

CHAPTER

54

**NACELLES/
PYLONS**



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-EFFECTIVE PAGES		54-10-01 ALLOWABLE DAMAGE 1 (cont)		54-10-01 REPAIR 4 (cont)	
1 thru 12 Jul 10/2016		108 Nov 10/2015		204 Jul 10/2015	
54-CONTENTS		109 Nov 10/2015		205 Nov 10/2012	
1 Nov 10/2015		110 Nov 10/2015		206 Nov 10/2012	
2 Nov 10/2015		54-10-01 ALLOWABLE DAMAGE 2		54-10-01 REPAIR 5	
3 Mar 10/2016		101 Jul 10/2013		201 Jul 10/2015	
O 4 Jul 10/2016		102 Jul 10/2014		202 Nov 10/2012	
O 5 Jul 10/2016		103 Jul 10/2013		203 Nov 10/2015	
O 6 Jul 10/2016		104 Jul 10/2013		204 Jul 10/2015	
54-00-01 GENERAL		105 Nov 10/2014		205 Nov 10/2012	
1 Nov 10/2012		106 BLANK		206 Nov 10/2012	
2 Nov 10/2012		54-10-01 REPAIR 1		54-10-01 REPAIR 6	
3 Nov 10/2012		201 Jul 10/2015		201 Jul 10/2015	
4 BLANK		202 Nov 10/2012		202 Nov 10/2012	
54-10-01 IDENTIFICATION 1		203 Nov 10/2015		203 Nov 10/2015	
1 Nov 10/2015		204 Jul 10/2015		204 Jul 10/2015	
2 Nov 10/2015		205 Nov 10/2012		205 Nov 10/2012	
3 Nov 10/2015		206 Nov 10/2012		206 Nov 10/2012	
R 4 Nov 10/2015		54-10-01 REPAIR 2		54-10-01 REPAIR 7	
R 5 Jul 10/2016		201 Jul 10/2015		201 Nov 10/2013	
R 6 Jul 10/2016		202 Nov 10/2012		202 Jul 10/2015	
7 Nov 10/2015		203 Nov 10/2015		203 Nov 10/2012	
8 Nov 10/2015		204 Jul 10/2015		204 Nov 10/2012	
9 Nov 10/2015		205 Nov 10/2012		205 Mar 10/2013	
10 Nov 10/2015		206 Nov 10/2012		206 BLANK	
11 Nov 10/2015		54-10-01 REPAIR 3		54-10-01 REPAIR 8	
12 Nov 10/2015		201 Jul 10/2015		201 Nov 10/2013	
13 Nov 10/2015		202 Nov 10/2012		202 Jul 10/2015	
14 Nov 10/2015		203 Nov 10/2015			
54-10-01 ALLOWABLE DAMAGE 1		204 Jul 10/2015			
101 Nov 10/2012		205 Nov 10/2012			
102 Nov 10/2012		206 Nov 10/2012			
103 Nov 10/2012		54-10-01 REPAIR 4			
104 Nov 10/2015		201 Jul 10/2015			
105 Nov 10/2015		202 Nov 10/2012			
106 Nov 10/2015		203 Nov 10/2015			
107 Nov 10/2015		204 Jul 10/2015			

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-10-01 REPAIR 9		54-10-01 REPAIR 13 (cont)		54-10-02 ALLOWABLE DAMAGE 1 (cont)	
201	Jul 10/2015	205	Nov 10/2015	110	BLANK
202	Jul 10/2015	206	Nov 10/2012	54-10-02 REPAIR 1	
203	Jul 10/2015	54-10-01 REPAIR 14		201	Nov 10/2015
204	Jul 10/2015	201	Nov 10/2015	202	Nov 10/2012
205	Jul 10/2015	202	Nov 10/2015	203	Nov 10/2015
206	Jul 10/2015	203	Nov 10/2015	204	Nov 10/2015
207	Jul 10/2015	204	Nov 10/2015	205	Nov 10/2012
208	Jul 10/2015	205	Nov 10/2015	206	Nov 10/2015
209	Jul 10/2015	206	BLANK	207	Nov 10/2015
210	BLANK	54-10-02 IDENTIFICATION 1		208	BLANK
54-10-01 REPAIR 10		1	Nov 10/2015	54-10-90 IDENTIFICATION 1	
201	Nov 10/2013	2	Nov 10/2015	1	Nov 10/2015
202	Nov 10/2015	3	Nov 10/2015	2	Nov 10/2015
203	Nov 10/2015	4	Nov 10/2015	3	Nov 10/2015
204	Nov 10/2012	5	Nov 10/2015	4	Nov 10/2015
205	Nov 10/2015	6	Nov 10/2015	54-10-90 ALLOWABLE DAMAGE 1	
206	Nov 10/2015	7	Nov 10/2015	101	Nov 10/2012
54-10-01 REPAIR 11		8	Nov 10/2015	102	Jul 10/2015
201	Nov 10/2013	9	Nov 10/2015	103	Jul 10/2015
202	Nov 10/2012	10	Nov 10/2015	104	Jul 10/2015
203	Nov 10/2015	11	Nov 10/2015	54-20-01 IDENTIFICATION 1	
204	Nov 10/2015	12	Nov 10/2015	1	Nov 10/2015
205	Nov 10/2015	13	Nov 10/2015	2	Nov 10/2015
206	Nov 10/2012	14	Nov 10/2015	3	Nov 10/2015
54-10-01 REPAIR 12		15	Nov 10/2015	4	Nov 10/2012
201	Nov 10/2013	16	Nov 10/2015	5	Nov 10/2015
202	Nov 10/2012	54-10-02 ALLOWABLE DAMAGE 1		6	BLANK
203	Nov 10/2015	101	Nov 10/2012	54-20-01 ALLOWABLE DAMAGE 1	
204	Nov 10/2015	102	Nov 10/2012	101	Nov 10/2012
205	Nov 10/2015	103	Nov 10/2012	102	Nov 10/2012
206	Nov 10/2012	104	Nov 10/2012	103	Nov 10/2012
54-10-01 REPAIR 13		105	Nov 10/2012	104	Nov 10/2015
201	Nov 10/2013	106	Nov 10/2012	105	Nov 10/2015
202	Nov 10/2012	107	Nov 10/2012	106	Nov 10/2012
203	Nov 10/2015	108	Nov 10/2012	107	Nov 10/2012
204	Nov 10/2015	109	Nov 10/2012		

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-20-01 ALLOWABLE DAMAGE 1 (cont)		54-20-01 REPAIR 5 (cont)		54-20-01 REPAIR 10	
108 Nov 10/2012		204 Nov 10/2015		201 Nov 10/2015	
54-20-01 REPAIR 1		205 Nov 10/2015		202 Nov 10/2015	
201 Nov 10/2015		206 Nov 10/2015		203 Nov 10/2015	
202 Jul 10/2014		207 Nov 10/2015		204 Nov 10/2015	
203 Nov 10/2015		208 BLANK		205 Nov 10/2012	
204 Nov 10/2015		54-20-01 REPAIR 6		206 Nov 10/2013	
205 Nov 10/2015		201 Nov 10/2015		54-20-01 REPAIR 11	
206 Nov 10/2012		202 Nov 10/2015		201 Nov 10/2012	
54-20-01 REPAIR 2		203 Nov 10/2015		202 Nov 10/2012	
201 Jul 10/2014		204 Nov 10/2015		203 Nov 10/2015	
202 Nov 10/2015		205 Nov 10/2015		204 Nov 10/2015	
203 Nov 10/2015		206 Nov 10/2015		205 Nov 10/2012	
204 Nov 10/2015		207 Nov 10/2015		206 Nov 10/2012	
205 Nov 10/2015		208 BLANK		207 Nov 10/2012	
206 Nov 10/2015		54-20-01 REPAIR 7		208 Nov 10/2012	
207 Nov 10/2015		201 Nov 10/2015		54-20-02 IDENTIFICATION 1	
208 BLANK		202 Nov 10/2015		1 Nov 10/2015	
54-20-01 REPAIR 3		203 Nov 10/2015		2 Nov 10/2012	
201 Nov 10/2015		204 Nov 10/2015		3 Nov 10/2015	
202 Nov 10/2015		205 Nov 10/2015		4 Nov 10/2012	
203 Nov 10/2015		206 Nov 10/2015		5 Nov 10/2015	
204 Nov 10/2015		54-20-01 REPAIR 8		6 BLANK	
205 Nov 10/2015		201 Nov 10/2015		54-20-02 ALLOWABLE DAMAGE 1	
206 Nov 10/2015		202 Nov 10/2015		101 Nov 10/2012	
54-20-01 REPAIR 4		203 Nov 10/2015		102 Nov 10/2012	
201 Nov 10/2015		204 Nov 10/2015		103 Nov 10/2012	
202 Nov 10/2015		205 Nov 10/2012		104 Nov 10/2012	
203 Nov 10/2015		206 Nov 10/2012		105 Nov 10/2012	
204 Nov 10/2015		54-20-01 REPAIR 9		106 BLANK	
205 Nov 10/2015		201 Nov 10/2015		54-20-02 REPAIR 1	
206 Nov 10/2015		202 Nov 10/2015		201 Nov 10/2015	
54-20-01 REPAIR 5		203 Nov 10/2015		202 Nov 10/2012	
201 Nov 10/2015		204 Nov 10/2015		203 Nov 10/2015	
202 Nov 10/2015		205 Nov 10/2012		204 Nov 10/2015	
203 Nov 10/2015		206 Nov 10/2012		205 Nov 10/2012	

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-20-02 REPAIR 1 (cont)		54-30-01 IDENTIFICATION 1 (cont)		54-30-01 IDENTIFICATION 2 (cont)	
207	Nov 10/2012	14	Nov 10/2015	25	Nov 10/2015
208	BLANK	15	Nov 10/2015	26	Nov 10/2015
54-20-90 IDENTIFICATION 1		16	Nov 10/2015	27	Nov 10/2015
1	Nov 10/2012	17	Nov 10/2015	28	Nov 10/2015
2	Nov 10/2015	18	Nov 10/2015	29	Nov 10/2015
3	Nov 10/2015	19	Nov 10/2015	30	Nov 10/2015
4	Nov 10/2015	20	Nov 10/2015	31	Nov 10/2015
5	Nov 10/2015	21	Nov 10/2015	32	Nov 10/2015
6	Nov 10/2015	22	Nov 10/2015	33	Nov 10/2015
7	Nov 10/2015	23	Nov 10/2015	34	BLANK
8	BLANK	24	Nov 10/2015	54-30-01 IDENTIFICATION 3	
54-20-90 ALLOWABLE DAMAGE 1		54-30-01 IDENTIFICATION 2		1	Nov 10/2015
101	Nov 10/2012	1	Nov 10/2015	2	Nov 10/2012
102	Nov 10/2012	2	Nov 10/2015	3	Nov 10/2015
103	Nov 10/2012	3	Nov 10/2015	4	Nov 10/2015
104	Nov 10/2012	4	Nov 10/2015	5	Nov 10/2015
105	Nov 10/2012	5	Nov 10/2015	6	Nov 10/2015
106	Nov 10/2012	6	Nov 10/2015	7	Nov 10/2015
107	Nov 10/2012	7	Nov 10/2015	8	Nov 10/2015
108	Nov 10/2012	8	Nov 10/2015	9	Nov 10/2015
109	Nov 10/2012	9	Nov 10/2015	10	Nov 10/2015
110	BLANK	10	Nov 10/2015	11	Nov 10/2015
54-30-01 IDENTIFICATION 1		11	Nov 10/2015	12	Nov 10/2015
1	Nov 10/2012	12	Nov 10/2015	13	Nov 10/2015
2	Nov 10/2013	13	Nov 10/2015	14	Nov 10/2015
3	Nov 10/2015	14	Nov 10/2015	15	Nov 10/2015
4	Nov 10/2015	15	Nov 10/2015	16	Nov 10/2015
5	Nov 10/2015	16	Nov 10/2015	17	Nov 10/2015
6	Nov 10/2015	17	Nov 10/2015	18	Nov 10/2015
7	Nov 10/2015	18	Nov 10/2015	19	Nov 10/2015
8	Nov 10/2015	19	Nov 10/2015	20	Nov 10/2015
9	Nov 10/2015	20	Nov 10/2015	21	Nov 10/2015
10	Nov 10/2015	21	Nov 10/2015	22	Nov 10/2015
11	Nov 10/2015	22	Nov 10/2015	23	Nov 10/2015
12	Nov 10/2015	23	Nov 10/2015	24	Nov 10/2015
13	Nov 10/2015	24	Nov 10/2015	25	Nov 10/2015

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-30-01 IDENTIFICATION 3 (cont)		54-30-01 ALLOWABLE DAMAGE 1 (cont)		54-30-01 ALLOWABLE DAMAGE 4	
26	Nov 10/2015	116	Nov 10/2015	101	Nov 10/2015
27	Nov 10/2015	54-30-01 ALLOWABLE DAMAGE 2		102	Nov 10/2012
28	Nov 10/2015	101	Nov 10/2015	103	Nov 10/2015
29	Nov 10/2015	102	Nov 10/2015	104	Nov 10/2012
30	Nov 10/2015	103	Nov 10/2013	105	Nov 10/2012
31	Nov 10/2015	104	Mar 10/2013	106	Nov 10/2012
32	Nov 10/2015	105	Nov 10/2012	54-30-01 ALLOWABLE DAMAGE 5	
33	Nov 10/2015	106	Nov 10/2015	101	Jul 10/2015
34	Nov 10/2015	107	Nov 10/2015	102	Nov 10/2012
35	Nov 10/2015	108	Nov 10/2012	103	Nov 10/2012
36	Nov 10/2015	109	Nov 10/2015	104	Nov 10/2012
37	Nov 10/2015	110	Nov 10/2012	105	Nov 10/2012
38	Nov 10/2015	111	Nov 10/2012	106	Jul 10/2015
39	Nov 10/2015	112	Nov 10/2015	107	Nov 10/2012
40	BLANK	113	Nov 10/2015	108	Nov 10/2012
54-30-01 IDENTIFICATION 4		114	Nov 10/2015	109	Nov 10/2012
1	Nov 10/2014	115	Nov 10/2015	110	BLANK
2	Nov 10/2014	116	Nov 10/2015	54-30-01 REPAIR 1	
3	Nov 10/2014	117	Nov 10/2015	201	Nov 10/2014
4	BLANK	118	BLANK	202	Jul 10/2014
54-30-01 ALLOWABLE DAMAGE 1		54-30-01 ALLOWABLE DAMAGE 3		203	Mar 10/2013
101	Nov 10/2015	101	Nov 10/2015	204	Nov 10/2015
102	Nov 10/2015	102	Nov 10/2015	205	Jul 10/2014
103	Nov 10/2012	103	Mar 10/2013	206	Nov 10/2012
104	Jul 10/2013	104	Nov 10/2015	207	Jul 10/2014
105	Nov 10/2015	105	Nov 10/2015	208	BLANK
106	Mar 10/2013	106	Nov 10/2015	54-30-01 REPAIR 2	
107	Nov 10/2015	107	Nov 10/2015	201	Jul 10/2014
108	Nov 10/2015	108	Nov 10/2015	202	Nov 10/2012
109	Nov 10/2015	109	Nov 10/2015	203	Mar 10/2013
110	Nov 10/2015	110	Nov 10/2015	204	Nov 10/2015
111	Nov 10/2015	111	Nov 10/2015	205	Jul 10/2014
112	Nov 10/2015	112	Nov 10/2015	206	Nov 10/2012
113	Nov 10/2015			207	Jul 10/2014
114	Nov 10/2015			208	BLANK
115	Nov 10/2015				

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-30-01 REPAIR 3		54-30-02 IDENTIFICATION 1 (cont)		54-30-02 ALLOWABLE DAMAGE 1 (cont)	
201	Jul 10/2014	10	Nov 10/2014	114	Mar 10/2016
202	Nov 10/2012	11	Nov 10/2014	115	Mar 10/2016
203	Mar 10/2013	12	Nov 10/2014	116	Mar 10/2016
204	Nov 10/2015	13	Nov 10/2014	117	Mar 10/2016
205	Jul 10/2014	14	Nov 10/2012	118	Mar 10/2016
206	Nov 10/2012	15	Nov 10/2014	119	Mar 10/2016
207	Jul 10/2014	16	Nov 10/2012	120	Mar 10/2016
208	BLANK	17	Nov 10/2014	121	Mar 10/2016
54-30-01 REPAIR 4		18	BLANK	122	Mar 10/2016
201	Jul 10/2014	54-30-02 IDENTIFICATION 2		123	Mar 10/2016
202	Nov 10/2012	1	Nov 10/2015	124	Mar 10/2016
203	Mar 10/2013	2	Nov 10/2015	125	Mar 10/2016
204	Nov 10/2015	3	Nov 10/2015	126	Mar 10/2016
205	Jul 10/2014	4	Nov 10/2015	127	Mar 10/2016
206	Jul 10/2014	5	Nov 10/2015	128	Mar 10/2016
207	Jul 10/2014	6	Nov 10/2015	129	Mar 10/2016
208	Jul 10/2014	7	Nov 10/2015	130	Mar 10/2016
209	Nov 10/2012	8	Nov 10/2015	54-30-02 ALLOWABLE DAMAGE 2	
210	Nov 10/2012	9	Nov 10/2015	101	Nov 10/2012
211	Nov 10/2012	10	Nov 10/2015	102	Nov 10/2012
212	Nov 10/2012	11	Nov 10/2015	103	Nov 10/2012
213	Jul 10/2014	12	BLANK	104	Nov 10/2015
214	BLANK	54-30-02 ALLOWABLE DAMAGE 1		105	Nov 10/2015
54-30-01 REPAIR 5		101	Nov 10/2012	106	Nov 10/2012
201	Nov 10/2015	102	Mar 10/2016	107	Nov 10/2012
202	BLANK	103	Mar 10/2016	108	Nov 10/2012
54-30-02 IDENTIFICATION 1		104	Mar 10/2016	54-30-02 REPAIR 2	
1	Nov 10/2012	105	Mar 10/2016	201	Nov 10/2012
2	Nov 10/2012	106	Mar 10/2016	202	BLANK
3	Nov 10/2012	107	Mar 10/2016	54-30-70 IDENTIFICATION 1	
4	Nov 10/2014	108	Mar 10/2016	1	Nov 10/2014
5	Nov 10/2012	109	Mar 10/2016	2	Nov 10/2012
6	Nov 10/2014	110	Mar 10/2016	3	Nov 10/2012
7	Nov 10/2012	111	Mar 10/2016	4	Nov 10/2012
8	Nov 10/2012	112	Mar 10/2016	5	Nov 10/2014
9	Nov 10/2012	113	Mar 10/2016		

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-30-70 IDENTIFICATION 1 (cont)		54-30-90 ALLOWABLE DAMAGE 1		54-30-90 ALLOWABLE DAMAGE 1	
6 BLANK		101 Nov 10/2012		(cont)	
54-30-70 ALLOWABLE DAMAGE 1		102 Nov 10/2015		137 Nov 10/2015	
101 Nov 10/2015		103 Nov 10/2015		138 Nov 10/2015	
102 Nov 10/2015		104 Nov 10/2015		54-30-90 REPAIR 1	
103 Nov 10/2015		105 Nov 10/2015		201 Nov 10/2012	
104 Nov 10/2015		106 Nov 10/2015		202 BLANK	
105 Nov 10/2015		107 Nov 10/2015		54-40-02 IDENTIFICATION 1	
106 Nov 10/2015		108 Nov 10/2015		1 Nov 10/2012	
107 Nov 10/2015		109 Nov 10/2015		2 Nov 10/2012	
108 Nov 10/2015		110 Nov 10/2015		3 Nov 10/2012	
109 Nov 10/2015		111 Nov 10/2015		4 Nov 10/2012	
110 Nov 10/2015		112 Nov 10/2015		5 Nov 10/2012	
111 Nov 10/2015		113 Nov 10/2015		R 6 Jul 10/2016	
112 Nov 10/2015		114 Nov 10/2015		R 7 Jul 10/2016	
113 Nov 10/2015		115 Nov 10/2015		8 Nov 10/2012	
114 Nov 10/2015		116 Nov 10/2015		9 Nov 10/2012	
115 Nov 10/2015		117 Nov 10/2015		R 10 Jul 10/2016	
116 BLANK		118 Nov 10/2015		R 11 Jul 10/2016	
54-30-70 REPAIR 1		119 Nov 10/2015		12 BLANK	
201 Nov 10/2012		120 Nov 10/2015		54-40-02 ALLOWABLE DAMAGE 1	
202 BLANK		121 Nov 10/2015		101 Jul 10/2013	
54-30-90 IDENTIFICATION 1		122 Nov 10/2015		102 Nov 10/2012	
1 Nov 10/2014		123 Nov 10/2015		103 Nov 10/2012	
2 Nov 10/2012		124 Nov 10/2015		104 Jul 10/2013	
3 Nov 10/2014		125 Nov 10/2015		105 Nov 10/2012	
4 Nov 10/2014		126 Nov 10/2015		106 Nov 10/2012	
5 Nov 10/2014		127 Nov 10/2015		107 Nov 10/2012	
6 Nov 10/2014		128 Nov 10/2015		108 Nov 10/2012	
7 Nov 10/2014		129 Nov 10/2015		109 Jul 10/2013	
8 Nov 10/2014		130 Nov 10/2015		110 Jul 10/2013	
9 Nov 10/2014		131 Nov 10/2015		111 Nov 10/2012	
10 Nov 10/2014		132 Nov 10/2015		112 Nov 10/2012	
11 Nov 10/2014		133 Nov 10/2015		54-40-02 ALLOWABLE DAMAGE 2	
12 Nov 10/2014		134 Nov 10/2015		101 Nov 10/2012	
13 Nov 10/2014		135 Nov 10/2015		102 Nov 10/2012	
14 Nov 10/2014		136 Nov 10/2015		103 Nov 10/2012	

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-40-02 ALLOWABLE DAMAGE 2 (cont)		54-40-02 REPAIR 4 (cont)		54-50-01 ALLOWABLE DAMAGE 1 (cont)	
104	Nov 10/2012	209	Mar 10/2016	109	Nov 10/2012
105	Nov 10/2012	210	Mar 10/2016	110	Nov 10/2012
106	Nov 10/2012	211	Mar 10/2016	111	Nov 10/2012
107	Nov 10/2012	212	Mar 10/2016	112	Nov 10/2012
108	Nov 10/2012	54-40-02 REPAIR 5		113	Jul 10/2014
109	Nov 10/2012	201	Mar 10/2016	114	BLANK
110	Nov 10/2012	202	Mar 10/2016	54-50-01 REPAIR 1	
111	Nov 10/2012	203	Mar 10/2016	201	Mar 10/2014
112	Nov 10/2012	204	Mar 10/2016	202	BLANK
113	Nov 10/2012	205	Mar 10/2016	54-50-02 IDENTIFICATION 1	
114	Nov 10/2012	206	Mar 10/2016	1	Nov 10/2012
54-40-02 REPAIR 1		207	Mar 10/2016	2	Nov 10/2012
201	Nov 10/2012	208	Mar 10/2016	3	Nov 10/2012
202	BLANK	54-40-02 REPAIR 6		4	BLANK
54-40-02 REPAIR 2		A 201	Jul 10/2016	54-50-02 IDENTIFICATION 2	
201	Mar 10/2016	A 202	Jul 10/2016	1	Nov 10/2012
202	BLANK	A 203	Jul 10/2016	2	Nov 10/2012
54-40-02 REPAIR 3		A 204	Jul 10/2016	3	Nov 10/2012
201	Mar 10/2016	A 205	Jul 10/2016	4	BLANK
202	Mar 10/2016	A 206	Jul 10/2016	54-50-02 ALLOWABLE DAMAGE 1	
203	Mar 10/2016	A 207	Jul 10/2016	101	Nov 10/2012
204	Mar 10/2016	A 208	Jul 10/2016	102	Nov 10/2012
205	Mar 10/2016	A 209	Jul 10/2016	103	Nov 10/2012
206	Mar 10/2016	A 210	Jul 10/2016	104	Nov 10/2015
207	Mar 10/2016	54-50-01 IDENTIFICATION 1		105	Nov 10/2012
208	Mar 10/2016	1	Nov 10/2012	106	Nov 10/2012
54-40-02 REPAIR 4		2	Nov 10/2012	107	Nov 10/2012
201	Mar 10/2016	54-50-01 ALLOWABLE DAMAGE 1		108	Nov 10/2012
202	Mar 10/2016	101	Nov 10/2012	109	Nov 10/2012
203	Mar 10/2016	102	Nov 10/2012	110	Nov 10/2012
204	Mar 10/2016	103	Nov 10/2015	111	Nov 10/2012
205	Mar 10/2016	104	Nov 10/2012	112	Nov 10/2012
206	Mar 10/2016	105	Nov 10/2012	54-50-02 ALLOWABLE DAMAGE 2	
207	Mar 10/2016	106	Nov 10/2012	101	Nov 10/2012
208	Mar 10/2016	107	Nov 10/2012	O 102	Jul 10/2016
		108	Nov 10/2012		

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-50-02 ALLOWABLE DAMAGE 2 (cont)		54-50-70 IDENTIFICATION 2		54-50-70 ALLOWABLE DAMAGE 1	
103	Nov 10/2012	1	Nov 10/2012	101	Nov 10/2012
104	Nov 10/2015	R 2	Jul 10/2016	102	Jul 10/2013
105	Nov 10/2012	R 3	Jul 10/2016	103	Mar 10/2013
106	Nov 10/2012	O 4	Jul 10/2016	104	Mar 10/2013
107	Nov 10/2012	O 5	Jul 10/2016	105	Mar 10/2013
108	Nov 10/2012	O 6	Jul 10/2016	106	Mar 10/2013
109	Nov 10/2012	O 7	Jul 10/2016	107	Mar 10/2013
110	Nov 10/2012	O 8	Jul 10/2016	108	Mar 10/2013
111	Nov 10/2012	O 9	Jul 10/2016	109	Mar 10/2013
112	Nov 10/2012	O 10	Jul 10/2016	110	Mar 10/2013
113	Nov 10/2012	O 11	Jul 10/2016	111	Mar 10/2013
114	Nov 10/2012	O 12	Jul 10/2016	112	Mar 10/2013
115	Nov 10/2012	O 13	Jul 10/2016	113	Nov 10/2012
116	Nov 10/2012	R 14	Jul 10/2016	114	Nov 10/2012
		R 15	Jul 10/2016	54-50-70 ALLOWABLE DAMAGE 2	
54-50-02 REPAIR 1		R 16	Jul 10/2016	101	Mar 10/2015
201	Nov 10/2012	A 17	Jul 10/2016	102	Mar 10/2015
202	BLANK	A 18	Jul 10/2016	103	Mar 10/2013
54-50-02 REPAIR 2		54-50-70 IDENTIFICATION 3		104	Mar 10/2013
201	Nov 10/2012	1	Nov 10/2012	105	Mar 10/2013
202	BLANK	2	Nov 10/2012	106	Mar 10/2015
54-50-70 IDENTIFICATION 1		3	Nov 10/2012	107	Nov 10/2012
1	Mar 10/2013	4	Nov 10/2012	108	Nov 10/2012
2	Nov 10/2012	5	Nov 10/2012	109	Nov 10/2012
3	Mar 10/2013	6	Nov 10/2012	110	Nov 10/2012
4	Nov 10/2012	7	Nov 10/2012	111	Nov 10/2012
5	Nov 10/2012	8	Nov 10/2012	112	Nov 10/2012
6	Nov 10/2012	9	Nov 10/2012	113	Nov 10/2012
7	Nov 10/2012	10	Nov 10/2012	114	Nov 10/2012
8	Nov 10/2012	11	Nov 10/2012	115	Nov 10/2012
9	Nov 10/2012	12	Nov 10/2012	116	Nov 10/2012
10	Nov 10/2012	13	Nov 10/2012	54-50-70 ALLOWABLE DAMAGE 3	
11	Nov 10/2012	14	Nov 10/2012	101	Jul 10/2014
12	BLANK	15	Jul 10/2013	102	Jul 10/2014
		16	BLANK	103	Jul 10/2014
				104	Jul 10/2014

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-50-70 ALLOWABLE DAMAGE 3 (cont)		54-50-71 IDENTIFICATION 1 1 2 3 4	Nov 10/2015 Nov 10/2015 Mar 10/2013 BLANK	54-50-71 ALLOWABLE DAMAGE 3 (cont) 108 54-50-71 REPAIR 1 201 202	Nov 10/2012 REPAIR 1 Nov 10/2014 Jul 10/2014
105 Jul 10/2014		54-50-71 IDENTIFICATION 2 1 2	Nov 10/2012 Nov 10/2012	54-50-71 REPAIR 2 201 202	Nov 10/2012 BLANK
106 Nov 10/2015		54-50-71 IDENTIFICATION 3 1	Nov 10/2012	54-50-71 REPAIR 3 201	Nov 10/2012
107 Jul 10/2014		2		202	
108 Jul 10/2014		3		201	Nov 10/2014
109 Jul 10/2014		4		202	Jul 10/2014
110 Jul 10/2014		54-50-71 ALLOWABLE DAMAGE 1 101 102 103	Nov 10/2012 Nov 10/2012 Nov 10/2015	54-50-71 REPAIR 4 201 202 203 204	Nov 10/2012 Nov 10/2012 Nov 10/2015 Nov 10/2015
111 Jul 10/2014		2		201	Nov 10/2012
112 Jul 10/2014		3		202	
54-50-70 REPAIR 1		4		201	Nov 10/2012
201 Jul 10/2014		54-50-71 ALLOWABLE DAMAGE 2 101 102 103	Nov 10/2012 Nov 10/2012 Nov 10/2015	202 203 204	Nov 10/2015 Nov 10/2015 Nov 10/2015
202 Nov 10/2012		104	Nov 10/2012	205	Nov 10/2015
203 Mar 10/2013		105	Nov 10/2012	206	Nov 10/2015
204 Jul 10/2014		106	Nov 10/2012	54-50-90 IDENTIFICATION 1 1	
205 Nov 10/2014		107	Nov 10/2012	2	Nov 10/2012
206 Jul 10/2014		108	BLANK	203	Nov 10/2015
54-50-70 REPAIR 2		54-50-71 ALLOWABLE DAMAGE 2 101 102 103	Nov 10/2012 Nov 10/2012 Nov 10/2015	204 205 206	Nov 10/2015 Nov 10/2015 Nov 10/2015
201 Jul 10/2014		104	Nov 10/2012	54-50-90 IDENTIFICATION 1 1	
202 Jul 10/2014		105	Nov 10/2012	2	Nov 10/2012
203 Mar 10/2013		106	Nov 10/2012	3	Nov 10/2012
204 Jul 10/2014		107	Nov 10/2012	4	Nov 10/2012
205 Jul 10/2014		108	BLANK	54-50-90 IDENTIFICATION 2 1	
206 Nov 10/2014		54-50-71 ALLOWABLE DAMAGE 3 101 102 103	Jul 10/2014 Nov 10/2012 Nov 10/2015	2	Nov 10/2012
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54-50-70 REPAIR 3		106	BLANK	54-50-90 IDENTIFICATION 2 1	
201 Jul 10/2014		107	54-50-71 ALLOWABLE DAMAGE 3 101 102 103	2	Nov 10/2012
202 Jul 10/2014		108	BLANK	3	Nov 10/2012
203 Mar 10/2013		54-50-71 ALLOWABLE DAMAGE 3 101 102 103	Nov 10/2012 Nov 10/2012 Nov 10/2012	4	Nov 10/2012
204 Jul 10/2014		104	Nov 10/2012	5	Nov 10/2012
205 Nov 10/2014		105	Nov 10/2012	6	Nov 10/2012
206 BLANK		106	54-50-90 IDENTIFICATION 3 101 102 103	54-50-90 IDENTIFICATION 3 1	
54-50-70 REPAIR 4		107	Nov 10/2012	2	Nov 10/2012
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202 BLANK		109	Nov 10/2012	2	Nov 10/2012
203		110			
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421		328			
422		329			
423		330			
424		331			
425		332			
426		333			
4					



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-50-90 IDENTIFICATION 4 (cont)		54-50-90 ALLOWABLE DAMAGE 2 (cont)		54-50-90 REPAIR 4	
3 Nov 10/2012		119 Nov 10/2012		201 Nov 10/2012	
4 BLANK		120 Nov 10/2012		202 BLANK	
54-50-90 ALLOWABLE DAMAGE 1		54-50-90 ALLOWABLE DAMAGE 3		54-70-90 IDENTIFICATION 1	
101 Jul 10/2013		101 Jul 10/2014		1 Nov 10/2012	
102 Nov 10/2012		102 Nov 10/2012		2 Nov 10/2012	
103 Nov 10/2014		103 Nov 10/2012		54-70-90 ALLOWABLE DAMAGE 1	
104 Nov 10/2012		104 Nov 10/2012		101 Nov 10/2012	
105 Nov 10/2012		105 Nov 10/2012		102 Nov 10/2012	
106 Nov 10/2012		106 Nov 10/2012		103 Nov 10/2015	
107 Nov 10/2015		107 Nov 10/2015		104 Nov 10/2015	
O 108 Jul 10/2016		108 Jul 10/2014		105 Nov 10/2012	
109 Nov 10/2012		109 Nov 10/2012		106 Nov 10/2015	
110 Nov 10/2012		110 Nov 10/2012		107 Nov 10/2015	
111 Nov 10/2012		111 Nov 10/2012		108 BLANK	
112 Nov 10/2012		112 Nov 10/2012		54-70-90 ALLOWABLE DAMAGE 2	
113 Nov 10/2012		113 Nov 10/2012		R 101 Jul 10/2016	
114 BLANK		114 Nov 10/2012		102 Nov 10/2012	
54-50-90 ALLOWABLE DAMAGE 2		54-50-90 ALLOWABLE DAMAGE 4		103 Jul 10/2015	
101 Nov 10/2012		101 Nov 10/2014		104 Nov 10/2012	
102 Nov 10/2012		102 Nov 10/2012		54-70-90 ALLOWABLE DAMAGE 3	
103 Nov 10/2012		103 Nov 10/2012		101 Mar 10/2016	
104 Nov 10/2012		104 Nov 10/2012		102 Nov 10/2012	
105 Nov 10/2012		105 Nov 10/2015		103 Nov 10/2012	
106 Nov 10/2012		106 Nov 10/2012		104 Nov 10/2012	
107 Nov 10/2012		107 Nov 10/2012		54-70-90 ALLOWABLE DAMAGE 4	
108 Nov 10/2012		108 Nov 10/2012		101 Jul 10/2014	
109 Nov 10/2012		54-50-90 REPAIR 1		102 Nov 10/2012	
110 Nov 10/2015		201 Nov 10/2012		103 Nov 10/2012	
O 111 Jul 10/2016		202 BLANK		104 Nov 10/2012	
112 Jul 10/2013		54-50-90 REPAIR 2		54-70-90 ALLOWABLE DAMAGE 5	
113 Nov 10/2012		201 Nov 10/2012		101 Mar 10/2016	
114 Nov 10/2012		202 BLANK		102 Nov 10/2012	
115 Nov 10/2012		54-50-90 REPAIR 3		103 Nov 10/2012	
116 Nov 10/2012		201 Nov 10/2012		104 Nov 10/2012	
117 Nov 10/2012		202 BLANK		105 Nov 10/2012	
118 Nov 10/2012				106 BLANK	

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

Subject/Page	Date	Subject/Page	Date	Subject/Page	Date
54-70-90 ALLOWABLE DAMAGE 6		54-70-90 ALLOWABLE DAMAGE 11 (cont)			
101	Nov 10/2012	104	Nov 10/2013		
102	Mar 10/2016	54-70-90 ALLOWABLE DAMAGE 12			
103	Nov 10/2012	101	Nov 10/2013		
104	Nov 10/2012	102	Nov 10/2013		
105	Nov 10/2012	103	Jul 10/2014		
106	BLANK	104	Nov 10/2013		
54-70-90 ALLOWABLE DAMAGE 7		105	Nov 10/2013		
101	Nov 10/2012	106	BLANK		
102	Jul 10/2015	54-70-90 ALLOWABLE DAMAGE 13			
103	Nov 10/2012	101	Nov 10/2013		
104	Nov 10/2012	102	Nov 10/2013		
105	Nov 10/2012	103	Jul 10/2014		
106	BLANK	104	Nov 10/2013		
54-70-90 ALLOWABLE DAMAGE 8		105	Nov 10/2013		
101	Jul 10/2014	106	Nov 10/2013		
102	Nov 10/2012				
103	Nov 10/2012				
104	Nov 10/2012				
54-70-90 ALLOWABLE DAMAGE 9					
101	Nov 10/2012				
102	Nov 10/2012				
103	Jul 10/2014				
104	Nov 10/2012				
105	Nov 10/2012				
106	Nov 10/2012				
107	Nov 10/2012				
108	Nov 10/2012				
54-70-90 ALLOWABLE DAMAGE 10					
101	Jul 10/2014				
102	Nov 10/2012				
103	Nov 10/2012				
104	Nov 10/2012				
54-70-90 ALLOWABLE DAMAGE 11					
101	Nov 10/2013				
102	Nov 10/2013				
103	Jul 10/2014				

A = Added, R = Revised, D = Deleted, O = Overflow

54-EFFECTIVE PAGES



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

<u>SUBJECT</u>	<u>CHAPTER</u>	<u>SECTION</u>	<u>SUBJECT</u>
NACELLES/PYLONS - GENERAL			54-00-01
GENERAL - Acoustic Panel Area Loss Limits			
INLET COWL SKIN			54-10-01
IDENTIFICATION 1 - Engine Inlet Cowl Skin			
ALLOWABLE DAMAGE 1 - Inlet Cowl Skins			
ALLOWABLE DAMAGE 2 - Inlet Cowl Lipskin Fastener			
REPAIR 1 - Inlet Cowl Outer Barrel External Skin Repair in the Field Area			
REPAIR 2 - Inlet Cowl Outer Barrel Skin Flush Repair in the Field Area			
REPAIR 3 - Inlet Cowl Outer Barrel Skin External Repair Between Two Frames			
REPAIR 4 - Inlet Cowl Outer Barrel External Skin Repair at a Frame			
REPAIR 5 - Inlet Cowl Outer Barrel External Skin Repair at Two Frames			
REPAIR 6 - Inlet Cowl Outer Barrel External Skin Repair at a Frame			
REPAIR 7 - Inlet Cowl Inner Barrel Acoustic Panel Damage That is 3.00 Inches (76.2 mm) or Less in Diameter			
REPAIR 8 - Inlet Cowl Inner Barrel Acoustic Panel Skin With Crack Damage			
REPAIR 9 - Inlet Cowl Inner Barrel Acoustic Panel Skin With Disbonds			
REPAIR 10 - Inlet Cowl Lip Skin			
REPAIR 11 - Inlet Cowl Skin Internal Doubler Repair at a Frame in Zone A			
REPAIR 12 - Inlet Cowl Skin Internal Doubler Repair at a Frame in Zone B			
REPAIR 13 - Inlet Cowl Skin Internal Doubler Repair at a Frame in Zone C			
REPAIR 14 - Inlet Cowl Inner Barrel Acoustic Panel Damage That is 1.00 Inches (25.4 mm) or Less in Diameter			
INLET COWL STRUCTURE			54-10-02
IDENTIFICATION 1 - Inlet Cowl Structure			
ALLOWABLE DAMAGE 1 - Inlet Cowl Structure			
REPAIR 1 - Inlet Cowl Outer Barrel Frames			
INLET COWL FITTINGS			54-10-90
IDENTIFICATION 1 - Inlet Cowl Fittings			
ALLOWABLE DAMAGE 1 - Inlet Cowl Fittings			
FAN COWL DOOR SKIN			54-20-01
IDENTIFICATION 1 - Fan Cowl Door Skin			

54-CONTENTS



**737-800
STRUCTURAL REPAIR MANUAL**

**CHAPTER 54
NACELLES/PYLONS**

<u>SUBJECT</u>	<u>CHAPTER</u> <u>SECTION</u> <u>SUBJECT</u>
ALLOWABLE DAMAGE 1 - Fan Cowl Door Skin	
REPAIR 1 - Fan Cowl Door Skin Flush Repair in the Field Area	
REPAIR 2 - Fan Cowl Skin External Repair in the Field Area	
REPAIR 3 - External Repair of the Fan Cowl Door Skin in the Field Area	
REPAIR 4 - Fan Cowl Skin External Repair at a Frame	
REPAIR 5 - Fan Cowl Skin External Repair at Two Frames	
REPAIR 6 - Fan Cowl Skin External Repair at a Frame	
REPAIR 7 - Fan Cowl Skin External Repair Between Two Frames	
REPAIR 8 - Fan Cowl Skin Internal Doubler Repair at a Frame in Zone A	
REPAIR 9 - Fan Cowl Skin Internal Doubler Repair at a Frame in Zone B	
REPAIR 10 - Fan Cowl Skin Internal Doubler Repair at a Frame in Zone C	
REPAIR 11 - Laminated Fireshield (NEXTEL or Fiberglass)	
FAN COWL DOOR STRUCTURE	54-20-02
IDENTIFICATION 1 - Fan Cowl Door Structure	
ALLOWABLE DAMAGE 1 - Fan Cowl Door Structure	
REPAIR 1 - Fan Cowl Door Frames	
FAN COWL ATTACHMENT FITTINGS	54-20-90
IDENTIFICATION 1 - Fan Cowl Fittings	
ALLOWABLE DAMAGE 1 - Fan Cowl Fittings	
FAN THRUST REVERSER COWL SKIN	54-30-01
IDENTIFICATION 1 - Thrust Reverser Translating Sleeve Outer Skin	
IDENTIFICATION 2 - Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel	
IDENTIFICATION 3 - Thrust Reverser Inner Duct Wall Skin	
IDENTIFICATION 4 - Thrust Reverser Aft Cowl Skin	
ALLOWABLE DAMAGE 1 - Thrust Reverser Translating Sleeve Outer Skin	
ALLOWABLE DAMAGE 2 - Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel	
ALLOWABLE DAMAGE 3 - Thrust Reverser Inner Duct Wall Skin Panel	
ALLOWABLE DAMAGE 4 - Thrust Reverser Aft Cowl Skin	
ALLOWABLE DAMAGE 5 - Thrust Reverser Blocker Doors	

54-CONTENTS



**737-800
STRUCTURAL REPAIR MANUAL**

**CHAPTER 54
NACELLES/PYLONS**

<u>SUBJECT</u>	<u>CHAPTER</u>	<u>SECTION</u>	<u>SUBJECT</u>
REPAIR 1 - Thrust Reverser Translating Sleeve Outer Cowl Skin			
REPAIR 2 - Thrust Reverser Translating Sleeve Acoustic Panels			
REPAIR 3 - Thrust Reverser Inner Duct Wall Acoustic Panel			
REPAIR 4 - Thrust Reverser Blocker Door Panels			
REPAIR 5 - Thrust Reverser Aft Cowl Skin			
FAN THRUST REVERSER COWL STRUCTURE			54-30-02
IDENTIFICATION 1 - Thrust Reverser Torque Box Structure			
IDENTIFICATION 2 - Thrust Reverser Aft Cowl Structure			
ALLOWABLE DAMAGE 1 - Thrust Reverser Torque Box Structure			
ALLOWABLE DAMAGE 2 - Thrust Reverser Aft Cowl Structure			
REPAIR 2 - Thrust Reverser Aft Cowl Structure			
KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM AND LATCH BEAM ASSEMBLIES			54-30-70
IDENTIFICATION 1 - Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings			
ALLOWABLE DAMAGE 1 - Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings			
REPAIR 1 - Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings			
FAN THRUST REVERSER COWL ATTACHMENT FITTINGS			54-30-90
IDENTIFICATION 1 - Thrust Reverser Fittings			
ALLOWABLE DAMAGE 1 - Thrust Reverser Fittings			
REPAIR 1 - Thrust Reverser Fittings			
PRIMARY EXHAUST SYSTEM			54-40-02
IDENTIFICATION 1 - Primary Exhaust System			
ALLOWABLE DAMAGE 1 - Primary Exhaust System			
ALLOWABLE DAMAGE 2 - Primary Exhaust - Performance Improvement Package			
REPAIR 1 - Primary Exhaust System			
REPAIR 2 - Primary Exhaust System - Performance Improvement Package			
REPAIR 3 - Primary Exhaust System - Performance Improvement Package - Weld Pin Repair of Dents and Punctures on the Honeycomb Sandwich Panel Assembly for the Primary Nozzle Assembly			

54-CONTENTS



**737-800
STRUCTURAL REPAIR MANUAL**

**CHAPTER 54
NACELLES/PYLONS**

SUBJECT	CHAPTER SECTION SUBJECT
REPAIR 4 - Primary Exhaust System - Performance Improvement Package - Pin Repair of Core to Face Sheet Disbond on the Honeycomb Sandwich Panel Assembly for the Primary Nozzle Assembly	
REPAIR 5 - Primary Exhaust System - Performance Improvement Package - Panel Section Repair/Replacement of Damaged Areas on the Honeycomb Sandwich Panel Assembly for the Primary Nozzle Assembly	
REPAIR 6 - Primary Exhaust System - Exhaust Nozzle Fence and Doubler Elongated Fastener Hole Repair	
STRUT SIDE SKINS	54-50-01
IDENTIFICATION 1 - Engine Strut Side Skins	
ALLOWABLE DAMAGE 1 - Engine Strut Side Skins	
REPAIR 1 - Engine Strut Side Skins	
ENGINE STRUT STRUCTURE	54-50-02
IDENTIFICATION 1 - Fan Cowl Support Beam Structure	
IDENTIFICATION 2 - Engine Strut Torque Box Structure	
ALLOWABLE DAMAGE 1 - Fan Cowl Support Beam Structure	
ALLOWABLE DAMAGE 2 - Engine Strut Torque Box Structure	
REPAIR 1 - Fan Cowl Support Beam Structure	
REPAIR 2 - Engine Strut Torque Box Structure	
ENGINE STRUT FAIRING SKIN	54-50-70
IDENTIFICATION 1 - Strut Thumbnail and Forward Fairing Skin Panels	
IDENTIFICATION 2 - Wing Junction and Thrust Reverser Strut Fairing Skin Panels	
IDENTIFICATION 3 - Engine Strut Aft Fairing Skin Panels	
ALLOWABLE DAMAGE 1 - Engine Strut Thumbnail and Forward Fairing Skin Panels	
ALLOWABLE DAMAGE 2 - Wing Junction and Thrust Reverser Strut Fairing Skin Panels	
ALLOWABLE DAMAGE 3 - Engine Strut Aft Fairing Skin Panels	
REPAIR 1 - Engine Strut Thumbnail and Forward Fairing Skin Panels	
REPAIR 2 - Wing Junction and Thrust Reverser Strut Fairing Skin Panels	
REPAIR 3 - Engine Strut Aft Fairing Skin Panels	
REPAIR 4 - Engine Strut Aft Fairing - Trailing Edge Skin and Heat Shield	
ENGINE STRUT FAIRING STRUCTURE	54-50-71
IDENTIFICATION 1 - Engine Strut Forward Fairing Structure	

54-CONTENTS



**737-800
STRUCTURAL REPAIR MANUAL**

**CHAPTER 54
NACELLES/PYLONS**

<u>SUBJECT</u>	<u>CHAPTER</u>	<u>SECTION</u>	<u>SUBJECT</u>
IDENTIFICATION 2 - Thrust Reverser Strut Fairing Structure			
IDENTIFICATION 3 - Engine Strut Aft Fairing Structure			
ALLOWABLE DAMAGE 1 - Engine Strut Forward Fairing Structure			
ALLOWABLE DAMAGE 2 - Thrust Reverser Strut Fairing Structure			
ALLOWABLE DAMAGE 3 - Engine Strut Aft Fairing Structure			
REPAIR 1 - Engine Strut Forward Fairing Structure			
REPAIR 2 - Thrust Reverser Strut Fairing Structure			
REPAIR 3 - Engine Strut Aft Fairing Structure			
REPAIR 4 - Engine Strut Forward Fairing Frame Repair			
<u>ENGINE STRUT ATTACHMENT FITTINGS</u>			54-50-90
IDENTIFICATION 1 - Engine Strut-to-Wing Attach Fittings			
IDENTIFICATION 2 - Engine Strut Hinge Fittings			
IDENTIFICATION 3 - Engine Strut Bulkhead Fittings			
IDENTIFICATION 4 - Engine Strut Torque Box Frame Fittings			
ALLOWABLE DAMAGE 1 - Engine Strut-to-Wing Attach Fittings			
ALLOWABLE DAMAGE 2 - Engine Strut Hinge Fittings			
ALLOWABLE DAMAGE 3 - Engine Strut Torque Box Bulkhead Fittings			
ALLOWABLE DAMAGE 4 - Engine Strut Torque Box Frame Fittings			
REPAIR 1 - Engine Strut-to-Wing Attach Fittings			
REPAIR 2 - Engine Strut Hinge Fittings			
REPAIR 3 - Engine Strut Torque Box Bulkhead Fittings			
REPAIR 4 - Engine Strut Torque Box Frame Fittings			
<u>MOUNTS AND LINKAGES</u>			54-70-90
IDENTIFICATION 1 - Engine Thrust Links			
ALLOWABLE DAMAGE 1 - Engine Thrust Links			
ALLOWABLE DAMAGE 2 - Aft Engine Mount Hanger Fitting Loop			
ALLOWABLE DAMAGE 3 - Forward Engine Mount Hanger Fitting Damage Near Link Attachment Holes			
ALLOWABLE DAMAGE 4 - Forward Engine Mount Fan Case Fitting Damage Near Link Attachment Holes			
ALLOWABLE DAMAGE 5 - Aft Engine Mount Hanger Fitting			

54-CONTENTS



737-800
STRUCTURAL REPAIR MANUAL

CHAPTER 54
NACELLES/PYLONS

SUBJECT

**CHAPTER
SECTION
SUBJECT**

ALLOWABLE DAMAGE 6 - Forward Engine Mount Fan Case Fitting Damage at Link Attachment Holes

ALLOWABLE DAMAGE 7 - Forward Engine Mount Hanger Fitting Damage at Link Attachment Holes

ALLOWABLE DAMAGE 8 - Forward Engine Mount Link Damage

ALLOWABLE DAMAGE 9 - Aft Engine Mount Right Link Damage

ALLOWABLE DAMAGE 10 - Aft Engine Mount Left Link Damage

ALLOWABLE DAMAGE 11 - Forward Fan Case Catcher Lug - CFM56-7 Engine

ALLOWABLE DAMAGE 12 - Aft Engine Mount Center Link - CFM56-7 Engine

ALLOWABLE DAMAGE 13 - Aft Engine Mount Evener Bar - CFM56-7 Engine

54-CONTENTS



737-800
STRUCTURAL REPAIR MANUAL

GENERAL - ACOUSTIC PANEL AREA LOSS LIMITS

1. Applicability

- A. This general subject gives the loss limits (the maximum amount of acoustic panel area that can be made non-acoustic) for the acoustic panels of the CFM56-7 engine nacelle.

NOTE: The acoustic panel area loss limits are related to the maximum estimated increase in noise of 0.1 Effective Perceived Noise, Decibels (EPNdB). This limit on the increase in noise is necessary to agree with the noise certification regulations in the United States. It is possible that the noise certification regulations in other countries are different.

2. General

- A. Acoustic panel repairs can cause a blockage of the holes of the perforated facesheet and cells of the core. The repair materials can cause a decrease in the acoustic panel area which absorbs the engine noise.
- B. Refer to Figure 1/GENERAL and Figure 2/GENERAL for the maximum area of the acoustic panels that can have a blockage because of the repairs.
- (1) For aircraft with the original production non-acoustic nozzle as shown in 54-40-02, IDENTIFICATION 1, refer to Figure 1/GENERAL for the acoustic area loss limits.
- (2) For aircraft with the Performance Improvement Package (PIP) acoustic nozzle as shown in 54-40-02, IDENTIFICATION 1, refer to Figure 2/GENERAL for the acoustic area loss limits.
- C. Refer to the applicable Chapter 54 subject for the repairs available for the inlet cowl and thrust reverser acoustic panels.

54-00-01

GENERAL
Page 1

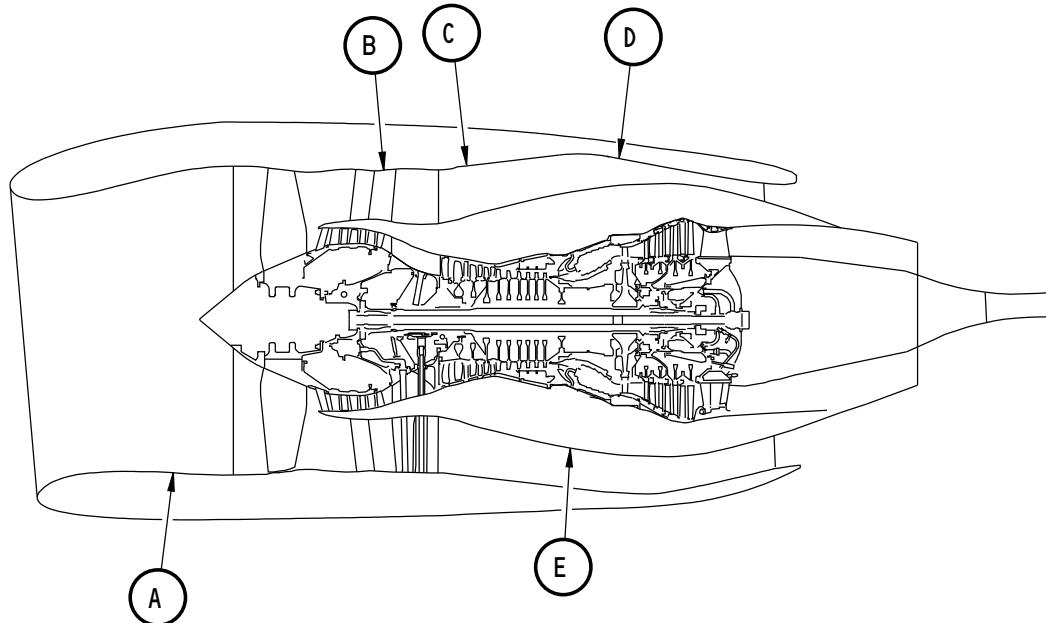
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737-800
STRUCTURAL REPAIR MANUAL



REPAIR AREA	DESCRIPTION	MAXIMUM PERMITTED LOSS OF AREA ON EACH PART (SQUARE INCHES) 
	Inlet Acoustic Panels, Upper and Lower	380
	Engine Fan Frame Acoustic Panels	1215
	Fan Thrust Reverser, Outer Wall Double Layer	1215
	Fan Thrust Reverser Sleeve Outer Wall Single Layer	1215
	Fan Duct Inner Wall and Bifurcations	1215

NOTES

 THE TOTAL LOSS OF ACOUSTIC PANEL AREA MUST ALSO AGREE WITH THE RELATION THAT FOLLOWS:

$$\frac{\textcircled{A}}{380} + \frac{\textcircled{B}}{1215} + \frac{\textcircled{C}}{1215} + \frac{\textcircled{D}}{1215} + \frac{\textcircled{E}}{1215} < 1.0$$

G64966 S0006591496_V2

Acoustic Panel Area Loss Limits - CFM56-7 Engine Nacelle with Original Production Non-Acoustic Nozzle
Figure 1

54-00-01

GENERAL
Page 2

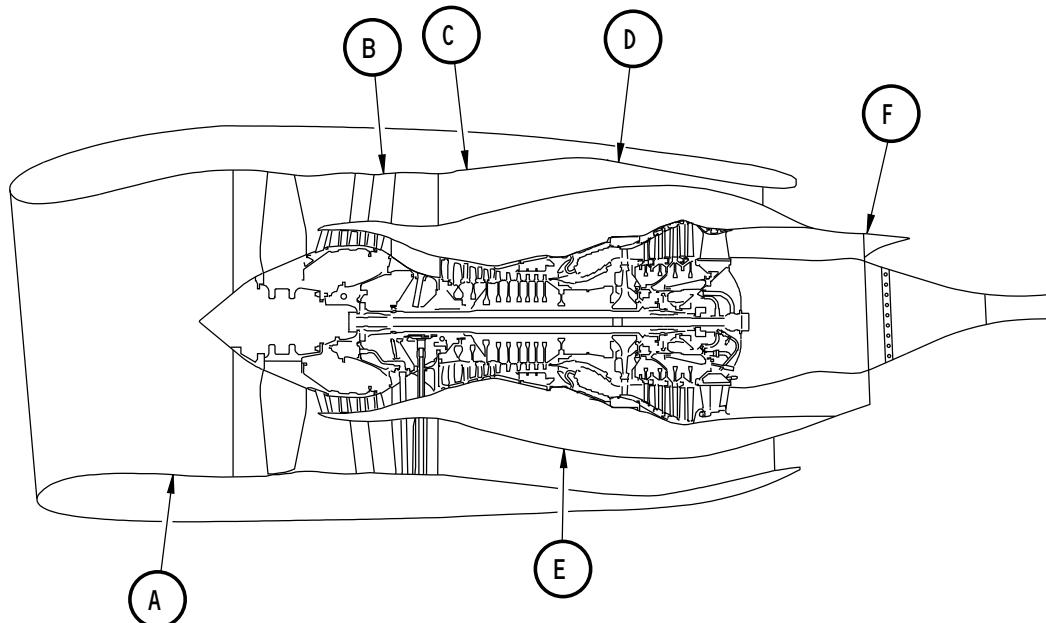
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737-800
STRUCTURAL REPAIR MANUAL



REPAIR AREA	DESCRIPTION	MAXIMUM PERMITTED LOSS OF AREA ON EACH PART (SQUARE INCHES) 
	Inlet Acoustic Panels, Upper and Lower	380
	Engine Fan Frame Acoustic Panels	1215
	Fan Thrust Reverser, Outer Wall Double Layer	1215
	Fan Thrust Reverser Sleeve Outer Wall Single Layer	1215
	Fan Duct Inner Wall and Bifurcations	1215
	Short Acoustic Nozzle	600

NOTES

 THE TOTAL LOSS OF ACOUSTIC PANEL AREA MUST ALSO AGREE WITH THE RELATION THAT FOLLOWS:

$$\frac{\textcircled{A}}{380} + \frac{\textcircled{B}}{1215} + \frac{\textcircled{C}}{1215} + \frac{\textcircled{D}}{1215} + \frac{\textcircled{E}}{1215} + \frac{\textcircled{F}}{600} < 1.0$$

2062985 S0000425954_V1

Acoustic Panel Area Loss Limits - CFM56-7 Engine Nacelle with Improved Performance Acoustic Nozzle
Figure 2

54-00-01

GENERAL

Page 3

Nov 10/2012

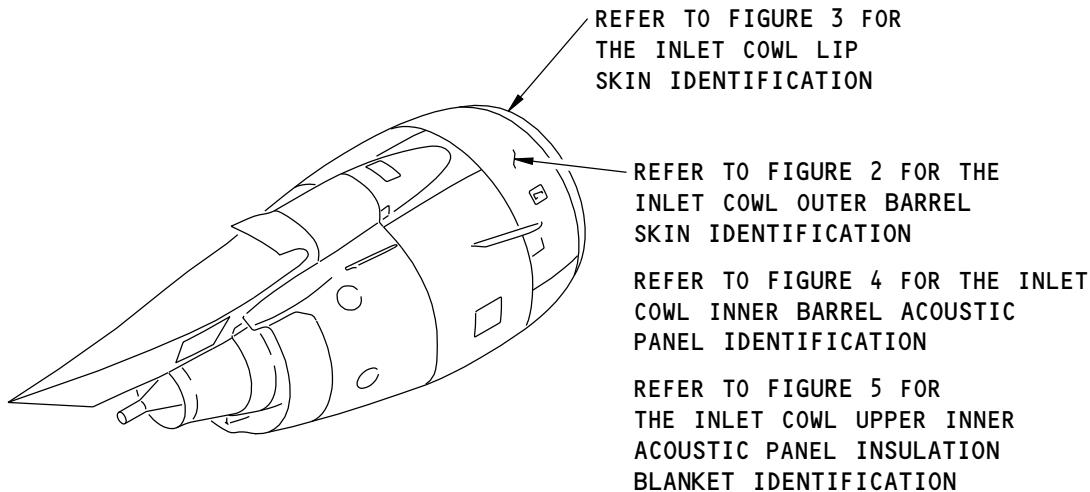
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ENGINE INLET COWL SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

E97997 S0006591501_V2

Inlet Cowl Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
334A2000	Inlet Installation - CFM56-7
314-2100	Cowl Assembly - Inlet
314-2111	Lip Skin Assembly - Inlet
314-2121	Panel Assembly - Inner Acoustic, Upper Inlet (Aluminum Bond Assembly)
314-2122	Panel Assembly - Inner Acoustic, Lower Inlet (Aluminum Bond Assembly)
314-2152	Skin - Upper and Lower Panels, Outer Barrel
314-2155	Door Assembly - Pressure Relief and T-12

54-10-01

IDENTIFICATION 1

Page 1

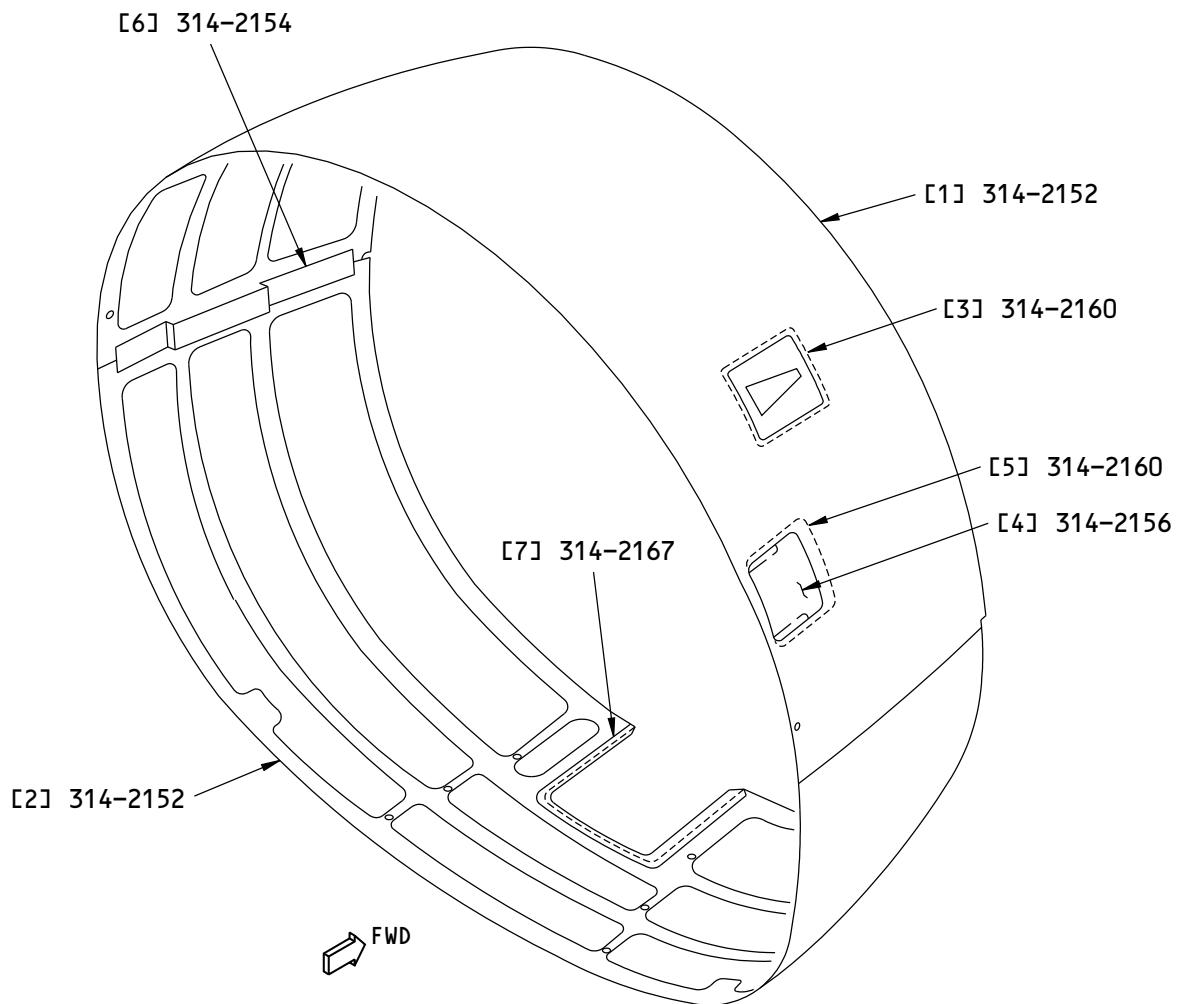
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



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

F41501 S0006591503_V2

Inlet Cowl Outer Barrel Skin Identification
Figure 2

54-10-01
IDENTIFICATION 1
Page 2
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Outer Barrel Skin	0.071 (1.80)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treat to T62, ^{*[2]} Chem-milled to 0.045 (1.14)	Inlet Cowl Serial Numbers 645 and On
		0.071 (1.80)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treat to T62 ^{*[2]} , Chem-milled to 0.050 (1.27)	Inlet Cowl Serial Numbers 1 Thru 644
[2]	Lower Outer Barrel Skin	0.071 (1.80)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treat to T62, ^{*[2]} , Chem-milled to 0.045 (1.14)	
[3]	Scoop Doubler	0.071 (1.80)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4	Inlet Cowl Serial Numbers 66 and On
		0.071 (1.80)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treat to T62	Inlet Cowl Serial Numbers 1 thru 65
[4]	Pressure Relief Door Skin	0.125 (3.17)	2024-T851 Aluminum Plate as given in AMS-QQ-A-250/4, machined to thickness of 0.105 (2.67) and 0.071 (1.80)	Inlet Cowl Serial Numbers 2070 and On
		0.125 (3.17)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treat to T62, Chem-milled to 0.105 (2.67) and 0.071 (1.80)	Inlet Cowl Serial Numbers 1 thru 2069. Alternate for Inlet Cowl Serial Numbers 2070 and On
[5]	Pressure Relief Door Doubler	0.063 (1.60)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4. Heat treat to T62.	Inlet Cowl Serial Numbers 7 and On
		0.063 (1.60)	2024-T81 Aluminum Sheet as given in AMS-QQ-A-250/4	Inlet Cowl Serial Numbers 1 thru 6
[6]	Outer Barrel Splice	0.071 (1.80)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treat to T62	
[7]	Access Panel Doubler	0.071 (1.80)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4	

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

*[2] Maximum permitted thinning of formed parts shall not be more than 10%

54-10-01

IDENTIFICATION 1

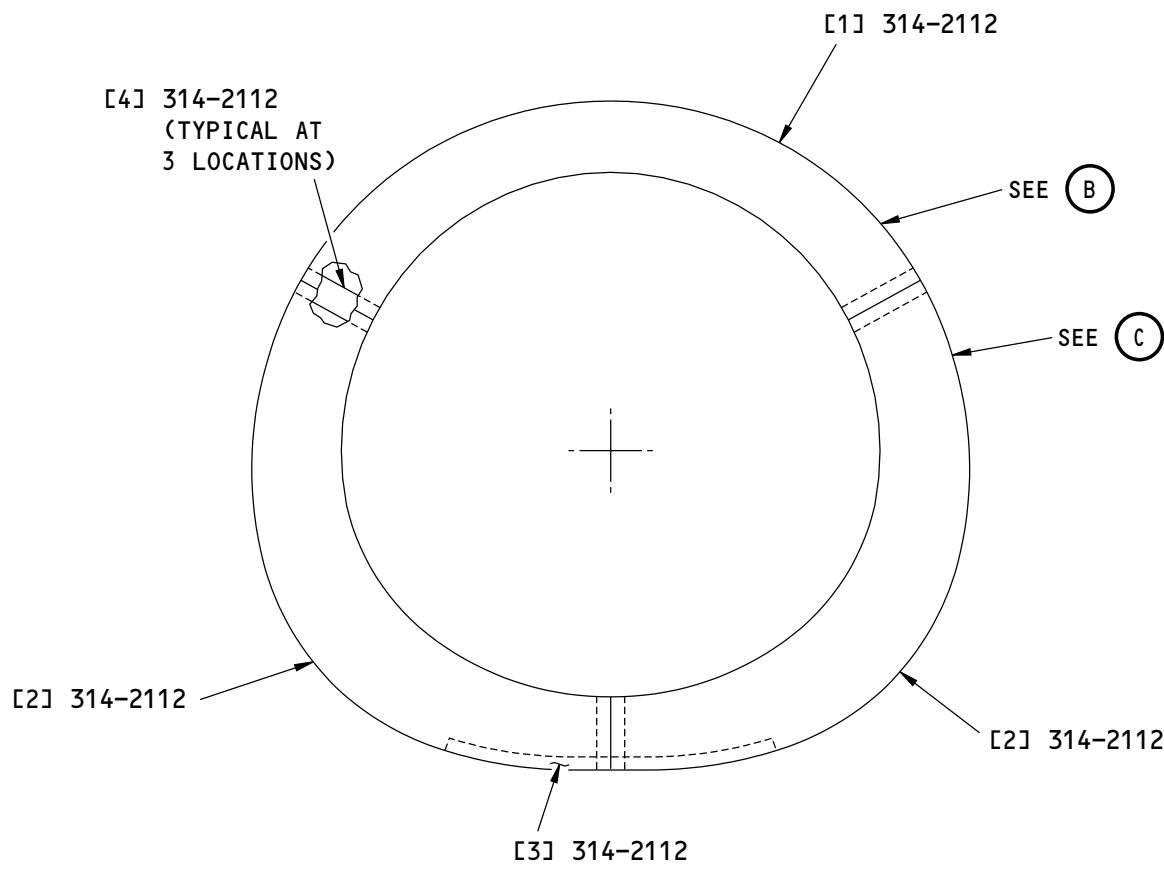
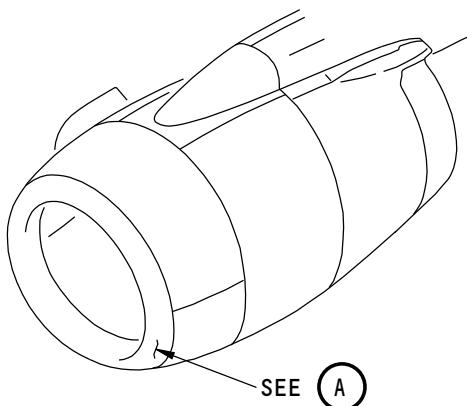
Page 3

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



VIEW WHEN YOU LOOK AFT



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

E99268 S0006591505_V2

Inlet Cowl Lip Skin Identification
Figure 3 (Sheet 1 of 2)

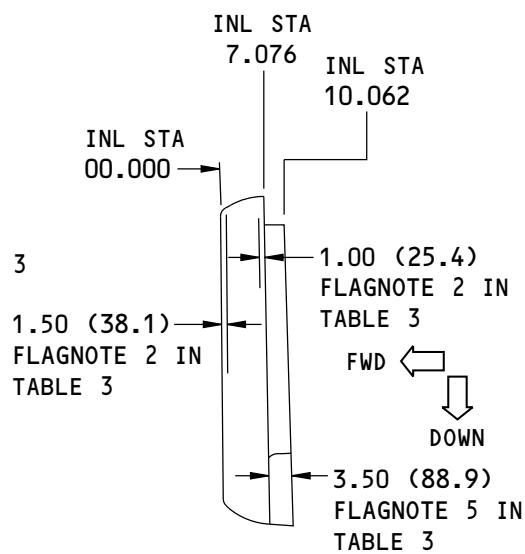
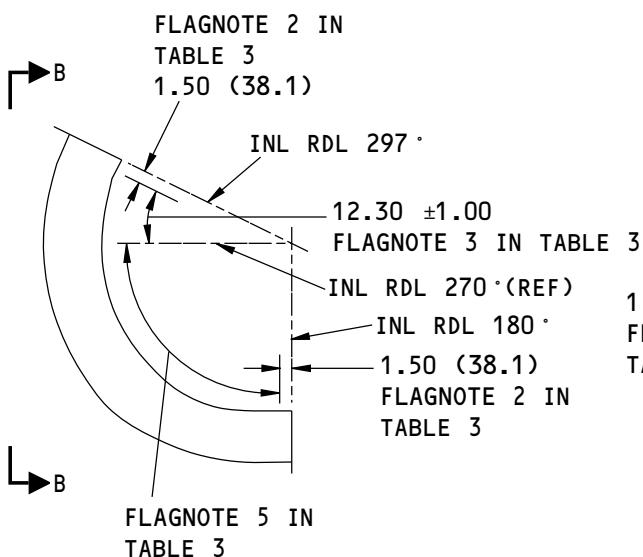
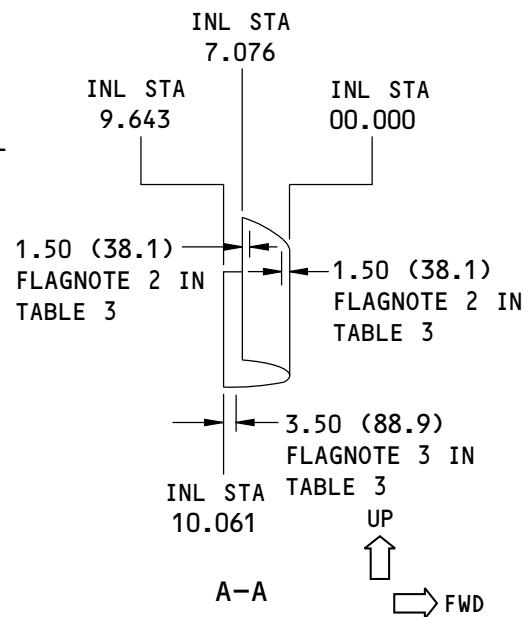
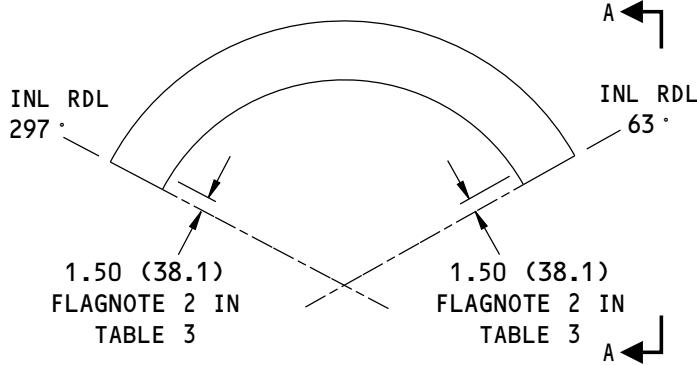
54-10-01
IDENTIFICATION 1
Page 4
Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



**VIEW WHEN YOU LOOK FORWARD
TYPICAL AT 2 LOCATIONS**

C

2456188 S0000571519_V3

**Inlet Cowl Lip Skin Identification
Figure 3 (Sheet 2 of 2)**

54-10-01
IDENTIFICATION 1
Page 5
Jul 10/2016



737-800
STRUCTURAL REPAIR MANUAL

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Inlet Lip Skin	0.090 (2.29)	2219-O Aluminum Sheet as given in AMS-QQ-A-250/30, Heat Treat to T62 ^{*[2]*[3]*[4]}	
[2]	Left and Right Lower Inlet Lip Skin	0.090 (2.29)	2219-O Aluminum Sheet as given in AMS-QQ-A-250/30, Heat Treat to T62 ^{*[2]*[3]*[5]*[4]}	
[3]	Skin Doubler	0.050 (1.27)	2219-O Aluminum Sheet as given in AMS-QQ-A-250/30, Heat Treat to T62 ^{*[6]}	
[4]	Skin Splice	0.071 (1.80)	2219-O Aluminum Sheet as given in AMS-QQ-A-250/30, Heat Treat to T62 ^{*[6]}	

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

*[2] A minimum material thickness of 0.070 (1.78) is acceptable in the hilite area (NL STA 0.000 to INL STA 1.500), in the splice fastener area, and in the outer edge of the lip Skins. Refer to Figure 3.

*[3] A minimum local material thickness of 0.063 (1.60) is acceptable on the inner edge of the lip skins. Refer to Figure 3.

*[4] Lip Skin's minimum material thickness shall be 0.069 (1.75) after forming, except (as shown) at noted areas.

*[5] A minimum local material thickness of 0.060 (1.52) is acceptable for the inner surface of the lip skins. Refer to Figure 3.

*[6] Maximum permitted thinning of formed parts shall not be more than 10%.

54-10-01

IDENTIFICATION 1

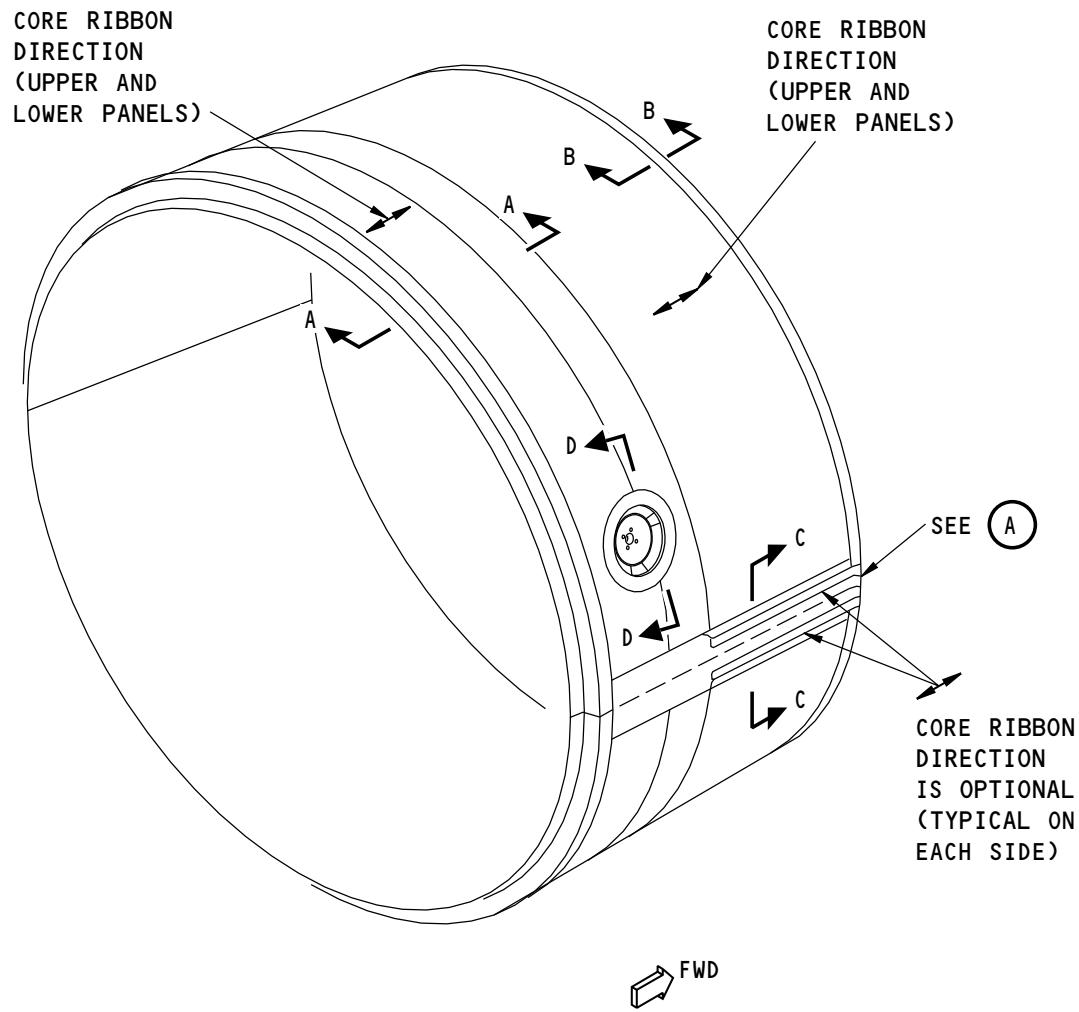
Page 6

Jul 10/2016

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737-800
STRUCTURAL REPAIR MANUAL

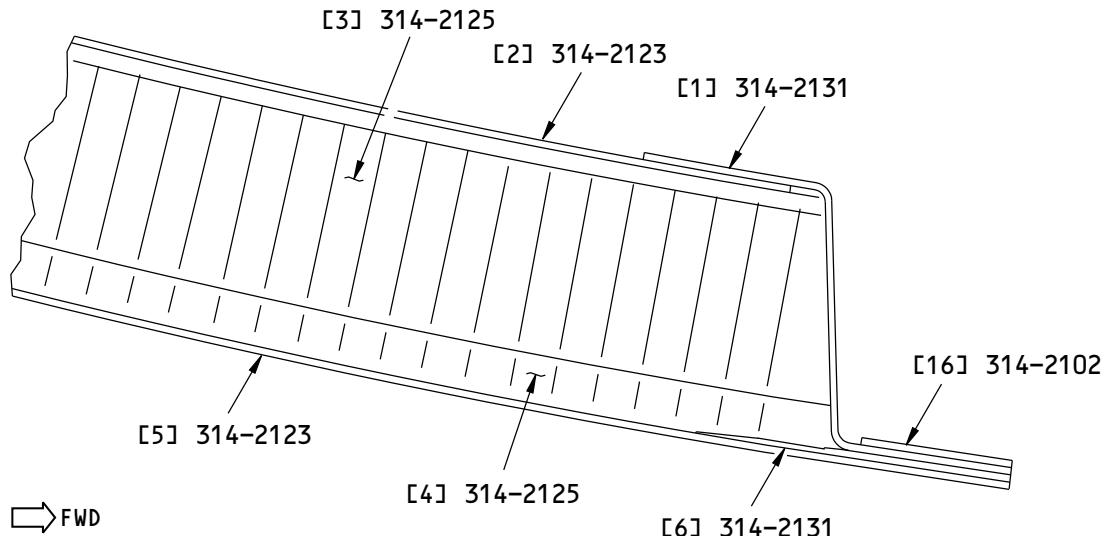
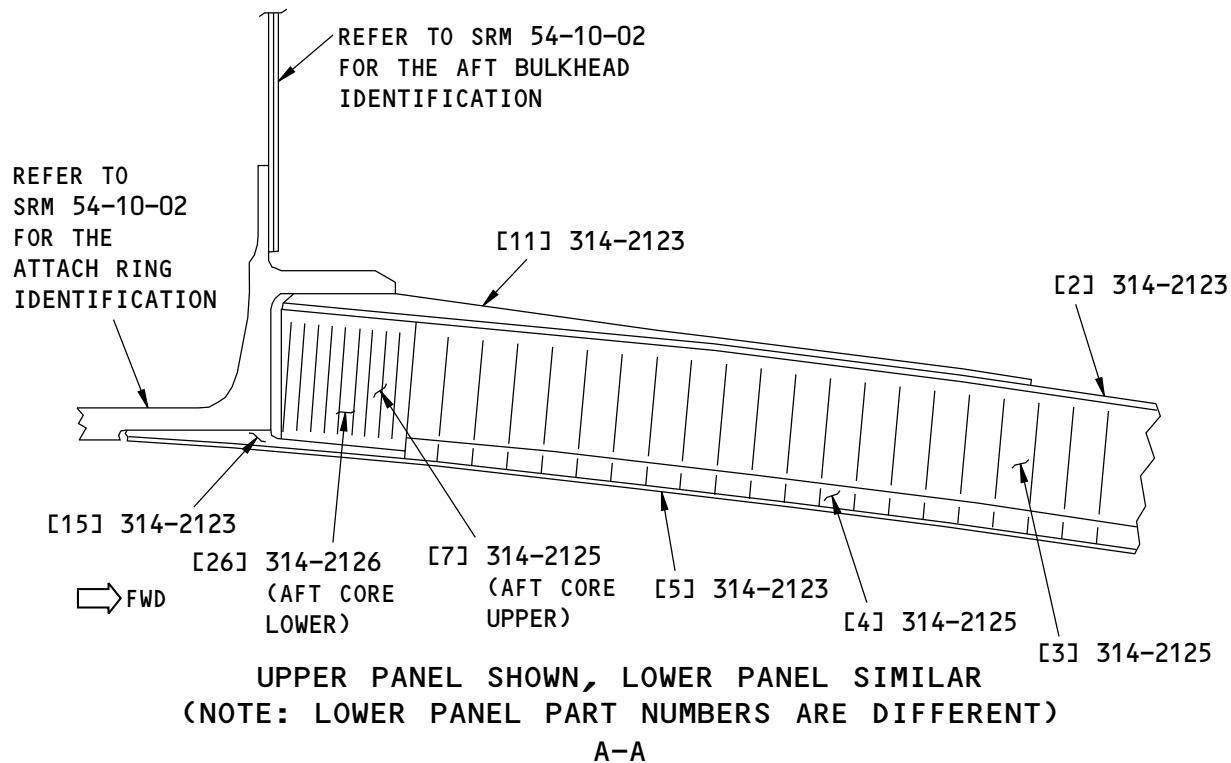


NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

E99360 S0006591507_V2

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 1 of 5)

54-10-01
IDENTIFICATION 1
Page 7
Nov 10/2015

**737-800
STRUCTURAL REPAIR MANUAL**


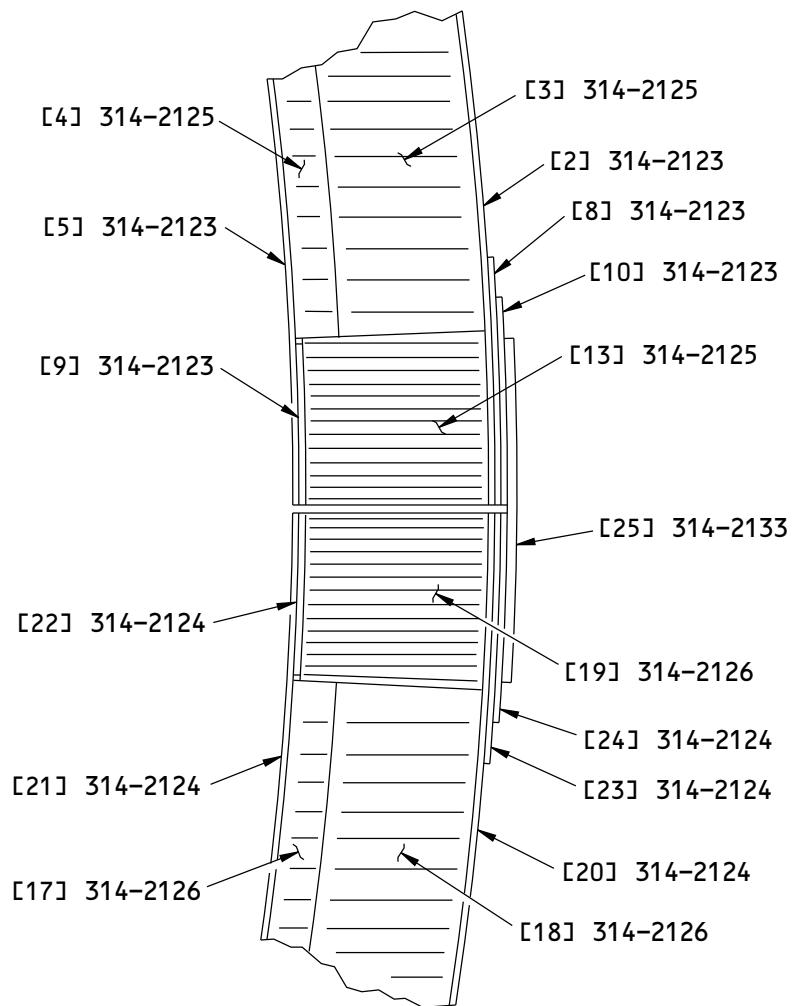
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**Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 2 of 5)**

54-10-01
IDENTIFICATION 1
Page 8
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



VIEW WHEN YOU LOOK FORWARD
C-C

F03891 S0006591509_V2

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 3 of 5)

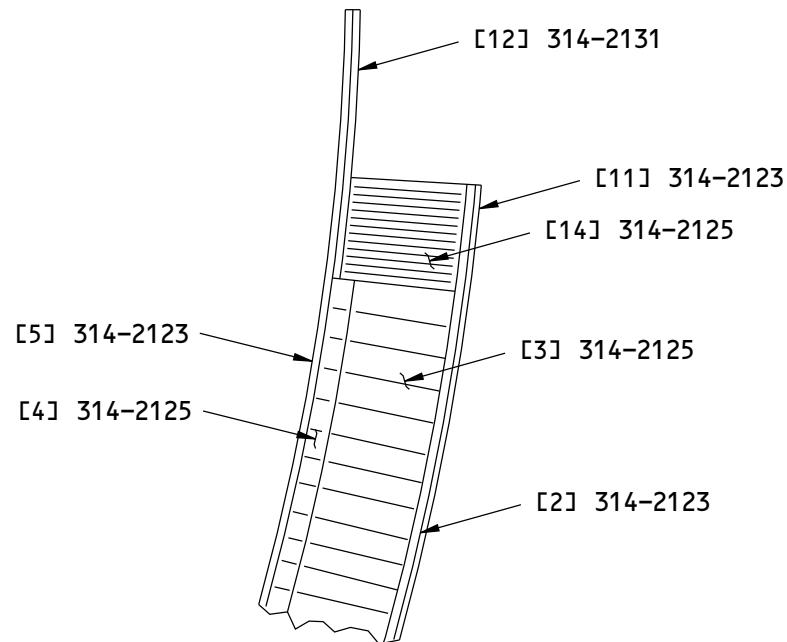
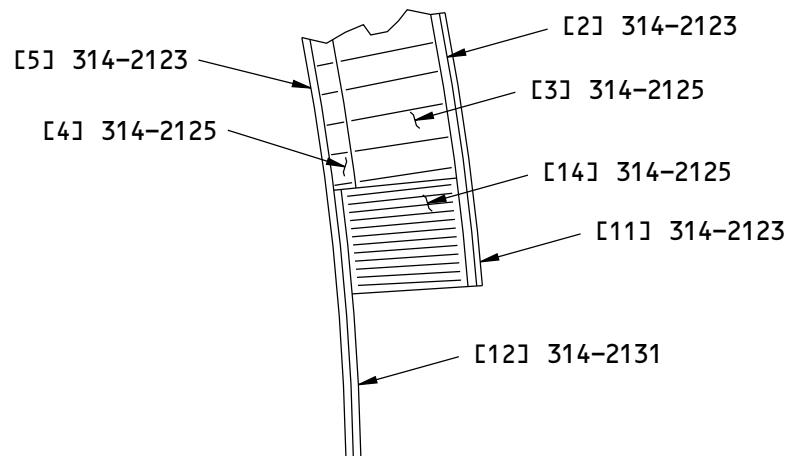
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IDENTIFICATION 1
Page 9
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



VIEW WHEN YOU LOOK AFT
D-D

F41439 S0006591511_V2

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 4 of 5)

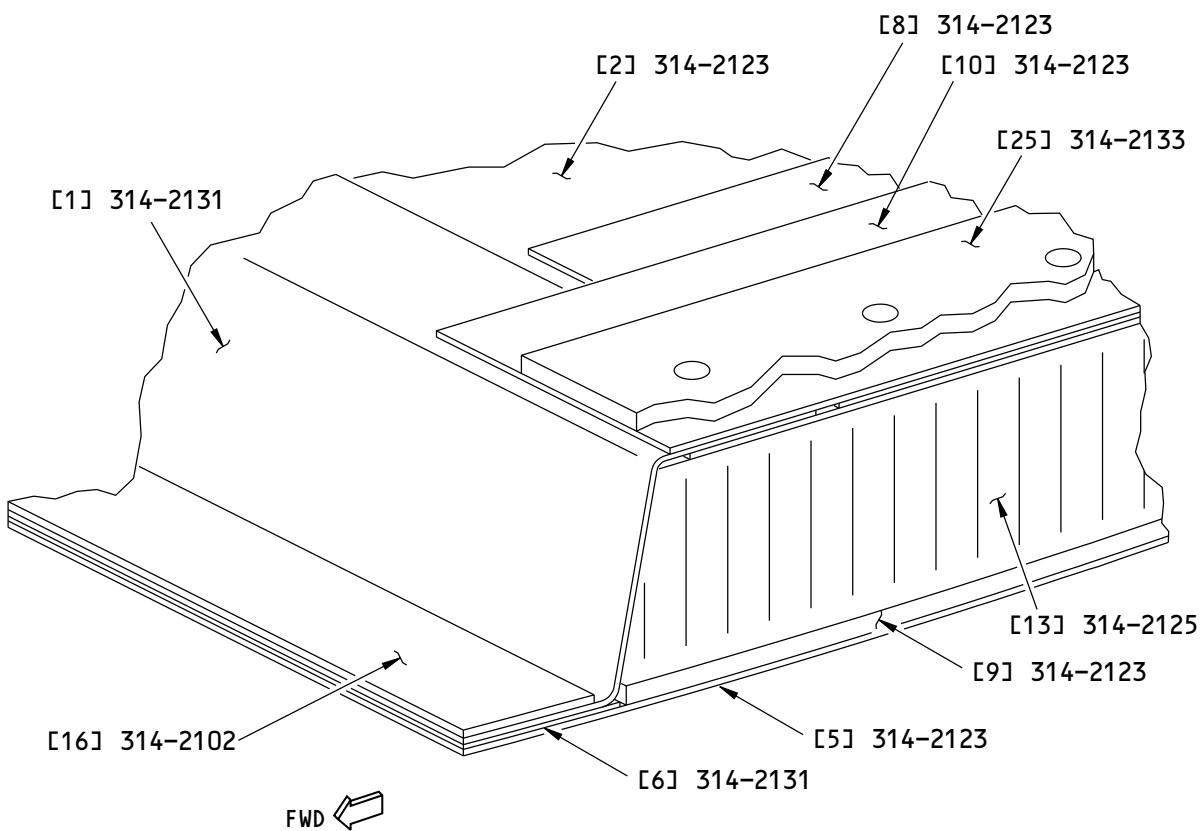
54-10-01
IDENTIFICATION 1
Page 10
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FORWARD CORNER
UPPER PANEL SHOWN, LOWER PANEL SIMILAR
NOTE: LOWER PANEL PART NUMBERS ARE DIFFERENT

(A)

F03894 S0006591510_V2

Inlet Cowl Inner Barrel Acoustic Panel Identification
Figure 4 (Sheet 5 of 5)

54-10-01
IDENTIFICATION 1
Page 11
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
Upper Inner Barrel Acoustic Panel				
[1]	Forward Closure	0.020 (0.51)	2024-O Aluminum Sheet as given in AMS-QQ-A 250/4, Heat Treat to T62	
[2]	Skin	0.020 (0.51)	2024-T3 Aluminum Sheet as given in AMS-QQ-A 250/4, Heat Treat to T81	Inlet Cowl Serial Number 134 and On
		0.020 (0.51)	2024-O Aluminum Sheet as given in AMS-QQ-A 250/4, Heat Treat to T62	Inlet Cowl Serial Number 1 thru 133
[3]	Outer Field Core	1.240 (31.5)	5052 Aluminum Phosphoric Acid Anodized Core, 4.2 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.003 in foil thickness	Inlet Cowl Serial Number 34 and On
		1.240 (31.5)	5052 Aluminum Phosphoric Acid Anodized Core, 3.7 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.0025 in foil thickness	Inlet Cowl Serial Number 1 thru 33
[4]	Inner Field Core	0.260 (6.60)	5052 Aluminum Phosphoric Acid Anodized Core, 4.2 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.003 in foil thickness	Inlet Cowl Serial Number 34 and On
		0.260 (6.60)	5052 Aluminum Phosphoric Acid Anodized Core, 3.7 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.0025 in foil thickness	Inlet Cowl Serial Number 1 thru 33
[5]	Perforated Skin	0.032 (0.81)	2024-T3 Aluminum Sheet perforated, Type 1A, solution heat treated, roll leveled and aged to T42	
[6]	Forward Inner Doubler	0.032 (0.81)	2024-O Aluminum Sheet as given in AMS-QQ-A-250/4, Heat Treated to T62, Chem-milled to thickness of 0.020 (0.51) and 0.010 (0.25)	
[7]	Aft Core Upper	1.405 (35.69)	502 Aluminum Phosphoric Acid Anodized Core, 12.0 lb per cu ft., 1/8 in (3.18 mm) cell size, 0.003 in foil thickness	
[8]	Outer Radial Doubler	0.032 (0.81)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4	
[9]	Inner Radial Doubler	0.090 (2.29)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4	
[10]	Outer Radial Doubler	0.063 (1.60)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4	Inlet Cowl Serial Number 2840 and On
		0.032 (0.81)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4, Quantity 2	Inlet Cowl Serial Number 223 thru 2839
		0.032 (0.81)	2024-T3 Aluminum Sheet as given in AMS-QQ-A-250/4	Inlet Cowl Serial Number 1 thru 222
[11]	Aft Outer Doubler	0.250 (6.35)	2024-T3 Aluminum Sheet per AMS-QQ- A-250/4, anneal 2024-T3 to 2024-O after machining, heat treat 2024-O to T62. 0.220 inch (5.59) thickness tapers to 0.080 inch (2.03)	Inlet Cowl Serial Number 230 and On
		0.250 (6.35)	2024-T3 Aluminum Sheet per AMS-QQ- A-250/4, anneal 2024-T3 to 2024-O after machining, heat treat 2024-O to T62. 0.190 inch (4.82) thickness tapers to 0.080 inch (2.03)	Inlet Cowl Serial Number 1 thru 229
[12]	T12 Inner Doubler	0.062 (1.58)	2024-O Aluminum Sheet as given in AMS-QQ-A 250/4, Heat Treat to T62	

54-10-01

IDENTIFICATION 1

Page 12

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

Table 4: (Continued)

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[13]	Radial Core	1.415 (35.94)	5052 Aluminum Phosphoric Acid Anodized Core, 8.1 lb per cu ft, 1/8 in (3.18 mm) cell size, 0.002 in foil thickness	
[14]	T12 Core	1.432 (36.37)	5052 Aluminum Phosphoric Acid Anodized Core, 8.1 lb per cu ft, 1/8 in (3.18 mm) cell size, 0.002 in foil thickness	
[15]	Aft Inner Doubler	0.250 (6.35)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4, anneal 2024-T3 to 2024-O after machining. Heat Treat 2024-O to T62.	
[16]	Shim	0.060 (1.52)	Laminated Aluminum Shim as given in MIL-S- 22499, Alloy 1, Type 1, Class 2	
Lower Inner Barrel Acoustic Panel				
[17]	Inner Field Core	0.260 (6.60)	5052 Aluminum Phosphoric Acid Anodized Core, 4.2 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.003 in foil thickness	Inlet Cowl Serial Number 34 and On
		0.260 (6.60)	5052 Aluminum Phosphoric Acid Anodized Core, 3.7 lb per cu ft, 3/8 inch (9.53 mm) cell size, 0.0025 foil thickness	Inlet Cowl Serial Number 1 thru 33
[18]	Outer Field Core	1.240 (31.5)	5052 Aluminum Phosphoric Acid Anodized Core, 4.2 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.003 in foil thickness	Inlet Cowl Serial Number 134 and On
		1.240 (31.5)	5052 Aluminum Phosphoric Acid Anodized Core, 3.7 lb per cu ft, 3/8 in (9.53 mm) cell size, 0.0025 in foil thickness	Inlet Cowl Serial Number 1 thru 133
[19]	Radial Core	1.415 (35.94)	5052 Aluminum Phosphoric Acid Anodized Core, 8.1 lb per cu ft, 1/8 in (3.18 mm) cell size, 0.002 in foil thickness	
[20]	Skin	0.020 (0.51)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4, Heat Treat to T81	Inlet Cowl Serial Number 134 and On
		0.020 (0.51)	2024-O Aluminum Sheet as given in AMS-QQ-A- 250/4, Heat Treat to T62	Inlet Cowl Serial Number 1 thru 133
[21]	Perforated Skin	0.032 (0.81)	2024-T3 Aluminum Sheet perforated, Type 1A, solution heat treated, roll leveled and aged to T42	
[22]	Inner Radial Doubler	0.090 (2.29)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4	
[23]	Outer Radial Doubler	0.032 (0.81)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4	
[24]	Outer Radial Doubler	0.063 (1.60)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4	Inlet Cowl Serial Number 2840 and On
		0.032 (0.81)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4, Quantity 2	Inlet Cowl Serial Number 223 thru 2839
		0.032 (0.81)	2024-T3 Aluminum Sheet as given in AMS-QQ-A- 250/4	Inlet Cowl Serial Number 1 thru 222
[25]	Radial Splice	0.110 (2.79)	Ti-6AL-4V titanium sheet, Annealed, as given in AMS 4911, Formed to minimum thickness of 0.090 (2.29)	

54-10-01

IDENTIFICATION 1

Page 13

Nov 10/2015

D634A210

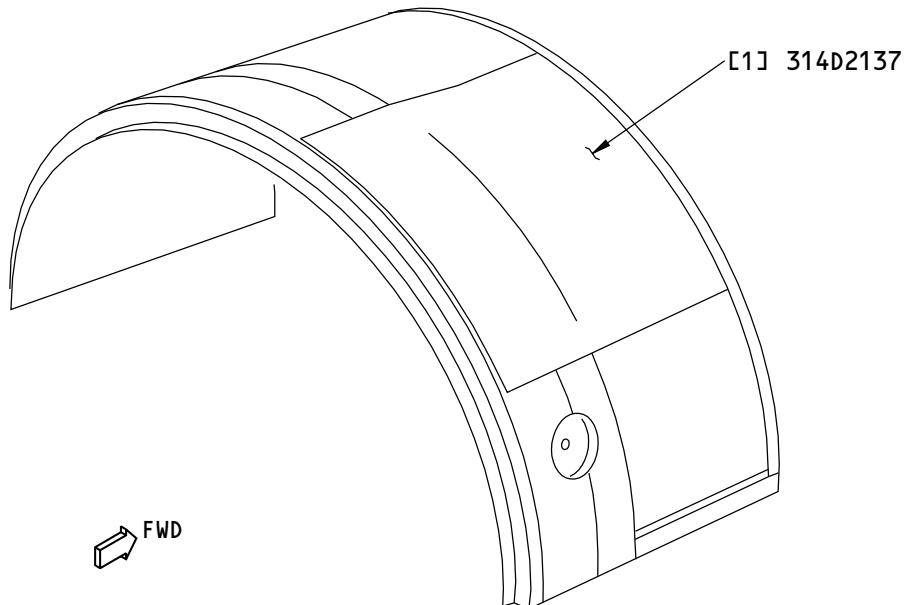


737-800
STRUCTURAL REPAIR MANUAL

Table 4: (Continued)

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[26]	Aft Core Lower	1.405 (35.69)	5052 Aluminum Phosphoric Acid Anodized Core, 12.0 lb per cu ft 1/8 in (3.18 mm) cell size, 0.003 in foil thickness	

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



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

BR-040

G09567 S0006591513_V2

Inlet Cowl Upper Inner Acoustic Panel Insulation Blanket Identification

Figure 5

Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Insulation Blanket		321 CRES foil, 112 fiberglass cloth, 4 PCF Fiberfrax Lo-Con felt	

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

54-10-01
IDENTIFICATION 1
Page 14
Nov 10/2015

D634A210

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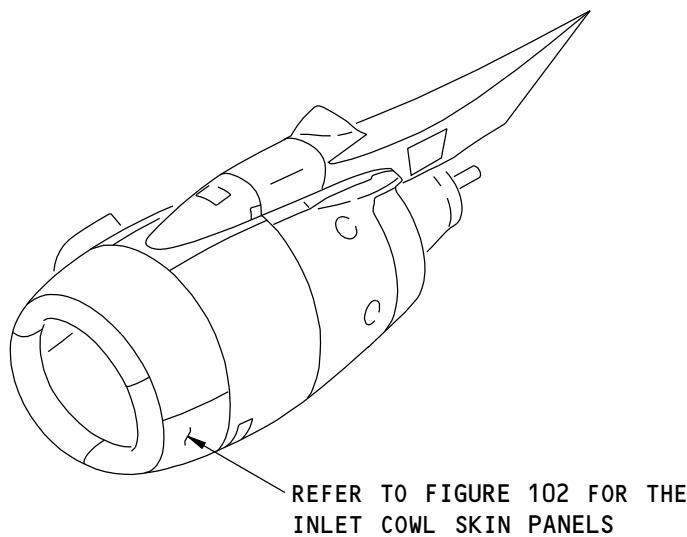


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - INLET COWL SKINS

1. Applicability

- A. This subject gives the allowable damage limits for the parts shown in Inlet Cowl Skin Panel Location, Figure 101/ALLOWABLE DAMAGE 1 as follows:
- (1) The Inlet Cowl Lip Skin segments
 - (2) The Inlet Cowl Outer Barrel Skin panels
 - (3) The Inlet Cowl Inner Barrel Acoustic Skin panels.



Inlet Cowl Skin Panel Location
Figure 101

G78006 S0006591517_V1

54-10-01

ALLOWABLE DAMAGE 1

Page 101

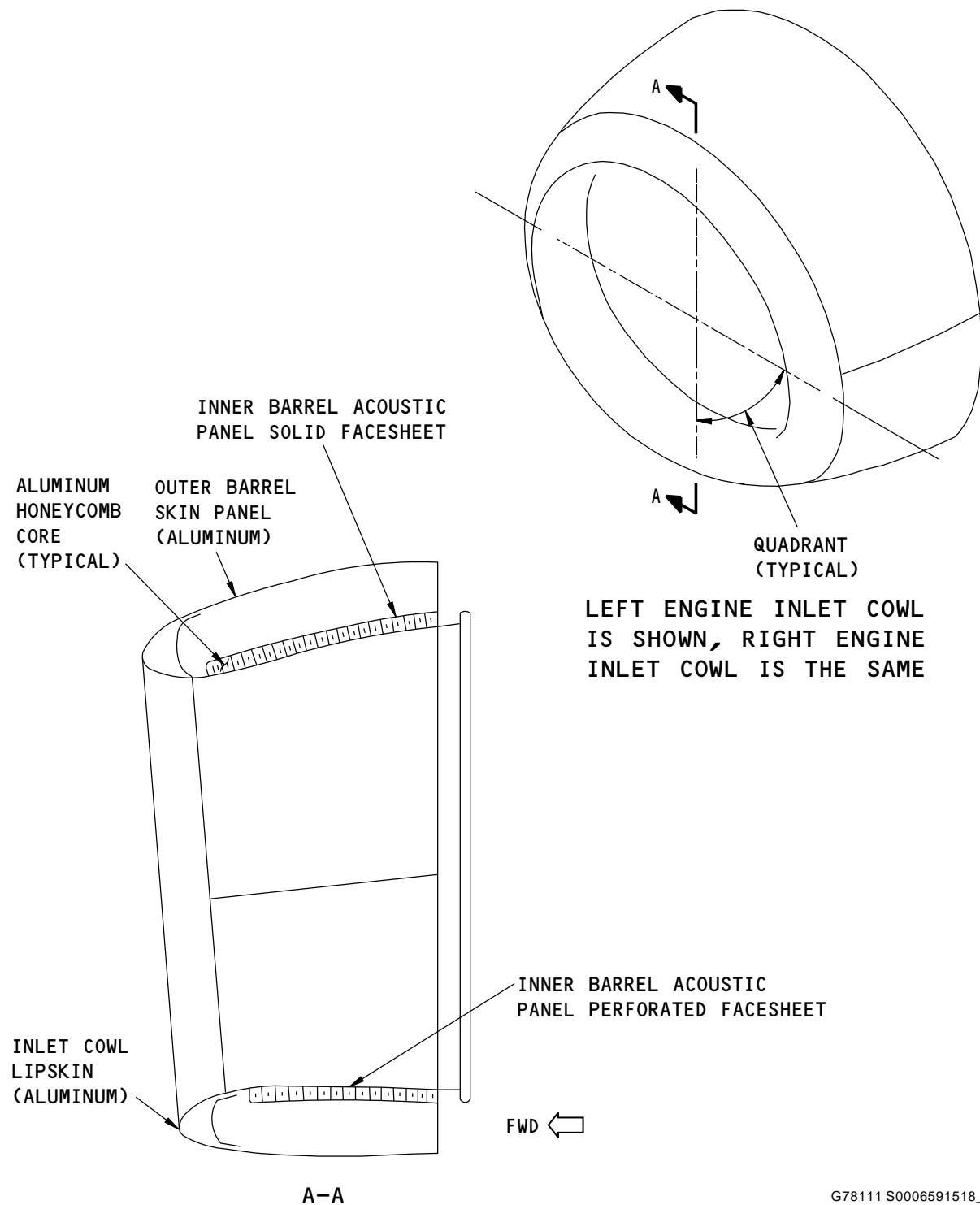
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



G78111 S0006591518_V1

Inlet Cowl Skin
Figure 102

54-10-01

ALLOWABLE DAMAGE 1

Page 102

Nov 10/2012

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

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 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 as follows:
 - (1) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-79, Type III primer on the outer barrel and inner barrel acoustic skin only as given in SOPM 20-44-04.
 - (3) Apply a finish to the reworked areas of the outer barrel and inner barrel skins as given in AMM 51-21-00/701.
- C. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits of the inlet cowl skin parts.
- D. These Allowable Damage Limits have FAA approval only if the inspections given in this subject are completed at the specified times.

Table 101:

PARAGRAPH REFERENCES OF THE ALLOWABLE DAMAGE LIMITS	
INLET COWL SKIN PARTS	PARAGRAPH
Nose Lip Segments	4.A
Outer Barrel	4.B
Inner Barrel Acoustic Panel - Perforated and Solid Face Sheets	4.C

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	REPAIR SEALING
51-20-08	EROSION PROTECTION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Nose Lip Skin

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .

