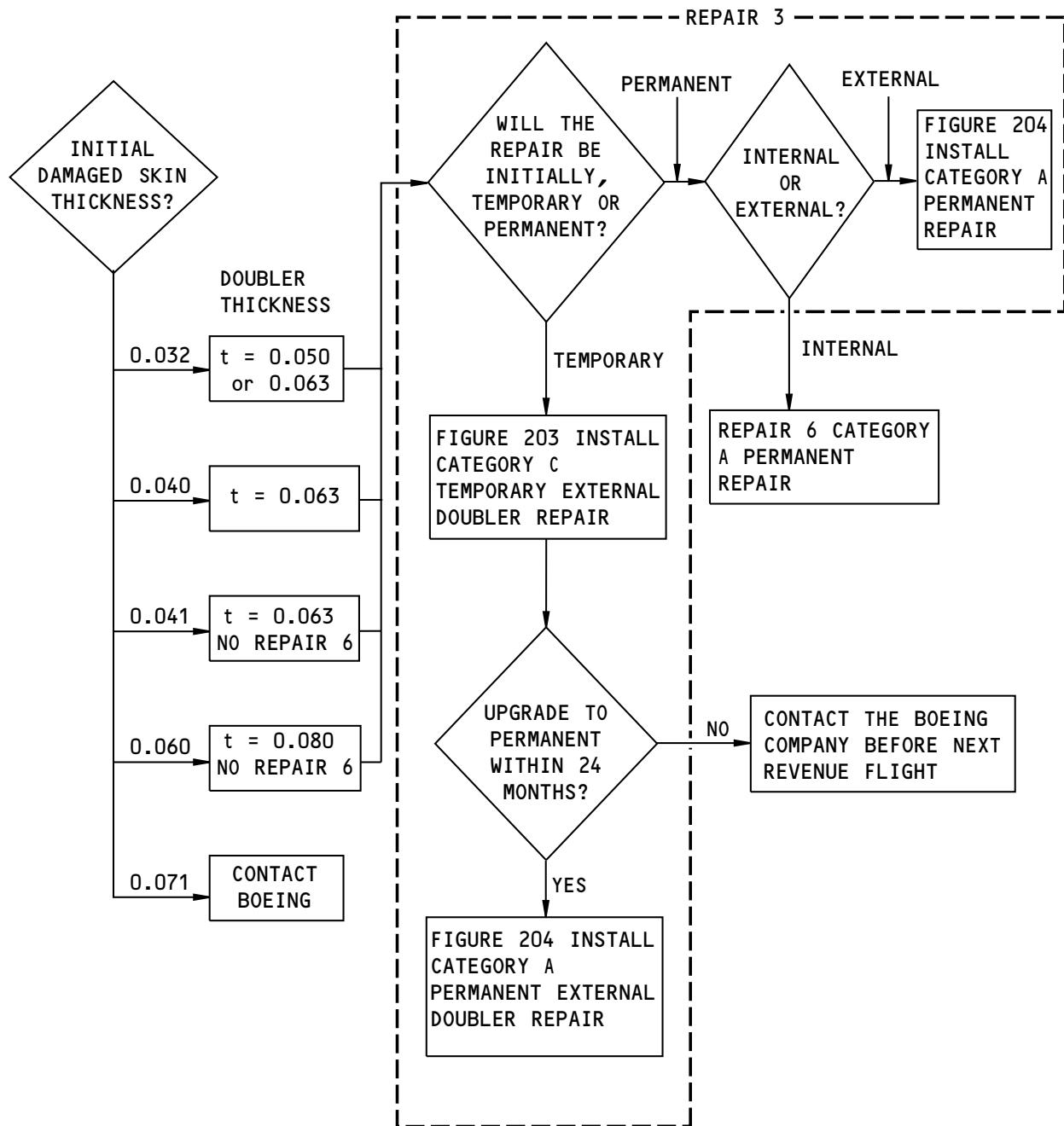
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REPAIR 3
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NOTE: ALL DIMENSIONS ARE IN INCHES (mm).

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**Process Flow Chart
Figure 201**

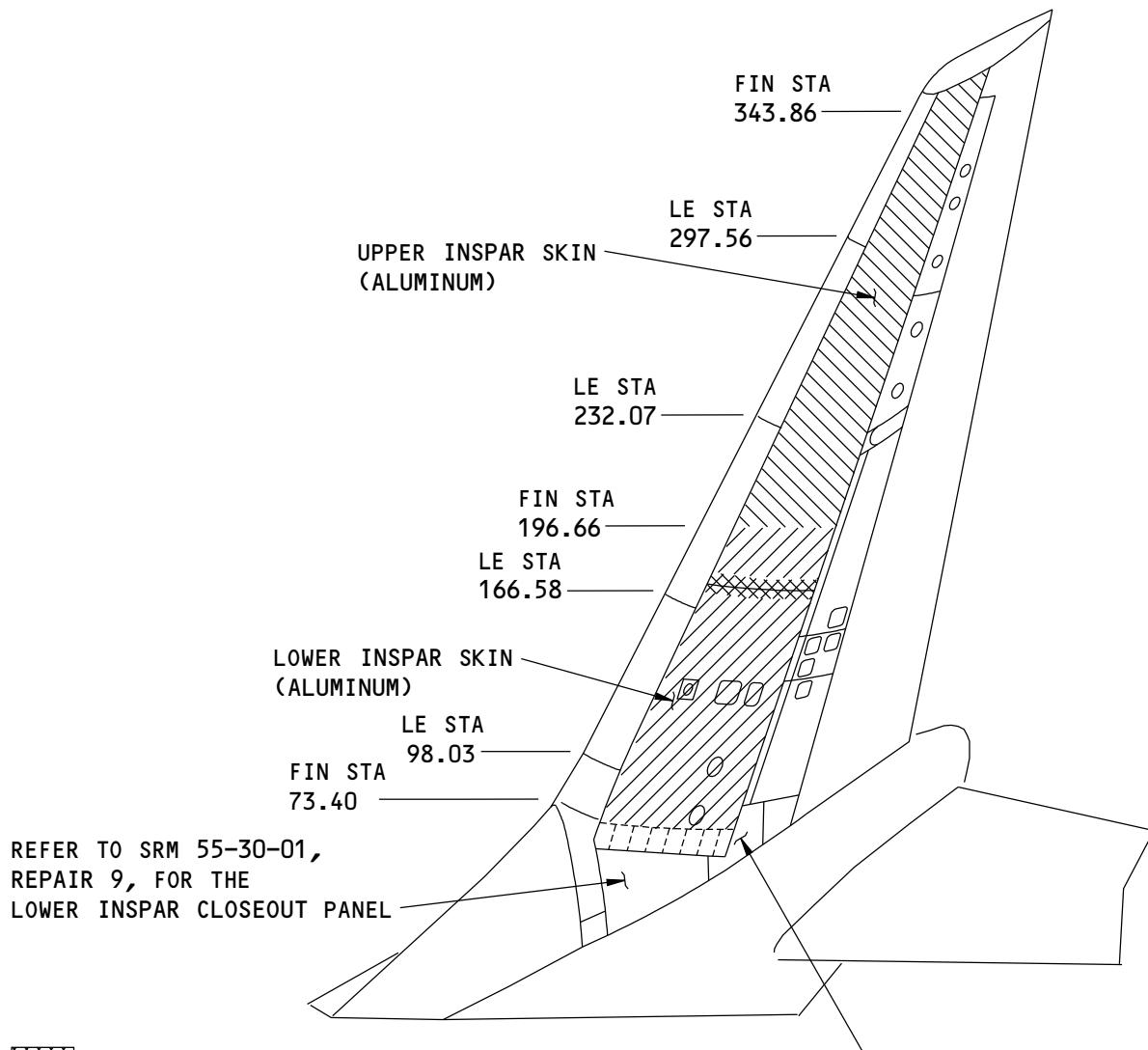
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LEFT SIDE IS SHOWN
RIGHT SIDE IS ALMOST THE SAME

F71900 S0006593334_V2

Vertical Stabilizer Inspark Skin Locations
Figure 202

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3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-40-02, GENERAL	Fastener Installation and Removal
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-99	DECORATIVE EXTERIOR PAINT SYSTEM
737 NDT Part 6, 51-00-00, Procedure 1	Fastener Holes in Aluminum Parts (Meter Display)
737 NDT Part 6, 51-00-00, Procedure 16	Aluminum Part Fastener Hole Inspection (Rotary Scanner)

4. Repair Instructions

A. Procedure I. Temporary Repair

- (1) Get access to the damaged area.
- (2) Do step (a) or (b) to remove damage:
 - (a) Drill a stop hole at the ends of all skin cracks that do not end at fastener holes. Refer to Inspark Skin External Category C Temporary and Category A permanent Repair - Fin Stations 73.400 thru 196.663, Figure 203/REPAIR 3, and 51-10-02, GENERAL for Procedure for Stop-Drilling of Cracks. Go to Step 4.A.(3).
 - 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - (b) Cut and remove the damaged part of the skin as shown in Figure 203/REPAIR 3. Refer to 51-10-02, GENERAL for the procedures to remove the damage.
 - 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - 2) For large cuts, make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - 3) Cutout can not be larger than 4.60 in. (11.68 cm) by 9.2 in. (23.4 cm).
 - 4) Make the corner radii of the cut a minimum of 0.50 inch.
- (3) Put the skin that is around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- (4) Make the part [1] doubler as shown in Figure 203/REPAIR 3. Refer to Table 201/REPAIR 3 for the repair material. Refer to Table 202/REPAIR 3 for the repair doubler thicknesses. Make the contour of the part [1] doubler the same as the initial contour of the skin.

Table 201: Repair Material

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 or 203 for the necessary thickness of the material. The use of clad material is recommended

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Table 202: Repair Material Thickness and Repair Fastener for Procedure I and Procedure II.

TEMPORARY AND INITIAL PERMANENT REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.050	5/32
0.040	0.063	5/32
0.041	0.063	5/32
0.060	0.080	5/32
0.071	CONTACT THE BOEING COMPANY	CONTACT THE BOEING COMPANY

(5) Assemble the part [1] doubler as shown in Inspark Skin External Category C Temporary and Category A permanent Repair - Fin Stations 73.400 thru 196.663, Figure 203/REPAIR 3.

(6) Drill the fastener holes. Refer to 51-40-02, GENERAL and 51-40-05, GENERAL.

NOTE: Make sure that blind rivets are correctly seated at inner face of the inspar skin. Refer to 51-40-02, GENERAL for fastener installation. Do not locate blind rivets too close to the radius of inspar skin chem-mill step.

(7) Remove the part [1] doubler.

(8) Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.

(9) Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.

(10) Apply one layer of BMS 10-79 Type II or III, primer to the part [1] doubler and the bare surfaces of the skin. Refer to 51-20-01, GENERAL for the procedures to apply the primer.

(11) Install repair washers in those original countersink holes where the countersink areas will be covered by the doubler. Refer to 51-40-08, GENERAL for countersink.

(12) Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL sealant application.

(13) Install the fasteners without sealant. Refer to 51-40-02, GENERAL for fastener installation.

(14) Apply a fillet seal along the edges of the repair parts. Refer to 51-20-05, GENERAL

(15) Apply the decorative finish to the repair area. Refer to AMM SUBJECT 51-21-99.

B. Procedure II. Initial Permanent Repair

(1) Get access to the damaged area.

NOTE: Remove the leading edge skin panels or install an access door to gain access back of the repair area to install fasteners correctly. You can use a long bucking bar to reach to the bucking side of the rivets through the access hole on the vertical stabilizer front spar web.

(2) Do Step (a) or (b) to remove damage:

(a) Drill a stop hole at the ends of all skin cracks that do not end at fastener holes. Refer to Figure 204/REPAIR 3, and 51-10-02, GENERAL for Procedure for Stop-Drilling of Cracks. Go to Step 4.B.(3).

1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.

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- (b) Cut and remove the damaged part of the skin as shown in Figure 204/REPAIR 3. Refer to 51-10-02, GENERAL for the procedures to remove the damage.
- 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - 2) For large cuts, make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - 3) Cutout can not be larger than 4.60 in. (11.68 cm) by 9.2 in. (23.37 cm).
 - 4) Make the corner radii of the cut a minimum of 0.50 inch.
- (3) Put the skin around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- (4) Make the part [1] doubler as shown in Figure 204/REPAIR 3. Refer to Table 201/REPAIR 3 and Table 202/REPAIR 3. Make the contour of the part [1] doubler the same as the initial contour of the skin.
- (5) Assemble the part [1] doubler as shown in Figure 204/REPAIR 3.
- (6) Drill the fastener holes. Refer to 51-40-02, GENERAL and 51-40-05, GENERAL.
- (7) Remove the part [1] doubler.
- (8) Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- (9) Apply a chemical conversion coating to the Part [1] doubler and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- (10) Apply one layer of BMS 10-79 Type II or III, primer to the Part [1] doubler and the bare surfaces of the skin. Refer to 51-20-01, GENERAL for the procedures to apply the primer.
- (11) Install repair washers in those original countersink holes where the countersink areas will be covered by the doubler. Refer to 51-40-08, GENERAL for countersink.
- (12) Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL sealant application.
- (13) Install the fasteners without sealant. Refer to 51-40-02, GENERAL for fastener installation.
- (14) Apply a fillet seal along the edges of the repair parts. Refer to 51-20-05, GENERAL
- (15) Apply the decorative finish to the repair area. Refer to AMM SUBJECT 51-21-99.

C. Procedure III. Permanent Repair that replaces temporary repair

- (1) Get access to the damaged area.

NOTE: Remove the leading edge skin panels or install an access door to gain access back of the repair area to install fasteners correctly. You can use a long bucking bar to reach to the bucking side of the rivets through the access hole on the vertical stabilizer front spar web.

- (2) Remove the BACR15FP5E blind rivets and discard the repair doubler. Refer to 51-10-02, GENERAL and 51-40-05, GENERAL.
- (3) Oversize fastener holes by 1/64 inch. Refer to 51-10-02, GENERAL and 51-40-05, GENERAL. Do eddy current inspection of the fastener holes. Refer to 737 NDT Part 6, 51-00-00, Procedure 1 or 737 NDT Part 6, 51-00-00, Procedure 16.
- (a) If no cracks are found, make the holes larger to install the BACR15CE6 rivets,

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- (b) If cracks are found, enlarge the holes to 3/16 inch in diameter to remove all remaining fatigue damaged material. Do eddy current inspection of the fastener holes again. Refer to 737 NDT Part 6, 51-00-00, Procedure 1 or 737 NDT Part 6, 51-00-00, Procedure 16.
- (c) If there is a crack, stop and contact to The Boeing Company for further instruction.
- (4) Put the skin around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- (5) Make the part [1] doubler as shown in Figure 203/REPAIR 3. Refer to Table 201/REPAIR 3 and Table 203/REPAIR 3. Make the contour of the part [1] doubler the same as the initial contour of the skin.

Table 203: Repair Material Thickness and Repair Fastener for Procedure III

INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.063	3/16
0.040	0.063	3/16
0.041	0.063	3/16
0.060	0.080	3/16
0.071	CONTACT THE BOEING COMPANY	CONTACT THE BOEING COMPANY

- (6) Assemble the part [1] doubler as shown in Figure 203/REPAIR 3.
- (7) Drill the fastener holes. Use solid fastener type hole size as shown in Table 203/REPAIR 3. Refer to 51-40-02, GENERAL and 51-40-05, GENERAL.
- (8) Remove the part [1] doubler.
- (9) Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- (10) Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- (11) Apply one layer of BMS 10-79 Type II or III, primer to the part [1] doubler and the bare surfaces of the skin. Refer to 51-20-01, GENERAL for the procedures to apply the primer.
- (12) Install repair washers in those original countersink holes where the countersink areas will be covered by the doubler. Refer to 51-40-08, GENERAL for countersink.
- (13) Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL sealant application.
- (14) Install the fasteners without sealant. Refer to 51-40-02, GENERAL for fastener installation.
- (15) Apply a fillet seal along the edges of the repair parts. Refer to 51-20-05, GENERAL
- (16) Apply the decorative finish to the repair area. Refer to AMM SUBJECT 51-21-99.

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REPAIR 3

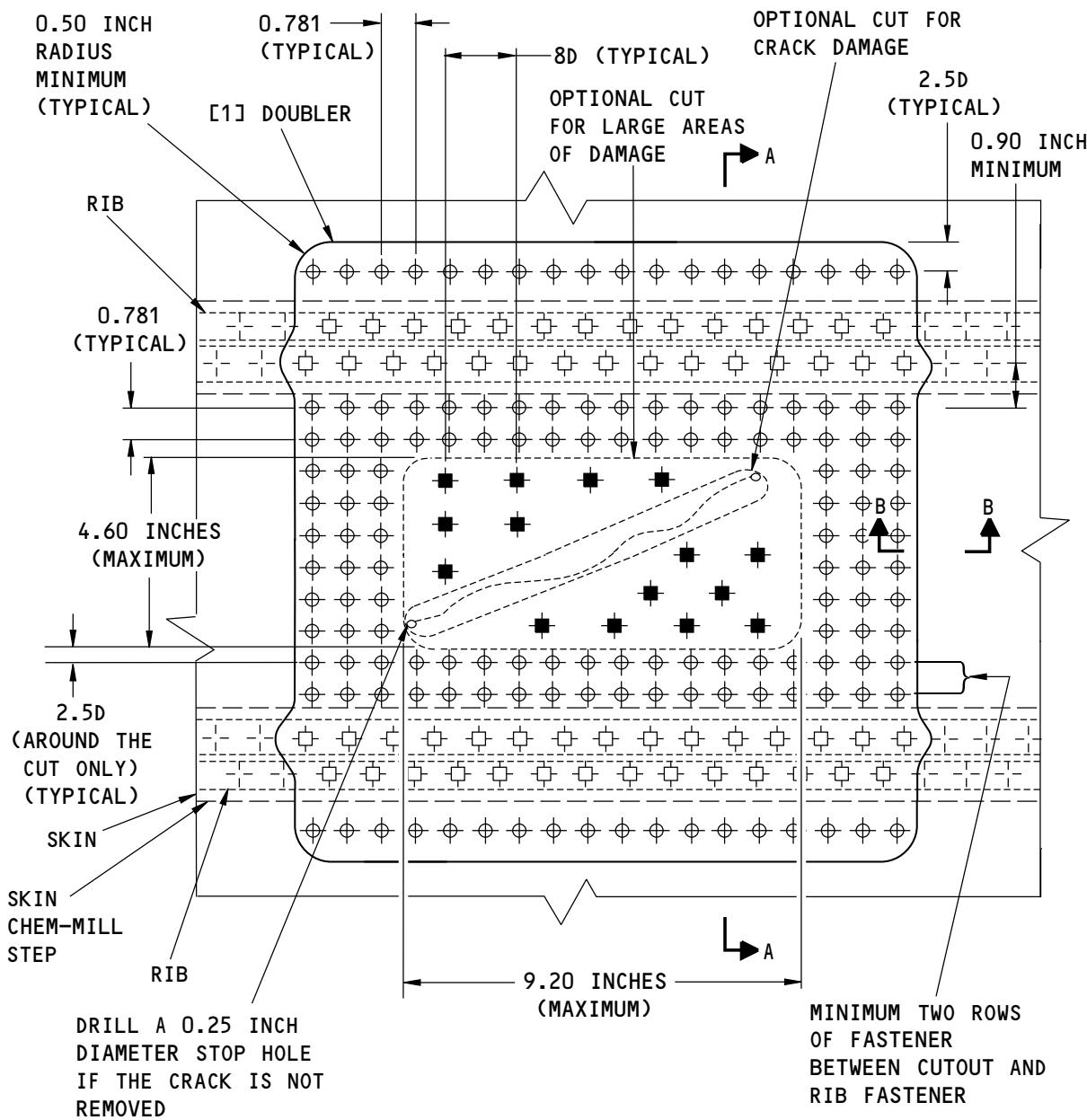
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CATEGORY C TEMPORARY REPAIR AND CATEGORY A PERMANENT REPAIR THAT REPLACES A
CATEGORY C TEMPORARY REPAIR IS SHOWN

DETAIL I

F72222 S0006593340_V2

Inspair Skin External Category C Temporary and Category A permanent Repair - Fin Stations 73.400 thru 196.663

Figure 203 (Sheet 1 of 3)

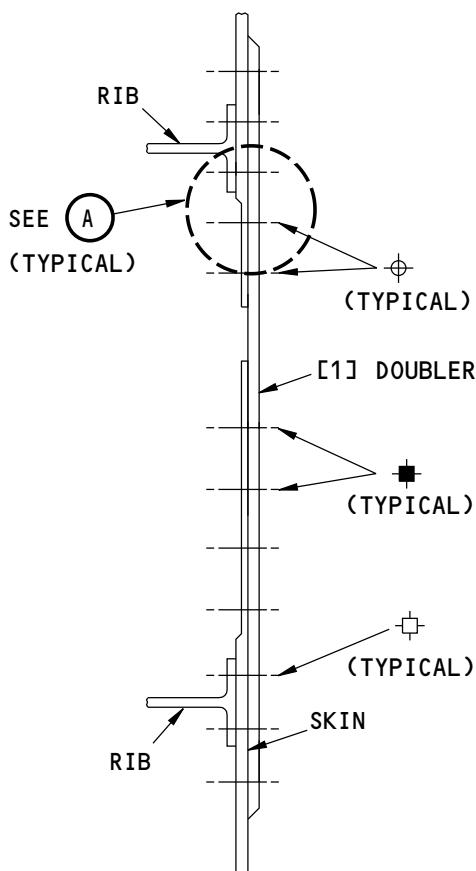
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Page 208

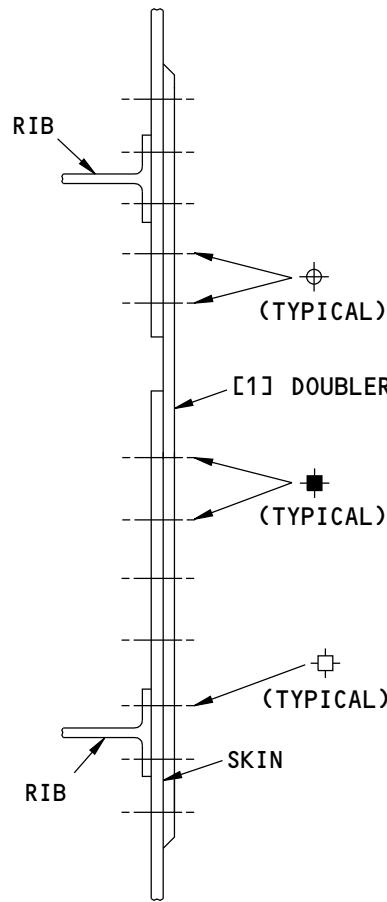
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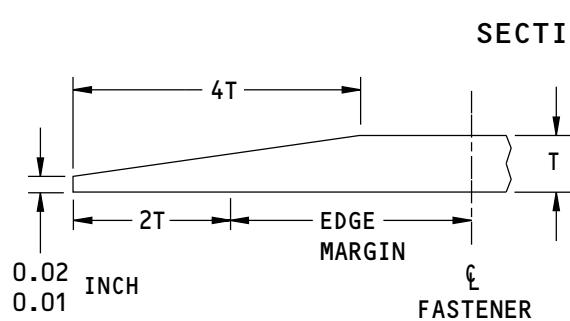
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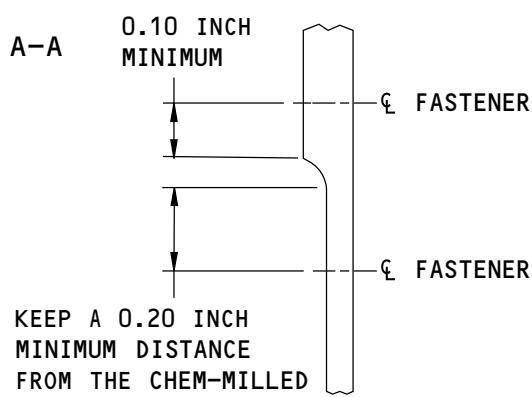
**SECTION THROUGH REPAIR
OF CHEM-MILLED SKIN
SMALL CUT IS SHOWN**



**SECTION THROUGH REPAIR OF
SKIN WITH CONSTANT THICKNESS**



**SECTION OF DOUBLER EDGE
SECTION B-B**



H02304 S0006593344_V2

**Inspar Skin External Category C Temporary and Category A permanent Repair - Fin Stations 73.400 thru
196.663**

Figure 203 (Sheet 2 of 3)

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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THERE IS A MINIMUM OF TWO ROWS OF FASTENERS BETWEEN THE TRIM EDGE AND RIB FASTENER ROW.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- IF DOUBLER [1] EDGE ENDS ON RIB FASTENER ROW, THEN EXTEND DOUBLER EDGE ONE ROW FASTENER BEYOND THE RIB FASTENER ROW.

FASTENER SYMBOLS

- !- REFERENCE FASTENER
- ⊕ REPAIR FASTENER LOCATION. INSTALL A BACR15FP5E BLIND RIVET FOR THE CATEGORY C TEMPORARY REPAIR. INSTALL A BACR15CE6() SOLID RIVET IF REPLACING A INITIAL CATEGORY C TEMPORARY REPAIR WITH A CATEGORY A PERMANENT REPAIR. REFER TO SRM 51-40-00 THROUGH SRM 51-40-06 FOR THE FASTENER DATA.
- INITIAL FASTENER LOCATION. INSTALL A BACR15FP()E BLIND RIVET THAT IS SAME DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER FOR THE CATEGORY C TEMPORARY REPAIR. INSTALL A BACR15CE6() SOLID RIVET IF REPLACING A INITIAL CATEGORY C TEMPORARY REPAIR WITH A CATEGORY A PERMANENT REPAIR. REFER TO SRM 51-40-00 THROUGH SRM 51-40-00 THROUGH SRM 51-40-08 FOR THE FASTENER DATA.
- REPAIR FASTENER LOCATION. YOU DO NOT NEED IF YOU MAKE A LARGE CUTOUT. INSTALL A BACR15FP5E BLIND RIVET FOR THE CATEGORY C TEMPORARY REPAIR. INSTALL A BACR15CE6() SOLID RIVET IF REPLACING A INITIAL CATEGORY C TEMPORARY REPAIR WITH A CATEGORY A PERMANENT REPAIR. REFER TO SRM 51-40-00 THROUGH SRM 51-40-06 FOR THE FASTENER DATA.

H02352 S0006593342_V2

Inspair Skin External Category C Temporary and Category A permanent Repair - Fin Stations 73.400 thru 196.663

Figure 203 (Sheet 3 of 3)

55-30-01

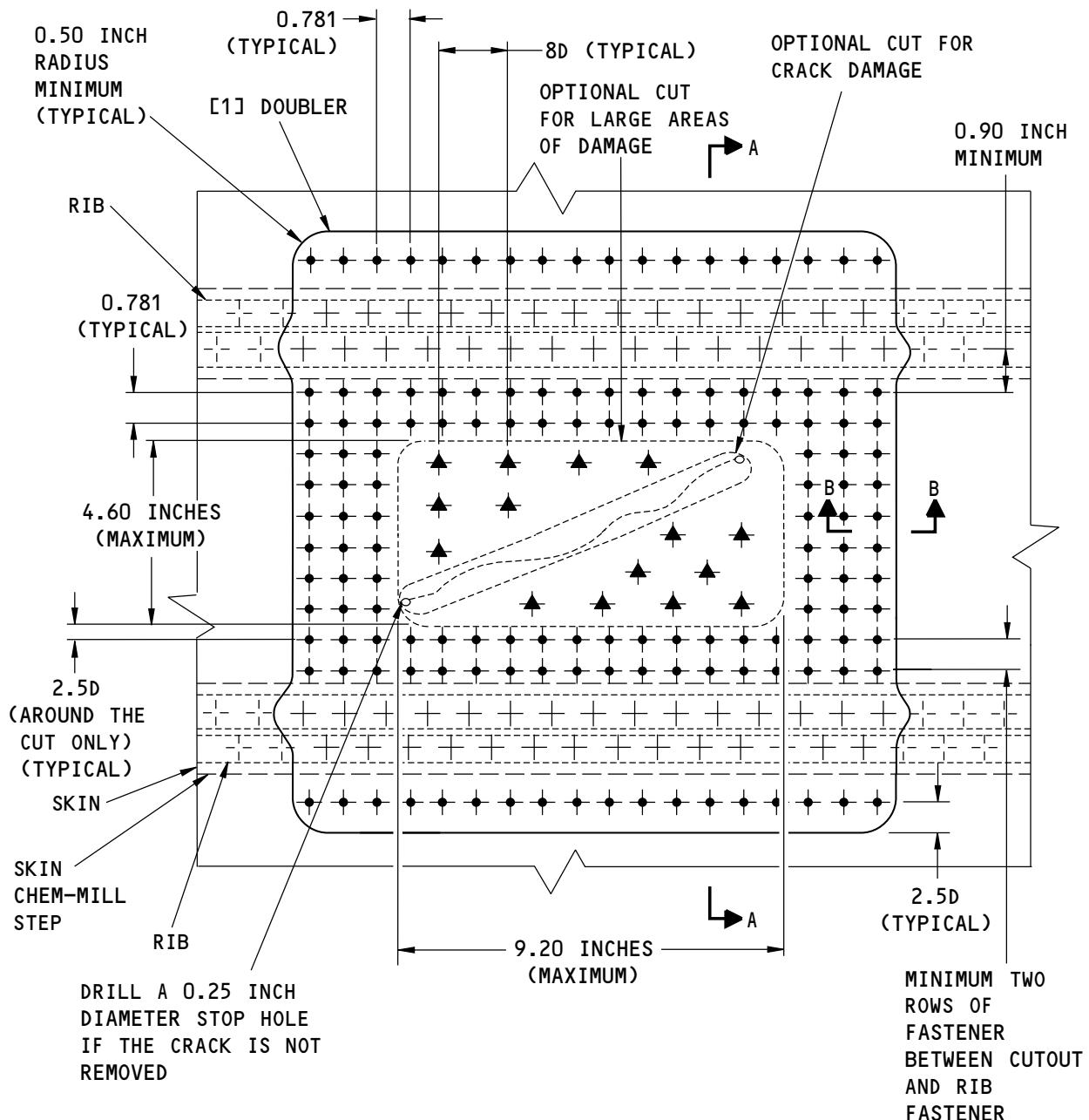
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CATEGORY A PERMANENT REPAIR IS SHOWN

DETAIL I

H02283 S0006593343_V2

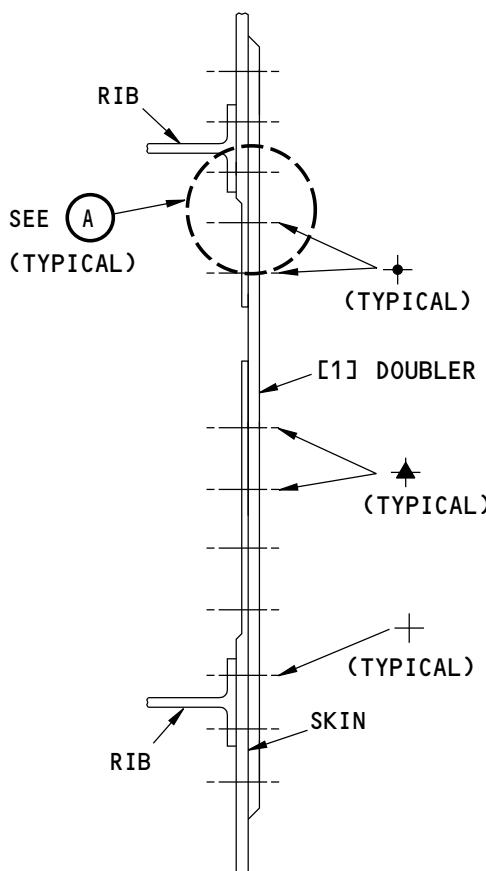
Inspair Skin External Category A permanent Repair - Fin Stations 73.400 thru 196.663
Figure 204 (Sheet 1 of 3)

55-30-01

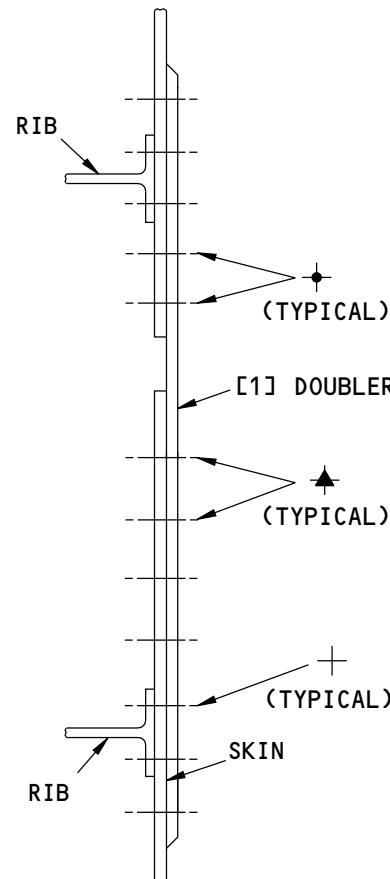
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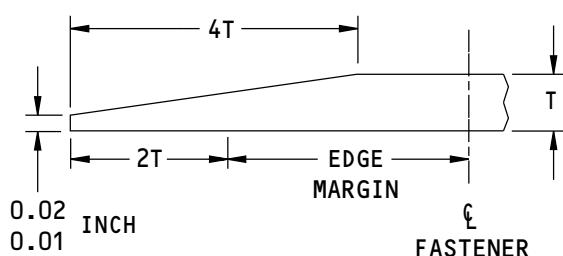
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**SECTION THROUGH REPAIR
OF CHEM-MILLED SKIN
SMALL CUT IS SHOWN**

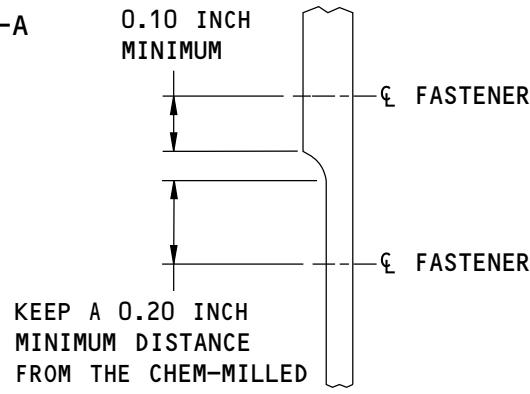


**SECTION THROUGH REPAIR OF
SKIN WITH CONSTANT THICKNESS
SMALL CUT IS SHOWN**

SECTION A-A



**SECTION OF DOUBLER EDGE
SECTION B-B**



F72177 S0006593341_V2

Inspair Skin External Category A permanent Repair - Fin Stations 73.400 thru 196.663
Figure 204 (Sheet 2 of 3)

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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THERE IS A MINIMUM OF TWO ROWS OF FASTENERS BETWEEN THE TRIM EDGE AND RIB FASTENER ROW.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- IF DOUBLER [1] EDGE ENDS ON RIB FASTENER ROW, THEN EXTEND DOUBLER EDGE ONE ROW FASTENER BEYOND THE RIB FASTENER ROW.

FASTENER SYMBOLS

- Reference Fastener
- Repair Fastener Location. Install a BACR15CE5 solid rivet. Refer to SRM 51-40-00 through SRM 51-40-06 for the fastener data.
- + Initial Fastener Location. Install a BACR15CE() solid rivet that is same diameter (up to 1/32 inch diameter oversize) as the initial fastener. Refer to SRM 51-40-00 through SRM 51-40-08 for the fastener data.
- ▲ Repair Fastener Location. You do not need if you make a large cutout. Install a BACR15CE5() solid rivet. Refer to SRM 51-40-00 through SRM 51-40-06 for the fastener data.

2131923 S0000458032_V1

Inspair Skin External Category A permanent Repair - Fin Stations 73.400 thru 196.663
Figure 204 (Sheet 3 of 3)

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5. Inspection Instructions

- A. Do a detailed visual inspection of the repair at each 2500 flight cycles interval or more frequently. Inspect the blind rivets carefully. Blind rivets that are loose, missing, or damaged must be replaced. Refer to 51-40-02, GENERAL Figure 9.
- B. Remove and replace the Category C temporary repair with a Category A permanent repair within 24 months after the repair installation. Refer to Procedure III.

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REPAIR 4 - VERTICAL STABILIZER INSPAR SKIN EXTERNAL REPAIR BETWEEN RIBS - FIN
STATIONS 196.663 THRU 343.863

1. Applicability

- A. Repair 4 is applicable to the vertical stabilizer inspar skins damage as shown in Figure 202/REPAIR 4 between Fin Stations 196.663 and 343.863.
- B. Applicable to the repair type chosen from the process flow chart as given in Figure 201/REPAIR 4.

2. General

- A. Repair Categorization:
 - (1) Repair 4 is a Category C temporary repair for the Procedure I repair. Refer to 51-00-06, GENERAL for repair categories and definitions. This Category C repair has FAA approval if you do the inspection as given in Figure 203/REPAIR 4. You must replace this Category C repair with Category A repair within 24 months of installation.
 - (2) Repair 4 is a Category A permanent repair for the Procedure II repair and Procedure III repair. Refer to 51-00-06, GENERAL for repair categories and definitions. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
 - (3) Category A Permanent Repair that replaces the initial Category C temporary repair. Refer to 51-00-06, GENERAL for repair categories and definitions. Refer to Procedure III.
- B. This repair has three alternative repair instructions.
 - (1) Procedure I: This repair uses only blind fasteners.
 - (2) Procedure II: This repair uses only solid fasteners.
 - (3) Procedure III: Use this repair to replace Category C temporary repair with Category A permanent repair. This repair uses only solid fasteners.
- C. Make sure the aerodynamic smoothness is satisfactory and in the limits given below:
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
 - (2) The conditions for aerodynamic smoothness shown in 51-10-01, GENERAL Figure 5 must be kept.

NOTE: If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
- D. It is optional to make an access door in the inspar skin. Use this opening to make sure the repair fasteners are installed correctly. Refer to REPAIR 11 to make an access door. Access door should be placed on the opposite side of the skin and staggered to the repair area.

NOTE: One access door installation is permitted. If you need more than one access door installation contact The Boeing Company for stress and weight increase analysis.

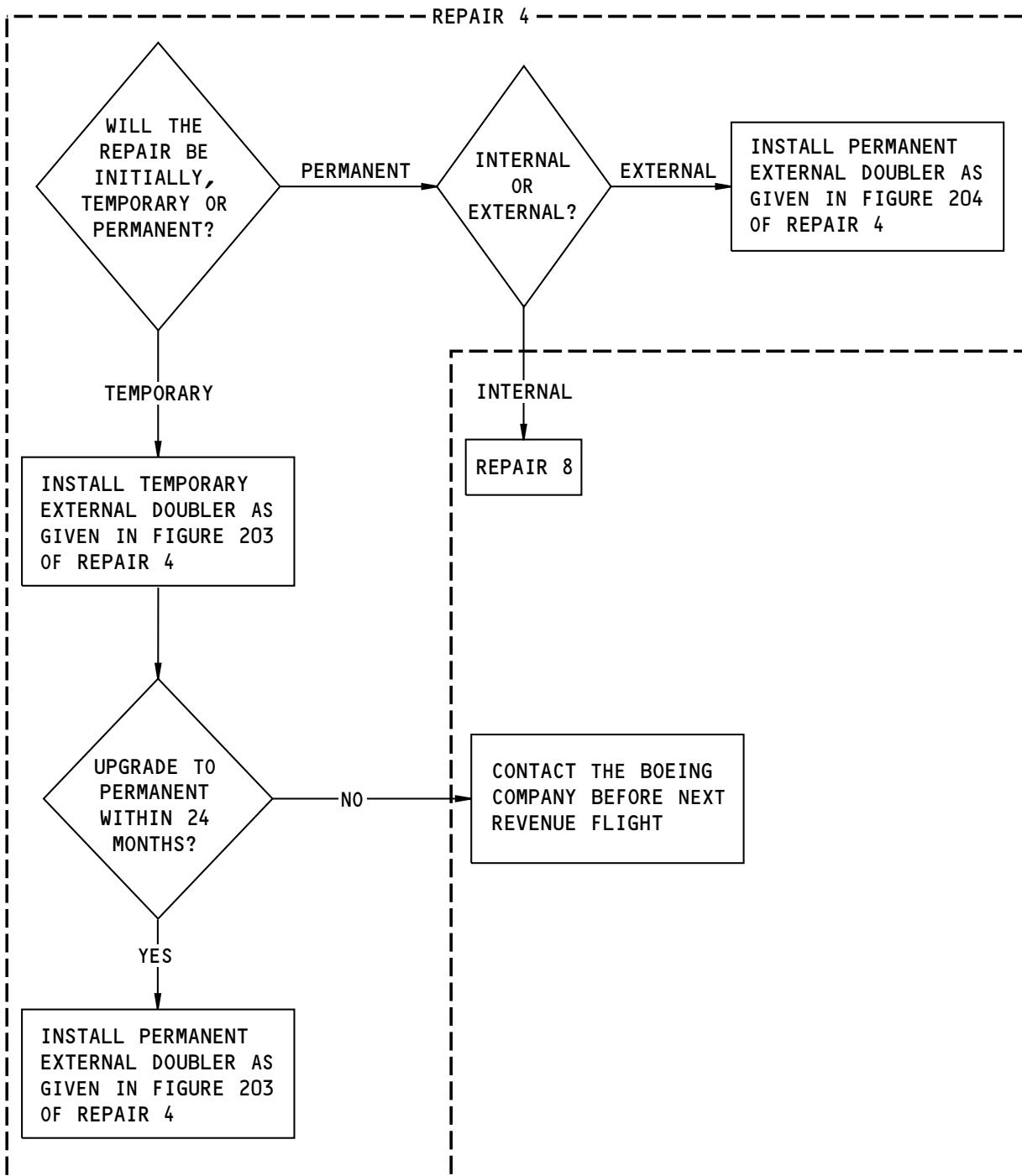
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2132722 S0000457169_V1

**Process Flow Chart
Figure 201**

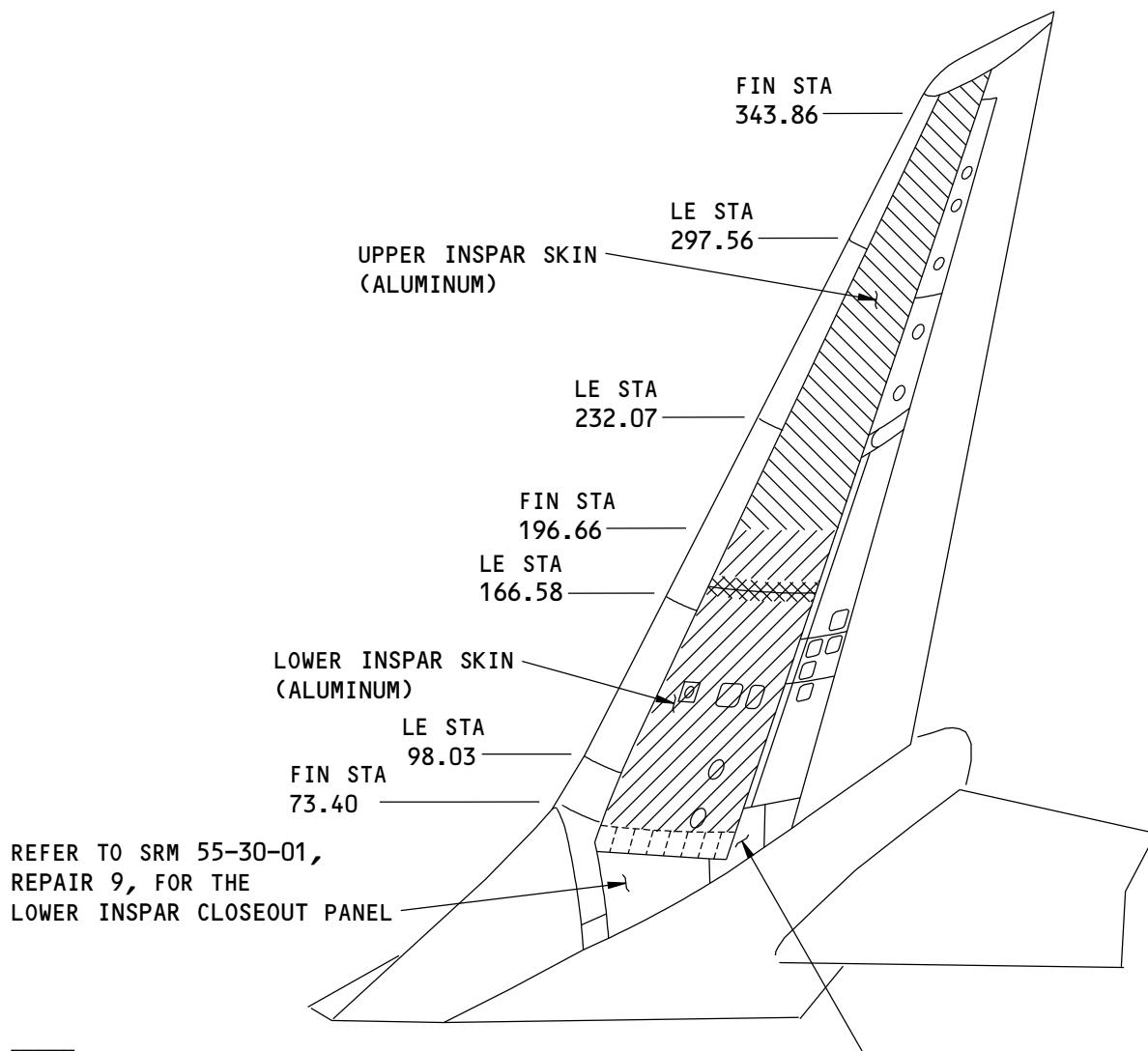
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**REPAIR 4
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FWD

LEFT SIDE IS SHOWN
RIGHT SIDE IS ALMOST THE SAME

2132762 S0000458821_V1

Vertical Stabilizer Inspark Skin Locations
Figure 202

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3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-40-02, GENERAL	Fastener Installation and Removal
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-99	DECORATIVE EXTERIOR PAINT SYSTEM
737 NDT Part 6, 51-00-00, Procedure 1	Fastener Holes in Aluminum Parts (Meter Display)
737 NDT Part 6, 51-00-00, Procedure 16	Aluminum Part Fastener Hole Inspection (Rotary Scanner)

4. Repair Instructions

A. Procedure I. Temporary Repair

- (1) Get access to the damaged area.
- (2) Do step (a) or (b) to remove damage:
 - (a) Drill a stop hole at the ends of all skin cracks that do not end at fastener holes. Refer to Figure 203/REPAIR 4, and 51-10-02, GENERAL for Procedure for Stop-Drilling of Cracks. Go to Step 4.A.(3).
 - 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - (b) Cut and remove the damaged part of the skin as shown in Figure 203/REPAIR 4. Refer to 51-10-02, GENERAL for the procedures to remove the damage.
 - 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - 2) For large cuts, make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - 3) Cutout can not be larger than 4.60 in. (11.68 cm) by 9.2 in. (23.4 cm).
 - 4) Make the corner radii of the cut a minimum of 0.50 inch.
- (3) Put the skin that is around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- (4) Make the part [1] doubler as shown in Figure 203/REPAIR 4. Refer to Table 201/REPAIR 4 for the repair material. Refer to Table 202/REPAIR 4 for the repair doubler thicknesses. Make the contour of the part [1] doubler the same as the initial contour of the skin.

Table 201: Repair Material

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 or 203 for the necessary thickness of the material. The use of clad material is recommended.

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Table 202: Repair Material Thicknesses And Repair Fastener Diameter for Procedure I and II

INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.050	5/32
0.041	0.063	5/32

- (5) Assemble the part [1] doubler as shown in Figure 203/REPAIR 4 and Table 202/REPAIR 4 for fasteners hole dimension.
- (6) Drill the fastener holes. Refer to 51-40-02, GENERAL and 51-40-05, GENERAL.
NOTE: Make sure that blind rivets are correctly seated at inner face of the inspar skin. Refer to 51-40-02, GENERAL for fastener installation. Do not locate blind rivets too close to the radius of inspar skin chem-mill step.
- (7) Remove the part [1] doubler.
- (8) Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- (9) Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- (10) Apply one layer of BMS 10-79 Type II or III, primer to the part [1] doubler and the bare surfaces of the skin. Refer to 51-20-01, GENERAL for the procedures to apply the primer.
- (11) Install repair washers in those original countersink holes where the countersink areas will be covered by the doubler. Refer to 51-40-08, GENERAL for countersink.
- (12) Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL sealant application.
- (13) Install the fasteners without sealant. Refer to 51-40-02, GENERAL.
- (14) Apply a fillet seal along the edges of the repair parts. Refer to 51-20-05, GENERAL
- (15) Apply the decorative finish to the repair area. Refer to AMM SUBJECT 51-21-99.

B. Procedure II. Initial Permanent Repair

- (1) Get access to the damaged area.

NOTE: Remove the leading edge skin panels or install an access door to gain access back of the repair area to install fasteners correctly. You can use a long bucking bar to reach to the bucking side of the rivets through the access hole on the vertical stabilizer front spar web.

- (2) Do step (a) or (b) to remove damage:
 - (a) Drill a stop hole at the ends of all skin cracks that do not end at fastener holes. Refer to Figure 204/REPAIR 4, and 51-10-02, GENERAL for Procedure for Stop-Drilling of Cracks. Go to Step 4.A.(3).
 - 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - (b) Cut and remove the damaged part of the skin as shown in Figure 204/REPAIR 4. Refer to 51-10-02, GENERAL for the procedures to remove the damage.
 - 1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.

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- 2) For large cuts, make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
- 3) Cutout can not be larger than 4.60 in. (11.68 cm) by 9.2 in. (23.4 cm).
- 4) Make the corner radii of the cut a minimum of 0.50 inch.
- (3) Put the skin around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to Figure 204/REPAIR 4.
- (4) Make the part [1] doubler as shown in Figure 204/REPAIR 4. Refer to Table 201/REPAIR 4 and Table 202/REPAIR 4 for the repair material. Make the contour of the part [1] doubler the same as the initial contour of the skin.
- (5) Assemble the part [1] doubler as shown in Figure 204/REPAIR 4 and Table 202/REPAIR 4 for fasteners hole dimension.
- (6) Drill the fastener holes. Refer to 51-40-02, GENERAL and 51-40-05, GENERAL.
- (7) Remove the part [1] doubler.
- (8) Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- (9) Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- (10) Apply one layer of BMS 10-79 Type II or III, primer to the part [1] doubler and the bare surfaces of the skin. Refer to 51-20-01, GENERAL for the procedures to apply the primer.
- (11) Install repair washers in those original countersink holes where the countersink areas will be covered by the doubler. Refer to 51-40-08, GENERAL for countersink.
- (12) Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL sealant application.
- (13) Install the fasteners without sealant. Refer to 51-40-02, GENERAL.
- (14) Apply a fillet seal along the edges of the repair parts. Refer to 51-20-05, GENERAL
- (15) Apply the decorative finish to the repair area. Refer to AMM SUBJECT 51-21-99.

C. Procedure III. Permanent Repair that replaces temporary repair

- (1) Get access to the damaged area.

NOTE: Remove the leading edge skin panels or install an access door to gain access back of the repair area to install fasteners correctly. You can use a long bucking bar to reach to the bucking side of the rivets through the access hole on the vertical stabilizer front spar web.

- (2) Remove the BACR15FP5E blind rivets and discard the repair doubler. Refer to 51-10-02, GENERAL and 51-40-05, GENERAL.
- (3) Oversize fastener holes by 1/64 inch. Refer to 51-10-02, GENERAL and 51-40-05, GENERAL. Do eddy current inspection of the fastener holes. Refer to 737 NDT Part 6, 51-00-00, Procedure 1 or 737 NDT Part 6, 51-00-00, Procedure 16.
 - (a) If no cracks are found, make the holes larger to install the BACR15CE6 rivets,
 - (b) If cracks are found, enlarge the holes to 3/16 inch in diameter to remove all remaining fatigue damaged material. Do eddy current inspection of the fastener holes again. Refer to 737 NDT Part 6, 51-00-00, Procedure 1 or 737 NDT Part 6, 51-00-00, Procedure 16.

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- (c) If there is a crack, stop and contact to The Boeing Company for further instruction.
- (4) Put the skin around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- (5) Make the part [1] doubler as shown in Figure 203/REPAIR 4. Refer to Table 201/REPAIR 4 and Table 203/REPAIR 4. Make the contour of the part [1] doubler the same as the initial contour of the skin.

Table 203: Repair Material Thicknesses And Repair Fastener Diameter for Procedure III

INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.063	3/16
0.041	0.063	3/16

- (6) Assemble the part [1] doubler as shown in Figure 203/REPAIR 4 and Table 203/REPAIR 4 for fasteners hole dimension..
- (7) Drill the fastener holes. Refer to 51-40-02, GENERAL.
- (8) Remove the part [1] doubler.
- (9) Remove the nicks, scratches, gouges, burrs, and sharp edges from the doubler and the bare surfaces of the skin.
- (10) Apply a chemical conversion coating to the part [1] doubler and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- (11) Apply one layer of BMS 10-79 Type II or III, primer to the part [1] doubler and the bare surfaces of the skin. Refer to 51-20-01, GENERAL for the procedures to apply the primer.
- (12) Install repair washers in those original countersink holes where the countersink areas will be covered by the doubler. Refer to 51-40-08, GENERAL for countersink.
- (13) Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL sealant application.
- (14) Install the fasteners without sealant. Refer to 51-40-02, GENERAL.
- (15) Apply a fillet seal along the edges of the repair parts. Refer to 51-20-05, GENERAL
- (16) Apply the decorative finish to the repair area. Refer to AMM SUBJECT 51-21-99.

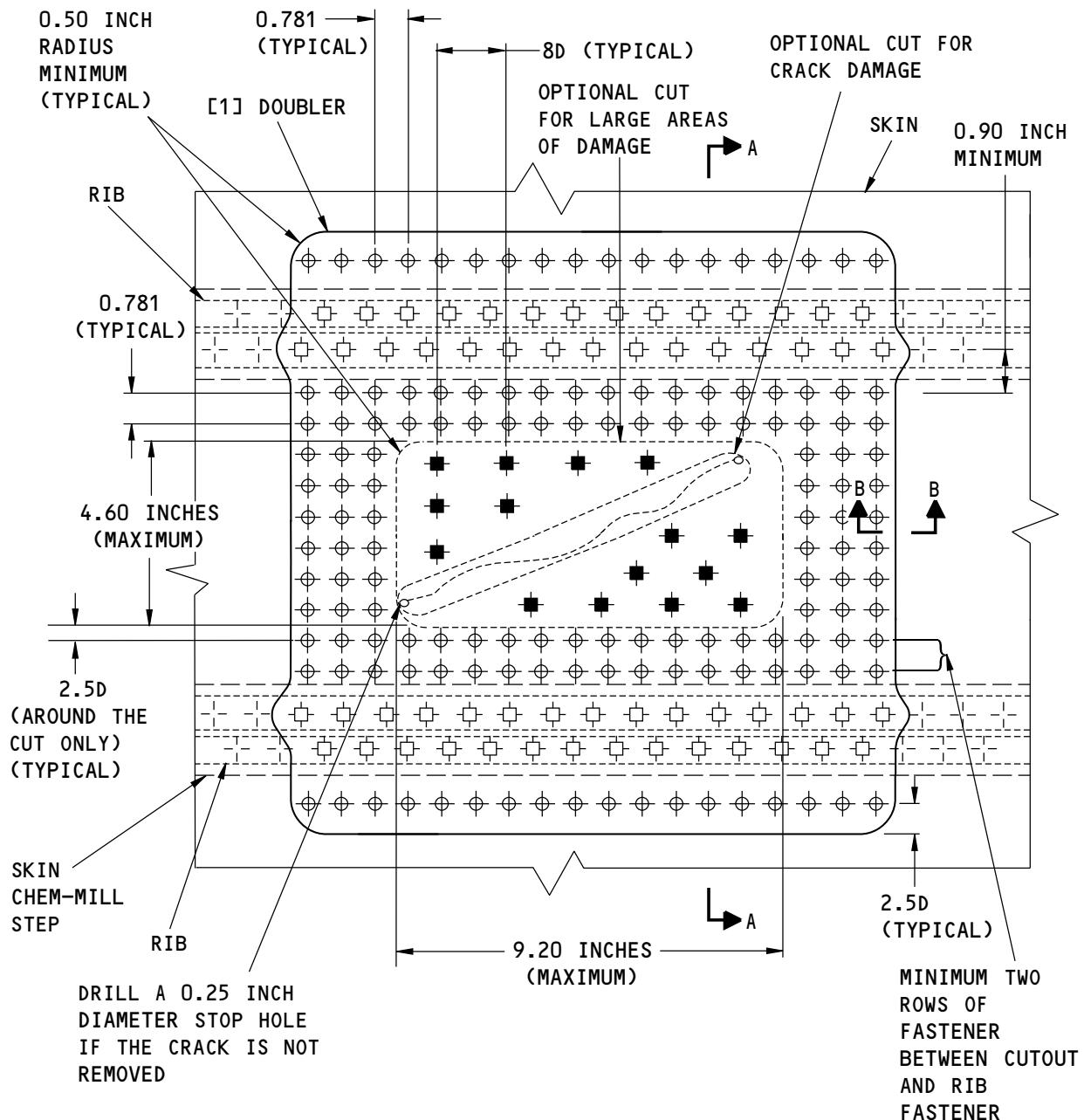
55-30-01

REPAIR 4
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**737-800
STRUCTURAL REPAIR MANUAL**


CATEGORY A PERMANENT REPAIR IS SHOWN

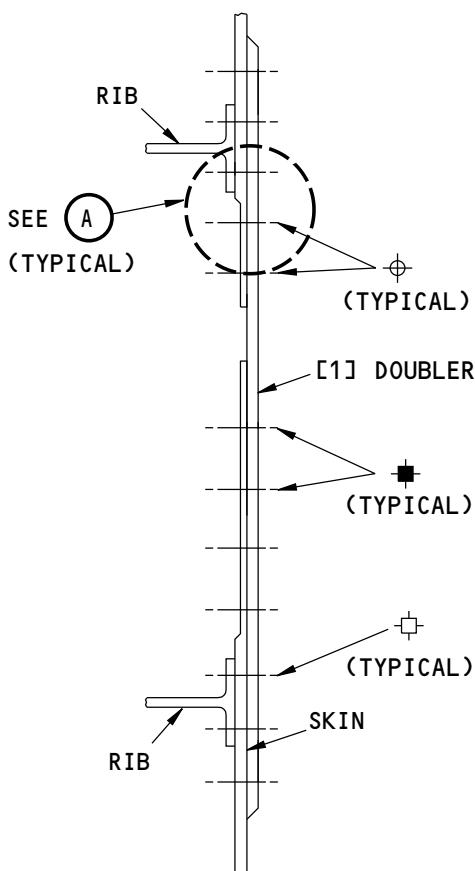
DETAIL I

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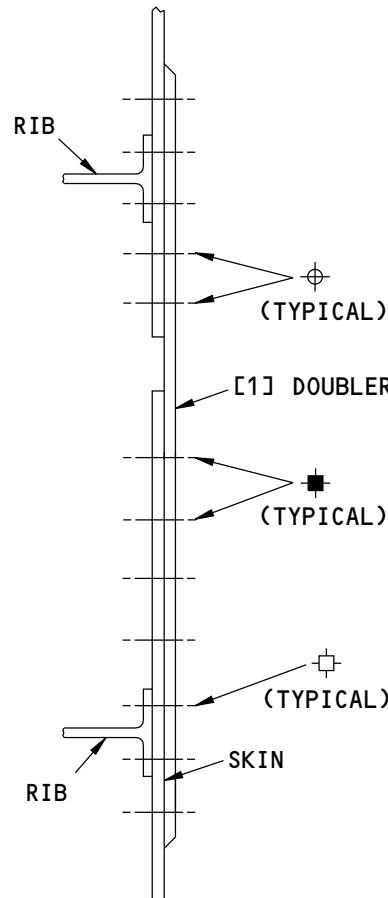
Inspair Skin External Category C Temporary and Category A permanent Repair - Fin Stations 196.663 thru 343.863
Figure 203 (Sheet 1 of 3)
55-30-01
**REPAIR 4
Page 208**

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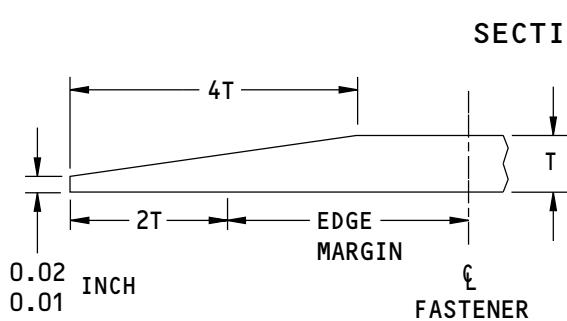
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**737-800
STRUCTURAL REPAIR MANUAL**


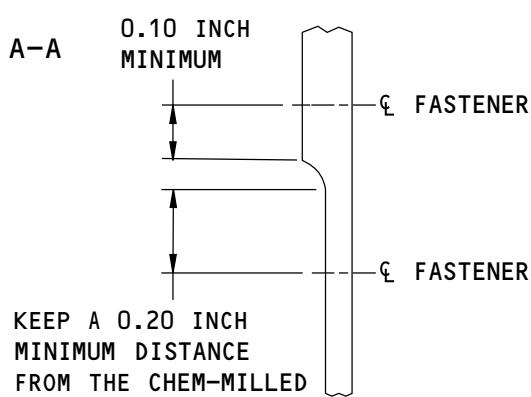
**SECTION THROUGH REPAIR
OF CHEM-MILLED SKIN
SMALL CUT IS SHOWN**



**SECTION THROUGH REPAIR OF
SKIN WITH CONSTANT THICKNESS**



**SECTION OF DOUBLER EDGE
SECTION B-B**



G82966 S0006593353_V2

**Inspair Skin External Category C Temporary and Category A permanent Repair - Fin Stations 196.663
thru 343.863**

Figure 203 (Sheet 2 of 3)

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STRUCTURAL REPAIR MANUAL

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THERE IS A MINIMUM OF TWO ROWS OF FASTENERS BETWEEN THE TRIM EDGE AND RIB FASTENER ROW.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- IF DOUBLER [1] EDGE ENDS ON RIB FASTENER ROW, THEN EXTEND DOUBLER EDGE ONE ROW FASTENER BEYOND THE RIB FASTENER ROW.

FASTENER SYMBOLS

- !- REFERENCE FASTENER
- ⊕ REPAIR FASTENER LOCATION. INSTALL A BACR15FP5E BLIND RIVET FOR THE CATEGORY C TEMPORARY REPAIR. INSTALL A BACR15CE6() SOLID RIVET IF REPLACING A INITIAL CATEGORY C TEMPORARY REPAIR WITH A CATEGORY A PERMANENT REPAIR. REFER TO SRM 51-40-00 THROUGH SRM 51-40-06 FOR THE FASTENER DATA.
- INITIAL FASTENER LOCATION. INSTALL A BACR15FP()E BLIND RIVET THAT IS SAME DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER FOR THE CATEGORY C TEMPORARY REPAIR. INSTALL A BACR15CE6() SOLID RIVET IF REPLACING A INITIAL CATEGORY C TEMPORARY REPAIR WITH A CATEGORY A PERMANENT REPAIR. REFER TO SRM 51-40-00 THROUGH SRM 51-40-00 THROUGH SRM 51-40-08 FOR THE FASTENER DATA.
- REPAIR FASTENER LOCATION. YOU DO NOT NEED IF YOU MAKE A LARGE CUTOUT. INSTALL A BACR15FP5E BLIND RIVET FOR THE CATEGORY C TEMPORARY REPAIR. INSTALL A BACR15CE6() SOLID RIVET IF REPLACING A INITIAL CATEGORY C TEMPORARY REPAIR WITH A CATEGORY A PERMANENT REPAIR. REFER TO SRM 51-40-00 THROUGH SRM 51-40-06 FOR THE FASTENER DATA.

2132766 S0000461878_V1

Inspair Skin External Category C Temporary and Category A permanent Repair - Fin Stations 196.663
thru 343.863

Figure 203 (Sheet 3 of 3)

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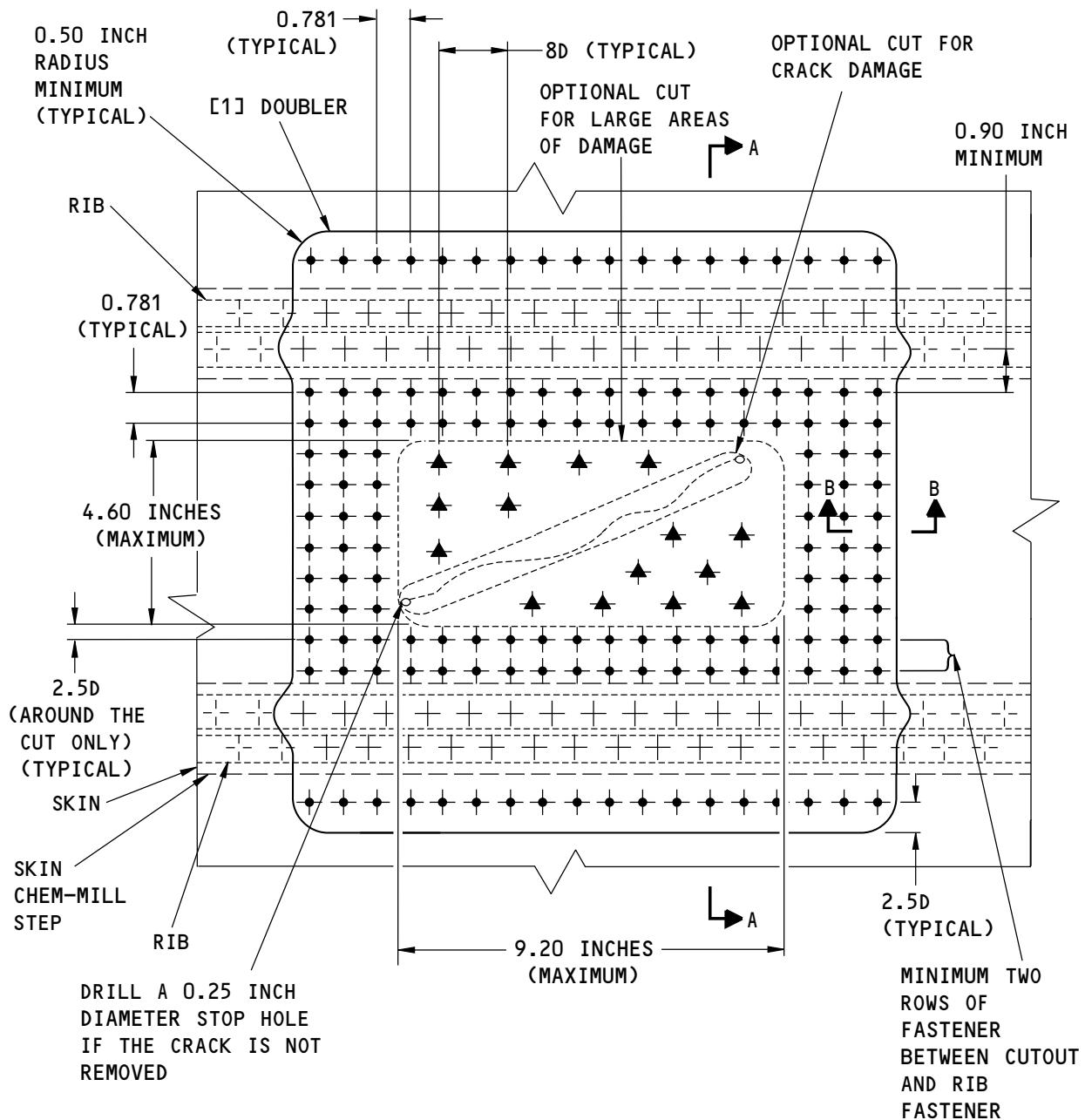
REPAIR 4
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STRUCTURAL REPAIR MANUAL



CATEGORY A PERMANENT REPAIR IS SHOWN

DETAIL I

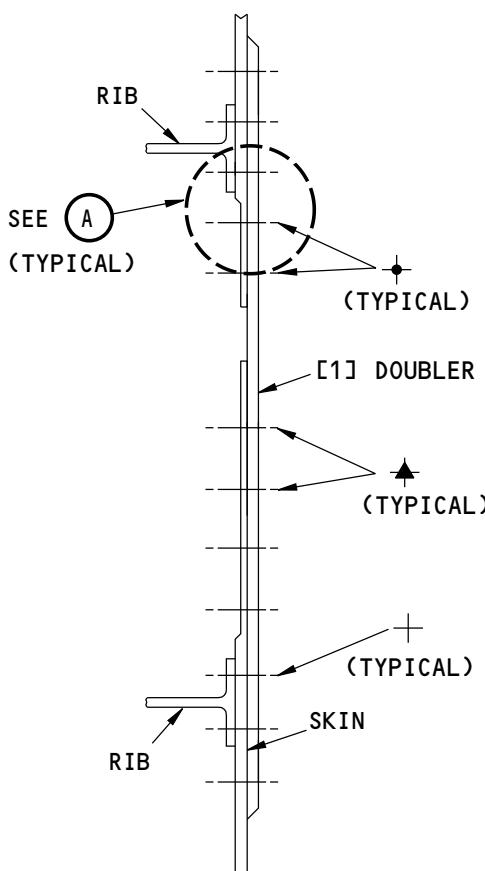
H02284 S0006593354_V2

Inspair Skin External Category A Permanent Repair - Fin Stations 196.663 thru 343.863
Figure 204 (Sheet 1 of 3)

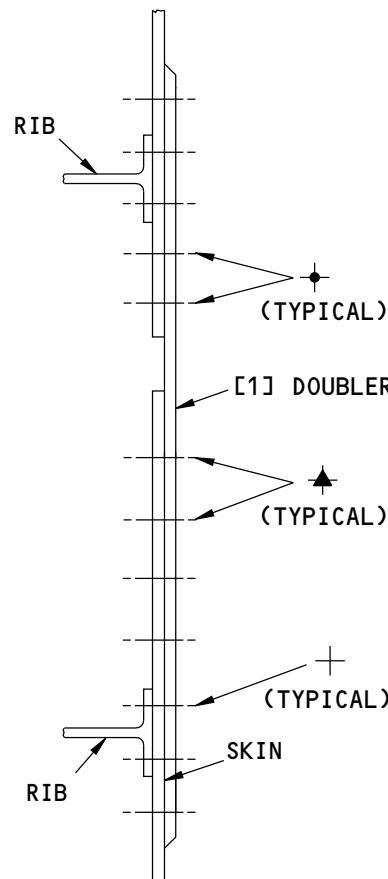
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REPAIR 4
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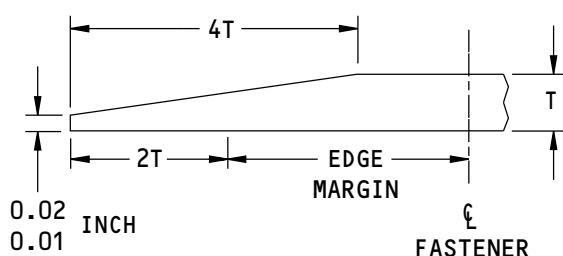
**737-800
STRUCTURAL REPAIR MANUAL**


**SECTION THROUGH REPAIR
OF CHEM-MILLED SKIN
SMALL CUT IS SHOWN**

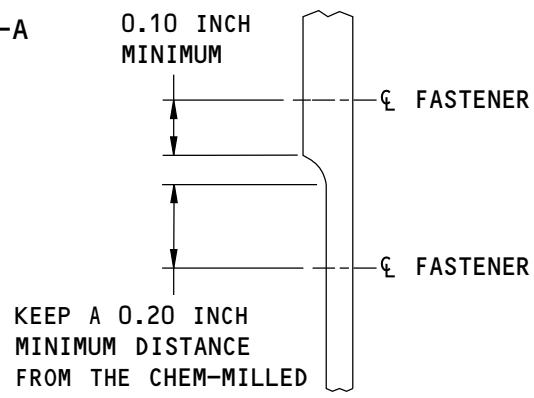


**SECTION THROUGH REPAIR OF
SKIN WITH CONSTANT THICKNESS
SMALL CUT IS SHOWN**

SECTION A-A



**SECTION OF DOUBLER EDGE
SECTION B-B**



H02303 S0006593355_V2

Inspair Skin External Category A Permanent Repair - Fin Stations 196.663 thru 343.863
Figure 204 (Sheet 2 of 3)

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STRUCTURAL REPAIR MANUAL**

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THERE IS A MINIMUM OF TWO ROWS OF FASTENERS BETWEEN THE TRIM EDGE AND RIB FASTENER ROW.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- IF DOUBLER [1] EDGE ENDS ON RIB FASTENER ROW, THEN EXTEND DOUBLER EDGE ONE ROW FASTENER BEYOND THE RIB FASTENER ROW.

FASTENER SYMBOLS

- Reference Fastener
- Repair Fastener Location. Install a BACR15CE5 solid rivet. Refer to SRM 51-40-00 through SRM 51-40-06 for the fastener data.
- + Initial Fastener Location. Install a BACR15CE() solid rivet that is same diameter (up to 1/32 inch diameter oversize) as the initial fastener. Refer to SRM 51-40-00 through SRM 51-40-08 for the fastener data.
- ▲ Repair Fastener Location. You do not need if you make a large cutout. Install a BACR15CE5() solid rivet. Refer to SRM 51-40-00 through SRM 51-40-06 for the fastener data.

2132769 S0000461879_V1

Inspar Skin External Category A Permanent Repair - Fin Stations 196.663 thru 343.863
Figure 204 (Sheet 3 of 3)

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5. Inspection Instructions

A. For Category C repair, do the follows:

- (1) Do a detailed visual inspection of the repair at each 2500 flight cycles interval or more frequently. Inspect the blind rivets carefully. Blind rivets that are loose, missing, or damaged must be replaced. Refer to 51-40-02, GENERAL Figure 9.
- (2) Remove and replace the Category C temporary repair with a Category A permanent repair within 24 months after the repair installation. Refer to Procedure III.

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REPAIR 5 - VERTICAL STABILIZER INSPAR SKIN FLUSH REPAIR BETWEEN RIBS - FIN STATIONS
73.400 THRU 196.663

1. Applicability

- A. Repair 5 is applicable:
 - (1) To damage to the vertical stabilizer inspar skins shown in Vertical Stabilizer Inspark Skin Locations, Figure 201/REPAIR 5 between Fin Stations 73.400 and 196.663.
 - (2) As a replacement repair for Repair 3.
 - (3) As an alternative to Repair 6.

2. General

- A. Repair 5 gives instructions for a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes.
 - (2) The conditions for aerodynamic smoothness shown in Vertical Stabilizer Inspark Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners, Figure 202/REPAIR 5 must be kept.
- C. It is optional to make an access door in the inspar skin. Use these openings to make sure the repair fasteners are installed correctly. Refer to Repairs 10 and 11 to make an access door.

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REPAIR 5
Page 201

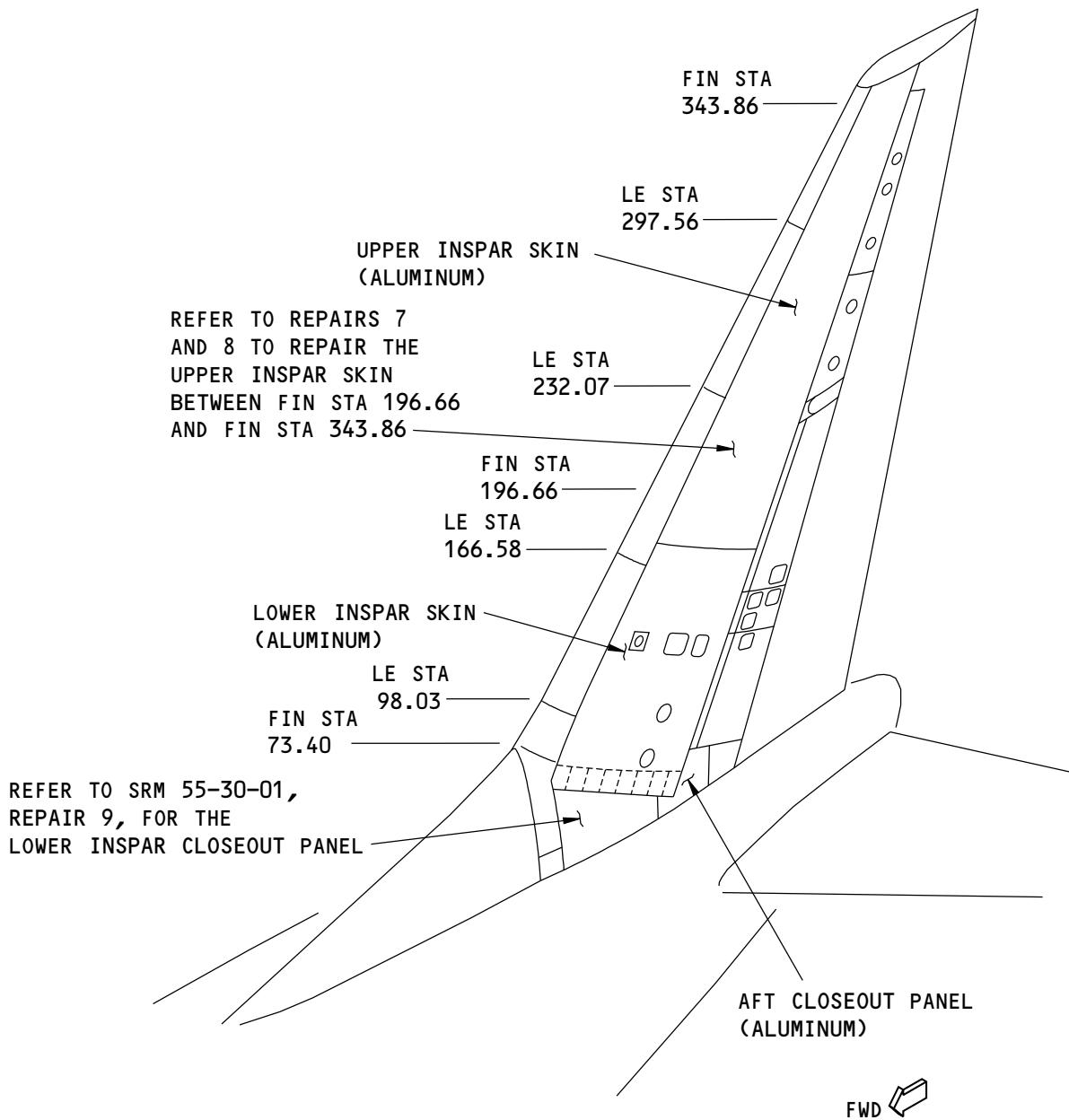
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Vertical Stabilizer Inspark Skin Locations
Figure 201

55-30-01

REPAIR 5
Page 202

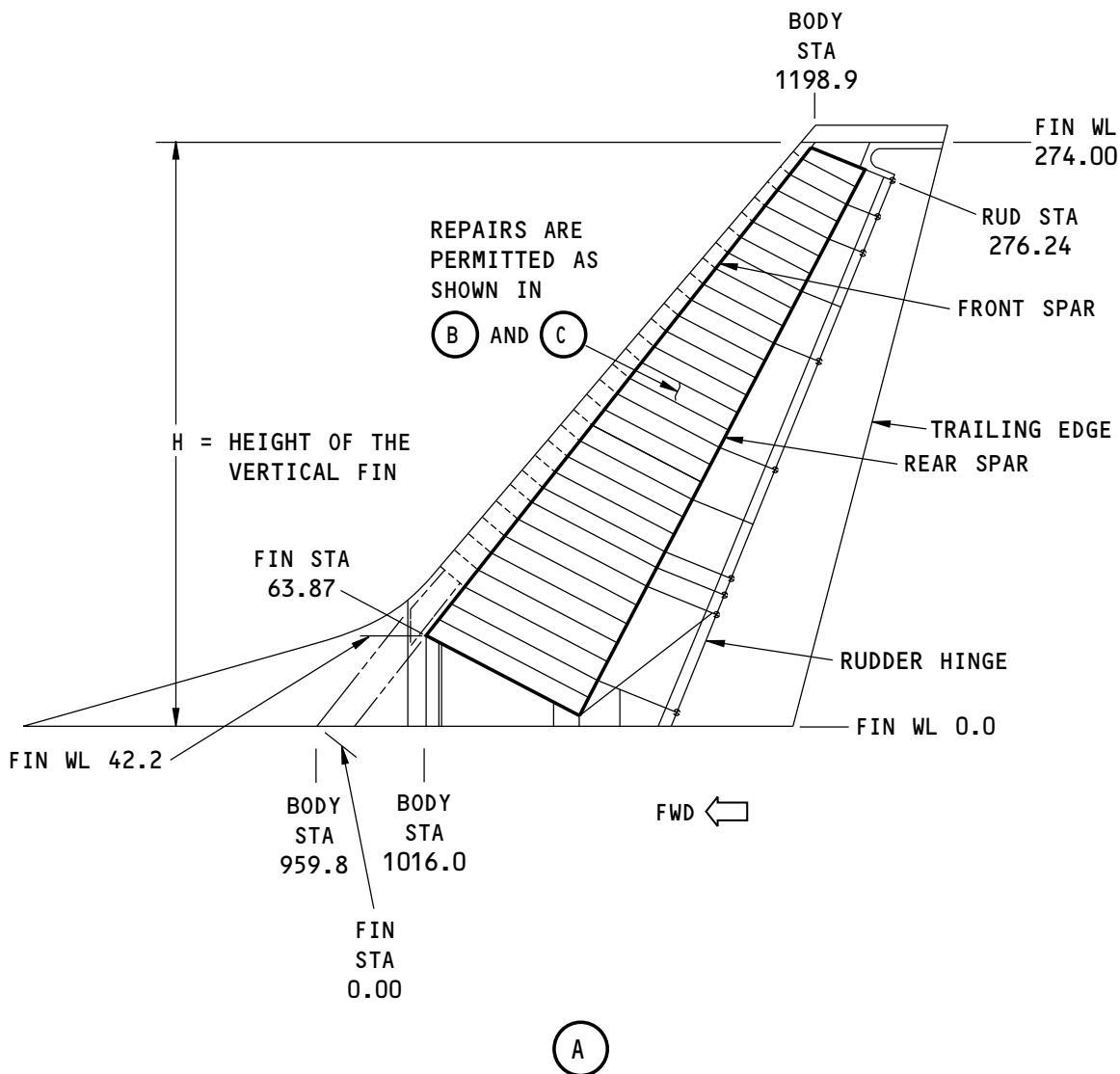
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G84076 S0006593358_V1

Vertical Stabilizer In-spar Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 202 (Sheet 1 of 3)

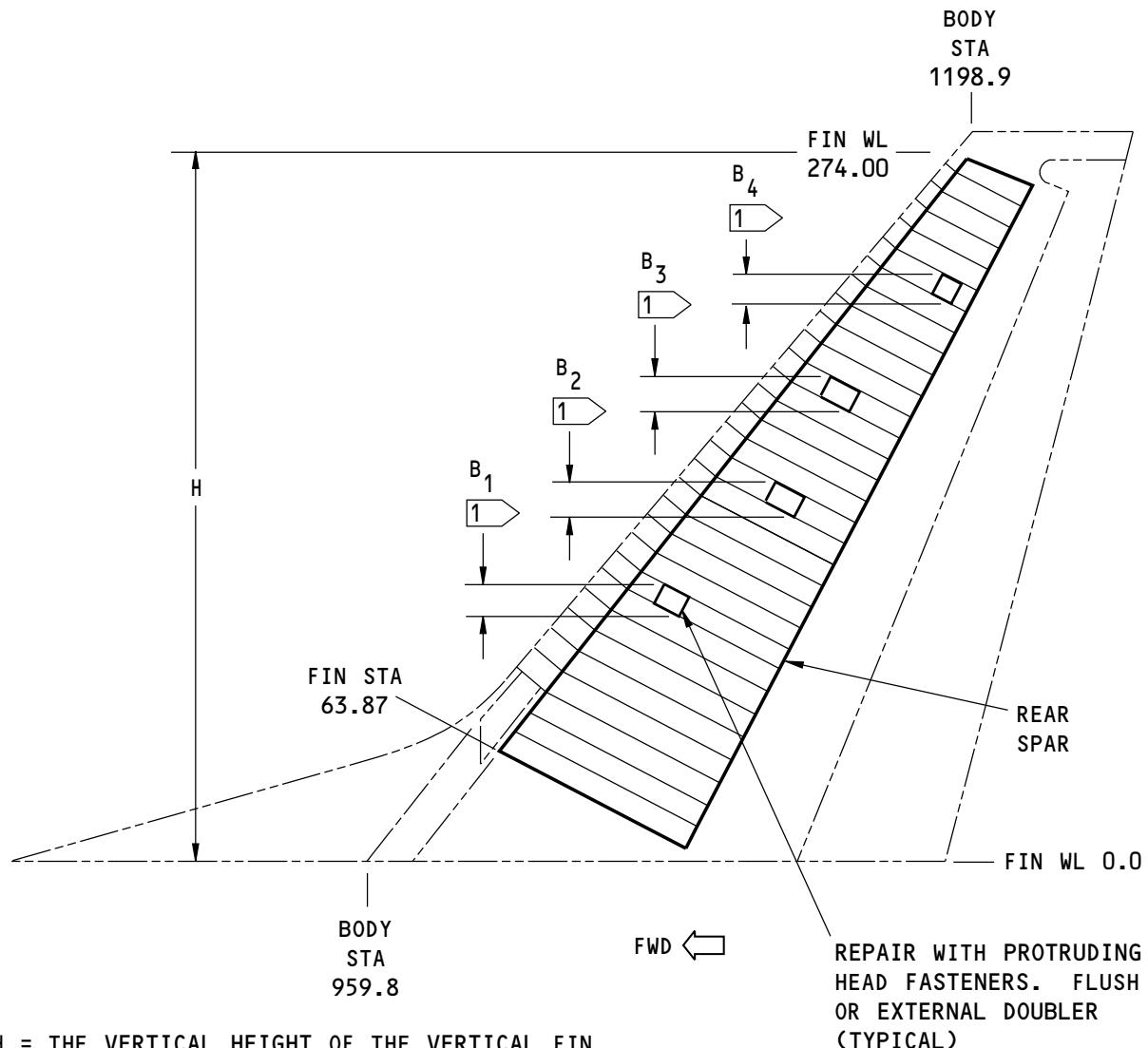
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H = THE VERTICAL HEIGHT OF THE VERTICAL FIN

B₁, B₂, B₃, B₄ = THE VERTICAL HEIGHTS OF THE REPAIRS

B₁ + B₂ + B₃ + B₄ = A MAXIMUM OF $\frac{H}{4}$ = 68.5 INCHES MAXIMUM

(B)

NOTES

1 ONLY ONE REPAIR IS PERMITTED ACROSS THE AIRFLOW. A SECOND REPAIR DOWNSTREAM IS NOT PERMITTED.

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Vertical Stabilizer In-spar Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 202 (Sheet 2 of 3)

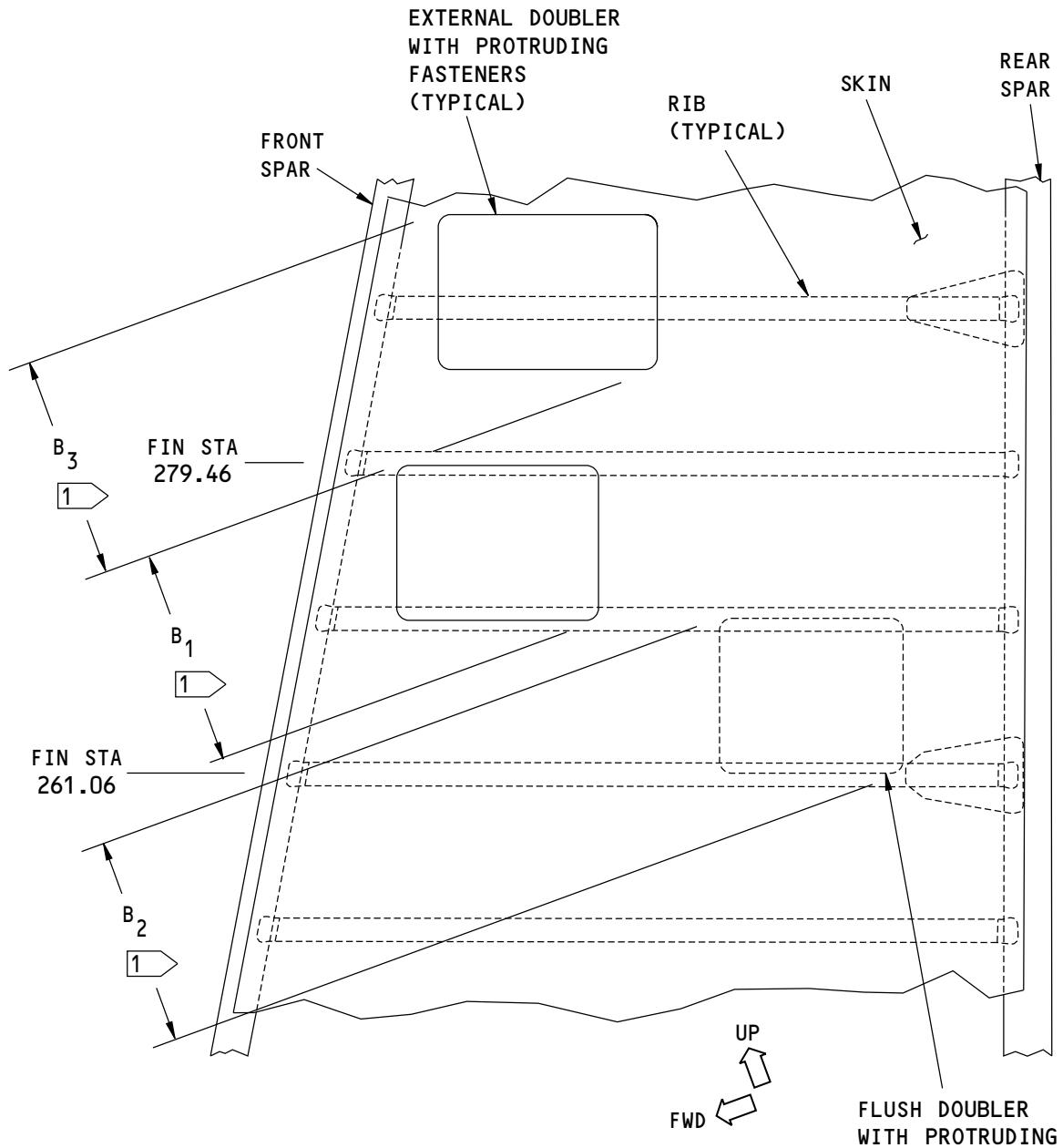
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(C)

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Vertical Stabilizer Inspar Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 202 (Sheet 3 of 3)

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. If this repair replaces an external repair, remove the repair fasteners, repair doubler, and sealant of the external repair. Refer to 51-40-02 for the procedures to remove the repair fasteners.
- B. Get access to the damaged area of the inspar skin as follows:
 - (1) Remove the leading edge skin panels or install an access door.
- C. Cut and remove the damaged part of the skin as shown in Vertical Stabilizer Inspar Skin Flush Repair Between Ribs - Fin Stations 73.400 through 196.663, Figure 203/REPAIR 5. Refer to 51-10-02 for the procedures to remove the damage.
 - (1) Make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - (2) Make the corner radii of the cut a minimum of 0.50 inch.
- D. Put the skin that is around the damage back to the initial contour.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01.
- E. Make the repair parts as shown in Vertical Stabilizer Inspar Skin Flush Repair Between Ribs - Fin Stations 73.400 through 196.663, Figure 203/REPAIR 5. Refer to Table 201/REPAIR 5 for the repair material.
 - (1) Make the contour of the repair parts the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended
[2]	Filler	1	Use clad or bare 2024-T3 that is the same thickness as the initial skin. The use of clad material is recommended

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Table 202:

REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.050	5/32
0.040	0.063	5/32
0.041	REPAIR NOT PERMITTED	-----
0.060	REPAIR NOT PERMITTED	-----
0.071	REPAIR NOT PERMITTED	-----

- F. Assemble the repair parts as shown in Vertical Stabilizer Inspark Skin Flush Repair Between Ribs - Fin Stations 73.400 through 196.663, Figure 203/REPAIR 5.
- G. Drill the fastener holes.
 - (1) Align fastener holes in the repair parts with holes in the skin made from an external repair.
- H. Remove the repair parts.
- I. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- J. Apply a chemical conversion coating to the repair parts and bare surfaces of the skin. Refer to 51-20-01 for the chemical conversion coating procedures.
- K. Apply one layer of BMS 10-79, Type II or III, primer to the area of the repair. Refer to SOPM 20-44-04 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the skin.
- L. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
- M. Install the rivets without sealant in the repair parts and skin.
- N. Apply BMS 5-95 or BMS 5-26 sealant in the space between the filler and the edge of the skin cut. Refer 51-20-05 for the procedures to apply the sealant.
- O. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.

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REPAIR 5
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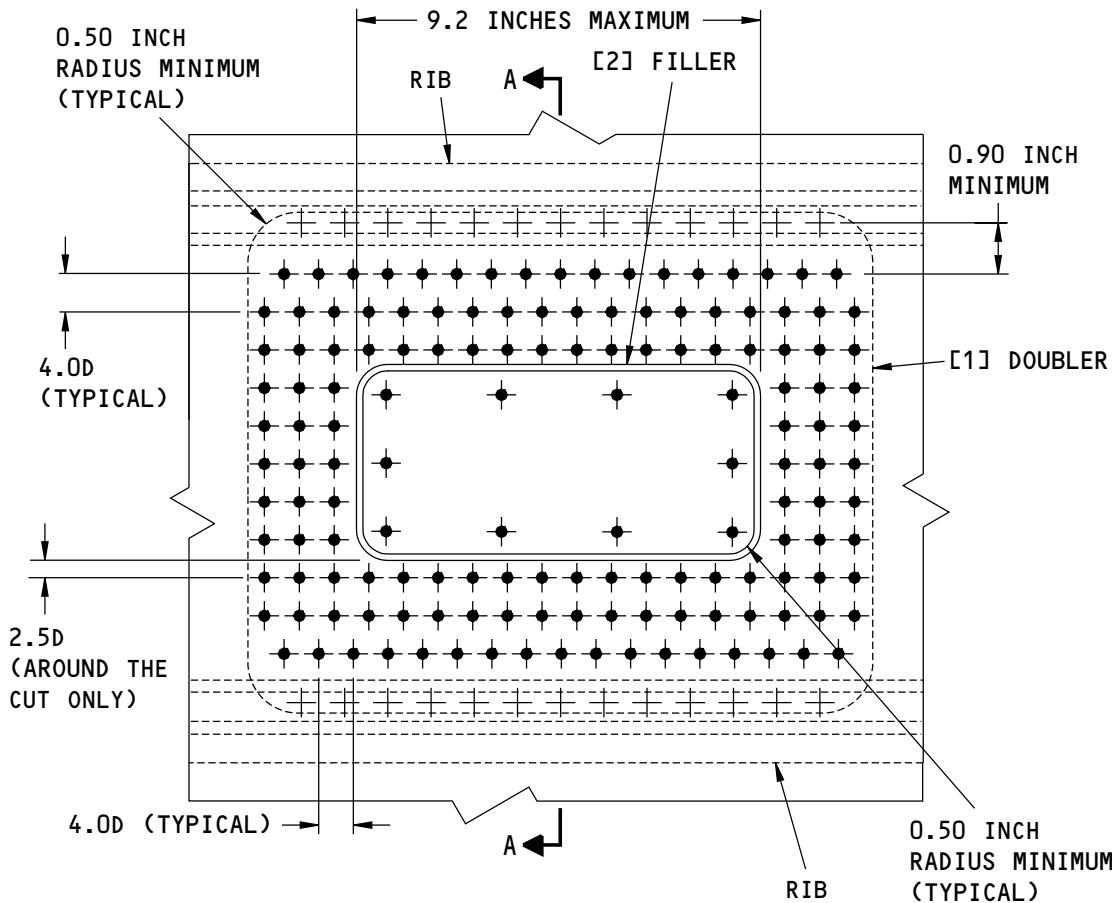
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STRUCTURAL REPAIR MANUAL



TYPICAL REPAIR

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACR15FT5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-06 FOR THE FASTENER DATA.

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Vertical Stabilizer Inspar Skin Flush Repair Between Ribs - Fin Stations 73.400 through 196.663
Figure 203 (Sheet 1 of 2)

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REPAIR 5
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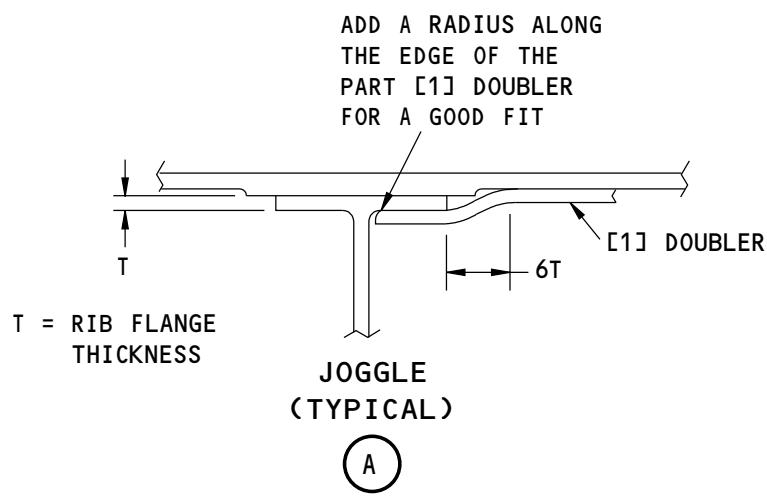
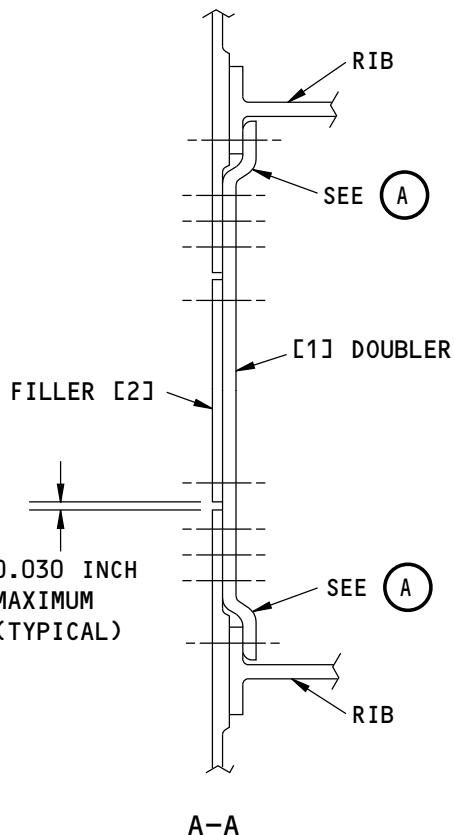
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Vertical Stabilizer Inspark Skin Flush Repair Between Ribs - Fin Stations 73.400 through 196.663
Figure 203 (Sheet 2 of 2)

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REPAIR 6 - VERTICAL STABILIZER INSPAR SKIN FLUSH REPAIR WITH SPLICED DOUBLER
BETWEEN RIBS - FIN STATIONS 73.400 THRU 196.663

1. Applicability

- A. Repair 6 is applicable:
 - (1) To the vertical stabilizer inspar skins damage as shown in Figure 201/REPAIR 6 between Fin Stations 73.400 and 196.663.
 - (2) As an alternate repair for REPAIR 3.

2. General

- A. Repair 6 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
 - B. Make sure the aerodynamic smoothness is satisfactory and in the limits as given below:
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
 - (2) The conditions for aerodynamic smoothness shown in 51-10-01, GENERAL Figure 5 must be kept.
 - NOTE:** If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - C. It is optional to make an access door in the inspar skin. Use these openings to make sure the repair fasteners are installed correctly. Refer to REPAIR 11 to make an access door. Access door have to be placed on opposite side of skin and staggered to the repair area.
- NOTE:** One access door installation is permitted. If you need more than one access door installation contact The Boeing Company for stress and weight increase analysis.

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REPAIR 6
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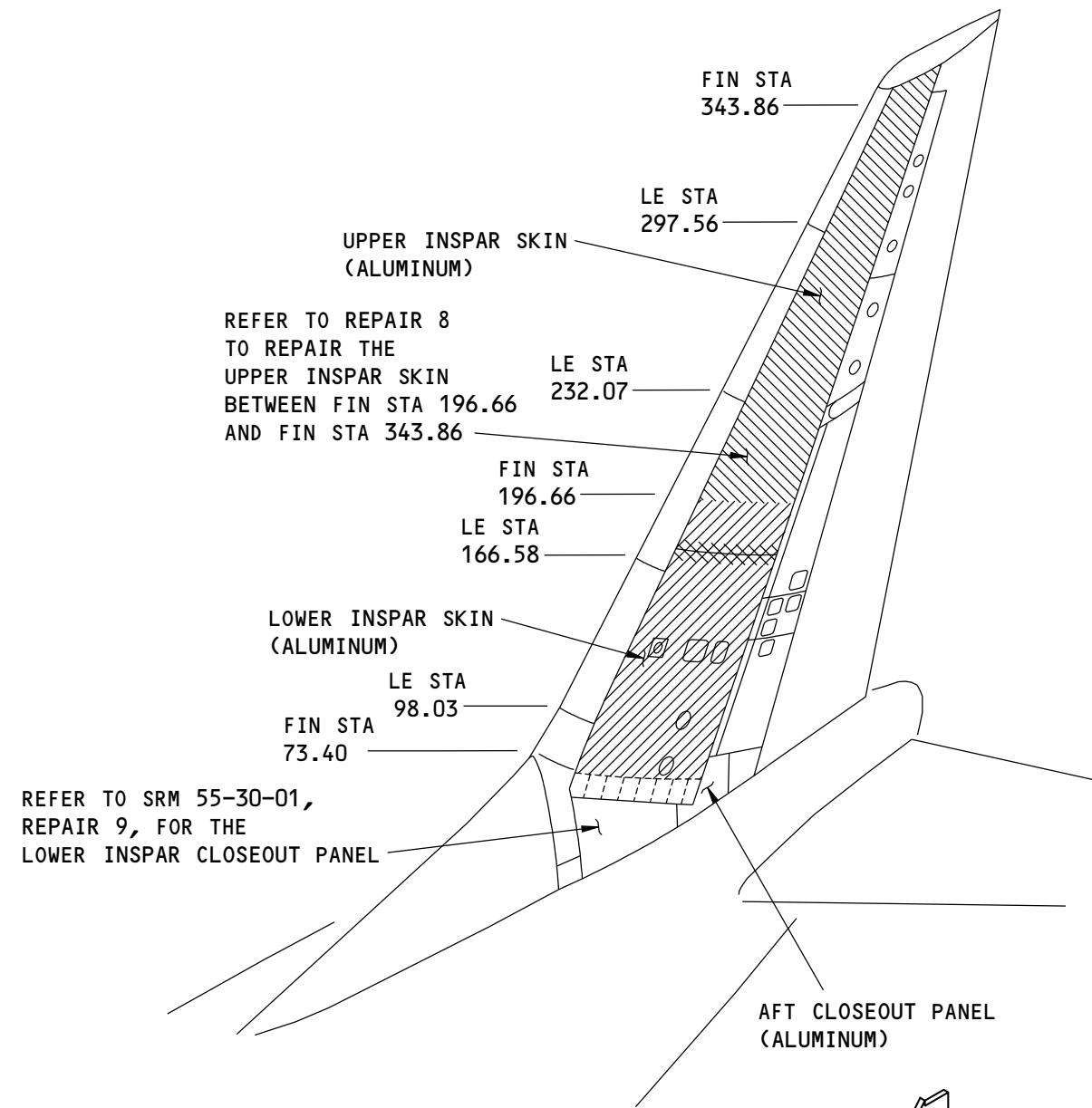
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STRUCTURAL REPAIR MANUAL



NO REPAIR IS PERMITTED AT INSPAR SKIN SPLICE AREA

FWD

PERMITTED REPAIR AREA AT INSPAR SKIN

REFER TO REPAIR 8 TO REPAIR UPPER SKIN

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

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Vertical Stabilizer Inspark Skin Locations
Figure 201

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-40-02, GENERAL	Fastener Installation and Removal
51-40-05, GENERAL	Fastener Hole Sizes
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Get access to the damaged area of the inspar skin.

NOTE: Remove the leading edge skin panels or install an access door to gain access back of the rivets to install fasteners correctly. You can use a long bucking bar to reach to the bucking side of the rivets through the access hole on the vertical stabilizer front spar web.

- B. Cut and remove the damaged part of the skin as shown in Figure 202/REPAIR 6. Refer to 51-10-02, GENERAL for the procedures to remove the damage.
- (1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - (2) Make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - (3) Make the cut in the shape of a rectangle is not larger than 4.60 in. (11.68 cm) by 9.20 in. (23.37 cm).
 - (4) Make the corner radii of the cut a minimum of 0.50 inch.
- C. Put the skin that is around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- D. Make the repair parts as shown in Vertical Stabilizer Inspar Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 73.400 through 196.663, Figure 202/REPAIR 6. Refer to Table 201/REPAIR 6 and Table 202/REPAIR 6 for the repair material. Make the contour of the repair parts the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended.
[2]	Filler	1	Use clad or bare 2024-T3 that is the same thickness as the initial skin. The use of clad material is recommended.
[3]	Doubler Splice	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended.

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Table 202:

REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER AND ITEM [3] DOUBLER SPLICE THICKNESSES (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.050	5/32
0.040	0.063	5/32
0.041	REPAIR NOT PERMITTED	-----
0.060	REPAIR NOT PERMITTED	-----
0.071	REPAIR NOT PERMITTED	-----

- E. Assemble the repair parts as shown in Vertical Stabilizer Inspark Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 73.400 through 196.663, Figure 202/REPAIR 6.
- F. Drill the fastener holes. Refer to 51-40-02, GENERAL and 51-40-05, GENERAL.
- G. Disassemble the repair parts.
- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- I. Apply a chemical conversion coating to the repair parts and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- J. Apply one layer of BMS 10-79, Type II or III, primer to the area of the repair. Refer to SOPM 20-44-04 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the skin.
- K. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL for the procedures to apply the sealant.
- L. Install the rivets without sealant in the repair parts and skin.
- M. Apply BMS 5-95 or BMS 5-26 sealant in the space between the filler and the edge of the skin cut. Refer 51-20-05, GENERAL for the procedures to apply the sealant.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.

55-30-01

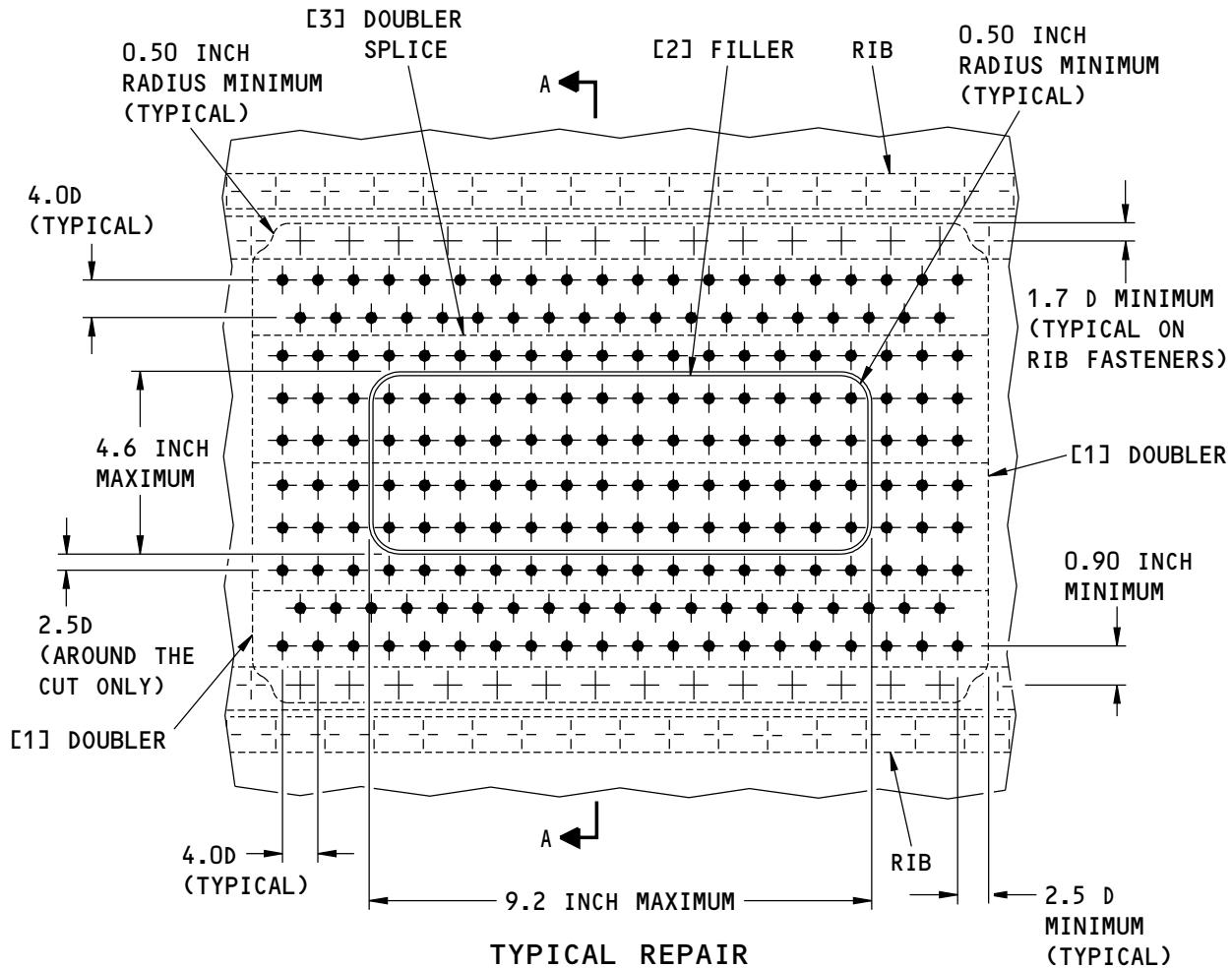
REPAIR 6
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STRUCTURAL REPAIR MANUAL**



NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- REFERENCE FASTENER LOCATION
- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACR15FT5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-06 FOR THE FASTENER DATA.

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Vertical Stabilizer Inspark Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 73.400 through 196.663

Figure 202 (Sheet 1 of 2)

55-30-01

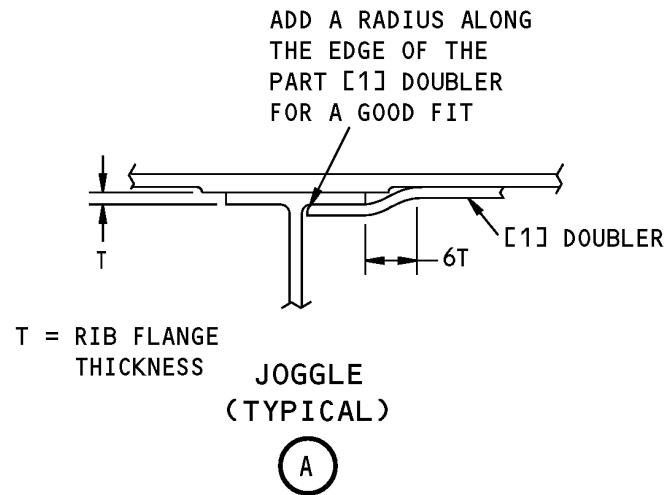
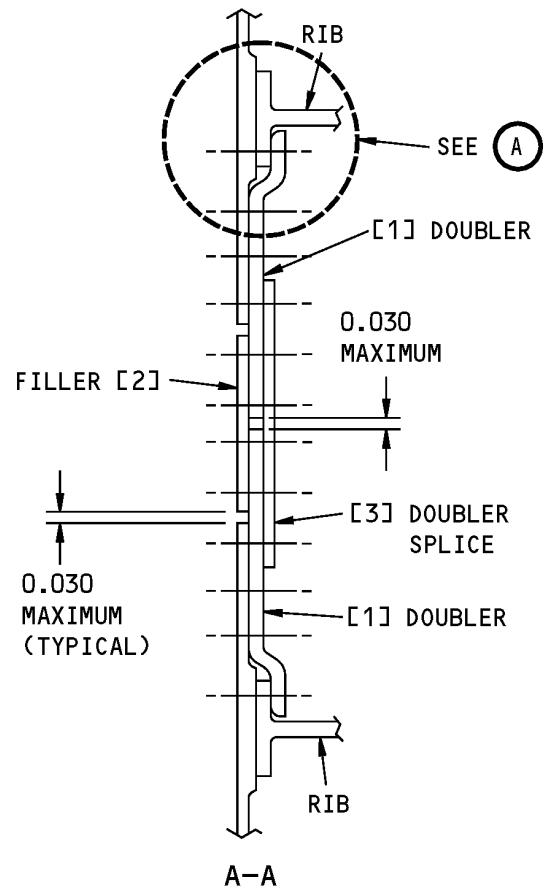
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Vertical Stabilizer Inspark Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 73.400 through 196.663
Figure 202 (Sheet 2 of 2)

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REPAIR 7 - VERTICAL STABILIZER INSPAR SKIN FLUSH REPAIR BETWEEN RIBS - FIN STATIONS
196.663 THRU 343.863

1. Applicability

- A. Repair 7 is applicable:
 - (1) To damage to the vertical stabilizer inspar skins shown in Vertical Stabilizer Inspark Skin Locations, Figure 201/REPAIR 7 between Fin Stations 196.663 and 343.863.
 - (2) As a replacement repair for Repair 4.
 - (3) As an alternative to Repair 8.

2. General

- A. Repair 7 gives instructions for a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes.
 - (2) The conditions for aerodynamic smoothness shown in Vertical Stabilizer Inspark Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners, Figure 202/REPAIR 7 must be kept.
- C. It is optional to make an access door in the inspar skin. Use these openings to make sure the repair fasteners are installed correctly. Refer to Repairs 10 and 11 to make an access door.

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REPAIR 7
Page 201

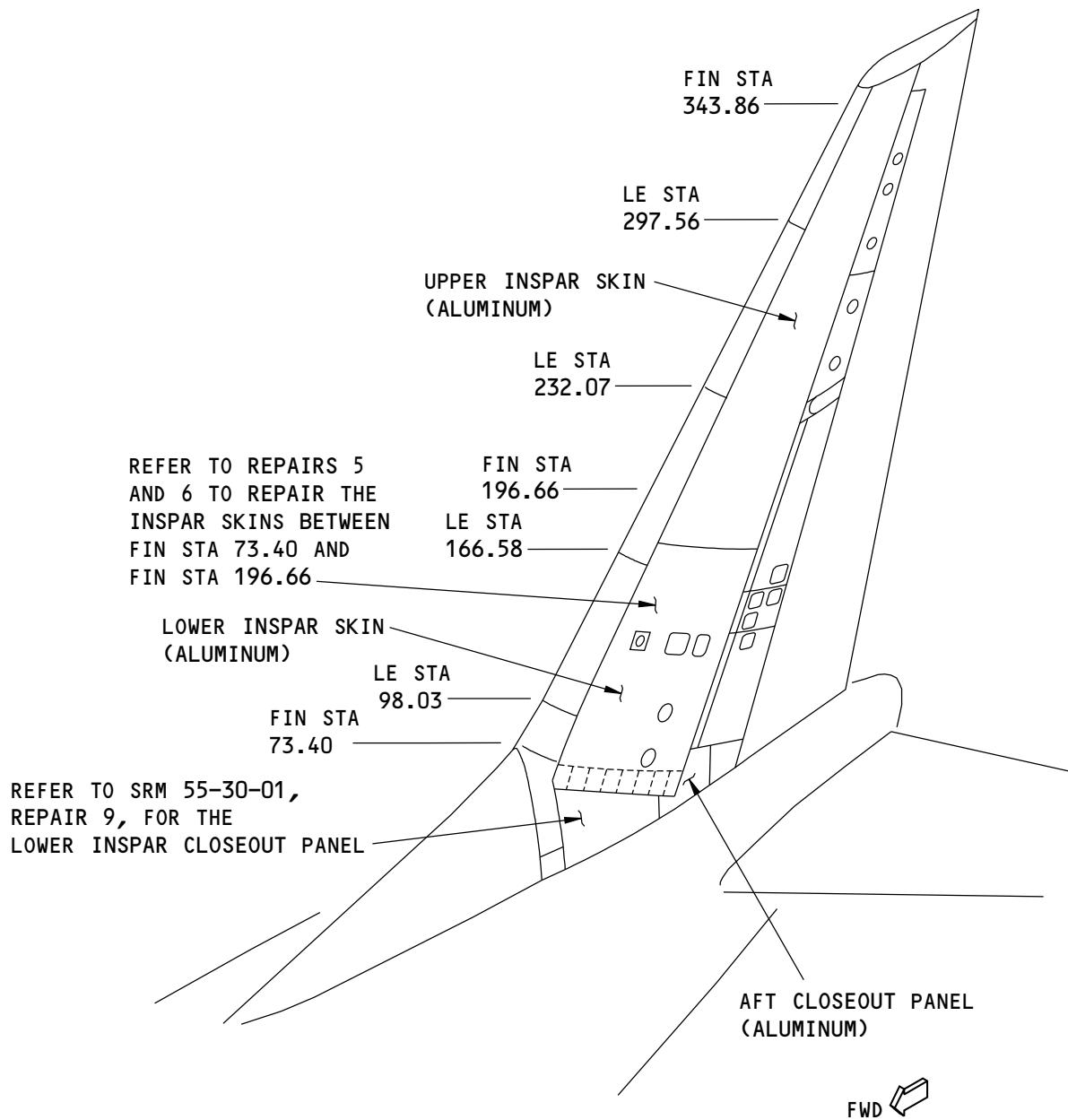
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LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

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Vertical Stabilizer Inspark Skin Locations
Figure 201

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REPAIR 7
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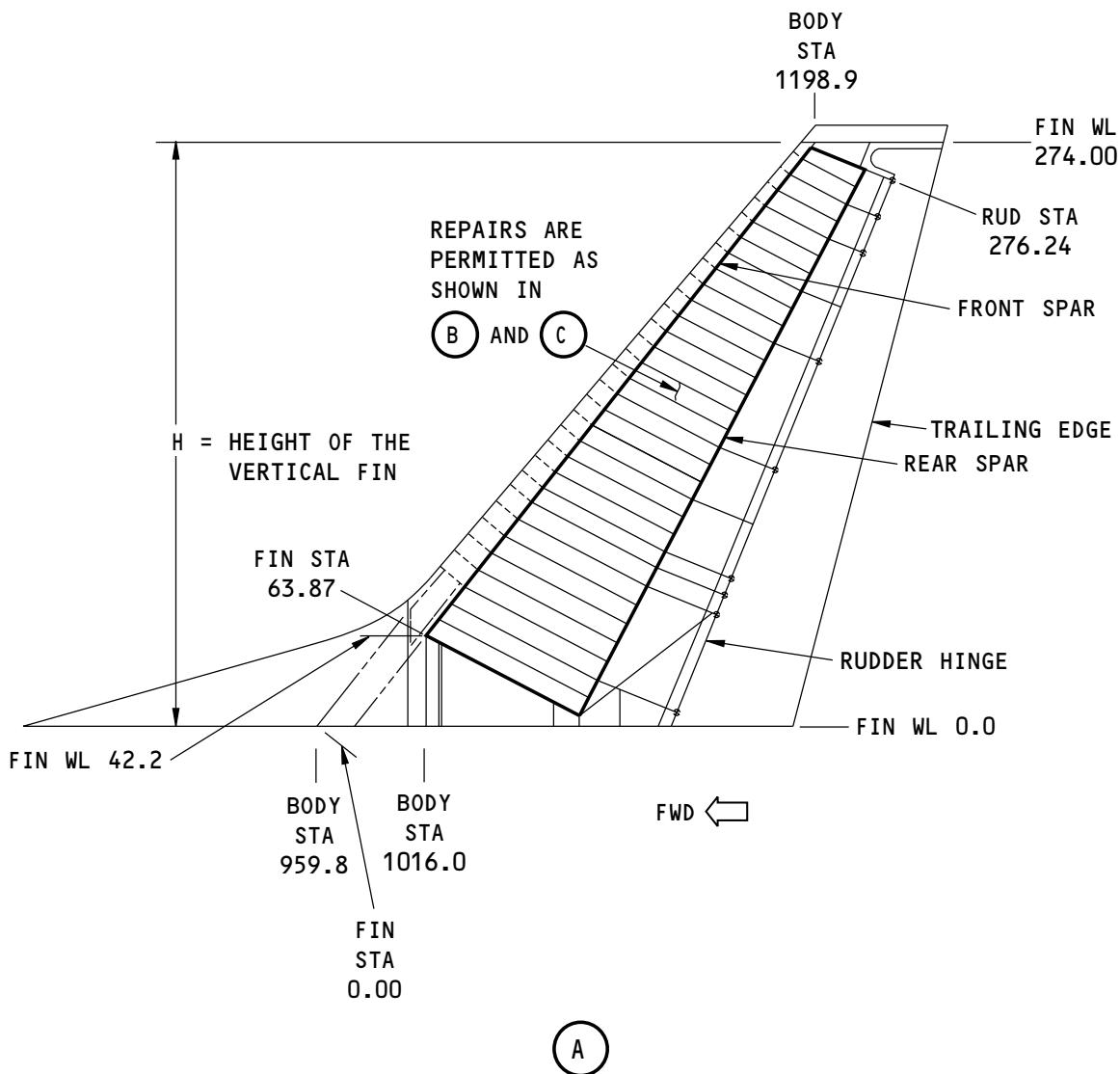
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STRUCTURAL REPAIR MANUAL



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Vertical Stabilizer In-spar Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 202 (Sheet 1 of 3)

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REPAIR 7
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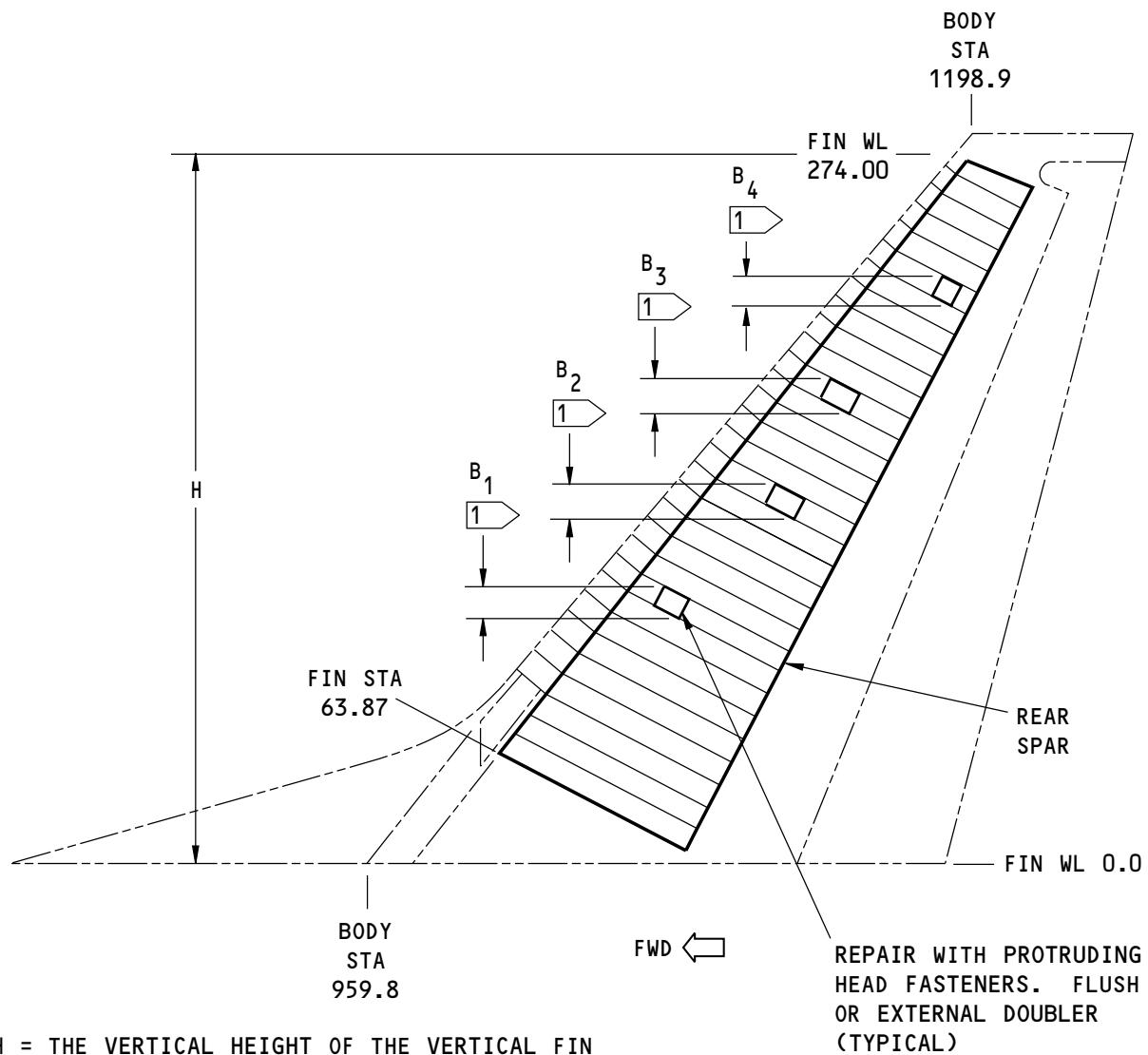
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H = THE VERTICAL HEIGHT OF THE VERTICAL FIN

B₁, B₂, B₃, B₄ = THE VERTICAL HEIGHTS OF THE REPAIRS

B₁ + B₂ + B₃ + B₄ = A MAXIMUM OF $\frac{H}{4}$ = 68.5 INCHES MAXIMUM

(B)

NOTES

- 1 ONLY ONE REPAIR IS PERMITTED ACROSS THE AIRFLOW. A SECOND REPAIR DOWNSTREAM IS NOT PERMITTED.

G84083 S0006593377_V1

Vertical Stabilizer Inspars Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 202 (Sheet 2 of 3)

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REPAIR 7
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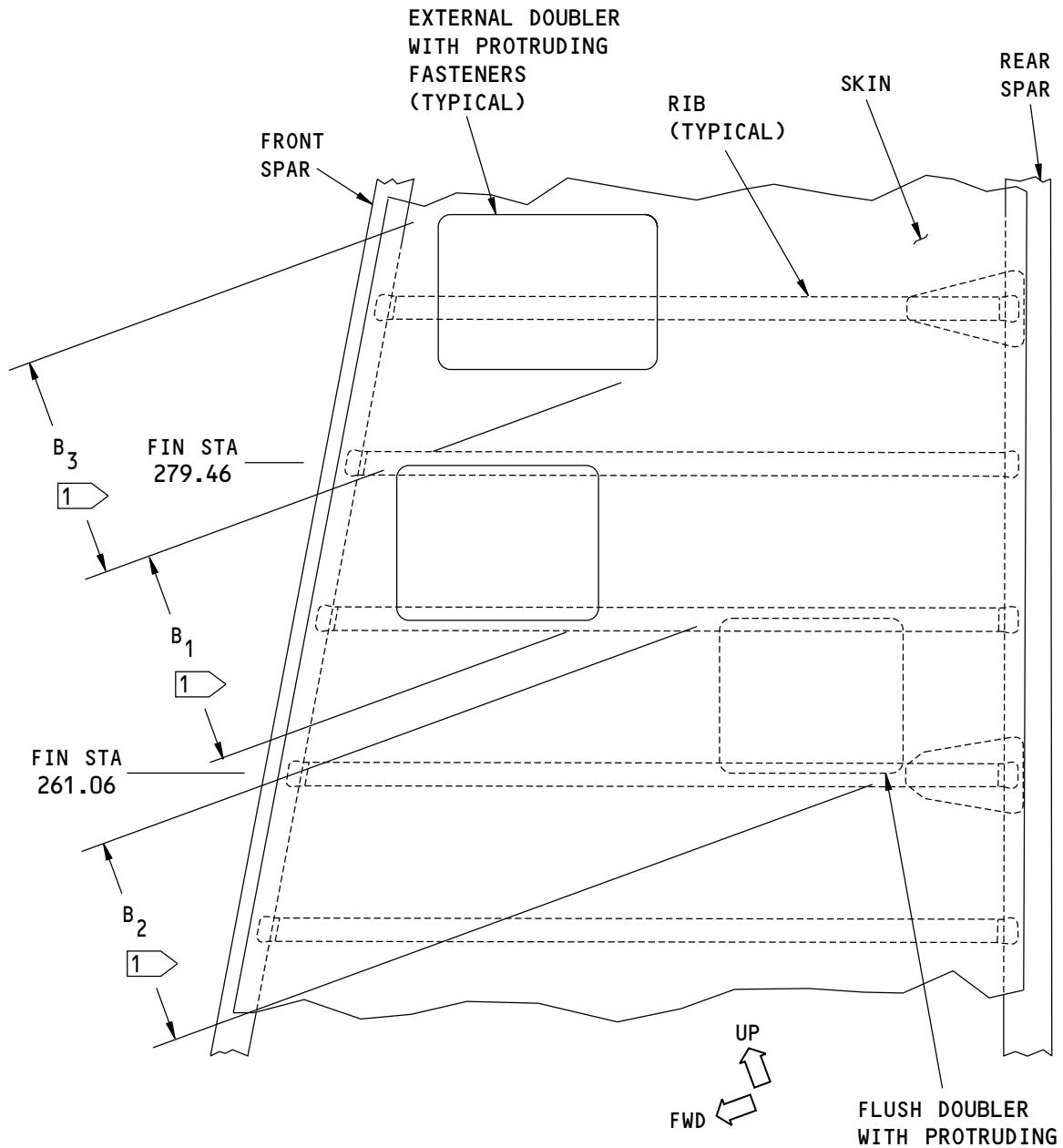
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B_1, B_2, B_3 = THE VERTICAL HEIGHTS OF THE REPAIRS

$B_1 + B_2 + B_3$ = A MAXIMUM OF $\frac{H}{4} = 68.5$ INCHES MAXIMUM

(C)

G84088 S0006593378_V1

Vertical Stabilizer Inspar Skins - Aerodynamic Limits of Repairs with Protruding Head Fasteners
Figure 202 (Sheet 3 of 3)

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. If this repair replaces an external repair, remove the repair fasteners, repair doubler, and sealant of the external repair. Refer to 51-40-02 for the procedures to remove the repair fasteners.
- B. Get access to the damaged area of the inspar skin as follows:
 - (1) Remove the leading edge skin panels or install an access door.
- C. Cut and remove the damaged part of the skin as shown in Vertical Stabilizer Inspar Skin Flush Repair Between Ribs - Fin Stations 196.663 through 343.863, Figure 203/REPAIR 7. Refer to 51-10-02 for the procedures to remove the damage.
 - (1) Make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - (2) Make the corner radii of the cut a minimum of 0.50 inch.
- D. Put the skin that is around the damage back to the initial contour.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01.
- E. Make the repair parts as shown in Vertical Stabilizer Inspar Skin Flush Repair Between Ribs - Fin Stations 196.663 through 343.863, Figure 203/REPAIR 7. Refer to Table 201/REPAIR 7 for the repair material.
 - (1) Make the contour of the repair parts the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended
[2]	Filler	1	Use clad or bare 2024-T3 that is the same thickness as the initial skin. The use of clad material is recommended

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Table 202:

REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER THICKNESS (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.050	5/32
0.041	0.063	5/32

- F. Assemble the repair parts as shown in Vertical Stabilizer Inspark Skin Flush Repair Between Ribs - Fin Stations 196.663 through 343.863, Figure 203/REPAIR 7.
- G. Drill the fastener holes.
 - (1) Align fastener holes in the repair parts with holes in the skin made from an external repair.
- H. Remove the repair parts.
- I. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- J. Apply a chemical conversion coating to the repair parts and bare surfaces of the skin. Refer to 51-20-01 for the chemical conversion coating procedures.
- K. Apply one layer of BMS 10-79, Type II or III, primer to the area of the repair. Refer to SOPM 20-44-04 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the skin.
- L. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
- M. Install the rivets without sealant in the repair parts and skin.
- N. Apply BMS 5-95 or BMS 5-26 sealant in the space between the filler and the edge of the skin cut. Refer 51-20-05 for the procedures to apply the sealant.
- O. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.

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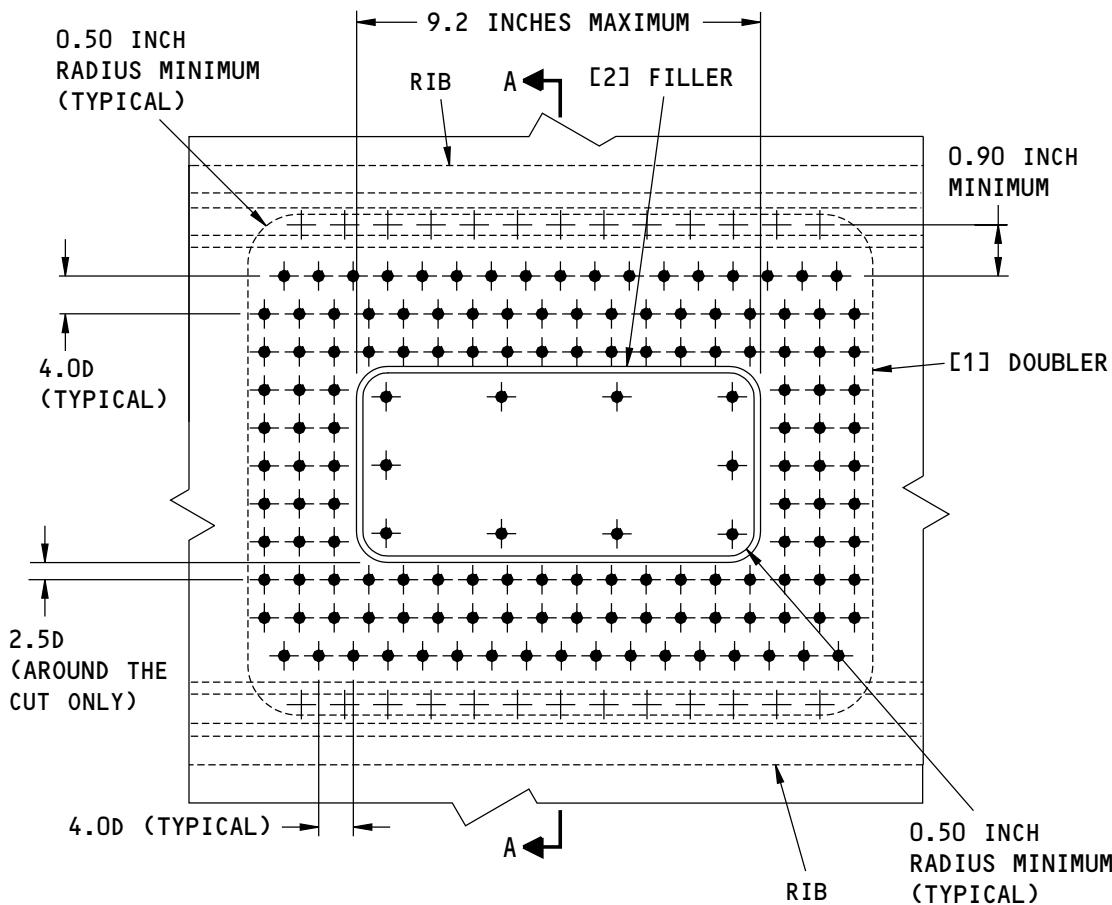
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STRUCTURAL REPAIR MANUAL**



TYPICAL REPAIR

NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACR15FT5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-06 FOR THE FASTENER DATA.

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Vertical Stabilizer Inspark Skin Flush Repair Between Ribs - Fin Stations 196.663 through 343.863
Figure 203 (Sheet 1 of 2)

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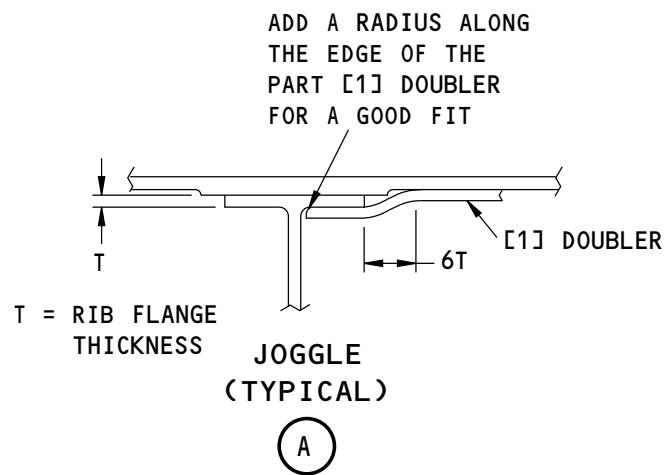
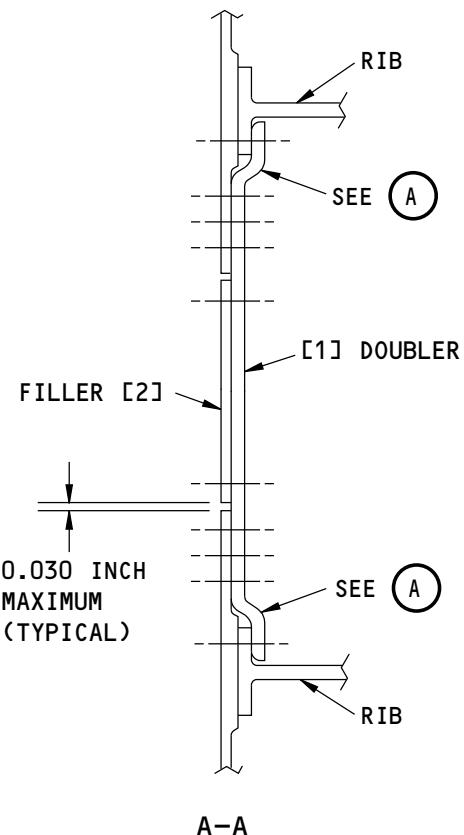
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Vertical Stabilizer Inspark Skin Flush Repair Between Ribs - Fin Stations 196.663 through 343.863
Figure 203 (Sheet 2 of 2)

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**REPAIR 8 - VERTICAL STABILIZER INSPAR SKIN FLUSH REPAIR WITH SPLICED DOUBLER
BETWEEN RIBS - FIN STATIONS 196.663 THRU 343.863**

1. Applicability

- A. Repair 8 is applicable:
 - (1) To damage to the vertical stabilizer inspar skins shown in Vertical Stabilizer Inspar Skin Locations, Figure 201/REPAIR 8 between Fin Stations 196.663 and 343.863.
 - (2) As an alternate repair for REPAIR 4.

2. General

- A. Repair 8 gives instructions for a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
 - B. Make sure the aerodynamic smoothness is satisfactory and in the limits as given below:
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
 - (2) The conditions for aerodynamic smoothness shown in 51-10-01, GENERAL, Figure 5 must be kept.
 - NOTE:** If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - C. It is optional to make an access door in the inspar skin. Use these openings to make sure the repair fasteners are installed correctly. Refer to Repair 11 to make an access door. Access door have to be placed on opposite side of skin and staggered to the repair area.
- NOTE:** One access door installation is permitted. If you need more than one access door installation contact The Boeing Company for stress and weight increase analysis.

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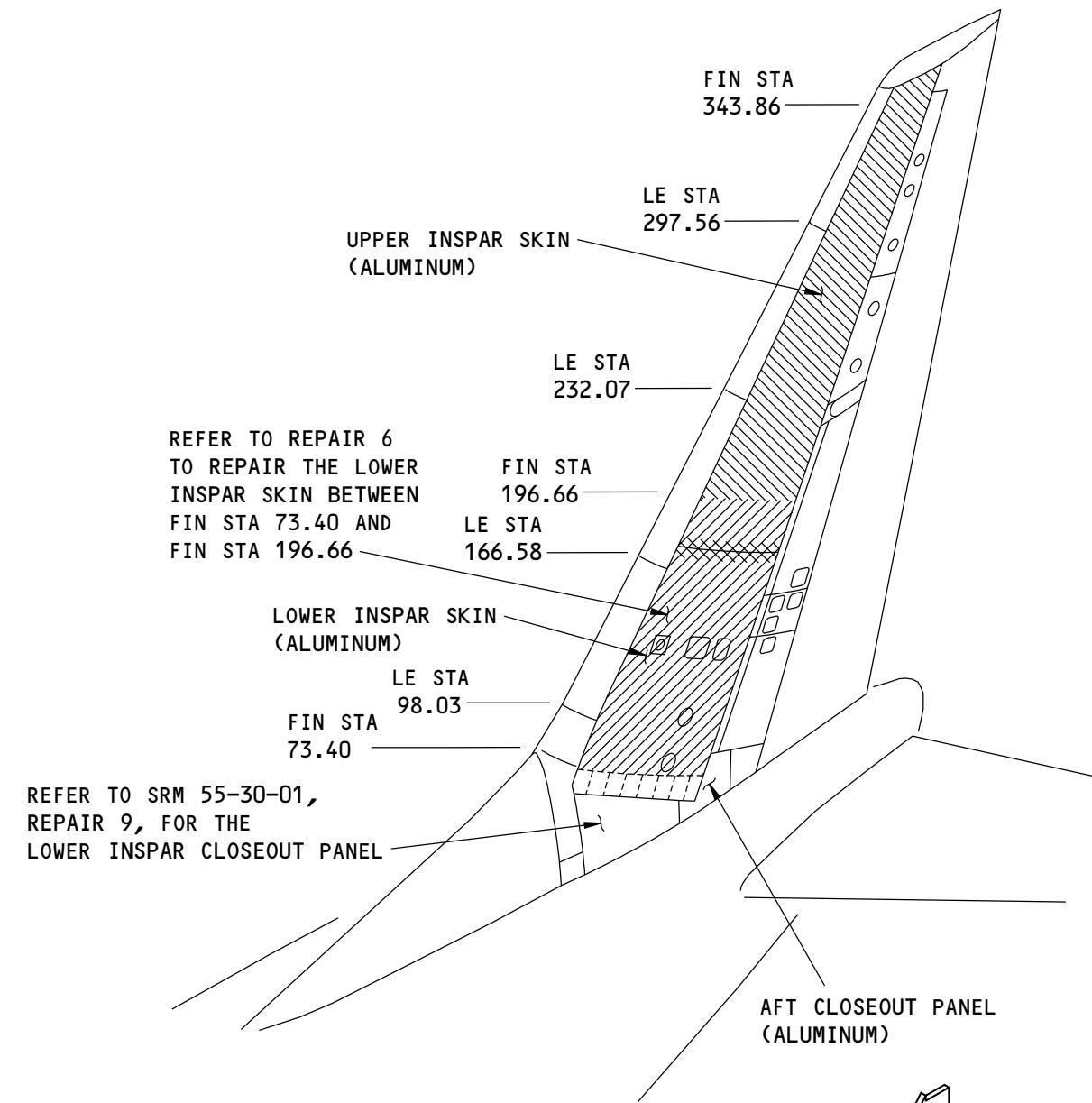
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NO REPAIR IS PERMITTED AT INSPAR SKIN SPLICE AREA

FWD

PERMITTED REPAIR AREA AT INSPAR SKIN

REFER TO REPAIR 6 TO REPAIR LOWER SKIN

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

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Vertical Stabilizer Inspark Skin Locations
Figure 201

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-40-02, GENERAL	Fastener Installation and Removal
51-40-05, GENERAL	Fastener Hole Sizes
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Get access to the damaged area of the inspar skin.

NOTE: Remove the leading edge skin panels or install an access door to gain access back of the repair area to install fasteners correctly. You can use a long bucking bar to reach to the bucking side of the rivets through the access hole on the vertical stabilizer front spar web.

- B. Cut and remove the damaged part of the skin as shown in Vertical Stabilizer Inspark Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 196.663 through 343.863, Figure 202/REPAIR 8. Refer to 51-10-02, GENERAL for the procedures to remove the damage.
- (1) Check with aerodynamic restriction as given in 51-10-01, GENERAL Figure 5 for repair sizes that can be installed on inspar skin.
 - (2) Make the cut in the shape of a rectangle with the longer sides parallel to the inspar ribs.
 - (3) Make the cut in the shape of a rectangle is not larger than 4.60 in. (11.68 cm) by 9.20 in. (23.37 cm).
 - (4) Make the corner radii of the cut a minimum of 0.50 inch.
- C. Put the skin that is around the damage back to the initial contour. The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes. Refer to 51-10-01, GENERAL.
- D. Make the repair parts as shown in Vertical Stabilizer Inspark Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 196.663 through 343.863, Figure 202/REPAIR 8. Refer to Table 201/REPAIR 8 for the repair material. Make the contour of the repair parts the same as the initial contour of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended
[2]	Filler	1	Use clad or bare 2024-T3 that is the same thickness as the initial skin. The use of clad material is recommended
[3]	Doubler Splice	1	Use clad or bare 2024-T3. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended

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Table 202:

REPAIR PART THICKNESSES AND REPAIR FASTENER DIAMETERS FOR INITIAL SKIN THICKNESSES		
INITIAL SKIN THICKNESS (INCH)	ITEM [1] DOUBLER AND ITEM [3] DOUBLER SPLICE THICKNESSES (INCH)	REPAIR FASTENER DIAMETER (INCH)
0.032	0.050	5/32
0.041	0.063	5/32

- E. Assemble the repair parts as shown in Vertical Stabilizer Inspar Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 196.663 through 343.863, Figure 202/REPAIR 8.
- F. Drill the fastener holes. 51-40-02, GENERAL and 51-40-05, GENERAL.
- G. Remove the repair parts.
- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the skin.
- I. Apply a chemical conversion coating to the repair parts and bare surfaces of the skin. Refer to 51-20-01, GENERAL for the chemical conversion coating procedures.
- J. Apply one layer of BMS 10-79, Type II or III, primer to the area of the repair. Refer to SOPM 20-44-04 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the skin.
- K. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL for the procedures to apply the sealant.
- L. Install the rivets without sealant in the repair parts and skin.
- M. Apply BMS 5-95 or BMS 5-26 sealant in the space between the filler and the edge of the skin cut. Refer 51-20-05, GENERAL for the procedures to apply the sealant.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.

55-30-01

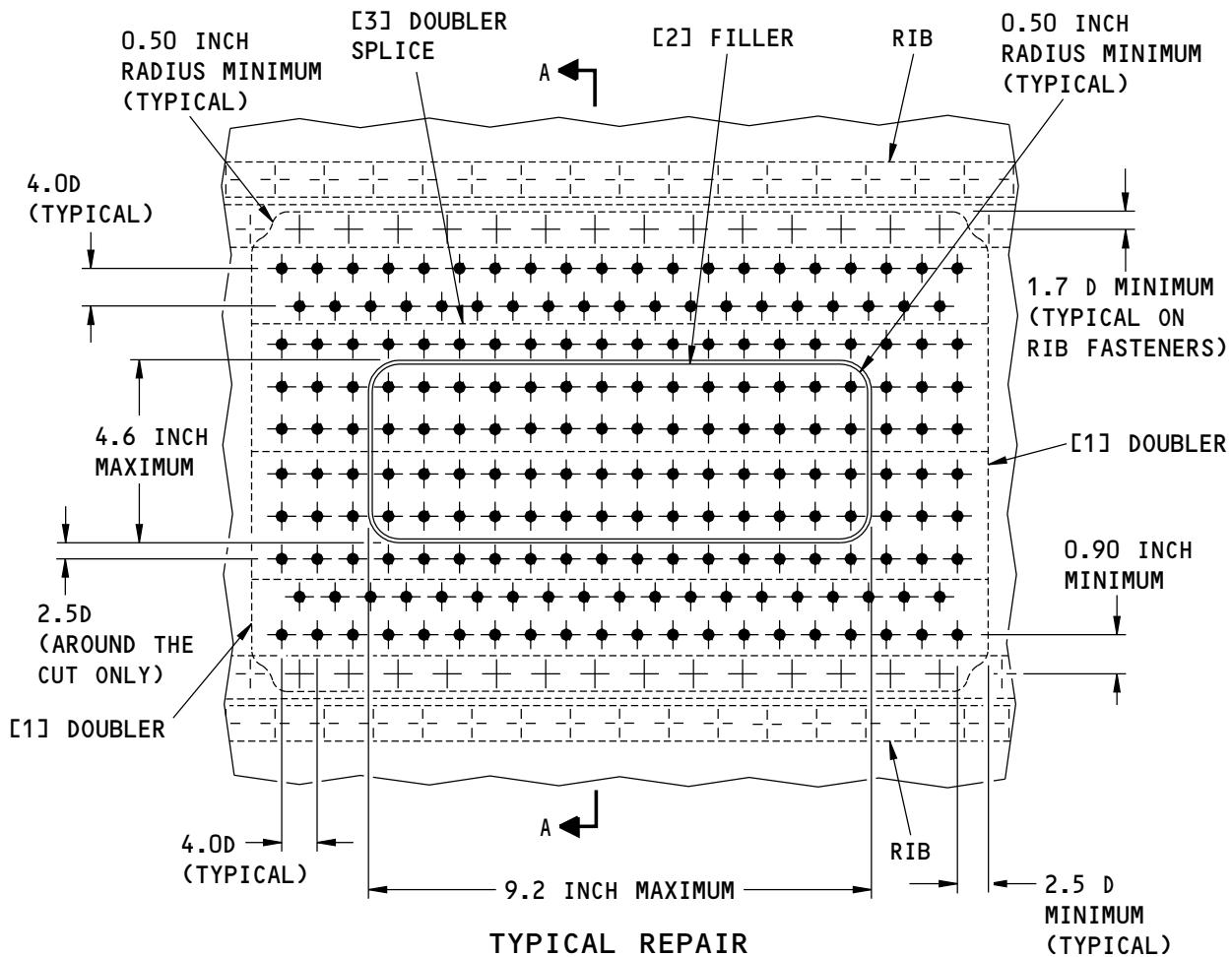
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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER. USE (D) TO CALCULATE EDGE MARGINS AND THE DISTANCE BETWEEN FASTENERS.
- MAKE SURE THAT THERE IS A MINIMUM OF THREE ROWS OF FASTENERS AROUND THE DAMAGE.
- MAKE SURE THAT THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- + REFERENCE FASTENER LOCATION
- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACR15FT5D() SOLID RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-06 FOR THE FASTENER DATA.

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Vertical Stabilizer Inspark Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 196.663 through 343.863

Figure 202 (Sheet 1 of 2)

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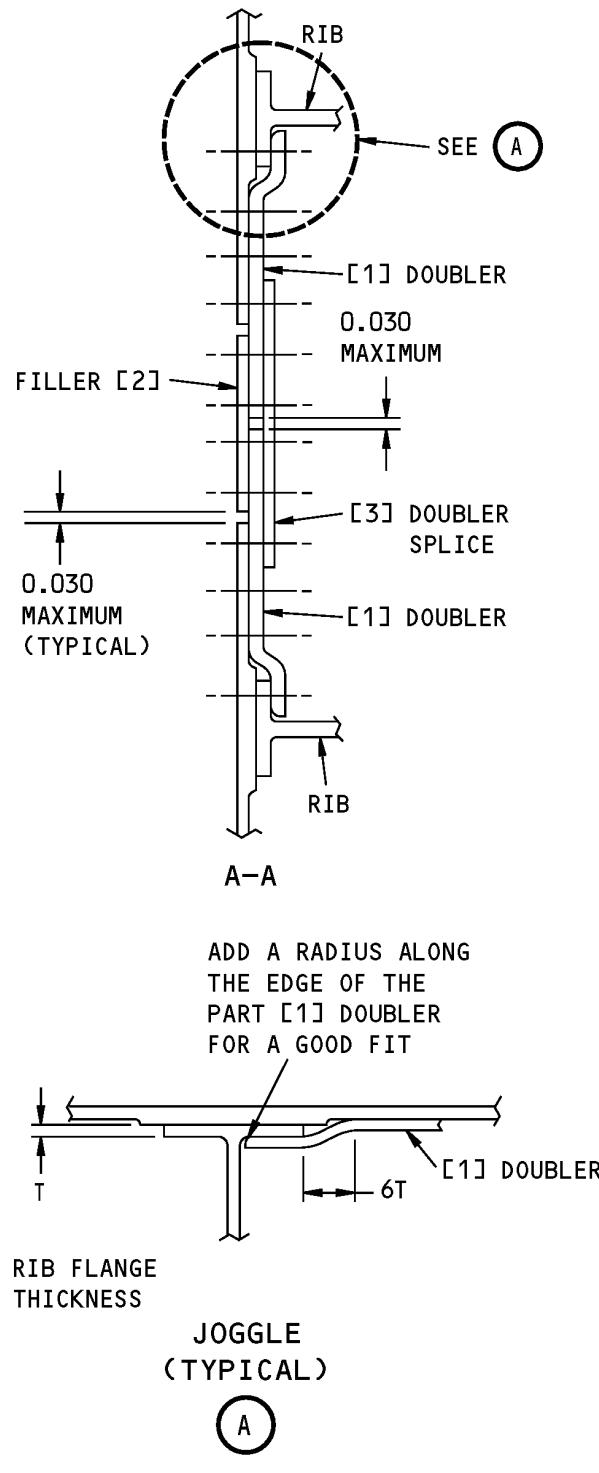
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Vertical Stabilizer Inspar Skin Flush Repair with Spliced Doubler Between Ribs - Fin Stations 196.663 through 343.863
Figure 202 (Sheet 2 of 2)

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REPAIR 9 - VERTICAL STABILIZER TRAILING EDGE AND CLOSEOUT PANELS

1. Applicability

- A. Repair 9 is applicable to damage to the vertical stabilizer trailing edge and closeout panels shown in Vertical Stabilizer Trailing Edge and Closeout Panel Locations, Figure 201/REPAIR 9. These panels are made of Glass Fiber Reinforced Plastic (GFRP) and Carbon Fiber Reinforced Plastic (CFRP).
- B. Repair 9 is applicable to damage that is more than the limits permitted in Allowable Damage 3. Refer to Allowable Damage 3 for the type and size of damage that is permitted.

2. General

- A. Repair 9 is a Permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the trailing edge panels as given in AMM 55-30-00/401.
 - (2) Refer to 51-40-02 for information on fastener removal.
- C. Refer to Damage Definitions, Figure 202/REPAIR 9, Details A, B, and C for the definitions of the length, width, and depth of damage.
- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 9 for the definitions of the facesheets of a honeycomb core area.
- E. Some trailing edge panels have a protective layer of Teflon film. If damage occurs, refer to AMM 51-21-81/701 for the procedures to repair the Teflon film.
- F. The conditions that follow must be true for panel areas other than the edgeband:
 - (1) The edges of the 200° F(93°C) cure Permanent repair must be 3 inches or more away from:
 - (a) The edge of other repairs
 - (b) The panel edge
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 3.
- G. Do the repair as given in Paragraph 4./REPAIR 9
- H. Put the trailing edge panels back to the initial condition, as applicable.
 - (1) Install the trailing edge panels as given in AMM 55-30-00/401, if they were removed.
 - (a) Refer to 51-40-02 for information on fastener installation.
 - (2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the performance of the airplane. Refer to 51-10-01.

55-30-01

REPAIR 9
Page 201

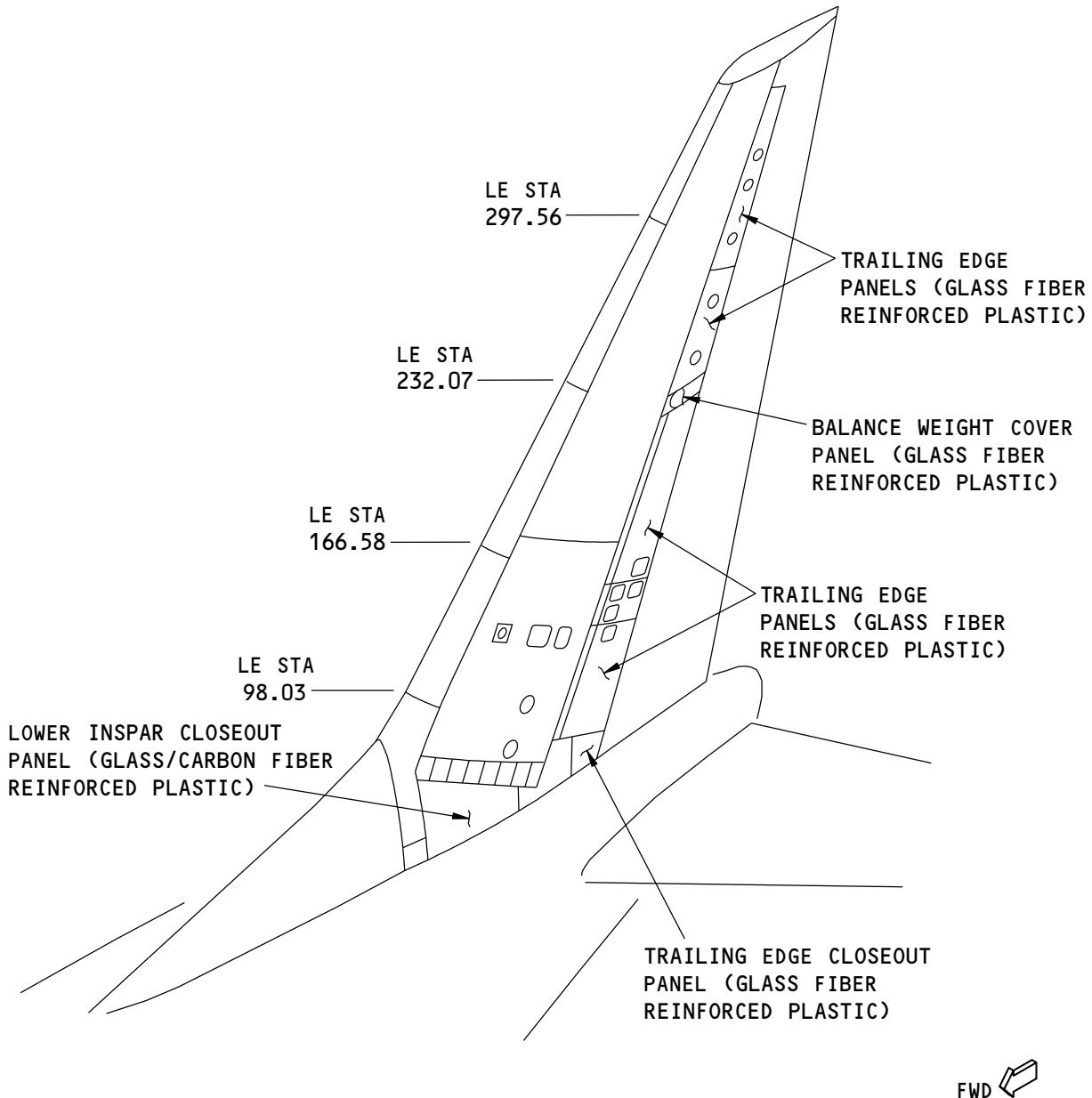
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STRUCTURAL REPAIR MANUAL



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Vertical Stabilizer Trailing Edge and Closeout Panel Locations
Figure 201

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Page 202

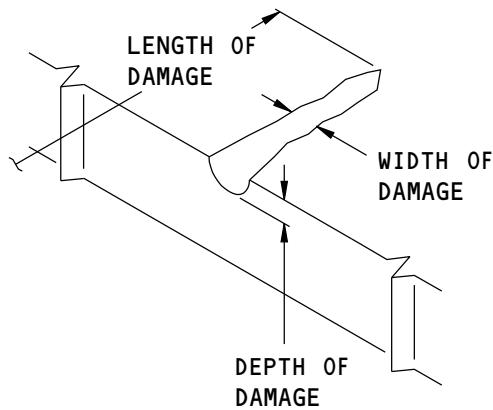
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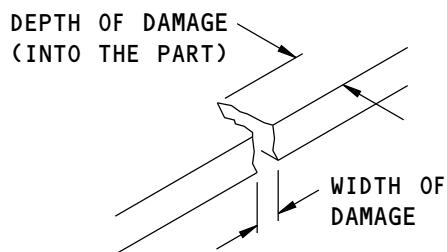


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DEFINITIONS FOR NICK,
GOUGE, OR SCRATCH DAMAGE

(A)



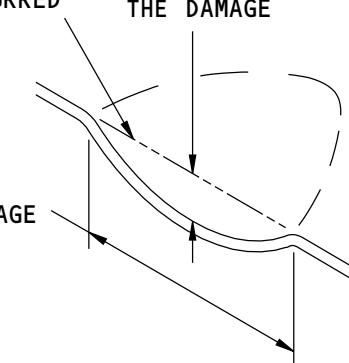
DEFINITIONS FOR EDGE DAMAGE

(C)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DEPTH OF
THE DAMAGE

DIAMETER OF THE DAMAGE
(USE THE LARGEST
DIMENSION ACROSS
THE DAMAGE)



DEFINITIONS FOR DENT DAMAGE

(B)

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Damage Definitions
Figure 202

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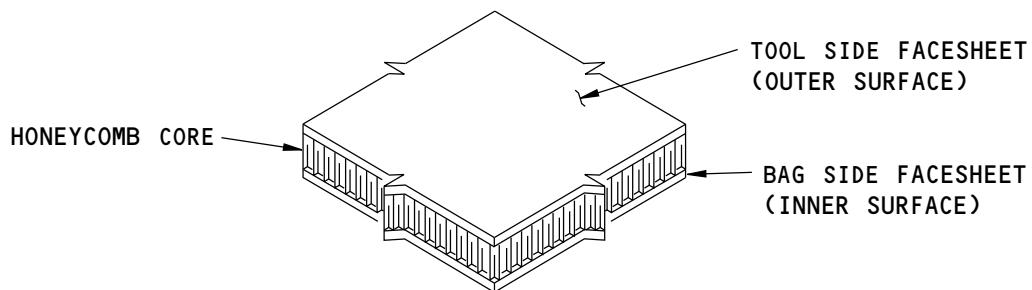
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Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-14, REPAIR GENERAL	Structures With Aluminum Coatings and Foils
55-30-01, ALLOWABLE DAMAGE 3	Vertical Stabilizer Trailing Edge Panels
AMM 51-21-81/701	Abrasion-resistant Teflon Finish - Cleaning/Painting
AMM 55-30-00/401	Vertical Stabilizer Removal/Installation

4. Repair Instructions

- A. For dents that are a maximum of 2 inches in diameter and have no fiber damage and delamination, do the steps that follow:
 - (1) Fill the dent with BMS 5-28, Type 7 potting compound.
 - (2) Apply a fiberglass patch over the potted area as given in 51-70-04.
- B. For dents that are not permitted by Paragraph 4.A./REPAIR 9 and for other damage that is not permitted by Allowable Damage 3, refer to:
 - (1) Table 201/REPAIR 9 for panel areas other than the edgeband
 - (2) Table 202/REPAIR 9 for the edgebands.
- C. Contact The Boeing Company for a repair made with room temperature wet layup materials.

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REPAIR 9
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Table 201:

REPAIR DATA FOR THE 250° F (121° C) CURE TRAILING EDGE PANELS FOR PANEL AREAS OTHER THAN THE EDGEBANDS				
REPAIR TYPE	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-06	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT PREIMPREGNATED LAYUP REPAIR AS GIVEN IN SRM 51-70-05
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Contact The Boeing Company	Damage that is a maximum of: - 6.0 inches in diameter - 50 percent of the smallest dimension across the panel at the damage location	There are no limits on the size of the repair
REPAIR INSTRUCTIONS	Refer to Paragraph 4.C	Refer to Paragraph 4.D	Refer to Paragraph 4.E	Refer to Paragraph 4.F

Table 202:

REPAIR DATA FOR THE EDGEBANDS OF 250°F (121°C) CURE TRAILING EDGE PANELS				
REPAIR TYPE	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-06	WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT WET LAYUP REPAIR AS GIVEN IN SRM 51-70-04	PERMANENT PREIMPREGNATED LAYUP REPAIR AS GIVEN IN SRM 51-70-05
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Contact The Boeing Company	There are no size limits on the dimensions of the repair	There are no limits on the size of the repair
REPAIR INSTRUCTIONS	Refer to Paragraph 4.C	Refer to Paragraph 4.D	Refer to Paragraph 4.E	Refer to Paragraph 4.F

- D. Contact The Boeing Company for a repair with wet layup materials at 150°F (66°C) cure.
- E. Use the instructions that follow to do a Permanent repair with wet layup materials at 200°F (93°C) cure.
 - (1) Repair the damage as given in 51-70-04, but for each facesheet or solid laminate area that is damaged, do the steps that follow:
 - (a) Use the same number of repair plies as the number of initial plies that were removed. Refer to Definitions of the Facesheets, Figure 203/REPAIR 9 for the definition of a facesheet.
 - (b) Add one ply (structural) of BMS 9-3, Type H-2, (or Type H-3) glass fabric that is ± 45 degrees.
 - (c) Add a second ply (structural) of BMS 9-3, Type H-2 (or Type H-3) glass fabric that is 0 or 90 degrees.
- F. Use the instruction that follows to do a Permanent repair with preimpregnated layup materials at 250°F (121°C) cure.

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- (1) Use the same number and type of repair plies as the initial plies that were removed.

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STRUCTURAL REPAIR MANUAL

REPAIR 10 - VERTICAL STABILIZER ACCESS PANEL INSTALLATION WITH A ONE-PIECE DOUBLER

1. Applicability

- A. Repair 10 can be used to make an access hole in the inspar skins of the vertical stabilizer shown in Vertical Stabilizer Inspar Skin Locations, Figure 201/REPAIR 10.
- B. Repair 10 is applicable to:
 - (1) Locations where there is sufficient clearance to install a one-piece doubler.
- C. You are permitted to install a maximum of one access panel repair on each vertical stabilizer. This one repair can be either REPAIR 10 or REPAIR 11. If it is necessary to install more than one repair, then contact The Boeing Company for repair instructions.

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REPAIR 10

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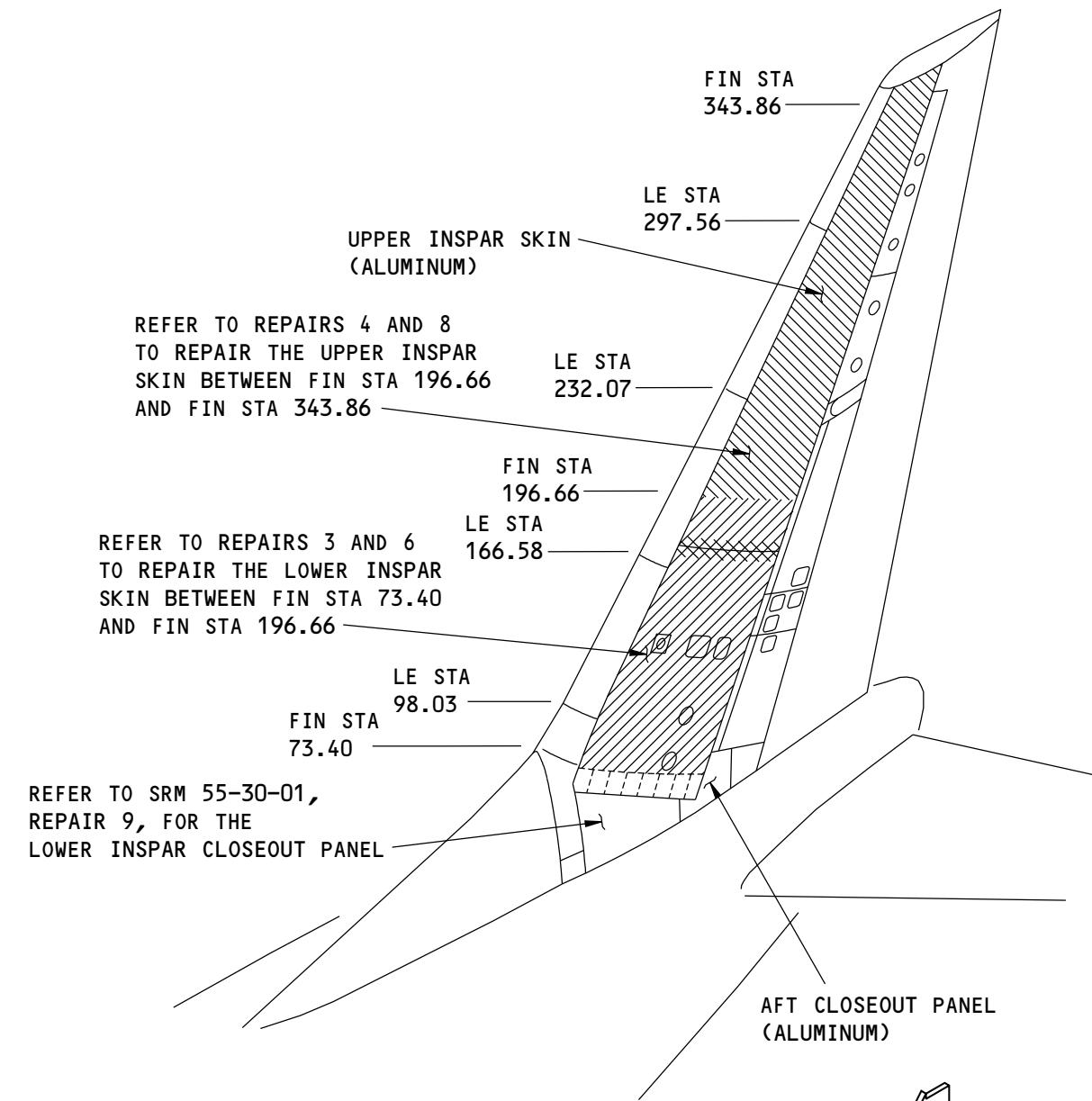
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NO REPAIR IS PERMITTED AT INSPAR SKIN SPLICE AREA

FWD

PERMITTED REPAIR AREA AT LOWER INSPAR SKIN

PERMITTED REPAIR AREA AT UPPER INSPAR SKIN

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

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Vertical Stabilizer Inspark Skin Locations
Figure 201

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2. General

- A. Repair 10 is a Category A repair. Refer to 51-00-06 for the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. The repair that follows is an alternative to Repair 10:
 - (1) Repair 11 is an access panel installation with a two-piece doubler for locations where there is not sufficient clearance to install a one-piece doubler.
- C. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes.
 - (2) The conditions for aerodynamic smoothness shown in AERODYNAMIC SMOOTHNESS, 51-10-01 Figure 5 must be kept.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Cut the hole in the skin.
 - (1) Make the cut in the shape shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 10.
 - (2) Refer to 51-10-02 for the procedures to cut the skin.
- B. Remove the fasteners from the rib chords as necessary.
 - (1) Refer to 51-40-02.
- C. Make the repair parts. Refer to Table 201/REPAIR 10.
- D. Assemble the part [2] doubler and the part [3] shim as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 10.
- E. Drill the fastener holes that go through the skin, rib chords, the part [2] doubler, and the part [3] shim. Refer to 51-40-05 for the fastener hole dimensions.
- F. Disassemble the repair parts.

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- G. Remove the nicks, scratches, gouges, and burrs from the initial parts and from the part [2] doubler and the part [3] shim.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Cover Plate	1	Use bare or clad 2024-T3 that is 0.071 inch thick
[2]	Doubler	1	Use bare or clad 2024-T3 that is 0.190 inch thick
[3]	Shim	1	Use bare or clad 2024-T3 that is 0.032 inch thick

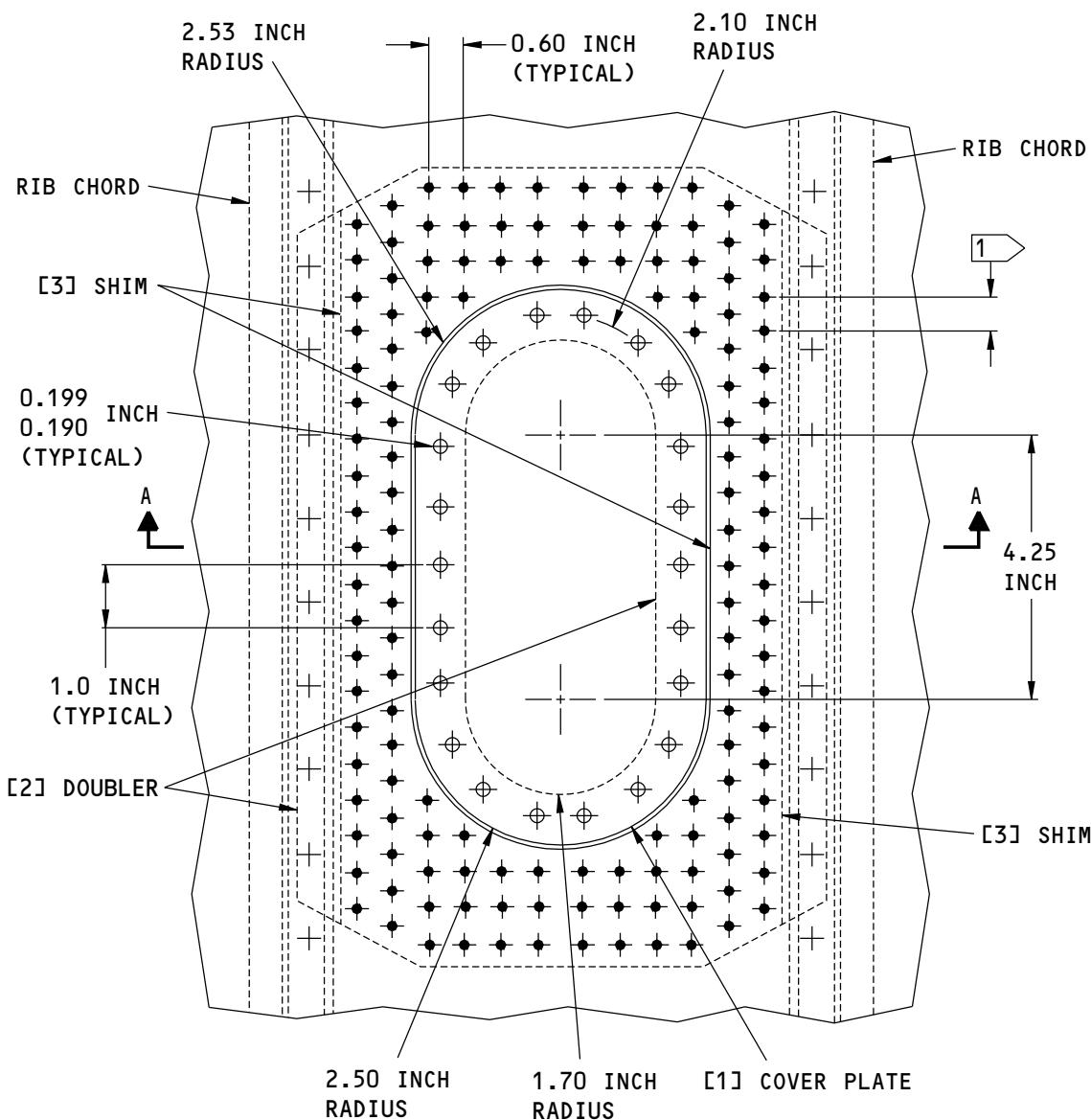
- H. Apply a chemical conversion coating to the bare surfaces of the initial parts and to the part [2] doubler and the part [3] shim. Refer to 51-20-01.
- I. Apply one layer of BMS 10-79, Type II or III, primer to the bare surfaces of the initial parts and to the part [2] doubler and the part [3] shim. Refer to SOPM 20-44-04.
- J. Install the part [2] doubler and the part [3] shim.
- (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Install the rivets without sealant.
 - (3) If you use hex drive bolts, install the fasteners wet with BMS 5-95 sealant.
- K. Put the part [1] cover plate in position as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 10.
- L. Drill the 0.190 to 0.199 inch diameter holes for the nutplates as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 10.
- M. Remove part [1].
- N. Put the nutplates in position on the part [2] doubler and drill the holes for the rivets.
- O. Remove the nicks, scratches, gouges, and burrs from the part [1] cover plate, the part [2] doubler, and the part [3] shim.
- P. Apply a chemical conversion coating to the part [1] cover plate and the bare surfaces of the part [2] doubler and the part [3] shim. Refer to 51-20-01.
- Q. Apply one layer of BMS 10-79, Type II or III, primer to the part [1] cover plate and the bare surfaces of the part [2] doubler and the part [3] shim. Refer to SOPM 20-44-04.
- R. Install the nutplates on the part [2] doubler.
- (1) Install the rivets without sealant.
- S. Apply BMS 10-86, Type I white abrasion resistant coating to the mating surfaces of the part [1] cover plate and the part [2] doubler. Refer to SOPM 20-44-01.
- T. Install the part [1] cover plate.
- (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Install the fasteners wet with BMS 5-95 sealant.
 - (3) Put BMS 5-95 sealant into the space between the skin and the part [1] cover plate.
- U. Apply the decorative finish to the repair area if necessary. Refer to AMM PAGEBLOCK 51-21-99/701.

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NOTES

- [1]** MAINTAIN A FASTENER SPACING OF
0.60 INCH TO 0.80 INCH

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Vertical Stabilizer Access Panel Installation
Figure 202 (Sheet 1 of 2)

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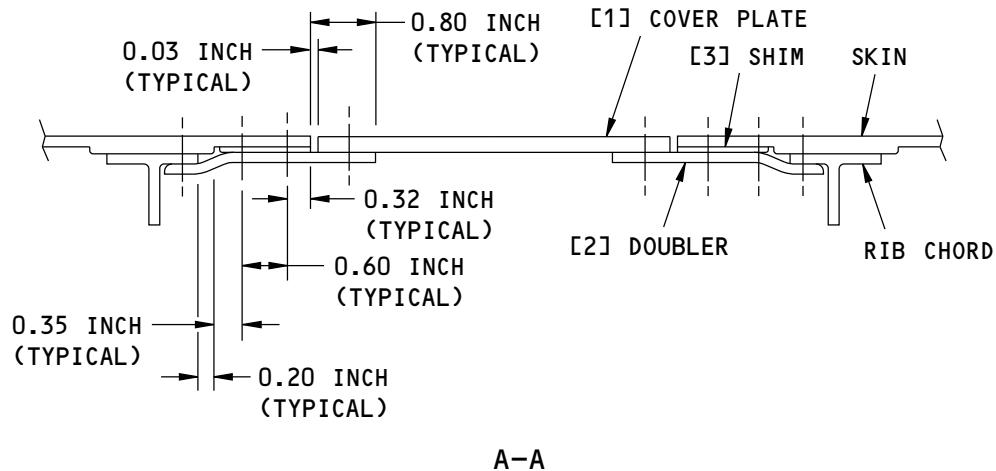
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FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER AS THE INITIAL FASTENER. YOU CAN INSTALL A FASTENER THAT IS UP TO 1/32 INCH DIAMETER OVERSIZE.
- REPAIR FASTENER LOCATION. INSTALL A BACB30VT5K HEX DRIVE BOLT.
- ⊕ REPAIR FASTENER LOCATION. INSTALL BACN10JR03CFM NUTPLATE WITH BACR15BA3D RIVETS. INSTALL A BACB30EL3-() BOLT TO ATTACH THE PART [1] COVER PLATE.

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Vertical Stabilizer Access Panel Installation
Figure 202 (Sheet 2 of 2)

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REPAIR 11 - VERTICAL STABILIZER ACCESS PANEL INSTALLATION WITH A TWO-PIECE DOUBLER

1. Applicability

- A. Repair 11 can be used to make an access hole in the inspar skins of the vertical stabilizer shown in Vertical Stabilizer Inspar Skin Locations, Figure 201/REPAIR 11.
- B. Repair 11 is applicable to:
 - (1) Locations where there is not sufficient clearance to install a one-piece part [2] doubler.
- C. You are permitted to install a maximum of one access panel repair on each vertical stabilizer. This one repair can be either REPAIR 10 or REPAIR 11. If it is necessary to install more than one repair, then contact The Boeing Company for repair instructions.

2. General

- A. Repair 11 is a Category A repair. Refer to 51-00-06 for the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. Make sure the aerodynamic smoothness is satisfactory and not more than the limits given in 51-10-01. If the aerodynamic smoothness is not satisfactory, there will be a decrease in the performance of the aircraft.
 - (1) The conditions for aerodynamic smoothness must be kept for the area around or upstream of the feel system pitot probes.
 - (2) The conditions for aerodynamic smoothness shown in AERODYNAMIC SMOOTHNESS, 51-10-01 Figure 5 must be kept.

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REPAIR 11

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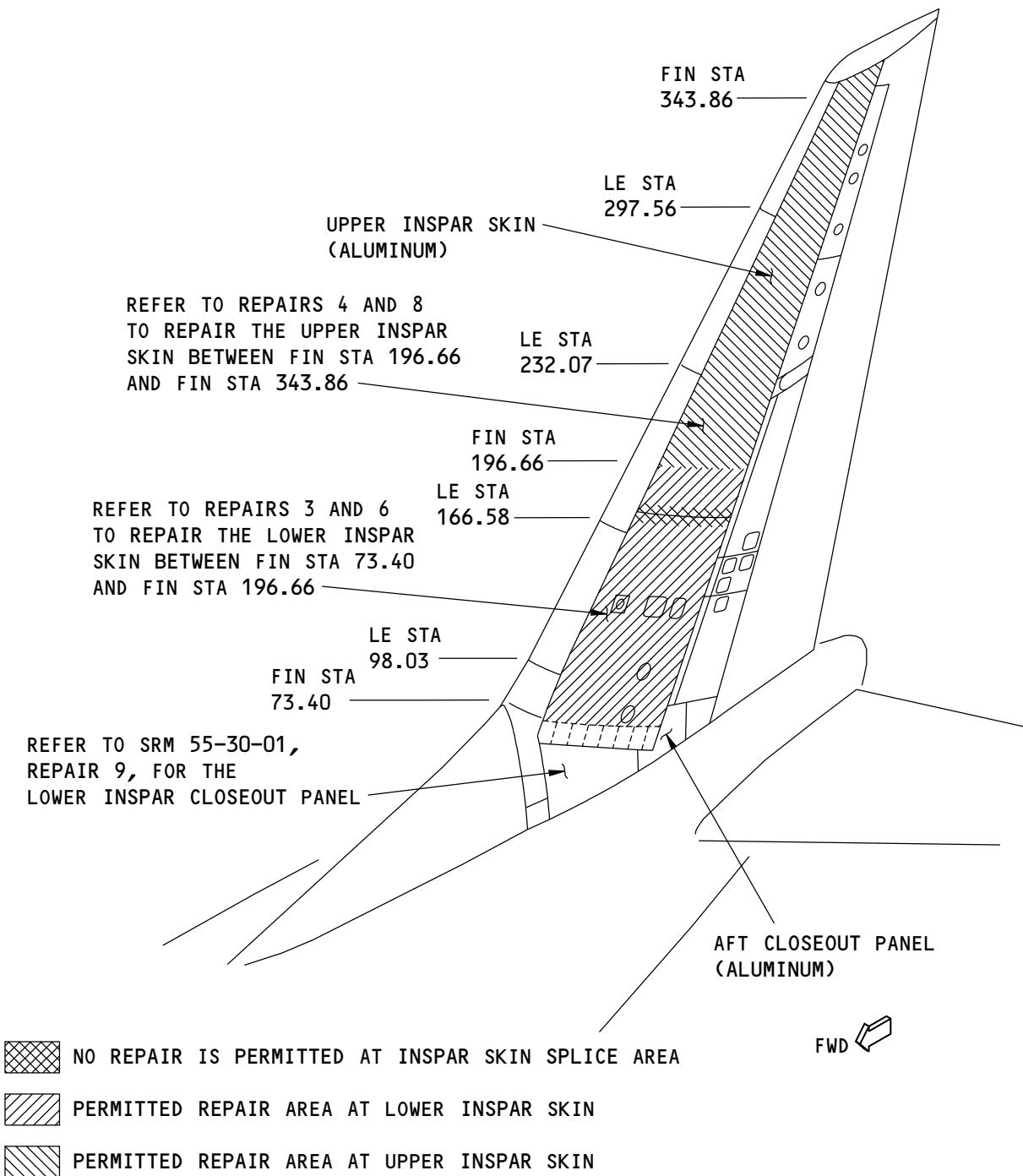
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LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

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Vertical Stabilizer Inspark Skin Locations
Figure 201

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Cut the hole in the skin.
 - (1) Cut the hole in the shape shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 11.
 - (2) Refer to 51-10-02 for the procedures to cut the skin.
- B. Remove the fasteners from the rib chords as necessary.
 - (1) Refer to 51-40-02.
- C. Make the repair parts. Refer to Table 201/REPAIR 11.
- D. Assemble the part [2] doublers and the part [3] shims as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 11.
- E. Drill the fastener holes that go through the skin, the rib chords, the part [2] doublers, and the part [3] shims. Refer to 51-40-05 for the fastener hole dimensions.
- F. Assemble the part [4] splice plates as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 11.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Cover Plate	1	Use bare or clad 2024-T3 that is 0.071 inch thick
[2]	Doubler	2	Use bare or clad 2024-T3 that is 0.190 inch thick
[3]	Shim	2	Use bare or clad 2024-T3 that is 0.032 inch thick
[4]	Splice Plate	2	Use bare or clad 2024-T3 that is 0.190 inch thick

- G. Drill the fastener holes that go through the skin, the part [2] doublers, and the part [4] splice plates. Refer to 51-40-05 for the fastener hole dimensions.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, gouges, and burrs from the initial parts and from the part [2] doublers, the part [3] shims, and the part [4] splice plates.

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REPAIR 11

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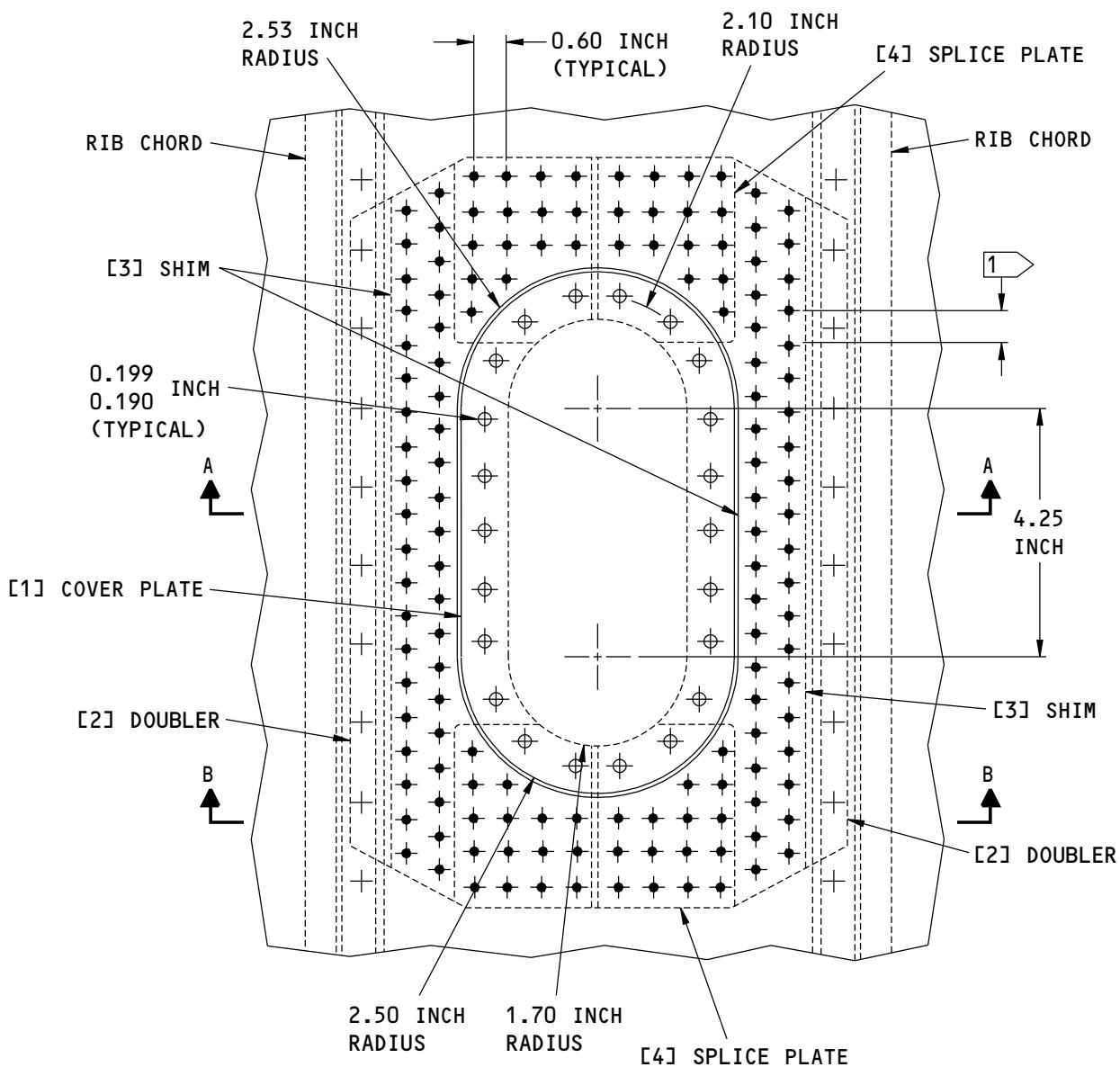
- J. Apply a chemical conversion coating to the bare surfaces of the initial parts and to the part [2] doublers, the part [3] shims, and the part [4] splice plates. Refer to 51-20-01.
- K. Apply one layer of BMS 10-79, Type II or III, primer to the bare surfaces of the initial parts and to the part [2] doubler, the part [3] shims, and the part [4] splice plate. Refer to SOPM 20-44-04.
- L. Install the part [2] doubler, the part [3] shims, and the part [4] splice plate.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Install the rivets without sealant.
 - (3) If you use hex drive bolts, install the fasteners wet with BMS 5-95 sealant.
- M. Put the part [1] cover plate in position as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 11.
- N. Drill the 0.190 to 0.199 inch diameter holes for the nutplates as shown in Vertical Stabilizer Access Panel Installation, Figure 202/REPAIR 11.
- O. Remove the part [1] cover plate.
- P. Put the nutplates in position on the part [2] doubler and drill the holes for the rivets.
- Q. Remove the nicks, scratches, gouges, and burrs from the repair parts.
- R. Apply a chemical conversion coating to the part [1] cover plate and the bare surfaces of the part [2] doublers, the part [3] shims, and the part [4] splice plates. Refer to 51-20-01.
- S. Apply one layer of BMS 10-79, Type II or III, primer to part [1] cover plate and the bare surfaces of the part [2] doublers, the part [3] shims, and the part [4] splice plates. Refer to SOPM 20-44-04.
- T. Install the nutplates on the part [2] doubler.
 - (1) Install the rivets without sealant.
- U. Apply BMS 10-86, Type I white abrasion resistant coating to the mating surfaces of the part [1] cover plate and the part [2] doublers. Refer to SOPM 20-44-01.
- V. Install the part [1] cover plate.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
 - (2) Install the fasteners wet with BMS 5-95 sealant.
 - (3) Put BMS 5-95 sealant into the space between the skin and the part [1] cover plate.
- W. Apply the decorative finish to the repair area if necessary. Refer to AMM PAGEBLOCK 51-21-99/701.

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NOTES

- MAINTAIN A FASTENER SPACING OF 0.60 INCH TO 0.80 INCH

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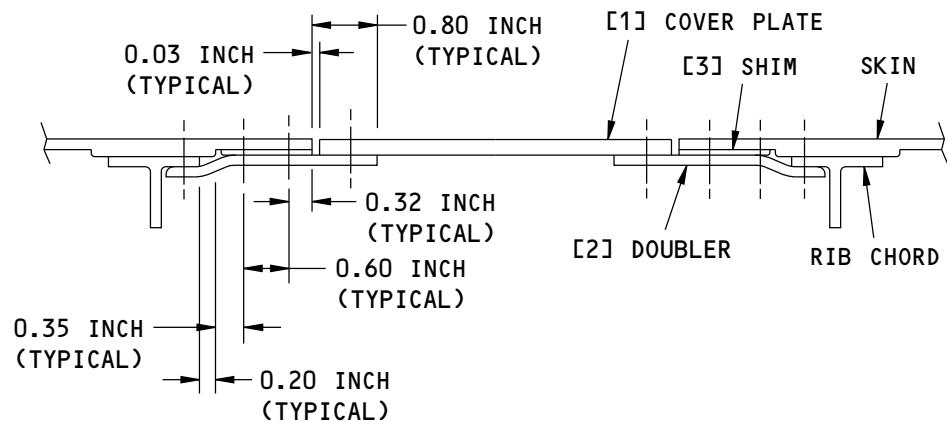
Vertical Stabilizer Access Panel Installation
Figure 202 (Sheet 1 of 2)

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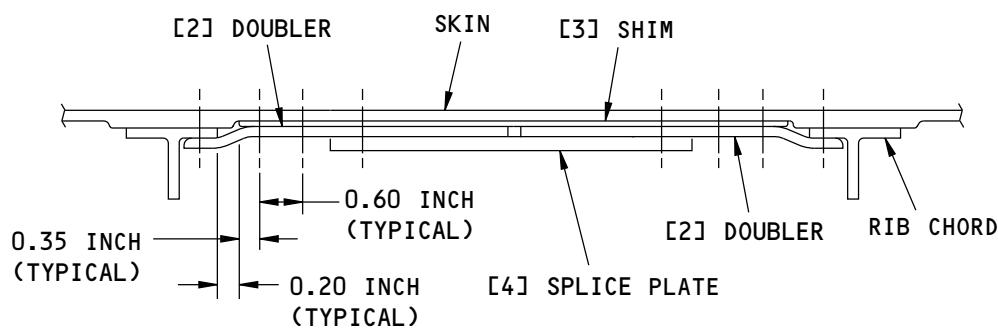
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A-A



B-B

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER AS THE INITIAL FASTENER. YOU CAN INSTALL A FASTENER THAT IS UP TO 1/32 INCH DIAMETER OVERRSIZE.
- REPAIR FASTENER LOCATION. INSTALL A BACB30VT5K HEX DRIVE BOLT.
- REPAIR FASTENER LOCATION. INSTALL BACN10JRO3CFM NUTPLATE WITH BACR15BA3D RIVETS. INSTALL A BACB30EL3-() BOLT TO ATTACH THE PART [1] COVER PLATE.

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Vertical Stabilizer Access Panel Installation
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REPAIR 12 - DORSAL FIN SKIN

1. Applicability

- A. Repair 12 is applicable to the dorsal fin skins made of Glass Fiber Reinforced Plastic (GFRP) and non-metallic honeycomb core shown in Dorsal Fin Skin Location, Figure 201/REPAIR 12.
- B. Repair 12 is applicable to damage that is more than the limits permitted in Allowable Damage 5. Refer to Allowable Damage 2 for the type and size of damage that is permitted.

2. General

- A. Repair 12 gives the instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the dorsal fin skin. Refer to AMM 55-32-11/401.
- C. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.
 - (2) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT procedure.
 - (3) Refer to Damage Definitions, Figure 202/REPAIR 12, for the definitions of the length, width, and depth of damage.
- D. Do the repair as given in Paragraph 4./REPAIR 12
- E. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the performance of the airplane. Refer to 51-10-01.
- F. Put the dorsal fin skin back to the initial condition, as applicable.
 - (1) Install the skin if it was removed. Refer to AMM 55-32-11/401.

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REPAIR 12

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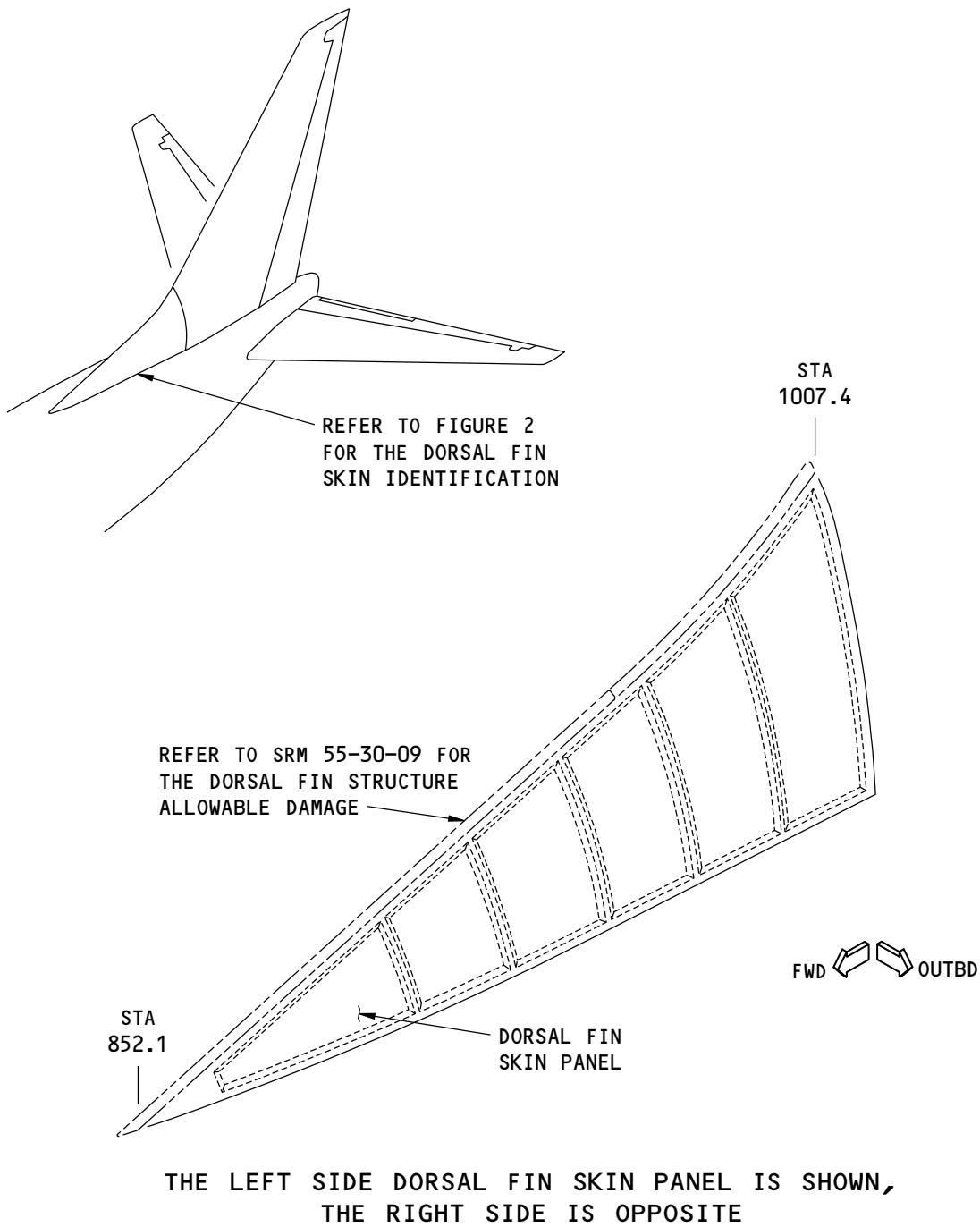
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Dorsal Fin Skin Location
Figure 201

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REPAIR 12

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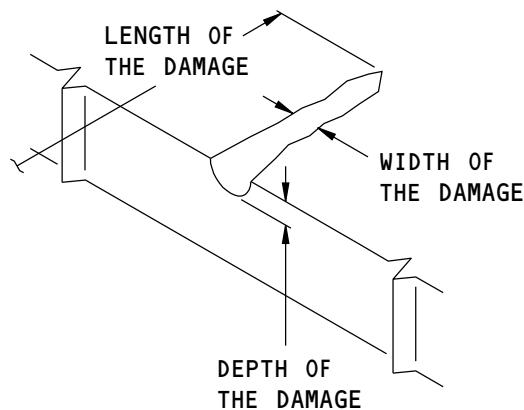
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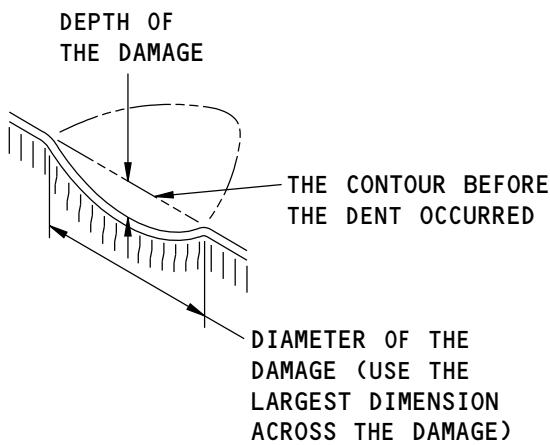


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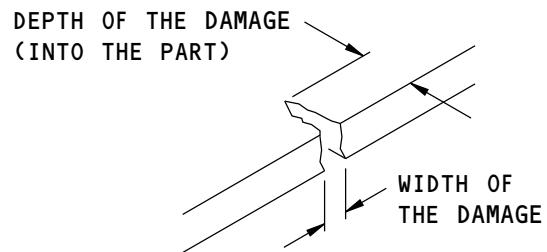
DEFINITIONS OF THE SIZES FOR NICK, GOUGE, AND SCRATCH DAMAGE

(A)



DEFINITIONS OF THE SIZES
FOR DENT DAMAGE

(B)



DEFINITIONS OF THE SIZES
FOR EDGE DAMAGE

(C)

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Damage Definitions
Figure 202

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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02, GENERAL	Inspection and Removal of Damage
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-06, REPAIR GENERAL	Room Temperature Cure Repairs With Wet Layup Materials For Glass Fabric Reinforced Plastic Solid Laminates and Honeycomb Core Panels
AMM 51-21	INTERIOR AND EXTERIOR FINISHES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 55-32-11/401	Removal and Installation of the Dorsal Fin
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. If a dent is 2 inches (50.80 mm) in diameter or less, and has no fiber damage or delamination, then fill the dent with potting compound and apply a fiberglass patch as given in Repair 14 of 51-70-04.
- B. If Paragraph 4.A./REPAIR 12 is not applicable, then refer to:
 - (1) Table 201/REPAIR 12 for the repair data that is applicable to damage in the honeycomb sandwich areas
 - (2) Table 202/REPAIR 12 for the repair data that is applicable to damage in the edgeband or solid laminate areas.
- C. For repairs made with wet layup materials, do as follows, as applicable:
 - (1) Use one repair ply of fabric for each initial ply that was damaged.
 - (2) Add two structural plies of fabric for each facesheet that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees. Refer to Identification 6 for the ply materials and ply direction.

NOTE: Repair plies or added plies are not necessary in the repair of delamination at an edge if the delamination is a minimum of 2D (D = the fastener diameter) away from a fastener hole.

- (3) Examine Category B repairs after each interval of 800 flight hours or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.

NOTE: Other inspection methods, equivalent to the methods used by Boeing, that have been examined and found to be satisfactory by the operator can be used.

- D. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged.

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REPAIR 12

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Table 201:

REPAIR DATA FOR THE 250°F (121°C) CURE DORSAL FIN SKIN PANELS IN THE HONEYCOMB CORE AREAS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREPREG LAYUP REPAIR
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Damage that is a maximum of: - 3.0 inches (76.2 mm) in diameter - One repair for each 144 square inches (929.03 cm ²) - 2.0 inches (50.8 mm) minimum clearance from: - other repair - fastener holes - panel edges	Damage that is a maximum of: - 6.0 inches (152.4 mm) in diameter - One repair for each 144 square inches (929.03 cm ²) - 2.0 inches (50.8 mm) minimum clearance from: - other repairs - fastener holes - panel edges	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	-----	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D

Table 202:

REPAIR DATA FOR THE 250°F (121°C) CURE EDGEBAND AND SOLID LAMINATE AREAS OF THE DORSAL FIN SKIN				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREPREG LAYUP REPAIR
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Contact The Boeing Company	Damage that is a maximum of: - 3.0 inches (76.2 mm) across the largest dimension of the damage - 10 percent of the edgeband length on the damage side	Damage that is a maximum of: - 6.0 inches (152.4 mm) across the largest dimension of the damage - 30 percent of the edgeband length on the damage side	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	-----	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D

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REPAIR 12

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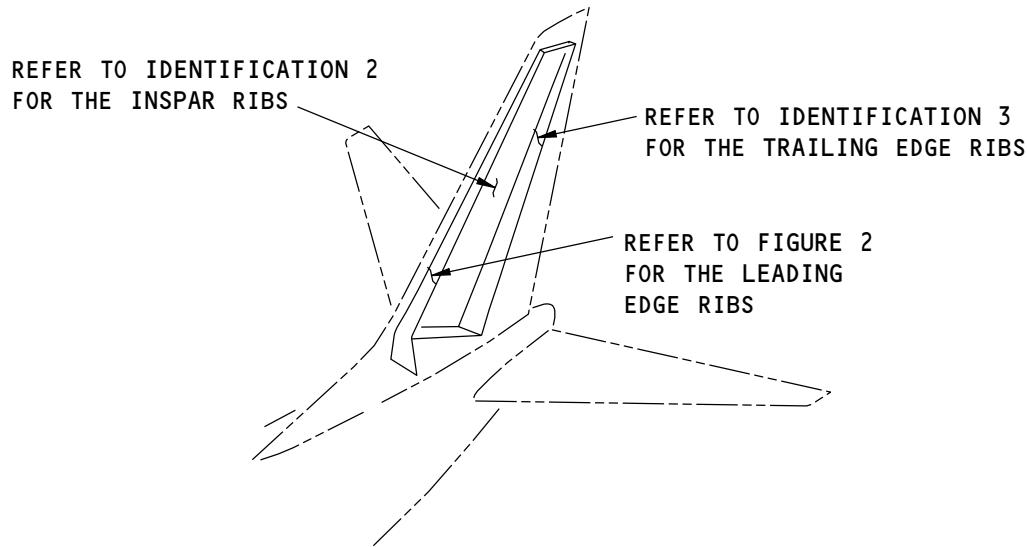
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IDENTIFICATION 1 - VERTICAL STABILIZER LEADING EDGE RIBS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F86382 S0006593422_V1

Vertical Stabilizer Leading Edge Rib Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A7001	Section 70 Vertical Fin - Product Collector
176A0001	Leading Edge and Miscellaneous Functional Collector - Vertical Fin
176A1001	Removable Leading Edge Assembly/Installation Vertical Fin
176A1201	Rib Assembly - Leading Edge Station 98.030 Vertical Fin
176A1202	Rib Assembly - Leading Edge Station 108.150 Vertical Fin
176A3001	Fixed Leading Edge Installation - Vertical Fin
176A3002	Rib Assembly - Body Station 1007.65, Fixed Leading Edge

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IDENTIFICATION 1

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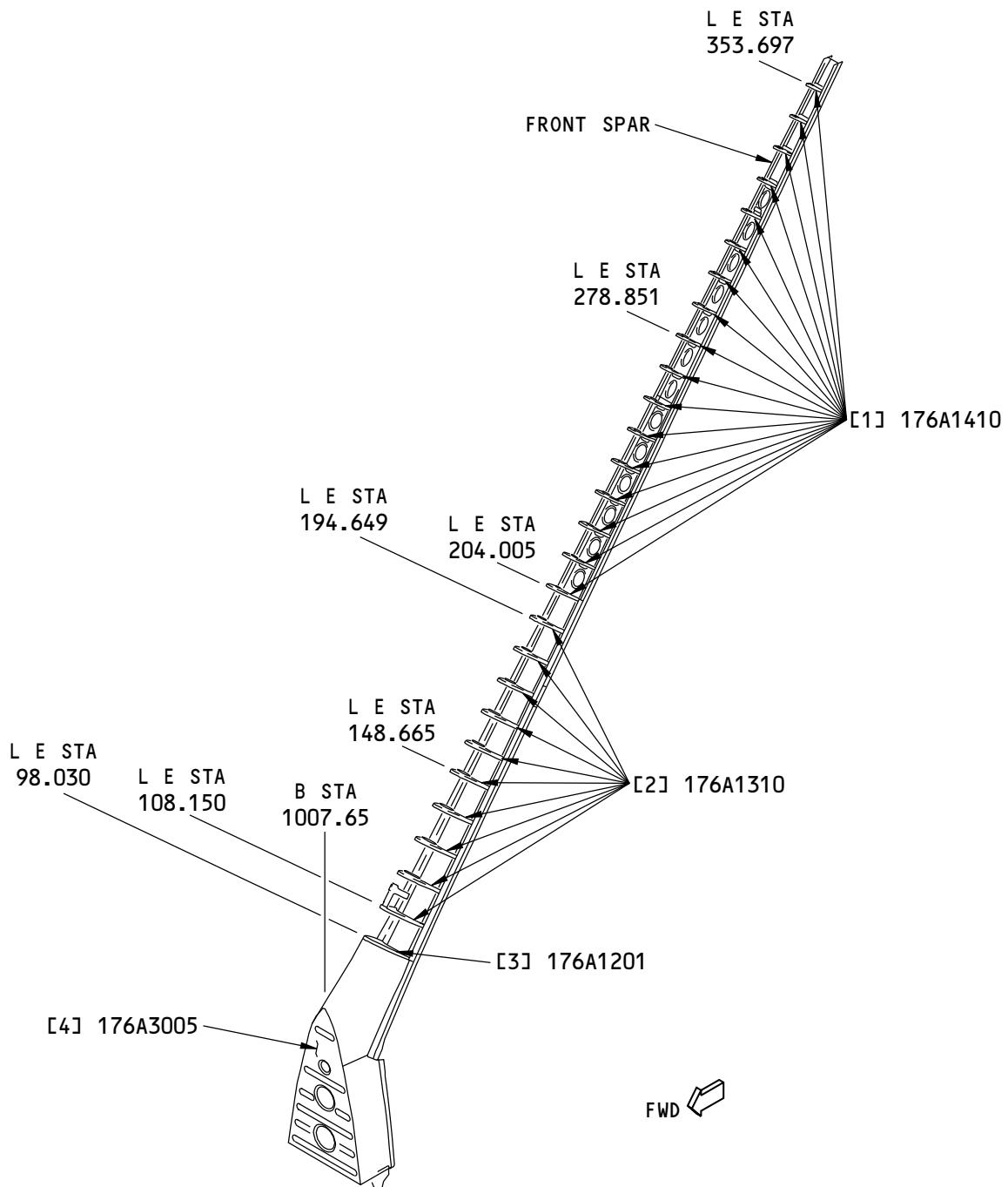
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Vertical Stabilizer Leading Edge Rib Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib, Removable LE	0.040 (1.016)	2024-T42 clad sheet as given in QQ-A-250/5	
[2]	Rib, Removable LE		Glass Fiber Reinforced Plastic (GFRP) laminate as given in BMS 8-79, Style 1581, Class III, Grade A	
[3]	Rib Assembly Web Chord	0.050 (1.270)	2024-T42 clad sheet as given in QQ-A-250/5 BAC1506-1950 7075-T62 extrusion as given in QQ-A-200/11	
[4]	Rib, Fixed LE	0.040 (1.016) 0.050 (1.270)	2024-T42 high formability clad sheet as given in BMS 7-305 2024-T42 high formability clad sheet as given in BMS 7-305	Airplane Line Numbers: 1 to 12 Airplane Line Numbers: 13 and on

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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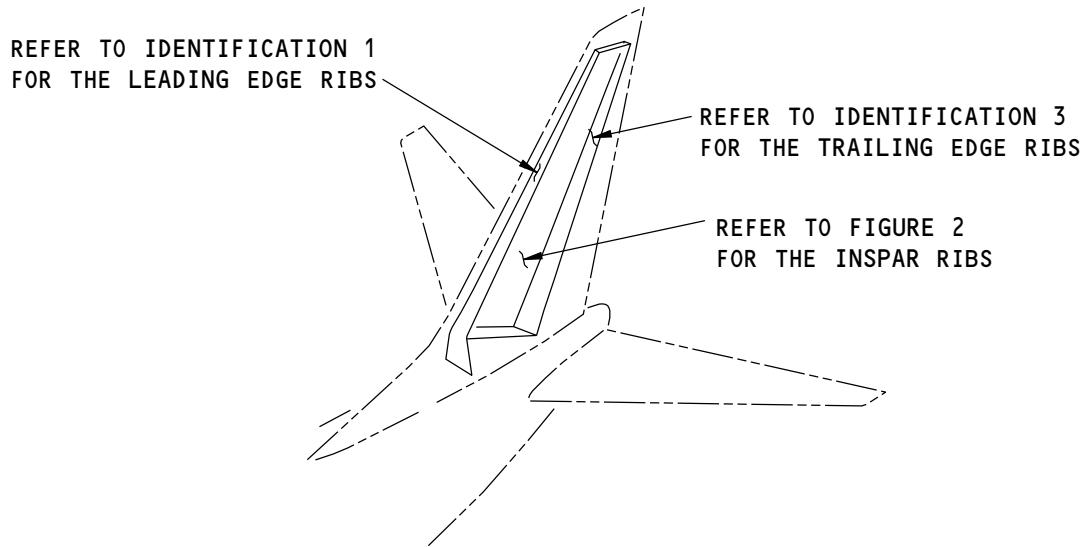
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IDENTIFICATION 2 - VERTICAL STABILIZER INSPAR RIBS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F86652 S0006593427_V1

Vertical Stabilizer Inspark Rib Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A7001	Section 70 Vertical Fin - Product Collector
172A0001	Torque Box Functional Collector - Vertical Fin
172A3101	Closure Rib Assembly/Installation-Lower, Vertical Fin
172A3202	Rib Installation-Fin WL 274.000, Vertical Fin
175A1307	Inspark and T.E. Hinge Rib Installation-Rudder Station 276.24

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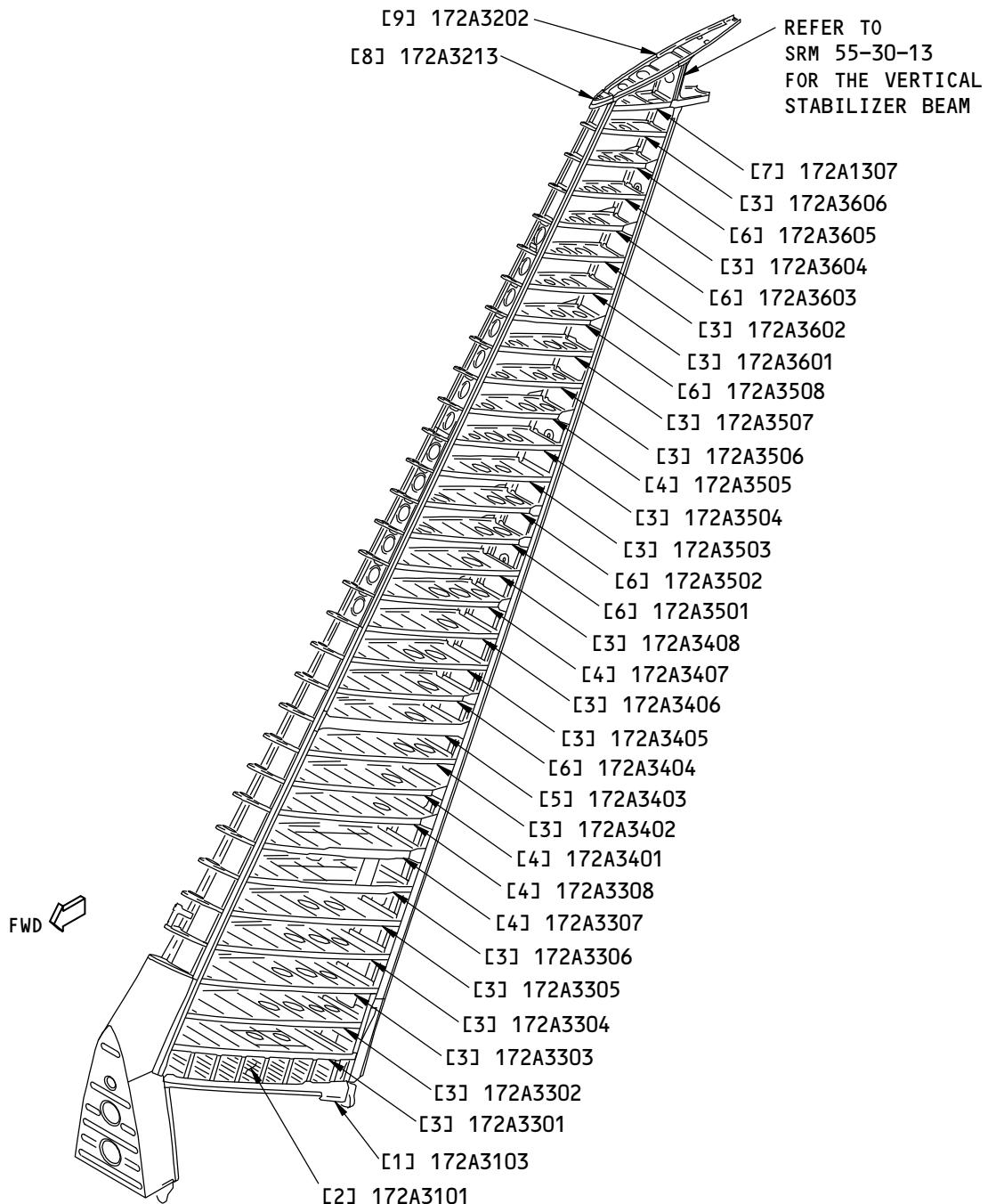
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Vertical Stabilizer Inspark Rib Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Strap (2)	0.300 (7.620)	7075-T7351 plate as given in QQ-A-250/12	
[2]	Closure Rib Assembly-		BAC1506-4289 2024-T3511 extrusion as given in QQ-A-200/3	
	Primary Chord (2)		BAC1506-1785 7075-T6511 extrusion as given in QQ-A-200/11	
	Failsafe Chord (2)		BAC1506-4288 7075-T6511 extrusion as given in QQ-A-200/11	
	Stiffener		BAC1506-4288 7075-T6511 extrusion as given in QQ-A-200/11	
	Web	0.200 (5.080)	7075-T6 as given in QQ-A-250/12. Refer to Figure 3 for the chem-milled thicknesses	
	Doubler	0.063 (1.600)	7075-T6 as given in QQ-A-250/12	
[3]	Doubler (2)	0.100 (2.540)	7075-T6 as given in QQ-A-250/12	
	Rib		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses. Refer to Figure 4 for an example of a typical machined rib	
[4]	Rib Assembly			
	Rib		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses. Refer to Figure 5 for an example of a typical machined rib	
	Doubler	0.050 (1.270)	2024-T3 clad as given in QQ-A-250/5	
[5]	Rib Assembly			
	Rib		7075 T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses. Refer to Figure 6 for an example of a typical machined rib	
	Splice Strap	0.063 (1.600)	2024-T3 clad as given in QQ-A-250/5	
[6]	Rib Assembly			
	Rib		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses. Refer to Figure 7 for an example of a typical machined rib	
	Doubler	0.040 (1.016)	2024-T3 clad as given in QQ-A-250/5	
[7]	Fitting Assembly			
	Stiffener		BAC1506-1844 7075-T6511 as given in QQ-A-200/11	
	Stiffener		BAC1503-1509 7075-T6511 as given in QQ-A-200/11	
	Fitting		7050-T7451 plate as given in BMS 7-323, Type I	

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Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[8]	Angle	0.063 (1.600)	7075-T62 clad as given in QQ-A-250/13	
[9]	Rib Assembly			
	Strap (2)		Glass Fiber Reinforced Plastic (GFRP) as given in BMS 8-79, Style 1581 or 7781, Class III	
	Chord (2)		Glass Fiber Reinforced Plastic (GFRP) as given in BMS 8-79, Style 1581 or 7781, Class III (Optional: BAC 5317-2, die mold, minimum 50 psi, cured at 265°F ± 10°F for a minimum of 60 minutes)	
	Web		2024-T3 clad sheet as given in QQ-A-250/5	
	Plate		2024-T42 clad sheet as given in QQ-A-250/5	
	Chord (2)		BAC1514-3145 7075-T62 extrusion as given in QQ-A-200/11	
	Stiffener (3)		BAC1503-470 7075-T62 extrusion as given in QQ-A-200/11	
	Stiffener		AND10136-1301 7075-T6511 extrusion as given in QQ-A-200/11	
	Angle	0.063 (1.600)	7075-T62 clad sheet as given in QQ-A-250/13	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 2

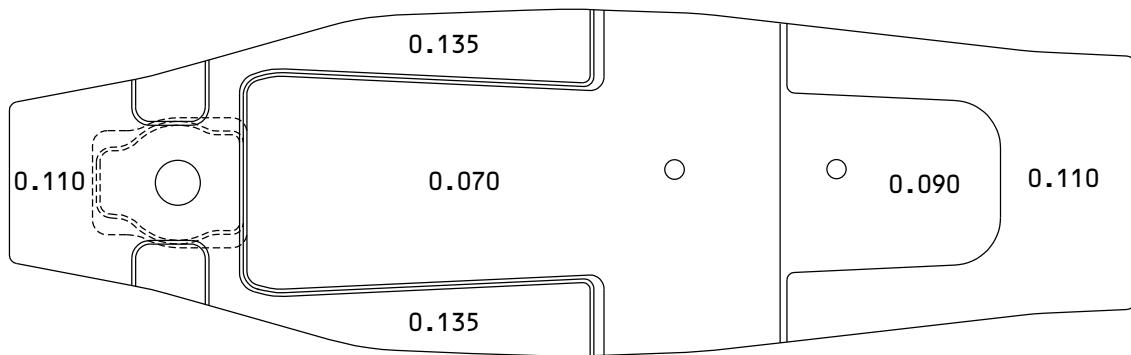
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NOTE: ALL DIMENSIONS ARE IN INCHES.

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Chem-Milled Areas of Figure 2, Item [2]
Figure 3

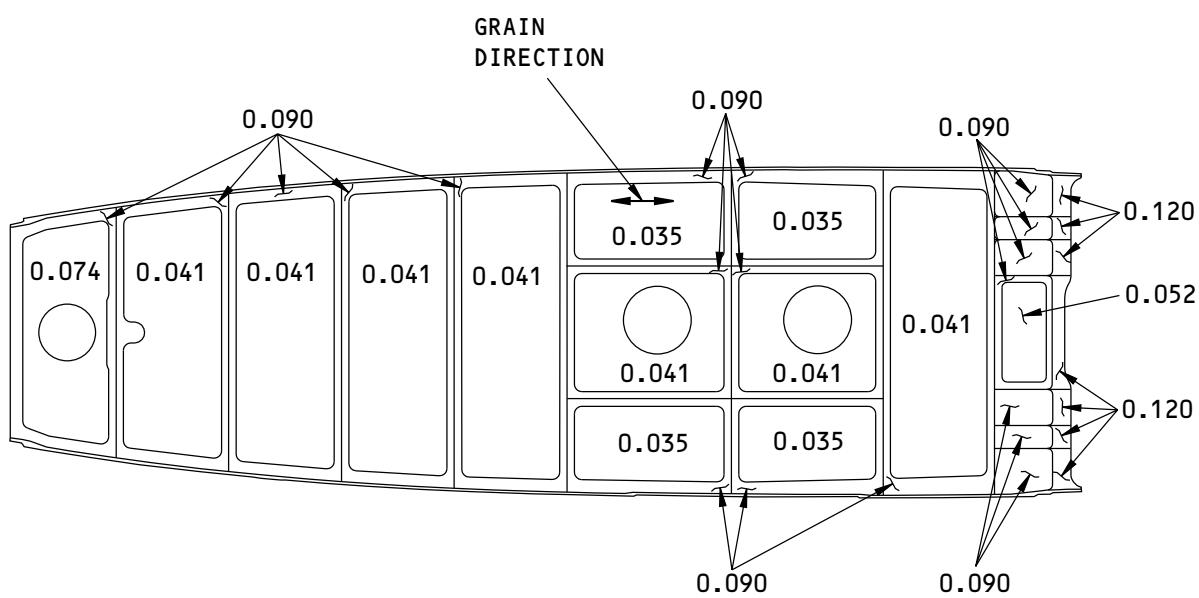
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TYPICAL MACHINED RIB

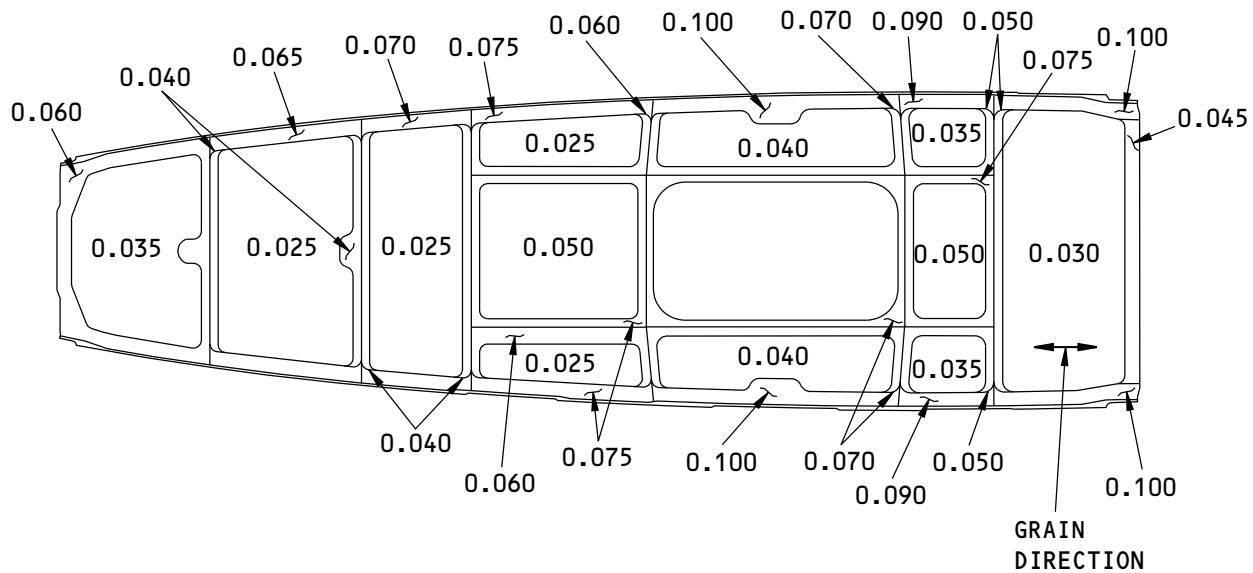
F86892 S0006593432_V1

Machined Areas for Figure 2, Item [3]
Figure 4

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TYPICAL MACHINED RIB

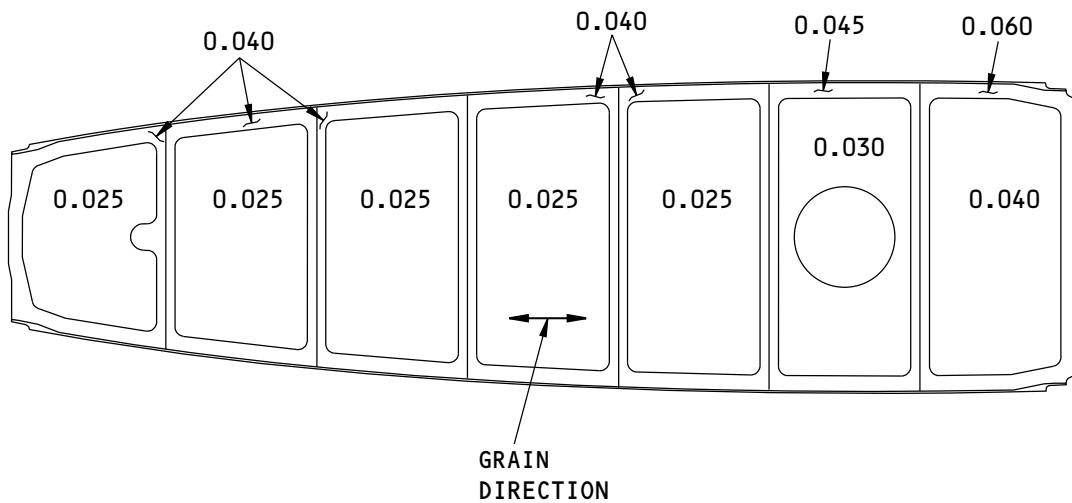
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Machined Areas for Figure 2, Item [4]
Figure 5

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TYPICAL MACHINED RIB

F86978 S0006593434_V1

Machined Areas for Figure 2, Item [5]
Figure 6

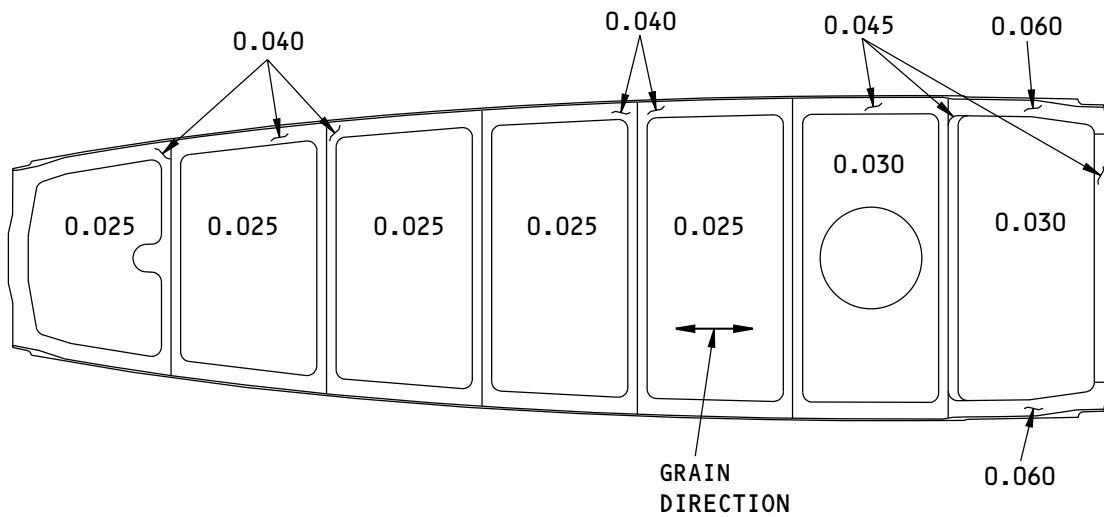
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TYPICAL MACHINED RIB

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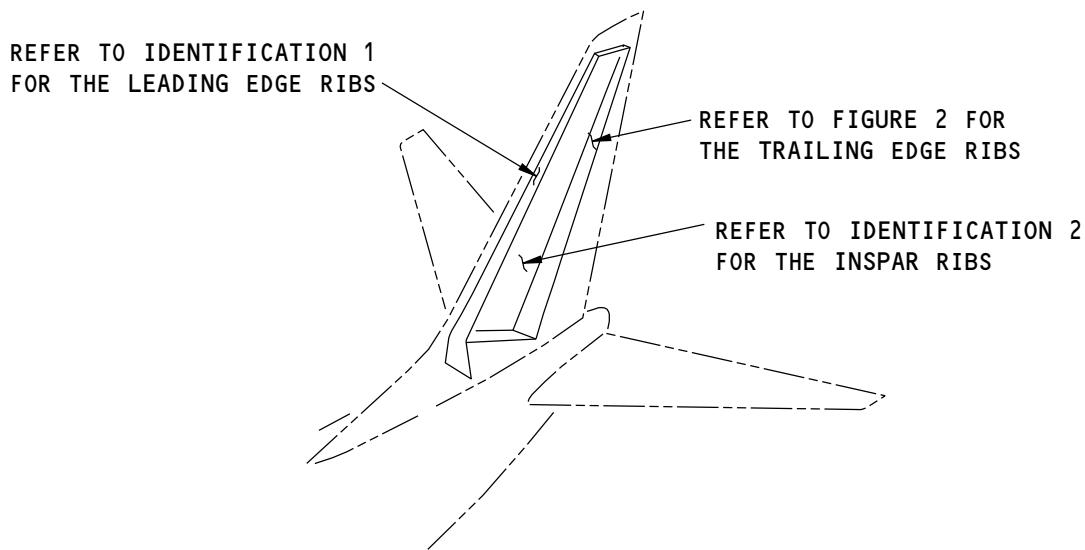
Machined Areas for Figure 2, Item [6]
Figure 7

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IDENTIFICATION 3 - VERTICAL STABILIZER TRAILING EDGE RIBS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

Vertical Stabilizer Trailing Edge Rib Locations

Figure 1

Table 1:

F87018 S0006593437_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A7001	Section 70 Vertical Fin - Product Collector
170A1540	Vertical Fin Centerline Diagram
175A0001	Trailing Edge Functional Collector - Vertical Fin
175A1201	Trailing Edge Hinge Rib Assembly/Installation-Rudder Station 6.96
175A1204	Trailing Edge Hinge Rib Installation - Rudder Station 56.48
175A1207	Trailing Edge Hinge Rib Assembly/Installation-Rudder Station 66.42
175A1210	Trailing Edge Hinge Rib Installation - Rudder Station 74.80

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Table 1: (Continued)

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
175A1213	Trailing Edge Hinge Rib Assembly/Installation-Rudder Station 129.74
175A1215	Trailing Edge Hinge Rib Installation - Rudder Station 257.93
175A1301	Trailing Edge Rib Installation - Rudder Station 184.67
175A1304	Trailing Edge Hinge Rib Installation - Rudder Station 239.61
175A1310	Trailing Edge Rib Installation - Rudder Station 212.15
175A1403	Trailing Edge Rib Assembly/Installation - Fin WL 147.09
175A1404	Trailing Edge Rib Assembly/Installation - Fin WL 155.25
175A1410	Trailing Edge Rib Installation - Rudder Station 102.27

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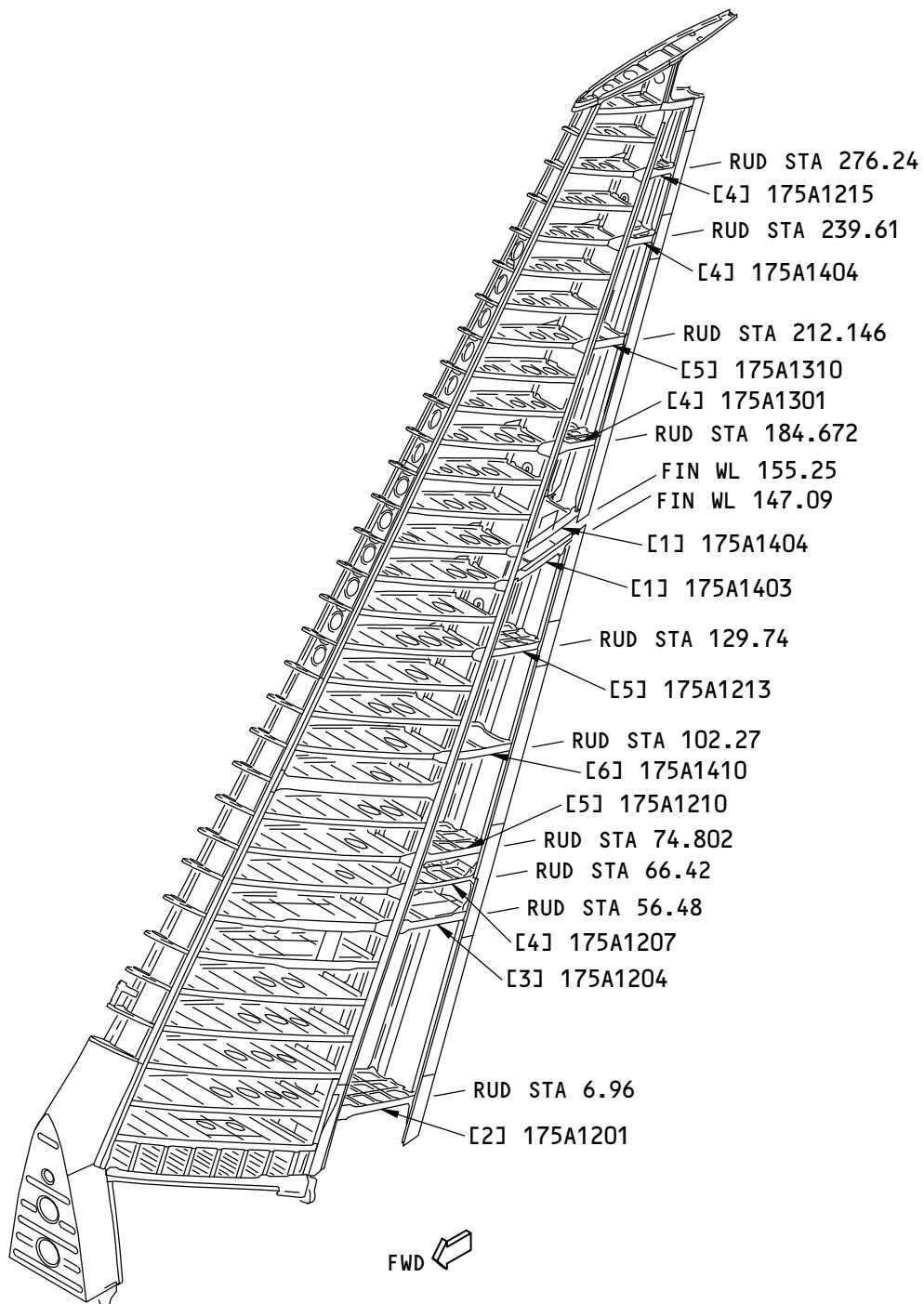
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Vertical Stabilizer Trailing Edge Rib Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib Assembly Angle (2) Chord (2) Stiffener Web		7050-T7451 plate as given in AMS 4050 (Grain direction controlled part). Refer to the production drawings for the grain direction 7050-T7451 plate as given in AMS 4050 (Grain direction controlled part). Refer to the production drawings for the grain direction BAC1503-100593 7075-T6511 extrusion as given in QQ-A-200/11 2024-T3 clad as given in QQ-A-250/5	
[2]	Rib Assembly Fitting Channel (2) Support (3)	0.040 (1.016)	7050-T7451 plate as given in BMS 7-323, Type I (Grain direction controlled part). Refer to the production drawings for the grain direction 2024-T3 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5	
[3]	Rib Assembly Fitting Pan	0.040 (1.016)	7050-T7451 plate as given in BMS 7-323, Type I (Grain direction controlled part). Refer to the production drawings for the grain direction 2024-T3 clad sheet as given in QQ-A-250/5	
[4]	Rib Assembly Fitting		7050-T7451 plate as given in BMS 7-323, Type I (Grain direction controlled part). Refer to the production drawings for the grain direction	
[5]	Rib Assembly Fitting		7050-T7451 plate as given in AMS 4050 (Grain direction controlled part). Refer to the production drawings for the grain direction	
[6]	Rib Assembly Fitting Support	0.063 (1.600)	7050-T7451 plate as given in AMS 4050 (Grain direction controlled part). Refer to the production drawings for the grain direction 2024-T42 clad as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 3

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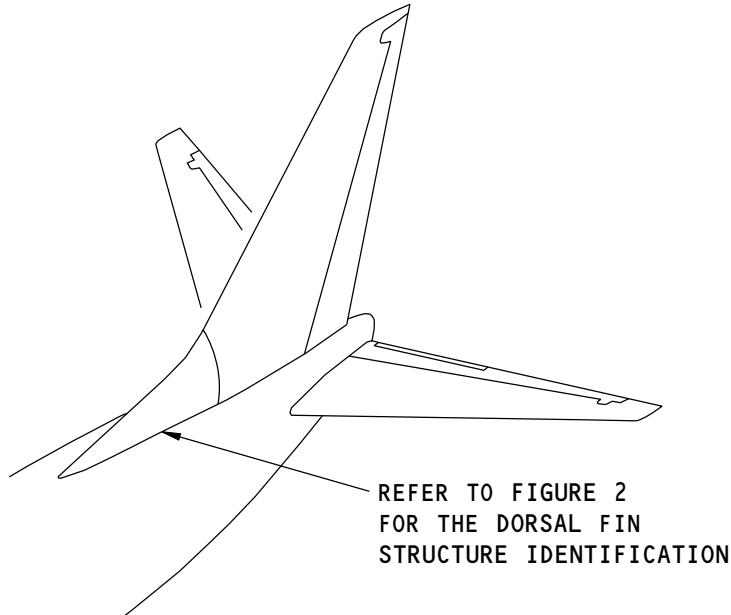
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IDENTIFICATION 4 - DORSAL FIN STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G22656 S0006593442_V1

Dorsal Fin Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
174A0101	Dorsal Fin Installation

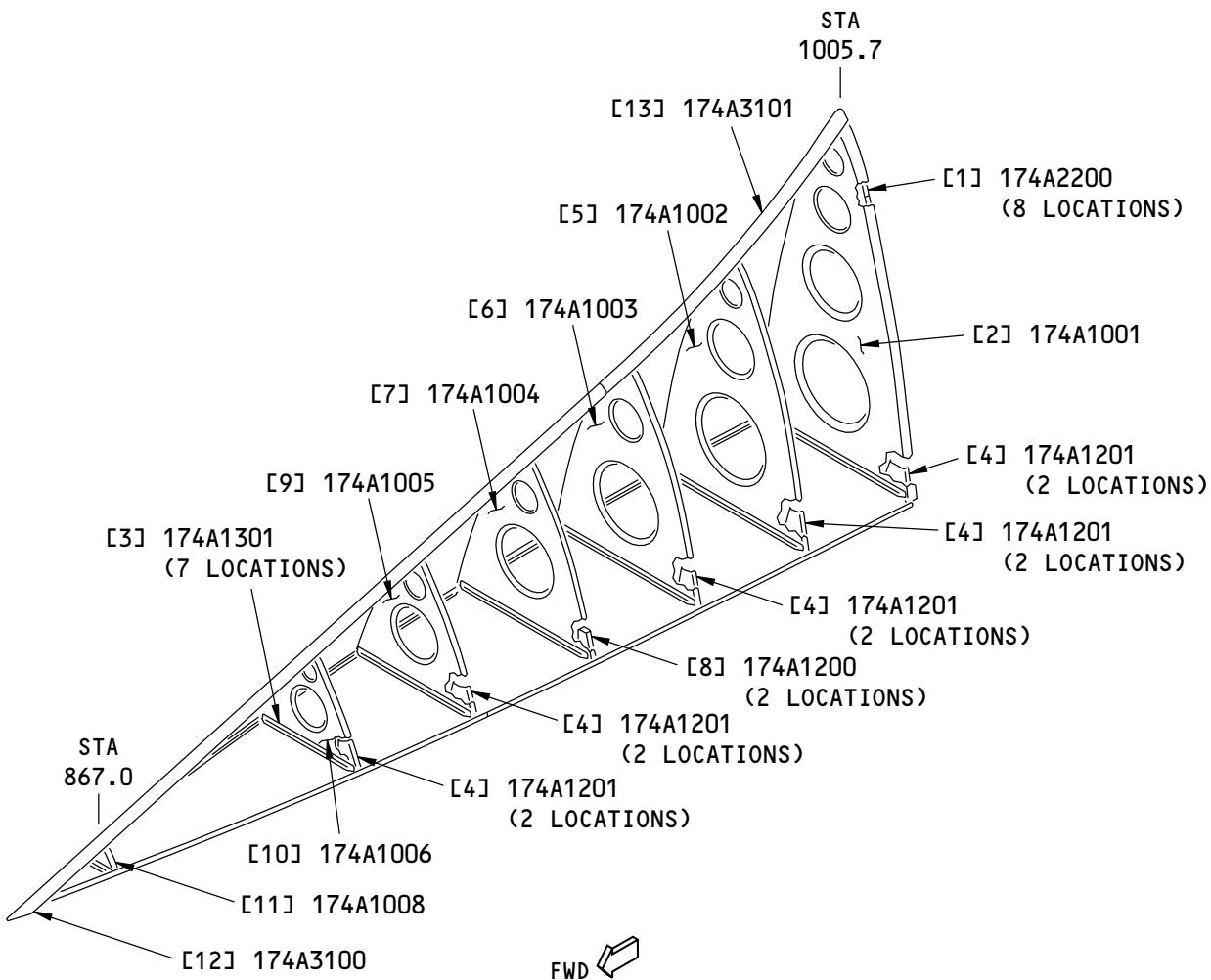
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

G22678 S0006593444_V1

Dorsal Fin Structure Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Seal Retainer	0.025 (0.63)	2024-T42 clad sheet as given in QQ-A-250/5	
[2]	Rib - BS 1005.7	0.050 (1.27)	2024-T42 clad sheet as given in QQ-A-250/5	
[3]	Stiffener		AND10134-0702 7075-T73511 extrusion	
[4]	Gusset	0.040 (1.02)	2024-T42 sheet as given in QQ-A-250/5	
[5]	Rib - BS 986.50	0.050 (1.27)	2024-T42 clad sheet as given in QQ-A-250/5	
[6]	Rib - BS 966.70	0.050 (1.27)	2024-T42 clad sheet as given in QQ-A-250/5	
[7]	Rib - BS 947.50	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[8]	Drag Load Fitting	1.40 (36.6)	7075-T7451 machined plate as given in AMS 4050	
[9]	Rib - BS 926.70	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[10]	Rib - BS 906.70	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[11]	Rib - BS 867	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[12]	Forward Leading Edge Cap		BAC1513-432 7075-T73511 extrusion	
[13]	Aft Leading Edge Cap		7050-T7451 plate as given in BMS 7-323, Type 1	
[14]	Attach Clip		BAC1503-100605 7075-T73511 extrusion as given in QQ-A-200/11	
[15]	Attach Clip		BAC1503-100698 7075-T73511 extrusion as given in QQ-A-200/11	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

55-30-09

IDENTIFICATION 4

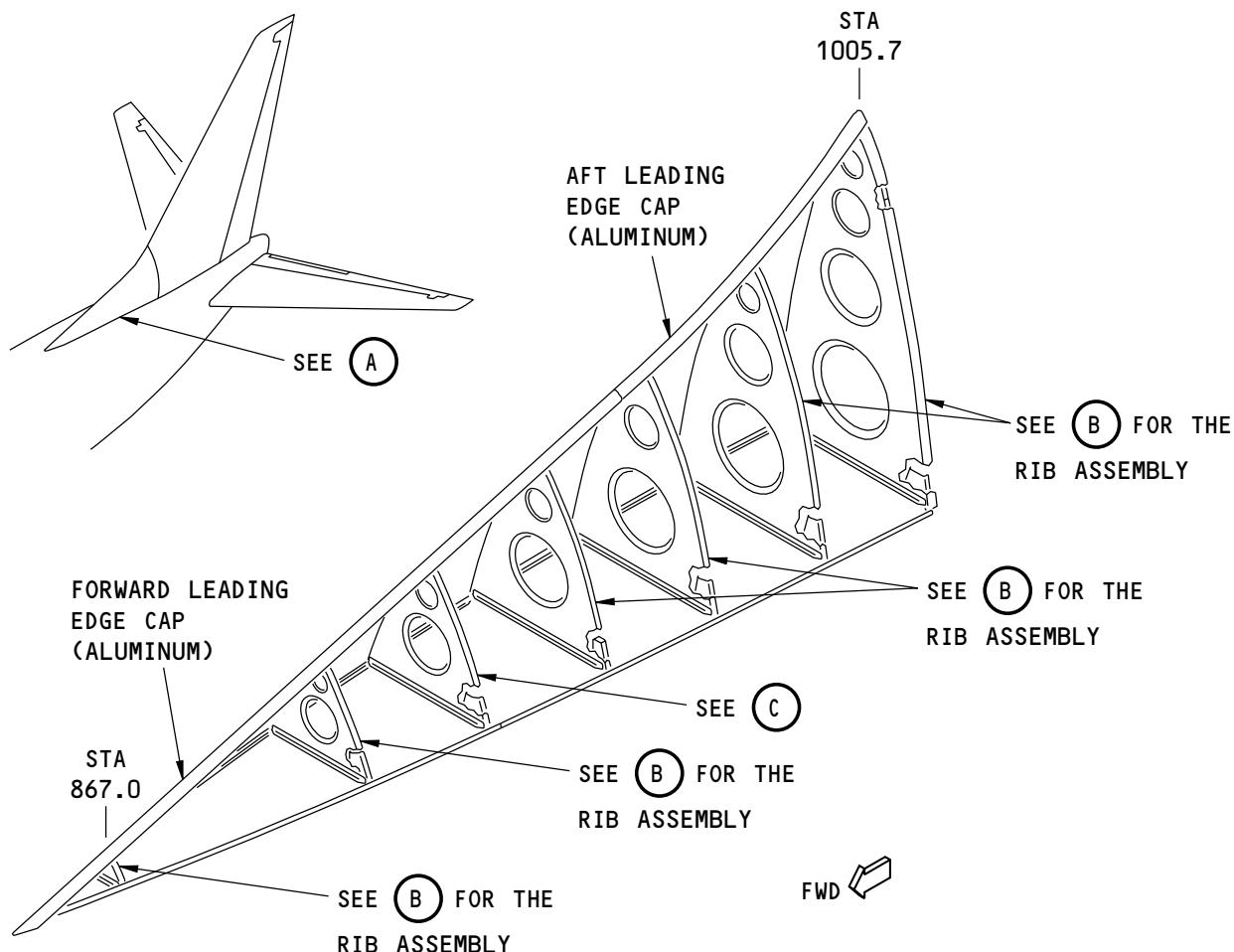
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**737-800
STRUCTURAL REPAIR MANUAL**
ALLOWABLE DAMAGE 2 - DORSAL FIN STRUCTURE
1. Applicability

- A. This subject gives the allowable damage limits for the dorsal fin structure shown in Dorsal Fin Structure Location, Figure 101/ALLOWABLE DAMAGE 2.