54-10-01

ALLOWABLE DAMAGE 1

Page 103

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (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 permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .
NOTE: Do not fill the dents.
- (4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:
 - (a) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the part
 - (b) You install an NAS1398D blind rivet wet with BMS 5-63 sealant.
- (5) Erosion damage is permitted as shown in Inlet Cowl Lip Skin Erosion Damage, Figure 104/ ALLOWABLE DAMAGE 1.

CAUTION: DO NOT USE TAPE FOR EROSION PROTECTION. IF YOU DO NOT OBEY, THE TAPE CAN BECOME LOOSE AND ENTER THE ENGINE.

- (a) Apply or remove erosion coatings as given in 51-20-08.

B. Outer Barrel Skin Panels

- (1) Cracks:
 - (a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ ALLOWABLE DAMAGE 1, Details A , B , and E .
 - (b) Surface cracks on the outer barrel skin panels are not permitted.
- (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 permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .
NOTE: Do not fill the dents.
- (4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:
 - (a) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the panel
 - (b) You install an NAS1398D blind rivet wet with BMS 5-63 sealant.

C. Inner Barrel Acoustic Panels (Perforated and Solid Face Sheets)

- (1) Cracks:
 - (a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ ALLOWABLE DAMAGE 1, Details A , B , and E .
 - (b) Surface cracks on the inner barrel acoustic panels are not permitted.
- (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 .

54-10-01

ALLOWABLE DAMAGE 1

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

NOTE: Make an inspection for a disbond between the face sheet and the core. If you find a disbond, then use the limits given for delaminations.

- (4) Holes and Punctures up to a maximum diameter of 0.50 inch (12.7 mm) are permitted if:
- (a) The edge of the damage is a minimum of 3.30 inch (83.8 mm) from the edge of the panel
 - (b) The damage is a minimum of 8.00 inches (203.2 mm) from other damage:
 - 1) That is caused by cracks, dents, holes, punctures or delaminations
 - 2) That is not repaired.
 - (c) You seal the hole with BMS 5-63 as given in 51-20-05
 - (d) There are not more than 2 holes in a quadrant as shown in Inlet Cowl Skin, Figure 102/ ALLOWABLE DAMAGE 1
 - (e) You make an inspection of the damage at each 25 flight cycles
 - (f) You make a permanent repair if:
 - 1) The hole or puncture becomes larger in diameter, or
 - 2) If the facesheets have cracks or delaminations.
- (5) Delaminations up to a maximum diameter of 2.00 inches (50.8 mm) are permitted if:
- (a) The edge of the damage is a minimum of 3.30 inch (83.8 mm) from the edge of the panel
 - (b) The damage is a minimum of 8.00 inches (203.2 mm) from other damage:
 - 1) That is caused by cracks, dents, holes, punctures or delaminations
 - 2) That is not repaired.
 - (c) There are not more than 2 delaminations in a quadrant as shown in Inlet Cowl Skin, Figure 102/ALLOWABLE DAMAGE 1
 - (d) You make an inspection of the damage at each 25 flight cycles
 - (e) You make a permanent repair not later than 100 flight cycles if the damage becomes larger in diameter.

54-10-01

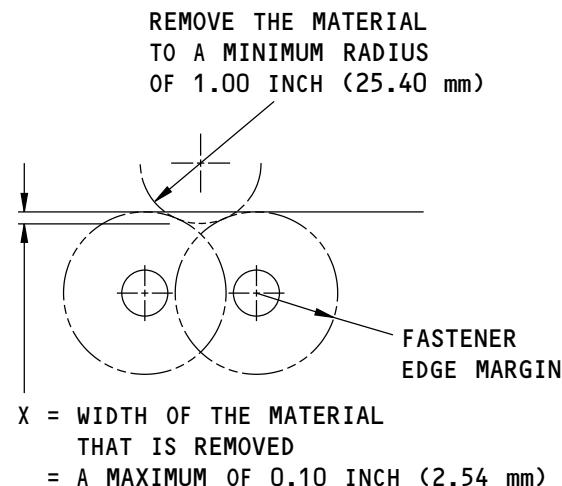
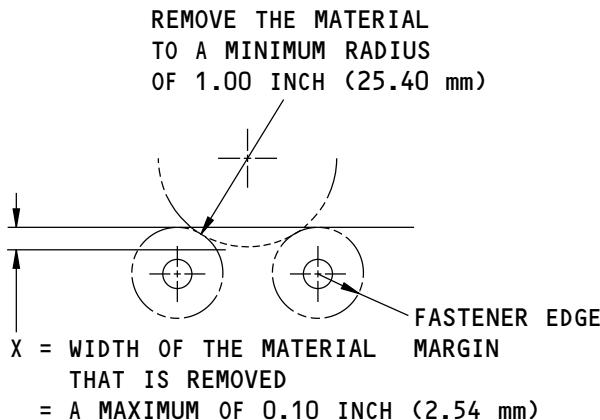
ALLOWABLE DAMAGE 1

Page 105

Nov 10/2015

D634A210

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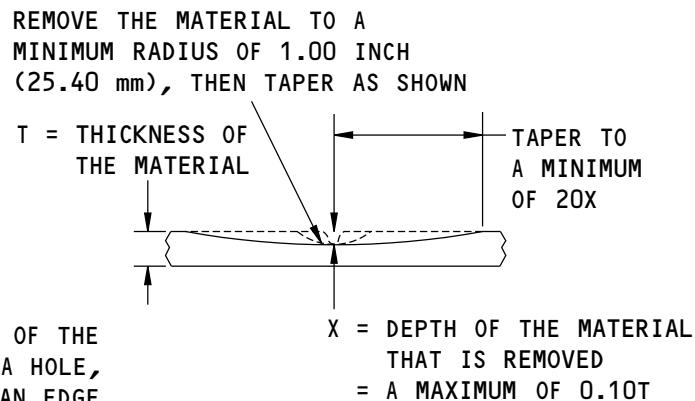
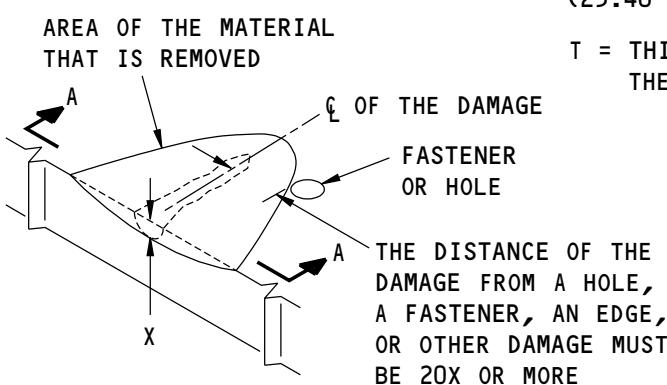
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STRUCTURAL REPAIR MANUAL**


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)

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Allowable Damage Limits
Figure 103 (Sheet 1 of 4)

54-10-01

ALLOWABLE DAMAGE 1

Page 106

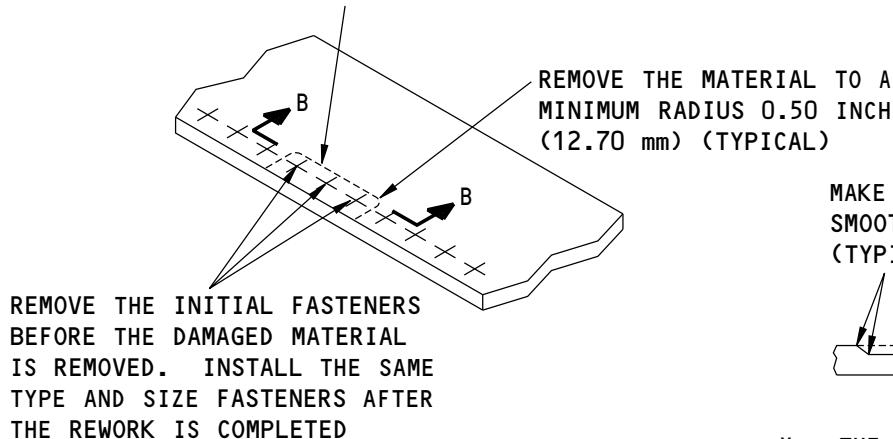
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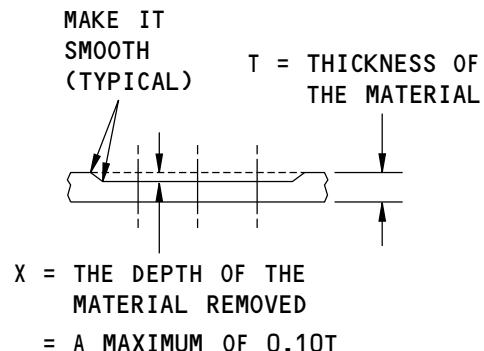
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THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN
A GROUP OF TEN IS PERMITTED
TO A MAXIMUM DEPTH OF X



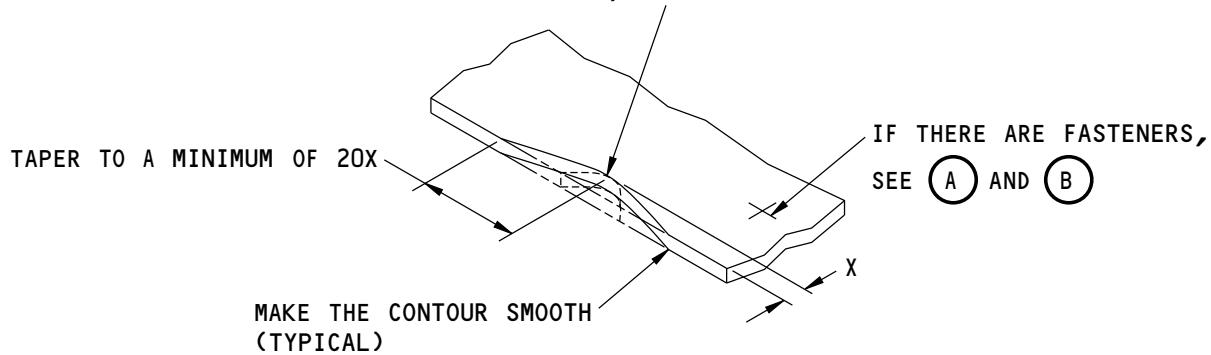
REMOVAL OF CORROSION AROUND THE FASTENERS

(D)



B-B

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(E)

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Allowable Damage Limits
Figure 103 (Sheet 2 of 4)

54-10-01

ALLOWABLE DAMAGE 1

Page 107

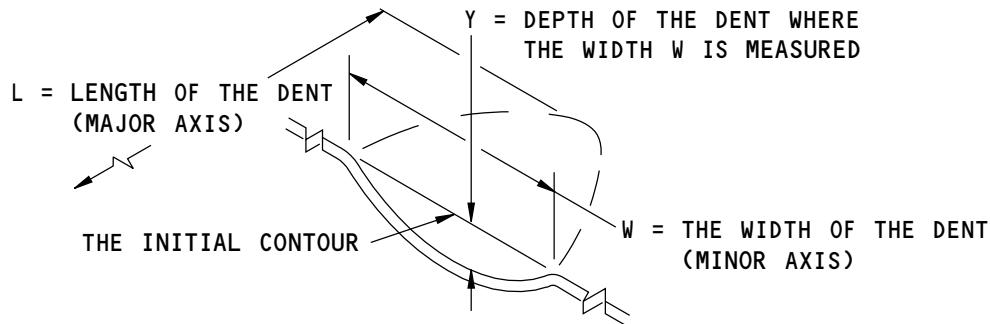
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



A. DENTS ARE PERMITTED IF:

- (1) THEY ARE SMOOTH AND HAVE NO CREASES, GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.
- (2) THERE IS A MAXIMUM OF TWO DENTS IN A QUADRANT AS SHOWN IN FIGURE 102.
- (3) THERE IS A MINIMUM OF 15.0 INCHES (381.0 mm) BETWEEN THE EDGES OF THE DENTS.
- (4) $\frac{W}{Y}$ IS 30 OR MORE AT ALL LOCATIONS ALONG THE DENT WHERE:
 $Y =$ A MAXIMUM OF 0.125 INCH (3.18 mm) AND
 $W =$ A MAXIMUM OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS
 $L =$ A MAXIMUM LENGTH OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS
OR $Y =$ A MAXIMUM OF 0.050 INCH (1.27 mm) AND
 $W =$ A MAXIMUM OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS
 $L =$ A MAXIMUM LENGTH OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS

DENT THAT IS PERMITTED (CONTINUED ON SHEET 4)

F

G78500 S0006591522_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 4)

54-10-01

ALLOWABLE DAMAGE 1

Page 108

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

B. DENTS THAT ARE LARGER THAN THE LIMITS GIVEN ABOVE ARE PERMITTED FOR A MAXIMUM OF 2 FLIGHT CYCLES IF:

- (1) THEY ARE SMOOTH AND HAVE NO GOUGES OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.
- (2) THE LENGTH OF A CREESE IN THE DENT IS A MAXIMUM OF 3.00 INCHES (76.2 mm) IN LENGTH.
- (3) THERE ARE A MAXIMUM OF TWO DENTS IN A QUADRANT AS SHOWN IN FIGURE 102.
- (4) THERE IS A MINIMUM OF 15.0 INCHES (381.0 mm) BETWEEN THE EDGES OF THE DENTS.
- (5) $Y =$ A MAXIMUM OF 0.25 INCH (6.35 mm) AND
 $W =$ A MAXIMUM OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS
 $L =$ A MAXIMUM LENGTH OF 4.00 INCHES (101.6 mm) FOR INLET COWL LIPSKINS AND OUTER BARREL SKINS

OR

$Y =$ A MAXIMUM OF 0.10 INCH (2.54 mm) AND
 $W =$ A MAXIMUM OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS
 $L =$ A MAXIMUM LENGTH OF 3.00 INCHES (76.2 mm) FOR THE INNER BARREL PERFORATED AND SOLID FACESHEETS

DENT THAT IS PERMITTED (CONTINUED FROM SHEET 3)

(F)

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Allowable Damage Limits
Figure 103 (Sheet 4 of 4)

54-10-01

ALLOWABLE DAMAGE 1

Page 109

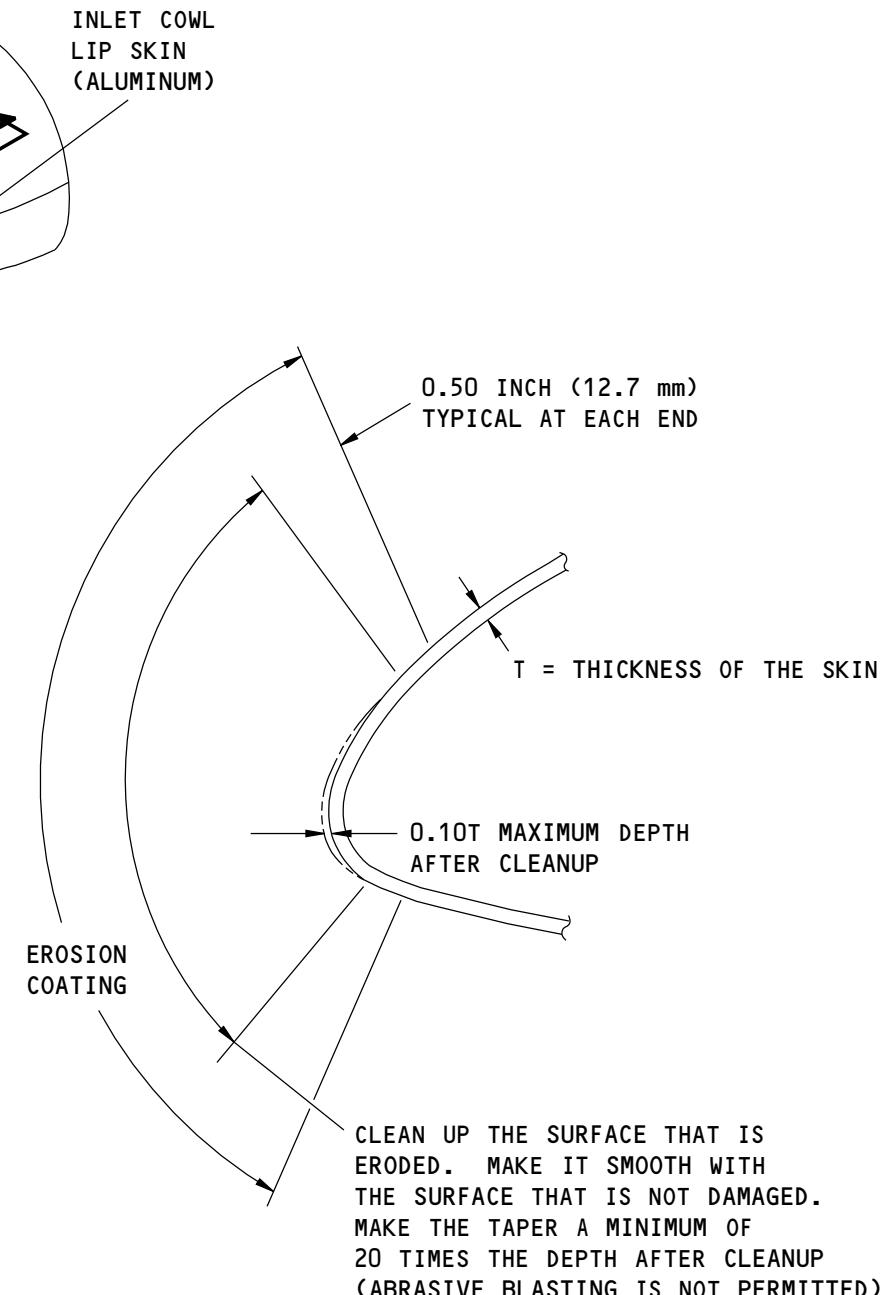
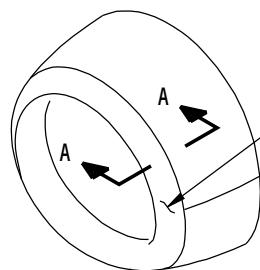
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737-800
STRUCTURAL REPAIR MANUAL



A-A

NOTE: REFER TO SRM 51-20-08 FOR APPLICATION AND REMOVAL OF EROSION COATINGS.

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Inlet Cowl Lip Skin Erosion Damage
Figure 104

54-10-01

ALLOWABLE DAMAGE 1

Page 110

Nov 10/2015

D634A210

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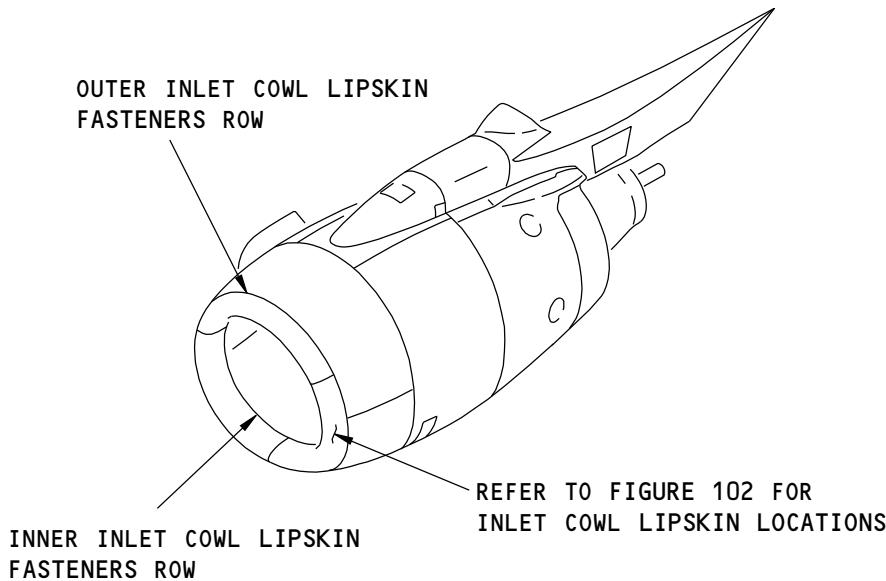


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - INLET COWL LIPSKIN FASTENER

1. Applicability

- A. This subject gives the allowable damage limits for the Outer Inlet Cowl Lipskin Fasteners shown in Figure 101 (Sheet 1) at the following locations:
 - (1) The Inlet Cowl Lipskin segments.
 - (2) Lipskin Splice Locations.
- B. Allowable Damage 2 is not applicable to the Inner Inlet Cowl Lipskin Fasteners shown in Figure 101 (Sheet 1).



2181359 S0000482165_V1

Inlet Cowl Panel Location
Figure 101

2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 2 for the allowable damage limits of the Inlet Cowl Lip Skin fasteners.
- B. Refer to 51-40-02, GENERAL for fastener installation and removal.
- C. It is optional to apply speed tape over the open holes or loose fasteners. The speed tape must cover the open holes or loose fasteners. Do not cover the adjacent, intact fastener edges. Install a temporary or permanent fastener within 10 days.
- D. Do the steps that follow to install a temporary fastener.
 - (1) Do a visual inspection of fastener holes.
 - (2) Do a High Frequency Eddy Current (HFEC) inspection to make sure the holes are free from damage. Refer to 737 NDT Part 6, 51-00-00, Procedure 16.
 - (3) Install a CR3552EE-5-XX or a CR3524EE-5-XX blind rivet. As an alternative, install a CR3552P-5-XX or a CR3524P-5-XX blind rivet.

54-10-01

ALLOWABLE DAMAGE 2

Page 101

Jul 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (4) Open the access panel located at the six o'clock anti-ice duct and remove any debris from missing fastener or fastener removal from the inlet cowling.
 - (5) You must replace the temporary blind fastener with a permanent fastener before or at 5000 flight cycles or two years (whichever comes first) after you install the blind rivet.
 - (6) Visually inspect every temporary blind fastener and its adjacent fastener every 500 hours. If any temporary blind fastener or adjacent fastener has become loose and exceeds the limit given in Paragraph 4./ALLOWABLE DAMAGE 2, contact the Boeing Company before the next flight.
- E. Do the steps that follow to install permanent fasteners.
- (1) Do a visual inspection of fastener holes.
 - (2) Do a High Frequency Eddy Current (HFEC) inspection to make sure the holes are free from damage. Refer to 737 NDT Part 6, 51-00-00, Procedure 16.
 - (3) Install permanent fasteners as given in 51-40-02, GENERAL for fastener installation and removal. Install the same type and size fastener or the first oversize fastener.

3. References

Reference	Title
51-40-02, GENERAL	Fastener Installation and Removal
737 NDT Part 6, 51-00-00, Procedure 16	Aluminum Part Fastener Hole Inspection (Rotary Scanner)

4. Allowable Damage Limits

- A. The General Lip Skin missing fastener requirements are as follows. Refer to Figure 102 (Sheet 1).
 - (1) You can have a maximum of 24 loose/missing/temporary fasteners on each Inlet Lip Skin Segment. You can have a maximum of 72 total loose/missing/temporary fasteners on each Inlet.
 - (2) You can have a maximum of ten loose/missing/temporary fasteners in a single group. You must have a minimum of four consecutive initial fasteners between any group of loose/missing/temporary fasteners. Refer to Figure 102 (Sheet 3), Detail B, Case 1
 - (3) You must have a minimum of four consecutive initial fasteners between a loose/missing/temporary General Lip Skin fastener and a loose/missing/temporary Lip Skin Splice fastener. Refer to Figure 102 (Sheet 3), Detail B, Case 3. If you have no loose/missing/temporary Lip Skin Splice fasteners, then you must have a minimum of four consecutive initial fasteners after the splice. Refer to Figure 102 (Sheet 3), Detail B, Case 1.
- B. The Lip Skin Splice fasteners are the four fasteners in a single row on either side of the splice. There are a total of eight fasteners. You can have a maximum of six loose/missing/temporary Lip Skin Splice fasteners. Refer to Figure 102 (Sheet 2).
- C. Install a temporary blind fastener as given in Paragraph 2.D./ALLOWABLE DAMAGE 2 or a permanent fastener as given in Paragraph 2.E./ALLOWABLE DAMAGE 2 within 10 days for each loose or missing fastener. Do a visual inspection of the loose or missing fastener every 24 hours until a temporary blind fastener or permanent fastener is installed.
- D. If there is a High Pressure Shut Off Valve (HPSOV) failure, then do a detailed visual inspection of the Lip Skin Splice fasteners before the next flight. Refer to Paragraph 4.B./ALLOWABLE DAMAGE 2. If there is damage to the Lip Skin, then contact The Boeing Company.

54-10-01

ALLOWABLE DAMAGE 2

Page 102

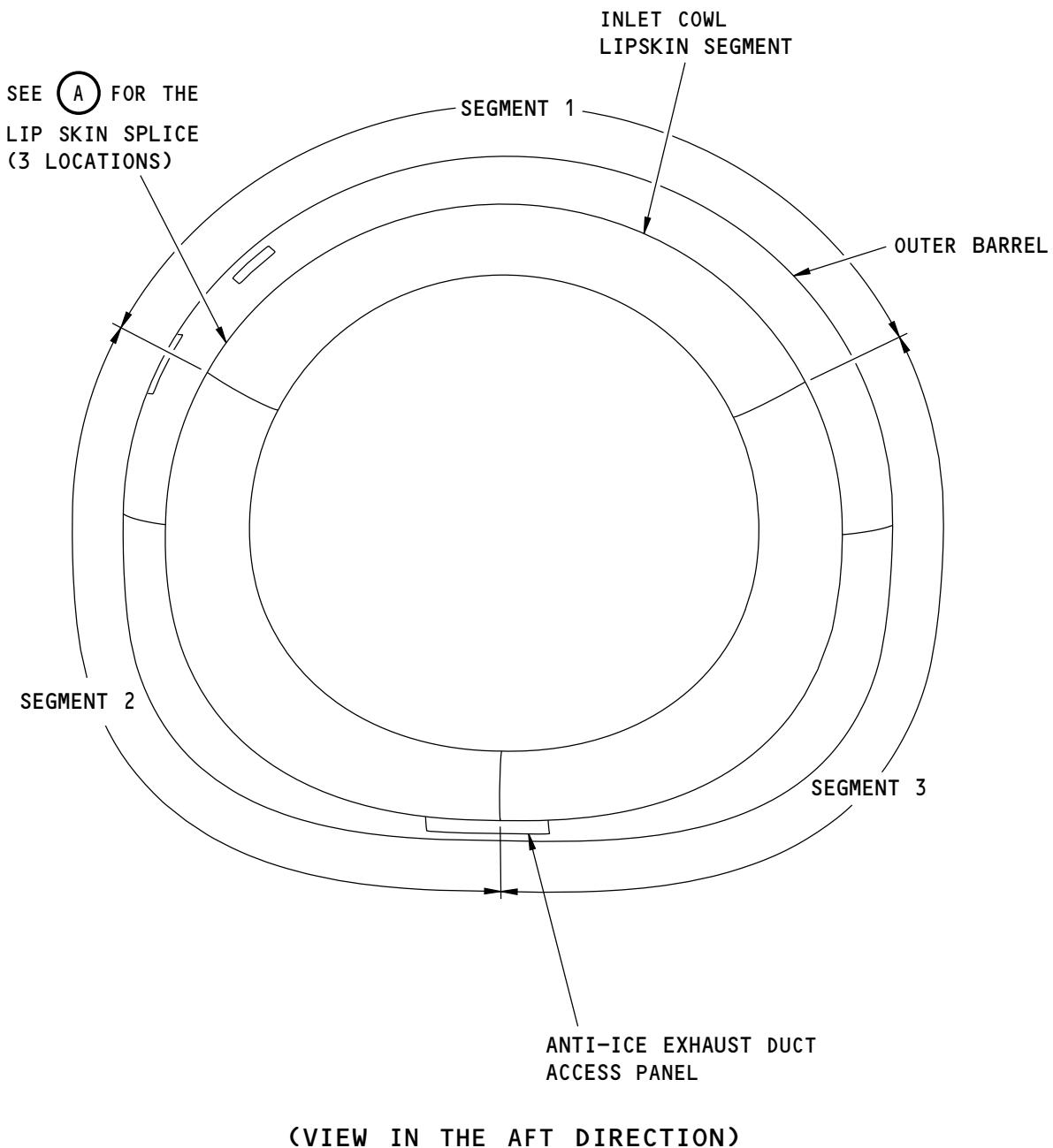
Jul 10/2014

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737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Loose/Missing/Temporary Fasteners
Figure 102 (Sheet 1 of 3)

54-10-01

ALLOWABLE DAMAGE 2

Page 103

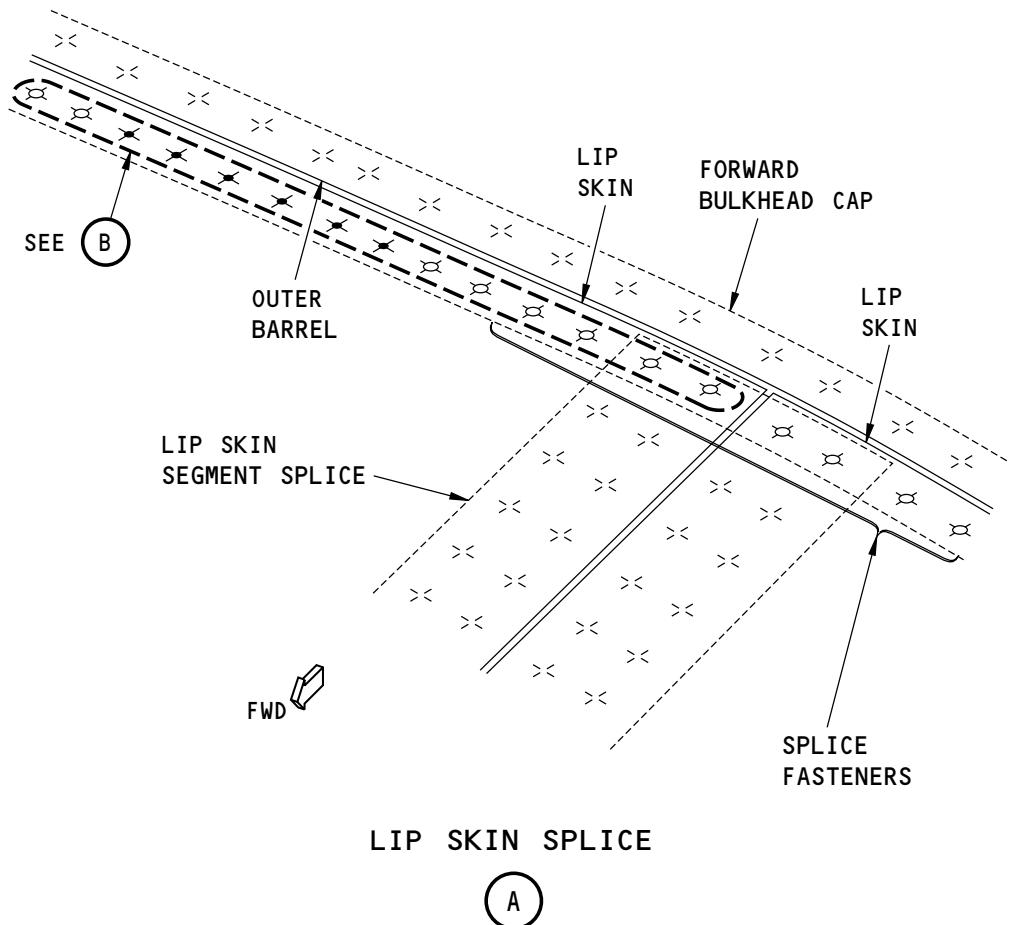
Jul 10/2013

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- INITIAL FASTENER LOCATION.
- LOOSE/MISSING/TEMPORARY FASTENER.
- - REFERENCE FASTENER.

2181368 S0000482169_V3

Inlet Cowl Loose/Missing/Temporary Fasteners
Figure 102 (Sheet 2 of 3)

54-10-01

ALLOWABLE DAMAGE 2

Page 104

Jul 10/2013

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

CASE	FASTENER CONFIGURATION	LIMIT
1		PERMITTED
2		NOT PERMITTED
3		PERMITTED
4		PERMITTED

EXAMPLES OF PERMITTED AND NOT PERMITTED SPLICING JOINT FASTENER CONFIGURATIONS

B

FASTENER SYMBOLS

- INITIAL FASTENER LOCATION.
 - LOOSE/MISSING/TEMPORARY FASTENER.
 - /- REFERENCE FASTENER.

2184885 S0000483886 V5

Inlet Cowl Loose/Missing/Temporary Fasteners

Figure 102 (Sheet 3 of 3)

54-10-01

ALLOWABLE DAMAGE 2

DAMAGE 2
Page 105

Page 103
Nov 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR IN THE FIELD AREA

1. Applicability

- A. Repair 1 is applicable to damage that is:
 - (1) On the Inlet Cowl Outer Barrel Skin in the field area
 - (2) 1.25 inches (31.75 mm) or less in diameter.
- B. Repair 1 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

- A. Repair 1 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- B. The edge of the repair doubler must be:
 - (1) A minimum of 10.00 inches (254.0 mm) from the leading edge of the inlet cowl lip
 - (2) A minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-milled step, fore/aft splice, or the Vortex Control Device.
- C. The use of this repair causes an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds (4.09 kg) to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.
- D. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

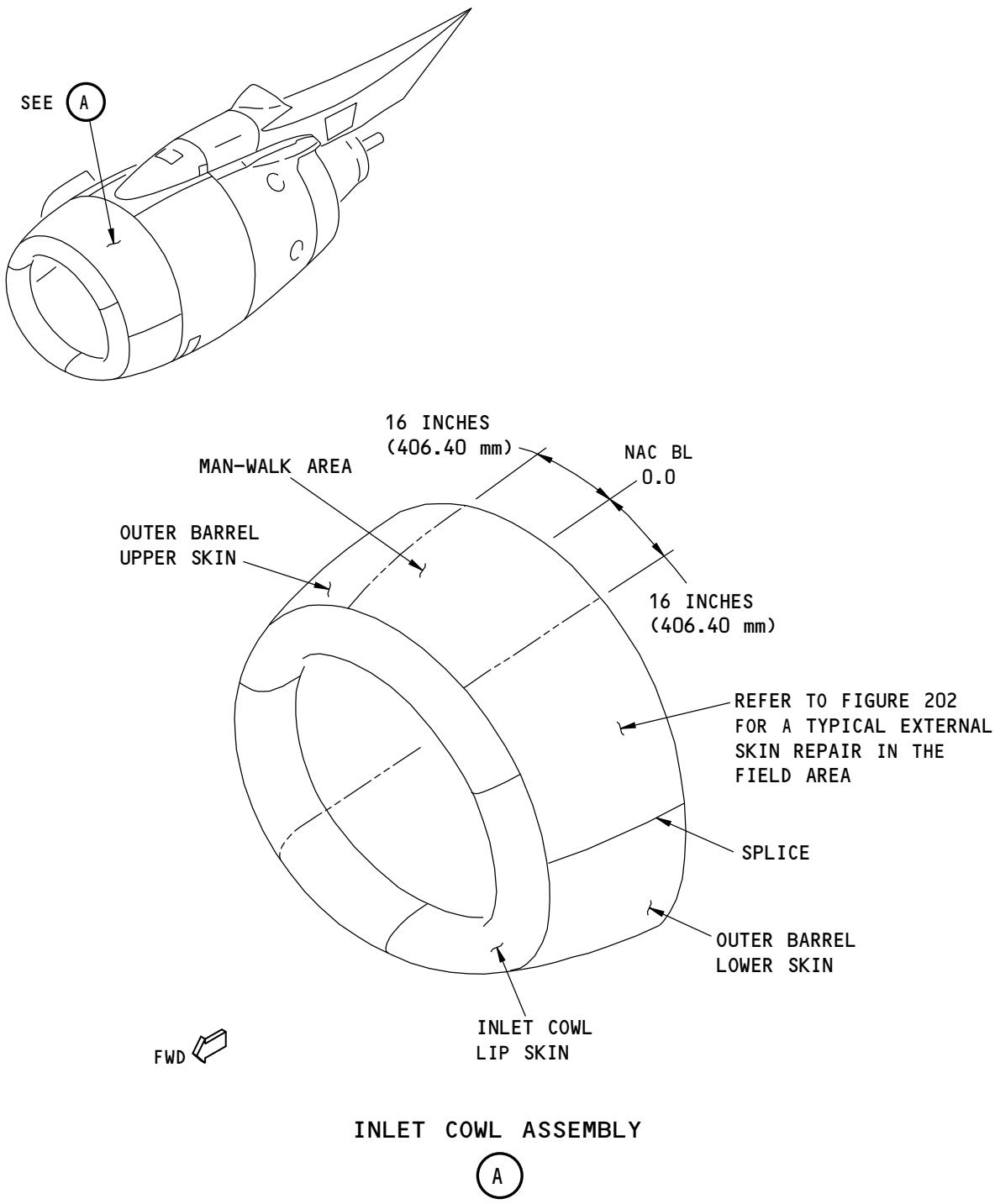
REPAIR 1
Page 201
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Outer Barrel Skin Repair
Figure 201

54-10-01

REPAIR 1
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to drill a stop hole.
 - C. Cut and remove the damaged skin in a circular shape to a maximum diameter of 1.25 inches (31.75 mm). Refer to Layout of the Repair Parts, Figure 202/REPAIR 1.
 - (1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step
 - (d) A fore/aft splice.
 - D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
- NOTE:** The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the part [1] doubler to the same contour as the inlet cowl outer barrel skin. Refer to Table 201 for the materials.
 - F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 1.
 - G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 1. Refer to 51-40-05, 51-40-06, and 51-40-08.
 - H. Remove the part [1] doubler.

54-10-01

REPAIR 1
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) for the upper skin man-walk zones

- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
- J. Remove the sharp edges of the doubler and the initial skin as given in BAC 5300 Sonic Edge Finish.
- K. Apply a chemical conversion coating to the part [1] doubler and to the bare surfaces of the initial skin. Refer to 51-20-01.
- L. Apply one layer of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the part [1] doubler.
- M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.
- N. Install the fasteners wet with BMS 5-95 sealant. Refer to 51-20-05.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.
- Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

54-10-01

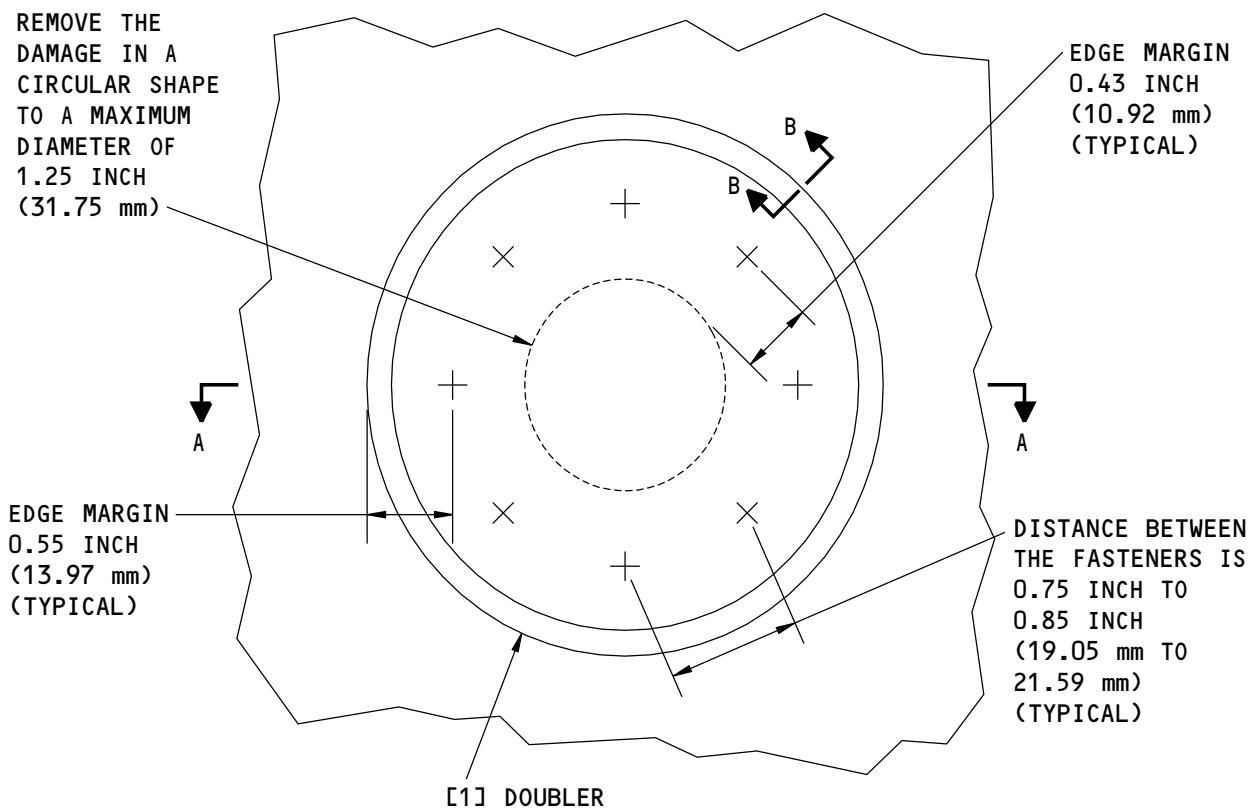
REPAIR 1

Page 204

Jul 10/2015

D634A210

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FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

G54665 S0006591529_V1

Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-10-01

REPAIR 1
Page 205

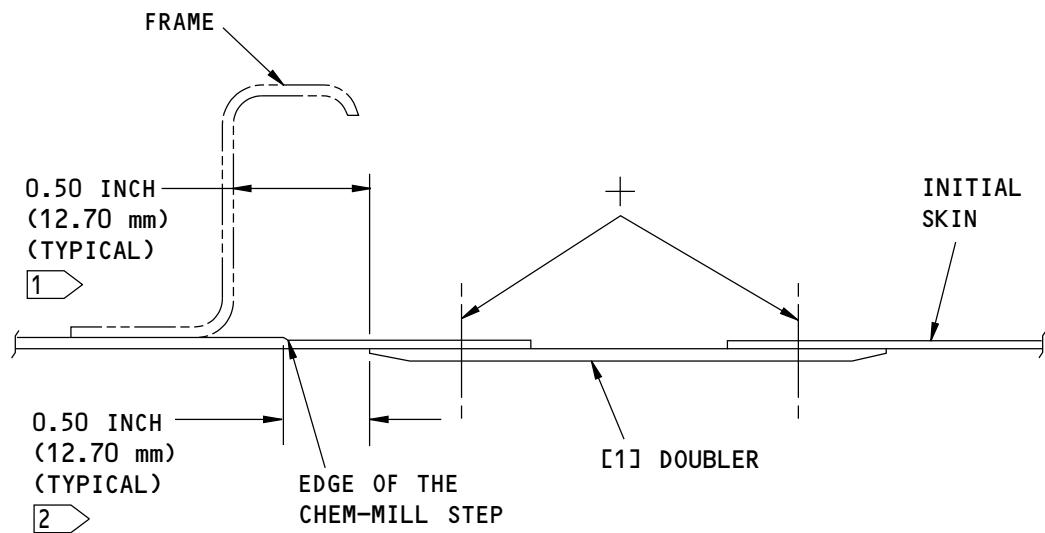
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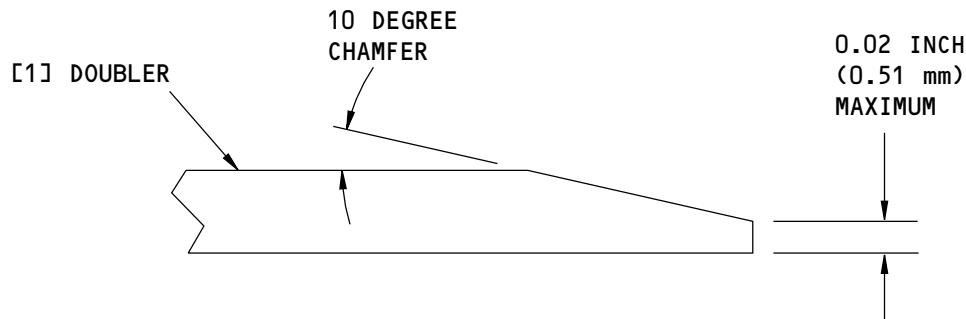
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737-800
STRUCTURAL REPAIR MANUAL



A-A



B-B

NOTES

- [1] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.
- [2] APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.

G54669 S0006591530_V1

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 1
Page 206

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - INLET COWL OUTER BARREL SKIN FLUSH REPAIR IN THE FIELD AREA

1. Applicability

- A. Repair 2 is applicable to damage that occurs to the inlet cowl outer barrel skin in the field area as shown in Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 2.
- B. The edge of the damage must be a minimum of 1.9 inch (48.26 mm) from a frame, doubler, splice, chem-mill step, or the Vortex Control Device.

2. General

- A. REPAIR 2 is a permanent repair.
- B. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- C. Make sure the aerodynamic smoothness of the repair is satisfactory or there can be a decrease in the economic performance of the airplane.

54-10-01

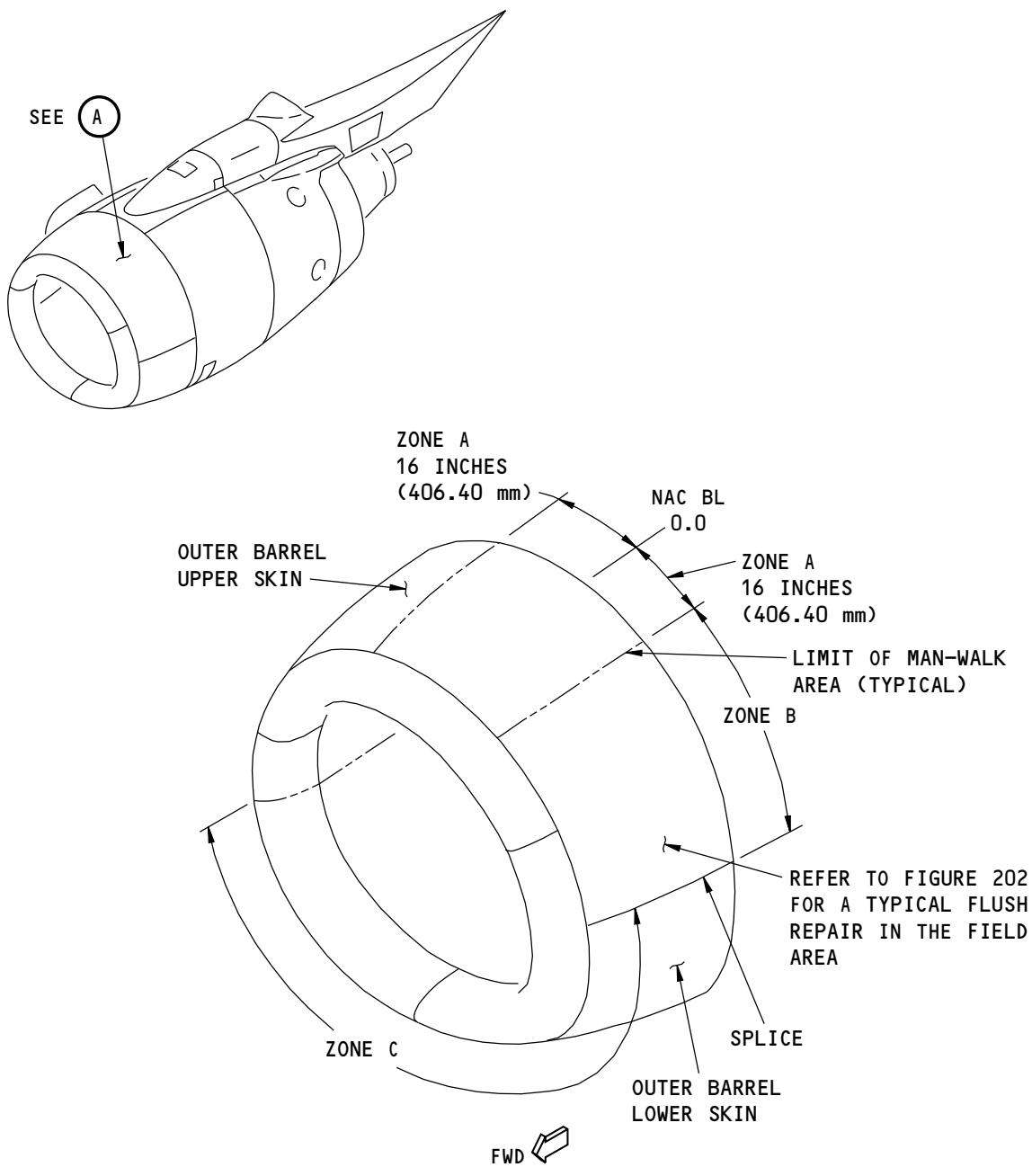
REPAIR 2
Page 201
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

(A)

G11945 S0006591532_V1

Inlet Cowl Outer Barrel Skin Zones
Figure 201

54-10-01

REPAIR 2
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
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
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
- B. Drill a 0.25 inch (6.35 mm) stop hole at the ends of the crack in the damaged skin. Refer to Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2.
- C. Cut out the damaged skin.

NOTE: The edge of the cutout must be a minimum of 1.9 inches (48.26 mm) from a frame, doubler, splice, or chem-mill step.

- (1) Make a radius at the corners of the cutout a minimum of 0.50 inch (12.70 mm).
- (2) Do not cause damage to the adjacent internal structure.

- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201 for the materials.
- F. Assemble the repair parts as shown in Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2.
- G. Drill the fastener holes as shown in Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, gouges, burrs from the repair parts and the initial skin, and break the sharp edges 0.015 inch to 0.030 inch (0.38 mm to 0.76 mm). Refer to 51-10-02.
- J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.
- K. Apply one layer of BMS 10-79, Type III primer to (Refer to SOPM 20-44-04):
 - (1) The bare external surfaces of the initial skin

54-10-01

REPAIR 2
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (2) The internal and external surfaces of the [1] doubler and [2] repair skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) in Zone A Use 0.050 inch (1.27 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) in Zone B Use 0.045 inch (1.14 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) in Zone C
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) in Zone A Use 0.050 inch (1.27 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) in Zone B Use 0.045 inch (1.14 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) in Zone C

- L. Apply BMS 5-95 sealant between the mating surfaces of the part [1] doubler and the initial skin. Refer to 51-20-05.
- M. Install the repair parts. Refer to Inlet Cowl Outer Barrel Flush Repair in the Field Area, Figure 202/REPAIR 2 and Table 202.
 - (1) For a repair in Zone A, install the NAS1097AD6 or BACR15CE6AD rivets without sealant.
 - (2) For a repair in Zones B or C, install the MS20470AD6 rivets without sealant.
- N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- O. Fill the space between the part [1] repair skin and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.
- P. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

Table 202:

SOLID RIVET FASTENER LOCATION, TYPE AND SIZE	
ZONE	REPAIR FASTENER TYPE AND SIZE
ZONE A	NAS1097AD6 or BACR15CE6AD
ZONE B	MS20470AD6
ZONE C	MS20470AD6

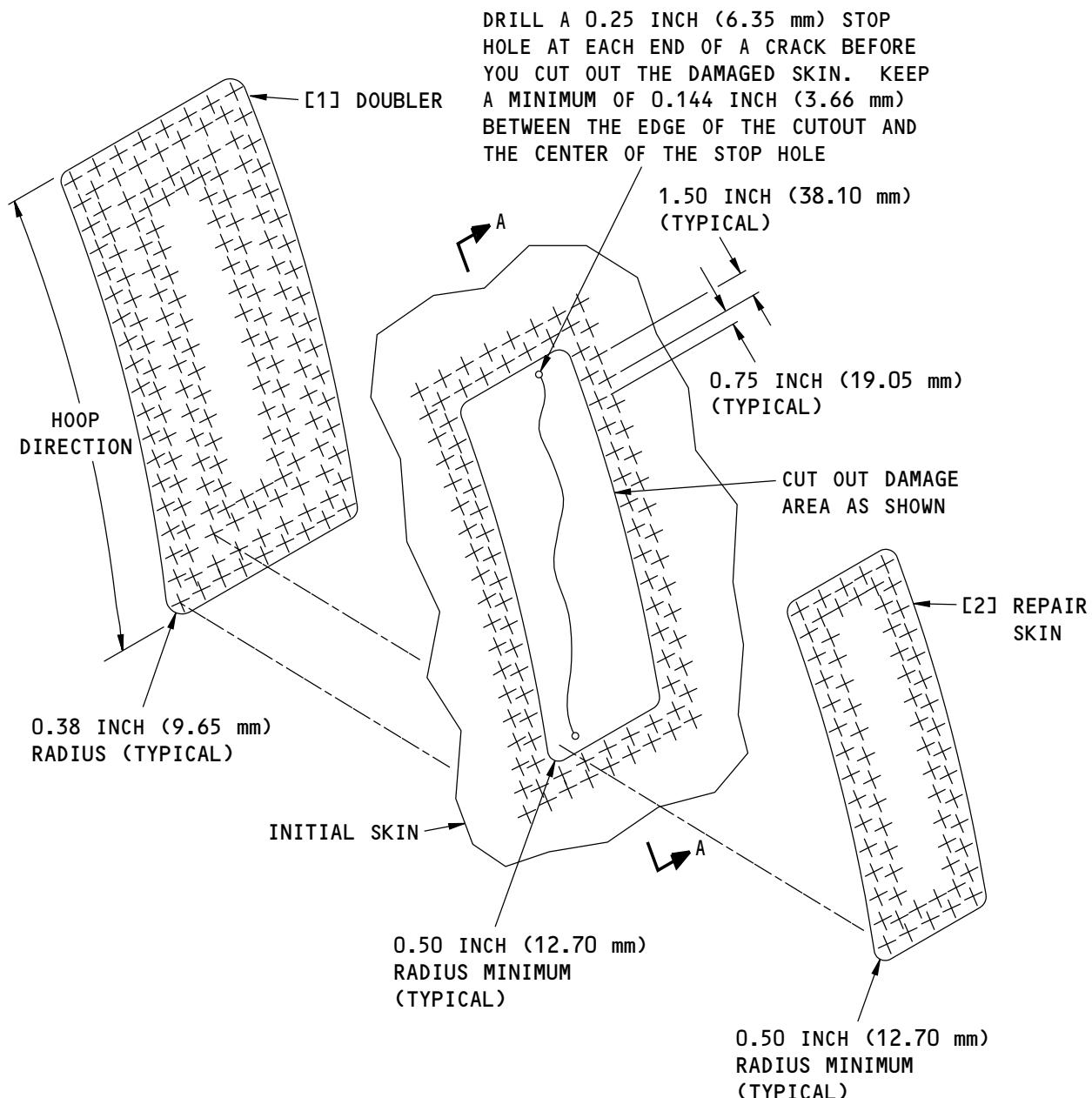
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REPAIR 2
Page 204
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. REFER TO TABLE 202 FOR THE FASTENERS.

G11996 S0006591535_V1

Inlet Cowl Outer Barrel Flush Repair in the Field Area
Figure 202 (Sheet 1 of 2)

54-10-01

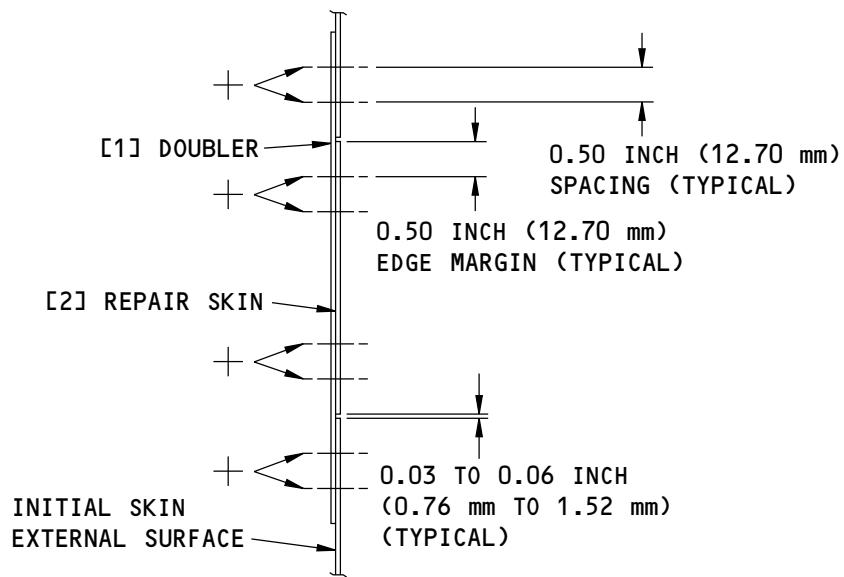
REPAIR 2
Page 205

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



A-A

G11998 S0006591536_V1

Inlet Cowl Outer Barrel Flush Repair in the Field Area
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 2
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 3 - INLET COWL OUTER BARREL SKIN EXTERNAL REPAIR BETWEEN TWO FRAMES

1. Applicability

- A. Repair 3 is applicable to damage that is: (Refer to Inlet Cowl Outer Barrel Skin Repair Between Frames in the Field Area, Figure 201/REPAIR 3.)
 - (1) On the Inlet Cowl Outer Barrel Skin between two frames
 - (2) More than 1.25 inches (31.75 mm) in diameter.
- B. Repair 3 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

- A. Repair 3 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).
- C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).
- D. The repair doublers must be a minimum of 10.00 inches (254.0 mm) away from the leading edge of the inlet cowl lip.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- E. The edge of the repair doubler must be a minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, fore/aft splice, or the Vortex Control Device.
- F. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.
- G. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

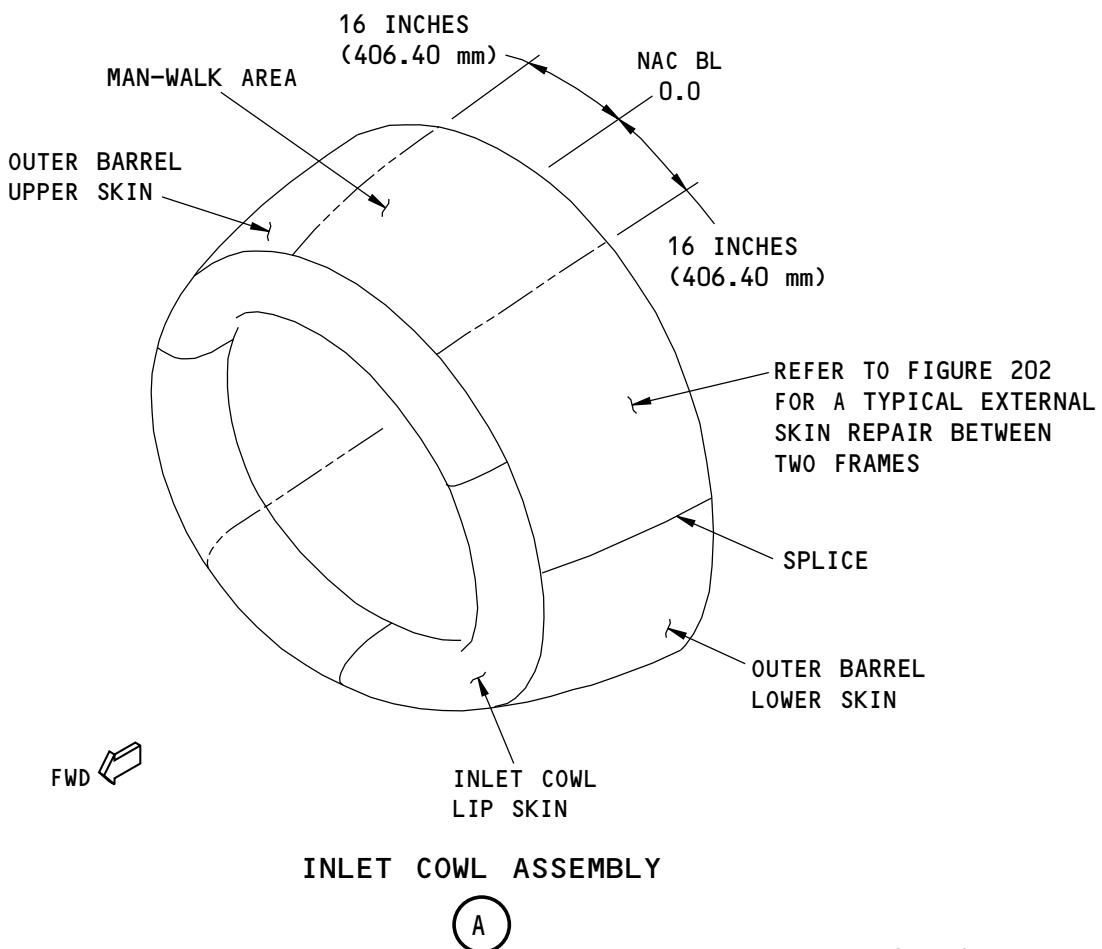
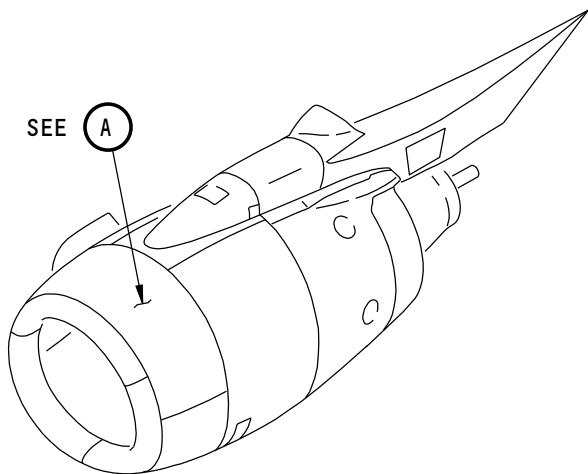
REPAIR 3
Page 201
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



G54672 S0006591538_V1

Inlet Cowl Outer Barrel Skin Repair Between Frames in the Field Area
Figure 201

54-10-01

REPAIR 3
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
- B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step
 - (d) A fore/aft splice.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the part [1] doubler to the same contour as the initial skin. Refer to Table 201 for the materials.
- F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 3.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 3. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the part [1] doubler.
 - I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
 - J. Remove the sharp edges from the part [1] doubler and the initial skin. Refer to BAC 5300.

54-10-01

REPAIR 3
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin.
Refer to 51-20-01.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick 2024-T3 sheet (2024-T62 Sheet is optional) for the upper skin man-walk zones

- L. Apply two layers of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)
(1) The bare external surfaces of the initial skin
(2) The internal and external surfaces of the part [1] doubler.
- M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.
- N. Install the fasteners wet with BMS 5-95 sealant.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.
- Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

54-10-01

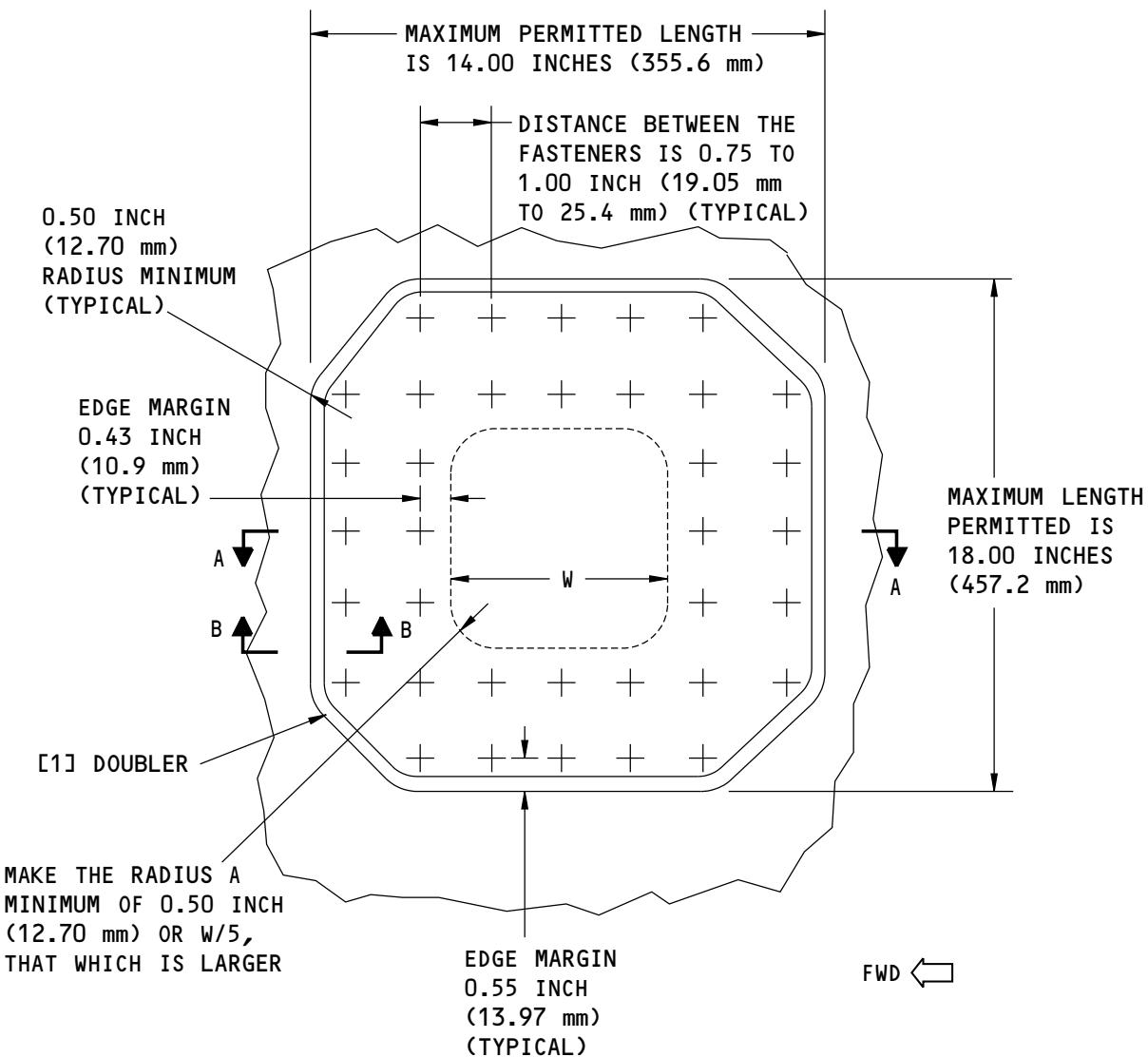
REPAIR 3
Page 204
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-10-01

REPAIR 3
Page 205

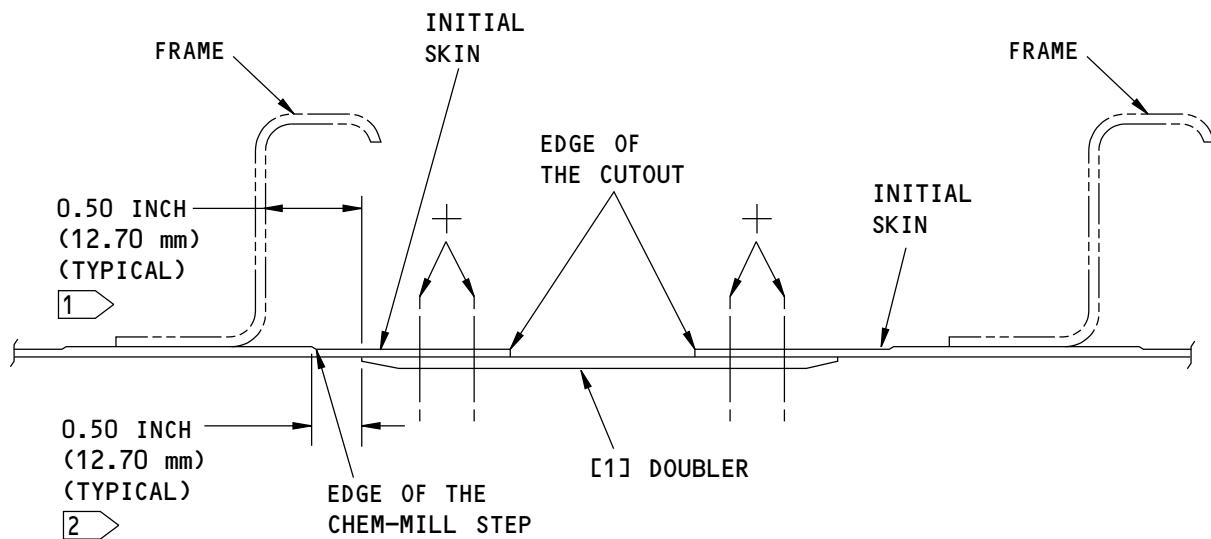
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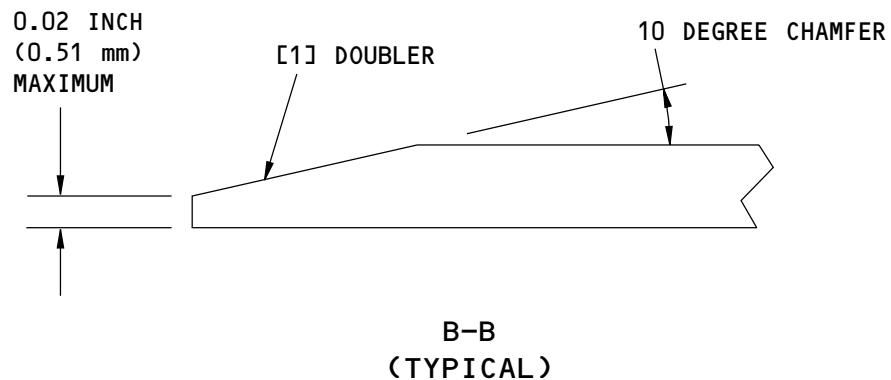
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737-800
STRUCTURAL REPAIR MANUAL



A-A



B-B
(TYPICAL)

NOTES

- [1] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.
- [2] APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.

G54753 S0006591541_V1

Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 3
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR AT A FRAME

1. Applicability

- A. Repair 4 is applicable to damage that is:
 - (1) On the Inlet Cowl Outer Barrel Skin at a frame
 - (2) More than 1.25 inches (31.75 mm) in diameter.
- B. Repair 4 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

- A. Repair 4 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).
- C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).
- D. The repair doublers must be a minimum of 10.00 inches (254.0 mm) away from the leading edge of the inlet cowl lip or the vortex control device.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- E. The edge of the repair doubler must be a minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.
- F. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.
- G. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

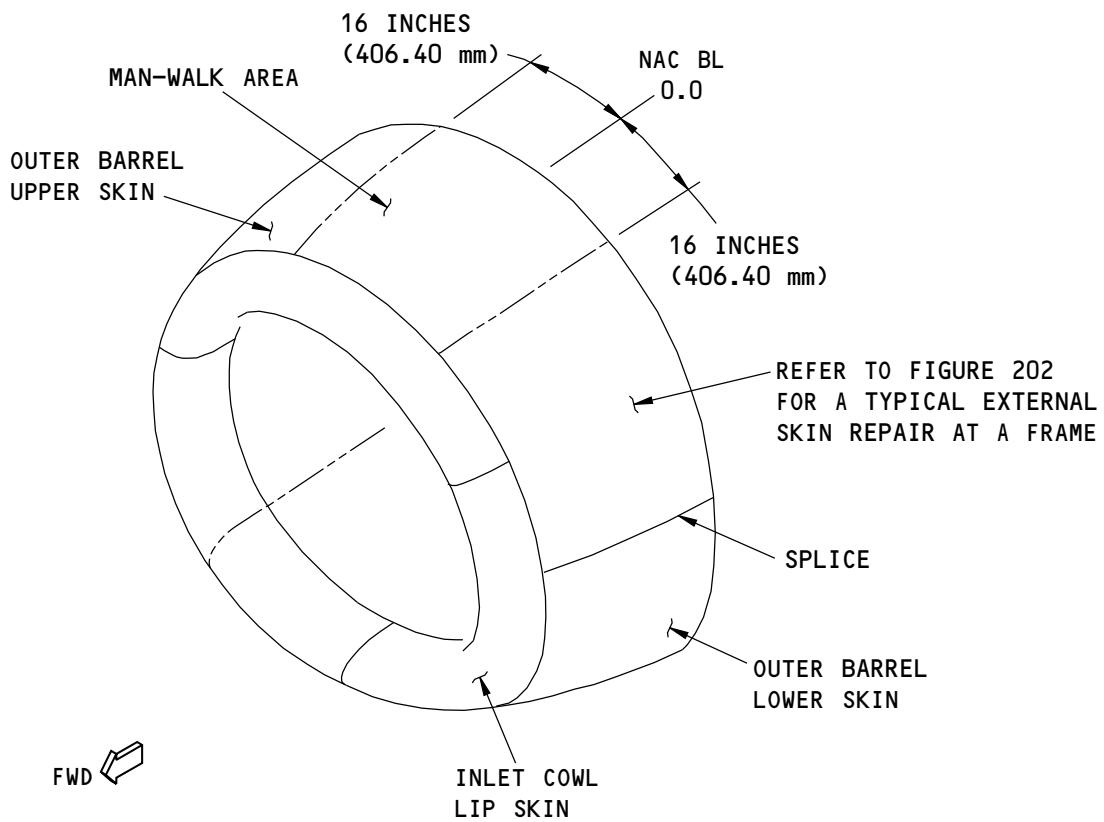
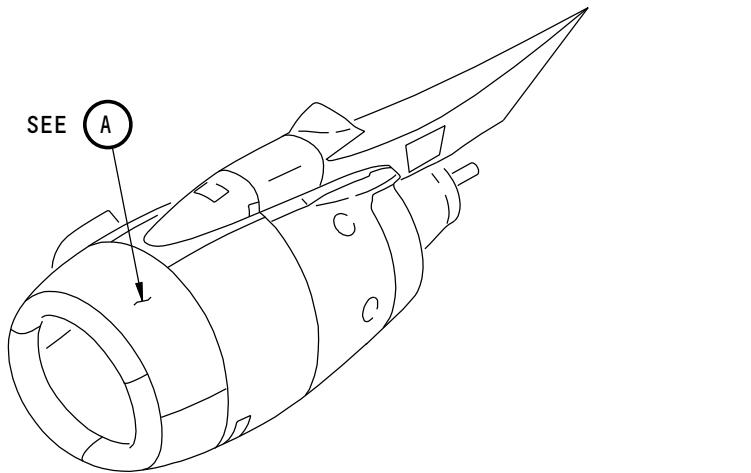
REPAIR 4
Page 201
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



INLET COWL ASSEMBLY

(A)

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Inlet Cowl Outer Barrel Skin Repair at a Frame
Figure 201

54-10-01

REPAIR 4
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, GENERAL	Repair Sealing
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
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
 - (1) If the stop hole is adjacent to a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
 - C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the repair Doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:
 - (a) A frame,
 - (b) A Doubler,
 - (c) A chem-mill step,
 - (d) A fore/aft splice.
 - (2) Do not cause damage to the frame.
 - D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
- NOTE:** The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the part [1] doubler to the same contour as the initial skin. Refer to Table 201/REPAIR 4 for the materials.
 - F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 4.

54-10-01

REPAIR 4
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 4. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the part [1] doubler.
 - I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
 - J. Remove the sharp edges from the part [1] doubler and the initial skin. Refer to BAC 5300.
 - K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.
 - L. Apply one layer of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the part [1] doubler.
- M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet for the upper skin man-walk zones

- N. Install the fasteners with BMS 5-95 sealant. Refer to 51-20-05, GENERAL.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.
- Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

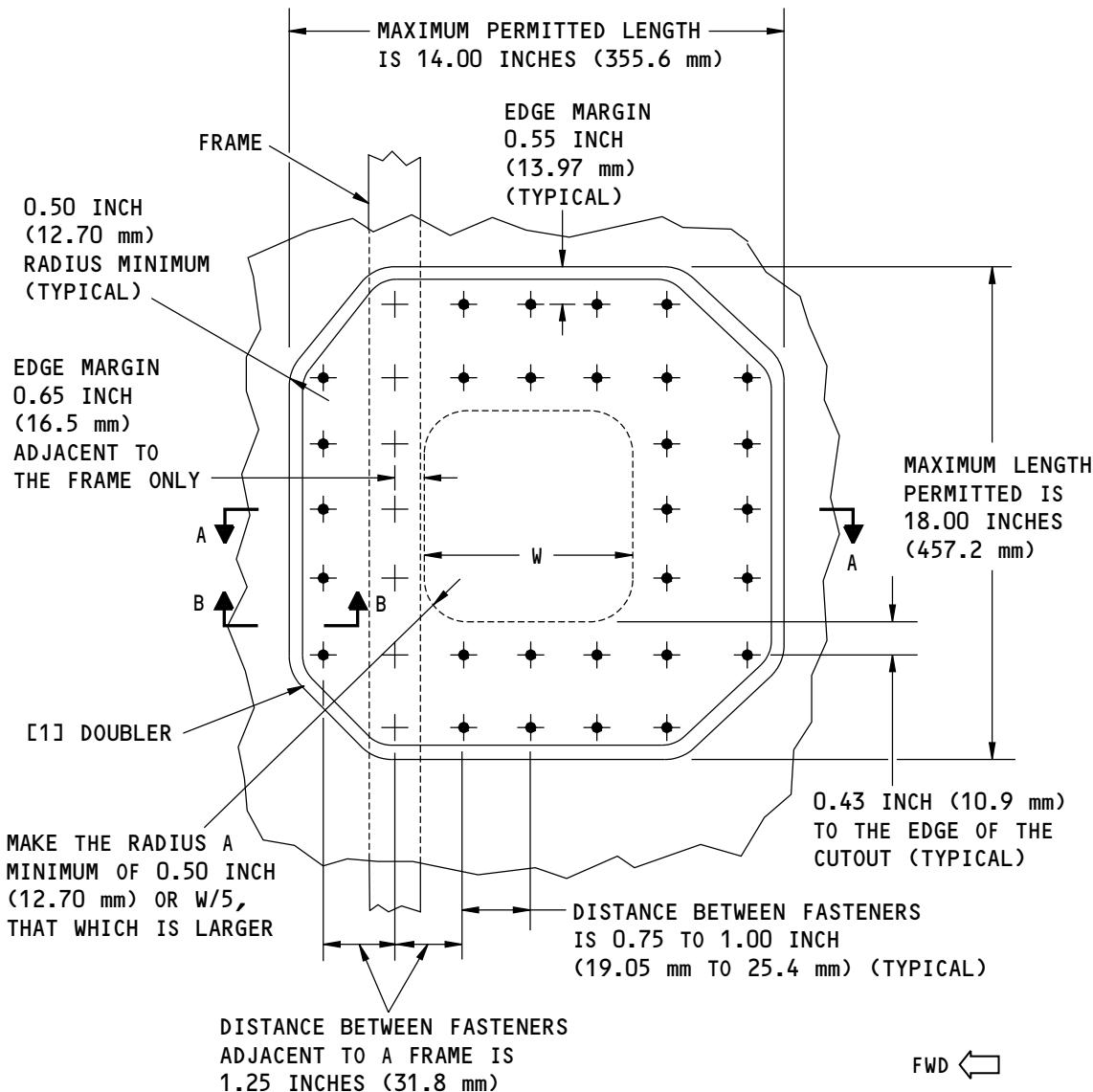
54-10-01

REPAIR 4
Page 204
Jul 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.
- ♦ REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

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**Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)**

54-10-01

**REPAIR 4
Page 205**

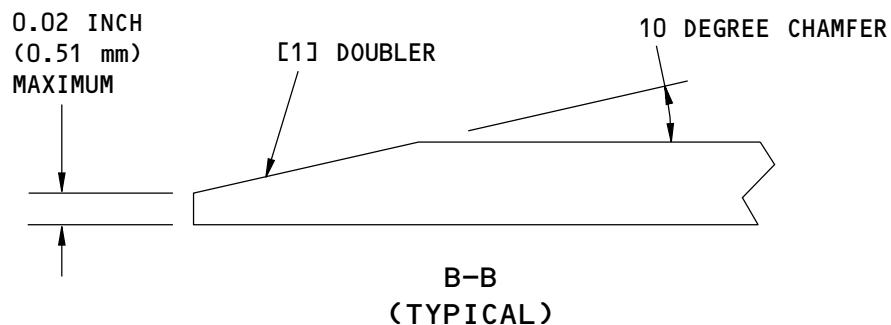
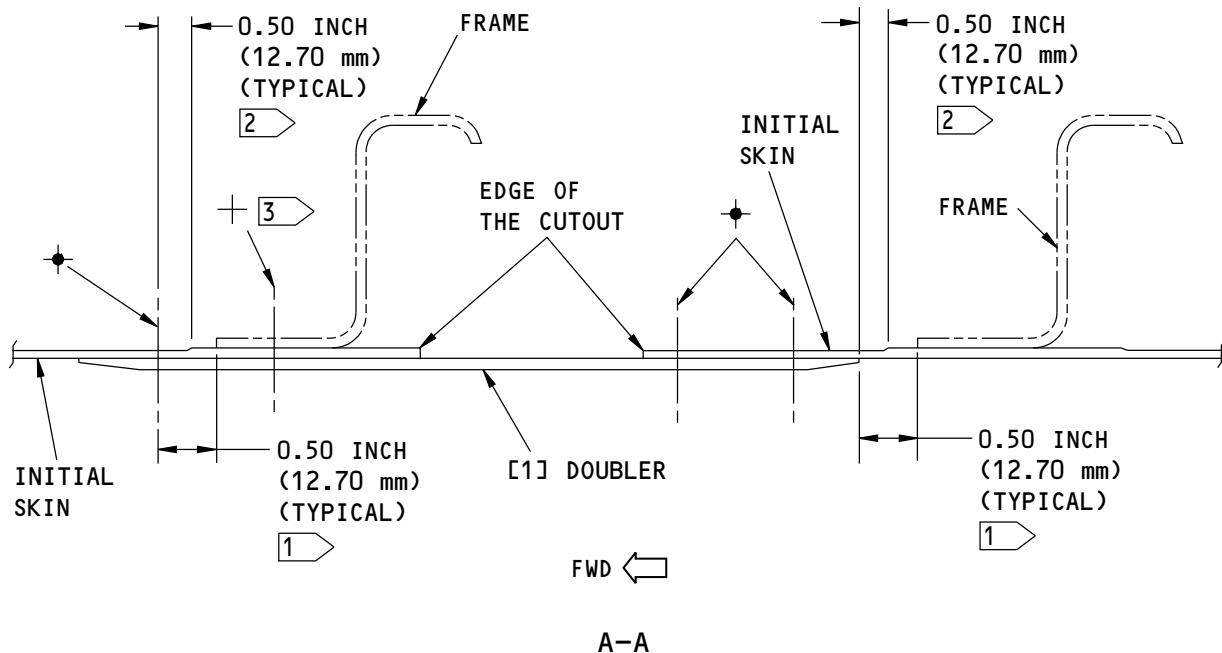
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



NOTES

- [1] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.
- [2] APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.
- [3] INSTALL A COUNTERSINK WASHER BETWEEN THE INITIAL SKIN AND THE PART [1] DOUBLER.

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 4
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 5 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR AT TWO FRAMES

1. Applicability

- A. Repair 5 is applicable to damage that is:
 - (1) On the Inlet Cowl Outer Barrel Skin at two frames
 - (2) More than 1.25 inches (31.75 mm) in diameter.
- B. Repair 5 is not applicable to damage at the front or rear edges of the inlet cowl outer barrel skin.

2. General

- A. Repair 5 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.00 inches (457.2 mm).
- C. The maximum fore/aft length of the repair doubler is 14.00 inches (355.6 mm).
- D. The repair doublers must be a minimum of 10.00 inches (254.0 mm) away from the leading edge of the inlet cowl lip or the vortex control device.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- E. The edge of the repair doubler must be a minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.
- F. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches (355.6 mm) add the equivalent of 9 pounds to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.
- G. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

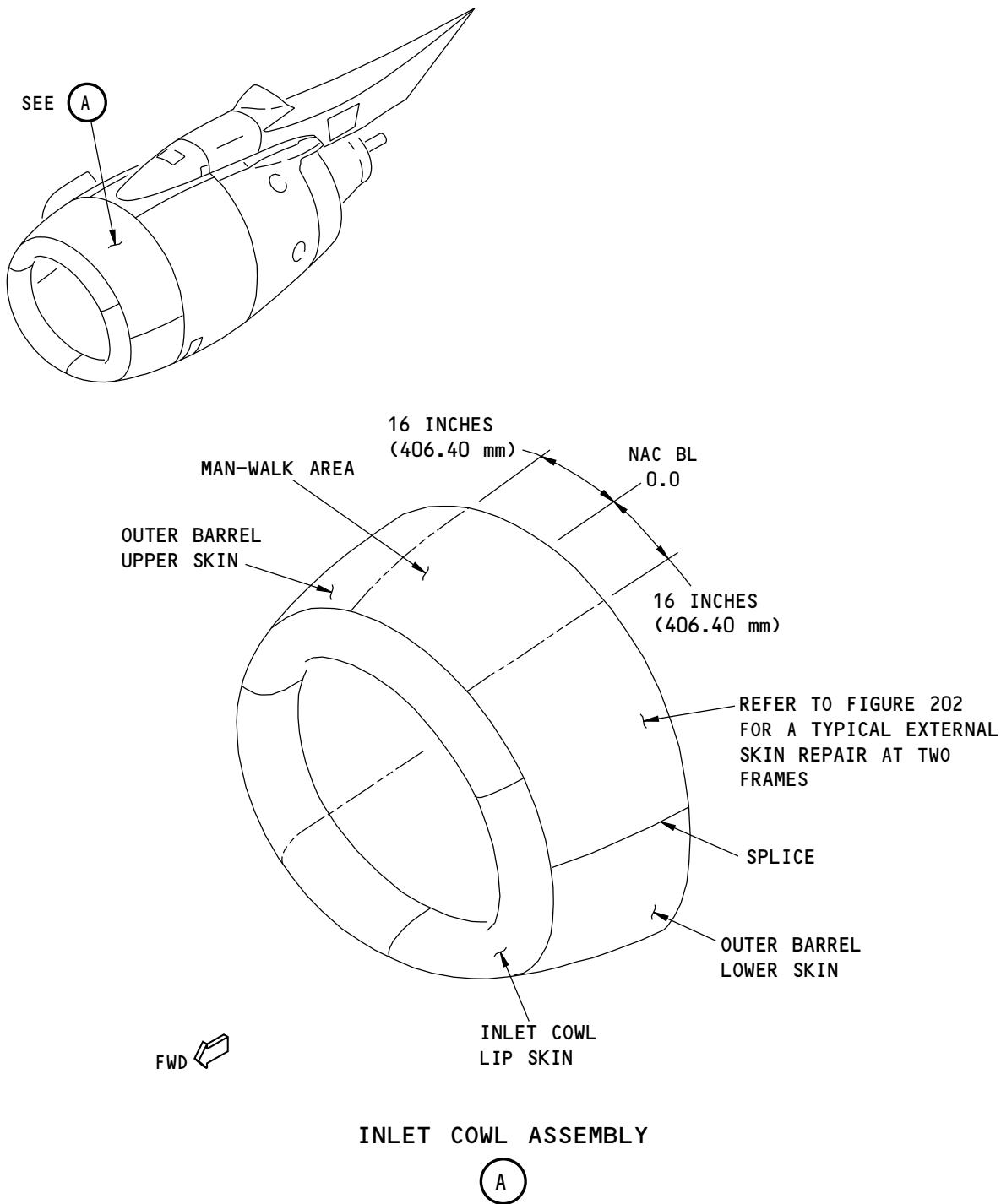
REPAIR 5
Page 201
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Outer Barrel Skin Repair at Two Frames
Figure 201

54-10-01

REPAIR 5
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
 - (1) If the stop hole is adjacent to a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
 - C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step
 - (d) A fore/aft splice.
 - (2) Do not cause damage to the frame.
 - D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
- NOTE:** The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the part [1] doubler to the same contour as the initial skin. Refer to Table 201/REPAIR 5 for the materials.
 - F. Assemble the part [1] doubler as shown in Layout of the Repair Parts, Figure 202/REPAIR 5.

54-10-01

REPAIR 5
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 5. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the part [1] doubler.
 - I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
 - J. Remove the sharp edges from the part [1] doubler and the initial skin. Refer to BAC 5300.
 - K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.
 - L. Apply one layer of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the part [1] doubler.
- M. Install the part [1] doubler with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet for the upper and lower skins. This does not include the upper skin man-walk zones Use 0.080 inch (2.03 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet for the upper skin man-walk zones

- N. Install the fasteners wet with BMS 5-95 sealant. Refer to 51-20-05.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.
- Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

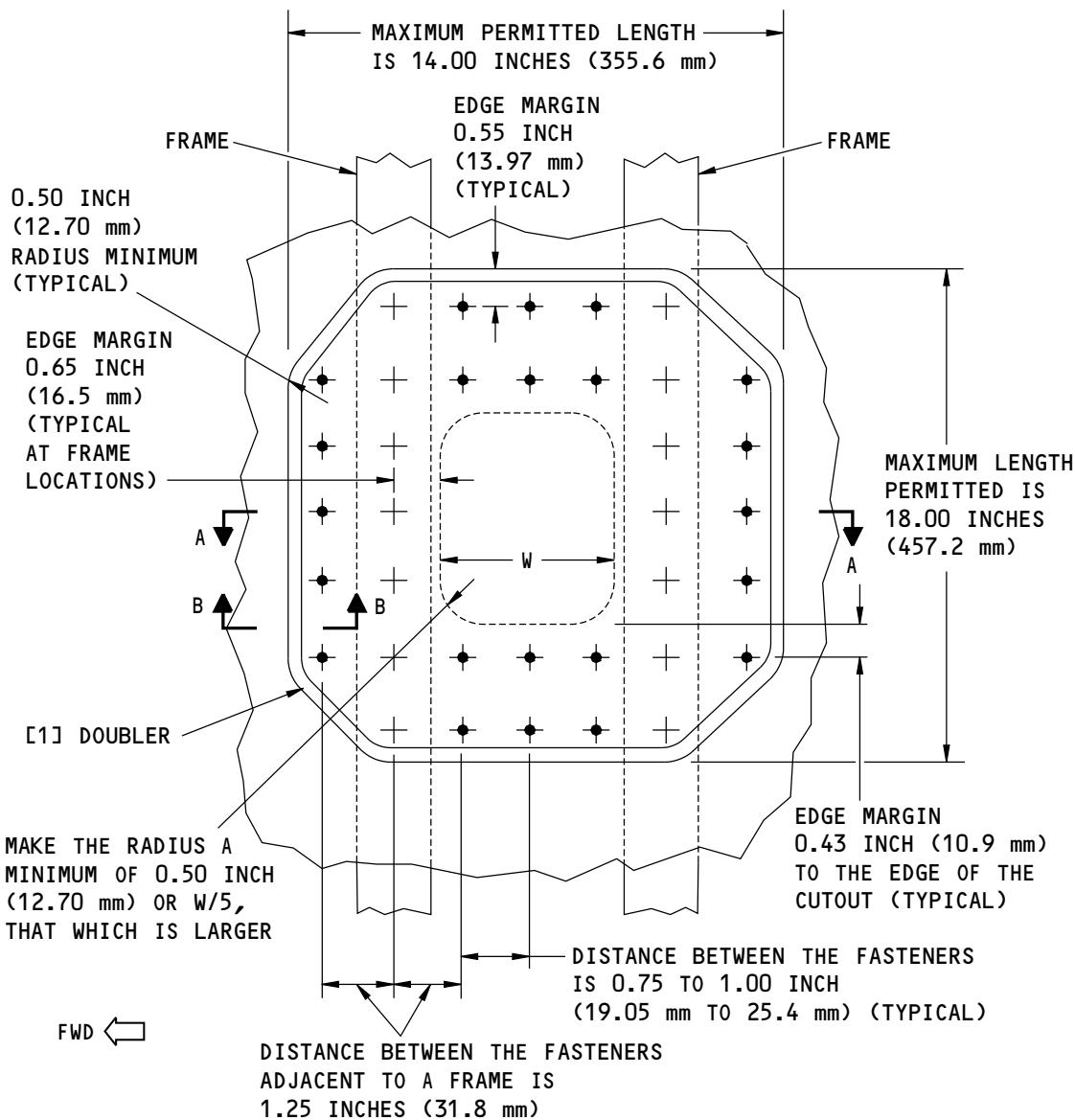
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REPAIR 5
Page 204
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.
- REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-10-01

REPAIR 5
Page 205

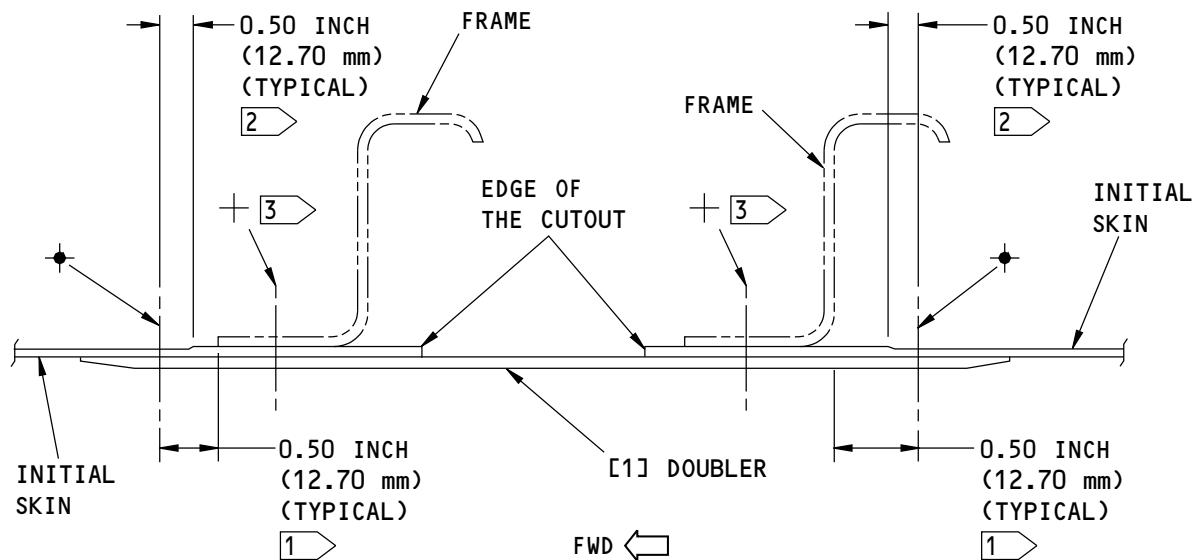
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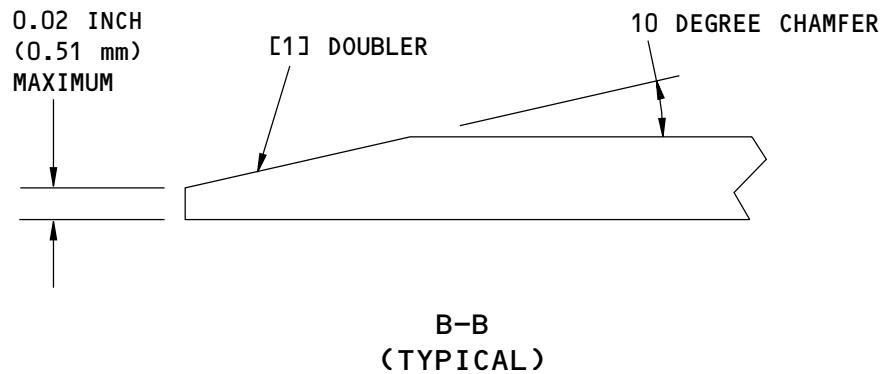
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737-800
STRUCTURAL REPAIR MANUAL



A-A



B-B
(TYPICAL)

NOTES

- [1] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS.
- [2] APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS.
- [3] INSTALL A COUNTERSINK WASHER BETWEEN THE [1] DOUBLER AND THE INITIAL SKIN.

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 5
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 6 - INLET COWL OUTER BARREL EXTERNAL SKIN REPAIR AT A FRAME

1. Applicability

- A. Repair 6 is applicable to damage that is on the Inlet Cowl Outer Barrel Skin shown in Inlet Cowl Outer Barrel Skin Repair at a Frame, Figure 201/REPAIR 6 that is:
 - (1) At a frame
 - (2) 1.25 inches (31.75 mm) or more in diameter.
- B. Repair 6 is not applicable to damage at the forward or aft edges of the inlet cowl.

2. General

- A. Repair 6 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. This repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 14.00 inches are the equivalent of adding 9 pounds of weight to the airplane. This will cause an added fuel consumption of approximately 100 gallons in a year.
- C. The dimensions of the repair doubler used in Repair 6 are:
 - (1) A maximum width of 18.00 inches around the circumference of the inlet cowl
 - (2) A maximum length of 14.00 inches in the fore and aft direction.

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES, GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS, THE LOWER ACCESS PANEL, OR OUTER BARREL ATTACHMENT FASTENERS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- D. The repair doubler used in Repair 6 must be put in position as follows:
 - (1) A minimum of 10.00 inches (254.0 mm) from the leading edge of the inlet cowl lip or the vortex control device.
 - (2) A minimum of 0.5 inch (12.70 mm) from a frame, doubler, chem-mill step, or fore/aft splice.
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

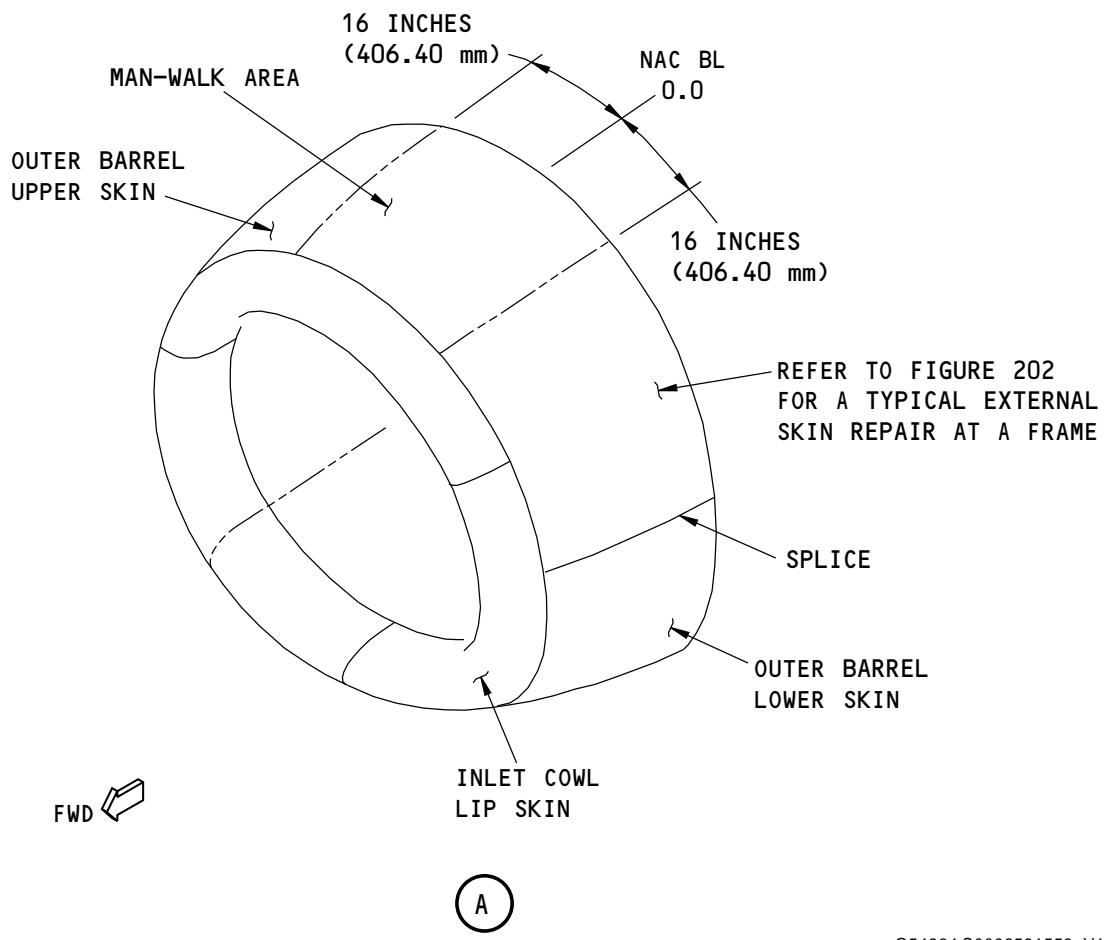
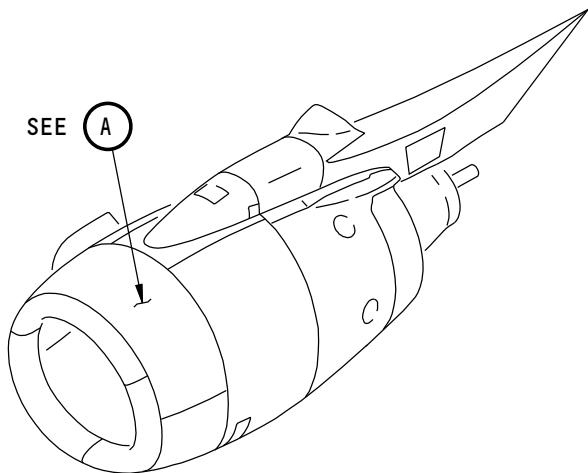
REPAIR 6
Page 201
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Outer Barrel Skin Repair at a Frame
Figure 201

54-10-01

REPAIR 6
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
- B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame or adjacent to it, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the repair doubler when installed will be a minimum of 0.5 inch (12.70 mm) from:
 - (a) A frame,
 - (b) A Doubler,
 - (c) A chem-mill step,
 - (d) A fore/aft splice.
 - (2) Do not cause damage to the frame.
 - (3) Put the skin that is around the damage cutout back to the initial contour.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
NOTE: The dye penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin panel. Refer to Table 201/REPAIR 6 for the materials.
- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 6.

54-10-01

REPAIR 6
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 6. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
- J. Remove the sharp edges from the repair parts and the initial skin as given in BAC 5300, Section 11.2.3.
- K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 inch (1.60 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet for the upper and lower skins
			Use 0.080 inch (2.03 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet for the upper skin man-walk zones
[2]	Filler Plate	1	Use 0.071 inch (1.80 mm) thick, 2024-T62 sheet. Optional to use 2024-T3 sheet

- L. Apply one layer of BMS 10-79, Type III primer to: (Refer to SOPM 20-44-04)
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- M. Install the repair parts with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05.
 - (1) Use countersink washers between the part [1] doubler and the initial skin at the initial fastener holes. Refer to 51-40-08.
- N. Install the fasteners wet with BMS 5-95 sealant. Refer to 51-20-05.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-95 sealant. Refer to 51-20-05.
- Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

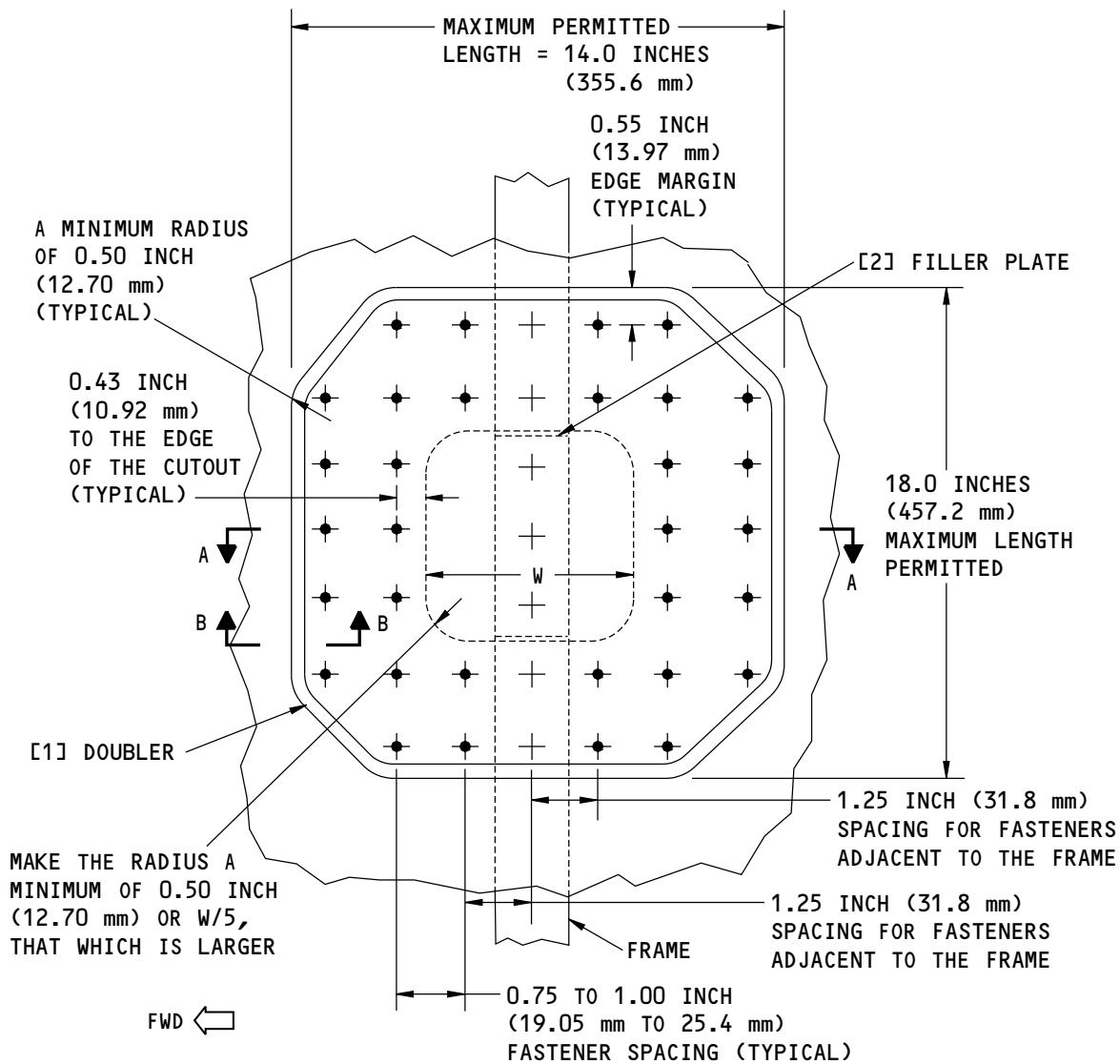
54-10-01

REPAIR 6
Page 204
Jul 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.
- REPAIR FASTENER LOCATION. INSTALL A NAS1097AD6 OR A BACR15CE6AD FLUSH HEAD RIVET.

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**Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)**

54-10-01

REPAIR 6
Page 205

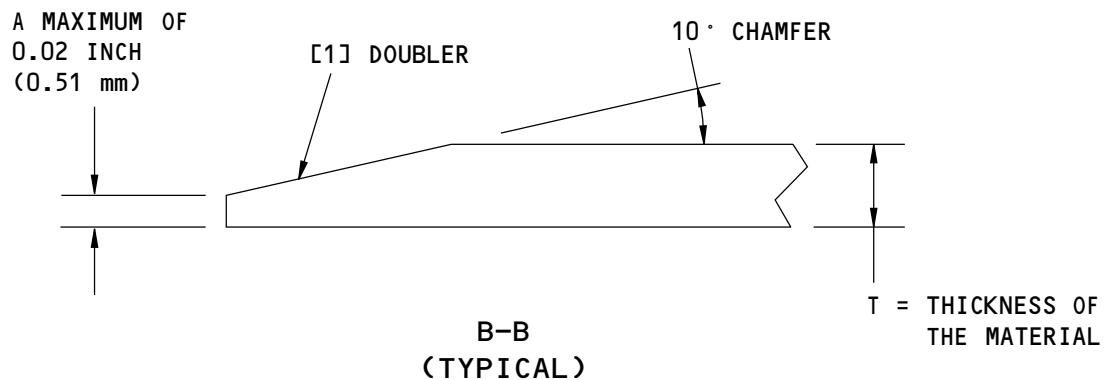
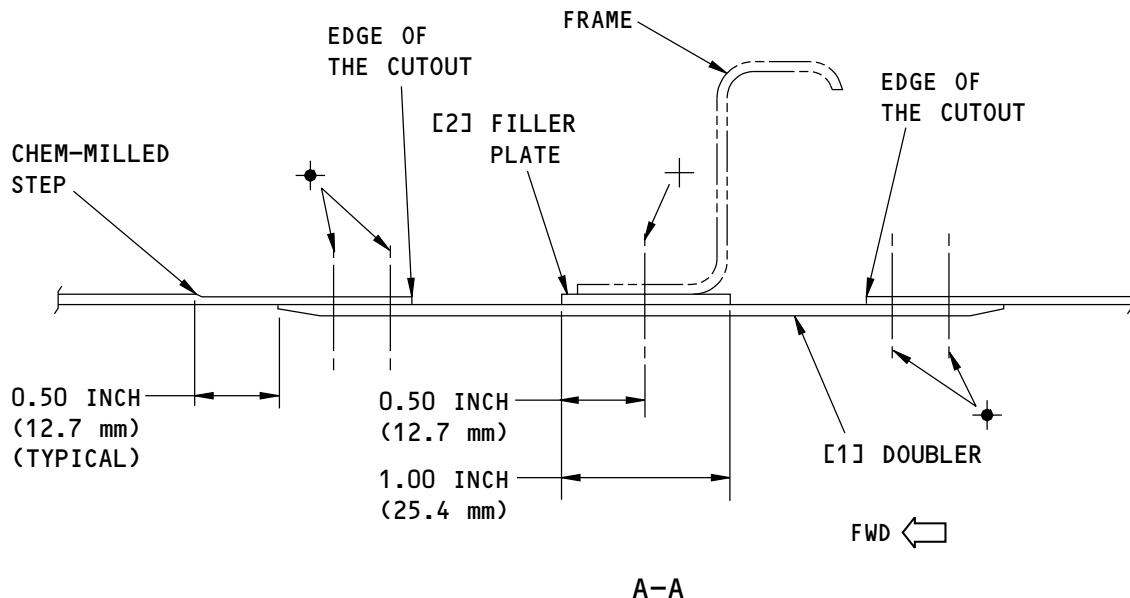
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737-800
STRUCTURAL REPAIR MANUAL



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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 6
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 7 - INLET COWL INNER BARREL ACOUSTIC PANEL DAMAGE THAT IS 3.00 INCHES (76.2 MM) OR LESS IN DIAMETER

1. Applicability

- A. Repair 7 is applicable to damage to the Inlet Cowl Inner Barrel Acoustic Panel shown in Inlet Cowl Inner Barrel Acoustic Panel Location, Figure 201/REPAIR 7 that is:
 - (1) A maximum diameter of 3.00 inches (76.2 mm)
 - (2) A minimum of 3.3 inches (83.8 mm) from a doubler or the edge of the acoustic panel.

2. General

- A. Repair 7 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. This repair will cause a loss in acoustic panel area. Refer to 54-00-01 for the acoustic loss limits for the inlet cowl.
- C. Get access to the damaged area.
- D. Use a Non-Destructive Test (NDT) procedure to find the length, and width of the damage. Refer to 737 NDT Part 1, 51-01-02.
 - (1) Refer to Definitions of the Facesheets, Figure 202/REPAIR 7 for the definitions of the perforated facesheet and the solid facesheet of the honeycomb core area.
- E. Do the repair as given in Paragraph 4./REPAIR 7
- F. 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.

54-10-01

REPAIR 7
Page 201

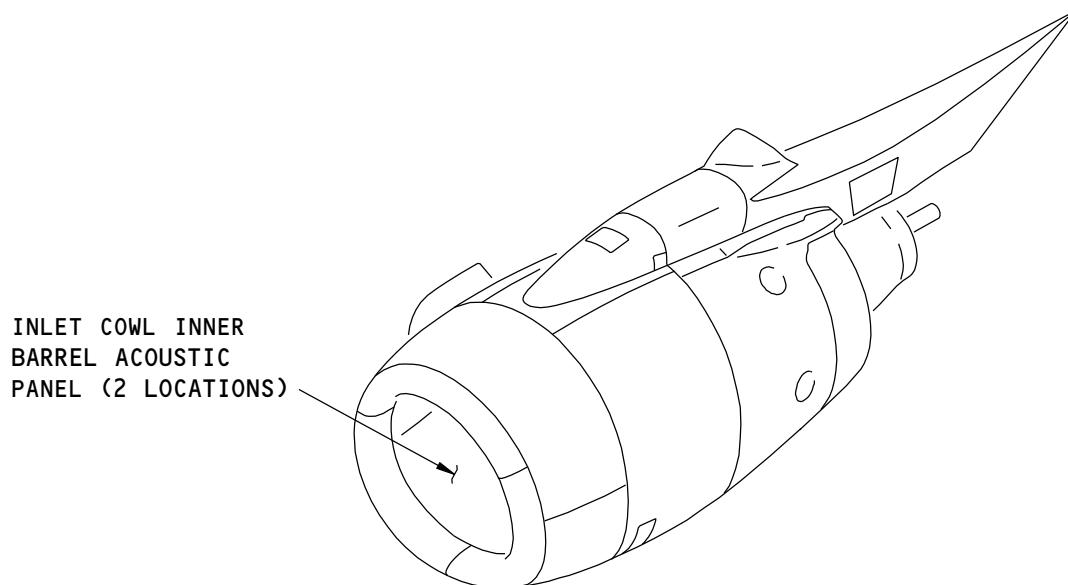
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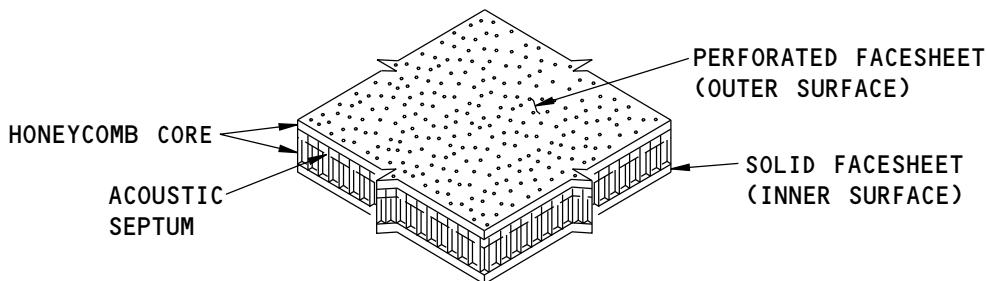


737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201



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Definitions of the Facesheets
Figure 202

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
54-00-01	NACELLES/PYLONS - GENERAL
SOPM 20-30-03	General Cleaning Procedures
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage

54-10-01

REPAIR 7
Page 202
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

4. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES, OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE WORK AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, SKIN IRRITATION OR INJURY TO PERSONS CAN OCCUR. DO NOT USE EQUIPMENT THAT CAUSES AN ELECTRICAL ARC OR SPARK IN AN AREA WHERE THE IGNITION OF THE SOLVENT IS POSSIBLE. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INTO THE INTERNAL AREAS OF THE ALUMINUM PANEL. IF YOU DO NOT OBEY, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

- A. Remove the damage as shown in Layout of the Repair Parts, Figure 203/REPAIR 7.
 - (1) Cut and remove the damaged perforated skin to a circular shape.
 - (2) Cut and remove the damaged honeycomb core to a circular shape.
 - (a) Cut away the core and the septum material below the perforated skin a minimum of 0.40 inch (10.2 mm) larger all around than the skin cutout.

NOTE: Make sure that the edge of the core cutout is a minimum of 3.3 inches (83.82 mm) from a doubler or the edge of the panel.

 - (b) Cut the core to a sufficient depth to make sure that all of the damaged core is removed.
 - (3) Remove all unwanted material from the repair area.
- B. Fill the space in the honeycomb core area below the skin cutout with BMS 5-28, Type 3 potting compound. Refer to Potting Compound Cure Times, Figure 204/REPAIR 7, Table A for the cure times.
 - (1) Fill the core flush with the surface of the perforated skin.
 - (2) Put a caul plate made from 0.016 inch (0.40 mm) thick aluminum sheet over the repair area and use masking tape to hold it in position.
- C. Cure the potting compound. Refer to Potting Compound Cure Times, Figure 204/REPAIR 7, Table A
- D. Remove the caul plate.
- E. Remove the unwanted potting compound with abrasive paper so that the repair is flush with the surface of the perforated skin.
- F. Apply a layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surfaces of the repair part and the initial perforated skin around the repair.

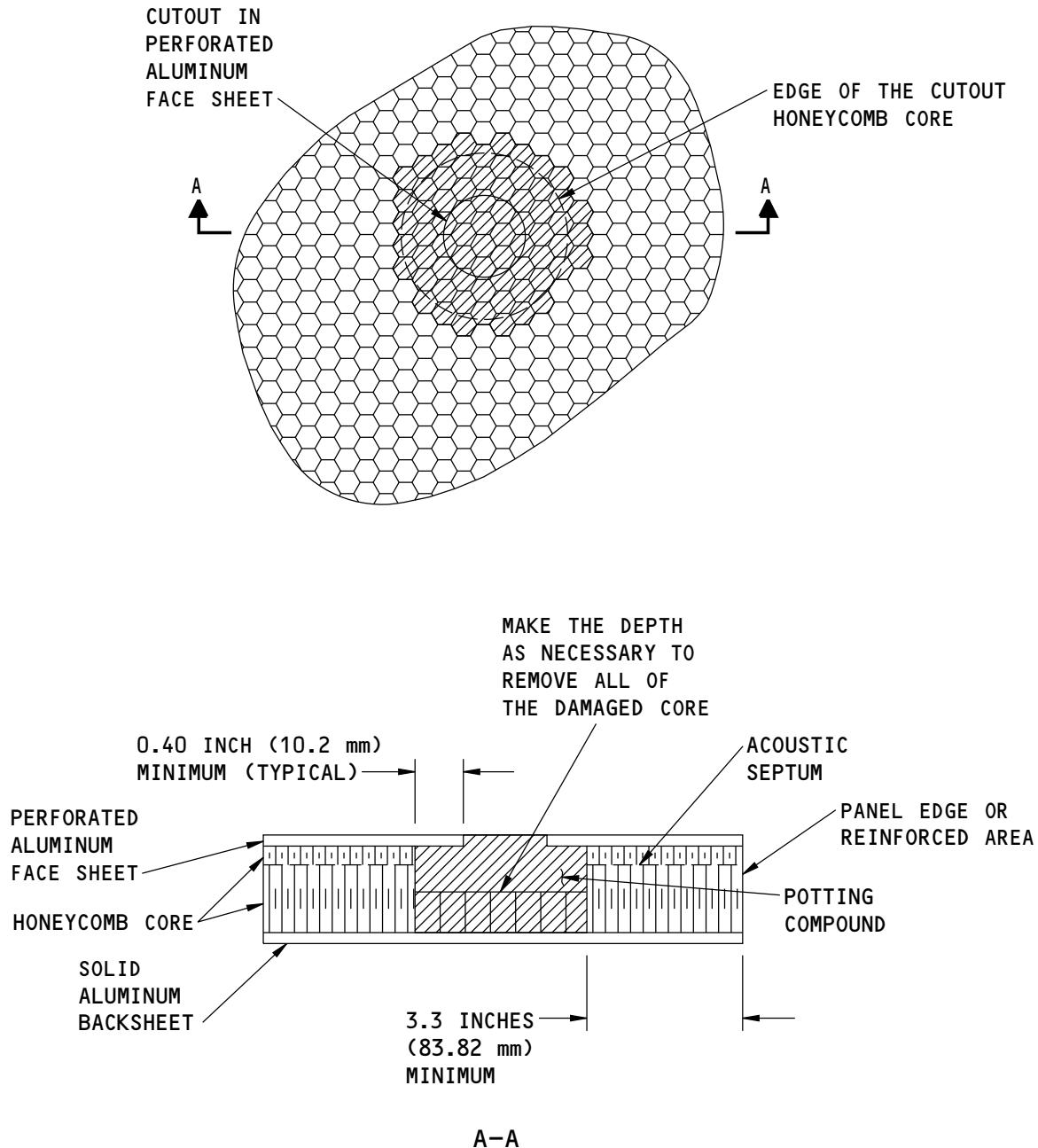
54-10-01

REPAIR 7
Page 203

Nov 10/2012

D634A210

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Layout of the Repair Parts
Figure 203

54-10-01
REPAIR 7
 Page 204

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME
BMS 5-28, TYPE 3 POTTING COMPOUND [2] [3]	EPOCAST 1511A/B	[4]	20 MINUTES	7 DAYS AT 77° ±10°F 5 HOURS AT 125° ±10°F
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND [5]	EPOCAST 1614-A1	[4]	8 HOURS	90 MINUTES AT 260°F ±10°F

TABLE A

NOTES

- [1] APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 5°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.
- [2] THE PASTE IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE 1 YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).
- [3] BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 3.
- [4] MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.
- [5] THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT 0°F (-18°C) OR LOWER TEMPERATURE.

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Potting Compound Cure Times
Figure 204

54-10-01

REPAIR 7
Page 205

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 8 - INLET COWL INNER BARREL ACOUSTIC PANEL SKIN WITH CRACK DAMAGE

1. Applicability

- A. Repair 8 is applicable to crack damage on the Inlet Cowl Inner Barrel Acoustic panel shown in Inlet Cowl Inner Barrel Acoustic Panel Location, Figure 201/REPAIR 8 that is:
 - (1) Between 3.00 inches and 6.00 inches (76.2 mm and 152.4 mm) in length
 - (2) A minimum of 3.3 inches (83.8 mm) from a doubler or the edge of the acoustic panel.
- B. Repair 8 is not applicable to an acoustic panel with honeycomb core damage.

2. General

- A. Repair 8 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. This repair will cause a loss in acoustic panel area. Refer to 54-00-01 for the acoustic loss limits for the inlet cowl.
- C. Get access to the damaged area.
- D. Use a Non-Destructive Test (NDT) procedure to find the length, and width of the damage. Refer to 737 NDT Part 1, 51-01-02.
- E. Refer to Definitions of the Facesheets, Figure 202/REPAIR 8 for the definitions of the perforated face sheet and the solid face sheet of the honeycomb core area.
- F. Do the repair as given in Paragraph 4./REPAIR 8
- G. 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.

54-10-01

REPAIR 8
Page 201

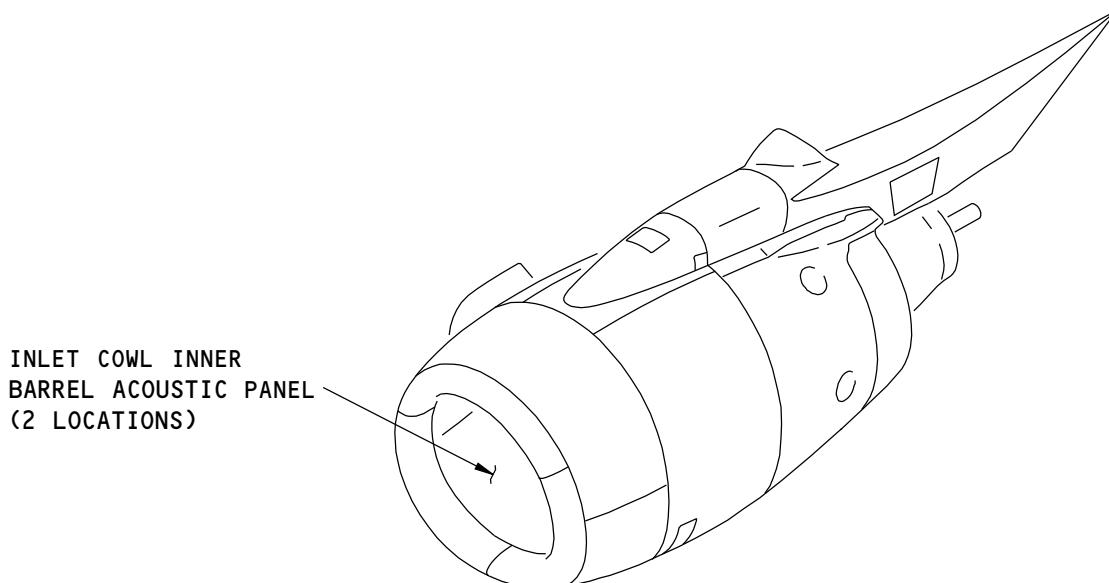
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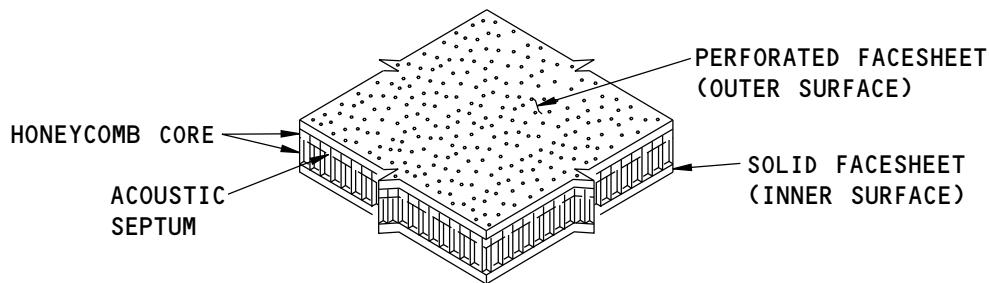


737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201



G67462 S0006591564_V1

Definitions of the Facesheets
Figure 202

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
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING

54-10-01

REPAIR 8
Page 202
Jul 10/2015

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
51-70-10	ALUMINUM HONEYCOMB STRUCTURE REPAIR PROCEDURES
54-00-01	NACELLES/PYLONS - GENERAL
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-41-04	Application of Interior Decorative 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. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES, OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE WORK AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, SKIN IRRITATION OR INJURY TO PERSONS CAN OCCUR. DO NOT USE EQUIPMENT THAT CAUSES AN ELECTRICAL ARC OR SPARK IN AN AREA WHERE THE IGNITION OF THE SOLVENT IS POSSIBLE. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INTO THE INTERNAL AREAS OF THE ALUMINUM PANEL. IF YOU DO NOT OBEY, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

- A. Drill a 0.25 inch (6.35 mm) diameter stop hole at the ends of the crack. Refer to 51-10-02 for the procedures.
 - B. Make the part [1] repair doubler to the same contour as the acoustic panel skin. Refer to Table 201/REPAIR 8.
 - C. Make the fastener hole pattern on the part [1] repair doubler. Refer to Layout of the Repair Parts, Figure 203/REPAIR 8.
 - (1) Assemble the part [1] repair doubler on the perforated face sheet.
 - (2) Mark the fastener pattern on the part [1] repair doubler.
 - (3) Put a mark on the perforated face sheet around the edges of the part [1] repair doubler to put it in position again later.
 - (4) Drill the pilot holes through the part [1] repair doubler and the perforated face sheet with a 0.161 inch diameter drill. Refer to Layout of the Repair Parts, Figure 203/REPAIR 8.
- NOTE:** Two rows of fasteners are necessary on each side of the crack and parallel to it.
- (5) Remove the part [1] repair doubler.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Doubler	1	2024-T3 sheet, 0.071 inch (1.80 mm) thick

54-10-01

REPAIR 8
Page 203

Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

D. Prepare the honeycomb core for the repair.

- (1) Cut out the honeycomb core below the perforated face skin at each fastener hole as shown in Layout of the Repair Parts, Figure 203/REPAIR 8.
- (2) Fill the spaces in the honeycomb core at each fastener hole with BMS 5-28, Type 7 potting compound.

NOTE: As an alternative to BMS 5-28, Type 7, you can use BMS 5-28, Type 14, Class 2. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A .
- (3) Cure the potting compound. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A for the cure times and 51-70-10 for the cure procedures.
- (4) After the potting compound has cured, remove the unwanted potting compound that protrudes from the perforated face sheet.
 - (a) Make the surface of the potting compound smooth with the surface of the skin.
- (5) Assemble the part [1] repair doubler on the perforated face sheet as shown in Layout of the Repair Parts, Figure 203/REPAIR 8.
 - (a) Make sure the fastener holes are aligned.
- (6) Drill the fastener holes through the acoustic panel with a 0.161 inch diameter drill.
- (7) Remove the part [1] repair doubler.
- (8) Remove the nicks, gouges, scratches, and sharp corners from the initial acoustic panel skin. Refer to 51-10-02.
- (9) Remove the sharp edges on the repair doubler and the initial skin as given in BAC 5300, Sonic Edge Finish.
- (10) Apply a chemical conversion coating to the bare surfaces of the part [1] repair doubler and the acoustic panel skins. Refer to 51-20-01.
- (11) Apply one layer of BMS 10-79, Type III primer to the mating surfaces of the part [1] Repair Doubler and the acoustic panel skins. Refer to SOPM 20-44-04.

E. Install the part [1] repair doubler as shown in Layout of the Repair Parts, Figure 203/REPAIR 8.

- (1) Apply BMS 5-109, Type II, Class 2 adhesive paste to the mating surface of the part [1] repair doubler.

NOTE: As an alternative to BMS 5-109, Type II, Class 2, use BMS 5-92, Type I. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A .

 - (a) Make the thickness of the adhesive paste approximately 0.020 inch (0.51 mm).
- (2) Put the part [1] repair doubler on the perforated face sheet and install temporary washers and fasteners to hold it in position.

NOTE: Install FEP parting film above the surface of the part [1] repair doubler at the washer locations. This will make it easier to remove the washers and temporary fasteners after the potting compound is cured.
- (3) Install the vacuum bag equipment on the repair as shown in Vacuum Bag Installation, Figure 205/REPAIR 8. Refer to 51-70-10 for the vacuum bag procedures.
- (4) Cure the layup. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 8, Table A and SRM 51-70-10.
- (5) Remove the vacuum bag equipment and the temporary fasteners.

54-10-01

REPAIR 8
Page 204
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

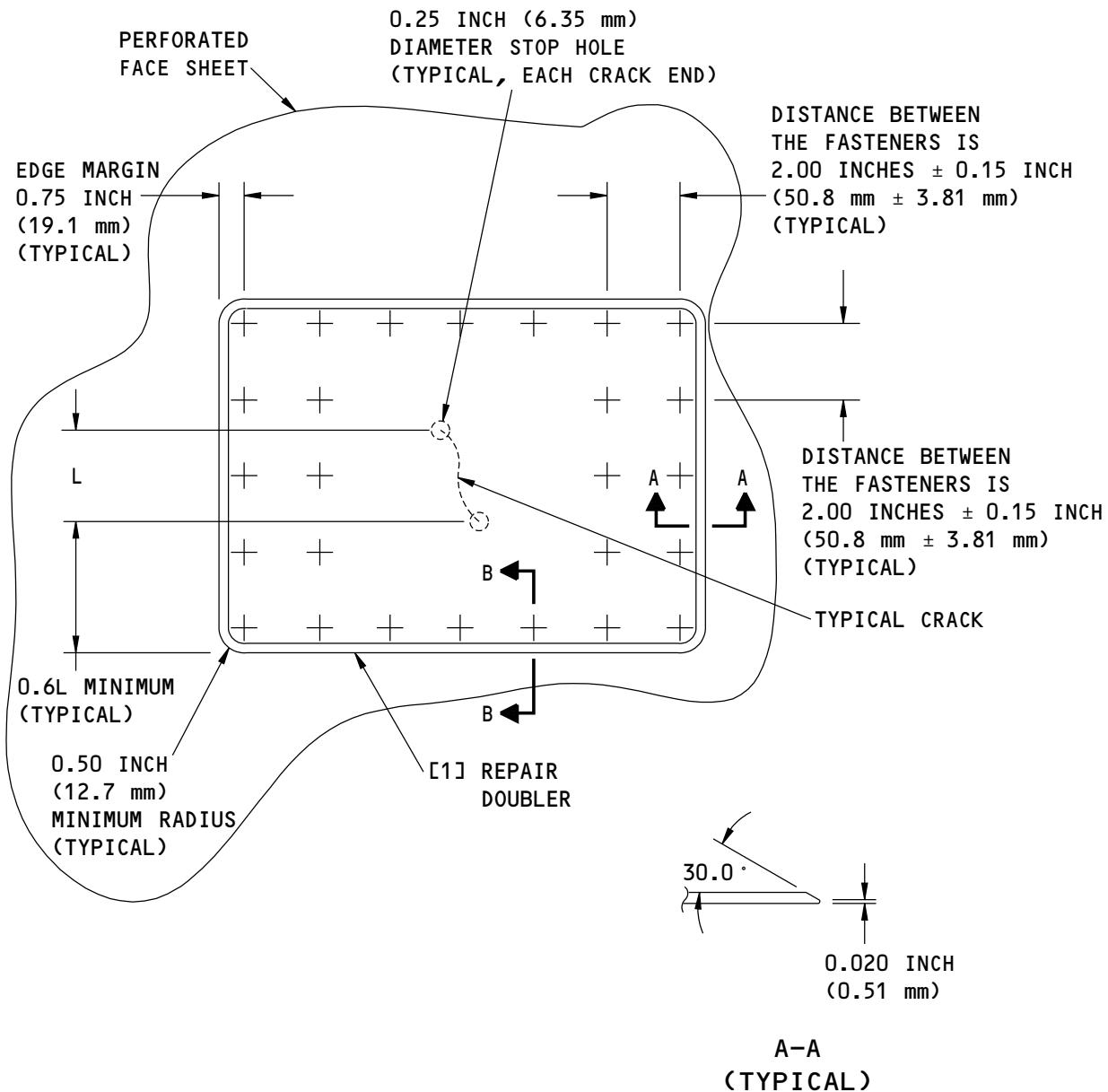
- (6) Drill the permanent fastener holes. Refer to SRM 51-40-05 .
- (7) Countersink the fastener holes. Refer to 51-40-08.
- (8) Apply a chemical conversion coating to the bare surfaces of the holes in the part [1] repair doubler and the acoustic panel skins. Refer to 51-20-01.
- (9) Install the permanent fasteners wet with BMS 5-95 sealant or BMS 5-45 as an option. Refer to 51-40-02.
 - (a) Use a torque that is between 25 and 35 pound inches.
- (10) Apply one layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surface of the part [1] repair doubler. Refer to SOPM 20-41-04.

54-10-01

REPAIR 8
Page 205
Jul 10/2015

D634A210

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FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL A BACB30NW6K HEX-DRIVE BOLT WITH A BACN10JC3CD NUT AND AN AN970-3 WASHER AS NECESSARY.

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Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)

54-10-01

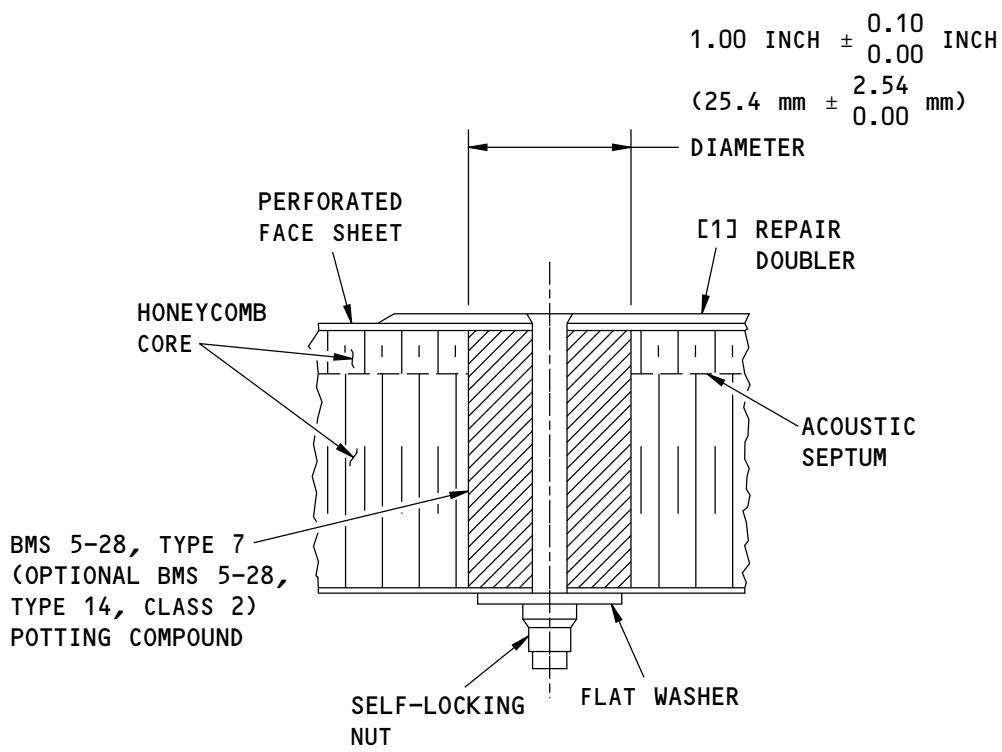
REPAIR 8
Page 206

Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



(TYPICAL AT EACH BOLT INSTALLATION)
B-B

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Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

54-10-01

REPAIR 8
Page 207
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE OR POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME
BMS 5-28, TYPE 7 POTTING COMPOUND [2] [3]	CG-1305 R/H EPOCAST 89537 A/B	[4]	60 MINUTES	7 DAYS AT 77° ±10°F 90 MIN AT 260° ±10°F [1]
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND [8]	EPOCAST 1614-A1	[4]	8 HOURS	90 MINUTES AT 260°F ±10°F
BMS 5-109, TYPE II, CLASS 2, ADHESIVE [5]	EA 934NA	[6]	30 MINUTES [7]	1 HOUR AT 200° ±10°F 9 HOURS AT 160° ±10°F 25 HOURS AT 120° ±10°F 7 DAYS AT 77° ±10°F
BMS 5-92, TYPE I ADHESIVE	EC 2216 B/A GRAY	[9]	90 MINUTES	60 MINUTES AT 250° ±10°F 130 MINUTES AT 160° ±10°F 180 MINUTES AT 120° ±10°F 24 HOURS AT 77° ±10°F

TABLE A

NOTES

- [1] APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 3°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.
- [2] THE LIQUID IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE ONE YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).
- [3] BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 7.
- [4] MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.
- [5] BMS 5-92, TYPE I ADHESIVE IS AN ALTERNATIVE TO BMS 5-109, TYPE II, CLASS 2 IN REPAIRS WHERE A LONGER WORK TIME IS NECESSARY.
- [6] MIX A RATIO OF 32-34 PARTS HARDENER (PART B) TO 100 PARTS RESIN (PART A) BY WEIGHT.
- [7] YOU MUST DO THE REPAIR BEFORE THE END OF THE TIME GIVEN.
- [8] THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT -20°F (-29°C) OR LOWER TEMPERATURE.
- [9] MIX A RATIO OF 100 PARTS BASE (PART B) TO 140 PARTS ACCELERATOR (PART A) BY WEIGHT.

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Potting Compound And Adhesive Cure Times
Figure 204

54-10-01

REPAIR 8

Page 208

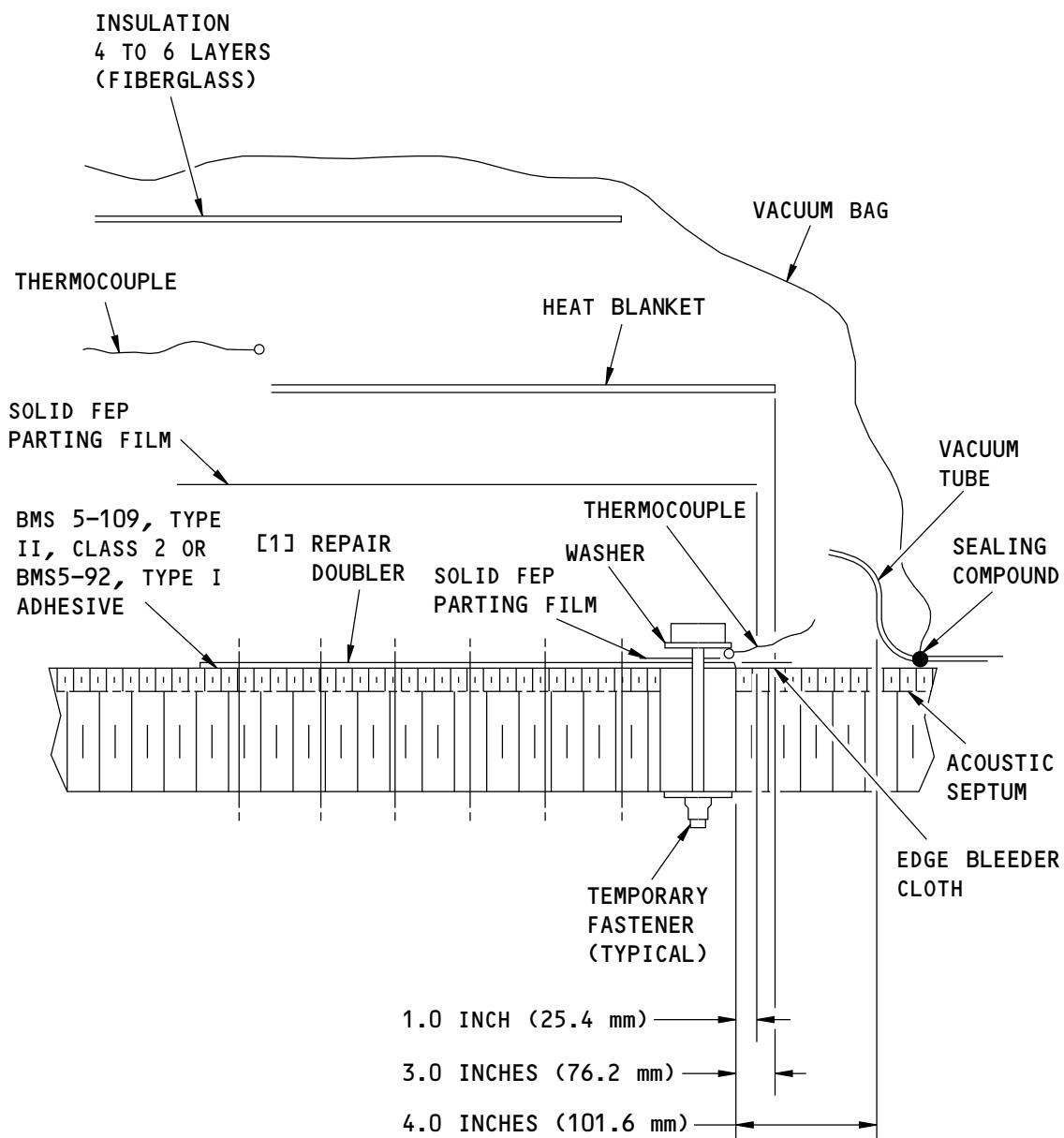
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: REFER TO SRM 51-70-10 FOR THE VACUUM BAG INSTALLATION PROCEDURES.

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Vacuum Bag Installation
Figure 205

54-10-01

REPAIR 8
Page 209
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 9 - INLET COWL INNER BARREL ACOUSTIC PANEL SKIN WITH DISBONDS

1. Applicability

- A. Repair 9 is applicable to disbond damage on the Inlet Cowl Inner Barrel Acoustic panel shown in Inlet Cowl Inner Barrel Acoustic Panel Location, Figure 201/REPAIR 9 that is:
 - (1) Between 3.00 inches and 7.00 inches (76.2 mm and 177.8 mm) in diameter.
 - (2) A minimum of 3.3 inches (83.8 mm) from a doubler or the edge of the acoustic panel.

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. This repair will cause a loss in acoustic panel area. Refer to 54-00-01 for the acoustic loss limits for the inlet cowl.
- C. Get access to the damaged area.
- D. Use a Non-Destructive Test (NDT) procedure to find the length, and width of the disbond. Refer to 737 NDT Part 1, 51-01-02.
 - (1) Refer to Definitions of the Facesheets, Figure 202/REPAIR 9 for the definitions of the perforated face sheet and the solid face sheet of the honeycomb core area.
- E. Do the repair as given in Paragraph 4./REPAIR 9
- F. 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.

54-10-01

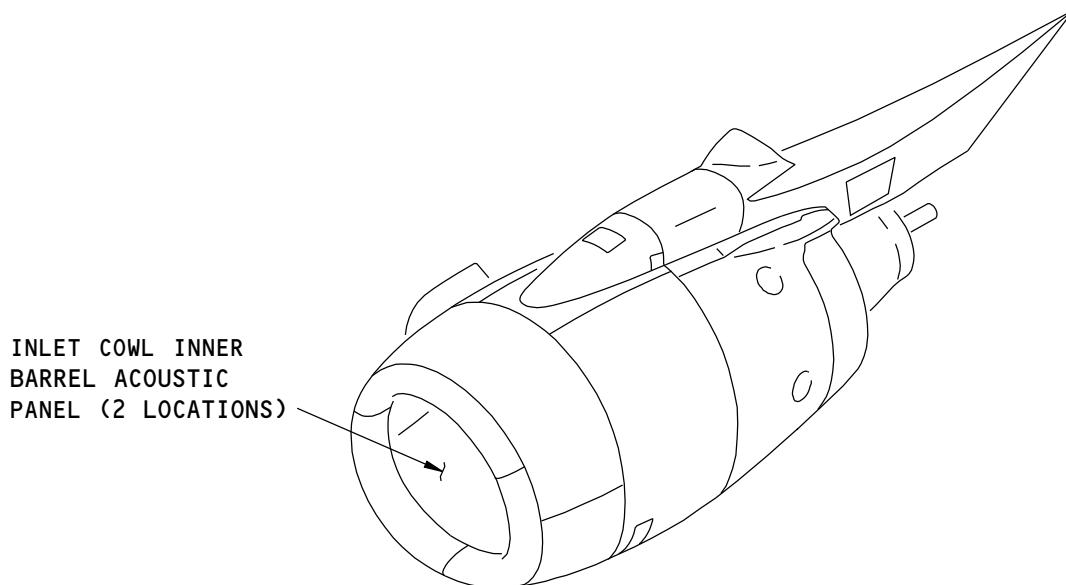
REPAIR 9
Page 201
Jul 10/2015

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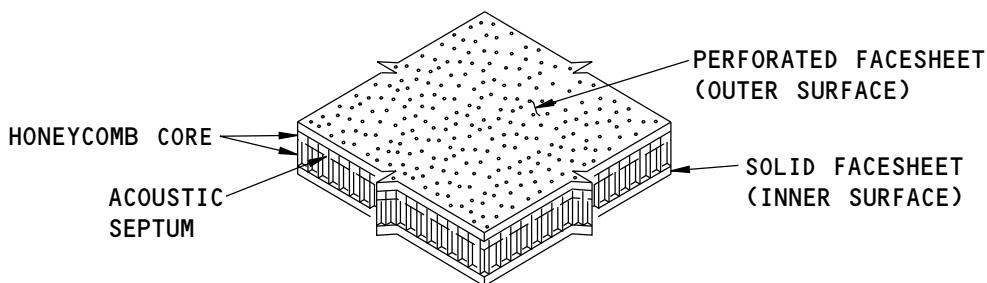
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737-800
STRUCTURAL REPAIR MANUAL



G68226 S0006591571_V1
Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201



G68229 S0006591572_V1

Definitions of the Facesheets
Figure 202

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
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
51-70-10	ALUMINUM HONEYCOMB STRUCTURE REPAIR PROCEDURES

54-10-01

REPAIR 9
Page 202
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
54-00-01	NACELLES/PYLONS - GENERAL
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-41-04	Application of Interior Decorative 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. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES, OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE WORK AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, SKIN IRRITATION OR INJURY TO PERSONS CAN OCCUR. DO NOT USE EQUIPMENT THAT CAUSES AN ELECTRICAL ARC OR SPARK IN AN AREA WHERE THE IGNITION OF THE SOLVENT IS POSSIBLE. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INTO THE INTERNAL AREAS OF THE ALUMINUM PANEL. IF YOU DO NOT OBEY, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

- A. Make the part [1] Repair Doubler to the same contour as the acoustic panel. Refer to Table 201/REPAIR 9.
 - B. Make the fastener hole pattern on the part [1] Repair Doubler. Refer to Layout of the Repair Parts, Figure 203/REPAIR 9.
 - (1) Assemble the part [1] Repair Doubler on the perforated face sheet.
 - (2) Mark the fastener pattern on the part [1] Repair Doubler.
 - (3) Put a mark on the perforated face sheet around the edges of the part [1] Repair Doubler to put it in position again later.
 - (4) Drill the pilot holes through the part [1] Repair Doubler and the perforated face sheet with a 0.161 inch diameter drill. Refer to Layout of the Repair Parts, Figure 203/REPAIR 9.
 - (5) Remove the part [1] Repair Doubler.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Doubler	1	2024-T3 sheet, 0.071 inch (1.80 mm) thick

- C. Prepare the honeycomb core for the repair.

- (1) Cut out the honeycomb core below the perforated face skin at each fastener hole as shown in Layout of the Repair Parts, Figure 203/REPAIR 9.

54-10-01

REPAIR 9

Page 203

Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (2) Fill the spaces in the honeycomb core at each fastener hole with BMS 5-28, Type 7 potting compound.

NOTE: As an alternative to BMS 5-28, Type 7 you can use BMS 5-28, Type 14, Class 2. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A .

- (3) Cure the potting compound. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A for the cure times and 51-70-10 for the cure procedures.
- (4) After the potting compound has cured, remove the unwanted potting compound that protrudes from the perforated face sheet flush with the surface of the skin.
- (5) Assemble the part [1] Repair Doubler on the perforated face sheet again as shown in Layout of the Repair Parts, Figure 203/REPAIR 9. Make sure the fastener holes are aligned.
- (6) Drill the fastener holes through the acoustic panel with a 0.161 inch diameter drill.
- (7) Remove the part [1] Repair Doubler.
- (8) Remove the nicks, gouges, scratches, from the initial acoustic panel skin. Refer to 51-10-02.
- (9) Remove the sharp edges from the repair doubler and the initial skin as given in BAC 5300, Sonic Edge Finish.
- (10) Apply a chemical conversion coating to the bare surfaces of the part [1] Repair Doubler and the acoustic panel skins. Refer to 51-20-01.
- (11) Apply one layer of BMS 10-79, Type III primer to the mating surfaces of the part [1] Repair Doubler and the acoustic panel skins. Refer to SOPM 20-44-04.

D. Install the part [1] Repair Doubler as shown in Layout of the Repair Parts, Figure 203/REPAIR 9.

- (1) Apply BMS 5-109, Type II, Class 2 adhesive paste on the mating surface of the part [1] Repair Doubler.

NOTE: As an alternative to BMS 5-109, Type II, Class 2 you can use BMS 5-92, Type I. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A .

- (a) Make the thickness of the adhesive paste approximately 0.020 inch (0.51 mm).

- (2) Put the part [1] Repair Doubler on the perforated face sheet and install temporary washers and fasteners to hold it in position.

NOTE: Install FEP parting film above the surface of the part [1] Repair Doubler at the washer locations. This will make it easier to remove the washers and temporary fasteners after the potting compound is cured.

- (3) Install the vacuum bag equipment on the repair as shown in Vacuum Bag Installation, Figure 205/REPAIR 9. Refer to 51-70-10 for the vacuum bag procedures.

- (4) Cure the layup. Refer to Potting Compound And Adhesive Cure Times, Figure 204/REPAIR 9, Table A and SRM 51-70-10.

- (5) Remove the vacuum bag equipment and the temporary fasteners.

- (6) Drill the permanent fastener holes. Refer to 51-40-05.

- (7) Countersink the fastener holes. Refer to 51-40-08.

- (8) Apply a chemical conversion coating to the bare surfaces of the holes in the part [1] Repair Doubler and the acoustic panel skins. Refer to 51-20-01.

- (9) Install the permanent fasteners wet with BMS 5-95 sealant or BMS 5-45 sealant as an option. Refer to 51-40-02.

54-10-01

REPAIR 9
Page 204

Jul 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

- (a) Use a torque that is between 25 and 35 pound inches.
- (10) Apply one layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surface of the part [1] Repair Doubler. Refer to SOPM 20-41-04.

54-10-01

REPAIR 9

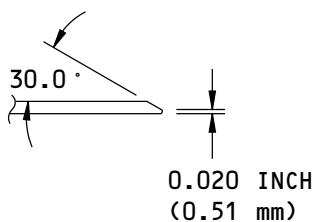
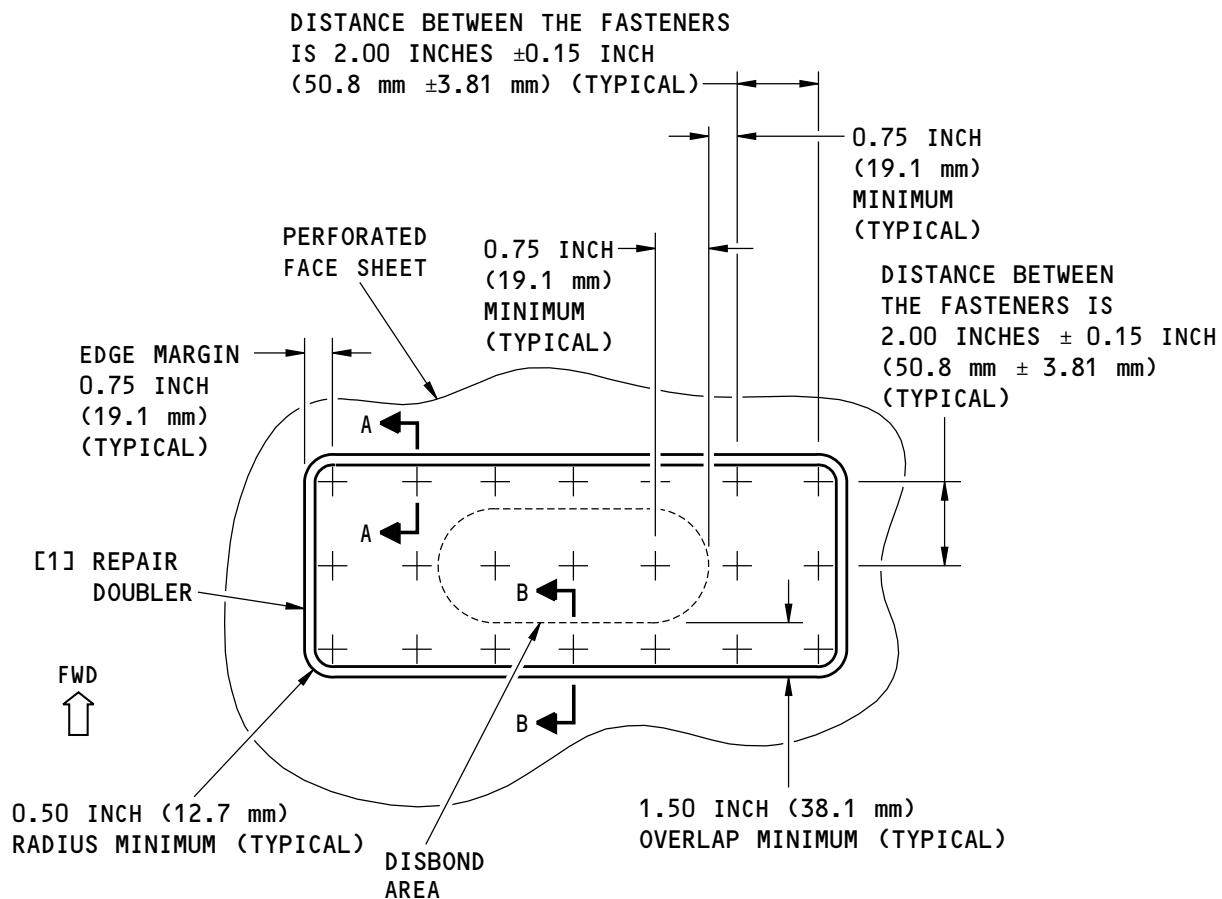
Page 205

Jul 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



A-A

FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL A BACB3ONW6K HEX-DRIVE BOLT WITH A BACN10JC3CD NUT AND AN AN970-3 WASHER AS NECESSARY.

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**Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)**

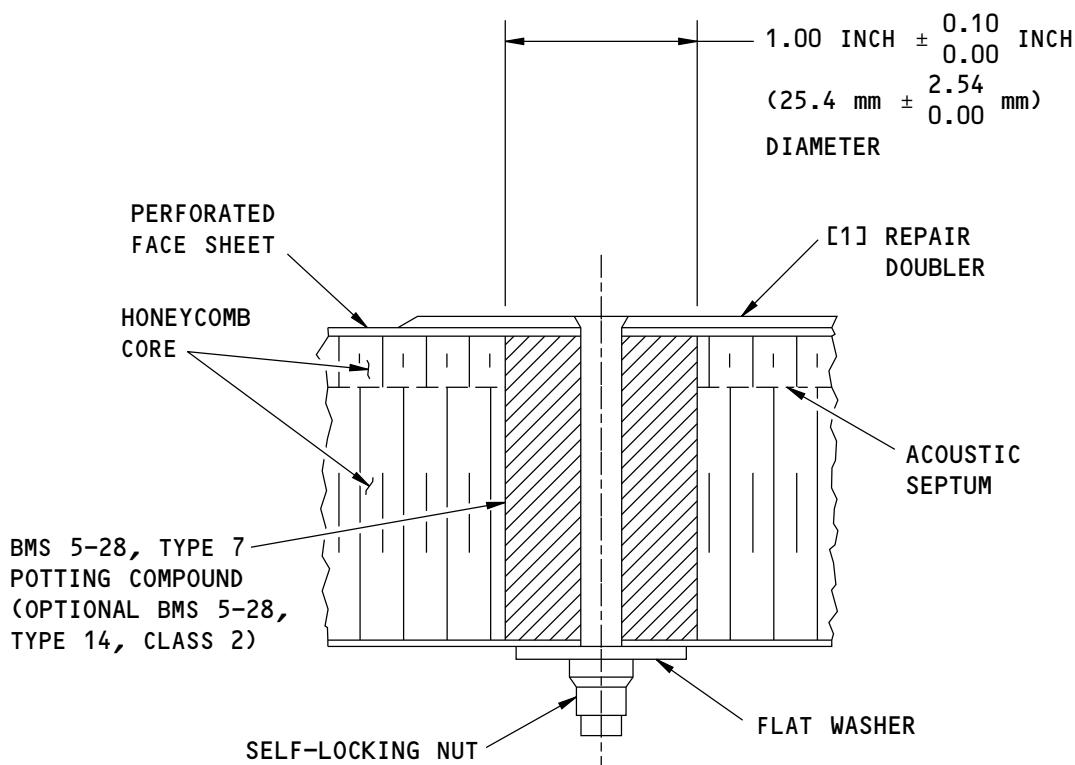
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REPAIR 9
Page 206
Jul 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



(TYPICAL AT EACH BOLT INSTALLATION)
B-B

2420614 S0000559124_V1

Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

54-10-01

REPAIR 9
Page 207
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE OR POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME
BMS 5-28, TYPE 7 POTTING COMPOUND 2 ➤ 3	CG-1305 R/H Epoxy 89537 A/B	4	60 MINUTES	7 DAYS AT 77° ±10°F 90 MIN AT 260° ±10°F 1
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND 8	Epoxy 1614-A1	4	8 HOURS	90 MINUTES AT 260°F ±10°F
BMS 5-109, TYPE II, CLASS 2, ADHESIVE 5	EA 934NA	6	30 MINUTES 7	1 HOUR AT 200° ±10°F 9 HOURS AT 160° ±10°F 25 HOURS AT 120° ±10°F 7 DAYS AT 77° ±10°F
BMS 5-92, TYPE I ADHESIVE	EC 2216 B/A Gray	9	90 MINUTES	60 MINUTES AT 250° ±10°F 130 MINUTES AT 160° ±10°F 180 MINUTES AT 120° ±10°F 24 HOURS AT 77° ±10°F

TABLE A

NOTES:

- 1 ➤ APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 3°F TO 7°F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.
- 2 ➤ THE LIQUID IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE ONE YEAR AFTER STORAGE AT 40°F TO 80°F (5°C TO 27°C).
- 3 ➤ BMS 5-28, TYPE 14, CLASS 2 IS AN ALTERNATIVE TO BMS 5-28, TYPE 7.
- 4 ➤ MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.
- 5 ➤ BMS 5-92, TYPE I ADHESIVE IS AN ALTERNATIVE TO BMS 5-109, TYPE II, CLASS 2 IN REPAIRS WHERE A LONGER WORK TIME IS NECESSARY.
- 6 ➤ MIX A RATIO OF 32-34 PARTS HARDENER (PART B) TO 100 PARTS RESIN (PART A) BY WEIGHT.
- 7 ➤ YOU MUST DO THE REPAIR BEFORE THE END OF THE TIME GIVEN.
- 8 ➤ THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTHS AFTER STORAGE AT -20°F (-29°C) OR LOWER TEMPERATURE.
- 9 ➤ MIX A RATIO OF 100 PARTS BASE (PART B) TO 140 PARTS ACCELERATOR (PART A) BY WEIGHT.

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Potting Compound And Adhesive Cure Times
Figure 204

54-10-01

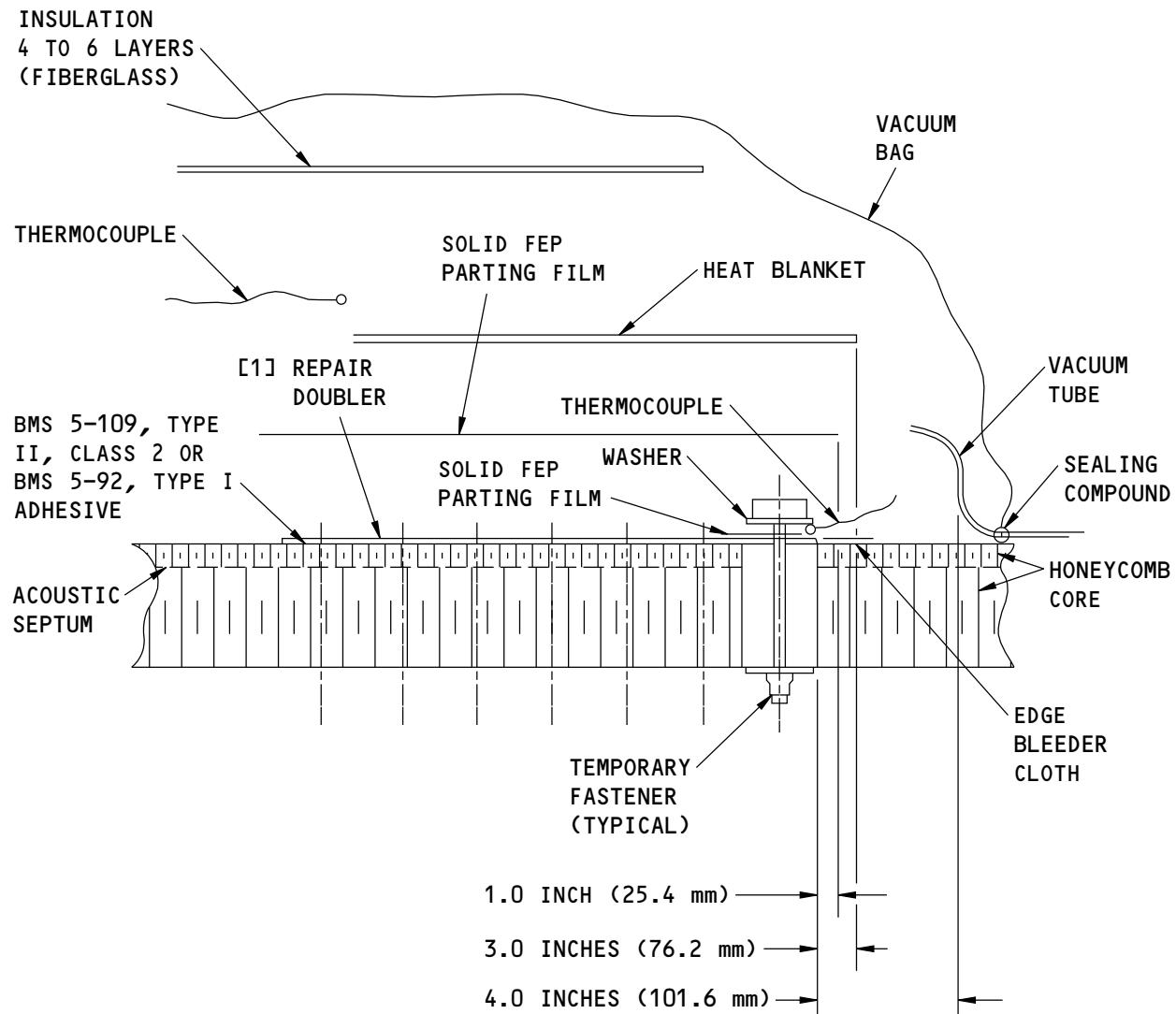
REPAIR 9
Page 208
Jul 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTE: REFER TO SRM 51-70-10 FOR THE VACUUM BAG INSTALLATION PROCEDURES.

2420713 S0000559127_V1

Vacuum Bag Installation
Figure 205

54-10-01

REPAIR 9
Page 209
Jul 10/2015

D634A210

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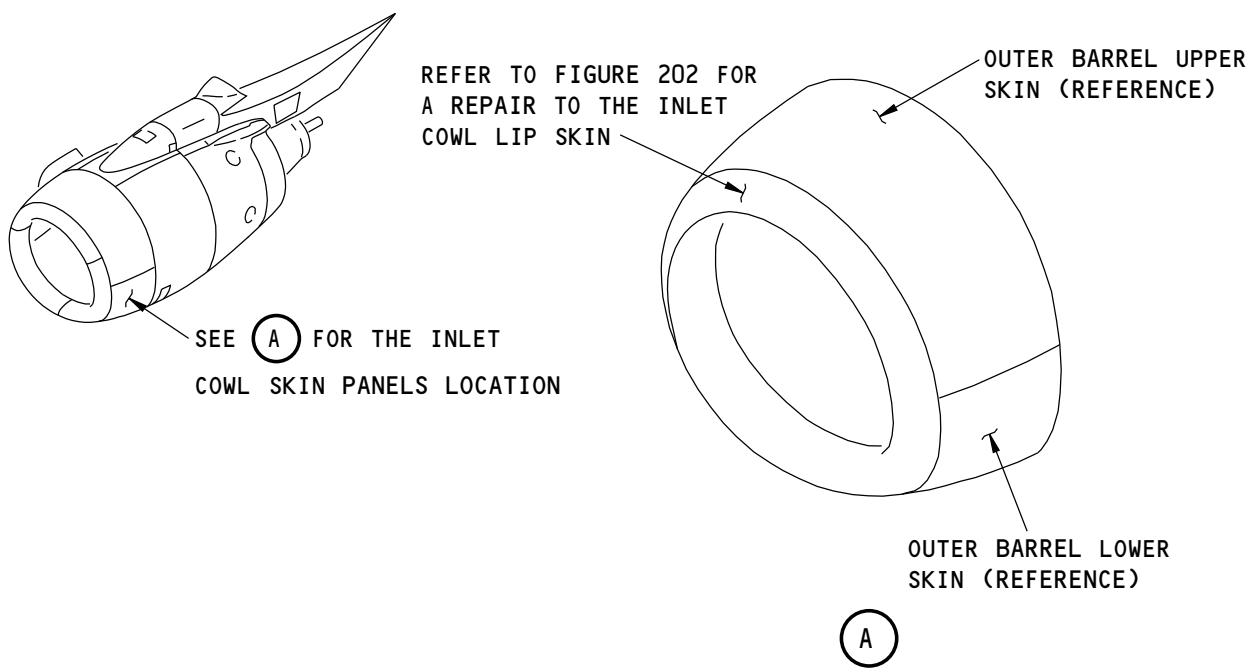


737-800 STRUCTURAL REPAIR MANUAL

REPAIR 10 - INLET COWL LIP SKIN

1. Applicability

- A. Repair 10 is applicable to damage that is:
- (1) On the lip skin of the inlet cowl (Refer to Inlet Cowl Skin Panels Location, Figure 201/REPAIR 10)
 - (2) A minimum of 1.75 inches (44.45 mm) from the nearest skin or repair splice
 - (3) A minimum of 2.85 inches (72.39 mm) from the edge of the lip skin
 - (4) Not more than 30 inches (762.0 mm) in the circumferential direction.



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**Inlet Cowl Skin Panels Location
Figure 201**

2. General

- A. Repair 10 is a permanent or time-limited repair.
- (1) Refer to 51-00-06 to find the definitions of the different categories of repairs.
 - (2) This is a permanent repair if you use the nutplates and countersink bolts as given in Figure 202/REPAIR 10. This is a time-limited repair if you use blind bolts. Refer to Paragraph 5./REPAIR 10 for the inspection instructions.
- B. Make sure the aerodynamic smoothness is satisfactory or there can be a decrease in the performance of the airplane. 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

54-10-01

REPAIR 10

Page 201

Nov 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300,	Forming, Straightening, and Fitting Metal Parts Blanking Sonic Area Edges
SOPM 20-20-02	Penetrant Methods of Inspection
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

CAUTION: MAKE SURE THAT YOU DO NOT CAUSE DAMAGE TO THE STRUCTURE ADJACENT TO THE LEADING EDGE SKINS.

- A. Cut and remove the damaged part of the inlet cowl skin as shown in Layout of the Repair Parts, Figure 202/REPAIR 10. Refer to 51-10-02 for the removal of damage.

- (1) Drill a 0.25 inch (6.35 mm) stop hole at each end of a crack to make sure that all of the crack damage is removed.
 - (2) Cut out the skin in the shape of a rectangle.
 - (3) Make the corner radii of the cut a minimum of 0.50 inch (12.7 mm).

- B. Put the skin around the cut back to the initial contour.

- C. Do a high frequency eddy current (HFEC) inspection of the damaged area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4 for the HFEC inspection procedures.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- D. Repeat steps 4.A through 4.C until all the damage is removed. If all the damage is removed, continue with step 4.E.

- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 10 and Figure 202/REPAIR 10.

- F. Put the repair parts in place as shown in Layout of the Repair Parts, Figure 202/REPAIR 10.

- G. Drill and countersink the necessary fastener holes. Refer 51-40-02, 51-40-05 and 51-40-08.

NOTE: Do not countersink more than 70 percent of the skin thickness to prevent a knife-edge condition in the skin.

- H. Remove all the nicks, scratches, burrs, gouges, and sharp edges from the repair parts and the bare surfaces of the skin.

- I. Break the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, for the sonic edge finish.

- J. Apply a chemical conversion coating to the repair parts and the bare surfaces of the initial skin. Refer to 51-20-01.

54-10-01

REPAIR 10

Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- K. Apply one layer of BAC 5710, Type 51 (Desoto Hi-Temp) primer (Refer to AMM PAGEBLOCK 51-21-99/701) to:
- (1) The internal and mating surfaces of the repair parts
 - (2) The bare surfaces of the internal surface of the skin.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 2219-0 sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 after forming. (Optional: Make from 2219-T62 sheet that is 0.080 inch (2.03 mm) thick.) (Optional: Make from 2024-0 clad sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 after forming.)
[2]	Doubler Splice	2	Use 2219-0 sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 after forming. (Optional: Make from 2219-T62 sheet that is 0.080 inch (2.03 mm) thick.) (Optional: Make from 2024-0 clad sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 after forming.)
[3]	Repair Plate	1	Use 2219-0 sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 after forming. (Optional: Cut the part from a spare lip skin or an undamaged part of a lip skin) (Optional: Make from 2024-0 clad sheet that is 0.080 inch (2.03 mm) thick. Heat treat to T62 after forming.)

- L. Install the part [1] doublers and part [2] doubler splices.
 - (1) Install the doublers and the doubler splices through the rectangular hole.
 - (2) Install the fasteners wet with BAC 5710, Type 51 (Desoto Hi-Temp) primer. Refer to Layout of the Repair Parts, Figure 202/REPAIR 10.
- M. Install the part [3] repair plate.
 - (1) Install the repair plate.
 - (2) Install the fasteners wet with BAC 5710, Type 51 (Desoto Hi-Temp) primer. Refer to Layout of the Repair Parts, Figure 202/REPAIR 10.
- N. Fill the space between the part [3] repair plate and the initial skin with BMS 5-63 aerodynamic smoother. Refer to 51-20-05.
- O. Apply the finish to the repair area as given in AMM 51-21-00/701.

54-10-01

REPAIR 10

Page 203

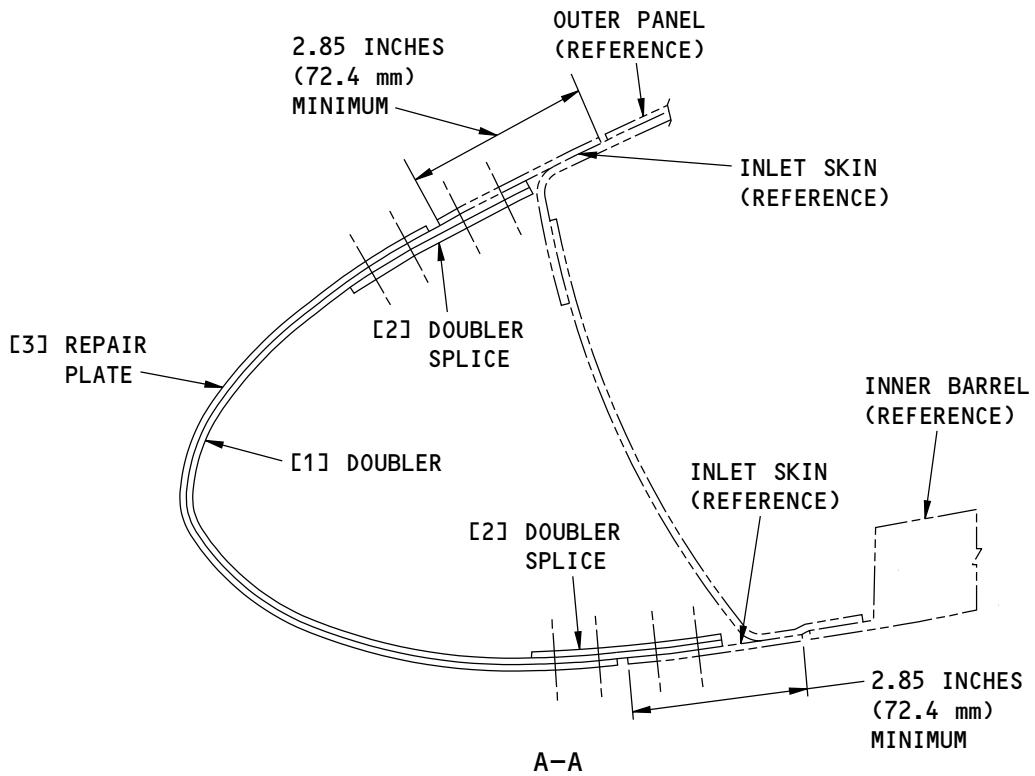
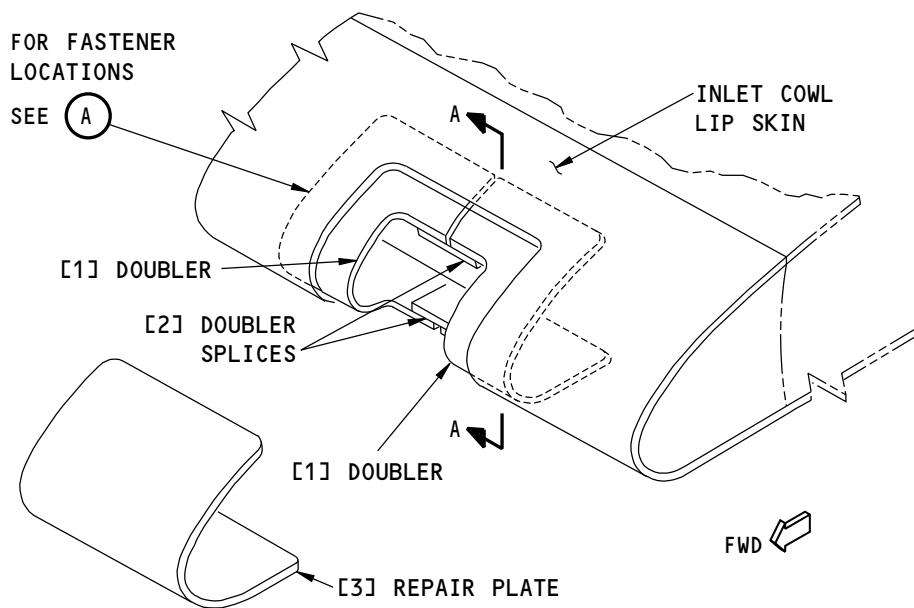
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

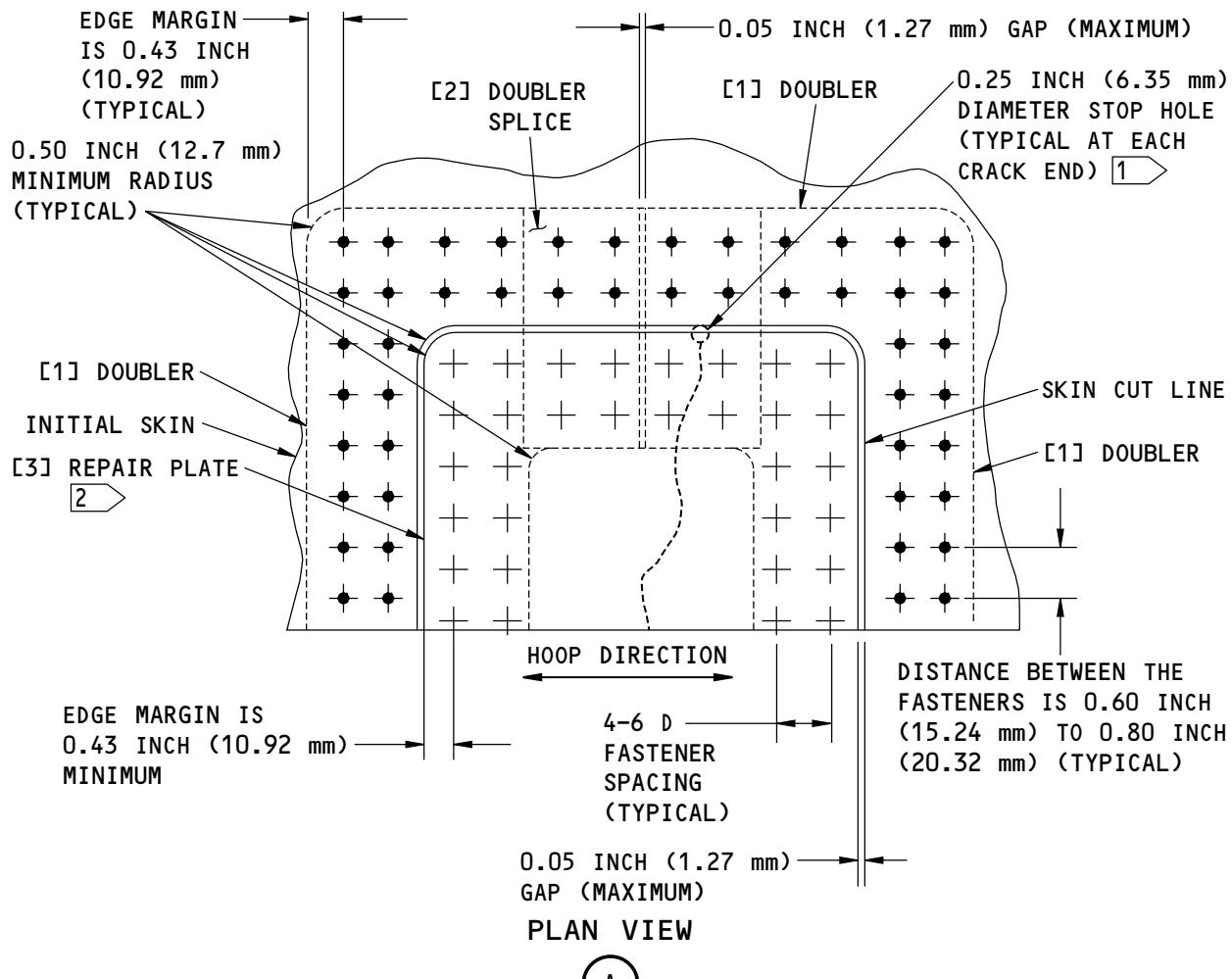
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REPAIR 10
Page 204
Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



NOTES

- [1] THE STOP HOLES PREVENT THE DAMAGE FROM BECOMING LARGER WHEN YOU CUT THE DAMAGED SKIN AWAY.
- [2] IF THE REPAIR PLATE IS CUT FROM INITIAL LIPSKIN, THE THICKNESS OF LIPSKIN MUST BE GREATER THAN OR EQUAL TO 0.08 INCH (2.03 mm) IF ALTERNATIVE NAS1399MW5 BLIND RIVETS ARE USED.

FASTENER SYMBOLS

- REPAIR FASTENER LOCATION. INSTALL AN NAS1097E5 RIVET
- + REPAIR FASTENER LOCATION. INSTALL A BACN10JP3CCD NUTPLATES WITH BACR15GF3() RIVETS. USE BACB30VF3K() COUNTERSINK BOLTS. AS AN ALTERNATIVE, YOU CAN INSTALL AN NAS1399MW5 BLIND RIVET AND INSPECT AS GIVEN PARGRAPH 5.

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**Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)**

54-10-01

REPAIR 10
Page 205
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

5. Inspection Instructions

- A. If you are using blind fasteners as given in Figure 202/REPAIR 10 then do an inspection of the repair at each 500 flight hours or 2 months interval, whichever comes first after installation of repair.

CAUTION: MAKE SURE THERE ARE NO LOOSE FASTENERS. IF YOU DO NOT OBEY, THE FASTENERS CAN ENTER THE ENGINE AND CAUSE DAMAGE.

- (1) Inspect all the blind rivets in the repair area.
- (2) Blind rivets that are loose, missing, or damaged must be replaced.

- B. Make sure that you replace the blind fasteners with permanent fasteners as given in Figure 202/REPAIR 10 before 3000 flight cycles or 18 months, whichever comes first after installation of repair.

54-10-01

REPAIR 10

Page 206

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 11 - INLET COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE A

1. Applicability

- A. Repair 11 is applicable to damage to the Inlet Cowl Outer Barrel Skin at a frame in Zone A (Man-Walk-Area). Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 11.
- B. Repair 11 is not applicable to damage over the forward or aft bulkheads.
- C. For repairs that overlap into Zone B, refer to 54-10-01, Repair 12. Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 11 for the locations of the repair zones.

2. General

- A. Repair 11 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).
- C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).
- D. The edges of the initial skin cutout must be a minimum of 2.50 inches (63.5 mm) from:
 - (1) Another repair doubler
 - (2) A chem-mill step
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

REPAIR 11

Page 201

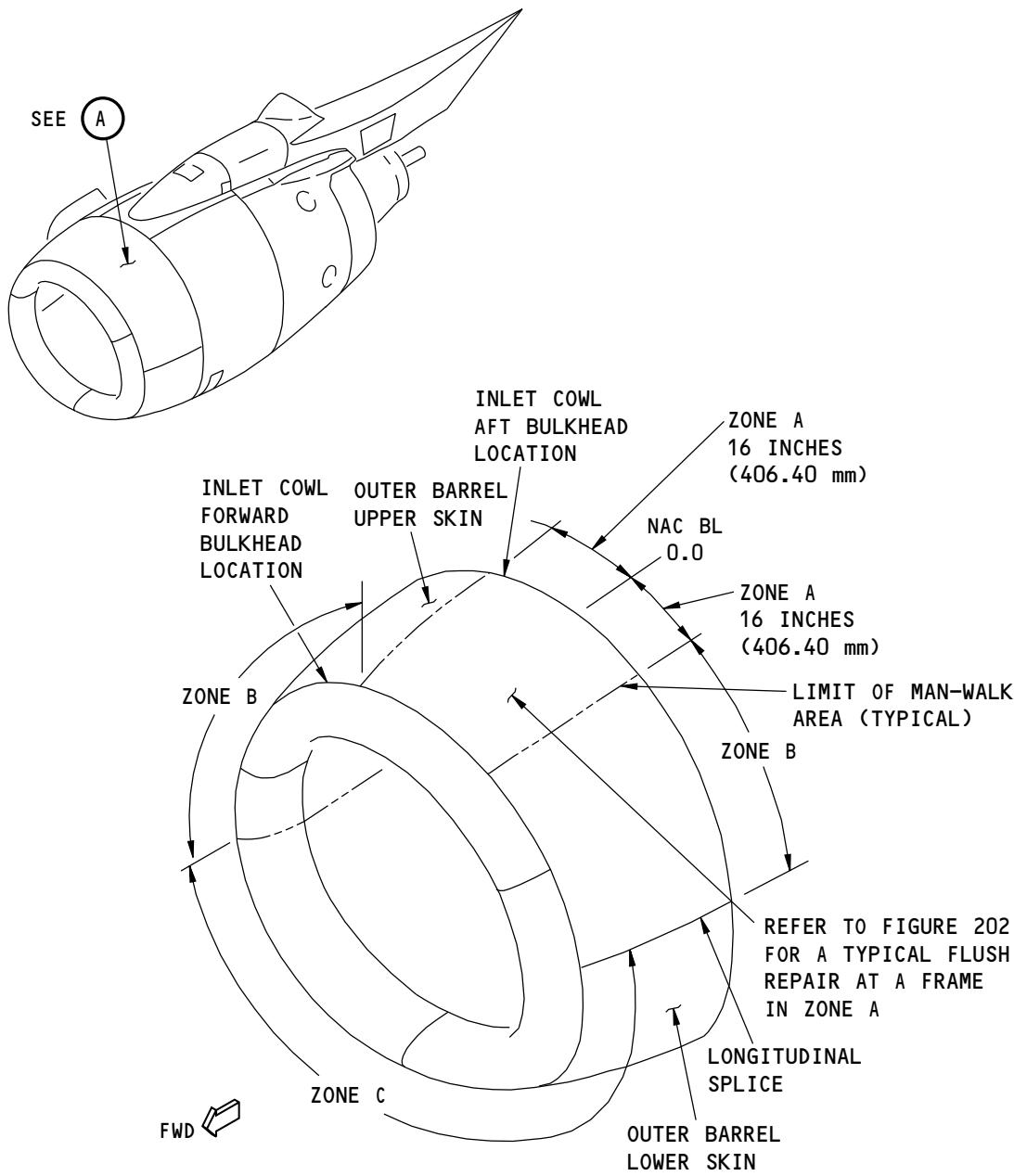
Nov 10/2013

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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE OF INLET COWL IS SHOWN,
RIGHT SIDE OF INLET COWL IS THE SAME

(A)

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Inlet Cowl Outer Barrel Skin Zones
Figure 201

54-10-01

REPAIR 11

Page 202

Nov 10/2012

D634A210



737-800 STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
54-10-01	INLET COWL SKIN
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when drilling the stop hole.
 - C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make the radii of the corners of the cutout a minimum of 0.50 inch (12.7 mm).
 - (2) Do not cause damage to the frame.
 - D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
- NOTE:** The penetrant inspection procedure is an alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 11 for the materials.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

54-10-01

REPAIR 11

Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: (Continued)

REPAIR MATERIAL			
[3]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 11.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 11. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
- J. Remove the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, section for the Sonic Edge Finish.
- K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.
- L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
- N. Install the fasteners with BMS 5-95 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after installation.
- P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):
 - (1) Around the edge of the part [1] doubler
 - (2) The space between the part [2] repair skin and the initial skin.
- Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

54-10-01

REPAIR 11

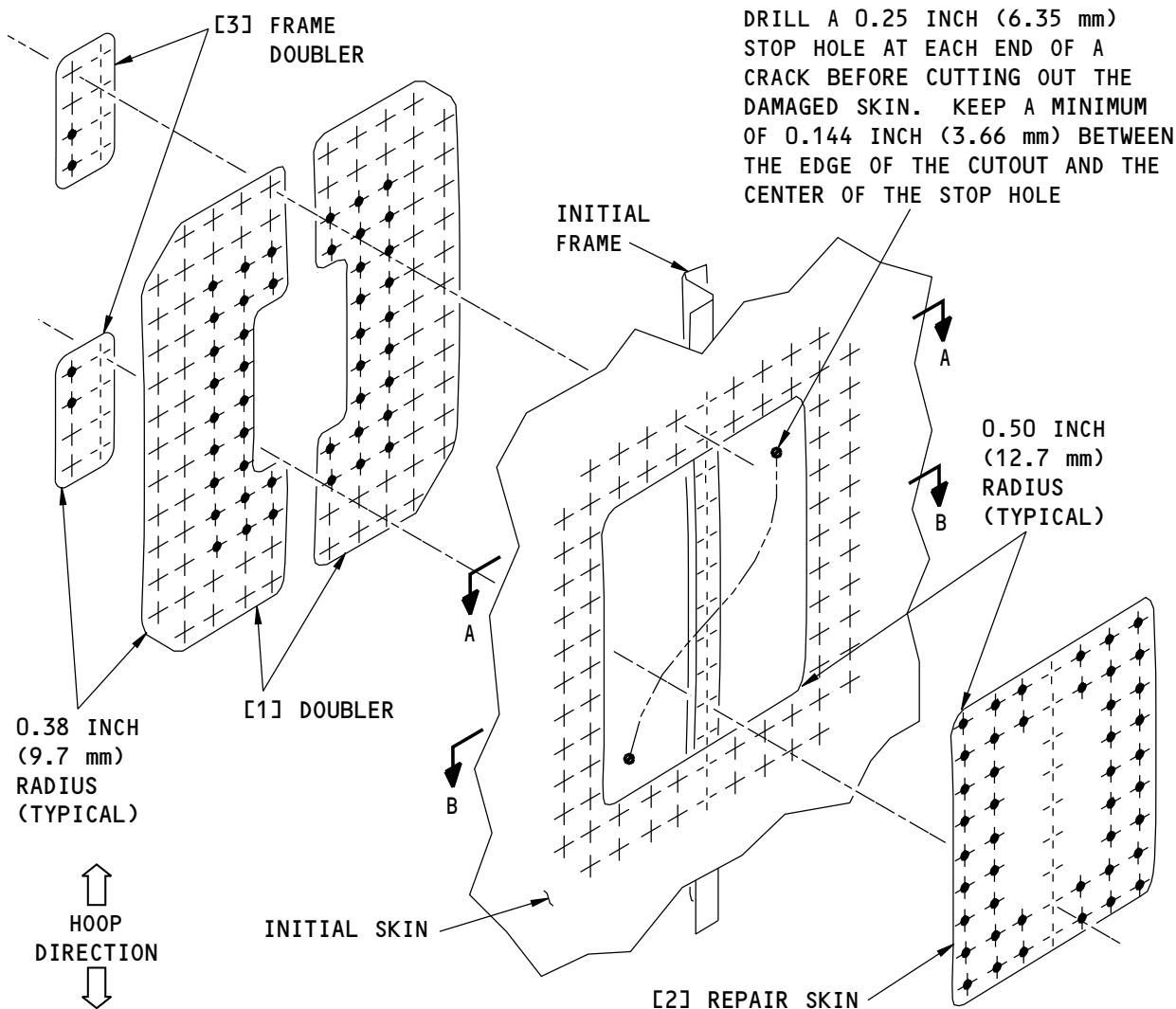
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

**FASTENER SYMBOLS**

- - INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.
- • REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.
- + REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-10-01**REPAIR 11**

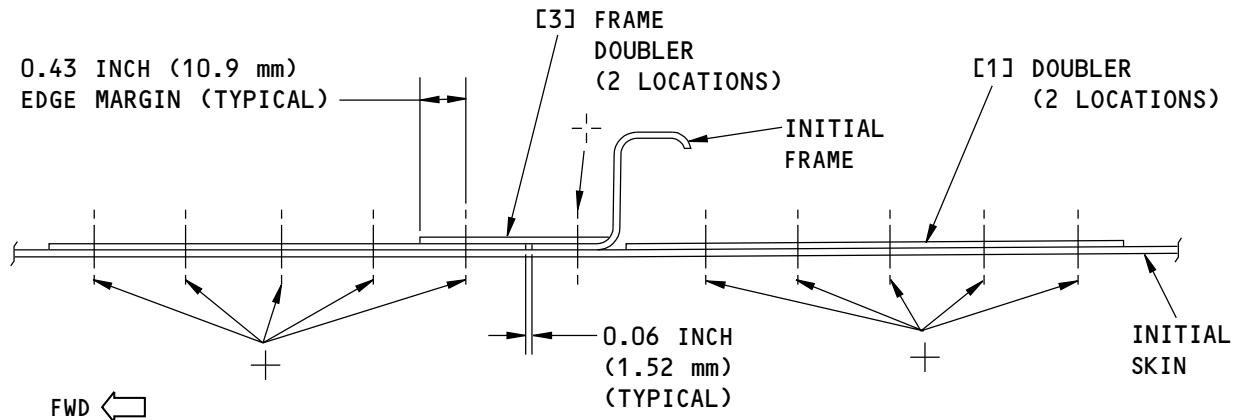
Page 205

Nov 10/2015

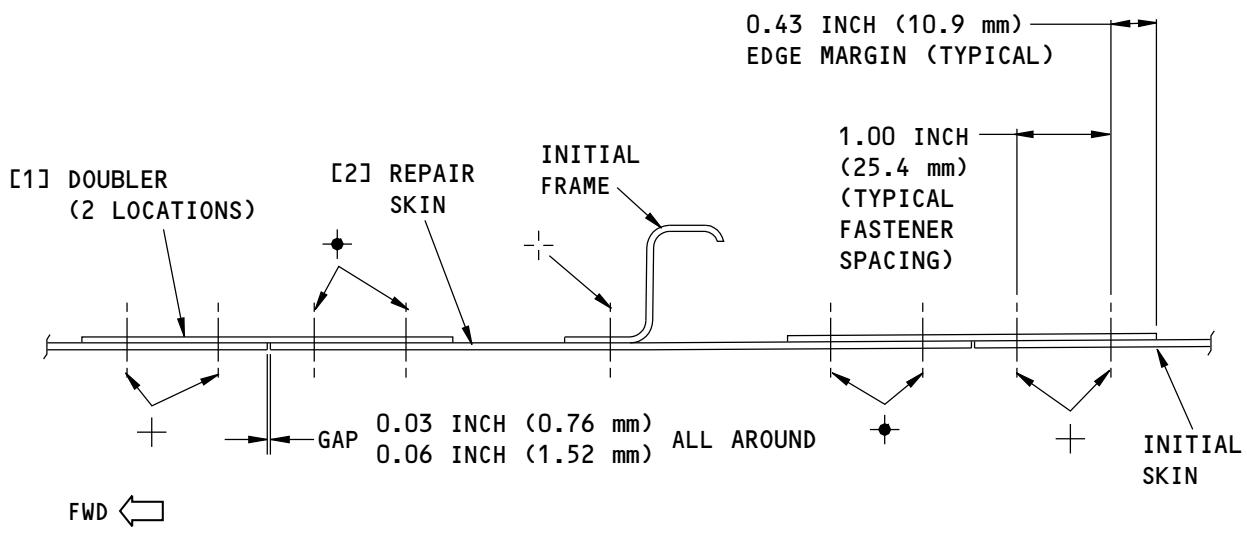
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737-800
STRUCTURAL REPAIR MANUAL



A-A



B-B

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 11
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 12 - INLET COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE B

1. Applicability

- A. Repair 12 is applicable to damage to the Inlet Cowl Outer Barrel Skin at a frame in Zone B. Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 12.
- B. Repair 12 is not applicable to damage over the forward or aft bulkheads.
- C. Repair 12 is not applicable to damage adjacent to ground support equipment (GSE) attachment points.

2. General

- A. Repair 12 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).
- C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).
- D. The edges of the initial skin cutout must be a minimum of 2.50 inches (63.5 mm) from:
 - (1) Another repair doubler
 - (2) A chem-mill step
 - (3) A fore/aft skin splice.
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

REPAIR 12

Page 201

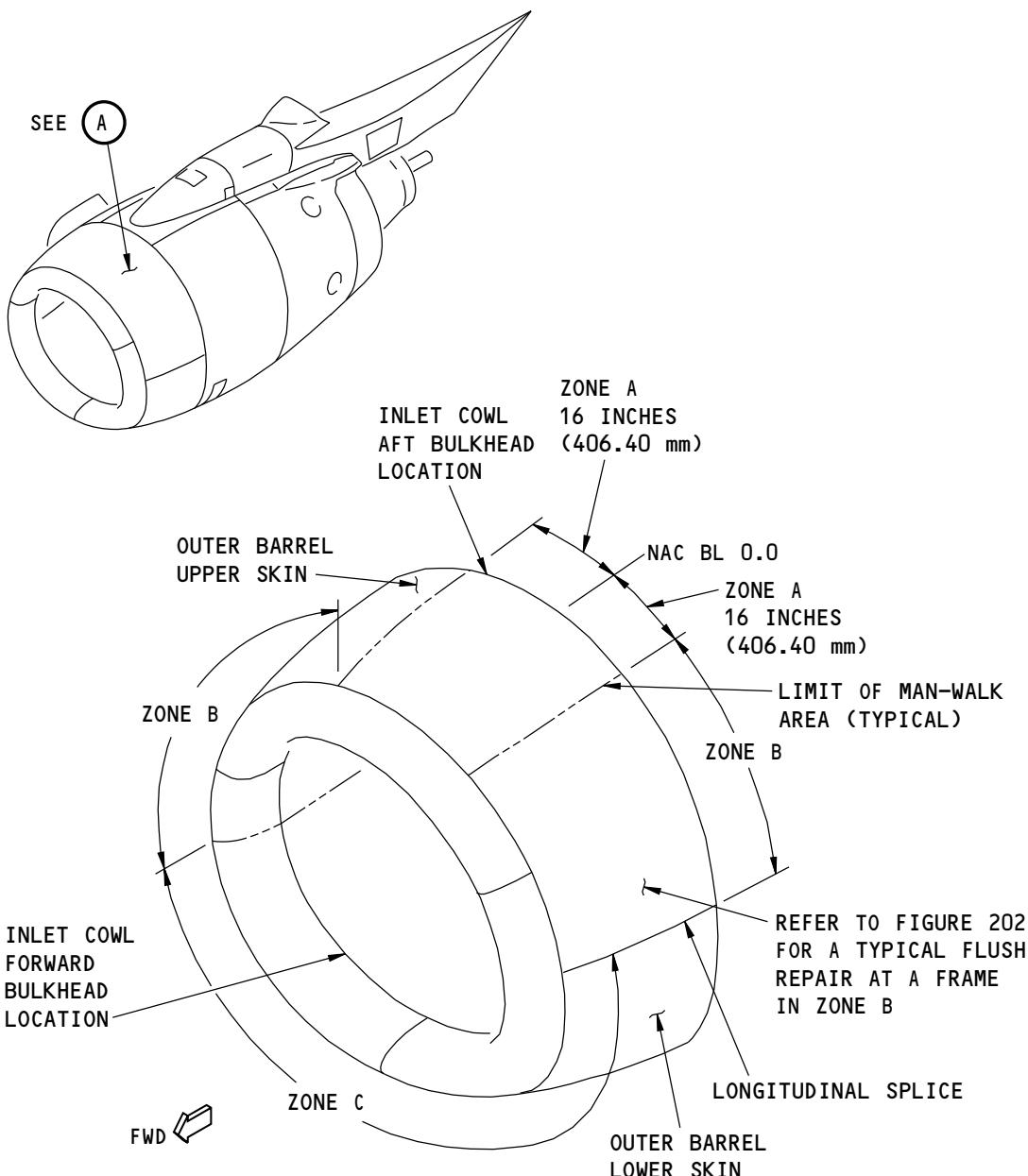
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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE OF INLET COWL IS SHOWN,
RIGHT SIDE OF INLET COWL IS OPPOSITE

(A)

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Inlet Cowl Outer Barrel Skin Zones
Figure 201

54-10-01

REPAIR 12
Page 202
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
- B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when drilling the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make the radii of the corners of the cutout a minimum of 0.50 inch (12.7 mm).
 - (2) Do not cause damage to the frame.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
NOTE: The penetrant inspection procedure is an alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 12 for the materials.
NOTE: If the part [3] fillers extend into Zone A, cut them where they overlap the chem-mill step of the skin. Discard the part of the fillers that overlap the thicker skin in Zone A.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet

54-10-01

REPAIR 12

Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: (Continued)

REPAIR MATERIAL			
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.020 inch (0.51 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 12.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 12. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the repair parts.
 - I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
 - J. Remove the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, for the Sonic Edge Finish.
 - K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.
 - L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
 - M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
 - N. Install the fasteners with BMS 5-95 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
 - O. Apply one layer of BMS 10-79, Type III primer to the fasteners after installing them.
 - P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):
 - (1) Around the edge of the part [1] doubler
 - (2) The space between the part [2] repair skin and the initial skin.
 - Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

54-10-01

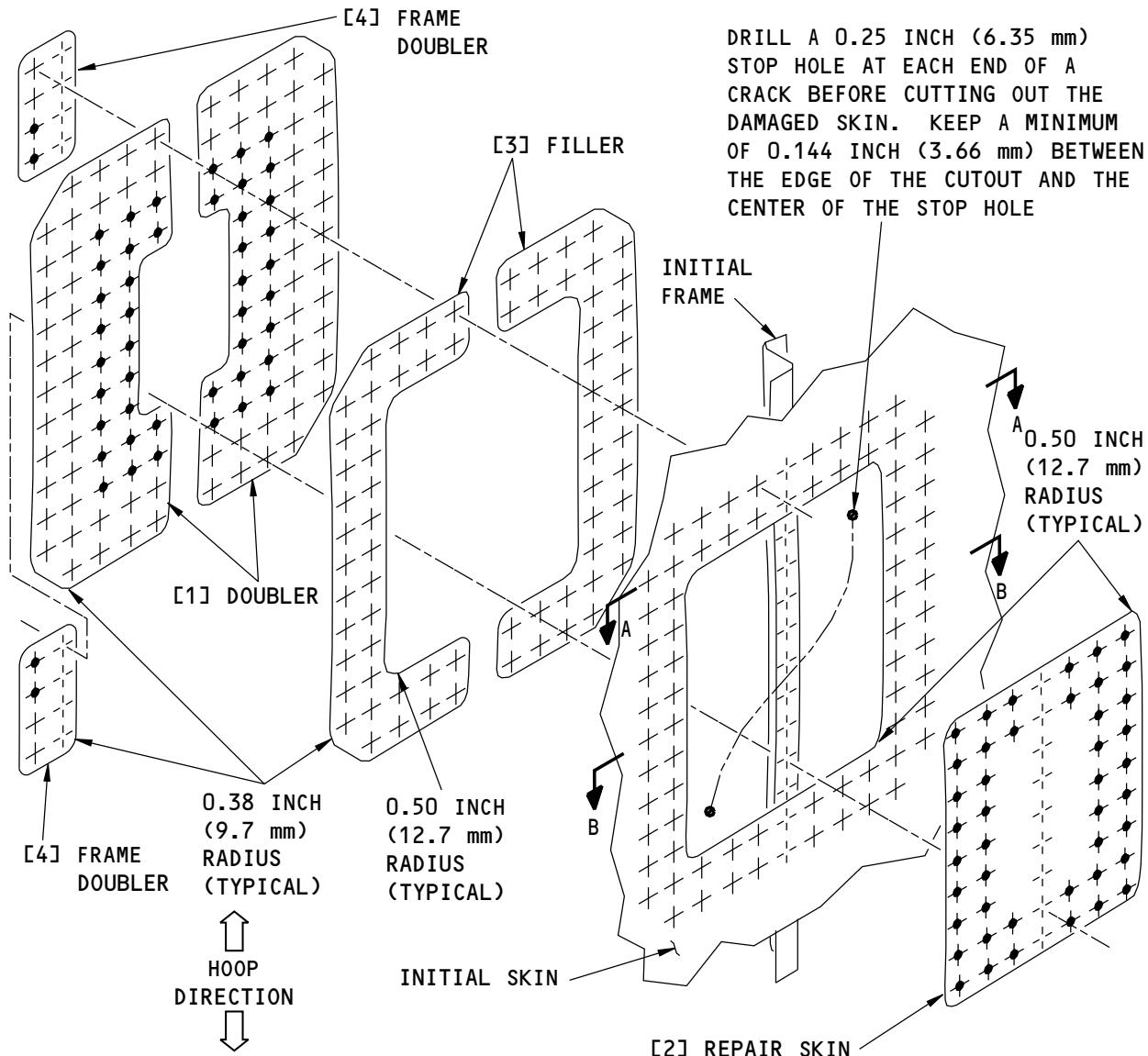
REPAIR 12

Page 204

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

FASTENER SYMBOLS

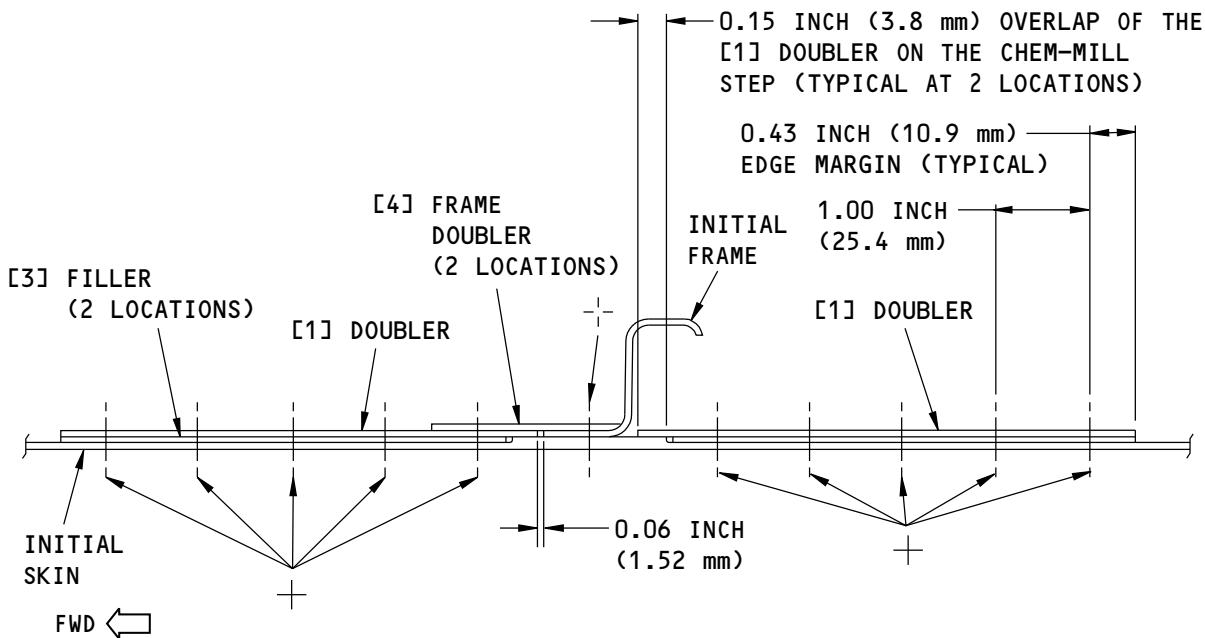
- + INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.
- + REPAIR FASTENER LOCATION. INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

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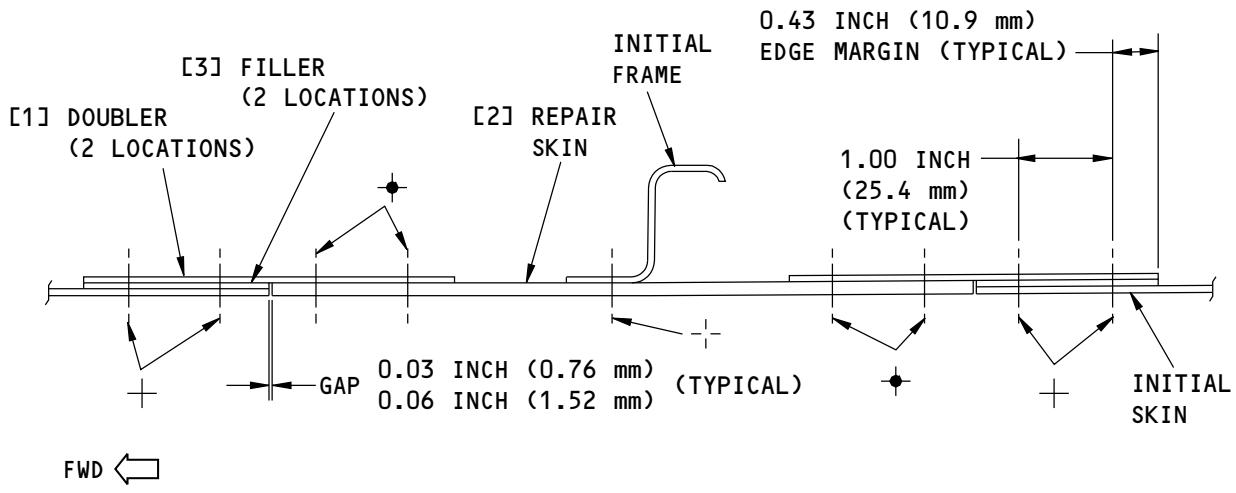
**Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)**

54-10-01
REPAIR 12
 Page 205
 Nov 10/2015

D634A210



A-A



B-B

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-10-01

REPAIR 12
Page 206

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 13 - INLET COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE C

1. Applicability

- A. Repair 13 is applicable to damage to the Inlet Cowl Outer Barrel Skin at a frame in Zone C. Refer to Inlet Cowl Outer Barrel Skin Zones, Figure 201/REPAIR 13.
- B. Repair 13 is not applicable to damage over the forward or aft bulkheads.
- C. Repair 13 is not applicable to damage adjacent to drain holes, lower access panels, or ground support equipment (GSE) attachment points.

2. General

- A. Repair 13 is a permanent repair. Refer to 51-00-06 to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the damage cutout is 12.00 inches (304.8 mm).
- C. The maximum fore/aft length of the damage cutout is 9.50 inches (241.3 mm).
- D. The edges of the initial skin cutout must be a minimum of 2.50 inches (63.5 mm) from:
 - (1) Another repair doubler
 - (2) A chem-mill step
 - (3) A fore/aft skin splice.
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01.

54-10-01

REPAIR 13

Page 201

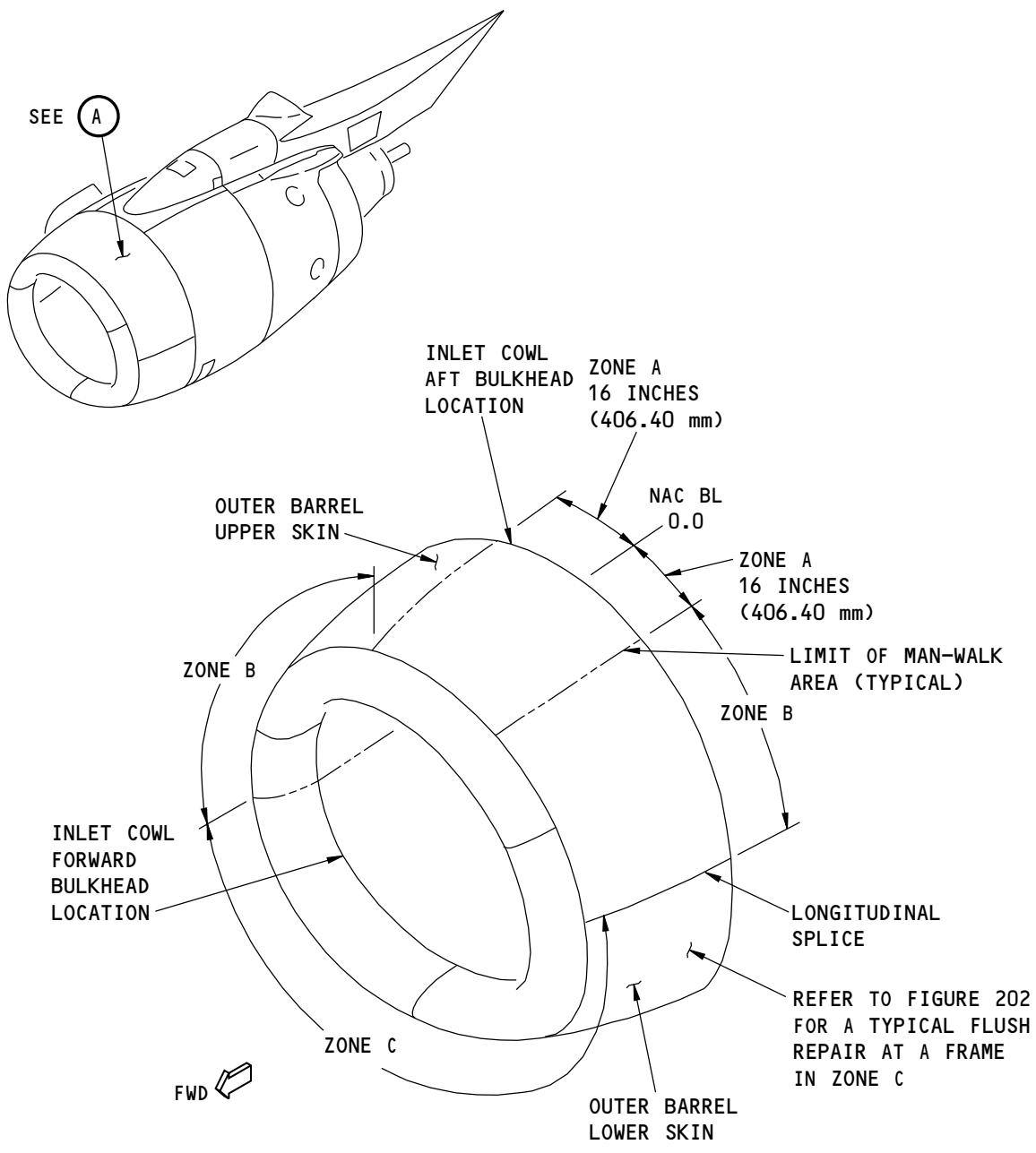
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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE OF INLET COWL IS SHOWN,
RIGHT SIDE INLET COWL IS THE SAME

A

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Inlet Cowl Outer Barrel Skin Zones
Figure 201

54-10-01

REPAIR 13
Page 202
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
51-40-06	FASTENER EDGE MARGINS
51-40-08	COUNTERSINKING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
- B. If there is a crack, drill 0.25 inch (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02 for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when drilling the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make the radii of the corners of the cutout a minimum of 0.50 inch (12.7 mm).
 - (2) Do not cause damage to the frame.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
- NOTE:** The penetrant inspection procedure is an alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 13 for the materials.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 inch (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.025 inch (0.64 mm) thick 2024-T3 sheet

54-10-01

REPAIR 13

Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: (Continued)

REPAIR MATERIAL			
[4]	Frame Doubler	2	Use 0.071 inch (1.80 mm) thick 2024-T3 sheet

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 13.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 13. Refer to 51-40-05, 51-40-06, and 51-40-08.
- H. Remove the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02.
- J. Remove the sharp edges from the repair parts and the initial skin. Refer to BAC 5300, for the Sonic Edge Finish.
- K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01.
- L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to REPAIR SEALING, 51-20-05.
- N. Install the fasteners with BMS 5-95 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after installing them.
- P. Apply a fillet seal with BMS 5-95 sealant to the areas that follow (Refer to 51-20-05):
 - (1) Around the edge of the part [1] doubler
 - (2) The space between the part [2] repair skin and the initial skin.
- Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

54-10-01

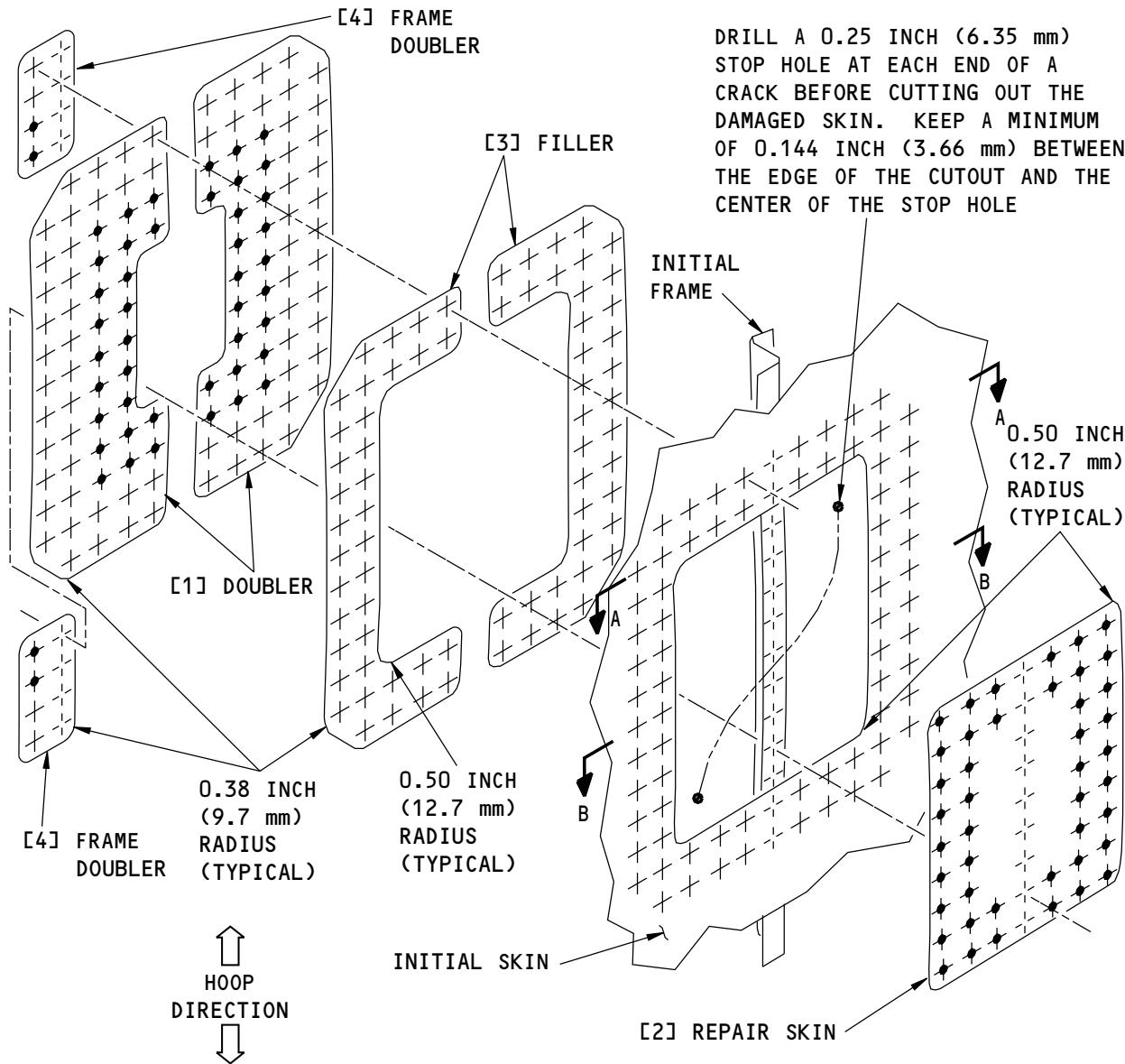
REPAIR 13

Page 204

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.
- + REPAIR FASTENER LOCATION. INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

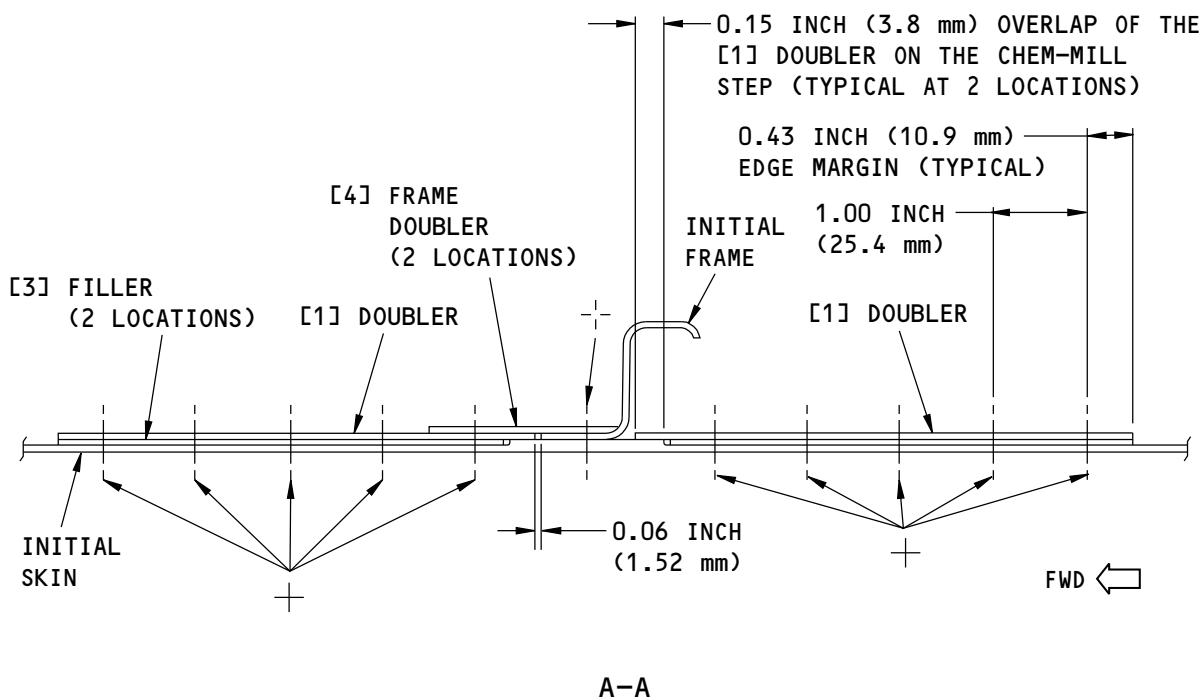
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**Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)**

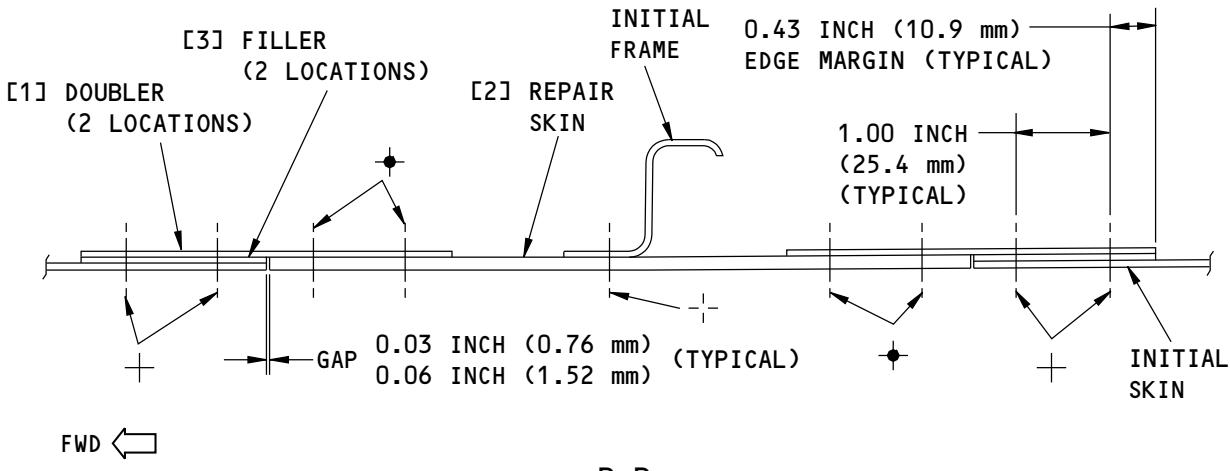
54-10-01
**REPAIR 13
Page 205
Nov 10/2015**

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



A-A



B-B

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**Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)**

54-10-01

**REPAIR 13
Page 206**

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

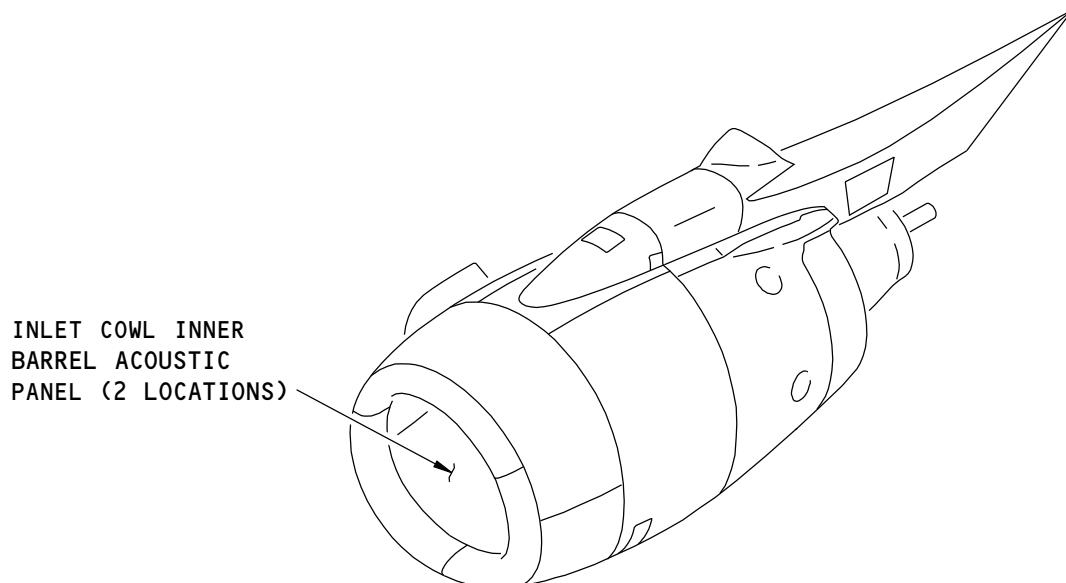
REPAIR 14 - INLET COWL INNER BARREL ACOUSTIC PANEL DAMAGE THAT IS 1.00 INCHES (25.4 MM) OR LESS IN DIAMETER

1. Applicability

- A. Repair 14 is applicable to dent damage to the Inlet Cowl Inner Barrel Acoustic Panel as shown in Figure 201/REPAIR 14 that is:
 - (1) A maximum diameter of 1.00 in. (25.4 mm).
 - (2) A maximum depth of 0.050 in. (1.27 mm).
 - (3) A minimum of 5.0 in. (127.0 mm) from a doubler or the edge of the acoustic panel.
 - (4) No more than five locations for each panel.