Dorsal Fin Structure Location
Figure 101 (Sheet 1 of 3)

G23051 S0006593481_V1

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ALLOWABLE DAMAGE 2

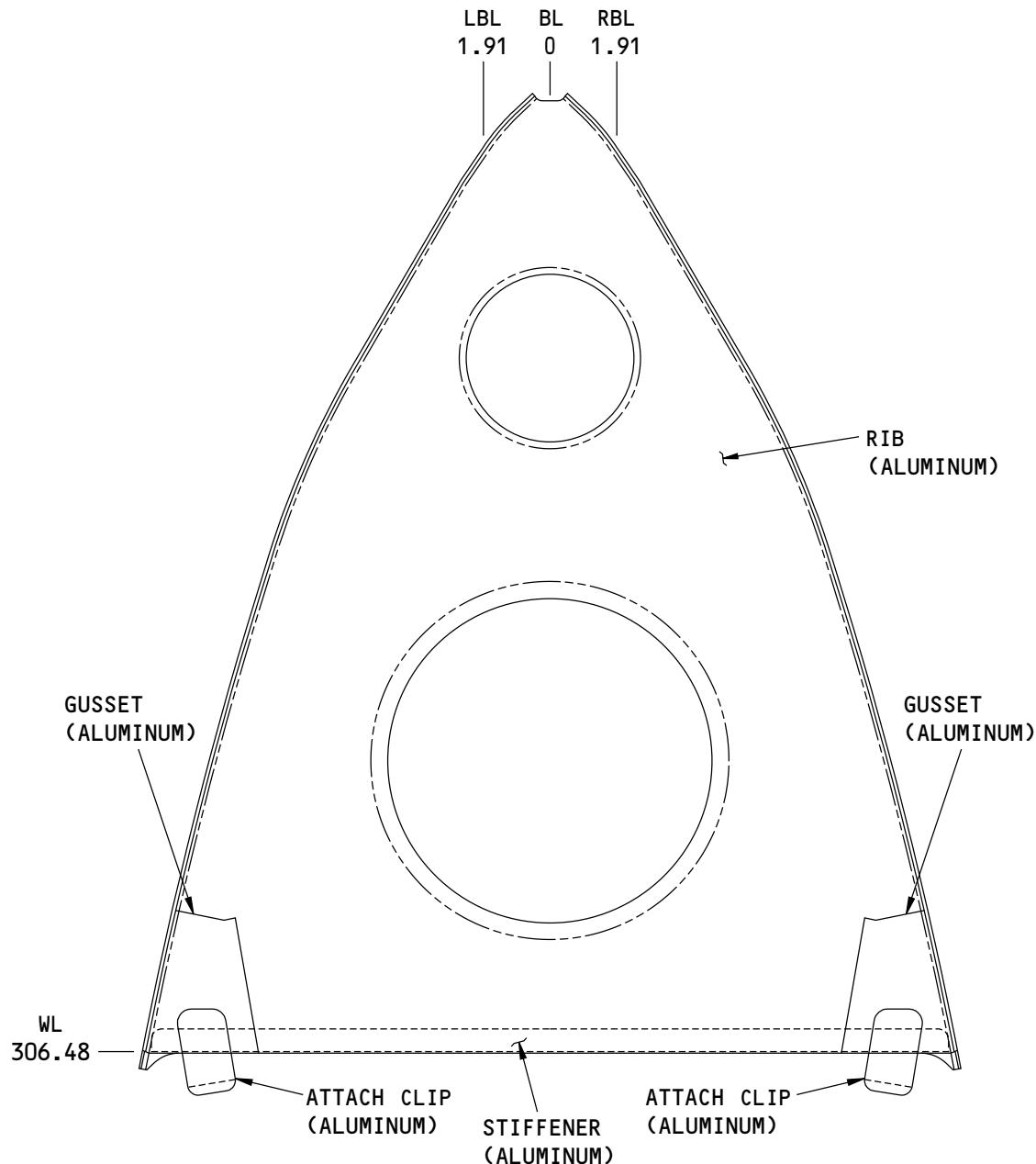
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VIEW WHEN YOU LOOK FORWARD
TYPICAL RIB ASSEMBLY AT SIX LOCATIONS

(B)

G22688 S0006593482_V1

Dorsal Fin Structure Location
Figure 101 (Sheet 2 of 3)

55-30-09

ALLOWABLE DAMAGE 2

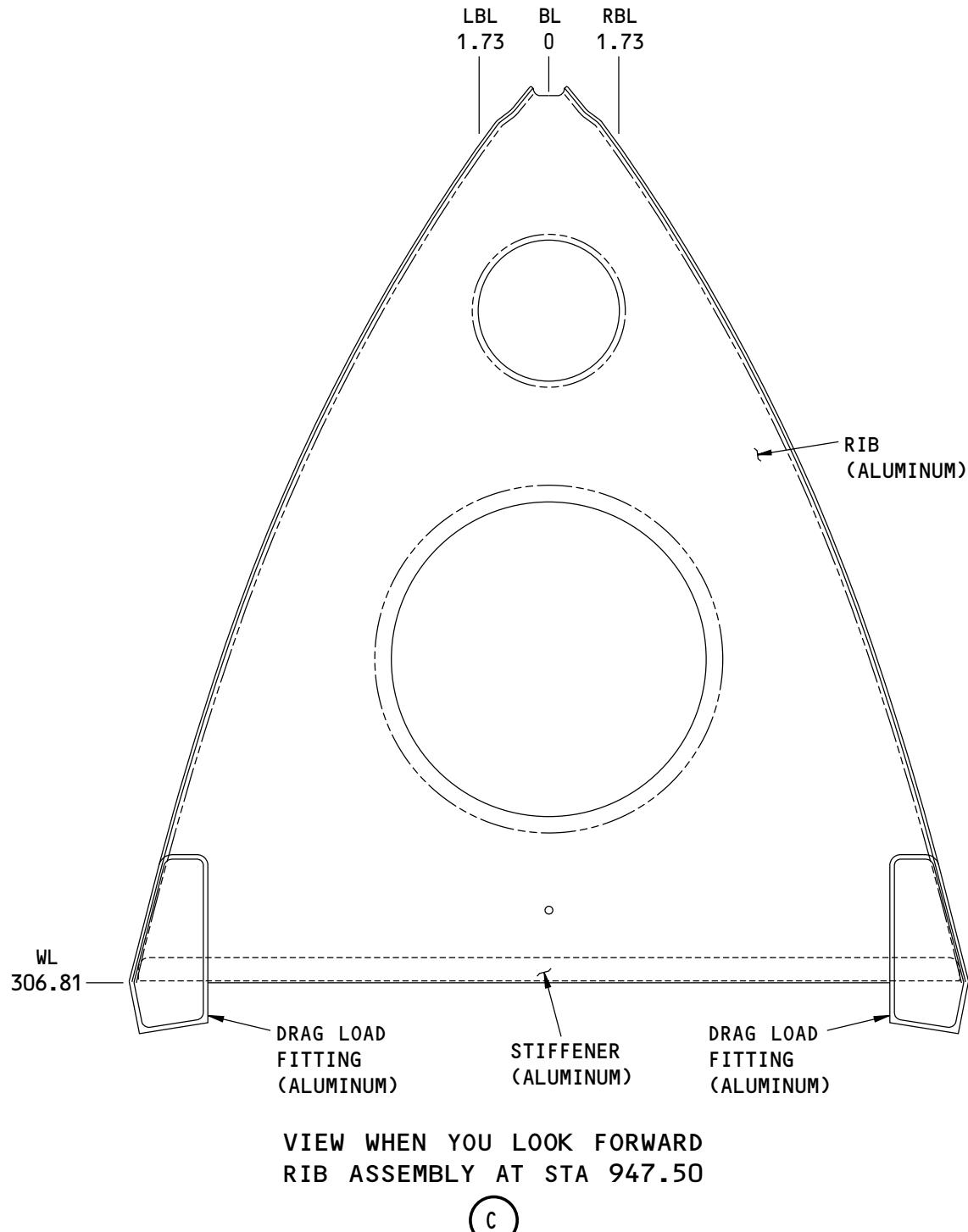
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STRUCTURAL REPAIR MANUAL



G23194 S0006593483_V1

Dorsal Fin Structure Location
Figure 101 (Sheet 3 of 3)

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ALLOWABLE DAMAGE 2

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2. General

- A. Remove the damaged material as necessary.
 - (1) Refer to 51-10-02 for the procedures.
 - (2) Refer to 51-30-03 for sources of non-metallic materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for sources of equipment and tools you can use to remove the damage.
- B. After you remove the damage, do as follows:
 - (1) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-79, Type III primer to the bare surfaces of the reworked areas. Refer to SOPM 20-44-04.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

- A. Ribs and Gussets
 - (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Details, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and C.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Details, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, D, E, and F.
 - (3) Dents are permitted as shown in Allowable Damage Details, Figure 102/ALLOWABLE DAMAGE 2, Detail G.
 - (4) Holes and Punctures:
 - (a) Damage is permitted in the free flange as shown in Allowable Damage Details, Figure 102/ALLOWABLE DAMAGE 2, Detail I.
 - (b) Do the steps that follow to remove the damage in the web:
 - 1) Drill out the damage to a maximum diameter of 0.25 inch (6.35 mm)
 - 2) The damage must be a minimum of 1.0 inch (25.4 mm) away from a fastener hole, material edge, or other damage.
 - 3) Install a 2117-T3 or 2117-T4 aluminum protruding head rivet. Install the rivet without sealant.

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ALLOWABLE DAMAGE 2

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B. Stiffeners, Leading Edge Caps, and Drag Fittings

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Details, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, H, and J.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Details, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, D, E, H, and J.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

55-30-09

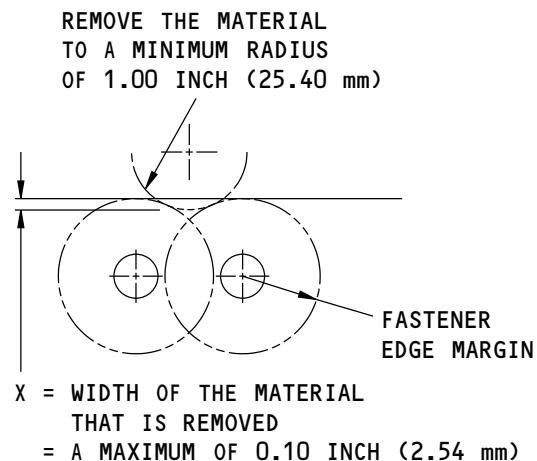
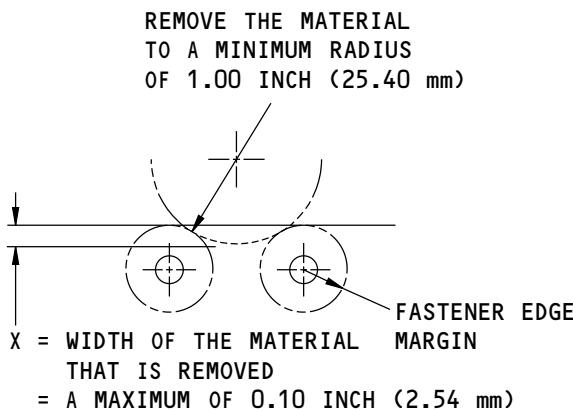
ALLOWABLE DAMAGE 2

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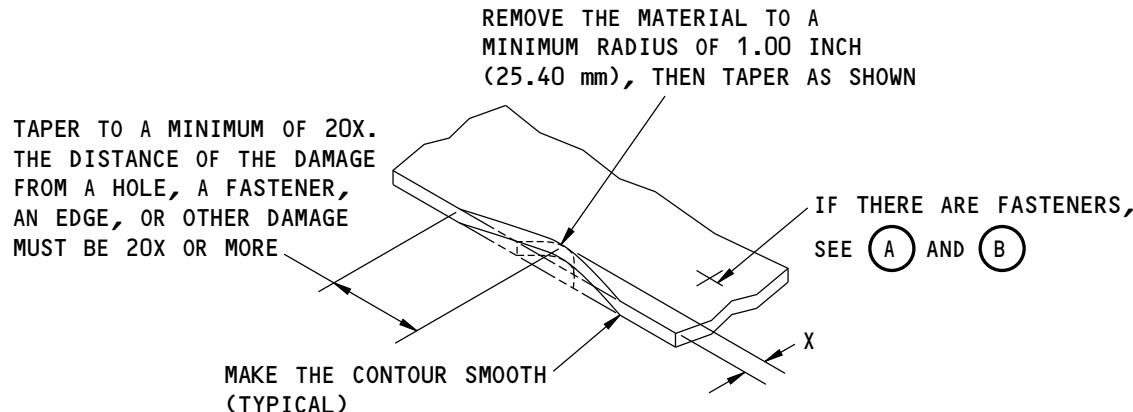
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STRUCTURAL REPAIR MANUAL**


REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS DO NOT HAVE AN OVERLAP

(A)

REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS HAVE AN OVERLAP

(B)



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.20 INCH (5.08 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A WEB

(C)

G22870 S0006593484_V1

Allowable Damage Details
Figure 102 (Sheet 1 of 5)

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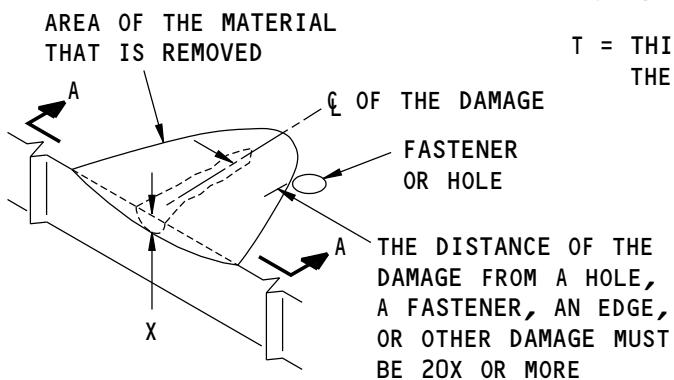
ALLOWABLE DAMAGE 2

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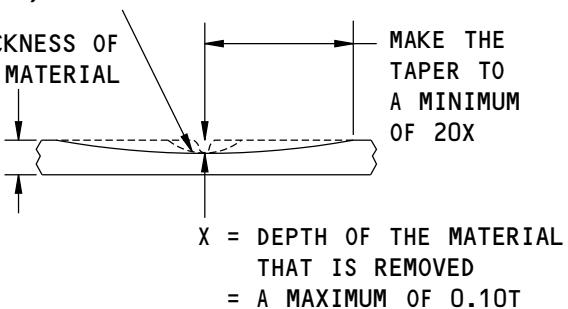
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STRUCTURAL REPAIR MANUAL**



REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN

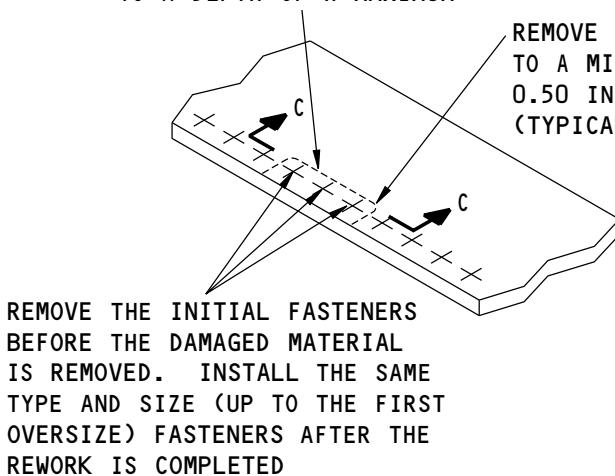


A-A

**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(D)

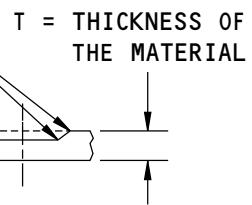
THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A DEPTH OF X MAXIMUM



REMOVE THE INITIAL FASTENERS BEFORE THE DAMAGED MATERIAL IS REMOVED. INSTALL THE SAME TYPE AND SIZE (UP TO THE FIRST OVERSIZE) FASTENERS AFTER THE REWORK IS COMPLETED

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 0.50 INCH (12.70 mm) (TYPICAL)

MAKE IT SMOOTH (TYPICAL)



X = THE DEPTH OF THE MATERIAL REMOVED = A MAXIMUM OF 0.10T

C-C

**REMOVAL OF CORROSION
AROUND THE FASTENERS**

(E)

G22880 S0006593485_V1

**Allowable Damage Details
Figure 102 (Sheet 2 of 5)**

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ALLOWABLE DAMAGE 2

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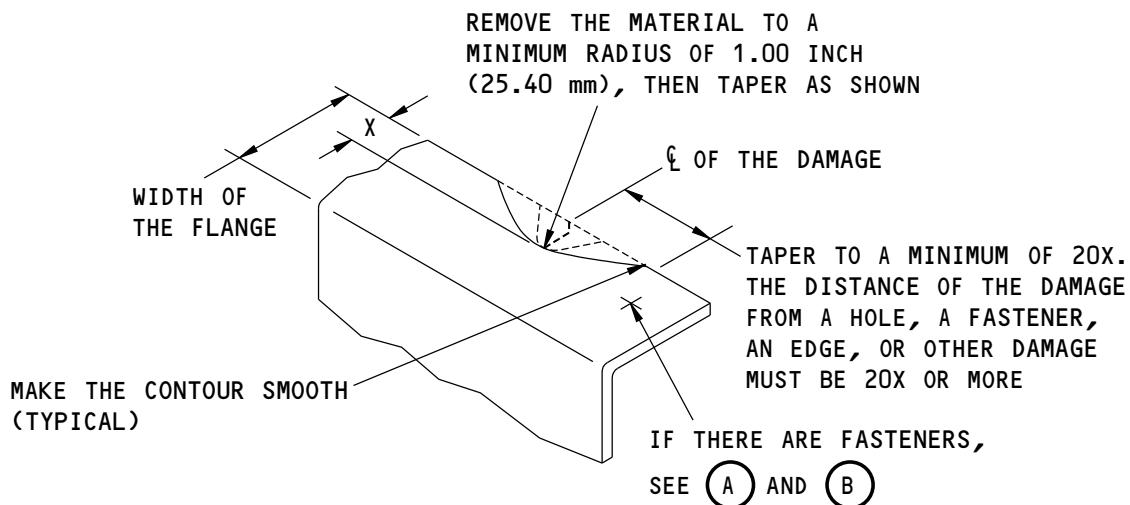
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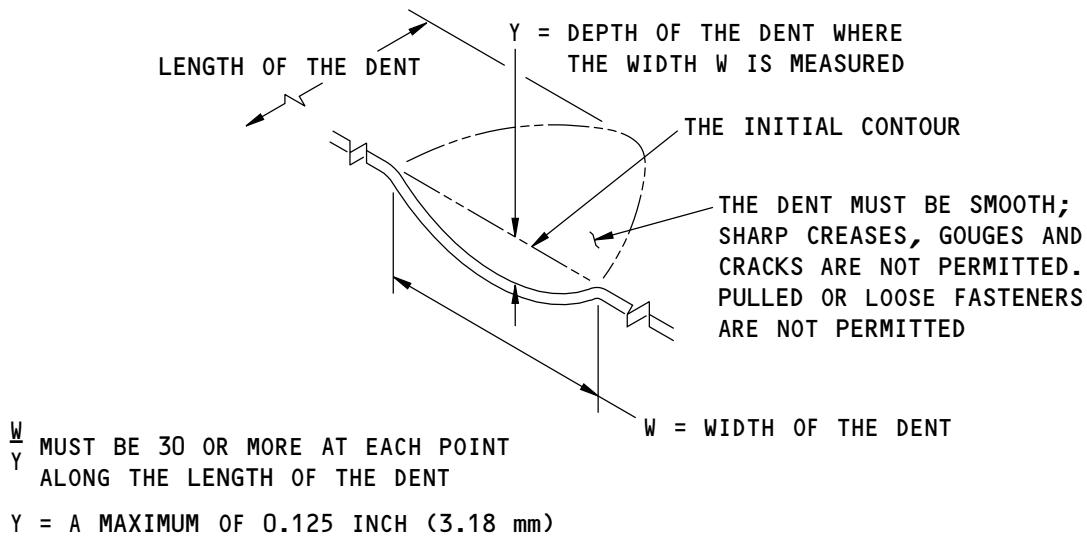
737-800 STRUCTURAL REPAIR MANUAL



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE OF A FORMED PART

(F)



DENT THAT IS PERMITTED

(G)

G22889 S0006593486_V1

Allowable Damage Details
Figure 102 (Sheet 3 of 5)

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ALLOWABLE DAMAGE 2

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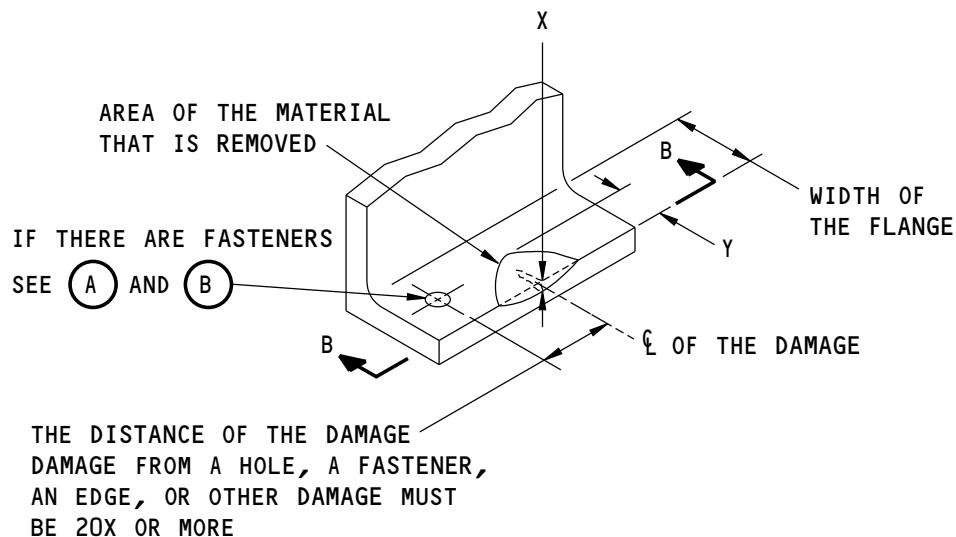
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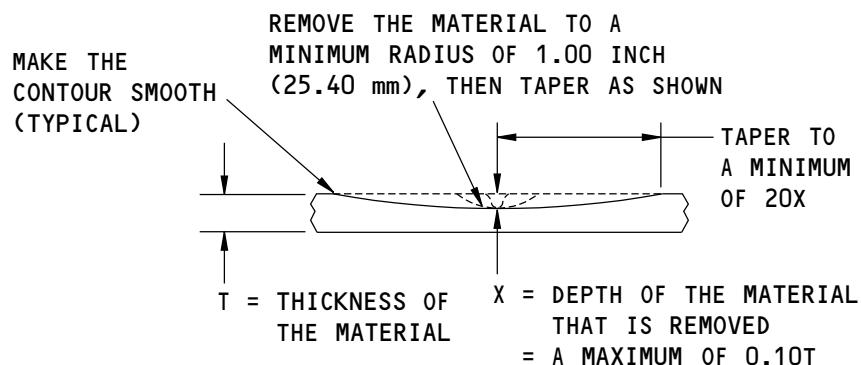
737-800
STRUCTURAL REPAIR MANUAL



Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON A SURFACE AT AN EDGE OF A MACHINED OR EXTRUDED PART

(H)



B-B

G22906 S0006593487_V1

Allowable Damage Details
Figure 102 (Sheet 4 of 5)

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ALLOWABLE DAMAGE 2

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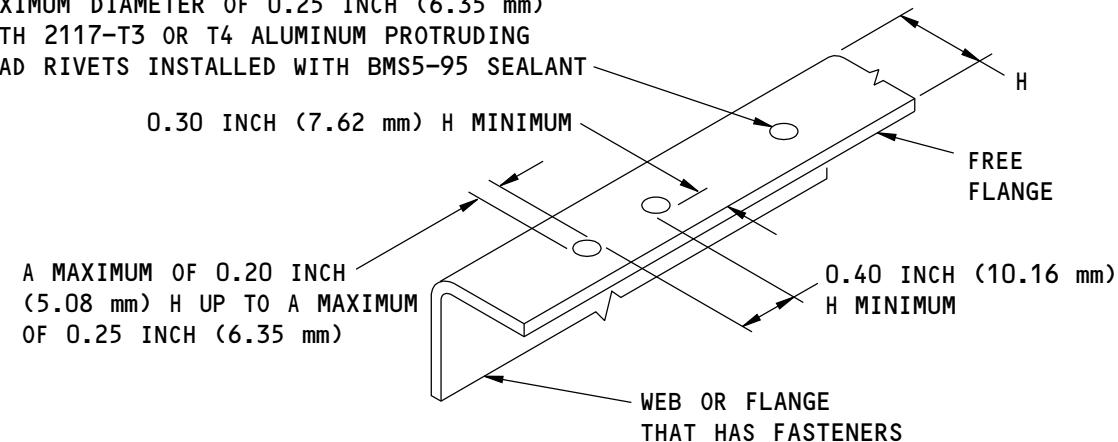
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A MAXIMUM OF 4 HOLES IN EACH LENGTH
OF 6 HOLES. FILL ALL HOLES UP TO A
MAXIMUM DIAMETER OF 0.25 INCH (6.35 mm)
WITH 2117-T3 OR T4 ALUMINUM PROTRUDING
HEAD RIVETS INSTALLED WITH BMS5-95 SEALANT

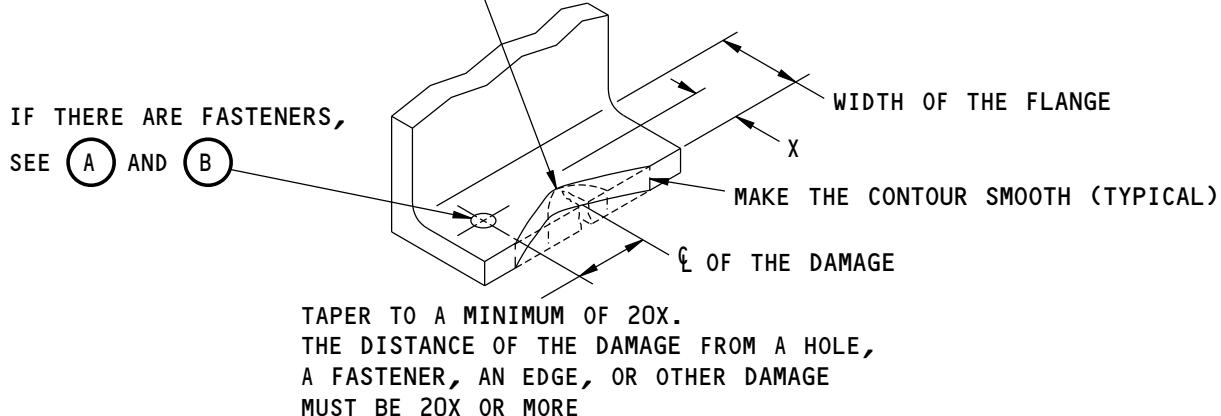


NOTE: HOLE DAMAGE IS NOT PERMITTED IN FLANGES THAT HAVE FASTENERS.

ALLOWABLE DAMAGE LIMITS FOR HOLES IN FREE FLANGE

(I)

REMOVE THE MATERIAL TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(J)

G22910 S0006593488_V1

Allowable Damage Details
Figure 102 (Sheet 5 of 5)

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ALLOWABLE DAMAGE 2

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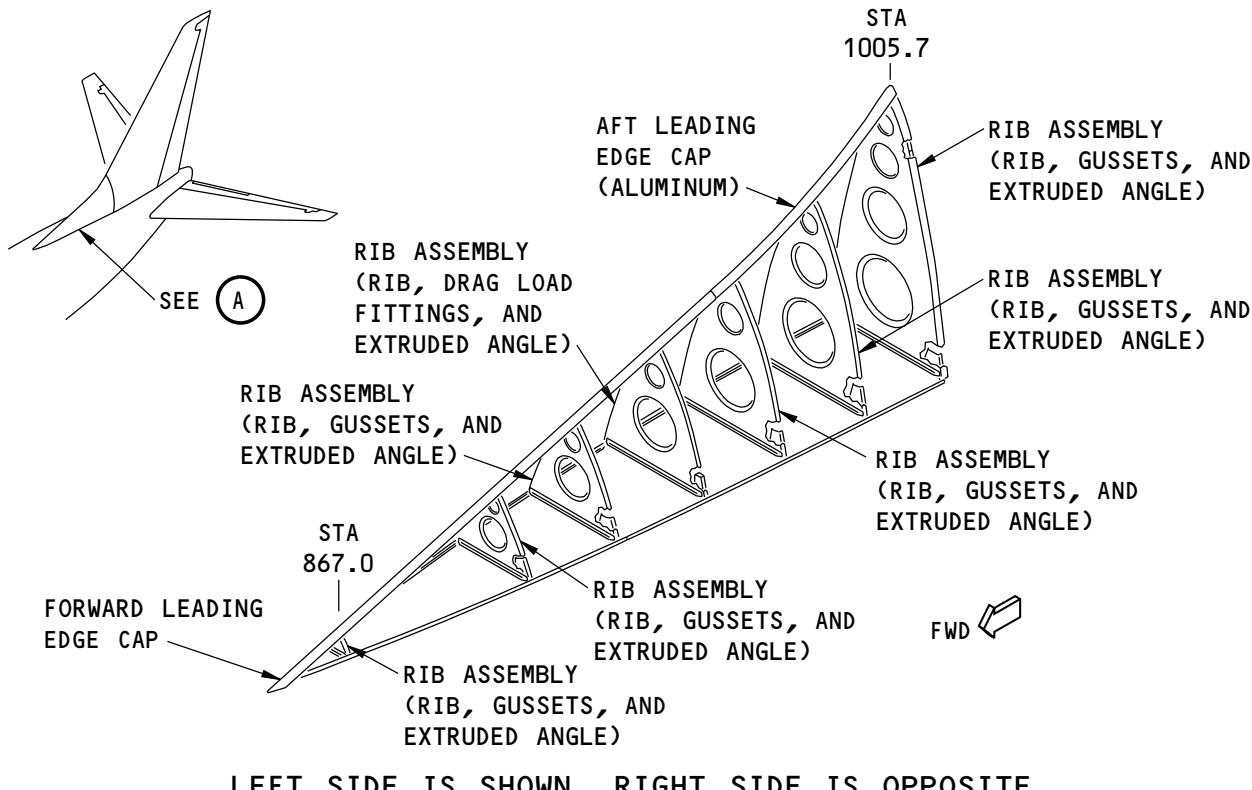
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STRUCTURAL REPAIR MANUAL
REPAIR 2 - DORSAL FIN STRUCTURE

1. Applicability

- A. Repair 2 is applicable to damage to the dorsal fin structure shown in 201.



NOTES

- REFER TO SRM 51-70-12 FOR THE TYPICAL EXTRUDED SECTION REPAIRS FOR THE ANGLES OF THE RIB ASSEMBLIES.
- YOU CAN USE THESE TYPICAL REPAIRS WHERE THEY ARE APPLICABLE IF:
 - SUFFICIENT SPACE IS AVAILABLE FOR THE INSTALLATION OF THE REPAIR PARTS, AND
 - THE REPAIR PARTS DO NOT TOUCH ADJACENT STRUCTURE.

G23046 S0006593491_V1

Dorsal Fin Structure Repair

Figure 201

2. General

- A. The typical repairs given in 51-70-12 can be used when applicable if:
- (1) There is sufficient clearance with the adjacent structure for the installation of repair parts.
- B. Refer to the limits of the typical repairs given in 51-70-12 before you start a repair.

3. References

Reference	Title
51-70-12	EXTRUDED SECTION REPAIRS

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REPAIR 2
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(Continued)

Reference	Title
55-30-09	VERTICAL STABILIZER RIBS
55-30-09, ALLOWABLE DAMAGE 2	Dorsal Fin Structure
55-30-09, IDENTIFICATION 4	Dorsal Fin Structure

4. Repair Instructions

A. Dorsal Fin Structure

- (1) Refer to Table 201/REPAIR 2 to find the applicable repairs of the dorsal fin structure.

NOTE: If necessary, refer to 55-30-09, Identification 4 to find the material and the process that was used to make the part which you want to repair.

Table 201:

REPAIR REFERENCES FOR THE DORSAL FIN STRUCTURE	
COMPONENT	REPAIR
Extruded Angles	Refer to SRM 51-70-12
Ribs and Gussets	There are no repairs for these components in the Structural Repair Manual at this time.
Leading Edge Caps	There are no repairs for these components in the Structural Repair Manual at this time. If the damage to the structure is more than the limits given in SRM 53-40-13, Allowable Damage 1, contact Boeing for a repair.

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REPAIR 2
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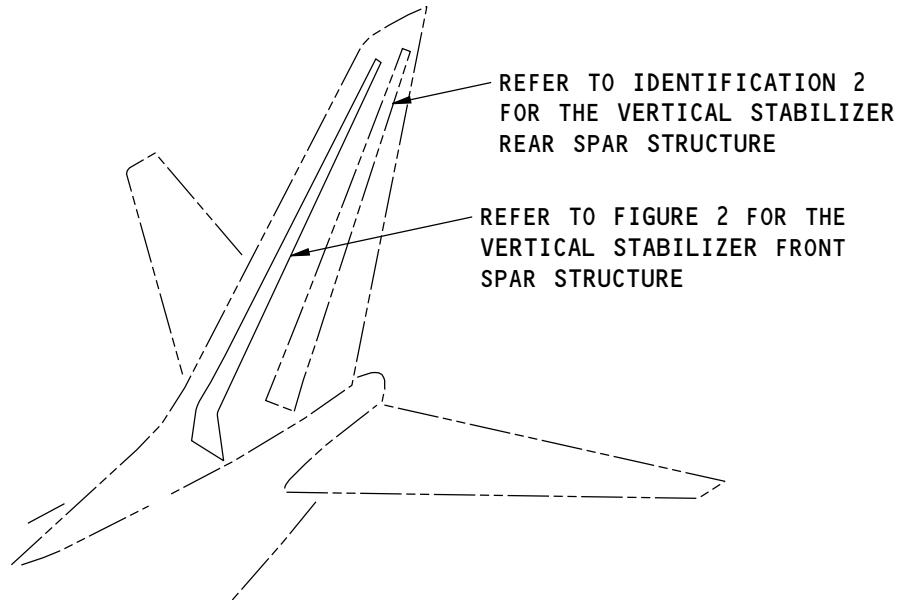
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - VERTICAL STABILIZER FRONT SPAR STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F83405 S0006593496_V1

Vertical Stabilizer Front Spar Structure Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A7001	Section 70 Vertical Fin - Product Collector
172A0001	Torque Box Functional Collector - Vertical Fin
172A2001	Front Spar Assembly/Installation - Vertical Fin

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IDENTIFICATION 1

Page 1

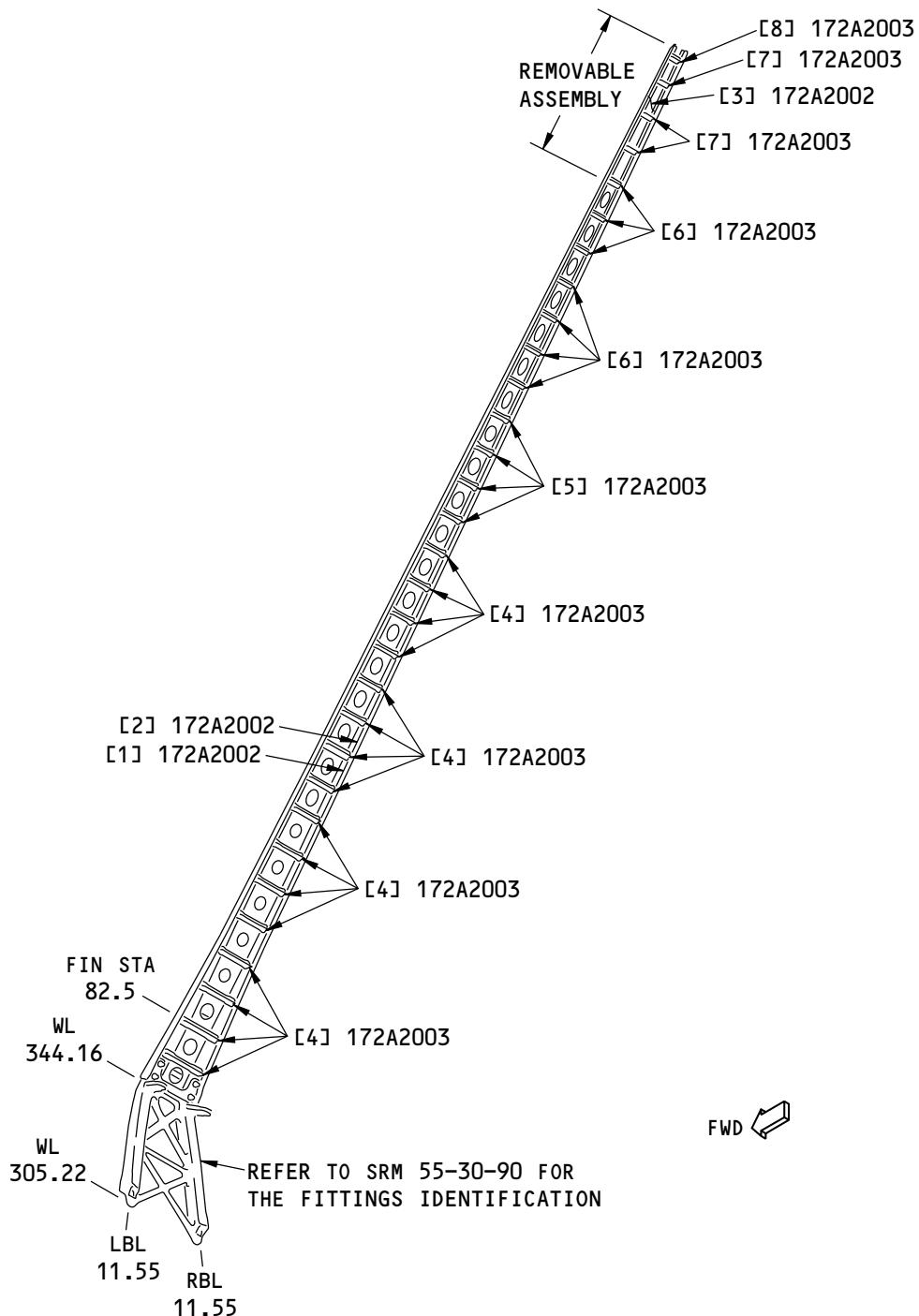
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

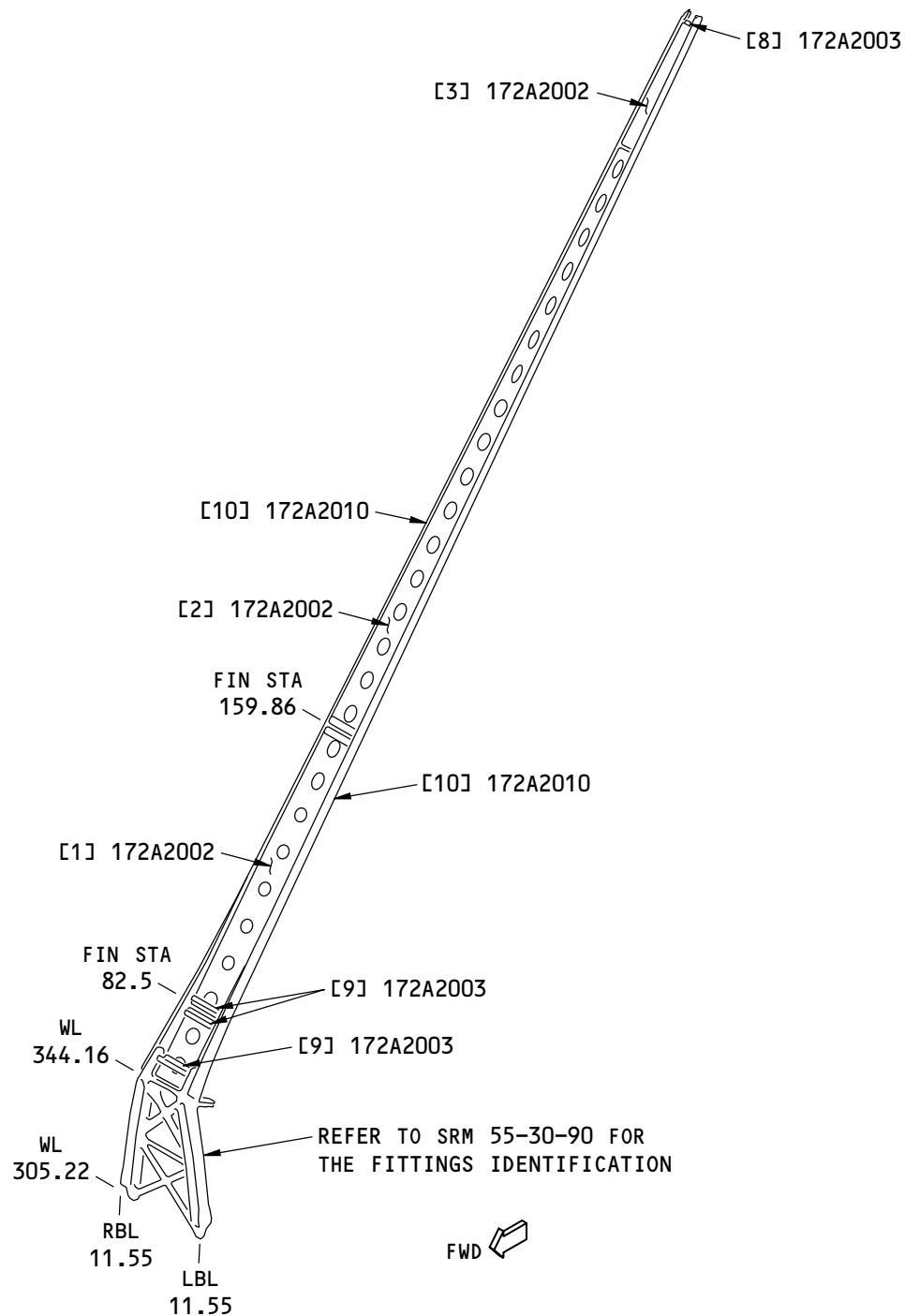
F83817 S0006593498_V1

Vertical Stabilizer Front Spar Structure Identification
Figure 2 (Sheet 1 of 2)

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IDENTIFICATION 1
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F83981 S0006593499_V1

Vertical Stabilizer Front Spar Structure Identification
Figure 2 (Sheet 2 of 2)

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Web	0.090 (2.29)	7075-T6 aluminum sheet as given in QQ-A-250/12, chem-milled to different thicknesses. Refer to Figure 3	Cum Line numbers 1 thru 4
	Web Assembly			Cum Line numbers 5 and on
	Web	0.100 (2.54)	7075-T6 aluminum sheet as given in QQ-A-250/12, chem-milled to different thicknesses. Refer to Figure 3	
	Cover Panel (5)	0.100 (2.54)	7075-T6 aluminum sheet as given in QQ-A-250/12. Refer to Figure 3	
[2]	Web	0.063 (1.60)	7075-T6 aluminum sheet as given in QQ-A-250/12, chem-milled to different thicknesses. Refer to Figure 4	
[3]	Web	0.040 (1.02)	7075-T6 aluminum sheet as given in QQ-A-250/12 milled to different thicknesses. Refer to Figure 5	
[4]	Stiffener		BAC1506-4406 7075-T73511 aluminum extrusion as given in QQ-A-200/11	
[5]	Stiffener		BAC1506-4407 7075-T73511 aluminum extrusion as given in QQ-A-200/11	
[6]	Stiffener		BAC1506-4408 7075-T73511 aluminum extrusion as given in QQ-A-200/11	
[7]	Stiffener		BAC1514-3266 7075-T73511 aluminum extrusion as given in QQ-A-200/11	
[8]	Stiffener		BAC1506-4410 7075-T73511 aluminum extrusion as given in QQ-A-200/11	
[9]	Stiffener		7075-T351 aluminum plate as given in QQ-A-250/12	
[10]	Chord		BAC1506-4319 7150-T77511 aluminum sheet as given in BMS 7-306	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

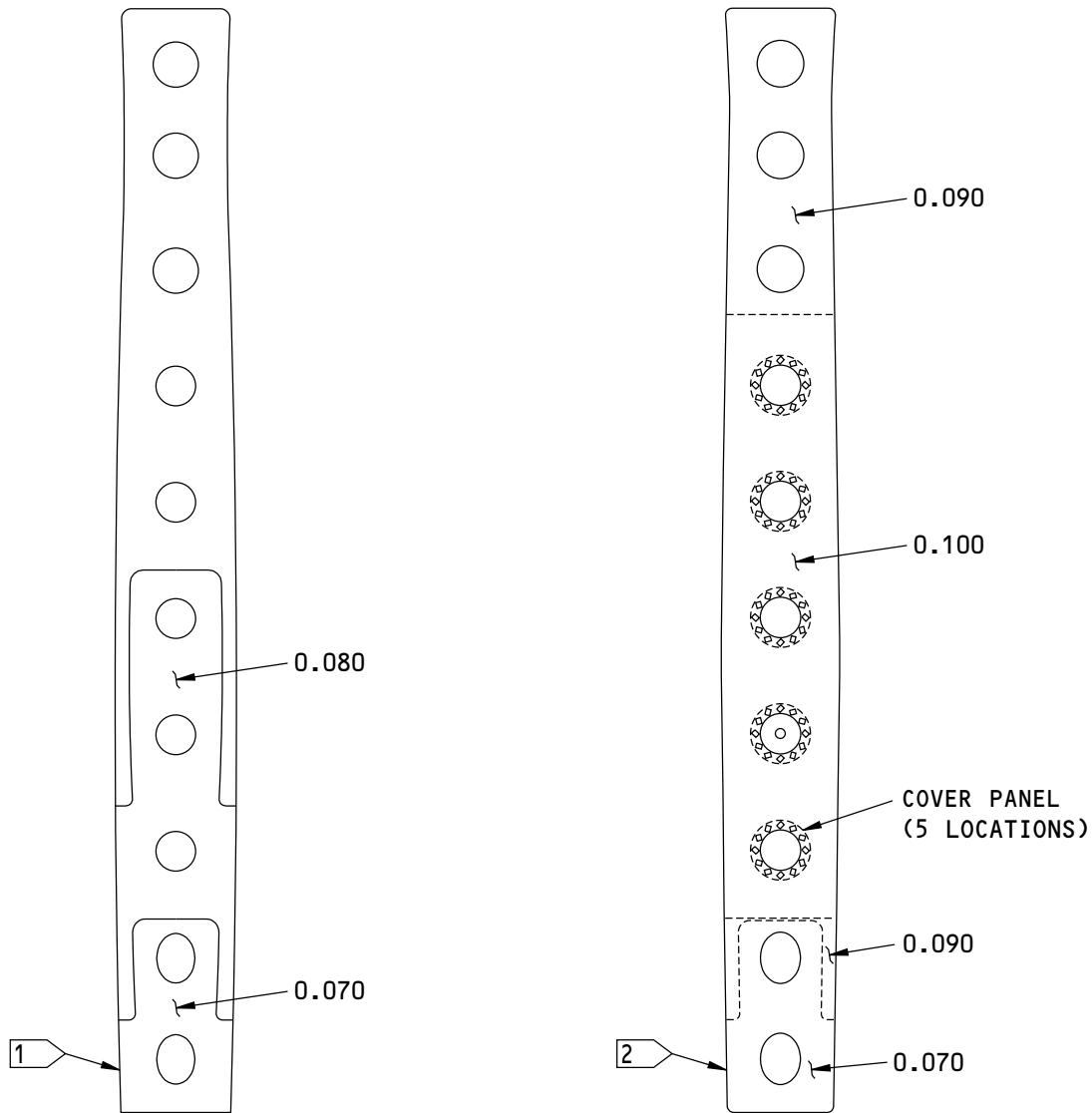
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STRUCTURAL REPAIR MANUAL



NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.
- ALL DIMENSIONS ARE IN INCHES.

[1] FOR CUM LINE NUMBERS 1 THRU 4

[2] FOR CUM LINE NUMBER 5 AND ON

F84863 S0006593501_V1

Chem-Milled Areas for Figure 2, Item [1]
Figure 3

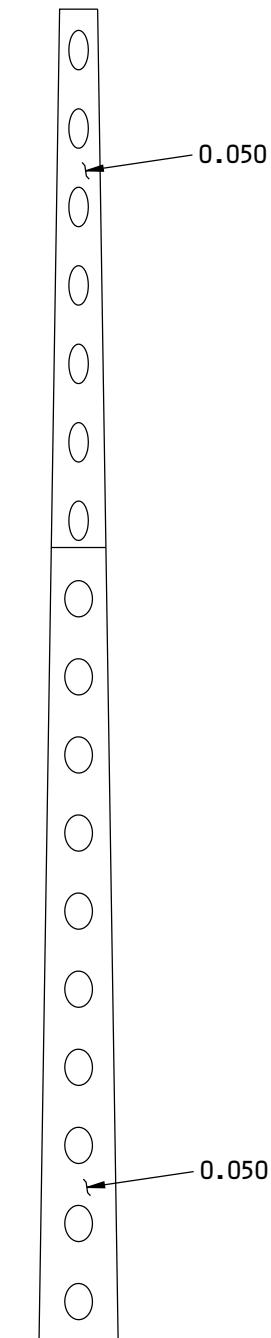
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

ALL DIMENSIONS ARE IN INCHES.

F84468 S0006593502_V1

Chem-Milled Areas for Figure 2, Item [2]
Figure 4

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IDENTIFICATION 1

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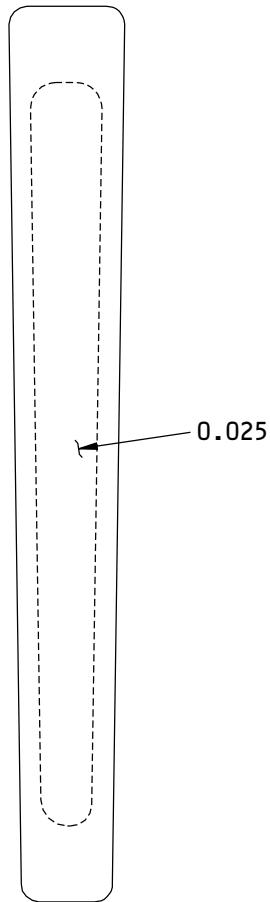
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.
ALL DIMENSIONS ARE IN INCHES.

F84461 S0006593503_V1

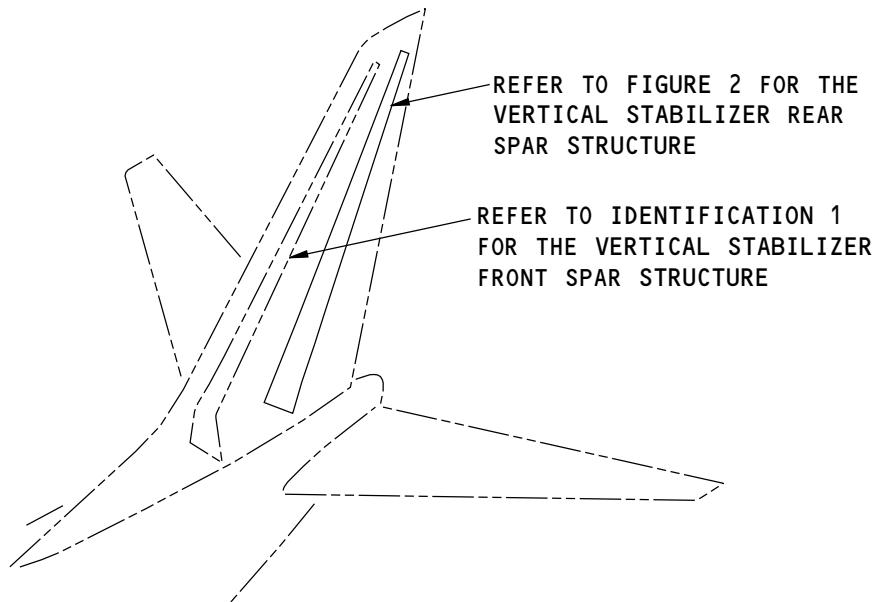
Chem-Milled Areas for Figure 2, Item [3]
Figure 5

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IDENTIFICATION 1
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IDENTIFICATION 2 - VERTICAL STABILIZER REAR SPAR STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F84529 S0006593505_V1

Vertical Stabilizer Rear Spar Structure Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A7001	Section 70 Vertical Fin - Product Collector
172A1001	Rear Spar Assembly/Installation - Vertical Fin
175A0001	Trailing Edge Functional Collector - Vertical Fin

55-30-10

IDENTIFICATION 2

Page 1

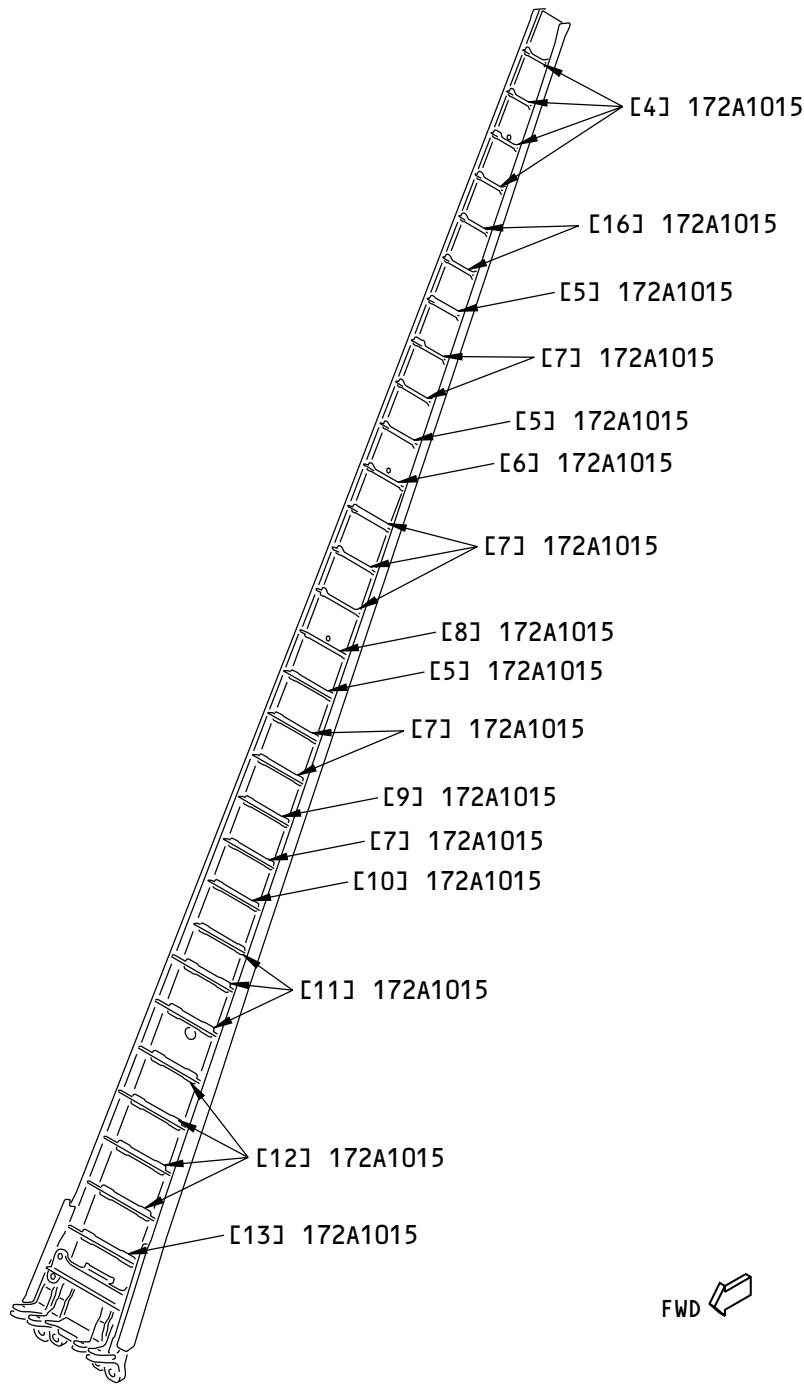
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F84583 S0006593507_V1

Vertical Stabilizer Rear Spar Structure Locations
Figure 2 (Sheet 1 of 2)

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IDENTIFICATION 2

Page 2

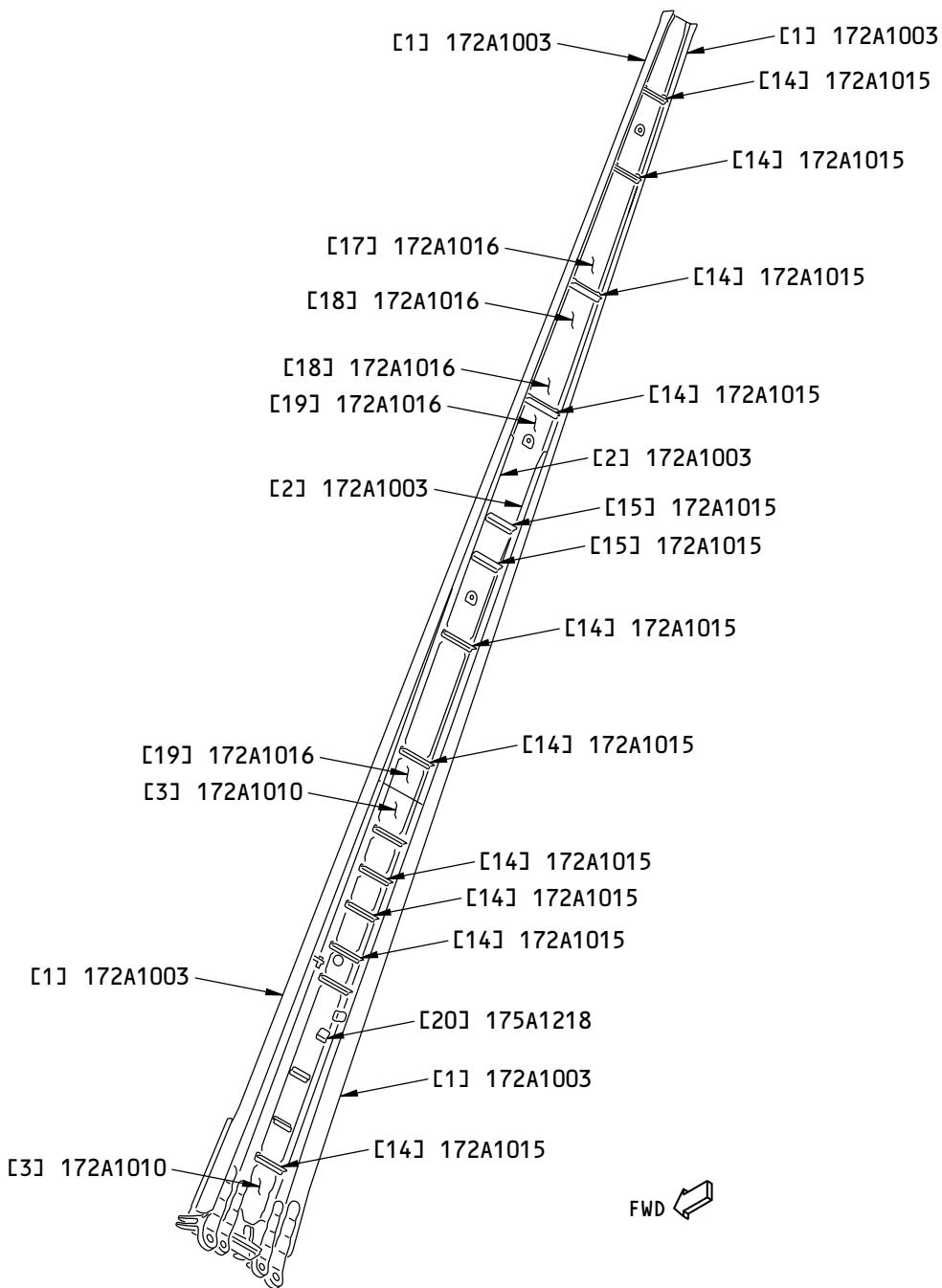
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F84814 S0006593508_V1

Vertical Stabilizer Rear Spar Structure Locations
Figure 2 (Sheet 2 of 2)

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IDENTIFICATION 2
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STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Primary Chord		BAC1506-4440 2024-T3511 extrusion as given in QQ-A-200/3	
[2]	Failsafe Chord		BAC1520-2796 7075-T6511 extrusion as given in QQ-A-200/11	
[3]	Web Assembly Failsafe Fitting Web	0.600 (15.2) 0.100 (2.54)	7075-T651 plate as given in QQ-A-250/12 7075-T6 sheet as given in QQ-A-250/12. Refer to Figure 3 for the chem-milled thicknesses	
[4]	Stiffener		BAC1505-100575 7075-T6511 extrusion as given in QQ-A-200/11	
[5]	Stiffener		BAC1505-100574 7075-T6511 extrusion as given in QQ-A-200/11	
[6]	Stiffener		BAC1518-585 7075-T6511 extrusion as given in QQ-A-200/11	
[7]	Stiffener		BAC1505-100876 7075-T6511 extrusion as given in QQ-A-200/11	
[8]	Stiffener		BAC1503-100854 7075-T6511 extrusion as given in QQ-A-200/11	
[9]	Stiffener		BAC1505-100570 7075-T6511 extrusion as given in QQ-A-200/11	
[10]	Stiffener		BAC1506-4435 7075-T6511 extrusion as given in QQ-A-200/11	
[11]	Stiffener		BAC1506-4436 7075-T6511 extrusion as given in QQ-A-200/11	
[12]	Stiffener		BAC1506-4434 7075-T6511 extrusion as given in QQ-A-200/11	
[13]	Stiffener		7075-T73511 extruded bar as given in QQ-A-200/11	
[14]	Stiffener		BAC1506-2401 7075-T73511 extrusion as given in QQ-A-200/11 (Optional: Make the necessary cross-section from 7075-T73511 extruded bar as given in QQ-A-200/11)	
[15]	Stiffener		BAC1506-1826 7075-T6511 extrusion as given in QQ-A-200/11	
[16]	Stiffener		BAC1505-100573 7075-T6511 extrusion as given in QQ-A-200/11	
[17]	Web Assembly Web Doubler	0.025 (0.64) 0.025 (0.64)	7075-T6 clad sheet as given in QQ-A-250/13 7075-T6 clad sheet as given in QQ-A-250/13	
[18]	Web Assembly Web Doubler	0.032 (0.81) 0.050 (1.27)	7075-T6 clad sheet as given in QQ-A-250/13 7075-T6 clad sheet as given in QQ-A-250/13	
[19]	Web Assembly			

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IDENTIFICATION 2

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STRUCTURAL REPAIR MANUAL

Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
	Web	0.040 (1.02)	7075-T6 clad sheet as given in QQ-A-250/13	
	Doubler	0.050 (1.27)	7075-T6 clad sheet as given in QQ-A-250/13	
[20]	Angle	0.063 (1.60)	2024-T3 clad sheet as given in QQ-A-250/5	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 2

Page 5

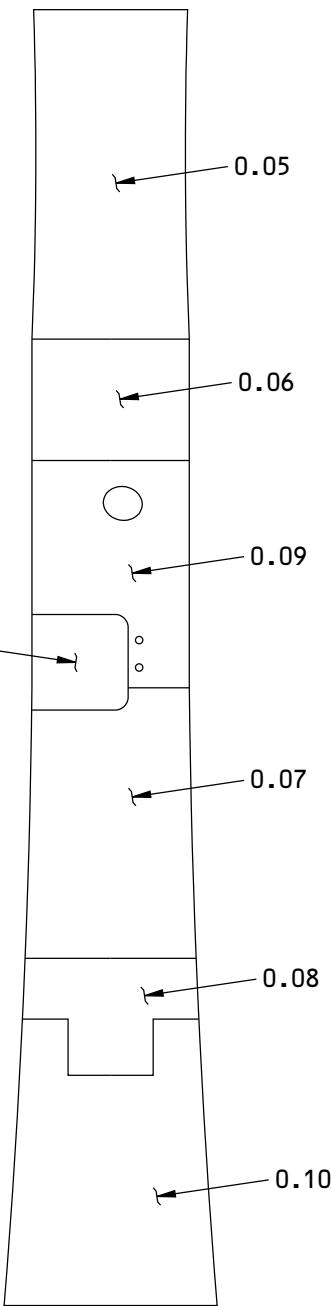
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STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.
ALL DIMENSIONS ARE IN INCHES.

F84827 S0006593510_V1

Chem-Milled Areas for Figure 2, Item [3]
Figure 3

55-30-10
IDENTIFICATION 2
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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - VERTICAL STABILIZER FRONT SPAR

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer front spar shown in Vertical Stabilizer Front Spar Location, Figure 101/ALLOWABLE DAMAGE 1.

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ALLOWABLE DAMAGE 1

Page 101

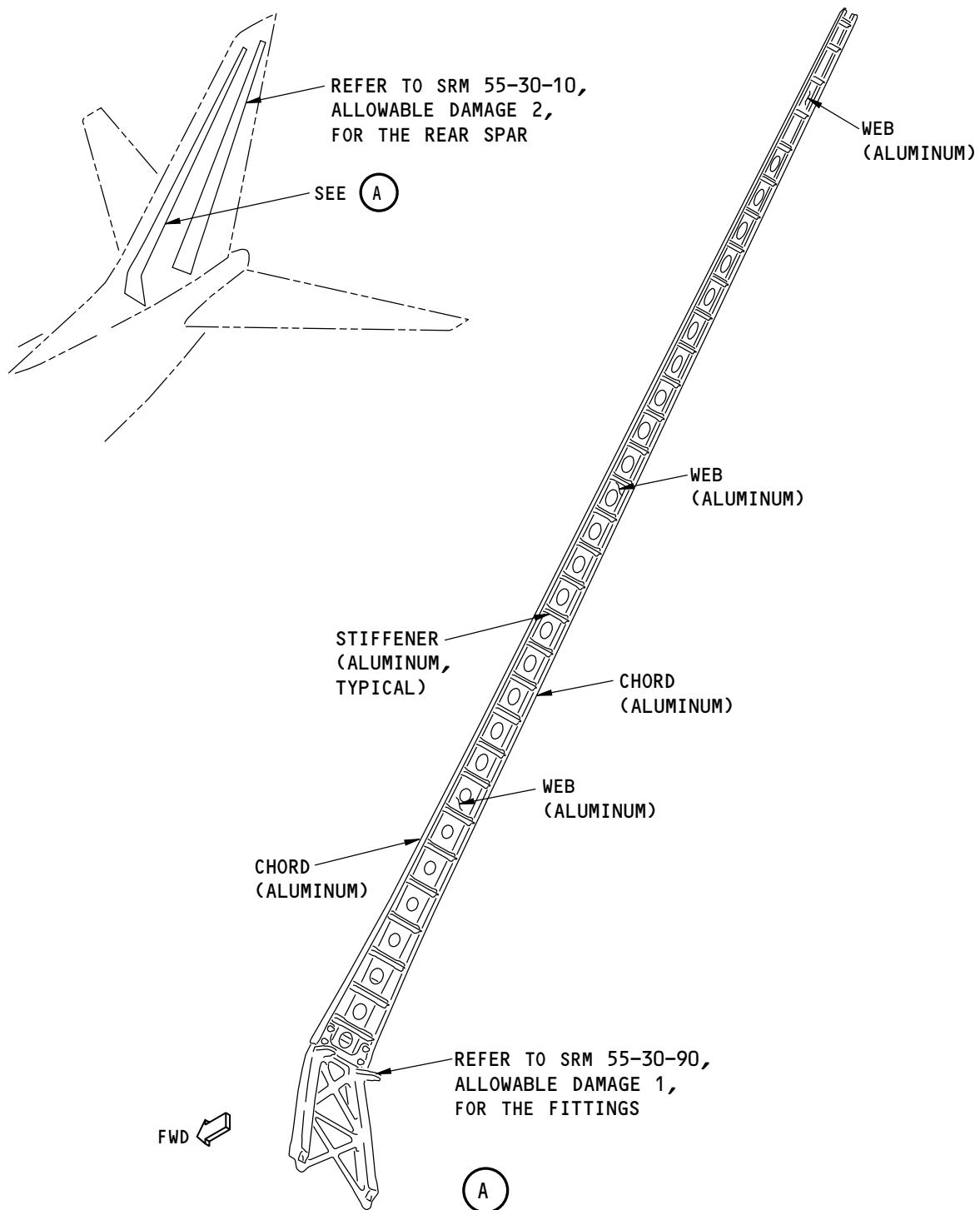
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STRUCTURAL REPAIR MANUAL



F80293 S0006593513_V1

Vertical Stabilizer Front Spar Location
Figure 101

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ALLOWABLE DAMAGE 1

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2. General

- A. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- B. After you remove the damage, do the procedures that follow.
 - (1) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
 - (2) Apply one layer of BMS 10-11, Type I, primer to the reworked areas of the stiffeners and the chords. Refer to SOPM 20-41-02.
 - (3) Apply two layers of BMS 10-11, Type I, primer to the reworked areas of the webs. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
55-30-90, ALLOWABLE DAMAGE 1	Vertical Stabilizer Fittings
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Chords

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, INJURY TO PERSONS CAN OCCUR.

- (5) Flap peen or shot peen the surfaces if you remove the damage.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.

B. Stiffeners

55-30-10

ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and F.
 - (b) The total cross-sectional area removed must not be more than the limits given in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail H.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, E, and F.
 - (b) The total cross-sectional area removed must not be more than the limits given in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail H.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Webs

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A and B.
 - (b) Damage is permitted as shown in Vertical Stabilizer Front Spar - Bay Location, Figure 103/ALLOWABLE DAMAGE 1 and Table 101.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, E, and F.
 - (b) Damage is permitted as shown in Vertical Stabilizer Front Spar - Bay Location, Figure 103/ALLOWABLE DAMAGE 1 and Table 101.

Table 101:

PERCENT OF CROSS-SECTIONAL AREA REMOVED FROM A WEB OF THE FRONT SPAR	
BAY NUMBER	MAXIMUM PERCENTAGE OF THE INITIAL CROSS-SECTIONAL AREA PERMITTED (AS MANUFACTURED BY BOEING)
1, 2, AND 3	15
4	5
5	10
6	NO DAMAGE PERMITTED
7	10
8	NO DAMAGE PERMITTED
9	10
10 AND 11	5
12	10
13 THRU 31	15

- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail D.
- (4) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail G, and Figure 103 if:

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ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

- (a) They are a maximum diameter D of 1.00 inch. (D = the maximum dimension of the largest damage)
 - (b) There are not more than two holes in each bay between two stiffeners
 - (c) The edge of the damage is a minimum of 4D away from the edge of:
 - 1) An initial hole
 - 2) A fastener hole
 - 3) Other damage.
 - (d) The edge of the damage is a minimum of 3D away from the edge of the part
 - (e) They are filled with a 2117-T3 or 2117-T4 aluminum protruding head rivet installed without sealant
- NOTE:** Do not fill holes and punctures that are more than 0.25 inch in diameter.
- (f) The total cross-sectional area removed from the web:
 - 1) Includes the cross-sectional area of all new fastener holes
 - 2) Includes the cross-sectional area of all damaged material that was removed
 - 3) Is not more than the limits given in Table 101/ALLOWABLE DAMAGE 1 between Points A and B of Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail G
 - 4) Is not more than the limits given in Table 101/ALLOWABLE DAMAGE 1 between Points M and N of Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Detail G.

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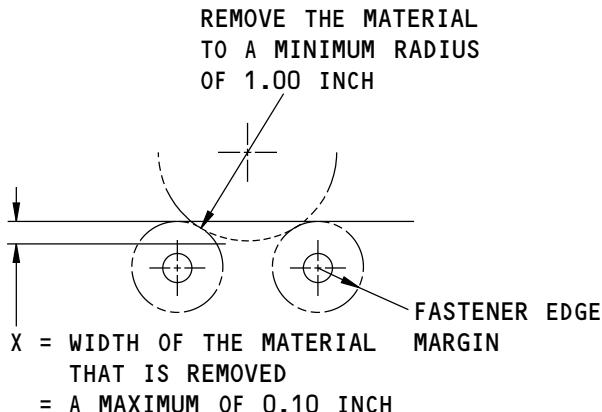
ALLOWABLE DAMAGE 1

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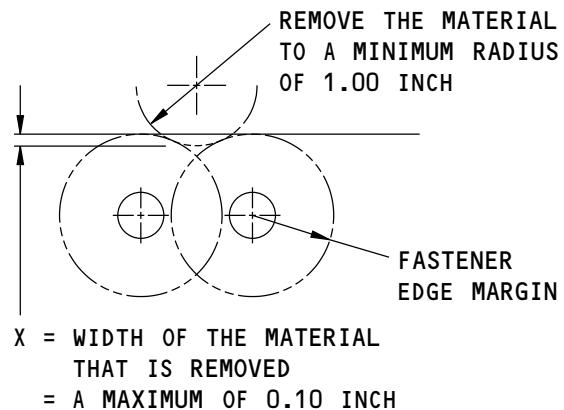
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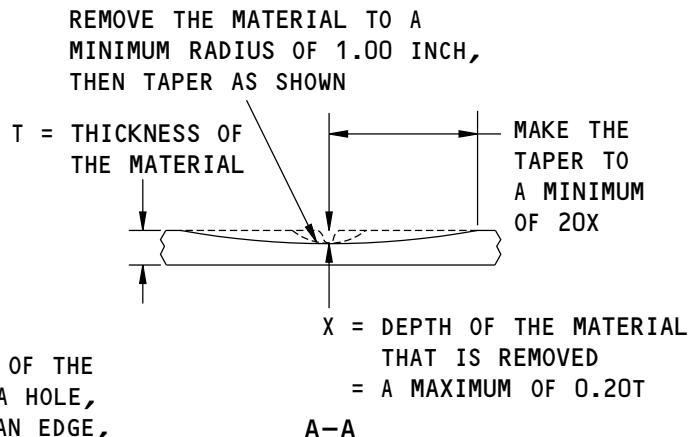
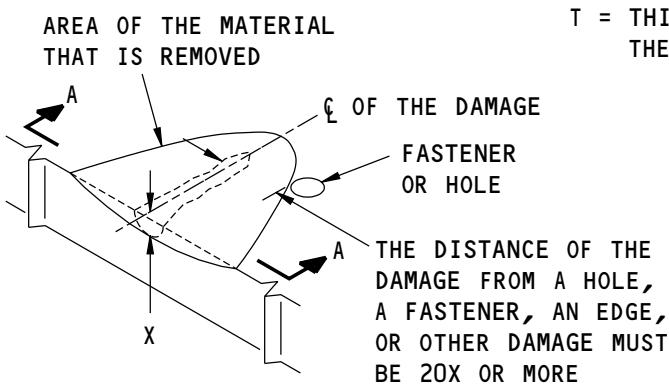
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

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**Allowable Damage Limits
Figure 102 (Sheet 1 of 5)**

55-30-10

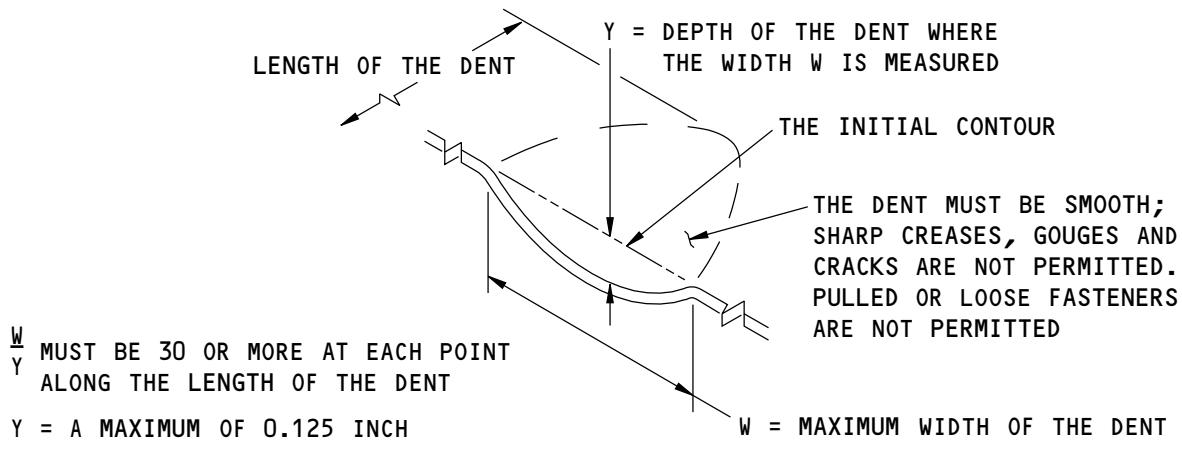
ALLOWABLE DAMAGE 1

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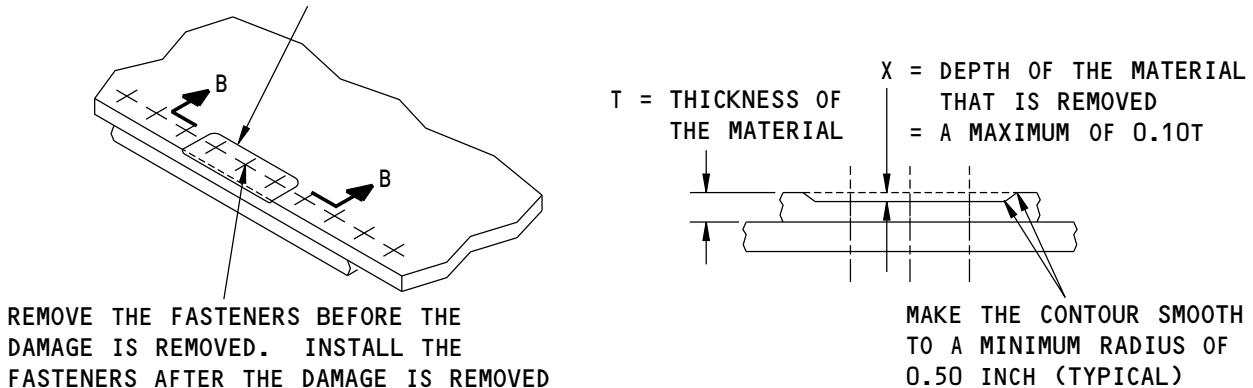
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DENT THAT IS PERMITTED

(D)

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN ALL GROUPS OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B

(E)

F80358 S0006593516_V1

Allowable Damage Limits
Figure 102 (Sheet 2 of 5)

55-30-10

ALLOWABLE DAMAGE 1

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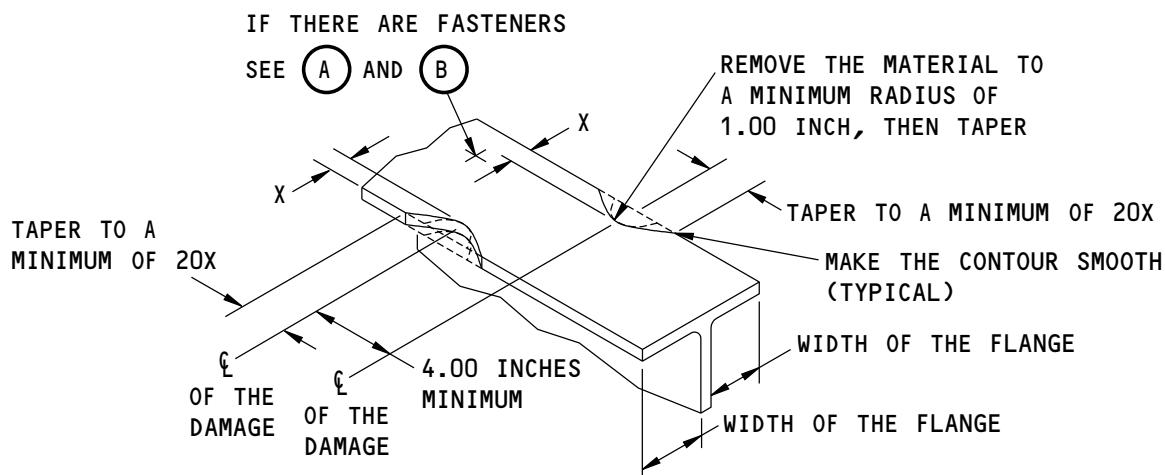
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X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE



F80366 S0006593517_V1

Allowable Damage Limits
Figure 102 (Sheet 3 of 5)

55-30-10

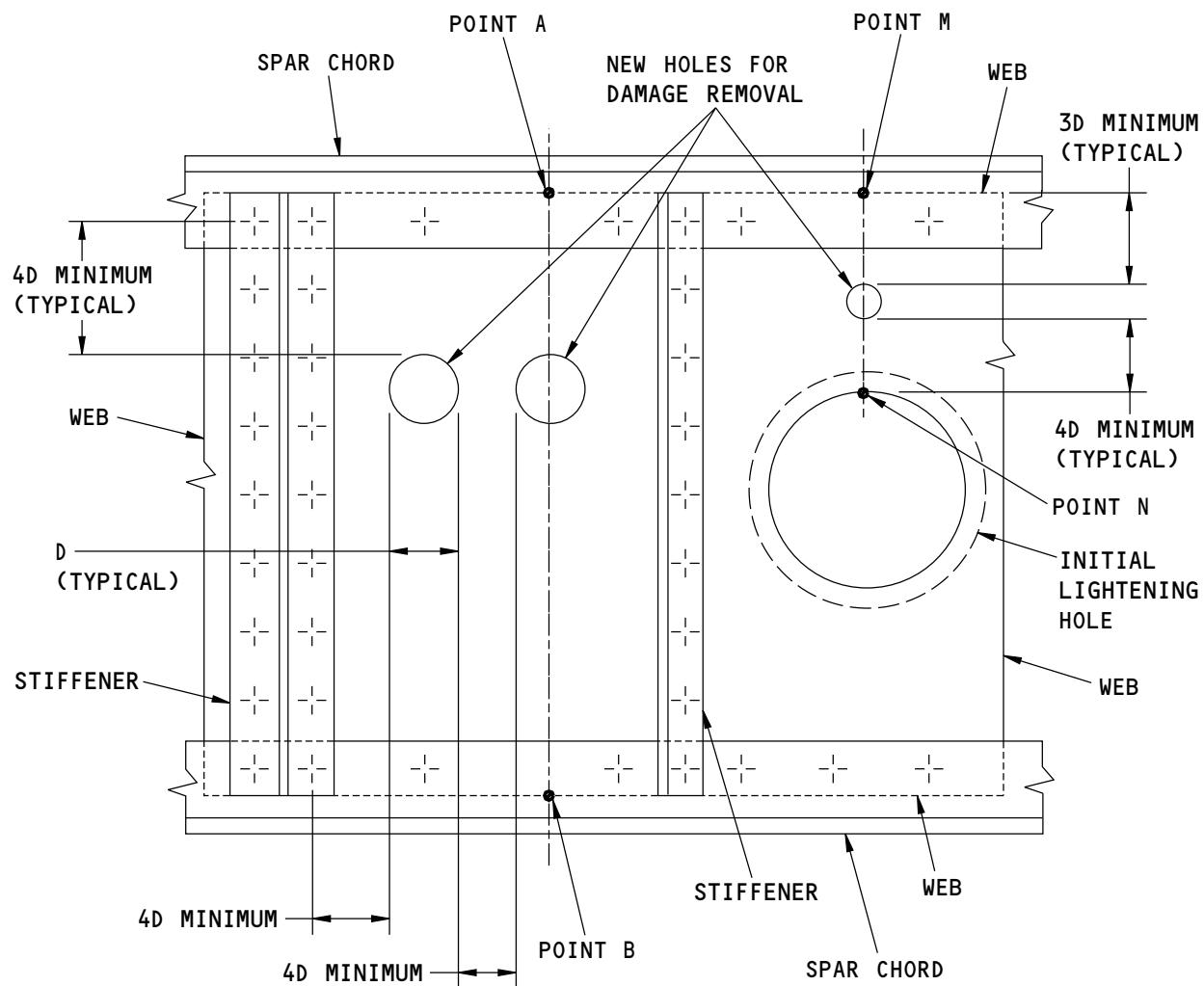
ALLOWABLE DAMAGE 1

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POINTS A, B, AND M ARE ON THE EDGES OF THE WEB

D = THE MAXIMUM DIMENSION OF THE DAMAGE REMOVAL

= 1.00 INCH MAXIMUM

-|- FASTENER LOCATION

HOLES THAT ARE PERMITTED TO REMOVE
DAMAGED MATERIAL IN WEBS

(G)

F80388 S0006593518_V1

Allowable Damage Limits
Figure 102 (Sheet 4 of 5)

55-30-10

ALLOWABLE DAMAGE 1

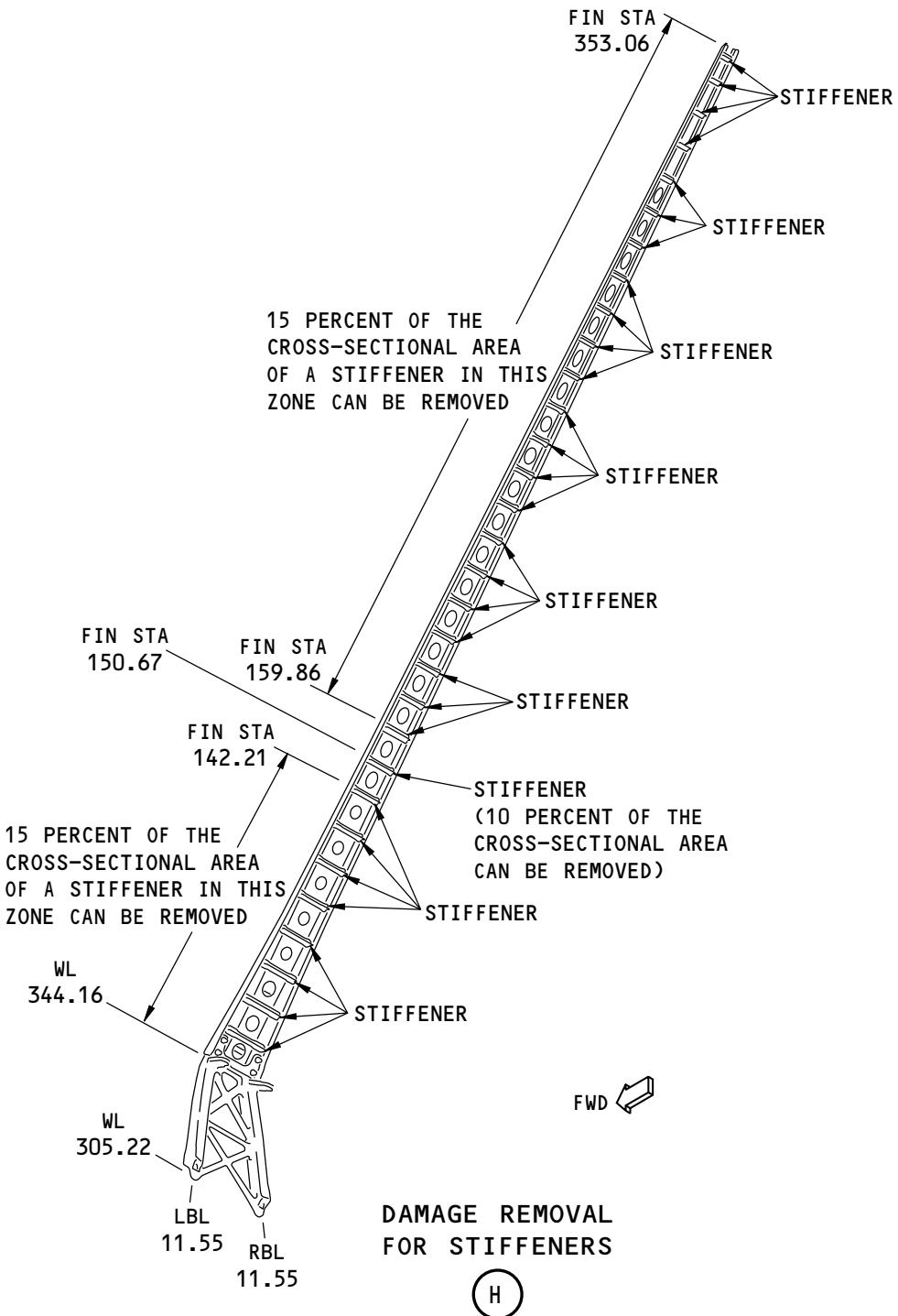
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G54616 S0006593519_V1

Allowable Damage Limits
Figure 102 (Sheet 5 of 5)

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ALLOWABLE DAMAGE 1

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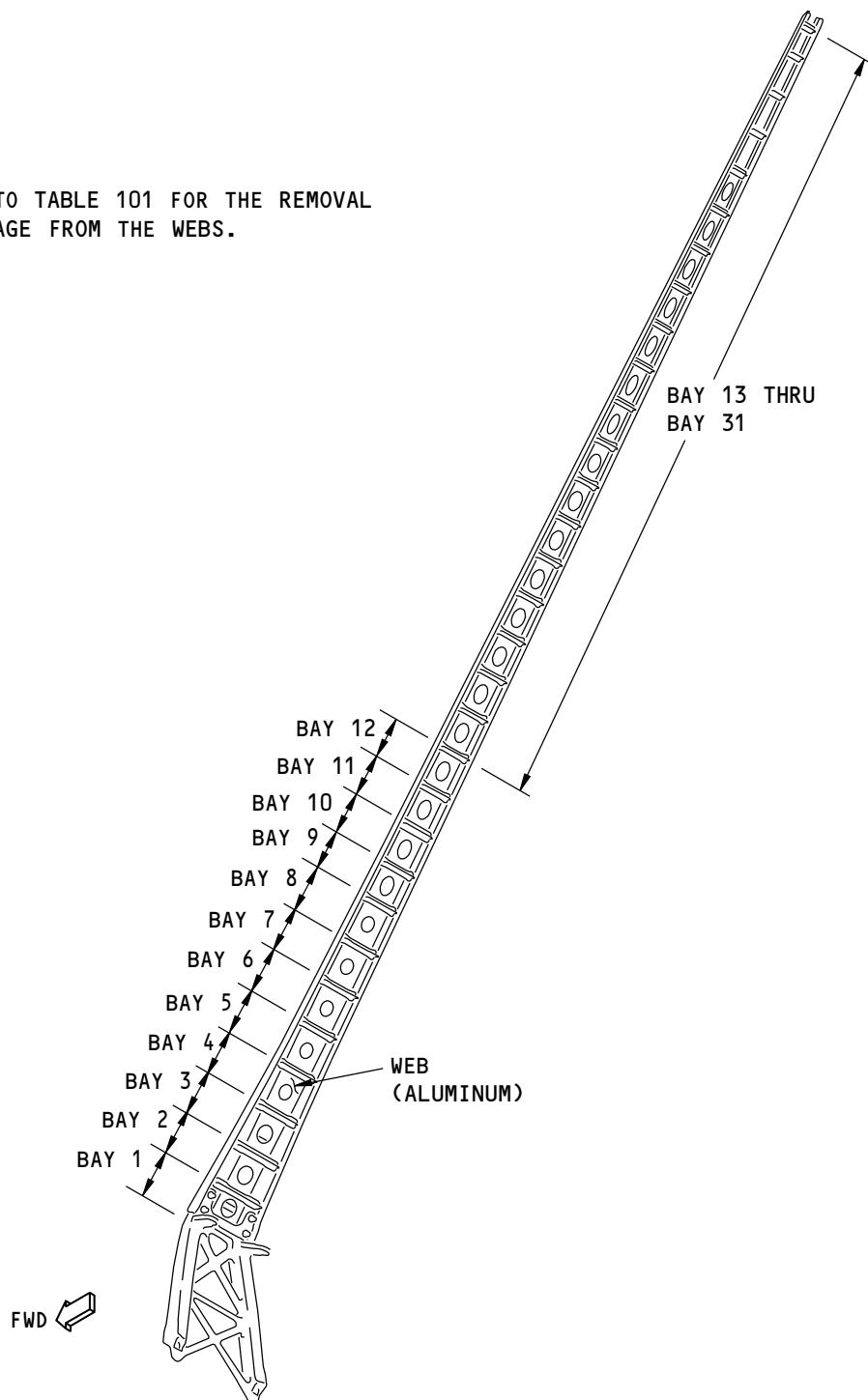
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STRUCTURAL REPAIR MANUAL

NOTE: REFER TO TABLE 101 FOR THE REMOVAL OF DAMAGE FROM THE WEBS.



G54622 S0006593520_V1

Vertical Stabilizer Front Spar - Bay Location
Figure 103

55-30-10

ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - VERTICAL STABILIZER REAR SPAR

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer rear spar shown in Vertical Stabilizer Rear Spar Location, Figure 101/ALLOWABLE DAMAGE 2.

55-30-10

ALLOWABLE DAMAGE 2

Page 101

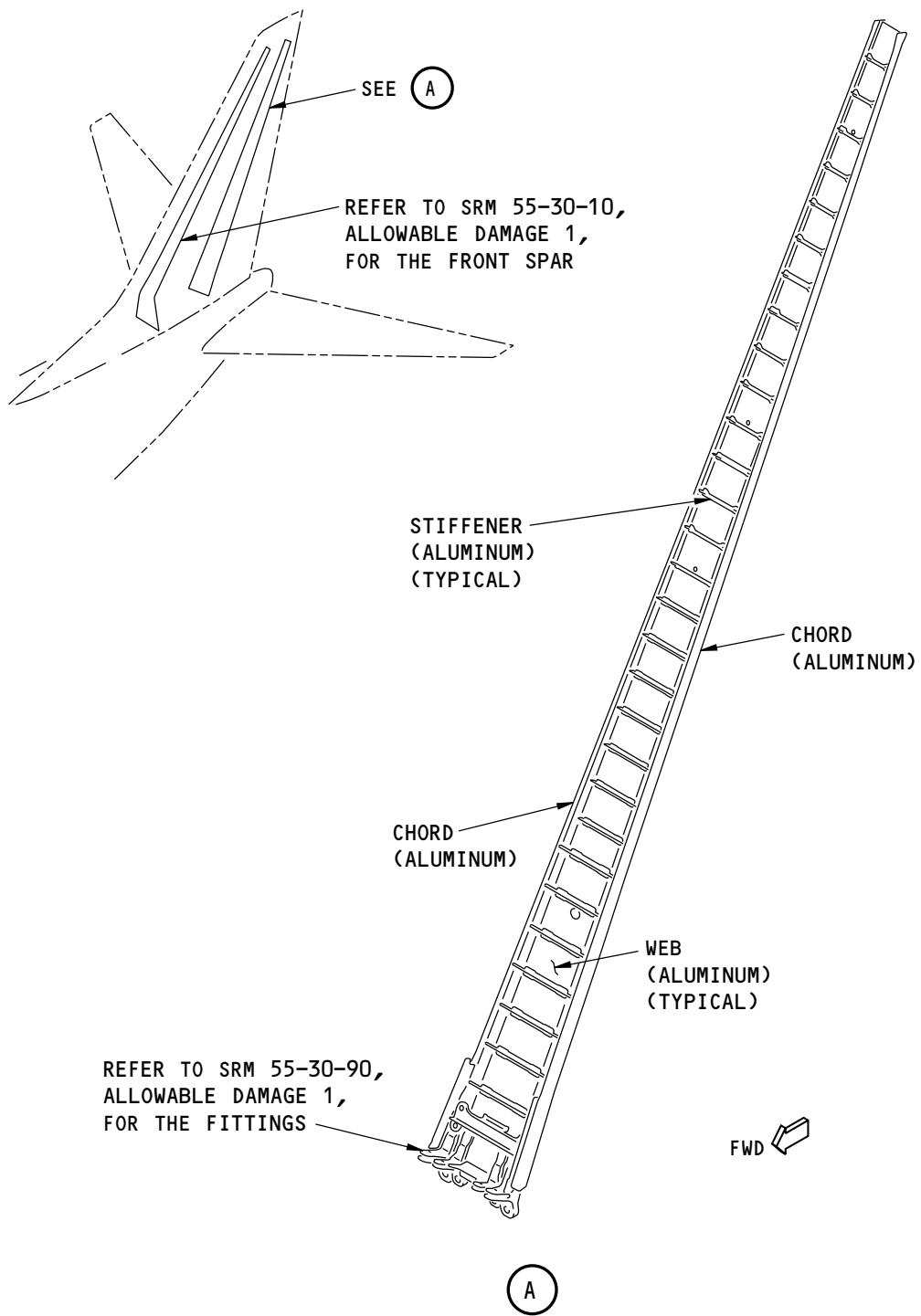
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(A)

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Vertical Stabilizer Rear Spar Location
Figure 101

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ALLOWABLE DAMAGE 2

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2. General

- A. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- B. After you remove the damage, do the procedures that follow.
 - (1) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
 - (2) Apply one layer of BMS 10-11, Type I, primer to the reworked areas of the stiffeners and the chords. Refer to SOPM 20-41-02.
 - (3) Apply two layers of BMS 10-11, Type I, primer to the reworked areas of the webs. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
55-30-90, ALLOWABLE DAMAGE 1	Vertical Stabilizer Fittings
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Chords

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, E, and F.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (5) Flap peen or shot peen the surfaces if you remove the damage.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.

B. Stiffeners

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ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and F.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, E, F, and H.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Webs

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, E, and F.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Detail D.
- (4) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Detail G if:
 - (a) They are a maximum diameter (D) of 1.00 inch. D is the maximum dimension of the largest damage.
 - (b) There is not more than two holes in each bay between two stiffeners
 - (c) The edge of the damage is a minimum of 4D away from the edge of:
 - 1) An initial hole
 - 2) A fastener hole
 - 3) Other damage
 - (d) The edge of the damage is a minimum of 3D away from the edge of the part
 - (e) They are filled with a 2117-T3 or 2117-T4 aluminum protruding head rivet:
 - 1) Do not fill holes and punctures that are more than 0.25 inch in diameter.
 - 2) Install the rivets without sealant.
 - (f) The total cross-sectional area removed from the web:
 - 1) Includes the cross-sectional area of all new fastener holes
 - 2) Includes the cross-sectional area of all damaged material that was removed
 - 3) Is not more than 15 percent of the initial cross-sectional area (as given by the nominal thickness on the production drawing) between Points A and B of Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Detail G
 - 4) Is not more than 15 percent of the initial cross-sectional area (as given by the nominal thickness on the production drawing) between Points M and N of Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Detail G.

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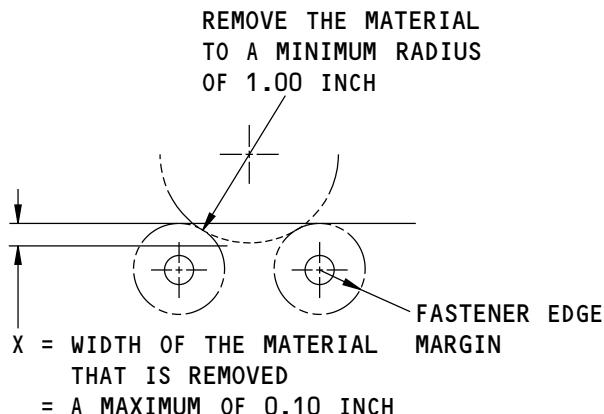
ALLOWABLE DAMAGE 2

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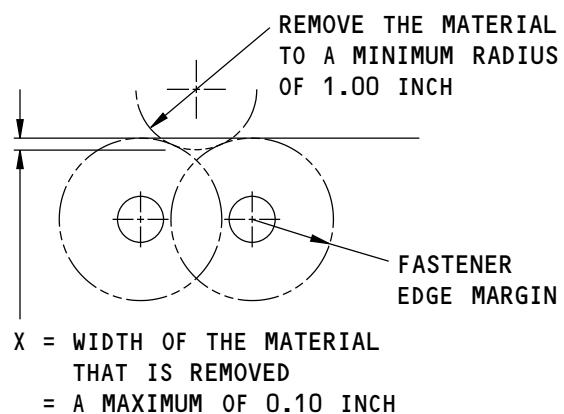
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STRUCTURAL REPAIR MANUAL**


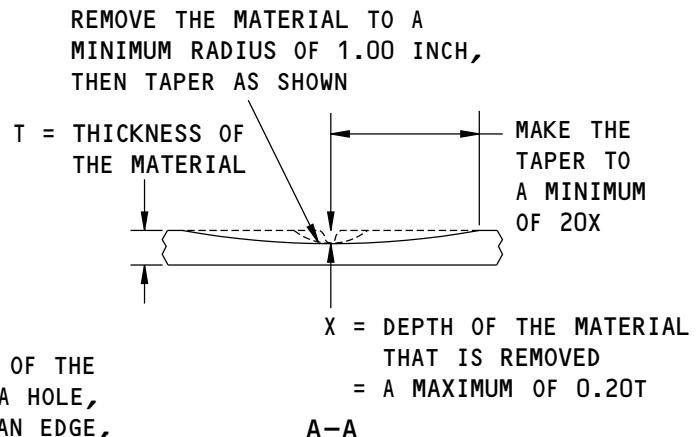
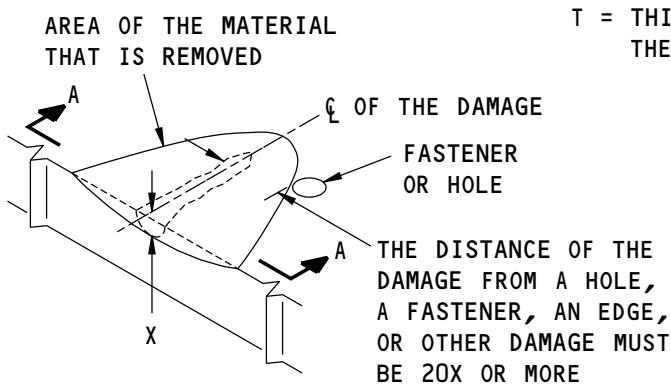
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(A)

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

F81567 S0006593523_V1

Allowable Damage Limits
Figure 102 (Sheet 1 of 5)

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ALLOWABLE DAMAGE 2

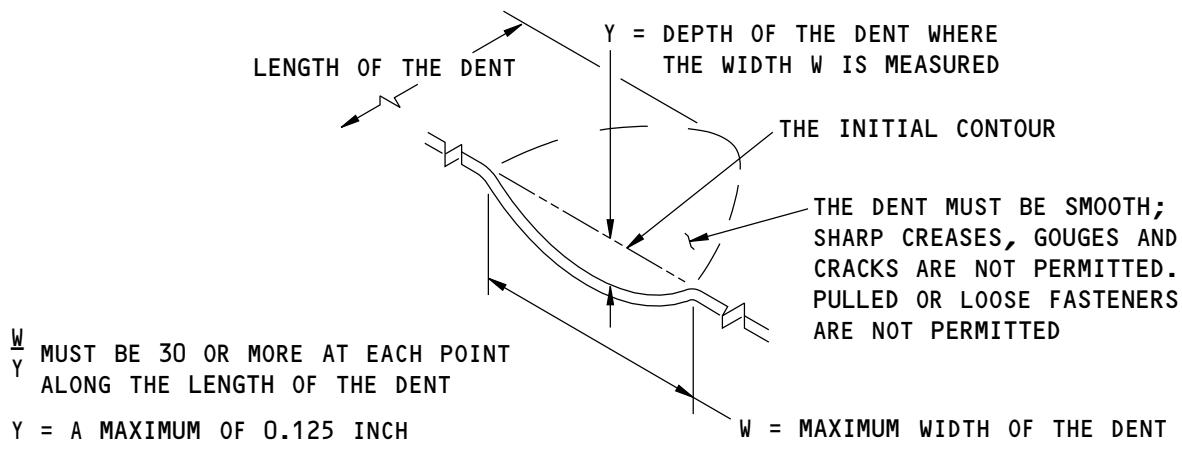
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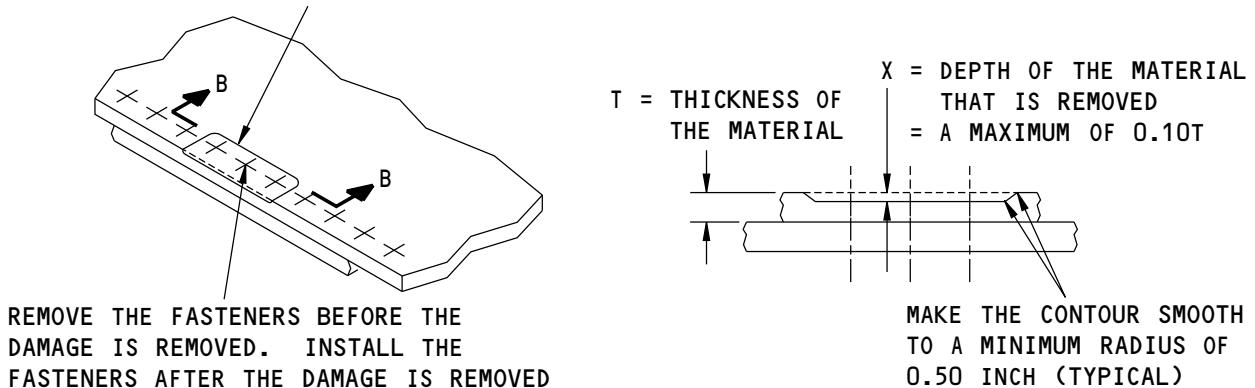
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DENT THAT IS PERMITTED

(D)

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN ALL GROUPS OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B

(E)

F81578 S0006593524_V1

Allowable Damage Limits
Figure 102 (Sheet 2 of 5)

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ALLOWABLE DAMAGE 2

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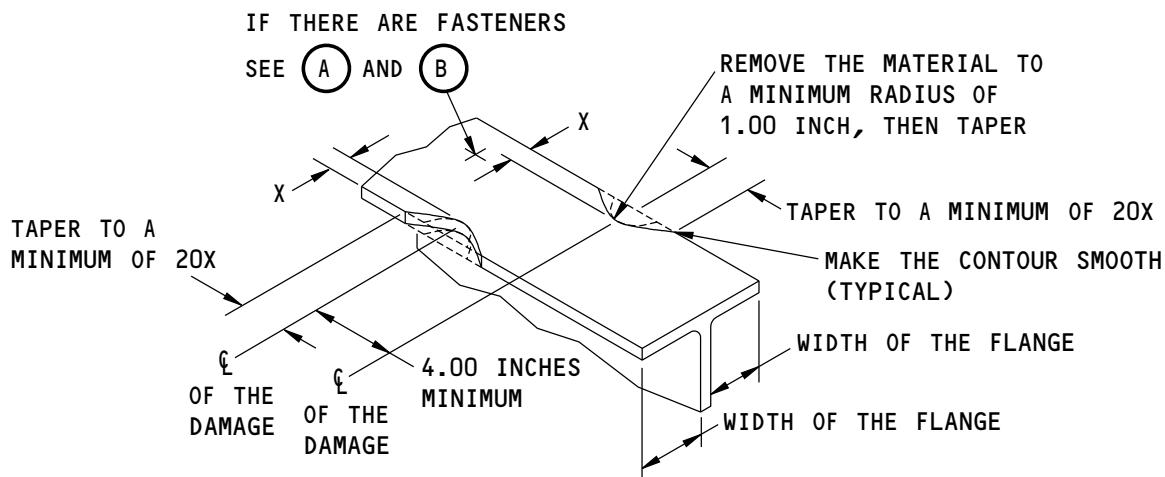
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STRUCTURAL REPAIR MANUAL



X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE



F81569 S0006593525_V1

Allowable Damage Limits
Figure 102 (Sheet 3 of 5)

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ALLOWABLE DAMAGE 2

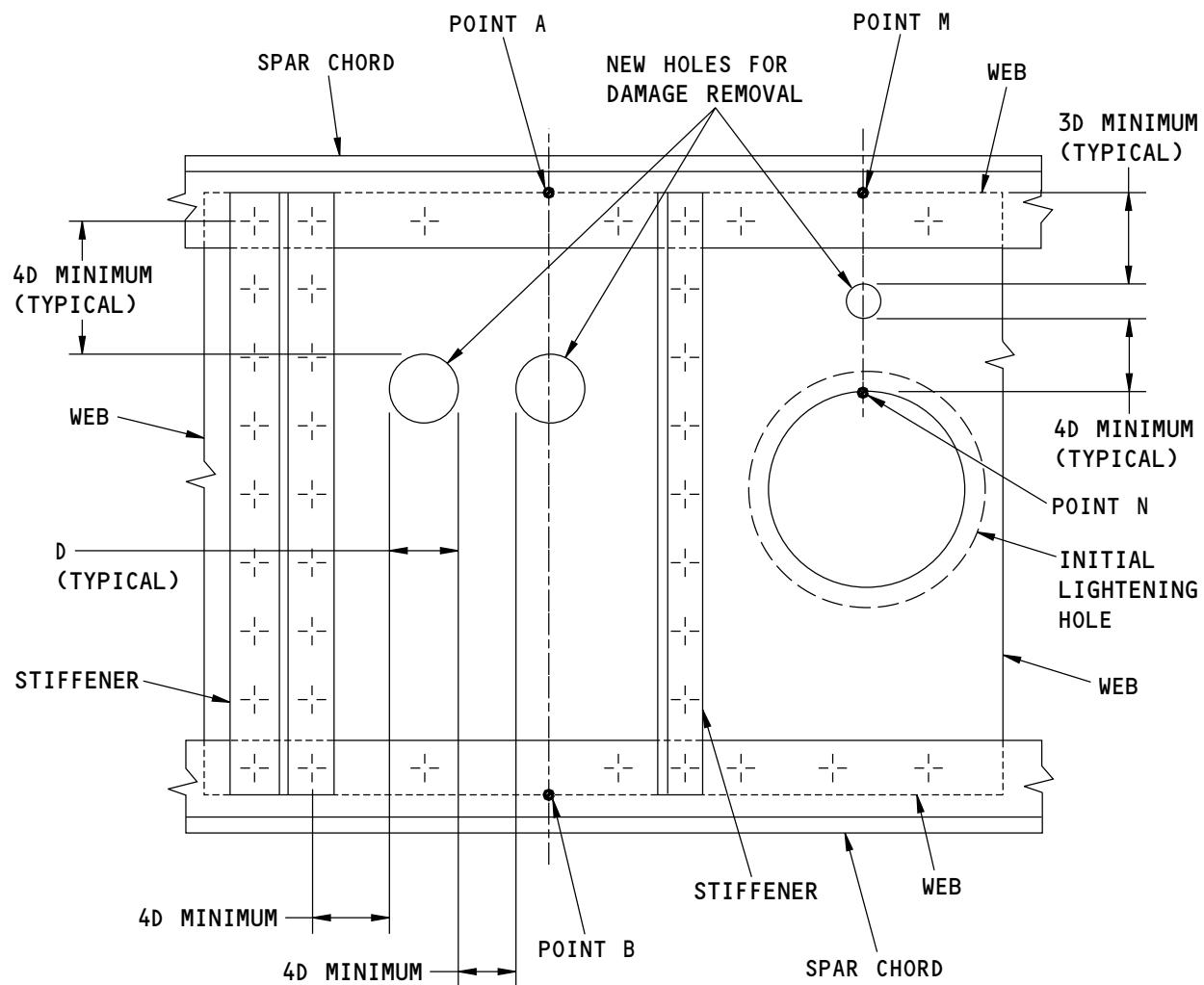
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STRUCTURAL REPAIR MANUAL



POINTS A, B, AND M ARE ON THE EDGES OF THE WEB

D = THE MAXIMUM DIMENSION OF THE DAMAGE REMOVAL

= 1.00 INCH MAXIMUM

- - FASTENER LOCATION

HOLES THAT ARE PERMITTED TO REMOVE
DAMAGED MATERIAL IN WEBS

G

F81570 S0006593526_V1

Allowable Damage Limits
Figure 102 (Sheet 4 of 5)

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ALLOWABLE DAMAGE 2

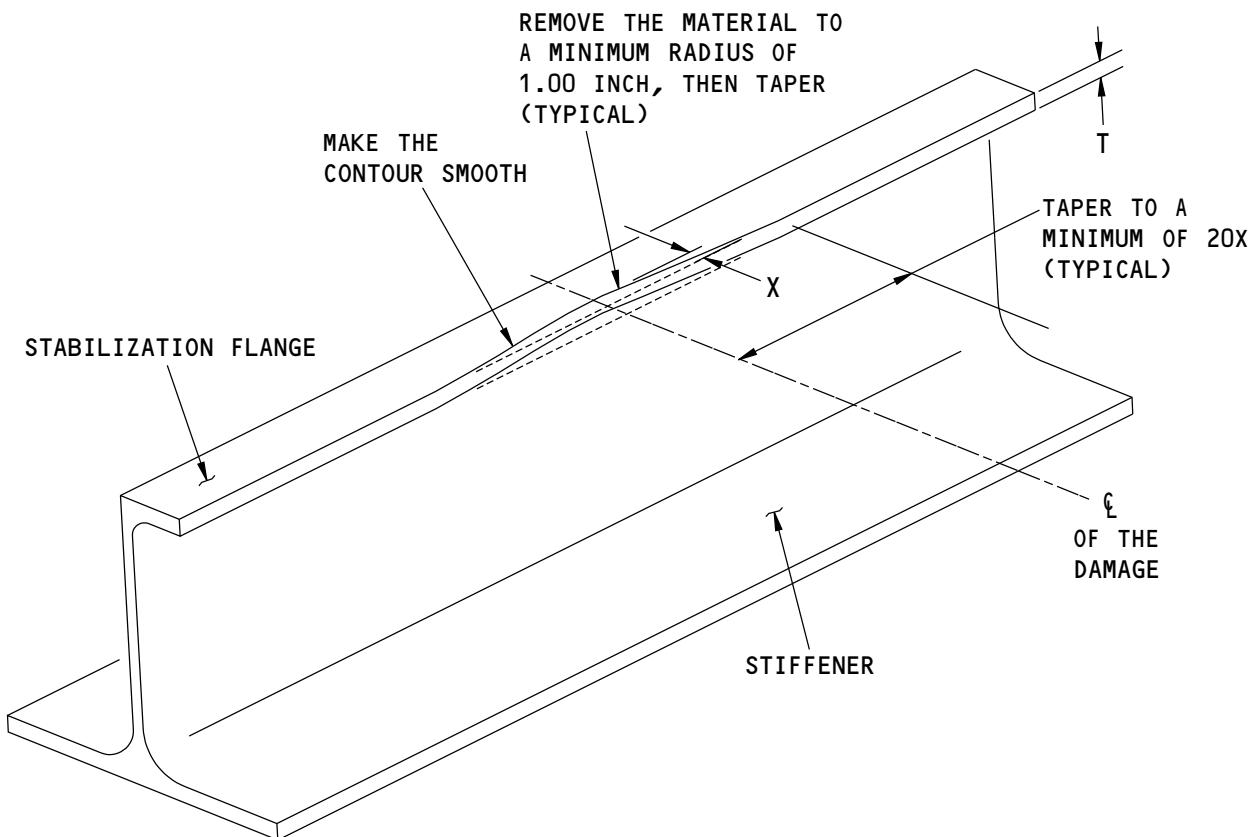
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T = THE THICKNESS OF THE FLANGE

X = THE DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.05T

REMOVAL OF DAMAGED MATERIAL FROM THE
STABILIZATION FLANGE OF A STIFFENER



G78794 S0006593527_V1

Allowable Damage Limits
Figure 102 (Sheet 5 of 5)

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ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

REPAIR 1 - VERTICAL STABILIZER SPAR

1. Applicability

- A. Repair 1 is applicable to damage to:
- (1) The front spar shown in Vertical Stabilizer Front Spar Repairs, Figure 201/REPAIR 1
 - (2) The rear spar shown in Vertical Stabilizer Rear Spar Repairs, Figure 202/REPAIR 1.

2. Repair Instructions

- A. Refer to:

- (1) Table 201 to find the applicable repair for a component of the front spar shown in Vertical Stabilizer Front Spar Repairs, Figure 201/REPAIR 1.
- (2) Table 202 to find the applicable repair for a component of the rear spar shown in Vertical Stabilizer Rear Spar Repairs, Figure 202/REPAIR 1.

Table 201:

REPAIR REFERENCES FOR THE VERTICAL STABILIZER FRONT SPAR	
COMPONENT	REPAIR
Stiffeners (Extrusion)	There are no repairs for this component in the Structural Repair Manual at this time.
Stiffeners (Plate)	There are no repairs for this component in the Structural Repair Manual at this time.
Chords (Extrusion)	There are no repairs for this component in the Structural Repair Manual at this time.
Webs	Refer to SRM 55-30-10, Repair 2

Table 202:

REPAIR REFERENCES FOR THE VERTICAL STABILIZER REAR SPAR	
COMPONENT	REPAIR
Stiffeners (Extrusion)	There are no repairs for this component in the Structural Repair Manual at this time.
Stiffeners (Bar Extrusion)	There are no repairs for this component in the Structural Repair Manual at this time.
Chords	There are no repairs for this component in the Structural Repair Manual at this time.
Webs	Refer to SRM 55-30-10, Repair 3

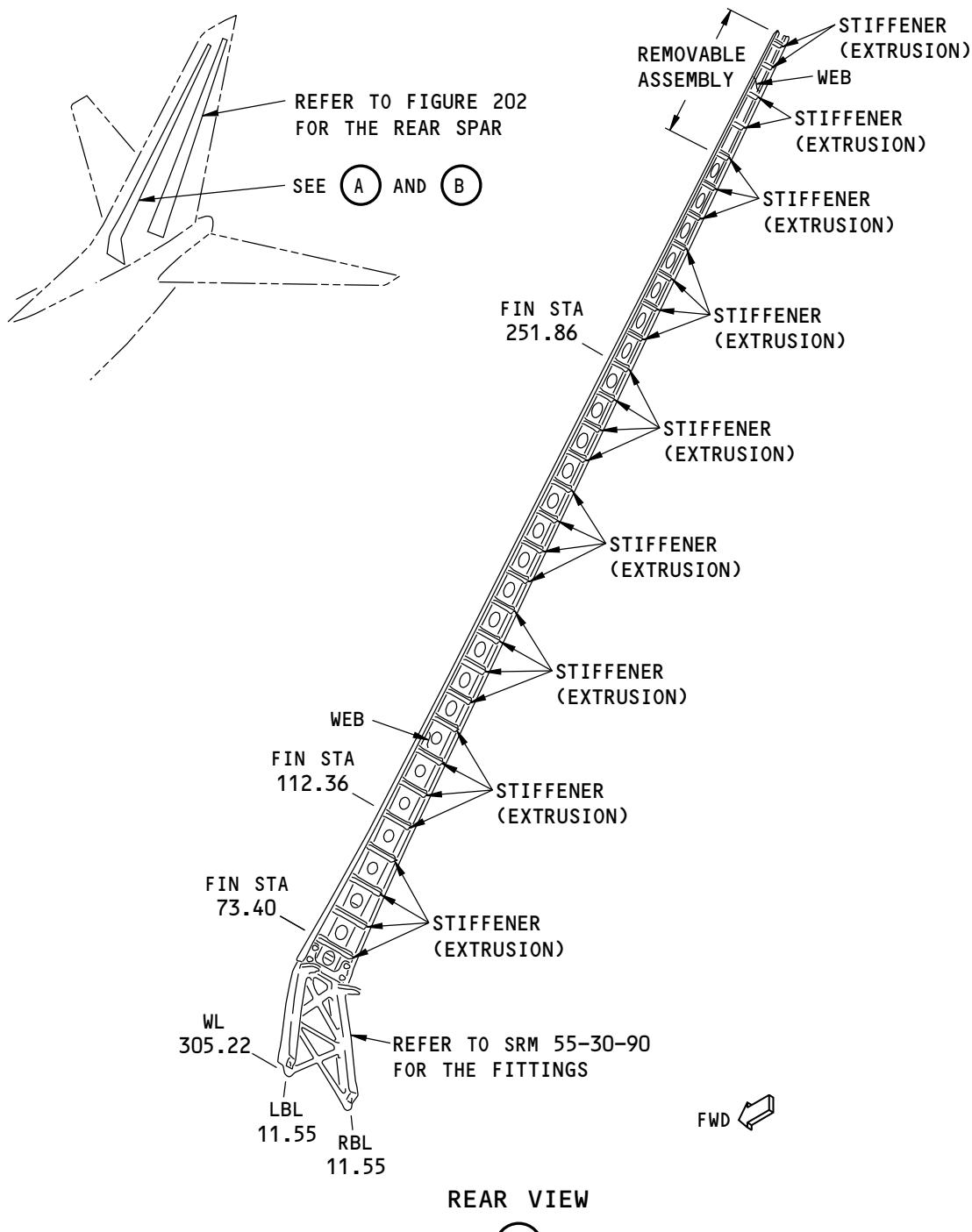
55-30-10

REPAIR 1
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STRUCTURAL REPAIR MANUAL**


F89838 S0006593532_V1

Vertical Stabilizer Front Spar Repairs
Figure 201 (Sheet 1 of 2)

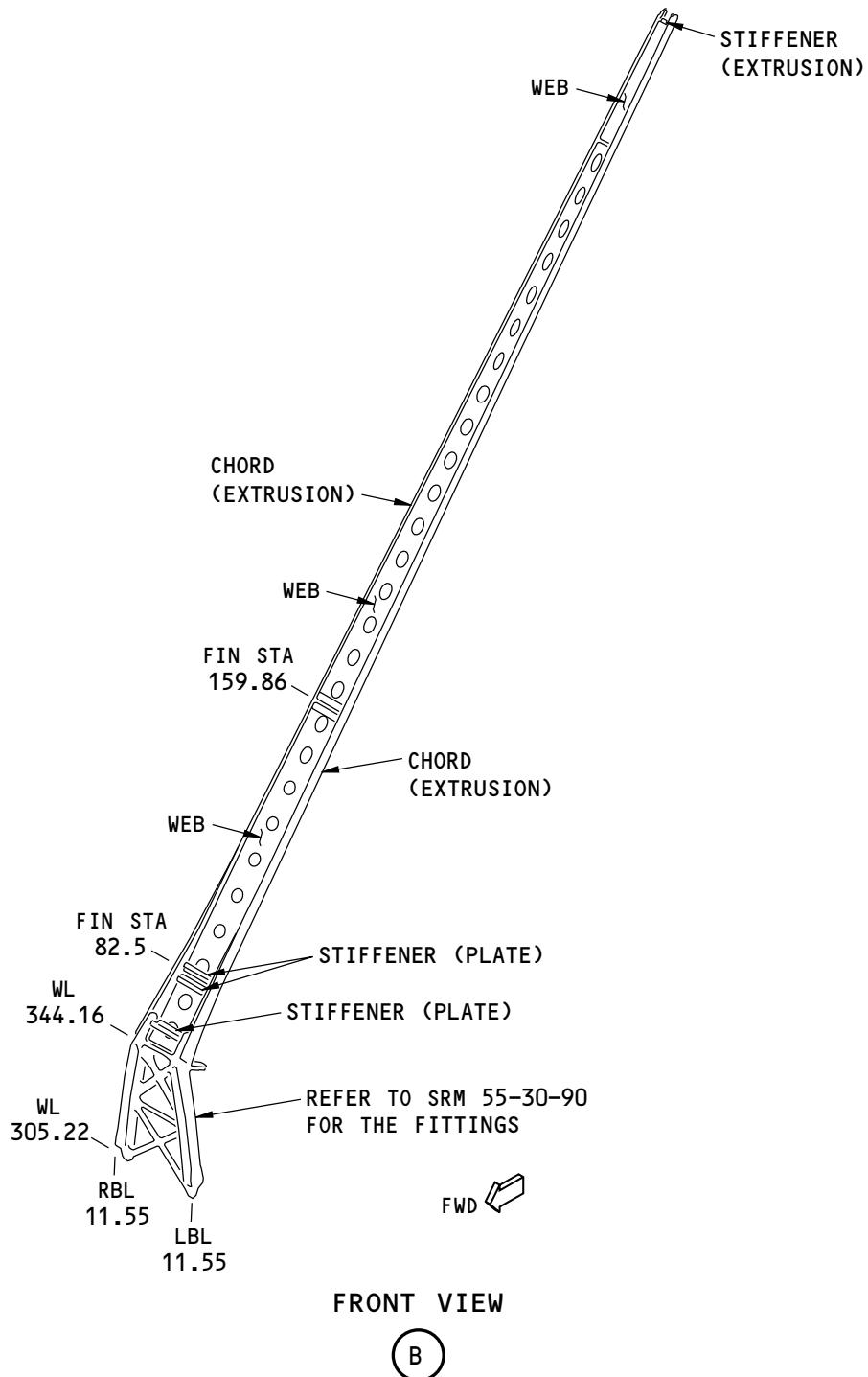
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F89841 S0006593533_V1

Vertical Stabilizer Front Spar Repairs
Figure 201 (Sheet 2 of 2)

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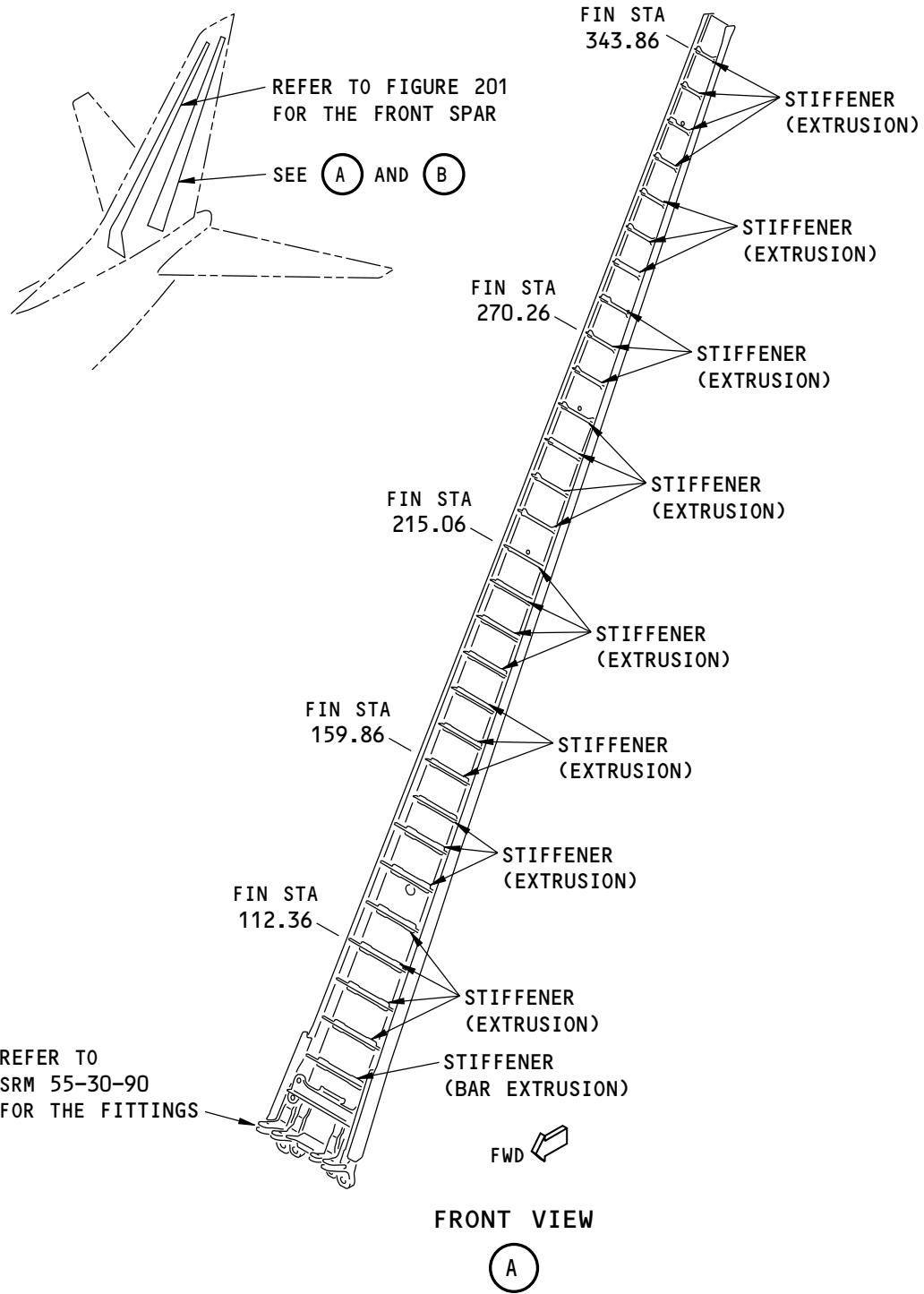
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Vertical Stabilizer Rear Spar Repairs
Figure 202 (Sheet 1 of 2)

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REPAIR 1
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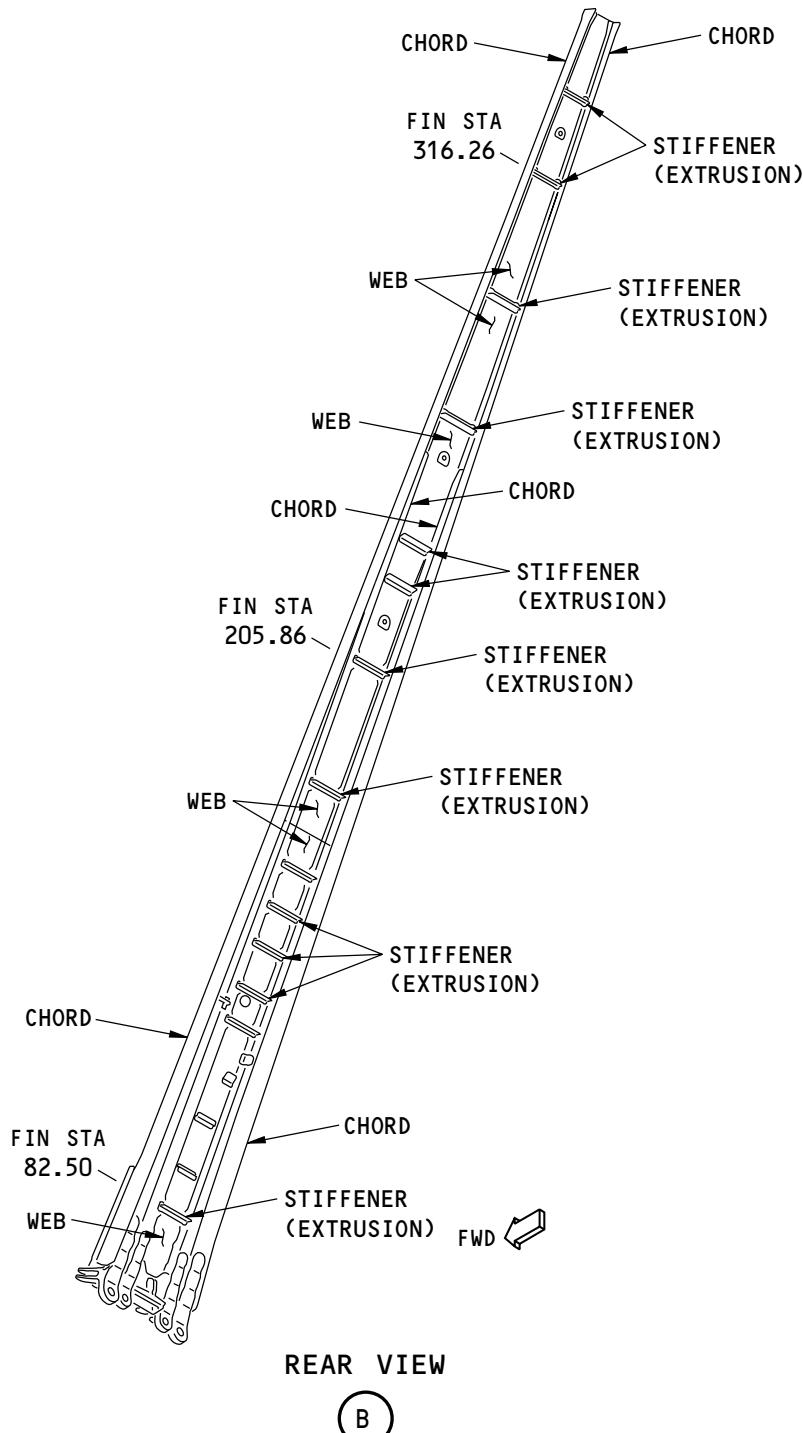
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STRUCTURAL REPAIR MANUAL



F89905 S0006593535_V1

Vertical Stabilizer Rear Spar Repairs
Figure 202 (Sheet 2 of 2)

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REPAIR 1
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STRUCTURAL REPAIR MANUAL

REPAIR 2 - VERTICAL STABILIZER FRONT SPAR WEB

1. Applicability

- A. Repair 2 is applicable to damage to the web of the vertical stabilizer front spar if the damage is between Fin Station 73.40 and Fin Station 316.26. Refer to Vertical Stabilizer Front Spar Location, Figure 201/REPAIR 2.

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REPAIR 2
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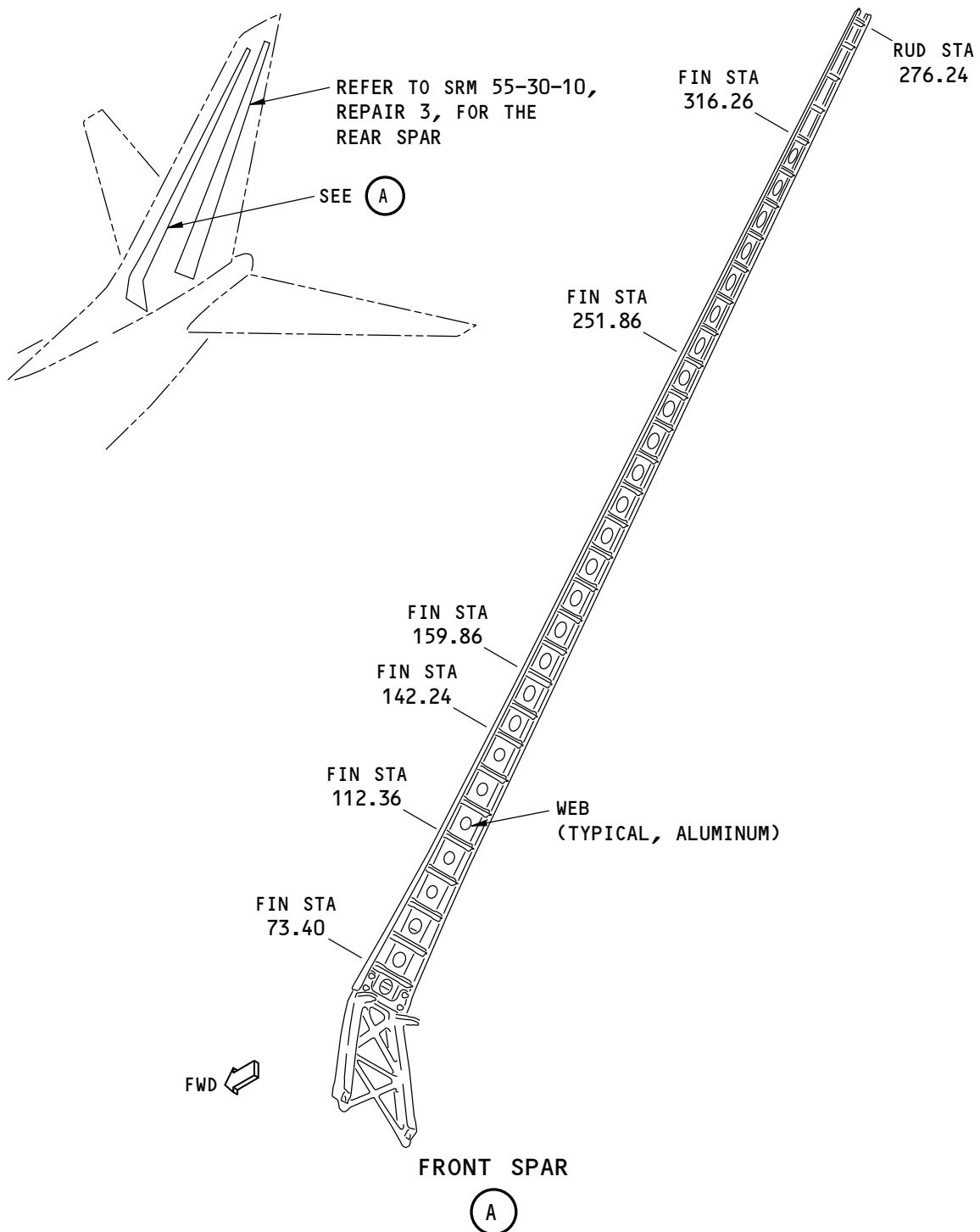
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Vertical Stabilizer Front Spar Location
Figure 201

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REPAIR 2
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2. General

- A. Repair 2 gives instructions for a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Repair Instructions

- A. Remove initial fasteners from skin assemblies as necessary to get access to the damaged area of the web. Refer to 51-40-02.
- B. Drill a stop hole at the ends of all web cracks that do not end at fastener holes. Refer to Vertical Stabilizer Front Spar Web Repair, Figure 202/REPAIR 2 and SRM 51-10-02 for the procedures to drill a stop hole. For other damage, do what follows:
 - (1) Cut and remove the damaged part of the web as shown in Vertical Stabilizer Front Spar Web Repair, Figure 202/REPAIR 2. Refer to 51-10-02 for the procedures to remove the damage.
- C. Assemble the repair part as shown in Vertical Stabilizer Front Spar Web Repair, Figure 202/REPAIR 2.
- D. Drill the fastener holes. Refer to 51-40-05 for the fastener hole dimensions.
- E. Remove the repair part.
- F. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair part and the bare surfaces of the web.
- G. Remove the initial web fasteners and stiffeners as necessary for the repair.
- H. Make the repair part as shown in Vertical Stabilizer Front Spar Web Repair, Figure 202/REPAIR 2. Refer to Table 201/REPAIR 2 for the repair material.

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REPAIR 2

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Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 7075-T6 sheet. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended. You are permitted to make the repair part from 7075-T6 plate

Table 202:

REPAIR PART THICKNESSES FOR INITIAL WEB THICKNESS		
INITIAL WEB THICKNESS (INCH)	LOCATION OF DAMAGE (FIN STATION, FS) (RUDDER STATION, RS)	ITEM [1] DOUBLER THICKNESS (INCH)
0.090	FS 73.40 TO FS 91.55	0.100
0.100	FS 91.55 TO FS 143.15	0.100
0.070	FS 143.15 TO FS 159.86	0.080
0.063	FS 159.86 TO FS 251.86	0.071
0.050	FS 251.86 TO FS 316.26	0.063

- I. Apply a chemical conversion coating to the repair part and bare surfaces of the web. Refer to 51-20-01 for the chemical conversion coating procedures.
- J. Apply one layer of BMS 10-11, Type I, primer to the area of the repair. Refer to SOPM 20-41-02 for the procedures to apply the primer.
 - (1) Apply the primer to the repair part.
 - (2) Apply the primer to the bare surfaces of the web.
- K. Install the repair part with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
 - (1) It is optional to bond the repair part to the initial web as given in 51-70-09. This option will increase the fatigue life of the repair.
- L. Install the initial web stiffeners.
- M. Install the fasteners.
 - (1) Install the hex drive fasteners wet with BMS 5-95 sealant in transition fit holes.
 - (2) Install the rivets at the initial locations without sealant.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.
- O. Install the skin assemblies, if they were removed.

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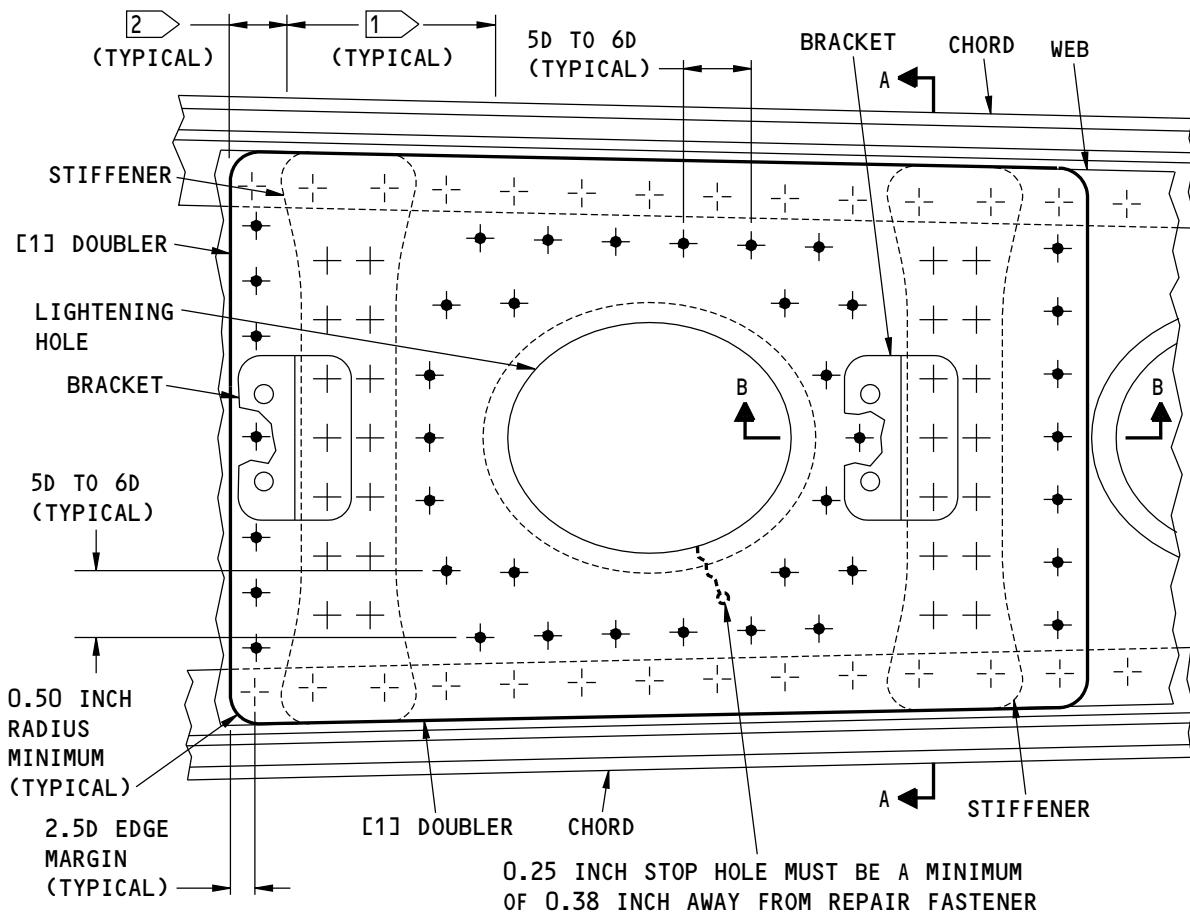
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**NOTES**

- (D) IS THE DIAMETER OF THE REPAIR FASTENER.
- 1 → MAKE SURE THAT THERE IS A MINIMUM OF THREE HORIZONTAL ROWS OF FASTENERS ON EACH SIDE OF THE DAMAGED AREA.
- 2 → PUT THE LAST ROW OF FASTENERS AWAY FROM A STIFFENER.

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACB30VT5K OR BACB30FM5A HEX DRIVE BOLT. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.
- + INITIAL FASTENER LOCATION. INSTALL A BACB30MY(K)X HEX DRIVE BOLT THAT IS UP TO 1/64 INCH DIAMETER OVERSIZE. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

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Vertical Stabilizer Front Spar Web Repair
Figure 202 (Sheet 1 of 3)

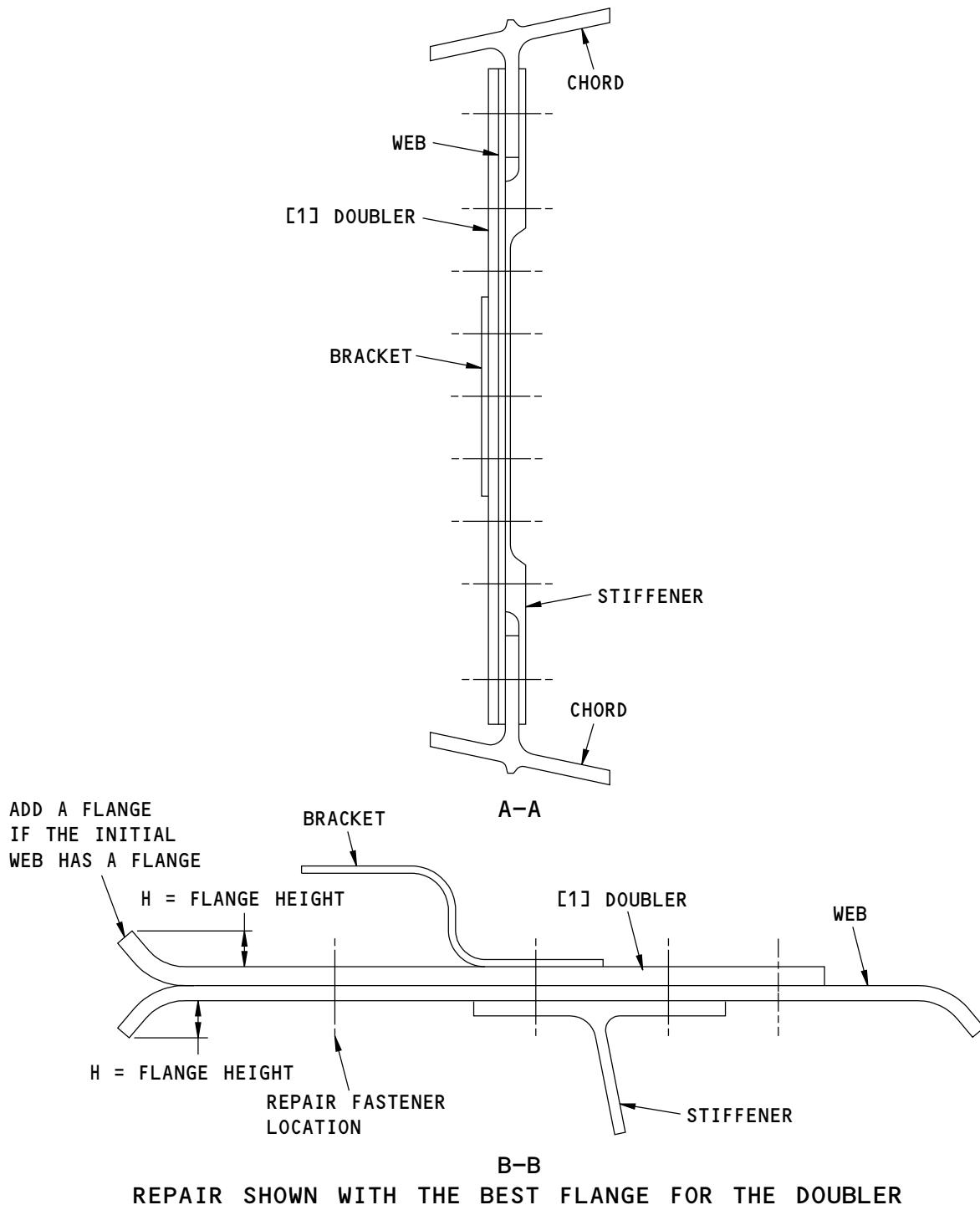
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REPAIR 2
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REPAIR SHOWN WITH THE BEST FLANGE FOR THE DOUBLER

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Vertical Stabilizer Front Spar Web Repair
Figure 202 (Sheet 2 of 3)

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REPAIR 2
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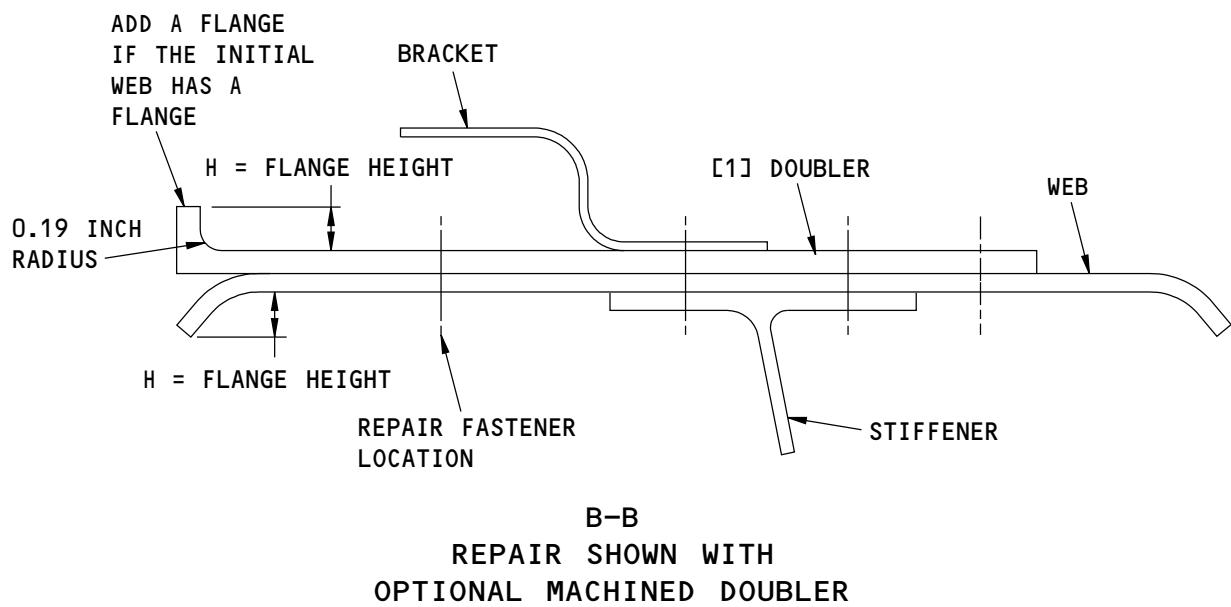
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Vertical Stabilizer Front Spar Web Repair
Figure 202 (Sheet 3 of 3)

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REPAIR 2
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REPAIR 3 - VERTICAL STABILIZER REAR SPAR WEB - FIN STATIONS 251.86 TO 350.00

1. Applicability

- A. Repair 3 is applicable to damage to the web of the vertical stabilizer rear spar shown in Vertical Stabilizer Rear Spar Location, Figure 201/REPAIR 3 if:
- (1) The damage is between Fin Stations 251.86 and 350.00.
 - (2) The repair is not trapped by a fixed trailing edge rib.

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REPAIR 3
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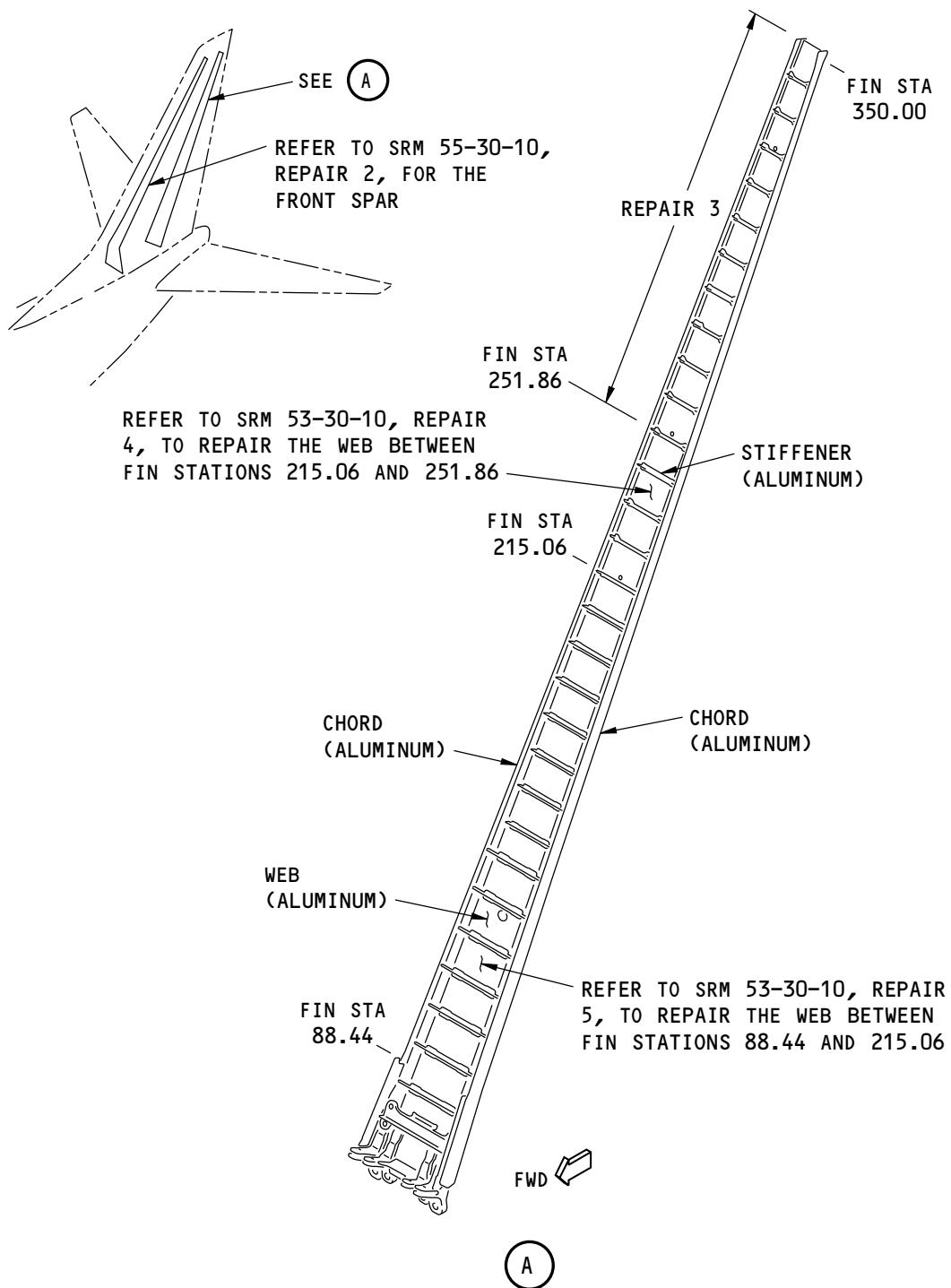
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Vertical Stabilizer Rear Spar Location
Figure 201

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REPAIR 3

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2. General

- A. Repair 3 is a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Repair Instructions

- A. Remove initial fasteners from skin assemblies as necessary to get access to the damaged area of the web. Refer to 51-40-02.
- B. Drill a stop hole at the ends of all web cracks that do not end at fastener holes. Refer to Vertical Stabilizer Rear Spar Web Repair, Figure 202/REPAIR 3 and SRM 51-10-02 for the procedures to drill a stop hole. For other damage, do what follows:
 - (1) Cut and remove the damaged part of the web as shown in Vertical Stabilizer Rear Spar Web Repair With the Area of Damage Removed , Figure 203/REPAIR 3. Refer to 51-10-02 for the procedures to remove the damage.
- C. Remove the initial web fasteners and stiffeners as necessary for the repair.
- D. Make the repair parts as shown in Vertical Stabilizer Rear Spar Web Repair, Figure 202/REPAIR 3 or Vertical Stabilizer Rear Spar Web Repair With the Area of Damage Removed , Figure 203/REPAIR 3, as applicable. Refer to Table 201/REPAIR 3 for the repair materials.
- E. Assemble the repair parts as shown in Vertical Stabilizer Rear Spar Web Repair, Figure 202/REPAIR 3 or Vertical Stabilizer Rear Spar Web Repair With the Area of Damage Removed , Figure 203/REPAIR 3, as applicable.
- F. Drill the fastener holes. Refer to 51-40-05 for the fastener hole dimensions.
- G. Remove the repair parts.

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REPAIR 3
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- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the web.
- I. Apply a chemical conversion coating to the repair parts and bare surfaces of the web. Refer to 51-20-01 for the chemical conversion coating procedures.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 7075-T6 sheet. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended
[2]	Tapered Shim	4	Use clad or bare 7075-T6 sheet. The use of clad material is recommended
[3]	Web Filler	1	Use clad or bare 7075-T6 sheet. Make the thickness of the filler the same as the initial web. The use of clad material is recommended. This part is applicable only for the repair shown in Figure 203

Table 202:

REPAIR PART THICKNESSES FOR INITIAL WEB THICKNESSES		
INITIAL WEB THICKNESS (INCH)	LOCATION OF DAMAGE (FIN STATION, FS)	ITEM [1] DOUBLER THICKNESS (INCH)
0.032	FS 251.86 to FS 288.66	0.040
0.025	FS 288.66 to FS 350.00	0.032

- J. Apply one layer of BMS 10-11, Type I, primer to the area of the repair. Refer to SOPM 20-41-02 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the web.
- K. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
 - (1) It is optional to bond the part [1] doubler to the initial web as given in 51-70-09. This option will increase the fatigue life of the repair.
- L. Install the initial web stiffeners.
- M. Install the fasteners.
 - (1) Install the rivets at the repair and initial locations without sealant.
 - (2) Install the hex drive fasteners at the initial locations wet with BMS 5-95 sealant in transition fit holes.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.
- O. Install the skin assemblies if they were removed.

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REPAIR 3
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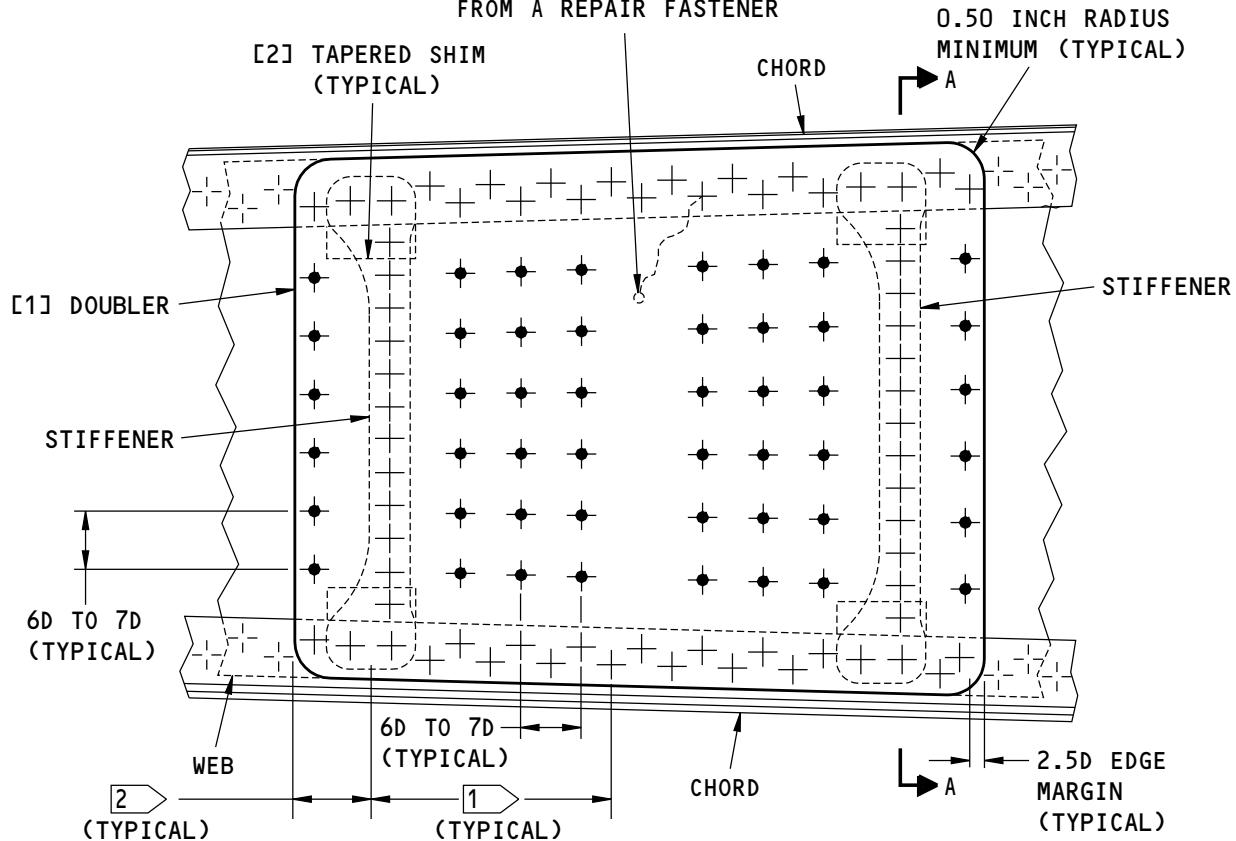
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0.25 INCH STOP HOLE MUST BE
A MINIMUM OF 0.38 INCH AWAY
FROM A REPAIR FASTENER



NOTES

- [1] MAKE SURE THERE IS A MINIMUM OF FOUR HORIZONTAL ROWS OF FASTENERS ON EACH SIDE OF THE DAMAGE.
- [2] PUT THE LAST ROW OF FASTENERS AWAY FROM A STIFFENER.
 - (D) IS THE DIAMETER OF THE REPAIR FASTENER.
 - MAKE SURE THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- + REFERENCE FASTENER LOCATION
- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE FOR RIVETS AND 1/64 INCH DIAMETER OVERSIZE FOR HEX DRIVE BOLTS) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACR15BB5D() RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

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Vertical Stabilizer Rear Spar Web Repair
Figure 202 (Sheet 1 of 2)

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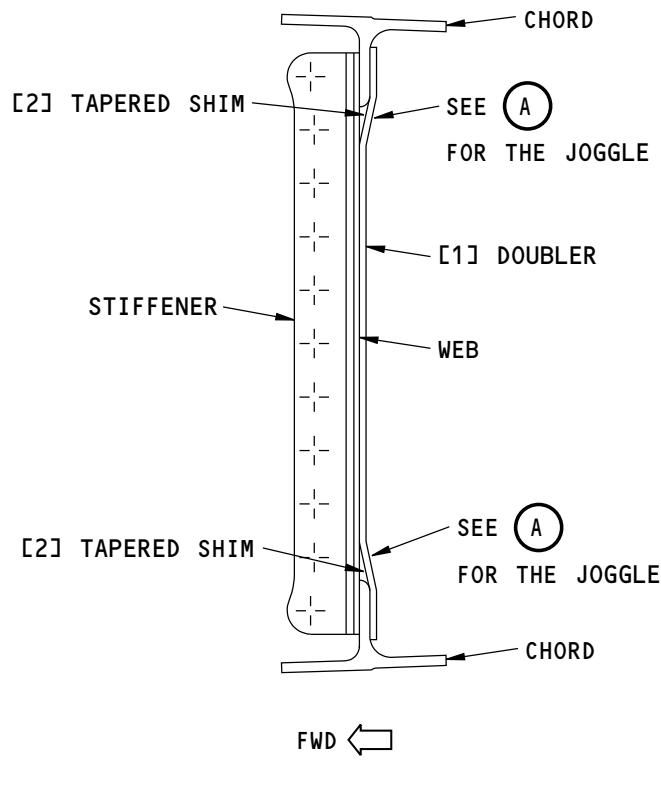
REPAIR 3
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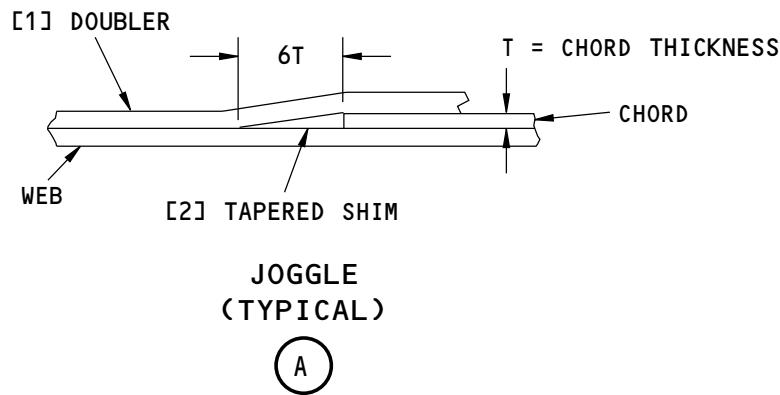
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Vertical Stabilizer Rear Spar Web Repair
Figure 202 (Sheet 2 of 2)

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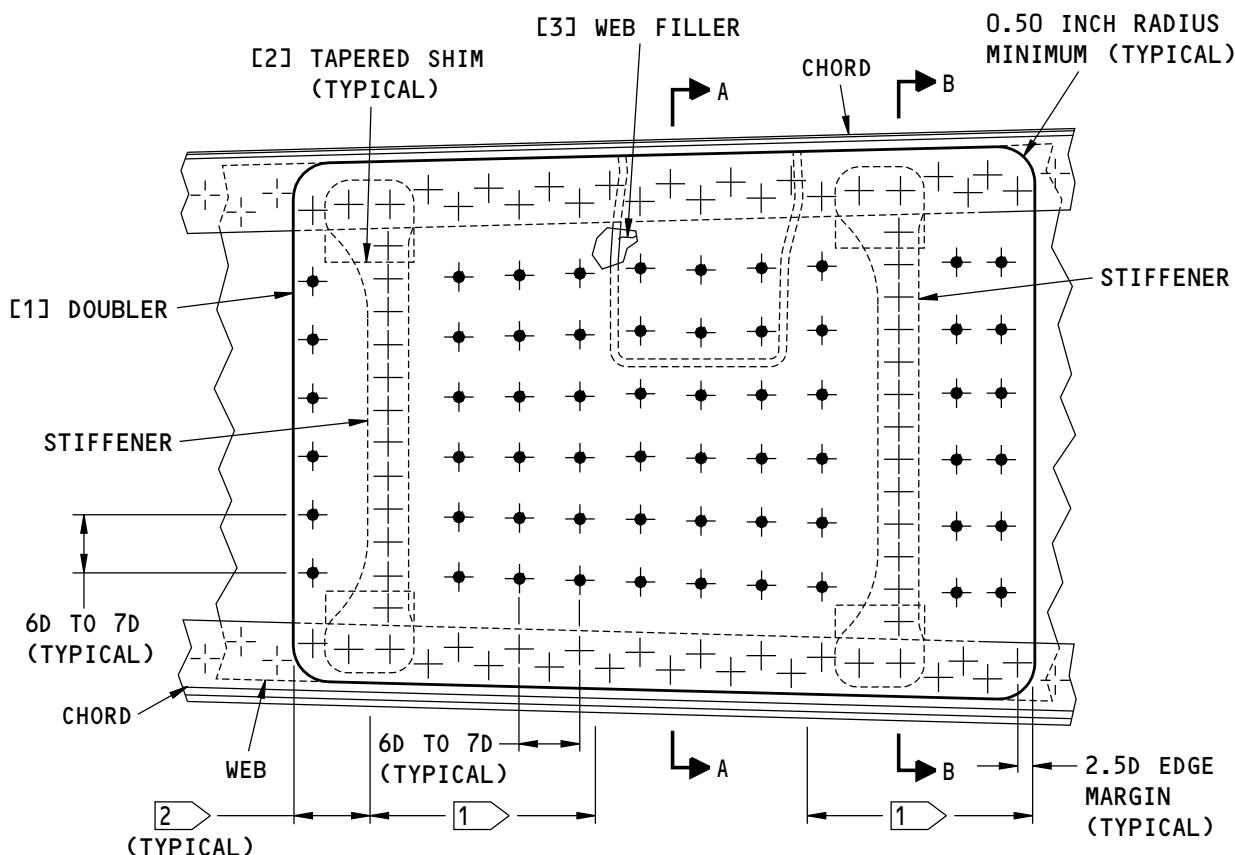
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NOTES

- [1] MAKE SURE THERE IS A MINIMUM OF FOUR HORIZONTAL ROWS OF FASTENERS ON EACH SIDE OF THE DAMAGE.
- [2] PUT THE LAST ROW OF FASTENERS AWAY FROM A STIFFENER.
 - (D) IS THE DIAMETER OF THE REPAIR FASTENER.
 - MAKE SURE THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.

FASTENER SYMBOLS

- REFERENCE FASTENER LOCATION
- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE FOR RIVETS AND 1/64 INCH DIAMETER OVERSIZE FOR HEX DRIVE BOLTS) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACR15BB5D() RIVET. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.

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Vertical Stabilizer Rear Spar Web Repair With the Area of Damage Removed
Figure 203 (Sheet 1 of 3)

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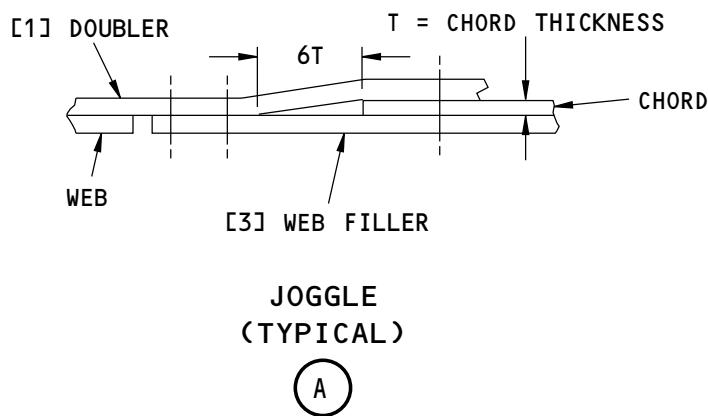
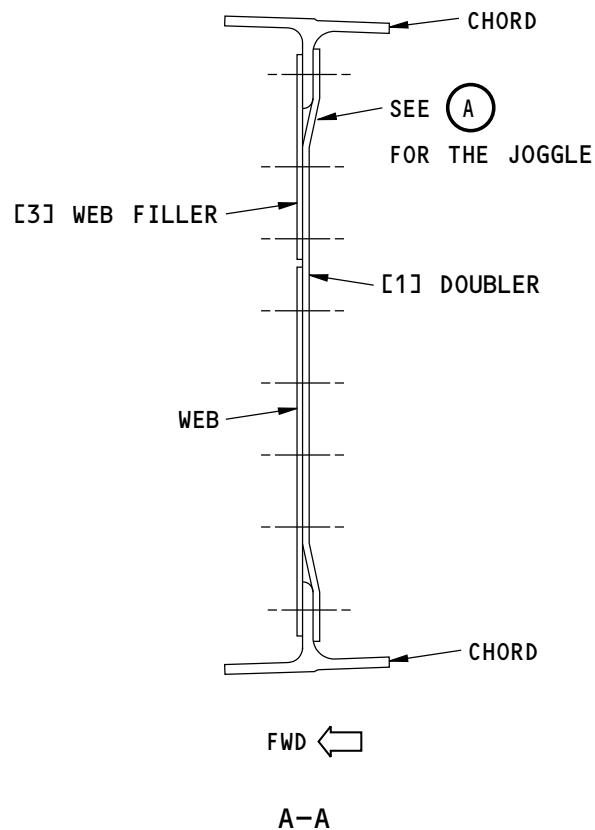
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Vertical Stabilizer Rear Spar Web Repair With the Area of Damage Removed
Figure 203 (Sheet 2 of 3)

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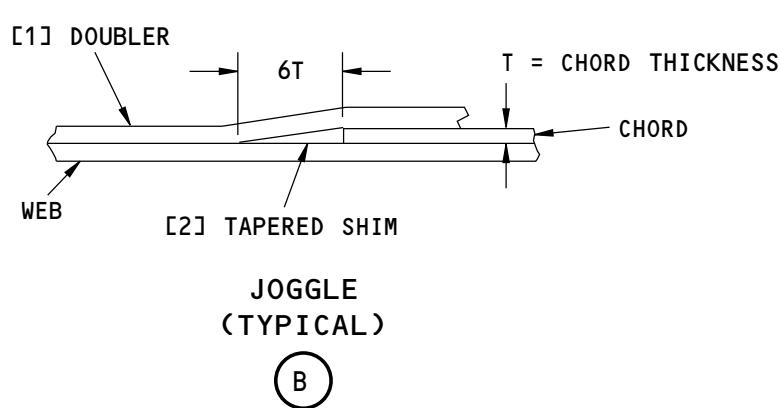
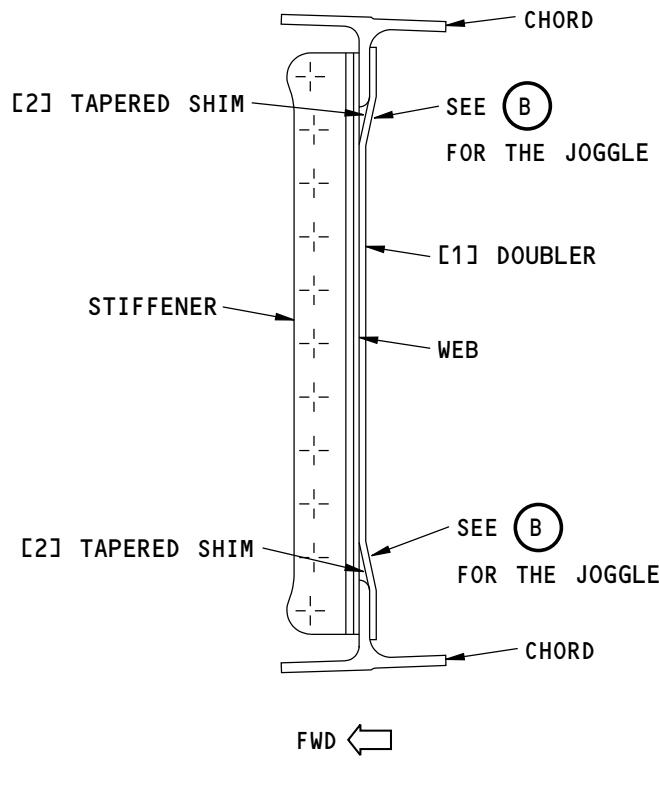
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Vertical Stabilizer Rear Spar Web Repair With the Area of Damage Removed
Figure 203 (Sheet 3 of 3)

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REPAIR 4 - VERTICAL STABILIZER REAR SPAR WEB REPAIR - FIN STATIONS 215.06 THRU 251.86

1. Applicability

- A. Repair 4 is applicable to damage to the web of the vertical stabilizer rear spar shown in Figure 201/REPAIR 4 if:
 - (1) The damage is between Fin Stations 215.06 and 251.86.

2. General

- A. Repair 4 gives instructions for a Category B repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. This category B repair has FAA approval if you complete the supplemental inspections given in Paragraph 5./REPAIR 4. Incorporation of these inspection requirements into the airplane maintenance program satisfies the damage tolerance assessment of the repair.
- B. Refer to 51-30-05 for possible sources of the equipment and tools you need to remove the damage.

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REPAIR 4
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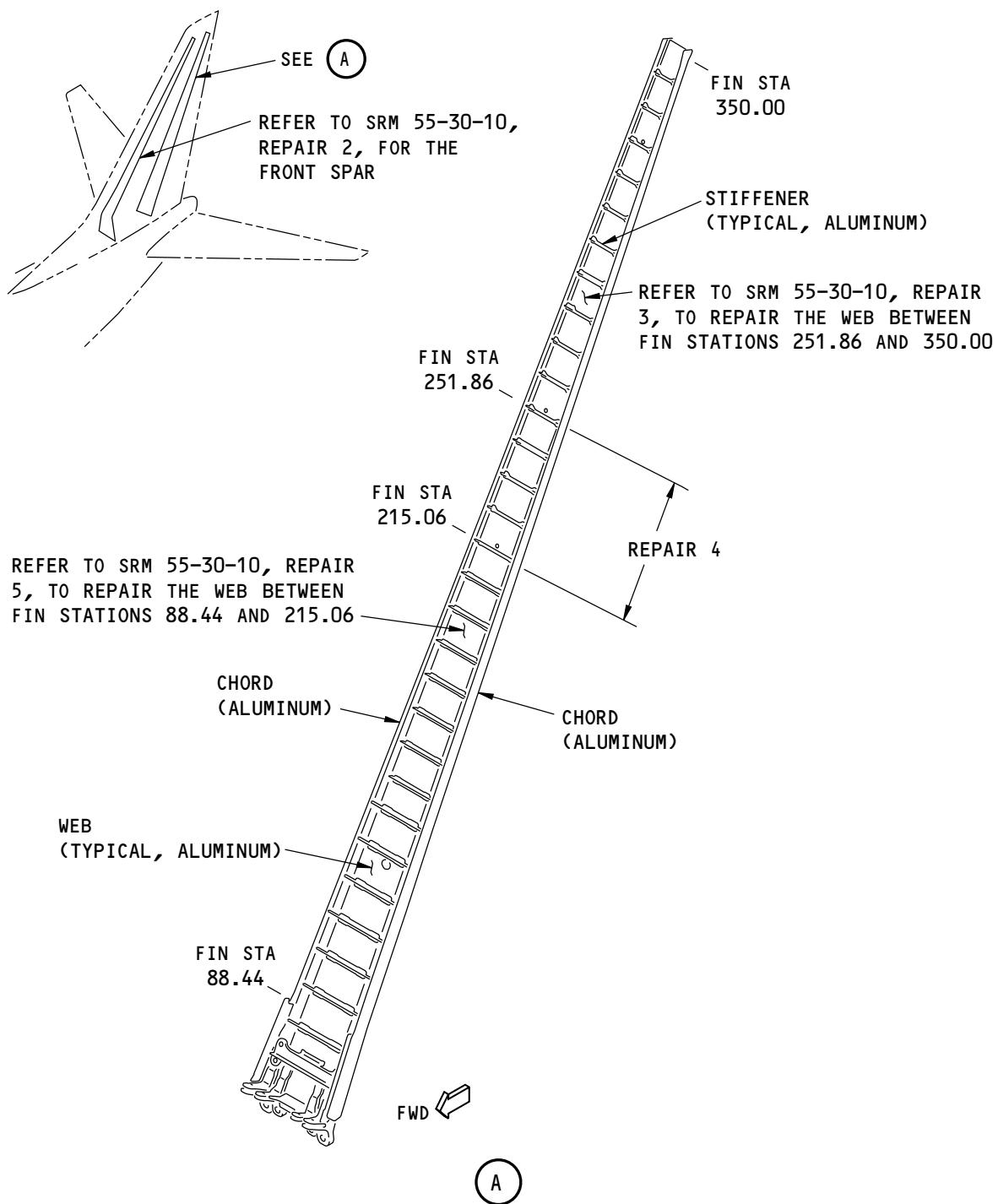
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Vertical Stabilizer Rear Spar Location
Figure 201

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REPAIR 4
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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
55-30-09	VERTICAL STABILIZER RIBS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 4, 55-30-01	Vertical Stabilizer Rear Spar Primary Chords
737 NDT Part 6, 53-30-00, Procedure 5	Inspection of External Fuselage Repairs

4. Repair Instructions

- A. Remove initial fasteners from skin assemblies as necessary to get access to the damaged area of the web. Refer to 51-40-02.
- B. Drill a stop hole at the ends of all web cracks that do not end at fastener holes. Refer to Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86, Figure 202/REPAIR 4, Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations 215.06 thru 251.86, Figure 203/REPAIR 4, and SRM 51-10-02 for the procedures to drill a stop hole. For other damage, do what follows:
 - (1) Cut and remove the damaged part of the web as shown in Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86, Figure 202/REPAIR 4 or Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations 215.06 thru 251.86, Figure 203/REPAIR 4. Refer to 51-10-02 for the procedures to remove the damage.
- C. Remove the initial web fasteners and stiffeners as necessary for the repair.
- D. Make the repair part as shown in Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86, Figure 202/REPAIR 4 or Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations 215.06 thru 251.86, Figure 203/REPAIR 4. Refer to Table 201/REPAIR 4 for the repair material.
- E. Assemble the repair part as shown in Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86, Figure 202/REPAIR 4 or Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations 215.06 thru 251.86, Figure 203/REPAIR 4.
- F. Drill the fastener holes. Refer to 51-40-05 for the fastener hole dimensions.

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REPAIR 4

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- G. Remove the repair part.
- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair part and the bare surfaces of the web.
- I. Apply a chemical conversion coating to the repair part and bare surfaces of the web. Refer to 51-20-01 for the chemical conversion coating procedures.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 7075-T6 that is 0.050 inch thick. Make the thickness 0.090 inch thick if you make the Part [2] Splice shown in Figure 203. The use of clad material is recommended
[2]	Splice	1	Use clad or bare 7075-T6 that is 0.090 inch thick. The use of clad material is recommended. This part is needed for the repair shown in Figure 203
[3]	Filler	1	Use clad or bare 7075-T6. The use of clad material is recommended. Use this filler when you do the repair shown in Figure 203
[4]	Filler	2	Use clad or bare 7075-T6 that is 0.090 inch thick. The use of clad material is recommended. Use these fillers when you do the repair shown in Figure 203
[5]	Stiffener	2	Make the stiffeners from a 7075-T6511 extrusion. Make the stiffeners the same shape as the initial stiffeners on the production drawing except for a shorter flange height. Use these stiffeners when you do the repair shown in Figure 203

- J. Apply one layer of BMS 10-11, Type I, primer to the area of the repair. Refer to SOPM 20-41-02 for the procedures to apply the primer.
 - (1) Apply the primer to the repair part.
 - (2) Apply the primer to the bare surfaces of the web.
- K. Install the repair part with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
 - (1) It is optional to bond the part [1] doubler to the initial web as given in 51-70-09. This option will increase the fatigue life of the repair.
- L. Install the initial web stiffeners, as necessary.
- M. Install the fasteners.
 - (1) Install the hex drive fasteners at the repair and initial locations wet with BMS 5-95 sealant in transition fit holes.
 - (2) Install the rivets at the initial locations without sealant.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.
- O. Install the skin assemblies, if they were removed.

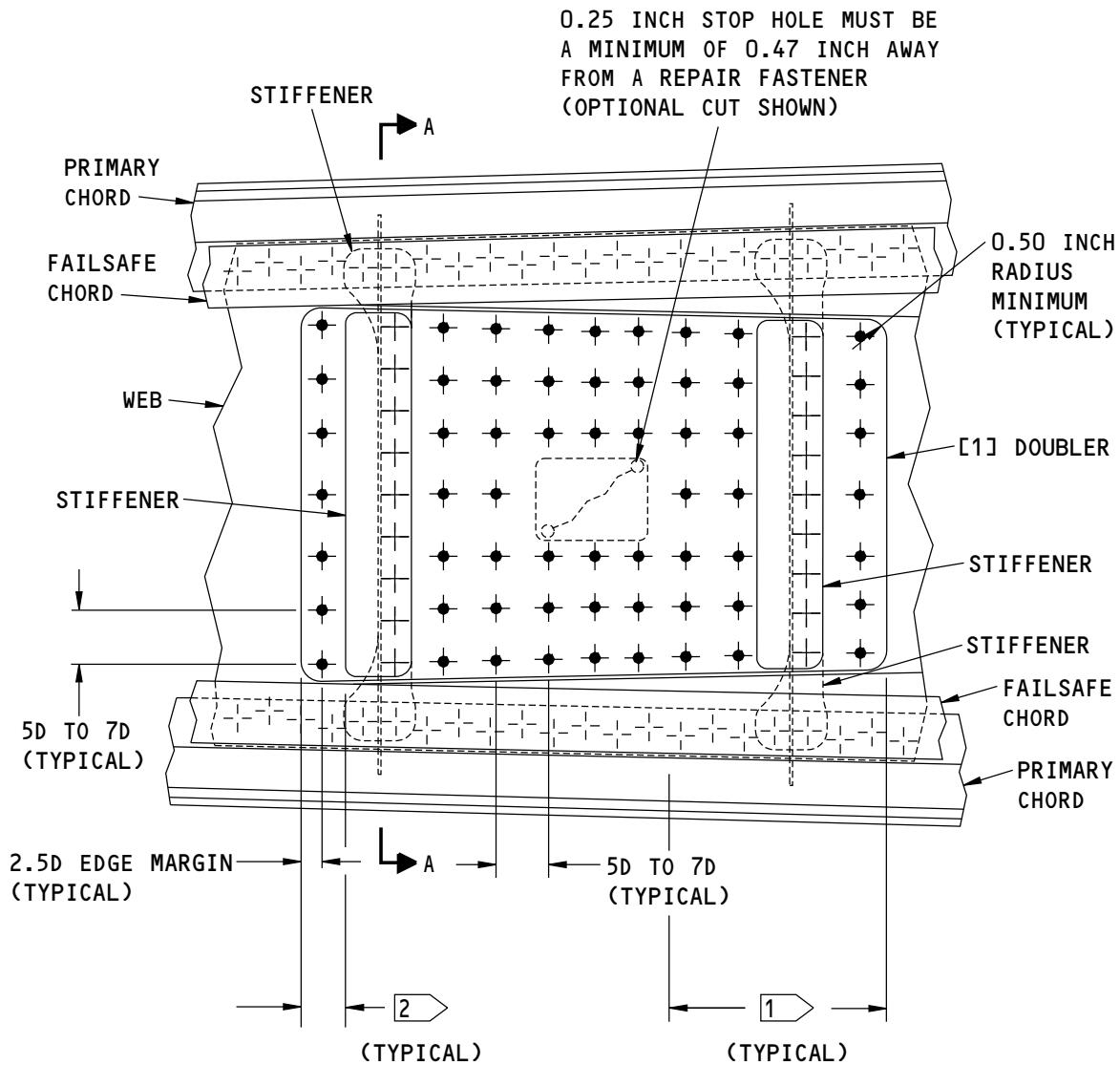
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Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86
Figure 202 (Sheet 1 of 3)

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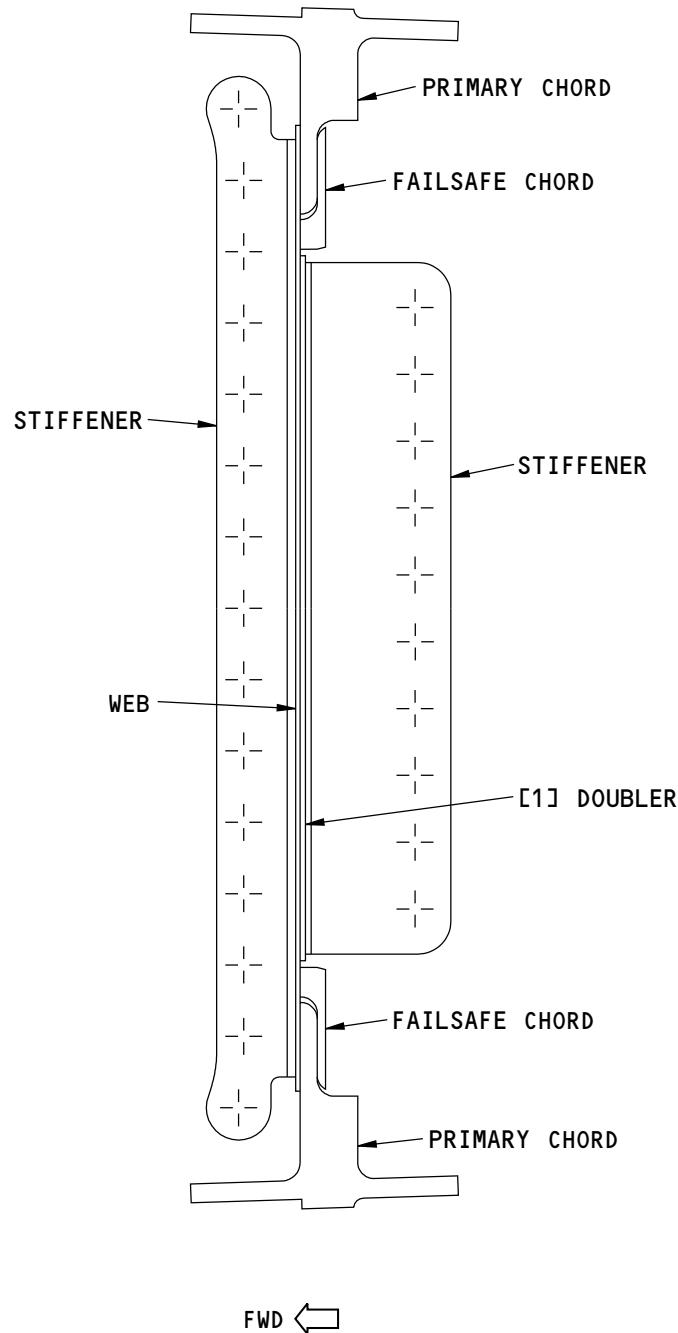
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Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86
Figure 202 (Sheet 2 of 3)

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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER.
 - MAKE SURE THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- 1 ➤ MAKE SURE THERE IS A MINIMUM OF THREE ROWS OF REPAIR FASTENERS ALL AROUND THE DAMAGE.
- 2 ➤ PUT THE LAST ROW OF FASTENERS AWAY FROM A STIFFENER.

FASTENER SYMBOLS

- Reference fastener location.
- + Initial fastener location. Install a fastener that is the same type and diameter (up to 1/32 inch diameter oversize for rivets and 1/64 inch diameter oversize for hex drive bolts) as the initial fastener.
- Repair fastener location. Install a BACB30NX6K() hex drive bolt. Refer to SRM 51-40-00 through 51-40-08 for the fastener data.

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Vertical Stabilizer Rear Spar Web Repair - Damage Near Center of Web, Fin Stations 215.06 thru 251.86
Figure 202 (Sheet 3 of 3)

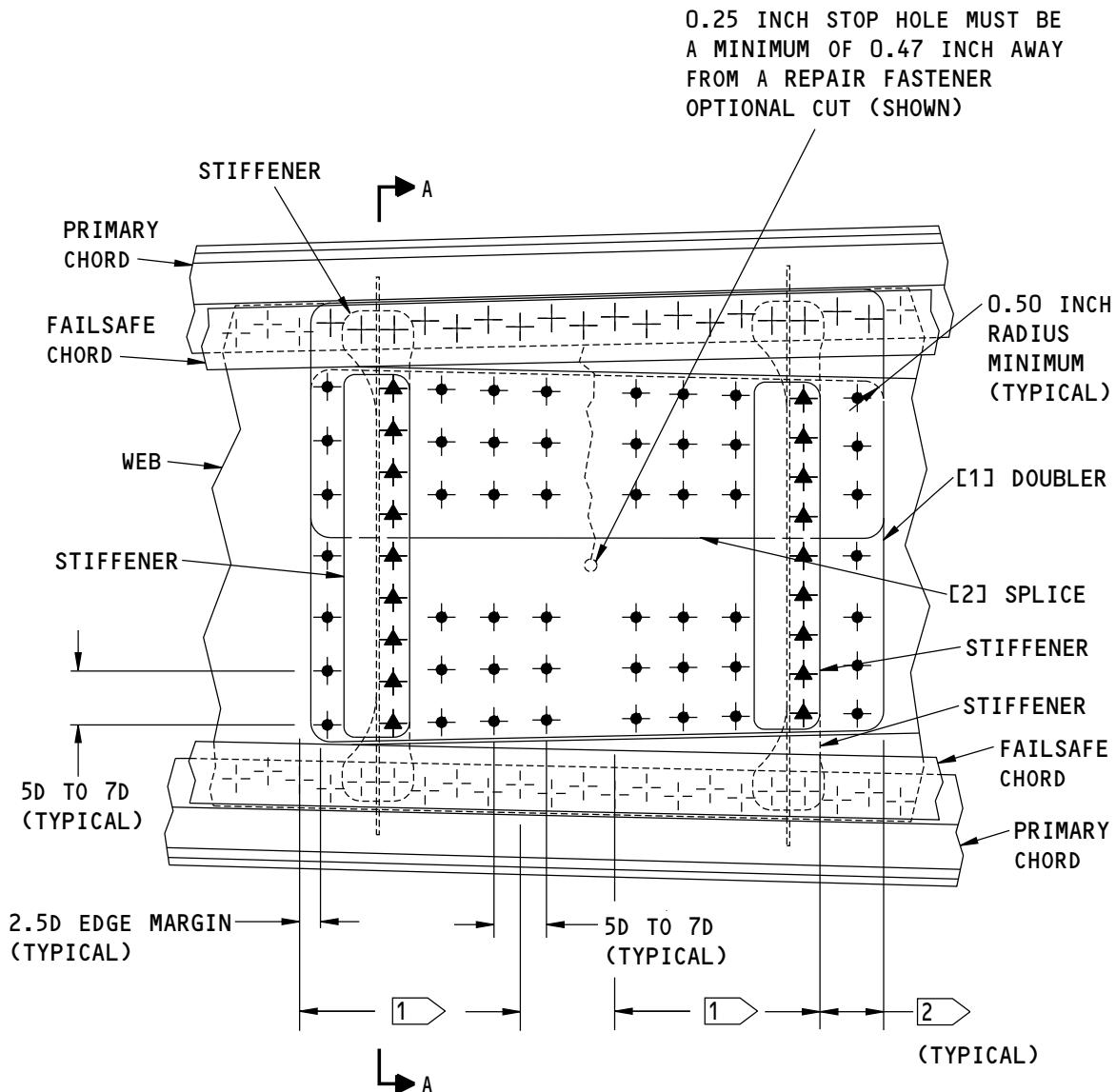
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**Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations
215.06 thru 251.86**
Figure 203 (Sheet 1 of 3)

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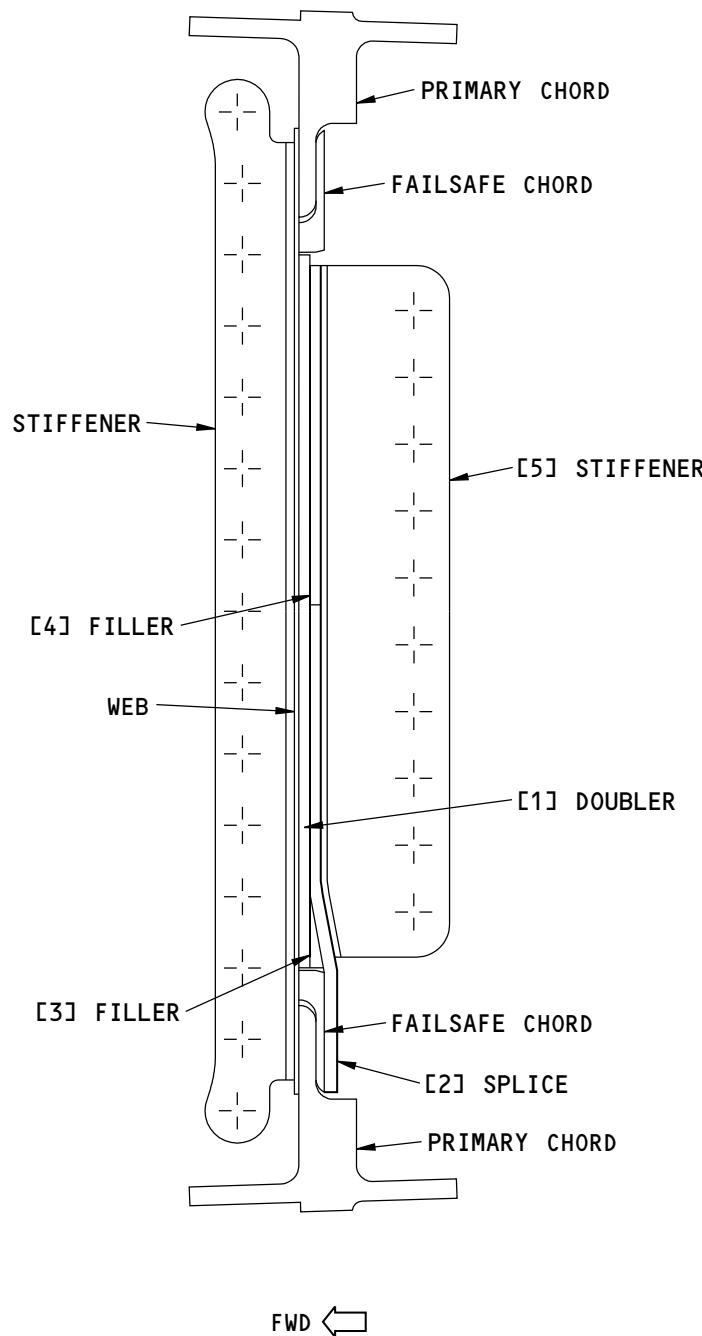
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Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations
215.06 thru 251.86
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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER.
- MAKE SURE THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- 1 ➤ MAKE SURE THERE IS A MINIMUM OF FOUR HORIZONTAL ROWS OF FASTENERS ON EACH SIDE OF THE DAMAGE.
- 2 ➤ PUT THE LAST ROW OF FASTENERS AWAY FROM A STIFFENER.

FASTENER SYMBOLS

- |- REFERENCE FASTENER LOCATION
- + INITIAL FASTENER LOCATION. INSTALL A FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERSIZE FOR RIVETS AND 1/64 INCH DIAMETER OVERSIZE FOR HEX DRIVE BOLTS) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACB30NX6K() HEX DRIVE BOLT. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA.
- ▲ INITIAL FASTENER LOCATION. INSTALL A BACB30NX6K() HEX DRIVE BOLT.

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Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations
215.06 thru 251.86
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5. Inspection Instructions

- A. Do a Low Frequency Eddy Current (LFEC) inspection every 24,000 cycles after you install the repair, if the repair is concealed by a stiffener on the rear face of the web.
 - (1) Do the inspection of the repair doubler and splice from the rear face of the web at the stiffener repair area.
 - (a) Inspect the entire doubler at all fasteners common to the repair parts and the stiffener.
 - (2) Refer to 737 NDT Part 6, 53-30-00, Procedure 5
- B. Refer to Table 202/REPAIR 4 for the inspection requirements to find cracks in the area of the fixed trailing edge rib brackets and the failsafe chord. Refer to 55-30-09 for the location of the trailing edge ribs.

Table 202:

CATEGORY B REPAIR INSPECTION REQUIREMENTS			
INSPECTION THRESHOLD	REPEAT INSPECTION ALTERNATIVES		
	METHOD	INTERVAL	REFERENCE
56,000 flight cycles after repair is installed	Low Frequency Eddy Current Inspection	24,000 flight cycles	737 NDT manual Part 6 53-30-00, Figure 5

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REPAIR 4

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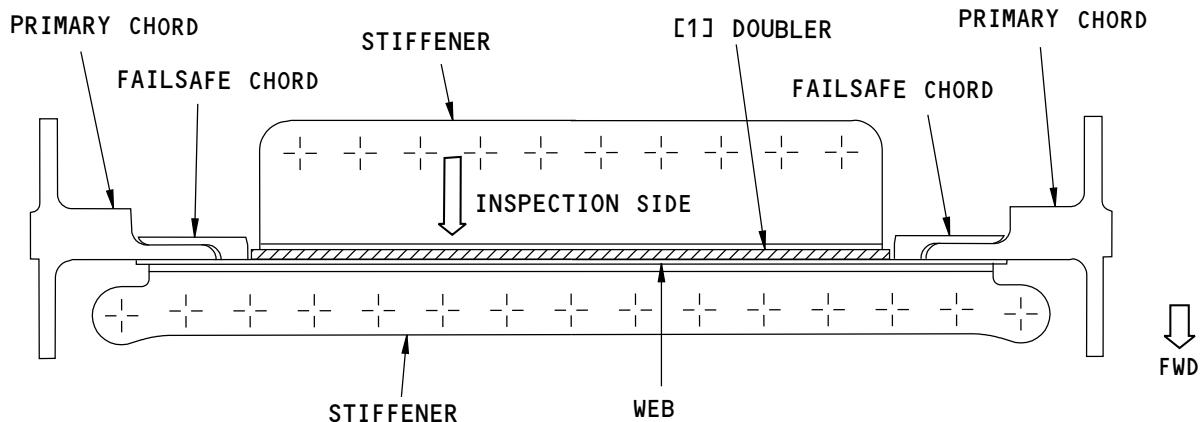
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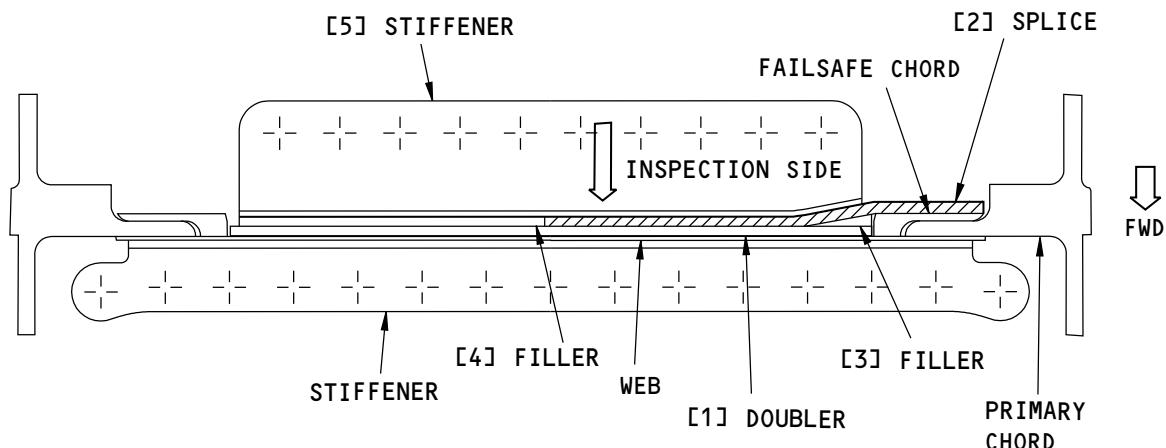


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VIEW OF SECTION TO BE INSPECTED WITH A REPAIR DUE TO DAMAGE NEAR THE CENTER OF THE WEB.

INSPECTION FOR SECTION A-A OF FIGURE 202



VIEW OF SECTION TO BE INSPECTED WITH A REPAIR DUE TO DAMAGE NEAR THE EDGE OF THE WEB.

INSPECTION FOR SECTION A-A OF FIGURE 203

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Vertical Stabilizer Rear Spar Web Repair with Web Splice, Damage Near Edge of Web - Fin Stations
215.06 thru 251.86
Figure 204

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REPAIR 5 - VERTICAL STABILIZER REAR SPAR WEB REPAIR - FIN STATIONS 88.44 THRU 215.06

1. Applicability

- A. Repair 5 is applicable to damage to the web of the vertical stabilizer rear spar shown in Vertical Stabilizer Rear Spar Location, Figure 201/REPAIR 5 if:
- (1) The damage is between Fin Stations 88.44 and 215.06
 - (2) There is no damage to the failsafe chords.
 - (3) The repair is not trapped by a fixed trailing edge rib.

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REPAIR 5
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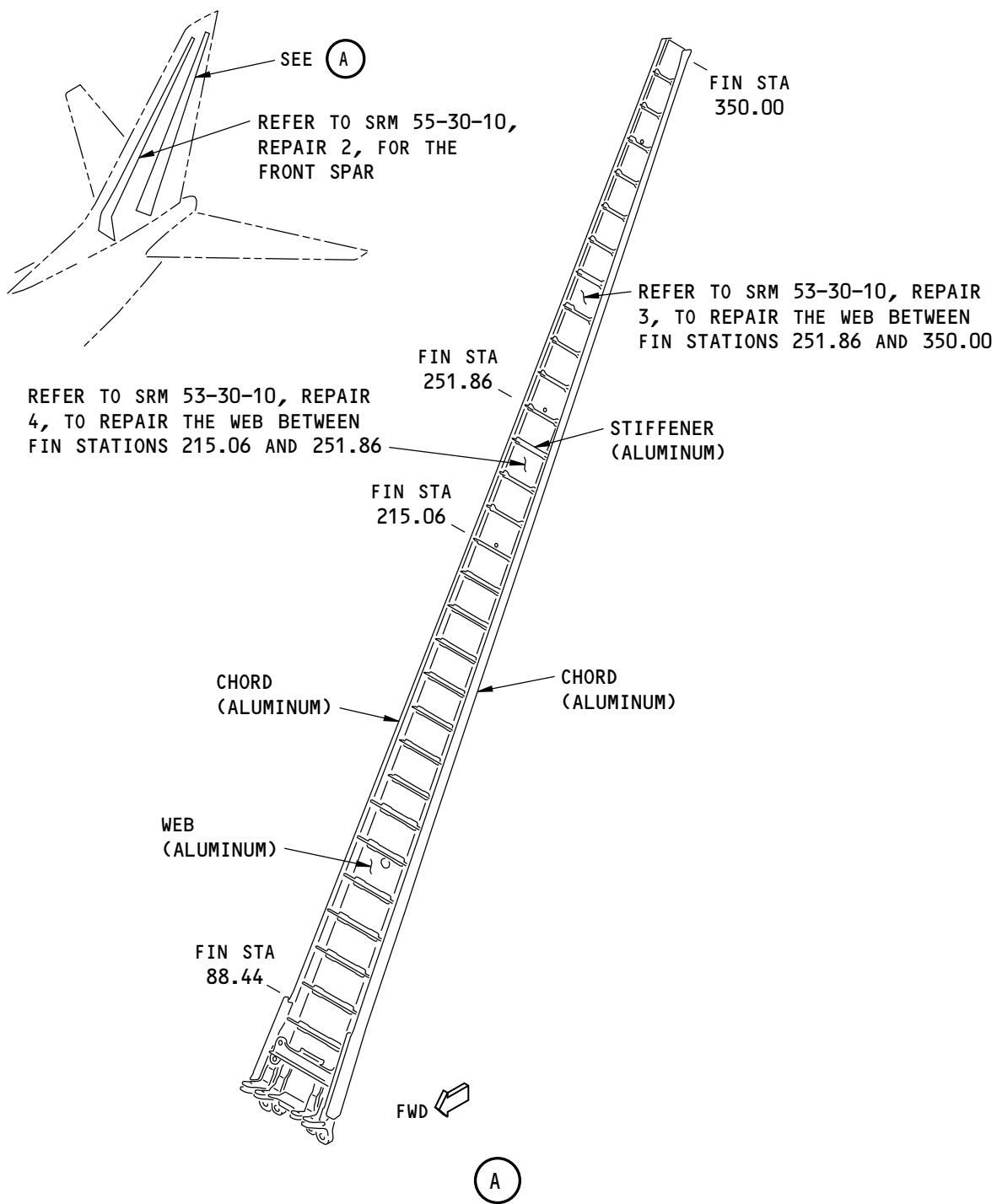
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Vertical Stabilizer Rear Spar Location
Figure 201

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2. General

- A. Repair 5 gives instructions for a Category A repair. Refer to 51-00-06 to find the definitions of the different categories of repairs. The inspections given in the Maintenance Planning Data (MPD) are sufficient to maintain the damage tolerance of the initial structure with this repair installed.
- B. Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-00, GENERAL	Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-40-05	FASTENER HOLE SIZES
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
51-70-09	BONDED METAL STRUCTURE REPAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-31-00 P/B 201	SEALS AND SEALING - MAINTENANCE PRACTICES
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Repair Instructions

- A. Remove initial fasteners from skin assemblies as necessary to get access to the damaged area of the web. Refer to 51-40-02.
- B. Drill a stop hole at the ends of all web cracks that do not end at fastener holes. Refer to Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06, Figure 202/REPAIR 5 and SRM 51-10-02 for the procedures to drill a stop hole. For other damage, do what follows:
 - (1) Cut and remove the damaged part of the web as shown in Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06, Figure 202/REPAIR 5. Refer to 51-10-02 for the procedures to remove the damage.
- C. Remove the initial web fasteners and stiffeners as necessary for the repair.
- D. Make the repair parts as shown in Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06, Figure 202/REPAIR 5. Refer to Table 201/REPAIR 5 for the repair material.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use clad or bare 7075-T6. Refer to Table 202 for the necessary thickness of the material. The use of clad material is recommended
[2]	Tapered Shim	4	Use clad or bare 7075-T6. The use of clad material is recommended

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REPAIR 5

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Table 202:

REPAIR PART THICKNESSES FOR INITIAL WEB THICKNESSES		
INITIAL WEB THICKNESS (INCH)	LOCATION OF DAMAGE (FIN STATION, FS)	ITEM [1] DOUBLER THICKNESS (INCH)
0.080	FS 88.44 TO FS 93.47	0.100
0.070	FS 93.47 TO FS 115.24	0.090
0.090	FS 115.24 TO FS 133.27	0.125
0.060	FS 133.27 TO FS 143.26	0.080
0.050	FS 143.26 TO FS 169.06	0.063
0.040	FS 169.06 TO FS 215.06	0.050

- E. Assemble the repair parts as shown in Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06, Figure 202/REPAIR 5.
- F. Drill the fastener holes. Refer to 51-40-05 for the fastener hole dimensions.
- G. Remove the repair parts.
- H. Remove the nicks, scratches, gouges, burrs, and sharp edges from the repair parts and the bare surfaces of the web.
- I. Apply a chemical conversion coating to the repair parts and bare surfaces of the web. Refer to 51-20-01 for the chemical conversion coating procedures.
- J. Apply one layer of BMS 10-11, Type I, primer to the area of the repair. Refer to SOPM 20-41-02 for the procedures to apply the primer.
 - (1) Apply the primer to the repair parts.
 - (2) Apply the primer to the bare surfaces of the web.
- K. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05 for the procedures to apply the sealant.
 - (1) It is optional to bond the part [1] doubler to the initial web as given in 51-70-09. This option will increase the fatigue life of the repair.
- L. Install the initial web stiffeners.
- M. Install the fasteners.
 - (1) Install the hex drive fasteners at the repair and initial locations wet with BMS 5-95 sealant in transition fit holes.
 - (2) Install the rivets at the initial locations without sealant.
- N. Apply the decorative finish to the repair area as given in AMM PAGEBLOCK 51-21-99/701.
- O. Install the skin assemblies, if they were removed.

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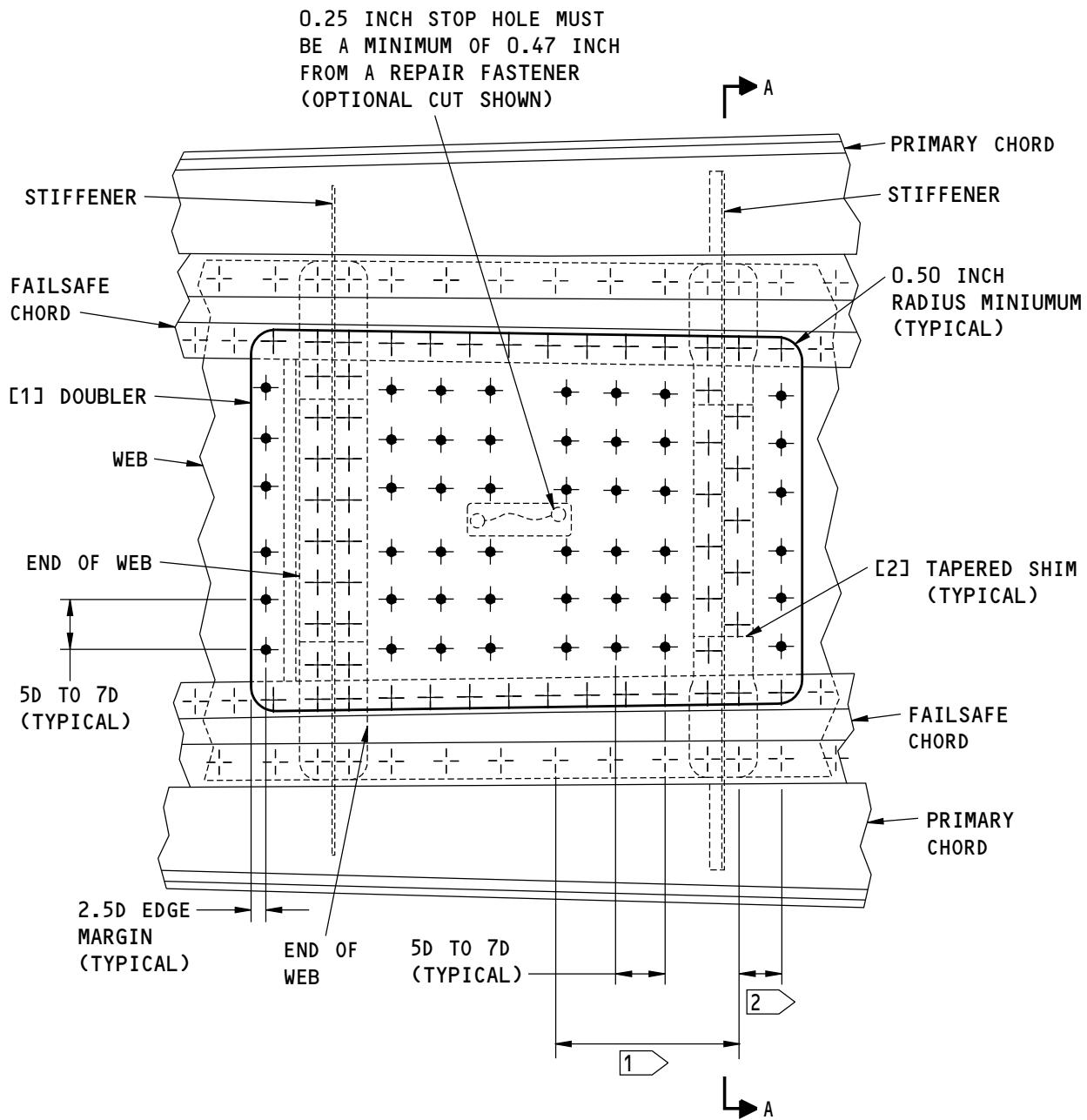
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Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06
Figure 202 (Sheet 1 of 3)

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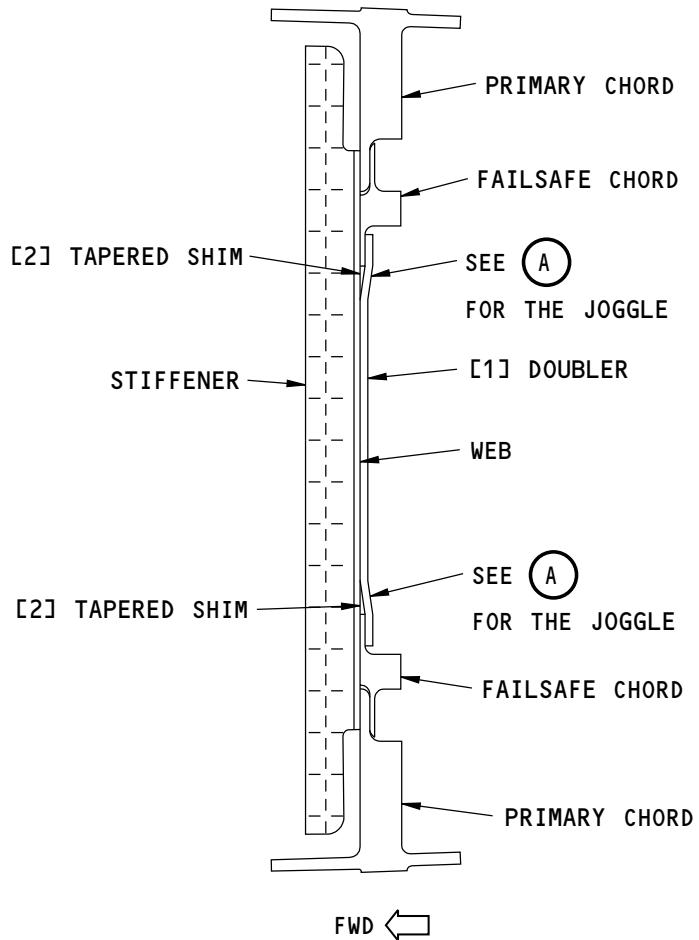
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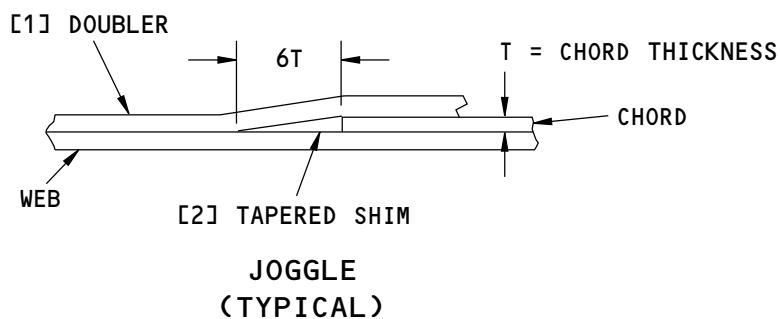
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A-A



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Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06
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NOTES

- (D) IS THE DIAMETER OF THE REPAIR FASTENER.
- MAKE SURE THE REPAIR IS SYMMETRICAL AROUND THE DAMAGE.
- 1 ➤ MAKE SURE THERE IS A MINIMUM OF THREE ROWS OF REPAIR FASTENERS ALL AROUND THE DAMAGE.
- 2 ➤ PUT THE LAST ROW OF FASTENERS AWAY FROM THE STIFFENER.

FASTENER SYMBOLS

- |- REFERENCE FASTENER LOCATION
- + INITIAL FASTENER LOCATION. INSTALL FASTENER THAT IS THE SAME TYPE AND DIAMETER (UP TO 1/32 INCH DIAMETER OVERRSIZE FOR RIVETS AND 1/64 INCH DIAMETER OVERRSIZE FOR HEX DRIVE BOLTS) AS THE INITIAL FASTENER.
- REPAIR FASTENER LOCATION. INSTALL A BACB30NX()K() HEX DRIVE BOLT OR A BACR15BB()D() RIVET THAT IS SAME DIAMETER AS THE INITIAL FASTENERS IN THE WEB AND CHORDS. REFER TO SRM 51-40-00 THROUGH 51-40-08 FOR THE FASTENER DATA. THE FASTENER DIAMETER IS 3/16 INCH BETWEEN FIN STATIONS 143.25 AND 215.06 AND 1/4 INCH BELOW FIN STATION 143.26.

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Vertical Stabilizer Rear Spar Web Repair - Fin Stations 88.44 thru 215.06
Figure 202 (Sheet 3 of 3)

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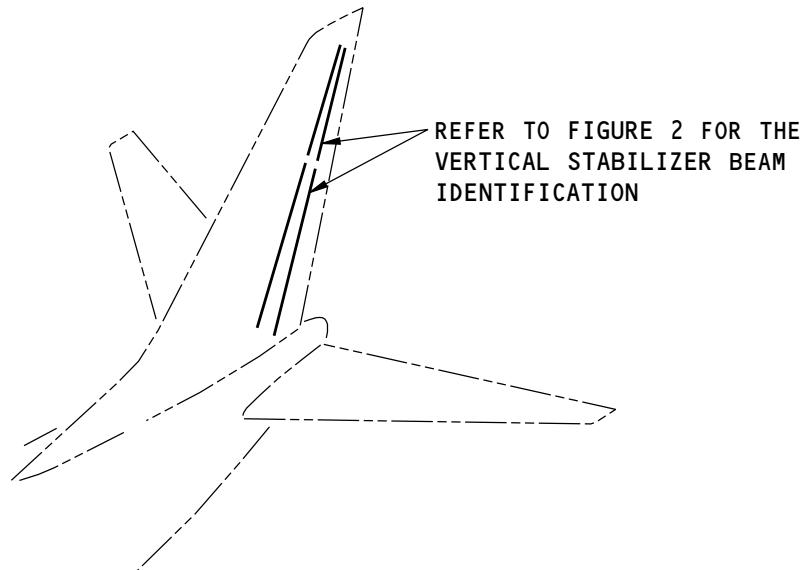
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IDENTIFICATION 1 - VERTICAL STABILIZER BEAM



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Vertical Stabilizer Beam Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
001A7001	Section 70 Vertical Fin - Product Collector
175A0001	Trailing Edge Functional Collector - Vertical Fin

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IDENTIFICATION 1

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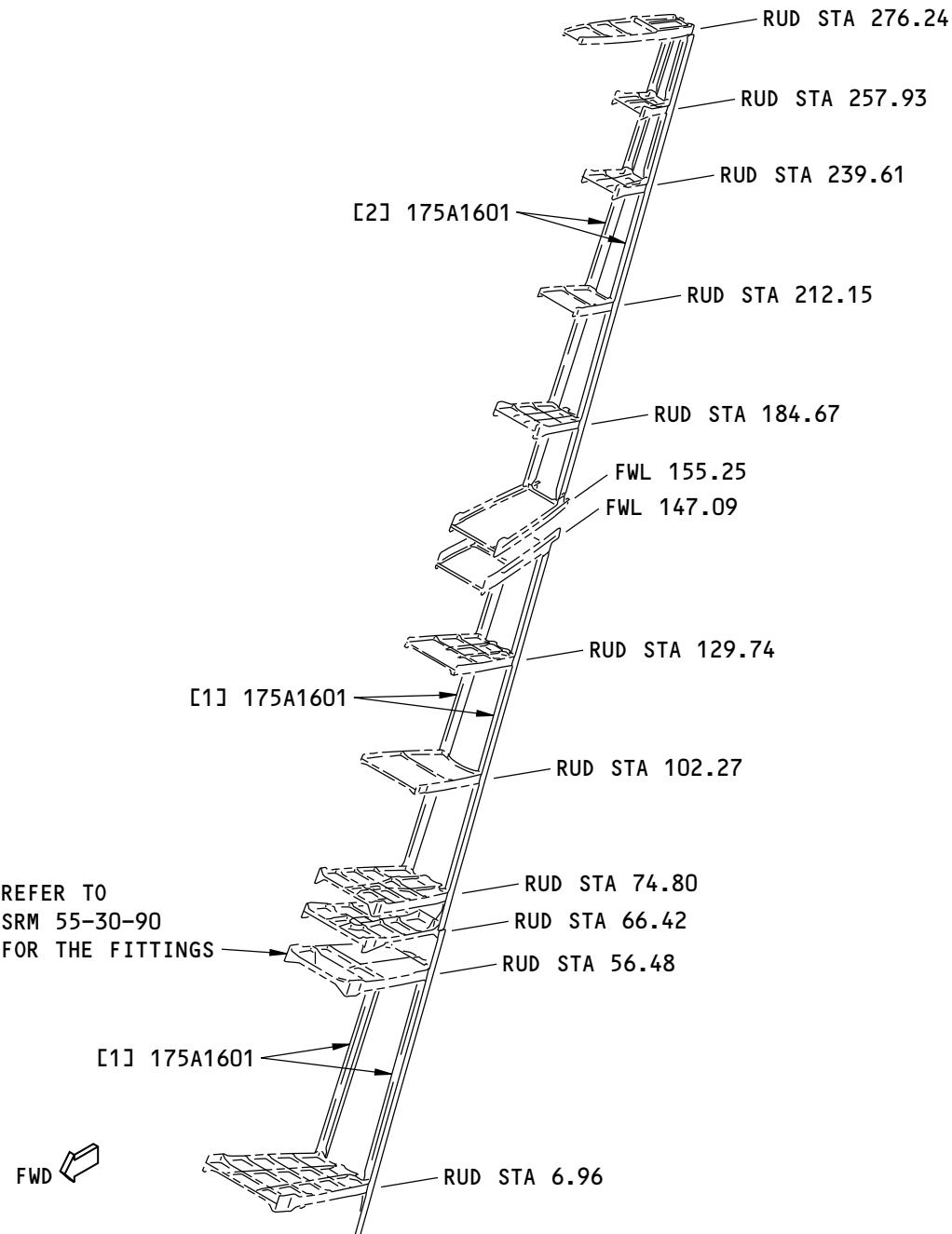
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

VERTICAL STABILIZER BEAM UPPER AND LOWER SECTIONS

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Vertical Stabilizer Beam Identification
Figure 2

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IDENTIFICATION 1
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Beam Assembly (2)	0.080 (2.03)	BAC1518-1188 7075-T6511 extrusion as given in QQ-A-200/11	
	Beam Strap		7075-T6 clad sheet as given in QQ-A-250/13	
(2)	Beam		BAC1518-1188 7075-T6511 extrusion as given in QQ-A-200/11	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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ALLOWABLE DAMAGE 1 - VERTICAL STABILIZER TRAILING EDGE BEAMS

1. Applicability

- A. This subject gives the allowable damage limits for the vertical stabilizer trailing edge beams shown in Vertical Stabilizer Upper and Lower Beam Locations, Figure 101/ALLOWABLE DAMAGE 1.

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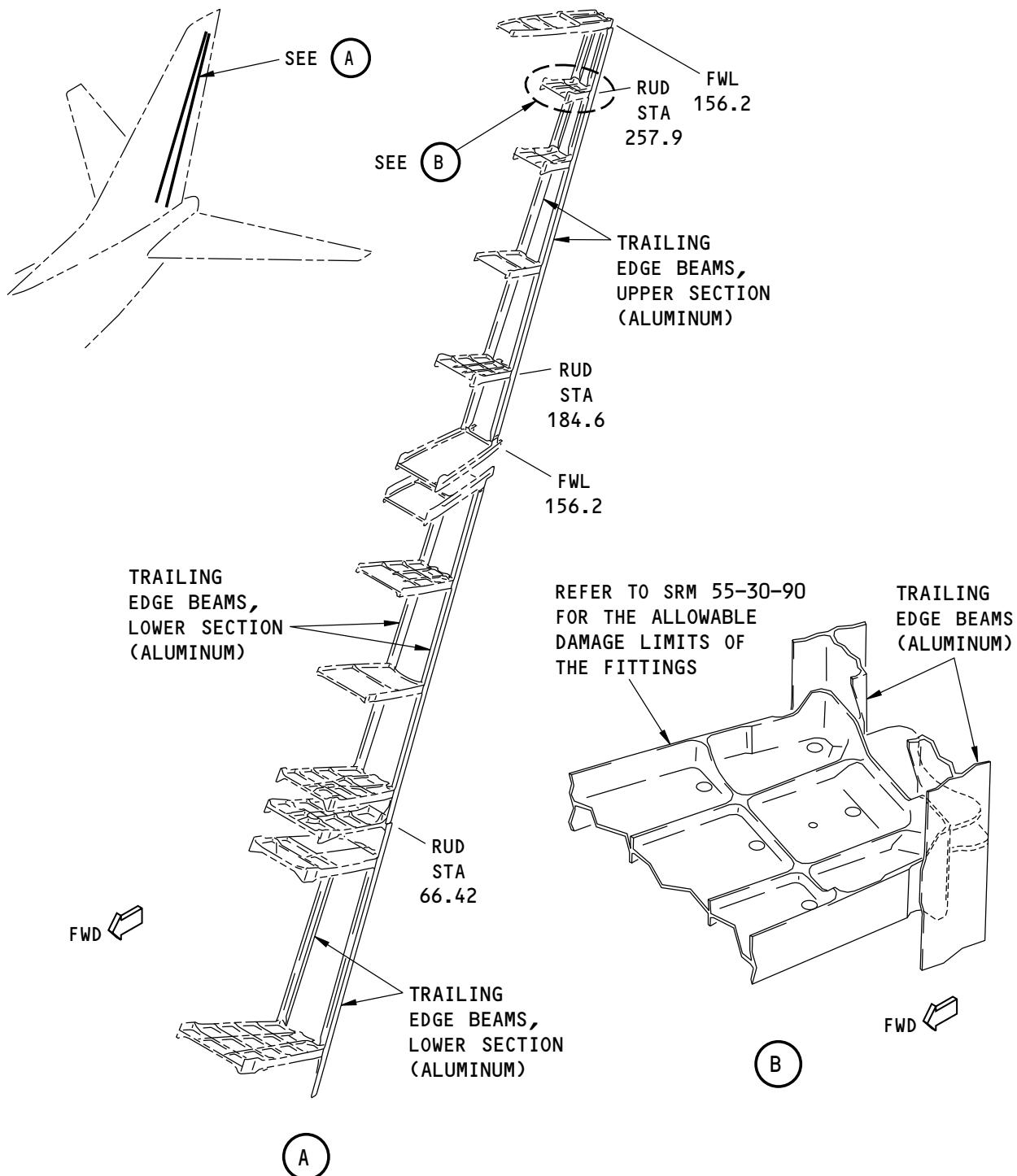
ALLOWABLE DAMAGE 1

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Vertical Stabilizer Upper and Lower Beam Locations
Figure 101

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ALLOWABLE DAMAGE 1

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2. General

- A. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- B. After you remove the damage, do the procedures that follow.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the surfaces of the beams if you remove the damage.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the bare surfaces of the reworked areas of the beams. Refer to 51-20-01.
- (3) Apply one layer of BMS 10-11, Type I, primer to the reworked areas of the beams. Refer to SOPM 20-41-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

- A. Cracks:
 - (1) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A and B
- B. Nicks, Gouges, Scratches, and Corrosion:
 - (1) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, D, and E
- C. Dents are not permitted.
- D. Holes and Punctures are not permitted.

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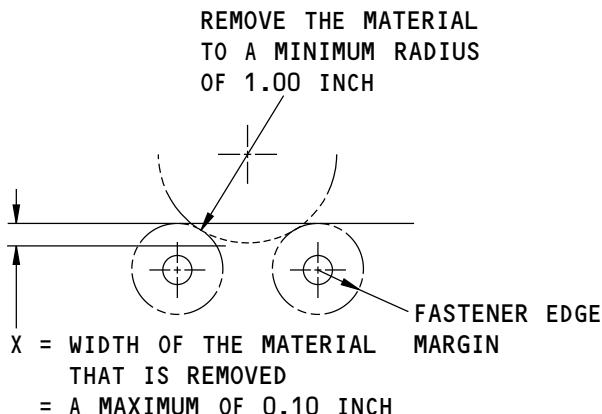
ALLOWABLE DAMAGE 1

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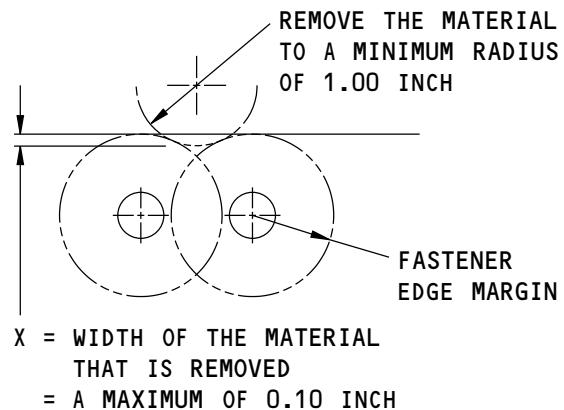
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STRUCTURAL REPAIR MANUAL**


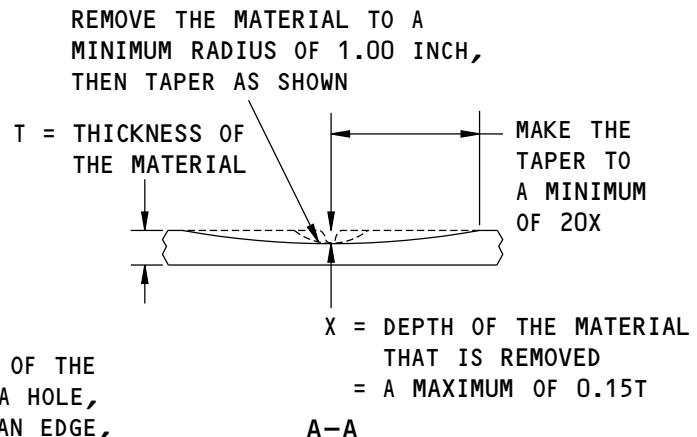
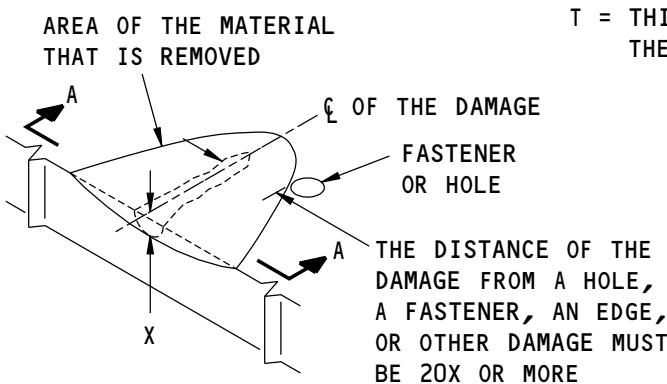
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

G08408 S0006593579_V1

**Allowable Damage Limits
Figure 102 (Sheet 1 of 2)**

55-30-13

ALLOWABLE DAMAGE 1

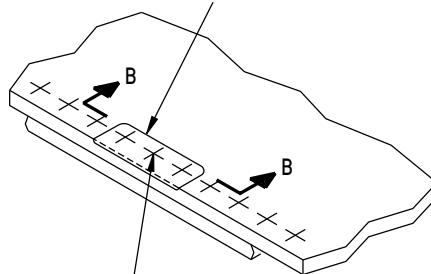
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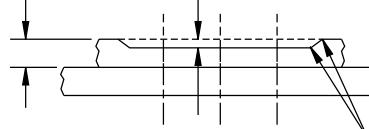
**737-800
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THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN ALL GROUPS OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVE THE FASTENERS BEFORE THE DAMAGE IS REMOVED. INSTALL THE FASTENERS AFTER THE DAMAGE IS REMOVED

T = THICKNESS OF THE MATERIAL
X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10T



MAKE THE CONTOUR SMOOTH TO A MINIMUM RADIUS OF 0.50 INCH (TYPICAL)

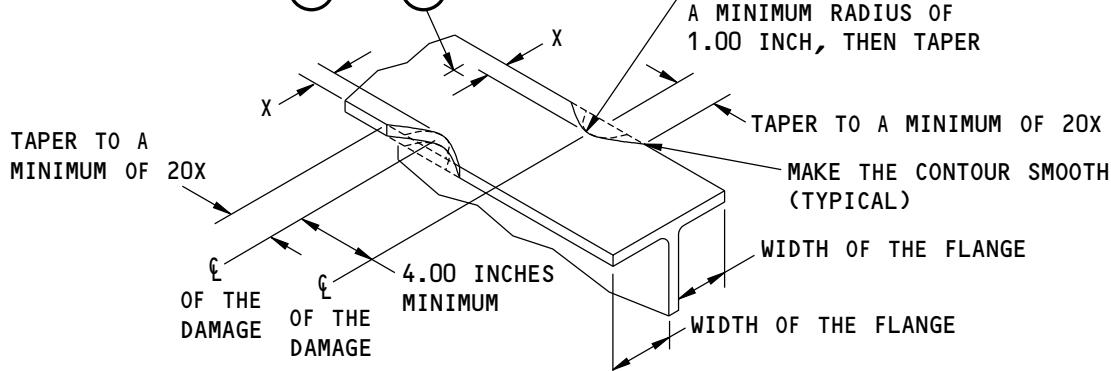
REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B

(D)

IF THERE ARE FASTENERS

SEE (A) AND (B)



X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(E)

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**Allowable Damage Limits
Figure 102 (Sheet 2 of 2)**

55-30-13

ALLOWABLE DAMAGE 1

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REPAIR 1 - VERTICAL STABILIZER TRAILING EDGE BEAM

1. Applicability

- A. Repair 1 is applicable to damage to the trailing edge beams shown in Vertical Stabilizer Upper and Lower Beam Locations, Figure 201/REPAIR 1.

2. References

Reference	Title
51-70-12	EXTRUDED SECTION REPAIRS

3. Repair Instructions

- A. Refer to 51-70-12 to repair the trailing edge beams.