2. General

- A. Repair 14 is a permanent repair. Refer to 51-00-06, GENERAL for repair categories and definitions.
- B. This repair will cause a loss in the acoustic panel area. Refer to 54-00-01, GENERAL for the acoustic loss limits for the inlet cowl.
- 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, GENERAL.



2435294 S0000564646_V1

Inlet Cowl Inner Barrel Acoustic Panel Location
Figure 201

54-10-01

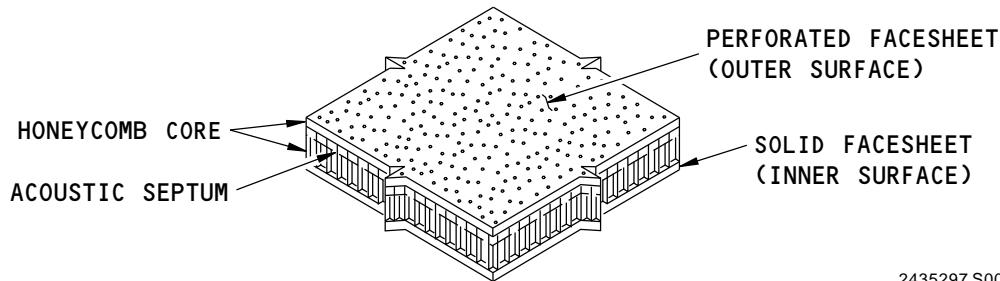
REPAIR 14
Page 201
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



2435297 S0000564647_V1

Definitions of the Facesheets
Figure 202

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
54-00-01, GENERAL	Acoustic Panel Area Loss Limits
SOPM 20-30-03	General Cleaning Procedures
737 NDT Part 1, 51-01-02	NDT Examination of Composite Structure for Impact Damage
737 NDT Part 1, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Repair Instructions

NOTE: Keep the mating surfaces of the repair part and the repair area clean with methyl isobutyl ketone (MIBK) or acetone during the repair procedure. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surfaces again if they become contaminated. Use clean lint-free gloves when you touch the repair parts and the repair area.

WARNING: KEEP THE SOLVENTS AWAY FROM SOURCES OF HEAT, FIRE, OR SPARKS. HEAT OR SPARKS CAN CAUSE AN EXPLOSION. DO NOT LET THE SOLVENTS GET INTO YOUR EYES OR ON YOUR SKIN OR CLOTHING. USE EYE PROTECTION. MAKE SURE THAT YOU USE AIRFLOW EQUIPMENT WHEN YOU DO WORK IN A CLOSED SPACE. IF YOU DO NOT OBEY, YOU CAN CAUSE INJURY TO PERSONS.

CAUTION: DO NOT PERMIT THE PAINT STRIPPER TO GET INSIDE THE ALUMINUM PANEL. IF YOU DO, DAMAGE TO THE ADHESIVE SYSTEM WILL OCCUR.

- A. Get access to the damaged area.
- B. Do a Non-Destructive Test (NDT) inspection to find the length, and width of the damage. Refer to 737 NDT Part 1, 51-01-02.
 - (1) Refer to Figure 202/REPAIR 14 for the definitions of the perforated facesheet and the solid facesheet of the honeycomb core area.
- C. Make sure that the dents are smooth, with no creases, gouges, cracks, or delaminations. Refer to 51-10-02, GENERAL.
- D. Fill the space in the honeycomb core area below the skin by injection compound from the perforated skin. Use BMS 5-28, Type 7, Class 1 potting compound. Refer to Figure 203/REPAIR 14.

NOTE: Do not cut or remove the perforated skin at the dent locations. Do not drill more holes.

54-10-01

REPAIR 14

Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (1) Fill the honeycomb core flush with the initial surface of the perforated facesheet.
 - (2) Make sure that the honeycomb core cells between the septum and inner surface of the perforated facesheet are filled.
 - (3) Fill for a minimum distance of 0.30 in. (7.62 mm) around the outer perimeter of the dent.
- E. Put aluminum foil tape on each dent repair location.
- F. Cure the potting compound. Refer to Figure 204/REPAIR 14 for cure times.
- G. Remove the aluminum foil tape.
- H. Remove unwanted potting compound with abrasive paper to keep the repair flush with the initial surface of the perforated skin.
- NOTE:** Make sure that the initial outer surface of the perforated skin is not damaged and does not contain potting compound.
- I. Do a tap test and a visual inspection of the repair locations to make sure that there is no disbond. Refer to 737 NDT Part 1, 51-05-01.
 - J. Apply a layer of aluminized epoxy primer (Base 463-6-4, Catalyst X-306, and Thinner TL-52) to the surfaces of the repair and the initial perforated skin around the repair.

54-10-01

REPAIR 14

Page 203

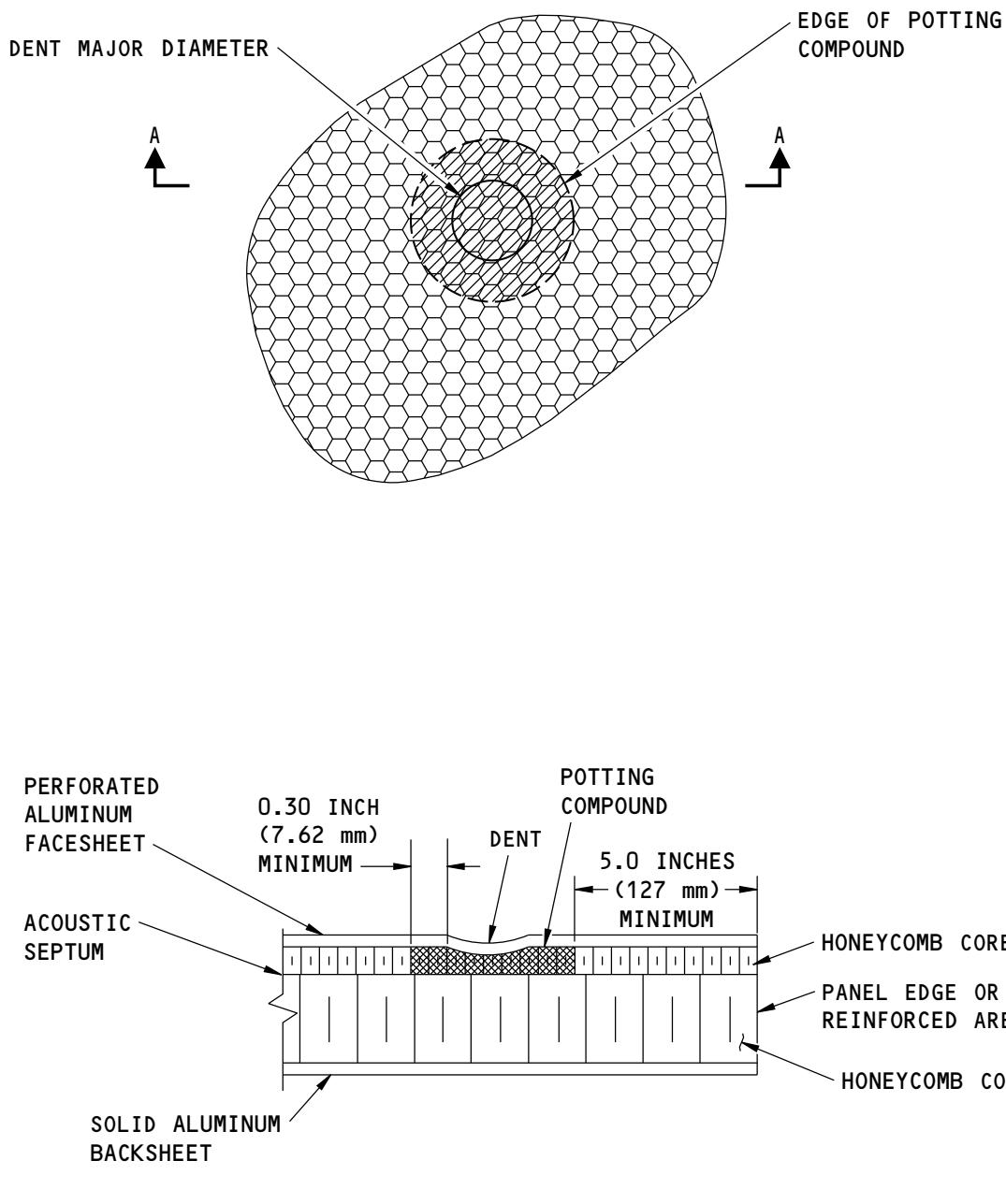
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737-800
STRUCTURAL REPAIR MANUAL



2435304 S0000564642_V1

Inlet Cowl Inner Barrel Acoustic Panel Dent Repair
Figure 203

54-10-01

REPAIR 14

Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

POTTING COMPOUND	COMPONENTS	PARTS BY WEIGHT	WORK TIME	CURING TIME
BMS 5-28, TYPE 7, CLASS 1 POTTING COMPOUND	CG-1305 R/H		60 MINUTES	7 DAYS AT 77 °±10 °F 90 MINUTES AT 260 °F ±10 °F
BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND	Epocast 1614-A1		8 HOURS	90 MINUTES AT 260 °F ±10 °F

TABLE A

NOTES

- APPLY HEAT TO THE MATERIAL AT A MAXIMUM RATE OF 3 °F TO 7 °F PER MINUTE, THEN KEEP AT THE CURE TEMPERATURE FOR THE GIVEN TIME.
- THE LIQUID IS A TWO PART ROOM TEMPERATURE CURE, IF THE COMPOUND CAN BE USED BEFORE 1 YEAR AFTER STORAGE AT 40 °F TO 80 °F (5 °C TO 27 °C).
- BMS 5-28, TYPE 14, CLASS 2 POTTING COMPOUND IS AN ALTERNATIVE TO BMS 5-28, TYPE 7, CLASS 1 POTTING COMPOUND.
- MIX AS GIVEN IN THE MANUFACTURER'S INSTRUCTIONS. VISCOSITY CAN BE INCREASED IF YOU ADD MILLED GLASS FIBERS UP TO 20% OF THE TOTAL WEIGHT OF THE COMPOUND.
- THE PUTTY IS A ONE PART HEAT CURE, IF THE COMPOUND CAN BE USED BEFORE 3 MONTH AFTER STORAGE AT -20 °F (-29 °C) OR LOWER TEMPERATURE.

2435404 S0000564644_V1

Potting Compound Cure Times
Figure 204

54-10-01

REPAIR 14

Page 205

Nov 10/2015

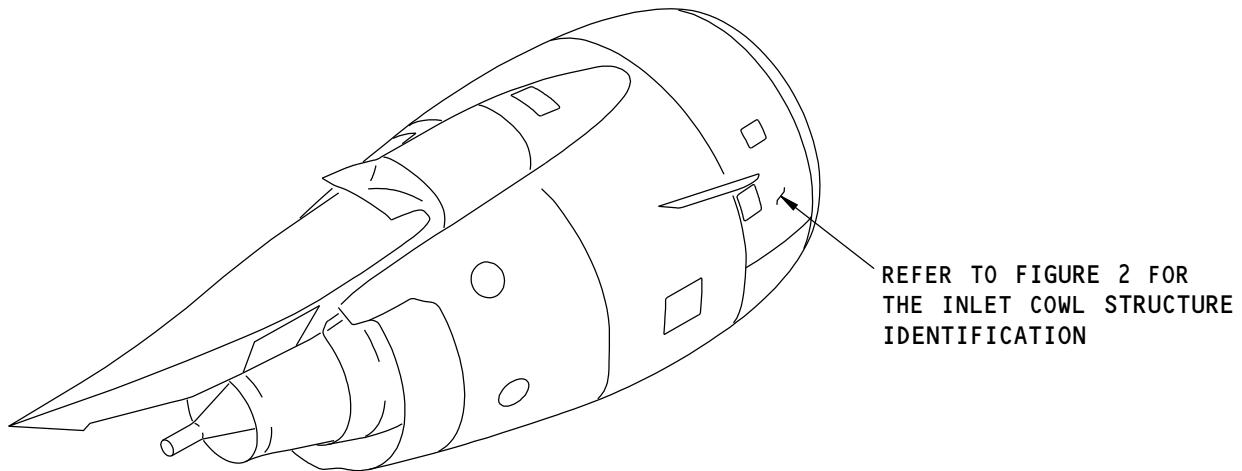
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - INLET COWL STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F03441 S0006591601_V1

Inlet Cowl Structure Location

Figure 1

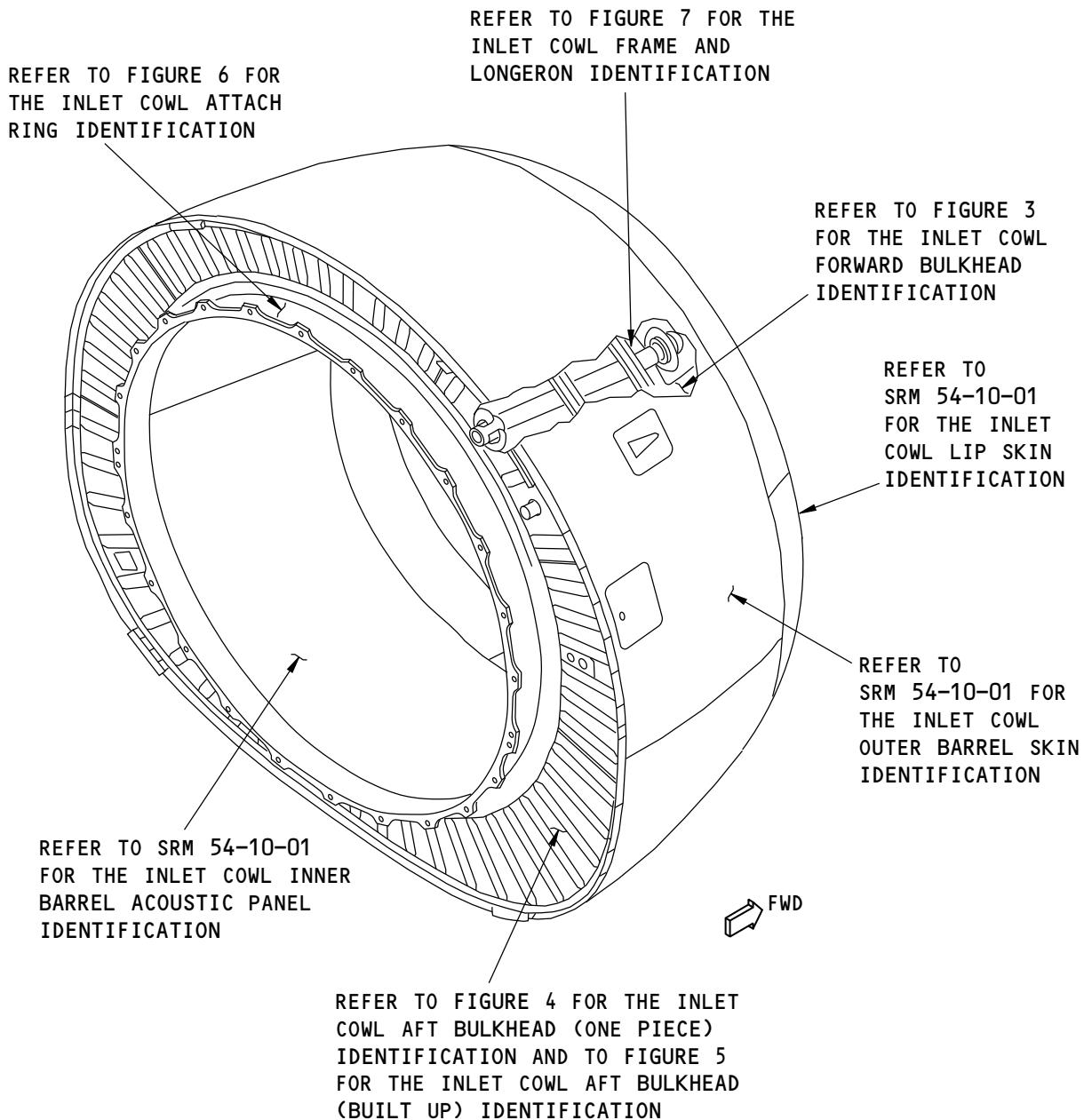
Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
334A2000	Inlet Installation - CFM56-7
314-2100	Cowl Assembly - Inlet
314-2103	Shim - Inlet Cowl
314-2113	Forward Bulkhead
314-2134	Inlet Cowl Attach Ring
314-2140	Aft Bulkhead - One Piece
314-2153	Frame and Longeron - Upper and Lower Panels, Outer Barrel
314-2162	Frame - Outer, Aft Bulkhead
314-2171	Aft Bulkhead, Built-Up

54-10-02
IDENTIFICATION 1
Page 1
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

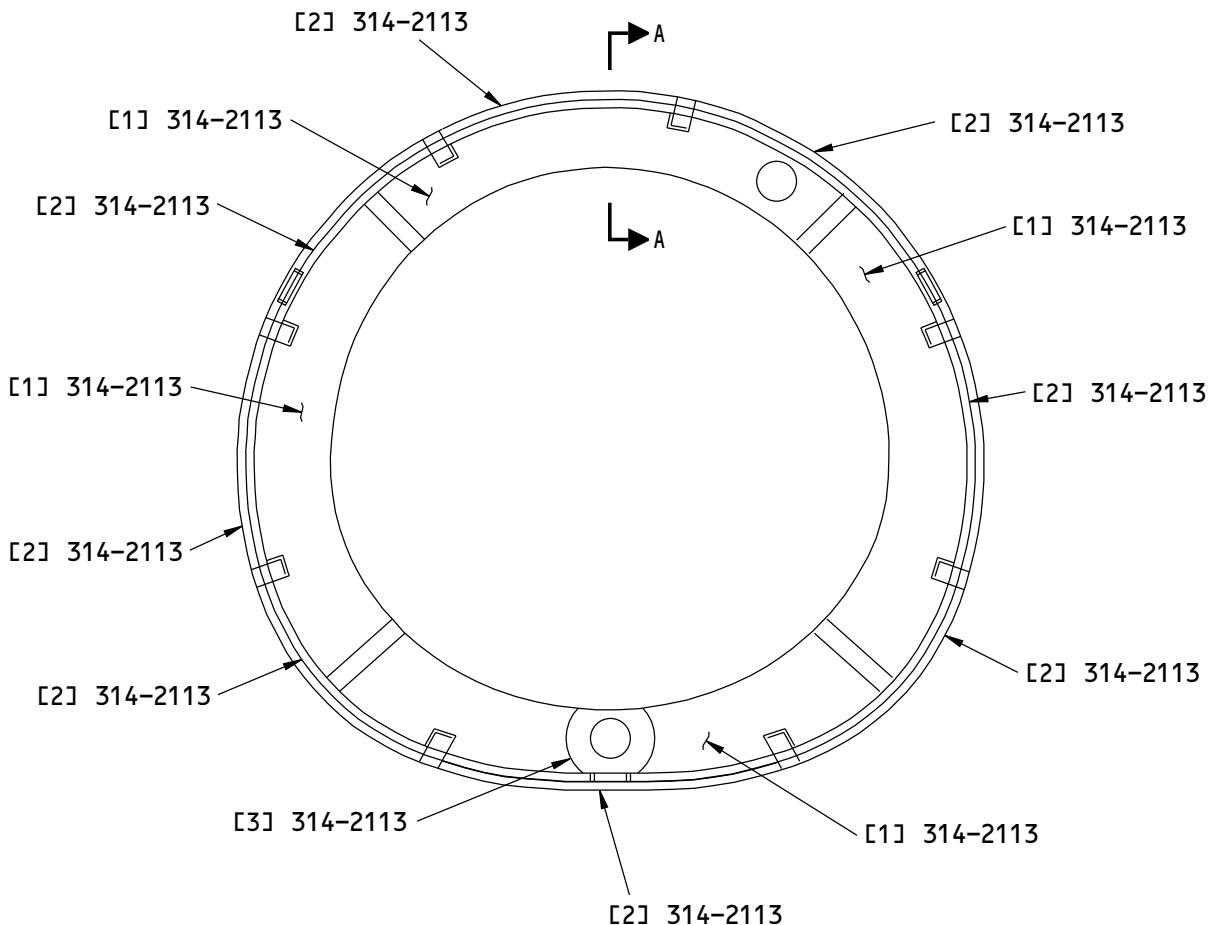
F03454 S0006591603_V2

Inlet Cowl Structure Identification
Figure 2

54-10-02
IDENTIFICATION 1
Page 2
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



VIEW WHEN YOU LOOK FORWARD

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

F04723 S0006591604_V2

Inlet Cowl Forward Bulkhead Identification
Figure 3 (Sheet 1 of 2)

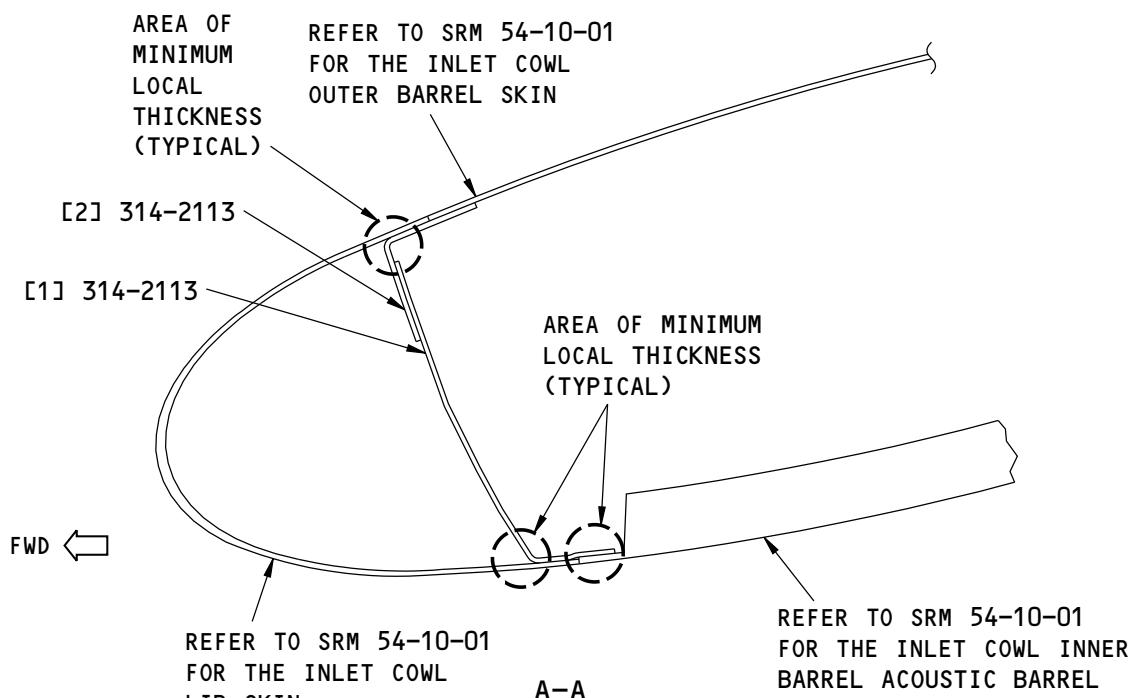
54-10-02
IDENTIFICATION 1
Page 3
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



Inlet Cowl Forward Bulkhead Identification

Figure 3 (Sheet 2 of 2)

F04737 S0006591605_V2

54-10-02
IDENTIFICATION 1
Page 4
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Inner Cap, Four Segments	0.080 (2.03)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911 ^{*[2]}	
[2]	Outer Cap, Eight Segments	0.090 (2.29)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911 ^{*[2]}	
[3]	Exhaust Duct Doubler	0.080 (2.03)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	

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

*[2] Minimum overall thickness is 0.056 (1.42) for Inlet Cowl serial numbers 1 thru 3036 and 0.050 (1.27) for Inlet Cowl serial number 3037 and on. Minimum local thickness is 0.046 (1.17) at the bend areas, as shown in Figure 3 (Sheet 2).

54-10-02

IDENTIFICATION 1

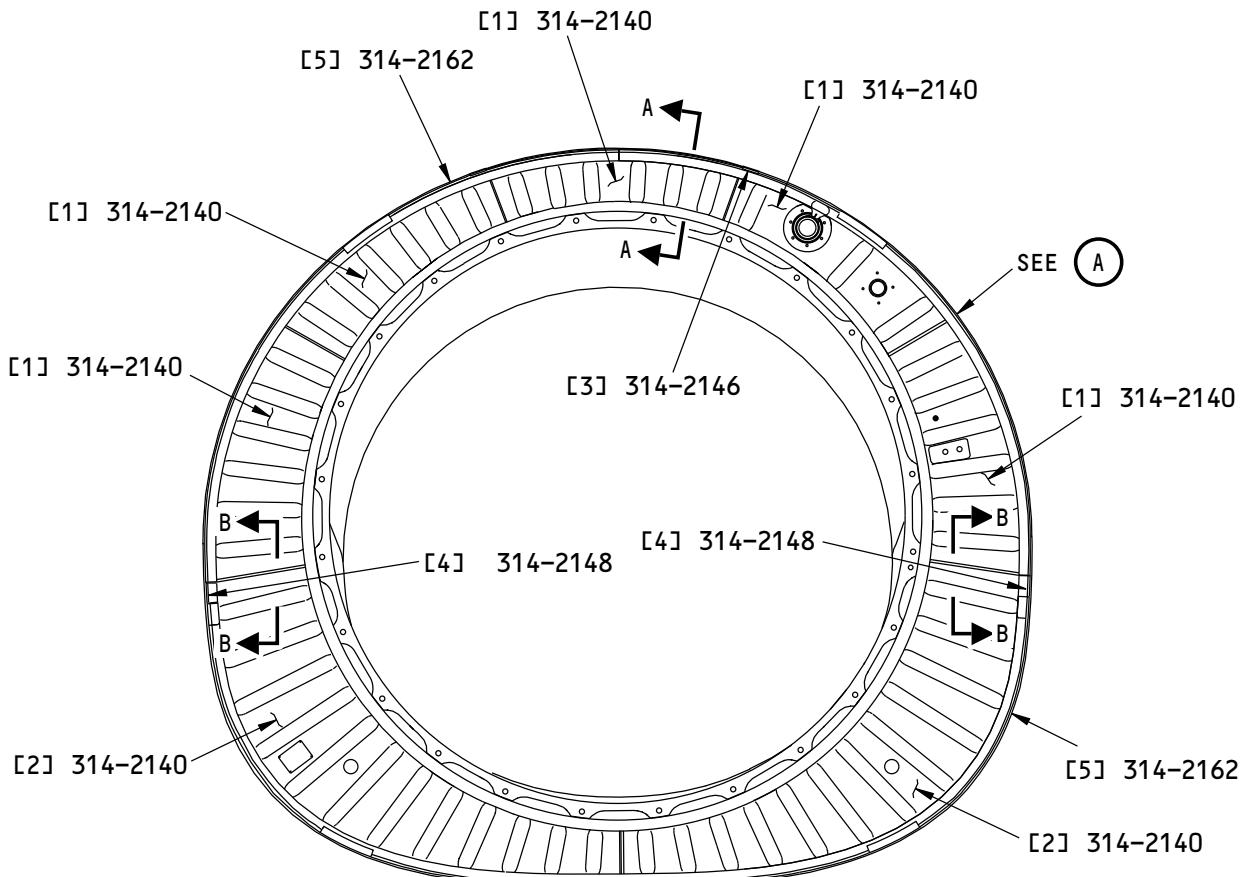
Page 5

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



VIEW WHEN YOU LOOK FORWARD
ONE-PIECE BULKHEAD AND STIFFENER ASSEMBLY

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

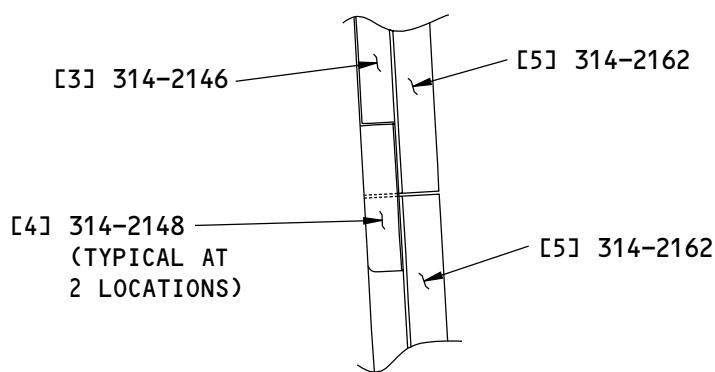
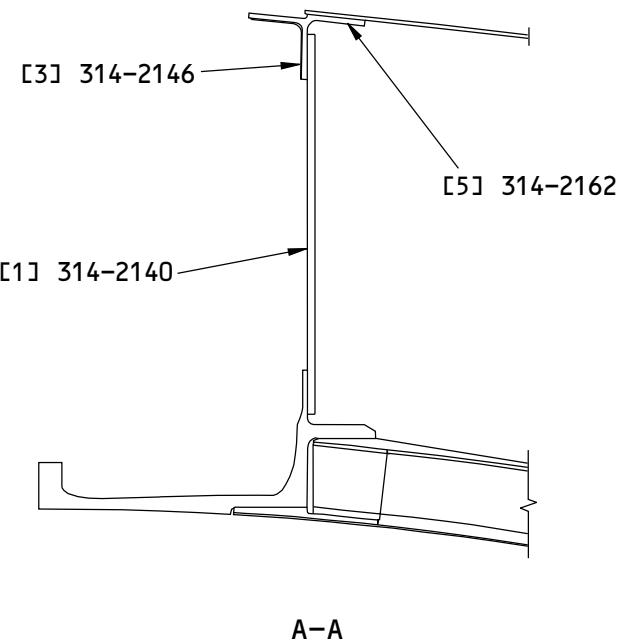
F04745 S0006591607_V2

Inlet Cowl Aft Bulkhead (One Piece) Identification EFFECTIVITY: LINE NUMBERS 1 THROUGH 1435
Figure 4 (Sheet 1 of 3)

54-10-02
IDENTIFICATION 1
Page 6
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



OUTER AFT BULKHEAD SPLICE AREA
VIEW FROM INSIDE LOOKING RADIALLY OUTWARDS
B-B

L90041 S0006591608_V2

Inlet Cowl Aft Bulkhead (One Piece) Identification EFFECTIVITY: LINE NUMBERS 1 THROUGH 1435
Figure 4 (Sheet 2 of 3)

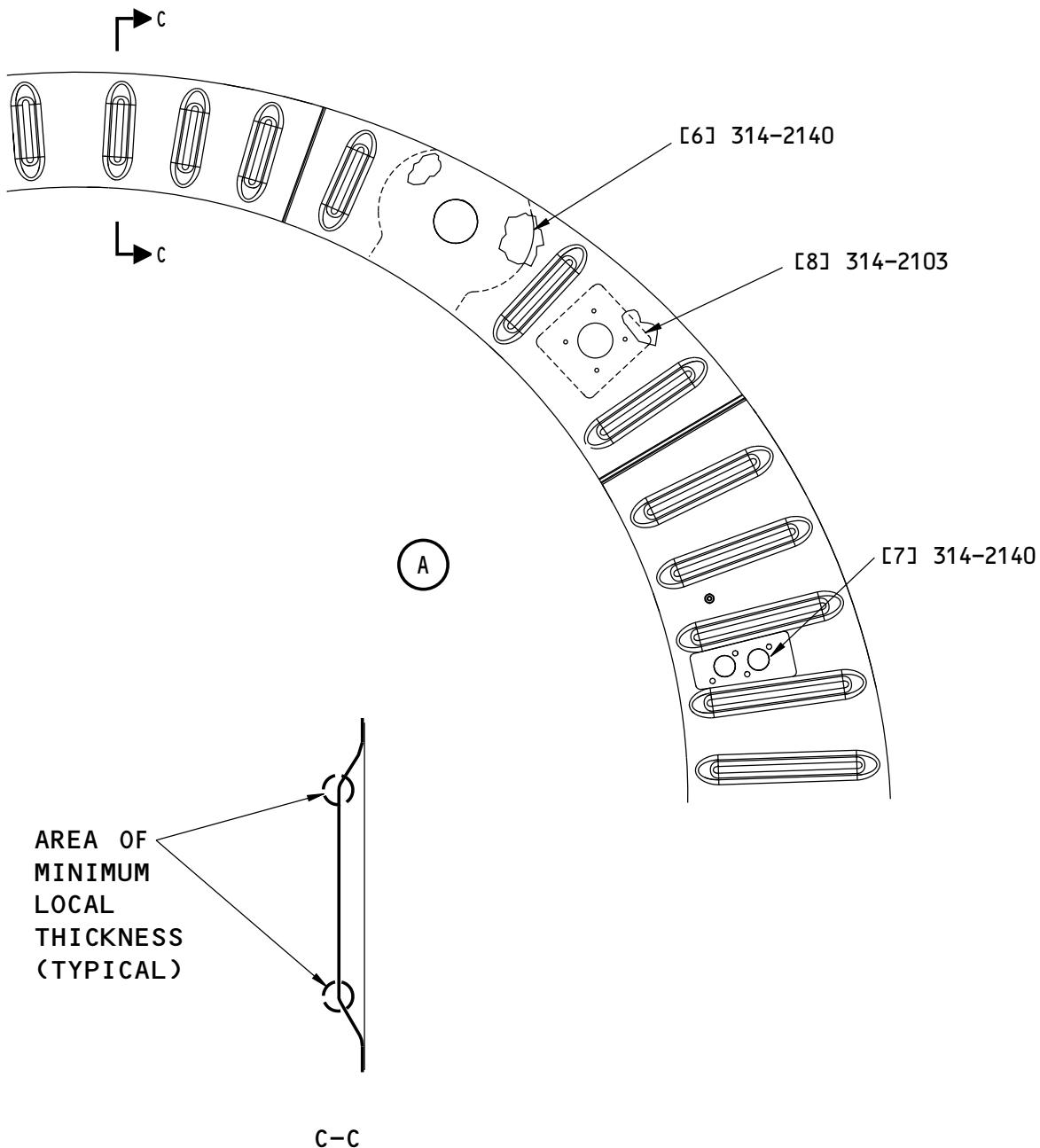
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IDENTIFICATION 1
Page 7
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



F41327 S0006591609_V2

Inlet Cowl Aft Bulkhead (One Piece) Identification EFFECTIVITY: LINE NUMBERS 1 THROUGH 1435
Figure 4 (Sheet 3 of 3)

54-10-02
IDENTIFICATION 1
Page 8
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Upper Bulkhead - Inlet, Aft	0.063 (1.60)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911 ^[2]	Line Numbers 1 Through 1435
[2]	Lower Bulkhead - Inlet, Aft	0.080 (2.03)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911 ^[3]	Line Numbers 1 Through 1435
[3]	Fire Barrier - Upper Frame, Outer Aft Bulkhead	0.016 (0.41)	CRES 301 sheet annealed, as given in AMS 5901	Line Numbers 1 Through 1435
[4]	Splice, Radial - Tee Frame, Outer Aft Bulkhead	0.050 (1.27)	CRES 301 sheet, 125 KSI, as given in AMS 5517	Line Numbers 1 Through 1435
[5]	Tee Frame, Outer Aft Bulkhead		2024-O aluminum extrusion, as given in AMS-QQ-A-200/3, heat treat to T62	Line Numbers 1 Through 1435
[6]	TAI Duct, Mating Doubler	0.050 (1.27)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1 Through 1435
[7]	T12 Connector Doubler	0.063 (1.60)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1 Through 1435
[8]	Shim. EEC Scoop, Aft Bulkhead	0.080 (2.03)	CRES Alloy 3, Type II, Class 2, as given in MIL-S-22499, laminated	Line Numbers 1 Through 1435

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

*[2] Minimum overall thickness is 0.045 (1.14), minimum local thickness at bend radius is 0.042 (1.07).

*[3] Minimum overall thickness is 0.058 (1.47), minimum local thickness at bend radius is 0.052 (1.32).

54-10-02

IDENTIFICATION 1

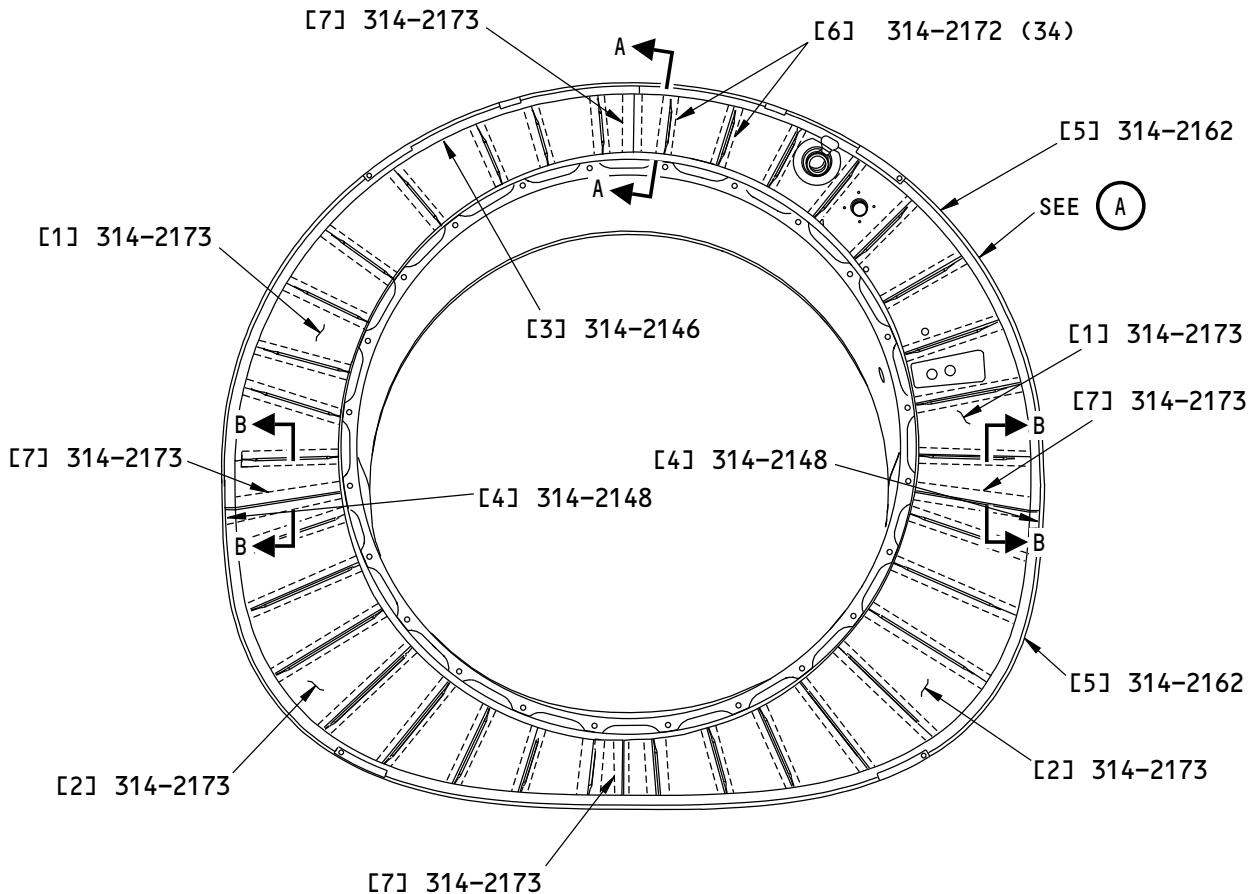
Page 9

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



VIEW WHEN YOU LOOK FORWARD
BUILT-UP BULKHEAD AND STIFFENER ASSEMBLY

NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS

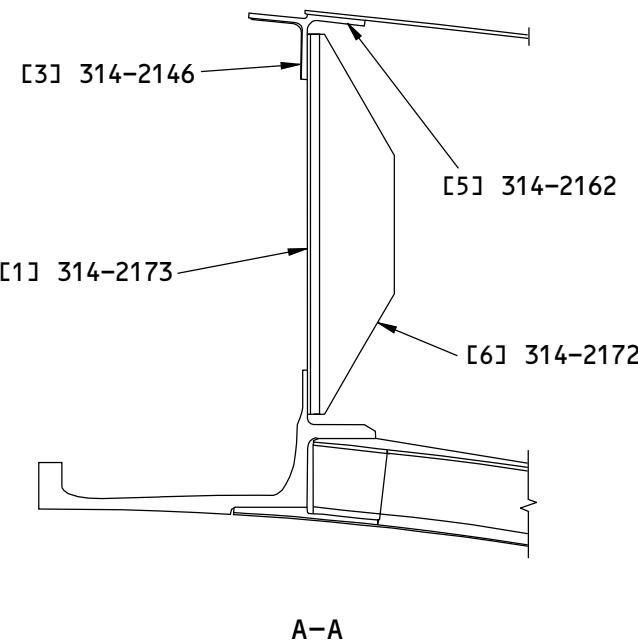
2456710 S0000570815_V1

Inlet Cowl Aft Bulkhead (Built-Up) Identification EFFECTIVITY: LINE NUMBERS 1436 AND ON
Figure 5 (Sheet 1 of 3)

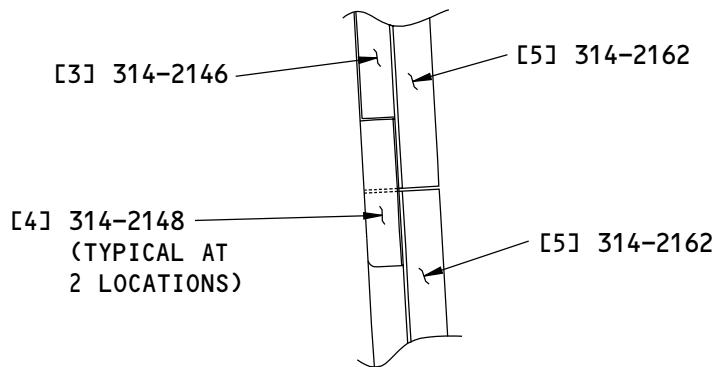
54-10-02
IDENTIFICATION 1
Page 10
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



A-A



OUTER AFT BULKHEAD SPLICE AREA
VIEW FROM INSIDE LOOKING RADIALLY OUTWARDS
B-B

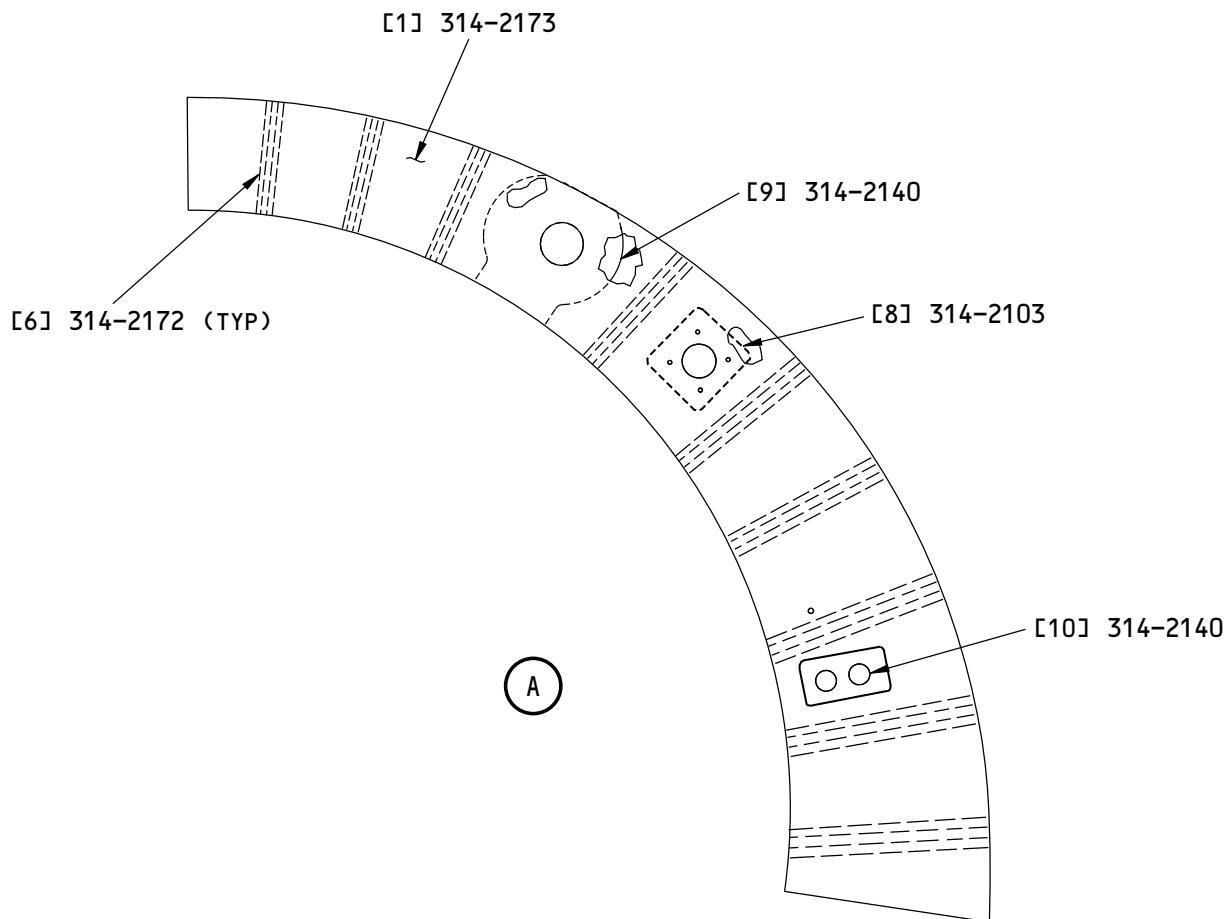
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Inlet Cowl Aft Bulkhead (Built-Up) Identification EFFECTIVITY: LINE NUMBERS 1436 AND ON
Figure 5 (Sheet 2 of 3)

54-10-02
IDENTIFICATION 1
Page 11
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



2456712 S0000570817_V1

Inlet Cowl Aft Bulkhead (Built-Up) Identification EFFECTIVITY: LINE NUMBERS 1436 AND ON
Figure 5 (Sheet 3 of 3)

54-10-02
IDENTIFICATION 1
Page 12
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Upper Bulkhead - Inlet, Aft	0.050 (1.27)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1436 and On
[2]	Lower Bulkhead - Inlet, Aft	0.050 (1.27)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1436 and On
[3]	Fire Barrier - Upper Frame, Outer, Aft Bulkhead	0.016 (0.41)	CRES 301 sheet annealed, as given in AMS 5901	Line Numbers 1436 and On
[4]	Splice, Radial - Tee Frame, Outer Aft Bulkhead	0.050 (1.27)	CRES 301 sheet, 125 KSI, as given in AMS 5517	Line Numbers 1436 and On
[5]	Tee Frame, Outer Aft Bulkhead		2024-O aluminum extrusion, as given in AMS-QQ-A-200/3, heat treat to T62	Line Numbers 1436 and On
[6]	Stiffener (34)		2024-T3511 aluminum extrusion, as given in AMS-QQ-A-200/3	Line Numbers 1436 and On
[7]	Splice, Bulkhead	0.050 (1.27)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1436 and On
[8]	Shim, EEC Scoop, Aft Bulkhead	0.080 (2.03)	CRES Alloy 3, Type II, Class 2, as given in MIL-S-22499, laminated	Line Numbers 1436 and On
[9]	TAI Duct, Mating Doubler	0.050 (1.27)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1436 and On
[10]	T-12 Connector Doubler	0.063 (1.60)	Ti-6Al-4V titanium sheet annealed, as given in AMS 4911	Line Numbers 1436 and On

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

54-10-02

IDENTIFICATION 1

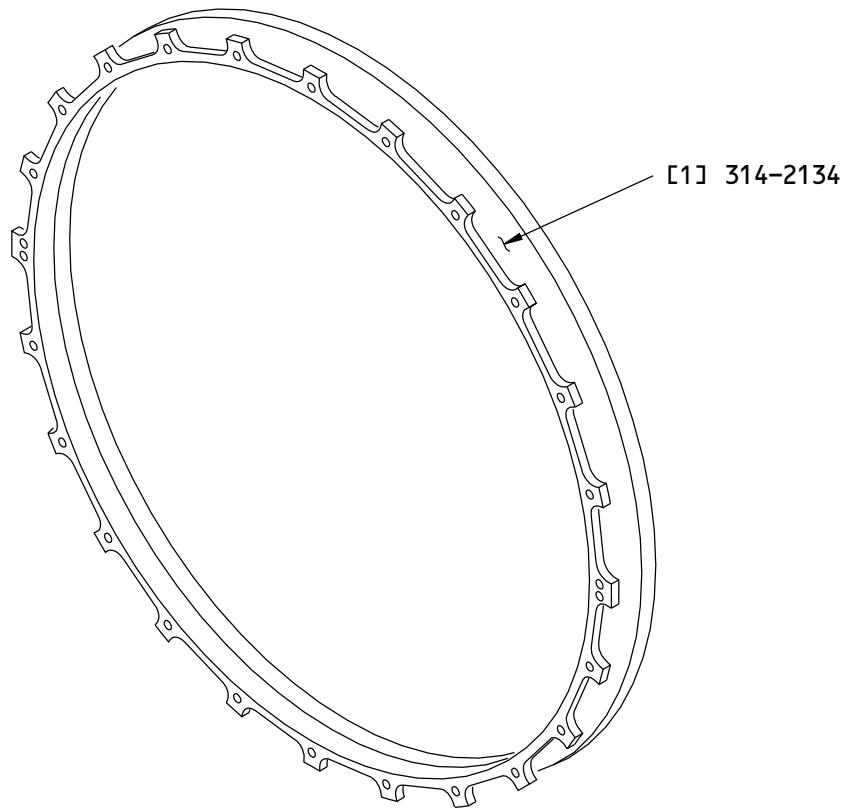
Page 13

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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

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Inlet Attach Ring Identification

Figure 6

Table 5:

LIST OF MATERIALS FOR FIGURE 6				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Inlet Attach Ring		7075-T7351 aluminum forging, as given in AMS 4311	

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

54-10-02

IDENTIFICATION 1

Page 14

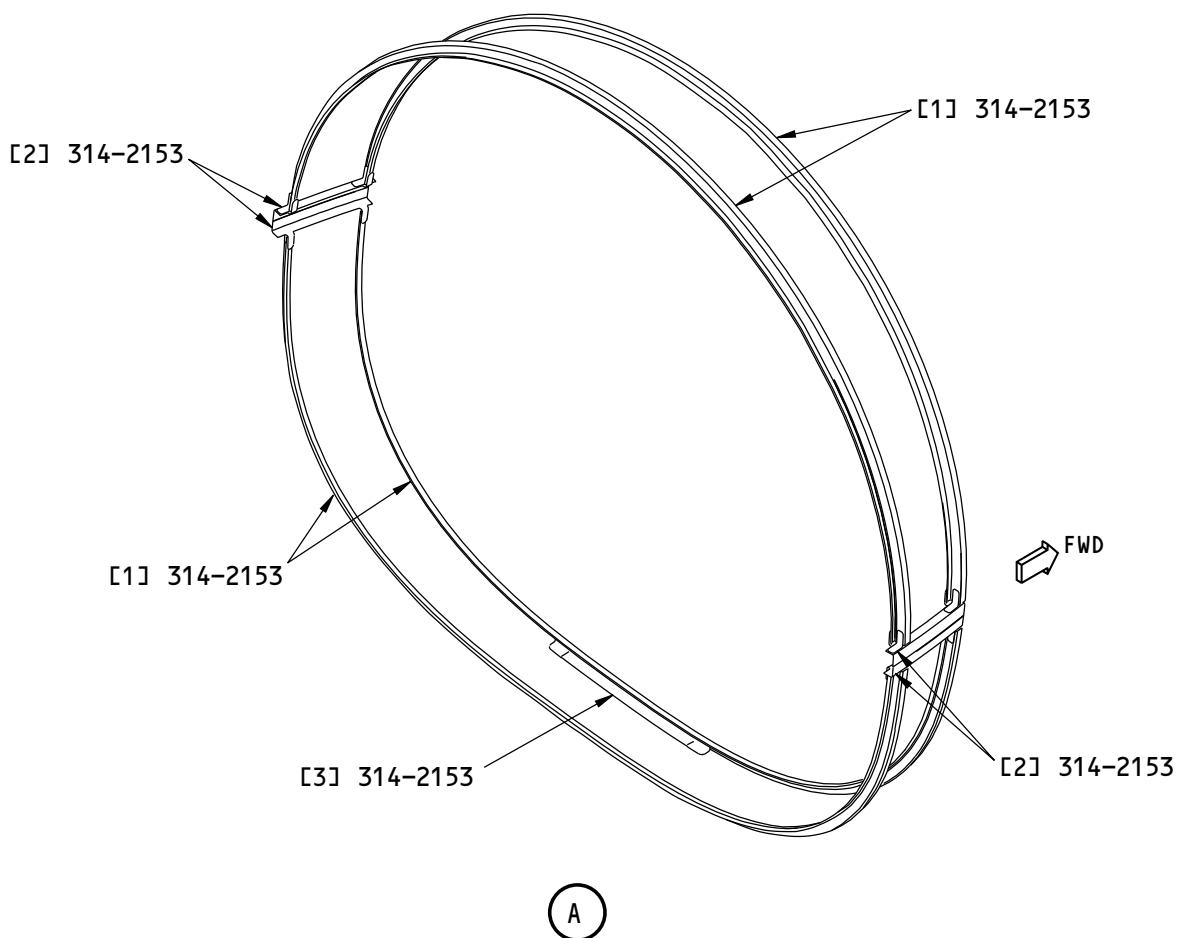
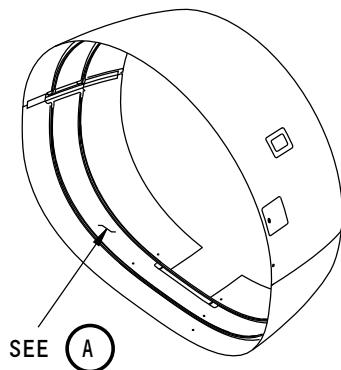
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



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

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Inlet Cowl Frame and Longeron Identification
Figure 7

54-10-02
IDENTIFICATION 1
Page 15
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 6:

LIST OF MATERIALS FOR FIGURE 7				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Frame	0.063 (1.60)	2024-O aluminum sheet , as given in AMS-QQ-A 250/4, heat treat to T62	
[2]	Longeron	0.063 (1.60)	2024-O aluminum sheet , as given in AMS-QQ-A 250/4, heat treat to T62	
[3]	Doubler, Frame Angle	0.063 (1.60)	2024-O aluminum sheet , as given in AMS-QQ-A 250/4, heat treat to T62	

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

54-10-02

IDENTIFICATION 1

Page 16

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - INLET COWL STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the structure of the inlet cowl shown in Inlet Cowl Structure Location, Figure 101/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 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 as follows:
- (1) Apply the finishes that follow to the reworked aluminum parts:
 - (a) Apply a chemical conversion coating as given in 51-20-01.
 - (b) Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04.
 - (2) Apply the finishes that follow to the reworked titanium parts:
 - (a) Apply two layers of BAC 5710, Type 51 (DeSoto high temperature primer).
 - (3) Apply a finish to the reworked areas as given AMM 51-20-00/701.
 - (4) Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits for the different components.

Table 101:

PARAGRAPH REFERENCES OF THE ALLOWABLE DAMAGE LIMITS	
COMPONENT	PARAGRAPH
Forward Bulkhead - Inner and Outer Caps	4.A
Aft Bulkhead Web	4.B
Tee Ring	4.C
Attach Ring	4.D
Outer Barrel Frames and Longerons	4.E

54-10-02

ALLOWABLE DAMAGE 1

Page 101

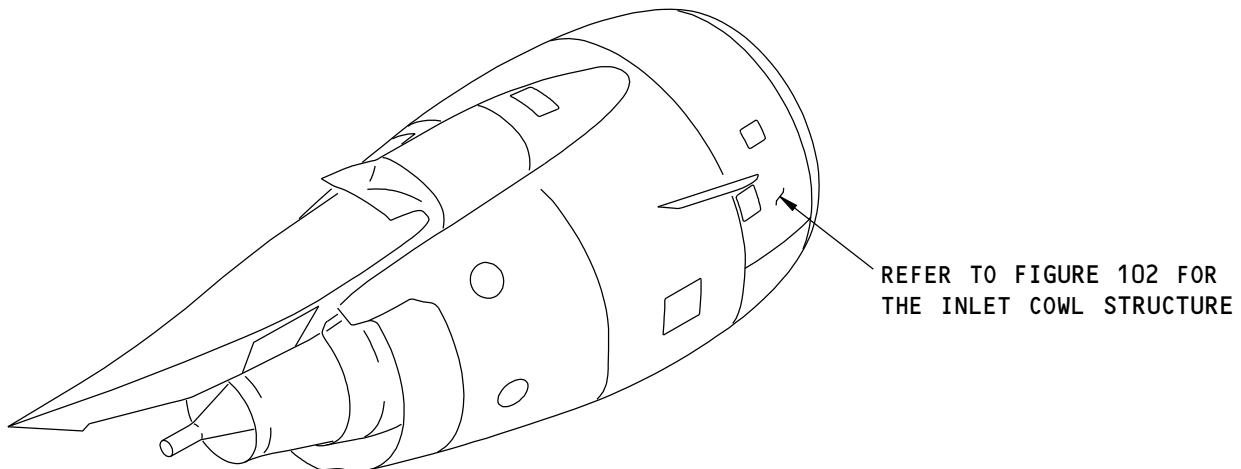
Nov 10/2012

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**737-800
STRUCTURAL REPAIR MANUAL**



**Inlet Cowl Structure Location
Figure 101**

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54-10-02

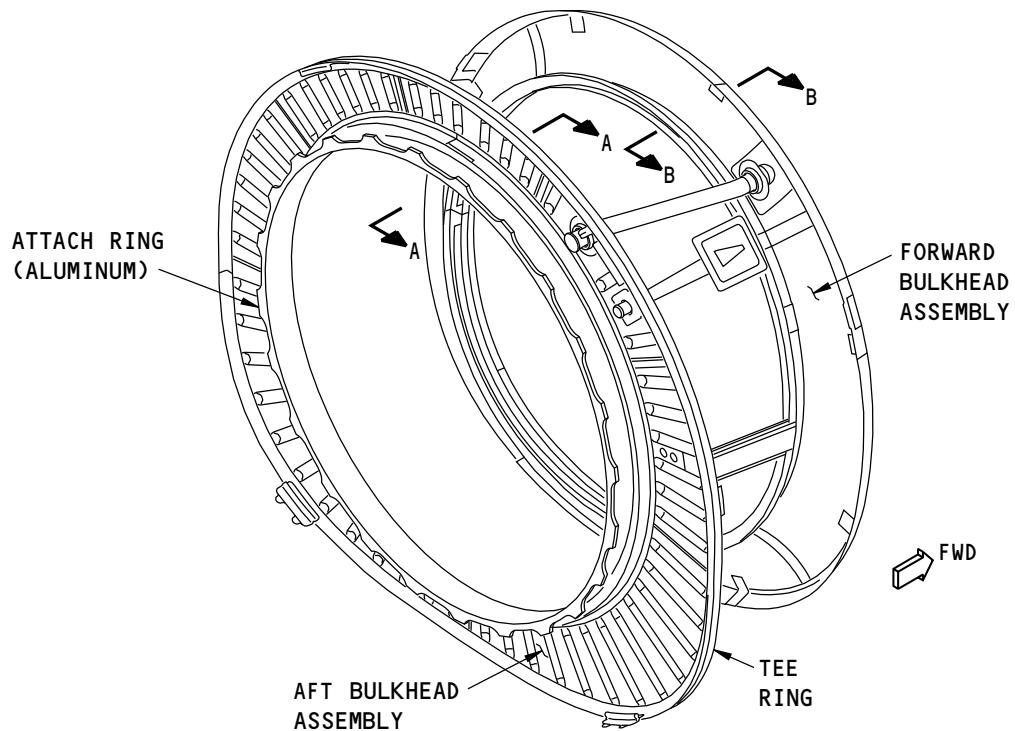
ALLOWABLE DAMAGE 1

Page 102

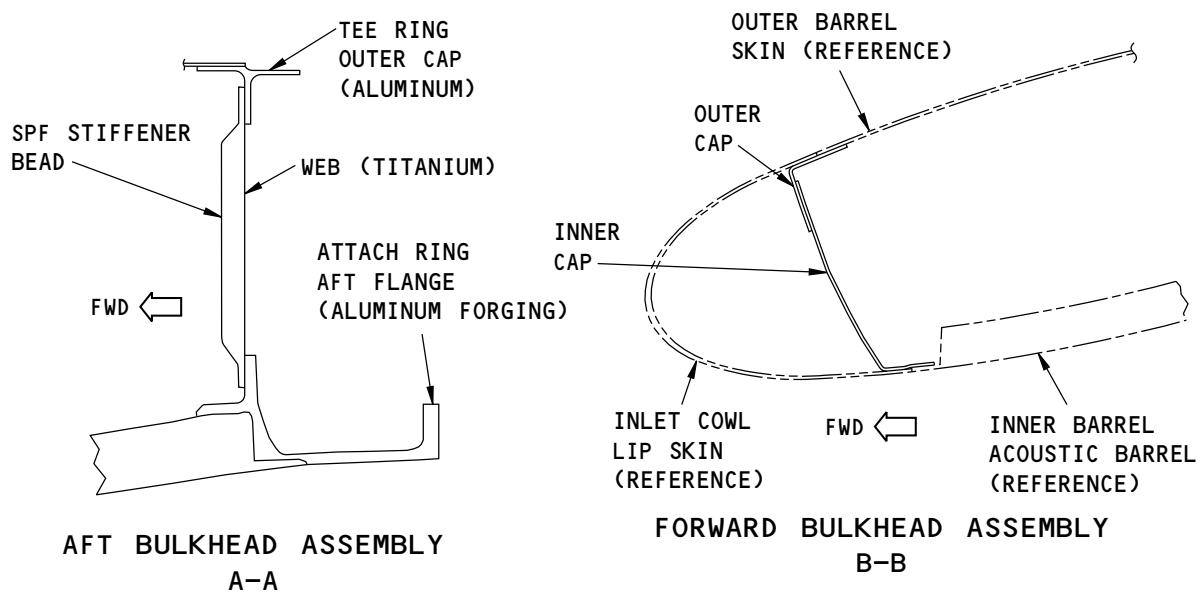
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**737-800
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LEFT ENGINE INLET COWL STRUCTURE IS SHOWN,
RIGHT ENGINE INLET COWL STRUCTURE IS THE SAME



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**Inlet Cowl Structure
Figure 102 (Sheet 1 of 2)**

54-10-02

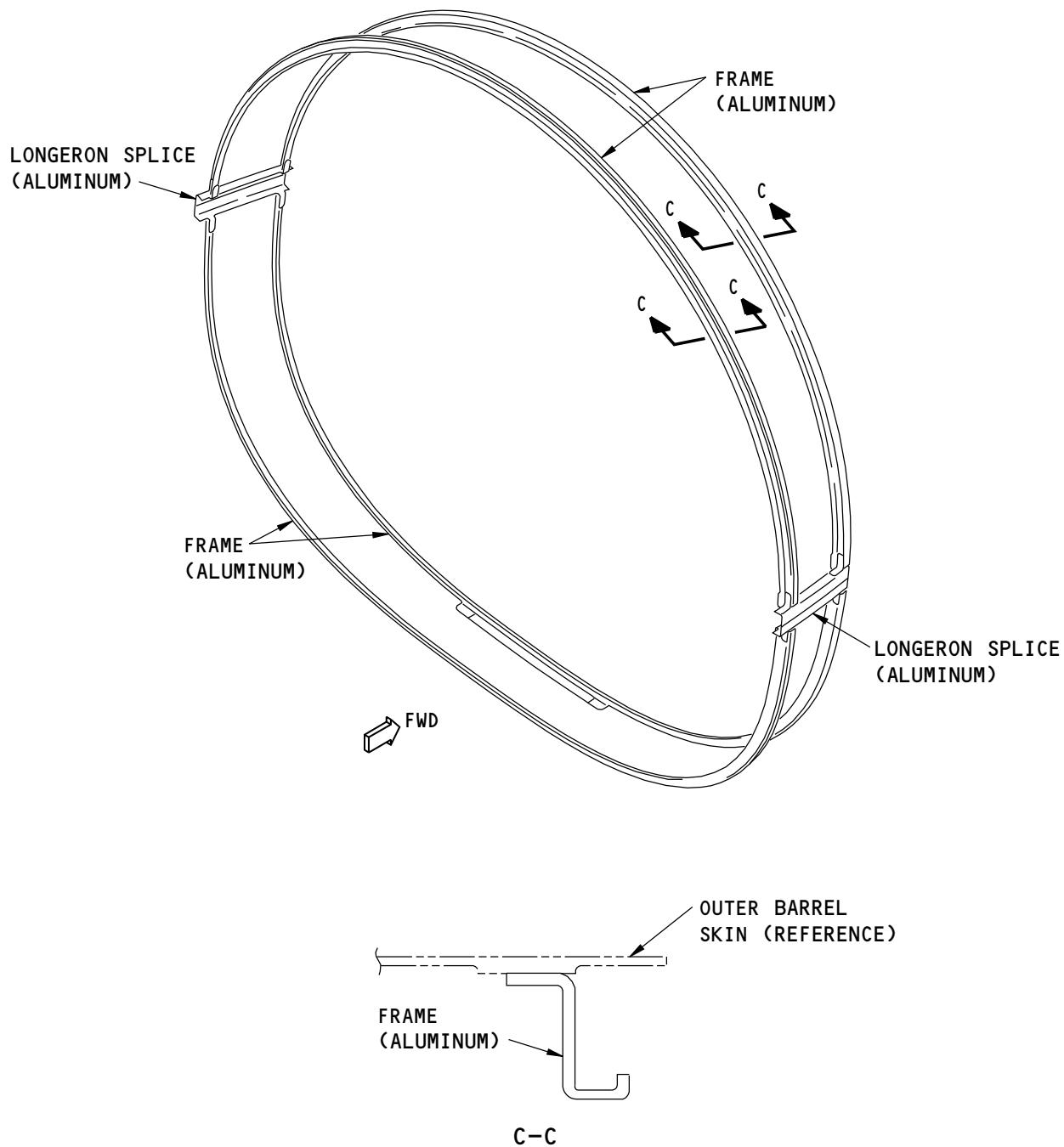
ALLOWABLE DAMAGE 1

Page 103

Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL



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Inlet Cowl Structure
Figure 102 (Sheet 2 of 2)

54-10-02

ALLOWABLE DAMAGE 1

Page 104

Nov 10/2012

D634A210

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737-800
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
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-20-00/701	Decorative Exterior Paint System - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Forward Bulkhead - Inner and Outer Caps:

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
- (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. Aft Bulkhead Web:

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
- (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 permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .
- (4) Holes and Punctures are permitted if:
 - (a) They are a maximum diameter of 0.25 inch (6.35 mm) after cleanup
 - (b) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the part
 - (c) You install an NAS1398M blind rivet wet with BMS 5-63 sealant.
 - 1) The head of the repair rivet must not touch the bend radius of a web stiffener bead.

C. Tee Ring:

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
- (2) Nicks, Gouges, Scratches, and Corrosion:

54-10-02

ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (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.
- D. Attach Ring:
- (1) Cracks are not permitted.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) For all areas but the attach flange:
 - 1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ ALLOWABLE DAMAGE 1, Details A , B , C , D , and E .
 - (b) Aft Flange:
 - 1) Damage is not permitted.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- E. Outer Barrel Frames and Longerons:
- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
 - (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.

54-10-02

ALLOWABLE DAMAGE 1

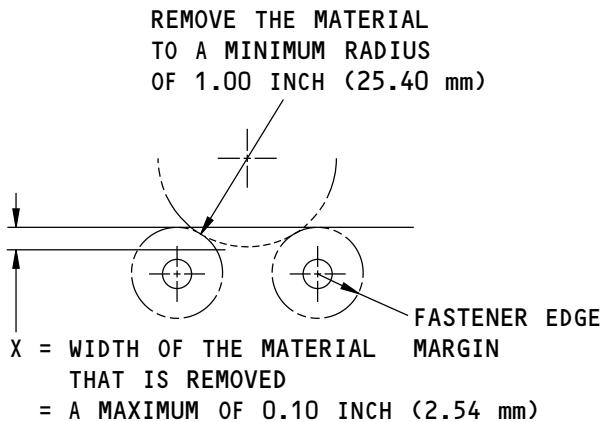
Page 106

Nov 10/2012

D634A210

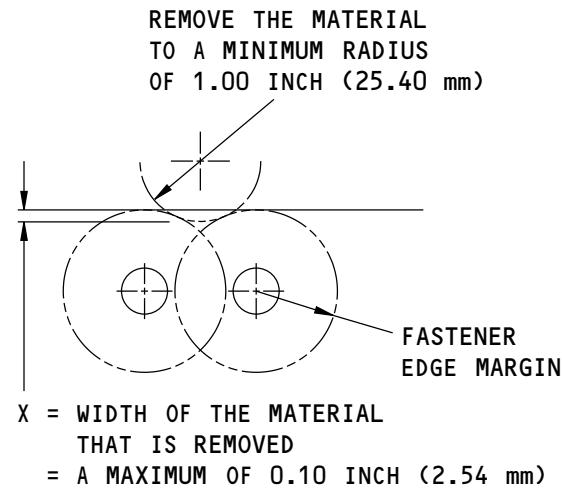
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STRUCTURAL REPAIR MANUAL**



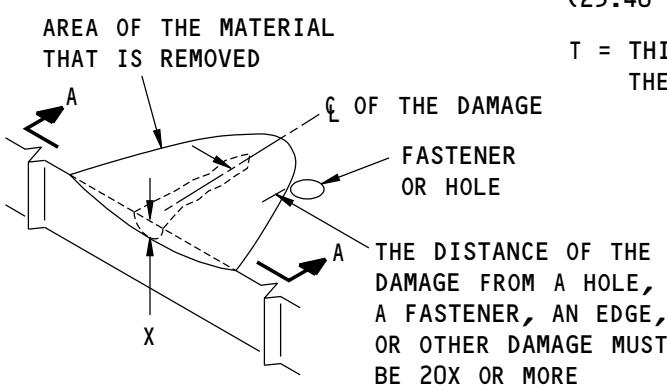
**REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS DO NOT HAVE AN OVERLAP**

(A)



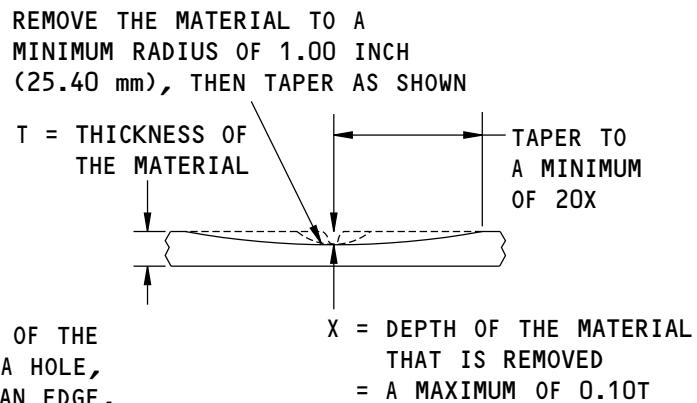
**REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS HAVE AN OVERLAP**

(B)



**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(C)



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**Allowable Damage Limits
Figure 103 (Sheet 1 of 3)**

54-10-02

ALLOWABLE DAMAGE 1

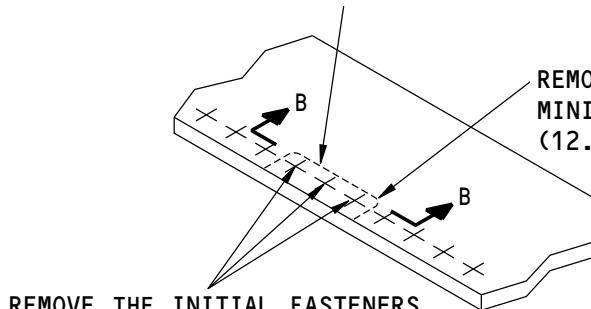
Page 107

Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

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

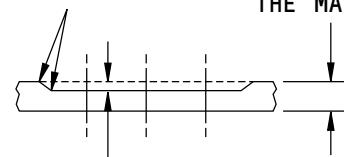


REMOVE THE INITIAL FASTENERS
BEFORE THE DAMAGED MATERIAL
IS REMOVED. INSTALL THE SAME
TYPE AND SIZE (UP TO THE FIRST
OVERSIZE) FASTENERS AFTER THE
REWORK IS COMPLETED

REMOVE THE MATERIAL TO A
MINIMUM RADIUS 0.50 INCH
(12.70 mm) (TYPICAL)

MAKE IT
SMOOTH
(TYPICAL)

T = THICKNESS OF
THE MATERIAL



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

B-B

**REMOVAL OF CORROSION
AROUND THE FASTENERS**

D

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

TAPER TO A
MINIMUM OF 20X

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 (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

E

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**Allowable Damage Limits
Figure 103 (Sheet 2 of 3)**

54-10-02

ALLOWABLE DAMAGE 1

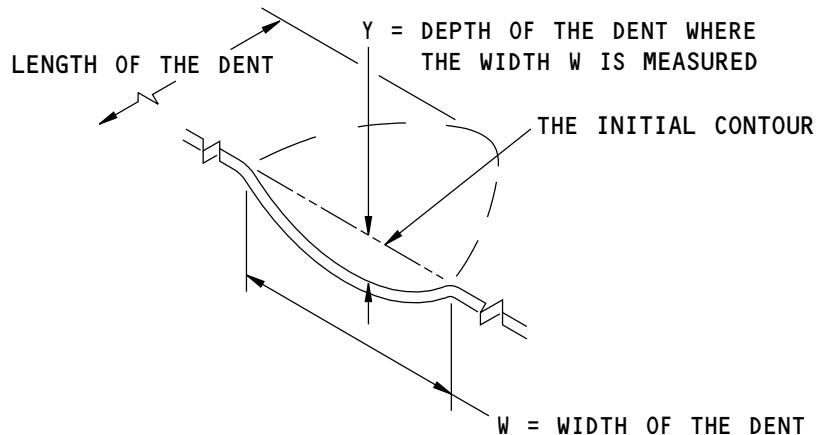
Page 108

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



A. DENTS ARE PERMITTED IF:

- (1) THEY ARE SMOOTH AND HAVE NO SHARP CREASES, GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.
- (2) $\frac{W}{Y}$ IS MORE THAN 30 AT ALL LOCATIONS ALONG THE DENT WHERE:
 Y = A MAXIMUM OF 0.125 INCH (3.2 mm) AND
THE SUM OF THE LENGTH AND WIDTH OF THE DENT IS 4.00 INCHES (101.6 mm)
OR LESS.

B. IF THE DAMAGE DOES NOT AGREE WITH THE CONDITIONS ABOVE, THEN THE DAMAGE IS PERMITTED FOR A MAXIMUM OF 25 FLIGHT HOURS IF:

- (1) THE DENT HAS A CREESE LESS THAN 3.00 INCHES (76.2 mm)
- (2) Y IS LESS THAN 1.00 INCH (25.4 mm)
- (3) THE SUM OF THE LENGTH AND THE WIDTH OF THE DENT IS 7.00 INCHES (177.8 mm)
OR LESS.
- (4) YOU MUST REPAIR THE DAMAGE AFTER 25 FLIGHT HOURS OR LESS.

DENT THAT IS PERMITTED

(F)

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Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

54-10-02

ALLOWABLE DAMAGE 1

Page 109

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - INLET COWL OUTER BARREL FRAMES

1. Applicability

- A. Repair 1 is applicable to damage to a Frame of the Inlet Cowl Outer Barrel. Refer to Inlet Cowl Outer Barrel Frame, Figure 201/REPAIR 1.

2. General

- A. REPAIR 1 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The edge of the damage must be a minimum of 4.0 in. (101.6 mm) away from:
 - (1) The longitudinal splice of the outer barrel
 - (2) The repair parts of other frame repairs.
- C. The length of the frame that is removed must not be more than 12.0 in. (304.8 mm).

54-10-02

REPAIR 1
Page 201

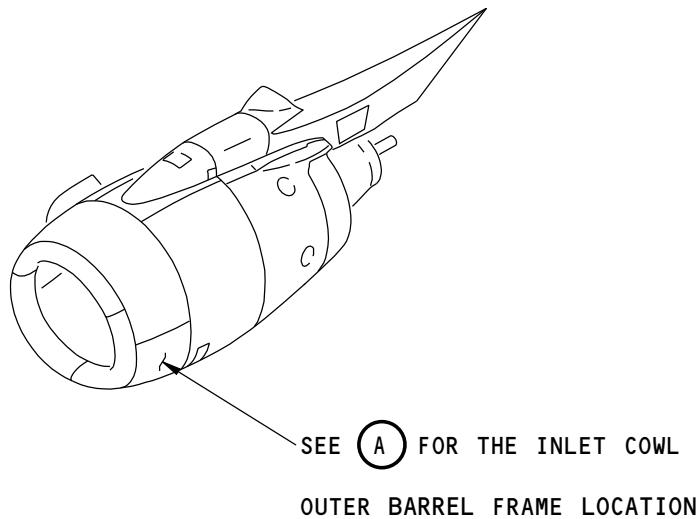
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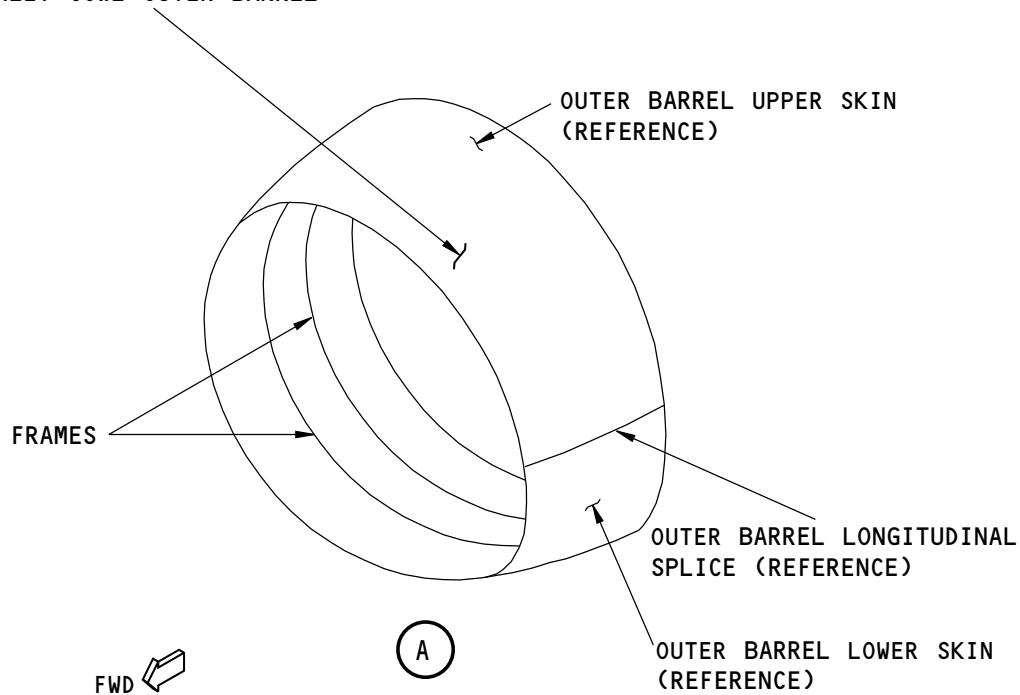
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737-800
STRUCTURAL REPAIR MANUAL



REFER TO FIGURES 202 AND 203
FOR A REPAIR TO A FRAME OF
THE INLET COWL OUTER BARREL



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Inlet Cowl Outer Barrel Frame
Figure 201

54-10-02

REPAIR 1
Page 202

Nov 10/2012

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-00-06, GENERAL	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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-03	FASTENER SUBSTITUTION
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300,	Forming, Straightening, and Fitting Metal Parts Blanking Sonic Area Edges
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. Remove the damaged part of the frame. Refer to 51-10-02, GENERAL.
- C. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- D. Make the repair parts to the same contour as the initial frame. Refer to Table 201/REPAIR 1 for the materials. Refer to Splice Dimensions, Figure 202/REPAIR 1 for the dimensions of the part [2] and the part [3] splices.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Filler	1	Use 0.063 in. (1.60 mm) thick 2024-T3 sheet
[2]	Splice	1	Use 0.040 in. (1.02 mm) thick 625 nickel alloy
[3]	Splice	1	Use 0.040 in. (1.02 mm) thick 625 nickel alloy

- E. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 203/REPAIR 1.
- F. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 203/REPAIR 1. Refer to 51-40-05, GENERAL and 51-40-06, GENERAL.
- G. Disassemble the repair parts.
- H. Remove the nicks, scratches, and gouges from the initial parts. Refer to 51-10-02, GENERAL.
- I. Remove the sharp edges from the initial and repair parts. Refer to BAC 5300, Sonic Edge Finish.

54-10-02

REPAIR 1
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- J. Abrade the surfaces of the CRES doublers with a cloth or fine grit sandpaper. Refer to SOPM 20-30-03
- K. Apply a chemical conversion coating to the part [1] filler and to the bare surfaces of the initial parts. Refer to 51-20-01, GENERAL.
- L. Apply two layers of BMS 10-79, Type III primer to the bare surfaces and edges of the initial and repair parts. Refer to SOPM 20-44-04.
- M. Install the repair parts as shown with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL.
 - (1) Install the part [1] filler and the part [2] splice on the inlet cowl outer barrel skin.
 - (2) Install the part [3] splice on the frame.
- N. Install the fasteners with BMS 5-95 sealant. Refer to 51-20-05, REPAIR 1.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-99/701.

54-10-02

REPAIR 1
Page 204

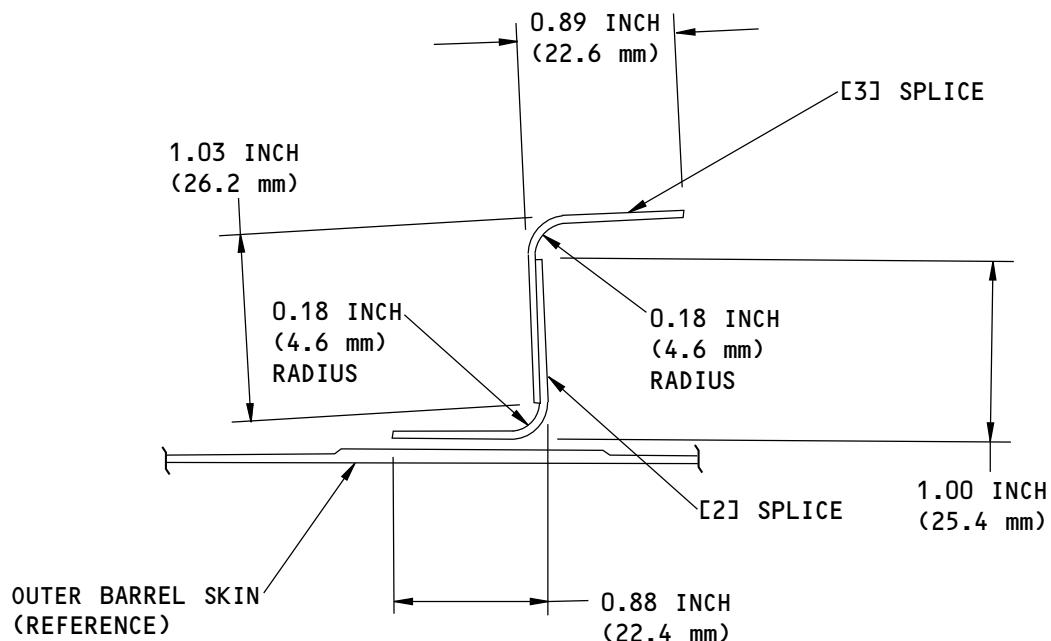
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737-800
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NOTE: MAKE THE LENGTH OF THE SPLICES SUFFICIENT TO GIVE A MINIMUM OF 3 FASTENERS ON BOTH ENDS OF THE REPAIR. REFER TO FIGURE 203.

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Splice Dimensions
Figure 202

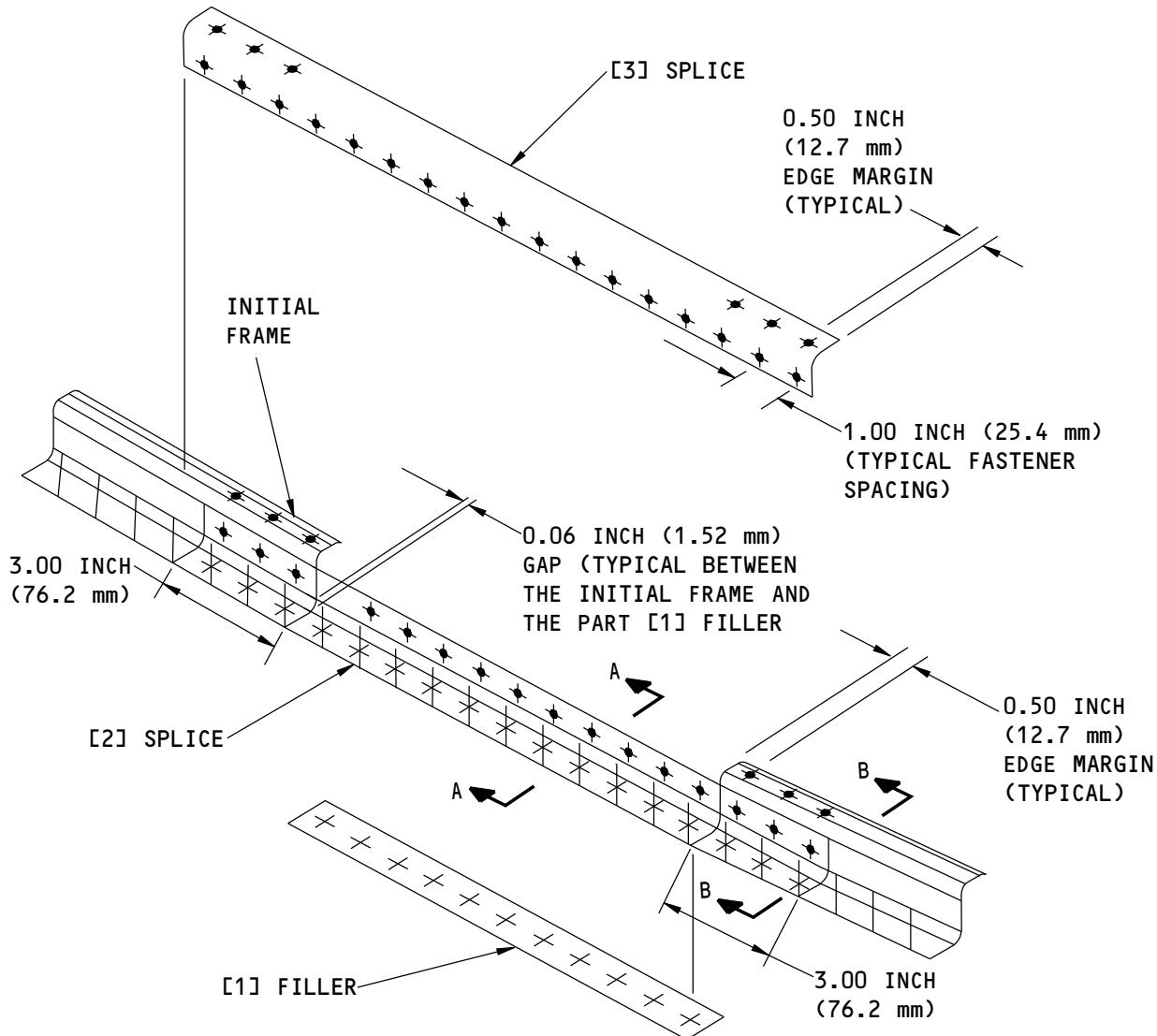
54-10-02

REPAIR 1
Page 205

Nov 10/2012

D634A210

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FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A NAS1200M6-(C)P RIVET
- REPAIR FASTENER LOCATION. INSTALL A MS20615-6MP RIVET.

G92265 S0006591629_V2

Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)

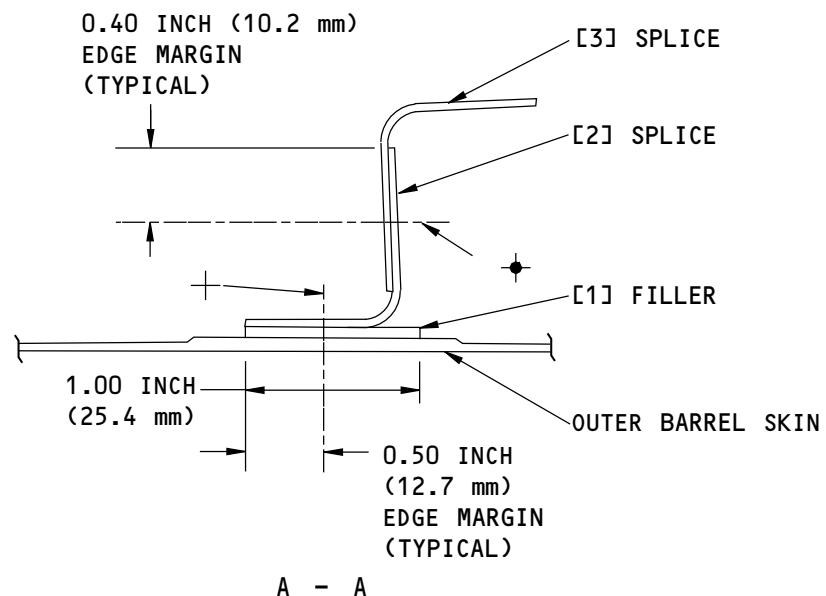
54-10-02
REPAIR 1
 Page 206

Nov 10/2015

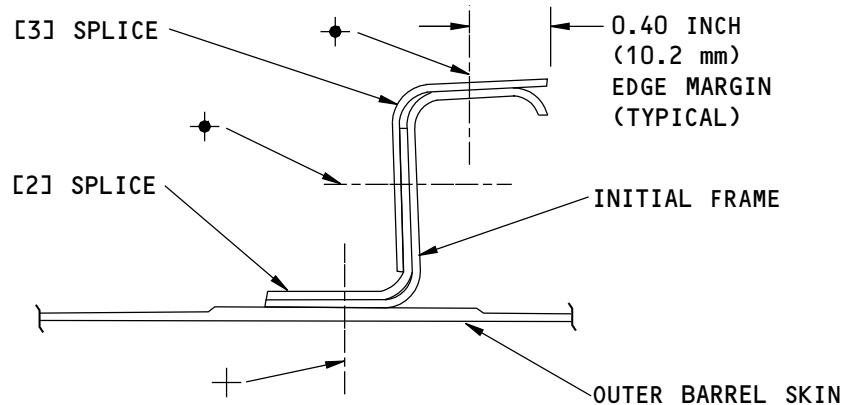
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737-800
STRUCTURAL REPAIR MANUAL



A - A



B - B

G92268 S0006591630_V2

Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

54-10-02

REPAIR 1
Page 207

Nov 10/2015

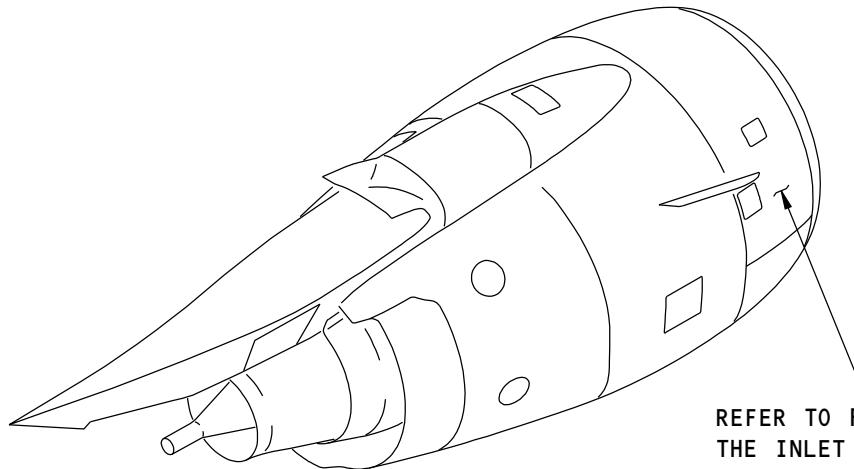
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - INLET COWL FITTINGS



REFER TO FIGURE 2 FOR
THE INLET COWL FITTINGS
IDENTIFICATION

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G10205 S0006591634_V2

Inlet Cowl Fittings Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
314-2135	Pan Assembly - Support, T12 Sensor
314-2142	Clip, Locators - Inlet
314-2145	Plate, Strike
314-2147	Seal - Spring, Inlet
314-2158	Hinge Bracket - Pressure Relief Door
314-2159	Bracket Assembly - Stop, Pressure Relief Door, Inlet

54-10-90

IDENTIFICATION 1

Page 1

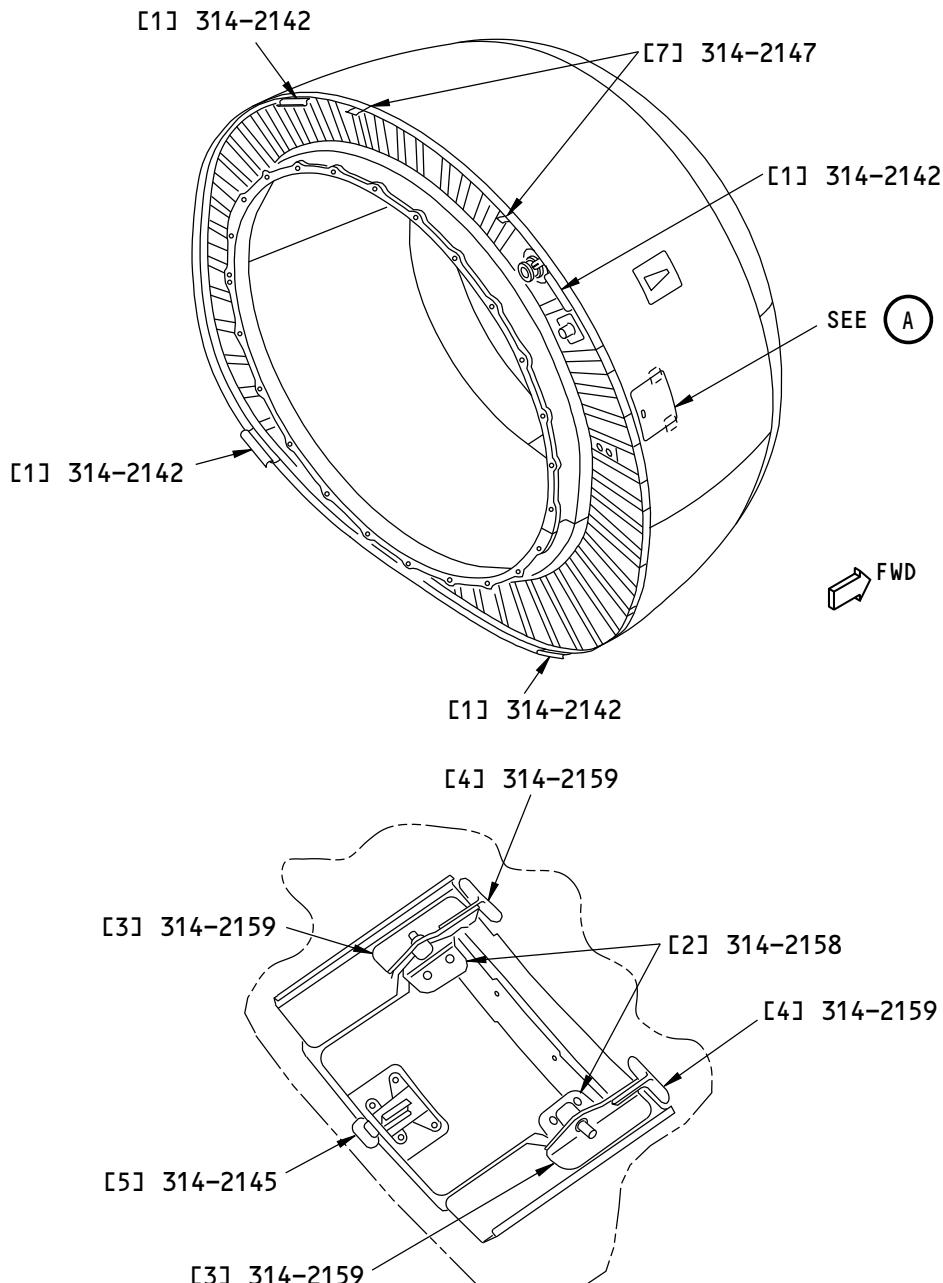
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737-800
STRUCTURAL REPAIR MANUAL



(VIEW LOOKING OUTBOARD DIRECTION)

A

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

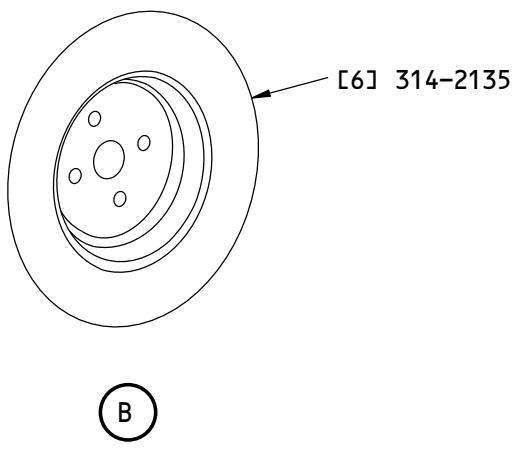
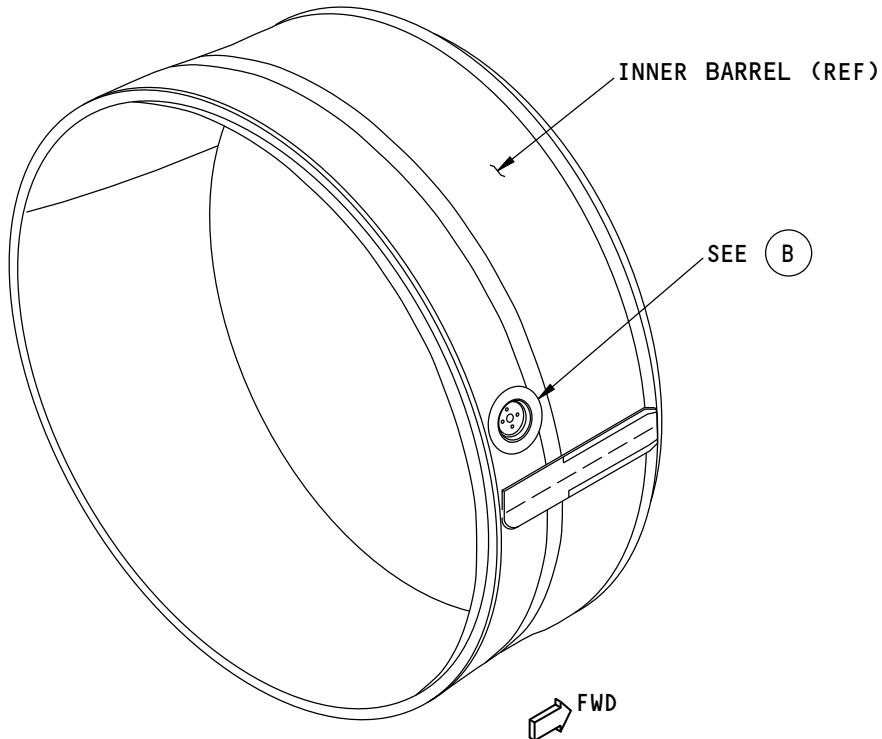
G10256 S0006591636_V2

Inlet Cowl Fittings Identification
Figure 2 (Sheet 1 of 2)

54-10-90
IDENTIFICATION 1
Page 2
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



G10252 S0006591637_V2

Inlet Cowl Fittings Identification
Figure 2 (Sheet 2 of 2)

54-10-90
IDENTIFICATION 1
Page 3
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Clip		17-4PH CRES casting, H1100 as given in AMS 5342	
[2]	Hinge Pin Bracket Assembly		2024-T8511 aluminum extrusion as given in AMS-QQ-A-200/3. Optional: 2024-T851 aluminum bar as given in AMS-QQ-A-225/6	
[3]	Bracket Assembly		2024-T8511 aluminum extrusion as given in AMS-QQ-A-200/3. Optional: 2024-T851 aluminum bar as given in AMS-QQ-A-225/6	
[4]	Bracket		2024-T62 aluminum extrusion as given in AMS-QQ-A-200/3	
[5]	Strike Plate	0.040 (1.02)	321 CRES sheet annealed as given in AMS 5510	
[6]	T12 Sensor Support Pan Assembly	0.050 (1.27)	302 CRES sheet, annealed, as given in AMS 5516	
[7]	Spring Seal	0.020 (0.51)	301 CRES Sheet, 125 ksi	

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

54-10-90

IDENTIFICATION 1

Page 4

Nov 10/2015

D634A210

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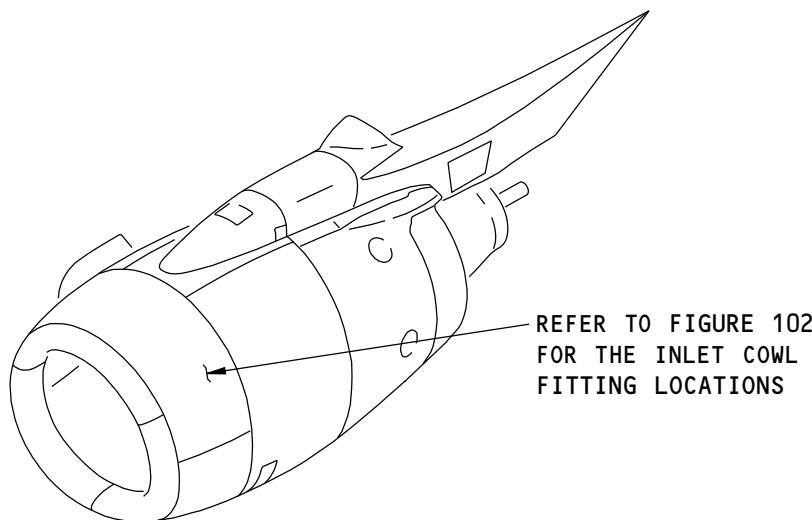


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - INLET COWL FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the inlet cowl fittings shown in Inlet Cowl Location, Figure 101/ALLOWABLE DAMAGE 1.