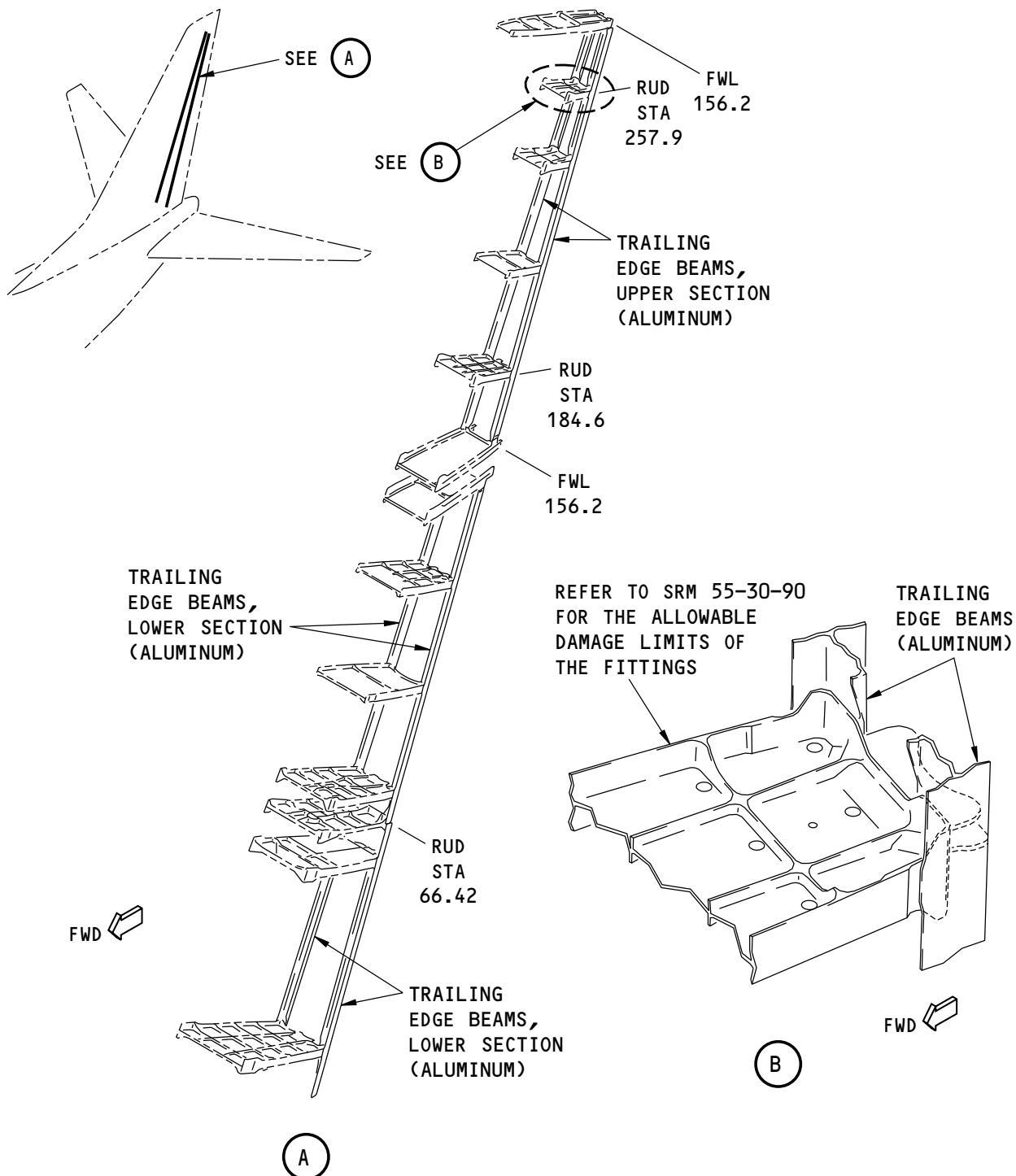
55-30-13

REPAIR 1
Page 201

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STRUCTURAL REPAIR MANUAL**


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**Vertical Stabilizer Upper and Lower Beam Locations
Figure 201**

55-30-13
**REPAIR 1
Page 202**

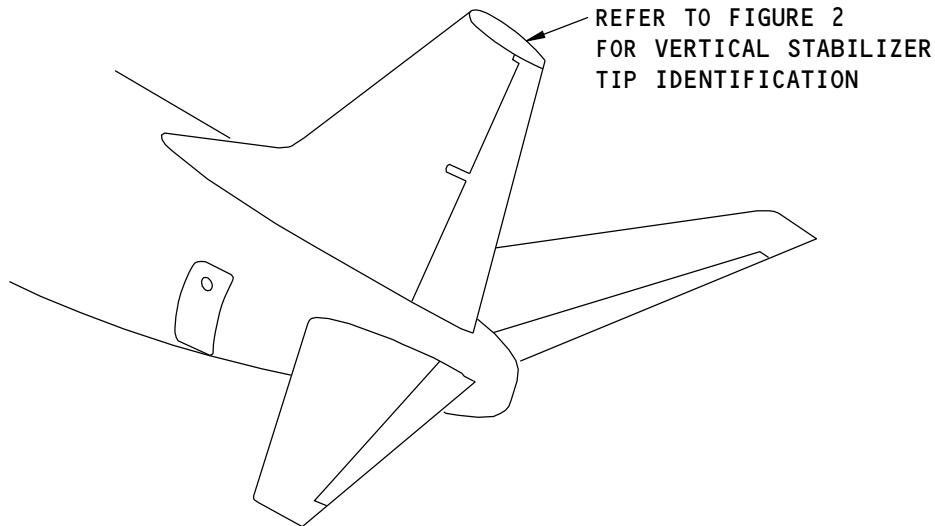
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - VERTICAL STABILIZER TIP



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F72888 S0006593587_V1

Vertical Stabilizer Tip Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
172A0001	Torque Box Functional Collector - Vertical Fin
172A3701	Nutplate Installation - FWL 274.570, Vertical Fin
284A0510	Antenna Installation - VOR
10-61333	Antenna Assembly - VOR/ILS, Fin Cap

55-30-30

IDENTIFICATION 1

Page 1

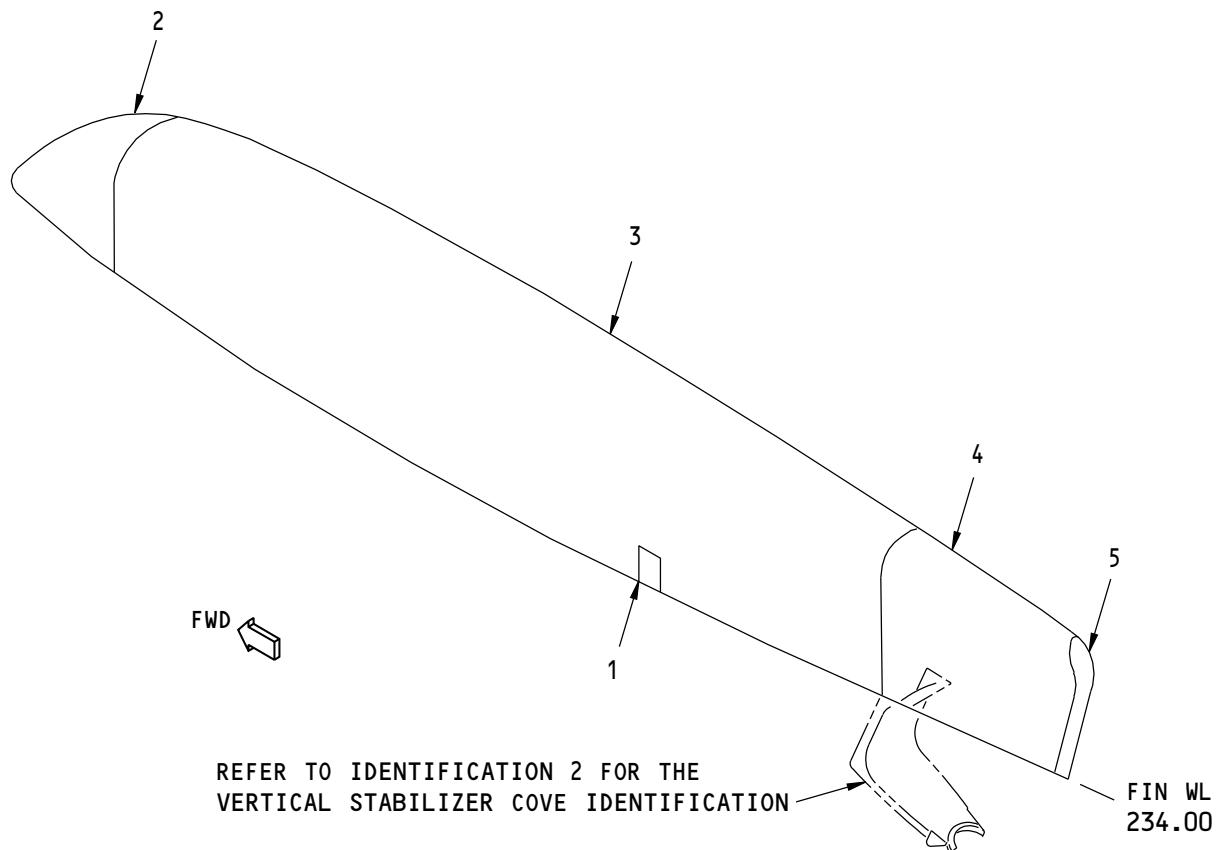
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STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F72892 S0006593589_V2

**Vertical Stabilizer Tip Identification
Figure 2**

55-30-30
IDENTIFICATION 1
Page 2
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Ground Strap	0.016 (0.41)	6061-0 sheet as given in QQ-A-250/11	
[2]	Leading Edge Access Assembly Nose Doubler	0.050 (1.27) 0.050 (1.27)	2024-T42 clad sheet as given in QQ-A-250/5 2024-T42 clad sheet as given in QQ-A-250/5	
[3]	Canopy Assembly Lightning Strip Canopy Splice (2) Splice (2)		BAC1511-3787 6061-0 extrusion as given in QQ-A-200/8 (Optional: 6061-T6) Glass Fabric Reinforced Plastic (GFRP) as given in BAC 5449. Glass fabric number 181, warp direction optional 2024-T42 clad sheet as given in QQ-A-250/5 GFRP as given in BAC 5449. Glass fabric number 181, warp direction optional	
[4]	Trailing Edge Assembly Skin Former Doubler Splice Plate	0.040 (1.02) 0.063 (1.60) 0.063 (1.60) 0.050 (1.27)	6061-T6 clad sheet as given in QQ-A-321 2024-T42 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5 2024-T3 clad sheet as given in QQ-A-250/5	
[5]	Fitting-Trailing Edge, Fin Tip		A360 aluminum die casting, Class II B, as given in QQ-A-591 (Optional: Machine from 2024-T351 rolled bar as given in AMS QQ-A-225/6. Grain direction is parallel to the length of the rolled bar)	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

55-30-30

IDENTIFICATION 1

Page 3

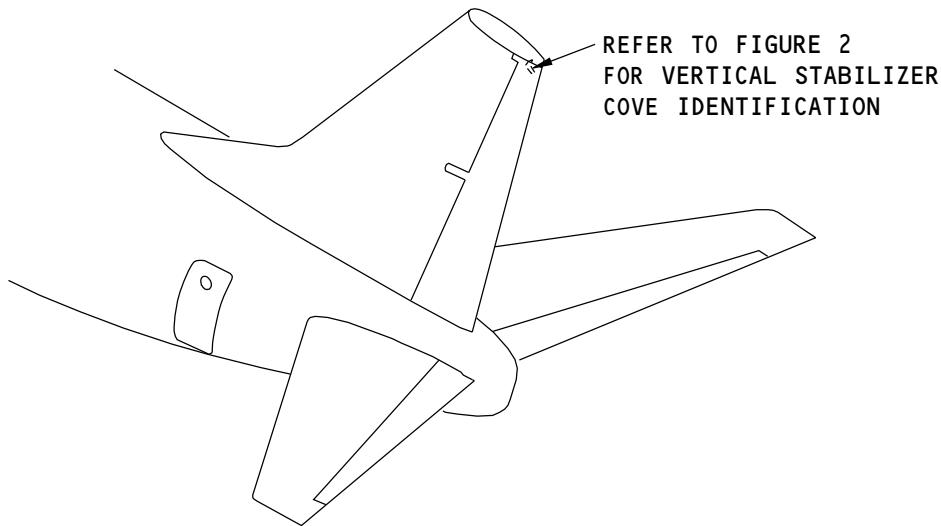
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - VERTICAL STABILIZER COVE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F78563 S0006593592_V1

Vertical Stabilizer Cove Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
176A0001	Leading Edge and Miscellaneous Functional Collector - Vertical Fin

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IDENTIFICATION 2

Page 1

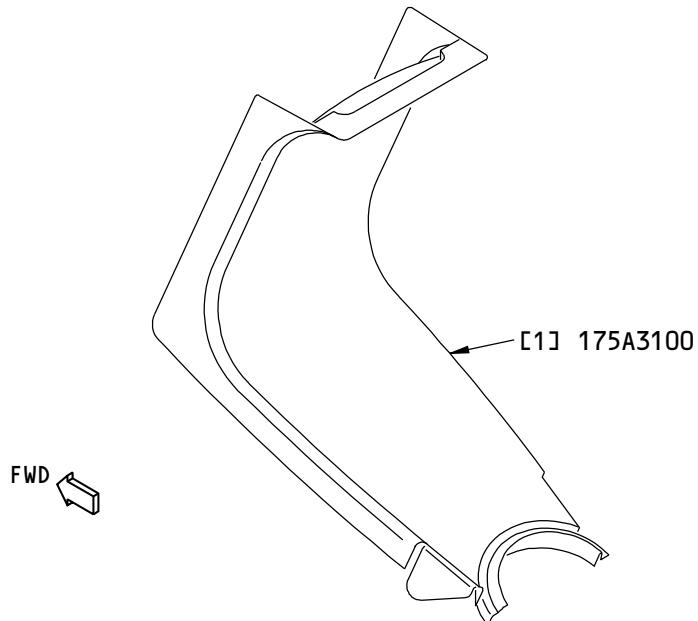
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F78567 S0006593594_V1

Vertical Stabilizer Cove Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Cove Assembly		Glass Fiber Reinforced Plastic (GFRP) laminate as given in BMS 8-79, Class III, Grade B, Type 1581 or 7781. Warp direction is optional	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 2

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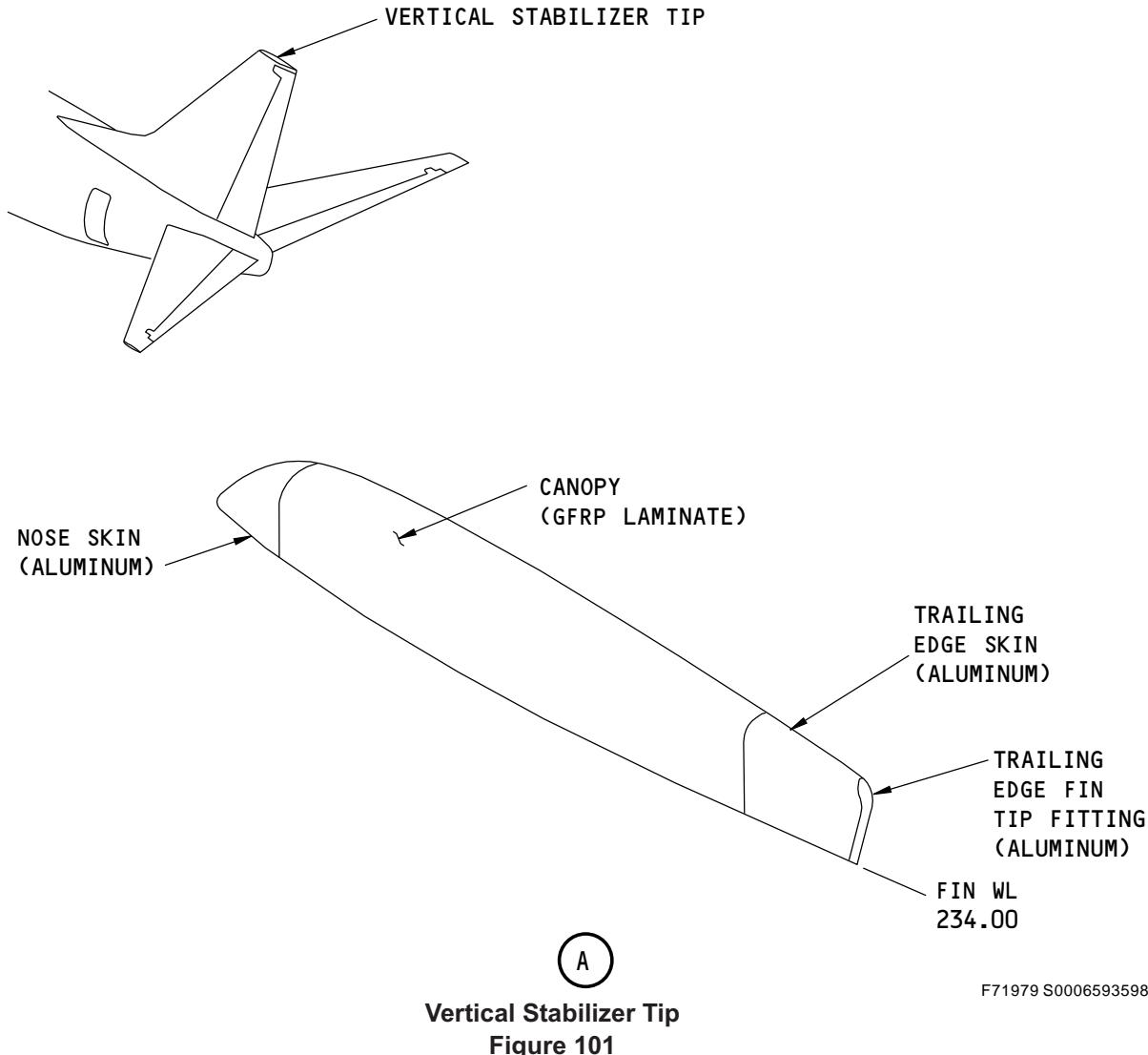


737-800 STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - VERTICAL STABILIZER TIP

1. Applicability

- A. Allowable Damage 1 is applicable to damage on the vertical stabilizer tip skin and fitting as shown in Vertical Stabilizer Tip, Figure 101/ALLOWABLE DAMAGE 1.



Vertical Stabilizer Tip
Figure 101

2. General

- A. Do the steps that follow for the canopy made of Glass Fabric Reinforced Plastic (GFRP).
- (1) Refer to Vertical Stabilizer Tip, Figure 101/ALLOWABLE DAMAGE 1 for the location of the canopy.
 - (2) Remove all the contamination and water from the structure. Refer to 51-30-05 and 51-70-04 for the tools and the cleanup procedures.
 - (3) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of damage.

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ALLOWABLE DAMAGE 1

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- (4) Seal the damaged areas with the steps that follow:
- (a) Seal the damage that is not more than one ply deep and that agrees with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1
 - 1) Make a temporary seal.
 - a) Apply aluminum foil tape (speed tape).
 - b) Keep a record of the location.
 - c) Make sure the tape is in satisfactory condition at each 400 flight hour interval or more frequently.
 - d) Seal the damage permanently no later than 5000 flight hours from the time the seal was made.
 - 2) Make a permanent seal.
 - a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - b) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM 51-21-00/701.
 - (b) Seal the damaged areas that are more than one ply deep and that agree with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1
 - 1) Use a vacuum and heat to remove moisture from the solid laminate or the honeycomb cells. Refer to 51-70-04.
 - 2) Make a temporary seal with aluminum foil tape (speed tape).
 - 3) Keep a record of the location.
 - 4) Repair the damage no later than 400 flight hours from the time the seal was made.
- B. Do the steps that follow for the parts made of aluminum.
- (1) Refer to Vertical Stabilizer Tip, Figure 101/ALLOWABLE DAMAGE 1 for the location of the parts made of aluminum.
 - (2) Refer to Paragraph 4 for the allowable damage limits
 - (3) Remove the damage.
 - (a) Refer to 51-10-02 for the investigation and cleanup procedures.
 - (b) Refer to 51-30-03 for possible sources of the abrasive and other materials you need to remove the damage.
 - (c) Refer to 51-30-05 for possible sources of the equipment and tools you need to remove the damage.
 - (d) Make the surface texture roughness for all cut surfaces 125 microinches Ra or smoother.
 - (4) After you remove the damage, do the steps that follow:
 - (a) For lightning strike damage to the trailing edge fin tip fitting or the trailing edge skin remove all finishes and do as follows:
 - 1) Do a High Frequency Eddy Current (HFEC) inspection to the damaged area as given in NDT Part 6 51-00-00, Figures 3 and 4.
 - 2) Do a resistance check between the fastener head and the initial structure as given in BAC 5117-6. The maximum resistance that is permitted is 0.010 ohms.
 - (b) Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.

55-30-30

ALLOWABLE DAMAGE 1

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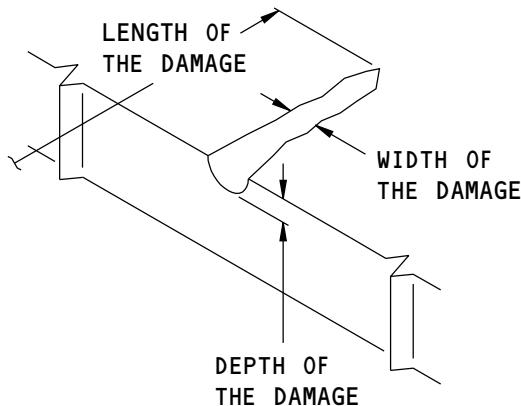
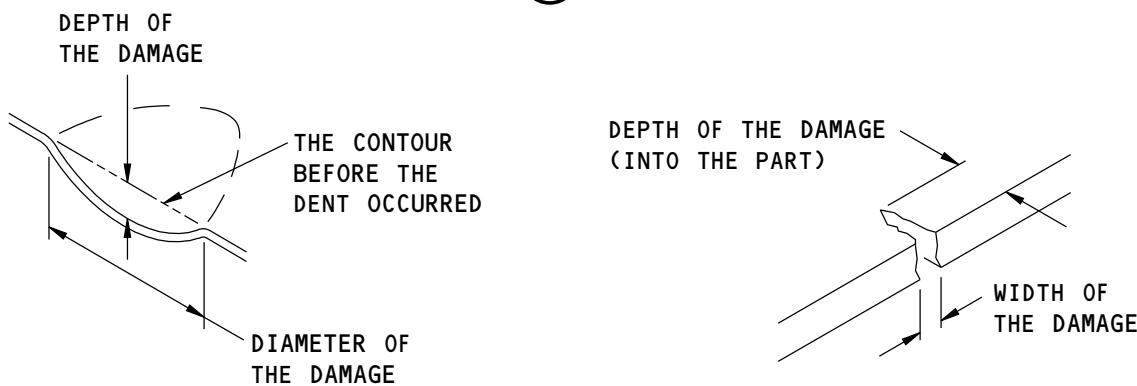
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STRUCTURAL REPAIR MANUAL**

- (c) Apply one layer of BMS 10-11, Type I primer to all the conversion coated, reworked areas other than the trailing edge fin tip fitting. Apply two layers of BMS 10-11, Type I primer to the conversion coated, reworked areas of the trailing edge fin tip fitting. Refer to SOPM 20-41-02.
- (d) Apply a decorative finish if necessary. Refer to AMM PAGEBLOCK 51-21-99/701.
- C. Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.


SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE
A

SIZE DEFINITIONS FOR DENT DAMAGE
B
SIZE DEFINITIONS FOR EDGE DAMAGE
C

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**Definitions of the Damage Size
Figure 102**
3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS

55-30-30
ALLOWABLE DAMAGE 1

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(Continued)

Reference	Title
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-01, REPAIR GENERAL	Procedures to Rework or Fill Allowable Dents on the External Aerodynamic Surfaces of Metallic Parts
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
51-70-14, ALLOWABLE DAMAGE GENERAL	Damage Limits and Sealing Instructions for Aluminum Coatings and Foils
55-30-30, REPAIR 1	Vertical Stabilizer Tip
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Canopy (GFRP)

- (1) Nicks, Gouges and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum of one ply in depth
NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum of 5.0 inches in length
 - (c) A maximum of 0.25 inch in width
 - (d) A minimum of 0.50 inch away from the edge of a fastener hole
 - (e) A minimum of 0.50 inch away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
- (3) Dents are permitted if:
 - (a) They are a maximum of 2.0 inch in diameter
 - (b) The edge of the damage is a minimum of 4D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of 1.50 inch in diameter
 - (b) A minimum of 4D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies

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ALLOWABLE DAMAGE 1

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- 2) Are sealed as given in Paragraph 2.
 - (5) Delaminations are permitted if they are:
 - (a) A maximum of 1.5 inch in diameter
 - (b) A minimum of 4D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
 - (6) Edge damage is permitted if it is:
 - (a) A maximum of 0.10 in depth
 - (b) A maximum of 0.50 inch in width
 - (c) The edge of the damage is a minimum of 2.5D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
 - (7) Edge Erosion is permitted as shown in Cleanup and Sealing of Edge Erosion, Figure 103/ALLOWABLE DAMAGE 1.
- B. Leading Edge Cap and Trailing Edge Skin (Aluminum)
- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A, B, and C.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, D, and E.
 - (b) Damage that does not go through the clad surface is permitted.
 - (3) Dents:
 - (a) Dents are permitted if they agree with the conditions shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail F.
 - (4) Holes and Punctures are permitted if:
 - (a) They are 0.25 inch in diameter or less
 - (b) The edge of the damage is a minimum of 1.0 inch away from another hole, an edge, or other damage
 - (c) They are filled with a 2017-T3 or 2117-T4 aluminum protruding head rivet. Install the rivet without sealant.
 - 1) Install the rivet without sealant.
 - (5) Trailing Edge Skin and Trailing Edge Fin Tip Fitting Lightning Strike damage is permitted if:
 - (a) You remove the damage as shown in Figure 104, Details D and G.

NOTE: If the damage is more than the limits shown in Figure 104, Details D and G then refer to 55-30-30, REPAIR 1.
 - (b) Make sure there is a minimum 1.0 inch (25.4 mm) blend radius at a 20:1 blend ratio at all locations.

55-30-30

ALLOWABLE DAMAGE 1

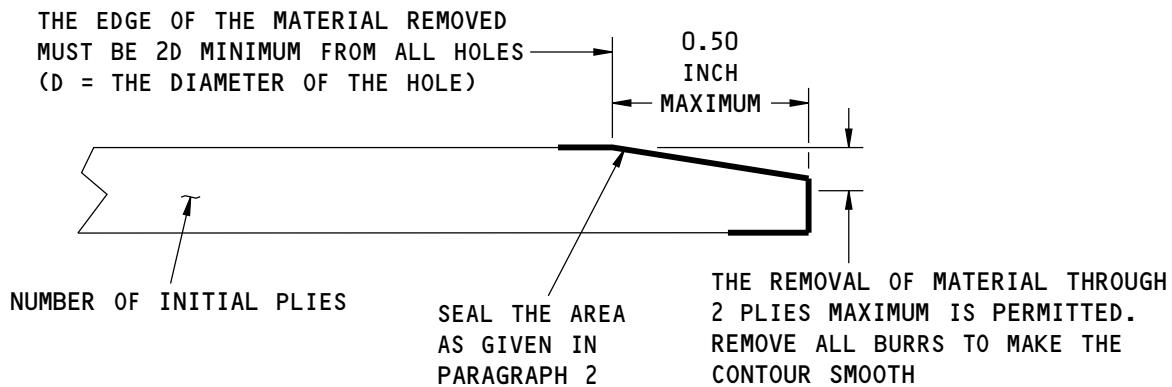
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- (c) Make sure there is a minimum distance of 2.0 inches (50.8 mm) between any two adjacent damage locations.
- (d) No fasteners are damaged.



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Cleanup and Sealing of Edge Erosion
Figure 103

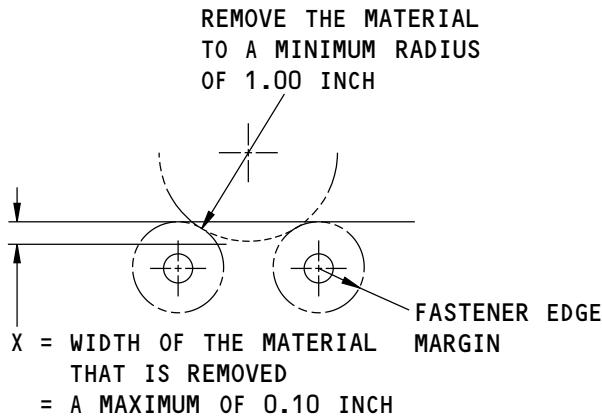
55-30-30

ALLOWABLE DAMAGE 1

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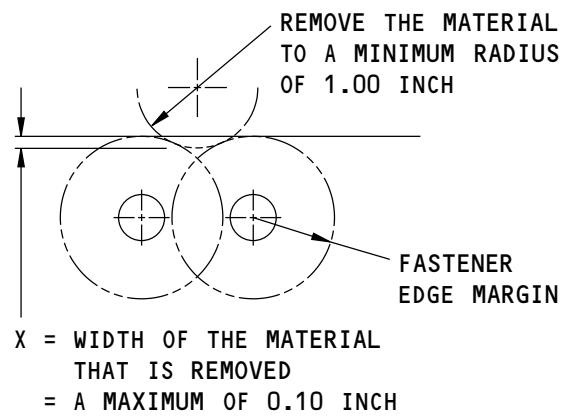
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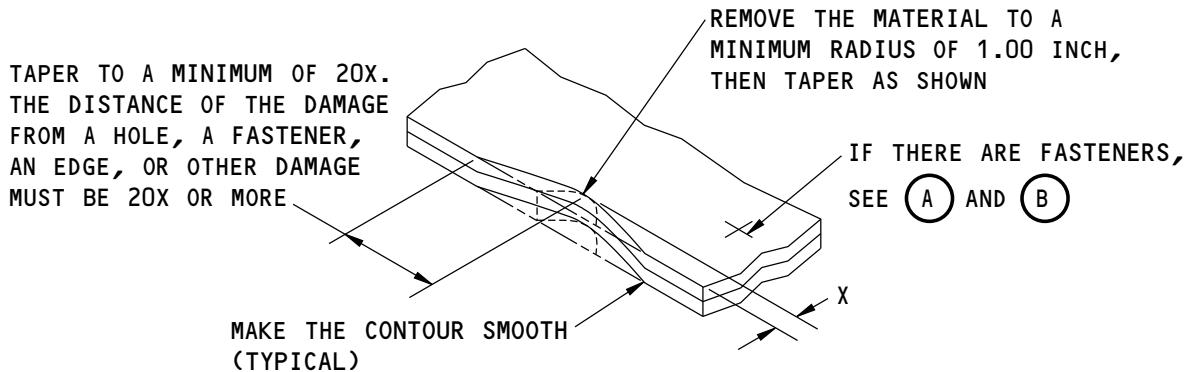
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH

REMOVAL OF DAMAGED MATERIAL ON AN EDGE OF BONDED METAL SKINS AND WEBS

(C)

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Allowable Damage Limits
Figure 104 (Sheet 1 of 4)

55-30-30

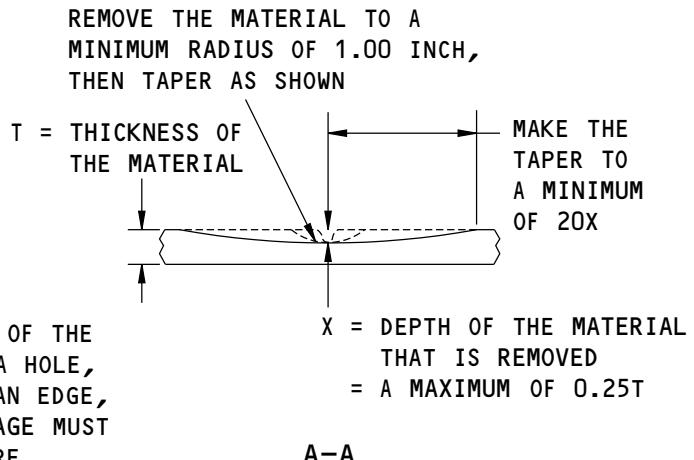
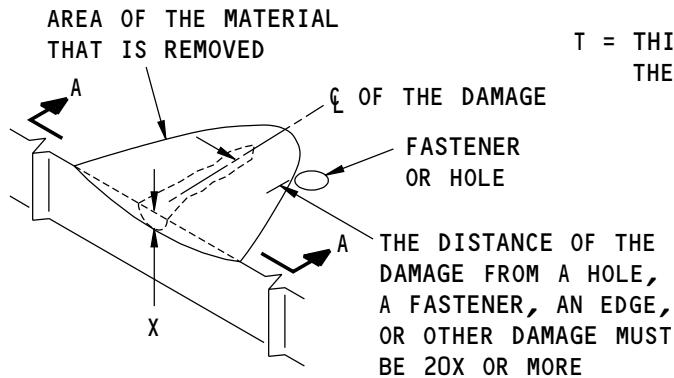
ALLOWABLE DAMAGE 1

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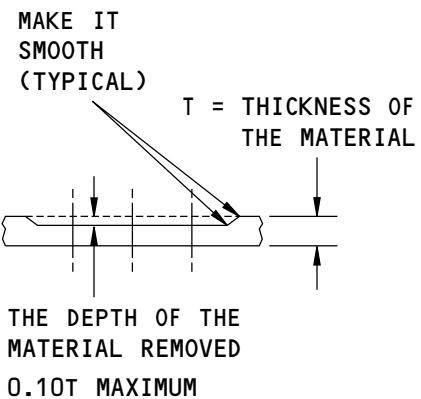
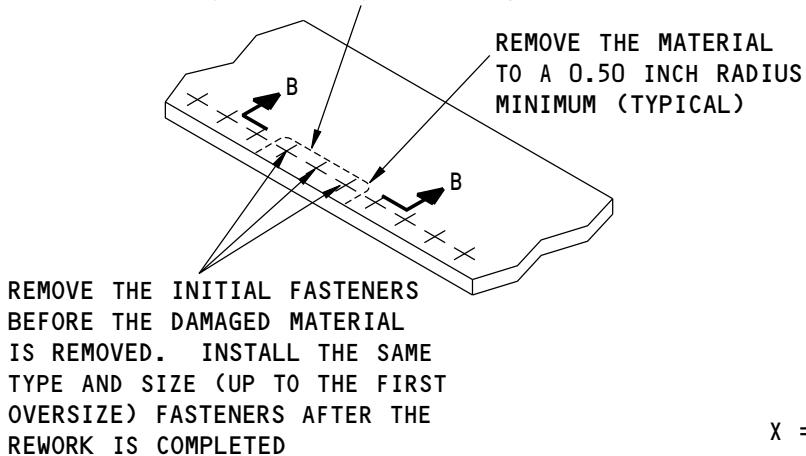
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**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(D)

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A DEPTH OF X MAXIMUM



**REMOVAL OF CORROSION
AROUND THE FASTENERS**

(E)

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**Allowable Damage Limits
Figure 104 (Sheet 2 of 4)**

55-30-30

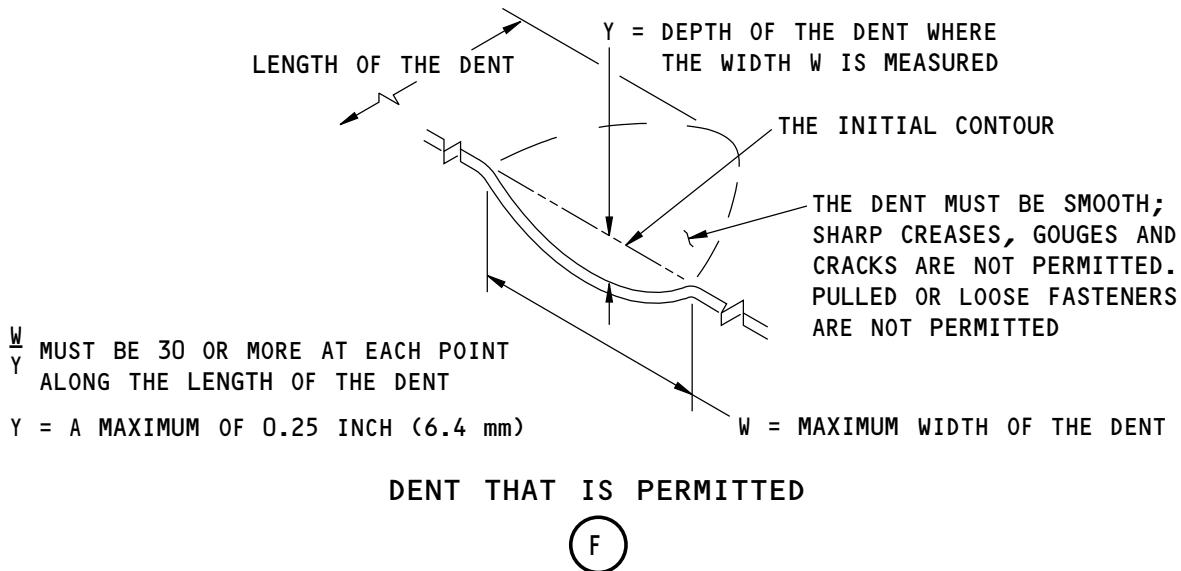
ALLOWABLE DAMAGE 1

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Allowable Damage Limits
Figure 104 (Sheet 3 of 4)

55-30-30

ALLOWABLE DAMAGE 1

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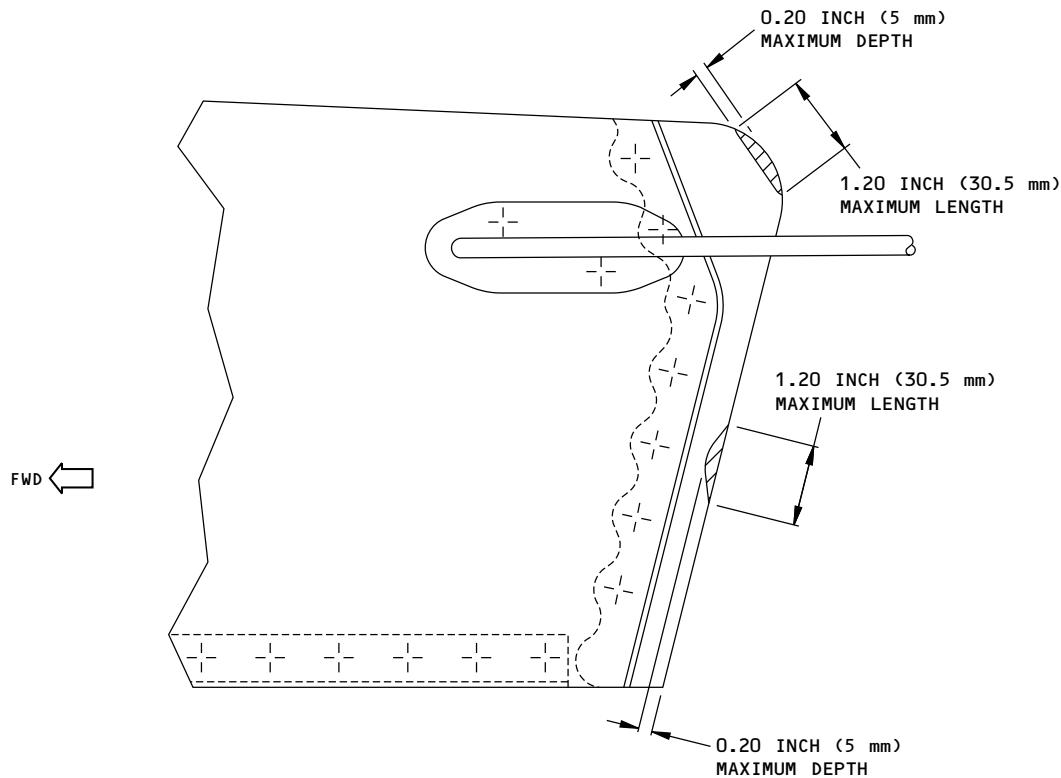
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TRAILING EDGE FIN TIP FITTING
(LIGHTNING STRIKE LIMITS)

G



MATERIAL REMOVED

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Allowable Damage Limits
Figure 104 (Sheet 4 of 4)

55-30-30

ALLOWABLE DAMAGE 1

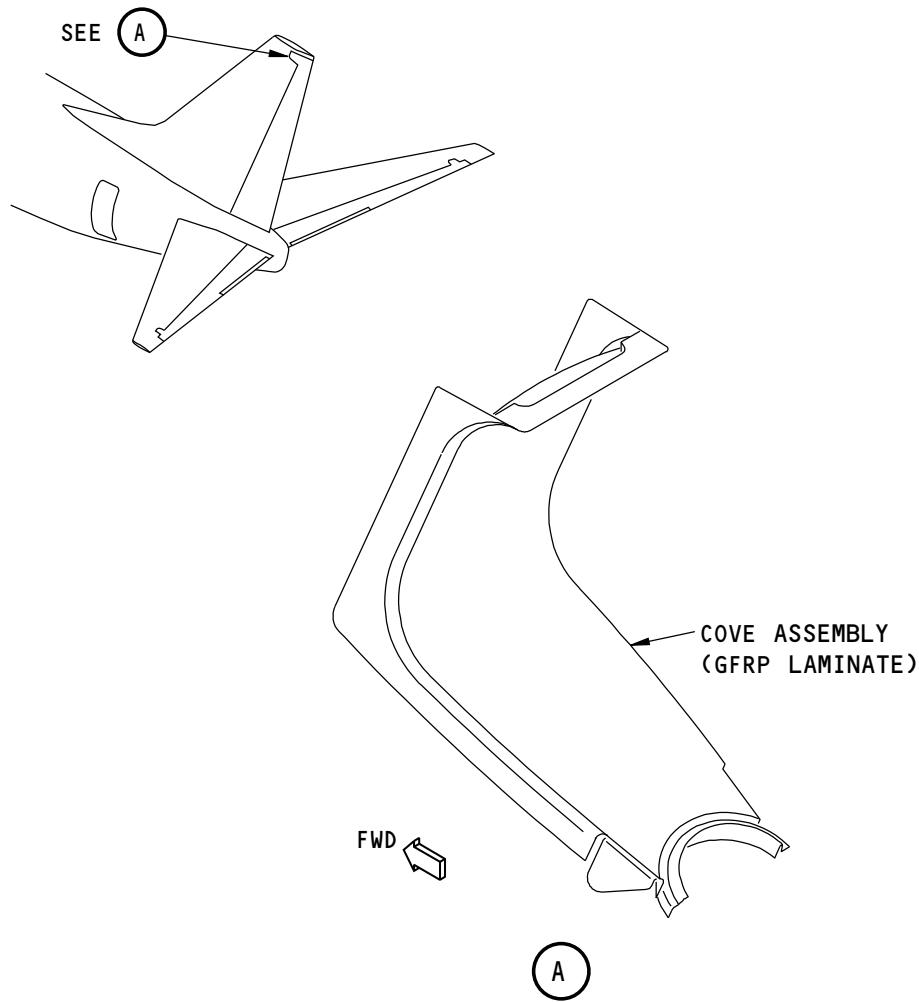
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737-800
STRUCTURAL REPAIR MANUALALLOWABLE DAMAGE 2 - VERTICAL STABILIZER COVE**1. Applicability**

- A. Allowable Damage 2 is applicable to damage on the vertical stabilizer cove panel shown in Vertical Stabilizer Cove, Figure 101/ALLOWABLE DAMAGE 2.



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Vertical Stabilizer Cove
Figure 101

2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and C for the definitions of the length, width, and length of damage.

55-30-30**ALLOWABLE DAMAGE 2**

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B. Do the steps that follow for the cove panel made of Glass Fabric Reinforced Plastic (GFRP).

- (1) Remove all the contamination and water from the structure.
 - (a) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (b) Refer to 51-70-04 for the damage removal procedures.
- (2) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and C for the definitions of the length, width, and depth of damage.
- (3) Seal the damaged areas with the steps that follow.
 - (a) Seal the damage that is not more than one ply deep and that agrees with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2
 - 1) Make a temporary seal.
 - a) Apply aluminum foil tape (speed tape).
 - b) Keep a record of the location.
 - c) Make sure the tape is in satisfactory condition every 400 flight hours.
 - d) Seal the damage permanently at or before 5000 flight hours.
 - 2) Make a permanent seal.
 - a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - b) Apply one layer of BMS 10-79, Type 3 or BMS 10-103, Type 1 primer. Refer to SOPM 20-44-04.
 - c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
 - (b) Seal the damaged areas that are more than one ply deep and that agree with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2
 - 1) Use a vacuum and heat to remove moisture from the solid laminate or the honeycomb cells. Refer to 51-70-04.
 - 2) Make a temporary seal with aluminum foil tape (speed tape).
 - 3) Keep a record of the location.
 - 4) Repair the damage at or before 400 flight hours.

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ALLOWABLE DAMAGE 2

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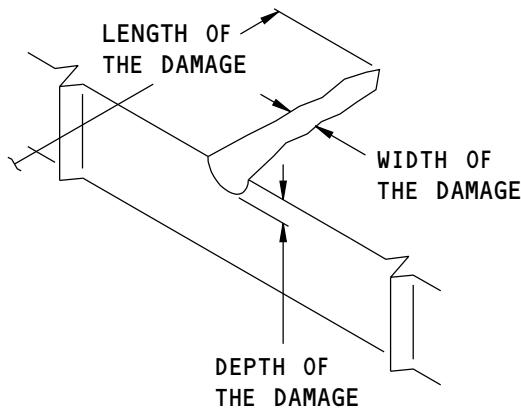
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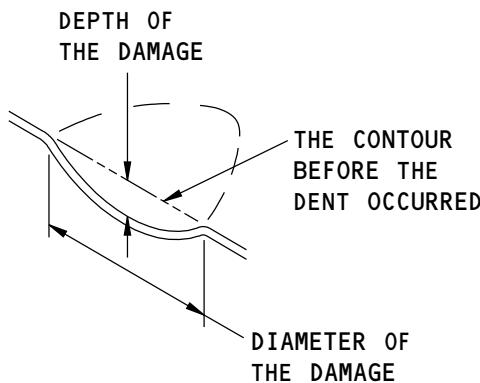


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STRUCTURAL REPAIR MANUAL



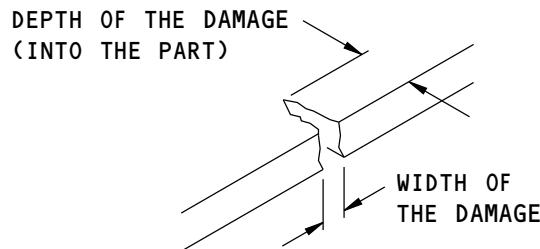
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

F78905 S0006593606_V1

Definitions of the Damage Size
Figure 102

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

- A. Inboard and Outboard Panels (GFRP Laminate)

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ALLOWABLE DAMAGE 2

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- (1) Nicks, Gouges and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges and Scratches that cause damage to the glass fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (b) A maximum of 5.0 inches in length
 - (c) A maximum of 0.25 inch in width
 - (d) A minimum of 0.50 inch away from the edge of a fastener hole
 - (e) A minimum of 0.50 inch away from the edge of other damage. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies, and
 - 2) Are sealed as given in Paragraph 2.
- (3) Dents are permitted if:
 - (a) They are a maximum of 2.0 inch in diameter.
 - (b) The edge of the damage is a minimum of 2.5D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies, and
 - 2) Are sealed as given in Paragraph 2.
- (4) Holes and Punctures are permitted if they are:
 - (a) A maximum of 2.0 inch in diameter
 - (b) A minimum of 2.5D (D = the diameter of the damage) from other damage, fastener holes or material edges. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies, and
 - 2) Are sealed as given in Paragraph 2.
- (5) Delaminations are permitted if they are:
 - (a) A maximum of 2.0 inch in diameter
 - (b) A minimum of 2.5D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.
- (6) Edge damage is permitted if it is:
 - (a) A maximum of 0.25 in depth
 - (b) A maximum of 1.00 inch in width
 - (c) A minimum of 2.5D (D = the diameter of the damage) from the edge of other damage, the edge of a hole, or the edge of the material. Other damage does not include nicks, gouges, and scratches that:
 - 1) Do not cause damage to the glass fiber plies
 - 2) Are sealed as given in Paragraph 2.

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ALLOWABLE DAMAGE 2

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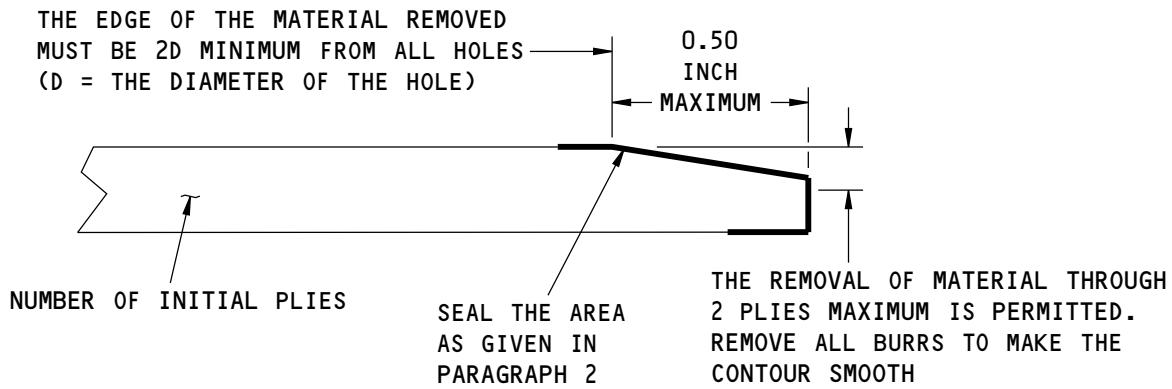
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- (7) Edge Erosion is permitted as shown in Cleanup and Sealing of Edge Erosion, Figure 103/
ALLOWABLE DAMAGE 2.



Cleanup and Sealing of Edge Erosion
Figure 103

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ALLOWABLE DAMAGE 2

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REPAIR 1 - VERTICAL STABILIZER TIP

1. Applicability

- A. Repair 1 is applicable to the vertical stabilizer canopy made of Glass Fiber Reinforced Plastic (GFRP) and the vertical stabilizer trailing edge skin (Aluminum) shown in Vertical Stabilizer Tip Canopy Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.

2. General

- A. Repair 1 gives instructions for Category A and B repairs for the vertical stabilizer canopy and a Category A repair for the vertical stabilizer trailing edge skin. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Refer to Paragraphs 2.C through 2G for damage to the vertical stabilizer canopy. Refer to Paragraph 2.H for lightning strike damage to the vertical stabilizer trailing edge skin.
- C. Get access to the damaged area.
 - (1) If necessary, remove the tip cap. Refer to AMM 55-33-21/401.
 - (2) Refer to 51-40-02 for information on fastener removal.
- D. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- E. Refer to Definitions of the Damage Size, Figure 202/REPAIR 1, Details A, B, and C for the definitions of the length, width, and depth of damage.
- F. Do the repair as given in Paragraph 4./REPAIR 1
- G. Put the tip cap back to the initial condition, as applicable.
 - (1) Install the tip cap, if it was removed. Refer to AMM 55-33-21/401.
 - (a) Refer to 51-40-02 for information on fastener installation.
 - (2) Make sure the aerodynamic smoothness is satisfactory or there will be a decrease in the performance of the airplane. Refer to 51-10-01.
- H. For damage to the aluminum vertical stabilizer trailing edge skin do as follows:
 - (1) Remove the damage.
 - (2) Do a High Frequency Eddy Current (HFEC) inspection to the edge of the damage locations to make sure that all of the damage has been removed. Refer to NDT Part 6, 51-00-00, Figure 3.
 - (3) Make a 0.08 inch (2.03 mm) insurance cut around the damage perimeter.
 - (4) Do the repair instructions as given in Paragraph 4.

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REPAIR 1
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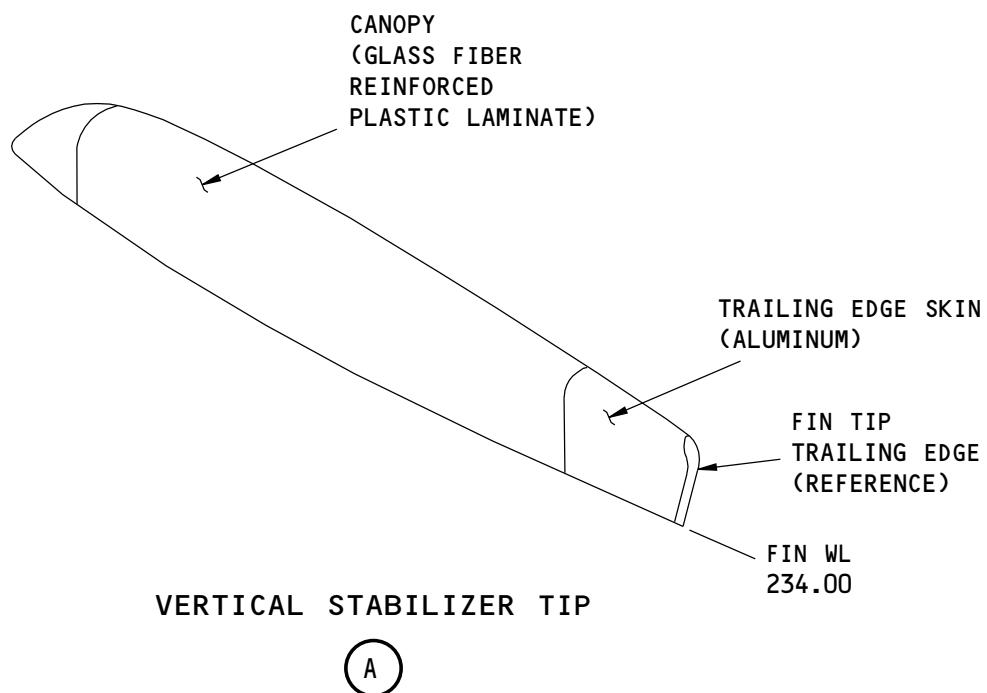
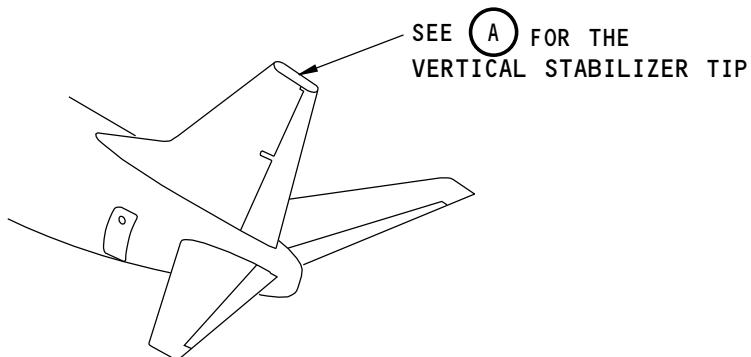
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Vertical Stabilizer Tip Canopy Location
Figure 201

55-30-30

REPAIR 1

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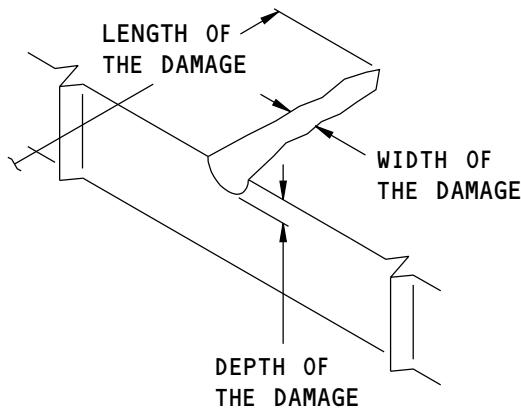
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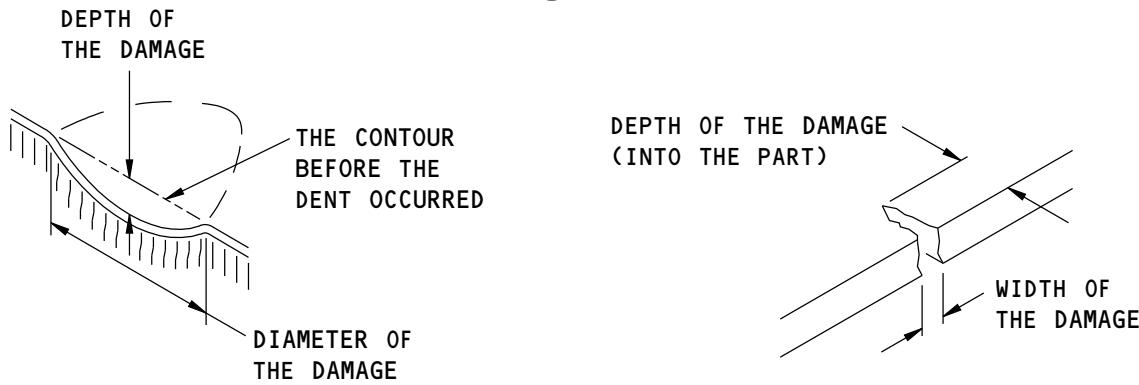


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SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)

SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

F73293 S0006593611_V1

Definitions of the Damage Size
Figure 202

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05, GENERAL	Fastener Hole Sizes
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials

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REPAIR 1
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(Continued)

Reference	Title
51-70-06	ROOM TEMPERATURE CURE REPAIRS
55-30-30, ALLOWABLE DAMAGE 1	Vertical Stabilizer Tip
AMM 55-33-21/401	Vertical Stabilizer (FIN) Tip Removal/Installation
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. Refer to paragraph 4.B through 4.G for damage to the vertical stabilizer canopy. Refer to Paragraph 4.H for damage to the vertical stabilizer trailing edge skins.
- B. For dents that are a maximum of 2 inches in diameter and have no fiber damage and delamination, do the steps that follow:
 - (1) Fill the dent with BMS 5-28, Type 7 potting compound.
 - (2) Apply a fiberglass patch over the potted area as given in 51-70-04.
- C. For dents that are not permitted by Paragraph 4.B./REPAIR 1 and for other damage that is not permitted by Allowable Damage 1, refer to Table 201.
- D. Use the instructions that follow to do a Category B repair with wet layup materials at room temperature cure.
 - (1) The edges of the repair must be 3 inches or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 1.
 - (2) Repair the damage as given in 51-70-06.
 - (3) Use the same number of repair plies as the number of initial plies that were removed.

Table 201:

REPAIR DATA FOR THE 250°F (121°C) CURE CANOPY				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Damage that is a maximum of: - 1.5 inches in diameter - 30 percent of the smallest dimension across the panel at the damage location	Damage that is a maximum of: - 3.0 inches in diameter - 50 percent of the smallest dimension across the panel at the damage location	There are no limits on the dimension of the repair	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-04 and Paragraph 4.E	SRM 51-70-05 and Paragraph 4.F

- (4) Do an inspection of the repair every 800 flight hours.
 - (a) If deterioration is found, replace the repair with a Category A repair.

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REPAIR 1
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- E. Use the instructions that follow to do a Category A repair with wet layup materials at 150°F (66°C) cure.
- (1) The edges of the repair must be 3 inches or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 1.
 - (2) Repair the damage as given in 51-70-04.
 - (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2, or Type H-3 glass fabric that is ±45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.
- F. Use the instructions that follow to do a Category A repair with wet layup materials at 200°F (93°C) cure.
- (1) Repair the damage as given in 51-70-04.
 - (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2, or Type H-3 glass fabric that is ±45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.
- G. Use the instruction that follows to do a Category A repair with preimpregnated layup materials at 250°F (121°C) cure.
- (1) Use the same number of repair plies as the number of initial plies that were removed.
- H. For the Category A repair to the vertical stabilizer trailing edge skins do as follows:
- (1) Remove the damage and initial finishes to a maximum 1.0 inch (25.4 mm) diameter hole as shown in Figure 203.
 - (2) Make sure the surface texture roughness for all cut surfaces is 63 microinches Ra, or smoother at all locations.
 - (3) Make the part [1] Doubler as given in Table 201. Make sure the part [1] Doubler has the same contour as the initial skin.
 - (4) Remove the finish from the trailing edge skin that is common to the part [1] Doubler.
 - (5) Assemble the part [1] Doubler as shown in Figure 203.
 - (6) Drill the necessary fastener holes as shown in Figure 203. Refer to 51-40-05, GENERAL for the fastener hole dimensions.
 - (a) Make sure that the maximum countersink depth is not more than 80 percent of the part [1] Doubler thickness. This will prevent a knife edge condition of the part [1] Doubler.
 - (7) Disassemble the part [1] Doubler.
 - (8) Remove all the nicks, scratches, gouges, burrs from the initial and repair parts.
 - (9) Chamfer the edge of the part [1] Doubler to a 20:1 ratio at all locations.
 - (10) Install the part [1] Doubler and fasteners without sealant.

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REPAIR 1
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- (11) Apply a chemical conversion coating to the part [1] Doubler and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.

Table 202:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 2024-T3 sheet with a thickness of 0.050 inch (12.70 mm).

- (12) Apply (2) layers of BMS 10-11, Type I primer to the part [1] Doubler and to the bare surfaces of the initial skin. Refer to SOPM 20-41-02.
- (13) Fillet seal the edges of the part [1] doubler and all gaps with BMS 5-95 sealant. Refer to 51-20-05, GENERAL.
- (14) Do a resistance check between the part [1] Doubler and the initial trailing edge skin. Refer to BAC 5117-6 for the test procedures. The maximum resistance that is permitted is 0.010 ohms.
- (15) Apply all initial production drawing finishes as necessary.

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REPAIR 1
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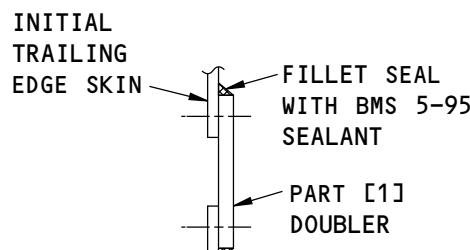
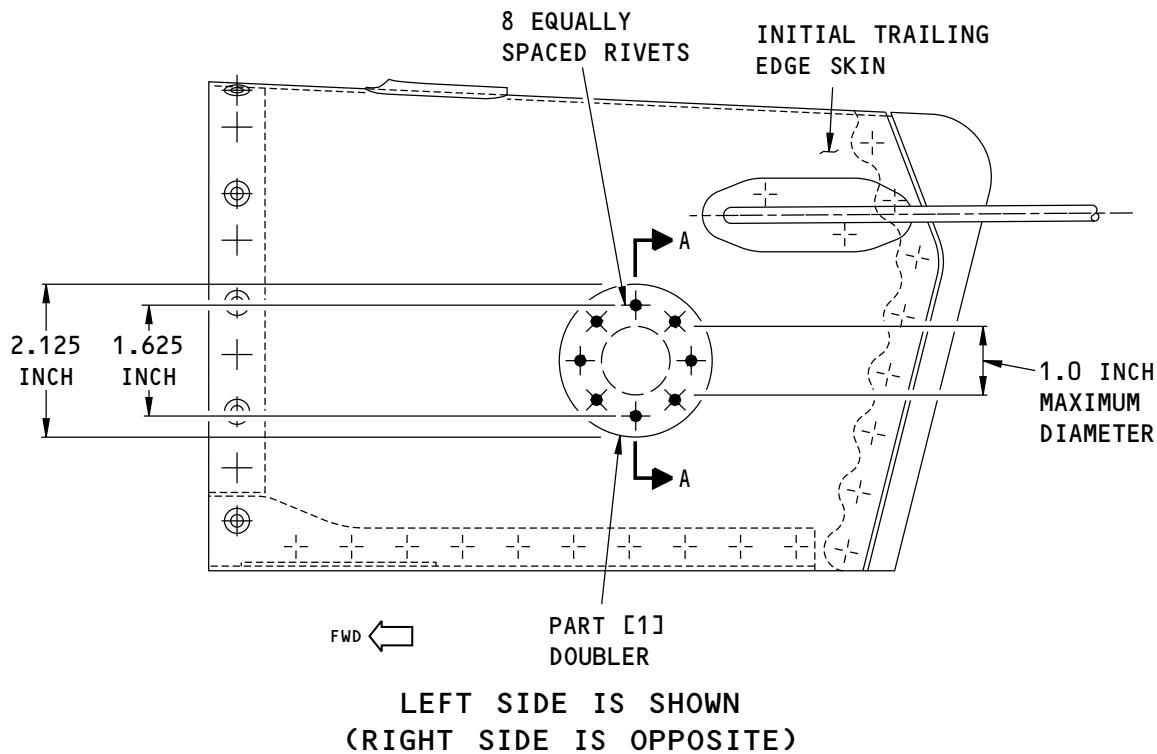
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A-A

NOTES

- MAKE SURE THERE IS A MINIMUM OF 2D EDGE MARGIN AT ALL LOCATIONS.
- MAKE SURE THE FASTENER SPACING IS 4D-6D.

FASTENER SYMBOLS

- REPAIR FASTENER LOCATION. INSTALL A BACR15CE4D() RIVET.

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Trailing Edge Skin Lightning Strike Repair
Figure 203

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REPAIR 1
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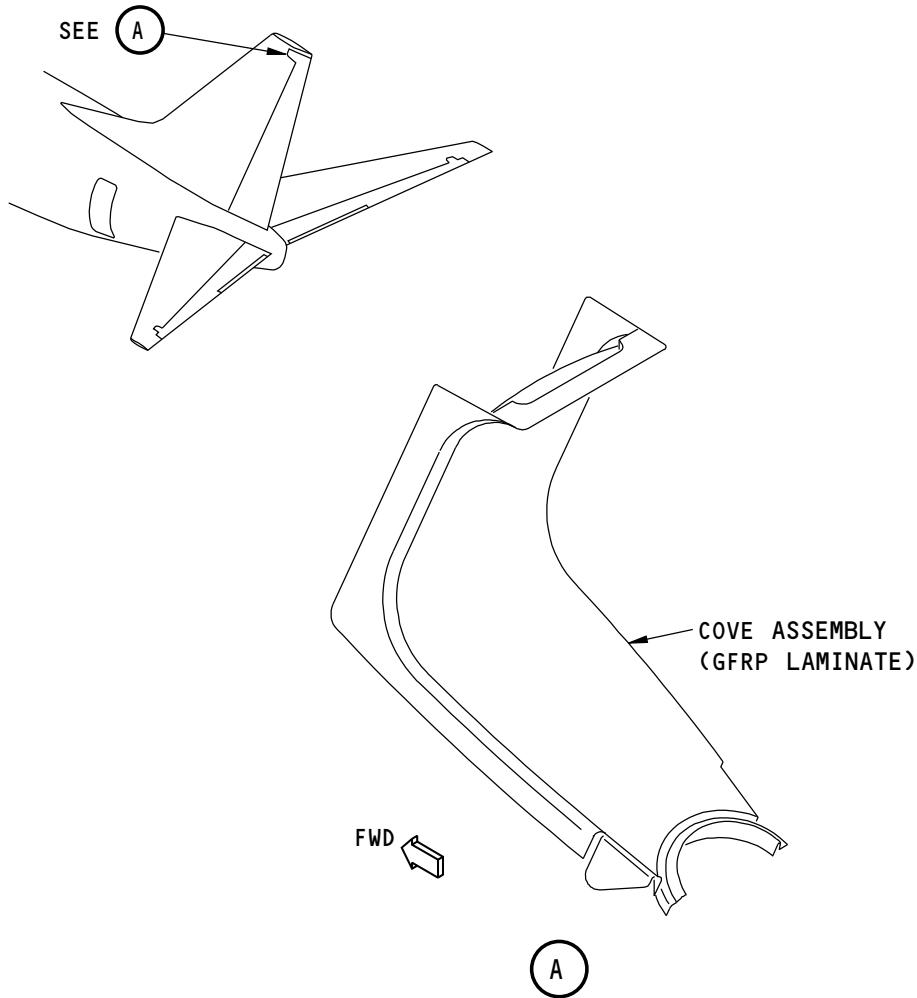


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REPAIR 2 - VERTICAL STABILIZER COVE

1. Applicability

- A. Repair 2 is applicable to the vertical stabilizer cove panel made of Glass Fiber Reinforced Plastic (GFRP) shown in Vertical Stabilizer Cove, Figure 201/REPAIR 2.
- B. Repair 2 is applicable to damage that is more than the limits permitted in Allowable Damage 2. Refer to Allowable Damage 2 for the type and size of damage that is permitted.



Vertical Stabilizer Cove
Figure 201

F79332 S0006593614_V1

2. General

- A. Repair 2 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the cove panel.

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REPAIR 2
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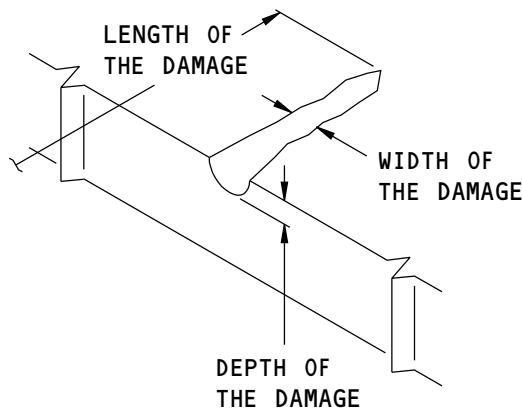
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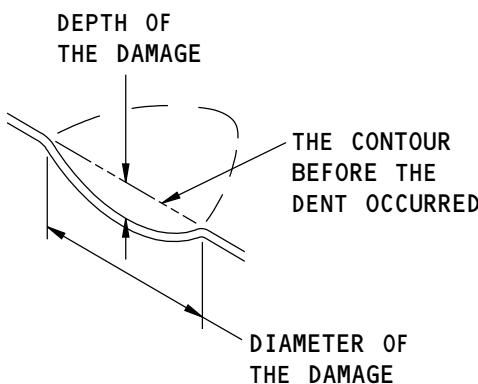
- (2) Refer to 51-40-02 for information on fastener removal.
- C. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.
- D. Refer to Definitions of the Damage Size, Figure 202/REPAIR 2, Details A, B, and C for the definitions of the length, width, and depth of damage.
- E. Do the repair as given in Paragraph 4./REPAIR 2
- F. Put the cove panel back to the initial condition, as applicable.
 - (1) Install the cove panel, if it was removed.
 - (a) Refer to 51-40-02 for information on fastener installation.



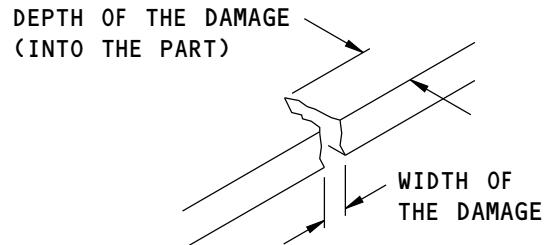
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR DENT DAMAGE

(B)



SIZE DEFINITIONS FOR EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 202

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REPAIR 2
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02, GENERAL	Inspection and Removal of Damage
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-06	ROOM TEMPERATURE CURE REPAIRS
55-10-30, ALLOWABLE DAMAGE 2	Horizontal Stabilizer Cove

4. Repair Instructions

- A. For dents that are a maximum of 2 inches in diameter and have no fiber damage and delamination, do the steps that follow:
 - (1) Fill the dent with BMS 5-28, Type 7 potting compound
 - (2) Apply a fiberglass patch over the potted area as given in 51-70-04.
- B. For dents that are not permitted by Paragraph 4.A./REPAIR 2 and for other damage that is not permitted by Allowable Damage 1, refer to Table 201/REPAIR 2.
- C. Use the instructions that follow to do a Category B repair with wet layup materials at room temperature cure.
 - (1) The edges of the repair must be 3.0 inch or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 2.
 - (2) Repair the damage as given in 51-70-06.
 - (3) Use the same number of repair plies as the number of initial plies that were removed.
 - (4) Do an inspection of the repair each 800 flight hour interval or more frequently.
 - (a) If deterioration is found, replace the repair with a Category A repair.

Table 201:

REPAIR DATA FOR THE 250°F (121°C) CURE COVE PANELS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE	Damage that is a maximum of: - 1.5 inches in diameter - 30 percent of the smallest dimension across the panel at the damage location	Damage that is a maximum of: - 3.0 inches in diameter - 50 percent of the smallest dimension across the panel at the damage location	There are no limits on the dimension of the repair	There are no limits on the dimensions of the repair

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REPAIR 2
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Table 201: (Continued)

REPAIR DATA FOR THE 250°F (121°C) CURE COVE PANELS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPERGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
	One repair is permitted for each 144 square inches of panel area	One repair is permitted for each 144 square inches of panel area		
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-04 and Paragraph 4.E	SRM 51-70-05 and Paragraph 4.F

D. Use the instructions that follow to do a Category A repair with wet layup materials at 150°F (66°C) cure.

- (1) The edges of the repair must be 3.0 inch or more away from:
 - (a) The edge of other repairs
 - (b) The edge of the part
 - (c) The edge of other damage. This does not include damage that is permitted and sealed as given in Allowable Damage 2.
- (2) Repair the damage as given in 51-70-04.
 - (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2, or Type H-3 glass fabric that is ±45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.

E. Use the instructions that follow to do a Category A repair with wet layup materials at 200°F (93°C) cure.

- (1) Repair the damage as given in 51-70-04.
 - (a) Use the same number of repair plies as the number of initial plies that were removed.
 - (b) Add one structural ply of BMS 9-3, Type H-2, or Type H-3 glass fabric that is ±45 degrees.
 - (c) Add a second structural ply of BMS 9-3, Type H-2 or Type H-3 glass fabric that is 0 or 90 degrees.

F. Use the instruction that follows to do a Category A repair with preimpregnated layup materials at 250°F (121°C) cure.

- (1) Use the same number of repair plies as the number of initial plies that were removed.

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REPAIR 2

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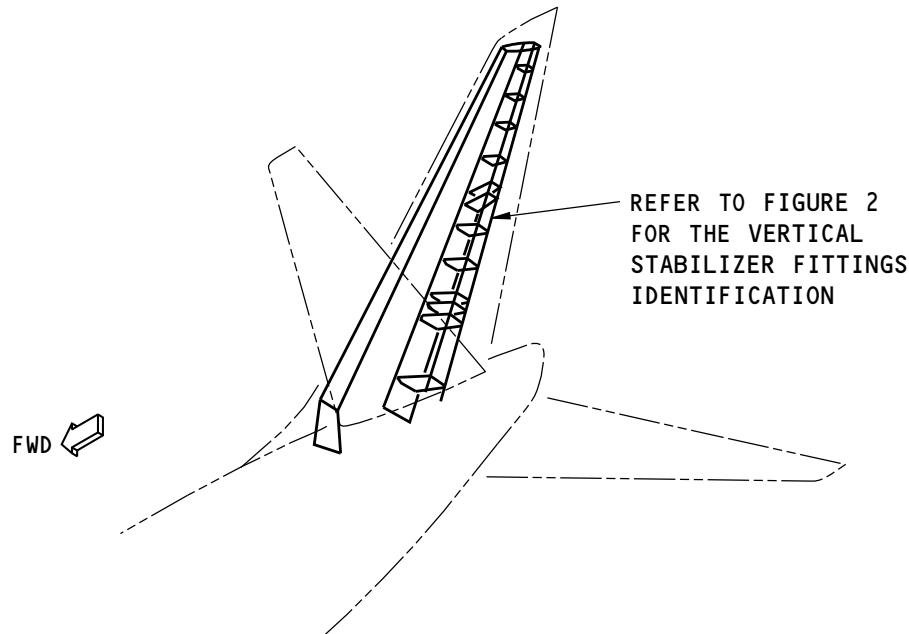
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IDENTIFICATION 1 - VERTICAL STABILIZER FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G27040 S0006593620_V1

Vertical Stabilizer Fittings Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
172A1001	Rear Spar Assembly / Installation - Vertical Fin
172A2001	Front Spar Assembly / Installation - Vertical Fin
175A0001	Trailing Edge Functional Collector - Vertical Fin

55-30-90

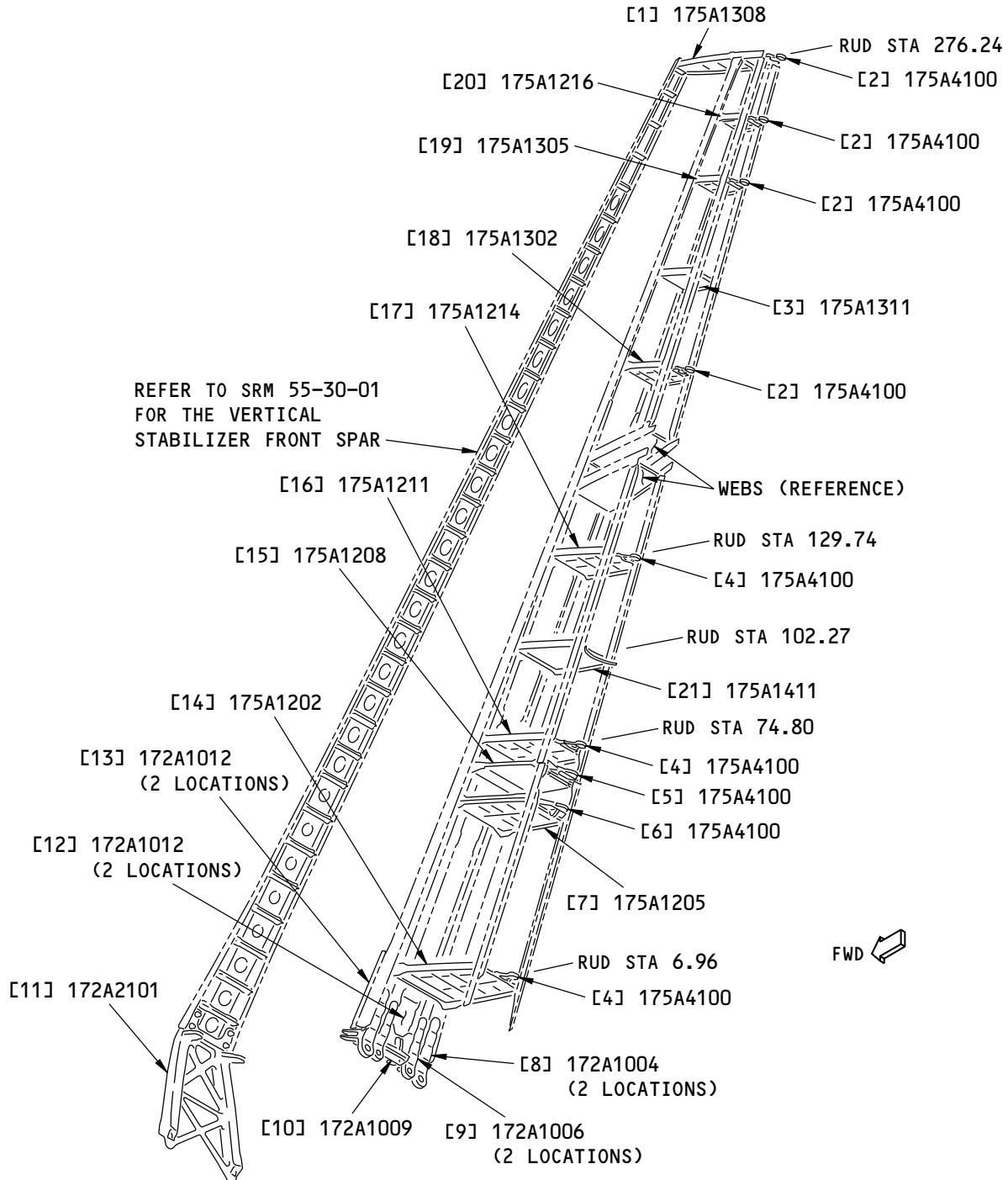
IDENTIFICATION 1

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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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**Vertical Stabilizer Fittings Identification
Figure 2**

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IDENTIFICATION 1
Page 2
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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Hinge Fitting		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[2]	Rudder Attach Hinge Plate (4)		7075-T7351 rolled plate as given in QQ-A-250/12, Class A. Refer to the production drawing for the machined thicknesses. (Grain direction controlled part)	
[3]	Beam, Support Fitting		7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[4]	Rudder Attach Hinge Plate (3)		7075-T7351 plate as given in QQ-A-250/12, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[5]	Rudder Attach Hinge Plate Assembly Hinge Plate Retainer Retainer		7075-T7351 plate as given in QQ-A-250/12, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part) 15-5PH CRES as given in BMS 7-240 Type I, heat treated to 180-200 KSI. Refer to the production drawing for the machined thicknesses 7075-T7351 plate as given in QQ-A-250/12, Class A. Refer to the production drawing for the machined thicknesses	
[6]	Rudder Attach Hinge Plate Assembly Hinge Plate Bearing Retainer		7075-T7351 plate as given in QQ-A-250/12, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part) 15-5PH CRES as given in BMS 7-240 Type I, heat treated to 180-200 KSI. Refer to the production drawing for the machined thicknesses	
[7]	Hinge Fitting Assembly Fitting, Upper Fitting, Lower		7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses 7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses	
[8]	Rear Spar Primary Fitting (2)		Ti-6Al-4V titanium machined forged block as given in MIL-T-9047, annealed. Refer to the production drawing for the machined thicknesses	
[9]	Rear Spar Failsafe Fitting (2)		Ti-6Al-4V titanium machined forged block as given in MIL-T-9047, annealed. Refer to the production drawing for the machined thicknesses	
[10]	Rear Spar Tension Tie Fitting		7075-T73 forged block as given in BMS 7-186, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	

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Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[11]	Front Spar Termination Fitting		7075-T73 forging as given in BMS 7-186, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[12]	Rear Spar Failsafe Fitting		7075-T651 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[13]	Rear Spar Fitting Strap (2)		7075-T7351 plate as given in QQ-A-250/12. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[14]	Hinge Fitting		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[15]	Hinge Fitting Assembly		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
	Fitting Failsafe Doubler		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Optional: 7050-T7451 plate as given in AMS 4050 (Grain direction controlled part))	
[16]	Hinge Fitting (2)		7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[17]	Hinge Fitting		7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[18]	Hinge Fitting		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[19]	Hinge Fitting		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[20]	Hinge Fitting		7050-T7451 plate as given in BMS 7-323, Type I. Refer to the production drawing for the machined thicknesses (Grain direction controlled part)	
[21]	Beam Support Fitting		7050-T7451 plate as given in AMS 4050, Class A. Refer to the production drawing for the machined thicknesses	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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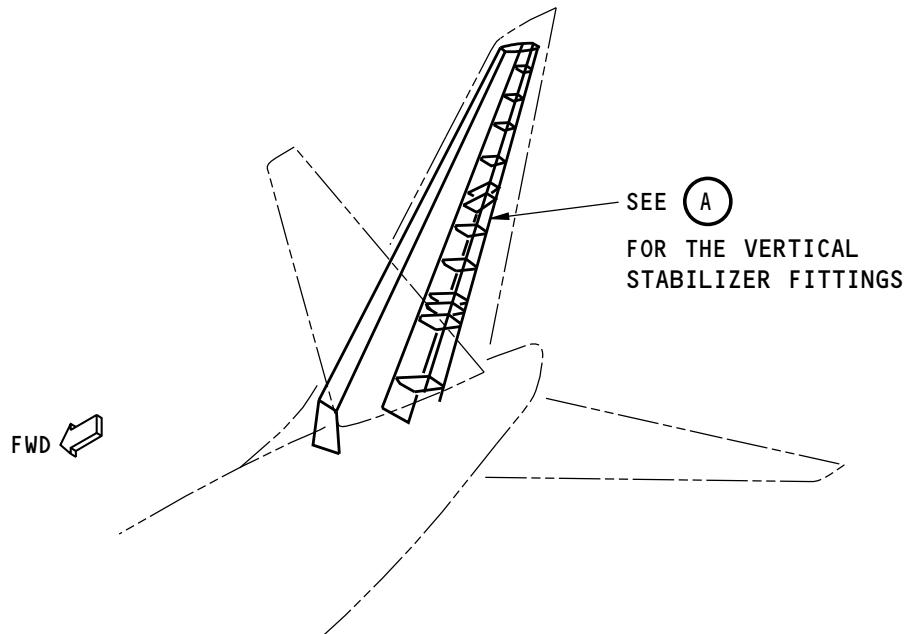


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STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - VERTICAL STABILIZER FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the fittings that attach to the vertical stabilizer shown in Vertical Stabilizer Fitting Locations, Figure 101/ALLOWABLE DAMAGE 1.



G52855 S0006593626_V1

Vertical Stabilizer Fitting Locations
Figure 101 (Sheet 1 of 2)

55-30-90

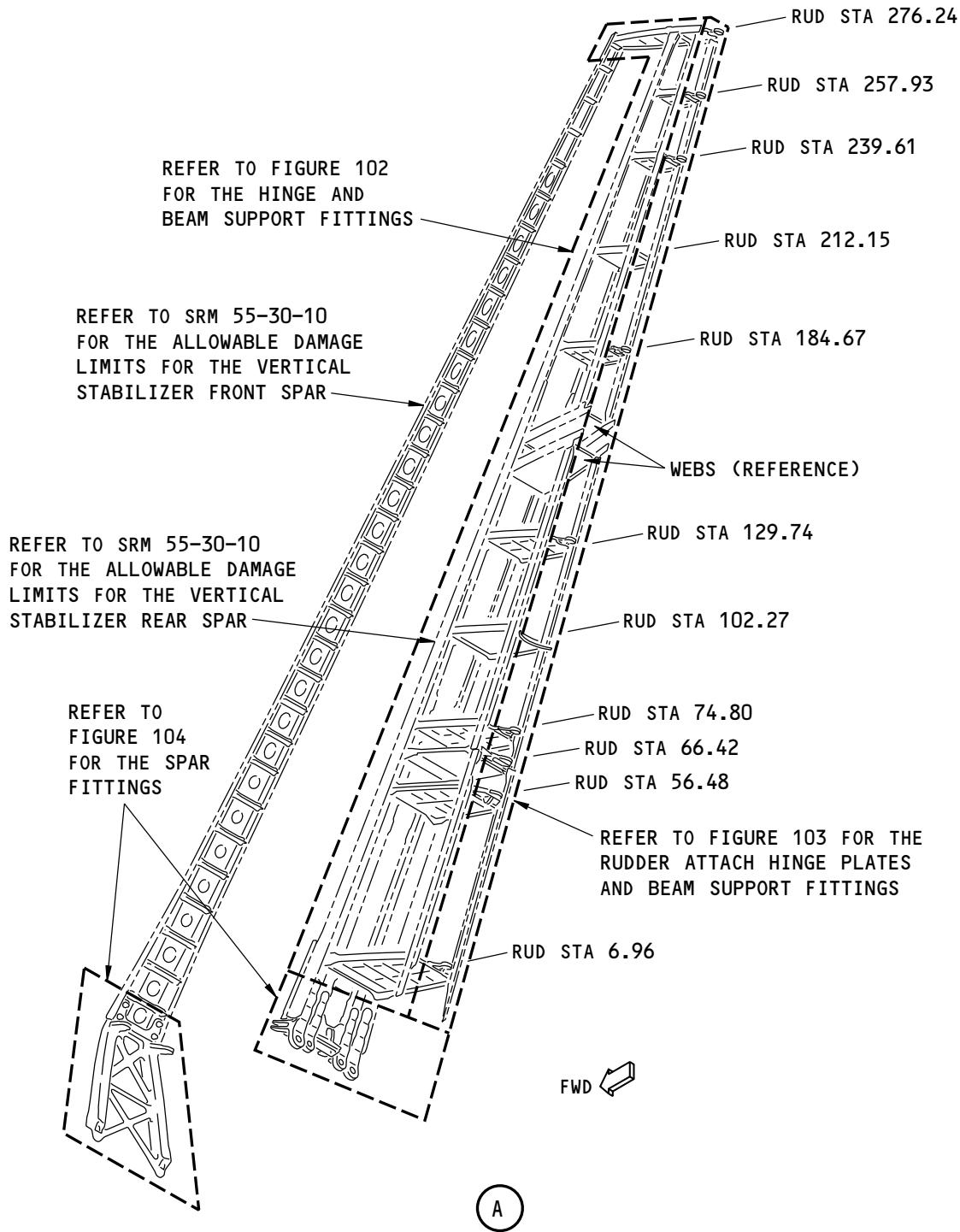
ALLOWABLE DAMAGE 1

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G52891 S0006593627_V1

**Vertical Stabilizer Fitting Locations
Figure 101 (Sheet 2 of 2)**

55-30-90
ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

2. General

- A. Remove the parts as necessary to get access to the vertical stabilizer fittings.
- B. Refer to Table 101/ALLOWABLE DAMAGE 1 for a list of the references for the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS	
STRUCTURAL PART	PARAGRAPH
End Pads	4.A
Gussets	4.A
Webs	4.A
Attach Flanges	4.A
Rear Spar Strap	4.A
Hinge Plates	4.B
Bearing Retainers	4.C
Lugs	4.C
Rear Spar Terminal Fittings	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH OR MORE ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON OR CARBON DIOXIDE. WATER IN CONTACT WITH MOLTEN TITANIUM CAN CAUSE A STREAM EXPLOSION. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- C. Do the steps that follow if you have damage to the aluminum, Corrosion Resistant Steel (CRES), or titanium parts:
 - D. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the investigation and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of nonmetallic materials you need to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - E. After you remove the damage, do the procedures that follow:
 - (1) Do a penetrant inspection to all parts except the rear spar strap and the bearing retainers to make sure that all the damage is removed. Refer to SOPM 20-20-02.
 - (2) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.
 - (3) Apply cadmium plating to the bare surfaces of the CRES parts. Refer to SOPM 20-42-05.
 - (4) Apply 2 layers of BMS 10-11, Type I primer to the surfaces of all reworked areas except the fitting straps, primary fittings, and failsafe fittings of the rear spar. Refer to SOPM 20-41-02.

NOTE: Do not apply the BMS 10-11, Type I primer to the holes of the fittings.

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ALLOWABLE DAMAGE 1

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- (5) Apply a layer of BMS 10-11, Type I primer to the surfaces of the fitting straps, primary fittings, and failsafe fittings of the rear spar. Refer to SOPM 20-41-02.

NOTE: Do not apply the BMS 10-11, Type I primer to the holes of the fittings.

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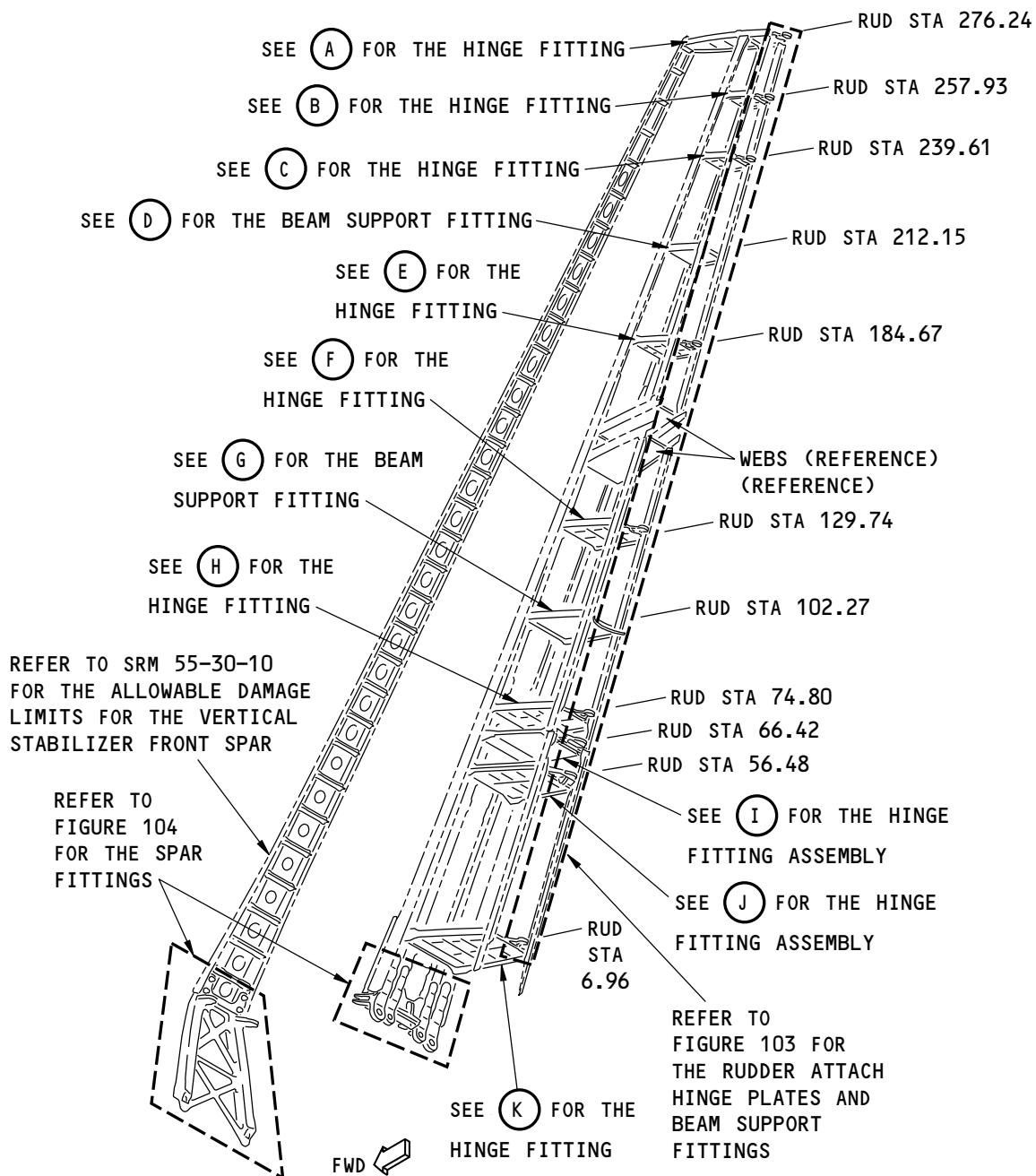
ALLOWABLE DAMAGE 1

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NOTES

- ALL THE PARTS IDENTIFIED ARE MACHINED ALUMINUM.

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**Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 1 of 7)**

55-30-90
ALLOWABLE DAMAGE 1

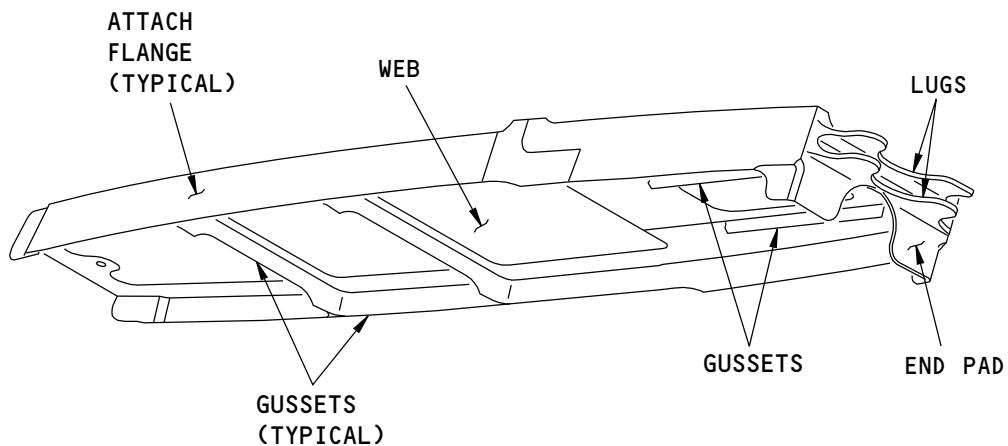
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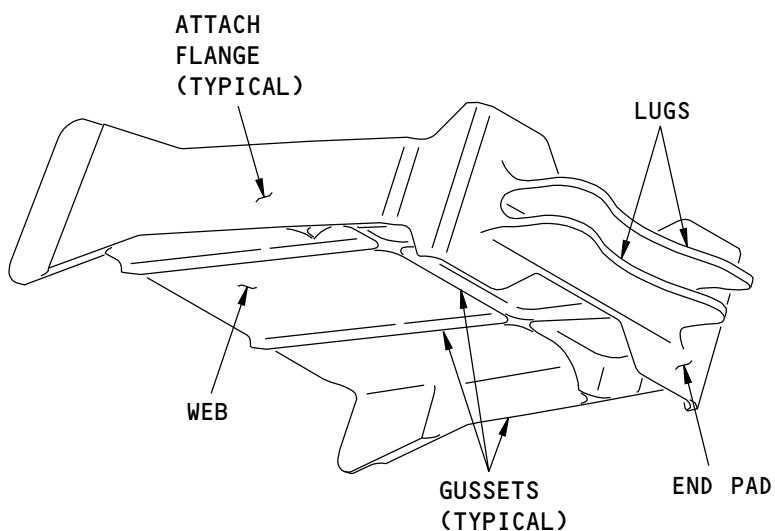


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STRUCTURAL REPAIR MANUAL



HINGE FITTING AT RUDDER STATION 276.24

(A)



HINGE FITTING AT RUDDER STATION 257.93

(B)

G54579 S0006593630_V1

Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 2 of 7)

55-30-90

ALLOWABLE DAMAGE 1

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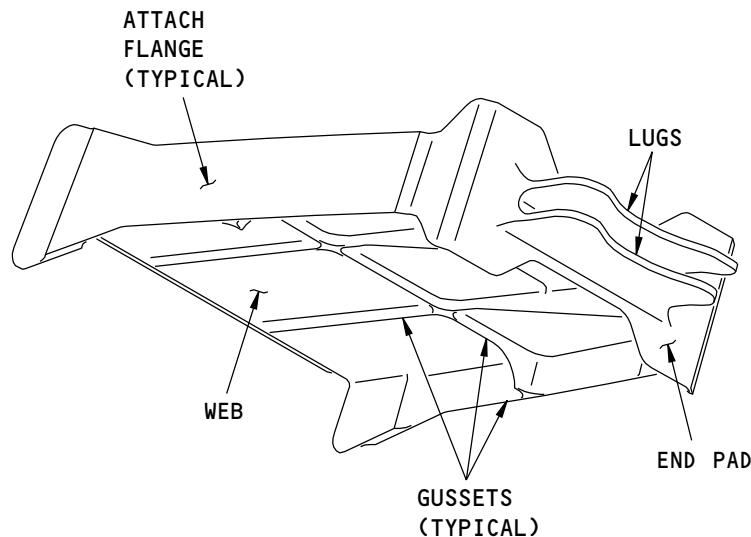
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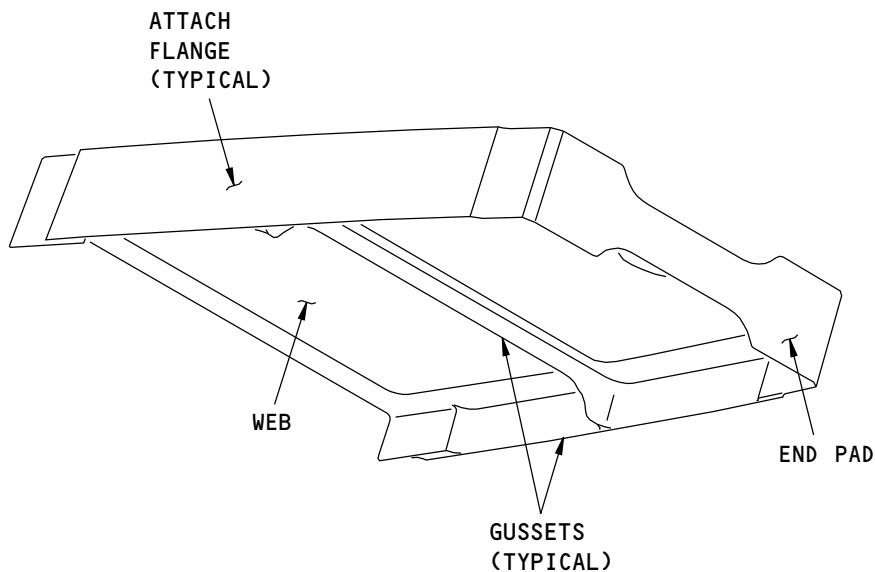


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HINGE FITTING AT RUDDER STATION 239.61

(C)



BEAM SUPPORT FITTING AT RUDDER STATION 212.15

(D)

G54581 S0006593631_V1

Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 3 of 7)

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ALLOWABLE DAMAGE 1

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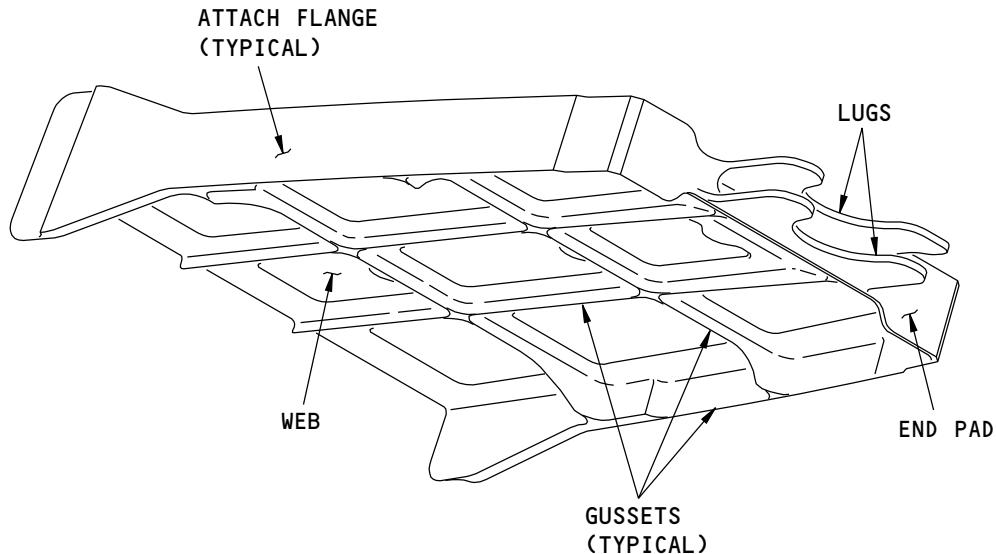
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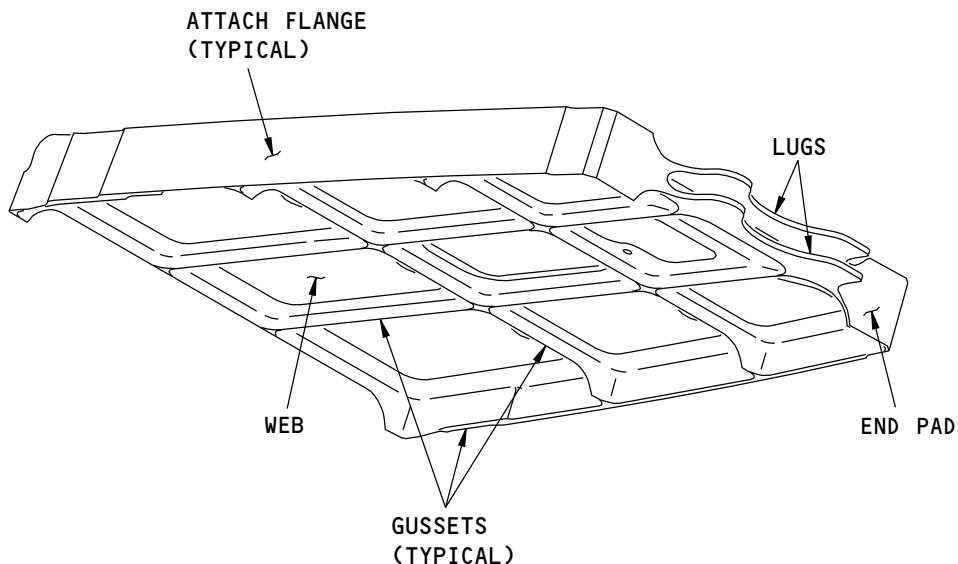


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HINGE FITTING AT RUDDER STATION 184.67

(E)



HINGE FITTING AT RUDDER STATION 129.74

(F)

G54594 S0006593632_V1

Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 4 of 7)

55-30-90

ALLOWABLE DAMAGE 1

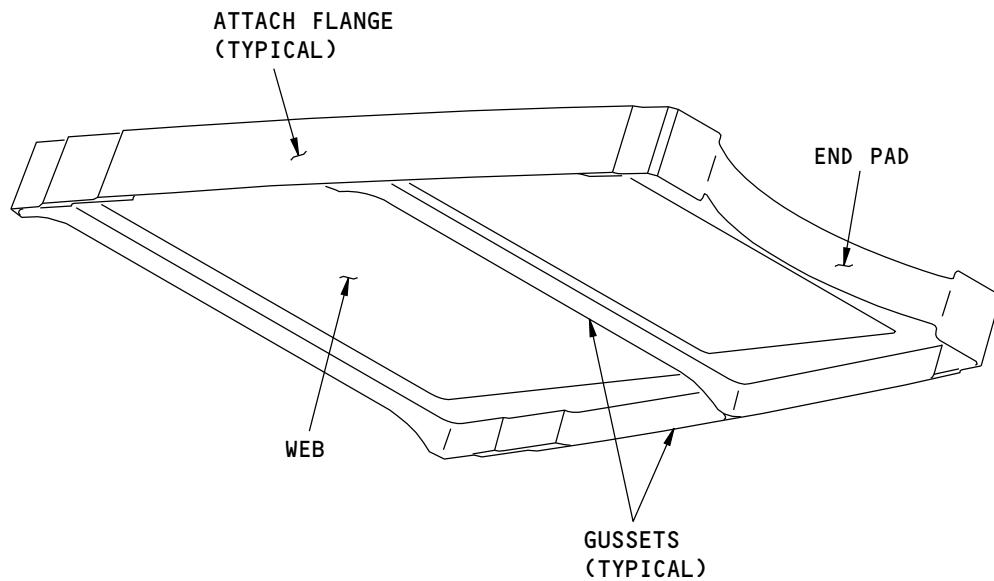
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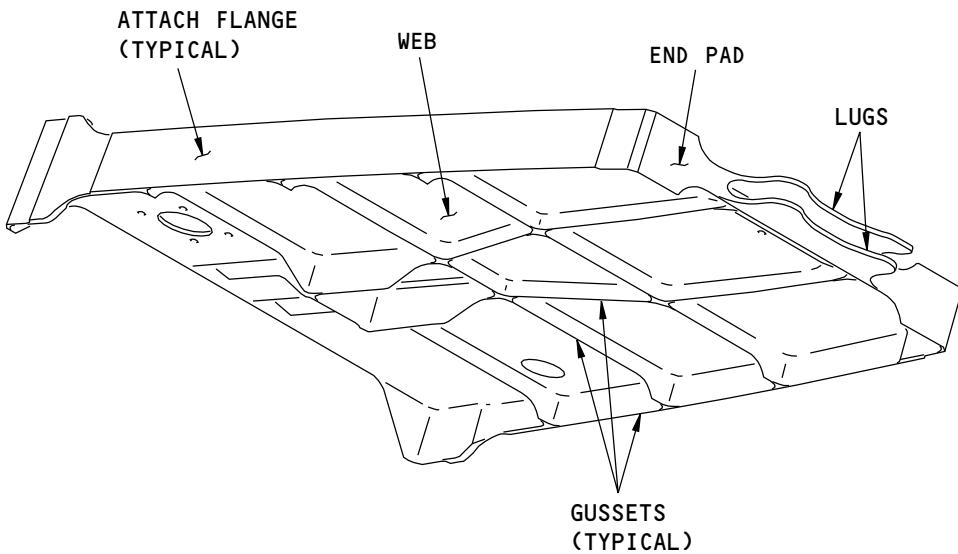


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BEAM SUPPORT FITTING AT RUDDER STATION 102.27

(G)



HINGE FITTING AT RUDDER STATION 74.80

(H)

G54596 S0006593633_V1

Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 5 of 7)

55-30-90

ALLOWABLE DAMAGE 1

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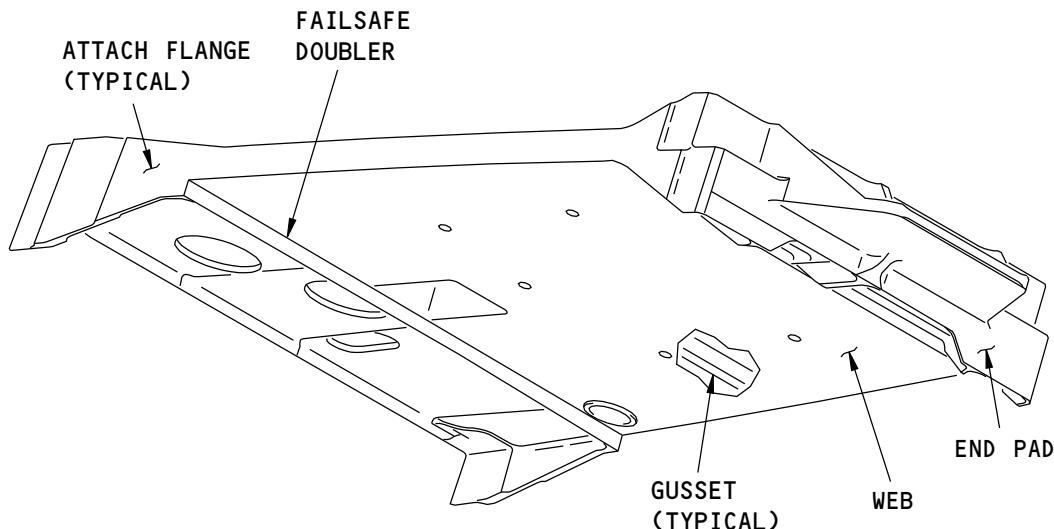
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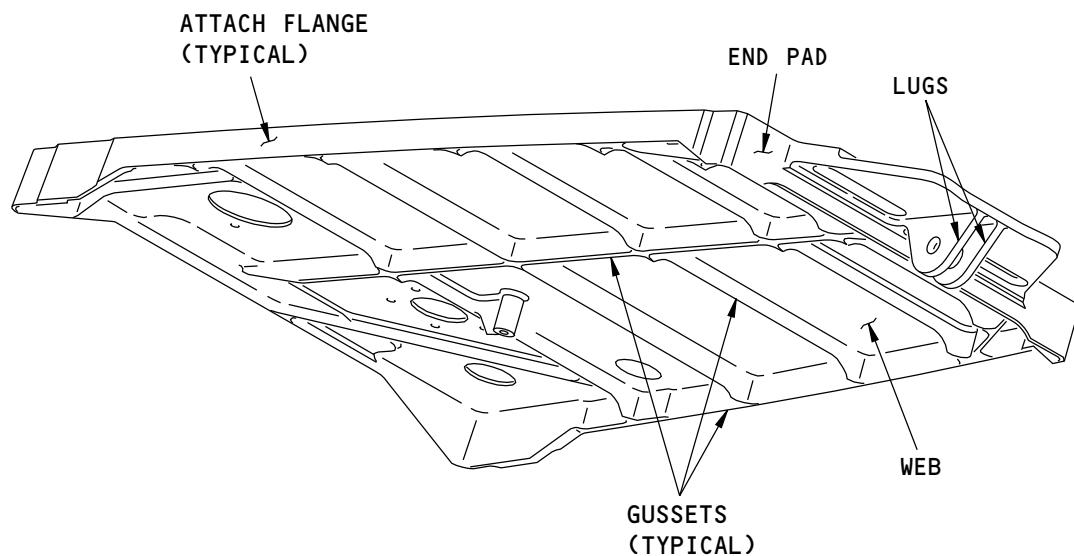


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HINGE FITTING ASSEMBLY AT RUDDER STATION 66.42

I



HINGE FITTING ASSEMBLY AT RUDDER STATION 56.48

J

G54601 S0006593634_V1

Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 6 of 7)

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ALLOWABLE DAMAGE 1

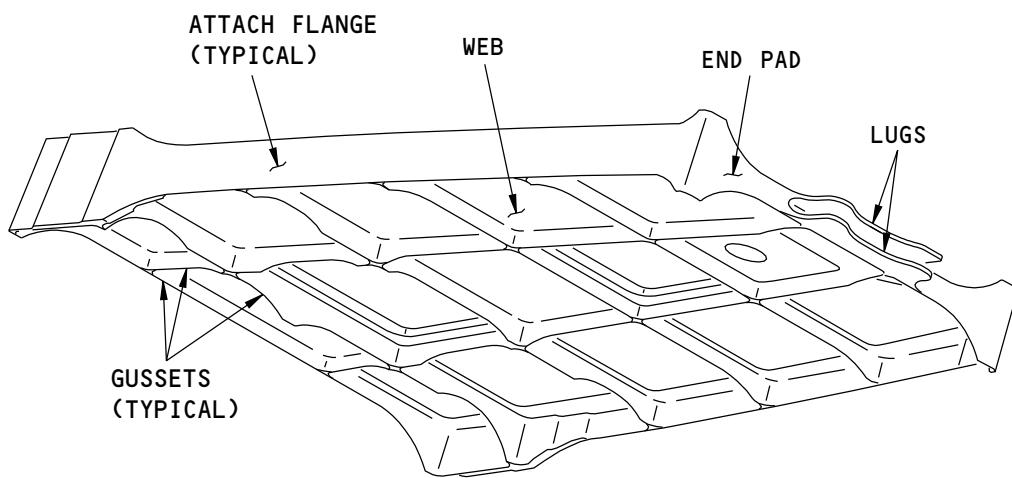
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HINGE FITTING AT RUDDER STATION 6.96

(K)

G57153 S0006593635_V1

Vertical Stabilizer Hinge and Beam Support Fittings
Figure 102 (Sheet 7 of 7)

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-42-05	Bright Cadmium Plating
SOPM 20-50-03	Bearing and Bushing Replacement

4. Allowable Damage Limits

A. End Pads, Gussets, Webs, Attach Flanges, and Rear Spar Strap

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Detail A, B, C, D, E, F, and G.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Hinge Plates

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Detail A, B, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Lugs and Bearing Retainers

NOTE: No damage is permitted in the surface of the lug bore. You are permitted to drill the bore to a maximum oversize diameter of 0.06 inch more than the initial bore diameter if:

- There is no damage on the edge of the lug initial bore
- You follow the bushing removal procedures as given in SOPM 20-50-03.

- (1) Cracks:

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ALLOWABLE DAMAGE 1

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- (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details H and I.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Details H and I.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- D. Rear Spar Terminal Fittings
- (1) Damage is not permitted.