H55029 S0006591641_V1

Inlet Cowl Location
Figure 101

54-10-90

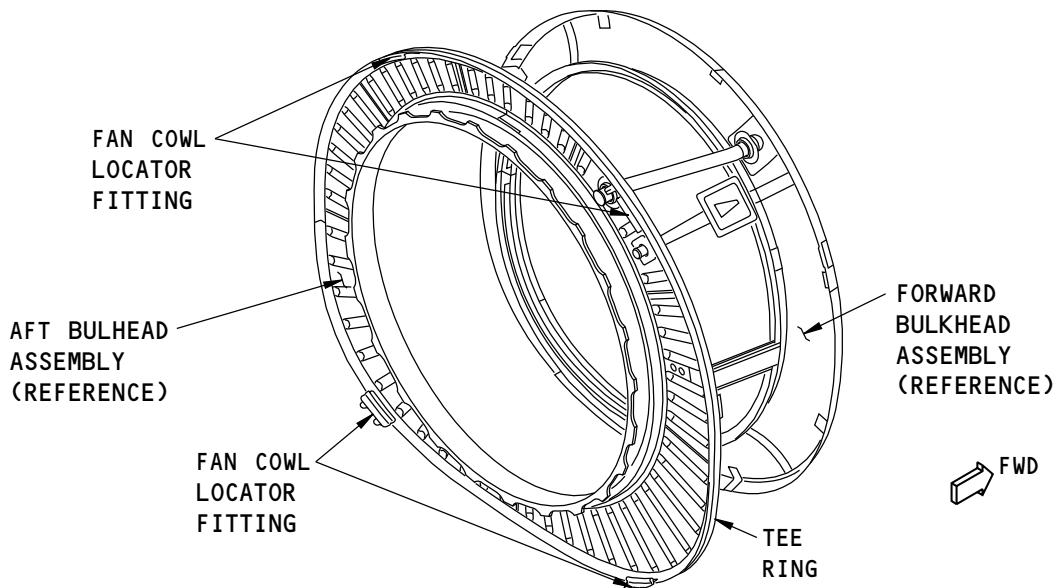
ALLOWABLE DAMAGE 1

Page 101

Nov 10/2012

D634A210

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LEFT ENGINE INLET COWL STRUCTURE IS SHOWN,
RIGHT ENGINE INLET COWL STRUCTURE IS THE SAME

H55031 S0006591642_V1

Inlet Cowl Fitting Locations
Figure 102

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 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.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS

4. Allowable Damage Limits

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

54-10-90

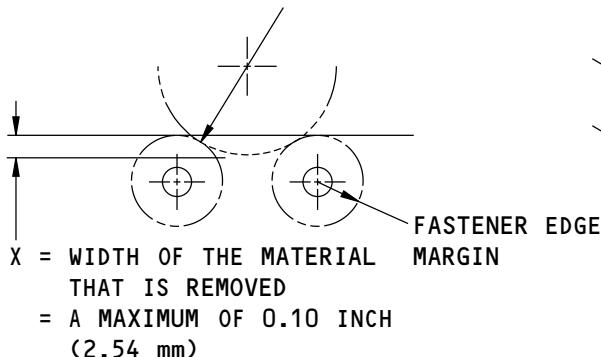
ALLOWABLE DAMAGE 1

Page 102

Jul 10/2015

**737-800
STRUCTURAL REPAIR MANUAL**

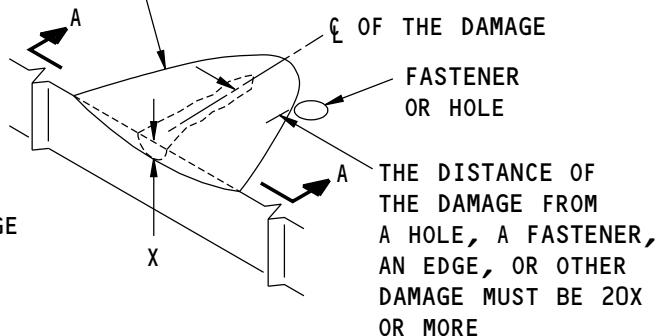
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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

A

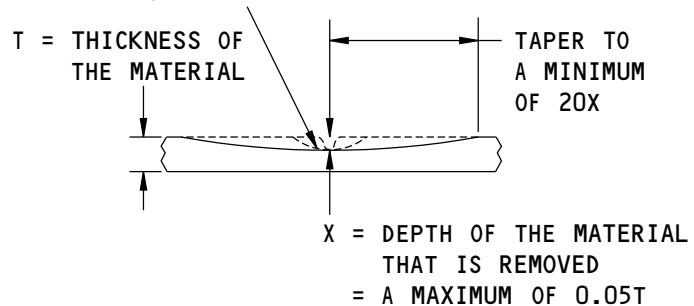
AREA OF THE MATERIAL
THAT IS REMOVED



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

B

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.4 mm), THEN TAPER AS SHOWN



A-A

H55038 S0006591643_V1

Allowable Damage Limits - Inlet Cowl Fittings
Figure 103 (Sheet 1 of 2)

54-10-90

ALLOWABLE DAMAGE 1

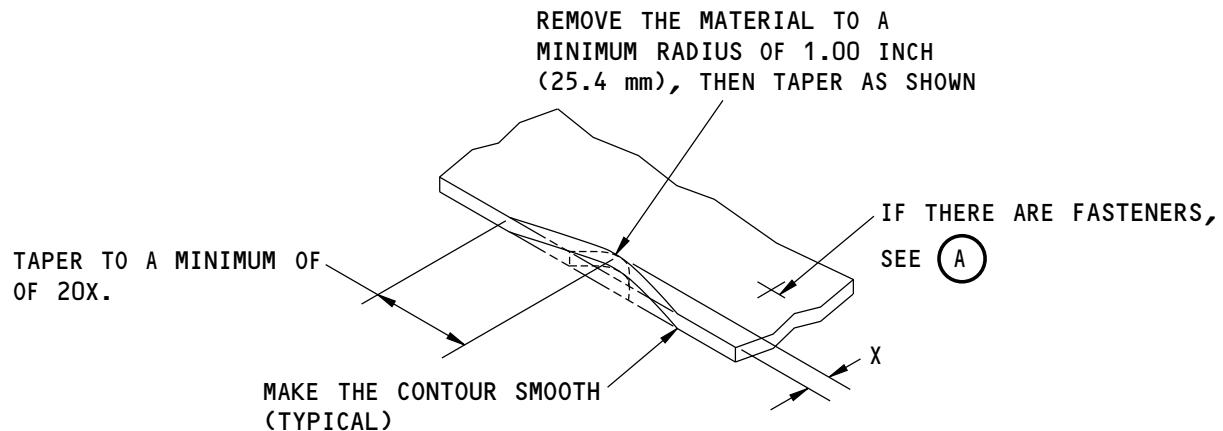
Page 103

Jul 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

H55042 S0006591644_V1

Allowable Damage Limits - Inlet Cowl Fittings
Figure 103 (Sheet 2 of 2)

54-10-90

ALLOWABLE DAMAGE 1

Page 104

Jul 10/2015

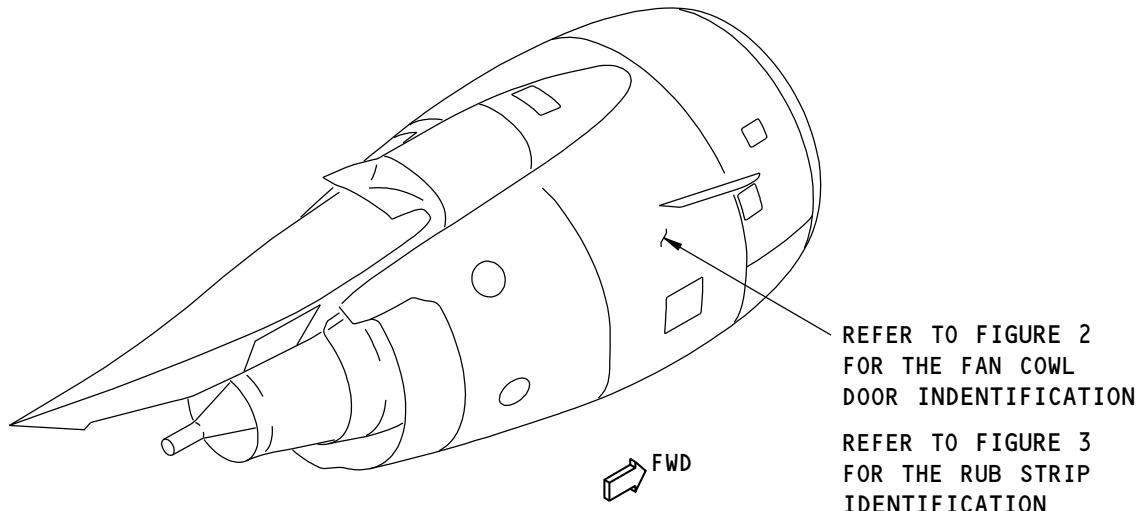
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - FAN COWL DOOR SKIN



REFER TO FIGURE 2
FOR THE FAN COWL
DOOR IDENTIFICATION

REFER TO FIGURE 3
FOR THE RUB STRIP
IDENTIFICATION

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F10584 S0006591649_V1

Engine Fan Cowl Door Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
314A2000	Fan Cowl Installation - CFM56-7
314-2200	Cowl Assembly - Fan, Left and Right
314-2203	Skin Assembly - Left and Right, Fan Cowl
314-2209	Rub Strip - Fan Cowl

54-20-01

IDENTIFICATION 1

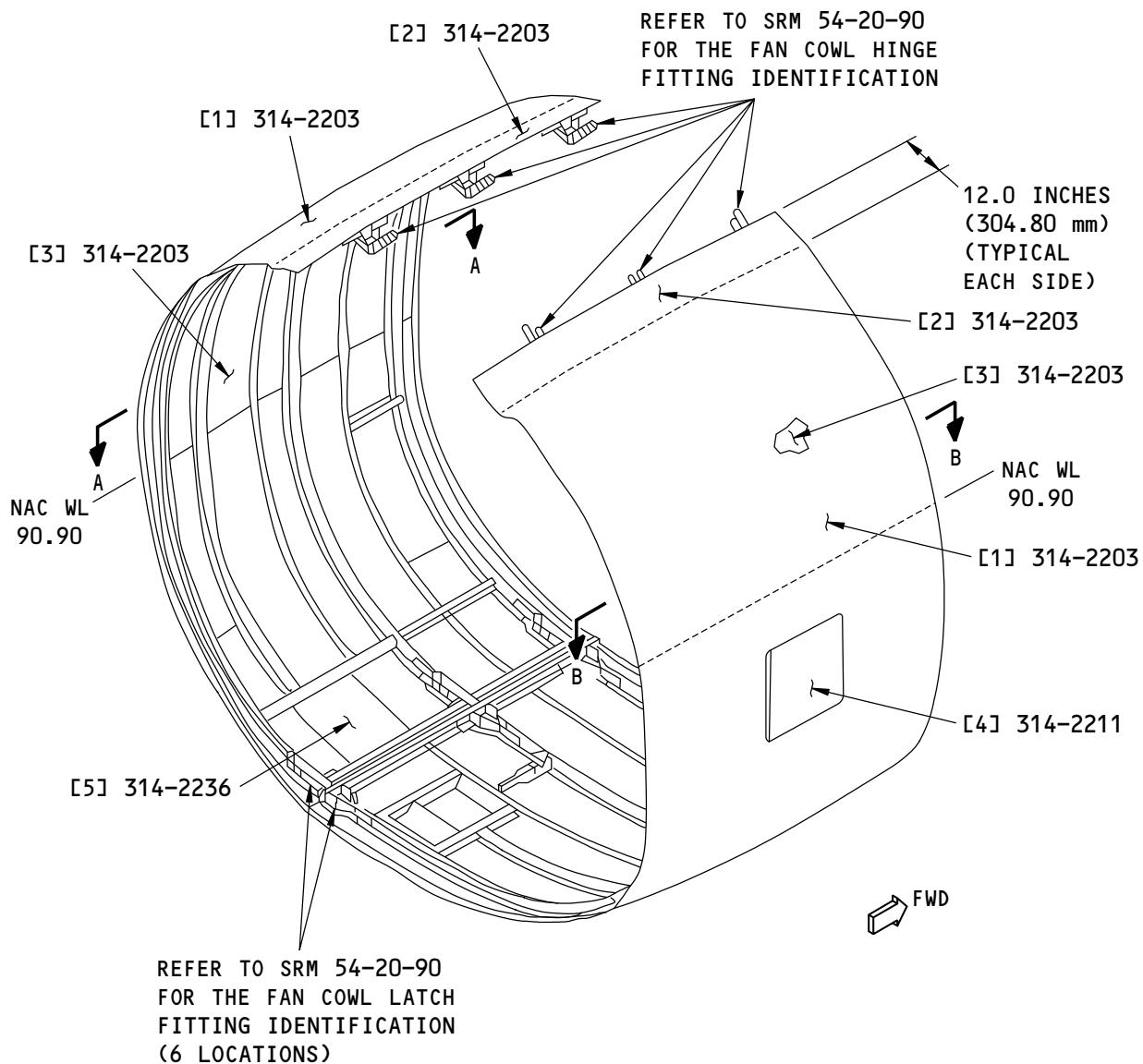
Page 1

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

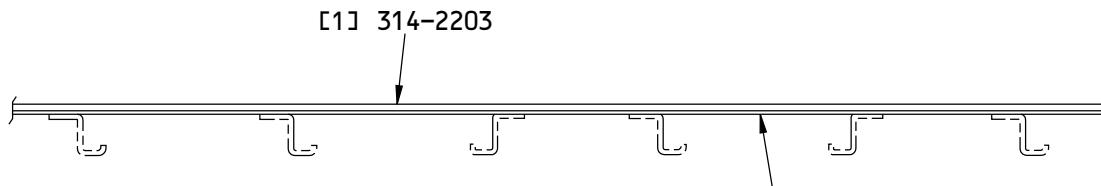
BR-017
F10601 S0006591651_V2

Engine Fan Cowl Door Skin Identification
Figure 2 (Sheet 1 of 2)

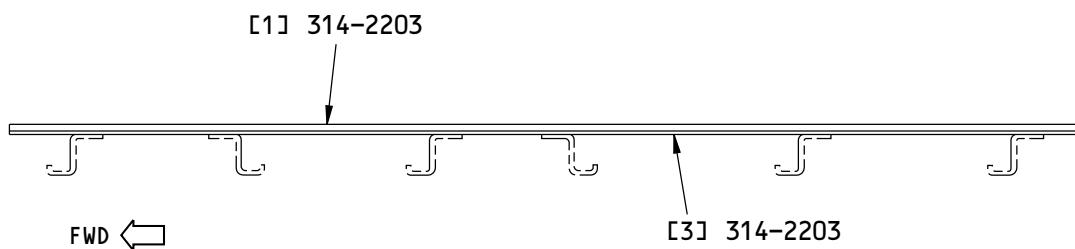
54-20-01
IDENTIFICATION 1
Page 2
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



LEFT FAN COWL DOOR
A-A



RIGHT FAN COWL DOOR
B-B

F12115 S0006591652_V1

Engine Fan Cowl Door Skin Identification

Figure 2 (Sheet 2 of 2)

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Fan Cowl Door Skin	0.071 (1.80)	2024-T62 aluminum sheet, chem-milled to 0.045 (1.14) as given in AMS-QQ-A-250/4	
[2]	Fan Cowl Door Skin, Man-Walk Area 12 inches (305 mm) from top	0.071 (1.80)	2024-T62 aluminum sheet (not chem-milled in this area) as given in AMS-QQ-A-250/4	
[3]	Bonded Fireshield (Nacelle Waterline 91.38 and above)	0.005 (0.13)	CRES 321 sheet	Line Number 1 and 2
		0.005 to 0.020 (0.13 to 0.25)	Nextel, DC90-006	Line Number 3 through 1539
			Fiberglass, 3732/DAPCO 2900 as given in MIL-Y-1140, Form 4, Class C	Line Number 1540 and on
[4]	Oil Tank Access Door Skin	0.071 (1.80)	2024-T62 aluminum sheet as given in AMS-QQ-A-250/4	
[5]	Pressure Relief Door Skin		A357.0-T61 aluminum casting as given in AMS 4219 (Optional: 2219-T851 aluminum plate as given in QQ-A-250/30)	

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

54-20-01

IDENTIFICATION 1

Page 3

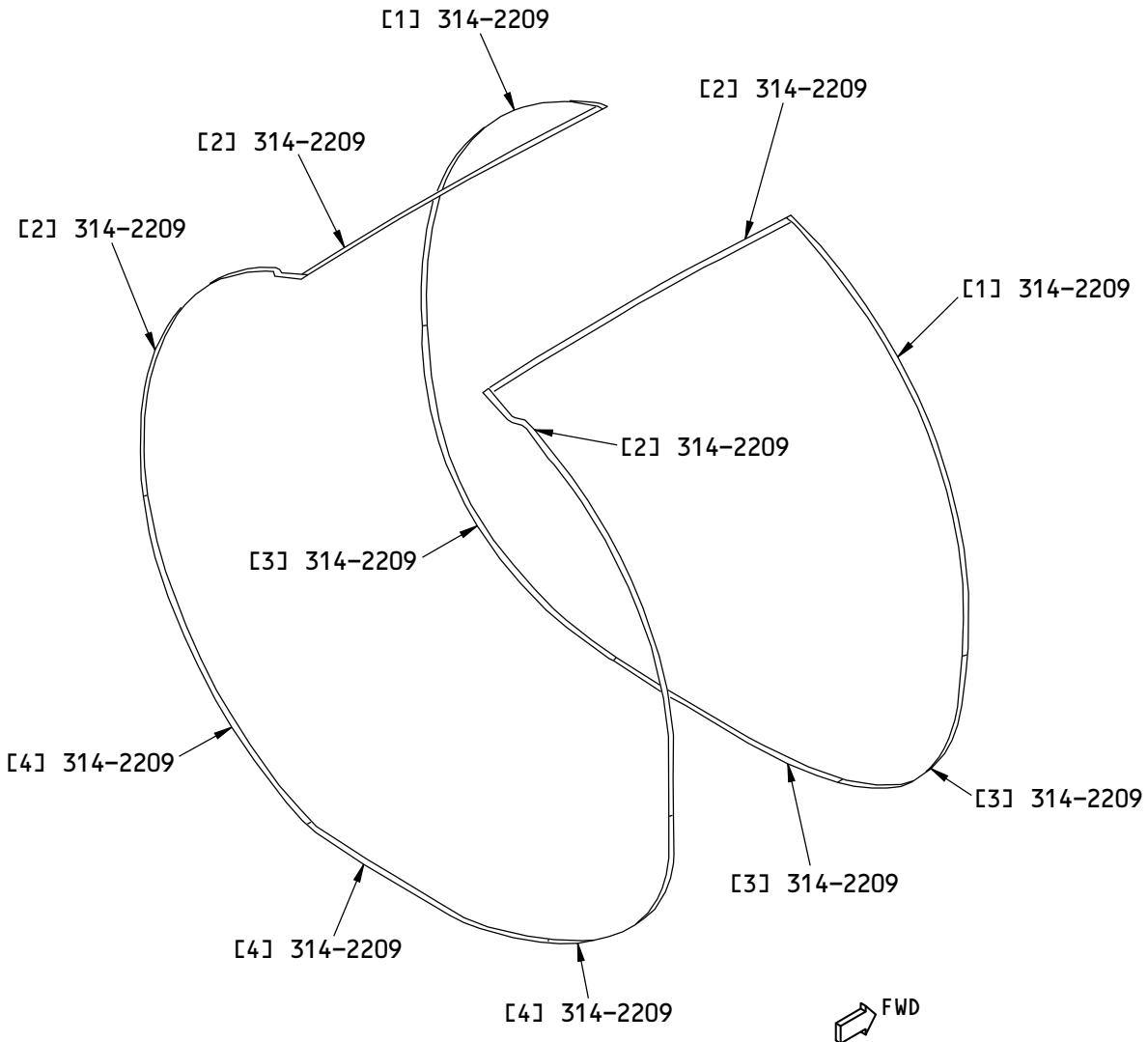
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737-800
STRUCTURAL REPAIR MANUAL



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

G12559 S0006591654_V1

Engine Fan Cowl Door Skin Rub Strip Identification
Figure 3

54-20-01
IDENTIFICATION 1
Page 4
Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Rub Strip	0.050 (1.27)	2024-T3 aluminum sheet as given in AMS-QQ-A-250/4	
[2]		0.040 (1.02)	CRES 302 sheet annealed as given in AMS 5516	Line Number 1 through 52
			Titanium-CP-40 sheet annealed as given in AMS 4902	Line Number 53 and on
[3]	Rub Strip	0.071 (1.80)	2024-T3 aluminum sheet as given in AMS-QQ-A-250/4	
[4]	Rub Strip	0.050 (1.27)	2024-T3 aluminum sheet as given in AMS-QQ-A-250/4	

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

54-20-01

IDENTIFICATION 1

Page 5

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - FAN COWL DOOR SKIN

1. Applicability

- A. This subject gives the allowable damage limits for the fan cowl door skin shown in Fan Cowl Skin Locations, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. These Allowable Damage Limits have FAA approval only if the inspections given in this subject are completed at the specified times.
- 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 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 as follows:
- (1) Apply a chemical conversion coating to the reworked aluminum areas. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-79, Type III primer on the reworked areas of the CRES fireshield and aluminum skins as given in SOPM 20-44-04.
 - (3) Apply a finish to the reworked areas of the fan cowl skin panels as given in AMM 51-21-00/701.
- D. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits for the fan cowl door parts.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS	
FAN COWL DOOR SKIN	PARAGRAPH
Skin (Aluminum)	4.A
Fireshield (CRES Foil)	4.B
Fireshield (Nextel or Fiberglass)	4.C

54-20-01

ALLOWABLE DAMAGE 1

Page 101

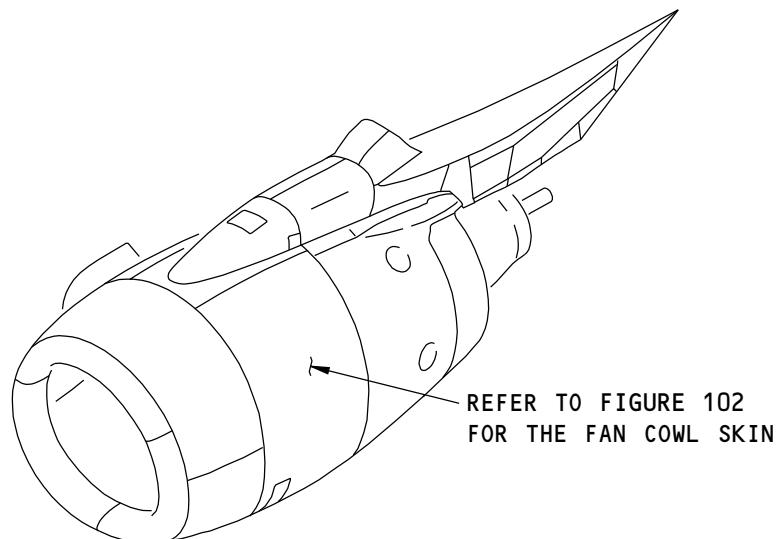
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**737-800
STRUCTURAL REPAIR MANUAL**



G78180 S0006591659_V1

**Fan Cowl Skin Locations
Figure 101**

54-20-01

ALLOWABLE DAMAGE 1

Page 102

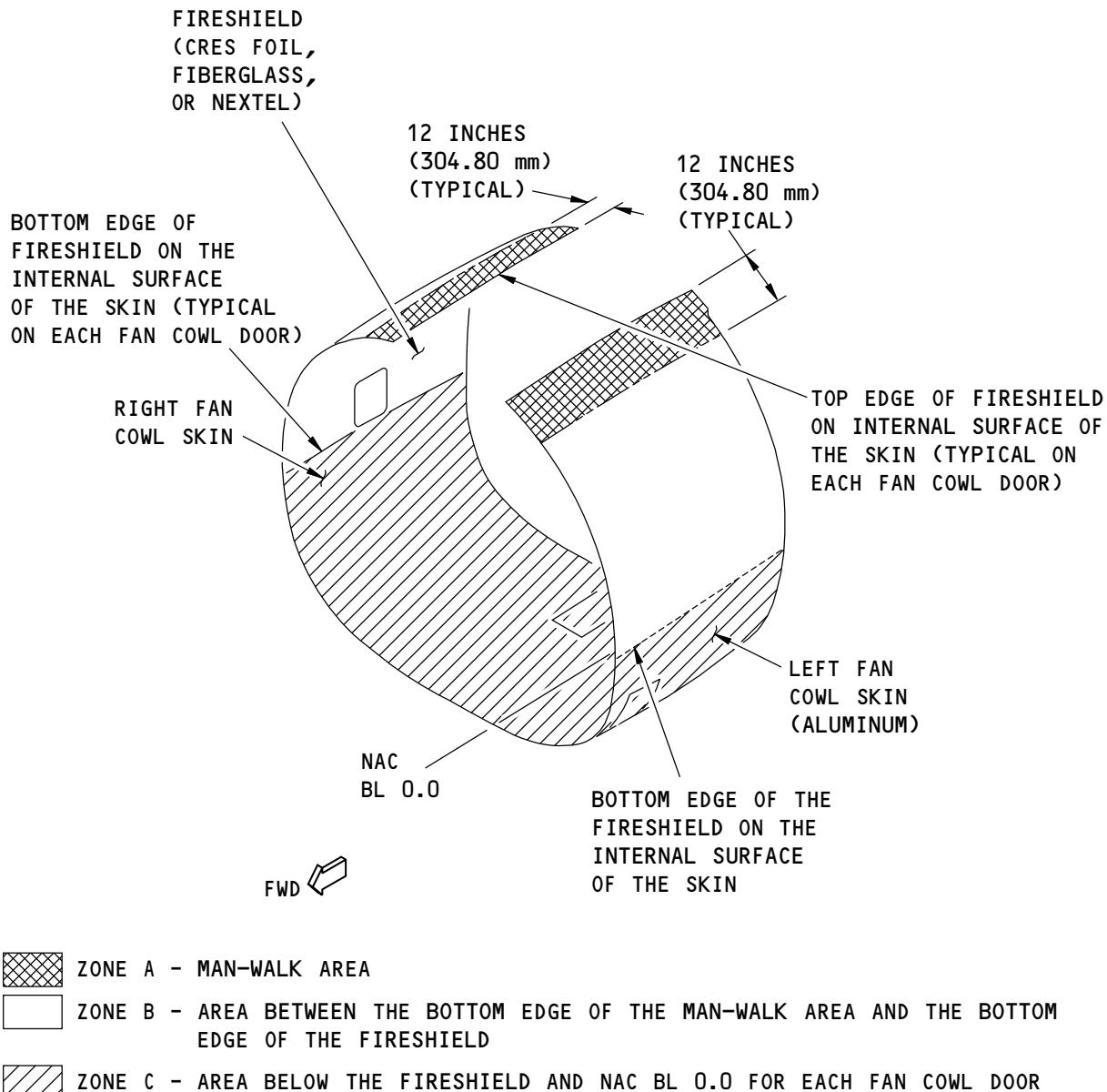
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

G78182 S0006591660_V2

Fan Cowl Door Skin Zones
Figure 102

54-20-01

ALLOWABLE DAMAGE 1

Page 103

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Fan Cowl Skin

- (1) Cracks:
 - (a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
 - (b) Surface cracks on the Fan Cowl Skin is not permitted.
 - (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 permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .
- NOTE:** Do not fill the dents.
- (4) Holes and Punctures up to a maximum diameter of 0.25 inch (6.35 mm) are permitted if:
 - (a) The center of the damage is a minimum of 1.00 inch (25.4 mm) from the center of an adjacent hole or the edge of the panel
 - (b) You install rivets in the holes wet with BMS 5-63 sealant.
 - 1) Install MS20615-()MP rivets in Zones A, B, and C.

B. Fireshield (CRES Foil)

- (1) Cracks:
 - (a) Remove the edge cracks as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
 - (b) Surface cracks on the Fireshield (CRES Foil) foil from the fan cowl skin are not permitted.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Nicks, gouges, and scratches that do not go through the foil are permitted
 - (b) Remove corrosion damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details C , and D
 - (c) Fill Nicks, Gouges, Scratches, and Corrosion completely with BMS 5-63 sealant.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail F .

NOTE: Do not fill the dents.

54-20-01

ALLOWABLE DAMAGE 1

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (4) Holes and Punctures up to a maximum diameter of 0.25 in. (6.35 mm) on the fireshield (CRES foil) from the fan cowl skin are permitted if:
 - (a) You install rivets in the holes wet with BMS 5-63 sealant.
 - 1) Install MS20615-()MP rivets in Zones A, B, and C.
 - (5) Delamination of the foil from the fan cowl skin is not permitted.
- C. Fireshield (Nextel or fiberglass)
- (1) Nicks, Gouges, and Scratches that do not go fully through the Nextel or fiberglass are permitted if you:
 - (a) Fill Nicks, Gouges, and Scratches completely with BMS 5-63 sealant.
 - (2) Dents are permitted if there is no delamination of the fireshield from the fan cowl skin.
 - (3) Holes or Tears damage that opens the fan cowl door skin to the air is not permitted.
 - (4) Delamination of the fireshield from the fan cowl skin is not permitted.

54-20-01

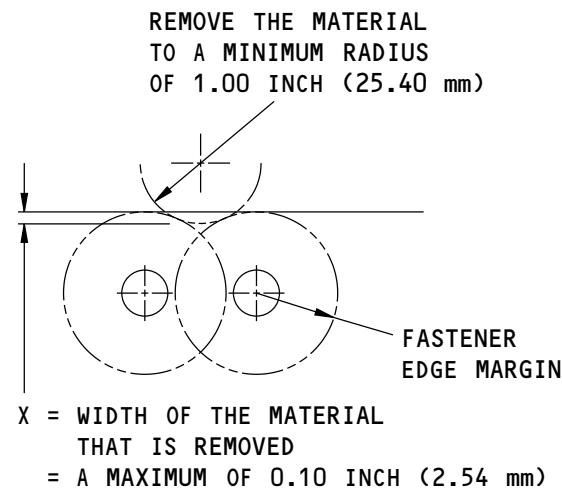
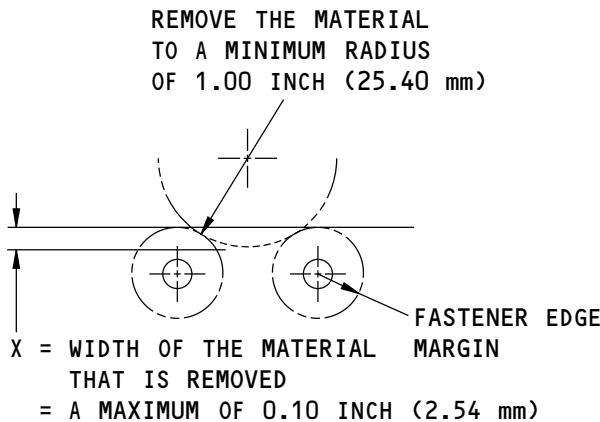
ALLOWABLE DAMAGE 1

Page 105

Nov 10/2015

D634A210

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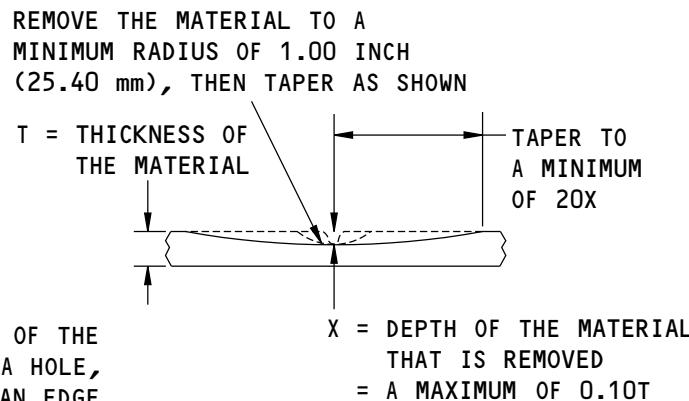
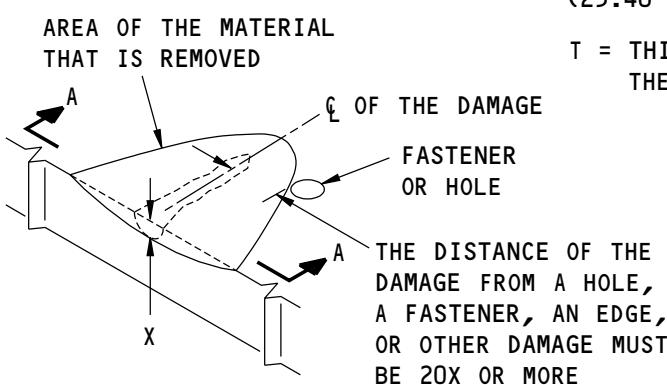
**737-800
STRUCTURAL REPAIR MANUAL**


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 A SURFACE

(C)

G78183 S0006591661_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)

54-20-01

ALLOWABLE DAMAGE 1

Page 106

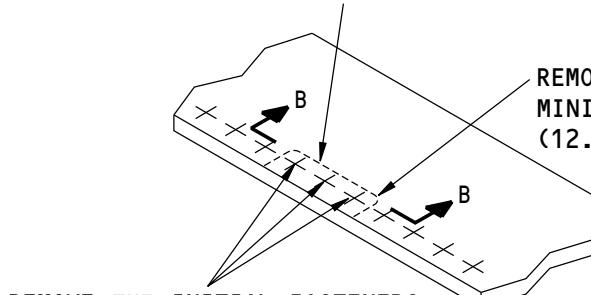
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737-800 STRUCTURAL REPAIR MANUAL

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

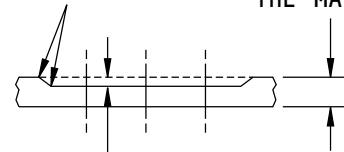


REMOVE THE INITIAL FASTENERS
BEFORE THE DAMAGED MATERIAL
IS REMOVED. INSTALL THE SAME
TYPE AND SIZE (UP TO THE FIRST
OVERSIZE) FASTENERS AFTER THE
REWORK IS COMPLETED

REMOVE THE MATERIAL TO A
MINIMUM RADIUS 0.50 INCH
(12.70 mm) (TYPICAL)

MAKE IT
SMOOTH
(TYPICAL)

T = THICKNESS OF
THE MATERIAL



X = THE DEPTH OF THE
MATERIAL REMOVED

= A MAXIMUM OF 0.10T

REMOVAL OF CORROSION AROUND THE FASTENERS

D

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

TAPER TO A
MINIMUM OF 20X

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 (2.54 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

E

G78185 S0006591662_V1

Allowable Damage Limits Figure 103 (Sheet 2 of 3)

54-20-01

ALLOWABLE DAMAGE 1

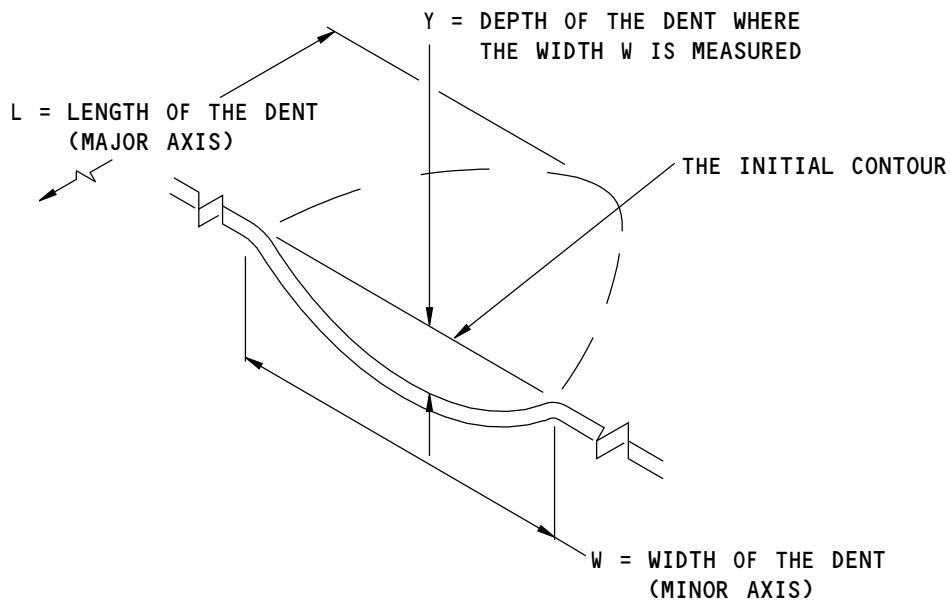
Page 107

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



A. DENTS ARE PERMITTED IF:

- (1) THEY ARE SMOOTH AND HAVE NO SHARP CREASES, GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.
- (2) $\frac{W}{Y}$ IS MORE THAN 30 AT ALL LOCATIONS ALONG THE DENT WHERE:
 - Y = A MAXIMUM OF 0.125 INCH (3.18 mm) AND
 - W = A MAXIMUM OF 4.00 INCHES (101.6 mm)
 - L = A MAXIMUM OF 4.00 INCHES (101.6 mm)
- (3) THERE IS A MAXIMUM OF EIGHT DENTS IN A FAN COWL DOOR AND THERE IS A MINIMUM OF 10.00 INCHES (254.0 mm) BETWEEN THE EDGES OF THE DENTS

B. DENTS THAT ARE MORE THAN THE LIMITS GIVEN IN A. ARE PERMITTED FOR A MAXIMUM OF TWO FLIGHT CYCLES IF:

- (1) THEY ARE SMOOTH AND HAVE NO GOUGES, OR CRACKS. PULLED OR LOOSE FASTENERS ARE NOT PERMITTED.
- (2) Y = A MAXIMUM OF 0.25 INCH (6.35 mm) AND
 - W = A MAXIMUM OF 4.00 INCHES (101.6 mm)
 - L = A MAXIMUM OF 4.00 INCHES (101.6 mm)
- (3) THE DENT HAS A CREESE LENGTH LESS THAN 3.00 INCHES (76.2 mm) IN LENGTH
- (4) THERE IS A MAXIMUM OF EIGHT DENTS IN A FAN COWL DOOR AND THERE IS A MINIMUM OF 10.00 INCHES (254.0 mm) BETWEEN THE EDGES OF THE DENTS

DENT THAT IS PERMITTED

F

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Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

54-20-01

ALLOWABLE DAMAGE 1

Page 108

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - FAN COWL DOOR SKIN FLUSH REPAIR IN THE FIELD AREA

1. Applicability

- A. Repair 1 is applicable to damage that occurs to the skin in the field area of the fan cowl of the engine nacelle. Refer to Fan Cowl Skin Zones, Figure 201/REPAIR 1.
- B. The edge of the damage must be a minimum of 1.9 in. (48.3 mm) from a frame, doubler, or chem-mill step.

2. General

- A. Repair 1 is a permanent repair.
- B. Refer to 51-00-06, GENERAL to find the definitions of the different categories of repairs.
- C. Make sure the aerodynamic smoothness of the repair is satisfactory or there can be a decrease in the economic performance of the airplane.

54-20-01

**REPAIR 1
Page 201**

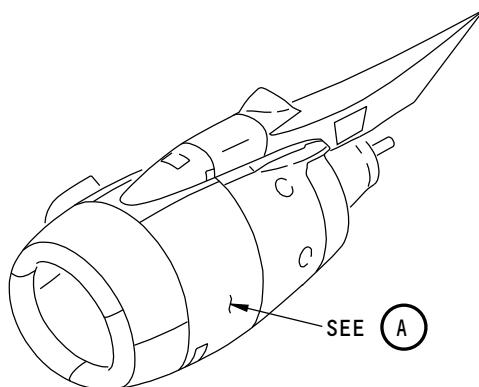
Nov 10/2015

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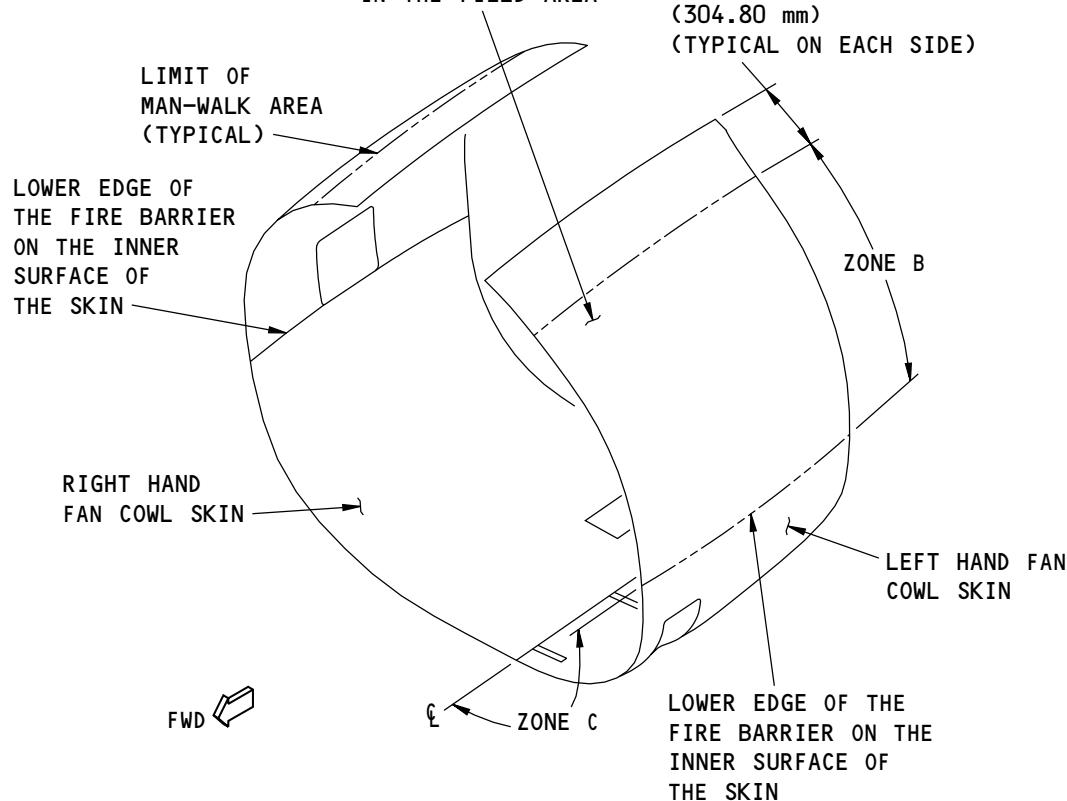


737-800
STRUCTURAL REPAIR MANUAL



REFER TO FIGURE 202
FOR A TYPICAL REPAIR
IN THE FIELD AREA

ZONE A
12 INCHES
(304.80 mm)
(TYPICAL ON EACH SIDE)



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE



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Fan Cowl Skin Zones
Figure 201

54-20-01

REPAIR 1
Page 202
Jul 10/2014

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
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
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. Drill a 0.25 in. (6.4 mm) stop hole at the ends of the crack in the damaged skin.

NOTE: The edge of the stop hole must be a minimum of 1.9 in. (48.3 mm) from a frame, doubler, or chem-mill step.

- C. Cut out the damaged skin.
 - (1) Make a radius at the corners of the cutout a minimum of 0.50 in. (12.7 mm).
 - (2) Do not cause damage to the adjacent internal structure.

- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 1.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.063 in. (1.60 mm) thick 321 CRES sheet. Optional to use 2024-T3 sheet that is 0.071 in. (1.80 mm) thick for Zone C only.
[2]	Repair Skin	1	For Zone A, use 2024-T3 sheet that is 0.071 in. (1.80 mm) thick. For Zones B and C use 2024-T3 sheet that is 0.045 in. (1.14 mm) thick.

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 1.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 1 . Refer to 51-40-05, GENERAL, 51-40-06, GENERAL, and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, gouges, and burrs from the repair parts and the initial skin, and break the sharp edges 0.015 in. (0.38 mm) to 0.030 in. (0.76 mm). Refer to 51-10-02, GENERAL.

54-20-01

REPAIR 1
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
- K. Clean the surfaces of the CRES doubler with Scotch-Brite or fine grit abrasive paper. Refer to SOPM 20-30-03.
- L. Apply one layer of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the following:
NOTE: Two layers of primer are necessary for all parts used in Zones A and B.
 - (1) The bare external surfaces of the initial skin.
 - (2) The internal and external surfaces of the part [1] doubler and the part [2] repair skin.
- M. Install the repair parts. Refer to Table 202/REPAIR 1 for the fasteners available for use.
 - (1) Install the non-aluminum fasteners in Zones A and B wet with BMS 10-79, Type III primer.
 - (2) Install the aluminum fasteners in Zone C without primer, if the optional material for the part [1] doubler is used.
- N. Apply one layer of BMS 10-79, Type III primer to the fastener heads after installation.
- O. Fill the space between the part [2] repair skin and the initial skin with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.
- P. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

Table 202: SOLID RIVET FASTENER LOCATION, TYPE AND SIZE

ZONE	REPAIR FASTENER TYPE AND SIZE
A	NAS1200M6()P (Optional: MS20615-6MP)
B	MS20615-6MP
C	MS20470AD6 (Optional: NAS1097AD6 or BACR15CE6AD for use in 0.071 in. (1.80 mm) thick areas only)

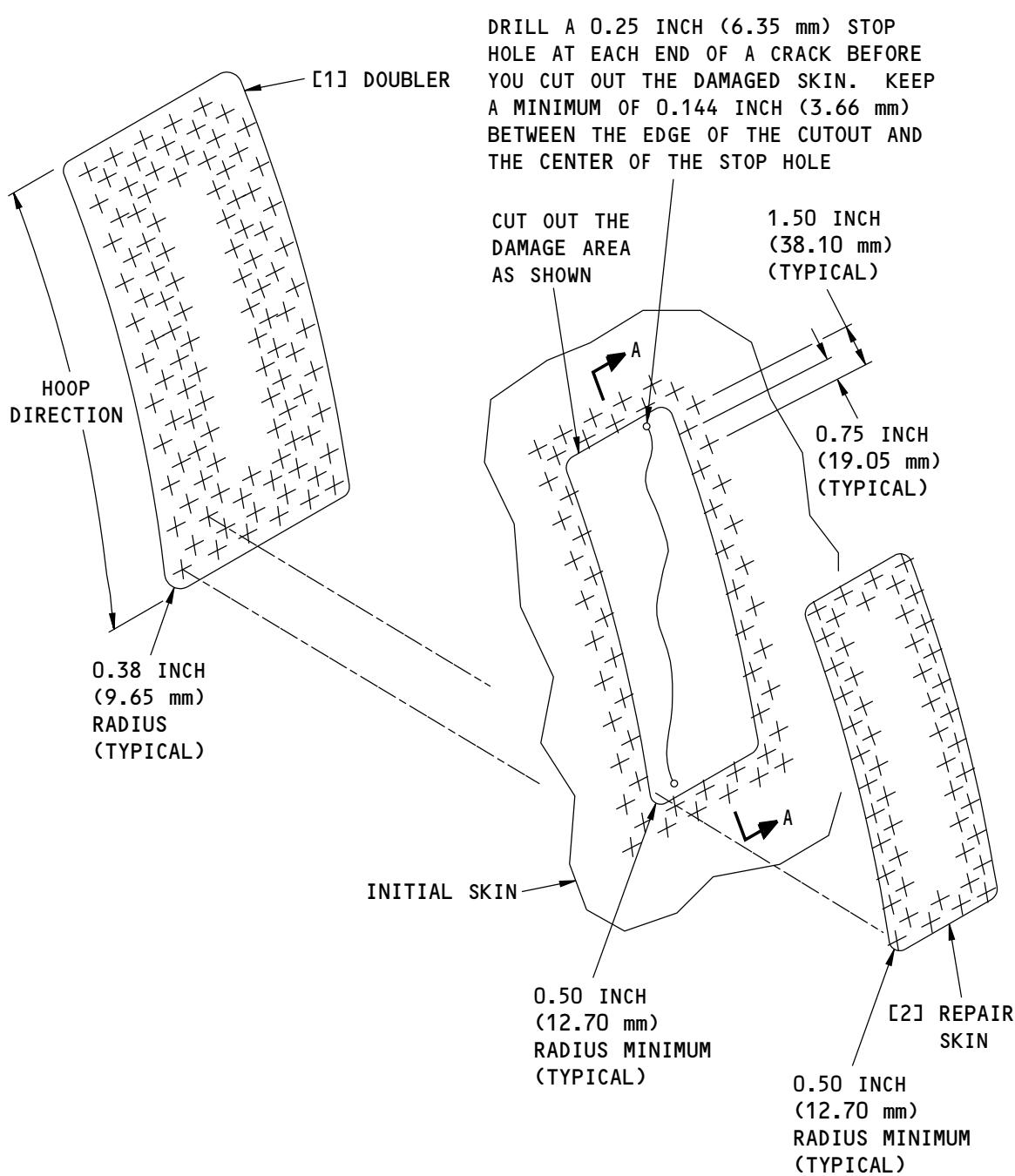
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REPAIR 1
Page 204

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

FASTENER SYMBOLS

+ REPAIR FASTENER LOCATION. REFER TO TABLE 202 FOR THE FASTENERS.

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**Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)**

54-20-01

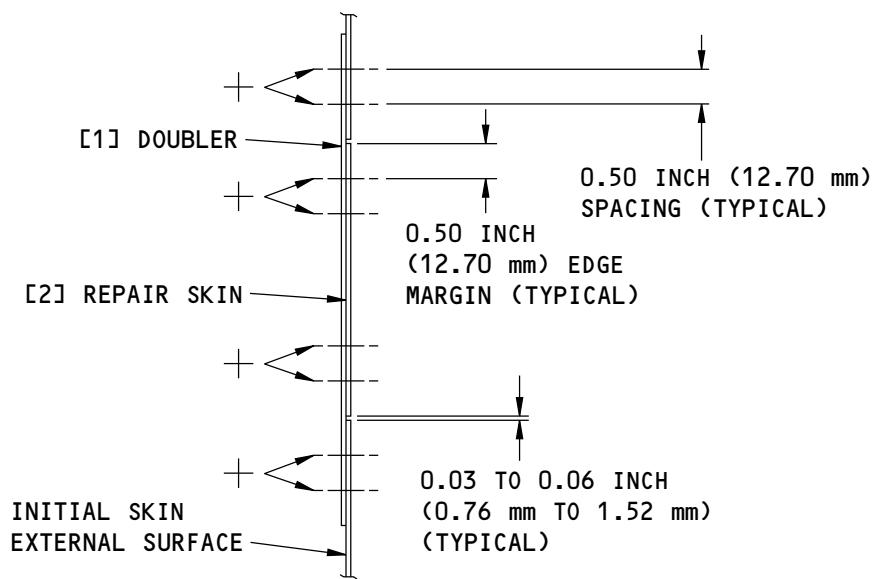
**REPAIR 1
Page 205**

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



A-A

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 1
Page 206

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - FAN COWL SKIN EXTERNAL REPAIR IN THE FIELD AREA

1. Applicability

- A. Repair 2 is applicable to damage that is:
 - (1) On the Fan Cowl External Skin in the field area
 - (2) Not more than 1.25 in. (31.8 mm) in diameter.
- B. Repair 2 is not applicable to damage at the forward or aft edges of the fan cowl skin.

54-20-01

REPAIR 2

Page 201

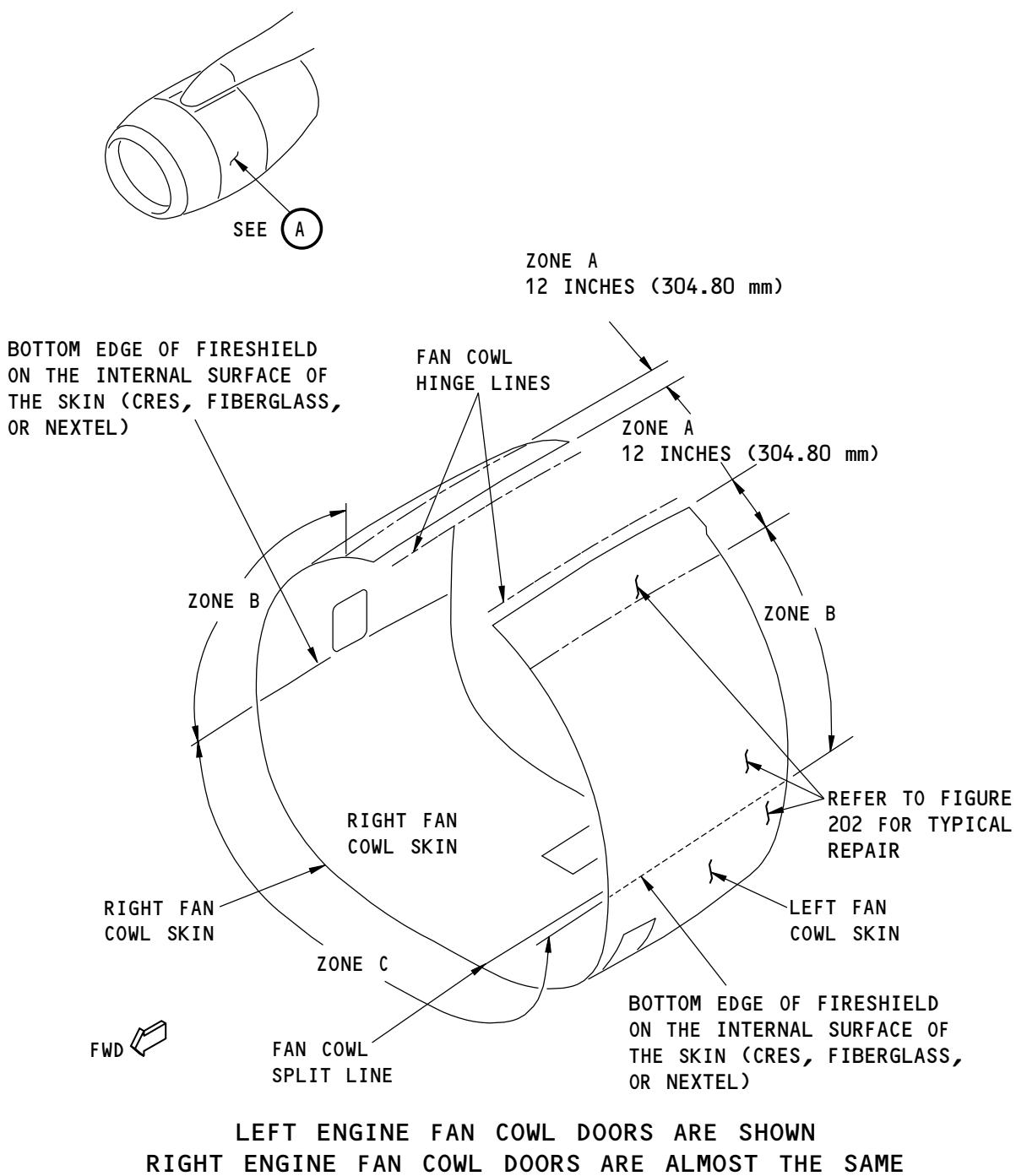
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737-800
STRUCTURAL REPAIR MANUAL



(A)

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Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 2
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

2. General

- A. Repair 2 is a permanent repair. Refer to 51-00-06, GENERAL to find the definitions of the different categories of repairs.
- B. The maximum doubler diameter is 3.21 in. (81.53 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- C. The edge of the repair doubler must be:
 - (1) A minimum of 0.50 in. (12.70 mm) from a frame, doubler or chem-mill step.
 - (2) A minimum of 2.00 in. (50.80 mm) away from the chine (Vortex Control Device)
 - (3) A minimum of 1.50 in. (38.10 mm) away from zee frames at the fitting attach fastener locations of the fan cowl hinges (forward and aft directions)
 - (4) A minimum of 3.00 in. (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the cowl hinge line
 - (5) A minimum of 3.00 in. (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.
- D. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 in. (660.40 mm) is equivalent to adding 9 lb (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gal (378.54 L) in a year.
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

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
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to drill a stop hole.

54-20-01

REPAIR 2

Page 203

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

- C. Cut and remove the damaged skin in the shape of a circle with a maximum diameter of 1.25 in. (31.75 mm). Refer to Layout of the Repair Parts, Figure 202/REPAIR 2.
- (1) Make sure that the edge of part [1] doubler, when installed, will be a minimum of 0.50 in. (12.70 mm) from:
- (a) A frame
(b) A doubler
(c) A chem-mill step
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .
- NOTE:** The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 2 and Figure 202/REPAIR 2.
- (1) Make the part [2] foil for repairs in zones A and B to the same dimensions as the part [1] doubler.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 in. (2.03 mm) thick 2024-T3 sheet for Zone A. Use 0.063 in. (1.60 mm) thick 2024-T3 sheet for Zones B and C.
[2]	Foil	1	Use 0.005 in. (0.13 mm) thick 321 CRES sheet for Zones A and B.
[3]	Doubler	1	Use 0.020 in. (0.51 mm) thick 321 CRES sheet for Zones A and B.

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 2.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 2. Refer to 51-40-05, GENERAL and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300.
- K. 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.
- L. Clean the surfaces of the CRES doubler with Scotch-Brite or fine grit abrasive paper. Refer to SOPM 20-30-03.
- M. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the following:
- (1) The bare external surfaces of the initial skin
(2) The internal and external surfaces of the repair parts.
- N. Install the repair parts with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 2.
- (1) Apply BMS 5-63, Type II, Class B-1/2 sealant between the part [1] doubler and the part [2] foil, and the initial skin and the part [3] doubler (Zones A and B). Refer to 51-20-05, GENERAL.
- (2) Install fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant.

54-20-01

REPAIR 2
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) For a repair in Zone A or B, install NAS1200M6()P rivets.
- (b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.
- Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

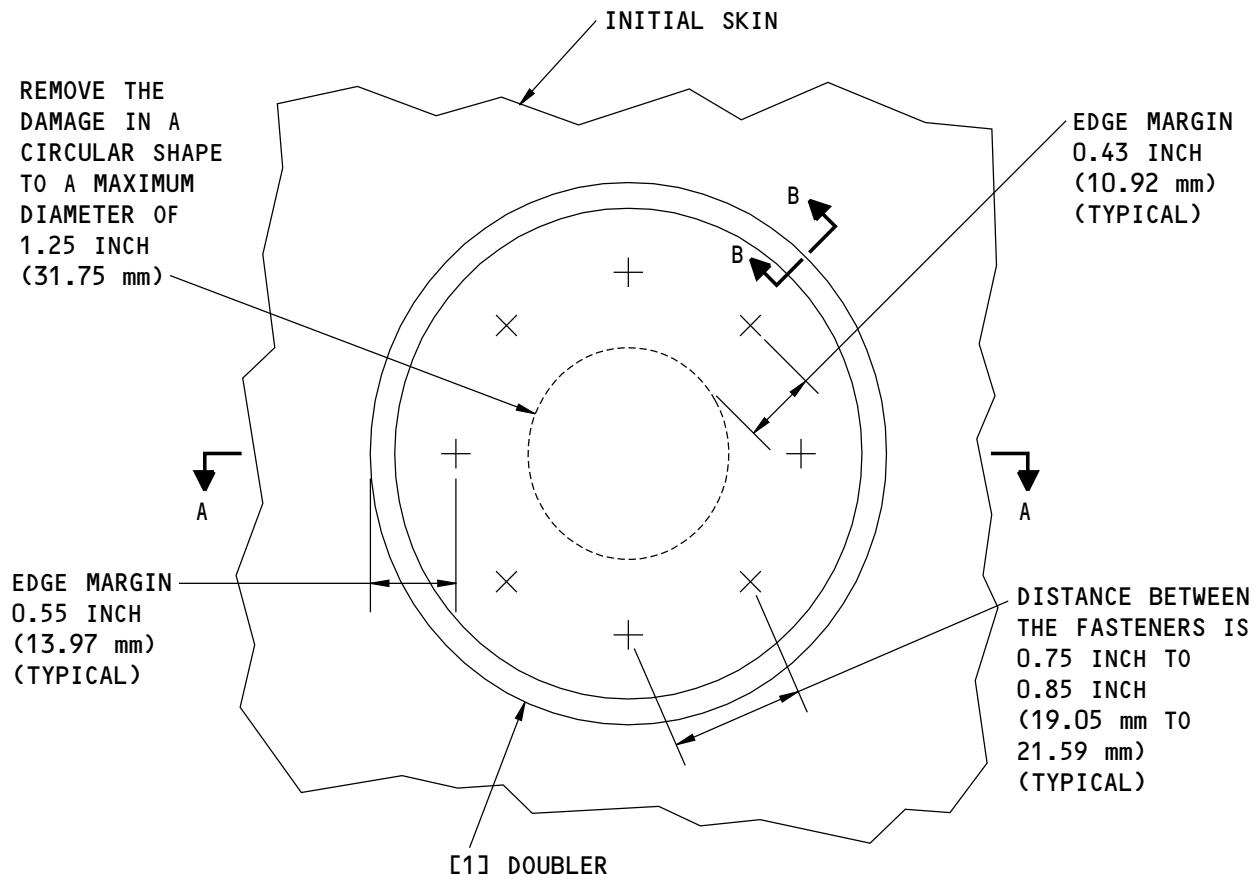
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REPAIR 2
Page 205

Nov 10/2015

D634A210

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FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P FLUSH HEADED RIVET, FOR ZONES A AND B. FOR ZONE C INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

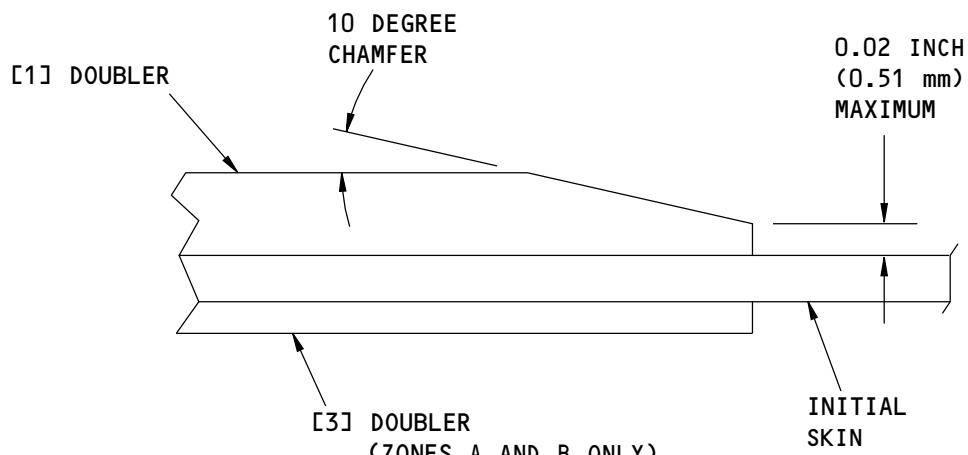
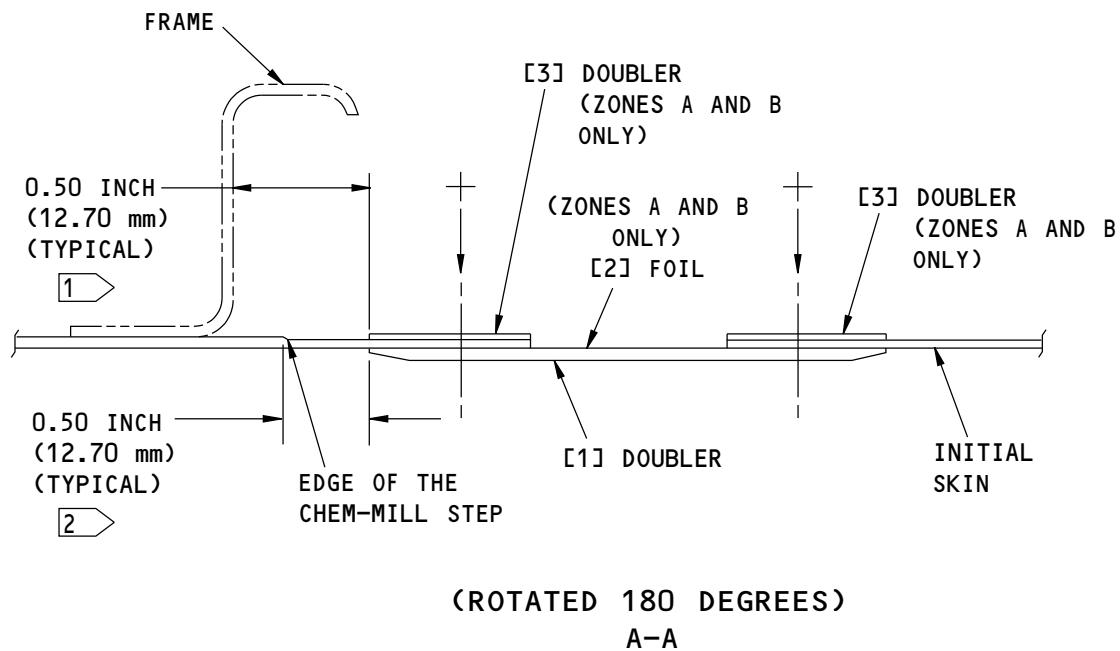
54-20-01
REPAIR 2
Page 206

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- [1] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS
- [2] APPLICABLE ONLY IN AREAS WITH CHEM-MILL STEPS

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 2
Page 207

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 3 - EXTERNAL REPAIR OF THE FAN COWL DOOR SKIN IN THE FIELD AREA

1. Applicability

- A. Repair 3 is applicable to damage that occurs to the skin in the field area of the fan cowl as shown in Engine Fan Cowl Skin Location, Figure 201/REPAIR 3.

2. General

- A. Repair 3 is a permanent repair.
- B. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- C. The edge of the damage must be a minimum of 1.90 in. (48.26 mm) from a frame, doubler, splice, or chem-mill step.
- D. Make sure the aerodynamic smoothness of the repair is satisfactory or there can be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 3
Page 201

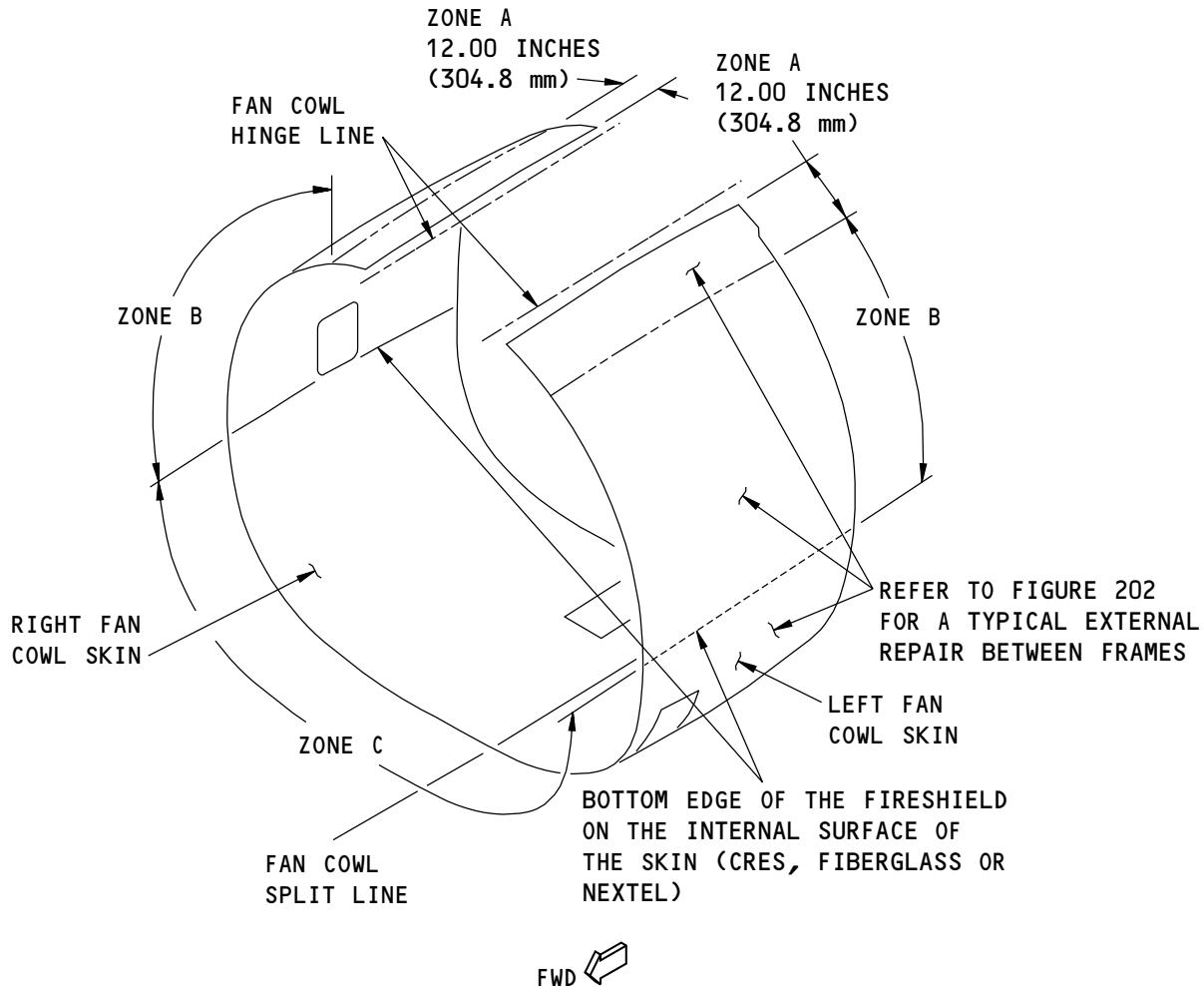
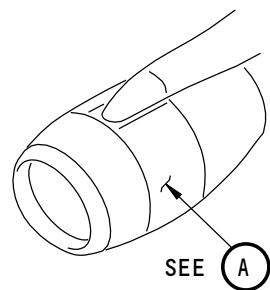
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

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Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 3
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. Drill a 0.25 in. (6.35 mm) stop hole at the ends of the crack in the damaged skin. Refer to Layout of the Repair Parts, Figure 202/REPAIR 3.
- C. Cut out the damaged skin.

NOTE: The edge of the cutout must be a minimum of 1.90 in. (48.26 mm) from a frame, doubler, splice, or chem-mill step.

- (1) Make a radius at the corners of the cutout a minimum of 0.50 in. (12.70 mm).
- (2) Do not cause damage to the adjacent internal structure.

- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 3 for the materials.
- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 3.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 3. Refer to 51-40-05, GENERAL, 51-40-06, GENERAL, and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, gouges, and burrs from the repair parts and the initial skin, and break the sharp edges 0.015 in. (0.38 mm) to 0.030 in. (0.76 mm). Refer to 51-10-02, GENERAL.
- J. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
- K. Abrade the surfaces of the CRES doublers with Scotchbrite or fine grit sandpaper as given in SOPM 20-30-03.

54-20-01

REPAIR 3
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin in Zone A and B.
 - (2) The internal and external surfaces of the repair parts.
- M. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin in Zone C.
 - (2) The internal and external surfaces of the part [1] doubler.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 in. (2.03 mm) thick 2024-T3 sheet in Zone A Use 0.063 in. (1.60 mm) thick 2024-T3 sheet in Zones B and C
[2]	Foil	1	Use 0.005 in. (0.13 mm) thick 321 CRES sheet
[3]	Doubler	1	Use 0.020 in (0.51 mm) thick 321 CRES sheet for Zone A and B

- N. Install the repair parts with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 3.
 - (1) Install fasteners wet with BMS 10-79, Type III primer in Zones A and B.
 - (2) For a repair in Zone A, install NAS1200M6()P rivets or, as an option, install MS20615-6MP rivets.
 - (3) For a repair in Zone B, install MS20615-6MP rivets.
 - (4) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.
- O. Apply two layers of BMS 10-79, Type III primer to the fastener heads after installation.
- P. Apply a fillet seal around the part [1] doubler and the part [2] foil with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.
- Q. Apply a finish to the external surface of the repair. Refer to AMM 51-21-00/701.

54-20-01

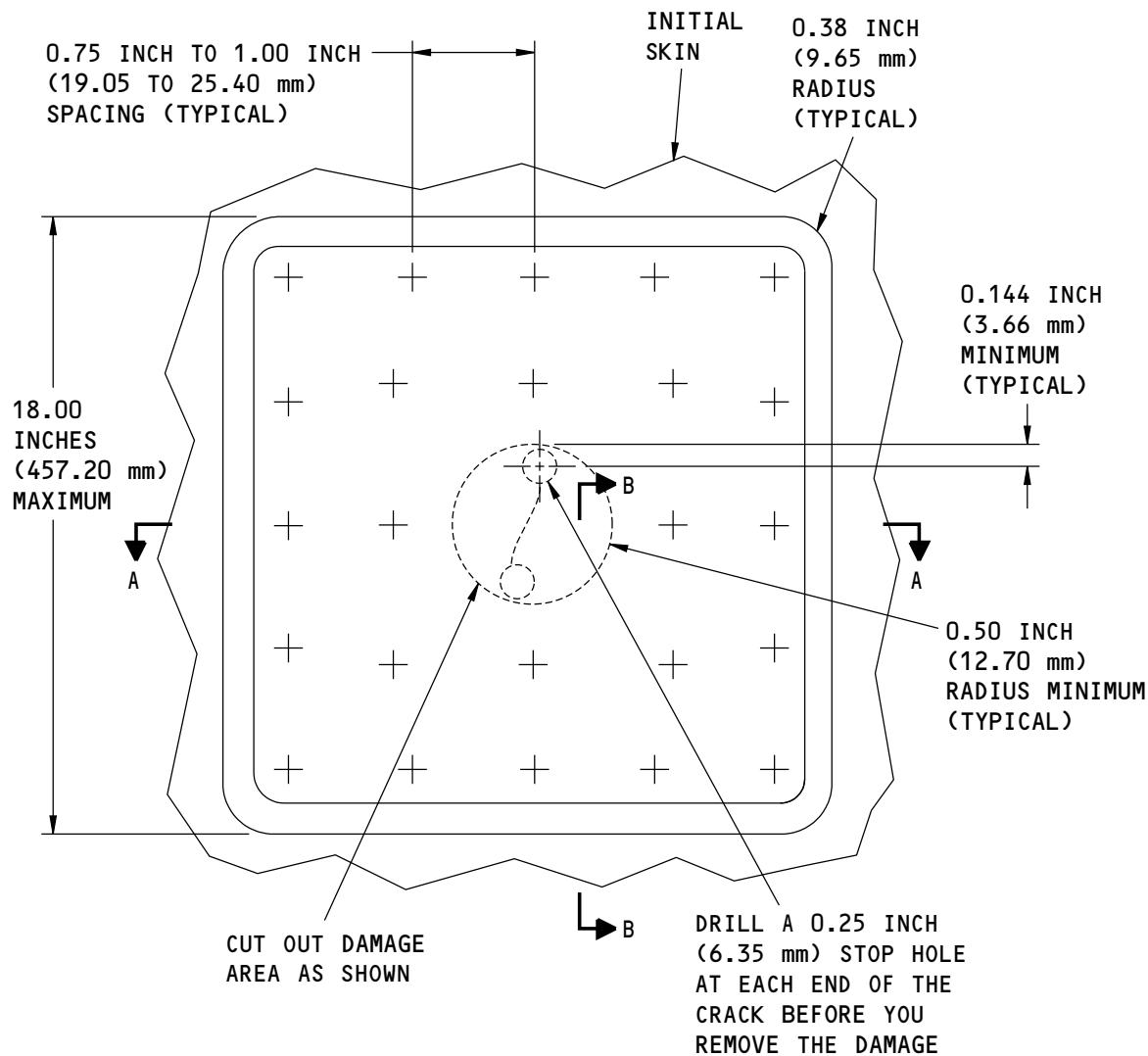
REPAIR 3
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL A NAS1200M6()P OR MS20615-6MP RIVET FOR REPAIRS IN ZONES A AND B. INSTALL A NAS1097AD6 OR BACR15CE6AD RIVET FOR REPAIRS IN ZONE C.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-20-01

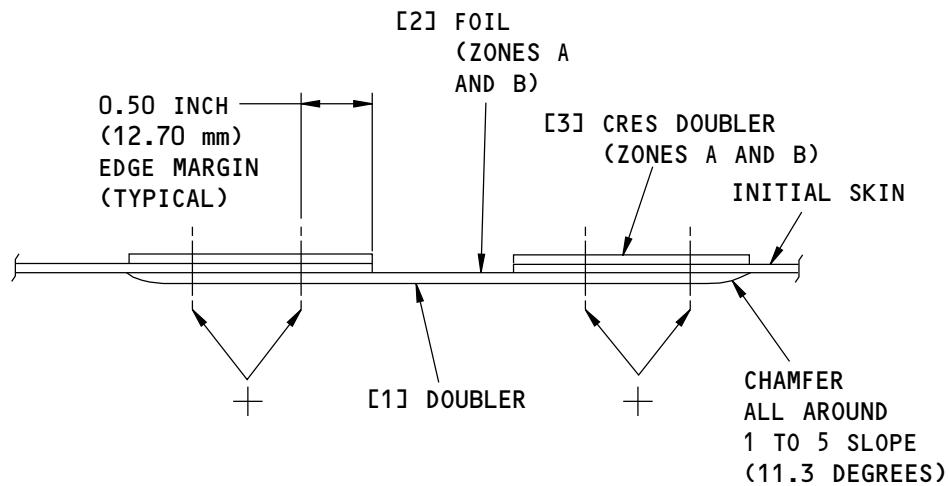
REPAIR 3
Page 205

Nov 10/2015

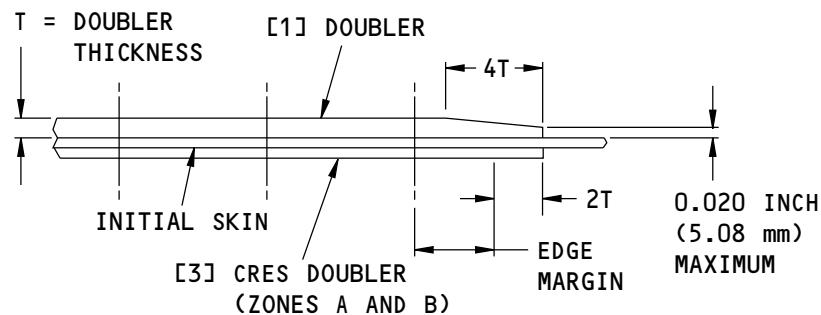
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737-800
STRUCTURAL REPAIR MANUAL



A-A



VIEW IS ROTATED 90° COUNTERCLOCKWISE

B-B
(TYPICAL)

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 3
Page 206

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - FAN COWL SKIN EXTERNAL REPAIR AT A FRAME

1. Applicability

- A. Repair 4 is applicable to damage that is:
 - (1) On the Fan Cowl Skin at a frame (Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 4)
 - (2) More than 1.25 in. (31.75 mm) diameter.
- B. Repair 4 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

- A. Repair 4 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.0 in. (457.20 mm).
- C. The maximum fore/aft length of the repair doubler is 14.0 in. (355.60 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- D. The edge of the repair doubler must be:
 - (1) A minimum of 0.50 in. (12.70 mm) from a frame, doubler or chem-mill step. Refer to Figure 202 (Sheet 2), View A-A.
 - (2) A minimum of 2.00 in. (50.80 mm) away from the Chine (Vortex Control Device)
 - (3) A minimum of 1.50 in. (38.10 mm) away from the zee frames at the fitting attach fastener locations of the fan cowl hinges (forward and aft directions)
 - (4) A minimum of 3.00 in. (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line
 - (5) A minimum of 3.00 in. (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.
- E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 in. (660.40 mm) is equivalent to adding 9 lb (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gal (378.54 l) in a year.
- F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 4
Page 201

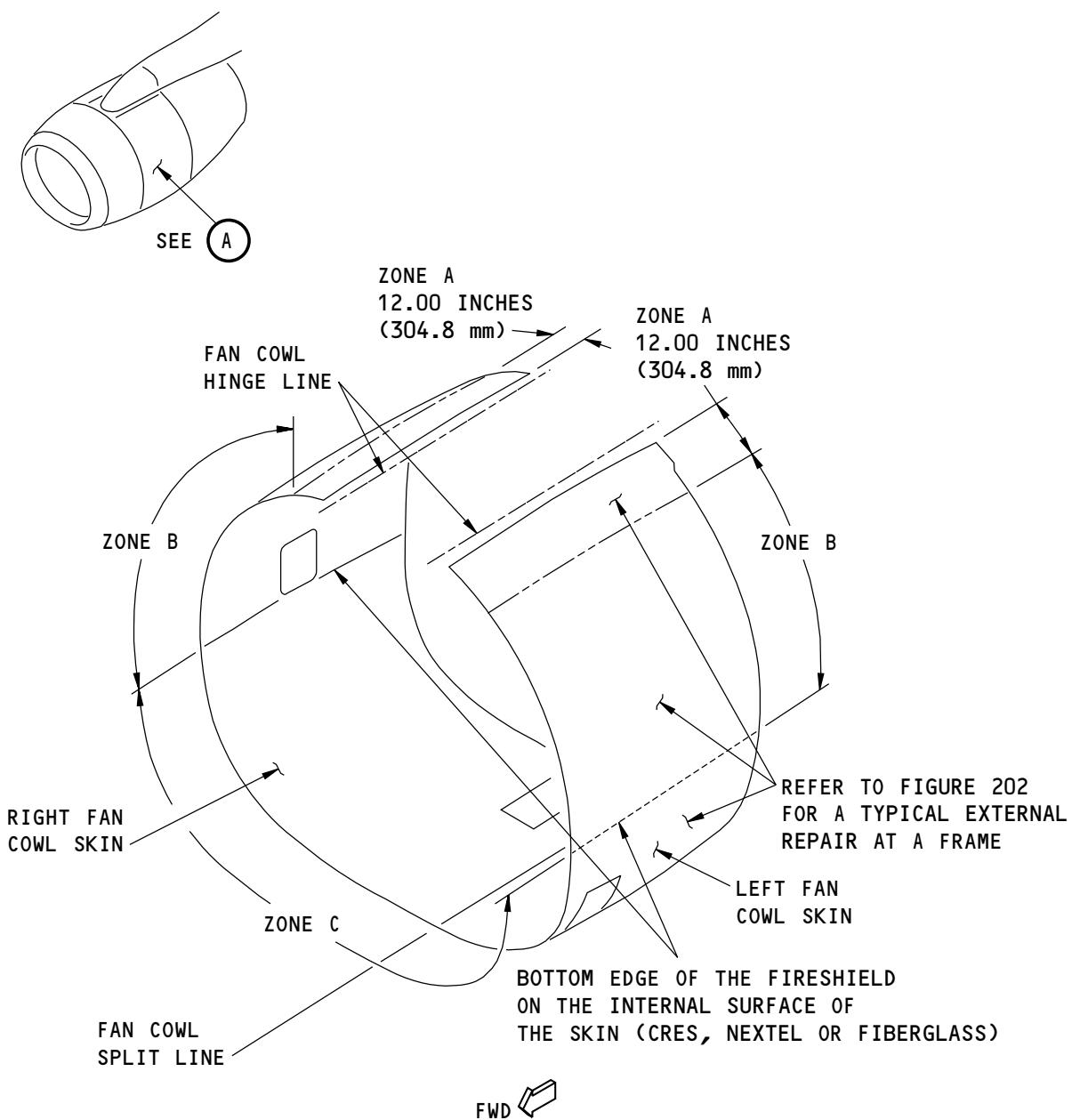
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

(A)

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Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 4
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300,	Forming, Straightening, and Fitting Metal Parts Blanking Sonic Area Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 in. (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step.
 - (2) Do not cause damage to the frame.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 4 and Figure 202/REPAIR 4.
 - (1) Make the part [1] doubler.
 - (2) Make the part [2] foil to the same dimensions as the part [1] doubler.
 - (3) Make the part [3] CRES doubler.

54-20-01

REPAIR 4
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 4.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 4. Refer to 51-40-05, GENERAL and 51-40-08, GENERAL.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 in. (2.03 mm) thick 2024-T62 Sheet for Zone A. (Optional: 2024-T3 sheet) Use 0.063 in. (1.60 mm) thick 2024-T62 Sheet for Zones B and C. (Optional: 2024-T3 sheet)
[2]	Foil	1	Use 0.005 in. (0.13 mm) thick 321 CRES for Zones A and B.
[3]	CRES Doubler	1	Use 0.020 inch (0.51 mm) thick 321 CRES sheet for Zones A and B.

- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300, Sonic Edge Finish.
- K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
- L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the following:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- M. Install the repair parts with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 4.

NOTE: As an alternate to BMS 5-63, Type II, Class B-1/2 sealant, BMS 5-95 sealant may be used in Zone C only.

 - (1) Apply BMS 5-63, Type II, Class B-1/2 sealant between part [1] doubler and part [2] foil (Zones A and B). Refer to 51-20-05, GENERAL for Repair Sealing.
 - (2) Apply BMS 5-63, Type II, Class B-1/2 sealant between part [3] CRES doubler and the initial skin (Zones A and B). Refer to 51-20-05, GENERAL.
 - (3) Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
 - (a) For a repair in Zone A or B, install NAS1200M6()P or BACR15CE6M rivets.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install BACR15CE6M rivets, apply the cadmium plate as given in AMS-QQ-P-416, Type 1, Class III, to a thickness of 0.0002 in. (0.0051 mm) to 0.0004 in. (0.0102 mm).

 - (b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.
- N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.
- P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

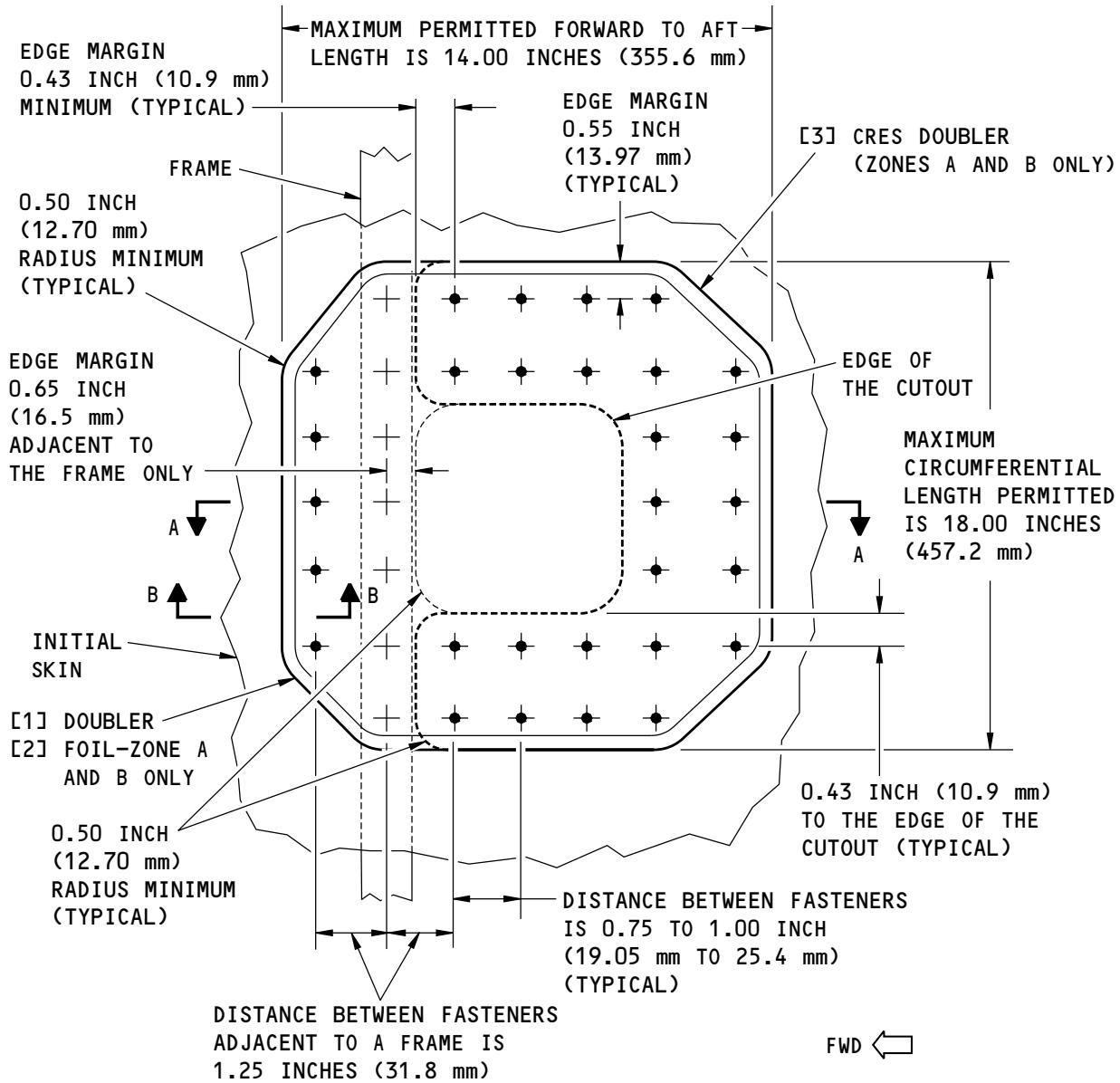
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REPAIR 4
Page 204

Nov 10/2015

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**737-800
STRUCTURAL REPAIR MANUAL**

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR A BACR15CE6AD RIVET FOR ZONE C.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

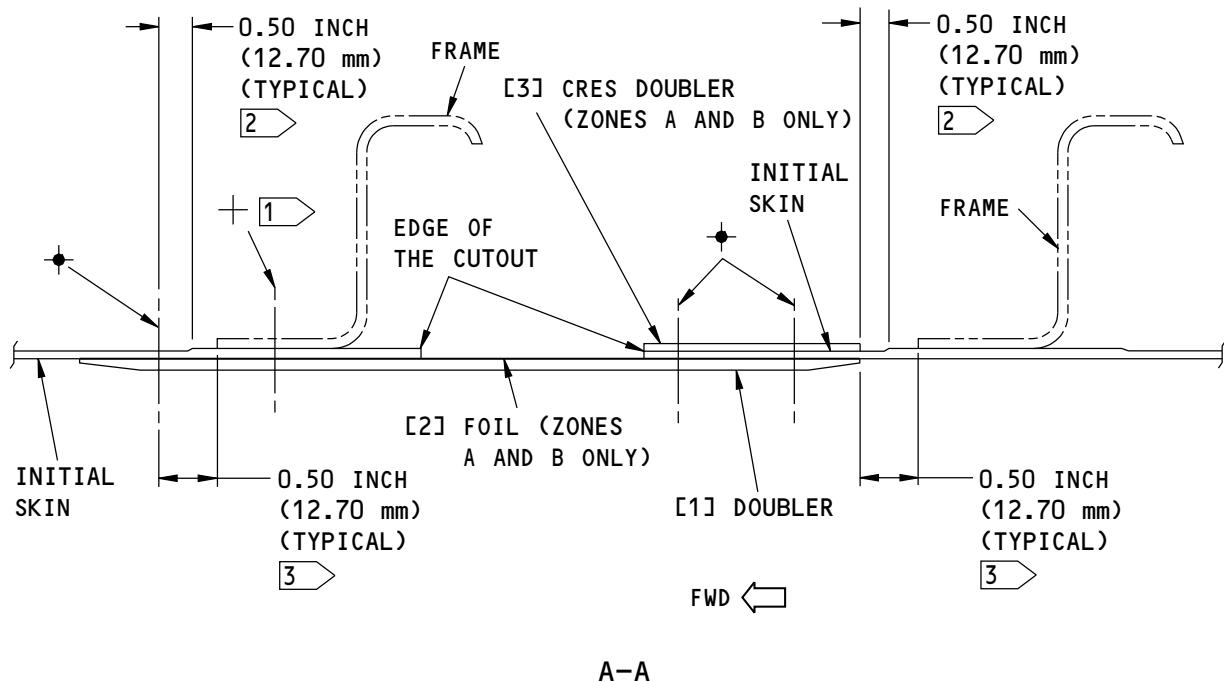
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REPAIR 4
Page 205

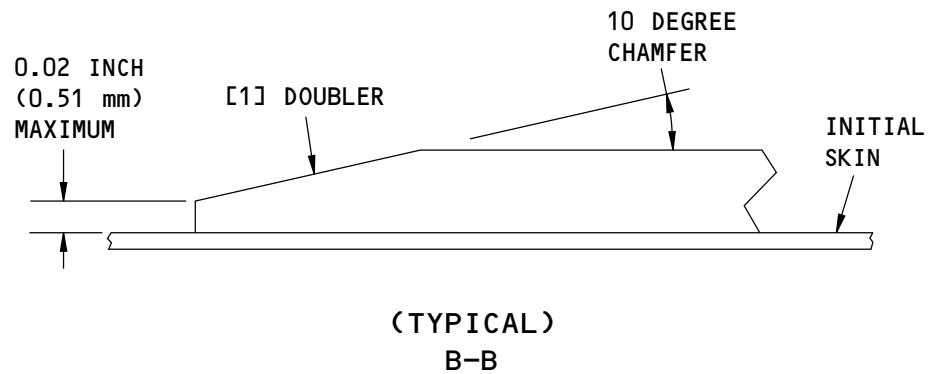
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



A-A



(TYPICAL)
B-B

NOTES

- [1] INSTALL A COUNTERSINK REPAIR WASHER BETWEEN THE INITIAL SKIN AND THE PART [1] DOUBLER.
- [2] APPLICABLE ONLY TO AREAS WITH CHEM-MILL STEPS.
- [3] APPLICABLE ONLY TO AREAS WITH NO CHEM-MILL STEPS.

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 4
Page 206

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 5 - FAN COWL SKIN EXTERNAL REPAIR AT TWO FRAMES

1. Applicability

- A. Repair 5 is applicable to damage that is:
 - (1) On the Fan Cowl Skin at two frames (Refer to Fan Cowl Skins Location, Figure 201/REPAIR 5)
 - (2) More than 1.25 in. (31.75 mm) in diameter.
- B. Repair 5 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

- A. Repair 5 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.0 in. (457.20 mm).
- C. The maximum fore/aft length of the repair doubler is 14.0 in. (355.60 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- D. The edge of the repair doubler must be:
 - (1) A minimum of 0.50 in. (12.70 mm) from a frame, doubler or chem-mill step
 - (2) A minimum of 2.00 in. (50.80 mm) away from the Chine (Vortex Control Device)
 - (3) A minimum of 1.50 in. (38.10 mm) away (forward and aft directions) from the zee frames at the attach fastener locations of the fan cowl hinge fittings
 - (4) A minimum of 3.00 in. (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line
 - (5) A minimum of 3.00 in. (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.
- E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 in. (660.40 mm) is equivalent to adding 9 lb (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gal (378.54 l) in a year.
- F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 5
Page 201

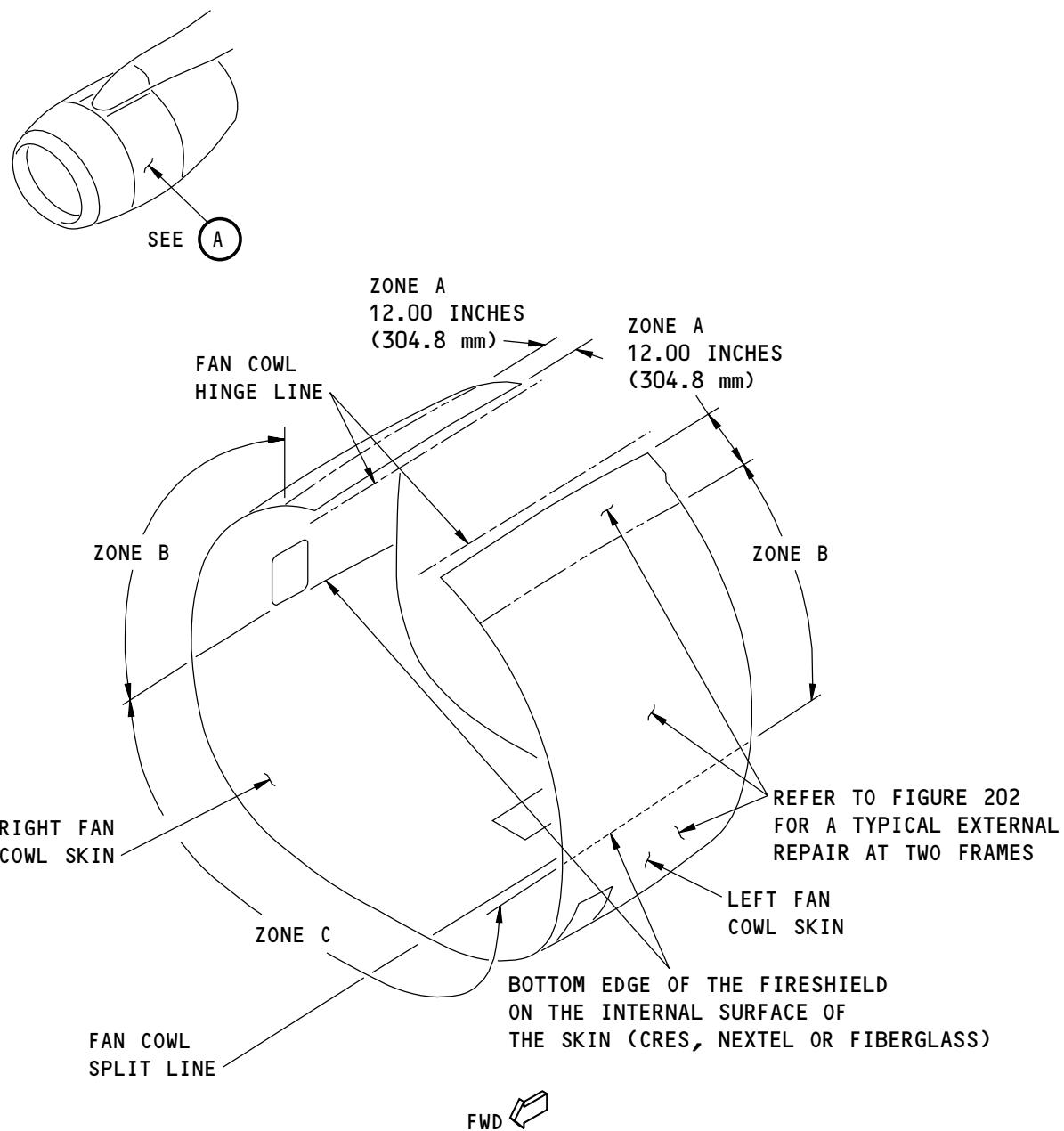
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

(A)

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Fan Cowl Skins Location
Figure 201

54-20-01

REPAIR 5
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300,	Forming, Straightening, and Fitting Metal Parts Blanking Sonic Area Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 in. (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step.
 - (2) Do not cause damage to the frame.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 5 and Figure 202/REPAIR 5.
 - (1) Make the part [1] doubler.
 - (2) Make the part [2] foil for repairs in Zones A and B to the same dimensions as the part [1] doubler.

54-20-01

REPAIR 5
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Make the part [3] CRES doublers.

F. Assemble the repair parts as shown in Fan Cowl Skin External Repair, Figure 202/REPAIR 5.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 in. (2.03 mm) thick 2024-T62 Sheet in Zone A. (Optional: 2024-T3 sheet) Use 0.063 in. (1.60 mm) thick 2024-T62 Sheet in Zones B and C. (Optional: 2024-T3 sheet)
[2]	Foil	1	Use 0.005 in. (0.13 mm) thick 321 CRES for Zones A and B.
[3]	CRES Doubler	2	Use 0.020 inch (0.51 mm) thick 321 CRES sheet for Zones A and B.

- G. Drill the fastener holes as shown in Fan Cowl Skin External Repair, Figure 202/REPAIR 5. Refer to 51-40-05, GENERAL and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300, Sonic Edge Finish.
- K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
- L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the following:
- (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- M. Install the repair parts with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to Fan Cowl Skin External Repair, Figure 202/REPAIR 5 and 51-20-05, GENERAL for Repair Sealing.

NOTE: BMS 5-95 sealant may be used as an alternative to BMS 5-63, Type II, Class B-1/2 sealant in Zone C only.

- (1) Use countersink repair washers between the part [1] doubler and the initial skin at the initial fastener holes. Refer to 51-40-08, GENERAL.
- (2) Apply BMS 5-63, Type II, Class B-1/2 sealant between the part [1] doubler and the part [2] foil (Zones A and B). Refer to 51-20-05, GENERAL.
- (3) Apply BMS 5-63, Type II, Class B-1/2 sealant between part [3] CRES doubler and the initial skin (Zones A and B). Refer to 51-20-05, GENERAL.
- (4) Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
 - (a) For a repair in Zone A or B, install NAS1200M6(P) or BACR15CE6M rivets.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install BACR15CE6M rivets, apply the cadmium plate as given in AMS-QQ-P-416, Type 1, Class III, to a thickness of 0.0002 in. (0.0051 mm) to 0.0004 in. (0.0102 mm).

- (b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

- N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.

54-20-01

REPAIR 5
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

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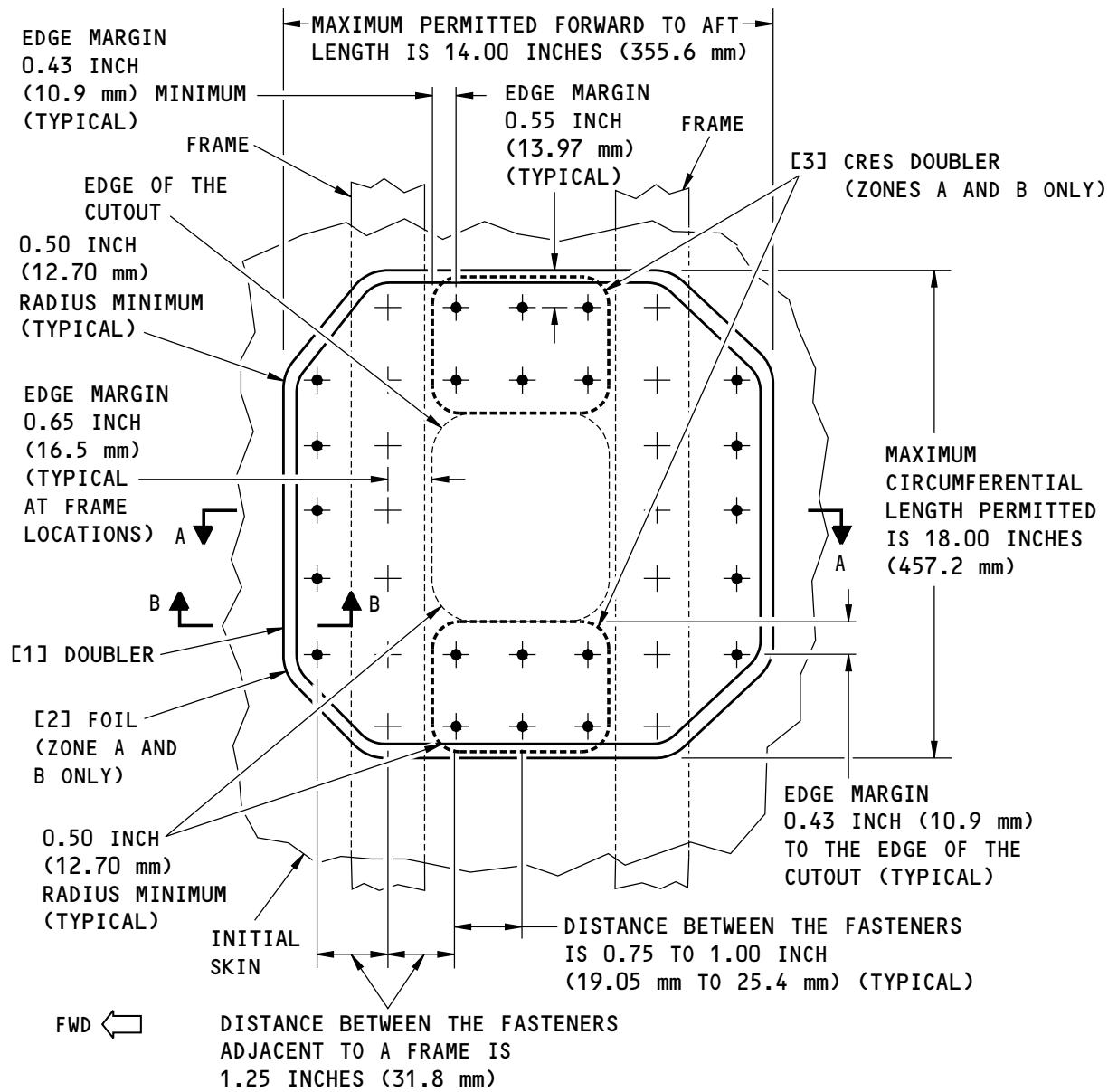
REPAIR 5
Page 205

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR A BACR15CE6AD RIVET FOR ZONE C.

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Fan Cowl Skin External Repair
Figure 202 (Sheet 1 of 2)

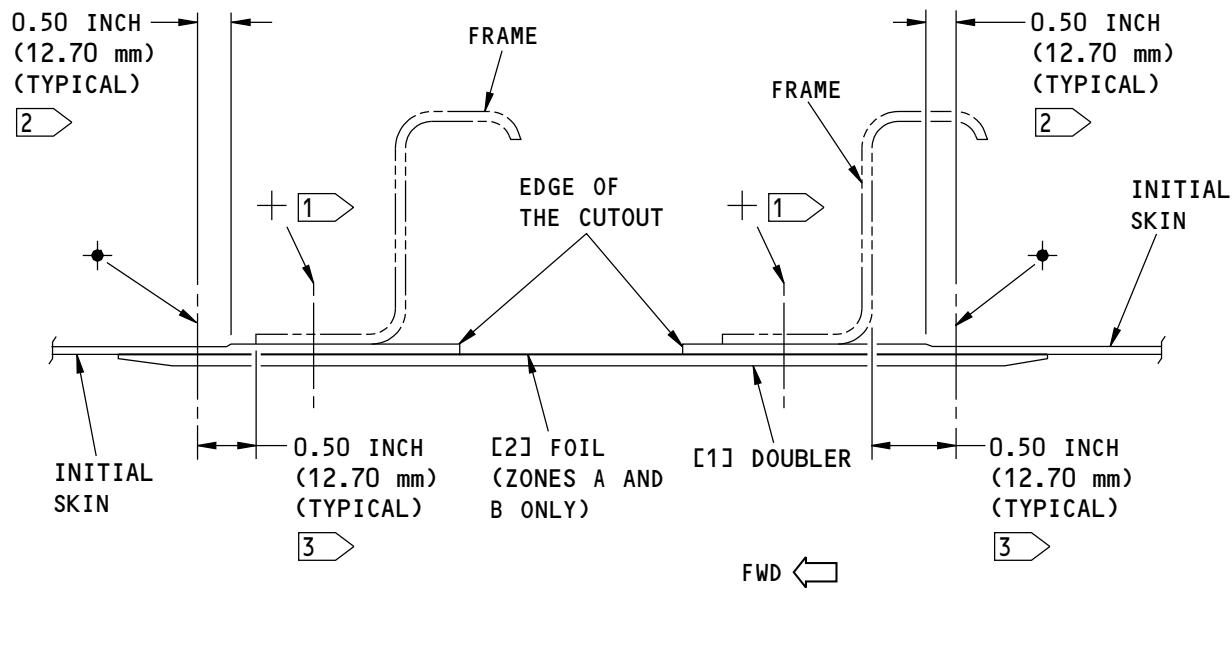
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REPAIR 5
Page 206

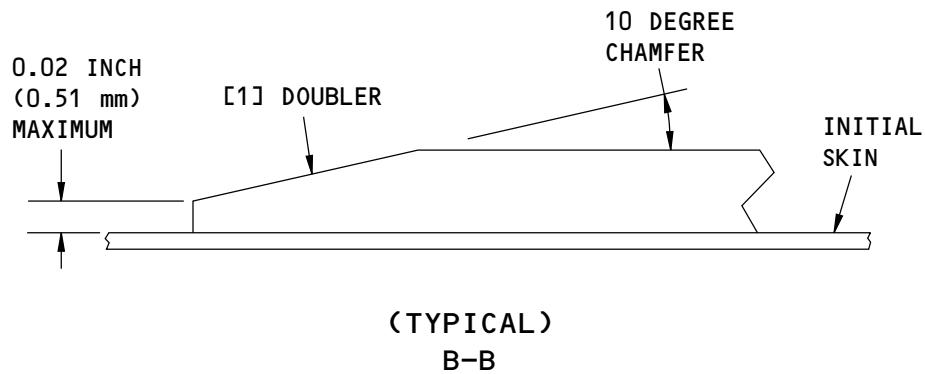
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



A-A



NOTES

- [1] INSTALL A COUNTERSINK REPAIR WASHER BETWEEN THE [1] DOUBLER AND THE INITIAL SKIN.
- [2] APPLICABLE TO AREAS WITH CHEM-MILL STEPS
- [3] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS

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Fan Cowl Skin External Repair
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 5
Page 207

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 6 - FAN COWL SKIN EXTERNAL REPAIR AT A FRAME

1. Applicability

- A. Repair 6 is applicable to damage that is:
 - (1) On the Fan Cowl Skin at a frame. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 6.
 - (2) More than 1.25 in. (31.75 mm) in diameter.
- B. Repair 6 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

- A. Repair 6 is a permanent repair. Refer to 51-00-06, GENERAL to find the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.0 in. (457.20 mm).
- C. The maximum fore/aft length of the repair doubler is 14.0 in. (355.60 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- D. The edge of the repair doubler must be a minimum of:
 - (1) 0.50 in. (12.70 mm) from a frame, doubler, or chem-mill step
 - (2) 2.00 in. (50.80 mm) away from the Chine (Vortex Control Device)
 - (3) 1.50 in. (38.10 mm) away from the zee frames at the fitting attach fastener locations of the fan cowl hinges (forward and aft directions)
 - (4) 3.00 in. (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line
 - (5) 3.00 in. (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.
- E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 in. (660.40 mm) is equivalent to adding 9 lb (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gal (378.54 l) in a year.
- F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 6
Page 201

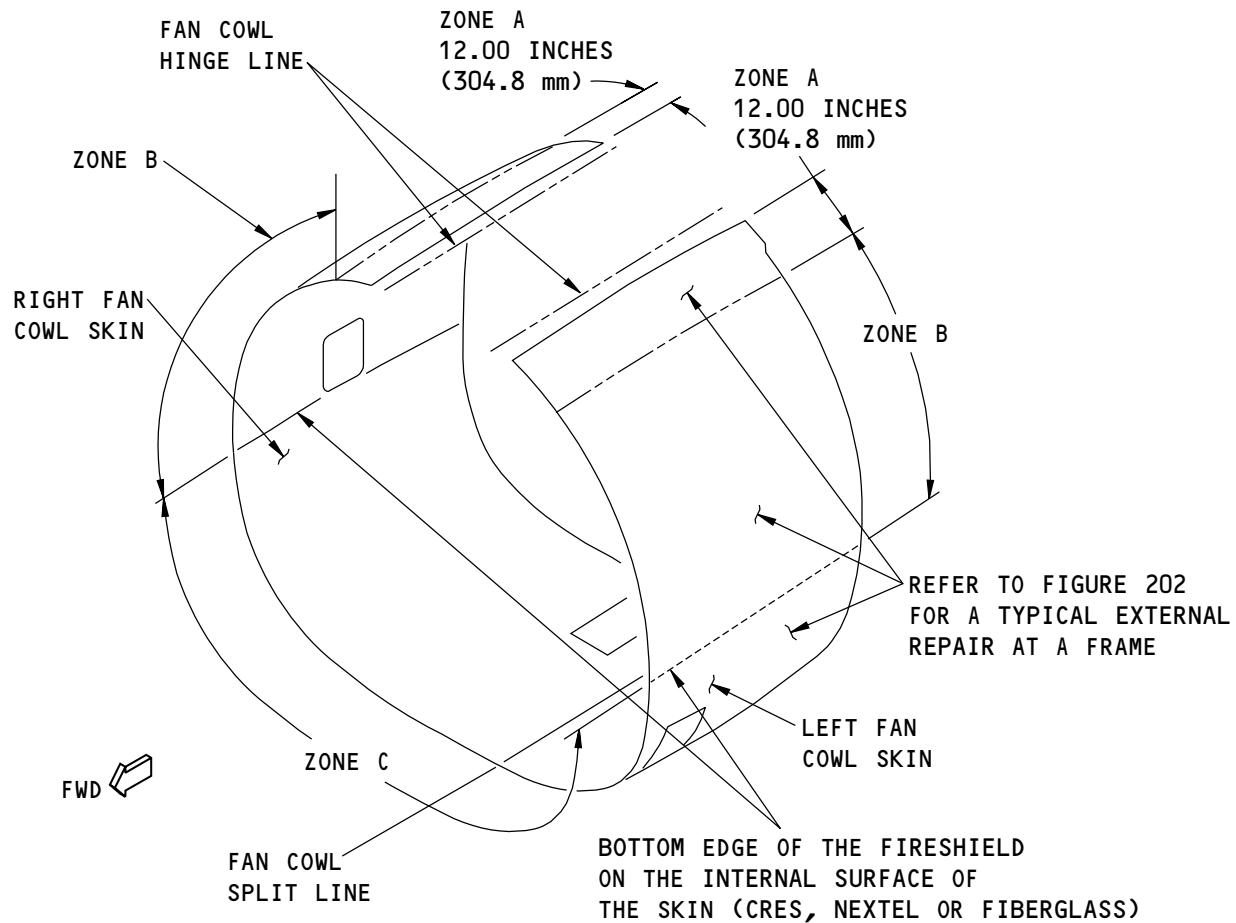
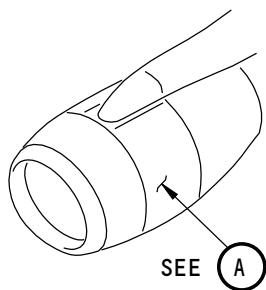
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

A

G89047 S0006591692_V3

Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 6
Page 202

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300,	Forming, Straightening, and Fitting Metal Parts Blanking Sonic Area Edges
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to stop drill a hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 in. (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step
 - (2) Do not cause damage to the frame.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 6 and Figure 202/REPAIR 6.
 - (1) Make the part [1] doubler.
 - (2) Make the part [3] filler plate.
 - (3) Make the part [4] CRES doublers.

54-20-01

REPAIR 6
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (4) Make the part [2] foil for repairs in Zone A and B to the same dimensions as the part [1] doubler.
- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 6.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 6. Refer to 51-40-05, GENERAL and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300, Sonic Edge Finish.
- K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 in. (2.03 mm) thick 2024-T62 sheet for Zone A. (Optional: 2024-T3 sheet) Use 0.063 in. (1.60 mm) thick 2024-T62 sheet for Zones B and C. (Optional: 2024-T3 sheet)
[2]	Foil	1	Use 0.005 in. (0.13 mm) thick 321 CRES for Zones A and B.
[3]	Filler Plate	1	Use 0.071 in. (1.80 mm) thick 2024-T62 sheet. (Optional: 2024-T3 sheet)
[4]	CRES Doubler	2	Use 0.020 inch (0.51 mm) thick 321 CRES sheet for Zones A and B.

- L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the following:
- (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- M. Install the repair parts with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 6 and 51-20-05, GENERAL for Repair Sealing.

NOTE: As an alternative to BMS 5-63, Type II, Class B-1/2 sealant, you can use BMS 5-95 sealant in Zone C only.

- (1) Use countersink repair washers between the part [1] doubler and the initial skin at the initial fastener holes. Refer to 51-40-08, GENERAL.
- (2) Apply BMS 5-63, Type II, Class B-1/2 sealant between the part [1] doubler and part [2] foil (Zones A and B). Refer to 51-20-05, GENERAL for Repair Sealing.
- (3) Apply BMS 5-63, Type II, Class B-1/2 sealant between part [4] CRES doubler and the initial skin (Zones A and B). Refer to 51-20-05, GENERAL.
- (4) Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
 - (a) For a repair in Zones A and B, install NAS1200M6()P or BACR15CE6M rivets.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Cadmium plate BACR15CE6M rivets as given in AMS-QQ-P-416, Type 1, Class III, 0.0002 in. (0.0051 mm) to 0.0004 in. (0.0102 mm) thick, before you install them.

- (b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.

- N. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.

54-20-01

REPAIR 6
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- O. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.
- P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

54-20-01

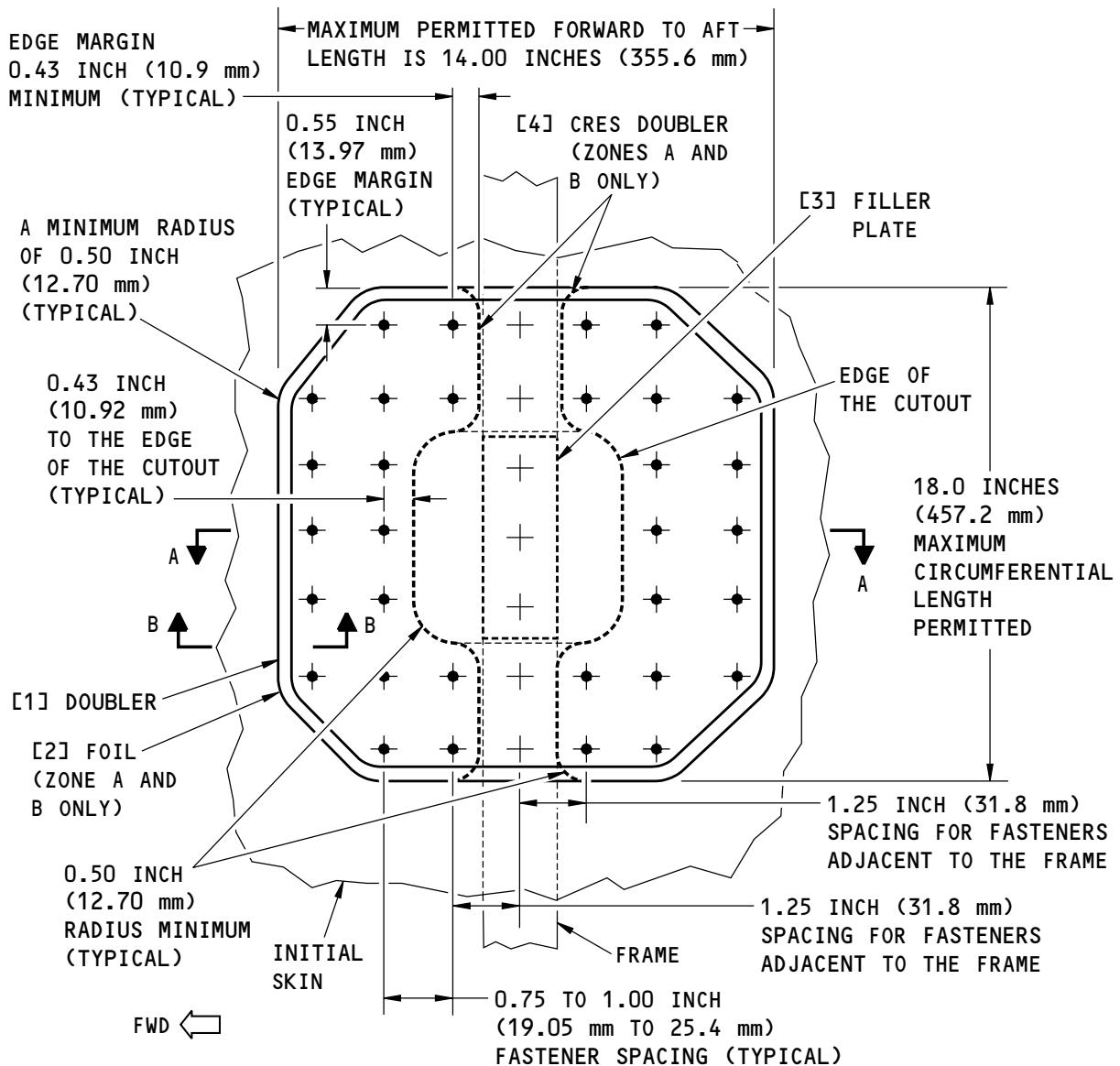
REPAIR 6
Page 205

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET, FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR A BACR15CE6AD RIVET FOR ZONE C.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

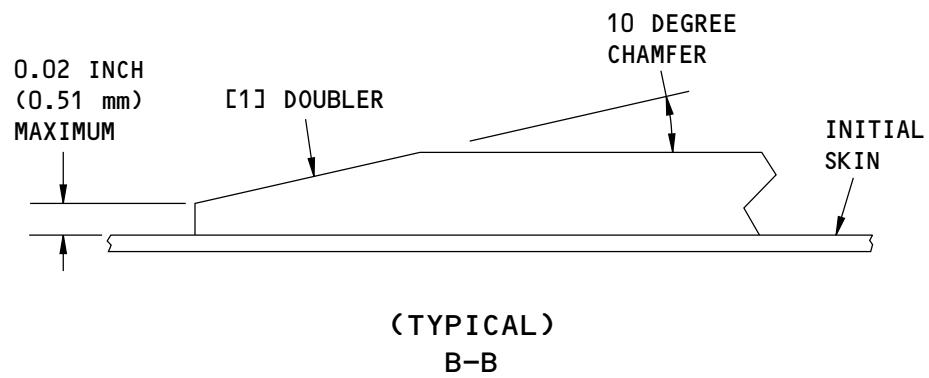
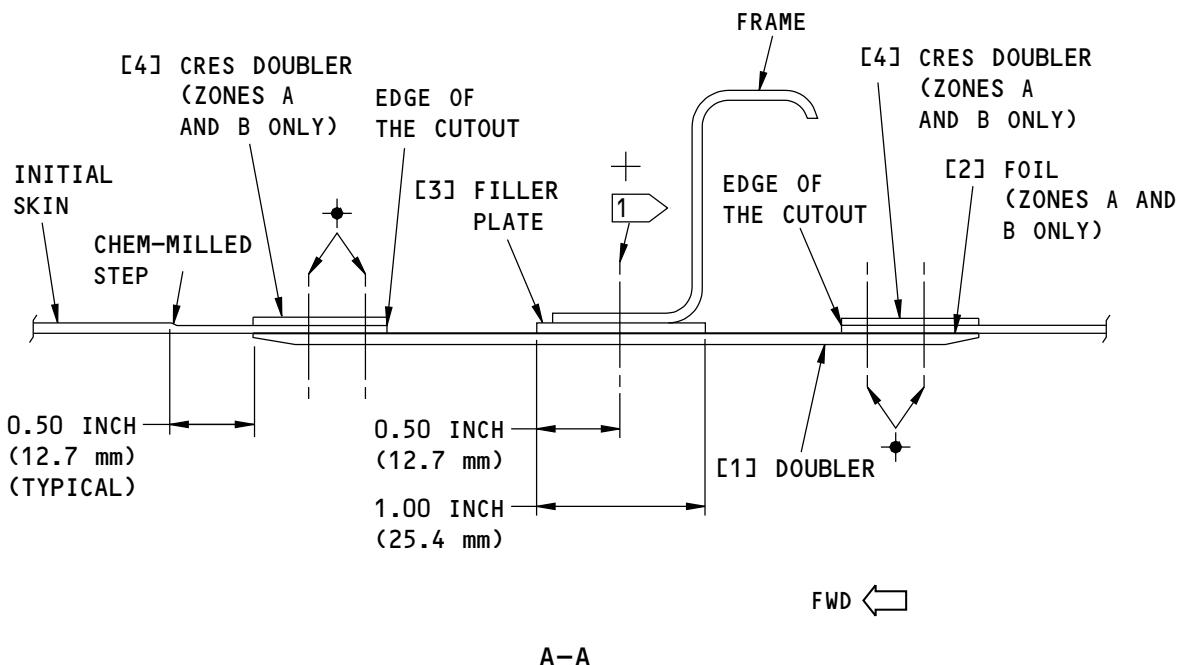
54-20-01

REPAIR 6
Page 206

Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- 1 ➤ INSTALL A COUNTERSINK REPAIR WASHER BETWEEN THE [1] DOUBLER AND THE INITIAL SKIN.

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 6
Page 207

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 7 - FAN COWL SKIN EXTERNAL REPAIR BETWEEN TWO FRAMES

1. Applicability

- A. Repair 7 is applicable to damage that is:
 - (1) On the Fan Cowl Skin between two frames. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 7.
 - (2) More than 1.25 in. (31.75 mm) in diameter.
- B. Repair 7 is not applicable to damage at the forward or aft edges of the fan cowl skin.

2. General

- A. Repair 7 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The maximum circumferential length of the repair doubler is 18.0 in. (457.20 mm).
- C. The maximum fore/aft length of the repair doubler is 14.0 in. (355.60 mm).

CAUTION: DO NOT PUT A REPAIR DOUBLER ON INITIAL DRAIN HOLES OR GROUND SUPPORT EQUIPMENT ATTACH LOCATIONS. IF YOU DO NOT OBEY, DAMAGE TO THE STRUCTURE IN THESE AREAS CAN OCCUR.

- D. The edge of the repair doubler must be:
 - (1) A minimum of 0.50 in. (12.70 mm) from a frame, doubler, or a chem-mill step
 - (2) A minimum of 2.00 in. (50.80 mm) away from the Chine (Vortex Control Device)
 - (3) A minimum of 1.50 in. (38.10 mm) away from the zee frames at the fitting attach fastener locations of the fan cowl hinge (forward and aft directions)
 - (4) A minimum of 3.00 in. (76.20 mm) below (circumferentially) the hinge attach fastener furthest from the fan cowl hinge line
 - (5) A minimum of 3.00 in. (76.20 mm) above (circumferentially) the latch-to-cowl attach fastener furthest from the fan cowl split line.
- E. The use of this repair will cause an increase in fuel consumption. For example, repairs that have a total circumferential length of 26.00 in. (660.40 mm) is equivalent to adding 9 lb (4.08 kg) of weight to the airplane. This will cause an added fuel consumption of about 100 gal (378.54 l) in a year.
- F. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 7
Page 201

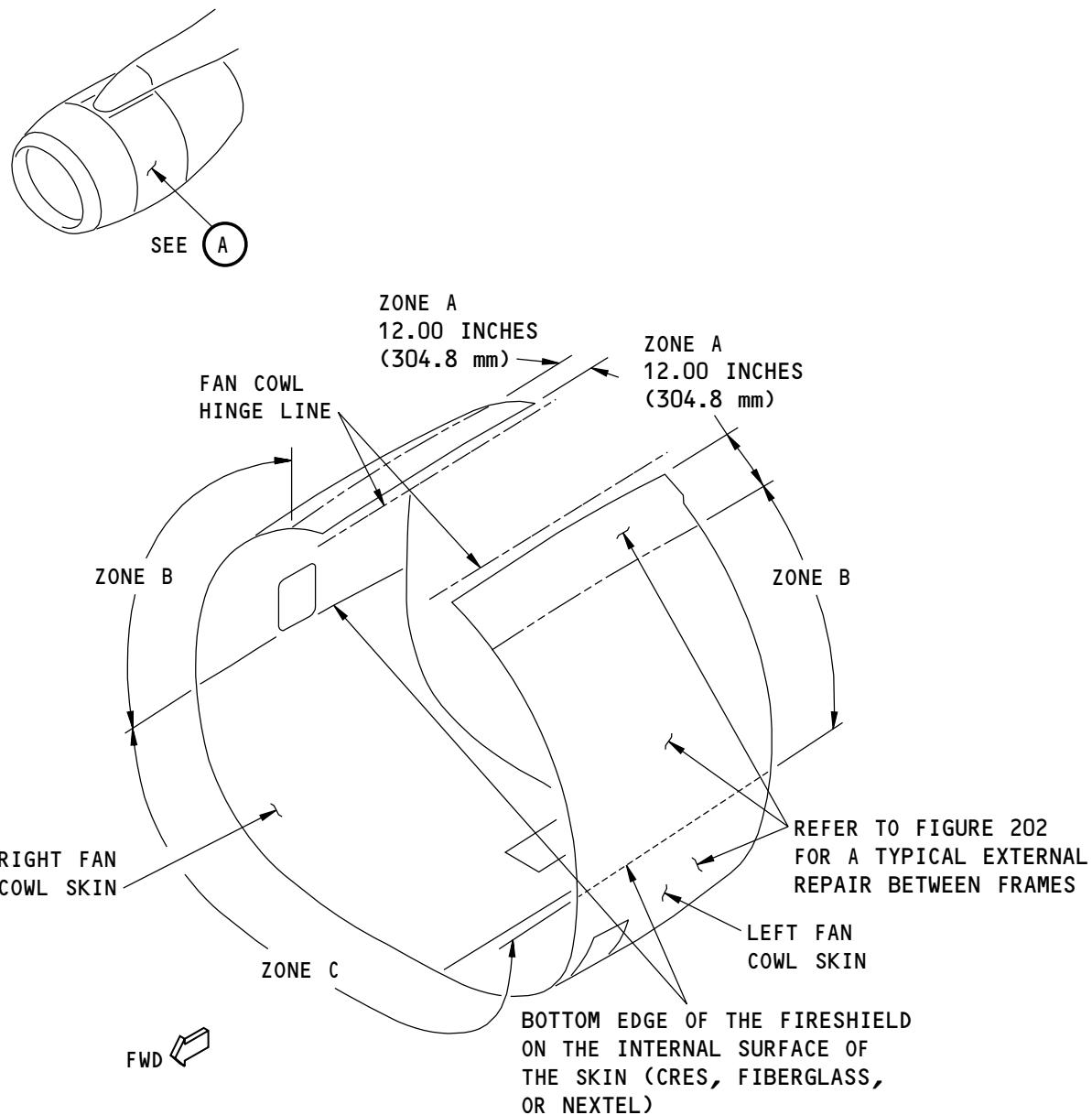
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

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Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 7
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to drill a stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.

- (1) Make sure that the edge of the part [1] doubler when installed will be a minimum of 0.50 in. (12.70 mm) from:
 - (a) A frame
 - (b) A doubler
 - (c) A chem-mill step

- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 7 and Figure 202/REPAIR 7.
 - (1) Make the part [2] foil for repairs in Zones A and B to the same dimensions as the part [1] doubler.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	1	Use 0.080 in. (2.03 mm) thick 2024-T3 sheet for Zone A Use 0.063 in. (1.60 mm) thick 2024-T3 sheet for Zones B and C
[2]	Foil	1	Use 0.005 in. (0.13 mm) thick 321 CRES for Zones A and B

54-20-01

REPAIR 7
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: REPAIR MATERIAL (Continued)

[3]	Doubler	1	Use 0.020 in. (0.51 mm) thick 321 CRES sheet for Zone A and B
-----	---------	---	---

- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 7.
- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 7. Refer to 51-40-05, GENERAL and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300 Sonic Edge Finish.
- K. 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.
- L. Abrade the surfaces of the CRES doublers with Scotchbrite or fine grit sandpaper as given in SOPM 20-30-03.
- M. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- N. Install the repair parts with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to Layout of the Repair Parts, Figure 202/REPAIR 7 and 51-20-05, GENERAL for Repair Sealing.
 - (1) Apply BMS 5-63, Type II, Class B-1/2 sealant between the part [1] doubler and the part [2] foil and initial skin and part [3] CRES doubler (Zones A and B). Refer to 51-20-05, GENERAL for Repair Sealing.
 - (2) Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
 - (a) For a repair in Zone A or B, install NAS1200M6()P.
 - (b) For a repair in Zone C, install NAS1097AD6 or BACR15CE6AD rivets.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners head and shaft after you install them.
- P. Apply a fillet seal around the edge of the part [1] doubler and the initial skin with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, GENERAL.
- Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

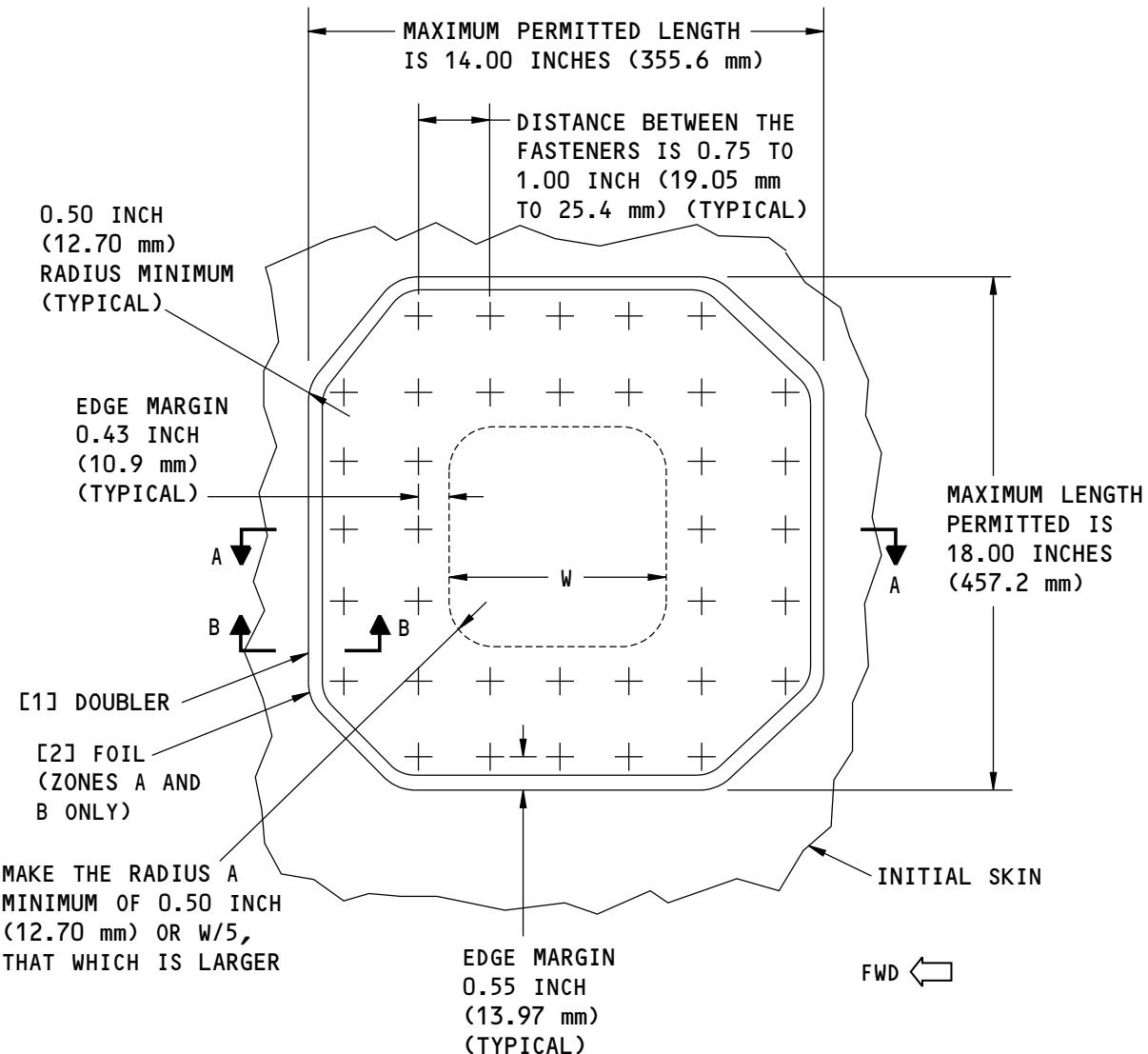
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REPAIR 7
Page 204

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

FASTENER SYMBOLS

- + REPAIR FASTENER LOCATION. INSTALL AN NAS1200M6()P OR A BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET FOR ZONES A AND B. INSTALL AN NAS1097AD6 OR BACR15CE6AD RIVET FOR ZONE C.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-20-01
REPAIR 7

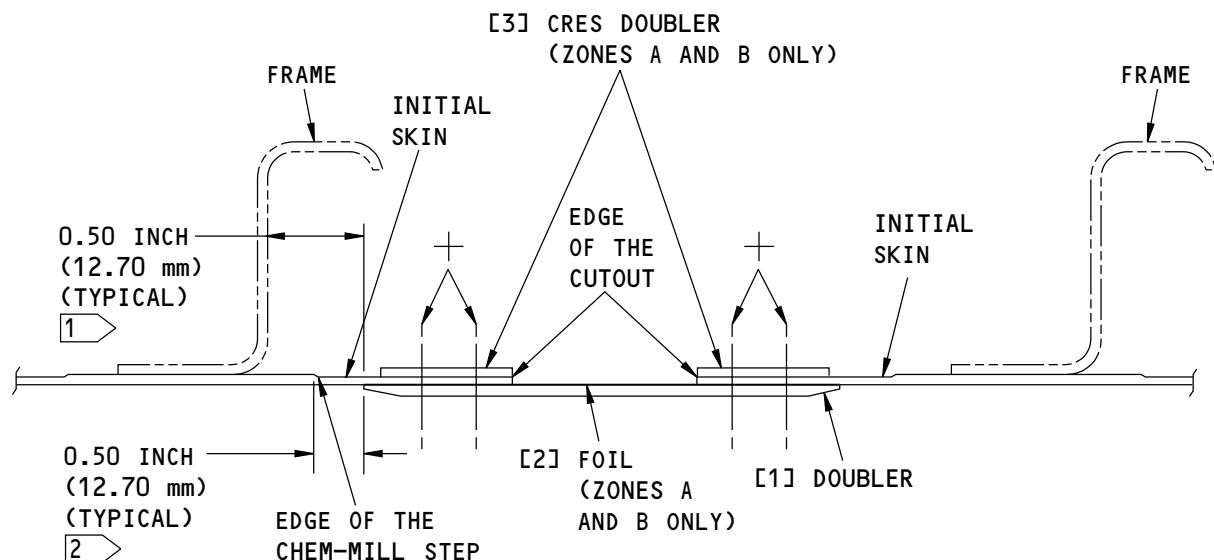
Page 205

Nov 10/2015

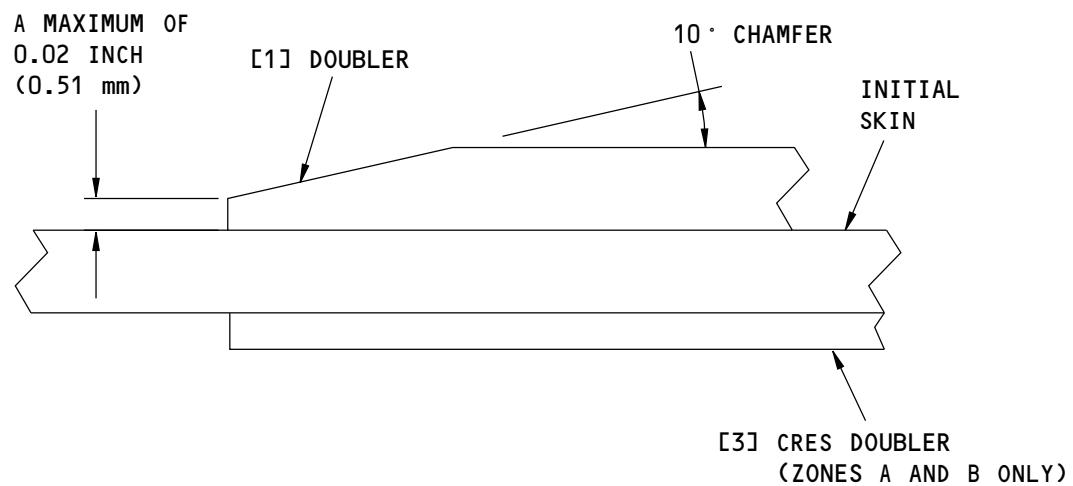
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737-800
STRUCTURAL REPAIR MANUAL



A-A



B-B
(TYPICAL)

NOTES

- [1] APPLICABLE TO AREAS WITH NO CHEM-MILL STEPS
- [2] APPLICABLE TO AREAS WITH CHEM-MILL STEPS

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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 7
Page 206

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 8 - FAN COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE A

1. Applicability

- A. Repair 8 is applicable to damage to the Fan Cowl Skin at a frame in Zone A (Man-Walk Area). Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 8.
- B. Repair 8 is not applicable to damage at the forward or aft edges of the fan cowl.
- C. For repairs that have an overlap of Zone B, shown in Engine Fan Cowl Skin Location, Figure 201/REPAIR 8, refer to REPAIR 9.

2. General

- A. Repair 8 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The maximum circumferential length of the damage cutout is 6.0 in. (152.40 mm).
- C. The maximum fore/aft length of the damage cutout is 9.50 in. (241.30 mm).
- D. The top edges of the repair doublers must be a minimum of 3.00 in. (76.20 mm) below (measured circumferentially):
 - (1) The hinge fitting-to-cowl attach fastener furthest from the fan cowl hinge line.
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 8
Page 201

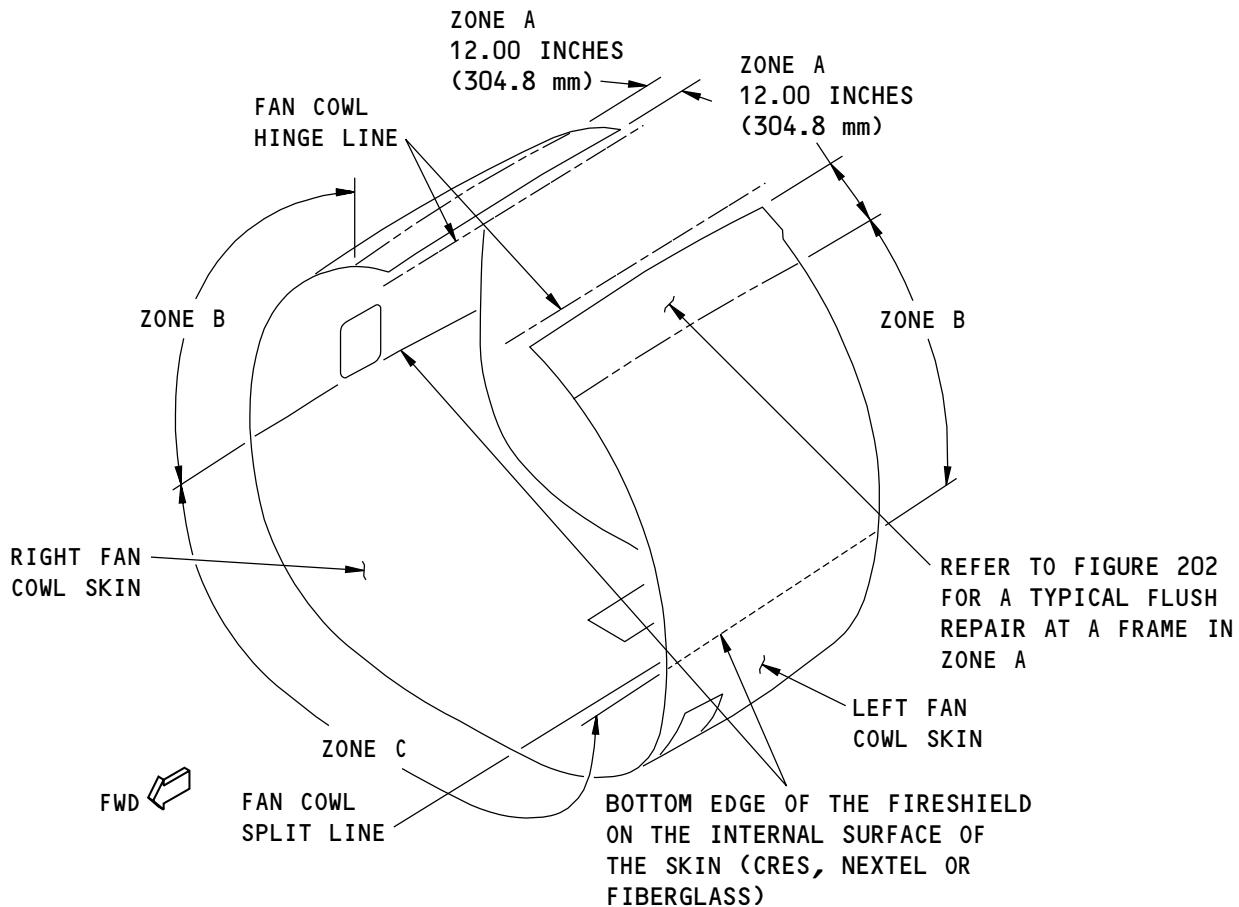
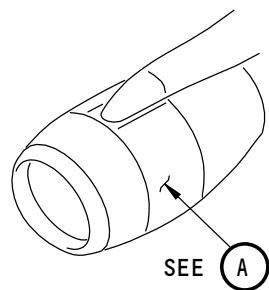
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

(A)

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Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 8
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
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 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to drill a stop hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make the radii of the corners of the cutout a minimum of 0.50 in. (12.70 mm).
 - (2) Do not cause damage to the frame.
- D. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4 .
NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 8 for the materials.
- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 8.

54-20-01

REPAIR 8
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 in. (1.60 mm) thick CRES 321 sheet
[2]	Repair Skin	1	Use 0.071 in. (1.80 mm) thick 2024-T3 sheet
[3]	Frame Doubler	2	Use 0.071 in. (1.80 mm) thick CRES 321 sheet
[4]	Repair Foil	1	Use 0.005 in. (0.13 mm) thick CRES 321 sheet

- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 8. Refer to 51-40-05, GENERAL, 51-40-06, GENERAL, and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300 Sonic Edge Finish.
- K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
- L. Abrade the surfaces of the CRES doublers with Scotchbrite or fine grit sandpaper as given in SOPM 20-30-03.
- M. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- N. Install the repair parts as shown with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to 51-20-05, GENERAL.
- O. Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.

NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install monel rivets, apply a cadmium plate to BACR15CE6M rivets as given in AMS-QQ-P-416, Type 1, Class III, to a thickness between 0.0002 in. (0.0051 mm) and 0.0005 in. (0.0127 mm).

- P. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- Q. Apply a fillet seal with BMS 5-63, Type II, Class B-1/2 sealant to the areas that follow (Refer to 51-20-05, GENERAL):
 - (1) Around the edge of the part [1] Doubler
 - (2) The space between the part [2] Repair Skin and the initial skin.
- R. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

54-20-01

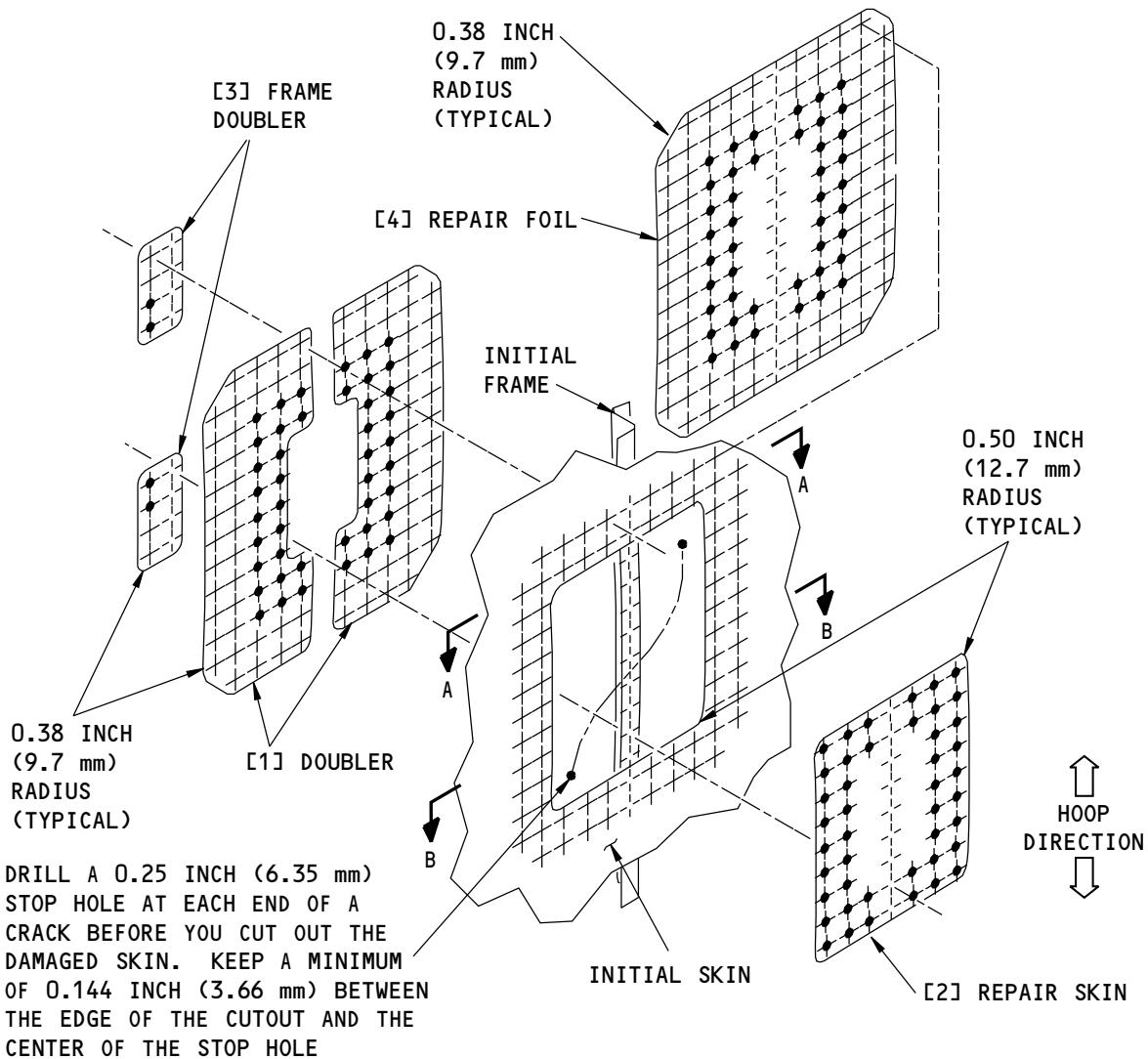
REPAIR 8
Page 204

Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.
- + REPAIR FASTENER LOCATION. INSTALL NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.

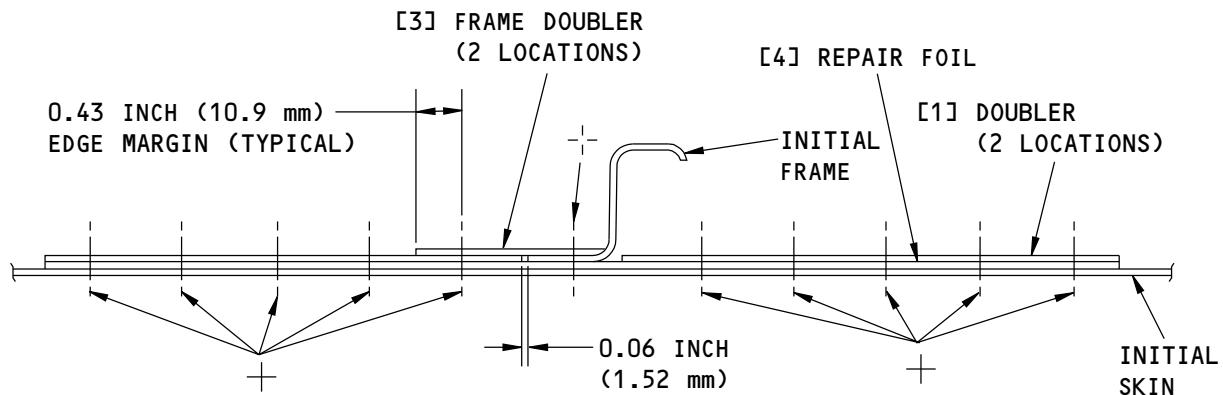
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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-20-01

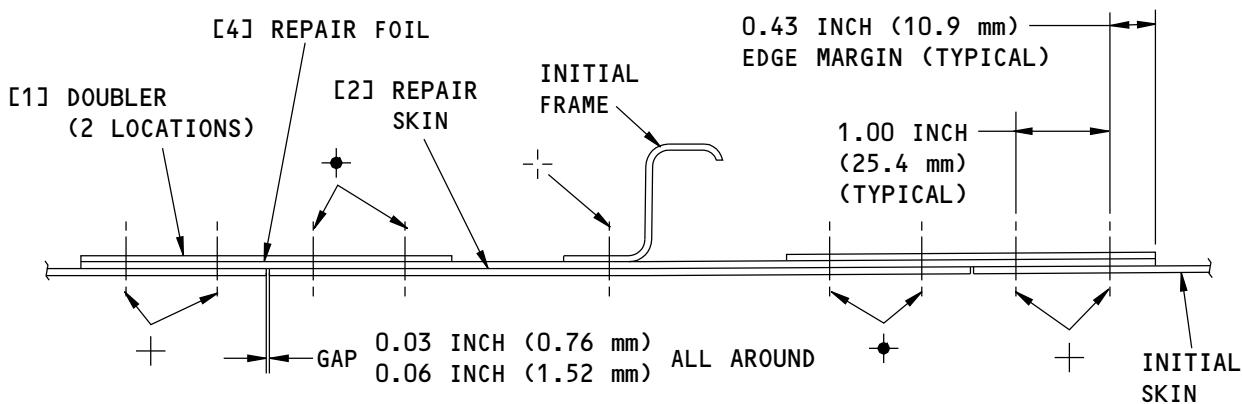
REPAIR 8
Page 205

Nov 10/2012



FWD ←

A-A



FWD ←

B-B

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**Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)**

54-20-01

**REPAIR 8
Page 206**

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 9 - FAN COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE B

1. Applicability

- A. Repair 9 is applicable to damage to the Fan Cowl Skin at a frame in Zone B. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 9.
- B. Repair 9 is not applicable to damage at the forward or aft edges.
- C. Repair 9 is not applicable to damage adjacent to drain holes, access panels, or ground support equipment (GSE) attachment points.

2. General

- A. Repair 9 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The maximum circumferential length of the damage cutout is 12.0 in. (304.80 mm).
- C. The maximum fore/aft length of the damage cutout is 9.50 in. (241.30 mm).
- D. The edges of the repair doublers must be a minimum of 2.00 in. (50.80 mm) from the chine (vortex control device).
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 9
Page 201

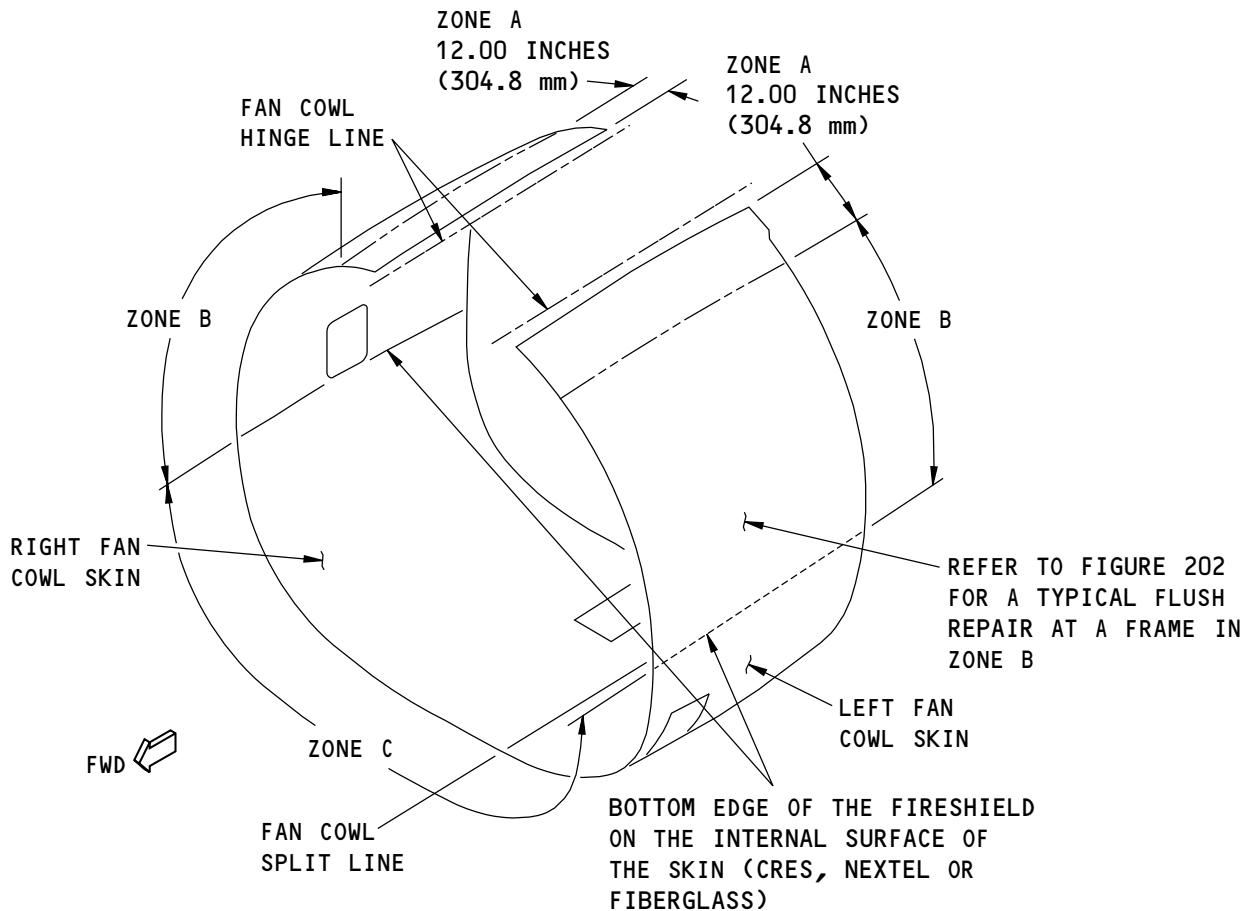
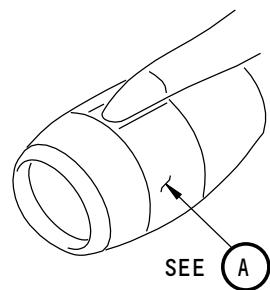
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

(A)

G94035 S0006591707_V2

Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 9
Page 202

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-05, GENERAL	Fastener Hole Sizes
51-40-08, GENERAL	Countersink Data and Procedures for Metal Structures
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to drill a stop hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make the radii of the corners of the cutout a minimum of 0.50 in. (12.70 mm).
 - (2) Do not cause damage to the frame.
- D. Do a High Frequency Eddy Current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The dye penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 9 for the materials.
- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 9.

NOTE: If the part [3] Fillers extend into Zone A, cut them where they overlap the chem-mill step of the skin. Discard the part of the fillers that overlap the thicker skin in Zone A.

54-20-01

REPAIR 9
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 in. (1.60 mm) thick CRES 321 sheet
[2]	Repair Skin	1	Use 0.071 in. (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.025 in. (0.64 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 in. (1.80 mm) thick CRES 321 sheet
[5]	Repair Foil	1	Use 0.005 in. (0.13 mm) thick CRES 321 sheet

- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 9. Refer to 51-40-05, GENERAL and 51-40-08, GENERAL.
- H. Disassemble the repair parts.
- I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
- J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given in BAC 5300 Sonic Edge Finish.
- K. Apply a chemical conversion coating to the aluminum repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
- L. Abrade the surfaces of the CRES doublers with Scotchbrite or fine grit sandpaper as given in SOPM 20-30-03.
- M. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
- N. Install the repair parts as shown with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to 51-20-05, GENERAL.
- O. Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
NOTE: Monel rivets in aluminum structure must be cadmium plated. Before you install monel rivets, apply a cadmium plate to BACR15CE6M rivets as given in AMS-QQ-P-416, Type 1, Class III to a thickness between 0.0002 in. (0.0051 mm) and 0.0005 in. (0.0127 mm).
- P. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
- Q. Apply a fillet seal with BMS 5-63, Type II, Class B-1/2 sealant to the areas that follow: Refer to 51-20-05, GENERAL.
 - (1) Around the edge of the part [1] Doubler
 - (2) The space between the part [2] Repair Skin and the initial skin.
- R. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

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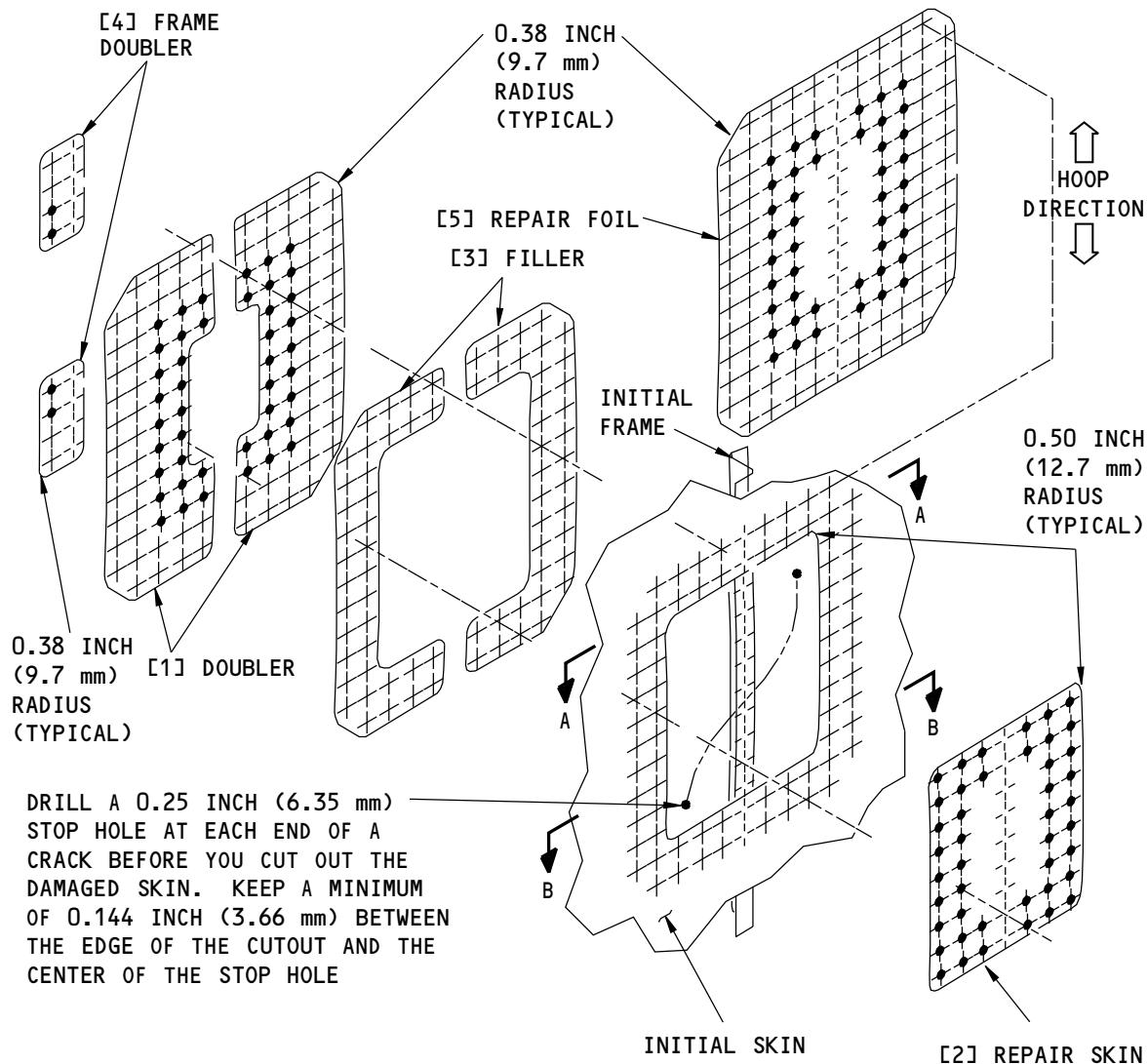
REPAIR 9
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



FASTENER SYMBOLS

- Initial fastener location. Install NAS1200M6()P or BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS.
- Repair fastener location. Install NAS1200M6()P or BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.
- + Repair fastener location. Install NAS1200M6()P or BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20615-6MP PROTRUDING HEAD RIVETS.

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Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)

54-20-01

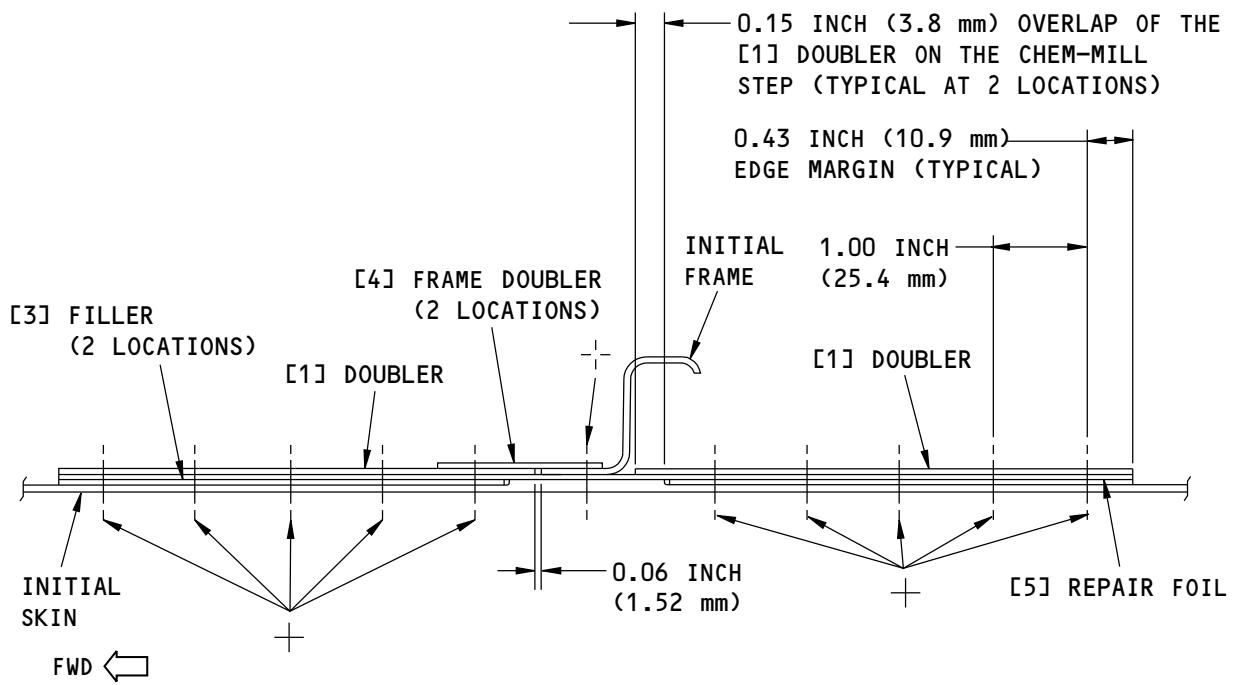
REPAIR 9
Page 205

Nov 10/2012

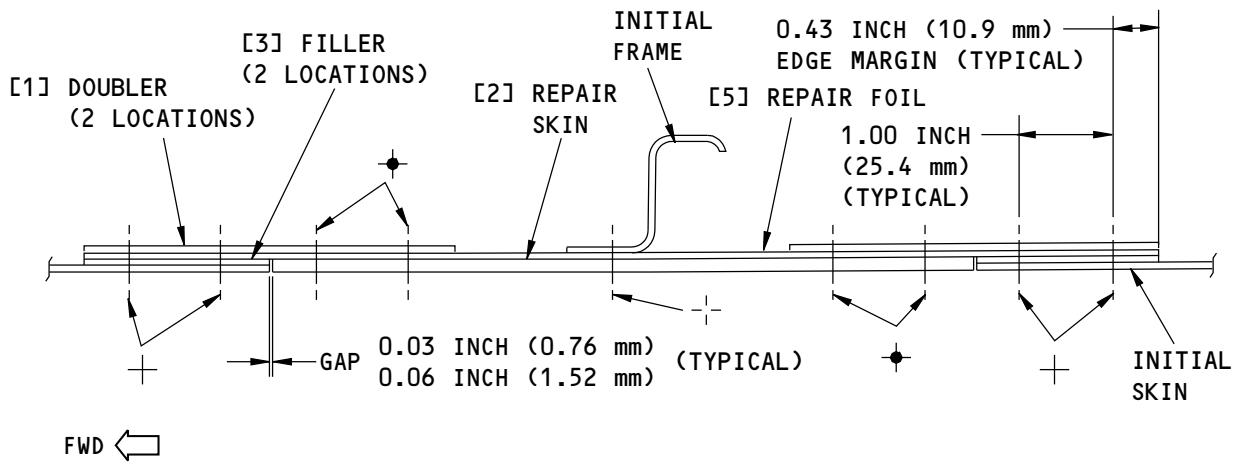
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**737-800
STRUCTURAL REPAIR MANUAL**



A-A



B-B

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**Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)**

54-20-01

**REPAIR 9
Page 206**

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 10 - FAN COWL SKIN INTERNAL DOUBLER REPAIR AT A FRAME IN ZONE C

1. Applicability

- A. Repair 10 is applicable to damage to the Fan Cowl Skin at a frame in Zone C. Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 10.
- B. Repair 10 is not applicable to damage at the forward or aft edges.
- C. Repair 10 is not applicable to damage adjacent to drain holes, access panels, or ground support equipment (GSE) attachment points.
- D. For repairs that overlap into Zone B, as shown in Engine Fan Cowl Skin Location, Figure 201/REPAIR 10, refer to REPAIR 9.

2. General

- A. Repair 10 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The maximum circumferential length of the damage cutout is 12.00 in. (304.80 mm).
- C. The maximum fore/aft length of the damage cutout is 9.50 in. (241.30 mm).
- D. The lower edges of the repair doublers must be a minimum of 3.00 in. (76.20 mm) above (measured circumferentially).
 - (1) The latch-to-cowl attach fastener furthest from the fan cowl split line.
- E. Make sure the aerodynamic smoothness of the repair is satisfactory or there will be a decrease in the economic performance of the airplane. Refer to 51-10-01, GENERAL.

54-20-01

REPAIR 10

Page 201

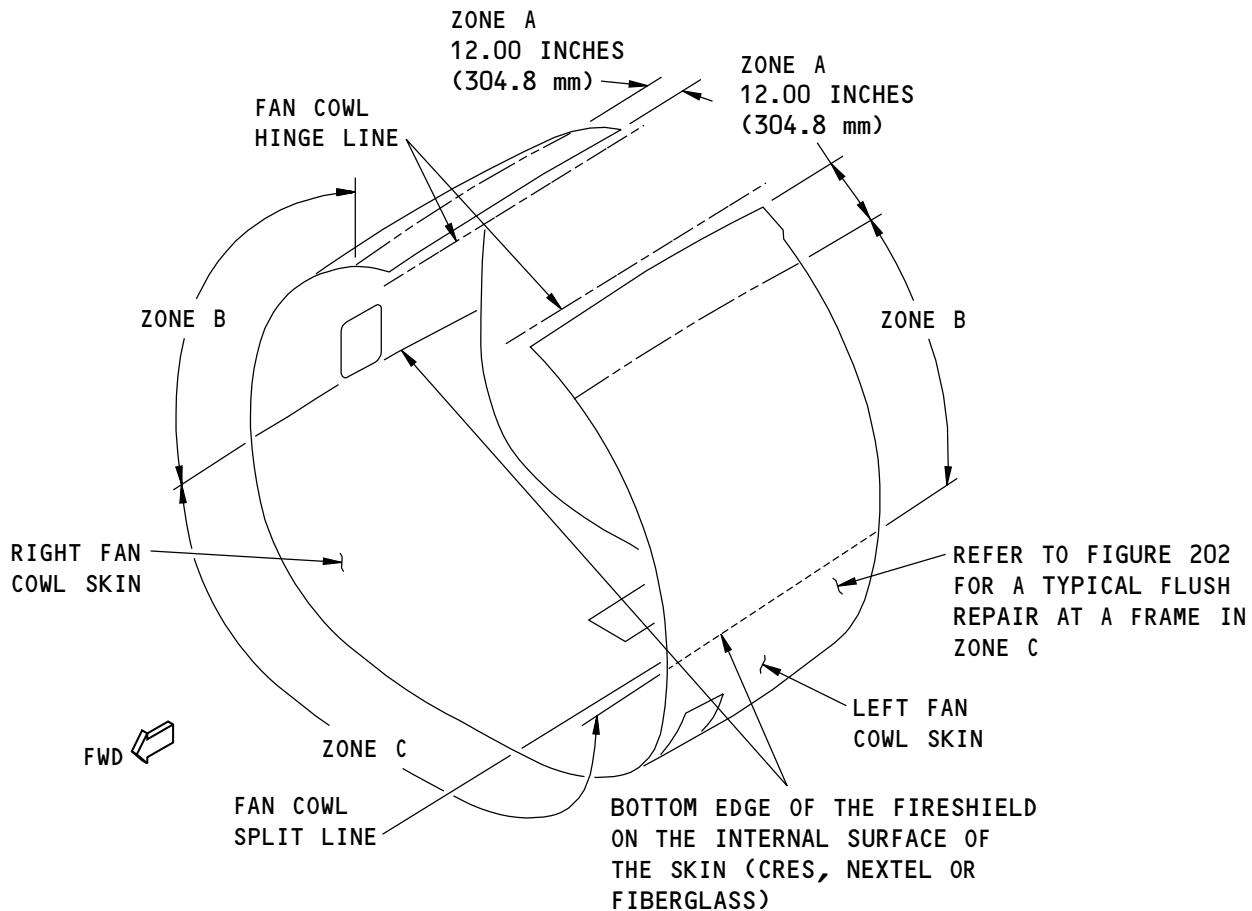
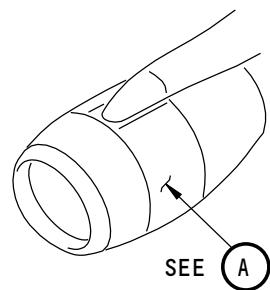
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE FAN COWL DOORS ARE SHOWN,
RIGHT ENGINE FAN COWL DOORS ARE ALMOST THE SAME

(A)

G94053 S0006591712_V2

Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 10
Page 202
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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
51-20-05, REPAIR 1	Wet Installation of Fasteners
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 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.
- B. If there is a crack, drill 0.25 in. (6.35 mm) stop holes at the ends of the crack. Refer to 51-10-02, GENERAL for the procedures to drill a stop hole.
 - (1) If the stop hole is at a frame, do the steps that follow:
 - (a) Remove a sufficient number of fasteners to move the skin away from the frame.
 - (b) Put a thin sheet of CRES between the skin and the frame to prevent damage to the frame when you drill the stop hole.
- C. Cut and remove the damaged skin to a rectangular shape.
 - (1) Make the radii of the corners of the cutout a minimum of 0.50 in. (12.70 mm).
 - (2) Do not cause damage to the frame.
- D. Do a High Frequency Eddy Current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.
NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 10 for the materials.
- F. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 10.

54-20-01

REPAIR 10

Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Doubler	2	Use 0.063 in. (1.60 mm) thick 2024-T3 sheet
[2]	Repair Skin	1	Use 0.071 in. (1.80 mm) thick 2024-T3 sheet
[3]	Filler	2	Use 0.25 in. (6.35 mm) thick 2024-T3 sheet
[4]	Frame Doubler	2	Use 0.071 in. (1.80 mm) thick 2024-T3 sheet

- G. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 10. Refer to 51-40-05, GENERAL, 51-40-06, GENERAL, and 51-40-08, GENERAL.
 - H. Disassemble the repair parts.
 - I. Remove the nicks, scratches, and gouges from the initial skin. Refer to 51-10-02, GENERAL.
 - J. Remove the sharp edges from the repair parts and the initial skin to a sonic edge finish as given inBAC 5300 Sonic Edge Finish.
 - K. Apply a chemical conversion coating to the repair parts and to the bare surfaces of the initial skin. Refer to 51-20-01, GENERAL.
 - L. Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04 to the areas that follow:
 - (1) The bare external surfaces of the initial skin
 - (2) The internal and external surfaces of the repair parts.
 - M. Install the repair parts as shown with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to 51-20-05, GENERAL.
- NOTE:** As an alternative to BMS 5-63, Type II, Class B-1/2 sealant, you can use BMS 5-95 sealant in Zone C only.
- N. Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
 - O. Apply one layer of BMS 10-79, Type III primer to the fasteners after you install them.
 - P. Apply a fillet seal with BMS 5-63, Type II, Class B-1/2 sealant to the areas that follow (Refer to 51-20-05, GENERAL):
 - (1) Around the edge of the part [1] Doubler
 - (2) The space between the part [2] Repair Skin and the initial skin.
 - Q. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or AMM PAGEBLOCK 51-21-99/701 as applicable.

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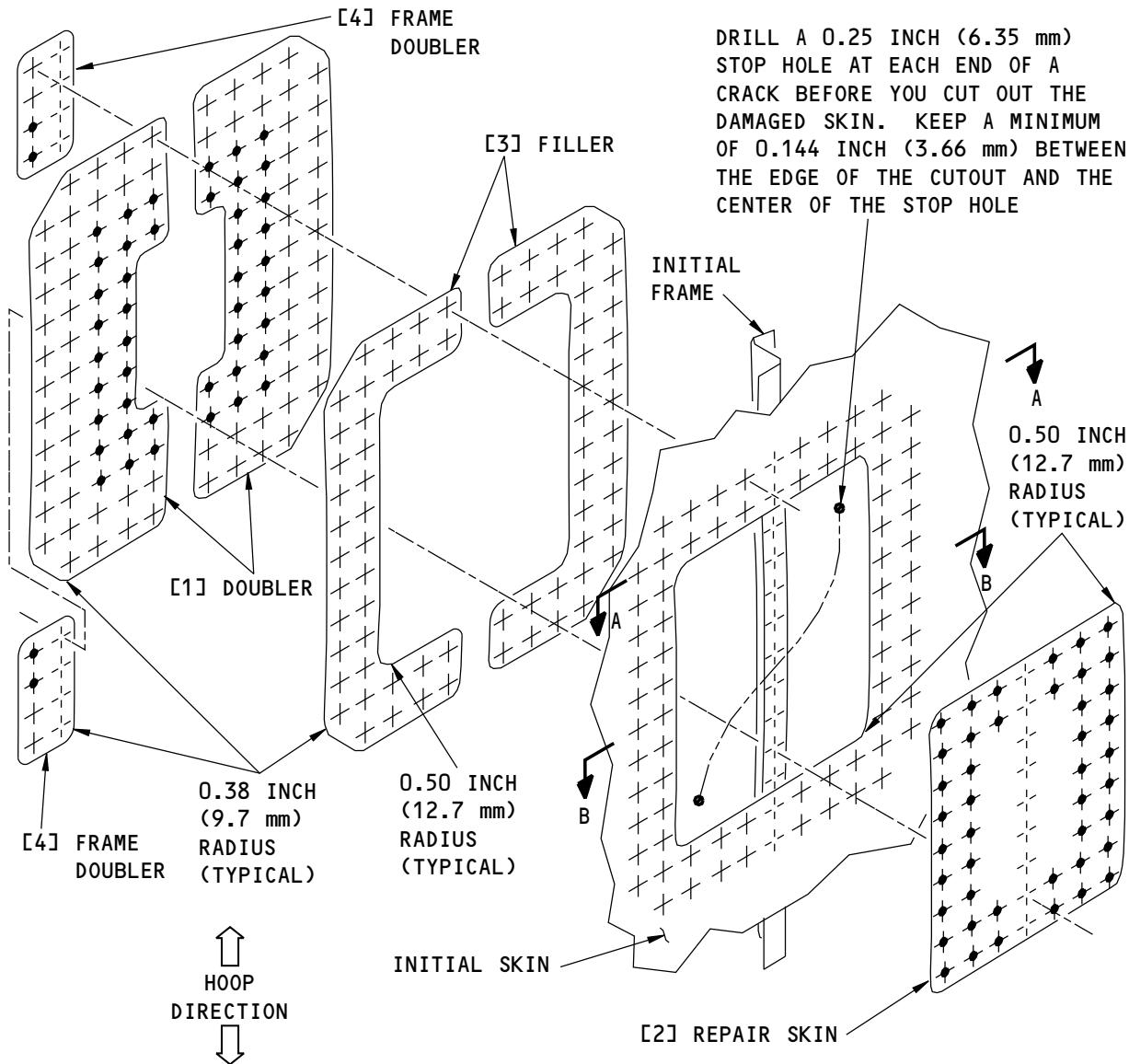
REPAIR 10

Page 204

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS.
- REPAIR FASTENER LOCATION. INSTALL NAS1097AD6 OR BACR15CE6AD FLUSH HEAD RIVETS. AS AN ALTERNATIVE, INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.
- + REPAIR FASTENER LOCATION. INSTALL MS20470AD6 PROTRUDING HEAD RIVETS.

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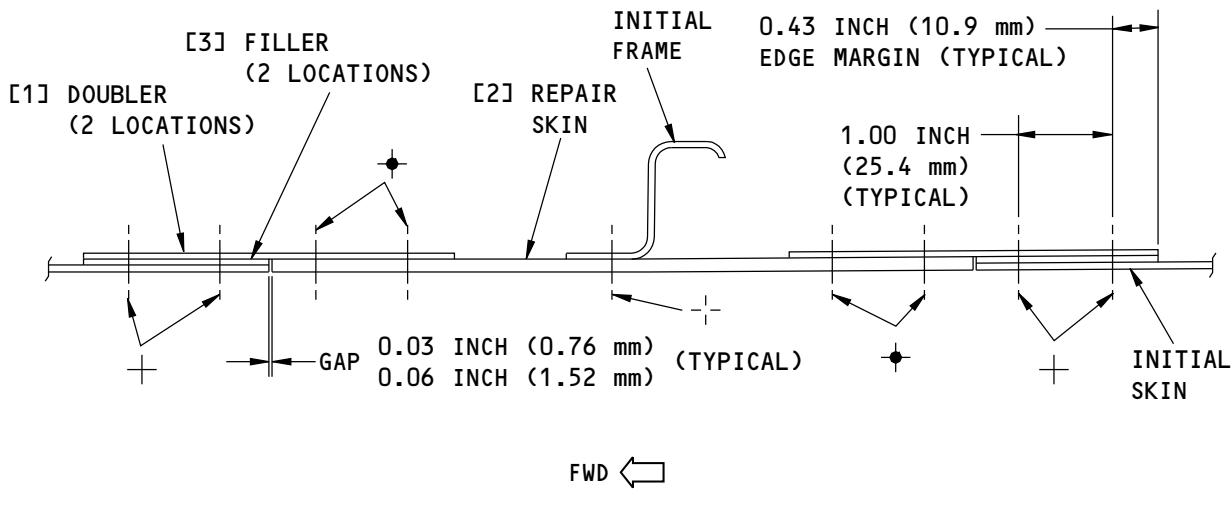
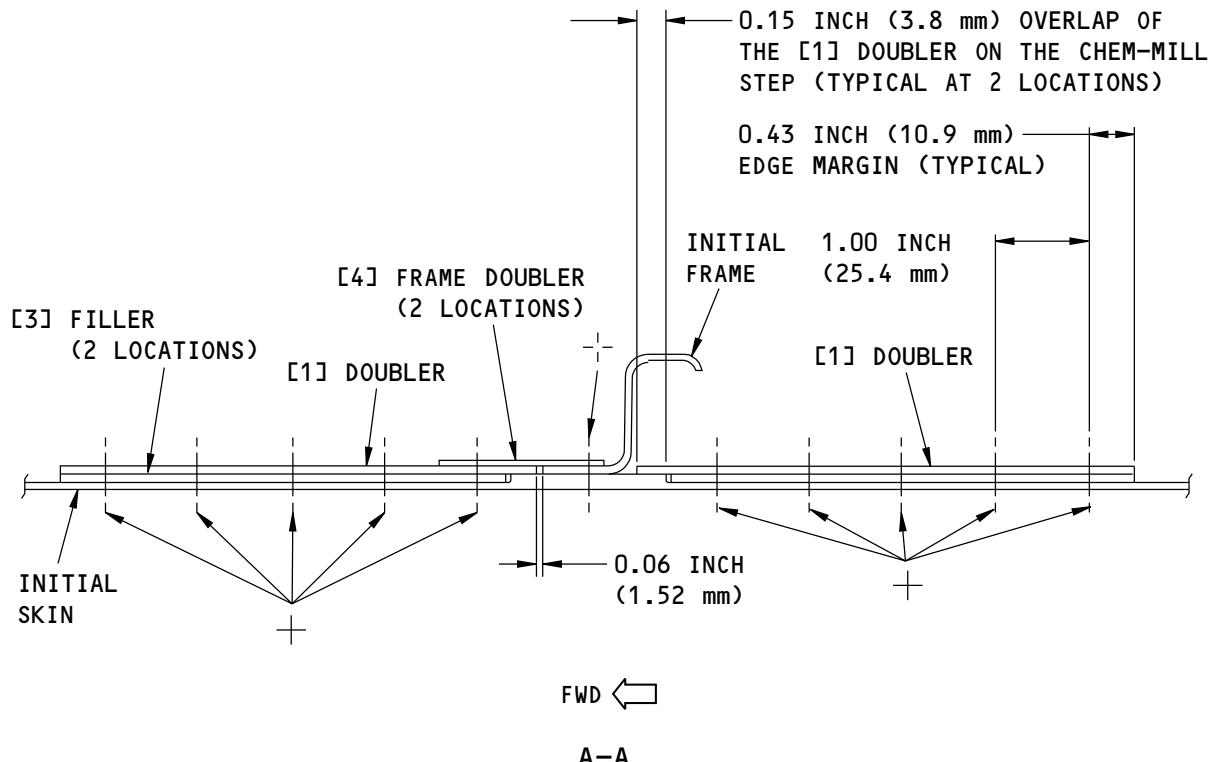
**Layout of the Repair Parts
Figure 202 (Sheet 1 of 2)**

54-20-01
**REPAIR 10
Page 205
Nov 10/2012**

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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Layout of the Repair Parts
Figure 202 (Sheet 2 of 2)

54-20-01

REPAIR 10

Page 206

Nov 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 11 - LAMINATED FIRESHIELD (NEXTEL OR FIBERGLASS)

1. Applicability

- A. Repair 11 is applicable to hole, puncture or delamination damage to the laminated fireshield material made from either Nextel or fiberglass that is:
 - (1) On the internal surface of the fan cowl skin between frames
 - (2) In Zones A and B, in areas with or without chem-milled pockets (Refer to Engine Fan Cowl Skin Location, Figure 201/REPAIR 11).
- B. Repair 11 is not applicable to damage at the forward or aft edges of the fan cowl doors.
- C. Repair 11 is not applicable to damage where the repair parts will cause interference with the initial structure.

2. General

- A. Repair 11 is a permanent repair. Refer to 51-00-06 to find the definitions of the different types of repairs.
- B. The maximum circumferential length of the damage cutout is 2.00 inches (50.8 mm).
- C. The maximum fore/aft length of the damage cutout is 7.00 inches (177.8 mm).
- D. The edges of the damaged part of the fireshield material must be a minimum of 1.25 inches (31.8 mm) from the parts of other repaired damage. The damage can extend up to a frame edge.
- E. There are three possible skin/frame configurations for this repair. Refer to Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , and C to find the applicable configuration for the repair area.

54-20-01

REPAIR 11

Page 201

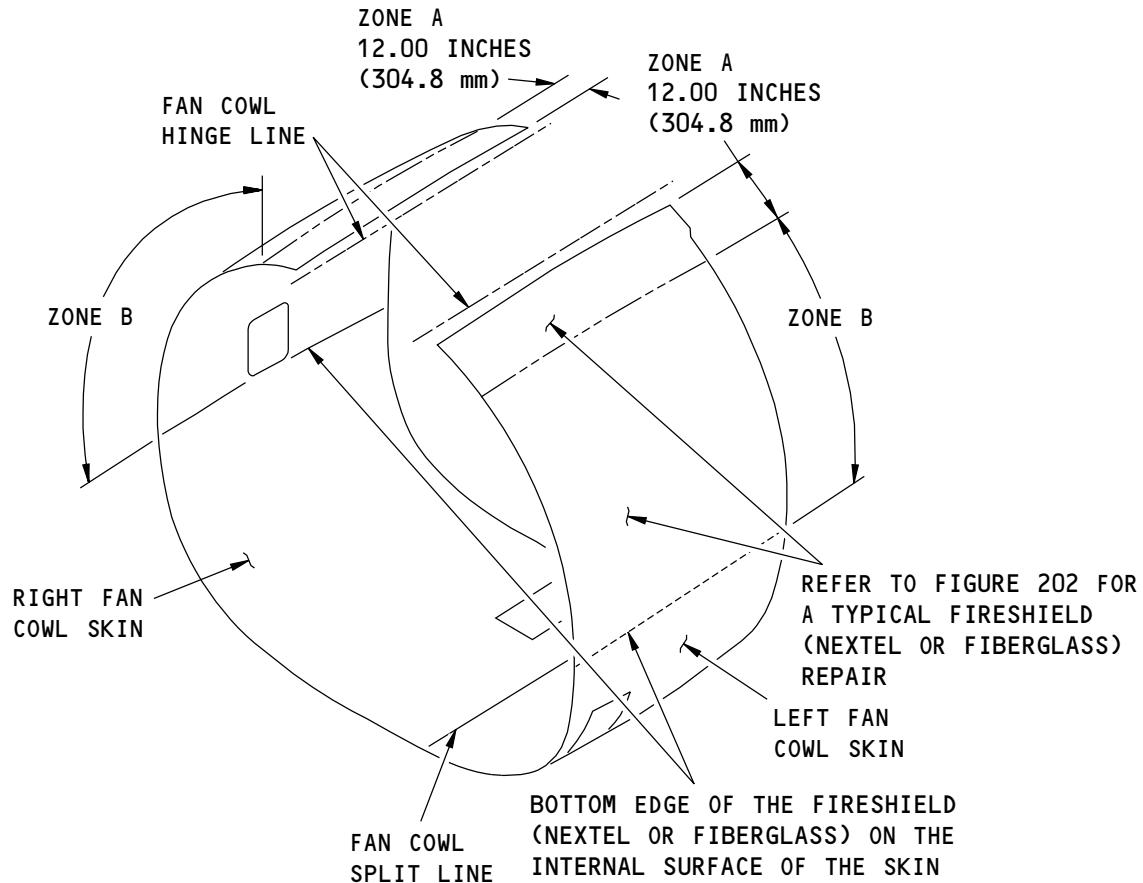
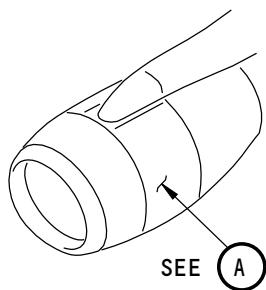
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



A

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Engine Fan Cowl Skin Location
Figure 201

54-20-01

REPAIR 11
Page 202
Nov 10/2012

D634A210

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737-800
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
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05	FASTENER HOLE SIZES
AMM 51-21-99 P/B 701	DECORATIVE EXTERIOR PAINT SYSTEM - CLEANING/PAINTING
BAC 5000	General Sealing
BAC 5300, Section 11.2.3	Broken Edges
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - B. Cut and remove the damaged fireshield material. Use small scissors and cut the material as near to the fan cowl door skin as possible.
 - C. Abrade the silicone coating in the repair area with 150-grit or smaller abrasive paper.
 - (1) Do not cause damage to the fibers below the silicone coating.
 - (2) Do not cause damage to the aluminum skin of the fan cowl door.
 - D. Remove the fasteners from the skin and frames in the repair area. Refer to Layout of the Repair Parts, Figure 202/REPAIR 11, Details A and B , and 51-40-02.
- NOTE:** Fastener removal is not necessary for Layout of the Repair Parts, Figure 202/REPAIR 11, Detail C .
- E. Make the repair parts to the same contour as the initial skin. Refer to Table 201/REPAIR 11 for the materials, and Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C for the layout of the repair parts.

WARNING: DO NOT BREATHE THE FUMES OR PERMIT THE SOLVENTS TO TOUCH YOUR SKIN, EYES OR CLOTHING. MAKE SURE THAT THE AIR SUPPLY TO THE AREA IS NOT BLOCKED. IF YOU DO NOT OBEY, YOU CAN CAUSE SKIN IRRITATION OR INJURY TO PERSONS. DO NOT USE SOLVENTS IN AREAS WITH EQUIPMENT THAT CAN PRODUCE HEAT OR SPARKS. IF YOU DO NOT OBEY, AN EXPLOSION CAN OCCUR AND CAUSE INJURIES.

- F. Clean the repair area and the repair parts with solvent and wipe them dry before the solvent evaporates. Refer to SOPM 20-30-03.
- G. Apply a thin layer of primer for BMS 5-63, Type I or Type II, as given in BAC5000. An additional layer of BMS 5-63, Type I, primer may be necessary to:

NOTE: Primer is optional for BMS 5-63, Type II, as given in BAC5000, but recommended for adhesion of the sealant.

- (1) All of the aluminum surfaces in the repair area that are open to the air
- (2) The mating surfaces of the fan cowl skin and the repair parts.

54-20-01

REPAIR 11

Page 203

Nov 10/2015

D634A210

BOEING PROPRIETARY - Copyright © Unpublished Work - See title page for details



737-800
STRUCTURAL REPAIR MANUAL

- (3) Do not apply the primer to the red silicone adhesive.
- H. Permit the primer to dry as given in BAC5000.
- I. Apply a layer of BMS 5-63, Type I or Type II sealant, as given in BAC5000 to the mating surfaces of the fan cowl skin and the repair parts.
- (1) To give a smooth surface, use a sufficient quantity of BMS 5-63, Type I or Type II, sealant to fill in the areas of the skin at:
- (a) The edges of the chem-milled pockets
- (b) The locations of missing Nextel or Fiberglass fireshield material.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Repair Foil	1	Use 0.005 inch (0.13 mm) thick CRES 321 foil
[2]	Repair Doubler	2	Use 0.020 inch (0.51 mm) thick CRES 321 sheet

- J. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C .
- K. Apply pressure to the repair area to get the maximum adhesion between the fan cowl door skin and the repair parts. Use a squeegee or a roller.
- L. Do a visual inspection to make sure that "squeeze out" of the sealant has occurred along the full length of all edges of the part 1 repair foil.
- M. Cure the BMS 5-63, Type I or Type II, sealant as given in BAC5000.
- N. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C . Refer to 51-40-05.
- O. Install the fasteners wet with BMS 5-63, Type I or Type II, as given in BAC5000.
- (1) In areas not covered by the part (2) doublers, install CRES washers under the upset heads of the rivets. Refer to Layout of the Repair Parts, Figure 202/REPAIR 11, Details A , B , or C for the fastener and CRES washer callouts.
- NOTE:** Monel rivets in aluminum structure must be cadmium plated. Before you install BACR15CE6M rivets, apply the cadmium as given in QQ-P-416, Type I, Class III, to a thickness of 0.0002 to 0.0004 inch (0.0051 mm to 0.010 mm).
- P. Apply a layer of BMS 5-63, Type I or Type II, primer and sealant as given in BAC5000 over the repair parts.

54-20-01

REPAIR 11

Page 204

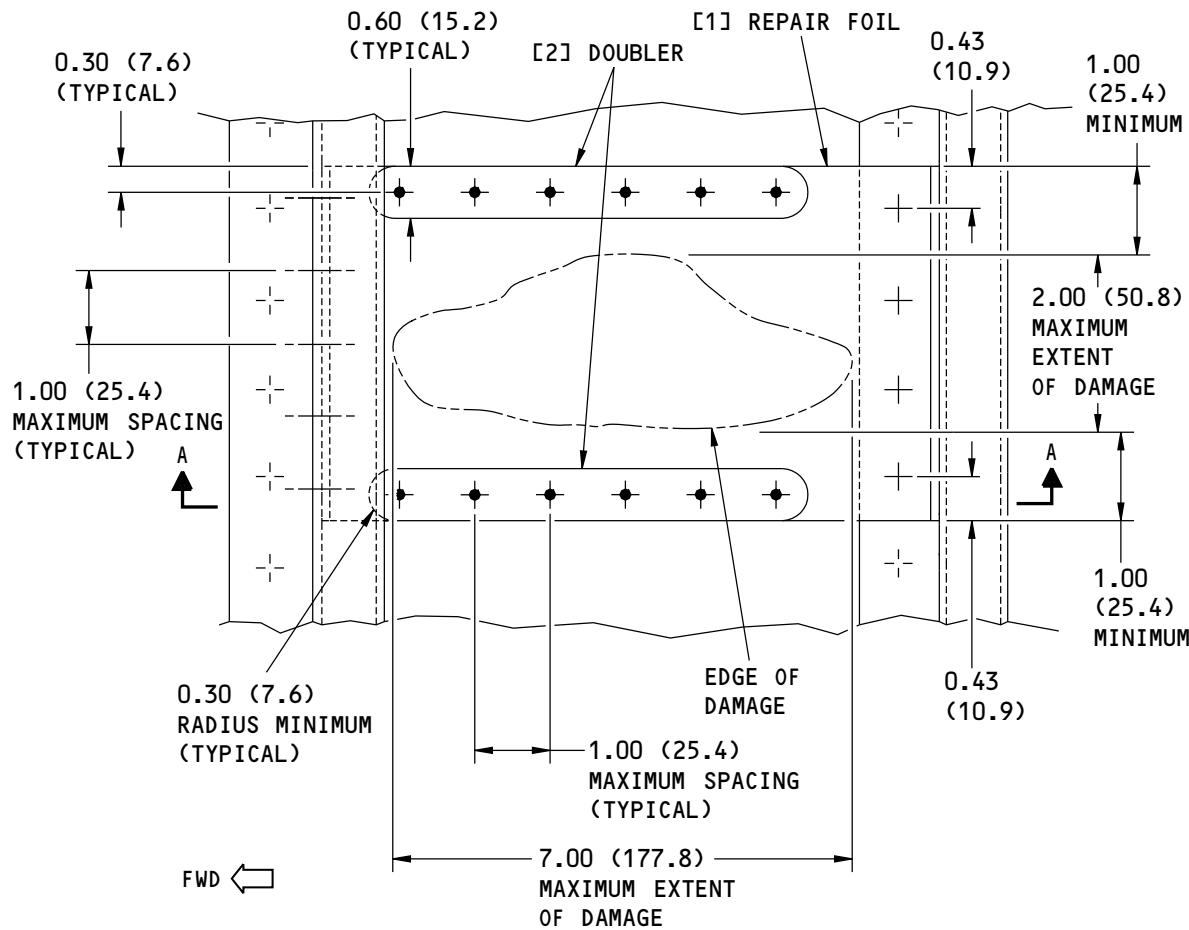
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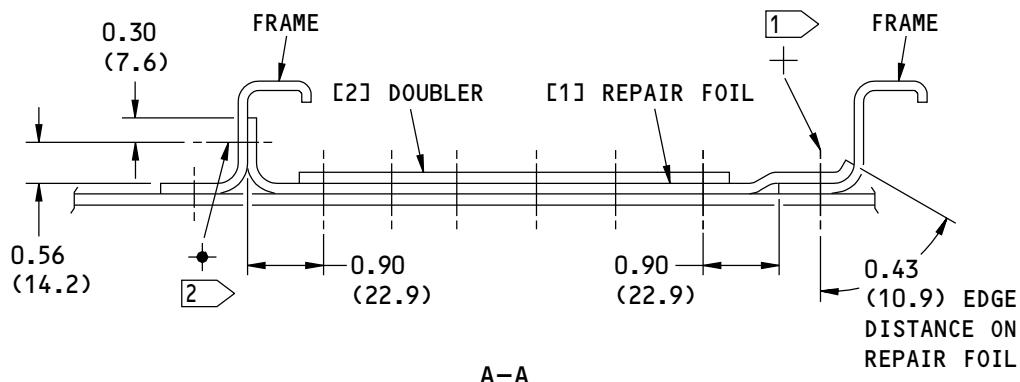
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**737-800
STRUCTURAL REPAIR MANUAL**



A



H59085 S0006591719_V1

**Layout of the Repair Parts
Figure 202 (Sheet 1 of 4)**

54-20-01

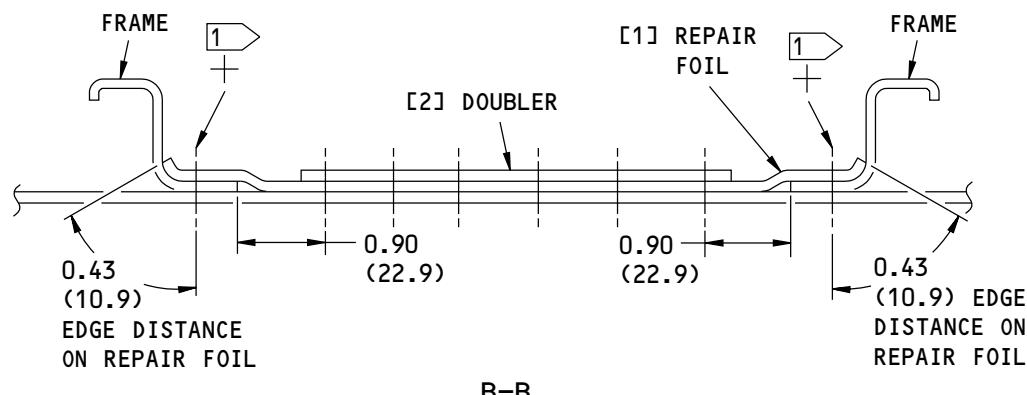
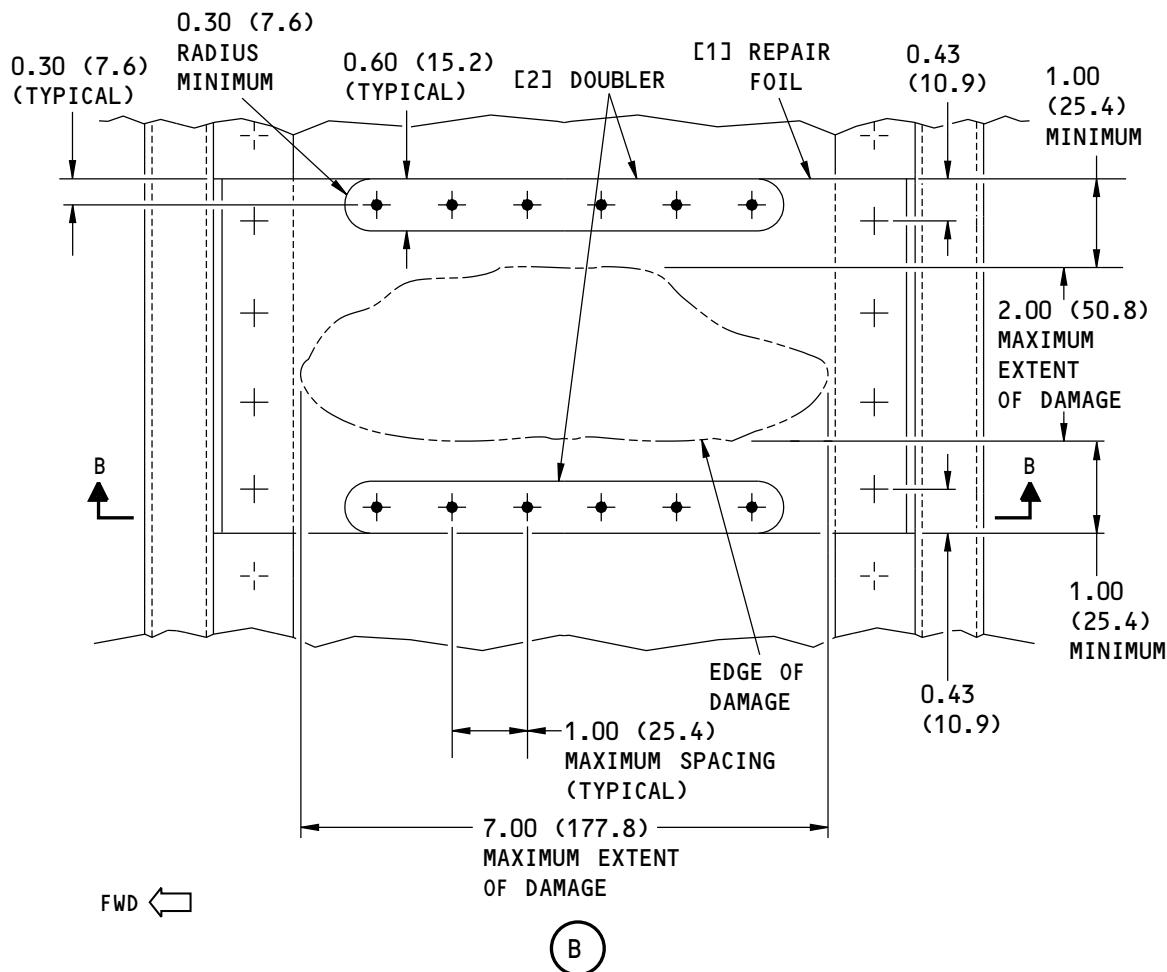
REPAIR 11

Page 205

Nov 10/2012

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**737-800
STRUCTURAL REPAIR MANUAL**


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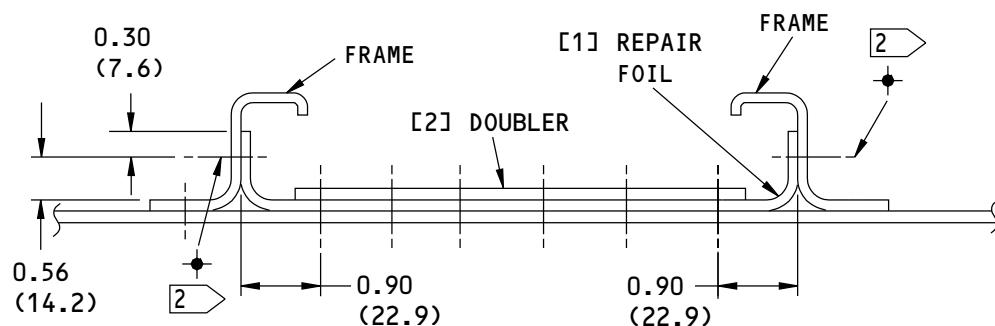
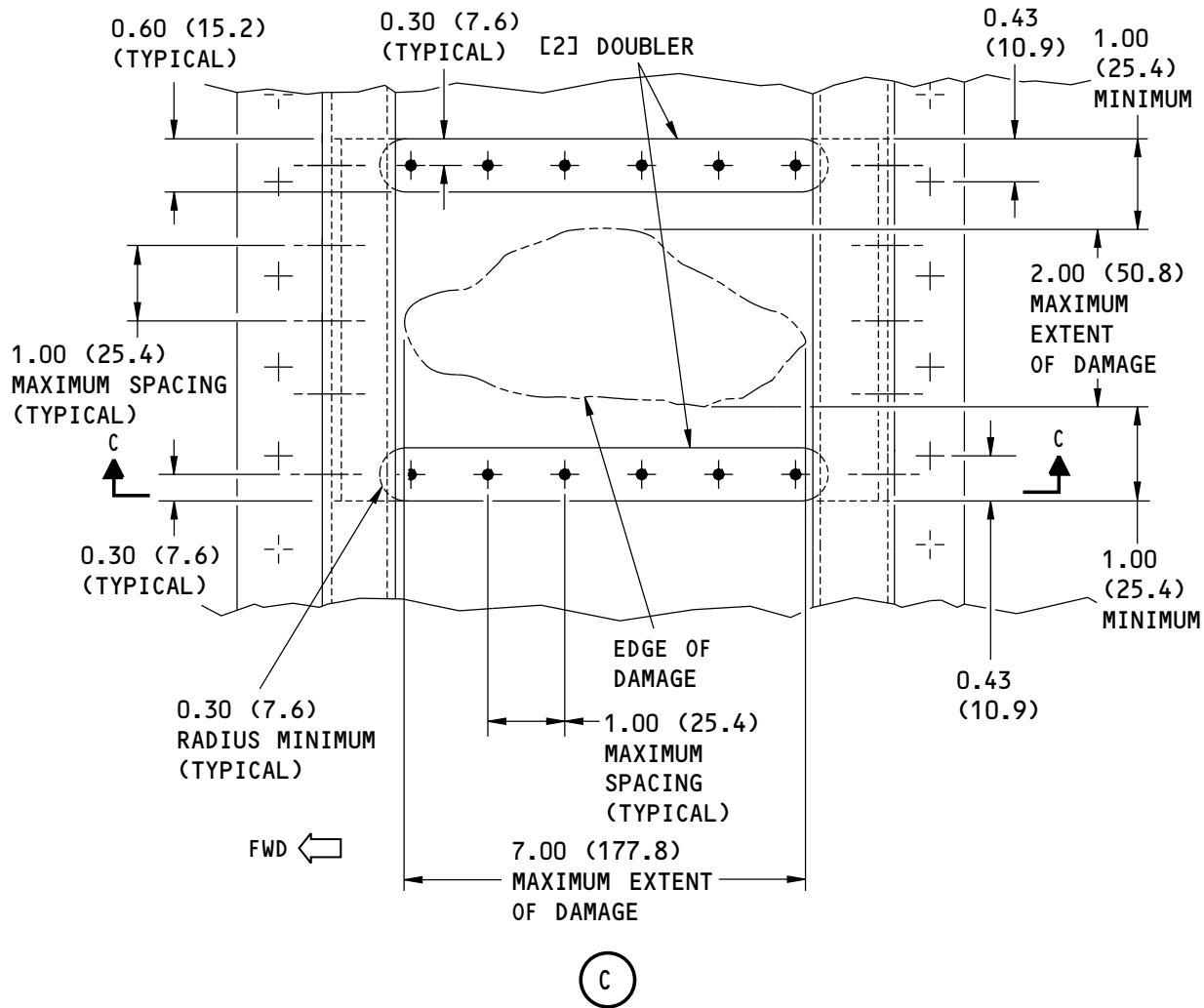
**Layout of the Repair Parts
Figure 202 (Sheet 2 of 4)**

54-20-01
REPAIR 11
Page 206

Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



C-C

H60114 S0006591721_V1

Layout of the Repair Parts
Figure 202 (Sheet 3 of 4)

54-20-01

REPAIR 11

Page 207

Nov 10/2012

D634A210



**737-800
STRUCTURAL REPAIR MANUAL**

NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).
- [1] ➤** INSTALL NAS1149C0332R CRES WASHERS UNDER THE UPSET HEAD OF 3/16 INCH DIAMETER RIVETS.
- [2] ➤** INSTALL NAS1149CN432R CRES WASHERS UNDER THE UPSET HEAD OF 1/8 INCH DIAMETER RIVETS (AT FRAME LOCATION ONLY)

FASTENER SYMBOLS

- +** INITIAL FASTENER LOCATION. INSTALL A NAS1200M6()P OR BACR15CE6M (CADMIUM PLATED) FLUSH HEAD RIVET.
- ◆** REPAIR FASTENER LOCATION. INSTALL A MS20615-4MP PROTRUDING HEAD RIVET.

H60044 S0006591722_V1

**Layout of the Repair Parts
Figure 202 (Sheet 4 of 4)**

54-20-01

REPAIR 11

Page 208

Nov 10/2012

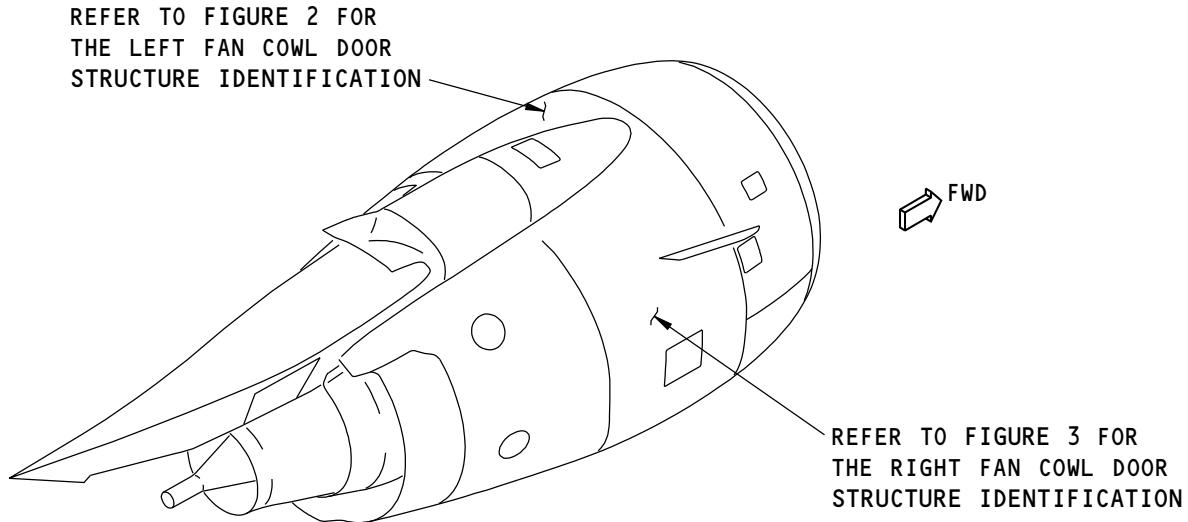
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - FAN COWL DOOR STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F03370 S0006591726_V1

Engine Fan Cowl Door Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
314A2000	Fan Cowl Installation - CFM56-7
314-2200	Cowl Assembly - Fan, Left and Right
314-2201	Fan Cowl Structure Assembly, LH
314-2202	Fan Cowl Structure Assembly, RH
314-2205	Details - Frames and Doublers, Fan Cowl, LH
314-2206	Details - Frames and Doublers, Fan Cowl, RH
314-2207	Details - Longeron, Intercostal, and Doubler

54-20-02

IDENTIFICATION 1

Page 1

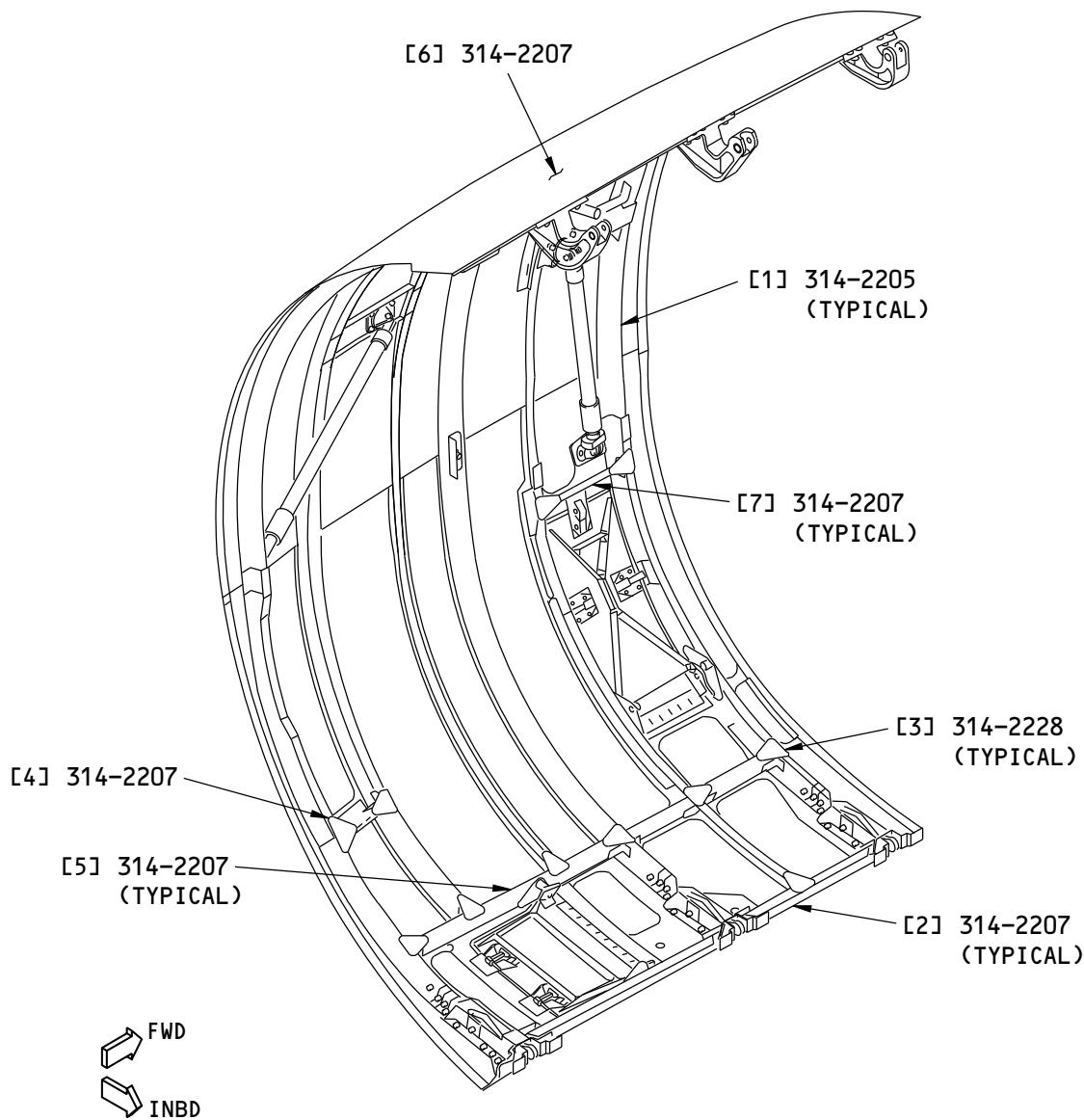
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737-800
STRUCTURAL REPAIR MANUAL



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

VIEW WHEN YOU LOOK OUTBOARD

G14588 S0006591728_V1

Left Fan Cowl Door Structure Identification
Figure 2

54-20-02
IDENTIFICATION 1
Page 2
Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Zee Frame	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[2]	CEE (Latch) Longeron	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[3]	Gusset	0.063 (1.60)	2024-T3 Aluminum sheet as given in AMS-QQ-A-250/12	
[4]	Zee Intercostal	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[5]	CEE Intercostal	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[6]	Zee (Hinge) Longeron	0.063 (1.60)	Nickel Alloy 625 sheet Annealed as given in AMS 5599	
[7]	Zee Intercostal	0.050 (1.27)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	

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

54-20-02

IDENTIFICATION 1

Page 3

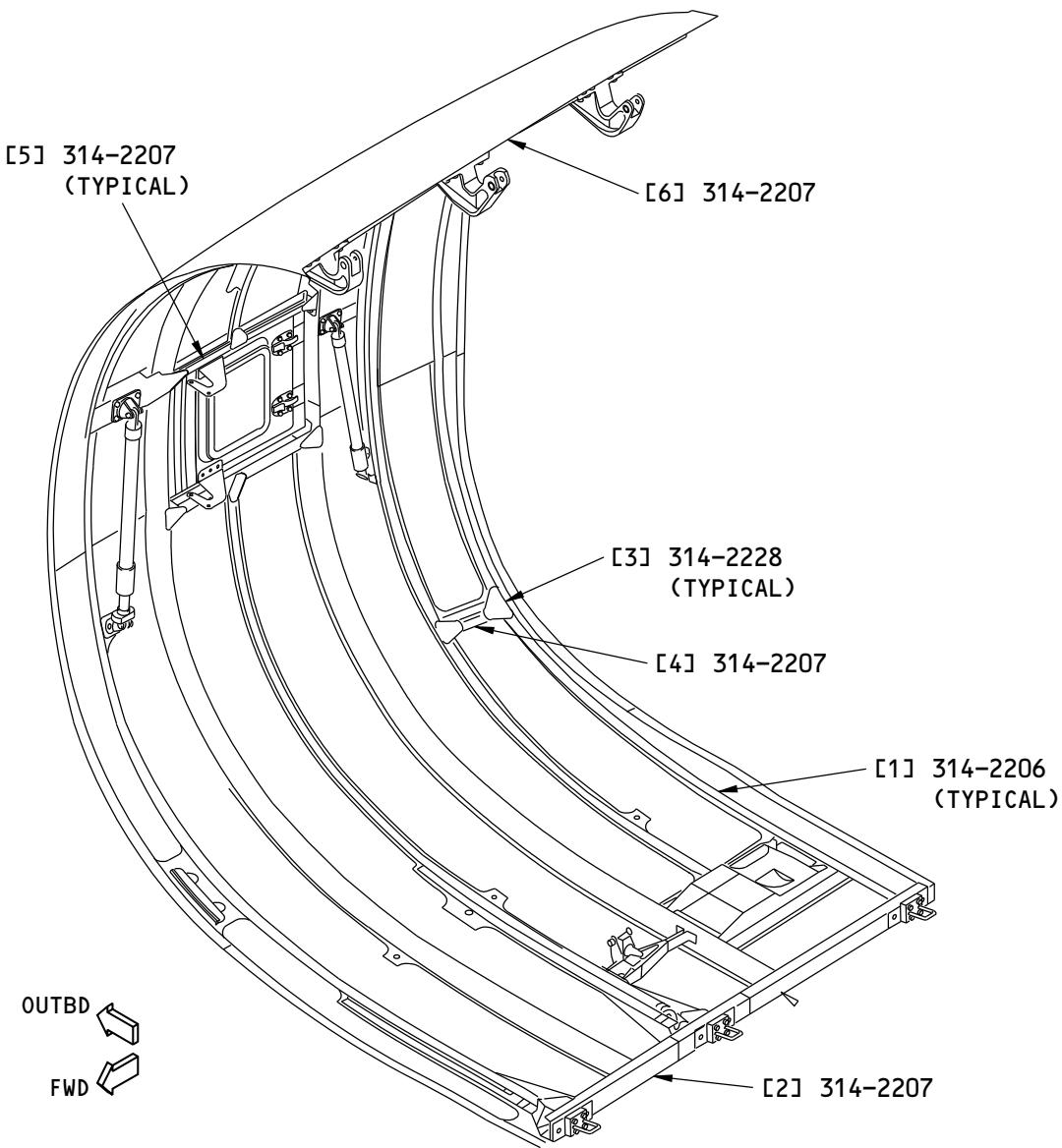
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737-800
STRUCTURAL REPAIR MANUAL



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

VIEW WHEN YOU LOOK OUTBOARD

G14469 S0006591730_V1

Right Fan Cowl Door Structure Identification
Figure 3

54-20-02
IDENTIFICATION 1
Page 4
Nov 10/2012



**737-800
STRUCTURAL REPAIR MANUAL**

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Zee Frame	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[2]	CEE (latch) Longeron	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[3]	Gusset	0.063 (1.60)	2024-T3 Aluminum sheet as given in AMS-QQ-A-250/12	
[4]	Zee Intercostal	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[5]	CEE Intercostal	0.063 (1.60)	2024-T62 Aluminum sheet as given in AMS-QQ-A-250/4	
[6]	Zee (Hinge) Longeron	0.063 (1.60)	Nickel Alloy 625 sheet Annealed as given in AMS 5599	

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

54-20-02

IDENTIFICATION 1

Page 5

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

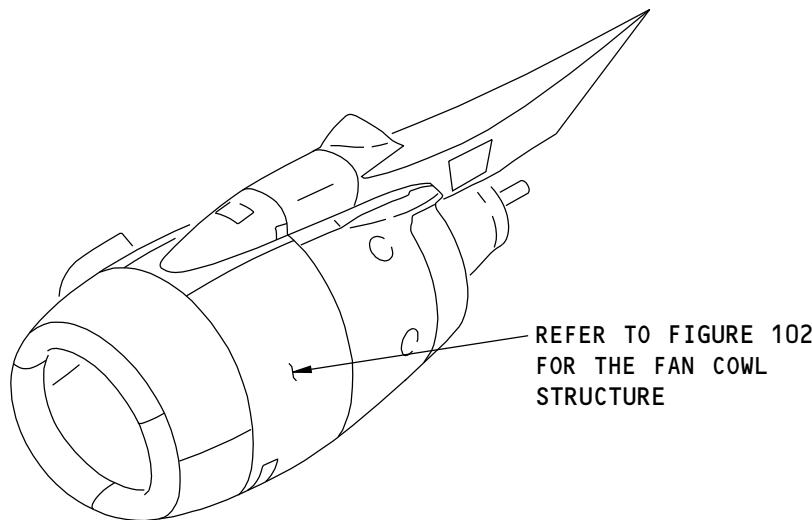
ALLOWABLE DAMAGE 1 - FAN COWL DOOR STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the fan cowl structure shown in Fan Cowl Door Structure Location, Figure 101/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 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 as follows:
- (1) Apply the finishes that follow to the reworked aluminum parts:
 - (a) Apply a chemical conversion coating as given in 51-20-01.
 - (b) Apply two layers of BMS 10-79, Type III primer as given in SOPM 20-44-04.
 - (2) Apply a finish to the reworked areas as given AMM 51-20-00/701.