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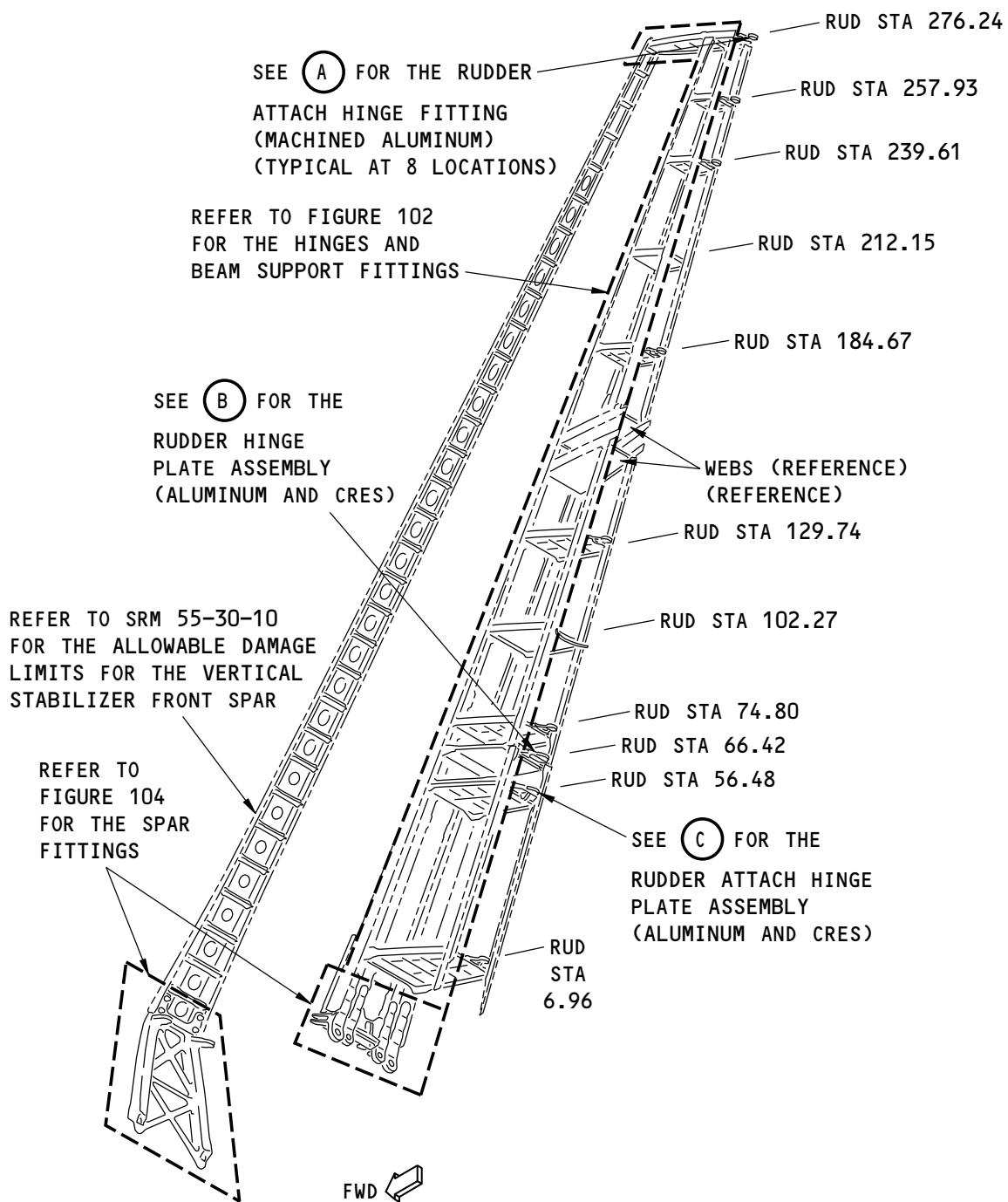
ALLOWABLE DAMAGE 1

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**Vertical Stabilizer Rudder Attach Hinge Plates and Beam Support
Figure 103 (Sheet 1 of 2)**

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ALLOWABLE DAMAGE 1

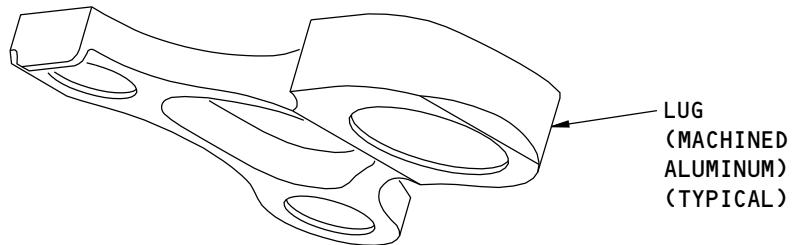
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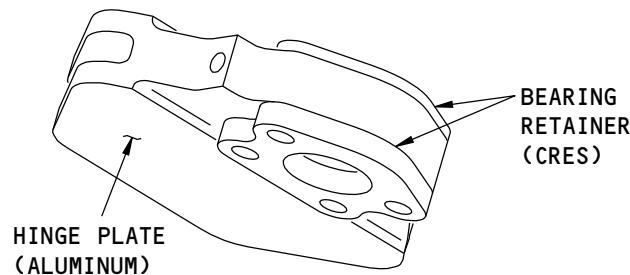


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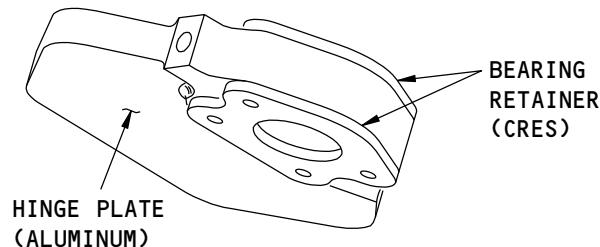
TYPICAL ATTACH HINGE FITTING
(LOCATED AT RUDDER STATIONS 276.24, 257.93,
239.61, 212.15, 184.67, 129.74, 74.80, AND 6.96)

(A)



RUDDER ATTACH HINGE PLATE AT RUDDER STATION 66.42

(B)



RUDDER ATTACH HINGE PLATE AT RUDDER STATION 56.48

(C)

G54891 S0006593637_V1

Vertical Stabilizer Rudder Attach Hinge Plates and Beam Support
Figure 103 (Sheet 2 of 2)

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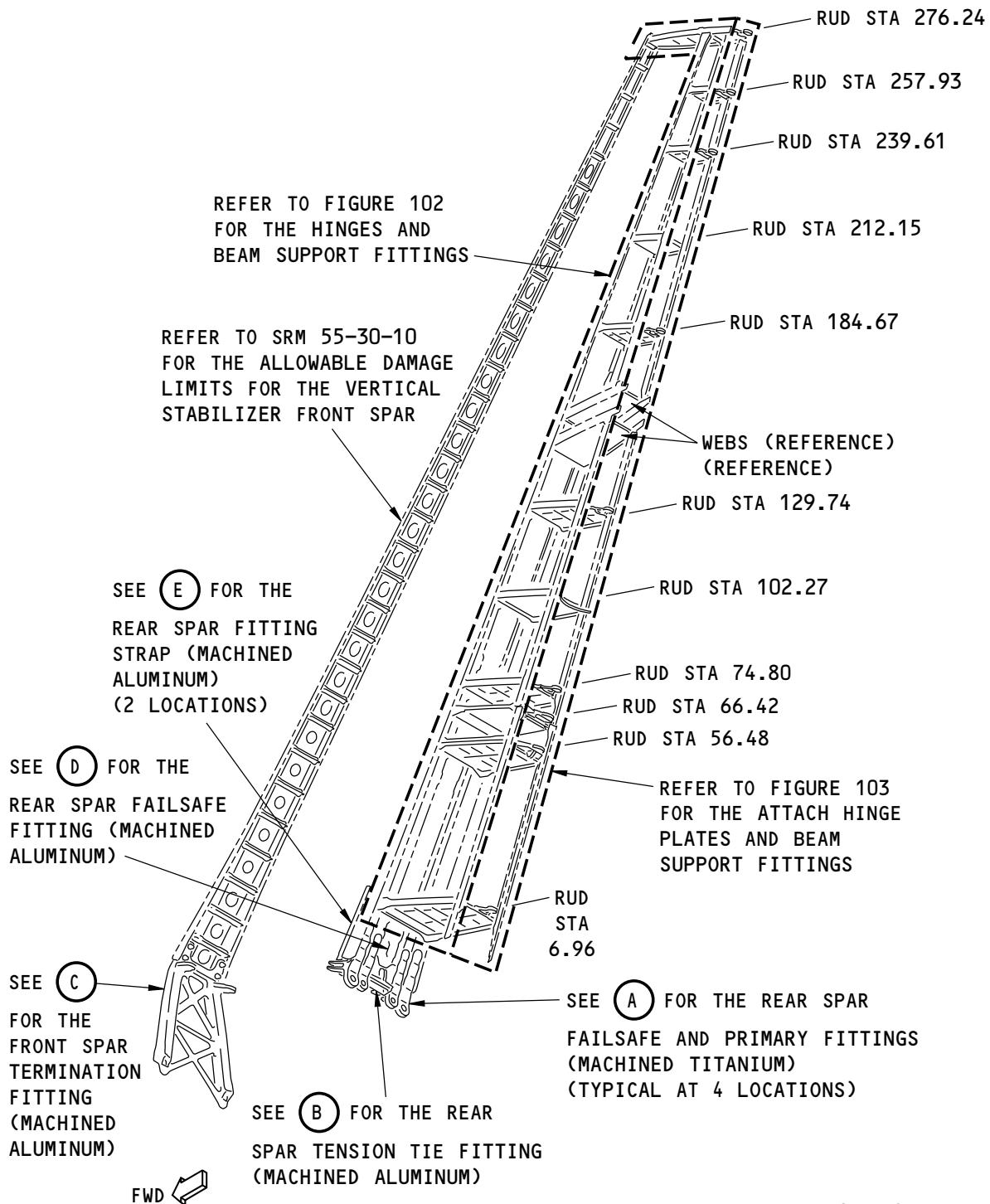
ALLOWABLE DAMAGE 1

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G54909 S0006593638_V1

**Vertical Stabilizer Spar Fittings
Figure 104 (Sheet 1 of 4)**

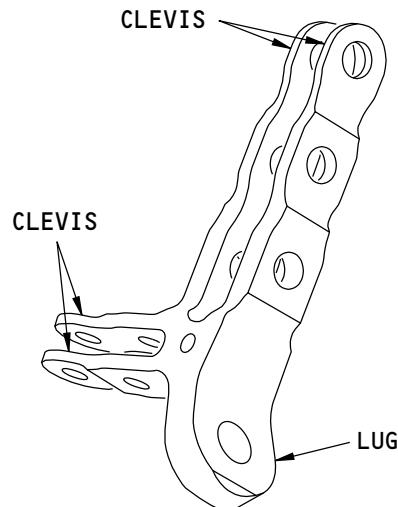
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ALLOWABLE DAMAGE 1

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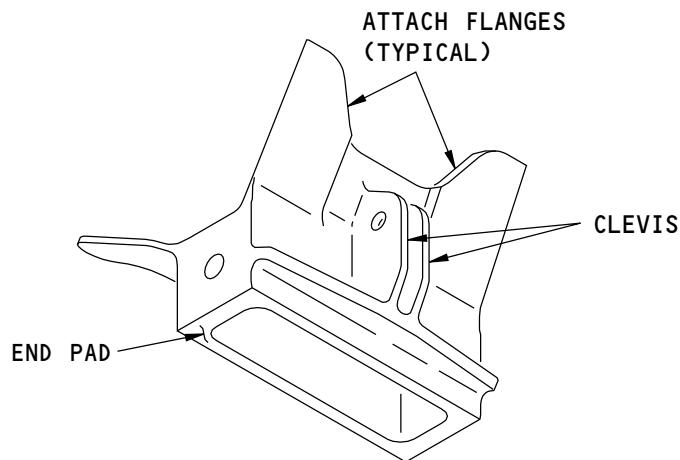


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TYPICAL REAR SPAR TERMINAL, PRIMARY, AND FAILSAFE FITTING

(A)



REAR SPAR TENSION TIE FITTING

(B)

G54928 S0006593639_V1

Vertical Stabilizer Spar Fittings
Figure 104 (Sheet 2 of 4)

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ALLOWABLE DAMAGE 1

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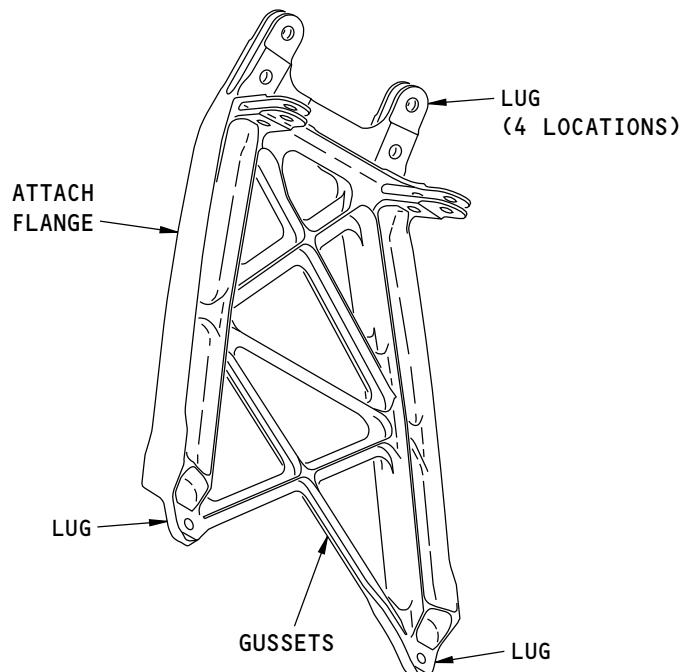
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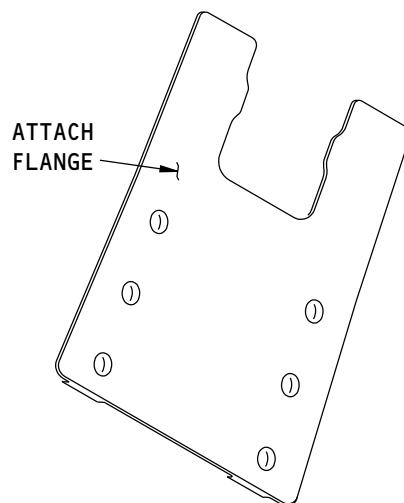


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FRONT SPAR TERMINATION FITTING

(C)



REAR SPAR FAILSAFE FITTING

(D)

G55277 S0006593640_V1

Vertical Stabilizer Spar Fittings
Figure 104 (Sheet 3 of 4)

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ALLOWABLE DAMAGE 1

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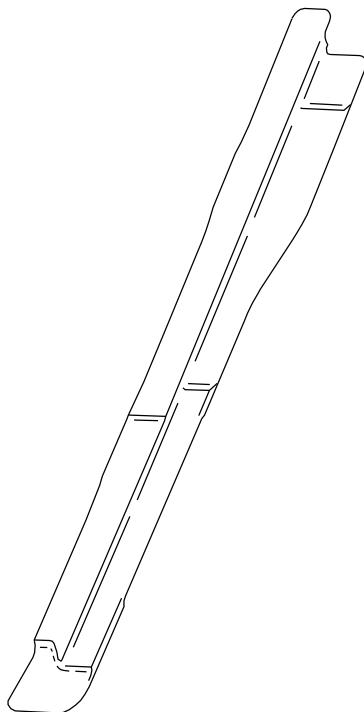
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REAR SPAR FITTING STRAP

(E)

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Vertical Stabilizer Spar Fittings
Figure 104 (Sheet 4 of 4)

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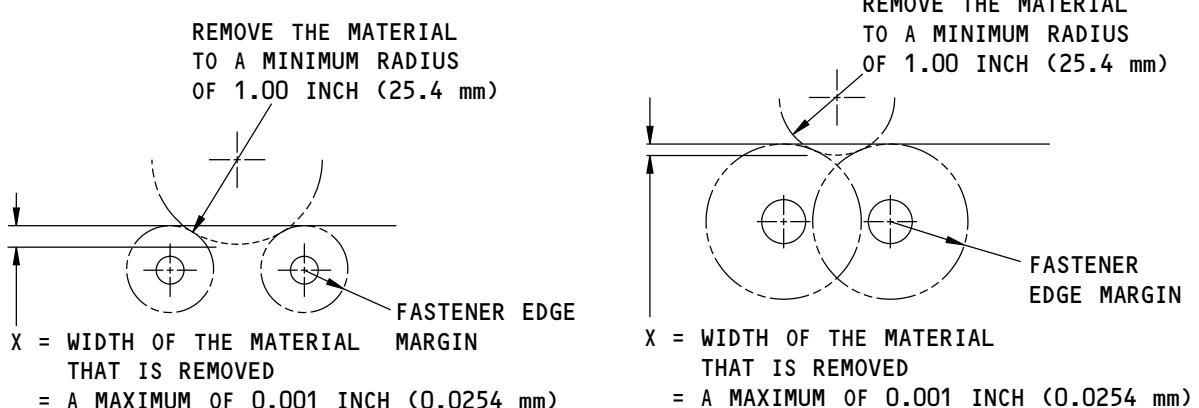
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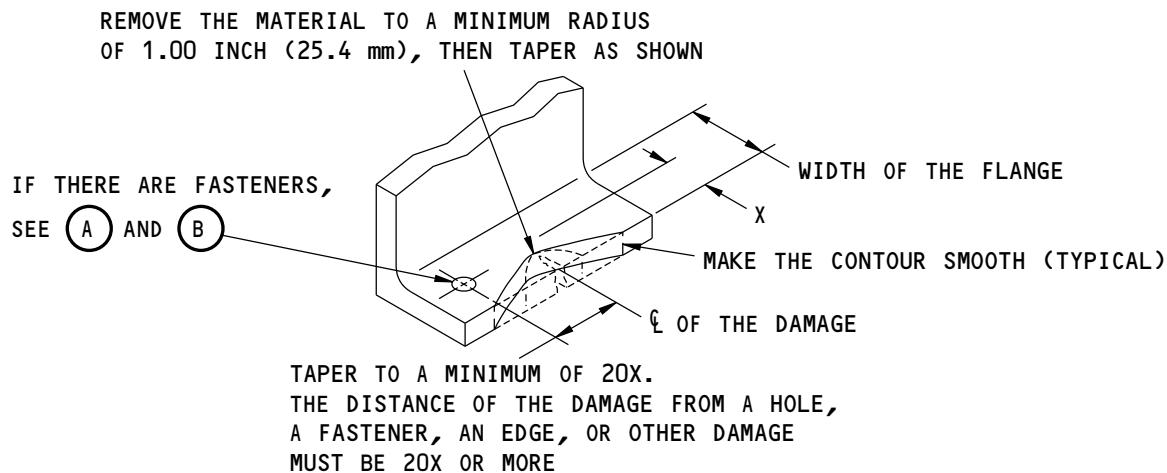
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REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)

REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 0.001 INCH (0.0254mm) THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

G72304 S0006593642_V1

**Allowable Damage Limits
Figure 105 (Sheet 1 of 5)**

55-30-90

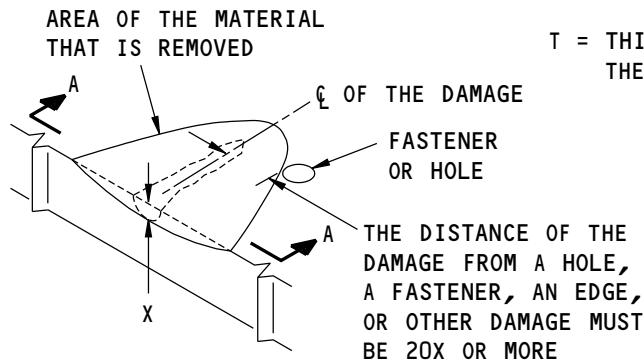
ALLOWABLE DAMAGE 1

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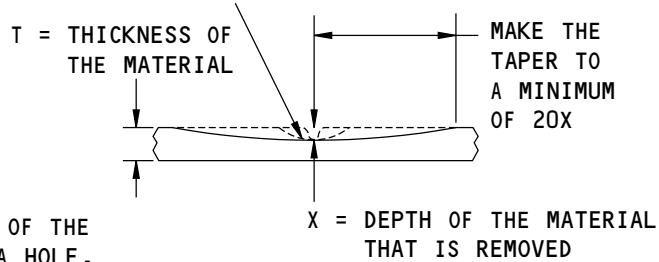
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STRUCTURAL REPAIR MANUAL**



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 0.001 INCH,
(0.0254 mm), THEN TAPER AS SHOWN

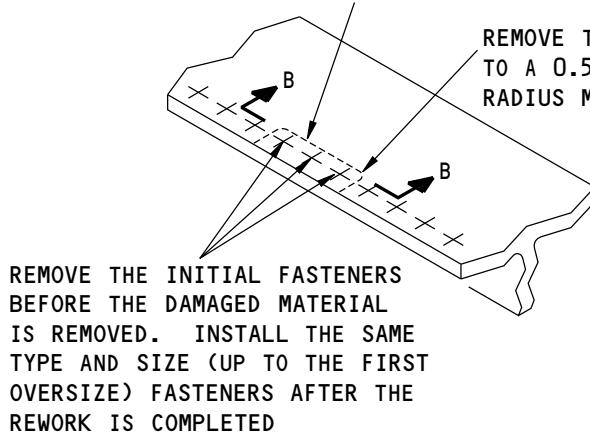


A-A

**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(D)

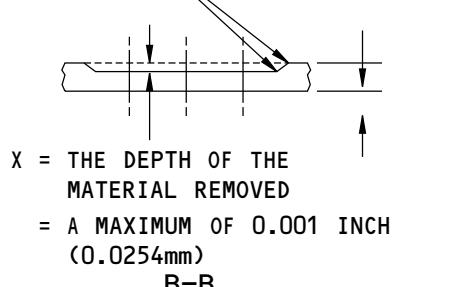
THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN
A GROUP OF TEN IS PERMITTED
TO A DEPTH OF X MAXIMUM



REMOVE THE MATERIAL
TO A 0.50 INCH (12.7 mm)
RADIUS MINIMUM (TYPICAL)

MAKE IT SMOOTH
(TYPICAL)

T = THICKNESS OF
THE MATERIAL



**REMOVAL OF CORROSION
AROUND THE FASTENERS**

(E)

G72305 S0006593643_V1

**Allowable Damage Limits
Figure 105 (Sheet 2 of 5)**

55-30-90

ALLOWABLE DAMAGE 1

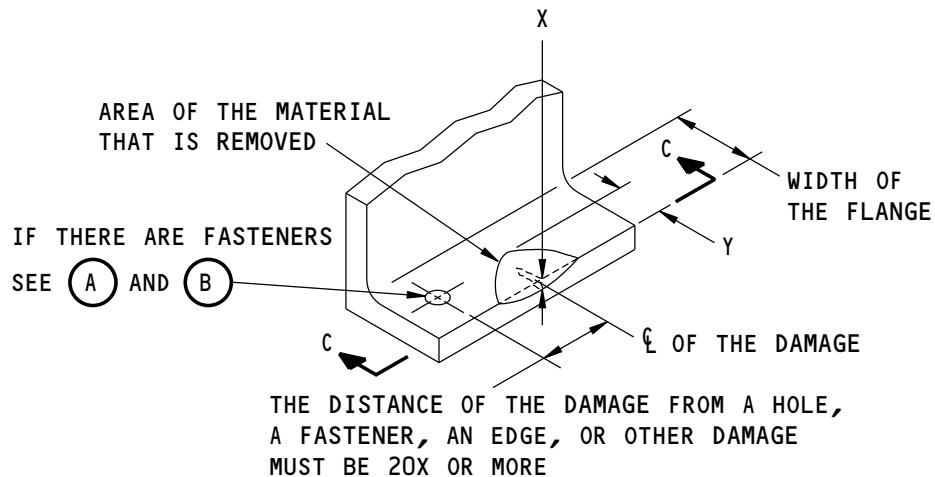
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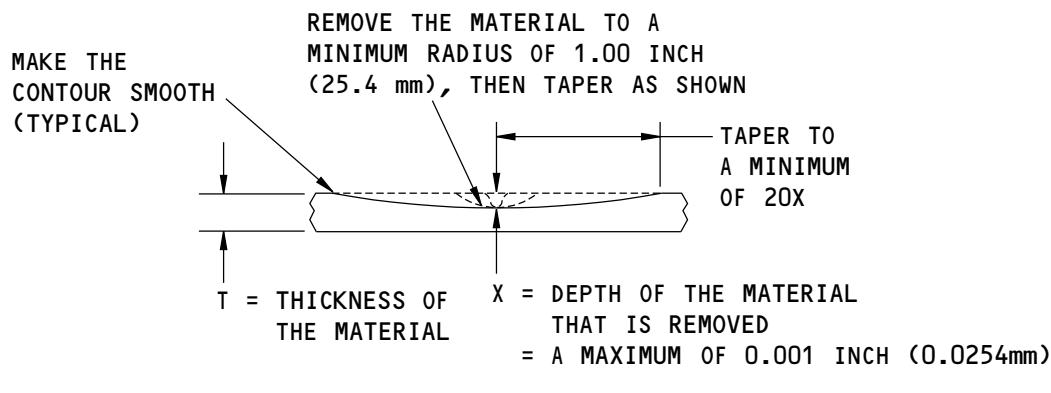
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STRUCTURAL REPAIR MANUAL



Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.001 INCH (0.0254 mm) OF THE WIDTH OF THE FLANGE

NOTE: AN ANGLE IS SHOWN. THIS DETAIL ALSO APPLIES TO PLATES.

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE



G72306 S0006593644_V1

Allowable Damage Limits
Figure 105 (Sheet 3 of 5)

55-30-90

ALLOWABLE DAMAGE 1

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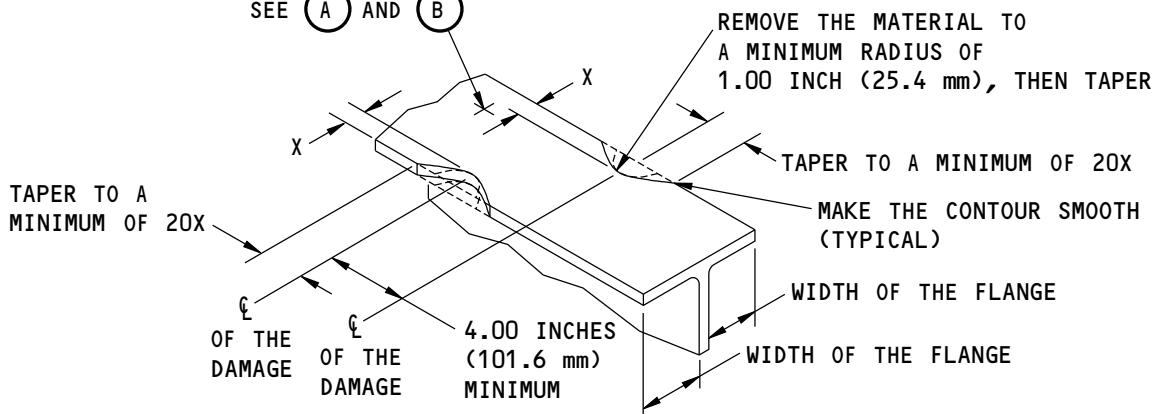
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IF THERE ARE FASTENERS

SEE A AND B



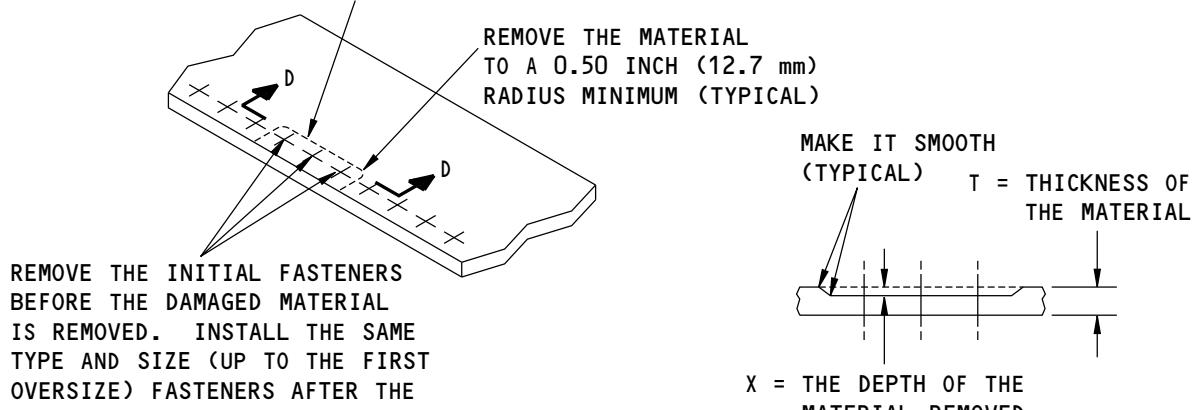
X = THE WIDTH OF THE MATERIAL THAT IS REMOVED

= A MAXIMUM OF 0.001 INCH (0.0254mm) OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(G)

THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN
A GROUP OF TEN IS PERMITTED
TO A DEPTH OF X MAXIMUM



REMOVAL OF CORROSION AROUND THE FASTENERS

(H)

D-D

G72326 S0006593645_V1

Allowable Damage Limits
Figure 105 (Sheet 4 of 5)

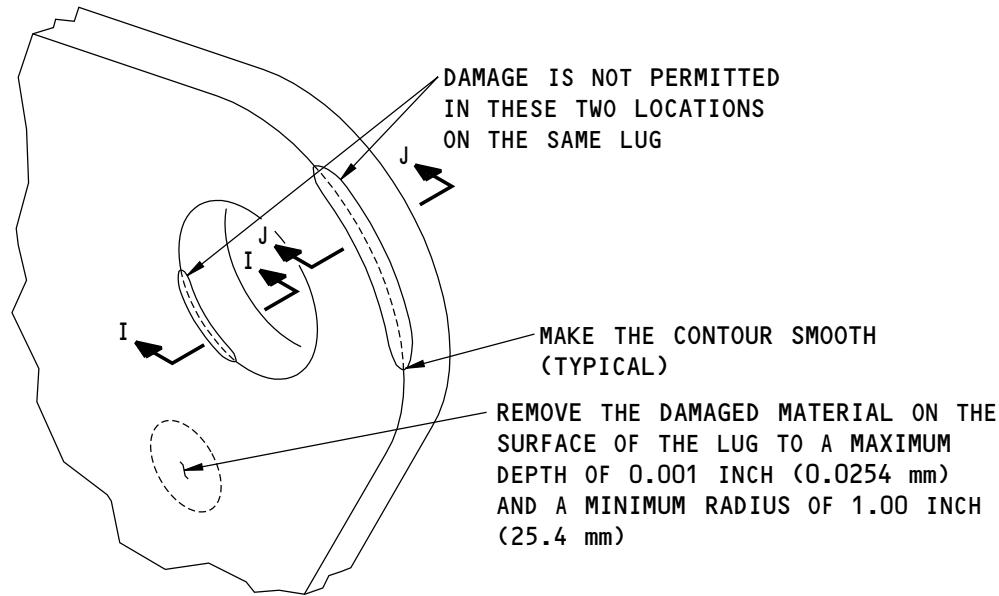
55-30-90

ALLOWABLE DAMAGE 1

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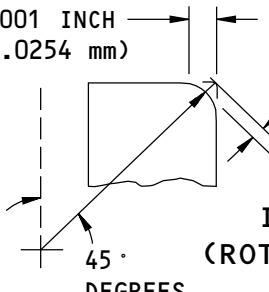
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REMOVAL OF DAMAGED MATERIAL ON A LUG WITHOUT BUSHINGS

I

A MAXIMUM OF
0.001 INCH
(0.0254 mm)

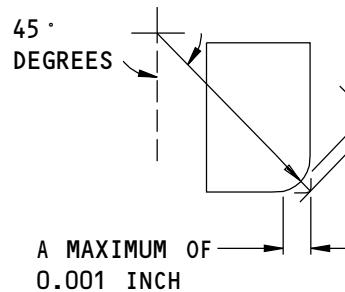


V = A MAXIMUM OF
0.001 INCH
(0.0254 mm)

I-I
(ROTATED)

REMOVE THE MATERIAL TO A MINIMUM
RADIUS OF 1.00 INCH (25.4 mm) AT
THE DEEPEST AREA OF DAMAGE REMOVAL.
TAPER TO A MINIMUM LENGTH OF 20V
ALONG THE CIRCUMFERENCE IN THE TWO
DIRECTIONS

REMOVE THE MATERIAL TO A MINIMUM
RADIUS OF 1.00 INCH (25.4 mm) AT THE
DEEPEST AREA OF DAMAGE REMOVAL. TAPER
TO A MINIMUM LENGTH OF 20V ALONG THE
CIRCUMFERENCE IN THE TWO DIRECTIONS



A MAXIMUM OF
0.001 INCH
(0.0254 mm)

V = A MAXIMUM OF
0.001 INCH
(0.0254 mm)

J-J

G77393 S0006593646_V1

Allowable Damage Limits
Figure 105 (Sheet 5 of 5)

55-30-90

ALLOWABLE DAMAGE 1

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ALLOWABLE DAMAGE 2 - SHIM MIGRATION AT THE VERTICAL STABILIZER REAR SPAR FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the migrated shims at the Vertical Fin Primary and Failsafe Rear Spar Fittings. Refer to Figure 101/ALLOWABLE DAMAGE 2 for applicable shim locations.
- B. If the damage to the shim is more than the limits given in Paragraph 4./ALLOWABLE DAMAGE 2, then contact The Boeing Company for a repair.

2. General

- A. Shims are used to fill the gap between adjacent parts. Installation of the shims prevents a preload on the adjacent part when fasteners are installed. Gaps in the joint can degrade the fastener clamp-up which will decrease the service life of the joint.
- B. Shim laminations can move in relation to each other at the bond lines because of shear forces at the joint. This movement is called shim migration. Usually the laminations that migrated broke apart at the fastener holes in the joint and will continue to move.
- C. Remove the necessary parts to get access to the vertical stabilizer fittings.
- D. Do a visual examination of the shims to determine if shim migration has occurred. Perform a visual inspection of the attachment bolts to determine if rotation has occurred. Refer to Paragraph 4./ALLOWABLE DAMAGE 2.

CAUTION: USE SPECIAL CARE TO TRIM THE EDGES OF A MIGRATED SHIM. DO NOT SCRATCH THE ADJACENT STRUCTURES. IF YOU DAMAGE THE ADJACENT STRUCTURE, MORE REWORK WILL BE NECESSARY.

- E. Trim the migrated shim as follows.
 - (1) Trim the shim to the edge of the fitting. Refer to Figure 102/ALLOWABLE DAMAGE 2, when you trim laminated shims. Use care to trim the shim so that you do not damage the structure.
 - (2) Record the amount of shim material that is removed for reference if future migration occurs. Include the shape, thickness and dimensions in the record.
 - (3) Record the amount of the trimmed shim that is past the edge of the fitting for reference if future migration occurs. Include the shape, thickness and dimensions in the record.
- F. Apply a chemical conversion coating to the cut edges of the shim. Refer to PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS, 51-20-01.
- G. Apply a fillet seal to the fittings. Fill all internal gaps with BMS5-95 sealant. Refer to REPAIR SEALING, 51-20-05.
- H. Do a visual inspection to see if there is more shim migration at the intervals defined in Paragraph 5./ALLOWABLE DAMAGE 2.

55-30-90

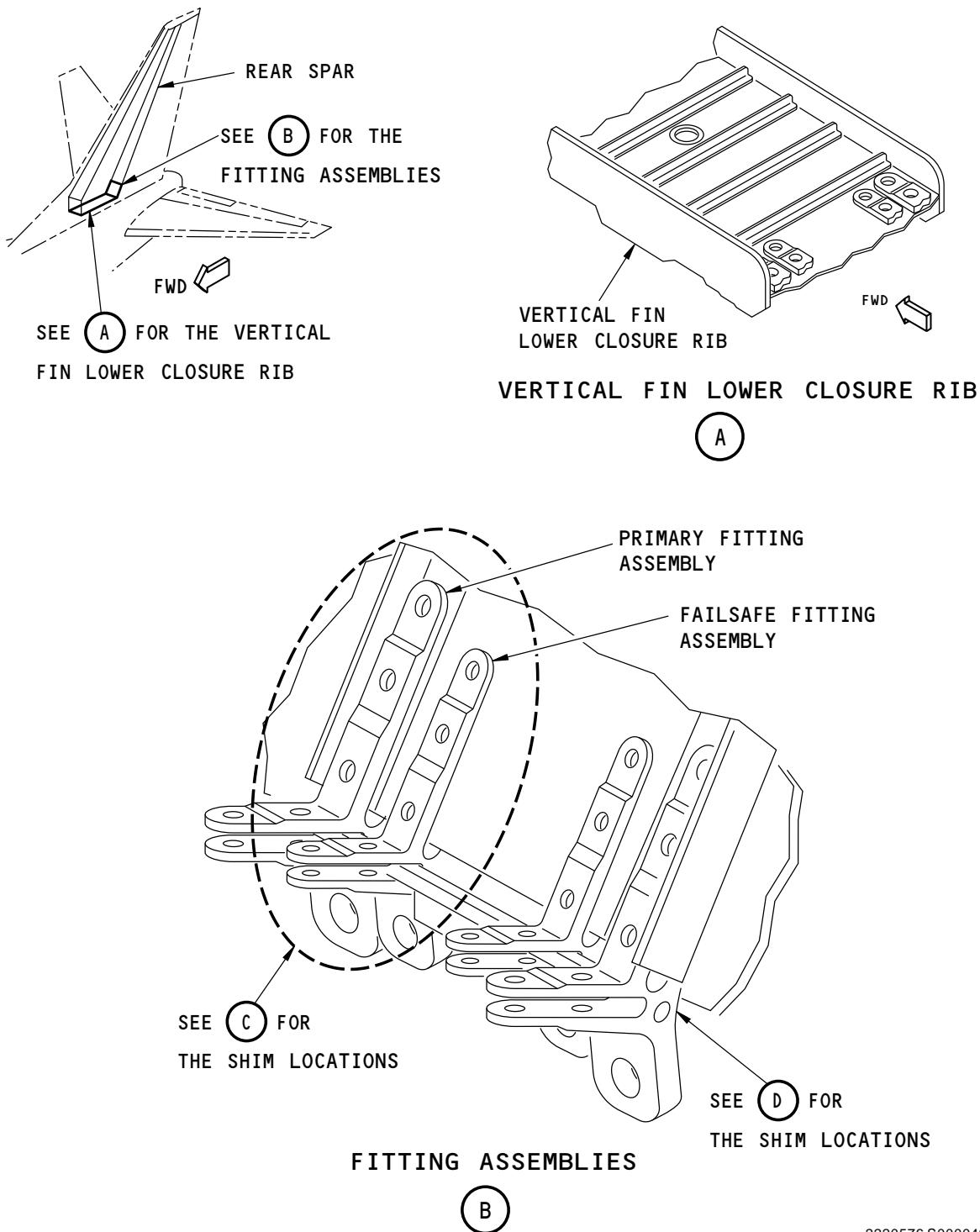
ALLOWABLE DAMAGE 2

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2220576 S0000496485_V1

Vertical Stabilizer Rear Spar Fittings Shim Locations
Figure 101 (Sheet 1 of 3)

55-30-90
ALLOWABLE DAMAGE 2

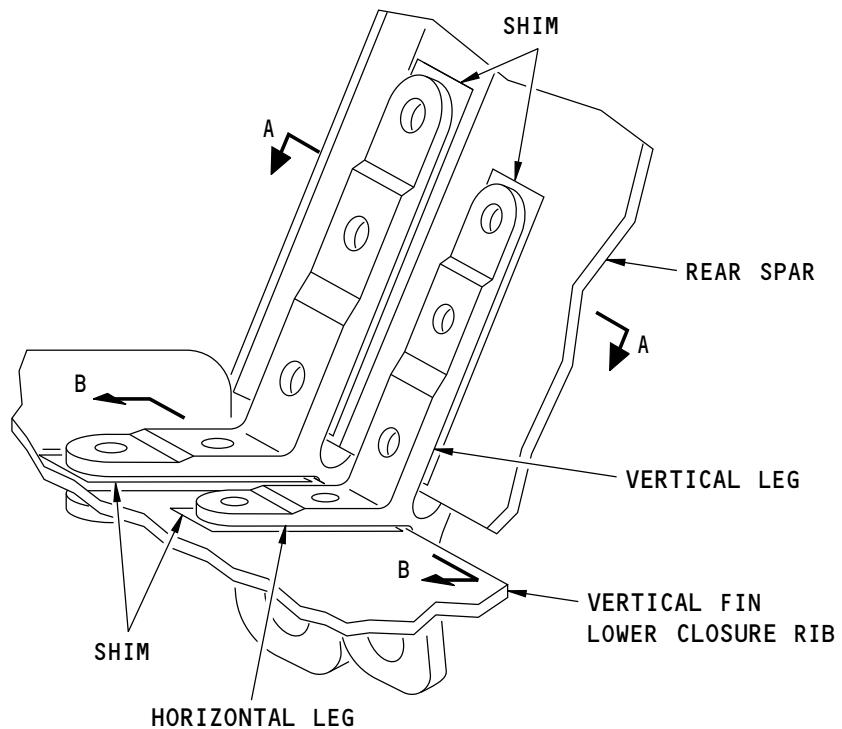
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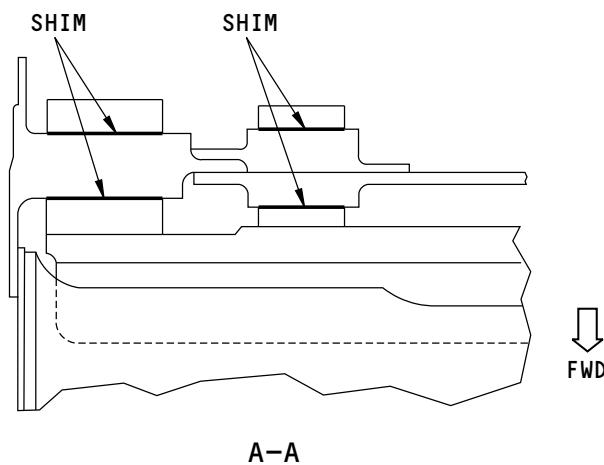


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SHIM LOCATIONS

(C)



A-A

2231019 S0000497349_V1

Vertical Stabilizer Rear Spar Fittings Shim Locations
Figure 101 (Sheet 2 of 3)

55-30-90

ALLOWABLE DAMAGE 2

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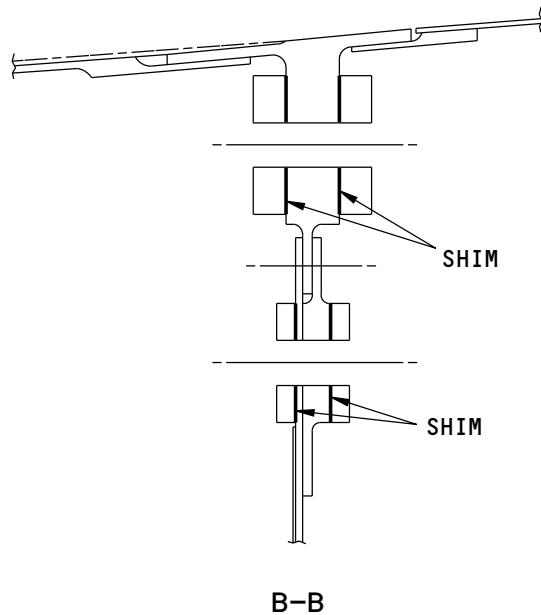
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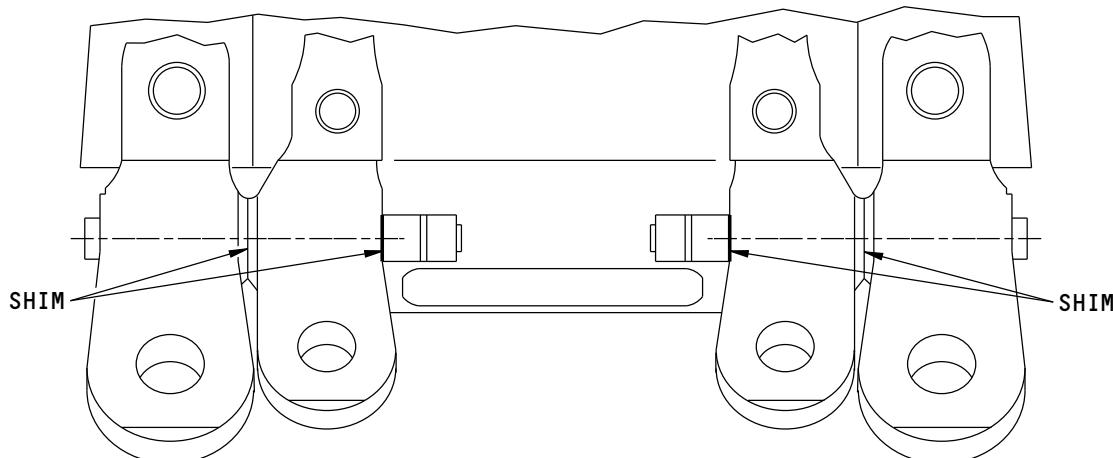
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STRUCTURAL REPAIR MANUAL



B-B



SHIM LOCATIONS

D

2231085 S0000497361_V1

Vertical Stabilizer Rear Spar Fittings Shim Locations
Figure 101 (Sheet 3 of 3)

55-30-90

ALLOWABLE DAMAGE 2

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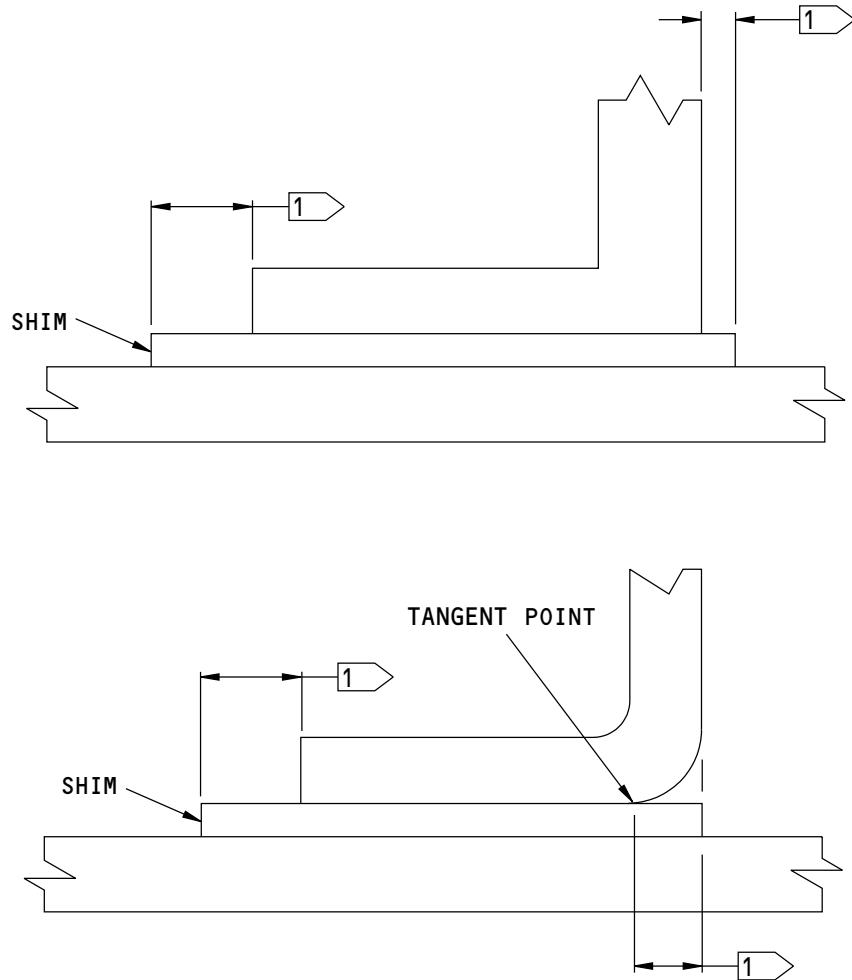
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STRUCTURAL REPAIR MANUAL



NOTES

- 1 WHEN YOU TRIM THE SHIM, MAKE SURE THE TRIMMED EDGE IS 0.00 TO 0.10 INCH (0.00 TO 2.54 mm) LONGER THAN THE EDGE OF THE PART, OR HAS A 0.00 TO 0.05 INCH (0.00 TO 1.27 mm) RECESS.

2221101 S0000496685_V1

Edge Mismatch Limits for Laminated Shims and Solid Fillers
Figure 102

55-30-90

ALLOWABLE DAMAGE 2

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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING

4. Allowable Damage Limits

- A. Attachment bolts
 - (1) Fastener rotation is not permitted.
 - (2) Fastener looseness is not permitted.
 - (3) Fastener damage, which includes corrosion, is not permitted.
 - B. Structural joint
 - (1) Corrosion is not permitted.
 - (2) Visible damage is not permitted.
 - C. Shim migration

Measure the gap between the shim and adjacent structure with a 0.002 in. (0.051 mm) thick and 0.50 in. (12.70 mm) wide feeler gage. Measure the shim thickness.

 - (1) If the migrated shim thickness is more than 0.020 in. (0.508 mm), contact The Boeing Company.
 - (2) Make sure that partial gaps on a surface of the shim are not more than 0.005 in. (0.127 mm).
 - (3) Make sure that partial gaps do not extend to the shank of the bolt.
 - (4) Do an estimate to make sure that the shim is under a minimum of 50 percent of the area of each fastener head in a joint. Do an estimate from the dimensions of the migrated shim and the gaps. If you cannot do the estimate, do the test that follows.
- NOTE:** Shim migration can decrease the preload in the fastener. If the fastener is tightened with a migrated shim, it can cause pull-up stresses in the structure. This can cause damage to the structure.
- (a) Make sure that the torque on the nut is a minimum torque value in Table 101/ALLOWABLE DAMAGE 2. Refer to Figure 103/ALLOWABLE DAMAGE 2 for fastener type identification.
 - 1) Tighten the nut gradually until the applied torque equals a minimum torque on the nut or the nut starts to turn.
 - 2) If the nut starts to turn before minimum torque on the nut, contact The Boeing Company. Include the torque value that caused rotation when you contact The Boeing Company.
 - (b) If there is no access to the nut, then make sure that the torque on the bolt head is a minimum torque value in Table 101/ALLOWABLE DAMAGE 2.
 - 1) Tighten the bolt head gradually until the applied torque equals a minimum torque on the bolt head or the bolt starts to turn.
 - 2) If the bolt head starts to turn before minimum torque on the bolt head, contact The Boeing Company. Include the torque value that caused rotation when you contact The Boeing Company.

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ALLOWABLE DAMAGE 2

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Table 101: Fastener Torque

FASTENER TYPE	MINIMUM TORQUE ON THE NUT	MINIMUM TORQUE ON THE BOLT HEAD
A	4300 in-lb (486 N·m)	4850 in-lb (548 N·m)
B	2275 in-lb (257 N·m)	2750 in-lb (311 N·m)
C	1500 in-lb (169 N·m)	1700 in-lb (192 N·m)
D	975 in-lb (110 N·m)	1075 in-lb (121 N·m)

- (5) Make sure that the shim is firmly in position and cannot be removed or pulled away from the fitting.

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ALLOWABLE DAMAGE 2

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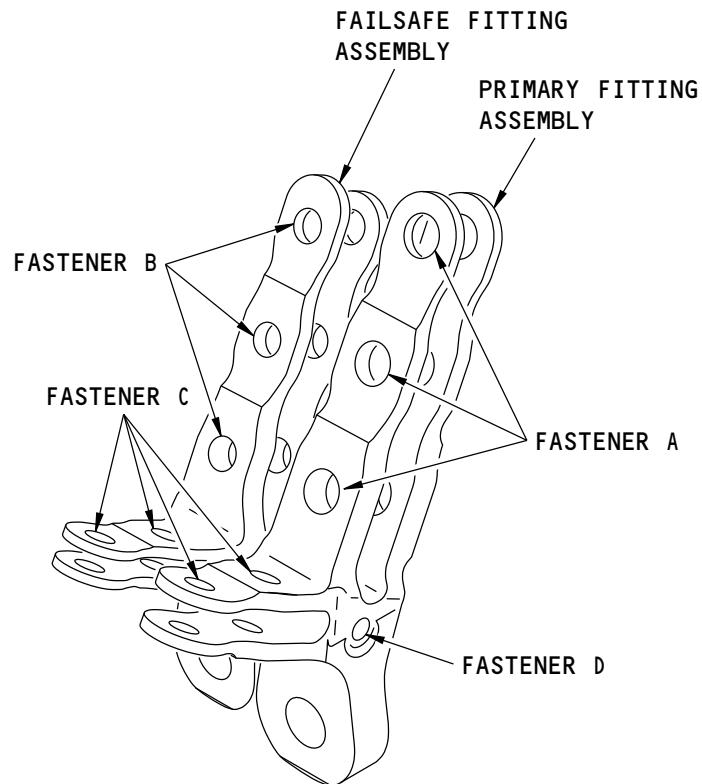
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2 FITTING ASSEMBLIES

2257956 S0000505957_V1

Fastener Torque Information
Figure 103

55-30-90

ALLOWABLE DAMAGE 2

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5. Inspection Requirements

- A. Regular Maintenance Planning Data (MPD) inspections (55-810-00, 55-814-00, 55-050-00, 55-060-00) will be used to examine this area.

NOTE: No supplemental inspections are necessary.

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ALLOWABLE DAMAGE 2

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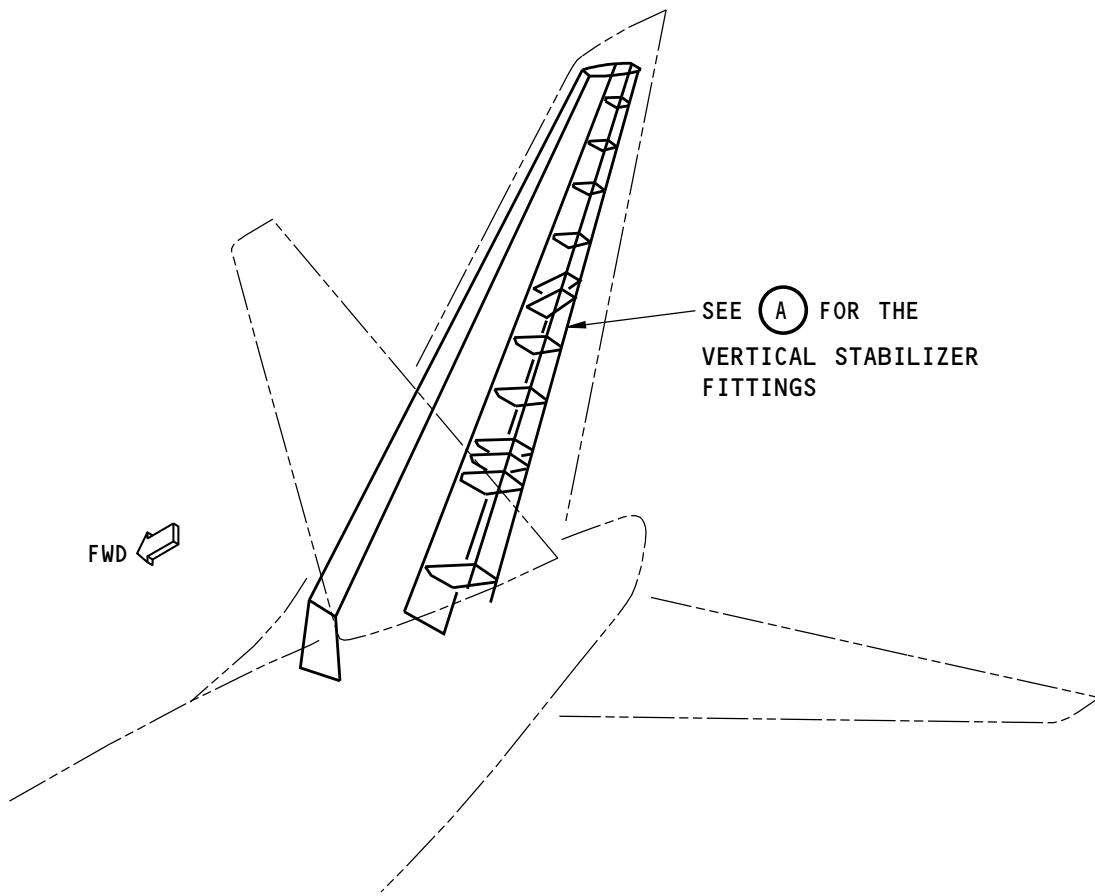
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REPAIR GENERAL - VERTICAL STABILIZER HINGE FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

G49437 S0006593649_V2

Vertical Stabilizer Fitting Repair
Figure 201 (Sheet 1 of 2)

55-30-90

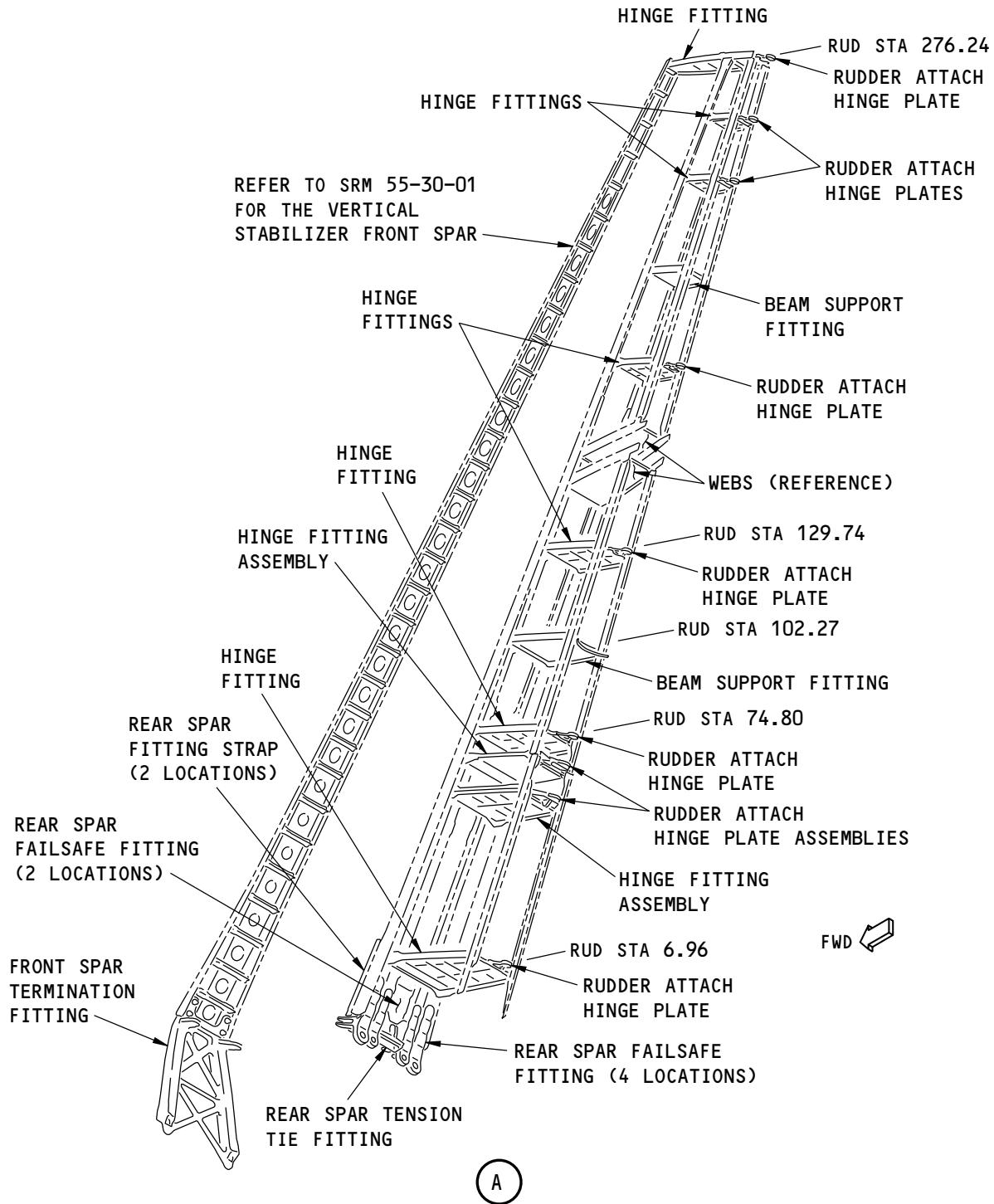
REPAIR GENERAL

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G57198 S0006593650_V1

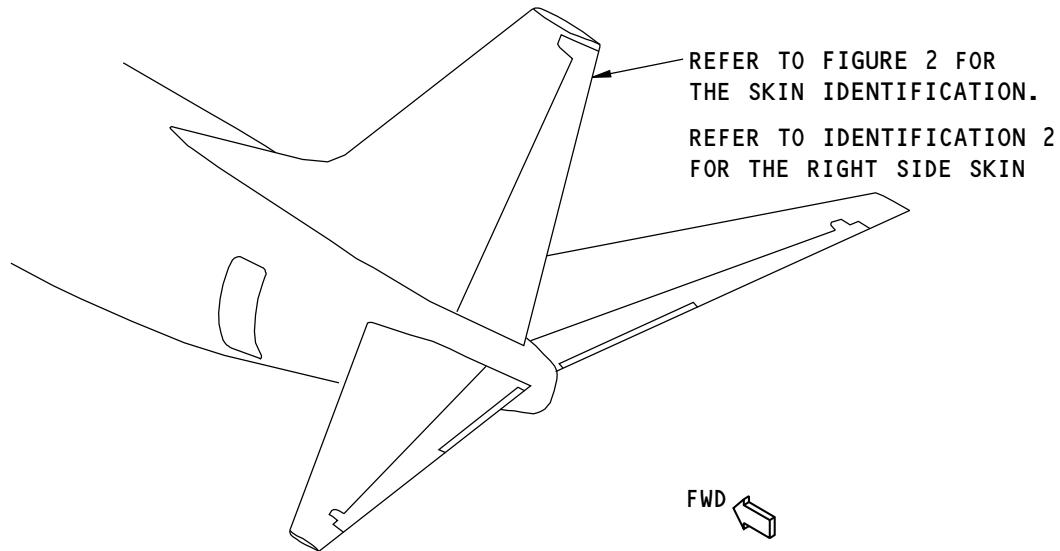
**Vertical Stabilizer Fitting Repair
Figure 201 (Sheet 2 of 2)**

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REPAIR GENERAL
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IDENTIFICATION 1 - RUDDER SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Rudder Skin Location

Figure 1

Table 1:

F75655 S0006593655_V1

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A0000	Rudder Integration Functional Product Collector
173A0001	Installation- Rudder
173A0100	Rudder Functional Product Collector
173A0150	Centerline Diagram - Rudder
173A4000	Skin Panel Installation-Rudder
173A4001	Skin Panel Assembly - Rudder
173A4300	Cover Panel Assembly - Rudder

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IDENTIFICATION 1

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Table 1: (Continued)

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A4301	Gap Cover Assembly - Balance Arm, Rudder
173A5000	Balance Arm Installation - Rudder
173A5001	Balance Arm Assembly - Rudder

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IDENTIFICATION 1

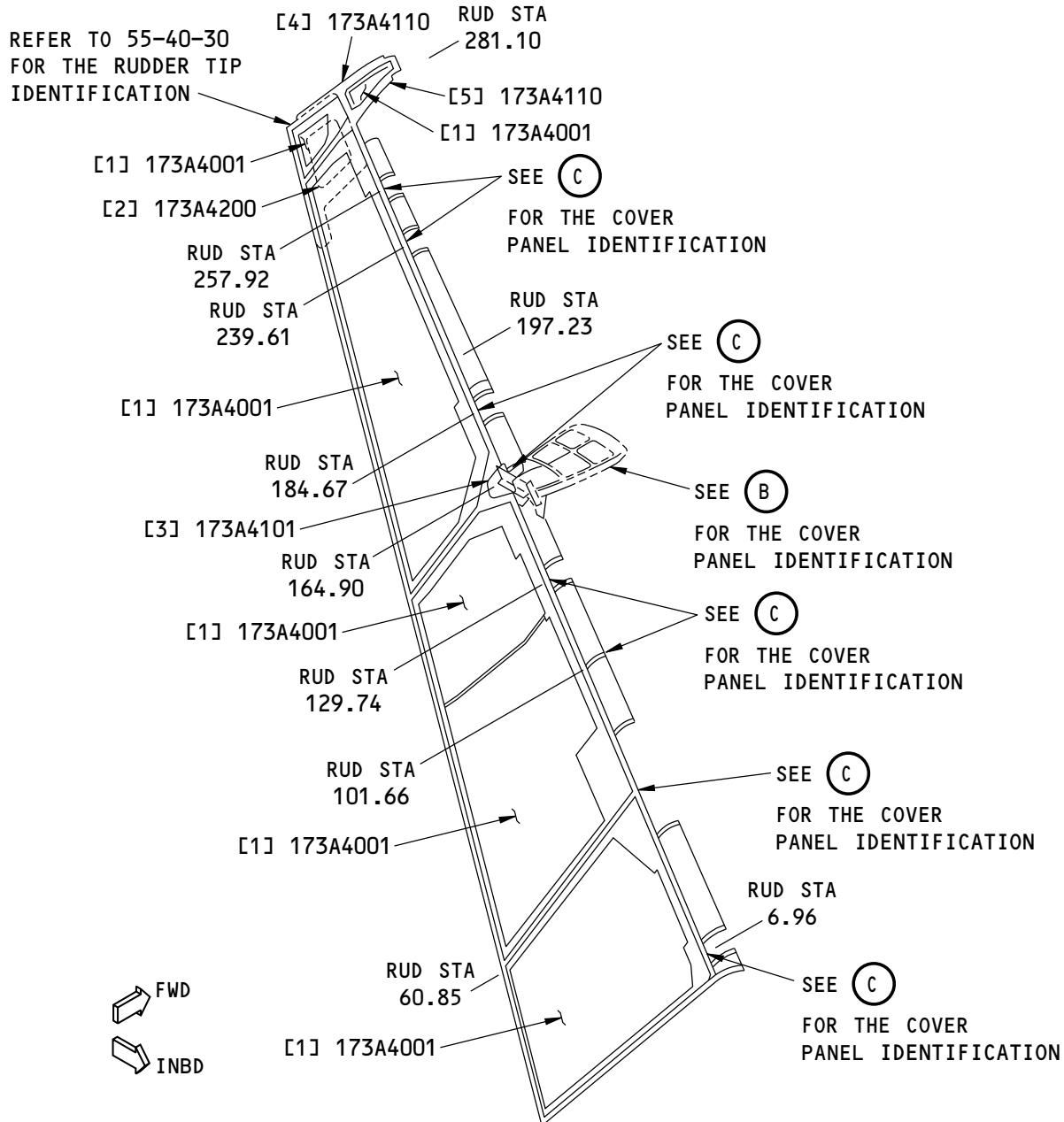
Page 2

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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(EXCEPT AS NOTED)

A

F76167 S0006593657_V2

**Rudder Skin Identification
Figure 2 (Sheet 1 of 3)**

55-40-01

IDENTIFICATION 1

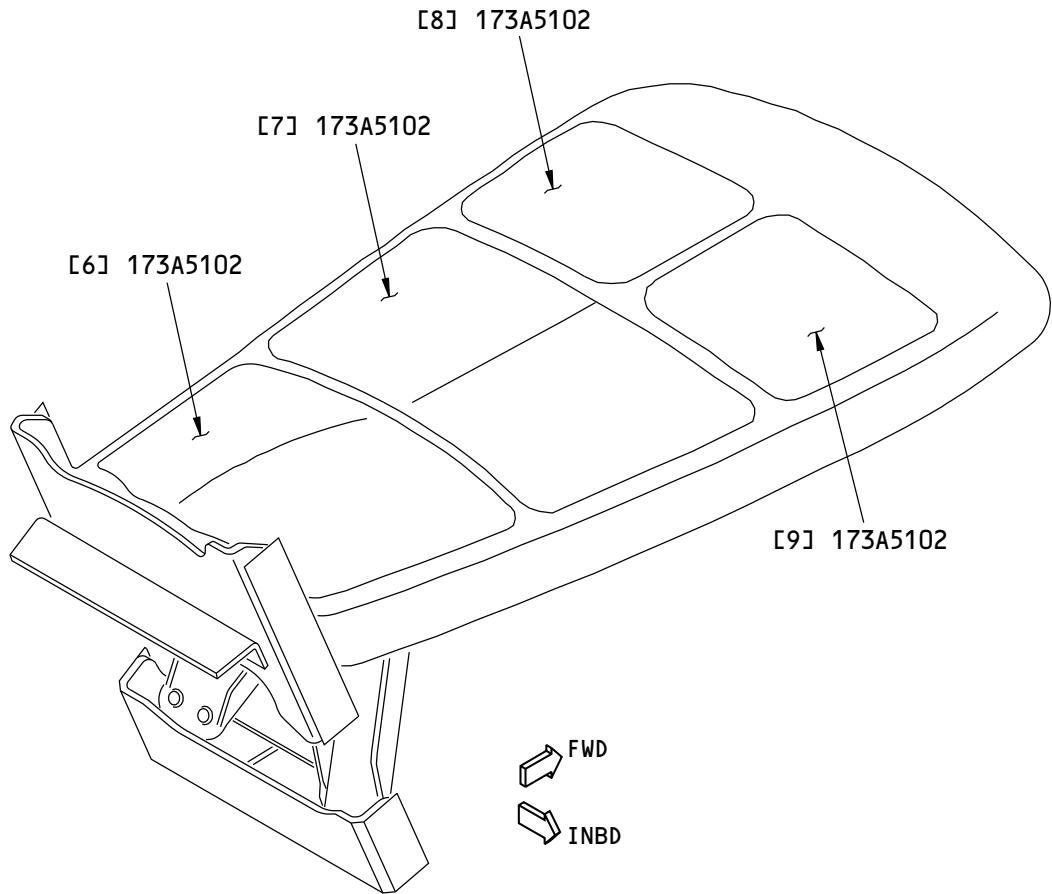
Page 3

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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE BALANCE ARM IS SHOWN, RIGHT SIDE IS OPPOSITE
(EXCEPT AS NOTED)

B

F76388 S0006593658_V1

Rudder Skin Identification
Figure 2 (Sheet 2 of 3)

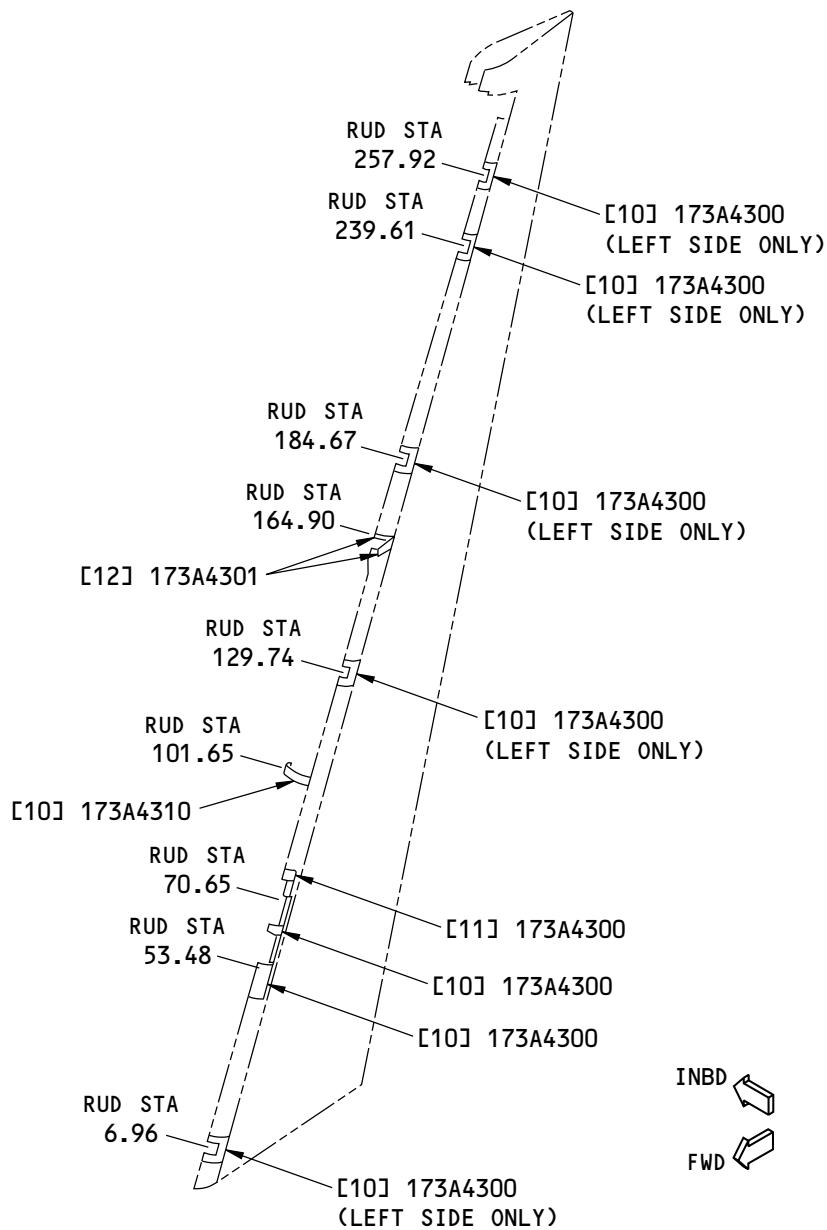
55-40-01
IDENTIFICATION 1
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

GAP COVER LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
(EXCEPT AS NOTED)

(C)

F76948 S0006593659_V1

Rudder Skin Identification
Figure 2 (Sheet 3 of 3)

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rudder Skin - Bonded Part Skin Core - Lower Closure Rib to RUD STA 61.39 Core - RUD STA 61.39 to RUD STA 164.90 Core - RUD STA 164.90 to RUD STA 282.17 Core - Aft of Rudder Front Spar RUD STA 282.17 to FIN WATERLINE 270 Core - Forward of Rudder Front Spar RUD STA 282.17 to FIN WATERLINE 270		Non-metallic honeycomb sandwich Refer to Figure 3 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[2]	Conductive Frame	0.020 (0.51)	6061-T4 sheet	
[3]	Doubler, Balance Arm - Rudder	0.025 (0.64)	Ti-6Al-4V titanium plate as given in MIL-T-9046, AB-1, Condition A	
[4]	Strap - Bonded		Epoxy impregnated graphite woven fabric. Refer to Figure 4	
[5]	Strap - Bonded		Epoxy impregnated graphite woven fabric. Refer to Figure 5	
[6]	Skin Panel		Fiberglass prepreg fabric. Refer to Figure 6	
[7]	Skin Panel		Fiberglass prepreg fabric. Refer to Figure 7	
[8]	Skin Panel		Fiberglass prepreg fabric. Refer to Figure 8	
[9]	Skin Panel		Fiberglass prepreg fabric. Refer to Figure 9	
[10]	Cover Panel	0.063 (1.60)	2024-T3 clad sheet	
[11]	Cover Panels (2)	0.063 (1.60)	2024-T3 clad sheet	
[12]	Gap Cover Assembly Cover Splice Plate	0.063 (1.60) 0.080 (2.03)	2024-T3 clad sheet 2024-T3 clad sheet (Optional: 2024-T42)	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

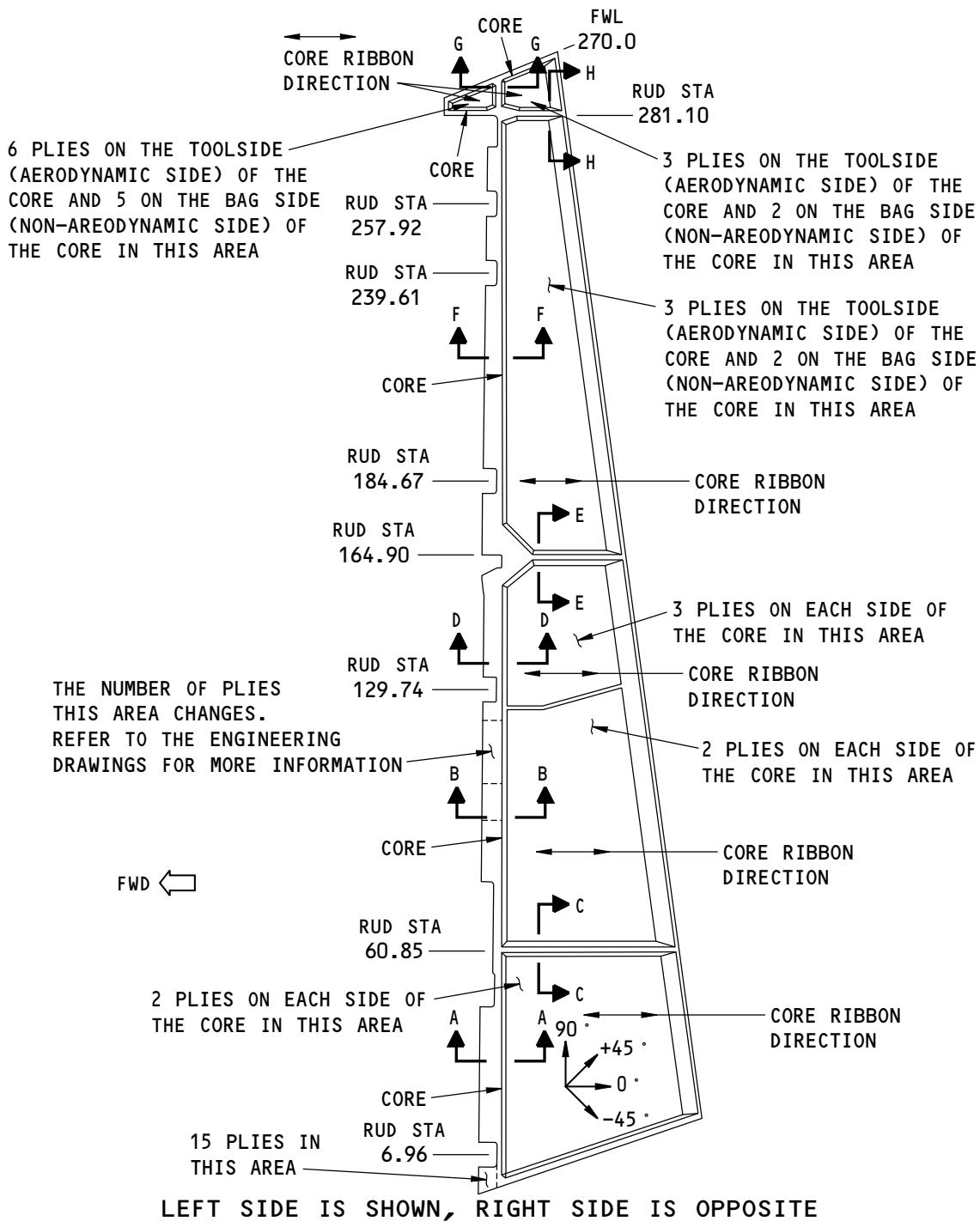
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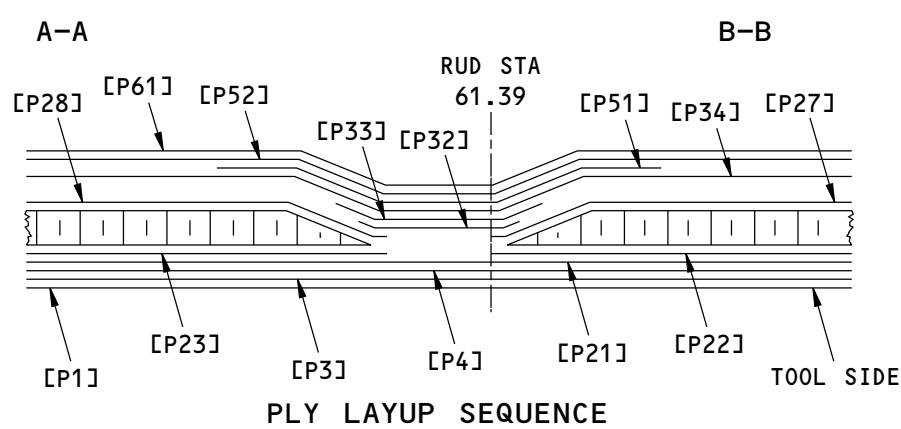
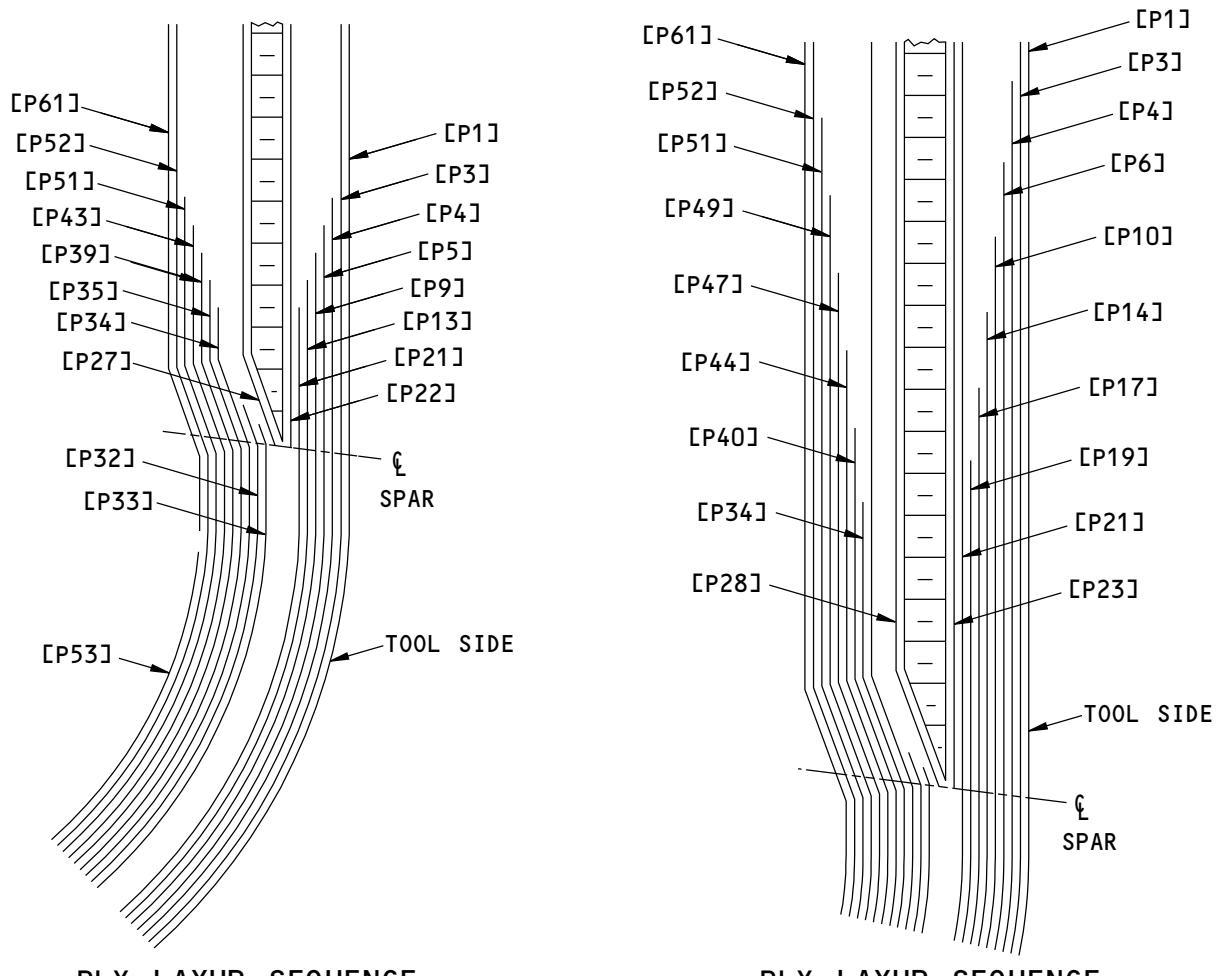
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F77084 S0006593661_V1

Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 1 of 4)

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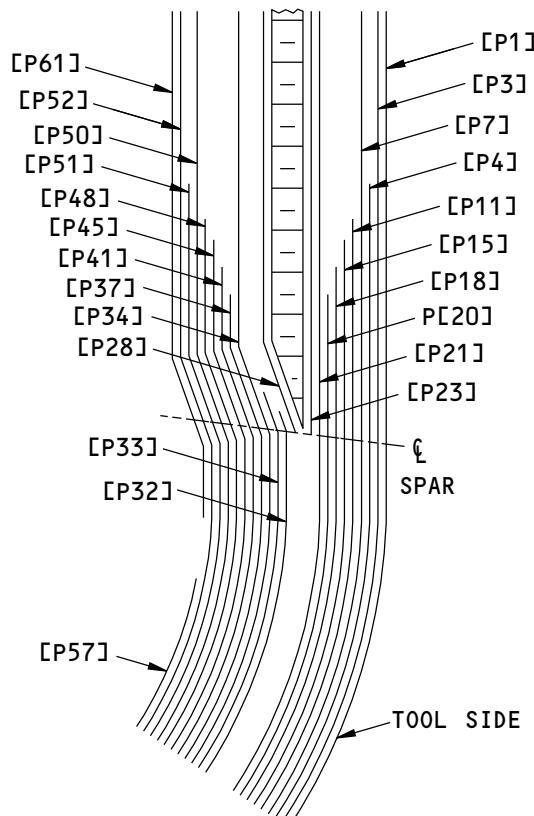
F77170 S0006593662_V1

Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 2 of 4)

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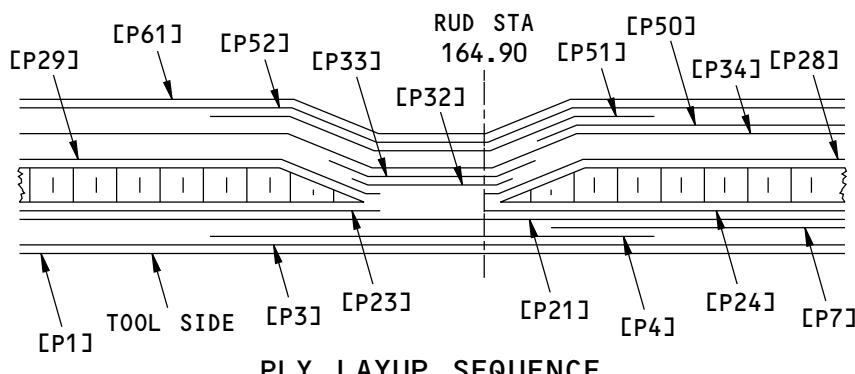


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PLY LAYUP SEQUENCE

D-D



PLY LAYUP SEQUENCE

E-E

F77270 S0006593663_V1

Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 3 of 4)

55-40-01

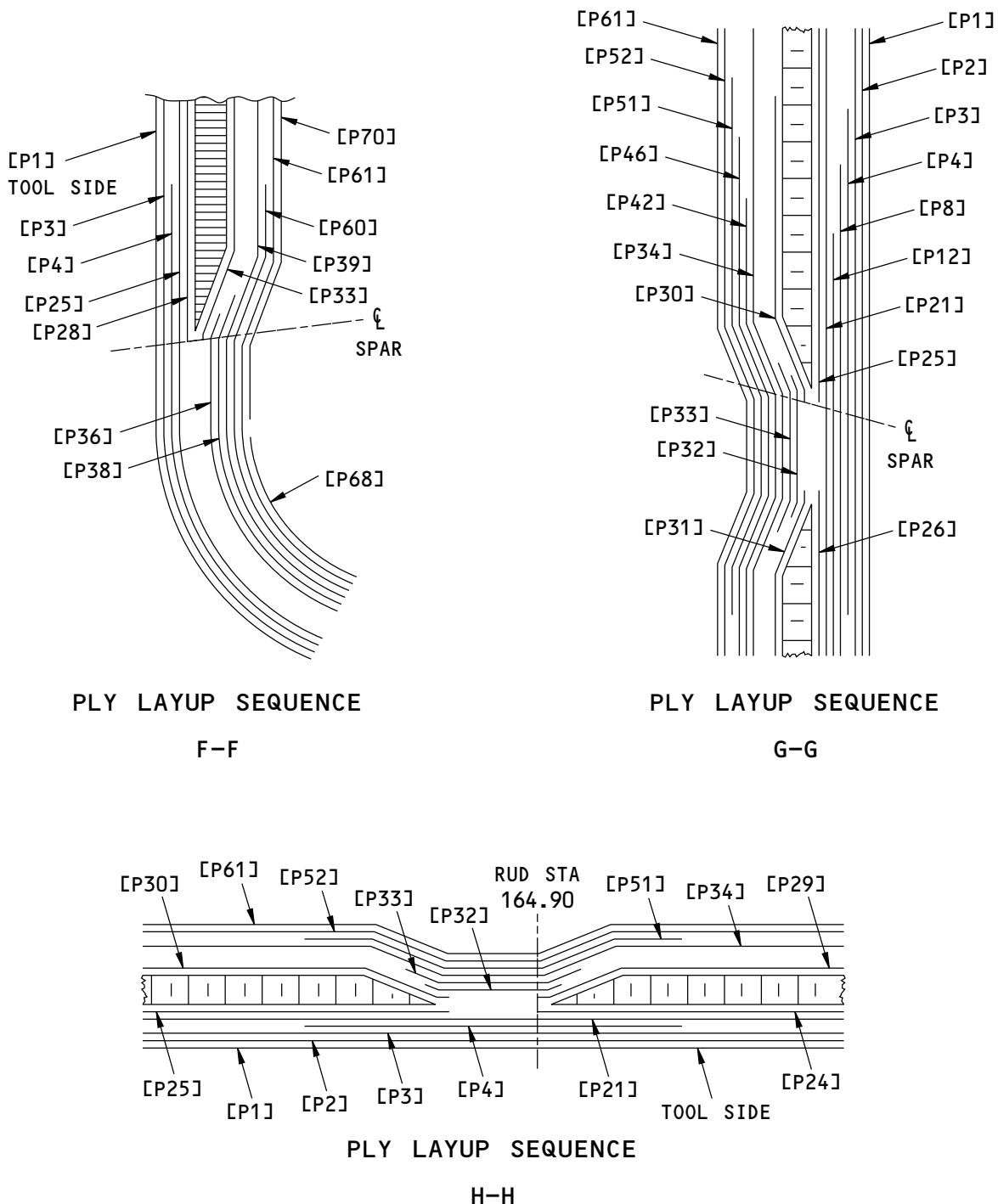
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F77309 S0006593664_V2

Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 4 of 4)

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IDENTIFICATION 1

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STRUCTURAL REPAIR MANUAL**

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1	-----	Co-cure surfacer as given in BMS 8-341, Type II
P2, P53, P54, P55, P56, P57, P58, P59, P60	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Class III, Style 108
P3, P5, P6, P7, P8, P13, P14, P15, P16, P19, P20, P32, P33, P35, P36, P37, P38, P43, P44, P45, P46, P49, P50, P52	+ or - 45 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P4, P9, P10, P11, P12, P17, P18, P21, P34, P39, P40, P41, P42, P47, P48, P51	0 or 90 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P22, P23, P24, P25, P26, P27, P28, P29, P30, P31	-----	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A
P61	-----	1 mil white bondable tedlar film as given in BAC 5315-4

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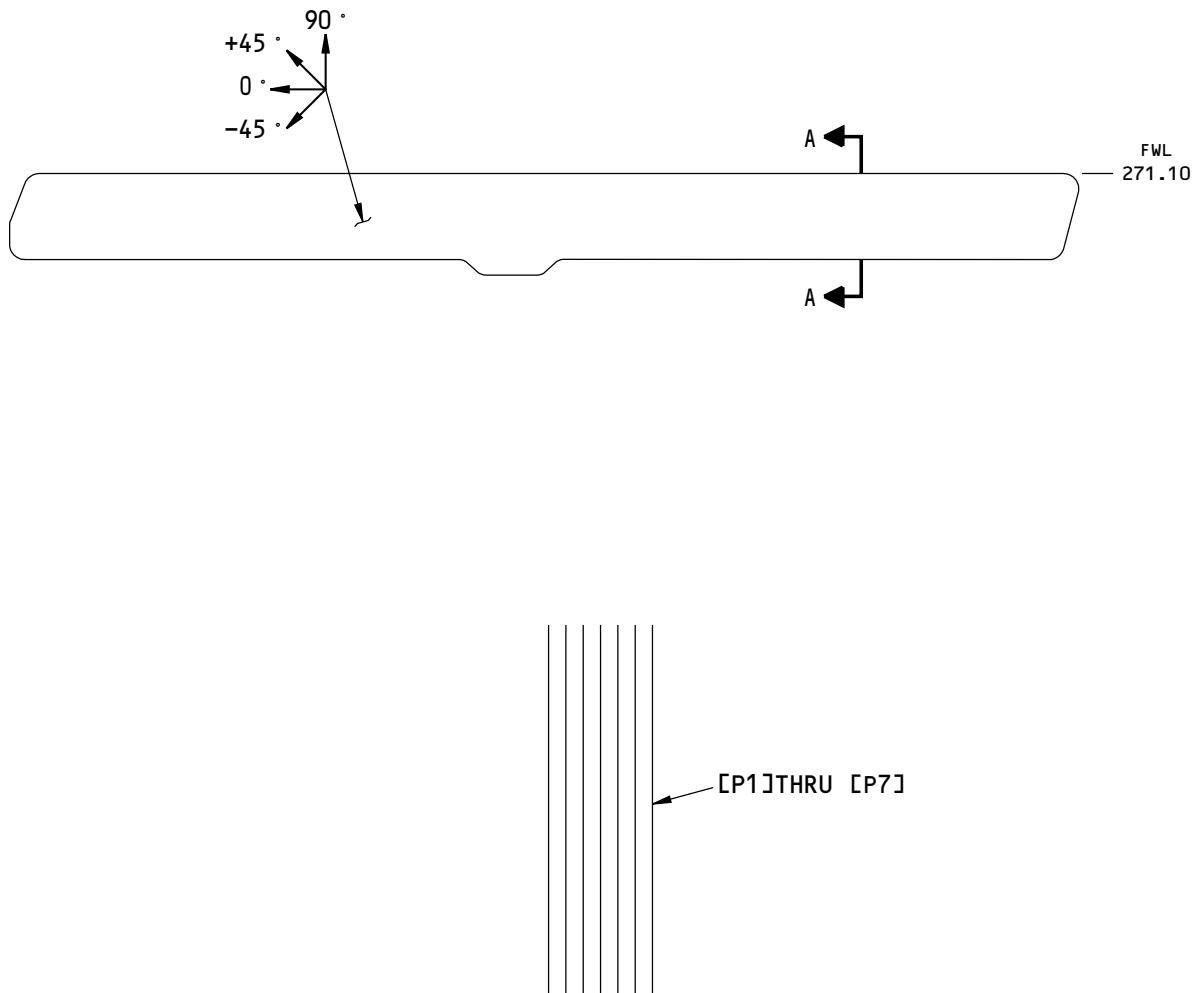
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Ply Direction and Ply Sequence for Figure 2, Item [4]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7	0 or 90 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6	+ or - 45 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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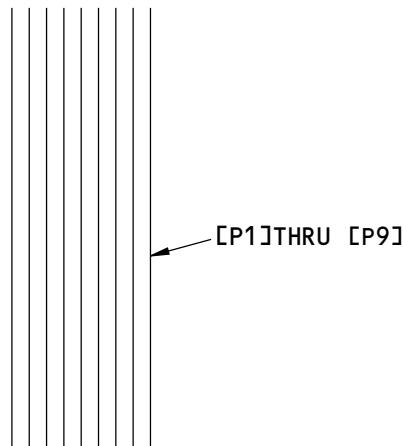
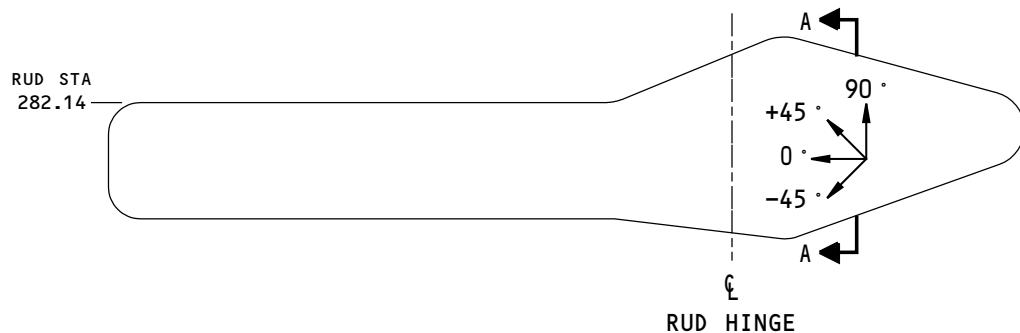
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PLY LAYUP SEQUENCE

A-A

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Ply Direction and Ply Sequence for Figure 2, Item [5]
Figure 5

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7, P9	0 or 90 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8	+ or - 45 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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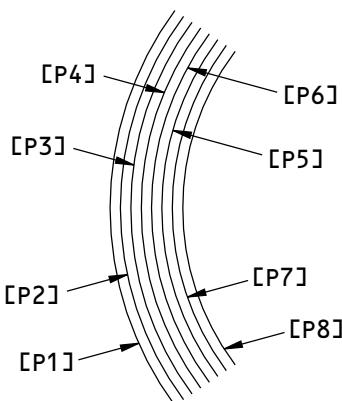
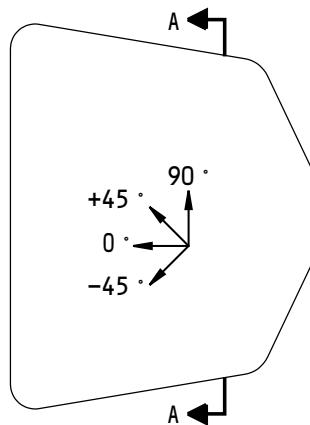
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PLY LAYUP SEQUENCE

A-A

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Ply Direction and Ply Sequence for Figure 2, Item [6]
Figure 6

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)
P2, P4, P5, P7	0 or 90 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)

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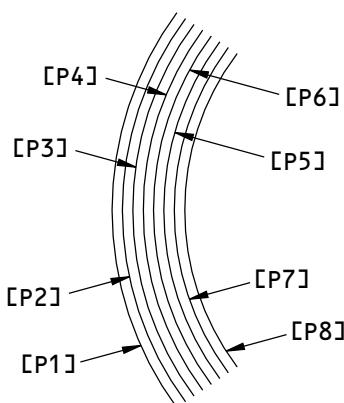
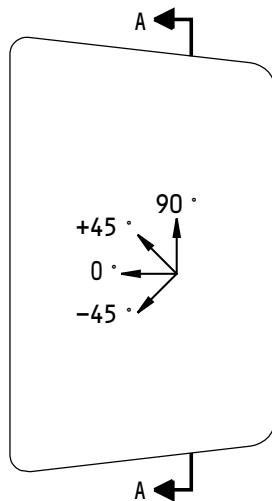
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PLY LAYUP SEQUENCE

A-A

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Ply Direction and Ply Sequence for Figure 2, Item [7]
Figure 7

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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [7]		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)
P2, P4, P5, P7	0 or 90 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)

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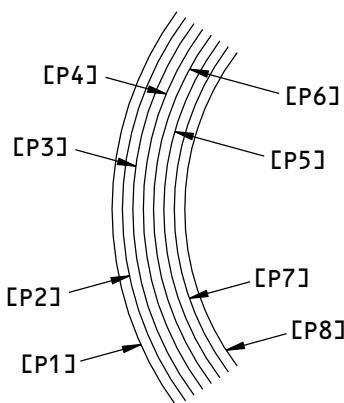
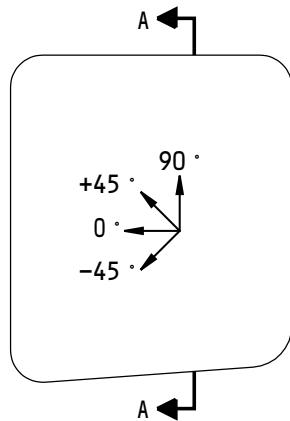
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PLY LAYUP SEQUENCE

A-A

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Ply Direction and Ply Sequence for Figure 2, Item [8]
Figure 8

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Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [8]		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)
P2, P4, P5, P7	0 or 90 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)

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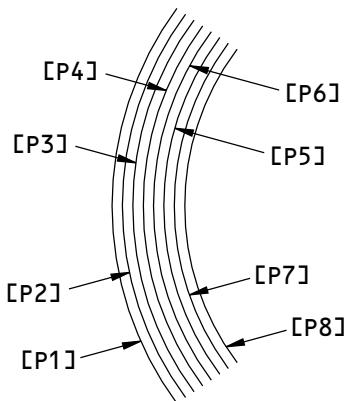
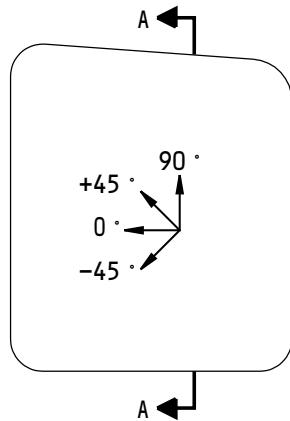
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PLY LAYUP SEQUENCE

A-A

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Ply Direction and Ply Sequence for Figure 2, Item [9]
Figure 9

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Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [9]		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)
P2, P4, P5, P7	0 or 90 degrees	Fiberglass prepreg fabric as given in BMS 8-79, Style 7781, Class III, Grade B, (Style 1581 is optional)

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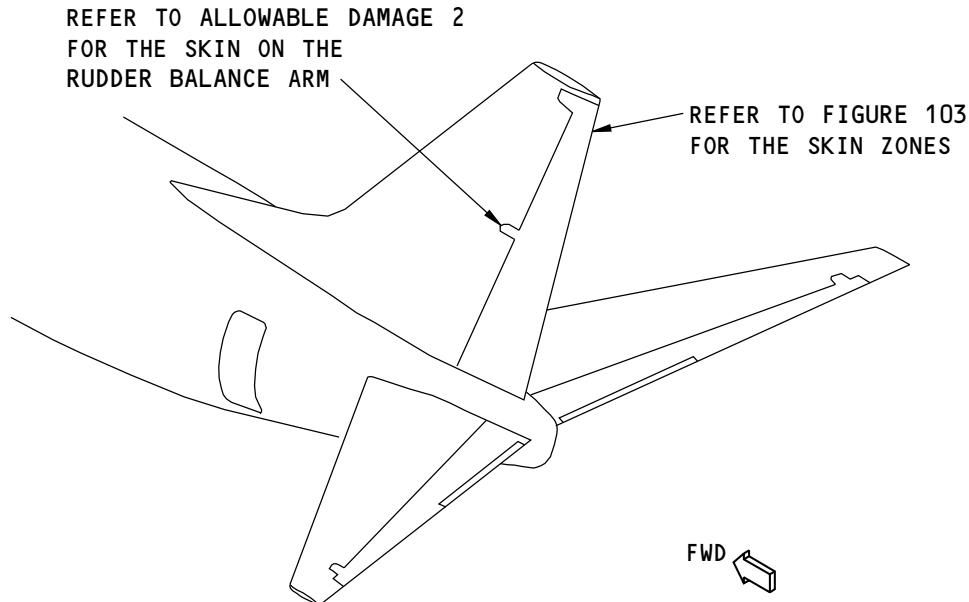


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ALLOWABLE DAMAGE 1 - RUDDER SKIN

1. Applicability

- A. Allowable Damage 1 gives the allowable damage limits for the Rudder Skin shown in Rudder Skin Location, Figure 101/ALLOWABLE DAMAGE 1.



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Rudder Skin Location
Figure 101

2. General

- A. Do an inspection of the damaged area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
 - (2) Refer to Definitions of Damage Size, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of the damage.
- B. Remove all contamination and water from the structure.
- (1) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (2) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (3) Refer to 51-70-04 for the damage removal procedures.

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- C. Seal all permitted damage areas that are not more than one ply deep and agree with the allowable damage limits. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 Seal the damage with one of the two methods that follow:
- (1) Make a temporary seal.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location.
 - (c) Make sure that the tape is in satisfactory condition at normal maintenance intervals.
 - (2) Make a permanent seal.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - (b) Apply one layer of BMS 10-79, Type III or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.
 - (c) Apply one layer of BMS 10-60, Type II enamel to the exterior surfaces of the areas sealed with epoxy resin. Refer to AMM 51-21-00/701.
- D. Seal all permitted damage areas that are more than one ply deep and agrees with the allowable damage limits as follows:
- (1) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
 - (2) Make a temporary seal with aluminum foil tape (speed tape).
 - (3) Keep a record of the location.
 - (4) Repair the damage at or before 250 flight cycles from the time the seal was made.
- E. Refer to Rudder Skin Zones, Figure 103/ALLOWABLE DAMAGE 1 for the locations of the rudder skin zones.
- F. Make sure that the rudder is balanced. Refer to 51-60-07 for the balance procedures.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
TYPE OF STRUCTURE	ZONE LOCATION	PARAGRAPH
HONEYCOMB CORE AREA	1	4.A
	2	4.B
	3	4.C
	4	4.D
	5	4.E
SOLID LAMINATE AREA	6	4.F
	7	4.G

3. References

Reference	Title
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS

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(Continued)

Reference	Title
51-60-07	RUDDER BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR 8	Repair of Damage to a Fastener Hole With Prepreg Materials
51-70-06, REPAIR GENERAL	Room Temperature Cure Repairs With Wet Layup Materials For Glass Fabric Reinforced Plastic Solid Laminates and Honeycomb Core Panels
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

A. Zone 1 - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 5.00 inches in length
- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in Paragraph 2

- (4) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one carbon ply in depth

NOTE: Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one carbon ply in depth.

- (b) A maximum of 2.0 inches in diameter
- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in Paragraph 2

- (5) Holes and Punctures are permitted if they are:

- (a) A maximum of 2.0 inches in diameter.

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- (b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that are sealed as given in Paragraph 2.

- (6) Delaminations are permitted if they are:

- (a) A maximum of 2.0 inches in diameter of the carbon ply
(b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in Paragraph 2

B. Zone 2 - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 5.0 inches in length
(c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in Paragraph 2

- (4) Dents that do not cause damage to the carbon fibers are permitted if they:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth

- (b) A maximum of 2.0 inches in diameter

- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass fiber plies
- Are sealed as given in Paragraph 2

- (5) Holes and Punctures are permitted if they are:

- (a) A maximum of 2.0 inches in diameter

- (b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that are sealed as given in Paragraph 2.

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- (6) Delaminations are permitted if they are:
- A maximum of 2.00 inches in diameter of the carbon ply
 - A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

C. Zone 3 - Honeycomb Core Area

- Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- A maximum of 5.0 inches in length
- A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- Dents that do not cause damage to the carbon fibers are permitted if they are:

- A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one carbon ply in depth.

- A maximum of 2.0 inches in diameter
- A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- Holes and Punctures are permitted if they are:

- A maximum of 2.0 inch in diameter

- A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that are sealed as given in Paragraph 2

- Delaminations are permitted if they are:

- A maximum of 2.0 inches in diameter of the carbon ply

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- (b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

D. Zone 4 - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
(2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A Maximum of 5.0 inches in length
(c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (4) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one carbon ply in depth.

- (b) A maximum of 2.0 inches in diameter

- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (5) Holes and Punctures are permitted if they are:

- (a) A maximum of 2.0 inches in diameter

- (b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that are sealed as given in Paragraph 2.

- 1) Are sealed as given in Paragraph 2

- (6) Delaminations are permitted if they are:

- (a) A maximum of 2.00 inches in diameter

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- (b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

E. Zone 5 - Honeycomb Core Area

- (1) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
(2) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted.
(3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 5.0 inches in length
(c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (4) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one carbon ply in depth.

- (b) A maximum of 2.0 inches in diameter

- (c) A minimum of 5.00 inches away from the edge

- (5) Holes and Punctures are permitted if they are:

- (a) A maximum of 2.0 inches in diameter

- (b) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that are sealed as given in Paragraph 2.

- (6) Delaminations are permitted if they are:

- (a) The diameter is a maximum of 2.0 inches

- (b) The damage is a minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

F. Zone 6 - Solid Laminate Areas

- (1) For lightning strike damage, refer to paragraph 4.I.

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- (2) Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted.
- (4) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 0.625 inch in length
- (c) A maximum of 0.25 inch in width
- (d) Not more than one fastener or fastener hole in eight is damaged
- (e) A minimum of 5.00 inches away from the edge of any damaged hole, damaged part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (5) Dents that do not cause damage to the carbon fibers are permitted if they are:

- (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 0.625 inch in diameter
- (c) Not more than one fastener hole in eight is damaged
- (d) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (6) Holes and Punctures are permitted if:

- (a) Not more than one fastener or fastener hole in eight is damaged
- (b) A maximum of 0.625 inch in diameter
- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that are sealed as given in Paragraph 2.

- (7) Delaminations are permitted if:

- (a) Not more than one fastener or fastener hole in eight is damaged
- (b) A maximum of 0.625 inch in diameter
- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies

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ALLOWABLE DAMAGE 1

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- Are sealed as given in Paragraph 2
- (8) Edge Erosion is permitted as shown in Rudder Skin Panel Allowable Damage, Figure 104/
ALLOWABLE DAMAGE 1.

- (9) Edge damage is permitted if it is:
 - (a) A maximum of one ply in depth
 - (b) A maximum of 0.25 inch in width

G. Zone 7 - Solid Laminate Areas

- (1) For lightning strike damage, refer to paragraph 4.I.
- (2) Nicks, Gouges, and Scratches that do cause damage to the glass fibers are permitted.
- (3) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (4) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if they are:
 - (a) A maximum of one ply in depth

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) A maximum of 0.625 inch in length
- (c) A maximum of 0.25 inch in width
- (d) Not more than one fastener or fastener hole in eight is damaged
- (e) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (5) Dents are permitted if:
 - (a) Not more than one fastener or fastener hole in ten is damaged
 - (b) They are a maximum of one ply in depth
 - (c) A maximum of 0.625 inch in diameter
 - (d) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (6) Holes and Punctures are permitted if:
 - (a) Not more than one fastener or fastener hole in eight is damaged
 - (b) A maximum of 0.625 inch in diameter
 - (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.
- (7) Delaminations are permitted if:
 - (a) Not more than one fastener or fastener hole in eight is damaged
 - (b) A maximum of 0.625 inch in diameter

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- (c) A minimum of 5.00 inches away from the edge of any fastener hole, part edge or other damage.

NOTE: Other damage does not include nicks, gouges, and scratches that:

- Do not cause damage to the glass or carbon fiber plies
- Are sealed as given in Paragraph 2

- (8) Edge Erosion is permitted as shown in Rudder Skin Panel Allowable Damage, Figure 104/
ALLOWABLE DAMAGE 1.

- (9) Edge damage is permitted if it is:

- (a) A maximum of one ply in depth
- (b) A maximum of 0.25 inch in width.

H. Zone 8 - Honeycomb Core Area

- (1) The same limits as described in either Zone 2 or Zone 4 are permitted.

I. Lightning Strike Trailing Edge Damage

NOTE: Damage is permitted to both sides of the skin panel at the same fastener location.

NOTE: Damage is time limited to 250 flight cycles. Refer to Paragraph I (1) (b).

- (1) Damage is permitted as given in Figure 105 provided:

- (a) There are a minimum of ten fastener lengths not damaged between any two damaged fastener locations.
- (b) You do a permanent repair of the damage at or before 250 flight cycles as given in 51-70-05, REPAIR 8.

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ALLOWABLE DAMAGE 1

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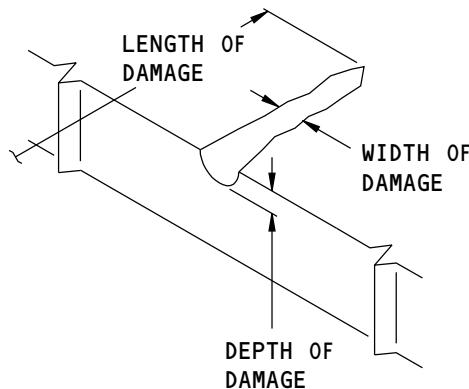
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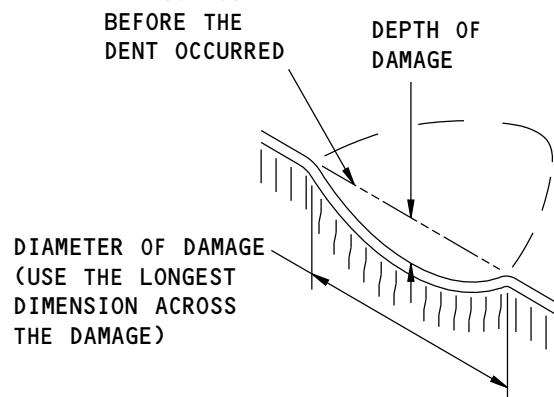
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SIZE DEFINITIONS FOR
NICK, GOUGE, OR SCRATCH DAMAGE

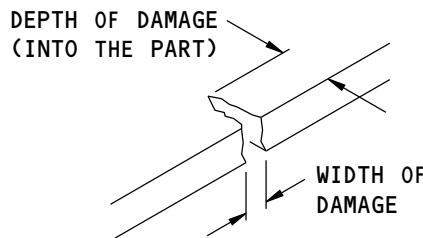
(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

F80761 S0006593682_V1

Definitions of Damage Size
Figure 102

55-40-01

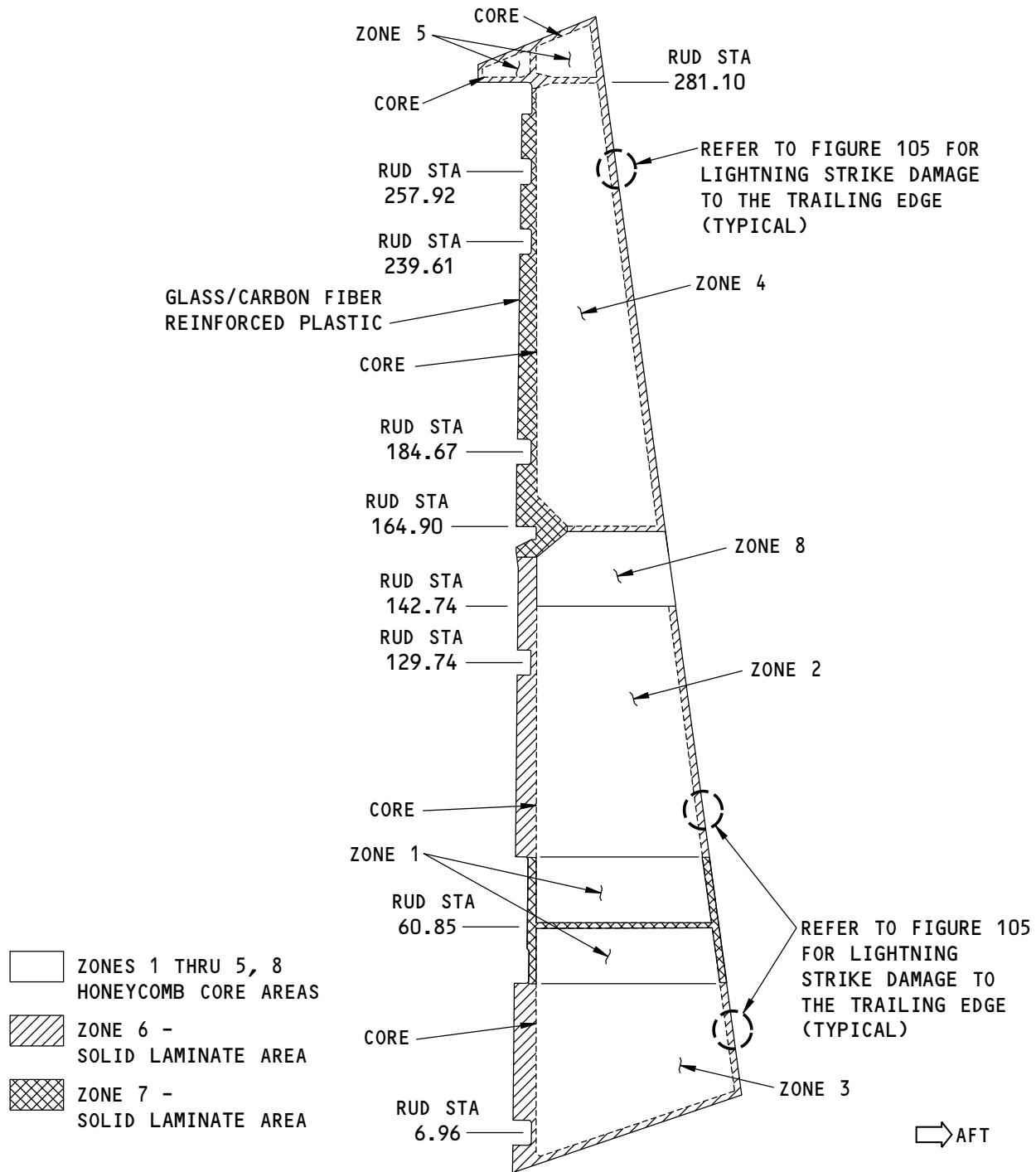
ALLOWABLE DAMAGE 1

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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE F80781 S0006593683_V2

Rudder Skin Zones
Figure 103

55-40-01

ALLOWABLE DAMAGE 1

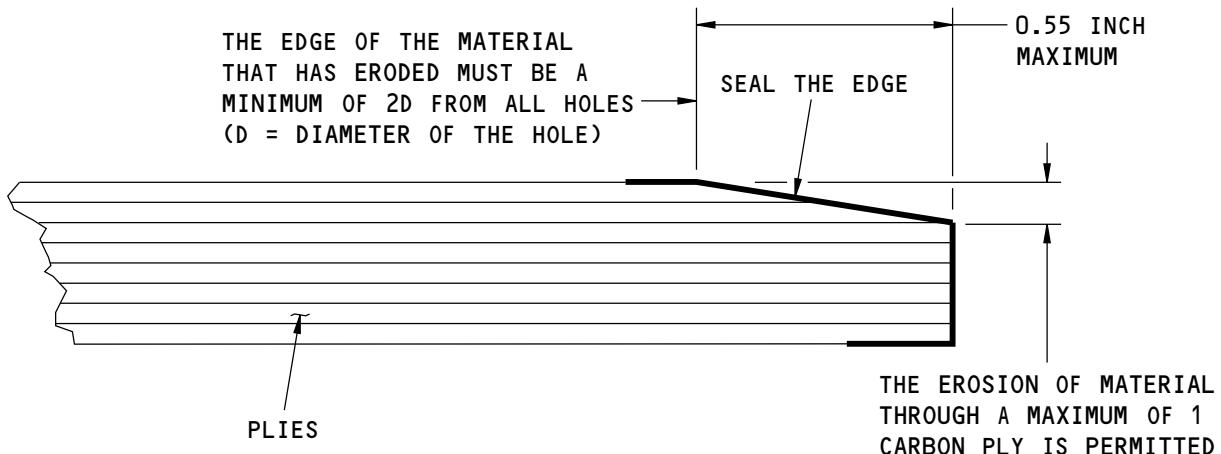
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SEALING OF EROSION DAMAGE AT AN EDGE OF COMPOSITE PARTS

G66890 S0006593684_V1

Rudder Skin Panel Allowable Damage
Figure 104

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ALLOWABLE DAMAGE 1

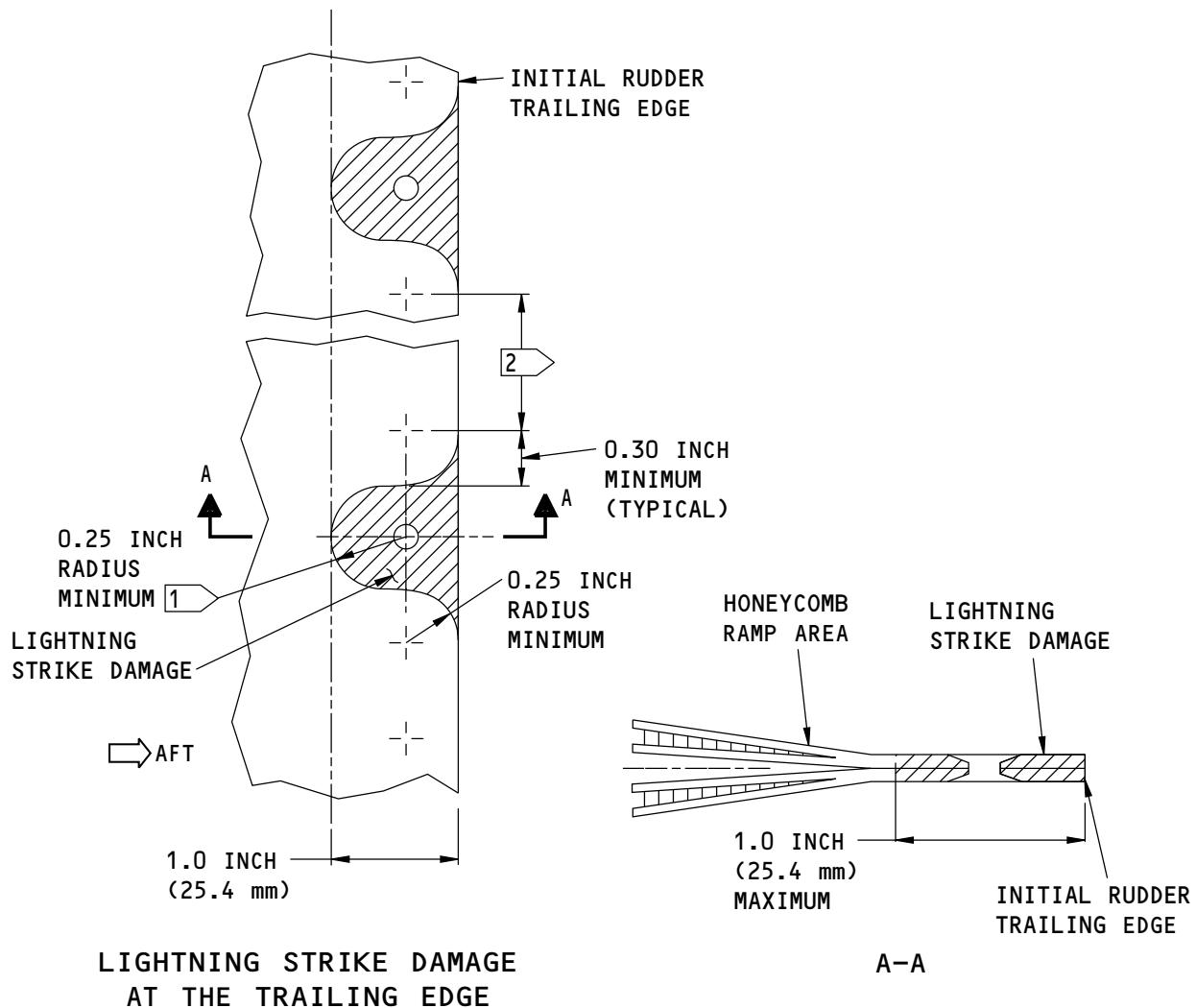
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NOTES

- [1] DAMAGE IS NOT PERMITTED INTO THE HONEYCOMB RAMP AREA.
- [2] MAKE SURE THERE ARE A MINIMUM OF TEN (10) FASTENERS NOT DAMAGED BETWEEN ANY ADJACENT LIGHTNING STRIKE DAMAGE.

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Rudder Skin Trailing Edge Lightning Strike Damage
Figure 105

55-40-01

ALLOWABLE DAMAGE 1

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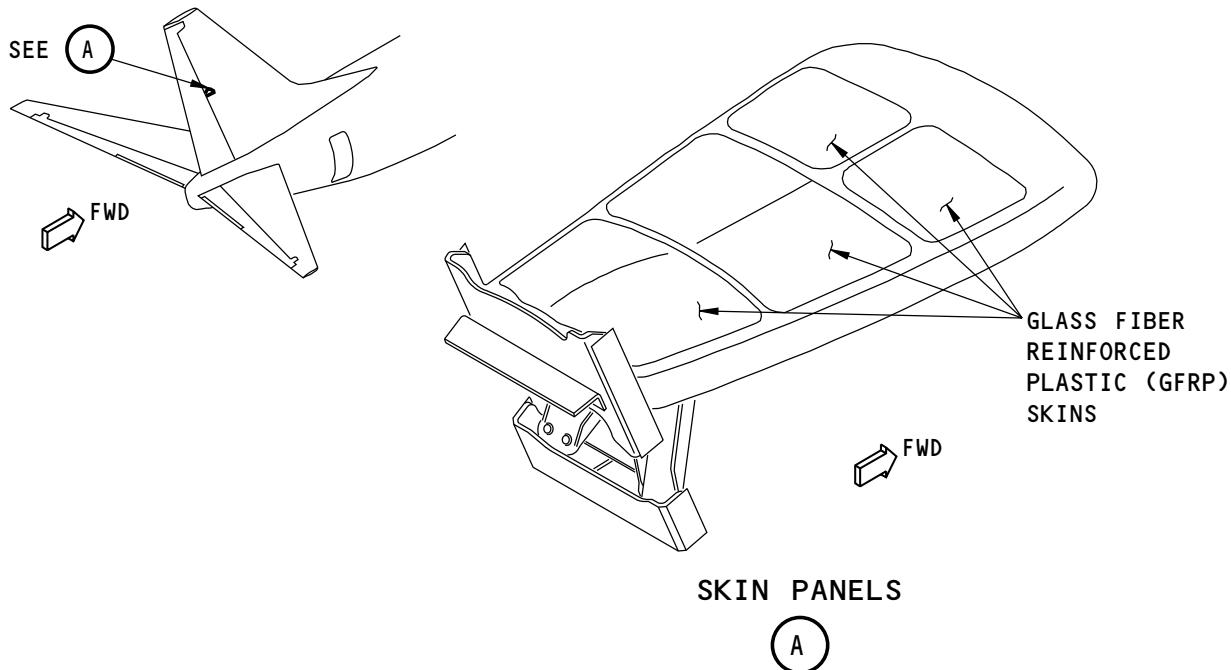
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ALLOWABLE DAMAGE 2 - RUDDER BALANCE ARM SKIN

1. Applicability

- A. This subject gives the allowable damage limits for the skin panels on the rudder balance arm as shown in Rudder Balance Arm Skin Location, Figure 101/ALLOWABLE DAMAGE 2.



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Rudder Balance Arm Skin Location

Figure 101

2. General

- A. Do an inspection of the damaged area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other equivalent inspection procedures that have been examined and found to be satisfactory by the operator, can be used.

- B. Refer to Definitions of Damage Size, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and C for the definitions of the length, width, and depth of damage.
- C. Remove contamination and water from the structure surface.
- D. Seal all permitted damage areas that agree with the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2 Seal the damage with one of the two methods that follows:
 - (1) Make a temporary seal for damage 1 ply deep or less.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location.
 - (c) Make sure that the tape is in a satisfactory condition at normal maintenance intervals.
 - (2) Make a permanent seal for damage 1 ply deep or less.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

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ALLOWABLE DAMAGE 2

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- (b) Apply one layer of BMS 10-79, Type III primer. Refer to SOPM 20-44-04.
- (c) Apply one layer of BMS 10-60 enamel to the areas sealed with epoxy resin. Refer to AMM 51-21-00/701.
- (3) For damage to locations that are more 1 ply in depth then do as follows:
 - (a) Apply vacuum and heat to the damage area to remove all moisture.
 - (b) Apply aluminum foil tape (speed tape)
 - (c) Keep a record of the location
 - (d) Repair the damage before 250 flight cycles from the time the seal was made

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ALLOWABLE DAMAGE 2

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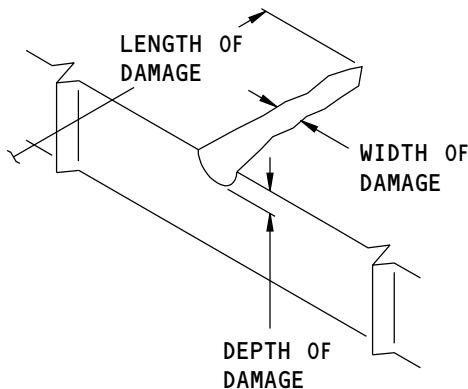
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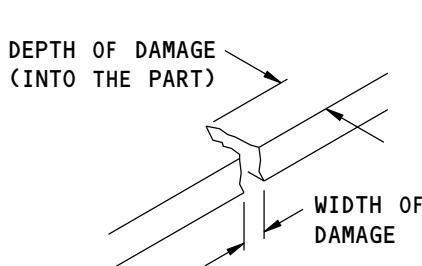
SIZE DEFINITIONS FOR
NICK, GOUGE, OR SCRATCH DAMAGE

(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED

DIAMETER OF DAMAGE
(USE THE LONGEST
DIMENSION ACROSS
THE DAMAGE)

DEPTH OF
DAMAGE



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

SIZE DEFINITIONS FOR
DENT DAMAGE

(B)

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Definitions of Damage Size
Figure 102

55-40-01

ALLOWABLE DAMAGE 2

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3. References

Reference	Title
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05, GENERAL	Equipment and Tools For Repairs
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

- A. Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- B. Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if:
 - (1) The depth is a maximum of one ply. If the depth is more than one ply, then use the limits for holes and punctures
 - (2) Not more than one fastener hole in six is damaged
 - (3) The damage is 6D (D= diameter of fastener) away from fasteners
 - (4) Damage is less than 0.625 inch in length
 - (5) Damage is a minimum of 4.0 inches away from other damage.
- C. Dents are permitted if:
 - (1) The glass fiber is not damaged. If the glass fiber is damaged, then use the limits for nicks, gouges and scratches
 - (2) The diameter is a maximum of 0.625 inch
 - (3) The depth is not more than one ply deep
 - (4) The dent is 6D (D = diameter of fastener) away from fastener locations
 - (5) Thd damage is a minimum of 4.0 inches away from other damage.
- D. Holes and Punctures are permitted if:
 - (1) The diameter is a maximum of 0.625 inch
 - (2) The damage is 6D (D = diameter of fastener) away from fastener locations
 - (3) The damage is a mimimum of 4.00 inches away from other damage.
- E. Delaminations are permitted if:
 - (1) The diameter is a maximum of 0.625 inch
 - (2) The damage is 6D (D = diameter of fastener) away from fastener locations
 - (3) The damage is 4.00 inches away from other damage.
- F. Edge damage is permitted if:
 - (1) The depth is a maximum of 0.10 inch
 - (2) The width is a maximum of 0.50 inch
 - (3) The damage is 4D (D = diameter of fastener) away from the edge of other damage.

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ALLOWABLE DAMAGE 2

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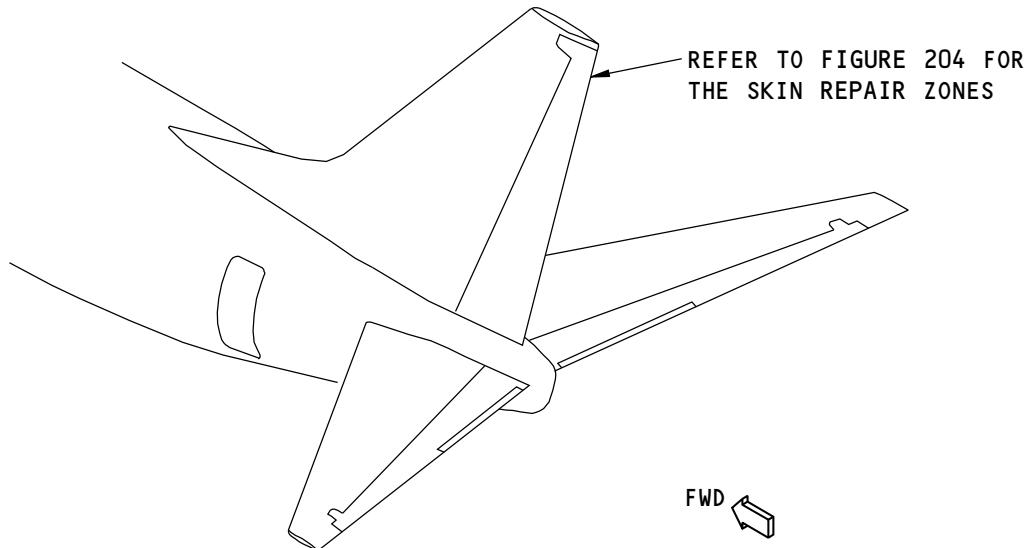


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REPAIR 1 - RUDDER SKIN

1. Applicability

- A. Repair 1 is applicable to the Rudder Skin panels as shown in Rudder Skin Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.