**Fan Cowl Door Structure Location
Figure 101**

G79008 S0006591734_V1

54-20-02

ALLOWABLE DAMAGE 1

Page 101

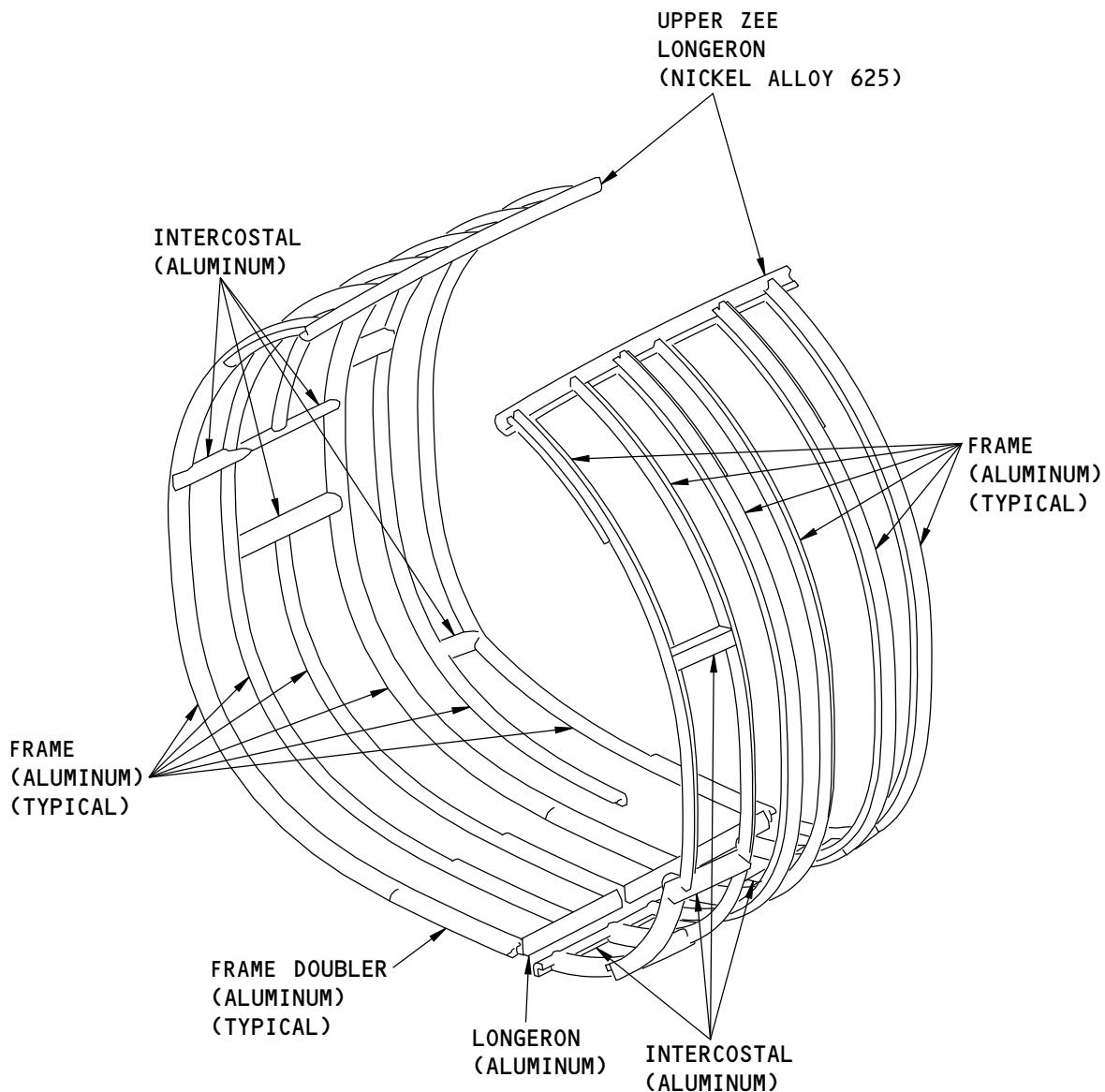
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737-800
STRUCTURAL REPAIR MANUAL



G80240 S0006591735_V1

Fan Cowl Structure
Figure 102

54-20-02

ALLOWABLE DAMAGE 1

Page 102

Nov 10/2012

D634A210



737-800
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
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-20-00/701	Decorative Exterior Paint System - Cleaning/Painting
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Frames, Longerons, Frame Doublers, and Intercostals:

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
- (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.

54-20-02

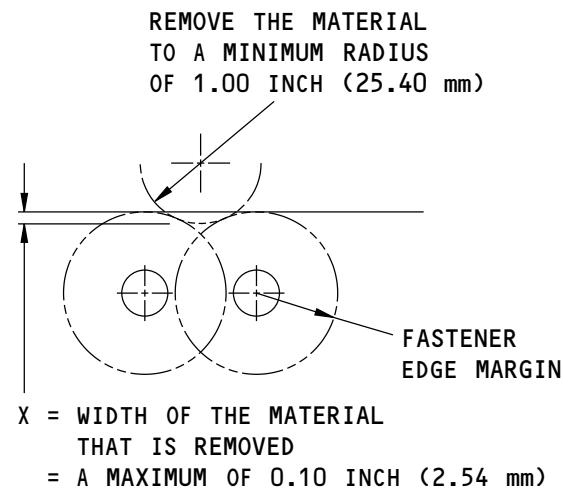
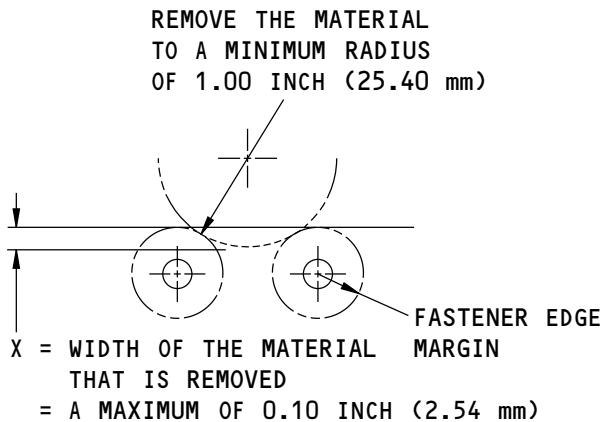
ALLOWABLE DAMAGE 1

Page 103

Nov 10/2012

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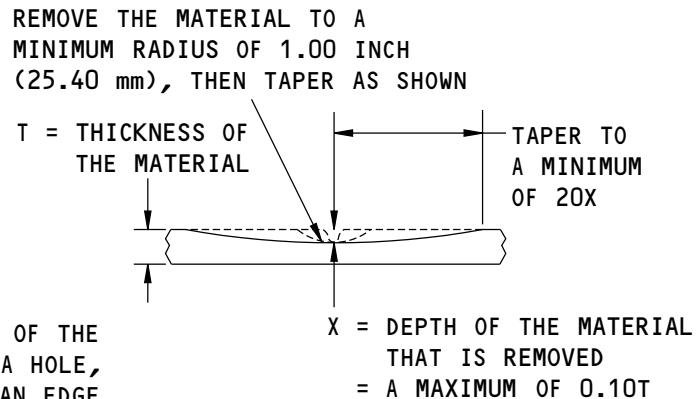
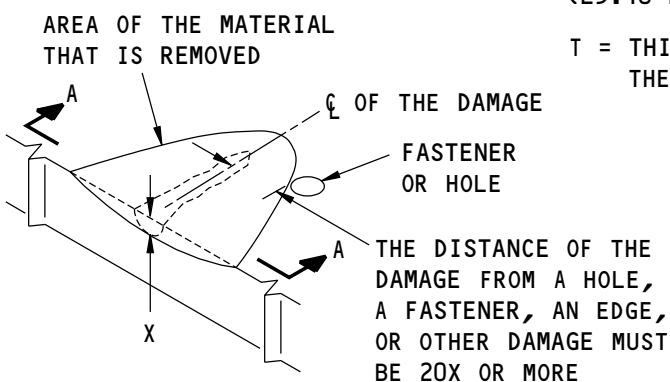
**737-800
STRUCTURAL REPAIR MANUAL**


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 A SURFACE

(C)

G79009 S0006591736_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 2)

54-20-02

ALLOWABLE DAMAGE 1

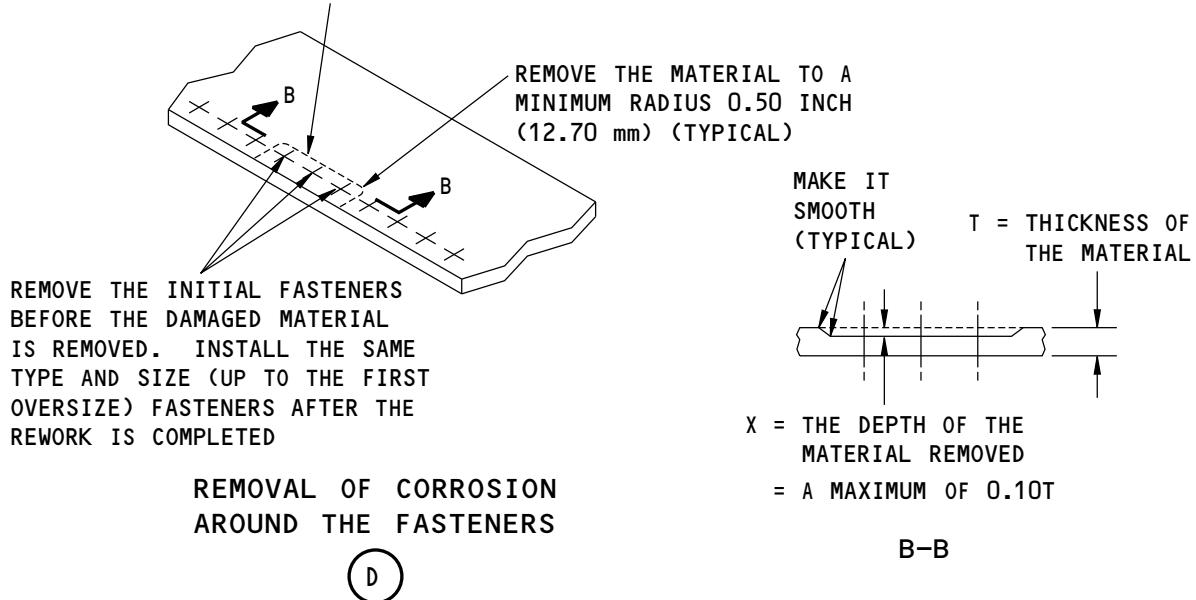
Page 104

Nov 10/2012

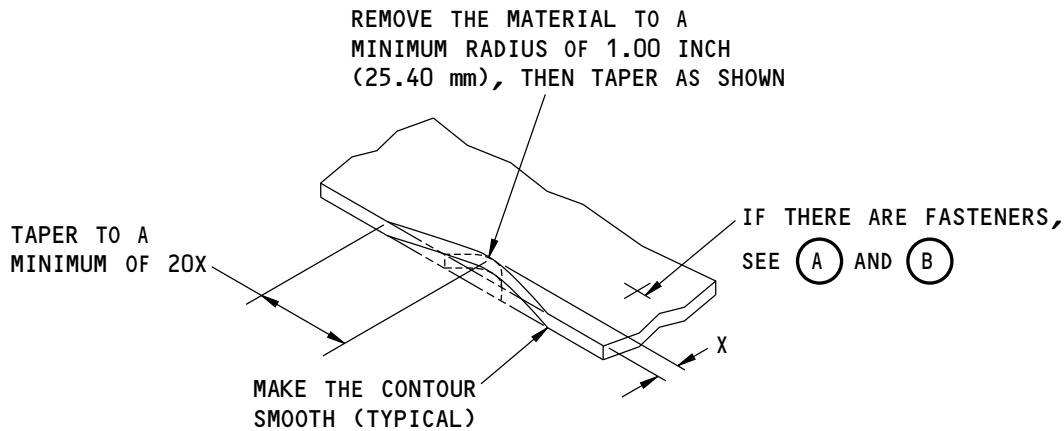
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**737-800
STRUCTURAL REPAIR MANUAL**

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


**REMOVAL OF CORROSION
AROUND THE FASTENERS**

(D)



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(E)

G79011 S0006591737_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 2)

54-20-02

ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL
REPAIR 1 - FAN COWL DOOR FRAMES

1. Applicability

- A. Repair 1 is applicable to damage to a Frame of the Fan Cowl Door. Refer to Fan Cowl Door Frame Location, Figure 201/REPAIR 1.
- B. Repair 1 is not applicable at frame locations where interference between the repair parts and initial structure can occur. This includes structures such as frames, reinforcing angles, reinforcing tees, and longerons.

2. General

- A. Repair 1 is a permanent repair. Refer to 51-00-06, GENERAL for the definitions of the different categories of repairs.
- B. The edge of the damage must be a minimum of 4.00 in. (101.60 mm) away from:
 - (1) The fan cowl hinge fittings
 - (2) The fan cowl latch fittings
 - (3) The repair parts of other frame repairs.
- C. The length of the frame that is removed must not be more than 12.00 in. (304.80 mm).

54-20-02

**REPAIR 1
Page 201**

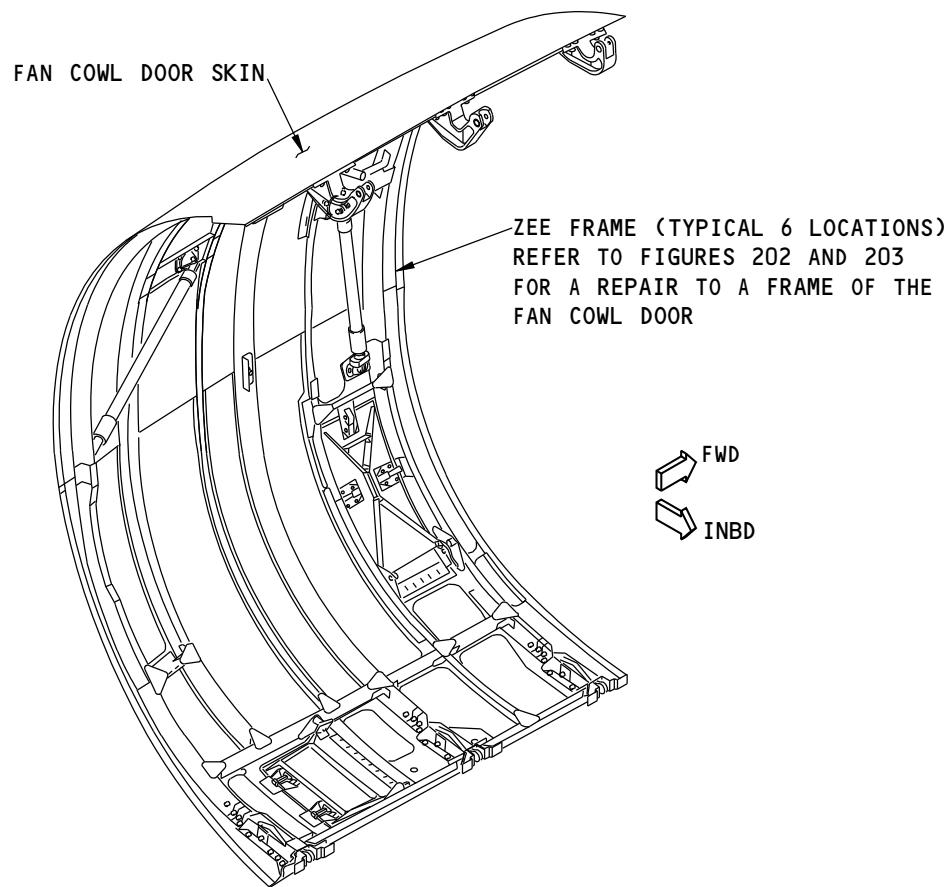
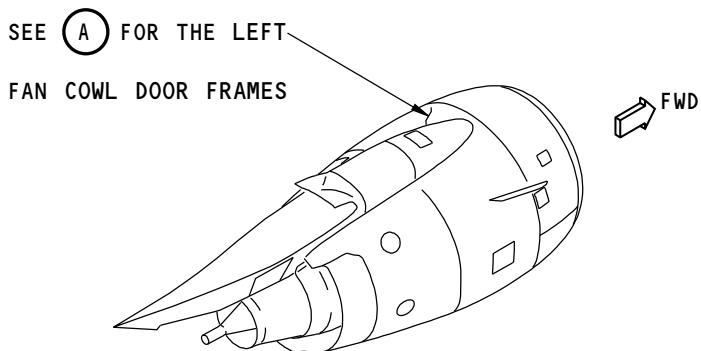
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737-800
STRUCTURAL REPAIR MANUAL



THE LEFT FAN COWL DOOR IS SHOWN
THE RIGHT FAN COWL DOOR IS ALMOST THE SAME

BS-003
G91195 S0006591740_V1

Fan Cowl Door Frame Location
Figure 201

54-20-02

REPAIR 1
Page 202
Nov 10/2012

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
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
51-20-05, REPAIR 1	Wet Installation of Fasteners
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
BAC 5300	FORMING, STRAIGHTENING AND FITTING METAL PARTS
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
SOPM 20-44-04	Application of Urethane Compatible Primer
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02, GENERAL.

- B. Remove the damaged part of the frame. Refer to 51-10-02, GENERAL.

NOTE: Use care not to cause damage to the Nextel, CRES fireshield, or fiberglass.

- C. Do a high frequency eddy current (HFEC) inspection of the repair area to make sure that all of the damage is removed. Refer to 737 NDT Part 6, 51-00-00, Figure 4.

NOTE: The penetrant inspection procedure is a permitted alternative to the HFEC inspection. Refer to SOPM 20-20-02 for the penetrant inspection procedures.

- D. Make the repair parts to the same contour as the initial frame. Refer to Table 201/REPAIR 1 for the materials. Refer to Splice Dimensions, Figure 202/REPAIR 1 for the dimensions of the part [2] and the part [3] splices.

Table 201: REPAIR MATERIAL

ITEM	PART	QUANTITY	MATERIAL
[1]	Filler	1	Use 0.063 in. (1.60 mm) thick 2024-T3 sheet
[2]	Splice	1	Use 0.040 in. (1.02 mm) thick 625 nickel alloy
[3]	Splice	1	Use 0.040 in. (1.02 mm) thick 625 nickel alloy.

- E. Assemble the repair parts as shown in Layout of the Repair Parts, Figure 203/REPAIR 1.
- F. Drill the fastener holes as shown in Layout of the Repair Parts, Figure 203/REPAIR 1. Refer to 51-40-05, GENERAL and 51-40-06, GENERAL.
- G. Disassemble the repair parts.
- H. Remove the nicks, scratches, and gouges from the initial parts. Refer to 51-10-02, GENERAL.
- I. Remove the sharp edges from the initial and repair parts. Refer to THE BOEING COMPANY BAC5300, Sonic Edge Finish.

54-20-02

REPAIR 1
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- J. Abrade the surfaces of the 625 Nickel alloy doublers with Scotchbrite or fine grit sandpaper as given in SOPM 20-30-03.
- K. Apply a chemical conversion coating to the part [1] filler and to the bare surfaces of the initial parts. Refer to 51-20-01, GENERAL.
- L. Apply two layers of BMS 10-79, Type III primer to the bare surfaces and edges of the initial and repair parts. Refer to SOPM 20-44-04.
- M. Install the repair parts as shown with BMS 5-63, Type II, Class B-1/2 sealant between the mating surfaces. Refer to 51-20-05, GENERAL.
 - (1) Install the part [1] Filler and the part [2] Splice on the fan cowl door skin.
 - (2) Install the part [3] Splice on the frame.
- N. Install the fasteners wet with BMS 5-63, Type II, Class B-1/2 sealant. Refer to 51-20-05, REPAIR 1 for Wet Installation of Fasteners.
- O. Apply one layer of BMS 10-79, Type III primer to the fasteners after installing them.
- P. Apply a finish to the external surface of the repair. Refer to AMM PAGEBLOCK 51-21-00/701 or as PGBLK 51-21-99-7 as applicable.

54-20-02

REPAIR 1
Page 204

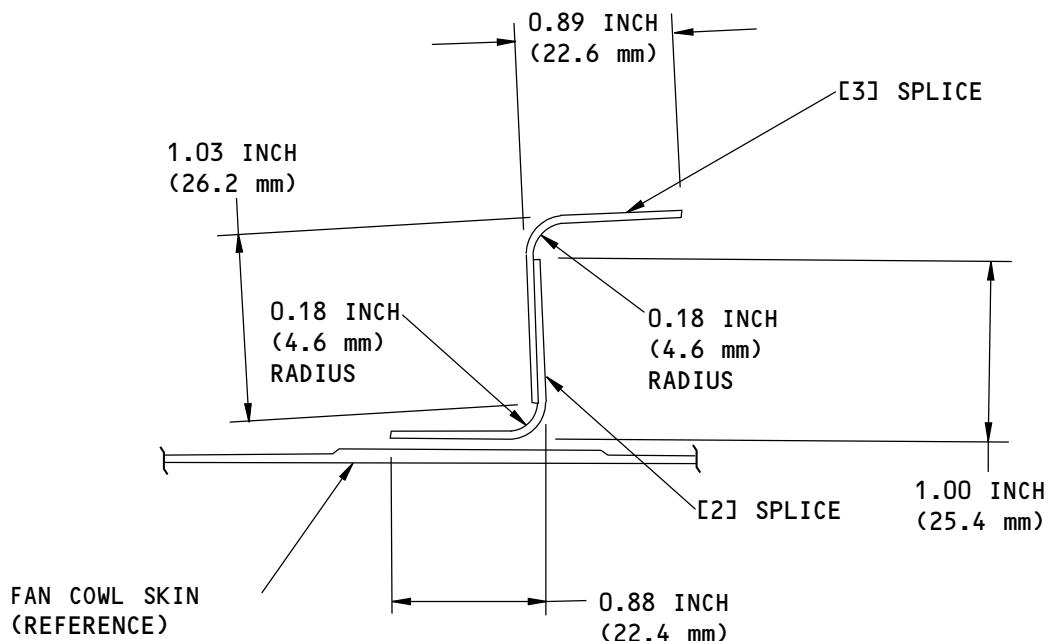
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737-800
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NOTE: MAKE THE LENGTH OF THE SPLICES SUFFICIENT TO GIVE A MINIMUM OF 3 FASTENERS ON BOTH ENDS OF THE REPAIR. REFER TO FIGURE 203.

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Splice Dimensions
Figure 202

54-20-02

REPAIR 1
Page 205

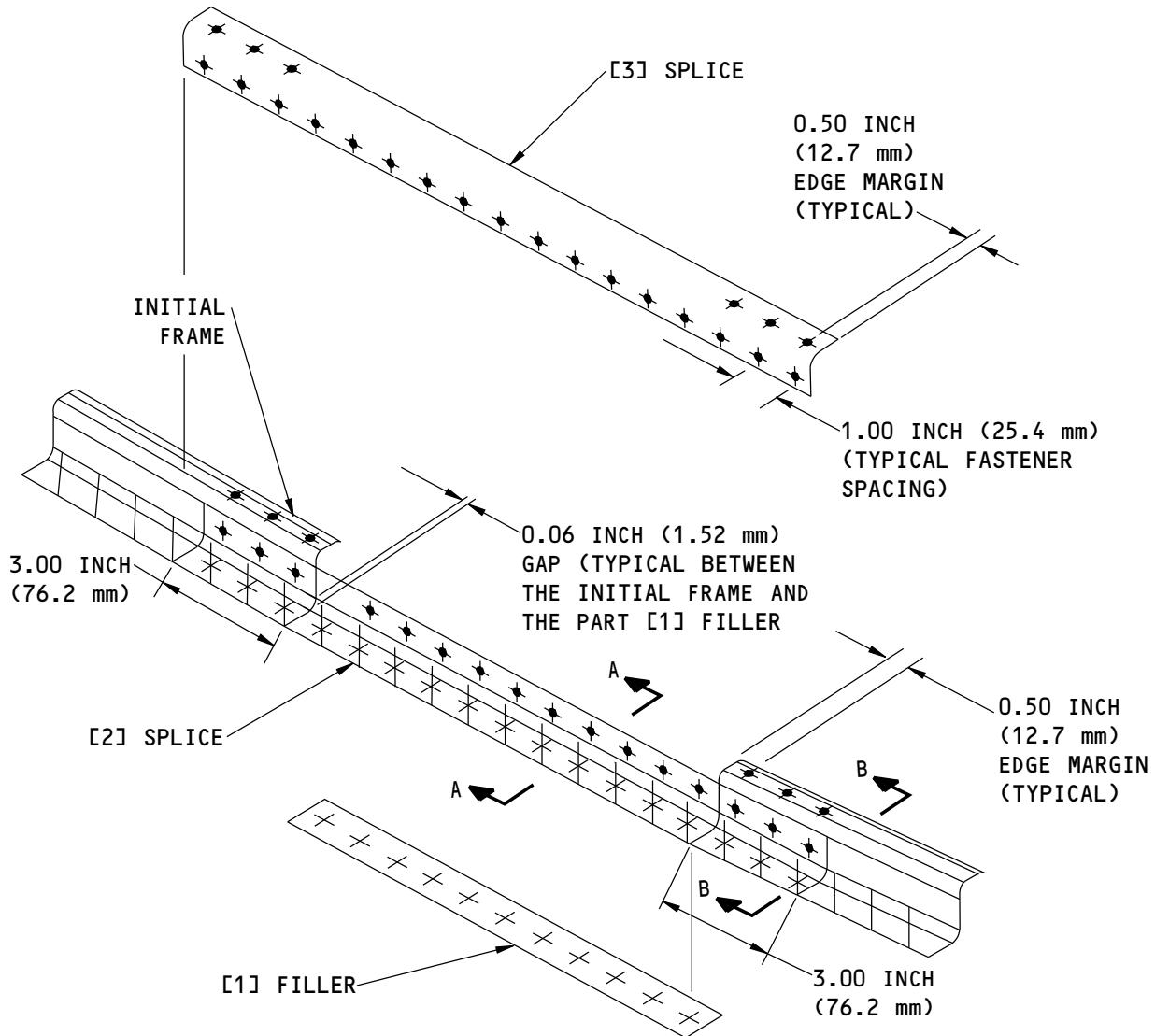
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737-800
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FASTENER SYMBOLS

- + INITIAL FASTENER LOCATION. INSTALL A NAS1200M6-(C)P RIVET
- REPAIR FASTENER LOCATION. INSTALL A MS20615-6MP RIVET.

G91579 S0006591743_V2

Layout of the Repair Parts
Figure 203 (Sheet 1 of 2)

54-20-02

REPAIR 1
Page 206

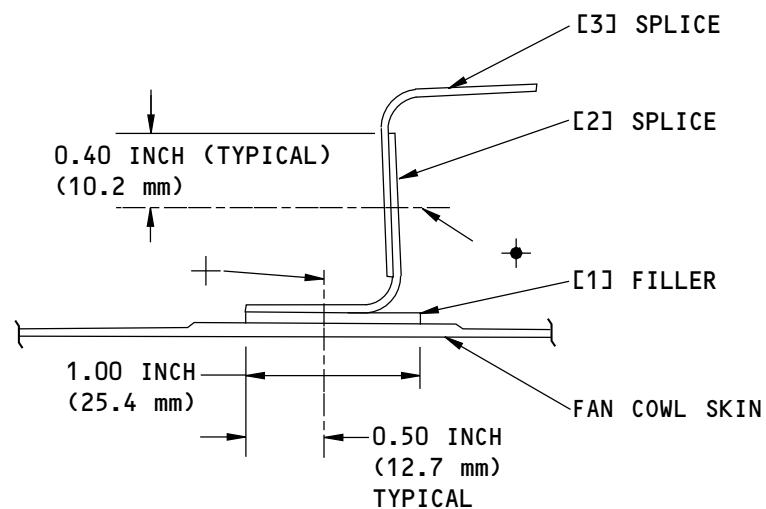
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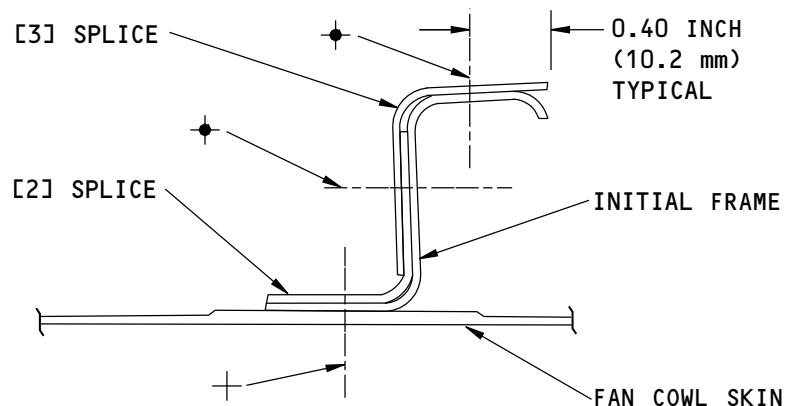
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737-800
STRUCTURAL REPAIR MANUAL



A - A



B - B

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Layout of the Repair Parts
Figure 203 (Sheet 2 of 2)

54-20-02

REPAIR 1
Page 207

Nov 10/2012

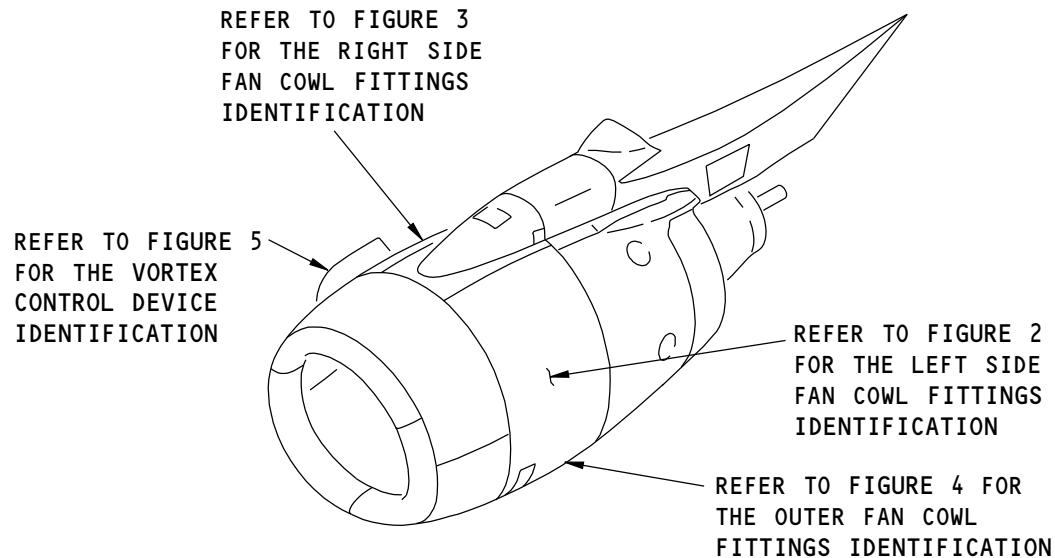
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - FAN COWL FITTINGS



NOTE: REFER TO TABLE 1 FOR THE LIST OF MATERIALS.

H26199 S0006591748_V1

Fan Cowl Fittings Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
314-2219	Plate - Strike
314-2223	Plate - Strike, Side IDG Door, Fan Cowl
314-2226	Plate Assembly, Stop - Access Door, Fan Cowl
314-2233	Port, Starter Guide
314-2234	Scupper - Drain, Fan Cowl
314-2240	Hinge - Forward, Fan Cowl
314-2241	Hinge - Center, Fan Cowl
314-2242	Hinge - Aft, Fan Cowl
314-2243	Housing - Latch, Forward, Fan Cowl, LH
314-2244	Housing - Latch, Mid, Fan Cowl, LH
314-2245	Housing - Latch, Aft, Fan Cowl, LH
314-2246	Housing - Keeper, Forward, Fan Cowl, RH
314-2247	Housing - Keeper, Mid, Fan Cowl, RH
314-2248	Housing - Keeper, Aft, Fan Cowl, RH
314-2251	Blade - Axial Locator, Fan Cowl, LH and RH
314-2253	Restraint Assembly, Radial - Fan Cowl, RH

54-20-90

IDENTIFICATION 1

Page 1

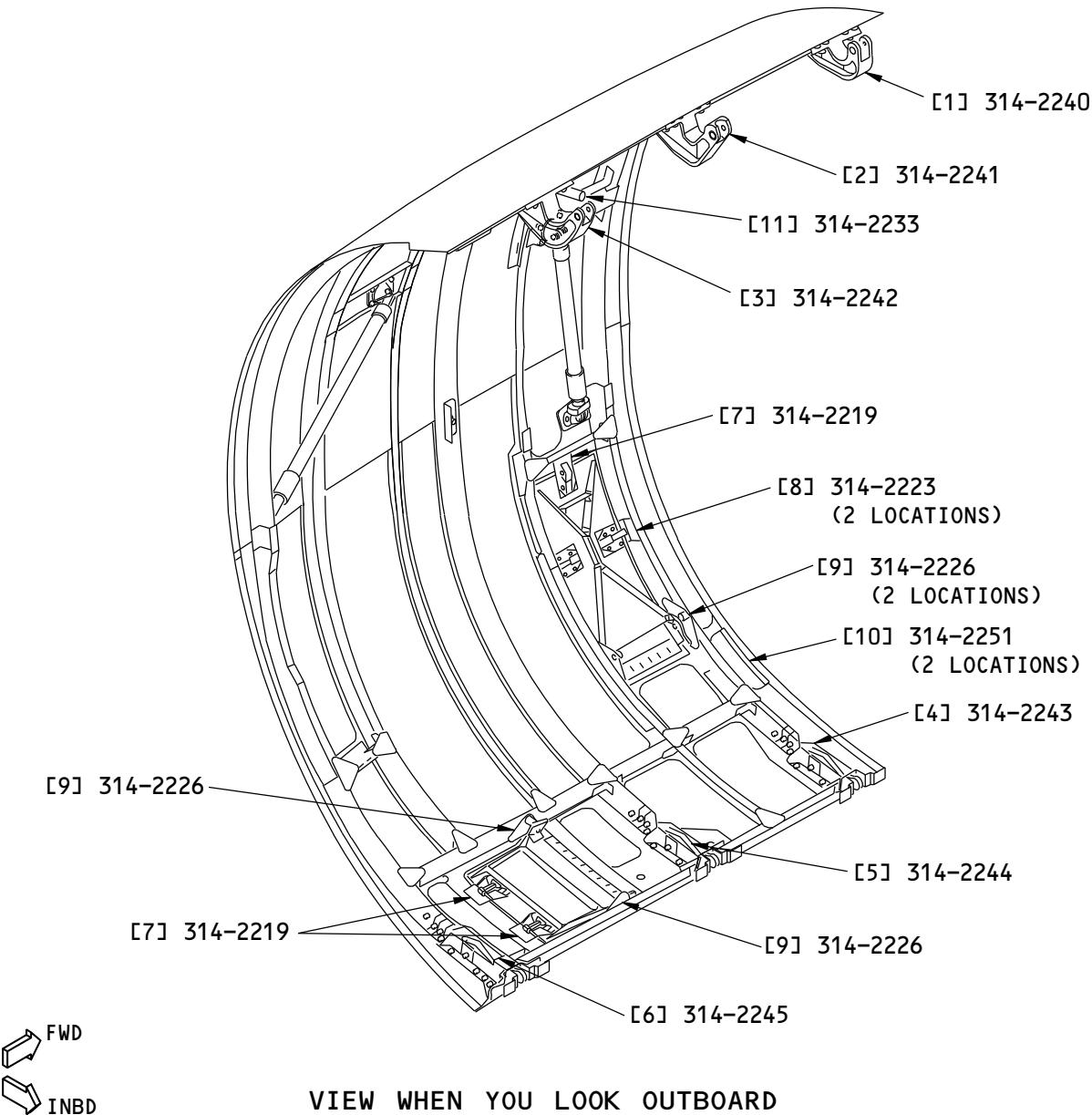
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737-800
STRUCTURAL REPAIR MANUAL



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

H26224 S0006591750_V2

Left Side Fan Cowl Fittings Identification
Figure 2

54-20-90
IDENTIFICATION 1
Page 2
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Hinge - Forward, Fan Cowl		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V titanium bar, annealed as given in AMS 4928)	
[2]	Hinge - Center, Fan Cowl		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V titanium bar, annealed as given in AMS 4928)	
[3]	Hinge - Aft, Fan Cowl		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V titanium bar, annealed as given in AMS 4928)	
[4]	Housing - Latch, Forward, Fan Cowl, LH		7075-T74 aluminum die forging as given in AMS 4131 (Optional: 7075-T7351 aluminum plate as given in AMS-QQ-A- 250/12)	
[5]	Housing - Latch, Mid, Fan Cowl, LH		7075-T74 aluminum die forging as given in AMS 4131 (Optional: 7075-T7351 aluminum plate as given in AMS-QQ-A- 250/12)	
[6]	Housing - Latch, Aft, Fan Cowl, LH		7075-T74 aluminum die forging as given in AMS 4131 (Optional: 7075-T7351 aluminum plate as given in AMS-QQ-A- 250/12)	
[7]	Strike Plate		301 CRES sheet, 125 KSI, as given in AMS 5517	
[8]	IDG Door Side Strike Plate	0.090 (2.286)	302 CRES sheet, annealed as given in AMS 5516	
[9]	Access Door Stop Plate Assembly	0.125 (3.18)	2024-T3 aluminium sheet as given in QQ-A-250/4	
[10]	Fan Cowl Axial Locator Blade		17-4PH CRES casting H1100 as given in AMS 5342 (Optional: 15-5PH CRES bar H1100 as given in AMS 5659)	
[11]	Starter Guide Port		A357.0-T61 aluminum casting as given in AMS 4219	

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

54-20-90

IDENTIFICATION 1

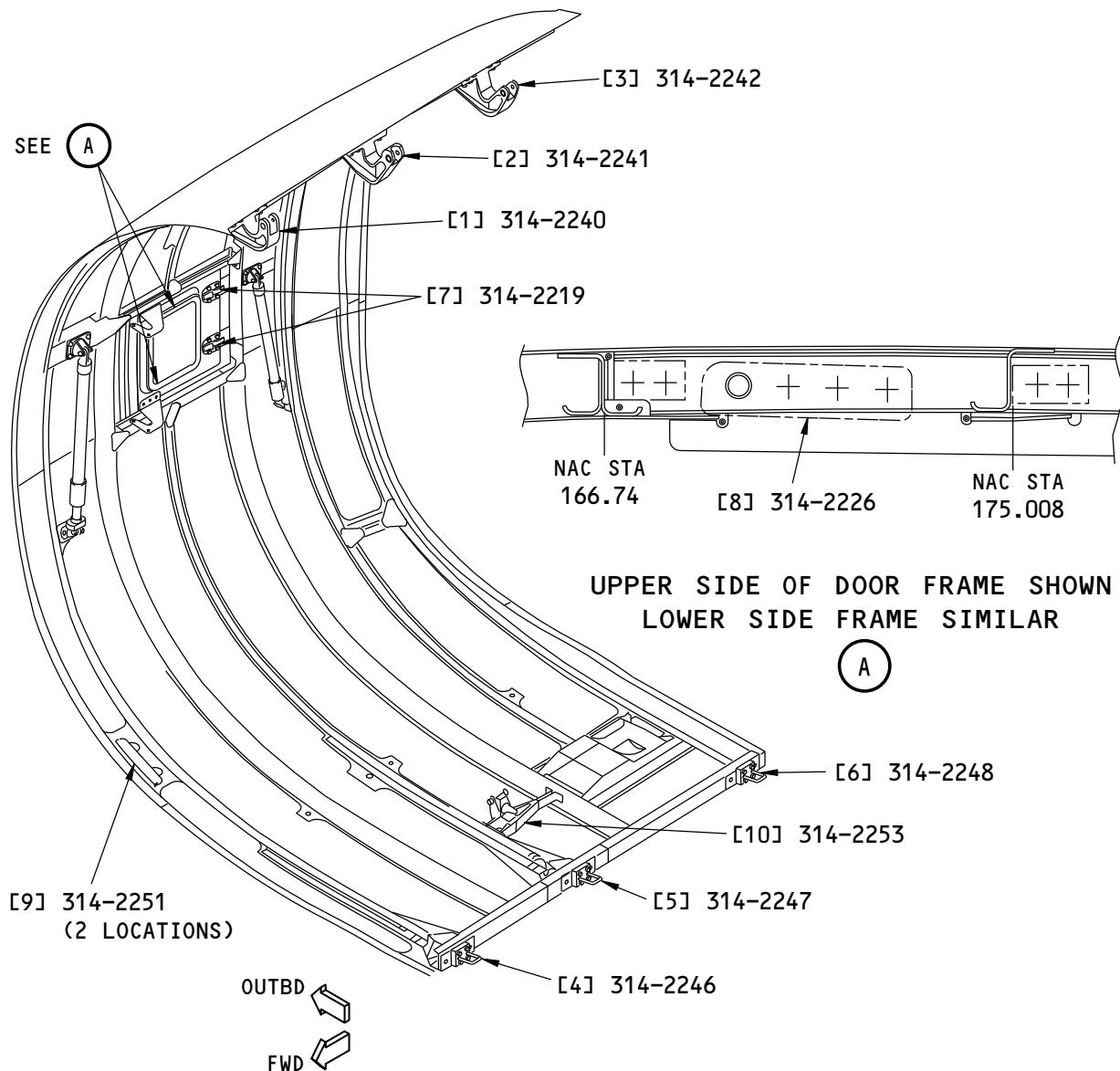
Page 3

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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

VIEW WHEN YOU LOOK OUTBOARD

H26244 S0006591752_V2

Right Side Fan Cowl Fittings Identification
Figure 3

54-20-90

IDENTIFICATION 1

Page 4

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Hinge - Forward, Fan Cowl		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V titanium bar, annealed as given in AMS 4928)	
[2]	Hinge - Center, Fan Cowl		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V titanium bar, annealed as given in AMS 4928)	
[3]	Hinge - Aft, Fan Cowl		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V titanium bar, annealed as given in AMS 4928)	
[4]	Housing - Keeper, Forward, Fan Cowl, RH		7075-T74 aluminum die forging as given in AMS 4131 (Optional: 7075-T7351 aluminum plate as given in AMS-QQ-A- 250/12)	
[5]	Housing - Keeper, Mid, Fan Cowl, RH		7075-T74 aluminum die forging as given in AMS 4131 (Optional: 7075-T7351 aluminum plate as given in AMS-QQ-A- 250/12)	
[6]	Housing - Keeper, Aft, Fan Cowl, RH		7075-T74 aluminum die forging as given in AMS 4131 (Optional: 7075-T7351 aluminum plate as given in AMS-QQ-A- 250/12)	
[7]	Strike Plate		301 CRES sheet, 125 KSI, as given in AMS 5517	
[8]	Access Door Stop Plate Assembly	0.125 (3.18)	2024-T3 aluminum sheet as given in QQ-A-250/4	
[9]	Fan Cowl Axial Locator Blade		17-4PH CRES casting H1100 as given in AMS 5342 (Optional: 15-5PH CRES bar as given in AMS 5659)	
[10]	Radial Restraint Assembly		Ti-6Al-4V titanium casting, annealed as given in RMS148, Type I, Grade C (Optional: Ti-6Al-4V bar, annealed as given in AMS 4928)	

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

54-20-90

IDENTIFICATION 1

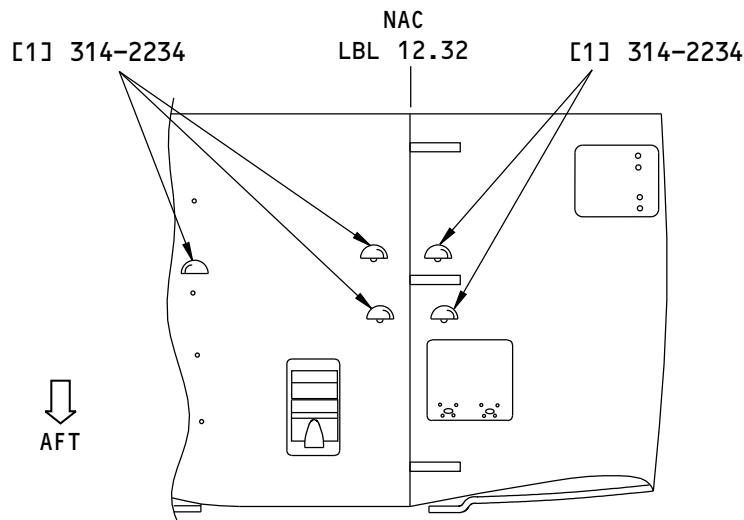
Page 5

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

VIEW WHEN YOU LOOK UP

H27054 S0006591754_V2

Outer Fan Cowl Fittings Identification, Right Side and Left Side

Figure 4

Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Fan Cowl Drain Scupper	0.040 (1.02)	2024-T62 aluminum sheet as given in AMS-QQ-A-250/4	

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

54-20-90

IDENTIFICATION 1

Page 6

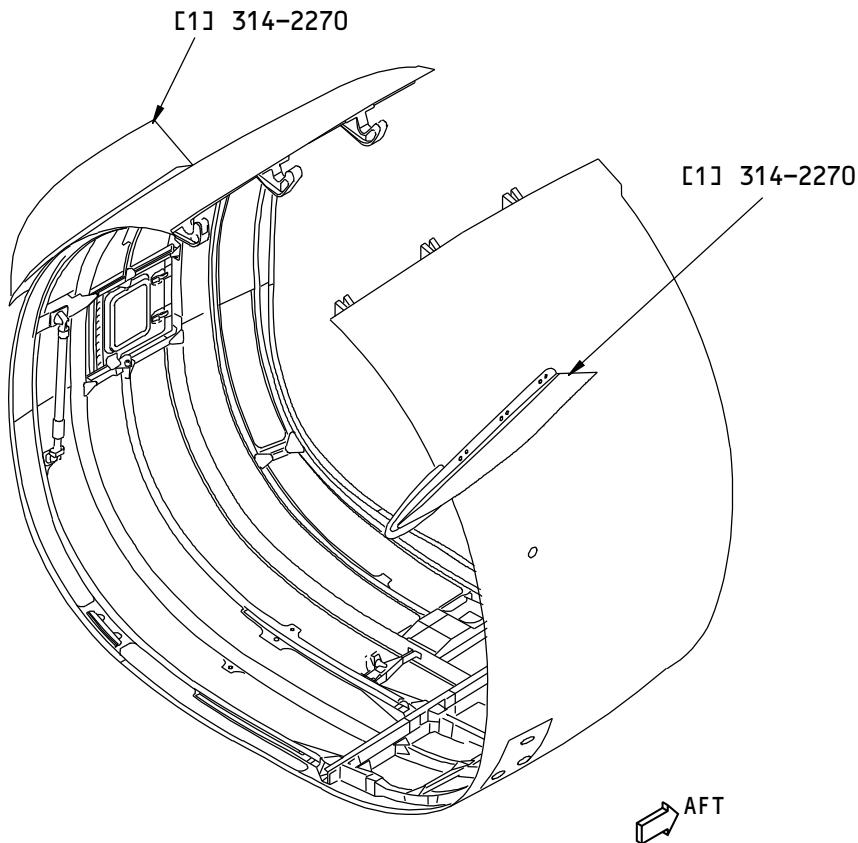
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737-800
STRUCTURAL REPAIR MANUAL



NOTES

- REFER TO TABLE 5 FOR THE LIST OF MATERIALS.
- BOTH VORTEX CONTROL DEVICES ARE ILLUSTRATED TO SHOW LOCATION. ONLY ONE IS INSTALLED ON THE INBOARD FAN COWL DOOR OF EACH ENGINE NACELLE.

H27026 S0006591756_V2

Fan Cowl Vortex Control Device Fittings Identification

Figure 5

Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Vortex Control Device		2024-T8511 aluminum extrusion as given in QQ-A-200/3	

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

54-20-90

IDENTIFICATION 1

Page 7

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - FAN COWL FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the fan cowl fittings shown in Fan Cowl Fittings Location, 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 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 as follows:
- (1) Apply a chemical conversion coating to the reworked aluminum areas. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-79, Type III primer on the reworked areas of the CRES, aluminum, and titanium areas as given in SOPM 20-44-04.
- NOTE:** This requirement is not applicable to Vortex Control Device.
- C. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits for the different fan cowl fittings.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS	
FAN COWL FITTINGS	PARAGRAPH
Hinge Fittings	4.A
Latch and Keeper Housings	4.B
Axial Locator and Radial Restraint Fittings	4.C
Vortex Control Device Fitting	4.D

54-20-90

ALLOWABLE DAMAGE 1

Page 101

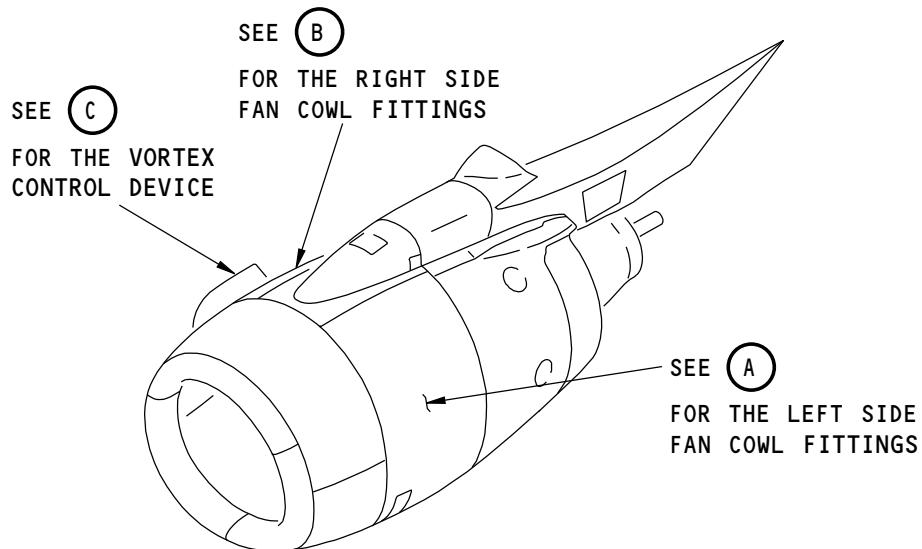
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737-800
STRUCTURAL REPAIR MANUAL



Fan Cowl Locations
Figure 101

H55203 S0006591761_V1

54-20-90

ALLOWABLE DAMAGE 1

Page 102

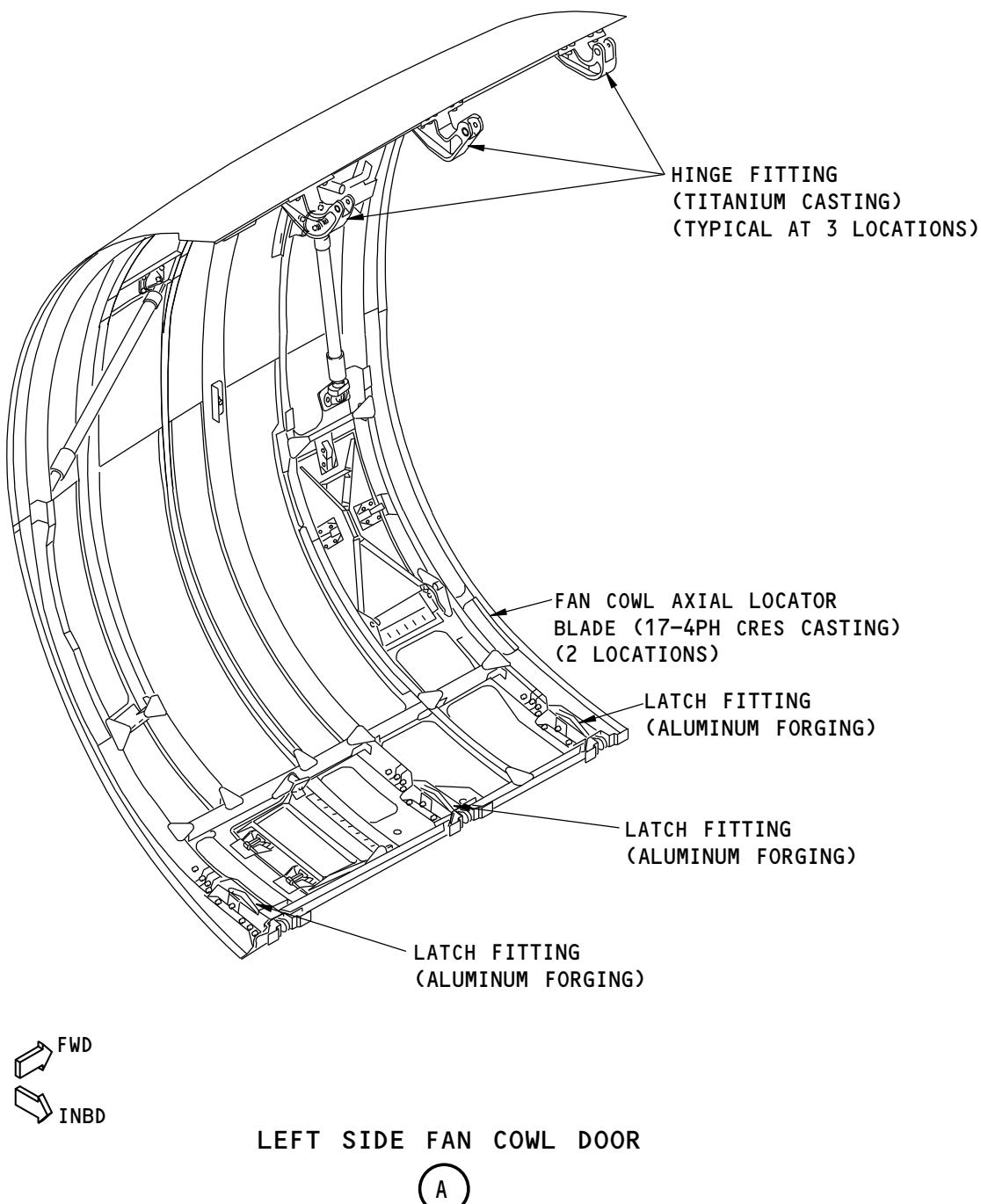
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737-800
STRUCTURAL REPAIR MANUAL



H55319 S0006591762_V1

Fan Cowl Fittings Location
Figure 102 (Sheet 1 of 3)

54-20-90

ALLOWABLE DAMAGE 1

Page 103

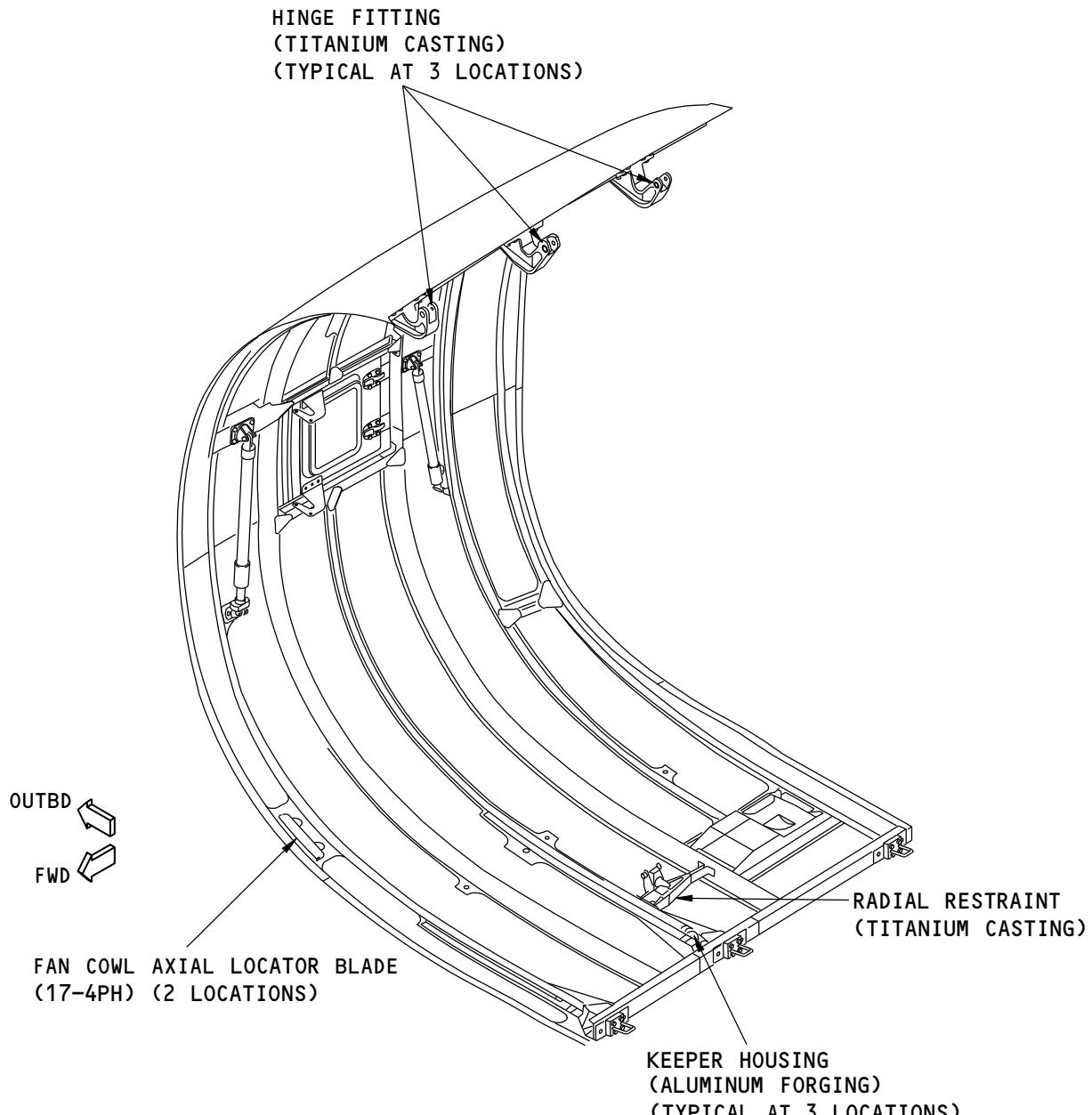
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737-800
STRUCTURAL REPAIR MANUAL



RIGHT SIDE FAN COWL DOOR

B

H55387 S0006591763_V1

Fan Cowl Fittings Location
Figure 102 (Sheet 2 of 3)

54-20-90

ALLOWABLE DAMAGE 1

Page 104

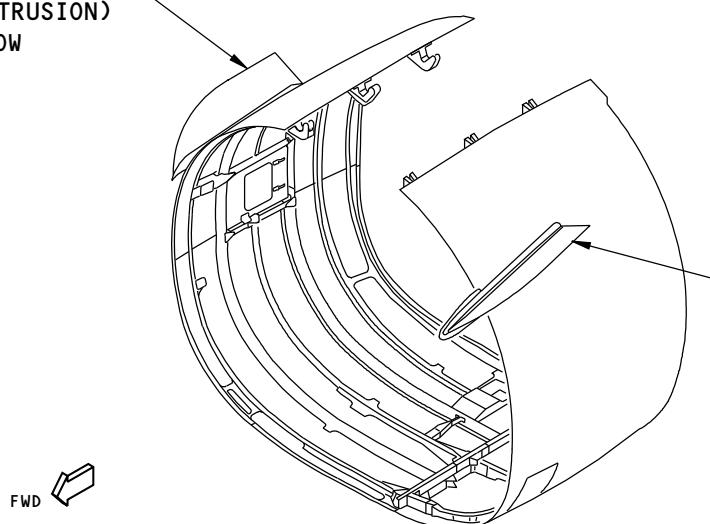
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737-800
STRUCTURAL REPAIR MANUAL

VORTEX CONTROL DEVICE
(ALUMINUM EXTRUSION)
SEE NOTE BELOW



VORTEX CONTROL DEVICE
(ALUMINUM EXTRUSION)
SEE NOTE BELOW

VORTEX CONTROL DEVICE FITTING

C

NOTE: BOTH VORTEX CONTROL DEVICES ARE ILLUSTRATED TO SHOW LOCATION. ONLY ONE IS INSTALLED ON THE INBOARD FAN COWL DOOR OF EACH ENGINE NACELLE.

H56493 S0006591764_V1

Fan Cowl Fittings Location
Figure 102 (Sheet 3 of 3)

54-20-90

ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012

D634A210

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737-800
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
51-20-05	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-02	FASTENER INSTALLATION AND REMOVAL
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Hinge Fittings

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

B. Latch and Keeper Housings

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

C. Axial Locator and Radial Restraint Fittings

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

D. Vortex Control Device Fitting

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

54-20-90

ALLOWABLE DAMAGE 1

Page 106

Nov 10/2012

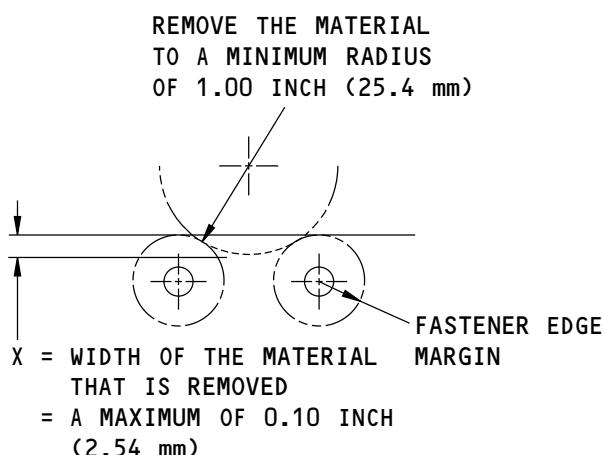
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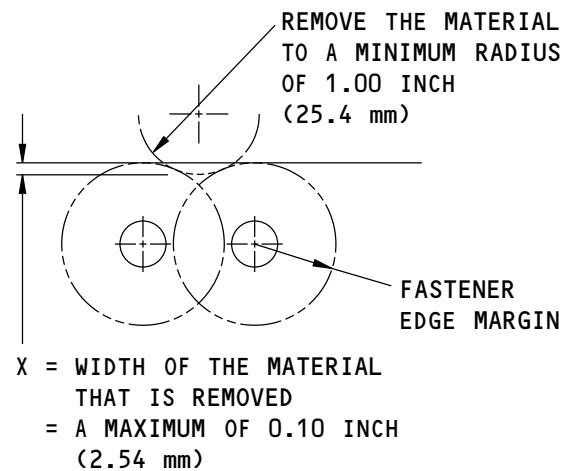
737-800
STRUCTURAL REPAIR MANUAL

- (4) Holes and Punctures are not permitted.



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

H56659 S0006591765_V1

Allowable Damage Limits - Fan Cowl Fittings

Figure 103 (Sheet 1 of 3)

54-20-90

ALLOWABLE DAMAGE 1

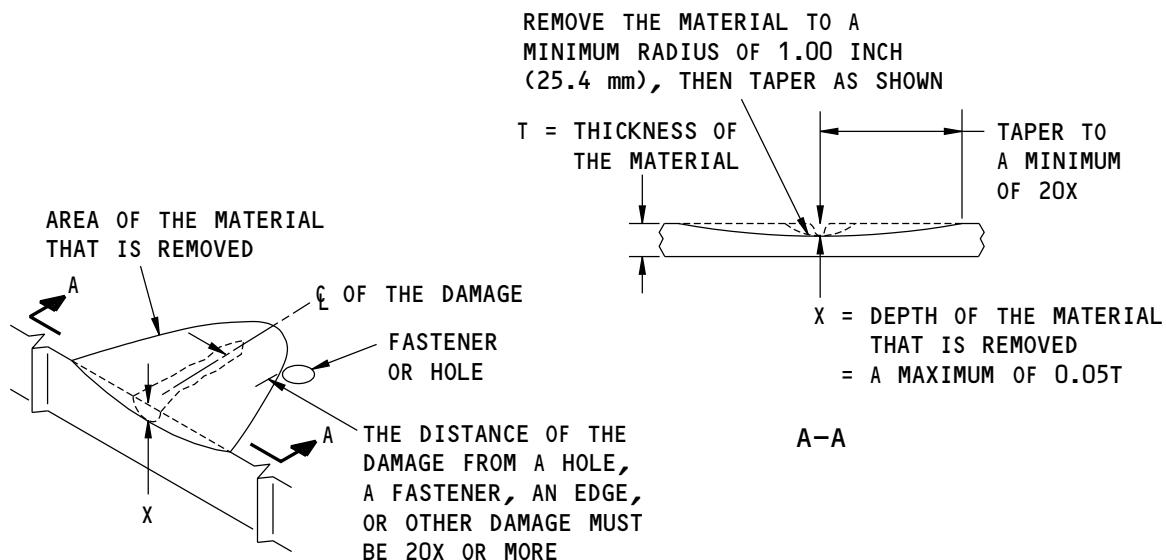
Page 107

Nov 10/2012

D634A210

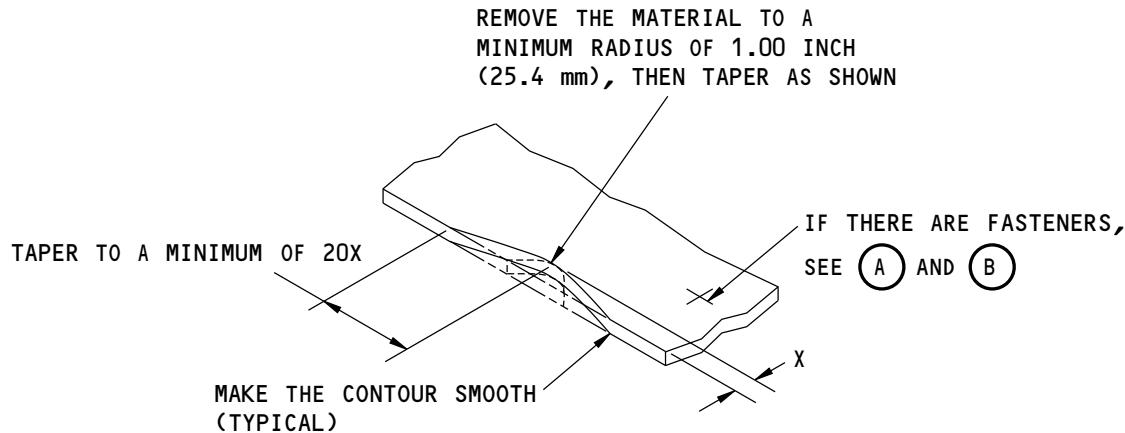


737-800
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**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(C)



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(D)

H56560 S0006591766_V1

Allowable Damage Limits - Fan Cowl Fittings
Figure 103 (Sheet 2 of 3)

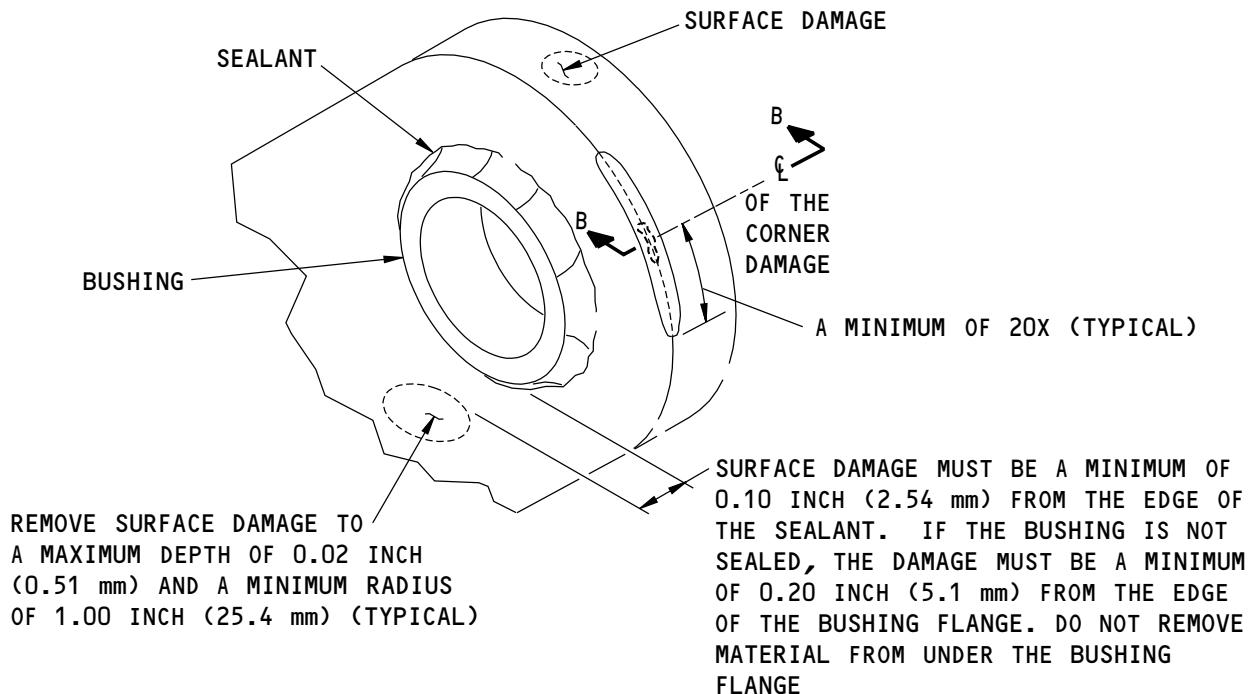
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ALLOWABLE DAMAGE 1

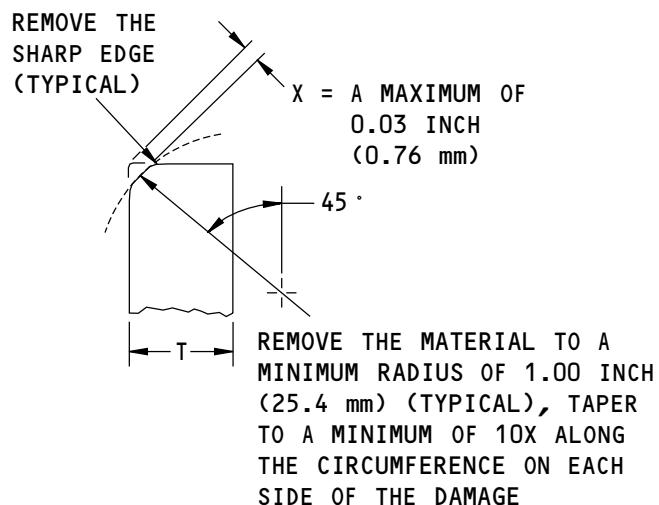
Page 108

Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING

(E)



B-B

H56529 S0006591767_V1

Allowable Damage Limits - Fan Cowl Fittings
Figure 103 (Sheet 3 of 3)

54-20-90

ALLOWABLE DAMAGE 1

Page 109

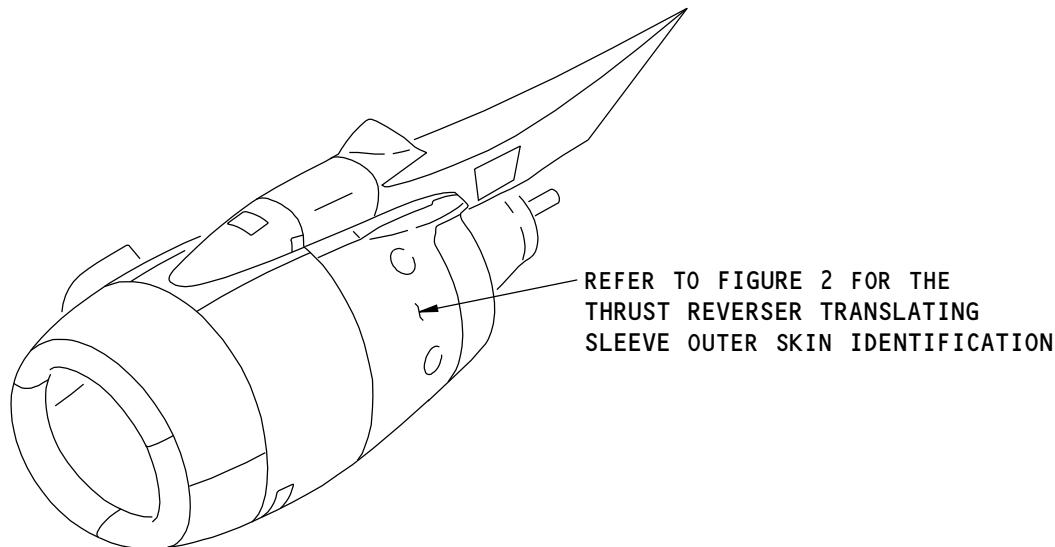
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - THRUST REVERSER TRANSLATING SLEEVE OUTER SKIN



F08819 S0006591772_V1

Thrust Reverser Translating Sleeve Outer Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
315A2000	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2500	Thrust Reverser Translating Sleeve Assembly

54-30-01

IDENTIFICATION 1

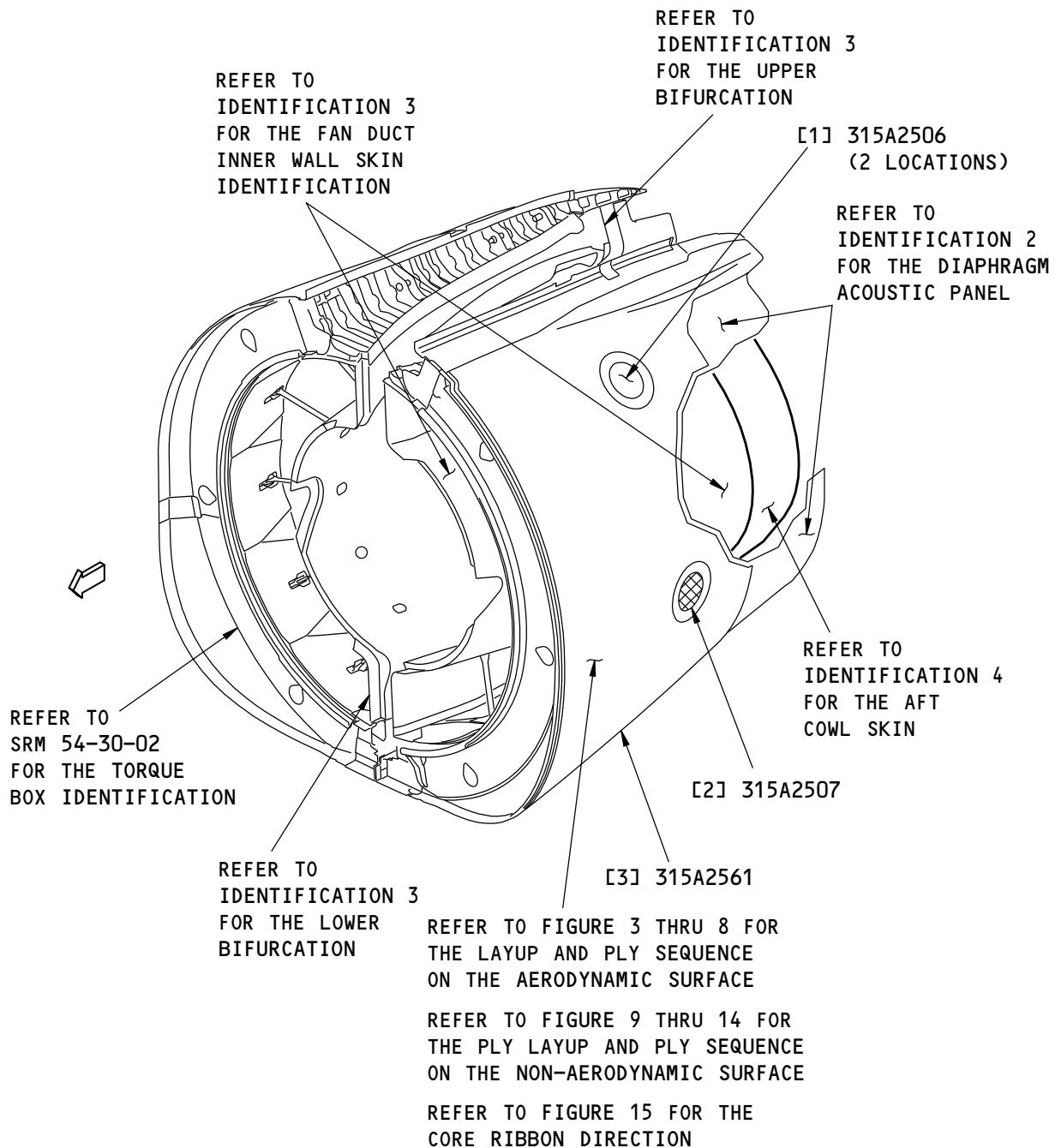
Page 1

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



F09735 S0006591774_V4

Thrust Reverser Translating Sleeve Outer Cowl Skin Identification
Figure 2

54-30-01
IDENTIFICATION 1
Page 2
Nov 10/2013

D634A210



737-800 STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Actuator Access Door - Common (2)		Epoxy sheet molding compound as given in BMS 8-327, Type 1	
[2]	Actuator Access Door - Vented		Epoxy sheet molding compound as given in BMS 8-327, Type 1	
[3]	Outer Cowl Panel Assembly - Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich, aluminum foil mesh lightning protection (Y6001 to Y6037 only), and Glass Fiber Reinforced Plastic (GFRP) isolation plies Skin Core 0.60 (15.24) Core 0.60 (15.24) Overexpanded Core 0.60 (15.24) Refer to Figure 3 for the aerodynamic surface (toolside) skin plies. Refer to Figure 4 for the non-aerodynamic surface (bag side) skin plies Non-metallic honeycomb as given in BMS 8-124, Type I, Class 1, Grade 8.0. Refer to Figure 5 for the core ribbon direction Non-metallic honeycomb as given in BMS 8-124, Type V, Class VI, Grade 3.0. Refer to Figure 5 for the core ribbon direction Non-metallic honeycomb as given in BMS 8-124, Type IV, Class I, Grade 4.5. Refer to Figure 5 for the core ribbon direction	
	Dense Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0. Refer to Figure 5 for the core ribbon direction	LINE NUMBERS 001 THROUGH 432
	Dense Core	0.60 (15.24)	Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0. (Optional: Non-metallic honeycomb as given in BMS 8-124, Type I, Class 7, Style C, Grade 16.0) Refer to Figure 5 for the core ribbon direction	LINE NUMBERS 433 AND ON

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

54-30-01

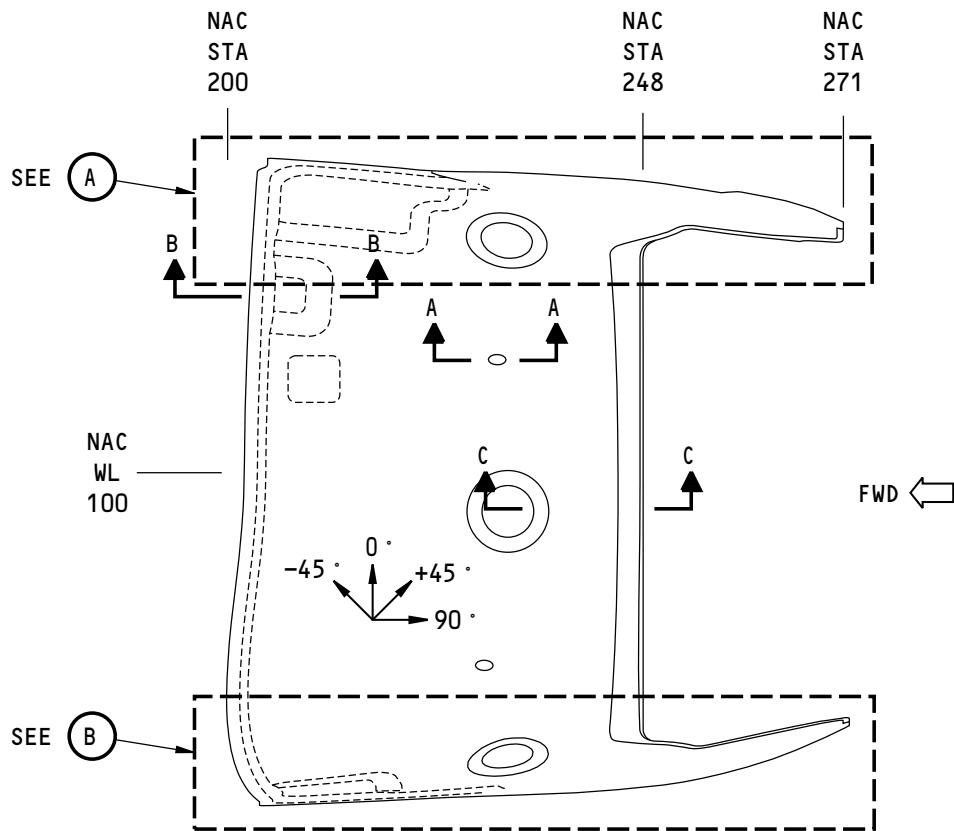
IDENTIFICATION 1

Page 3

Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



PLY LAYUP AND CORE RIBBON DIRECTION

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

2392069 S0000549713_V1

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 3 (Sheet 1 of 2)

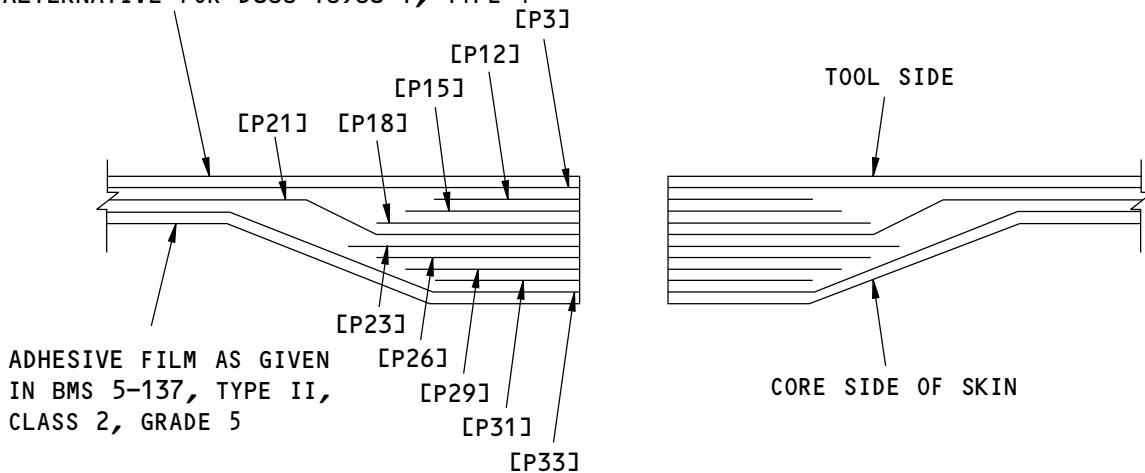
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IDENTIFICATION 1
Page 4
Nov 10/2015

D634A210

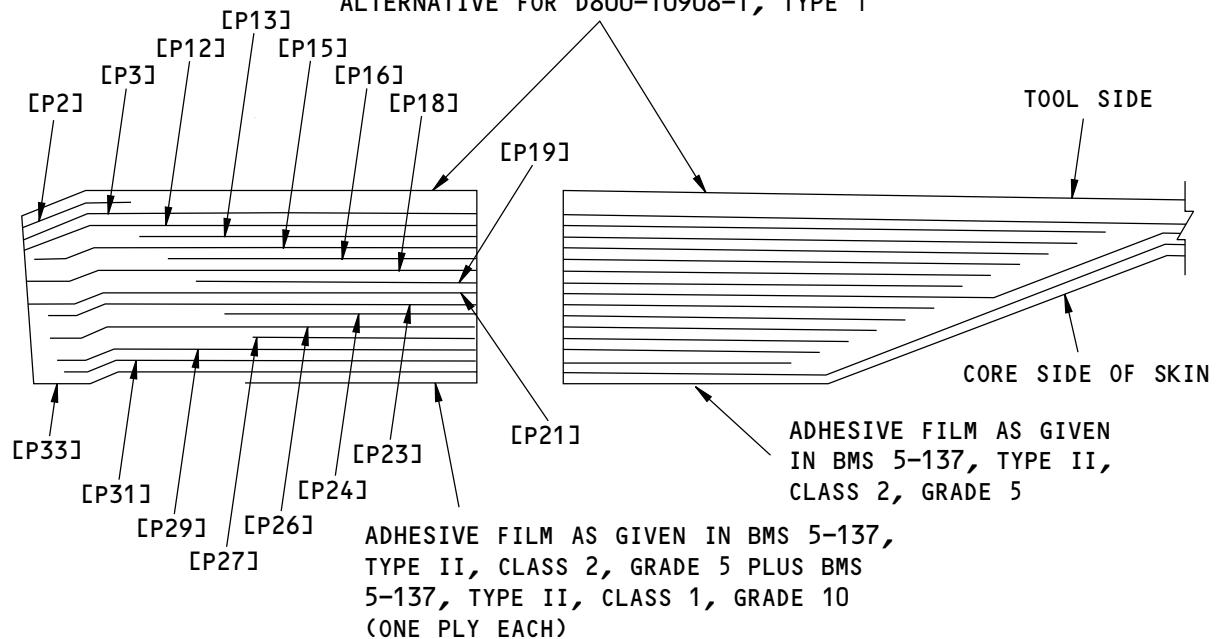
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**737-800
STRUCTURAL REPAIR MANUAL**

ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II, CLASS 1,
GRADE 5. OPTIONAL SURFACER AS GIVEN IN D800-10908-1
TYPE 1, IS RECOMMENDED. YOU CAN USE BMS 8-341 AS AN
ALTERNATIVE FOR D800-10908-1, TYPE 1


A-A

ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II, CLASS 1,
GRADE 5. OPTIONAL SURFACER AS GIVEN IN D800-10908-1
TYPE 1, IS RECOMMENDED. YOU CAN USE BMS 8-341 AS AN
ALTERNATIVE FOR D800-10908-1, TYPE 1


B-B

2392191 S0000549742_V1

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin

Figure 3 (Sheet 2 of 2)

54-30-01
IDENTIFICATION 1
Page 5

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

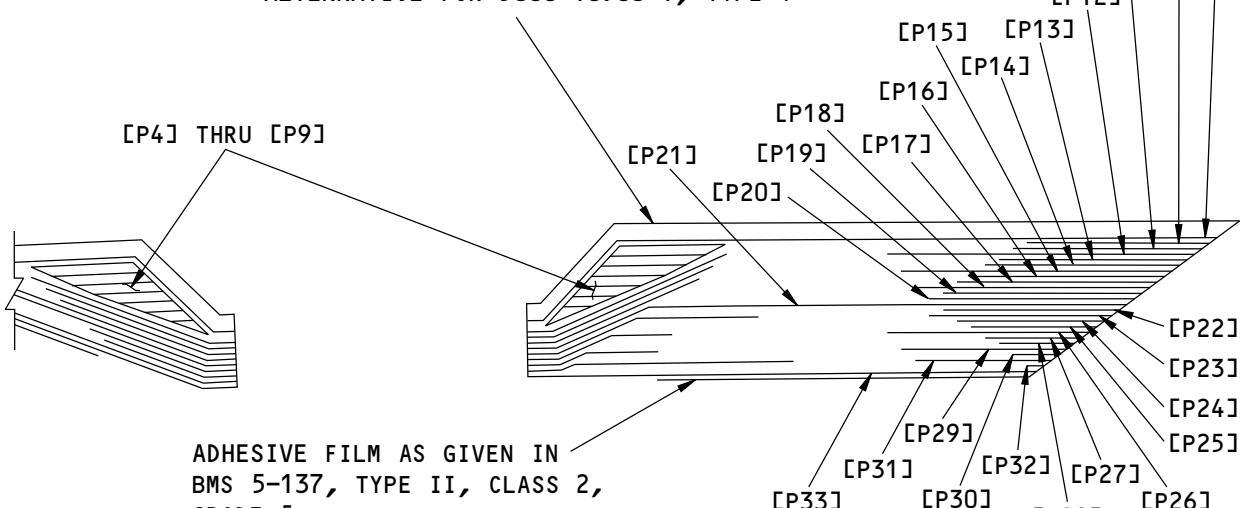
Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION A-A		
PLY	DIRECTION	MATERIAL
P3, P15, P18, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P21, P23, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION B-B		
PLY	DIRECTION	MATERIAL
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P24, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P13, P16, P19, P21, P23, P27, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II, CLASS 1,
GRADE 5. OPTIONAL SURFACER AS GIVEN IN D800-10908-1
TYPE 1, IS RECOMMENDED. YOU CAN USE BMS 8-341 AS AN
ALTERNATIVE FOR D800-10908-1, TYPE 1



C-C

2392373 S0000549767_V1

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 4

54-30-01

IDENTIFICATION 1

Page 6

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION C-C		
PLY	DIRECTION	MATERIAL
P4, P5, P6, P7, P8	-----	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 30, Form 67, Style G. Optional to use any combination of Grade 10 and/or Grade 20 to equal the Grade 30
P9	-----	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 20, Form 67, Style G. Optional to use two sheets of Grade 10
P3, P11, P15, P17, P18, P20, P24, P26, P28, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P13, P19, P21, P23, P25, P27, P29, P32, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

54-30-01

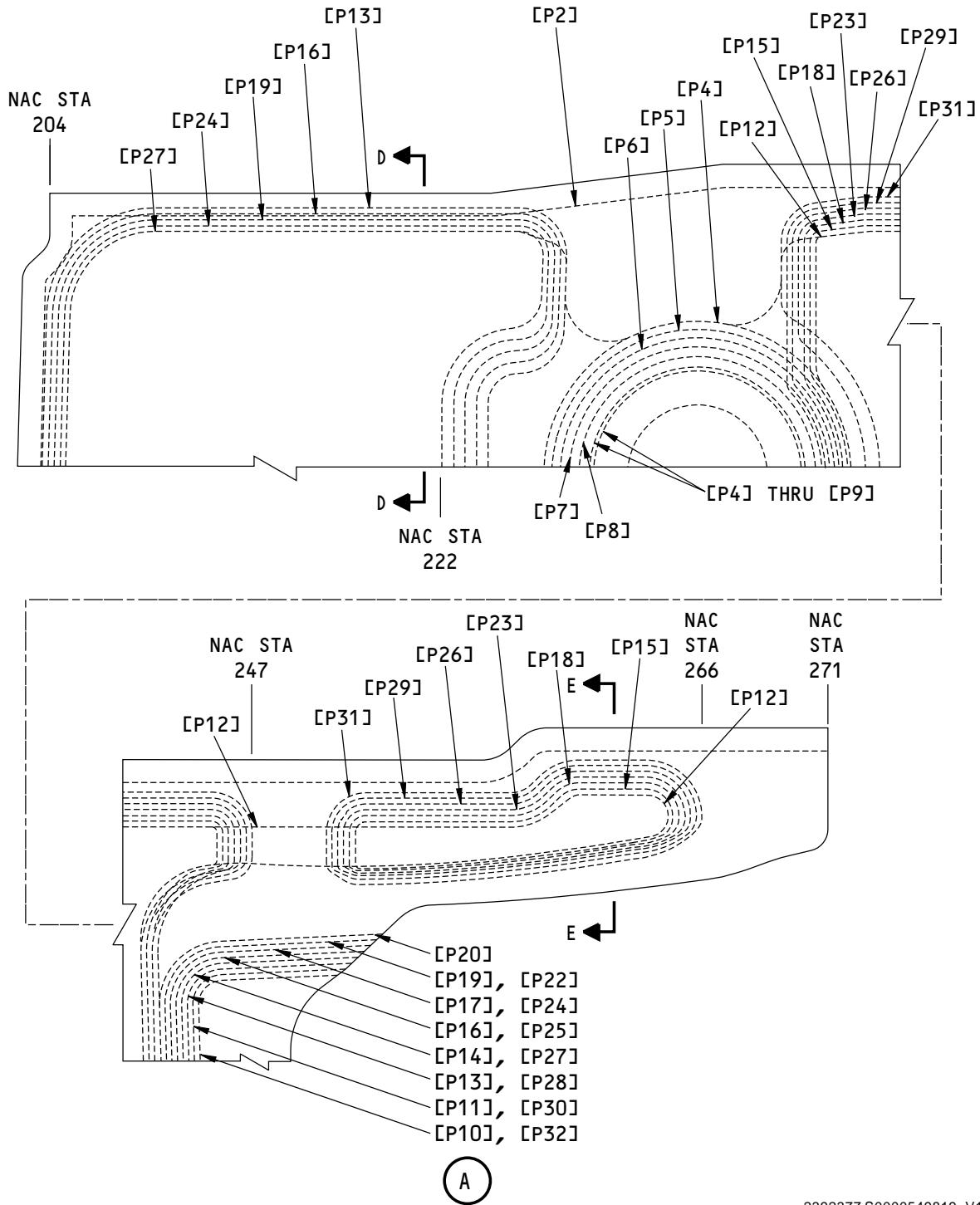
IDENTIFICATION 1

Page 7

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 5

54-30-01
IDENTIFICATION 1
Page 8
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 5, DETAIL A		
PLY	DIRECTION	MATERIAL
P4, P5, P6, P7, P8	-----	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 30, Form 67, Style G. Optional to use any combination of Grade 10 and/or Grade 20 to equal the Grade 30
P9	-----	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 20, Form 67, Style G. Optional to use two sheets of Grade 10
P11, P15, P17, P18, P20, P24, P26, P28, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P10, P12, P13, P14, P16, P19, P22, P23, P25, P27, P29, P30, P32	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

54-30-01

IDENTIFICATION 1

Page 9

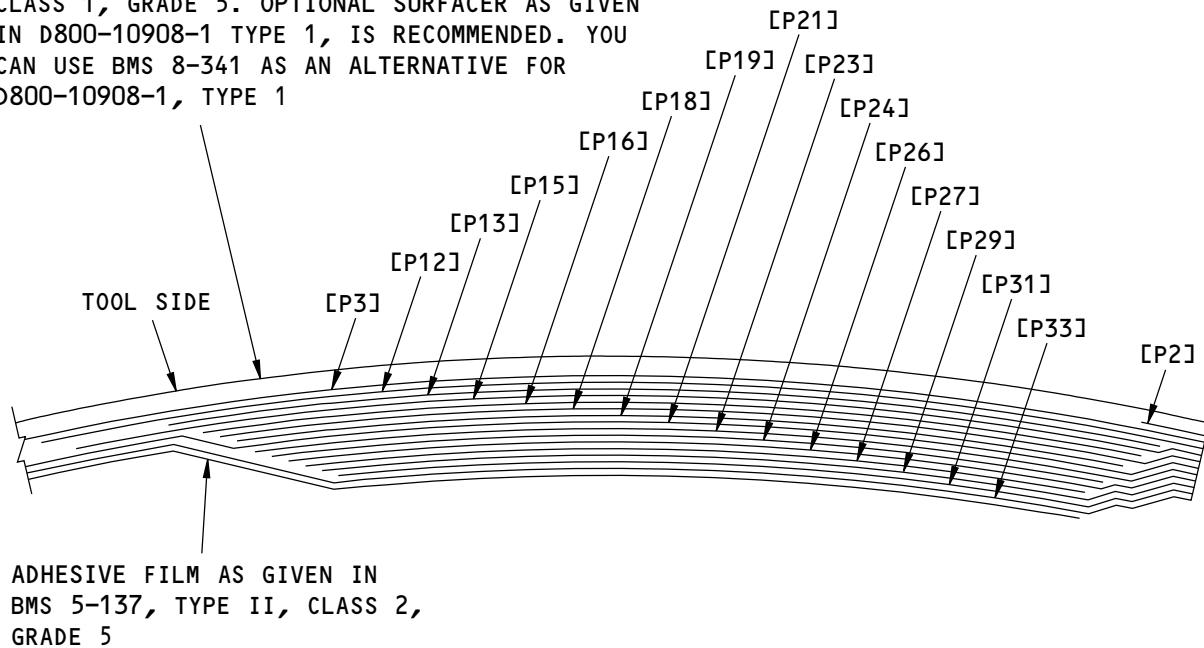
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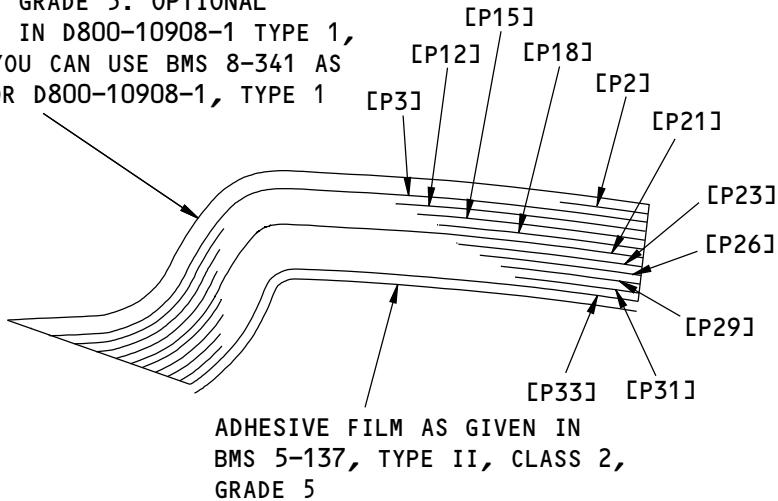
**737-800
STRUCTURAL REPAIR MANUAL**

ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II,
CLASS 1, GRADE 5. OPTIONAL SURFACER AS GIVEN
IN D800-10908-1 TYPE 1, IS RECOMMENDED. YOU
CAN USE BMS 8-341 AS AN ALTERNATIVE FOR
D800-10908-1, TYPE 1



D-D

ADHESIVE FILM AS GIVEN IN BMS 5-154,
TYPE II, CLASS 1, GRADE 5. OPTIONAL
SURFACER AS GIVEN IN D800-10908-1 TYPE 1,
IS RECOMMENDED. YOU CAN USE BMS 8-341 AS
AN ALTERNATIVE FOR D800-10908-1, TYPE 1



E-E

2392380 S0000549843_V1

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 6

54-30-01

IDENTIFICATION 1

Page 10

Nov 10/2015



**737-800
STRUCTURAL REPAIR MANUAL**

Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 6, SECTION D-D		
PLY	DIRECTION	MATERIAL
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P24, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P13, P16, P19, P21, P23, P27 ,P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 6, SECTION E-E		
PLY	DIRECTION	MATERIAL
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P21, P23, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

54-30-01

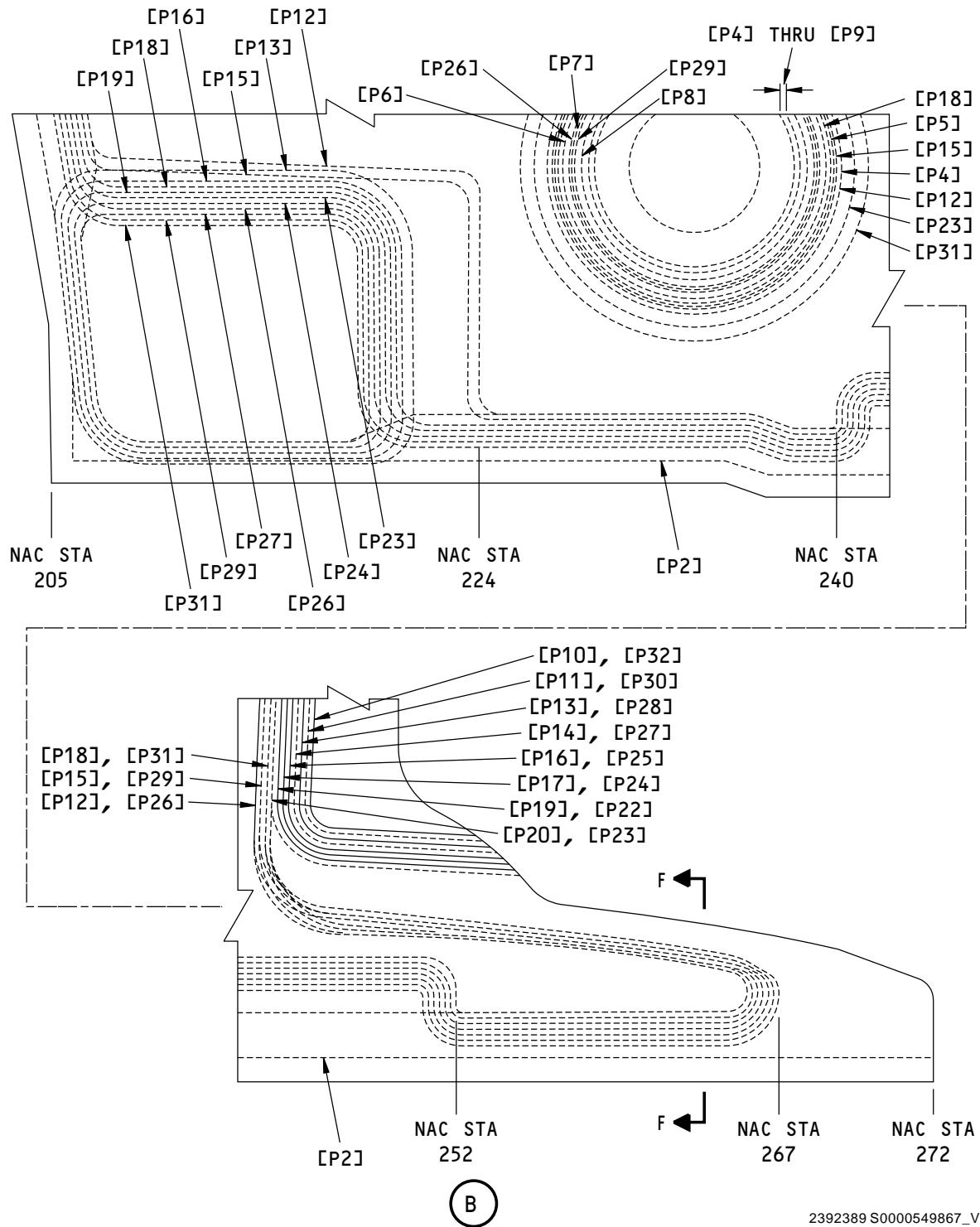
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Page 11

Nov 10/2015

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2392389 S0000549867_V1

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin
Figure 7

54-30-01
IDENTIFICATION 1

Page 12

Nov 10/2015

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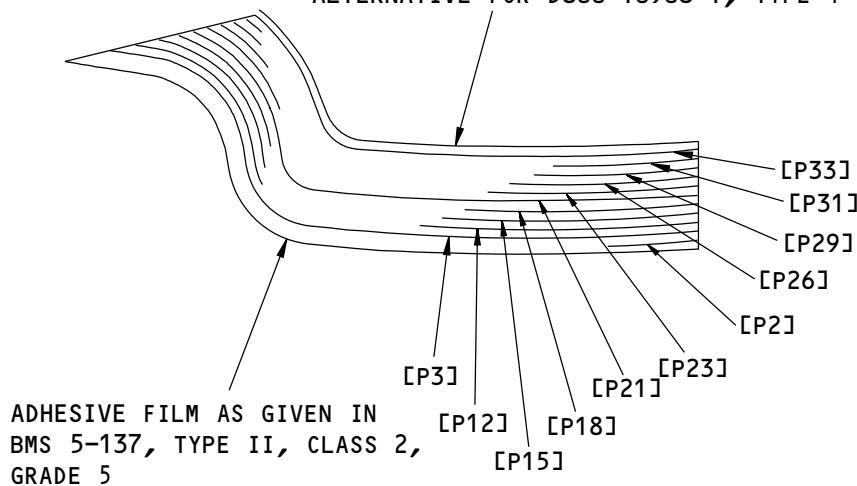


**737-800
STRUCTURAL REPAIR MANUAL**

Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 7, DETAIL B		
PLY	DIRECTION	MATERIAL
P11, P15, P17, P18, P20, P24, P26, P28, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P10, P12, P13, P14, P16, P19, P22, P23, P25, P27, P29, P30, P32	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P4, P5, P6, P7, P8	Optional	Syntactic core as given in BMS 8-324, Type I, Class 350, Grade 30, Form 67, Style G. Optional to use any combination of Grade 10 and/or Grade 20 to equal Grade 30

ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II, CLASS 1, GRADE 5. OPTIONAL SURFACER AS GIVEN IN D800-10908-1 TYPE 1, IS RECOMMENDED. YOU CAN USE BMS 8-341 AS AN ALTERNATIVE FOR D800-10908-1, TYPE 1



F-F

2392390 S0000549954_V1

Ply Layup and Ply Sequence on the Aerodynamic Surface (Toolside) of the Translating Sleeve Outer Cowl Skin

Figure 8

Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 8, SECTION F-F		
PLY	DIRECTION	MATERIAL
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P15, P18, P26, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P12, P21, P23, P29, P33	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

54-30-01

IDENTIFICATION 1

Page 13

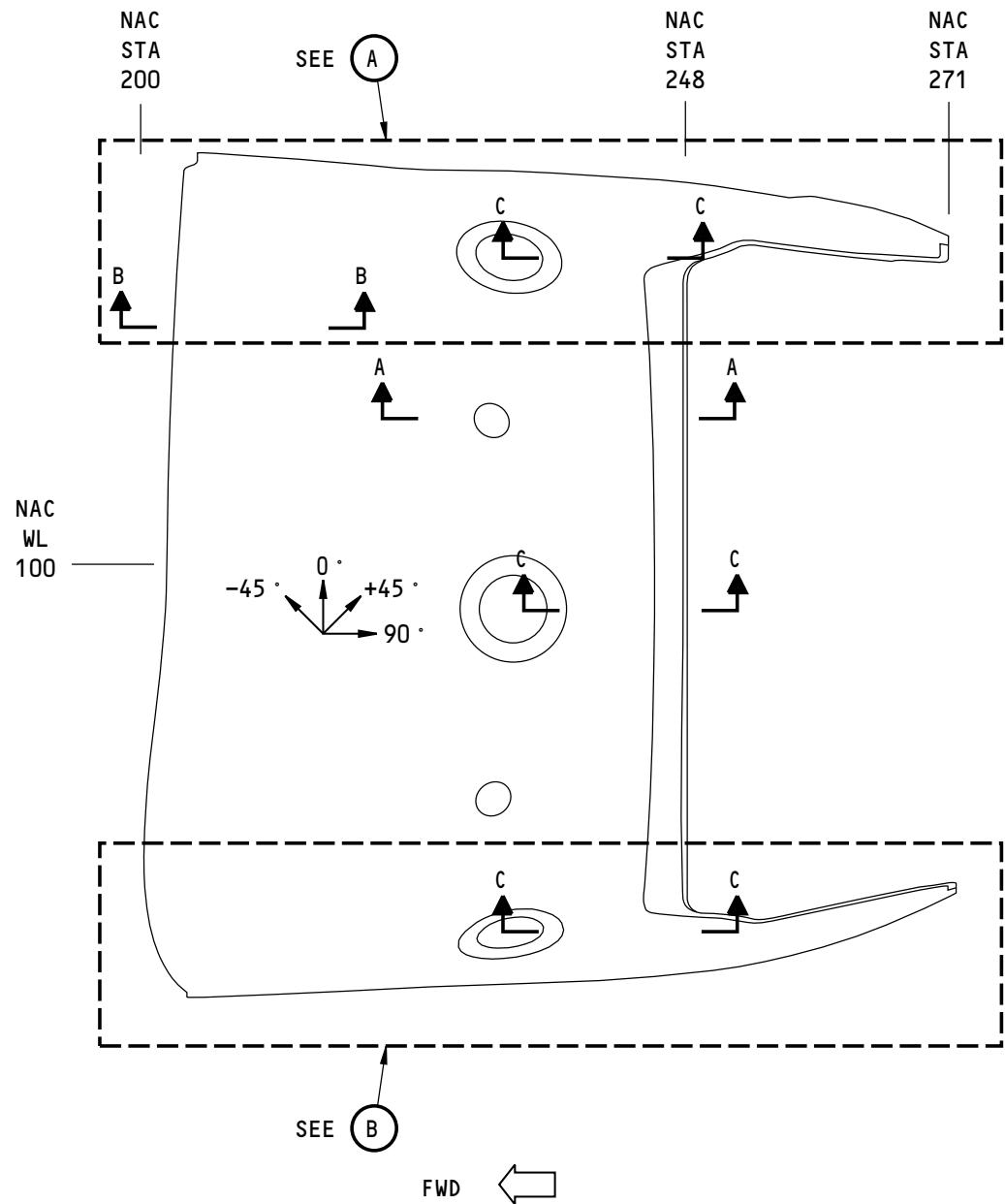
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737-800
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F09947 S0006591791_V2

Ply Layup and Ply Sequence on the Non-Aerodynamic (Bagside) of the Translating Sleeve Outer Cowl Skin

Figure 9 (Sheet 1 of 2)

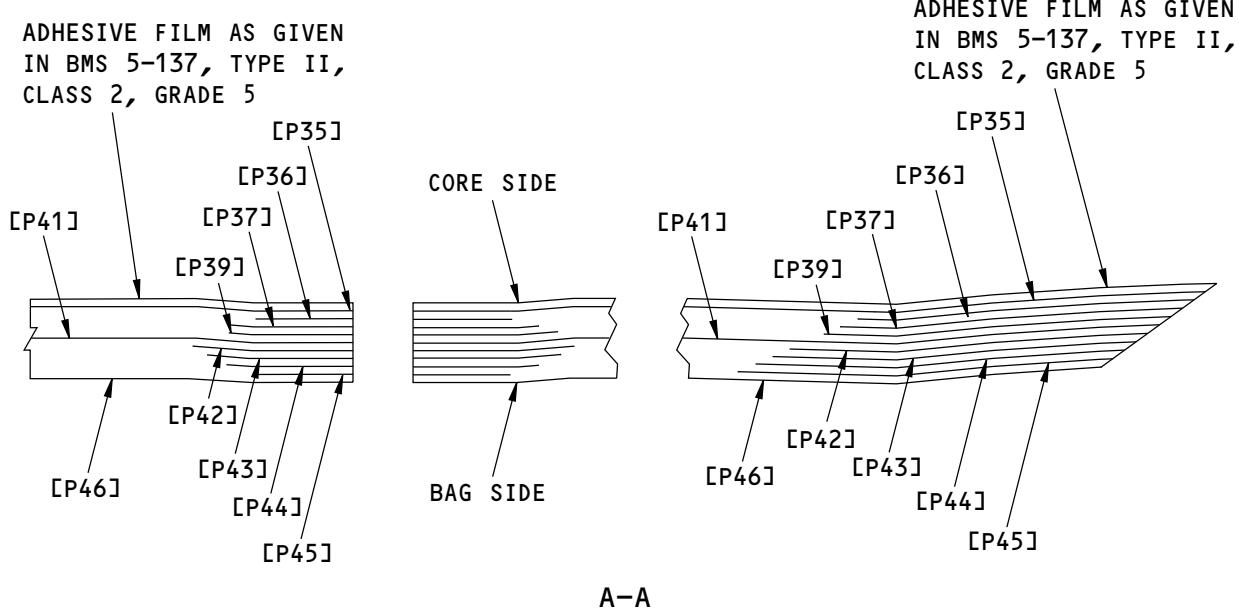
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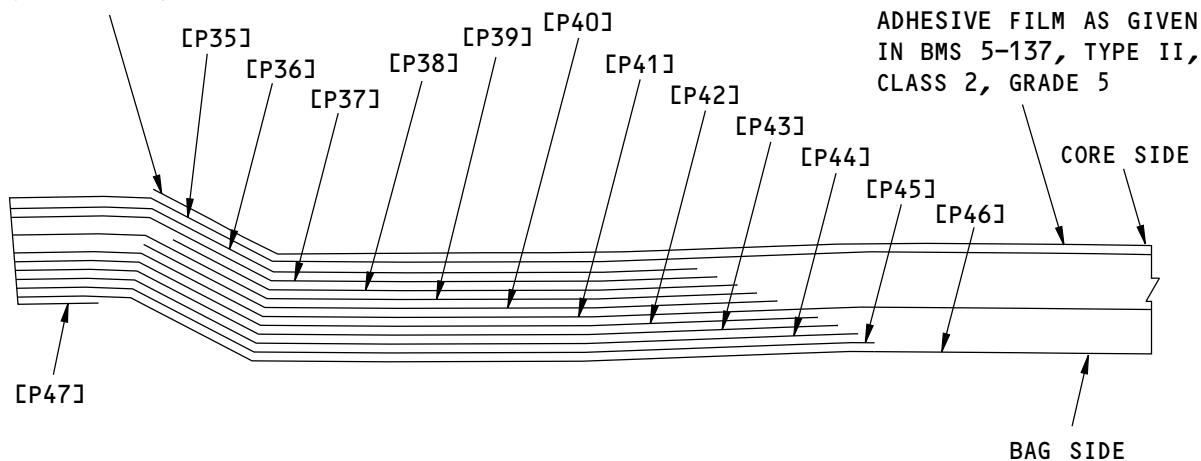
Page 14

Nov 10/2015

D634A210


A-A

ADHESIVE FILM AS GIVEN IN BMS 5-137, TYPE II, CLASS 2, GRADE 5 PLUS BMS 5-137, TYPE II, CLASS 1, GRADE 10 (ONE PLY EACH)


B-B

2392395 S0000549963_V1

Ply Layup and Ply Sequence on the Non-Aerodynamic (Bagside) of the Translating Sleeve Outer Cowl Skin

Figure 9 (Sheet 2 of 2)

54-30-01
IDENTIFICATION 1
 Page 15
 Nov 10/2015

D634A210



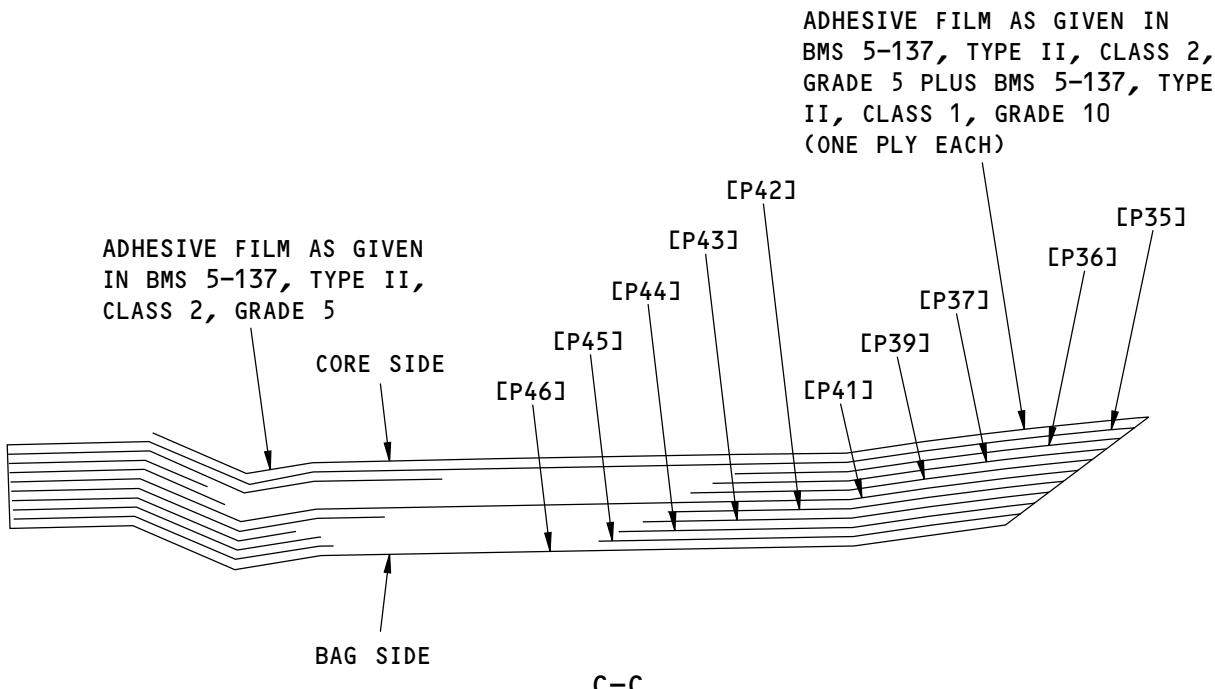
737-800
STRUCTURAL REPAIR MANUAL

Table 11:

PLY MATERIAL AND DIRECTION FOR FIGURE 9, SECTION A-A		
PLY	DIRECTION	MATERIAL
P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or -45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.