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Rudder Skin Location
Figure 201

2. General

- A. Repair 1 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the rudder, as necessary. Refer to AMM 27-21-11/401.
- C. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) Refer to Definitions of Damage Size, Figure 202/REPAIR 1 for the definitions of the diameter and depth of damage.
- (2) Refer to Definitions of the Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.
- D. Do the repair as given in Paragraph 4./REPAIR 1.
- E. Make sure that the rudder is balanced. Refer to 51-60-07 for the balance procedures.

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REPAIR 1
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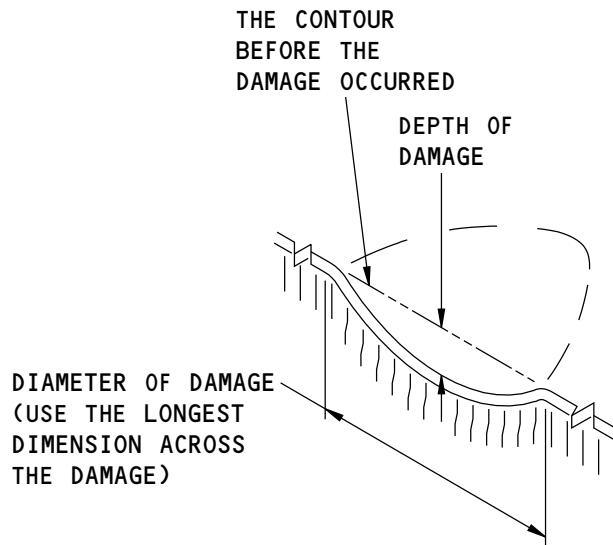
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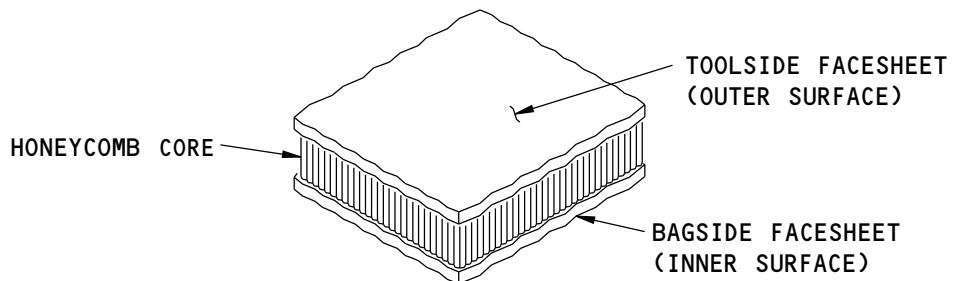
F. Install the rudder, as applicable. Refer to AMM 27-21-11/401.



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Definitions of Damage Size

Figure 202



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Definitions of the Facesheets

Figure 203

55-40-01

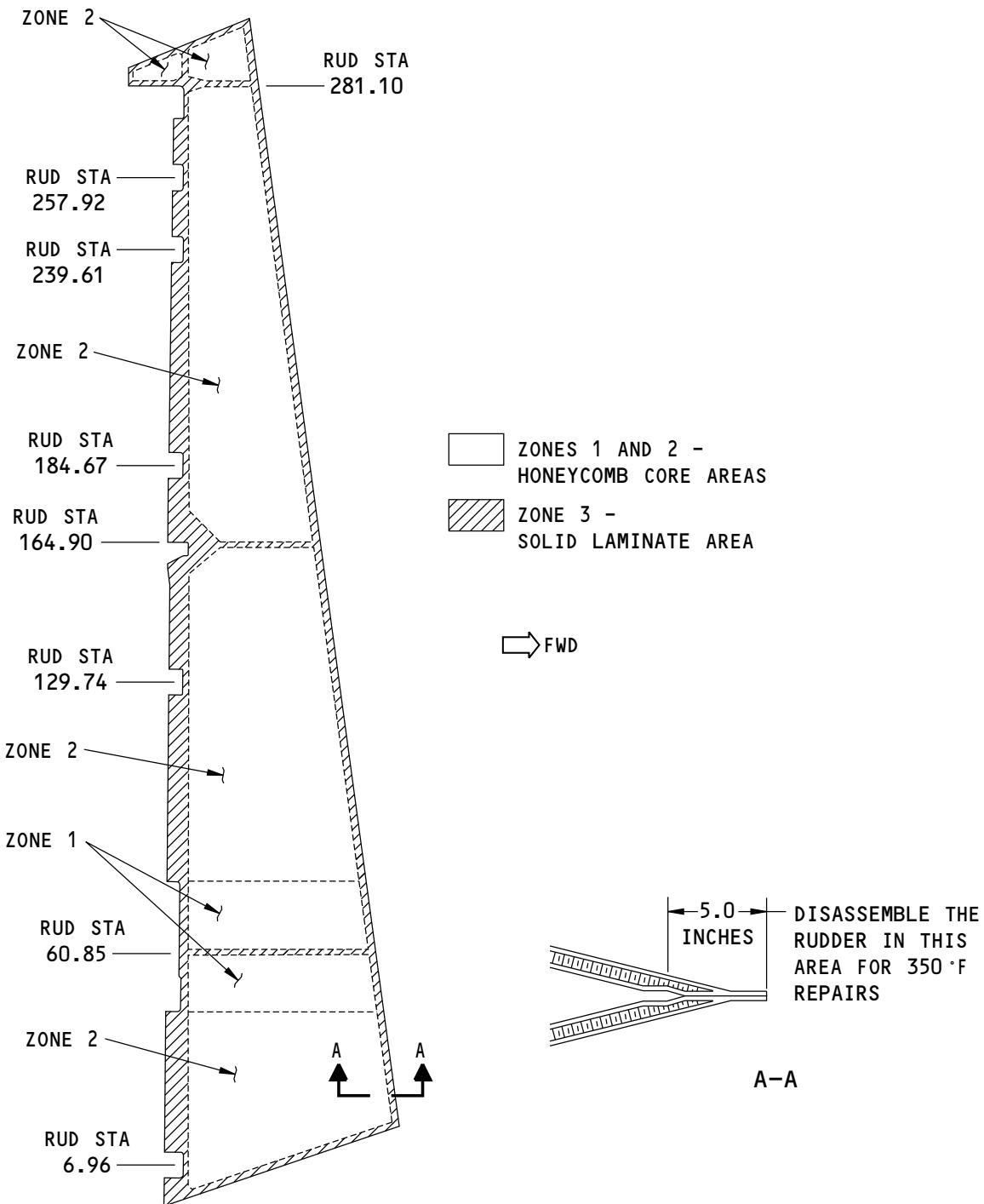
REPAIR 1
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**Rudder Skin Zones
Figure 204**

55-40-01

**REPAIR 1
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02, GENERAL	Fastener Installation and Removal
51-40-03, GENERAL	Fastener Substitution
51-60-07	RUDDER BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
AMM 27-21-11/401	Rudder - Removal/Installation
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure

4. Repair Instructions

- A. If a dent is 1.50 inches in diameter or less, and has no fiber damage or delamination, then fill the dent with potting compound and apply a fiberglass patch as given in Repair 14 of 51-70-04.
- B. If Paragraph 4.A./REPAIR 1 is not applicable, then refer to:
 - (1) Table 201 for the repair data that is applicable to damage in Zones 1, 2, and 3.
- C. For repairs made with wet layup materials, do as follows, as applicable:
 - (1) Use one repair ply of fabric for each initial ply that was damaged.
 - (2) Add two structural plies of fabric for each facesheet that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of delamination at an edge if the delamination is a minimum of 2.5D (D = fastener diameter) away from a fastener hole.
- (3) Inspect Category B repairs after each 400 flight hour interval or more frequently. Refer to 737 NDT Part 1, 51-01-01 for inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- D. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged.

Table 201:

REPAIR DATA FOR ZONE 1, 2, AND 3 OF THE 350°F (177°C) CURE RUDDER SKIN PANELS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Contact The Boeing Company.	Damage that is a maximum of: - 5.0 inches in diameter	Damage that is a maximum of: - 5.0 inches in diameter	There are no size limits on the repair.

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REPAIR 1
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Table 201: (Continued)

REPAIR DATA FOR ZONE 1, 2, AND 3 OF THE 350°F (177°C) CURE RUDDER SKIN PANELS				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
		One repair for each 144 square inches 3.0 inches minimum clearance from: - other repairs - fastener holes - panel edges	One repair for each 144 square inches 3.0 inches minimum clearance from: - other repairs - fastener holes - panel edges	
REPAIR PROCEDURES	-----	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.D

55-40-01

REPAIR 1
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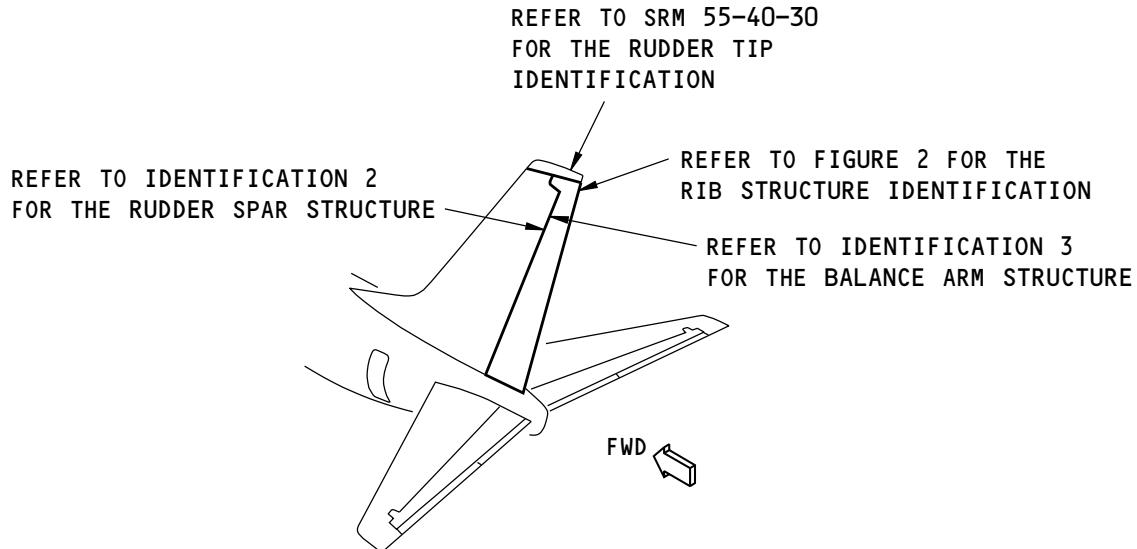
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IDENTIFICATION 1 - RUDDER RIB STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Rudder Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A0100	Rudder Functional Product Collector
173A0150	Centerline Diagram - Rudder
173A1001	Rib Installation - Lower Closure, Rudder
173A1002	Rib Installation - Main Actuator, Rudder
173A1005	Rib Installation - Balance Arm, Rudder
173A1006	Rib Installation - Forward Tip Balance, Rudder
173A1007	Rib Installation - Aft Tip Balance, Rudder
173A1008	Rib Installation - Upper Closure, Rudder

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IDENTIFICATION 1

Page 1

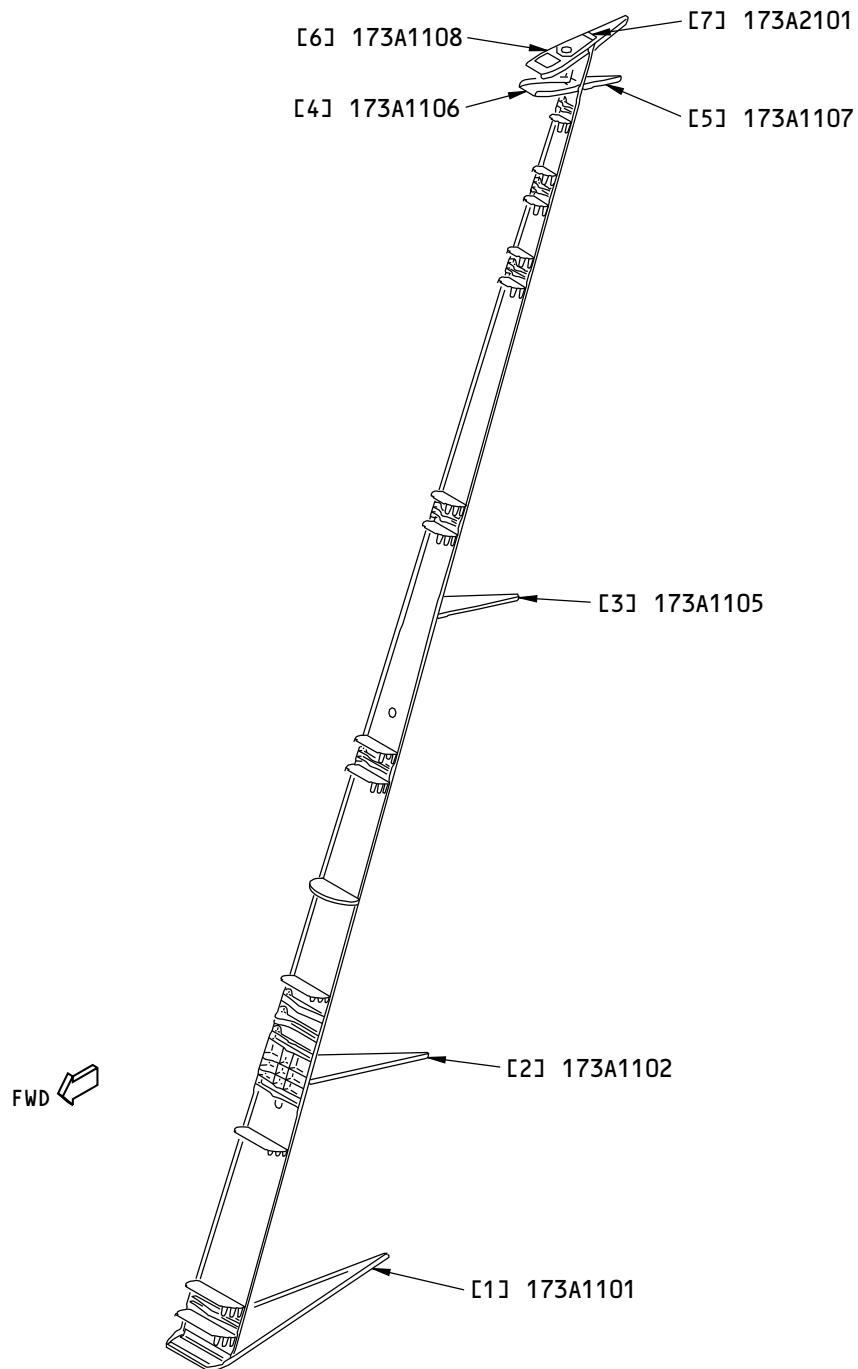
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Rudder Rib Structure Identification
Figure 2

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IDENTIFICATION 1

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T*[1]	MATERIAL	EFFECTIVITY
[1]	Lower Closure Rib - Bonded Part Skin Core Lower Closure Rib - Bonded Part Skin		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich Refer to Figure 3, Detail A Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 CRFP solid laminate with Glass Fiber Reinforced Plastic (GFRP) isolation ply Refer to Figure 3, Detail B	CUM LINE 001 THRU 472 CUM LINE 473 AND ON
[2]	Main Actuator Rib - Bonded Part Skin Core		CFRP honeycomb sandwich Refer to Figure 4 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[3]	Balance Arm Rib - Bonded Part Skin Core		CFRP honeycomb sandwich Refer to Figure 5 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[4]	Forward Tip Balance Rib - Bonded Part Skin Core		CFRP honeycomb sandwich Refer to Figure 6 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[5]	Aft Tip Balance Rib - Bonded Part Skin		CFRP Woven Fabric Refer to Figure 7	
[6]	Upper Closure Rib Assembly - Bonded Part Skin Core		CFRP honeycomb sandwich Refer to Figure 8 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
(7)	Rib Post		CFRP Woven Fabric Refer to Figure 9	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

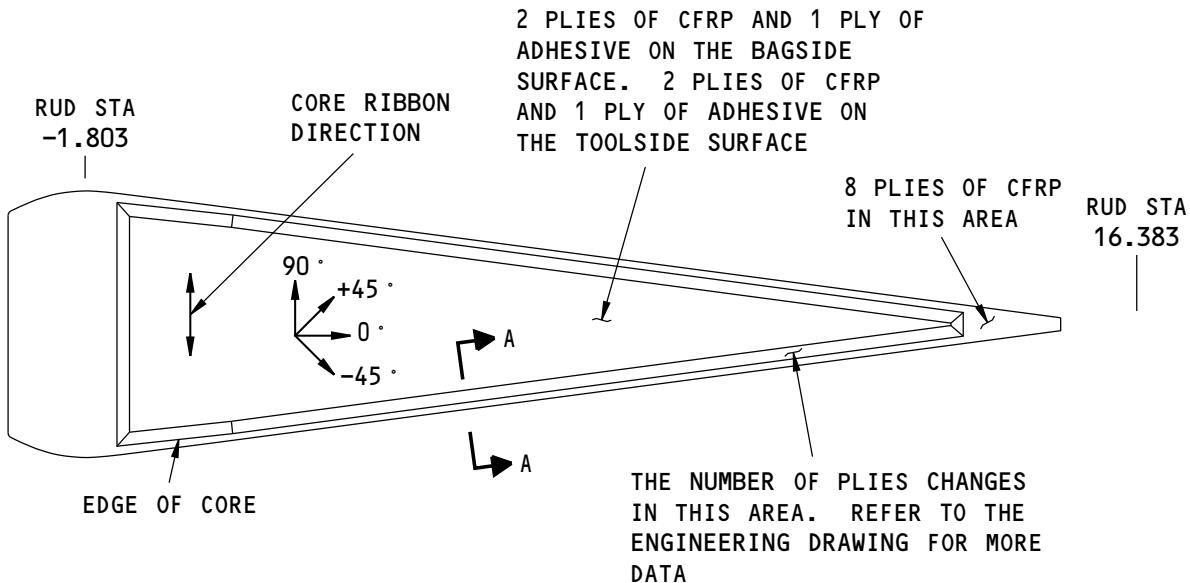
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PLAN VIEW IS SHOWN
VIEW IS ON THE BAGSIDE SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F78265 S0006593704_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Closure Rib, Figure 2, Item [1]
Figure 3 (Sheet 1 of 4)

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IDENTIFICATION 1

Page 4

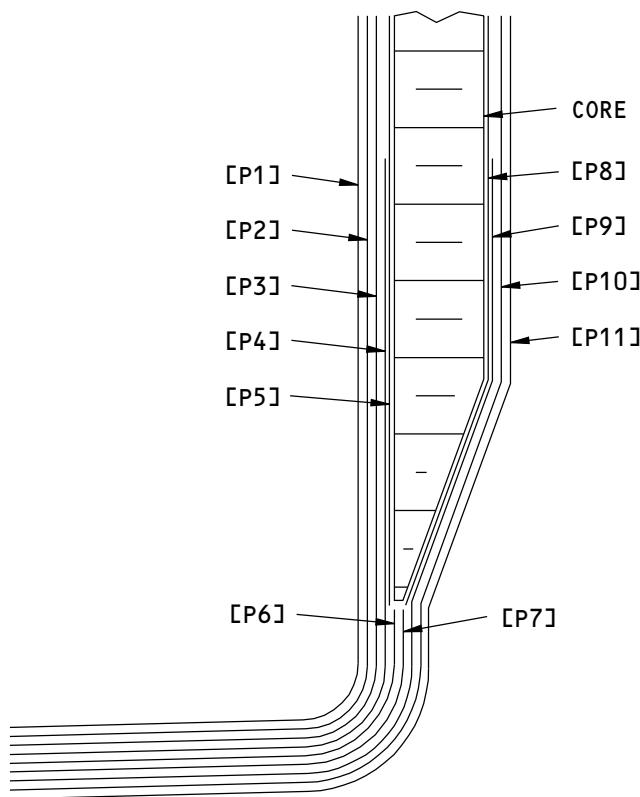
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PLY LAYUP SEQUENCE
A-A

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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Closure Rib, Figure 2, Item [1]
Figure 3 (Sheet 2 of 4)

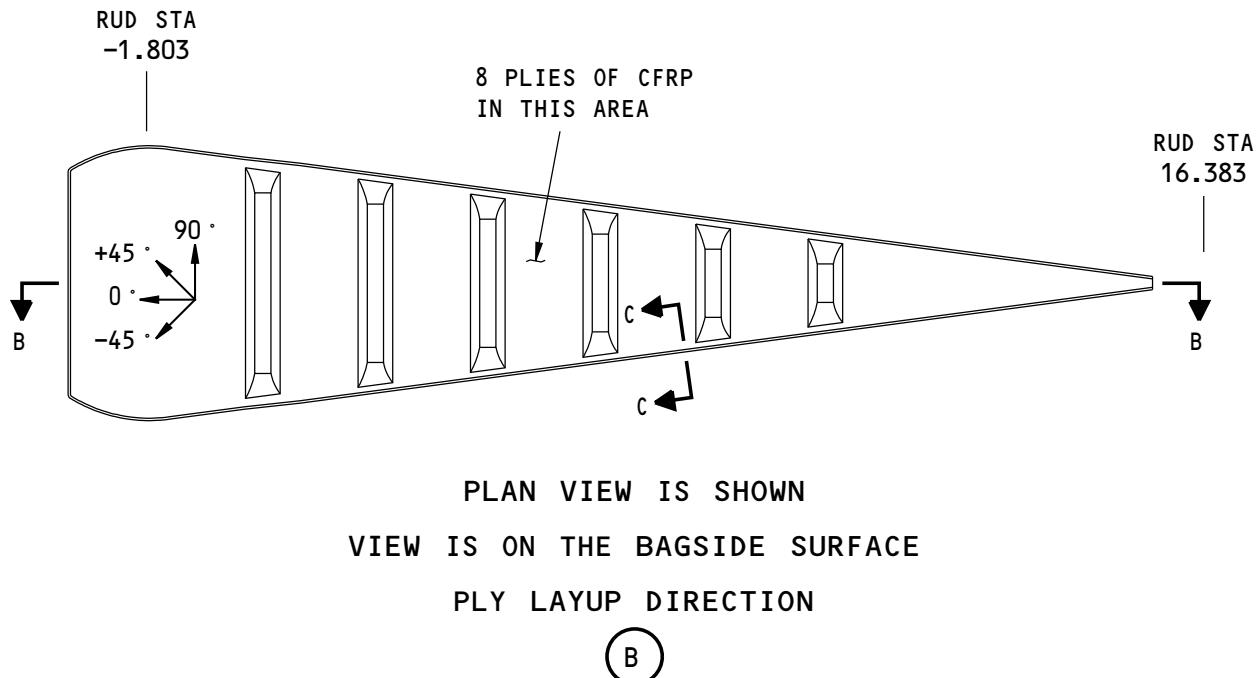
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NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL B FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTION B-B FOR THE PLY SEQUENCE. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION C-C.

L72910 S0006593707_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Closure Rib, Figure 2, Item [1]
Figure 3 (Sheet 3 of 4)

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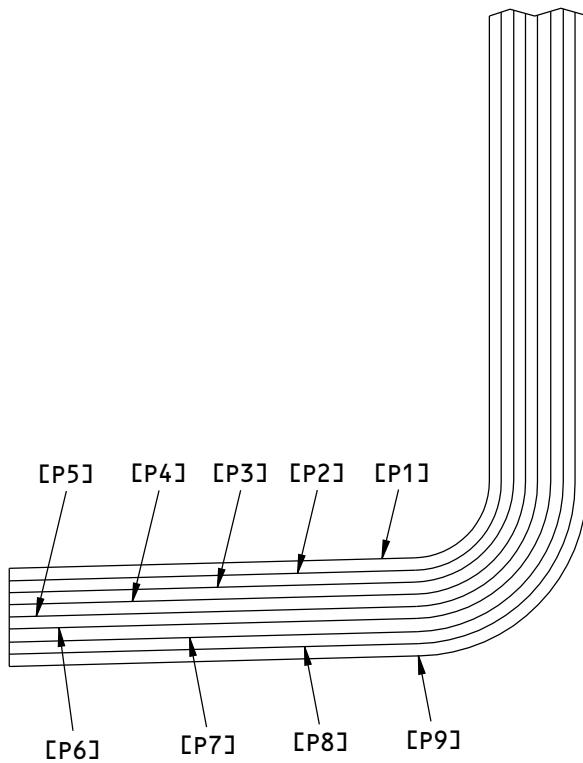
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B-B



VIEW ROTATED 90 DEGREES COUNTER CLOCKWISE
PLY LAYUP
C-C

L72917 S0006593708_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Lower Closure Rib, Figure 2, Item [1]
Figure 3 (Sheet 4 of 4)

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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, Detail A		
PLY	DIRECTION	MATERIAL
P1	Optional	1 mil white Tedlar as given in BAC 5317-4
P2, P4, P9, P11	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Style 3K-70-PW
P3, P6, P7, P10	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P5, P8	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, Detail B		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	CFRP woven fabric as given in BMS 9-8, Type 1, Class 2, Style 3K-70-P
P2, P4, P5, P7	0 or 90 degrees	CFRP woven fabric as given in BMS 9-8, Type 1, Class 2, Style 3K-70-P
P9	Optional	GFRP woven fabric as given in BMS 9-3, Type D, Class 7, Style 120

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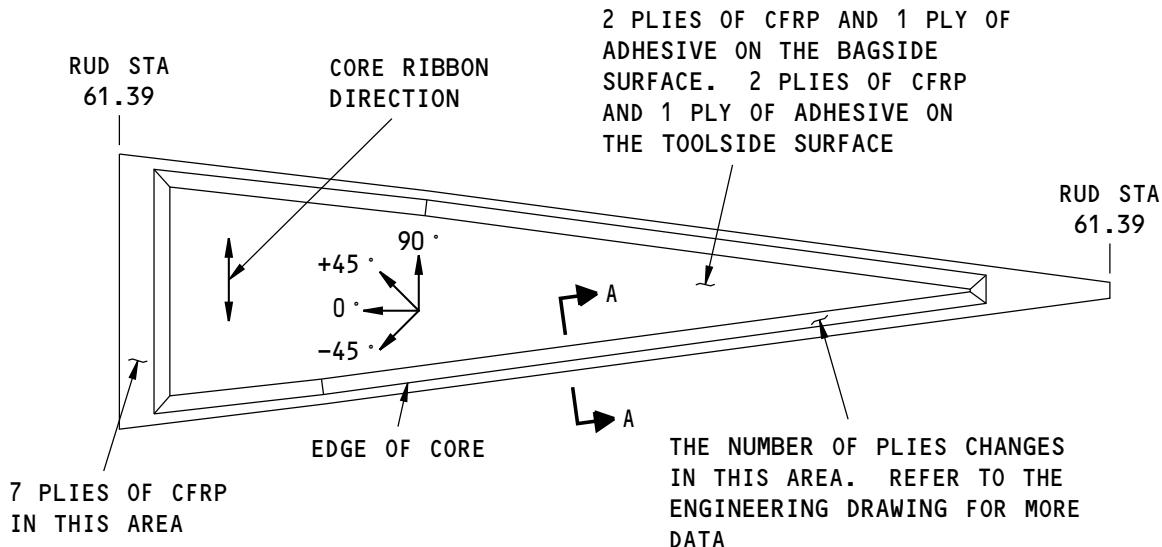
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PLAN VIEW IS SHOWN
VIEW IS ON THE BAGSIDE SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F78358 S0006593710_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Main Actuator Rib, Figure 2, Item [2]
Figure 4 (Sheet 1 of 2)

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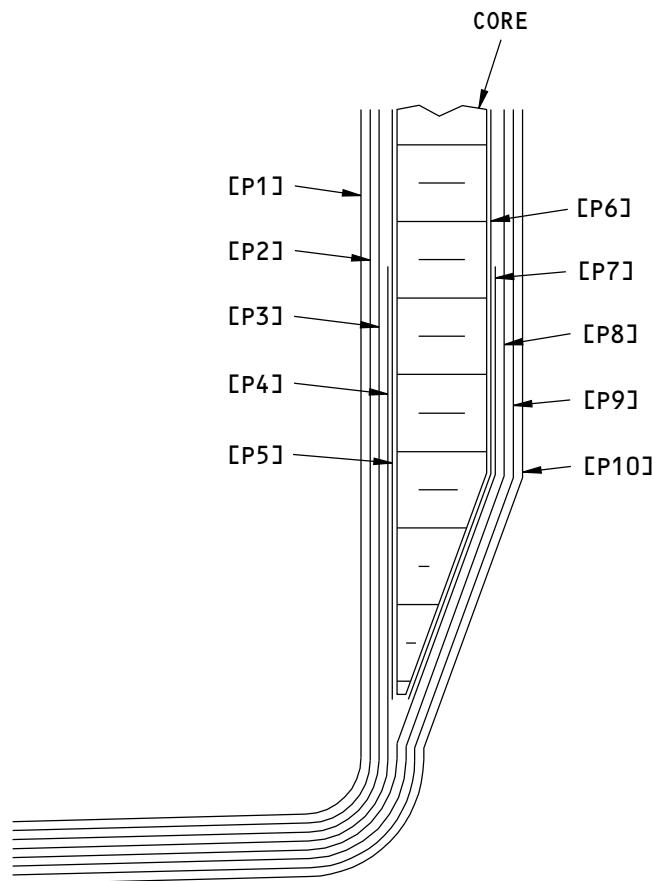
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PLY LAYUP SEQUENCE
A-A

F78368 S0006593711_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Main Actuator Rib, Figure 2, Item [2]
Figure 4 (Sheet 2 of 2)

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P10	Optional	1 mil white Tedlar as given in BAC 5317-4
P2, P4, P7, P9	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P8	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P5, P6	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A

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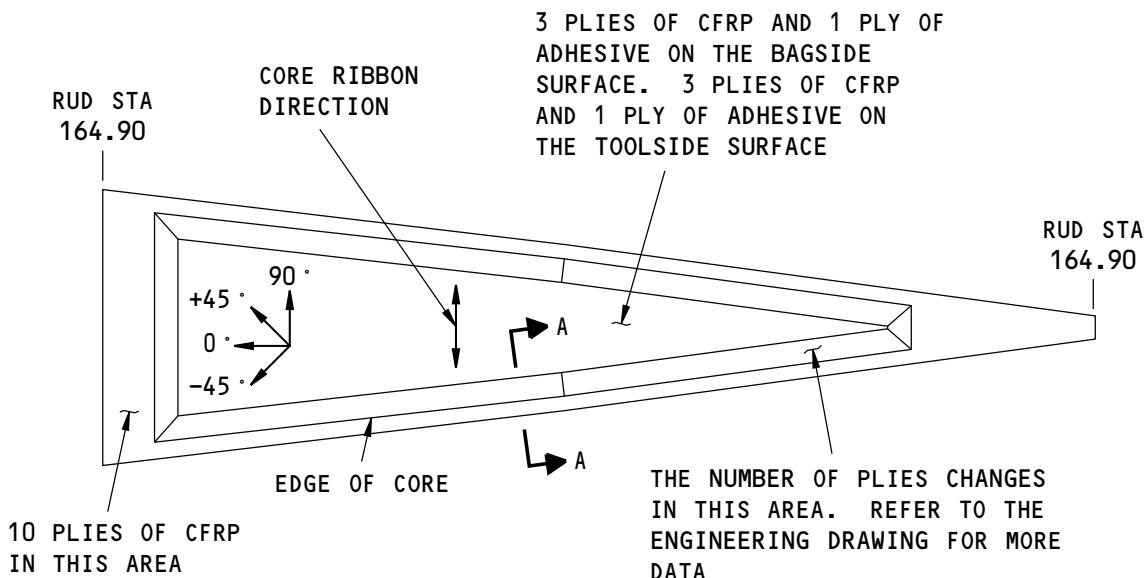
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PLAN VIEW IS SHOWN
VIEW IS ON THE BAGSIDE SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F78389 S0006593713_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Balance Arm Rib, Figure 2, Item [3]
Figure 5 (Sheet 1 of 2)

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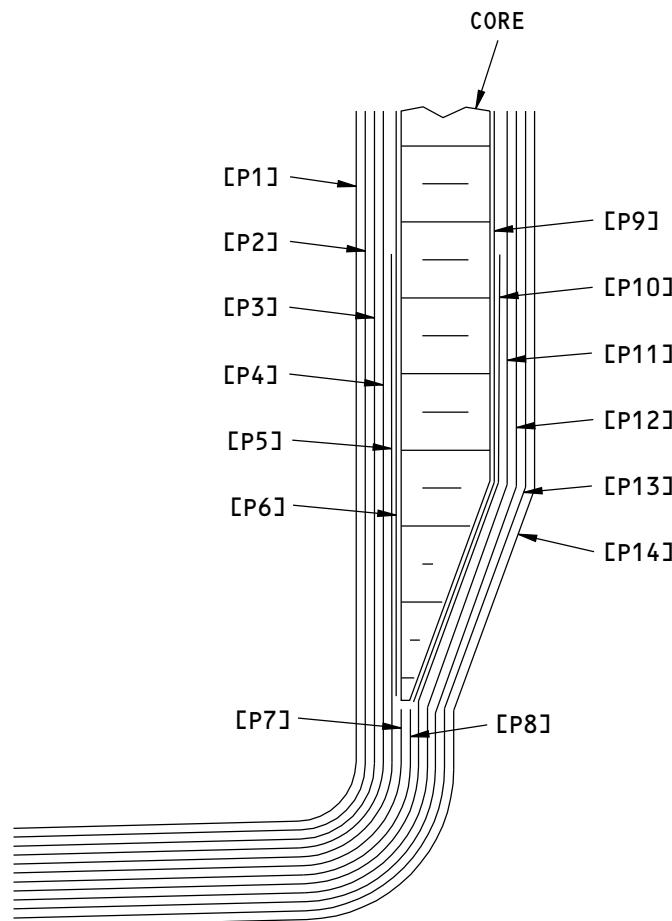
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PLY LAYUP SEQUENCE
A-A

F78397 S0006593714_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Balance Arm Rib, Figure 2, Item [3]
Figure 5 (Sheet 2 of 2)

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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P1, P14	Optional	1 mil white Tedlar as given in BAC 5317-4
P2, P4, P7, P8, P11, P13	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P5, P10, P12	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P6, P9	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A

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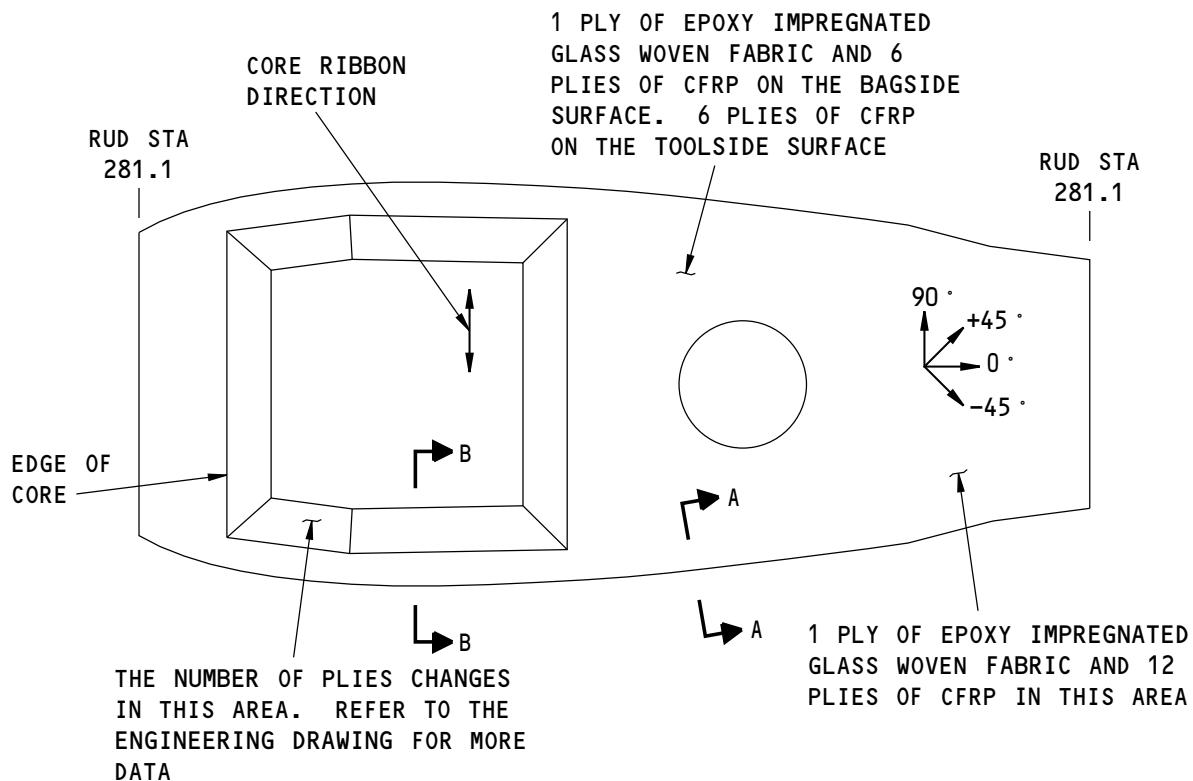
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PLAN VIEW IS SHOWN

VIEW IS ON THE BAGSIDE SURFACE

PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION



NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A AND B-B.

F78450 S0006593716_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Forward Tip Balance Rib, Figure 2, Item [4]
Figure 6 (Sheet 1 of 2)

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IDENTIFICATION 1

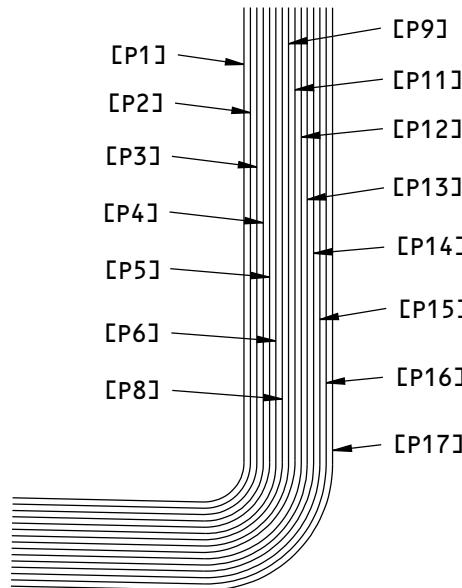
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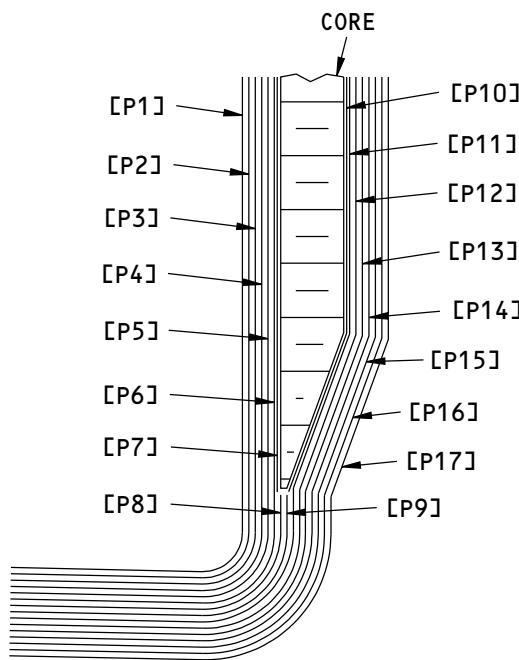
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**PLY LAYUP SEQUENCE
A-A**



**PLY LAYUP SEQUENCE
B-B**

F78434 S0006593717_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Forward Tip Balance Rib, Figure 2, Item
[4]
Figure 6 (Sheet 2 of 2)

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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P17	Optional	1 mil white Tedlar as given in BAC 5317-4
P2, P4, P6, P11, P13, P15	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P5, P8, P9, P12, P14	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P7, P10	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A
P16	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Class III, Style 108

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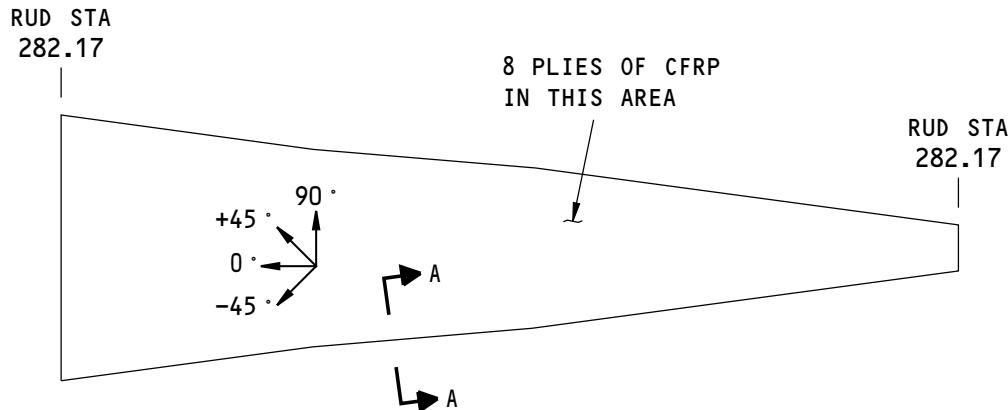
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PLAN VIEW IS SHOWN
VIEW IS ON THE BAGSIDE SURFACE
PLY LAYUP DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 8 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F78523 S0006593719_V1

Ply Direction, and Ply Sequence for the Aft Tip Balance Rib, Figure 2, Item [5]
Figure 7 (Sheet 1 of 2)

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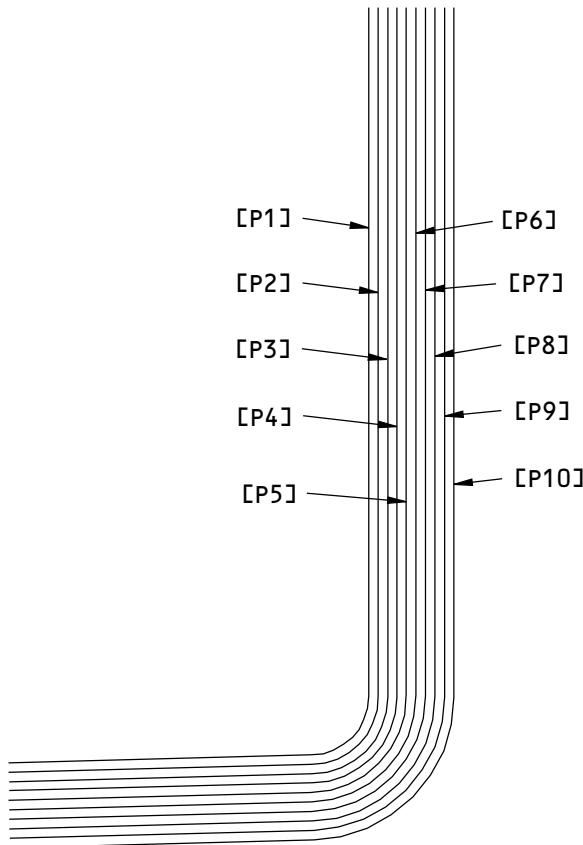
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PLY LAYUP SEQUENCE
A-A

F78526 S0006593720_V1

Ply Direction, and Ply Sequence for the Aft Tip Balance Rib, Figure 2, Item [5]
Figure 7 (Sheet 2 of 2)

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Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 7		
PLY	DIRECTION	MATERIAL
P1, P10	Optional	1 mil white Tedlar as given in BAC 5317-4
P2, P4, P7, P9	+ or - 45 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P5, P6, P8	0 or 90 degrees	Epoxy impregnated graphite woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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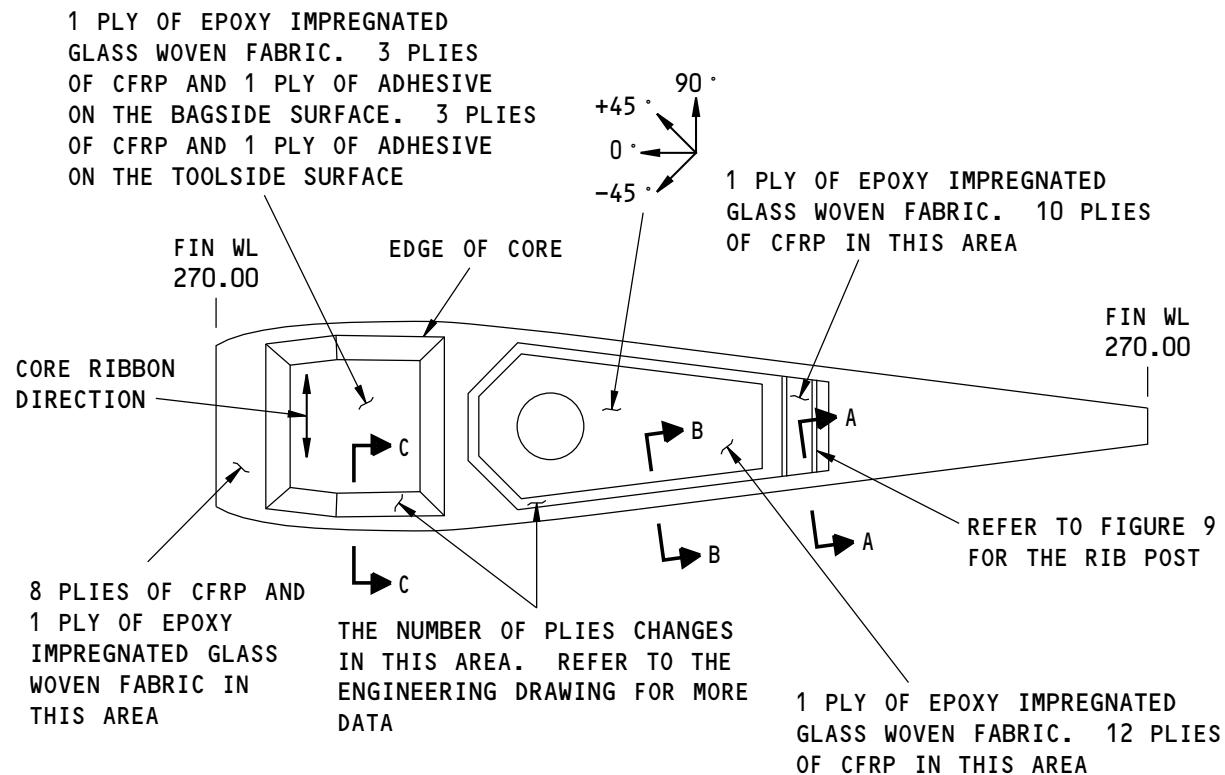
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PLAN VIEW IS SHOWN

VIEW IS ON THE BAGSIDE SURFACE

PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION



NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, AND C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 9 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A, B-B, AND C-C.

F78619 S0006593722_V1

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Closure Rib, Figure 2, Item [6]
Figure 8 (Sheet 1 of 2)**

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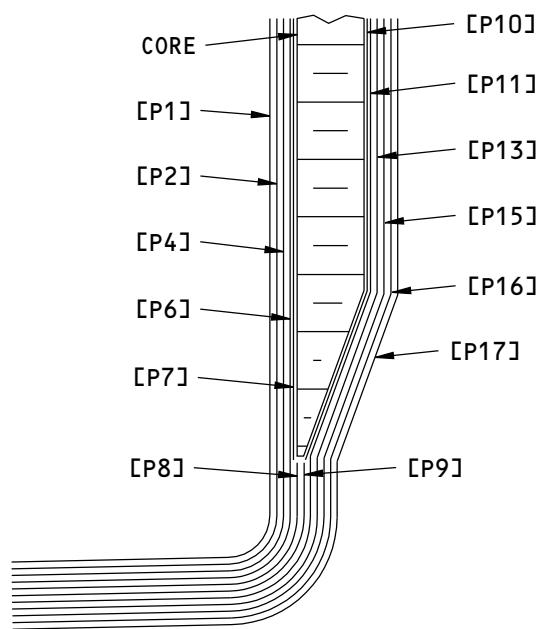
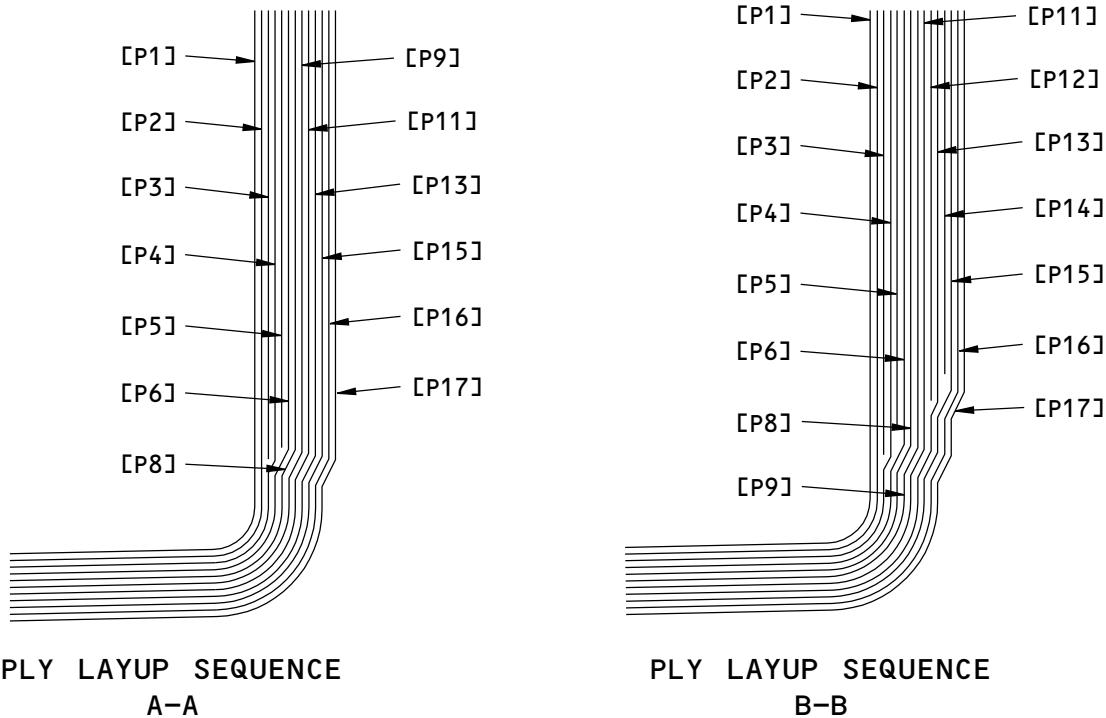
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F78631 S0006593723_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Upper Closure Rib, Figure 2, Item [6]
Figure 8 (Sheet 2 of 2)

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Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 8		
PLY	DIRECTION	MATERIAL
P1, P17	Optional	1 mil white Tedlar as given in BAC 5317-4
P2, P5, P8, P9, P12, P15	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P4, P6, P11, P13, P14	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P7, P10	Optional	Adhesive film as given in BMS 8-245, Type II, Class 1, Grade 03A
P16	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Class III, Style 108

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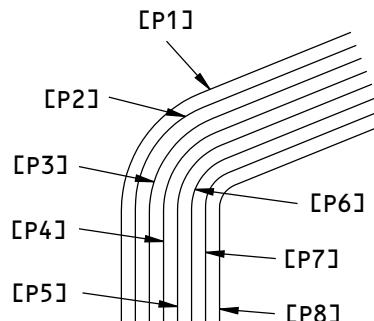
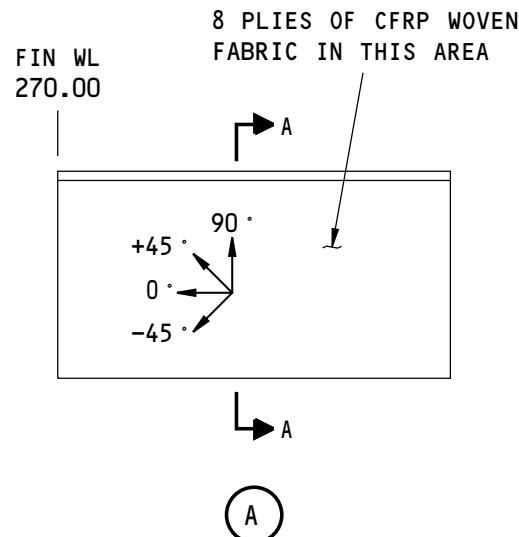
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PLY LAYUP SEQUENCE
A-A

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- REFER TO TABLE 10 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTION A-A.

F78639 S0006593725_V1

Ply Direction and Ply Sequence for the Rib Post, Figure 2, Item [7]
Figure 9

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Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 9		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P5, P7	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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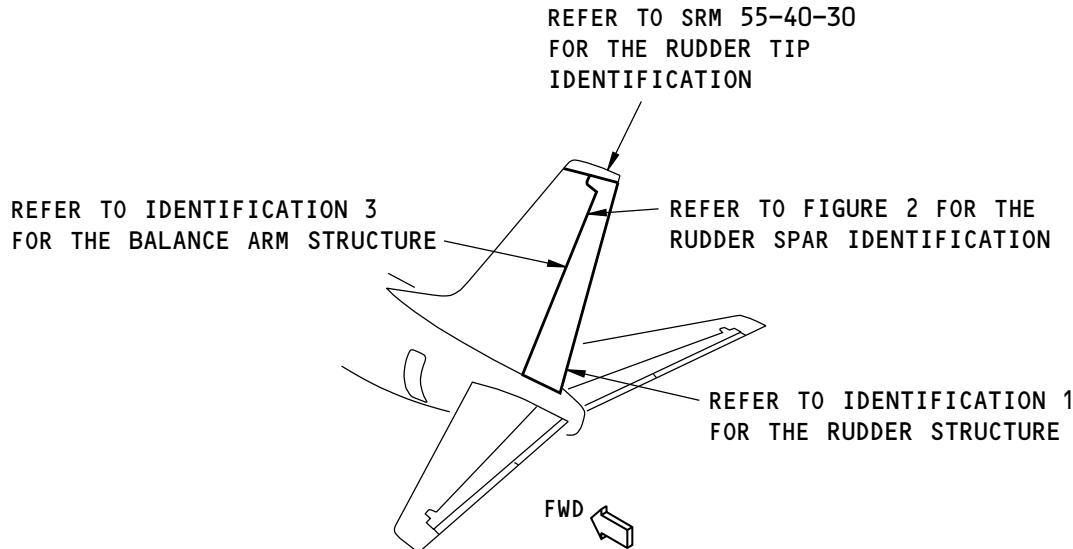
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IDENTIFICATION 2 - RUDDER SPAR RIB STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F78831 S0006593728_V1

Rudder Spar Rib Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A0100	Rudder Functional Product Collector
173A0150	Centerline Diagram - Rudder
173A2001	Spar Installation - Rudder

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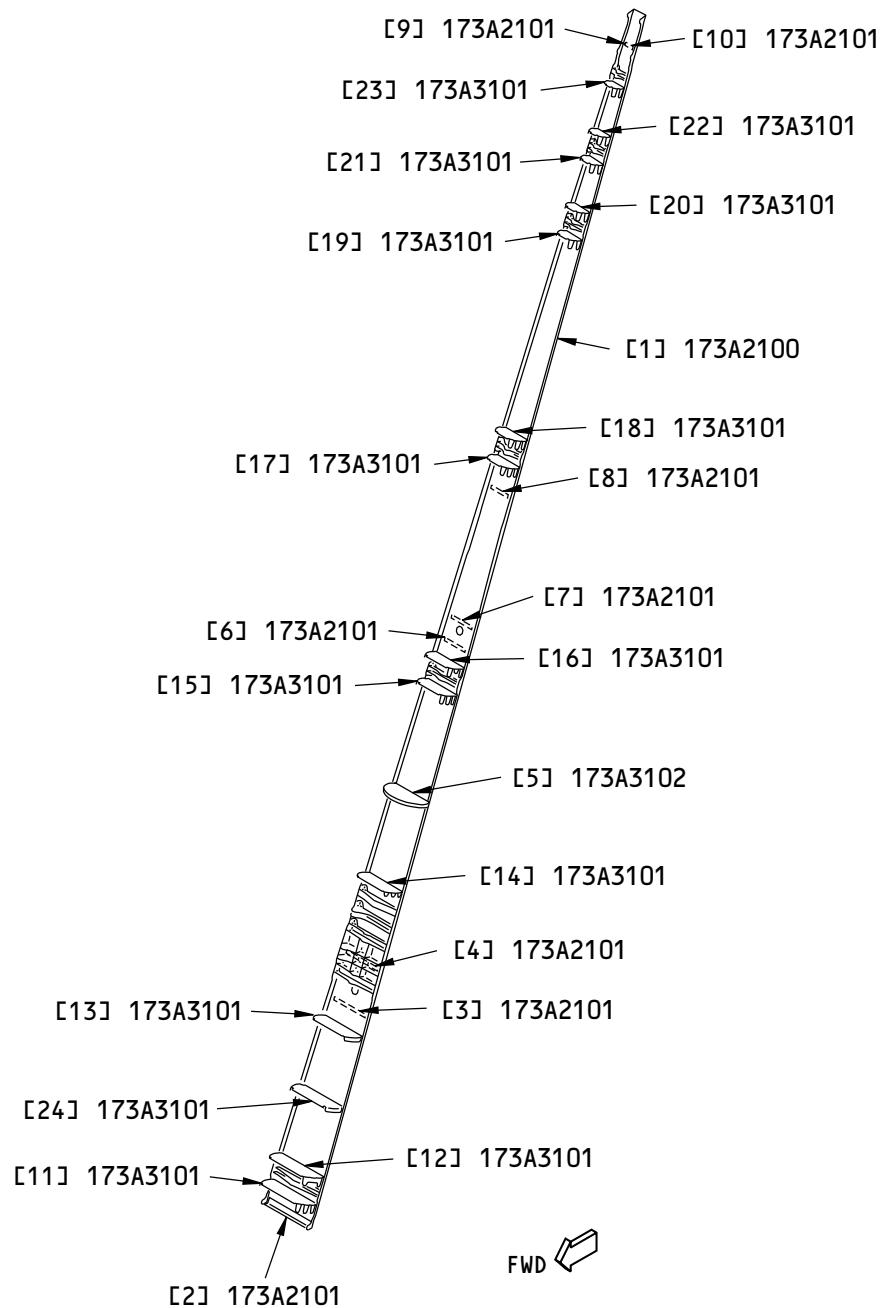
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Rudder Spar Rib Structure Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Rudder Spar-Bonded Part Skin Core - RUD STA 8.09 to RUD STA 48.10 Core - RUD STA 79.02 to RUD STA 100.16 Core - RUD STA 102.08 to RUD STA 126.30 Core - RUD STA 189.00 to RUD STA 236.10		Carbon Fiber Reinforced Plastic (CFRP) and fiberglass honeycomb sandwich Refer to Figure 3 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 3.0	
[2]	Rib Post		CFRP woven fabric Refer to Figure 4	
[3]	Stiffener		CFRP woven fabric Refer to Figure 5	
[4]	Rib Post		CFRP woven fabric Refer to Figure 6	
[5]	Air Rib Dam	0.063 (1.60)	2024-T42 clad as given in QQ-A-250/5	
[6]	Stiffener		CFRP woven fabric Refer to Figure 7	
[7]	Stiffener		CFRP woven fabric Refer to Figure 8	
[8]	Stiffener		CFRP woven fabric Refer to Figure 9	
[9]	Rib Post		CFRP woven fabric Refer to Figure 10	
[10]	Rib Post		CFRP woven fabric Refer to Figure 11	
[11]	Rib - RUD STA 4.50	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[12]	Rib - RUD STA 11.00 Rib - RUD STA 11.00	0.040 (1.02) 0.063 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5 2024-T42 clad sheet as given in QQ-A-250/5	CUM LINE 001 THRU 120 CUM LINE 121 AND ON
[13]	Rib - RUD STA 45.70 Rib - RUD STA 45.70	0.040 (1.02) 0.063 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5 2024-T42 clad sheet as given in QQ-A-250/5	CUM LINE 001 THRU 120 CUM LINE 121 AND ON
[14]	Rib - RUD STA 79.92	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[15]	Rib - RUD STA 127.30	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[16]	Rib - RUD STA 133.80	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[17]	Rib - RUD STA 182.20	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[18]	Rib - RUD STA 188.90	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[19]	Rib - RUD STA 237.15	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[20]	Rib - RUD STA 243.80	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[21]	Rib - RUD STA 255.45	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[22]	Rib - RUD STA 262.10	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	
[23]	Rib - RUD STA 273.85	0.040 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	

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Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[24]	Rib - RUD STA 28.39	0.063 (1.02)	2024-T42 clad sheet as given in QQ-A-250/5	CUM LINE 121 AND ON

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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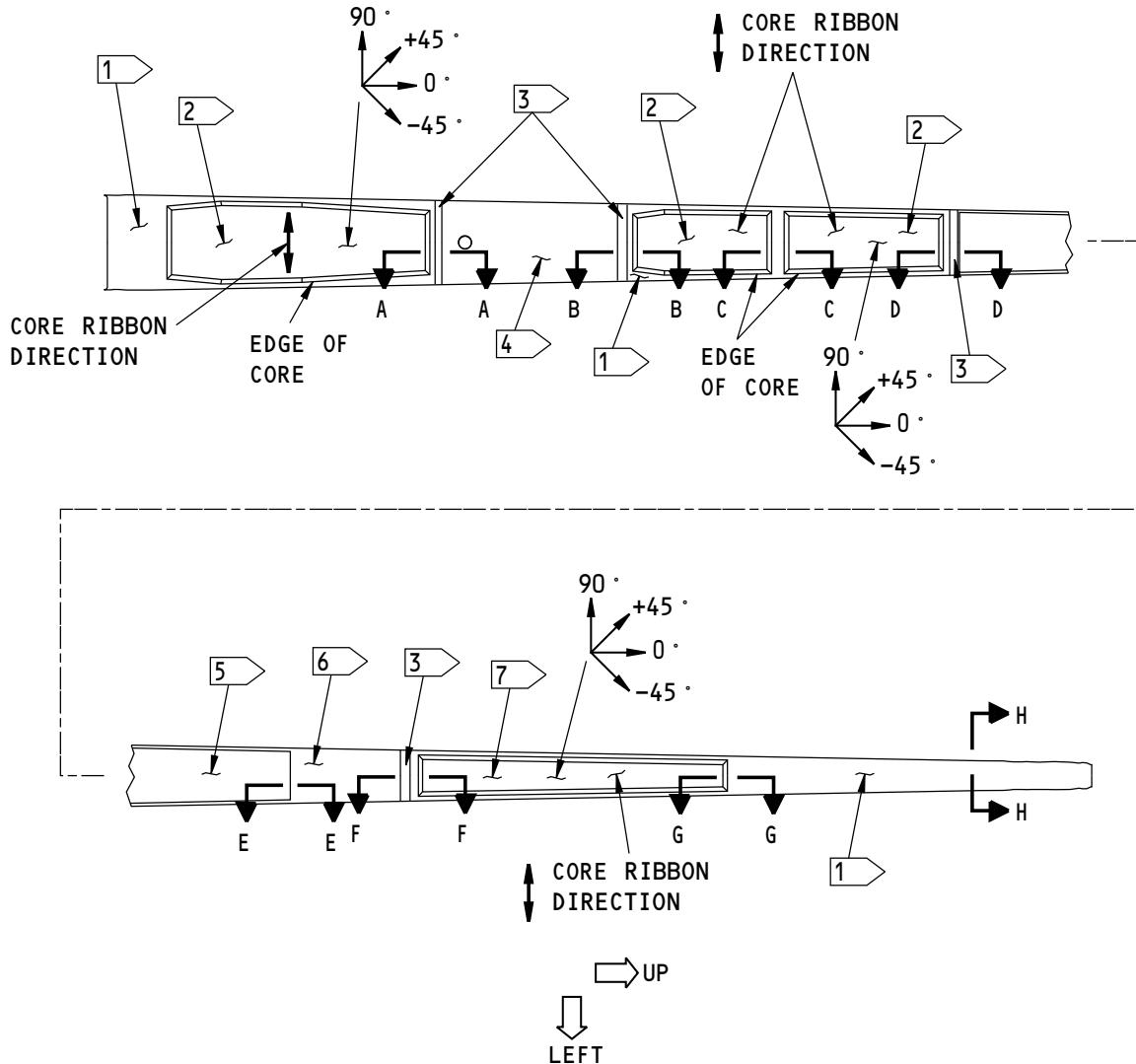
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**PLY LAYUP AND CORE RIBBON DIRECTION FOR THE
FRONT SPAR BETWEEN STATION 0 AND FIN WATERLINE 270.00**

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A, B-B, C-C, D-D, E-E, F-F, G-G, AND H-H FOR THE PLY SEQUENCE AT THOSE LOCATIONS. REFER TO THE ENGINEERING DRAWING FOR MORE DATA.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A, B-B, C-C, D-D, E-E, F-F, G-G, AND H-H.

F79132 S0006593732_V1

**Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 1 of 5)**

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NOTES

- FILM ADHESIVE USED AS GIVEN IN BMS 8-245, TYPE II, CLASS 1, GRADE 03A
- [1] 1 PLY OF EPOXY PREIMPREGNATED GLASS WOVEN FABRIC AND 10 PLIES OF CFRP WOVEN FABRIC IN THIS AREA.
- [2] 1 PLY OF FILM ADHESIVE AND 2 PLIES OF CFRP WOVEN FABRIC ON THE BAGSIDE SURFACE.
1 PLY OF FILM ADHESIVE AND 2 PLIES OF CFRP WOVEN FABRIC ON THE TOOLSIDE SURFACE.
- [3] THE NUMBER OF PLIES CHANGES IN THIS AREA. REFER TO THE ENGINEERING DRAWINGS FOR MORE DATA.
- [4] 1 PLY OF EPOXY PREIMPREGNATED GLASS WOVEN FABRIC AND 16 PLIES OF CFRP WOVEN FABRIC IN THIS AREA.
- [5] 1 PLY OF EPOXY PREIMPREGNATED GLASS WOVEN FABRIC AND 18 PLIES OF CFRP WOVEN FABRIC IN THIS AREA.
- [6] 1 PLY OF EPOXY PREIMPREGNATED GLASS WOVEN FABRIC AND 14 PLIES OF CFRP WOVEN FABRIC IN THIS AREA.
- [7] 3 PLIES OF CFRP WOVEN FABRIC ON THE BAGSIDE SURFACE. 3 PLIES OF CFRP WOVEN FABRIC AND 1 PLY OF EPOXY IMPREGNATED GLASS WOVEN FABRIC ON THE TOOLSIDE SURFACE.

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Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 2 of 5)

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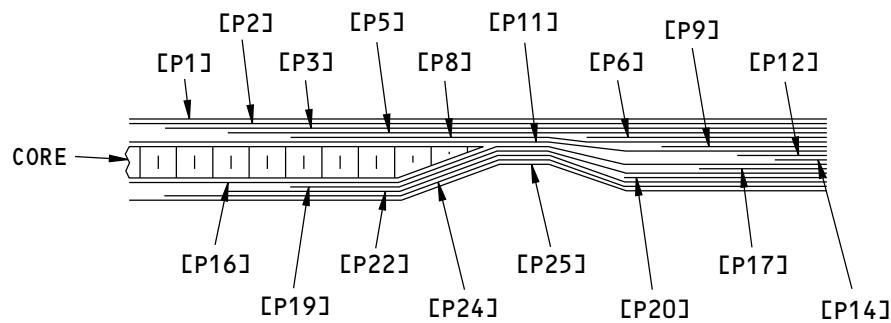
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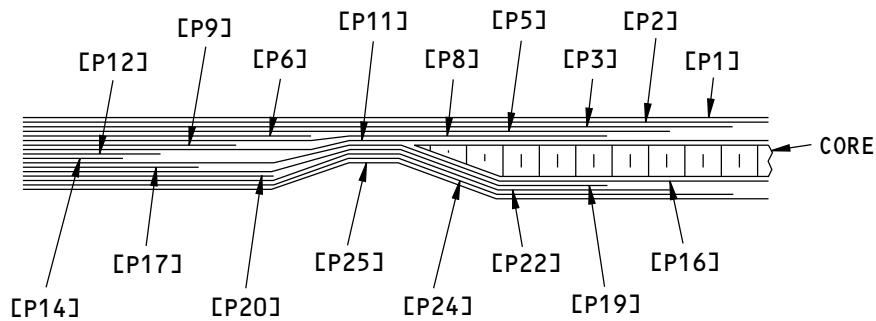
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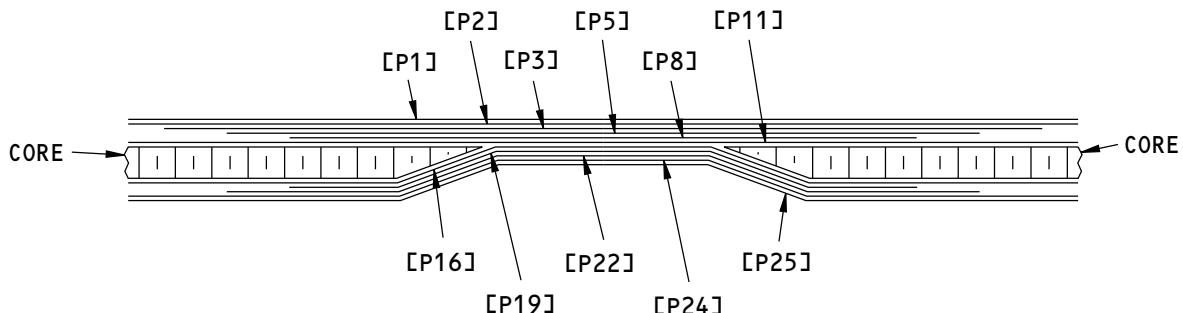
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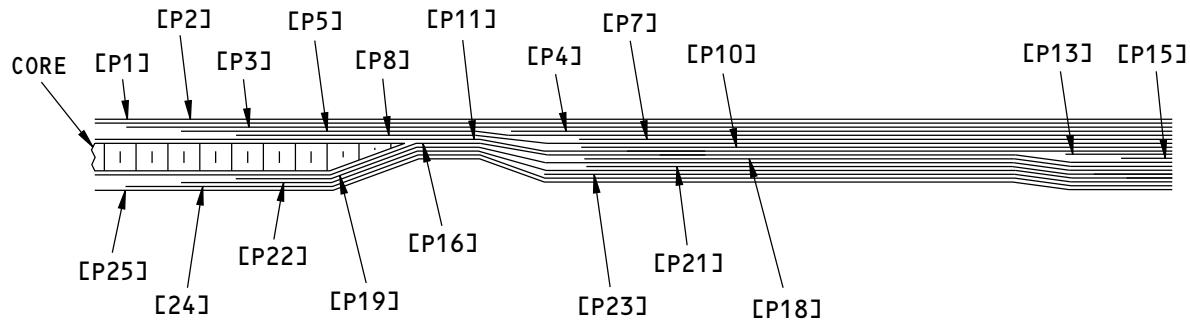
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Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 3 of 5)

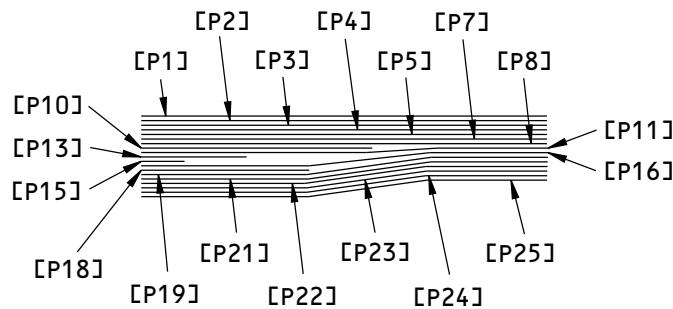
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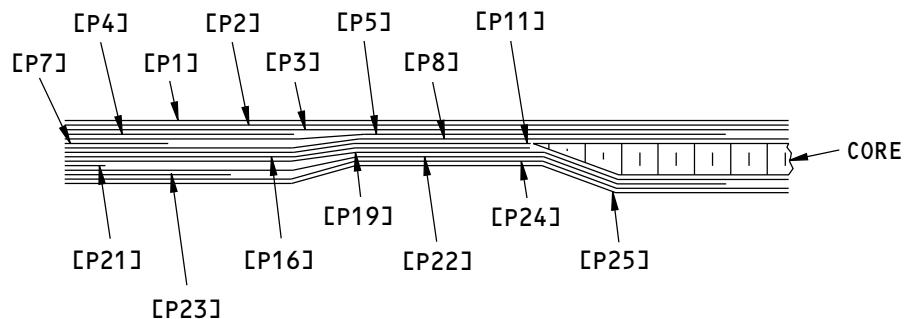
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F-F

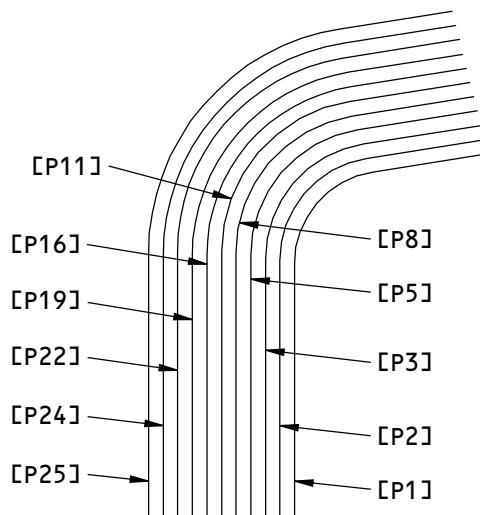
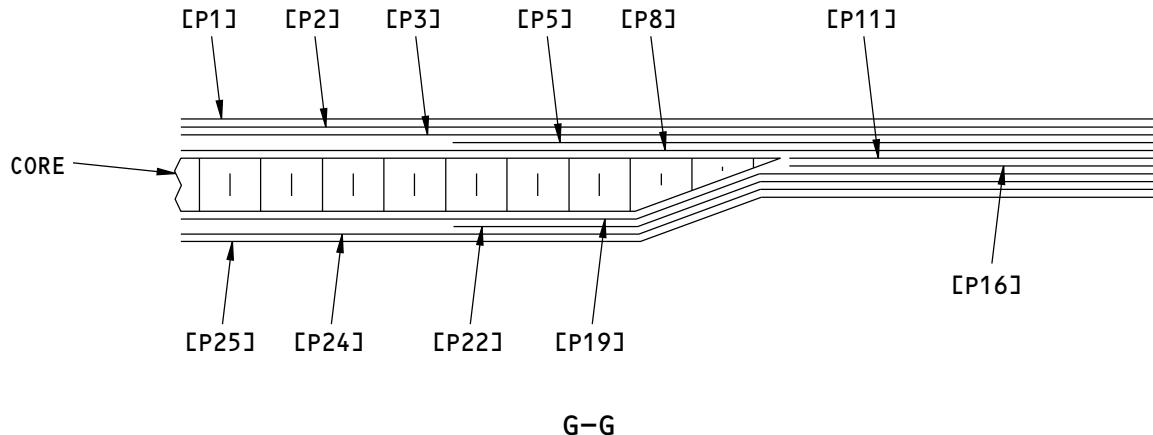
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Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
Figure 3 (Sheet 4 of 5)

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Ply Direction, Ply Sequence and Core Ribbon Direction for Figure 2, Item [1]
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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Class III, Style 108
P2, P4, P5, P8, P9, P10, P12, P13, P14, P15, P17, P18, P19, P22, P23, P25	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P3, P6, P7, P11, P16, P20, P21, P24	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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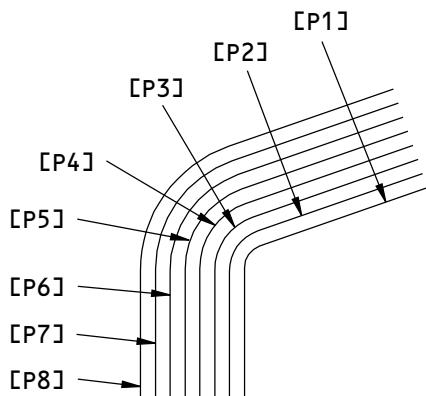
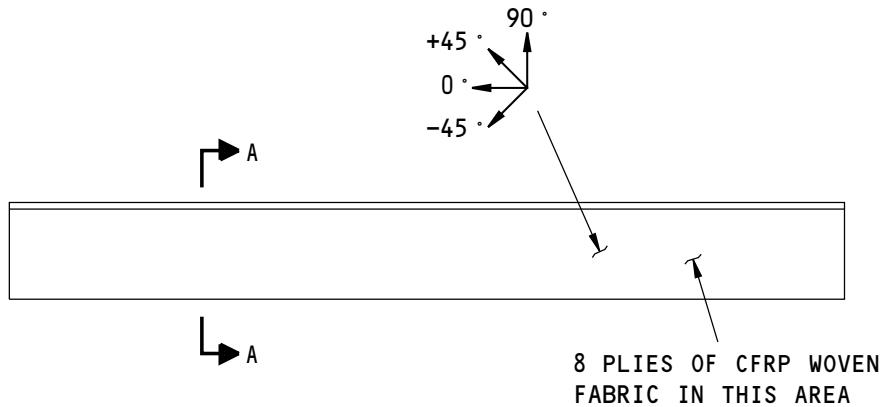
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Ply Direction and Ply Sequence for the Rib Post, Figure 2, Item [2]
Figure 4

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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P3, P6, P8	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P5, P7	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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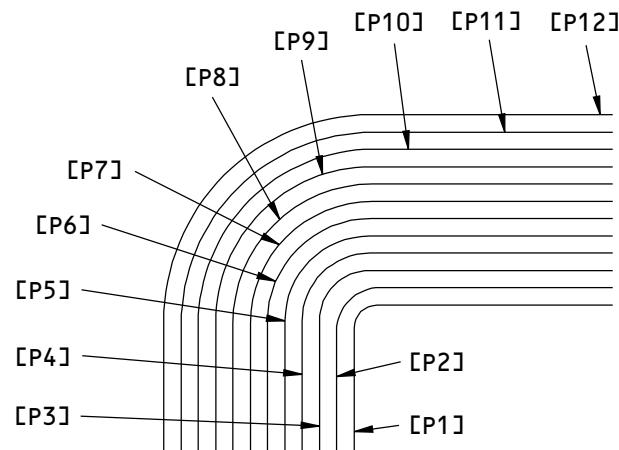
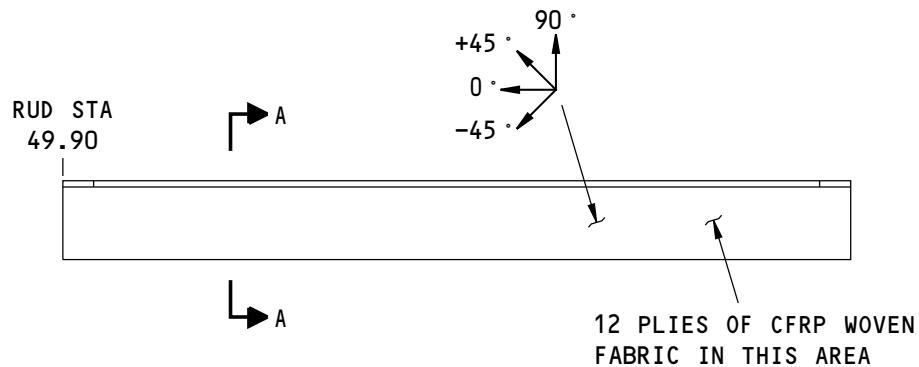
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Ply Direction and Ply Sequence for the Stiffener, Figure 2, Item [3]
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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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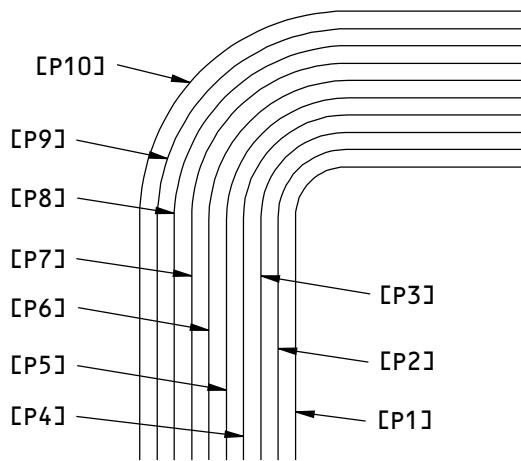
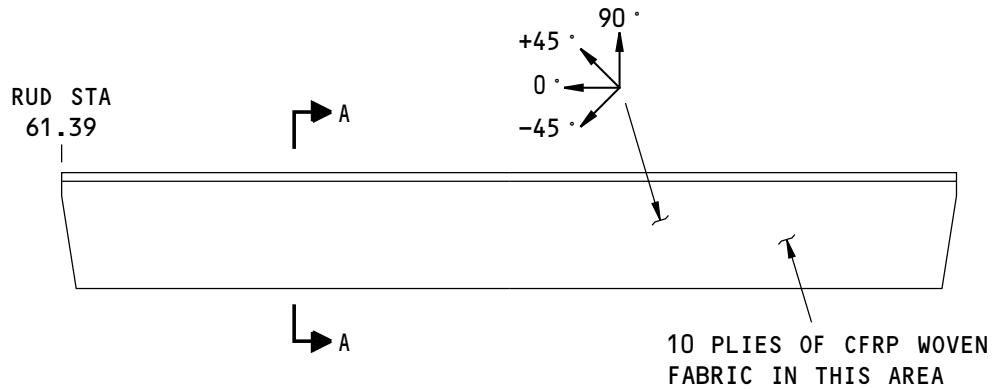
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Ply Direction and Ply Sequence for the Rib Post, Figure 2, Item [4]
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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P6, P8, P10	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P7, P9	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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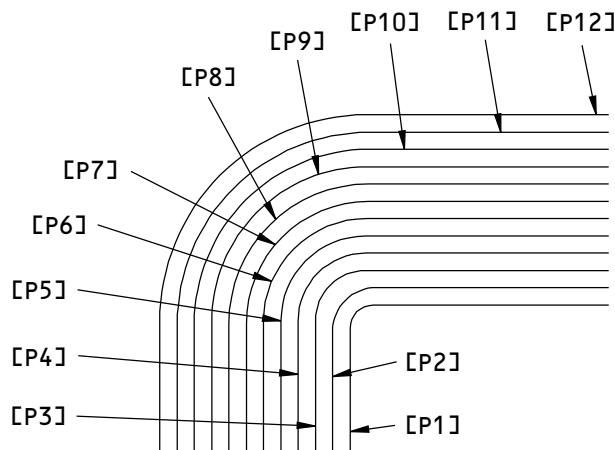
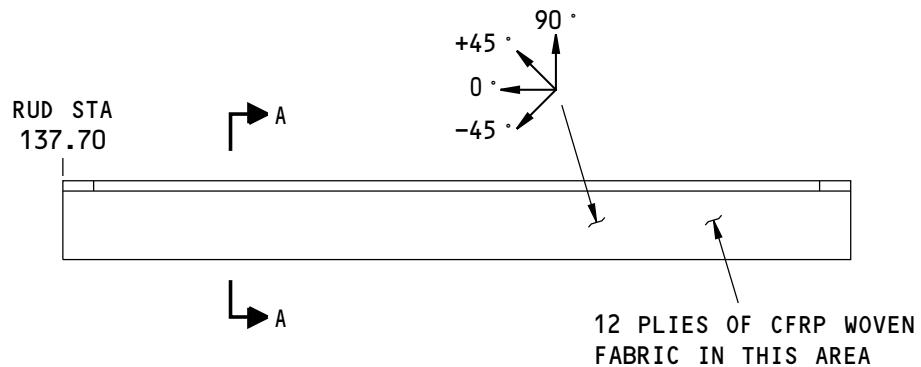
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Ply Direction and Ply Sequence for the Stiffener, Figure 2, Item [6]
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Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 7		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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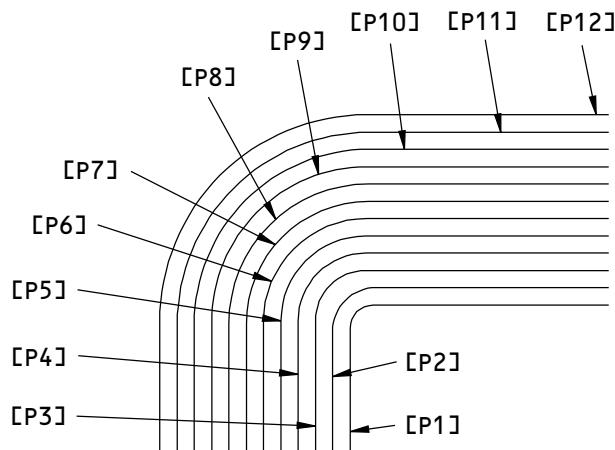
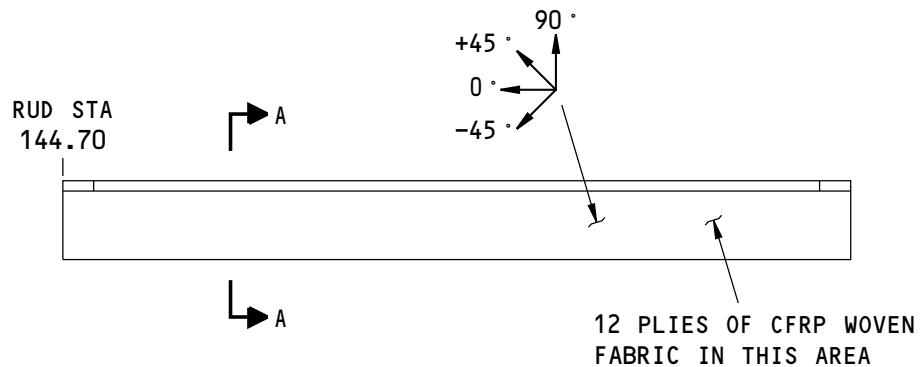
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Ply Direction and Ply Sequence for the Stiffener, Figure 2, Item [7]
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Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 8		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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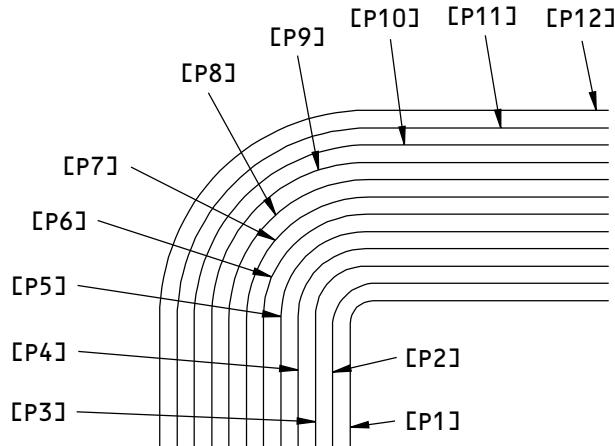
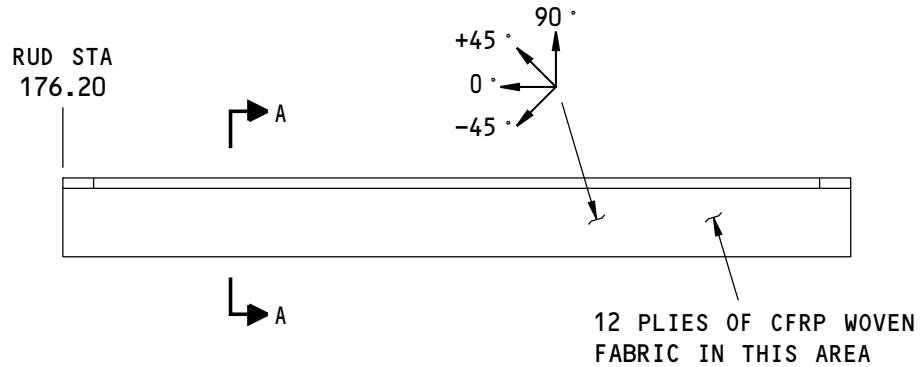
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Ply Direction and Ply Sequence for the Stiffener, Figure 2, Item [8]
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Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 9		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P8, P10, P12	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P7, P9, P11	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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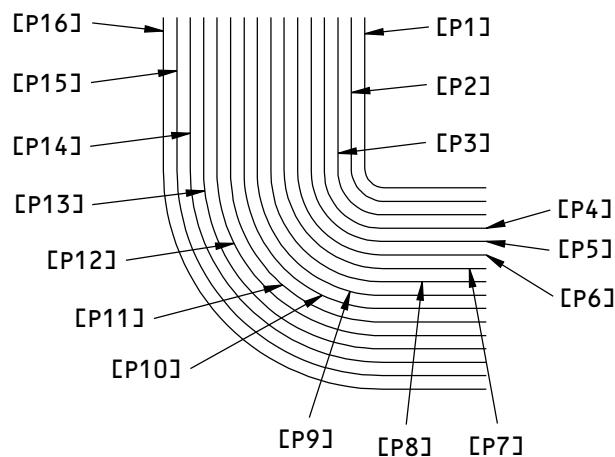
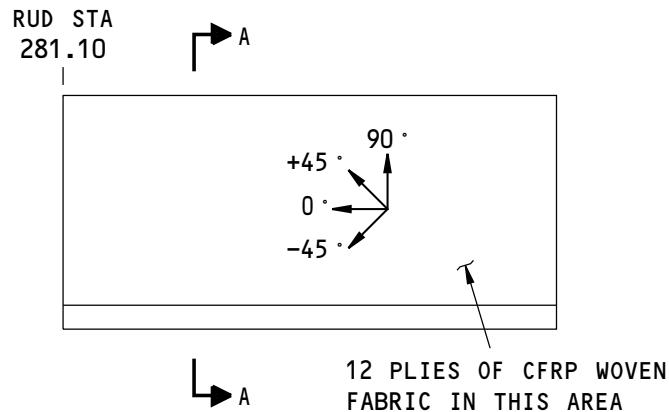
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Ply Direction and Ply Sequence for the Rib Post, Figure 2, Item [9]
Figure 10

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Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 10		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7, P10, P12, P14, P16	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8, P9, P11, P13, P15	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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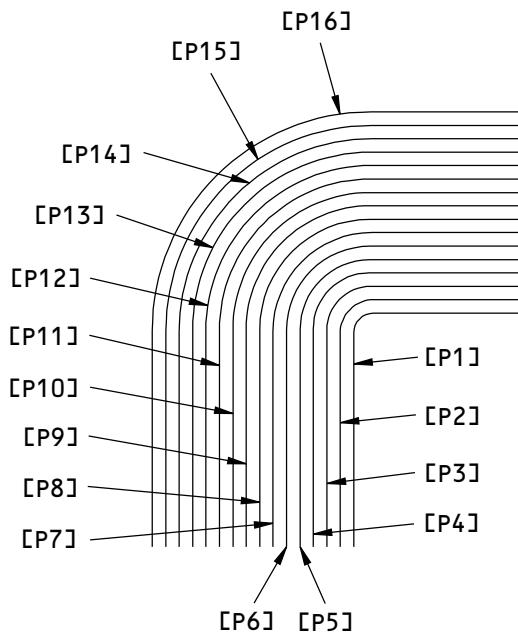
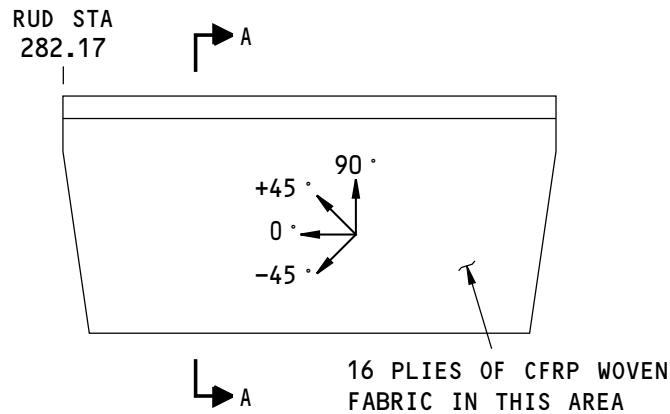
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Ply Direction and Ply Sequence for the Rib Post, Figure 2, Item [10]
Figure 11

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Table 11:

PLY MATERIAL AND DIRECTION FOR FIGURE 11		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7, P10, P12, P14, P16	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8, P9, P11, P13, P15	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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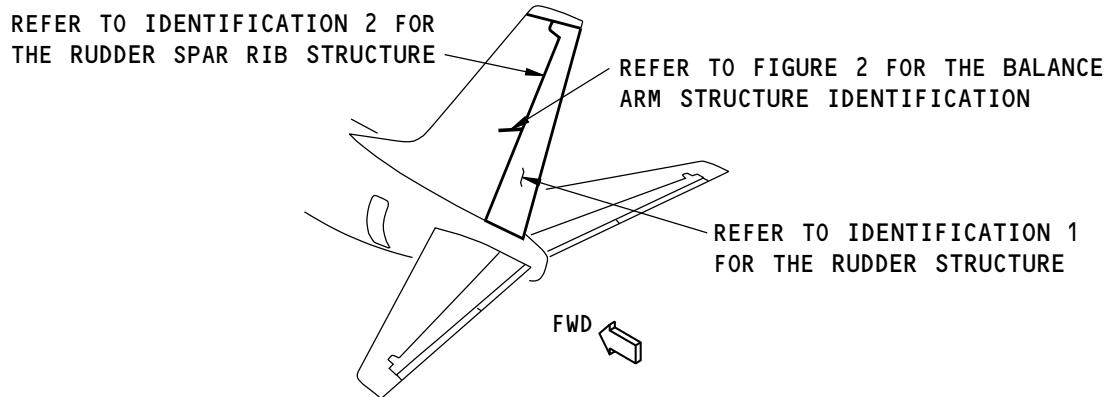
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IDENTIFICATION 3 - RUDDER BALANCE ARM STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Balance Arm Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A0002	Rudder Adjust Weight Installation
173A0100	Rudder Functional Product Collector
173A0150	Centerline Diagram - Rudder
173A5000	Balance Arm Installation - Rudder
173A5001	Balance Arm Assembly - Rudder

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IDENTIFICATION 3

Page 1

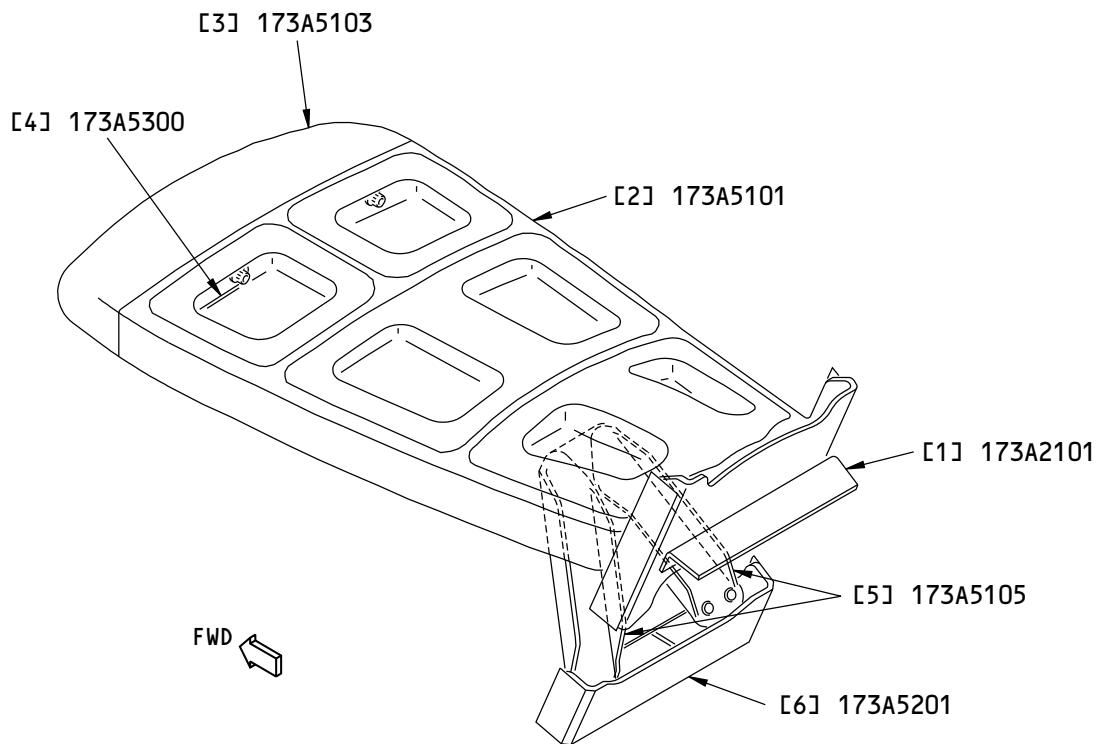
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Balance Arm Structure Identification
Figure 2

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Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rib Post		Carbon Fiber Reinforced Plastic (CFRP) woven fabric Refer to Figure 3	
[2]	Balance Arm Casting		A357.0-T6 high strength aluminum casting as given in MIL-A-21180 with Class 11 mechanical properties	
[3]	Balance Weight		Tungsten base high-density metal as given in MIL-T-21014	
[4]	Adjust Weight		Tungsten base high-density metal as given in MIL-T-21014	
[5]	Strut-Balance Arm	0.750 (19.1)	7050-T7451 plate as given in AMS 4050. Ultrasonic inspect as given in BAC 5439, Class B (Optional: Class A)	
[6]	Strut Support Fitting		7050-T7451 plate as given in AMS 4050. Ultrasonic inspect as given in BAC 5439, Class B (Optional: Class A)	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 3

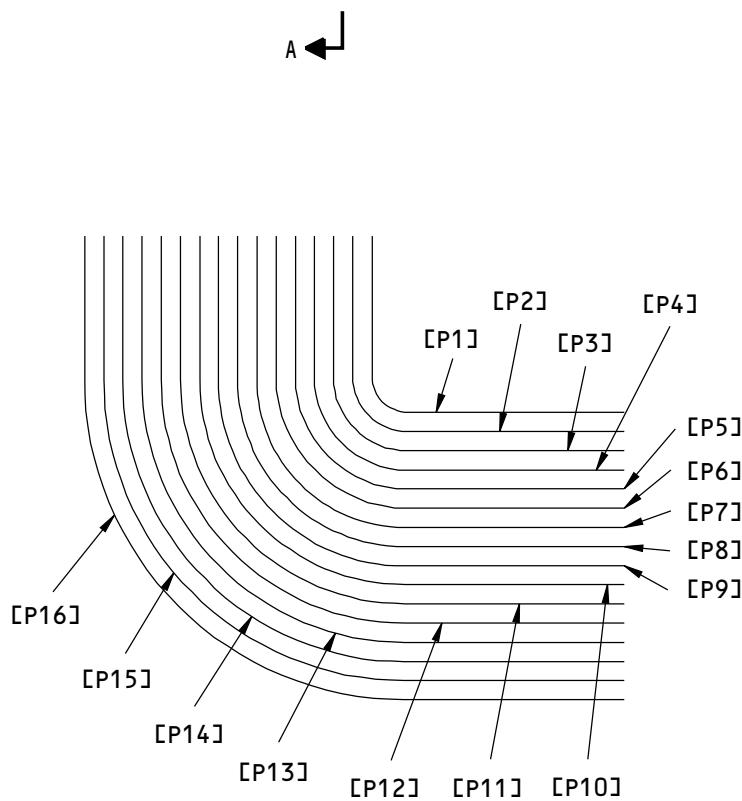
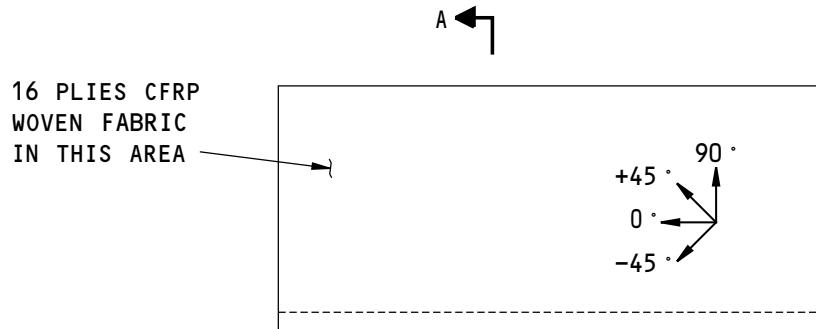
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PLY LAYUP SEQUENCE
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Ply Direction and Ply Sequence for the Rib Post, Figure 2, Item [1]
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Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7, P10, P12, P14, P16	+ or - 45 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P2, P4, P6, P8, P9, P11, P13, P15	0 or 90 degrees	CFRP woven fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW

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ALLOWABLE DAMAGE 1 - RUDDER SPAR AND SPAR RIBS

1. Applicability

- A. Allowable Damage 1 gives the allowable damage limits for the rudder spar and spar ribs shown in Rudder Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Do an inspection of the damaged area to find the length, width and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to 737 NDT Part 1, 51-01-02 for inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT.
 - (2) Refer to Definitions of Damage Size, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of the damage.
- B. Remove all contamination and water from the structure. Refer to 51-30-05 and 51-70-04 for the tools and the cleanup procedures.
- C. Seal all permitted damage areas that are not more than one ply deep. Refer to the allowable damage limits. Seal the damage with one of the two methods that follows:
- (1) Make a temporary seal.
 - (a) Apply aluminum foil tape (speed tape).
 - (b) Keep a record of the location.
 - (c) If the tape is on the external surface of the spar, then make sure that it is in satisfactory condition after each 400 flight hour interval or more frequently.
 - (d) Repair the damage at or before 5000 flight hours or 18 months, that which occurs first, from the time the seal was made.
 - (2) Make a permanent seal.
 - (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.
 - (b) Apply one layer of BMS 10-79, Type III or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.
- D. Seal all permitted damage areas that are more than one ply deep. Refer to the allowable damage limits. Seal the damage as follows:
- (1) Use a vacuum and heat to remove moisture from the solid laminate and/or honeycomb cells. Refer to 51-70-04.
 - (2) Make a temporary seal with aluminum foil tape (speed tape).
 - (3) Keep a record of the location.
 - (4) Repair the damage at or before 400 flight hours from the time the seal was made.
- E. The definition of the words "other damage" as used in the allowable damage limits, does not include nicks, gouges, and scratches that do not cause carbon fiber damage and are sealed.
- F. Make sure that the rudder is balanced. Refer to 51-60-07 for the balance procedures.

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ALLOWABLE DAMAGE 1

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Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
TYPE OF STRUCTURE	ZONE LOCATION	PARAGRAPH
SOLID LAMINATE AREA	1	4.A
	2	4.C
HONEYCOMB CORE AREA	1	4.B
	2	4.D

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ALLOWABLE DAMAGE 1

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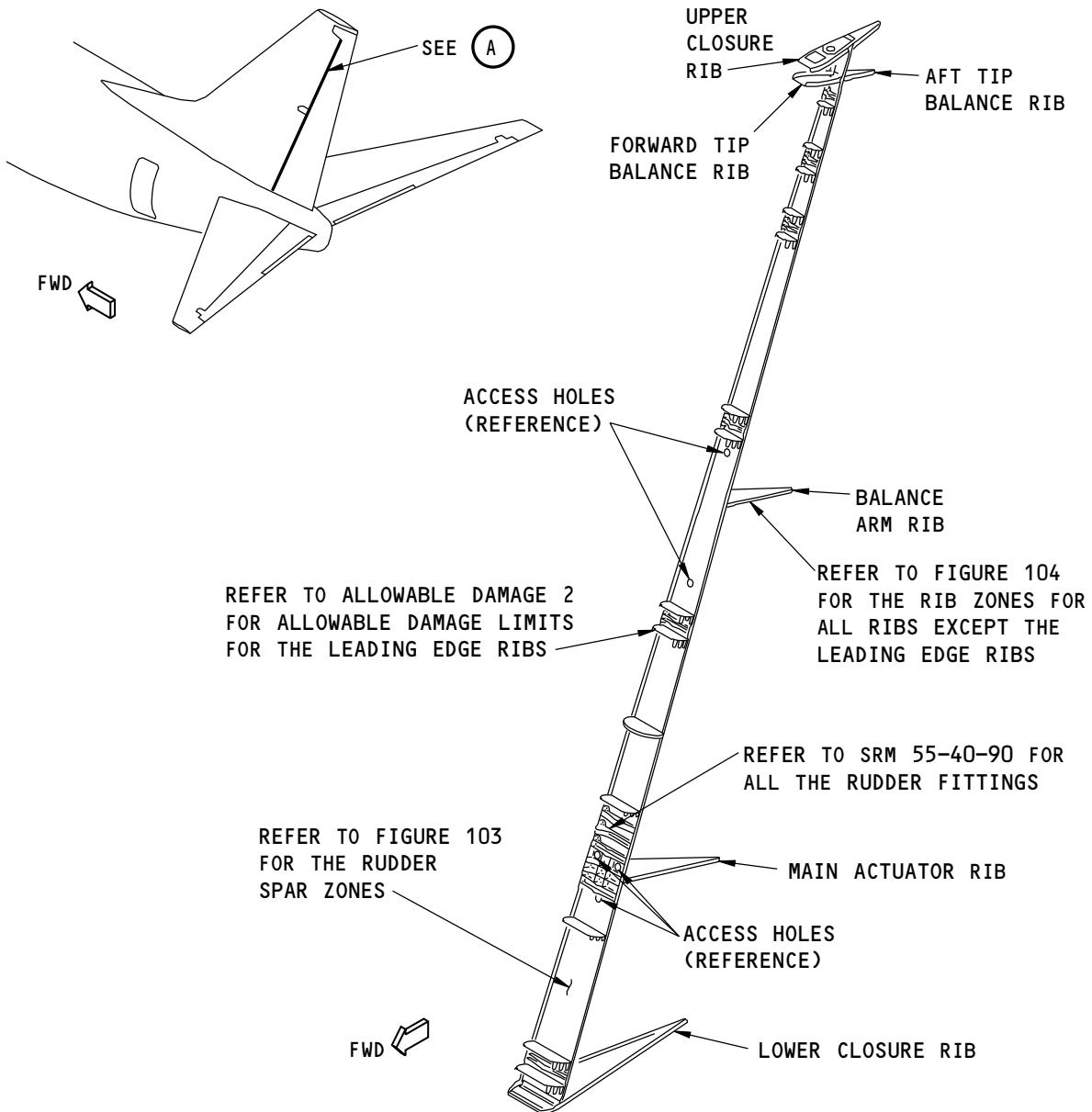
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NOTE: THE RUDDER SPAR AND RIBS (EXCEPT THE LEADING EDGE RIBS) ARE MADE OF CARBON FIBER REINFORCED PLASTIC (CFRP).

RUDDER SPAR AND RIBS

(A)

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Rudder Structure Location
Figure 101

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ALLOWABLE DAMAGE 1

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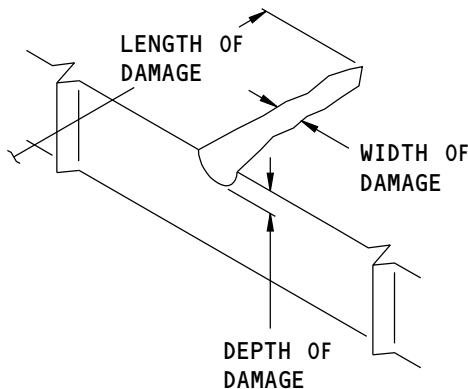
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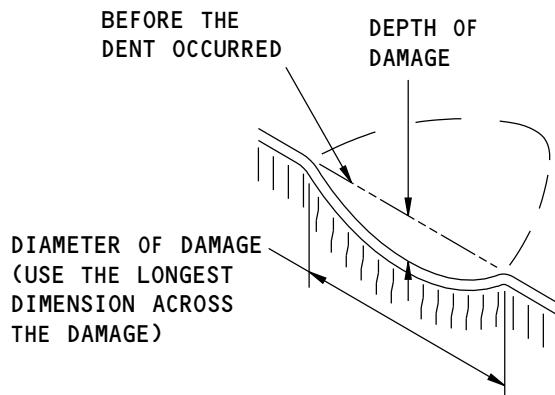
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**SIZE DEFINITIONS FOR
NICK, GOUGE, OR SCRATCH DAMAGE**

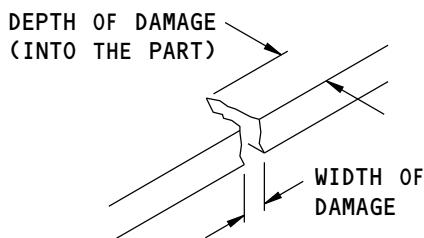
(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED



**SIZE DEFINITIONS FOR
DENT DAMAGE**

(B)



**SIZE DEFINITIONS FOR
EDGE DAMAGE**

(C)

F97072 S0006593764_V1

**Definitions of Damage Size
Figure 102**

55-40-02

ALLOWABLE DAMAGE 1

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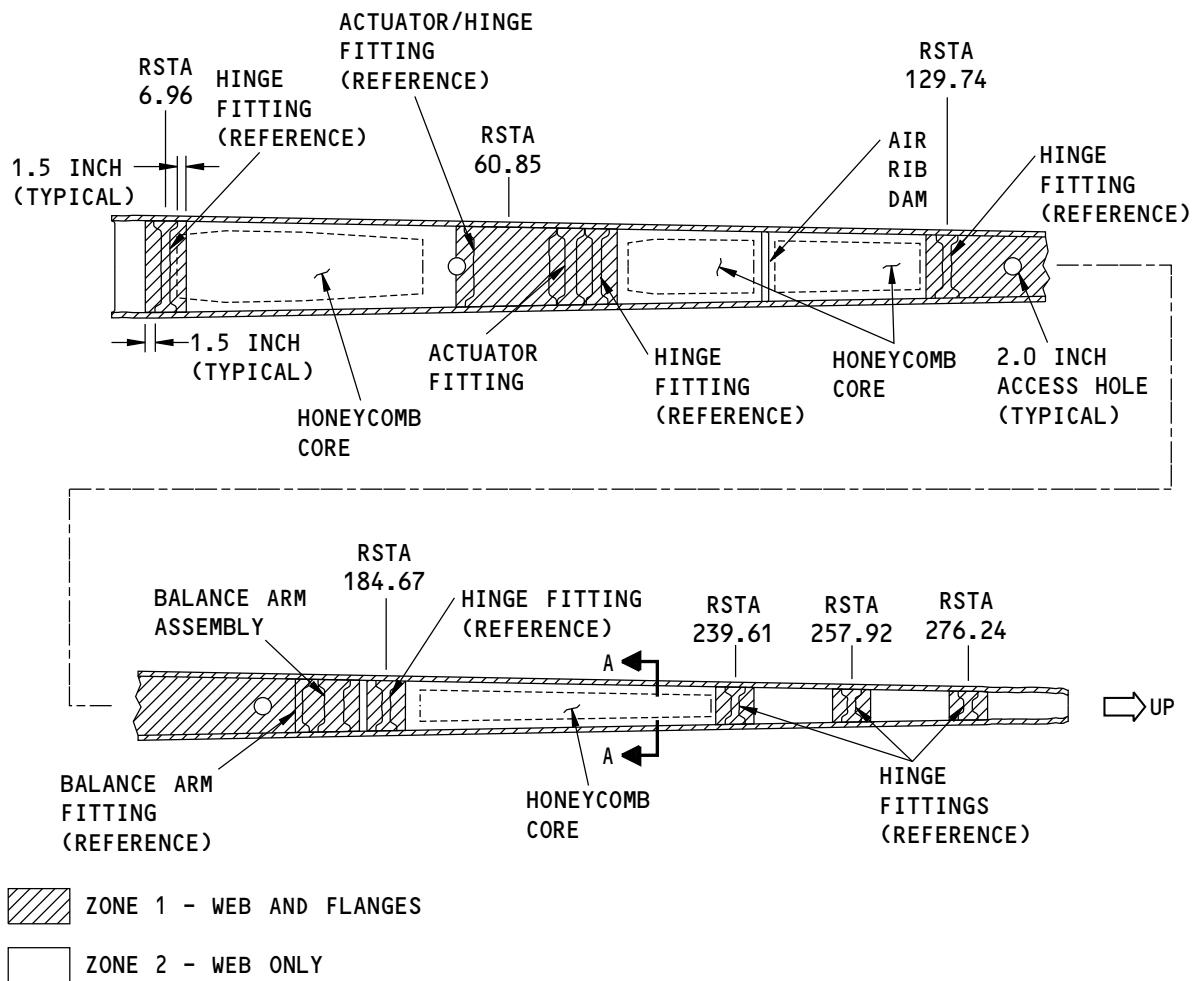
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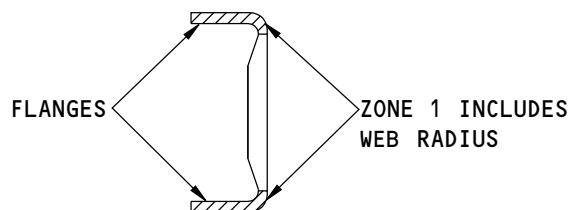


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STRUCTURAL REPAIR MANUAL



FRONT VIEW OF SPAR

A



A-A

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Rudder Spar Zone Locations
Figure 103

55-40-02

ALLOWABLE DAMAGE 1

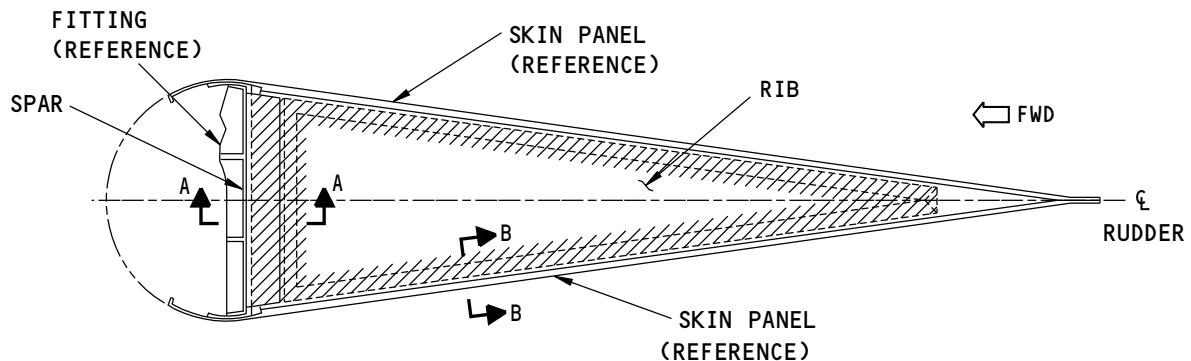
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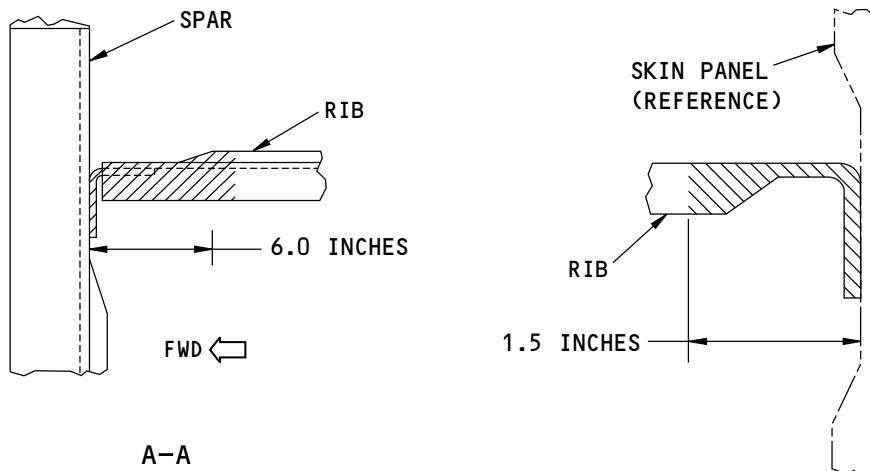
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THE BALANCE ARM RIB IS SHOWN,
THE OTHER RIBS ARE ALMOST THE SAME



- ZONE 1
- ZONE 2

NOTES

- USE THE ZONE 2 LIMITS FOR THE UPPER CLOSURE RIB, AFT TIP BALANCE RIB, AND FORWARD TIP BALANCE RIB.

F97111 S0006593767_V1

**Rudder Rib Zone Locations
Figure 104**

55-40-02

ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-05, GENERAL	Repair Sealing
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-60-07	RUDDER BALANCE PROCEDURE
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits for the Rudder Spar and Ribs

A. Solid Laminate Area of Zone 1

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the fiberglass ply are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are not permitted.
- (4) Holes and Punctures are not permitted.
- (5) Dents are not permitted.
- (6) Delaminations are not permitted.
- (7) Edge damage is permitted if:
 - (a) The depth is a maximum of one ply
 - (b) The width is a maximum of 0.25 inch
 - (c) The damage is a minimum of 6 inches away from the edge of other damage.

B. Honeycomb Core Area of Zone 1

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are not permitted.
- (3) Dents that do not cause damage to the carbon fibers are permitted if:
 - (a) The depth is a maximum of one face sheet
 - (b) The diameter is a maximum of 0.5 inch
 - (c) The damage is a minimum of 6 inches away from the edge of other damage.
- (4) Holes and Punctures are not permitted.
- (5) Delaminations are not permitted.

C. Solid Laminate Area of Zone 2

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.
- (2) Nicks, Gouges, and Scratches that cause damage to the fiberglass ply are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if:

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ALLOWABLE DAMAGE 1

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- (a) The depth is a maximum of one ply

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) The length is a maximum of 1.0 inch
(c) The width is a maximum of 0.25 inch
(d) Not more than 1 fastener hole in 6 is damaged
(e) The damage is a minimum of 3 inches away from the edge of other damage.

- (4) Dents that do not cause damage to the carbon fibers are permitted if:

- (a) The depth is a maximum of one ply

NOTE: Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one ply.

- (b) The diameter is a maximum of 0.625 inch
(c) Not more than 1 fastener hole in 6 is damaged
(d) The damage is a minimum of 3 inches away from the edge of other damage.

- (5) Holes and Punctures are permitted if:

- (a) The diameter is a maximum of 0.25 inch

- (b) The damage is a minimum of 3 inches away from the edge of other damage, a fastener hole, or a part edge.

- (6) Delaminations are permitted if:

- (a) The depth is a maximum of one ply
(b) The diameter is a maximum of 0.50 inch
(c) The damage is a minimum of 3 inches away from the edge of other damage, a fastener hole, or a part edge.

- (7) Edge damage is permitted if:

- (a) The depth is a maximum of one ply
(b) The width is a maximum of 0.25 inch
(c) The damage is a minimum of 3 inches away from the edge of other damage or a hole.

D. Honeycomb Core Area of Zone 2

- (1) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.

- (2) Nicks, Gouges, and Scratches that cause damage to the fiberglass fibers are permitted.

- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if:

- (a) The depth is a maximum of one ply

NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.

- (b) The length is a maximum of 0.625 inch
(c) The width is a maximum of 0.25 inch
(d) The damage is a minimum of 3 inches away from the edge of other damage.

- (4) Dents that do not cause damage to the carbon fibers are permitted if:

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ALLOWABLE DAMAGE 1

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- (a) The depth is a maximum of one face sheet

NOTE: Use the limits for holes and punctures if there is carbon fiber damage or if the dent depth is more than one ply.

- (b) The diameter is a maximum of 0.5 inch

- (c) The damage is a minimum of 3 inches away from the edge of other damage.

- (5) Holes and Punctures are permitted if:

- (a) A maximum of one face sheet and the core in depth

- (b) The diameter is a maximum of 0.50 inch

- (c) The damage is a minimum of 3 inches away from the edge of other damage or a fastener hole.

- (6) Delaminations are permitted if:

- (a) The diameter is a maximum of 0.5 inch

- (b) The damage is a minimum of 3 inches away from the edge of other damage or a fastener hole.

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ALLOWABLE DAMAGE 1

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ALLOWABLE DAMAGE 2 - LEADING EDGE RIBS OF THE RUDDER STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the leading edge ribs of the rudder structure shown in Leading Edge Rib Locations, Figure 101/ALLOWABLE DAMAGE 2.

2. General

- A. Remove the damaged material, as applicable. Make sure that the material to be removed is less than or equal to the allowable damage limits.
- B. Apply a chemical conversion coating to the bare surfaces of the reworked areas. Refer to 51-20-01.
- C. Apply a layer of BMS 10-79, Type III primer to the bare surfaces of the reworked areas. Refer to SOPM 20-44-04.
- D. Apply a layer of BMS 10-60 enamel to the reworked areas. Refer to AMM 51-21-00/701.

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ALLOWABLE DAMAGE 2

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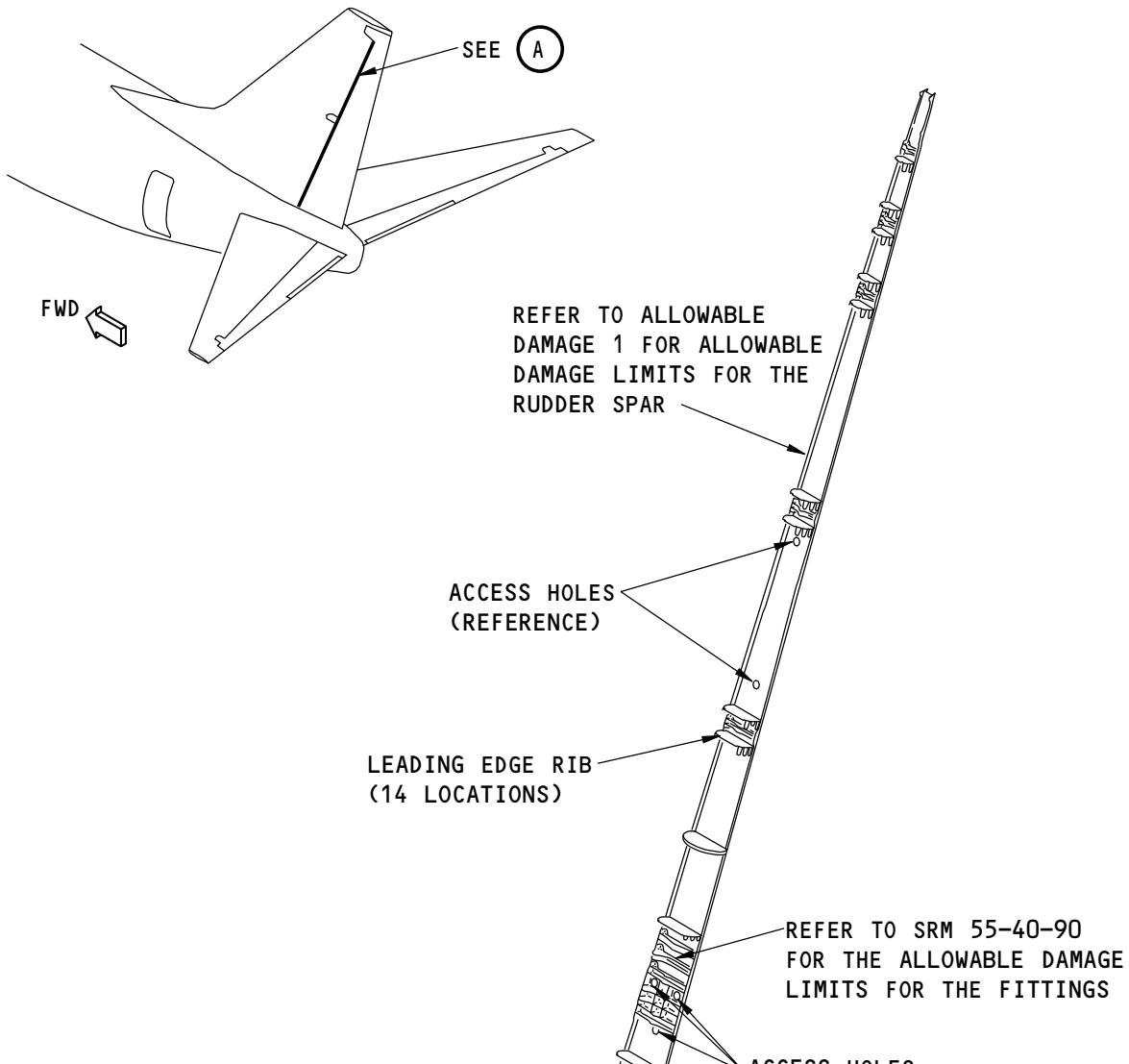
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LEADING EDGE RIBS (ALUMINUM)

A

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Leading Edge Rib Locations
Figure 101

55-40-02

ALLOWABLE DAMAGE 2

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3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05, GENERAL	Equipment and Tools For Repairs
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Cracks:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A, and B.

B. Nicks, Gouges, Scratches, and Corrosion:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, D, and E.

C. Dents:

- (1) Refer to Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 2, Detail F for the damage that is permitted.

D. Holes and Punctures:

- (1) The maximum diameter of damage permitted is 0.25 inch (6.35 mm) after cleanup.
- (2) The damage must be 1.00 inch (25.4 mm) minimum from other holes, part edge, or other damage.
- (3) Fill the hole with a 2117-T3 or 2117-T4 aluminum rivet.
 - (a) Install the rivet without sealant.

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ALLOWABLE DAMAGE 2

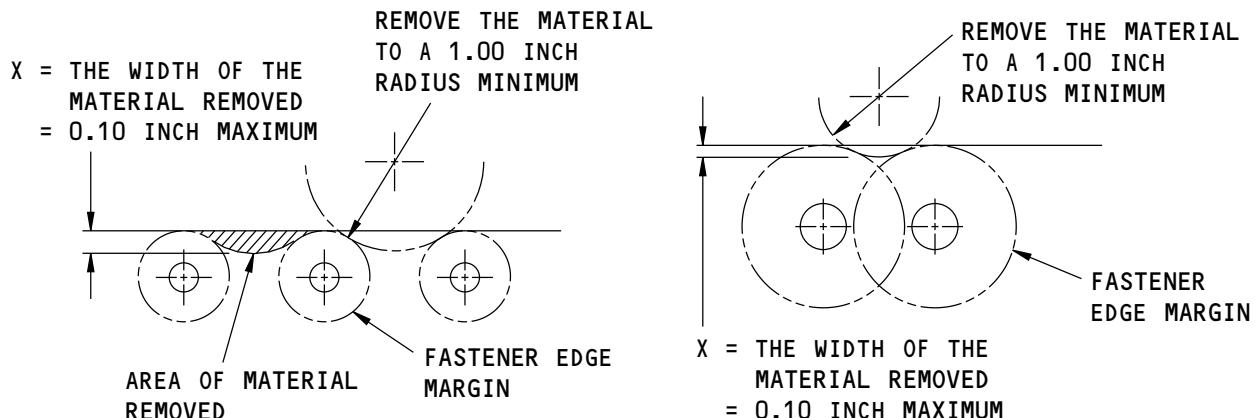
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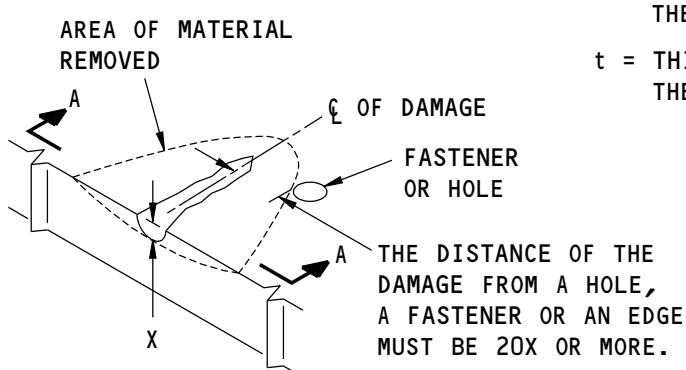


REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)

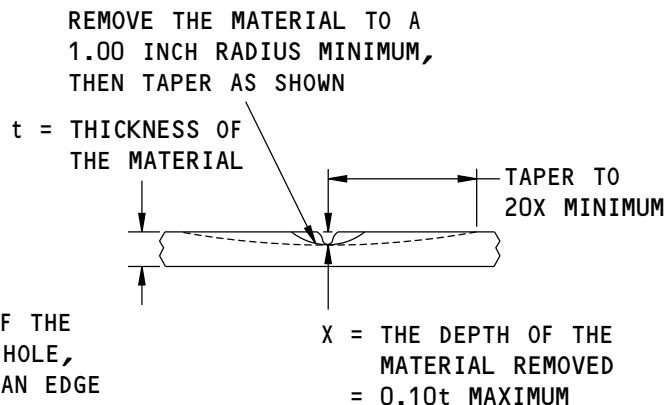
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)



A-A

F97113 S0006593770_V1

**Allowable Damage Limits
Figure 102 (Sheet 1 of 3)**

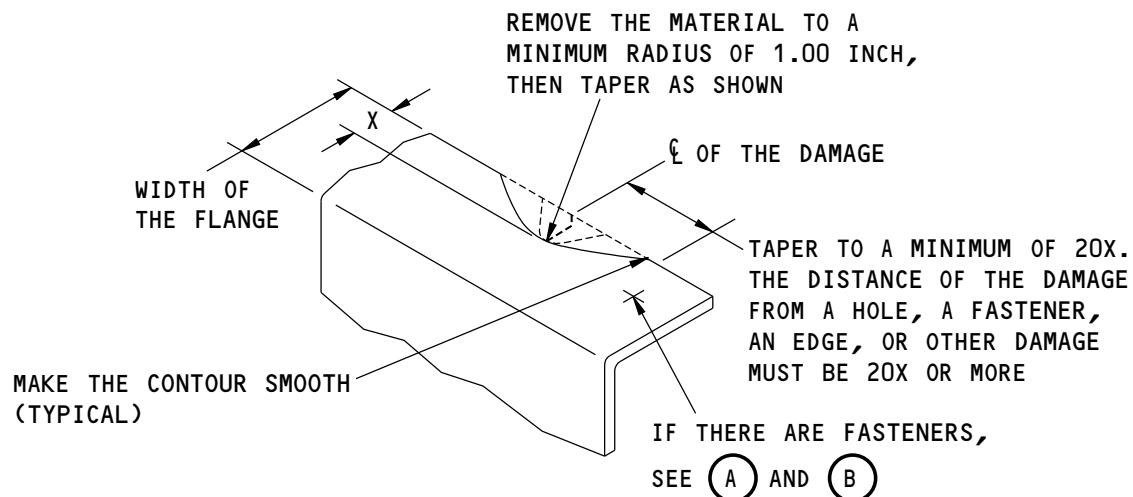
55-40-02

ALLOWABLE DAMAGE 2

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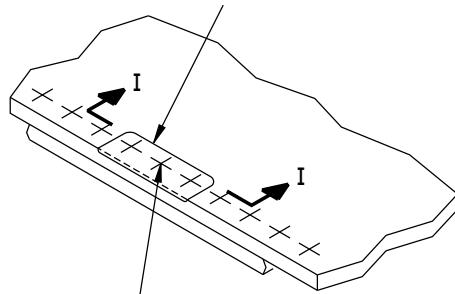
**737-800
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X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

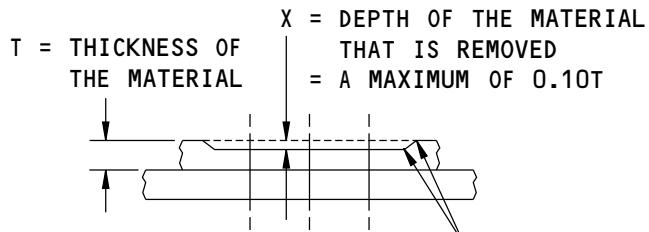
REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(D)

THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVE THE FASTENERS BEFORE THE DAMAGE IS REMOVED. INSTALL THE FASTENERS AFTER THE REWORK IS DONE



MAKE THE CONTOUR SMOOTH TO A MINIMUM RADIUS OF 0.50 INCH (TYPICAL)

REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

I-I

(E)

F97115 S0006593771_V1

Allowable Damage Limits
Figure 102 (Sheet 2 of 3)

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ALLOWABLE DAMAGE 2

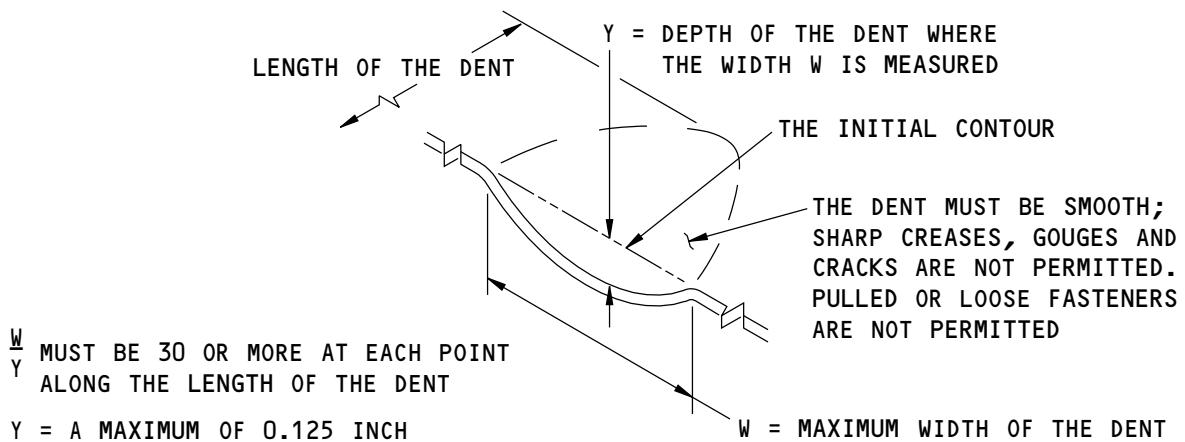
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DENT THAT IS PERMITTED



F97116 S0006593772_V1

Allowable Damage Limits
Figure 102 (Sheet 3 of 3)

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ALLOWABLE DAMAGE 2

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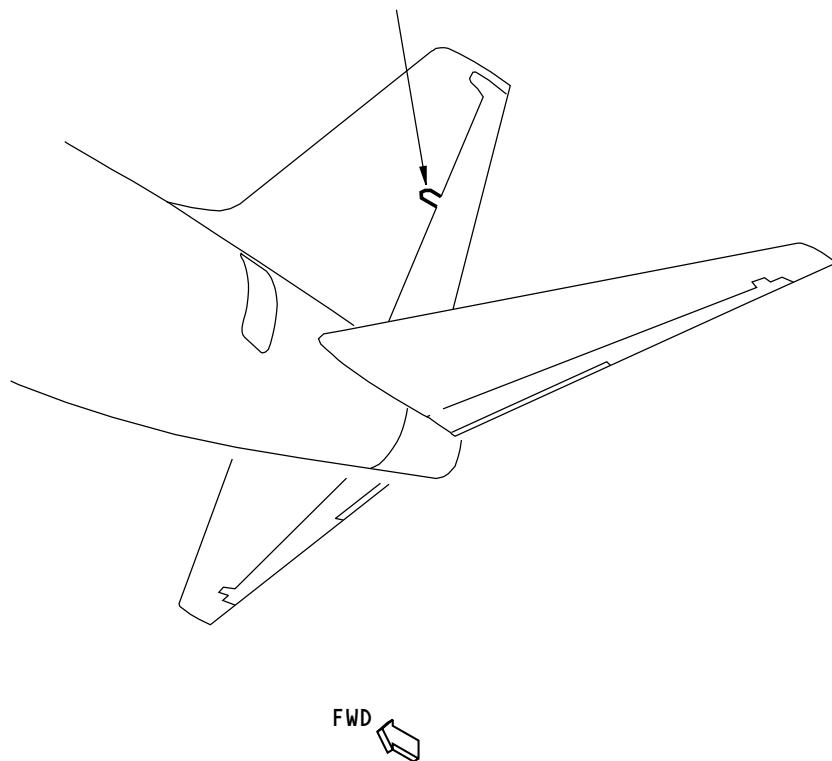
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ALLOWABLE DAMAGE 3 - RUDDER BALANCE ARM STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the balance arm structure shown in Rudder Balance Arm Location, Figure 101/ALLOWABLE DAMAGE 3.

REFER TO FIGURE 102 FOR
THE BALANCE ARM STRUCTURE



Rudder Balance Arm Location
Figure 101

F97276 S0006593774_V1

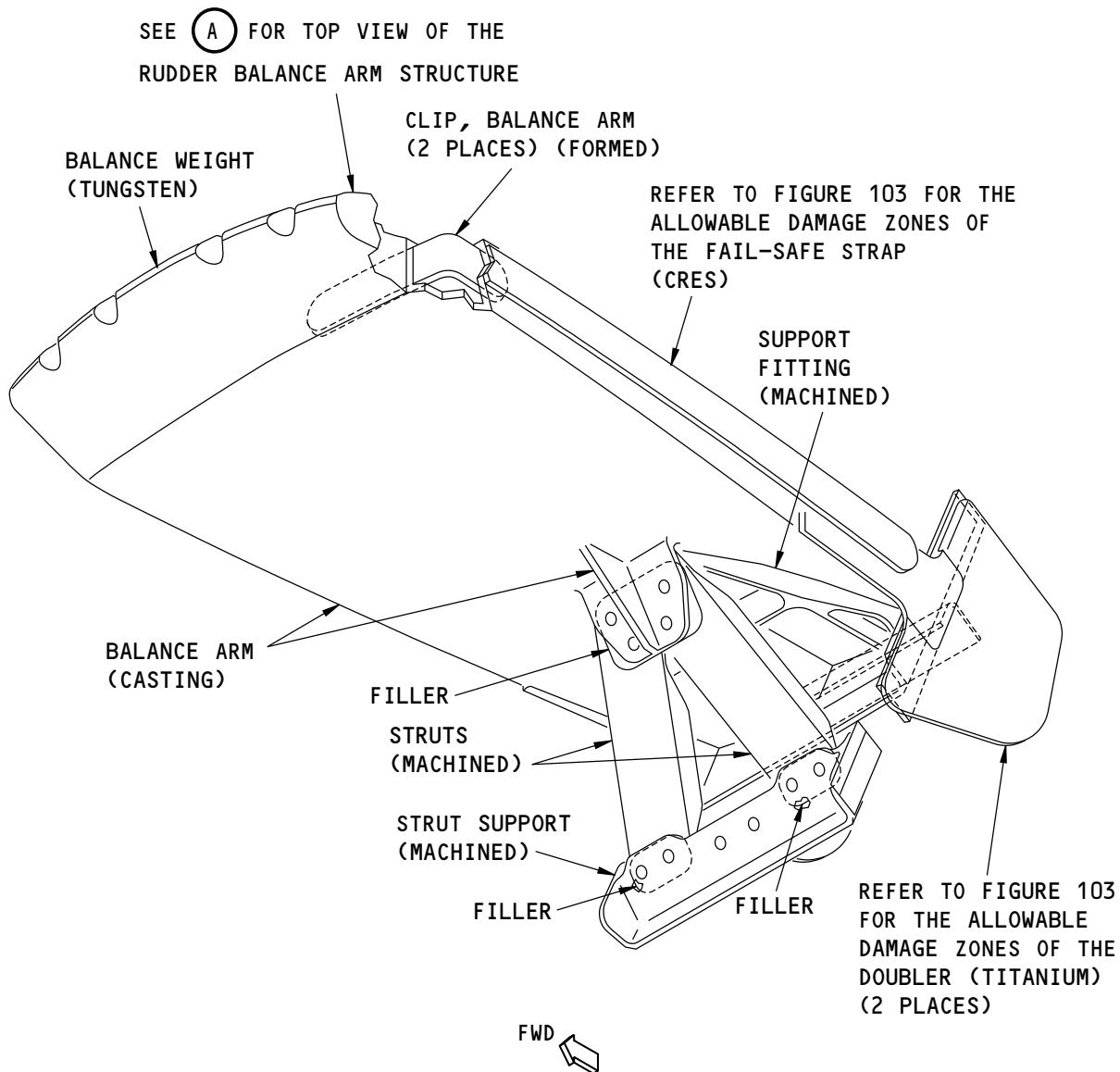
55-40-02

ALLOWABLE DAMAGE 3

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NOTES

- ALL PARTS ARE MADE OF ALUMINUM UNLESS OTHERWISE NOTED.

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Rudder Balance Arm
Figure 102 (Sheet 1 of 2)

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ALLOWABLE DAMAGE 3

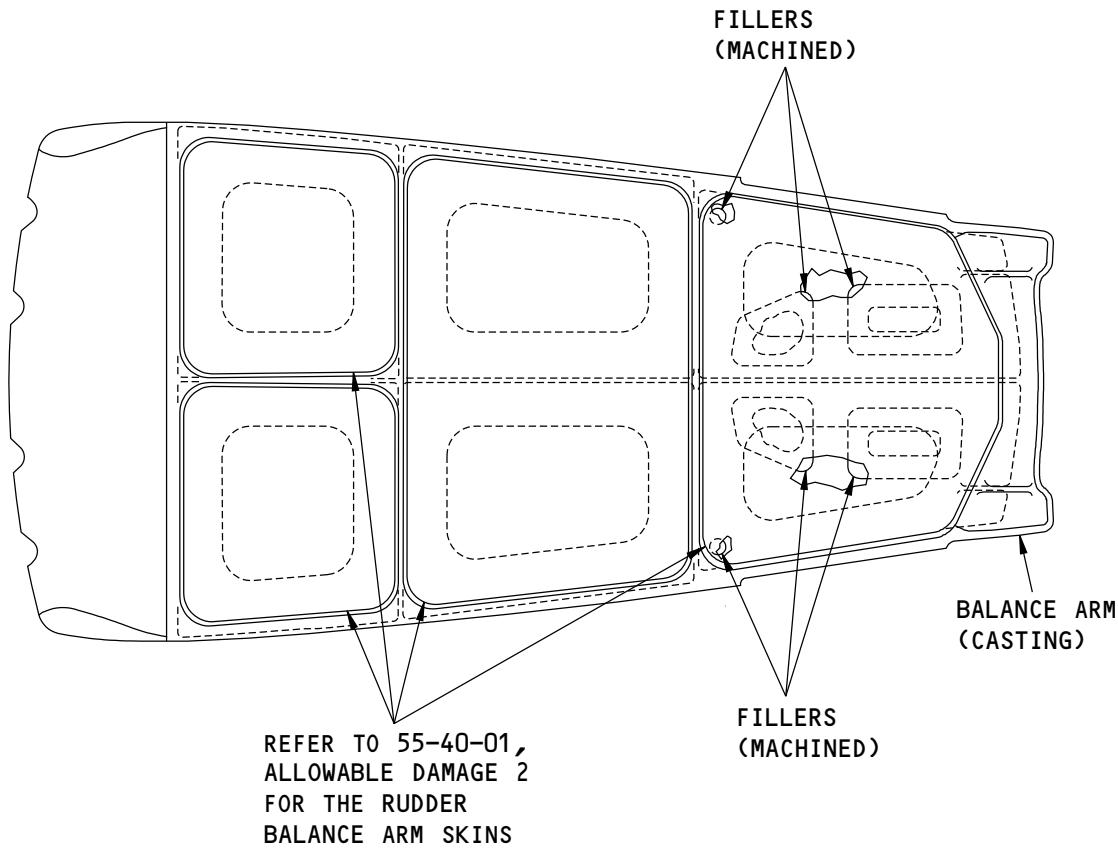
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TOP VIEW
BALANCE ARM STRUCTURE

A

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Rudder Balance Arm
Figure 102 (Sheet 2 of 2)

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ALLOWABLE DAMAGE 3

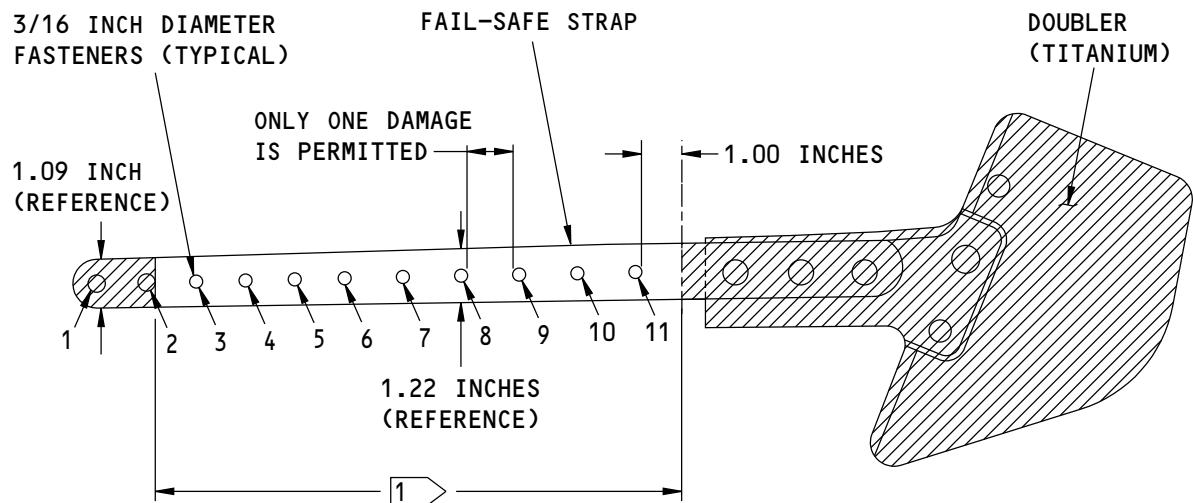
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NOTES

- NO DAMAGE IS PERMITTED
- THE MAXIMUM DAMAGE DEPTH PERMITTED AT THE STRAP EDGES ACROSS FROM FASTENER LOCATIONS IS 0.15 INCH.
THE MAXIMUM DAMAGE DEPTH PERMITTED AT THE STRAP EDGES OTHER THAN EDGES ACROSS FROM FASTENER LOCATIONS IS 0.20 INCH.
- REFER TO FIGURE 104, DETAIL F, FOR THE REMOVAL OF DAMAGE.
- IF DAMAGE IS FOUND ON THE FAIL SAFE STRAP, YOU MUST DO AN INSPECTION OF THE ADJACENT STRUCTURE.
MAKE SURE THERE IS NO DAMAGE IN THE ADJACENT STRUCTURE.

G82567 S0006593777_V1

Allowable Damage Zones - Doubler and Fail Safe Strap Assembly
Figure 103

55-40-02

ALLOWABLE DAMAGE 3
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2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 3 for the allowable damage limits.
- B. Remove the damage material as necessary.
 - (1) Refer to 51-10-02 for inspection and removal of the damage.
 - (2) Refer to 51-30-03 for possible sources of the abrasive and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
- C. After you remove the damage, do the steps that follow.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the reworked area of the balance arm struts, strut supports or support fittings.
 - (a) Refer to 51-20-06 for the shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for the flap peen or shot peen procedures.
- (2) Apply a chemical conversion coating to the bare reworked surfaces of the aluminum parts. Refer to 51-20-01.
- (3) Apply a cadmium plating to the bare reworked surfaces of the CRES parts. Refer to SOPM 20-42-05.
- (4) Apply a layer of BMS 10-79, Type III primer to the bare reworked surfaces of the aluminum and CRES parts. Refer to SOPM 20-44-04.
- (5) Apply a layer of BMS 10-60 enamel to the reworked areas of the aluminum and CRES parts. Refer to AMM 51-21-00/701.
- (6) Make sure that the rudder is balanced. Refer to 51-60-07 for the balance procedures.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02, GENERAL	Fastener Installation and Removal
51-60-07	RUDDER BALANCE PROCEDURE
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-42-05	Bright Cadmium Plating
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

- A. Balance Arm, Support Fitting, Strut Support, Struts, Clips and Fillers

- (1) Cracks:

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ALLOWABLE DAMAGE 3

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- (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details A, B, and D.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details A, B, C, D and E.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- B. Fail-Safe Straps
- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Detail F.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details C, E and F.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- C. Doublers
- (1) Cracks are not permitted.
 - (2) Nicks, Gouges, Scratches, and Corrosion are not permitted.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.

55-40-02

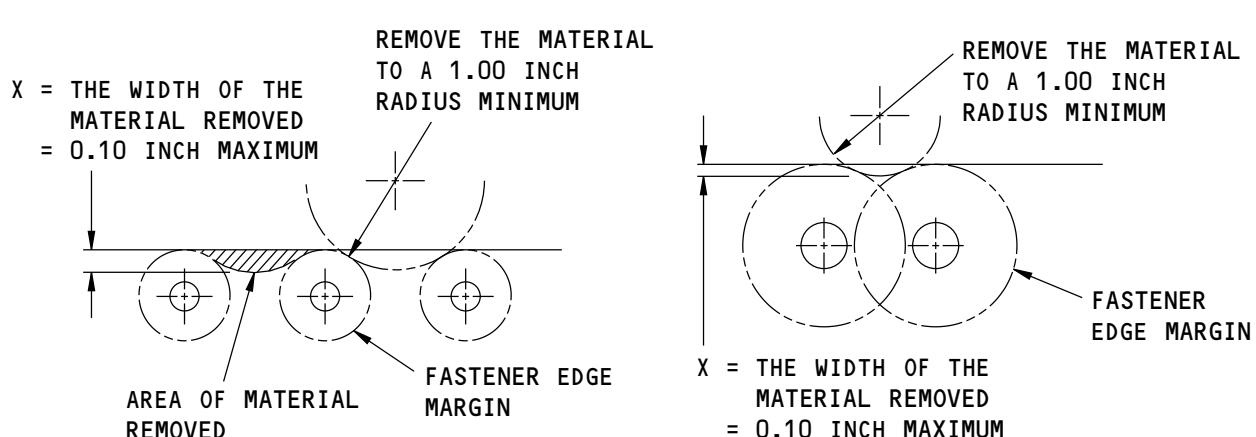
ALLOWABLE DAMAGE 3

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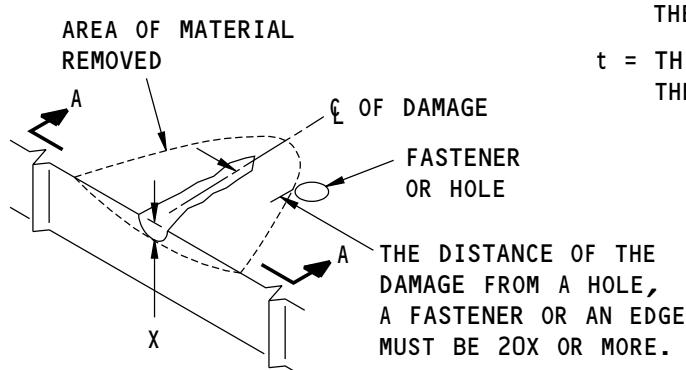
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REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)

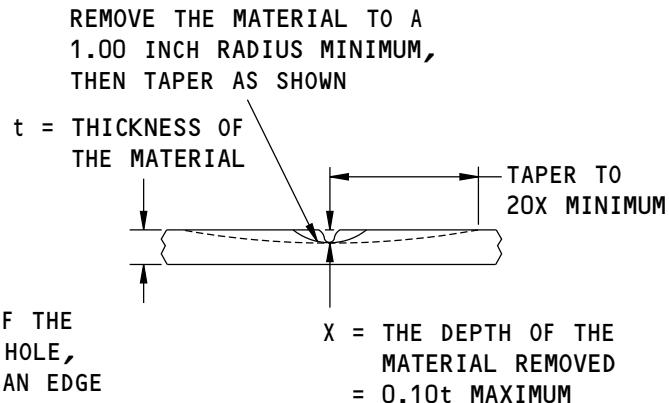
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)



A-A

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**Allowable Damage Limits
Figure 104 (Sheet 1 of 3)**

55-40-02

ALLOWABLE DAMAGE 3

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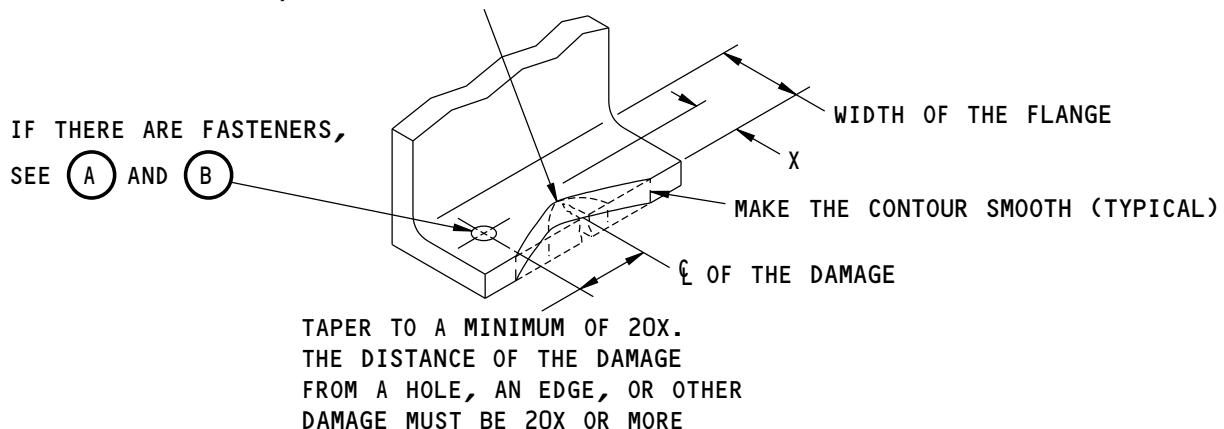
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737-800 STRUCTURAL REPAIR MANUAL

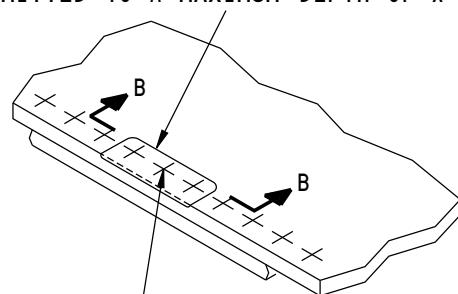
REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER AS SHOWN



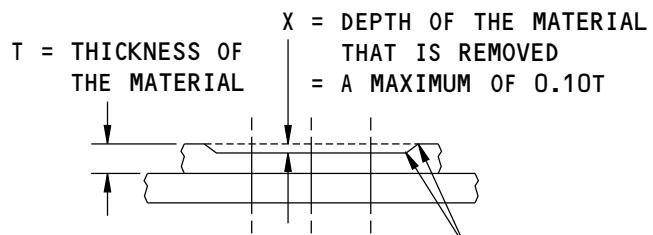
REMOVAL OF DAMAGED MATERIAL AT AN EDGE



THE REMOVAL OF MATERIAL AROUND THREE FASTENERS IN A GROUP OF TEN IS PERMITTED TO A MAXIMUM DEPTH OF X



REMOVE THE FASTENERS BEFORE THE DAMAGE IS REMOVED. INSTALL THE FASTENERS AFTER THE REWORK IS DONE



MAKE THE CONTOUR SMOOTH TO A MINIMUM RADIUS OF 0.50 INCH (TYPICAL)

REMOVAL OF DAMAGE AROUND THE FASTENERS ON AN EDGE OR A SURFACE

B-B



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Allowable Damage Limits
Figure 104 (Sheet 2 of 3)

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ALLOWABLE DAMAGE 3

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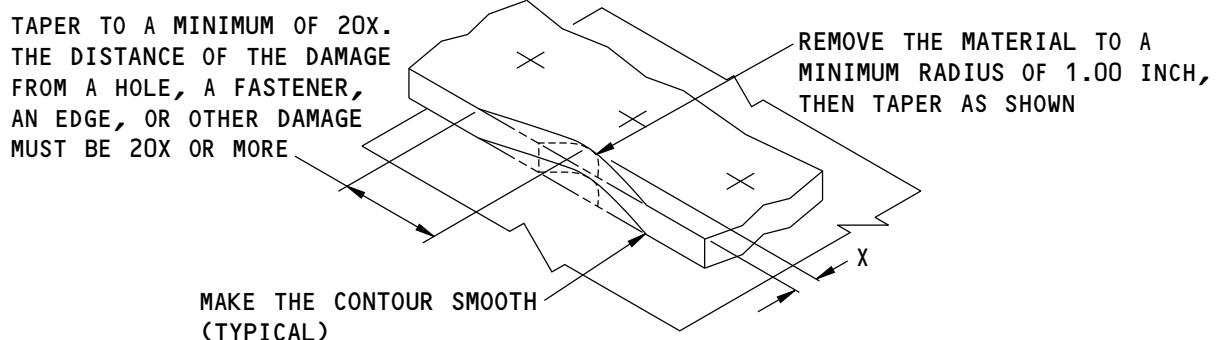
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X = DEPTH OF THE MATERIAL THAT IS REMOVED
(REFER TO FIGURE 103 ON PAGE 106)

REMOVAL OF DAMAGED MATERIAL FROM THE FAIL-SAFE STRAP



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Allowable Damage Limits
Figure 104 (Sheet 3 of 3)

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ALLOWABLE DAMAGE 3

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STRUCTURAL REPAIR MANUAL

REPAIR 1 - RUDDER STRUCTURE

1. Applicability

- A. Repair 1 is applicable to the rudder structure as shown in Rudder Structure Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.

2. General

- A. Repair 1 gives instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Remove the rudder, as necessary. Refer to AMM 27-21-11/401.
- C. Remove the skin, as necessary to get access to the spar and ribs. Refer to 51-40-02 for fastener removal procedures.
- D. Remove the fittings or the leading edge ribs from the spar, as necessary to get access to the spar. Refer to SOPM 20-10-08.
- E. Do an inspection of the damaged area to find the dimensions of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02, and NDT, Part 1, 51-01-03 for inspection procedures.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- (1) For the honeycomb core areas, the tap test is an alternative procedure to an instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the inspection procedures.
- (2) Refer to Definitions of Damage Size, Figure 202/REPAIR 1 for the definitions of the length, width and depth of damage.
- (3) Refer to Definitions of the Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.
- F. Refer to Rudder Spar Zone Locations, Figure 204/REPAIR 1 for the rudder spar zone locations.
- G. Refer to Rudder Rib Zone Locations, Figure 205/REPAIR 1 for the rudder rib zone locations.
- H. Do the repair as given in Paragraph 4./REPAIR 1
- I. Install the fittings or the leading edge ribs on the spar, as applicable.
 - (1) Apply BMS 5-95 sealant to the mating surfaces. Refer to 51-20-05.
- J. Install the skin, as applicable. Refer to 51-40-02 for fastener installation procedures.
- K. Make sure that the rudder is balanced. Refer to 51-60-03.
- L. Install the rudder, as applicable. Refer to AMM 27-21-11/401.

55-40-02

REPAIR 1
Page 201

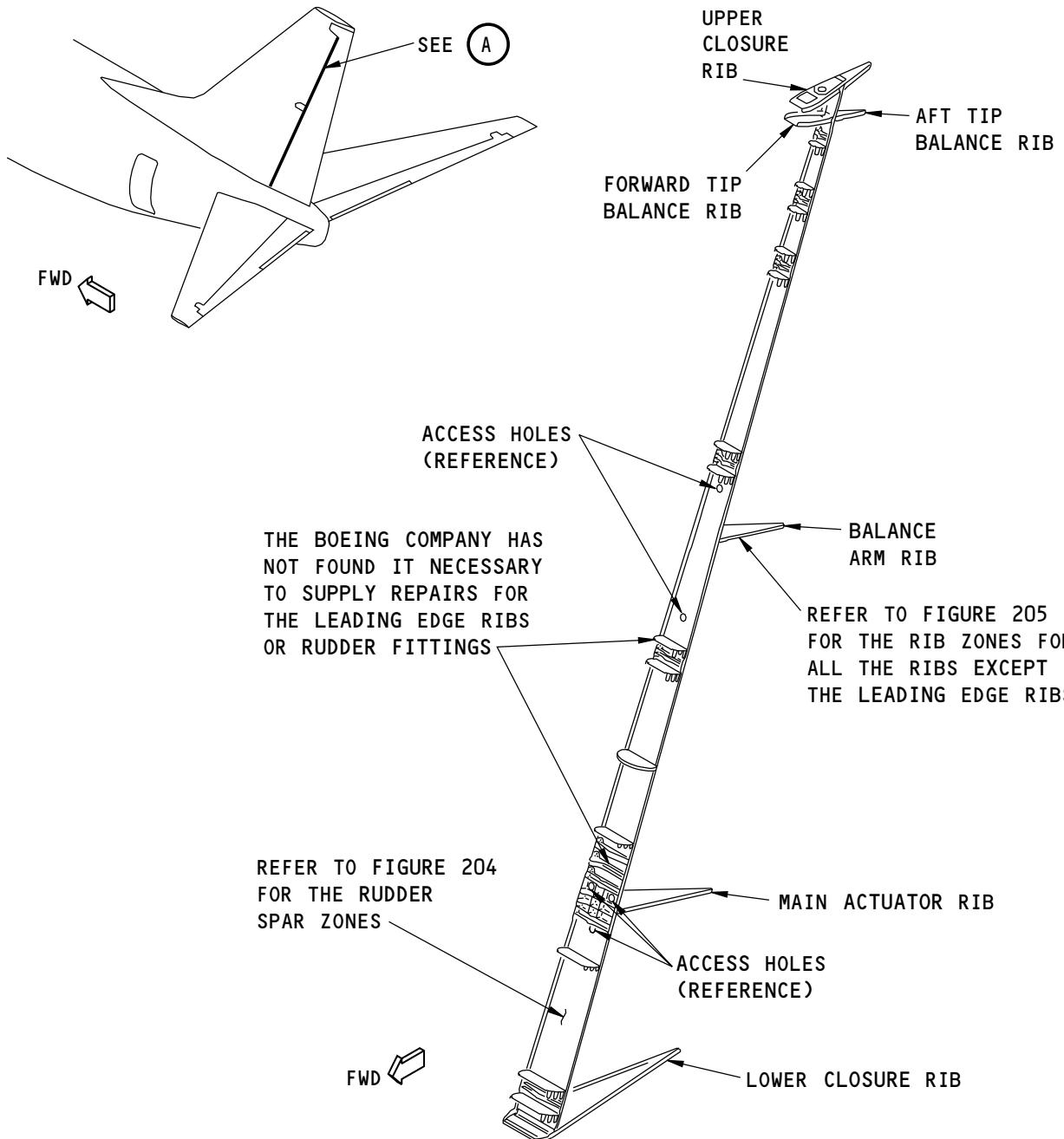
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RUDDER SPAR AND RIBS (CARBON FIBER REINFORCED PLASTIC)

(A)

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Rudder Structure Location
Figure 201

55-40-02

REPAIR 1
Page 202

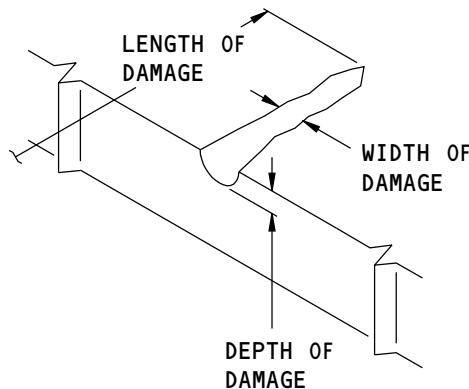
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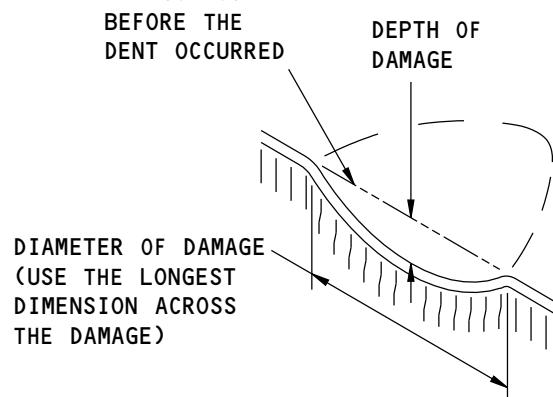
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SIZE DEFINITIONS FOR
NICK, GOUGE, OR SCRATCH DAMAGE

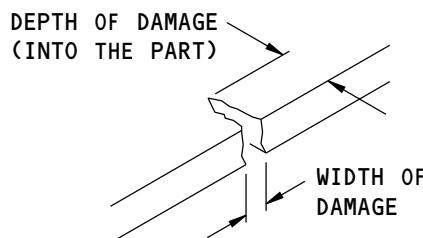
(A)

THE CONTOUR
BEFORE THE
DENT OCCURRED



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of Damage Size
Figure 202

55-40-02

REPAIR 1
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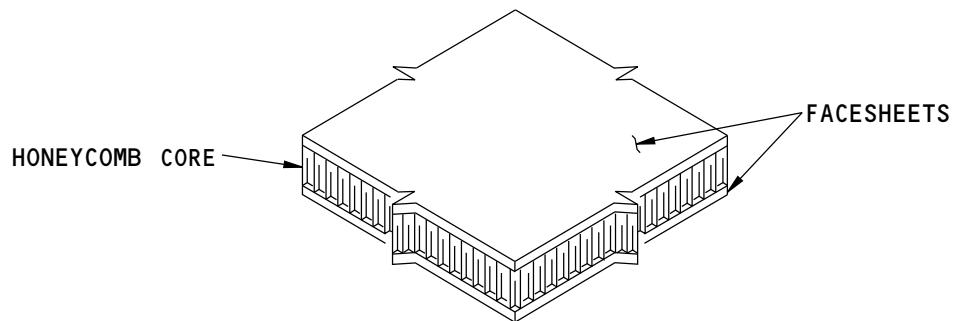
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Definitions of the Facesheets
Figure 203

55-40-02

REPAIR 1
Page 204

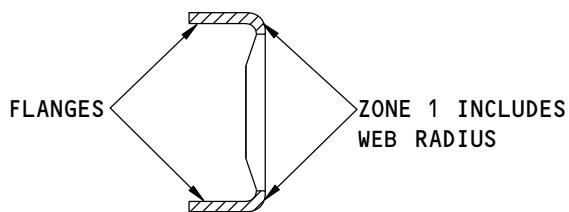
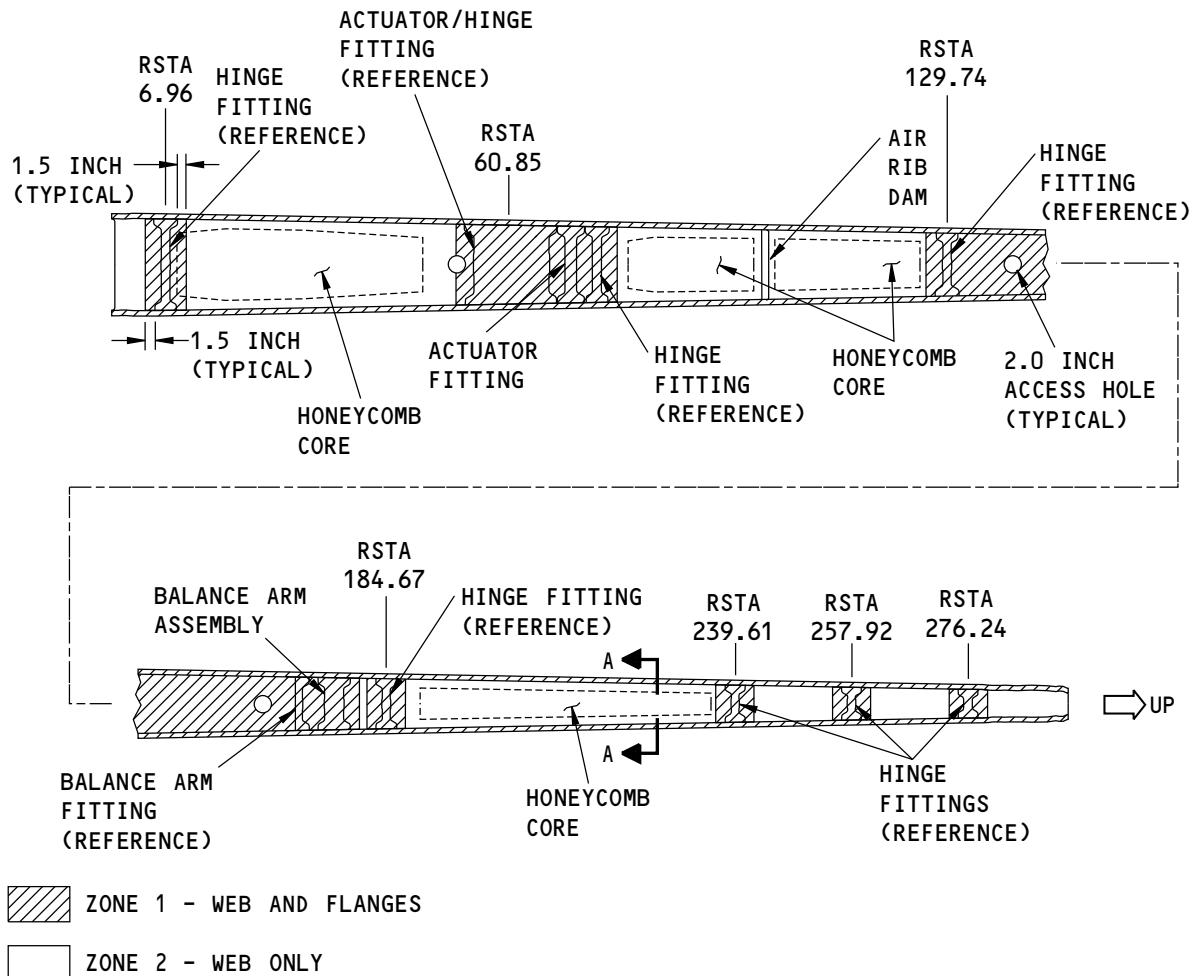
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STRUCTURAL REPAIR MANUAL



A-A

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Rudder Spar Zone Locations
Figure 204

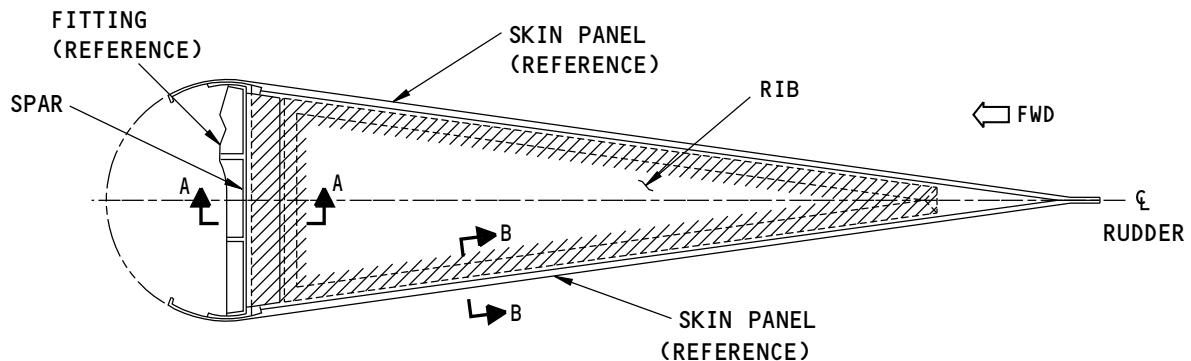
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REPAIR 1
Page 205

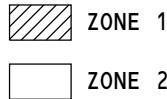
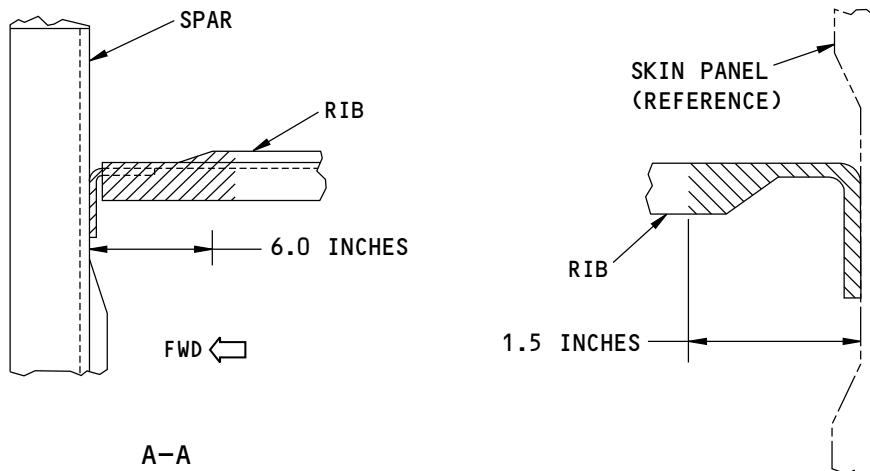
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THE BALANCE ARM RIB IS SHOWN,
THE OTHER RIBS ARE ALMOST THE SAME


NOTES

- USE THE ZONE 2 LIMITS FOR THE UPPER CLOSURE RIB, AFT TIP BALANCE RIB, AND FORWARD TIP BALANCE RIB.

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Rudder Rib Zone Locations
Figure 205

55-40-02

REPAIR 1
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05	REPAIR SEALING
51-30-05, GENERAL	Equipment and Tools For Repairs
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03, GENERAL	Fastener Substitution
51-60-03	AILERON TAB BALANCE PROCEDURE
51-60-07, GENERAL	Rudder Balance Procedure
51-70-04, REPAIR P/B REPAIR	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
55-40-02, ALLOWABLE DAMAGE 1	Rudder Spar and Spar Ribs
55-40-02, ALLOWABLE DAMAGE 2	Leading Edge Ribs of the Rudder Structure
55-40-02, ALLOWABLE DAMAGE 3	Rudder Balance Arm Structure
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 27-21-11/401	Rudder - Removal/Installation
SOPM 20-10-08	Removal of Faying Surface Sealed Metal Fittings from Composite Structures
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Repair Instructions

A. Do as follows when you make a repair:

- (1) When you remove the damage, do not cut or make an abrasion into the radius of the structure.
- (2) If the repair plies make an overlap of a hole or cutout, do the steps that follow:
 - (a) Cure the repair.
 - (b) Drill or cut the plies to the initial diameter of the hole or cutout.
- (3) If you need clearance with adjacent structure, install a tapered shim on each side of the repair.
- (4) It is permitted to put the repair plies around the full width of the structure.
 - (a) Do not make an overlap of the edges of the structure.

B. Refer to:

- (1) Table 201/REPAIR 1 for the repair data that is applicable to damage in the solid laminate area of Zone 1.
- (2) Table 202/REPAIR 1 for the repair data that is applicable to damage in the honeycomb core area of Zone 1.
- (3) Table 203/REPAIR 1 for the repair data that is applicable to damage in the solid laminate area of Zone 2.
- (4) Table 204/REPAIR 1 for the repair data that is applicable to damage in the honeycomb core area of Zone 2.

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REPAIR 1
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- C. For repairs made with wet layup materials, do as follows, as applicable:
- (1) Use one repair ply of fabric for each initial ply that was damaged.
 - (2) Add two more structural plies of fabric for each facesheet, or side of the part that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.
 - (3) Inspect Category B repairs after each 400 flight hour interval or more frequently. Refer to 737 NDT Part 1, 51-01-01 for inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.

NOTE: Other equivalent inspection methods that have been examined and found to be satisfactory by the operator, can be used.

- D. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged (plus a filler ply).

Table 201:

REPAIR DATA FOR THE SOLID LAMINATE AREA OF ZONE 1 ON THE 350°F (177°C) CURE RUDDER STRUCTURE	
REPAIR TYPE	PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	350°F (177°C) CURE
REPAIR DIMENSIONS AND LIMITS	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	Refer to SRM 51-70-05 and Paragraph 4.D

Table 202:

REPAIR DATA FOR THE HONEYCOMB CORE AREA OF ZONE 1 ON THE 350°F (177°C) CURE RUDDER STRUCTURE			
REPAIR TYPE	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: 1.00 inch (25.4 mm) in diameter One facesheet and the honeycomb core in depth 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	Damage that is a maximum of: 1.00 inch (25.4 mm) in diameter One facesheet and the honeycomb core in depth 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	There are no limits on the dimensions of the repair.
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.D

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REPAIR 1
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Table 203:

REPAIR DATA FOR THE SOLID LAMINATE AREA OF ZONE 2 ON THE 350°F (177°C) CURE RUDDER STRUCTURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED IAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: 0.50 inch (12.7 mm) in diameter 20 percent of the smallest dimension across the part at the damage location One repair for each 144 inches ² (929.03 cm ²) 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	Damage that is a maximum of: 2.0 inches (50.8 mm) in diameter 40 percent of the smallest dimension across the part at the damage location One repair for each 144 inches ² (929.03 cm ²) 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	Damage that is a maximum of: 2.0 inches (50.8 mm) in diameter 40 percent of the smallest dimension across the part at the damage location One repair for each 144 inches ² (929.03 cm ²) 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	There are no limits on the dimensions of the repair.
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.D

Table 204:

REPAIR DATA FOR THE HONEYCOMB CORE AREA OF ZONE 2 ON THE 350°F (177°C) CURE RUDDER STRUCTURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED IAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)	350°F (177°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: 0.50 inch (12.7 mm) in diameter 20 percent of the smallest dimension across the part at the damage location One facesheet and honeycomb core in depth One repair for each 144 inches ² (929.03 cm ²) 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	Damage that is a maximum of: 4.0 inches (101.6 mm) in diameter 50 percent of the smallest dimension across the part at the damage location One repair for each 144 inches ² (929.03 cm ²) 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	Damage that is a maximum of: 4.0 inches (101.6 mm) in diameter 50 percent of the smallest dimension across the part at the damage location One repair for each 144 inches ² (929.03 cm ²) 3.0 inches (76.2 mm) minimum clearance from: - other repairs - fastener holes - part edges	There are no limits on the dimensions of the repair
REPAIR PROCEDURES	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.D

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REPAIR 1
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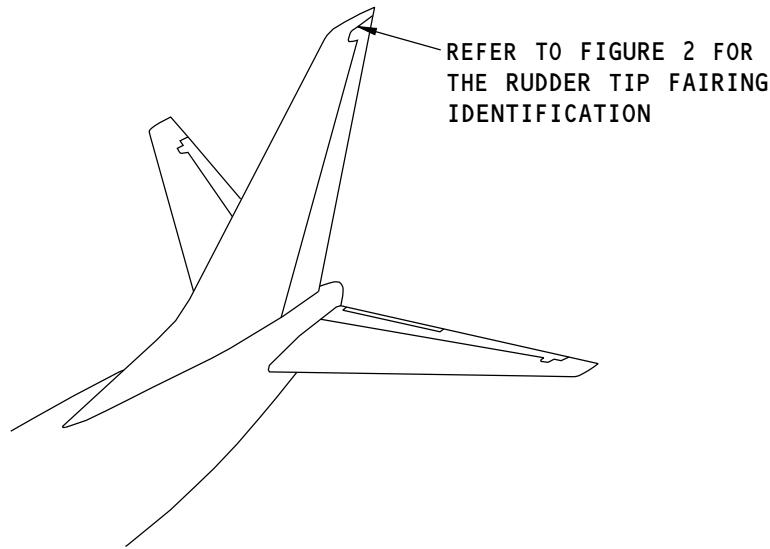
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IDENTIFICATION 1 - RUDDER TIP FAIRING SKINS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Rudder Tip Fairing Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A0100	Rudder Functional Product Collector
173A4300	Cover Panel Assembly
173A6000	Rudder Tip Installation
173A6201	Rudder Tip Lower Fairing Assembly
173A6210	Rudder Tip Upper Fairing - Bonded Part

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IDENTIFICATION 1

Page 1

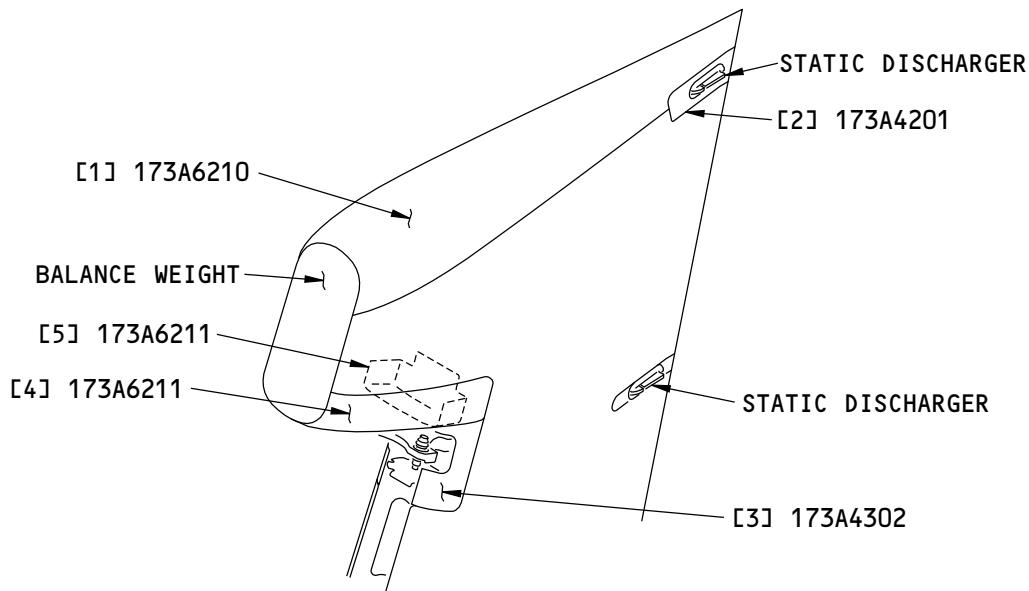
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

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Rudder Tip Fairing Skin Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Fairing Fairing Wedge		Glass Fiber Reinforced Plastic (GFRP) laminate with aluminum foil mesh lightning protection. Refer to Figure 3 Phenolic sheet as given in ASTM D709, Type IV, Grade G-3	
[2]	Splice Plate	0.063 (1.60)	6061-T4 clad sheet as given in QQ-A-250/11 or AMS 4026	
[3]	Hinge Cover		GFRP laminate. Refer to Figure 4	
[4]	Lower Fairing		GFRP laminate. Refer to Figure 5	
[5]	Closure		GFRP laminate. Refer to Figure 6	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

Page 2

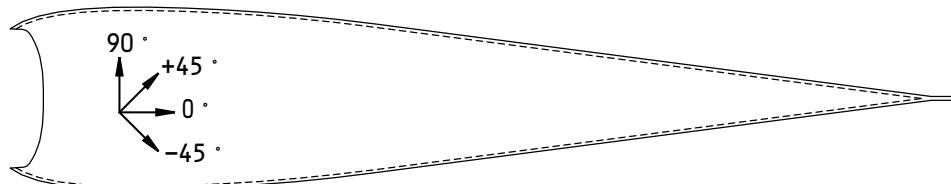
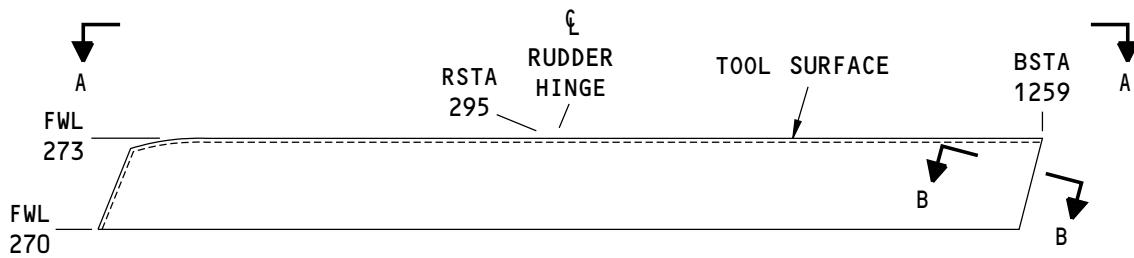
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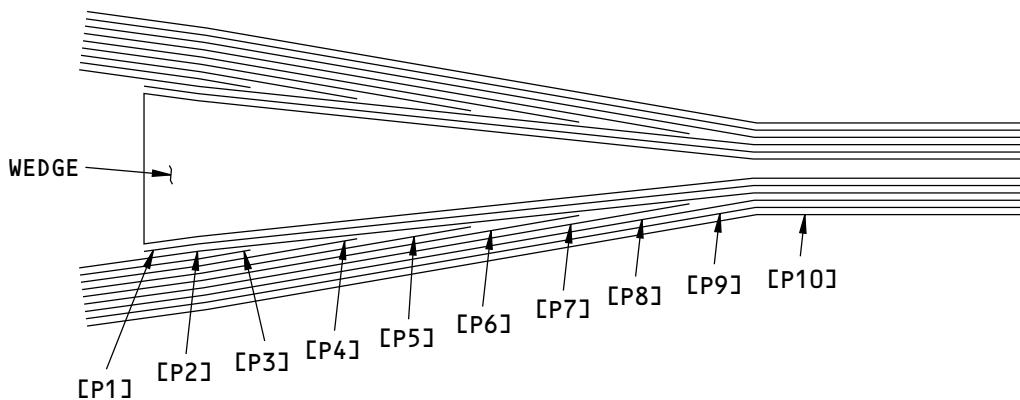
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A-A



B-B

G04486 S0006593799_V1

Ply Direction and Ply Sequence for the Upper Fairing, Figure 2, Item [1]
Figure 3

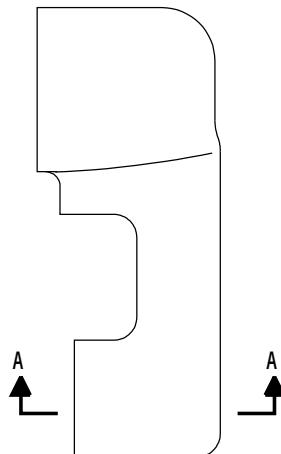
55-40-30
IDENTIFICATION 1
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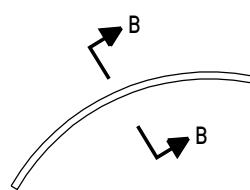
737-800
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Table 3:

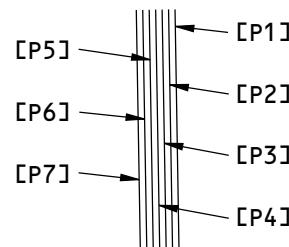
PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [1]		
PLY	DIRECTION	MATERIAL
P1	----	Adhesive film as given in BMS 5-129, Type 2, Grade 5
P2, P4, P6, P8	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B
P3, P5, P7	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B
P9	----	Adhesive film as given in BMS 8-245, Type III, Class 1, Grade 05
P10	----	Expanded aluminum foil mesh as given in BMS 8-336, Type I, Class 1, Grade 016, Form A



THE LEFT HINGE COVER IS SHOWN,
THE RIGHT HINGE COVER IS OPPOSITE



A-A (TYPICAL)



B-B

Ply Sequence for the Hinge Cover, Figure 2, Item [3]
Figure 4

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IDENTIFICATION 1
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Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [3]		
PLY	DIRECTION	MATERIAL
P1 through P7	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B

55-40-30

IDENTIFICATION 1

Page 5

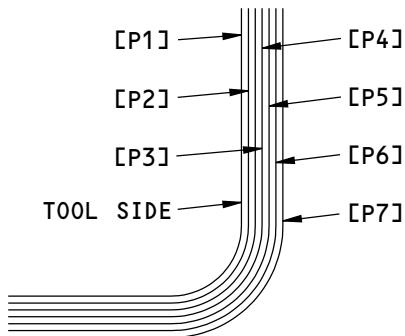
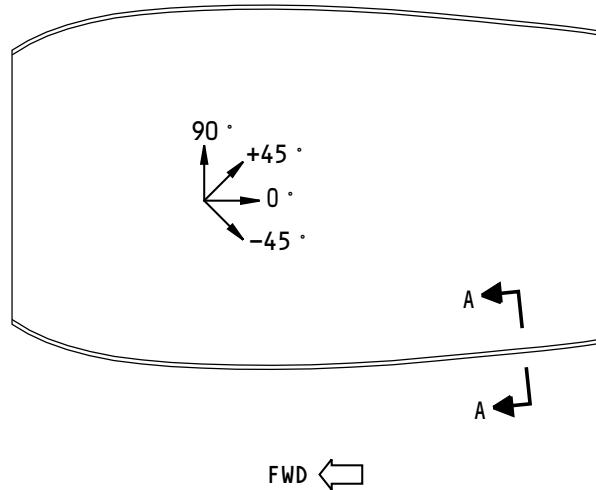
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A-A

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Ply Direction and Ply Sequence for the Lower Fairing, Figure 2, Item [4]
Figure 5

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Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [4]		
PLY	DIRECTION	MATERIAL
P1, P3, P5, P7	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B
P2, P4, P6	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B

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IDENTIFICATION 1

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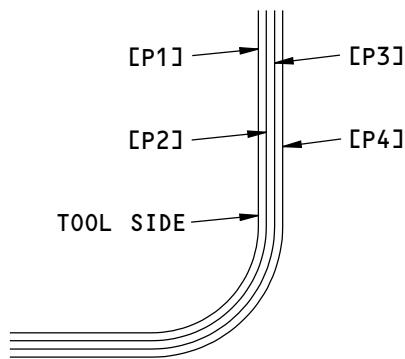
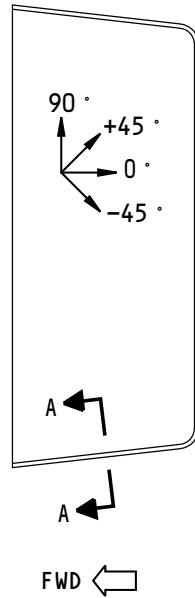
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A-A

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Ply Direction and Ply Sequence for the Closure, Figure 2, Item [5]
Figure 6

55-40-30
IDENTIFICATION 1
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Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 2, ITEM [5]		
PLY	DIRECTION	MATERIAL
P1, P4	0 or 90 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B
P2, P3	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-79, Style 1581 or Style 7781, Class III, Grade B

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IDENTIFICATION 1

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ALLOWABLE DAMAGE 1 - RUDDER TIP FAIRING SKINS

1. Applicability

- A. Allowable Damage 1 is applicable to damage on rudder tip fairing skins shown in Figure 101.

2. General

- A. Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- (1) Refer to Damage Definitions, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C for the definitions of the length, width, and depth of the damage.

- B. Remove all the contamination and water from the fairing.

- (1) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

- (2) Refer to 51-70-04 for the cleanup procedures.

- C. Seal all the permitted damage areas that are not more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1 Use one of the two methods that follows:

- (1) Make a temporary seal.

- (a) Apply aluminum foil tape (speed tape).

- (b) Keep a record of the location of the damage.

- (c) If the tape is on the exterior surface of the fairing, then make sure that it is in satisfactory condition at normal maintenance intervals.

- (2) Make a permanent seal.

- (a) Apply BMS 8-207 or BMS 8-301 epoxy resin to the area as given in 51-70-08.

- (b) Apply one layer of BMS 10-79, Type III or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.

- (c) Apply one layer of BMS 10-60, Type II enamel to the exterior surfaces of the rudder tip fairing skins that are sealed with epoxy resin. Refer to AMM 51-21-00/701.

- D. Seal all of the damage areas that are more than one ply in depth. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1

- (1) Use a vacuum and heat to remove moisture from the solid laminate. Refer to 51-70-04.

- (2) Make a temporary seal with aluminum foil tape (speed tape).

- (3) Keep a record of the location of the damage.

- (4) Repair the damage at or before 250 flight cycles from the time the seal was made.

- E. The definition of the words "other damage", as used in the allowable damage limits, does not include nicks, gouges, and scratches that do not cause damage to the glass fibers and are sealed.

55-40-30

ALLOWABLE DAMAGE 1

Page 101

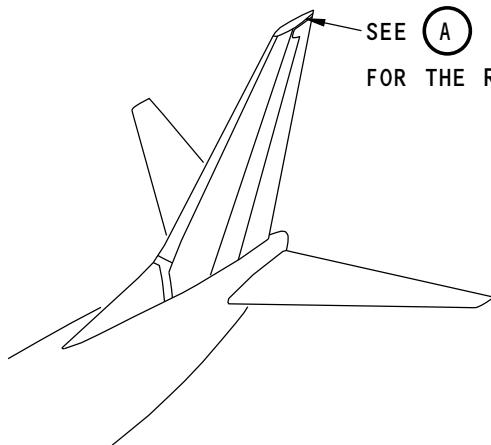
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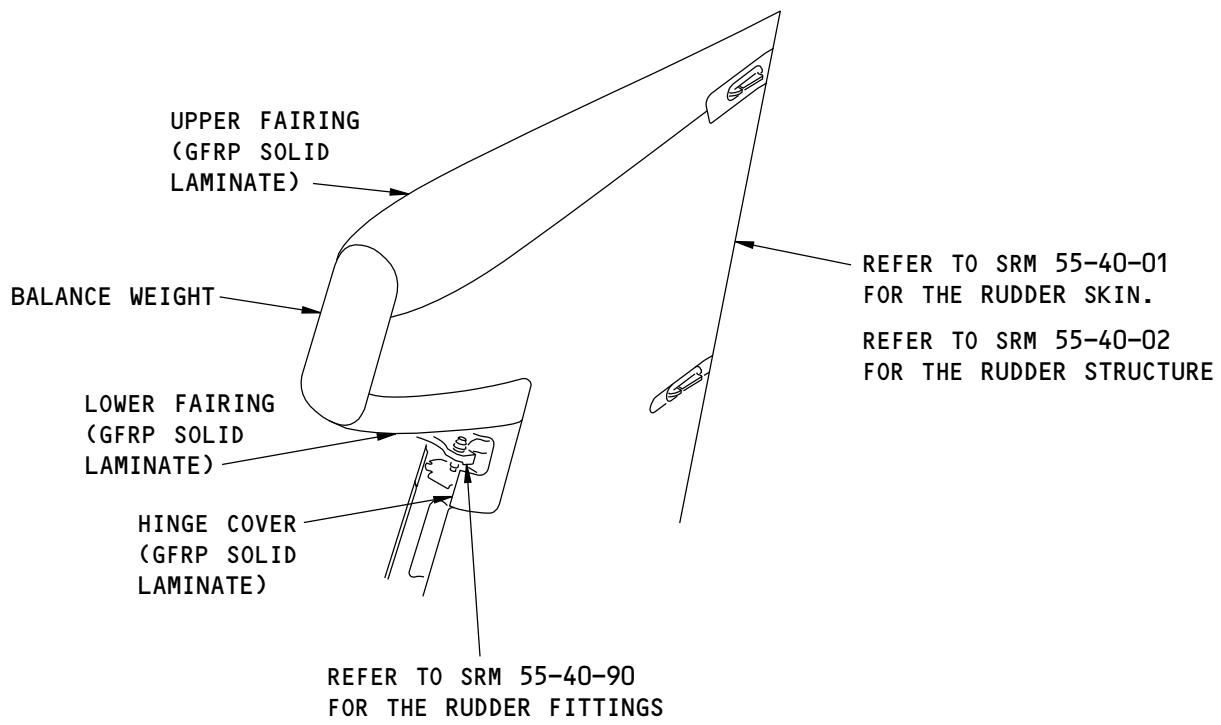
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SEE FOR THE RUDDER TIP



A

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Rudder Tip Fairing Skin Location
Figure 101

55-40-30

ALLOWABLE DAMAGE 1

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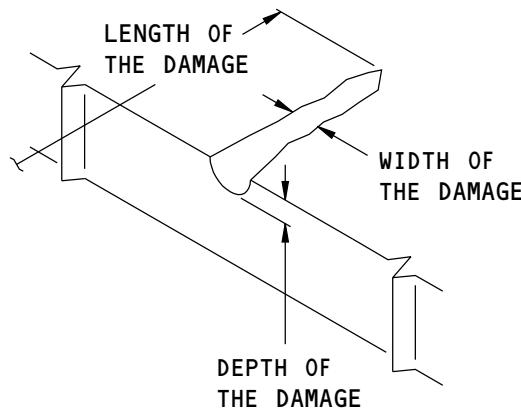
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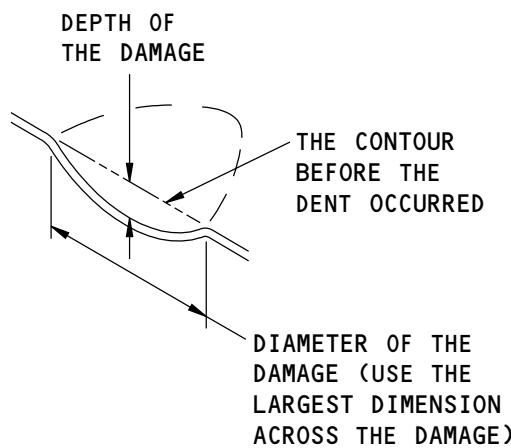


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STRUCTURAL REPAIR MANUAL



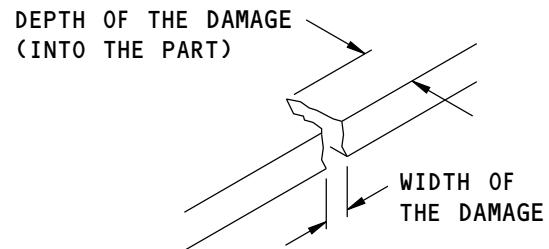
DEFINITIONS OF THE SIZES FOR NICK, GOUGE, AND SCRATCH DAMAGE

(A)



DEFINITIONS OF THE SIZES
FOR DENT DAMAGE

(B)



DEFINITIONS OF THE SIZES
FOR EDGE DAMAGE

(C)

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Damage Definitions
Figure 102

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ALLOWABLE DAMAGE 1

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STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-01, GENERAL	Protective Treatment of Metallic and Composite Materials
51-20-05, GENERAL	Repair Sealing
51-30-03, GENERAL	Sources for Non-Metallic Repair Materials
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-60-04, GENERAL	Elevator Balance Procedure For Airplane Line Numbers 1 Through 1174 Prior To Completion of Service Bulletins 737-55-1080, 737-55-1081, and 737-55-1082
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-08	RESIN SWEEP-FAIR PROCEDURES
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Allowable Damage Limits

- A. Nicks, Gouges, and Scratches that do not cause damage to the glass fibers are permitted.
- B. Nicks, Gouges, and Scratches that cause damage to the glass fibers are permitted if:
 - (1) The depth is a maximum of one ply.
NOTE: Use the limits for holes and punctures if the damage is more than one ply in depth.
 - (2) The length is a maximum of 5.0 inches (127.00 mm)
 - (3) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage.
- C. Dents that do not cause damage to the glass fibers are permitted if:
 - (1) The depth is a maximum of 0.05 inch (1.27 mm)
NOTE: Use the limits for holes and punctures if the damage is more than 0.05 inch (1.27 mm) in depth.
 - (2) The diameter is a maximum of 2.0 inches (50.80 mm)
 - (3) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage, a hole, or the edge of the part.
- D. Holes and Punctures are permitted if:
 - (1) The diameter is a maximum of 2.0 inches (50.80 mm)
 - (2) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage, a hole, or the edge of the part.
- E. Delaminations are permitted if:
 - (1) The diameter is a maximum of 2.0 inches (50.80 mm)
 - (2) The damage is a minimum of 2D (D = the diameter of the damage) away from the edge of other damage, a hole, or the edge of the part.
- F. Edge damage is permitted if:
 - (1) The depth is a maximum of 0.10 inch (2.54 mm)

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ALLOWABLE DAMAGE 1

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- (2) The width is a maximum of 0.50 inch (12.70 mm)
- (3) The damage is a minimum of 4D (D = the diameter of the damage) away from the edge of other damage.

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ALLOWABLE DAMAGE 1

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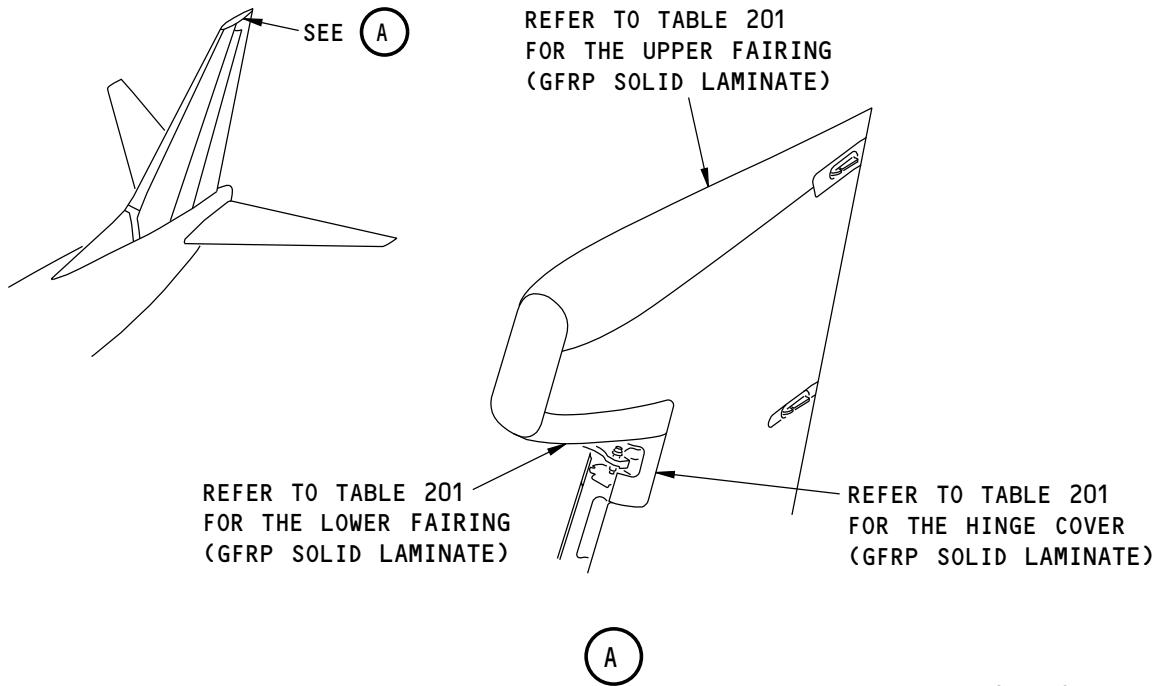
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STRUCTURAL REPAIR MANUAL

REPAIR 1 - RUDDER TIP FAIRING SKINS

1. Applicability

- A. Repair 1 is applicable to the skin parts of the rudder tip fairing skins made of Glass Fiber Reinforced Plastic (GFRP) as shown in Rudder Tip Fairing Skin Location, Figure 201/REPAIR 1.
- B. Repair 1 is applicable to damage that is more than the limits permitted in Allowable Damage 1. Refer to Allowable Damage 1 for the type and size of damage that is permitted.



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**Rudder Tip Fairing Skin Location
Figure 201**

2. General

- A. Repair 1 gives the instructions for Category A and B repairs. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. Get access to the damaged area.
 - (1) If necessary, remove the rudder tip fairing skins.
 - (2) Refer to 51-40-02 for information on fastener removal.
- C. Do an inspection of the damaged area to find the dimensions of the damage.
 - (1) Boeing recommends that you use an instrumented Non-Destructive Test (NDT) procedure. Refer to NDT, Part 1, 51-01-02 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.
- D. Refer to Damage Definitions, Figure 202/REPAIR 1, Details A, B, and C for the definitions of the length, width, and depth of damage.
- E. Do the repair as given in Paragraph 4./REPAIR 1
- F. Put the rudder tip fairing skin back to the initial condition, as applicable.

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REPAIR 1
Page 201

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- (1) Install the fairing if it was removed. Refer to 51-40-02 for the data about fastener installation.

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REPAIR 1
Page 202

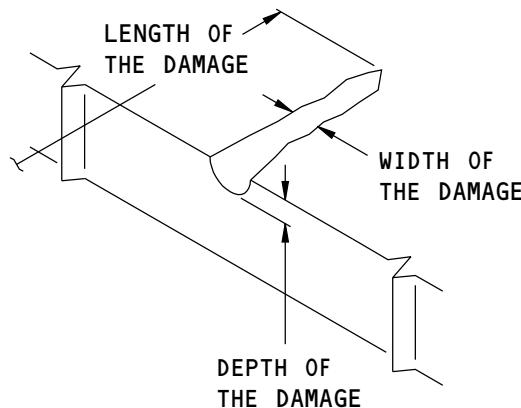
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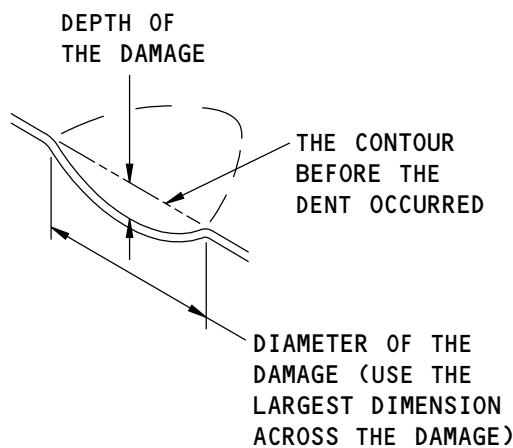


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STRUCTURAL REPAIR MANUAL



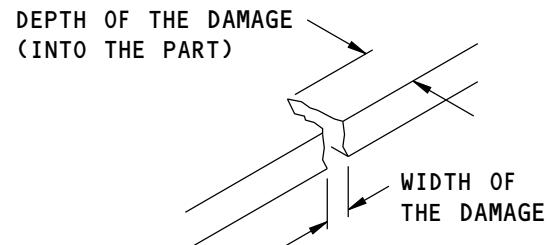
DEFINITIONS OF THE SIZES FOR NICK, GOUGE, AND SCRATCH DAMAGE

(A)



DEFINITIONS OF THE SIZES
FOR DENT DAMAGE

(B)



DEFINITIONS OF THE SIZES
FOR EDGE DAMAGE

(C)

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Damage Definitions
Figure 202

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REPAIR 1
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3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-05, GENERAL	Repair Sealing
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05, REPAIR GENERAL	Repair Procedures for Pre-impregnated Materials
51-70-06, REPAIR GENERAL	Room Temperature Cure Repairs With Wet Layup Materials For Glass Fabric Reinforced Plastic Solid Laminates and Honeycomb Core Panels
737 NDT Part 1, 51-01-01	Inspection of Repairs to Composite Structure
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

4. Repair Instructions

- A. If a dent is 2 inches (50.80 mm) in diameter or less, and has no fiber damage or delamination, then fill the dent with potting compound and apply a fiberglass patch as given in Repair 14 of 51-70-04.
- B. If Paragraph 4.A./REPAIR 1 is not applicable, then refer to Table 201/REPAIR 1 for the repair data that is applicable to damage to the rudder tip fairing skins.
- C. For repairs made with wet layup materials, do as follows, as applicable:
 - (1) Use one repair ply of fabric for each initial ply that was damaged.
 - (2) Add two structural plies of fabric for each facesheet that is repaired. Put one structural ply at ± 45 degrees to the core ribbon direction and the other at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.
- (3) Examine Category B repairs after each interval of 800 flight hours or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures. If deterioration is found, then they must be replaced with Category A repairs.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used.

- D. For repairs made with preimpregnated layup materials, use the same number of repair plies as the number of initial plies that were damaged.

Table 201:

REPAIR DATA FOR THE RUDDER TIP FAIRING SKINS - 250°F (121°C) CURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE AND LIMITS	Contact The Boeing Company	Damage that is a maximum of: - 5.0 inches (127.00 mm) in diameter	Damage that is a maximum of: - 5.0 inches (127.00 mm) in diameter	There are no limits on the dimensions of the repair

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REPAIR 1
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Table 201: (Continued)

REPAIR DATA FOR THE RUDDER TIP FAIRING SKINS - 250°F (121°C) CURE				
REPAIR TYPE	CATEGORY B WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A WET LAYUP	CATEGORY A PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	Room Temperature	150°F (66°C)	200°F (93°C)	250°F (121°C)
		- 2.0 inches (50.8 mm) minimum clearance from: - other repairs - fastener hole - panel edges	- 2.0 inches (50.8 mm) minimum clearance from: - other repairs - fastener holes - panel edges	
REPAIR PROCEDURES	-----	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.C

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REPAIR 1

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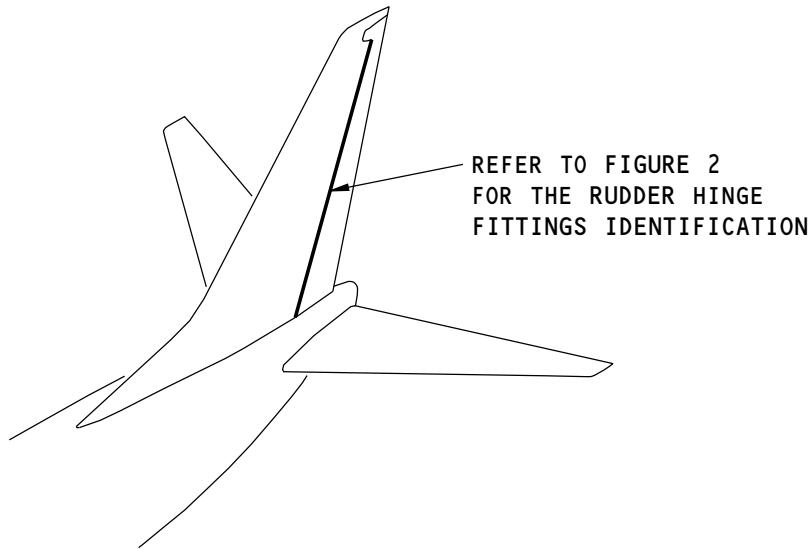
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IDENTIFICATION 1 - RUDDER HINGE FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Rudder Hinge Fittings Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
173A0001	Rudder Installation
173A0100	Rudder Functional Product Collector
173A0103	Rudder Assembly
173A2001	Spar Installation - Rudder
173A2200	Fitting Assembly - Thrust and Actuator, Rudder

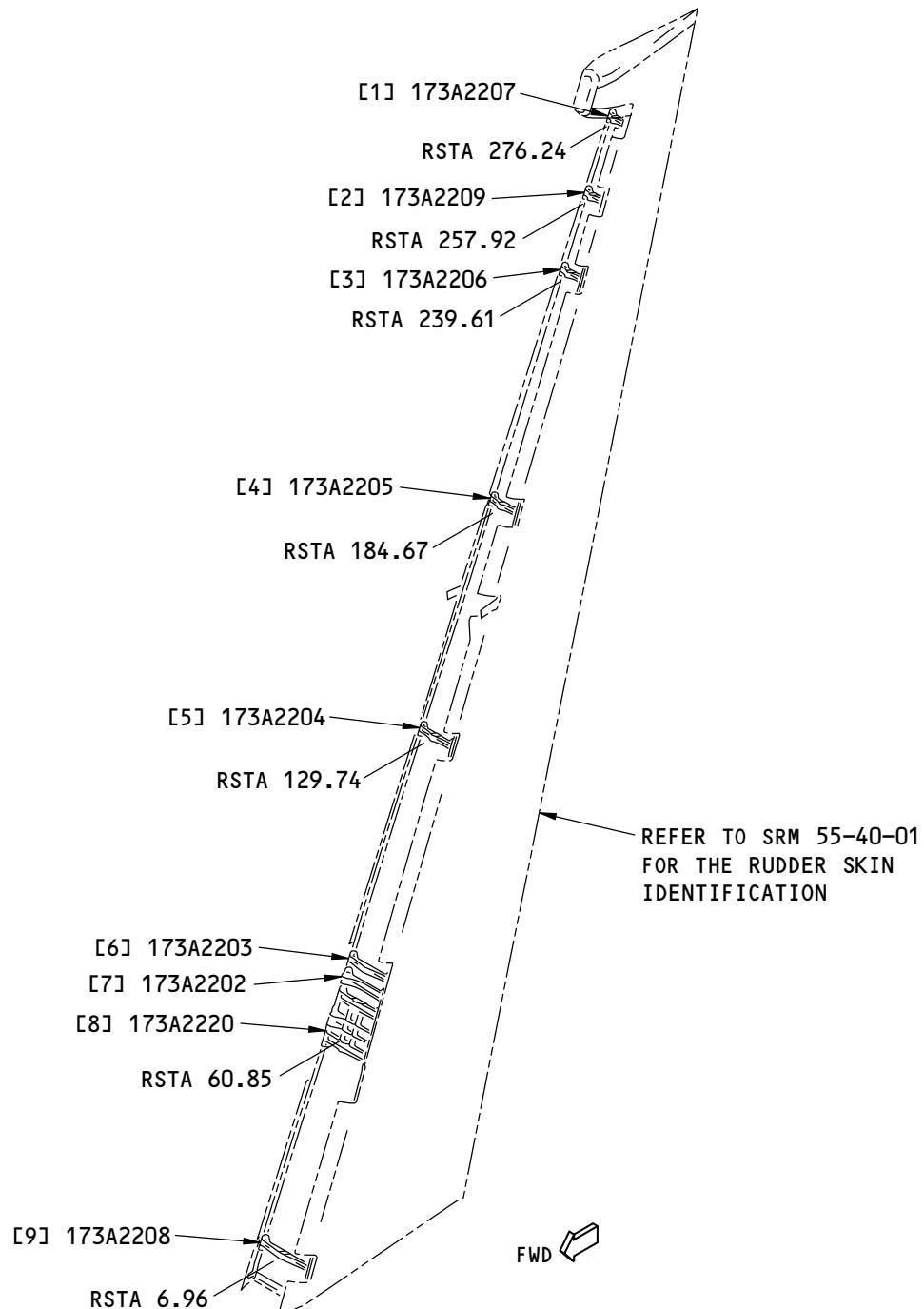
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IDENTIFICATION 1
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

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Rudder Hinge Fittings Identification
Figure 2

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IDENTIFICATION 1
Page 2
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Table 2:

LIST OF MATERIALS FOR FIGURE 1				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Hinge Fitting STA 276.24		7050-T7451 plate as given in AMS 4050. Refer to the production drawing for the machined areas, and the grain direction	
[2]	Hinge Fitting STA 257.92		7050-T7451 plate as given in AMS 4050. Refer to the production drawing for the machined areas, and the grain direction	
[3]	Hinge Fitting STA 239.61		7050-T7451 plate as given in AMS 4050. Refer to the production drawing for the machined areas, and the grain direction	
[4]	Hinge Fitting STA 184.67		7050-T7451 plate as given in AMS 4050. Refer to the production drawing for the machined areas, and the grain direction	
[5]	Hinge Fitting STA 129.74		7050-T7451 plate as given in BMS 7-323. Refer to the production drawing for the machined areas, and the grain direction	
[6]	Hinge Fitting STA 74.80		7050-T7451 plate as given in BMS 7-323. Refer to the production drawing for the machined areas, and the grain direction	
[7]	Actuator Fitting		7050-T7451 plate as given in BMS 7-323. Refer to the production drawing for the machined areas, and the grain direction	
[8]	Thrust Fitting		7050-T7451 plate as given in BMS 7-323. Refer to the production drawing for the machined areas, and the grain direction	
[9]	Hinge Fitting STA 6.96		7050-T7451 plate as given in BMS 7-323. Refer to the production drawing for the machined areas, and the grain direction	

*[1] Note: T = Pre-manufactured thickness in inches (millimeters).

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IDENTIFICATION 1

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ALLOWABLE DAMAGE 1 - RUDDER HINGE FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the rudder hinge fittings shown in Rudder Hinge Fitting Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.
- B. Remove the damage as necessary.
 - (1) Refer to 51-10-02 for the investigation and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of nonmetallic materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment and tools you can use to remove the damage.
 - (4) Put a surface finish of 125 microinches Ra or better on the reworked areas.
- C. After you remove the damage, do the steps that follow.

WARNING: MAKE SURE THAT YOU WEAR EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- (1) Flap peen or shot peen the reworked areas of the parts, but not the inner surfaces of the lug bores.
 - (a) Refer to 51-20-06 for the shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.
- (2) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
- (3) Apply a layer of BMS 10-79, Type III primer to the reworked areas. Refer to SOPM 20-44-04.

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ALLOWABLE DAMAGE 1

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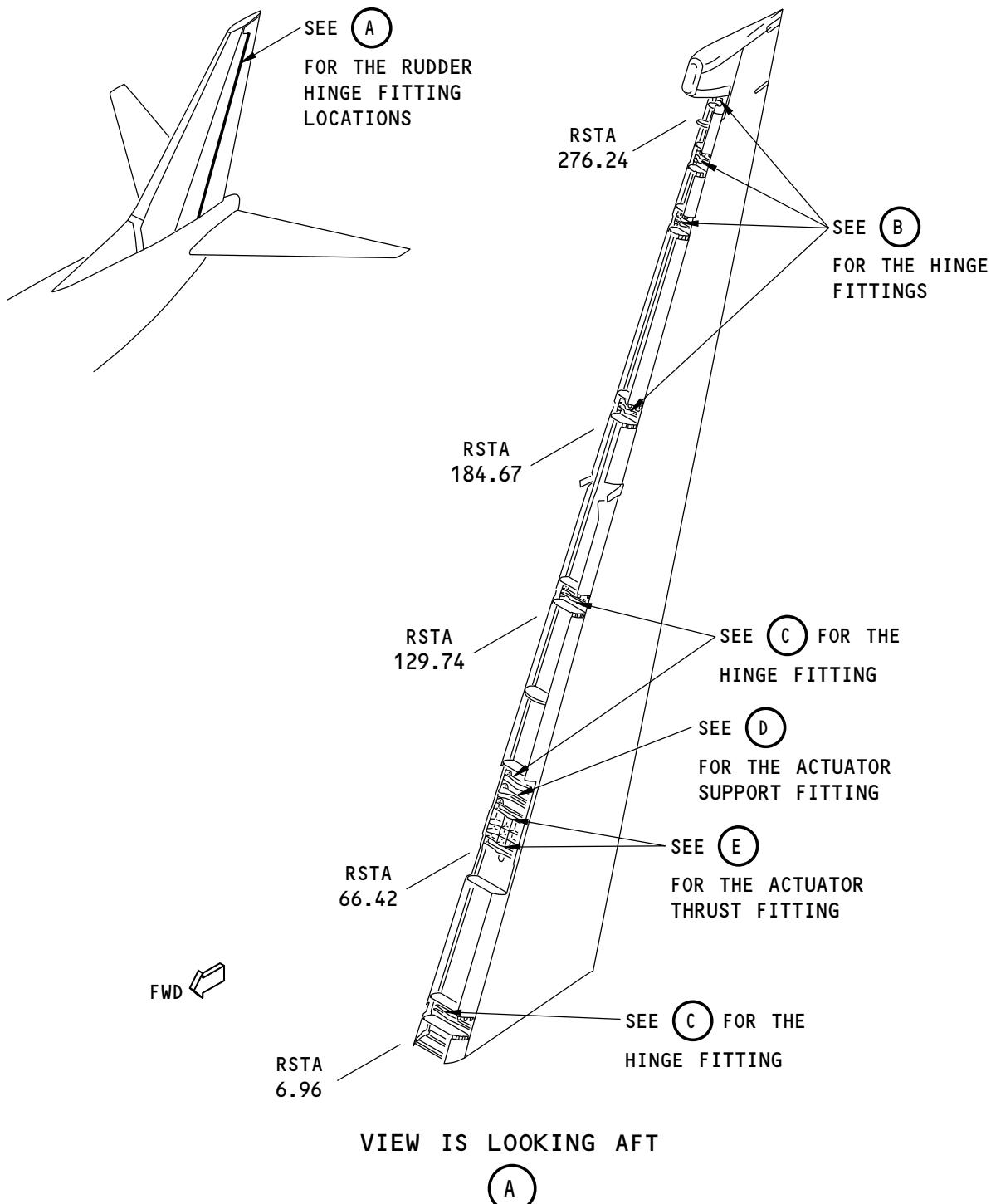
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Rudder Hinge Fitting Location
Figure 101 (Sheet 1 of 3)

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ALLOWABLE DAMAGE 1

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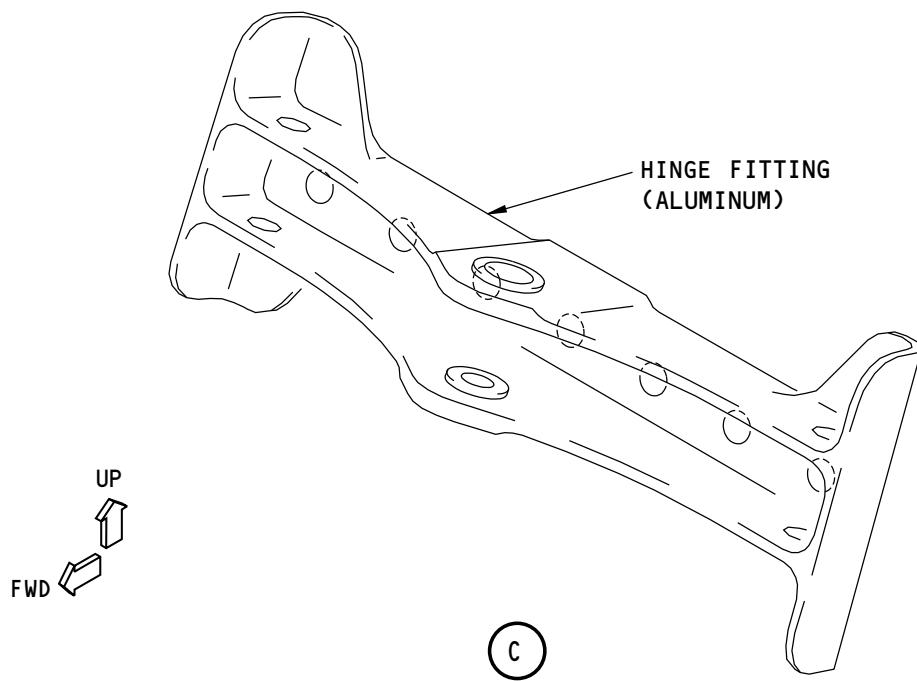
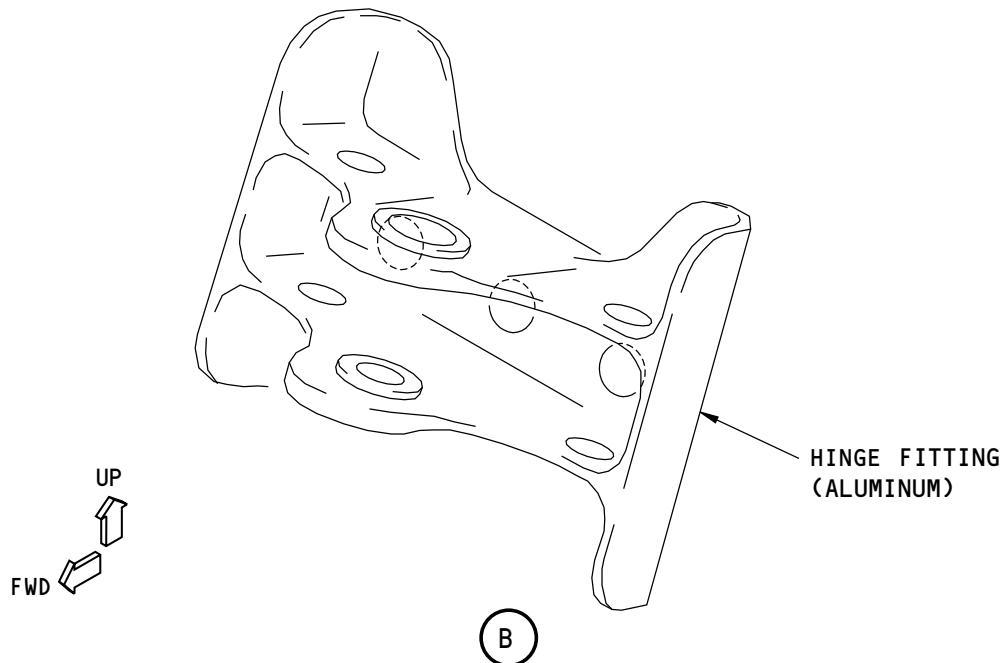
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Rudder Hinge Fitting Location
Figure 101 (Sheet 2 of 3)

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ALLOWABLE DAMAGE 1

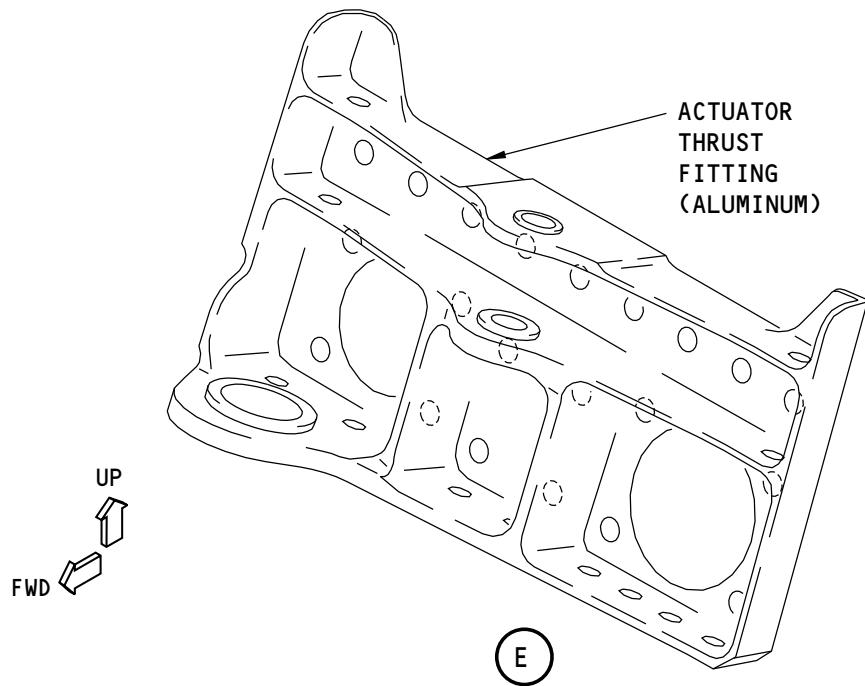
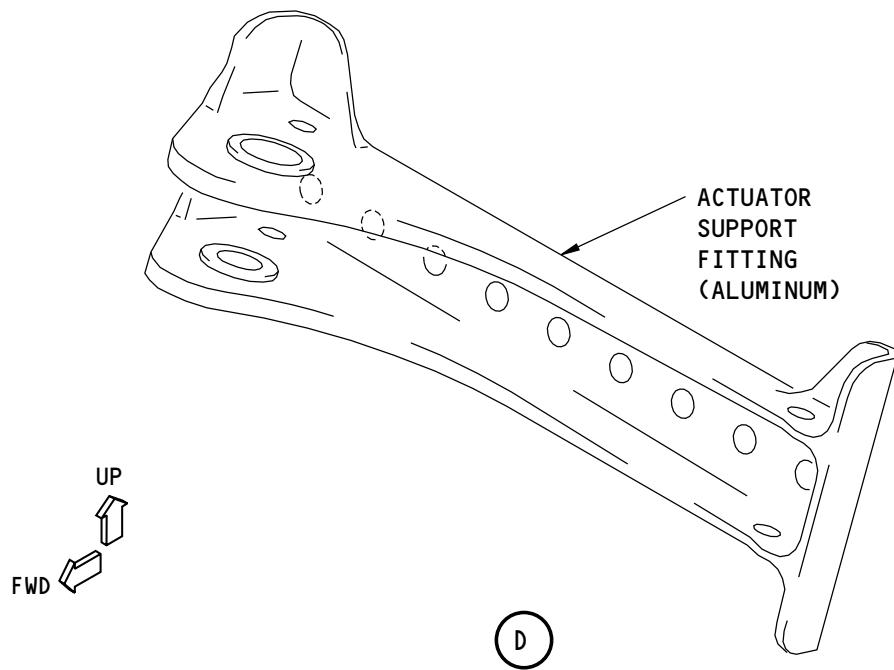
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Rudder Hinge Fitting Location
Figure 101 (Sheet 3 of 3)

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ALLOWABLE DAMAGE 1

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3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-06	SHOT PEENING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Hinge Fittings (Except at RSTA 129.74 and RSTA 184.67)

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, D, and E.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Hinge Fitting at RSTA 129.74

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A and B.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A and B.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

C. Hinge Fitting at RSTA 184.67

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and C.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, C, and D.
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

D. Actuator Thrust Fitting

- (1) Damage is not permitted.

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ALLOWABLE DAMAGE 1

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E. Actuator Support Fitting

(1) Cracks:

- (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A and B.

(2) Nicks, Gouges, Scratches, and Corrosion:

- (a) Remove the damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 1, Details A, B, and E.

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ALLOWABLE DAMAGE 1

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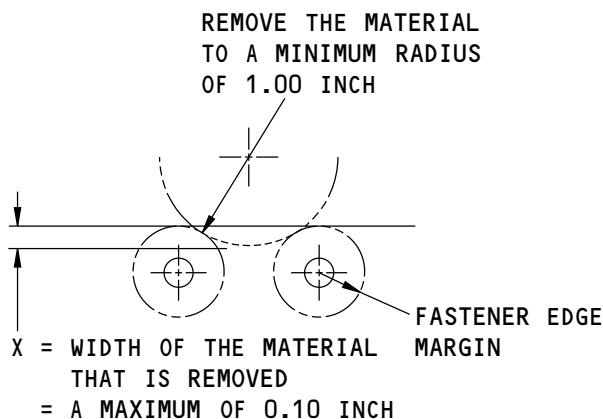
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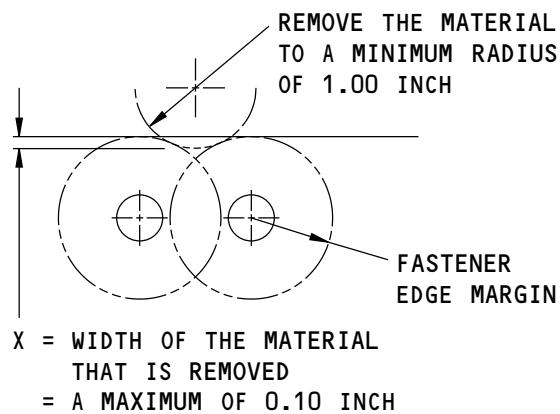


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STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)

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Allowable Damage Limits
Figure 102 (Sheet 1 of 3)

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ALLOWABLE DAMAGE 1

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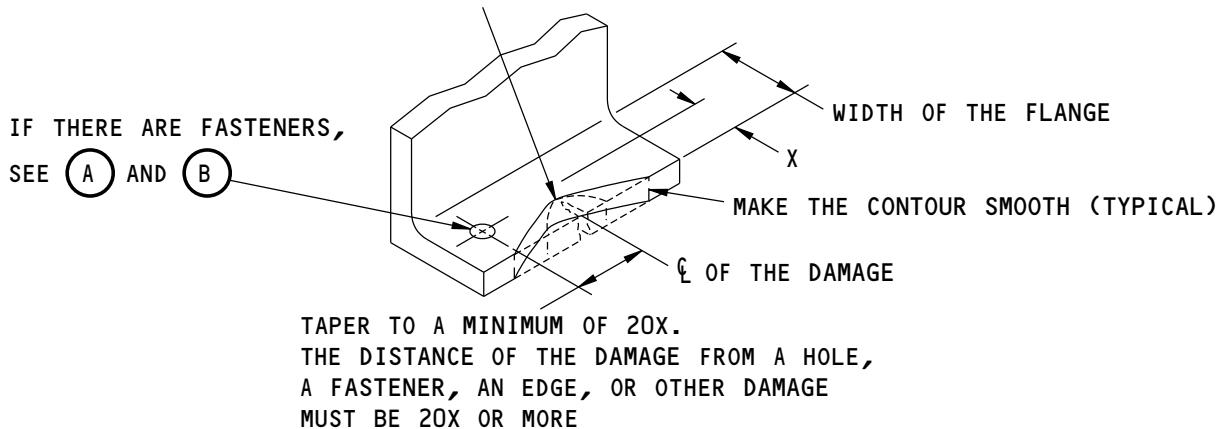
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**737-800
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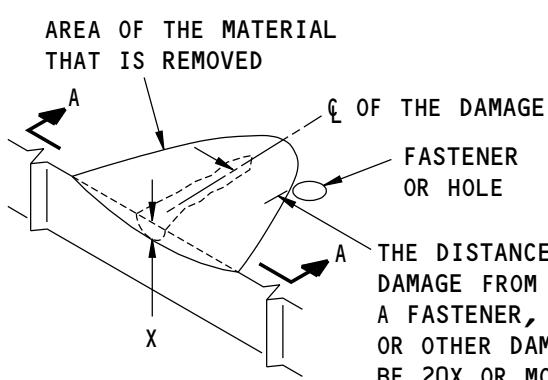
REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER AS SHOWN



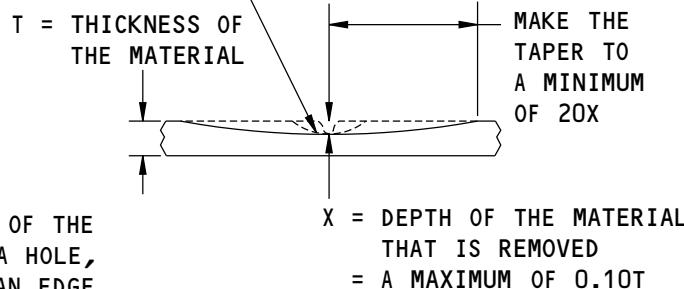
X = WIDTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)



REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH, THEN TAPER AS SHOWN



A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)

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**Allowable Damage Limits
Figure 102 (Sheet 2 of 3)**

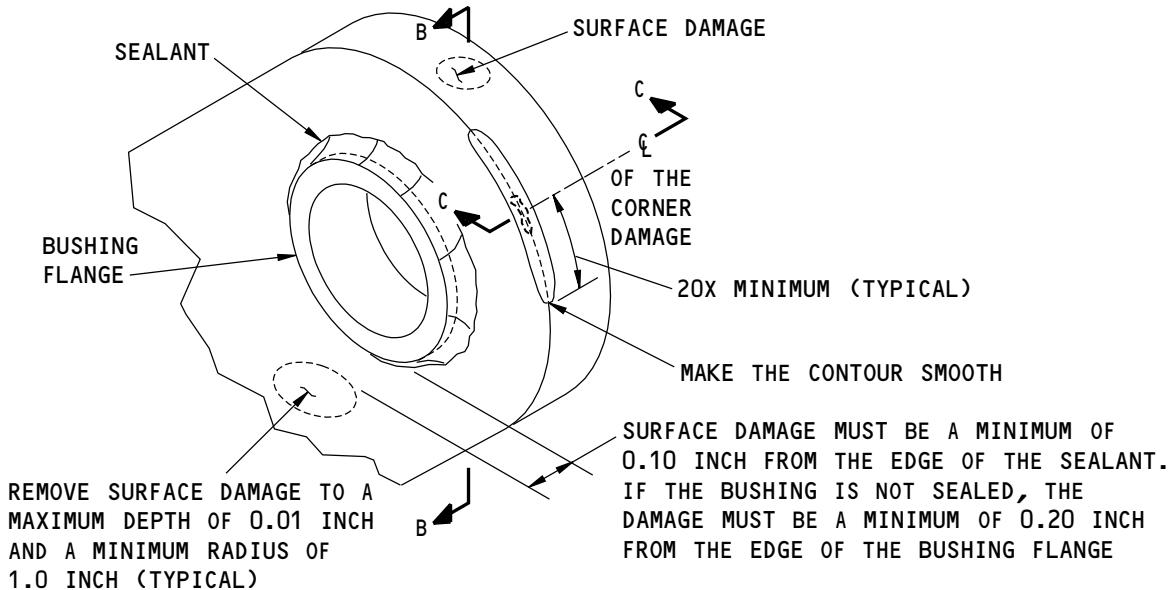
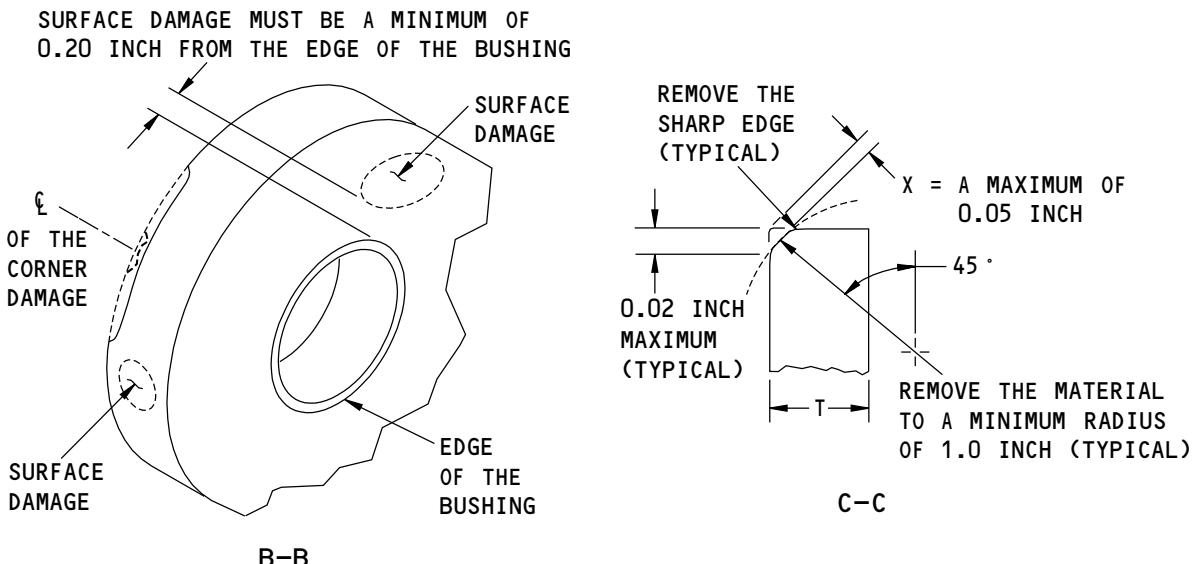
55-40-90

ALLOWABLE DAMAGE 1

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**737-800
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REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING
E


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Allowable Damage Limits
Figure 102 (Sheet 3 of 3)

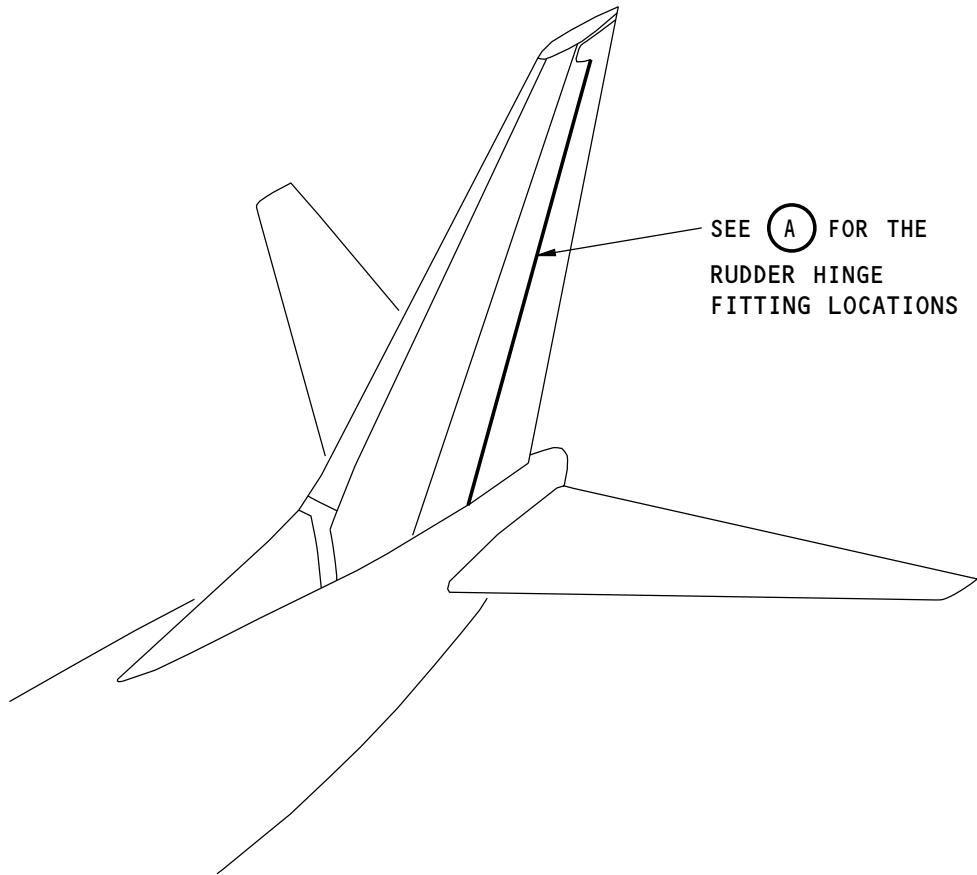
55-40-90
ALLOWABLE DAMAGE 1

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REPAIR 1 - RUDDER HINGE FITTINGS



Rudder Hinge Fitting Repair
Figure 201 (Sheet 1 of 2)

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55-40-90

REPAIR 1
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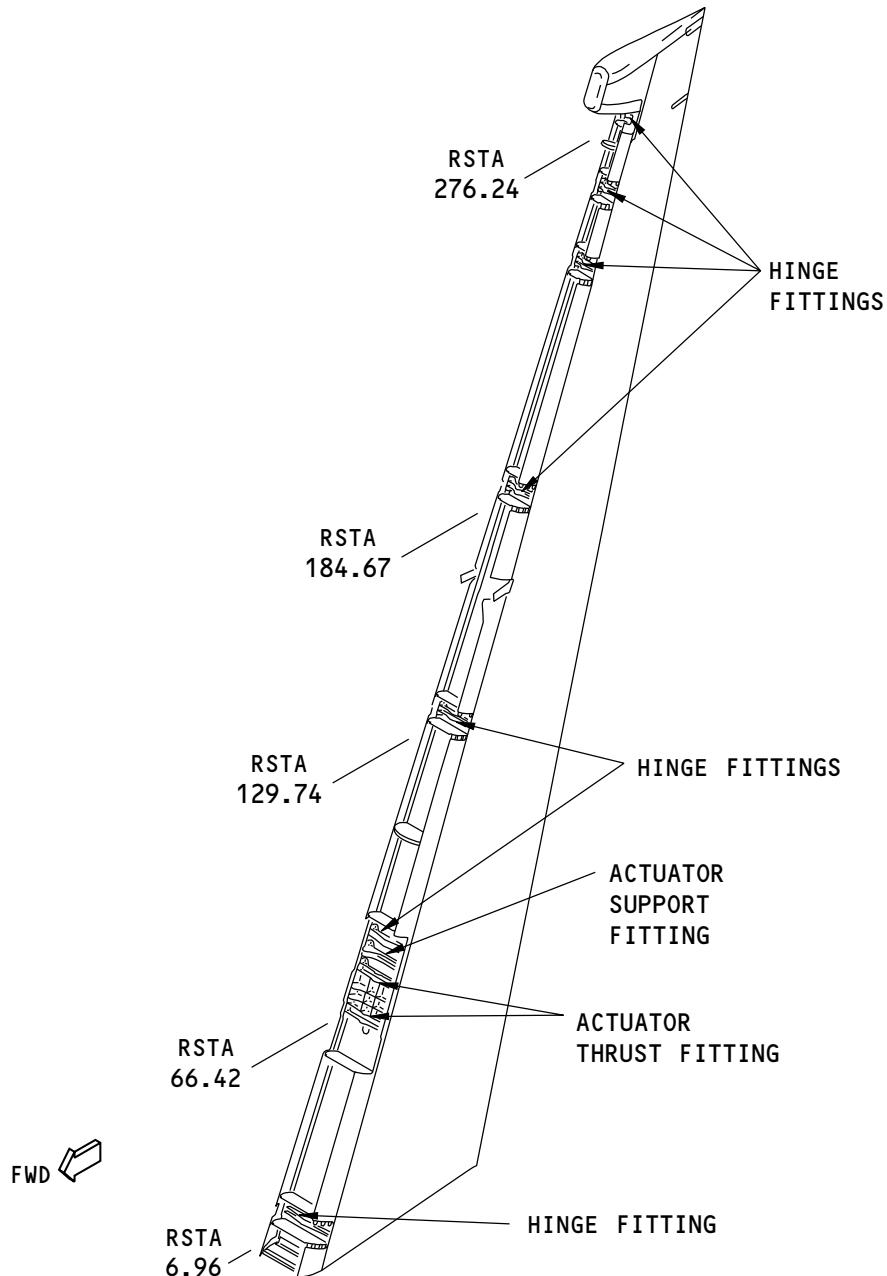
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STRUCTURAL REPAIR MANUAL



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

VIEW IS LOOKING AFT

(A)

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Rudder Hinge Fitting Repair
Figure 201 (Sheet 2 of 2)

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REPAIR 1
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