Table 12:

PLY MATERIAL AND DIRECTION FOR FIGURE 9, SECTION B-B		
PLY	DIRECTION	MATERIAL
P40, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or -45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.



Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowl Skin
Figure 10

2392727 S0000550003_V1

54-30-01
IDENTIFICATION 1
Page 16
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 13:

PLY MATERIAL AND DIRECTION FOR FIGURE 10, SECTION C-C		
PLY	DIRECTION	MATERIAL
P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.

54-30-01

IDENTIFICATION 1

Page 17

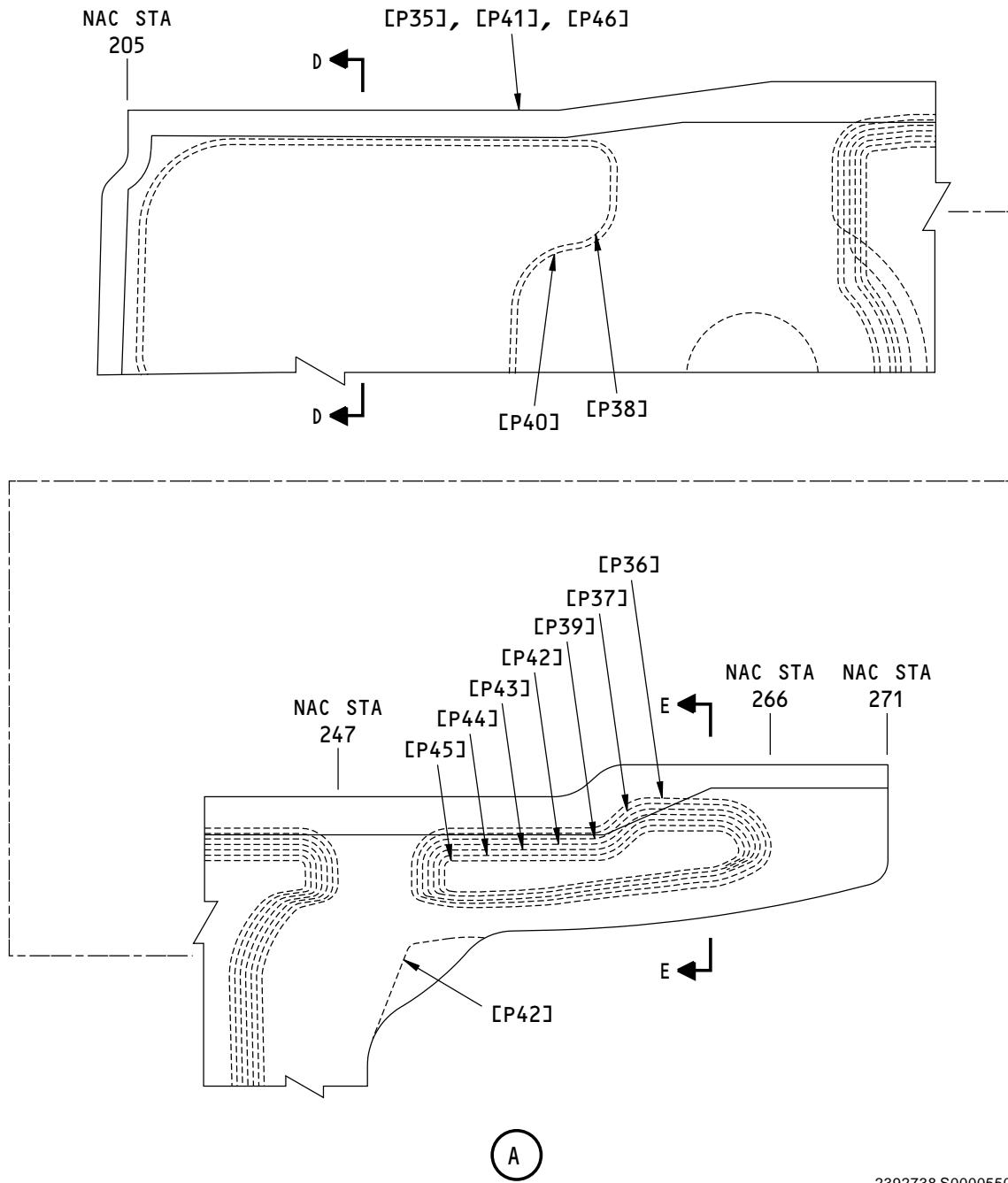
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2392738 S0000550014_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Translating Sleeve Outer Cowl Skin,
Figure 2
Figure 11

54-30-01
IDENTIFICATION 1
Page 18
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 14:

PLY MATERIAL AND DIRECTION FOR FIGURE 11, DETAIL A		
PLY	DIRECTION	MATERIAL
P40, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

54-30-01

IDENTIFICATION 1

Page 19

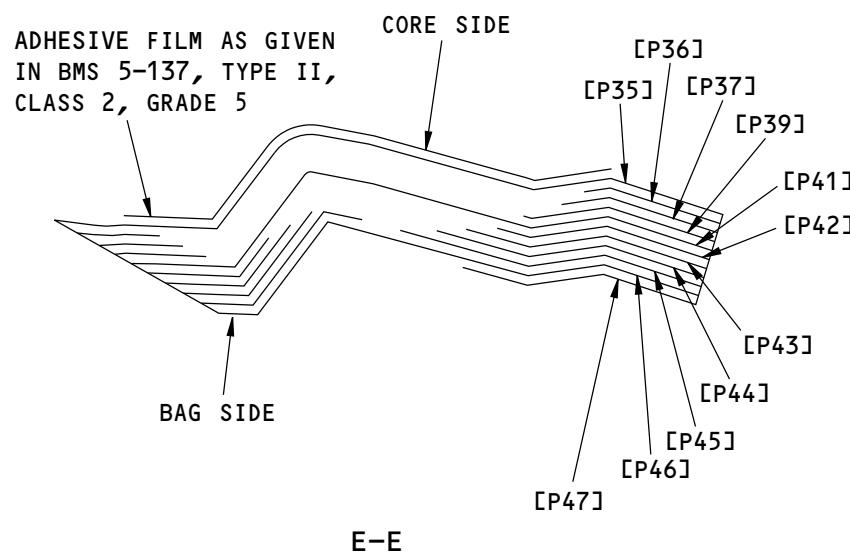
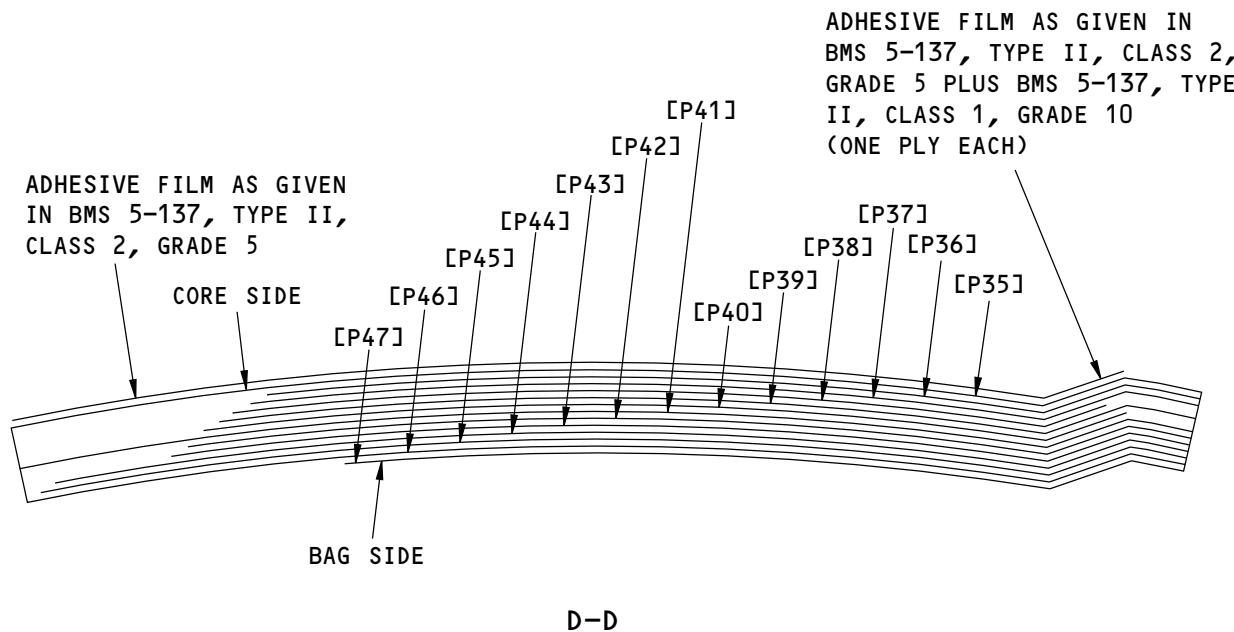
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737-800
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2392759 S0000550030_V1

Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowlskin
Figure 12

54-30-01

IDENTIFICATION 1

Page 20

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 15:

PLY MATERIAL AND DIRECTION FOR FIGURE 12, SECTION D-D		
PLY	DIRECTION	MATERIAL
P47	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P40, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

Table 16:

PLY MATERIAL AND DIRECTION FOR FIGURE 12, SECTION E-E		
PLY	DIRECTION	MATERIAL
P47	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

54-30-01

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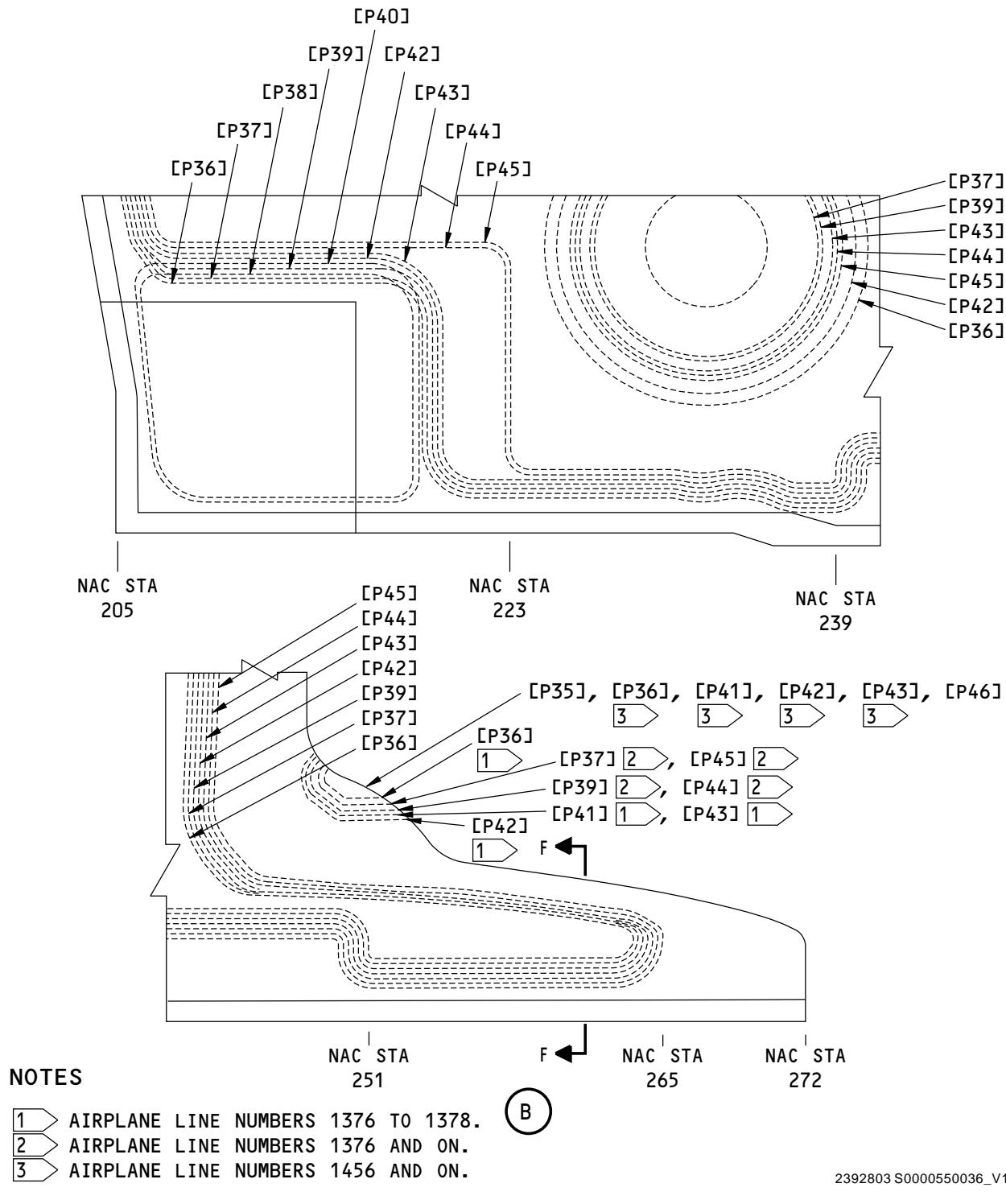
Page 21

Nov 10/2015

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**737-800
STRUCTURAL REPAIR MANUAL**



**Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve
Outer Cowl Skin**
Figure 13

54-30-01

IDENTIFICATION 1

Page 22

Nov 10/2015

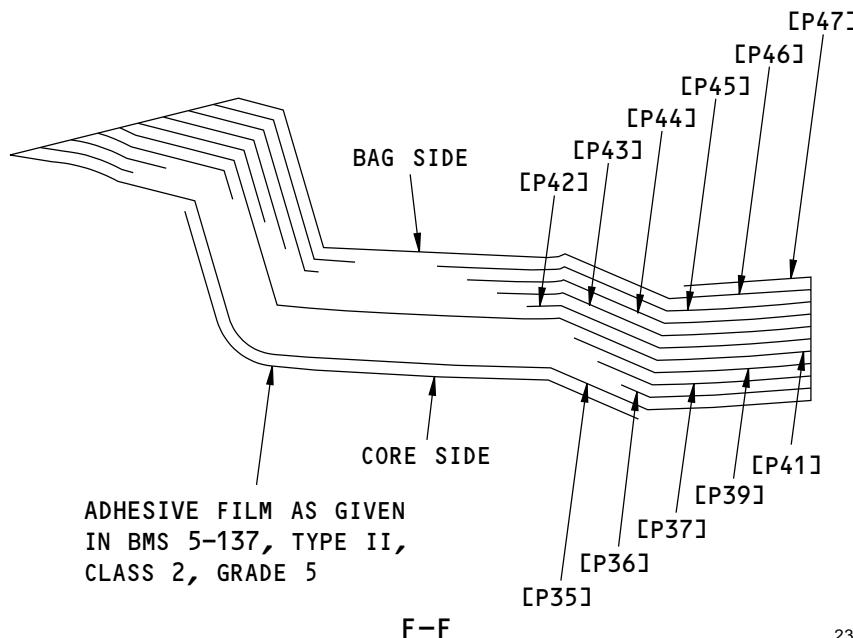
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737-800
STRUCTURAL REPAIR MANUAL

Table 17:

PLY MATERIAL AND DIRECTION FOR FIGURE 13, DETAIL B		
PLY	DIRECTION	MATERIAL
P40, P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P38, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW



2392822 S0000550083_V1

Ply Layup and Ply Sequence on the Non-Aerodynamic Surface (Bagside) for the Translating Sleeve Outer Cowl Skin

Figure 14

Table 18:

PLY MATERIAL AND DIRECTION FOR FIGURE 14, SECTION F-F		
PLY	DIRECTION	MATERIAL
P47	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class I, Grade A
P46	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P35, P37, P41, P42, P44, P45	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P36, P39, P43	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX. Optional to use epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW

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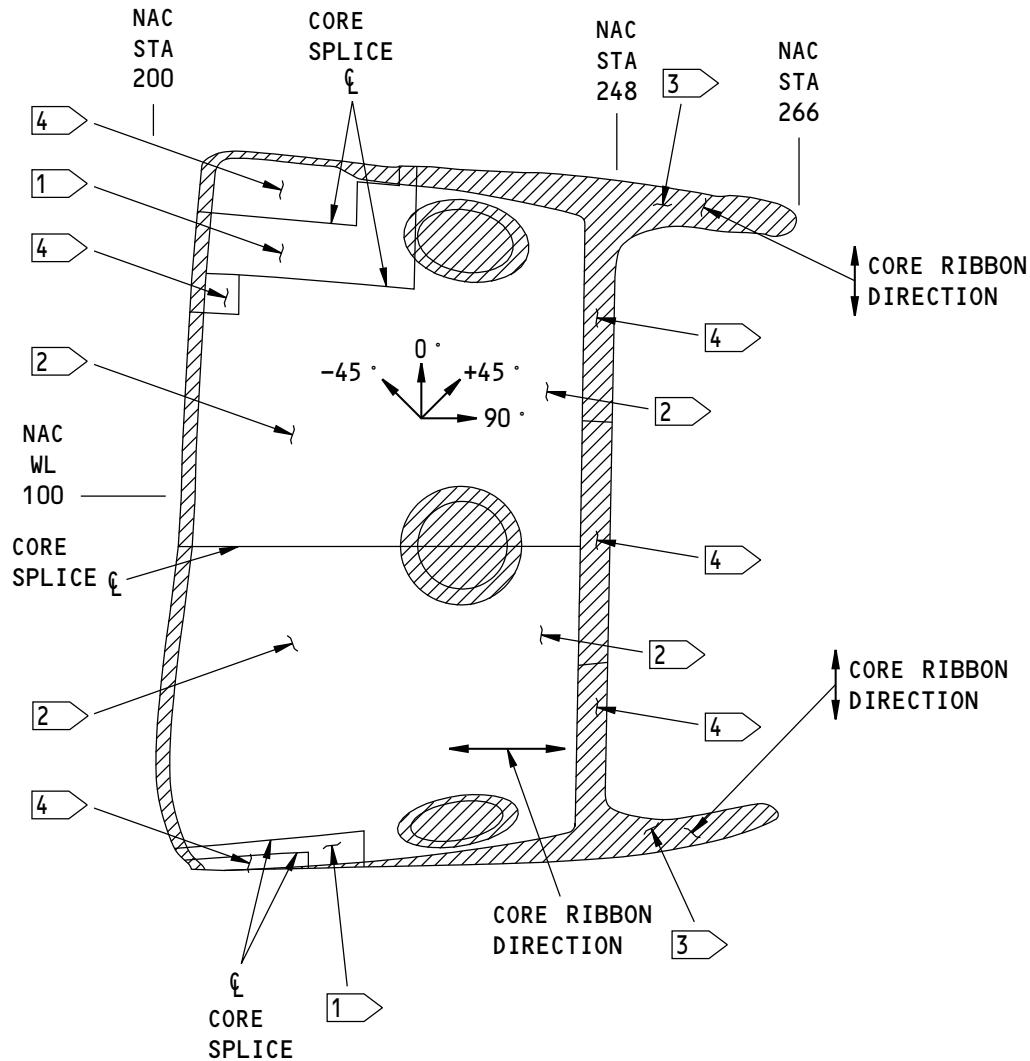
Page 23

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- ALL HONEYCOMB CORE RIBBON DIRECTIONS ARE FORE/AFT UNLESS SHOWN DIFFERENTLY.
- [1] BMS 8-124, TYPE I, CLASS I, GRADE 8.0 HONEYCOMB CORE.
[2] BMS 8-124, TYPE V, CLASS VI, GRADE 3.0 HONEYCOMB CORE.
[3] BMS 8-124, TYPE IV, CLASS I, GRADE 4.5 HONEYCOMB CORE.
[4] BMS 8-124, TYPE I, CLASS 7, GRADE 16.0, STYLE C OR BMS 8-342, TYPE III, CLASS II, GRADE 15.0.

2392828 S0000550104_V1

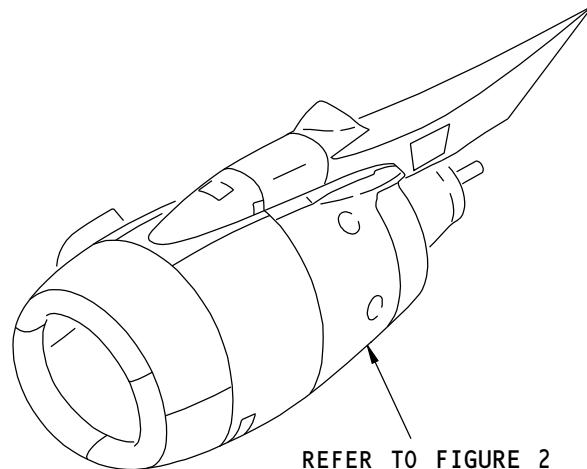
Core Ribbon Direction
Figure 15

54-30-01
IDENTIFICATION 1
Page 24
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - THRUST REVERSER TRANSLATING SLEEVE DIAPHRAGM ACOUSTIC PANEL



REFER TO FIGURE 2
FOR THE THRUST REVERSER
TRANSLATING SLEEVE DIAPHRAGM
PANEL IDENTIFICATION

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F12893 S0006591808_V1

Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
300A2020	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2500	Thrust Reverser Sleeve Assembly
315A2501	Thrust Reverser Sleeve Acoustic Panel Assembly
315A2502	Acoustic Panel/Diaphragm Bond Assembly
315A2509	Blocker Door Installation
315A2510	Common Blocker Door Assembly - Composite
315A2512	End Blocker Door Assembly - Composite
315A2533	Common Blocker Door Assembly - Aluminum
315A2535	End Blocker Door Assembly - Aluminum

54-30-01

IDENTIFICATION 2

Page 1

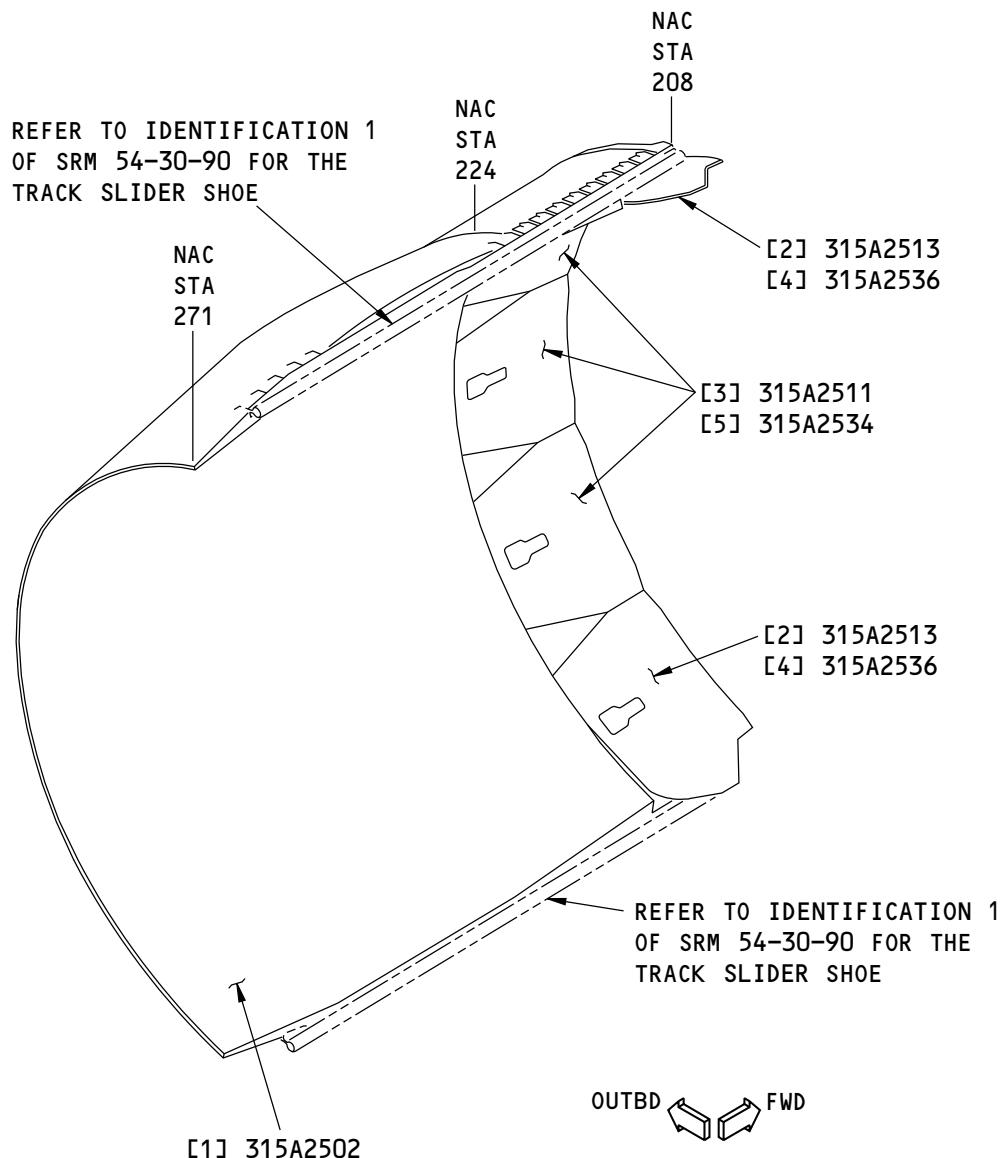
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F12889 S0006591810_V2

Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Identification
Figure 2

54-30-01

IDENTIFICATION 2

Page 2

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Diaphragm Acoustic Panel Assembly Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich and Glass Fiber Reinforced Plastic (GFRP) isolation plies Refer to Figures 3, 4, 5	LINE NUMBERS 001 THROUGH 432
	Perforated Facesheet		Refer to Figures 6, 7, 8, 9	
	Solid Facesheet		Refer to Figures 6, 7, 8, 9	
	Diaphragm Panel - Bonded Part		Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0	
	High Density Core	0.70 (17.78) 1.00 (25.40) 2.00 (50.80)	Non-metallic honeycomb as given in BMS 8-124, Type 1, Class 7, Style C, Grade 16.0 (Optional: Non-metallic honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0)	
	High Density Core	0.70 (17.78) 1.00 (25.40) 2.00 (50.80)	Non-metallic honeycomb as given in BMS 8-124, Type III, Class 1, Grade 4.5	
	Core	1.10 (27.94) 2.70 (68.58)	Non-metallic honeycomb as given in BMS 8-124, Type III, Class 1, Grade 6.0	
	Core	1.10 (27.94)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class 6, Grade 3.0	
	Core	0.70 (17.78)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class 1, Grade 5.5	
	Septum	0.70 (17.78)	Septum material as given in BMS 5-114, Grade 17	
[2]	End Blocker Door Bonded Part		CFRP honeycomb sandwich with GFRP isolation plies	LINE NUMBERS 001 THROUGH 4299
	Skin		Refer to Figure 10	LINE NUMBERS 001 THROUGH 4299
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class 1, Grade 8	LINE NUMBERS 001 THROUGH 4299
[3]	Common Blocker Door Bonded Part		CFRP honeycomb sandwich with GFRP isolation plies	LINE NUMBERS 001 THROUGH 4299
	Skin		Refer to Figure 11	LINE NUMBERS 001 THROUGH 4299
	Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class 1, Grade 8	LINE NUMBERS 001 THROUGH 4299
[4]	End Blocker Door, Aluminum Part	3.70 (93.98)	7050-T7451 Plate as given in BMS 7-323	LINE NUMBERS 4300 AND ON
[5]	Common Blocker Door, Aluminum Part	3.00 (76.20)	7050-T7451 Plate as given in BMS 7-323	LINE NUMBERS 4300 AND ON

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

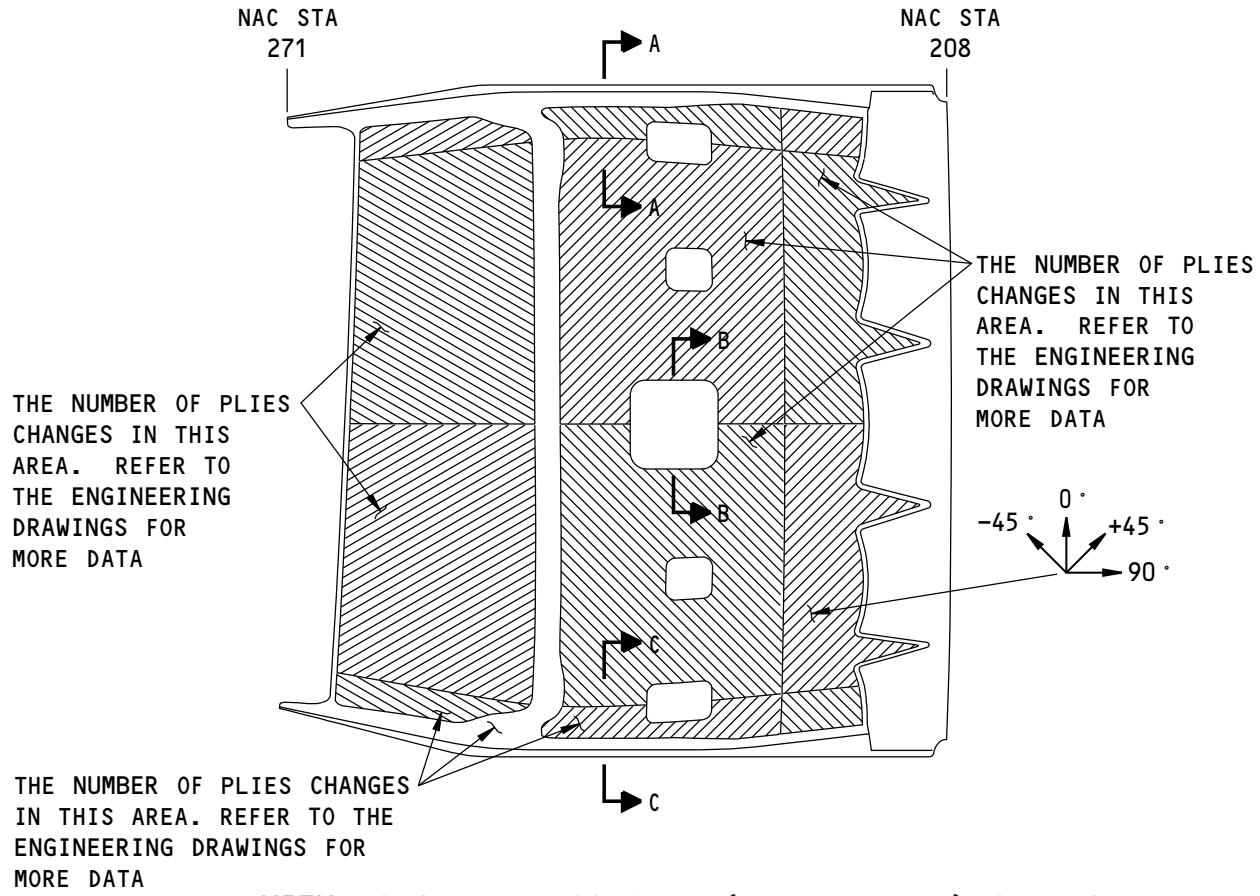
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IDENTIFICATION 2

Page 3

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

NOTES

(A)

- PERFORATED FACESHEET EXISTS UNDER CORE-SEPTUM ASSEMBLIES. SOLID FACESHEET EXISTS UNDER HIGH DENSE CORE.
- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO FIGURE 3 FOR SECTION A-A, FIGURE 4 FOR SECTION B-B, AND FIGURE 5 FOR SECTION C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO FIGURE 3, TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION A-A.
- REFER TO FIGURE 4, TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION B-B.
- REFER TO FIGURE 5, TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION C-C.

F38601 S0006591812_V2

**Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 3 (Sheet 1 of 4)**

54-30-01

IDENTIFICATION 2

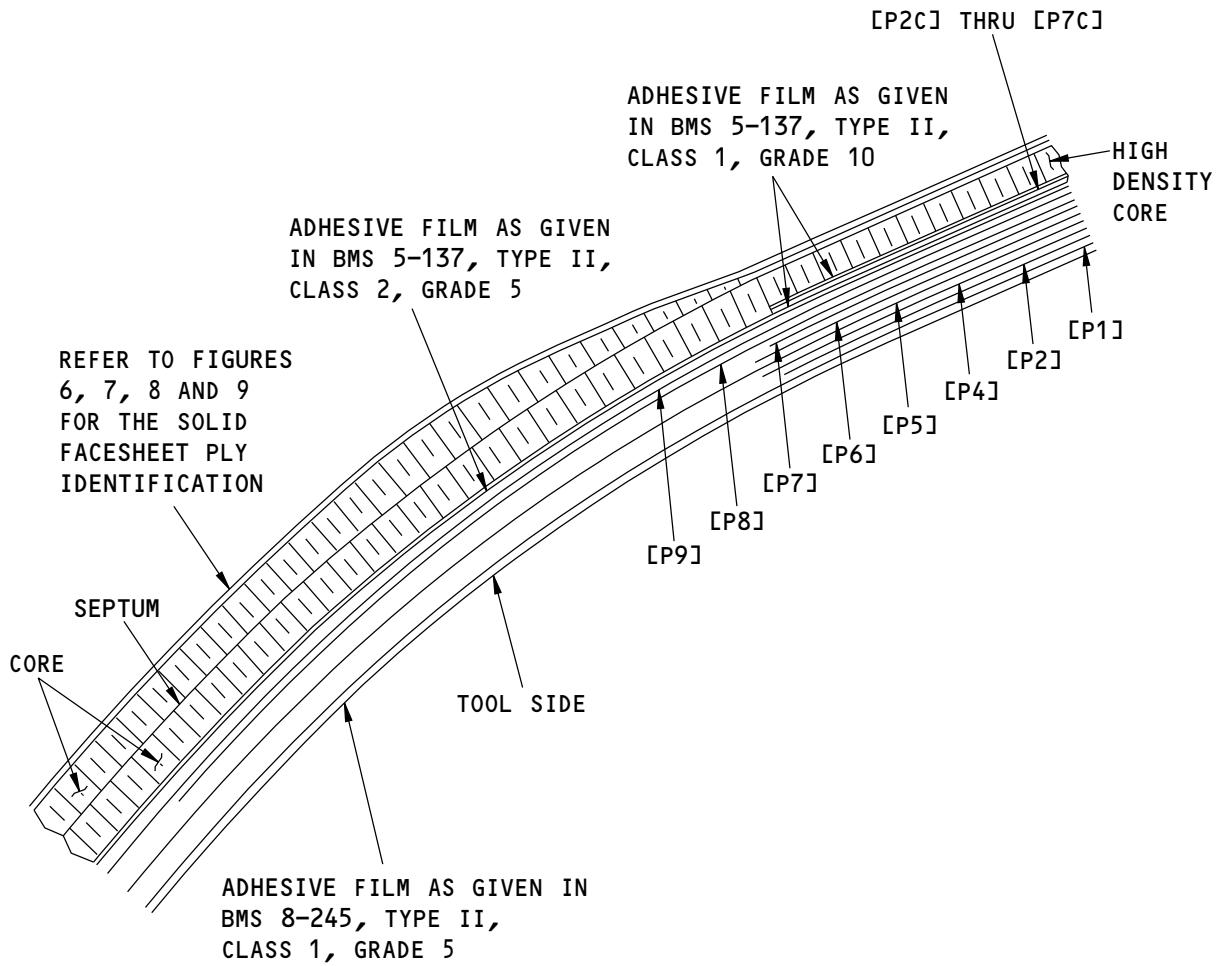
Page 4

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
(FOR LINE NUMBERS 001 THROUGH 396)
A-A

F38612 S0006591813_V2

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 3 (Sheet 2 of 4)

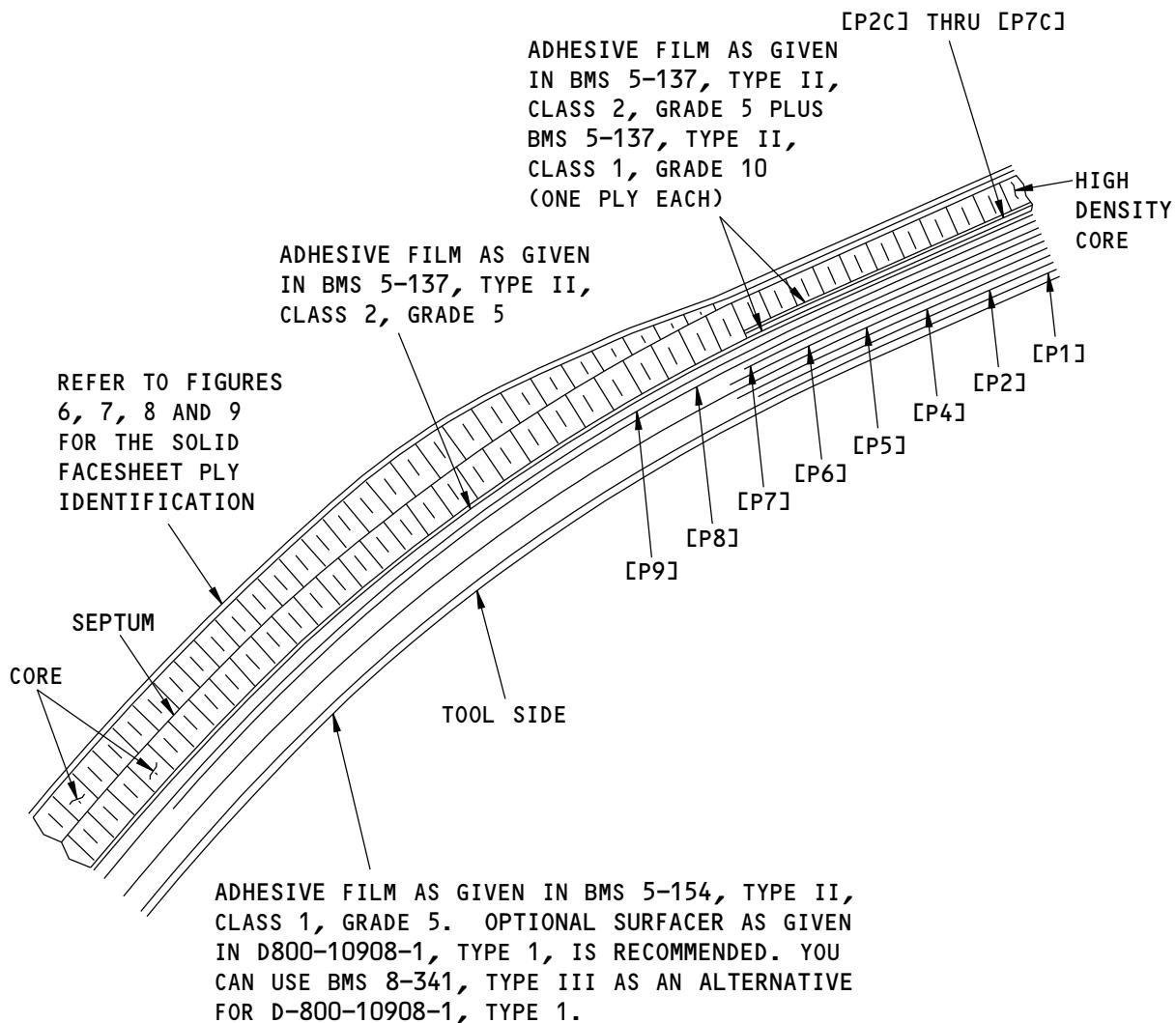
54-30-01
IDENTIFICATION 2
Page 5
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
(FOR LINE NUMBERS 397 THROUGH 4501)
A-A

2453868 S0000570254_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 3 (Sheet 3 of 4)

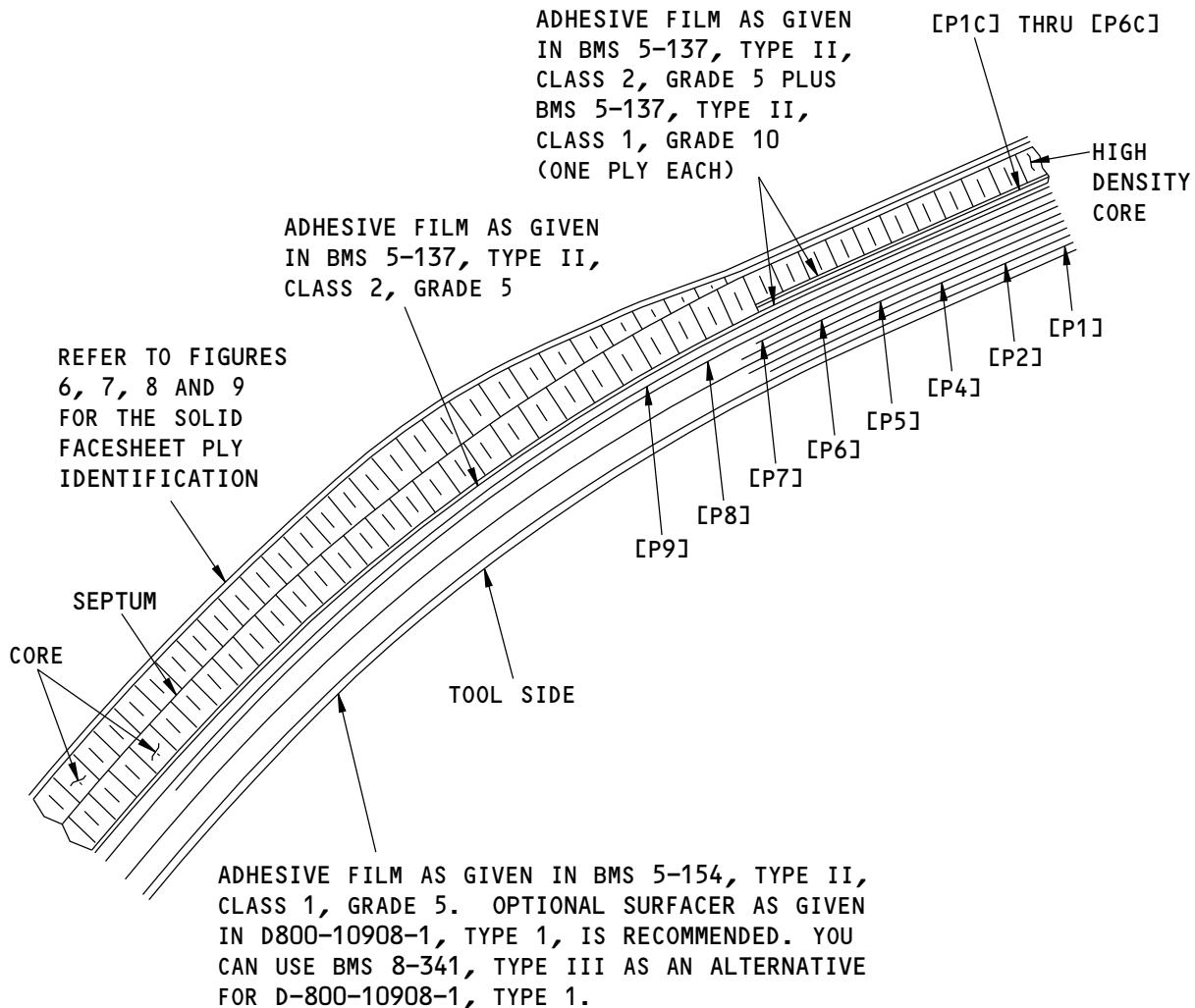
54-30-01
IDENTIFICATION 2
Page 6
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTE: (C) = CORE-PERF ASSEMBLY PLY

PLY SEQUENCE
(FOR LINE NUMBERS 4502 AND ON)
A-A

2453867 S0000570256_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 3 (Sheet 4 of 4)

54-30-01
IDENTIFICATION 2
Page 7
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION A-A			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P5, P9	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	
P1, P6, P8	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	
P2, P7	0 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 396
	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 397 AND ON
P4	90 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 396
	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 397 AND ON
P3(C), P6(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 001 THROUGH 4501
P2(C), P5(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 4502 AND ON
P2(C), P4(C), P5(C), P7(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 001 THROUGH 4501
P1(C), P3(C), P4(C), P6(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 4502 AND ON

54-30-01

IDENTIFICATION 2

Page 8

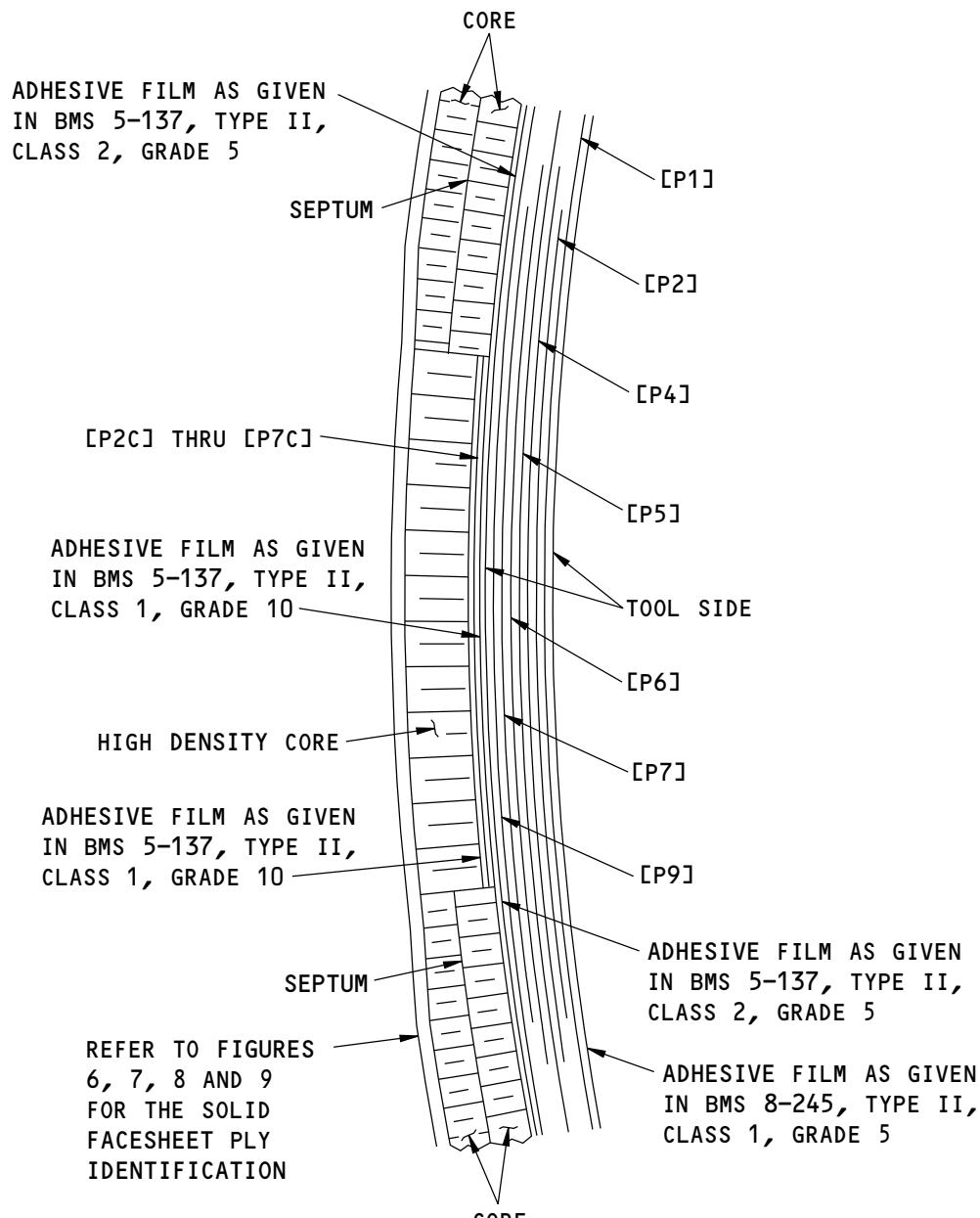
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: (C) = CORE DOUBLER ASSEMBLY PLY
PLY SEQUENCE
(FOR LINE NUMBERS 001 THROUGH 396)
B-B

F38619 S0006591815_V2

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic
Facesheet, Figure 2, Item [1]
Figure 4 (Sheet 1 of 3)

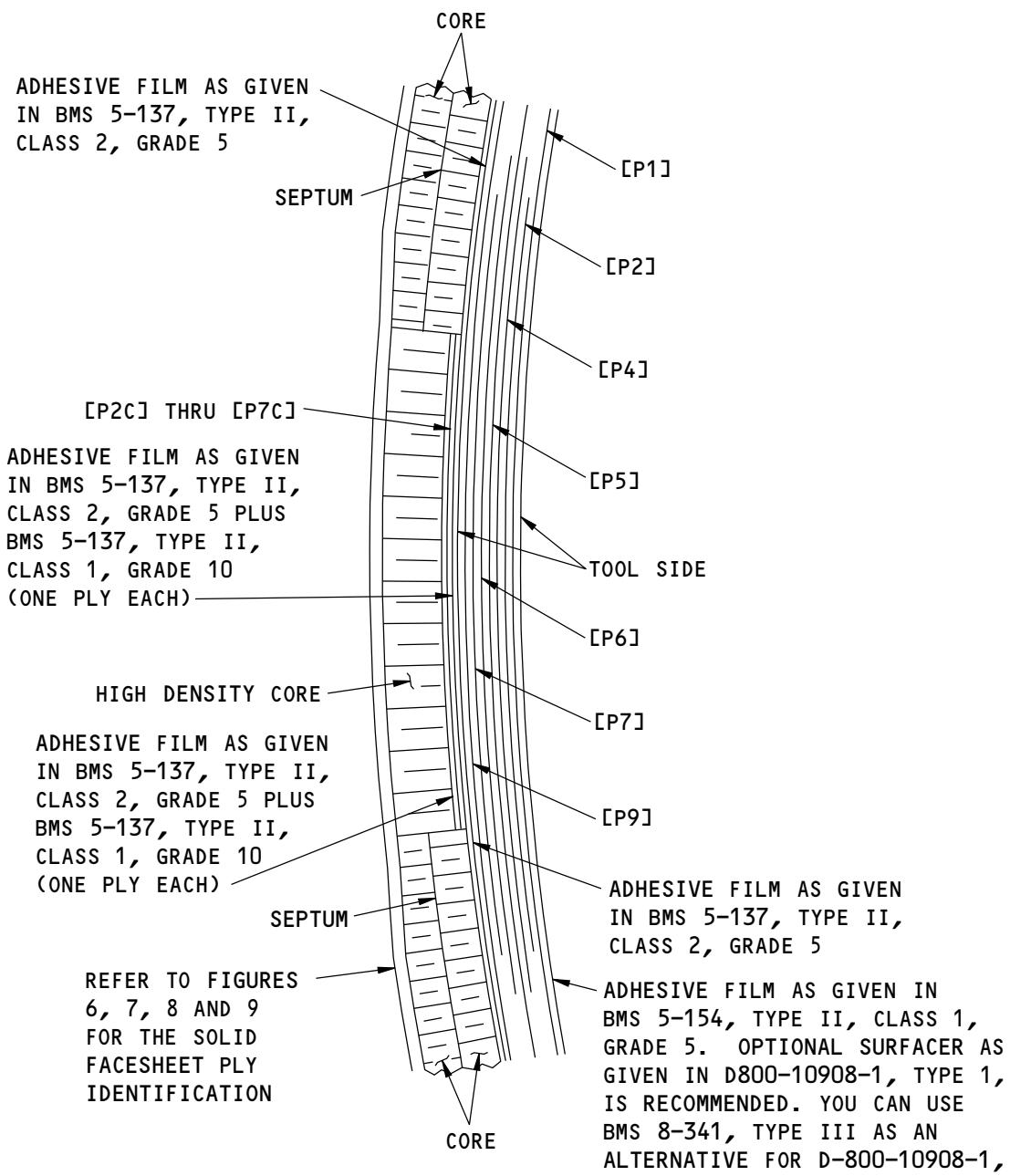
54-30-01
IDENTIFICATION 2
Page 9
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTE: (C) = CORE DOUBLER ASSEMBLY PLY
PLY SEQUENCE
(FOR LINE NUMBERS 397 THROUGH 4501)

B-B

2453879 S0000570268_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 4 (Sheet 2 of 3)

54-30-01

IDENTIFICATION 2

Page 10

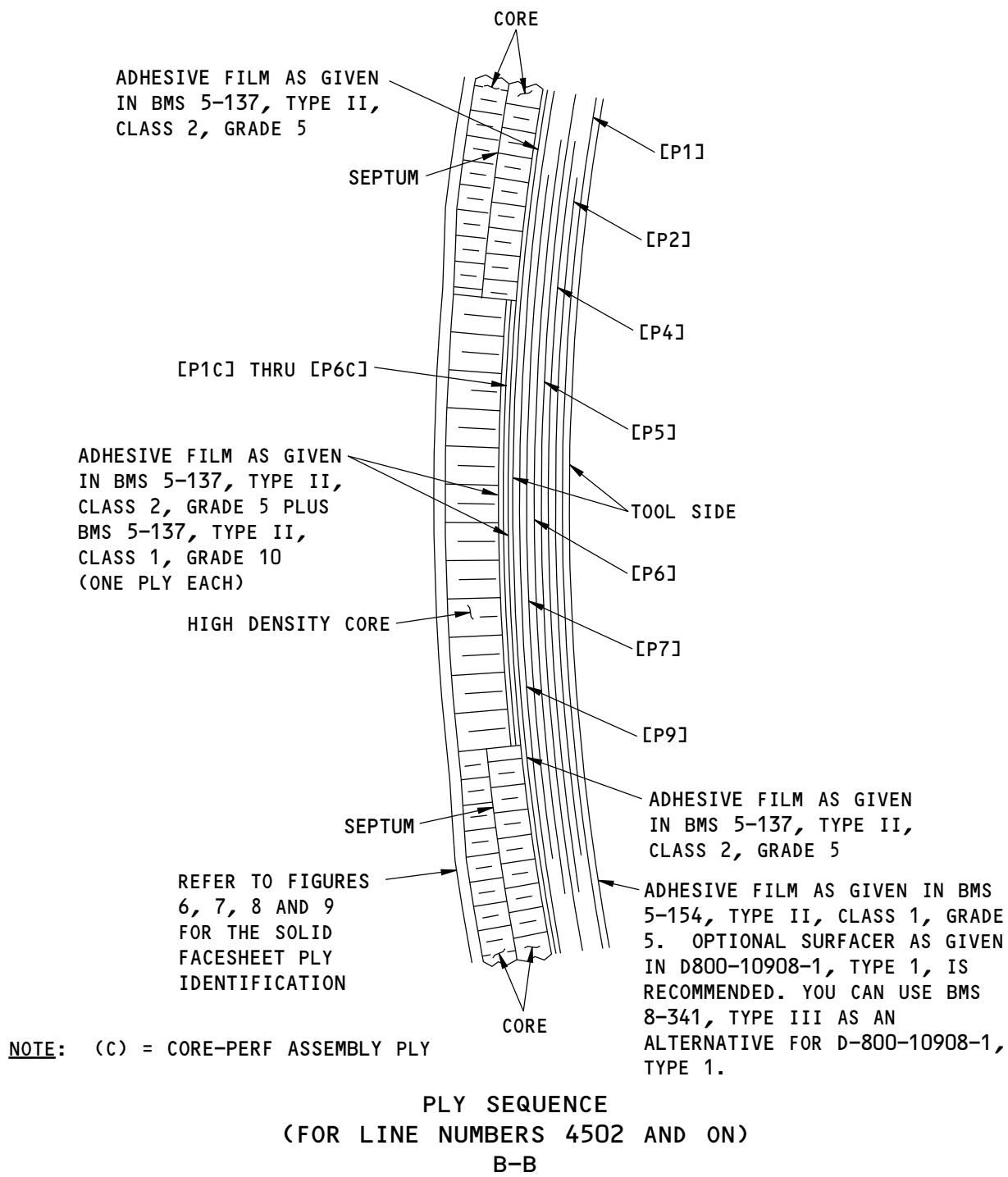
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737-800
STRUCTURAL REPAIR MANUAL



2453880 S0000570269_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 4 (Sheet 3 of 3)

54-30-01
IDENTIFICATION 2
Page 11
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION B-B			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P5, P9	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	
P1, P6,	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	
P2, P7	0 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 396
	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 397 AND ON
P4	90 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 396
	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 397 AND ON
P3(C), P6(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 001 THROUGH 4501
P2(C), P5(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 4502 AND ON
P2(C), P4(C), P5(C), P7(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 001 THROUGH 4501
	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 4502 AND ON

54-30-01

IDENTIFICATION 2

Page 12

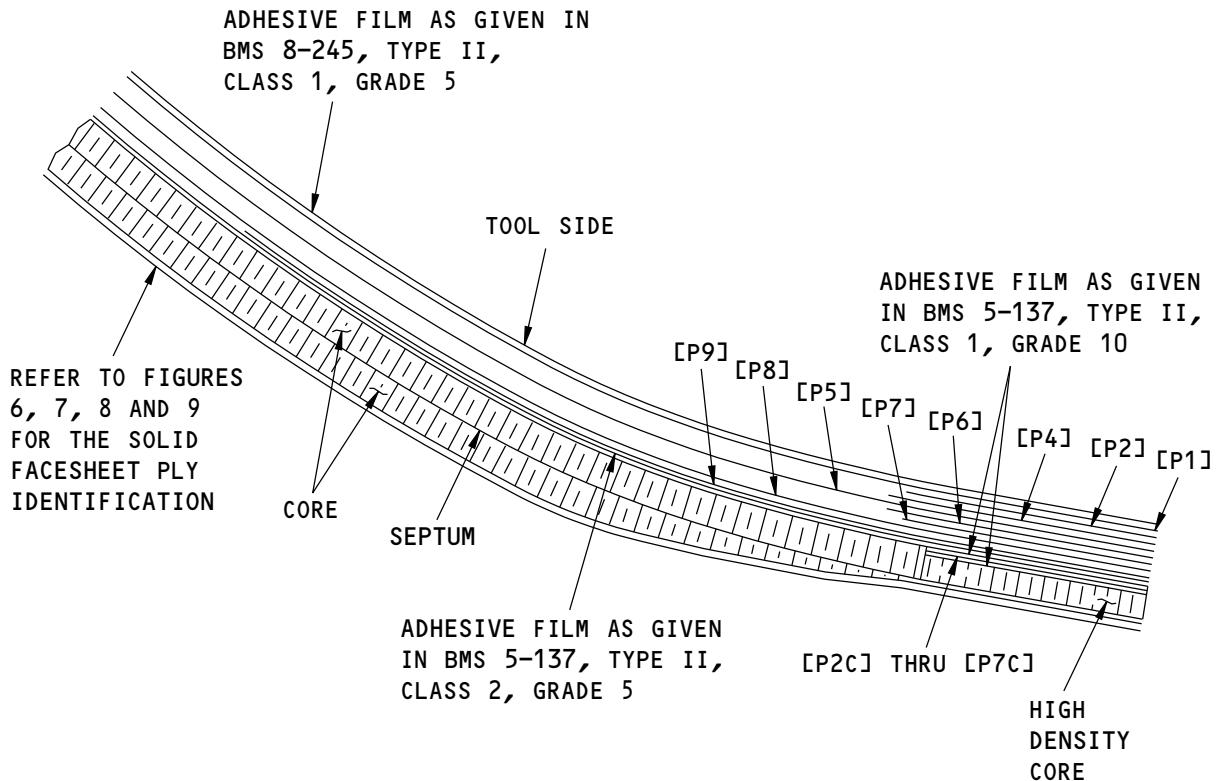
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
(FOR LINE NUMBERS 001 THROUGH 396)
C-C

F41987 S0006591817_V2

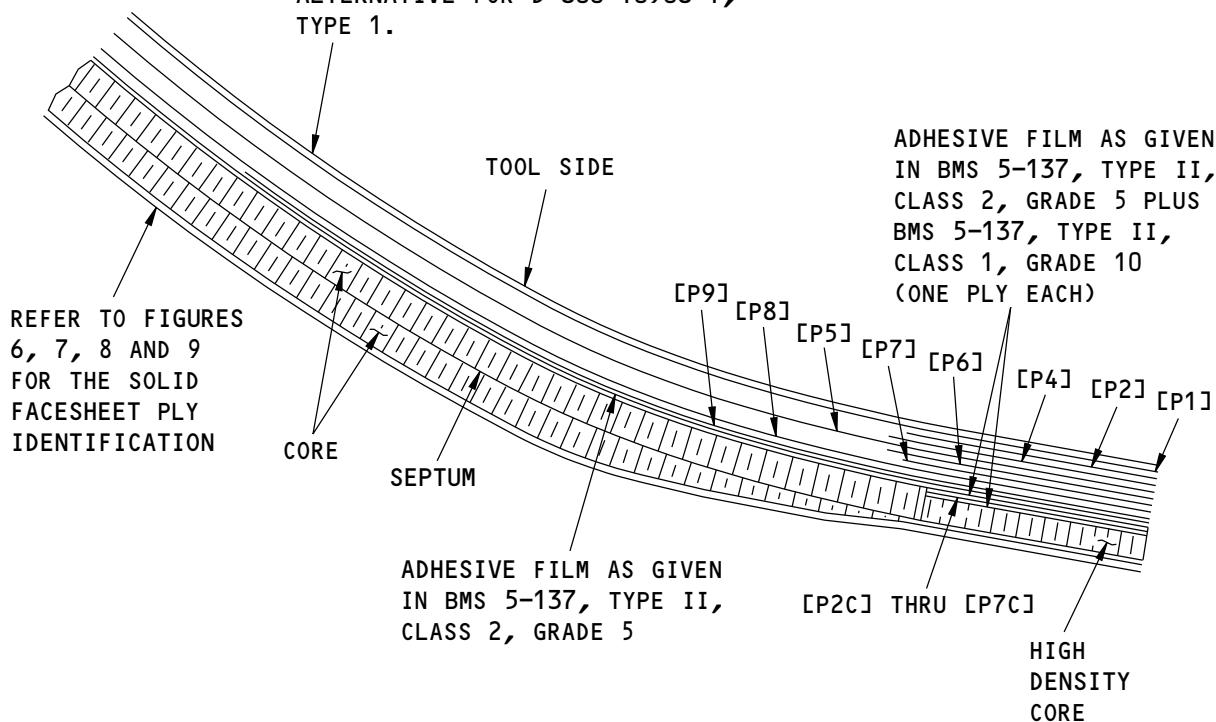
Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic Facesheet, Figure 2, Item [1]
Figure 5 (Sheet 1 of 3)

54-30-01
IDENTIFICATION 2
Page 13
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE FILM AS GIVEN IN
BMS 5-154, TYPE II, CLASS 1,
GRADE 5. OPTIONAL SURFACER AS
GIVEN IN D800-10908-1, TYPE 1,
IS RECOMMENDED. YOU CAN USE
BMS 8-341, TYPE III AS AN
ALTERNATIVE FOR D-800-10908-1,
TYPE 1.



NOTE: (C) = CORE DOUBLER ASSEMBLY PLY

PLY SEQUENCE
(FOR LINE NUMBERS 397 THROUGH 4501)
C-C

2454062 S0000570271_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic
Facesheet, Figure 2, Item [1]
Figure 5 (Sheet 2 of 3)

54-30-01
IDENTIFICATION 2
Page 14
Nov 10/2015

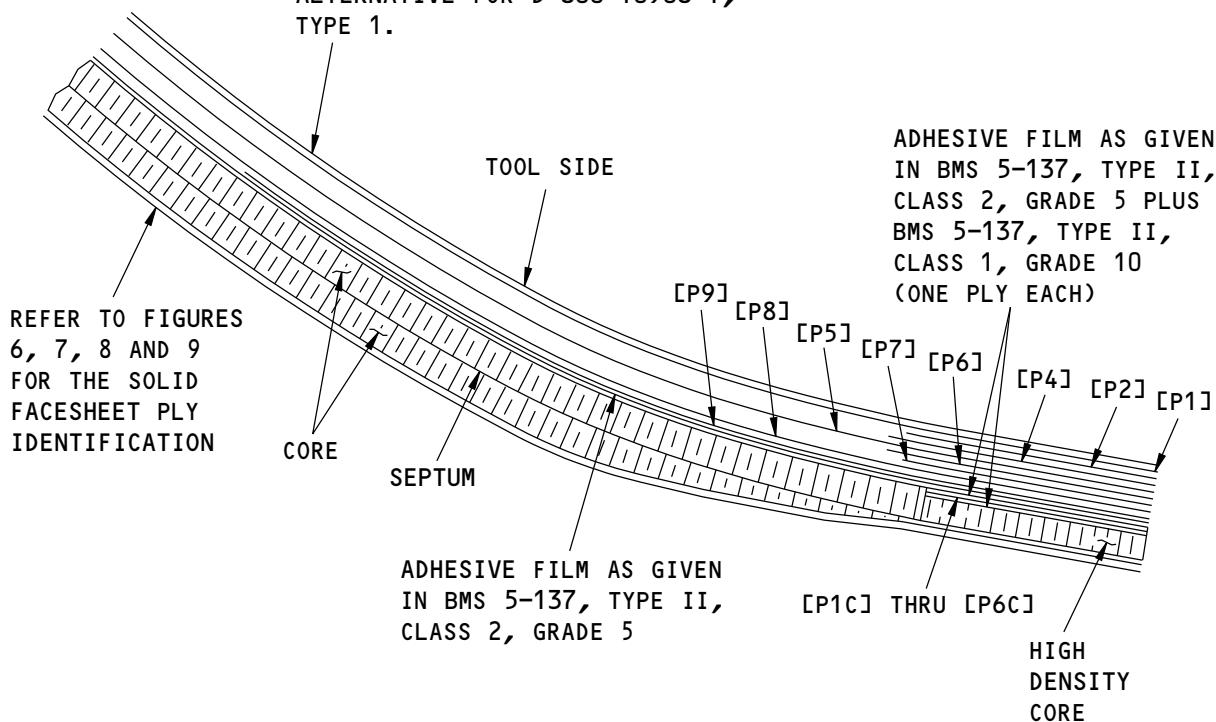
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737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE FILM AS GIVEN IN
BMS 5-154, TYPE II, CLASS 1,
GRADE 5. OPTIONAL SURFACER AS
GIVEN IN D800-10908-1, TYPE 1,
IS RECOMMENDED. YOU CAN USE
BMS 8-341, TYPE III AS AN
ALTERNATIVE FOR D-800-10908-1,
TYPE 1.



NOTE: (C) = CORE-PERF ASSEMBLY PLY

PLY SEQUENCE
(FOR LINE NUMBERS 4502 AND ON)
C-C

2454063 S0000570272_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Diaphragm Perforated Acoustic
Facesheet, Figure 2, Item [1]
Figure 5 (Sheet 3 of 3)

54-30-01
IDENTIFICATION 2
Page 15
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5, SECTION C-C			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P5, P9	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	
P1, P6, P8	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	
P2, P7	0 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 396
	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 397 AND ON
P4	90 degrees	Epoxy impregnated unidirectional tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 396
	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 397 AND ON
P3(C), P6(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 001 THROUGH 4501
P2(C), P5(C)	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 4502 AND ON
P2(C), P4(C), P5(C), P7(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 001 THROUGH 4501
P1(C), P3(C), P4(C), P6(C)	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Class 2, Type III, Style 3K-135-8H	LINE NUMBERS 4502 AND ON

54-30-01

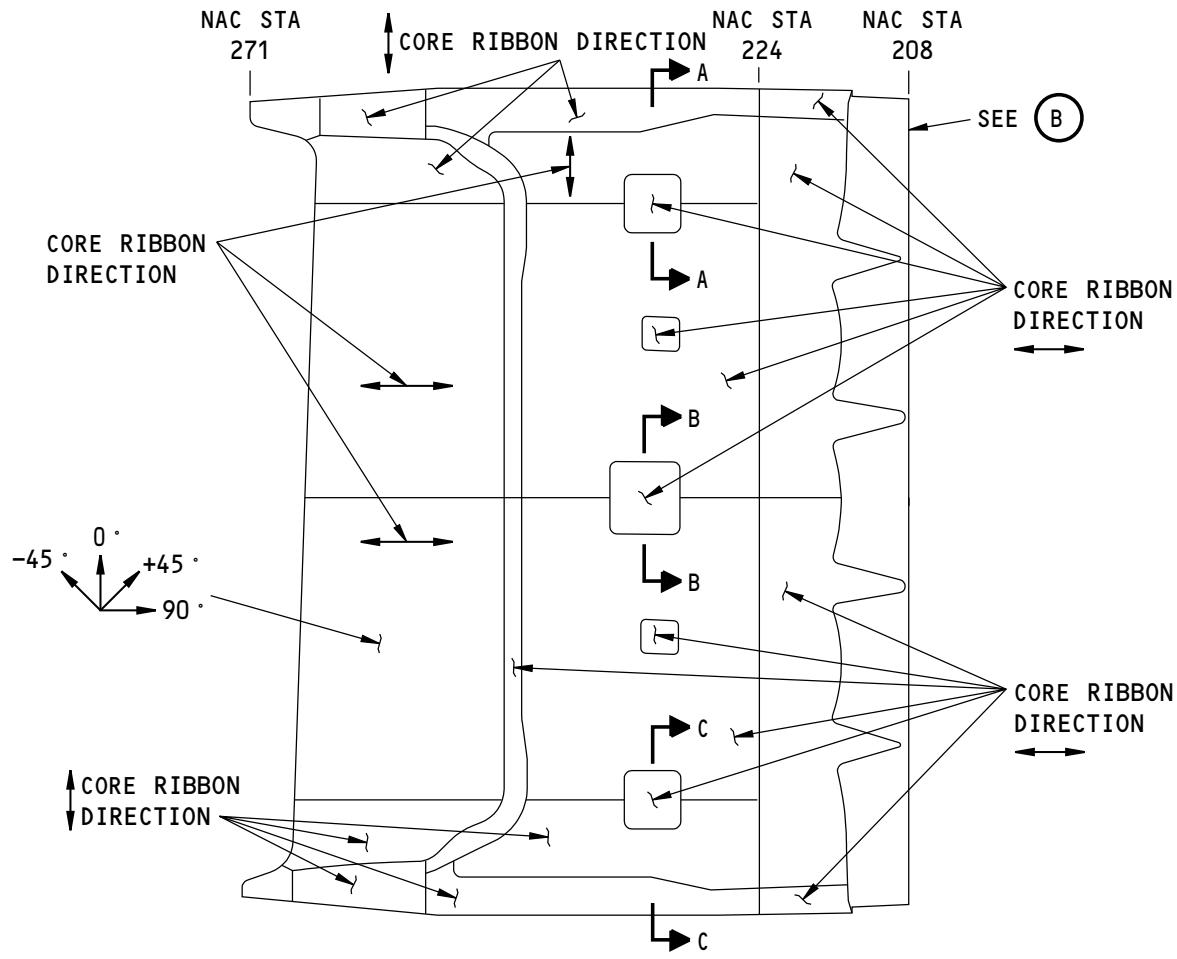
IDENTIFICATION 2

Page 16

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



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 FIGURE 6 FOR SECTION A-A, FIGURE 7 FOR SECTION B-B, AND FIGURE 8 FOR SECTION C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO FIGURE 6, TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION A-A.
- REFER TO FIGURE 7, TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION B-B.
- REFER TO FIGURE 8, TABLE 8 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTION C-C.

F45560 S0006591819_V2

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 6 (Sheet 1 of 3)**

54-30-01

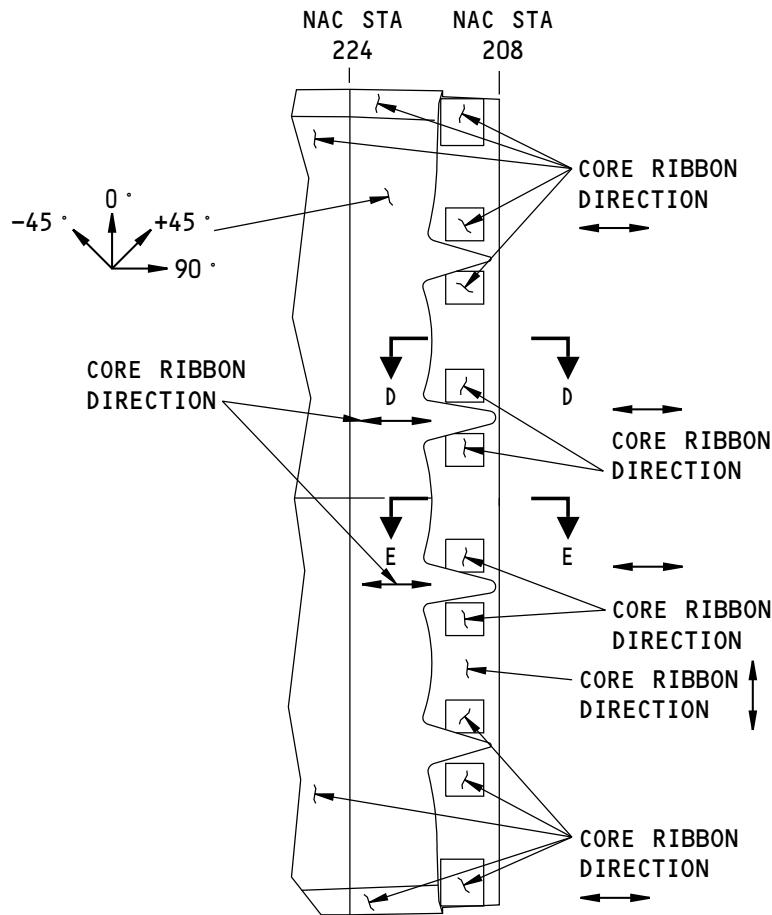
IDENTIFICATION 2

Page 17

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

(B)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL B FOR THE 0 DEGREE PLY DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO FIGURE 9 FOR SECTIONS D-D AND E-E FOR THE PLY SEQUENCE AT THESE LOCATIONS.
- REFER TO FIGURE 9, TABLE 9 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN FOR THE SOLID FACESHEET IN SECTIONS D-D AND E-E.

G19663 S0006591820_V2

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 6 (Sheet 2 of 3)**

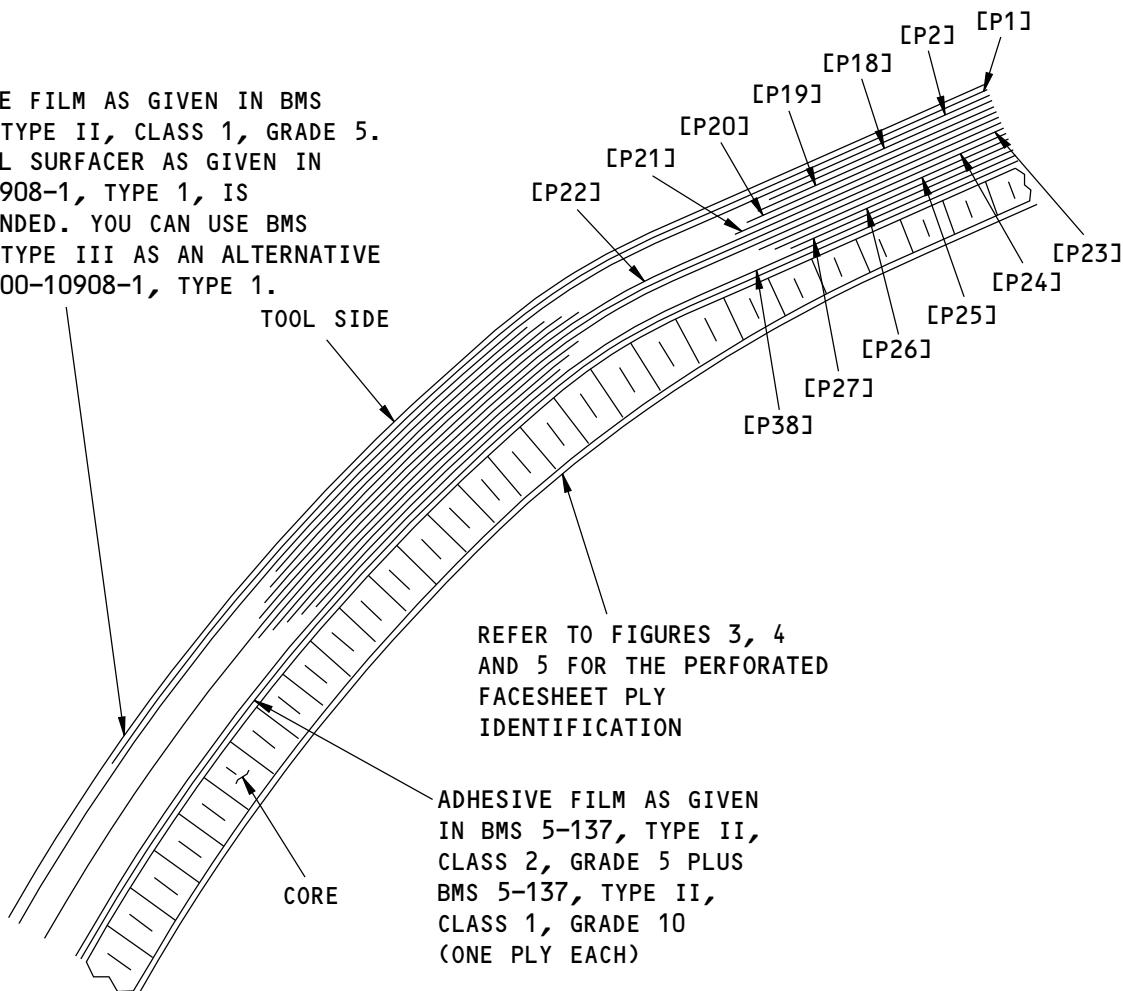
54-30-01
IDENTIFICATION 2
Page 18
Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II, CLASS 1, GRADE 5. OPTIONAL SURFACER AS GIVEN IN D800-10908-1, TYPE 1, IS RECOMMENDED. YOU CAN USE BMS 8-341, TYPE III AS AN ALTERNATIVE FOR D-800-10908-1, TYPE 1.



PLY SEQUENCE
A-A

F38955 S0006591821_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 6 (Sheet 3 of 3)

54-30-01
IDENTIFICATION 2
Page 19
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6, SECTION A-A		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-139, Style 108
P18, P20, P22, P23, P25, P27, P38	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW

54-30-01

IDENTIFICATION 2

Page 20

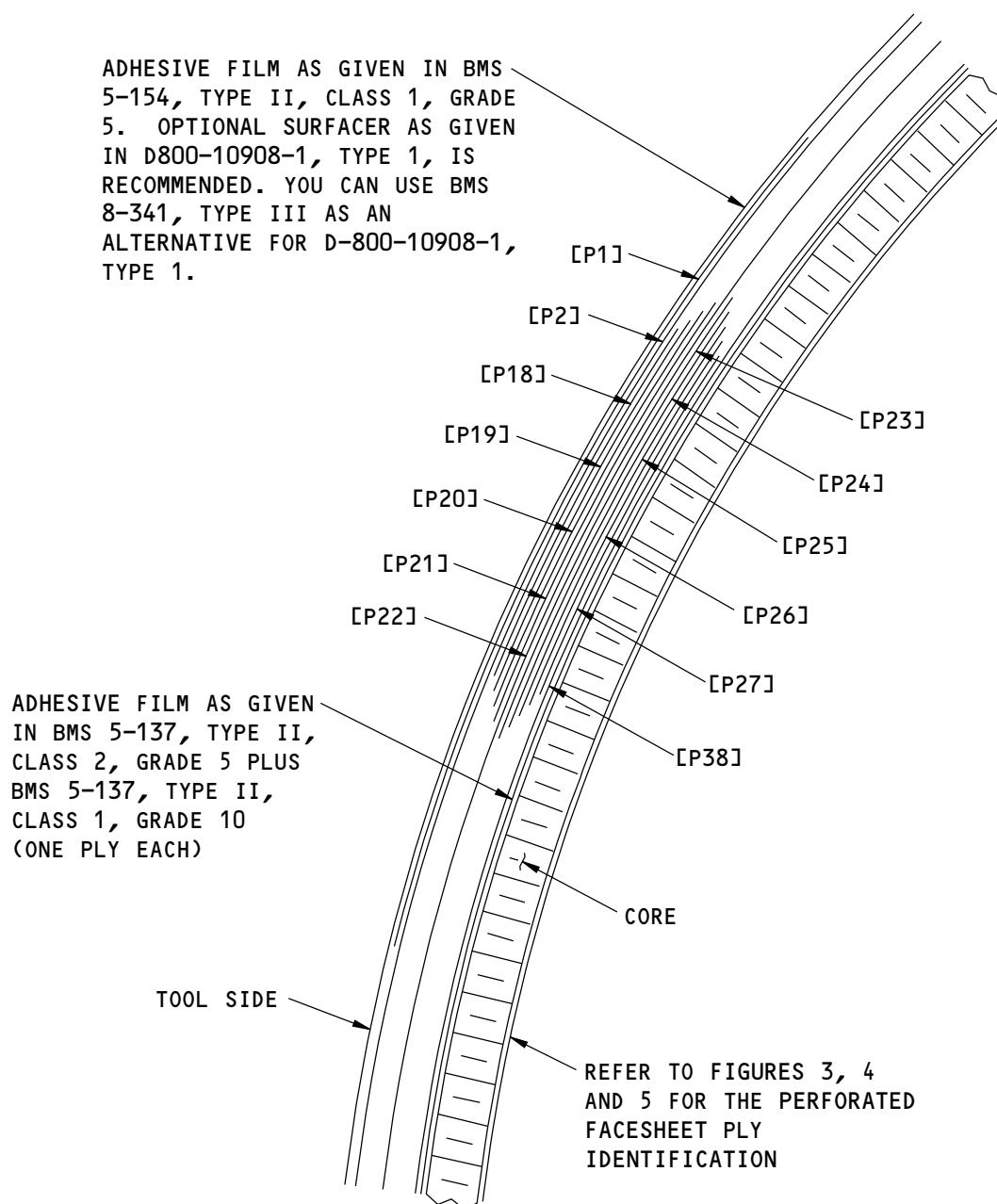
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737-800
STRUCTURAL REPAIR MANUAL



F38959 S0006591823_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 7

54-30-01
IDENTIFICATION 2
Page 21
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 7, SECTION B-B		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-139, Style 108
P18, P20, P22, P23, P25, P27, P38	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW

54-30-01

IDENTIFICATION 2

Page 22

Nov 10/2015

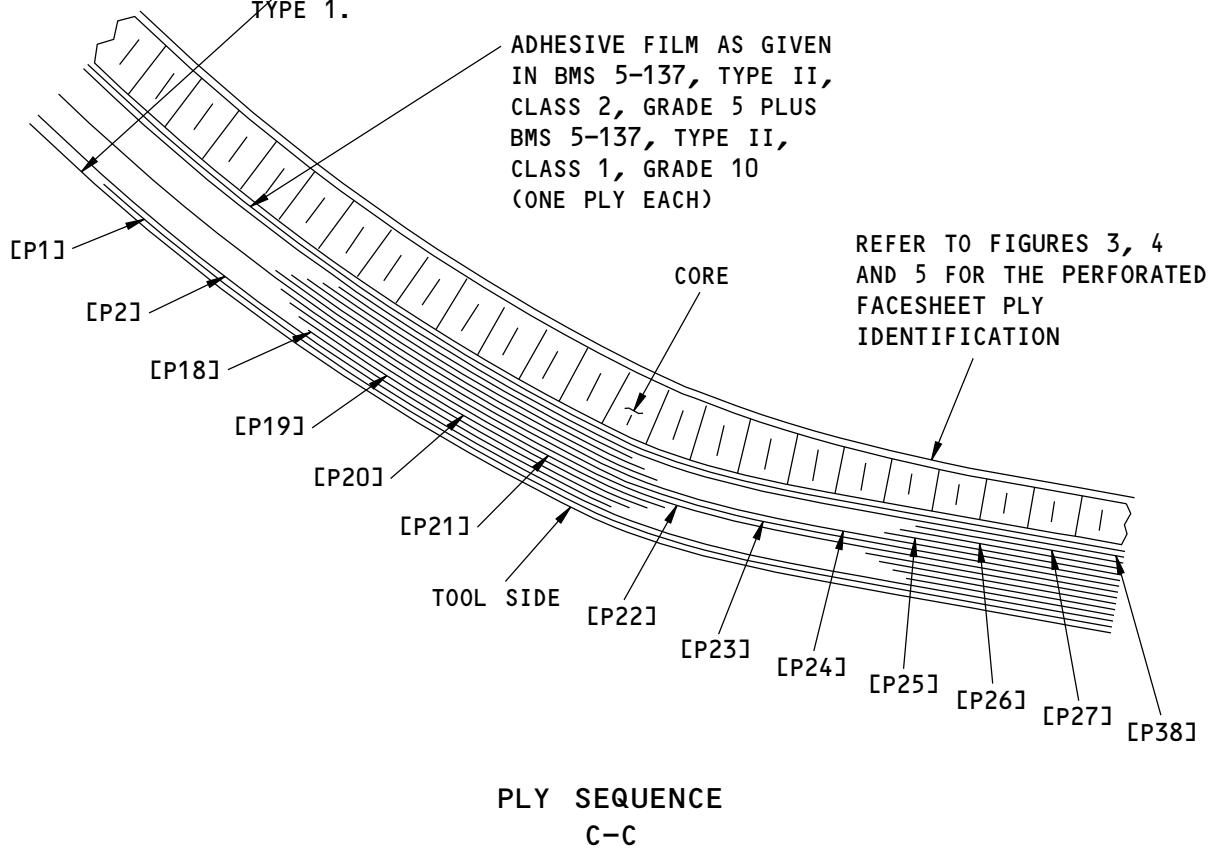
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737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE FILM AS GIVEN IN BMS
5-154, TYPE II, CLASS 1, GRADE
5. OPTIONAL SURFACER AS GIVEN
IN D800-10908-1, TYPE 1, IS
RECOMMENDED. YOU CAN USE BMS
8-341, TYPE III AS AN
ALTERNATIVE FOR D-800-10908-1,
TYPE 1.



F38964 S0006591825_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid
Facesheet, Figure 2, Item [1]
Figure 8

54-30-01
IDENTIFICATION 2
Page 23
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 8, SECTION C-C		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-139, Style 108
P18, P20, P22, P23, P25, P27, P38	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW

54-30-01

IDENTIFICATION 2

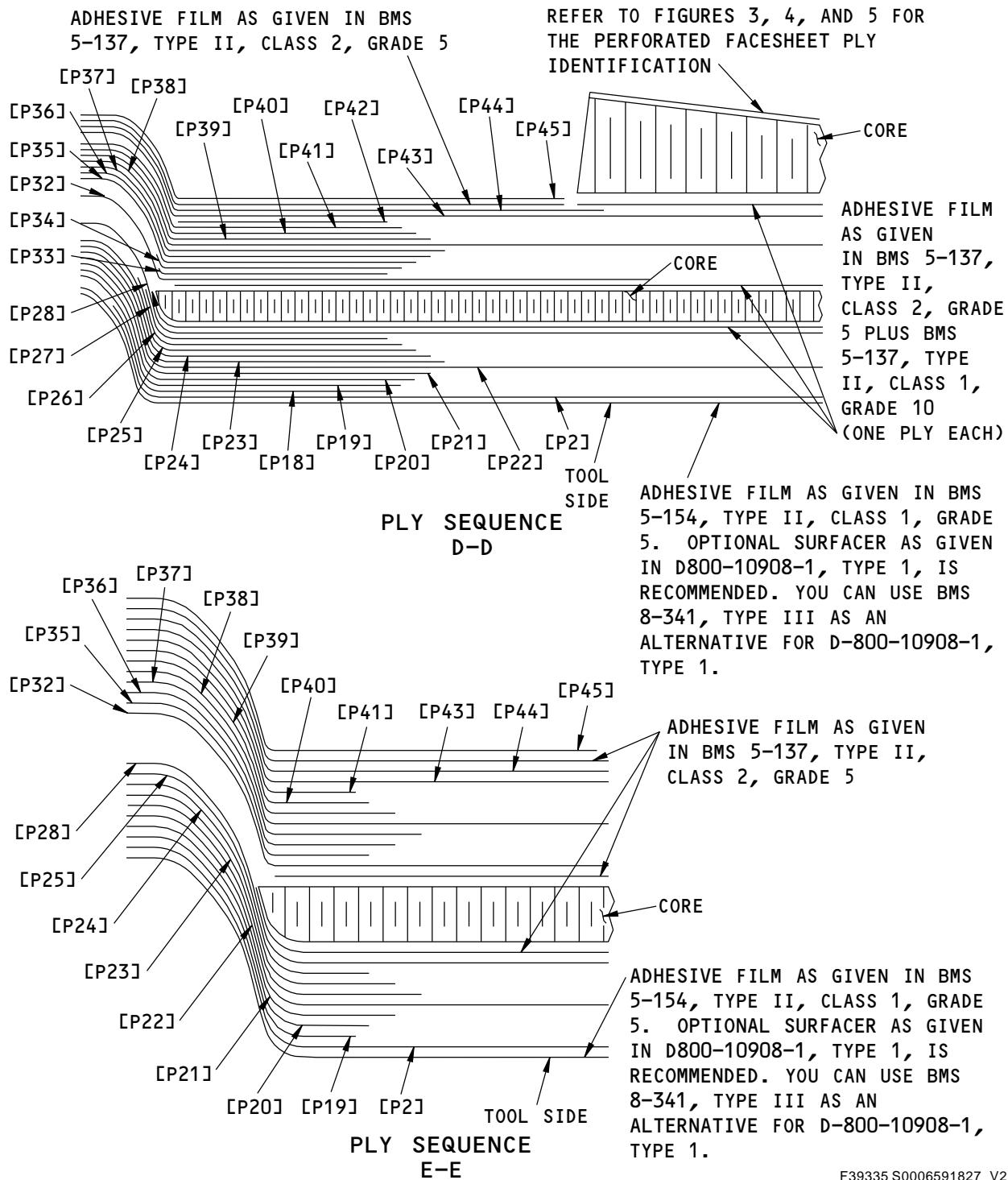
Page 24

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



Ply Direction, Core Ribbon Direction, and Ply Sequence for the Diaphragm Acoustic Panel Solid Facesheet, Figure 2, Item [1]
Figure 9

54-30-01
IDENTIFICATION 2
Page 25
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 9, SECTIONS D-D and E-E		
PLY	DIRECTION	MATERIAL
P18, P20, P22, P23, P25, P27, P28, P32, P33, P35, P37, P38, P40, P42	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P2, P19, P21, P24, P26, P34, P36, P39, P41, P43	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW
P44	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-139, Style 108
P45	Optional	Peel ply or parting film material as given in BAC 5317-1. After the machine operation, make sure to remove all of the peel ply or parting film.

54-30-01

IDENTIFICATION 2

Page 26

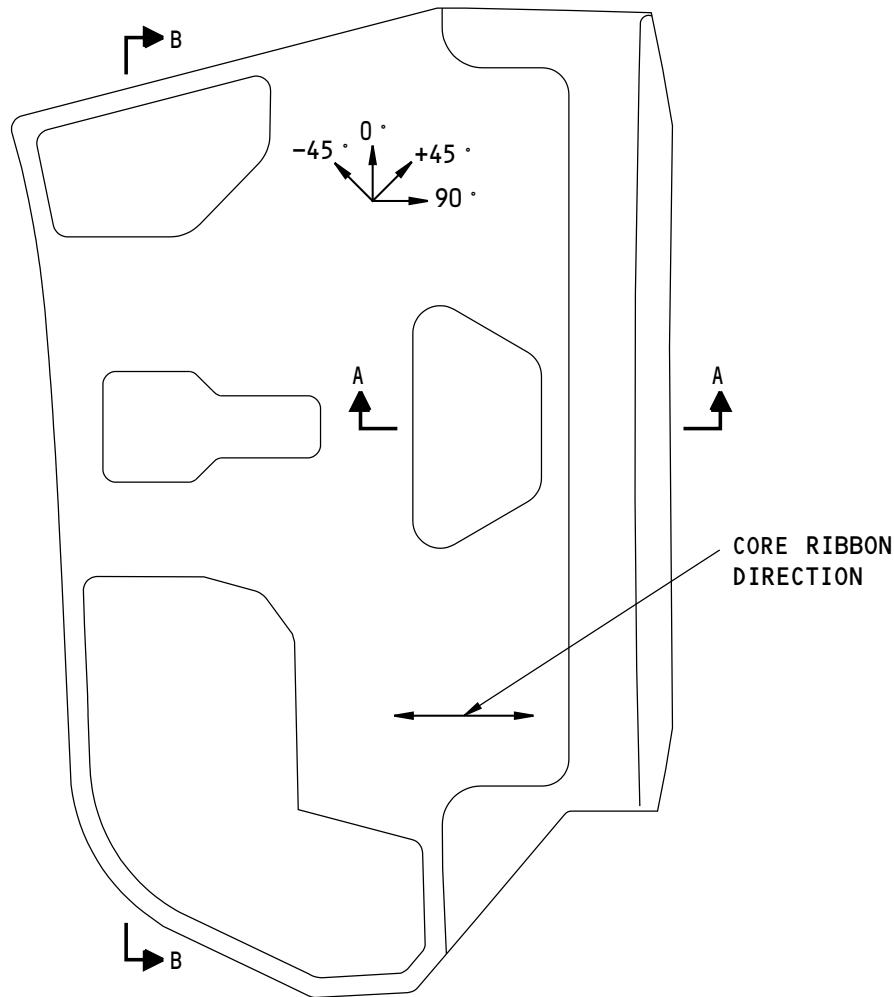
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737-800
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THE VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION, AND THE CORE RIBBON DIRECTION
- REFER TO FIGURE 10, SECTIONS A-A AND B-B FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO FIGURE 10, TABLE 10 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A AND B-B.

F39343 S0006591829_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the End Blocker Door Panel, Figure 2, Item [2]

Figure 10 (Sheet 1 of 2)

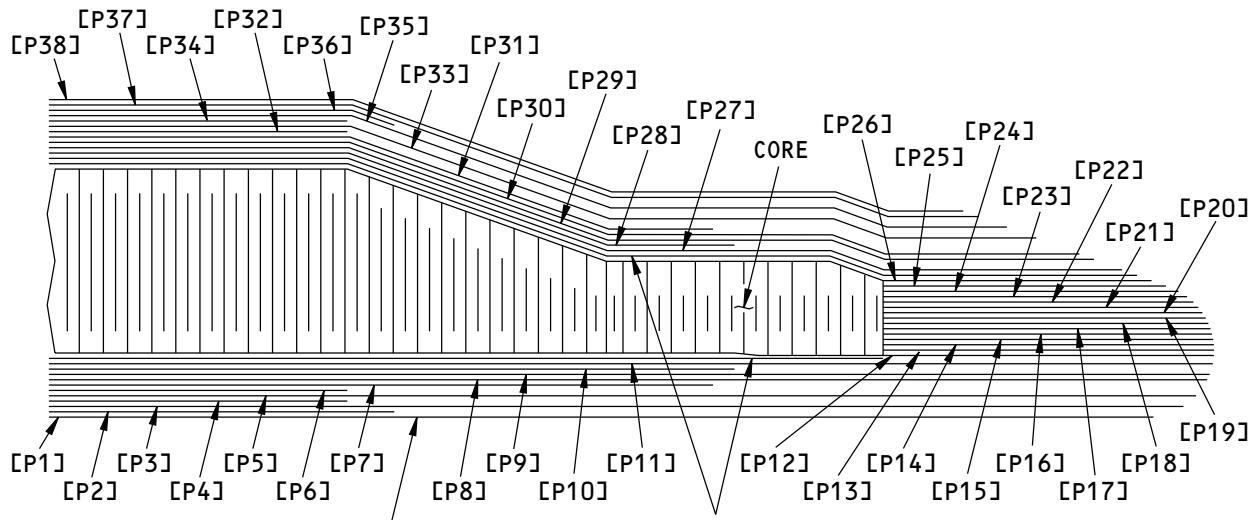
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IDENTIFICATION 2
Page 27

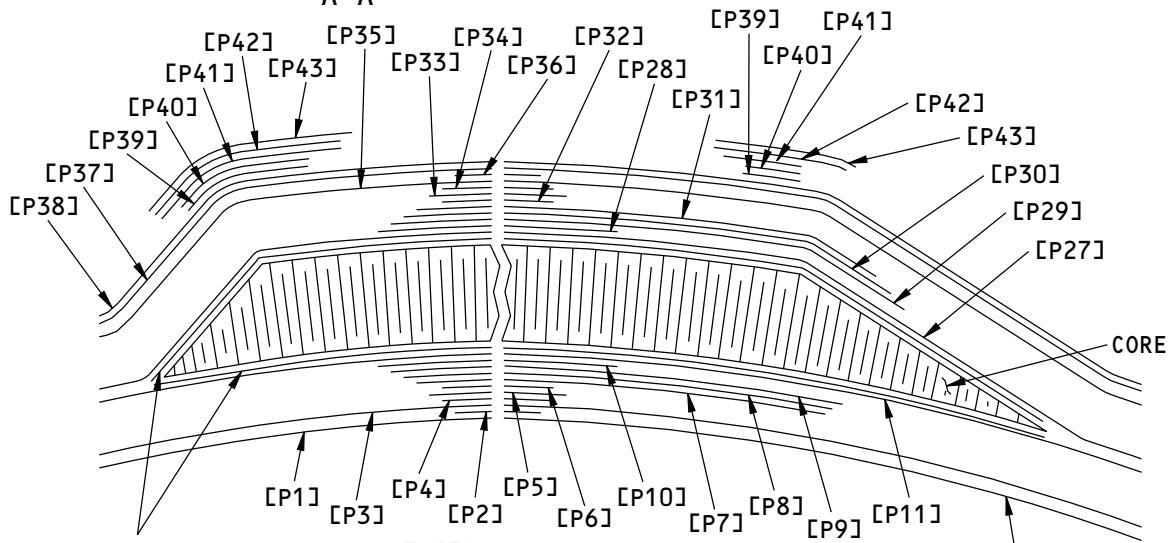
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**737-800
STRUCTURAL REPAIR MANUAL**


ADHESIVE FILM AS GIVEN IN BMS 5-154, TYPE II,
CLASS 1, GRADE 5. OPTIONAL SURFACER AS GIVEN
IN D800-10908-1, TYPE 1, IS RECOMMENDED. YOU
CAN USE BMS 8-341, TYPE III AS AN ALTERNATIVE
FOR D-800-10908-1, TYPE 1.

**PLY SEQUENCE
A-A**


ADHESIVE FILM AS GIVEN IN BMS 5-154,
TYPE II, CLASS 1, GRADE 5. OPTIONAL
SURFACER AS GIVEN IN D800-10908-1, TYPE
1, IS RECOMMENDED. YOU CAN USE BMS
8-341, TYPE III AS AN ALTERNATIVE FOR
D-800-10908-1, TYPE 1.

**ROTATED 90° COUNTER CLOCKWISE
PLY SEQUENCE
B-B**

F46194 S0006591830_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the End Blocker Door Panel, Figure 2, Item [2]

Figure 10 (Sheet 2 of 2)

54-30-01

IDENTIFICATION 2

Page 28

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 10, SECTIONS A-A and B-B			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P2, P3, P11, P13, P15, P17, P19, P21, P23, P25, P27, P35, P36	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 001 THROUGH 4299
P1, P4, P6, P8, P10, P12, P14, P16, P18, P20, P22, P24, P26, P28, P30, P32, P34, P37	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 001 THROUGH 4299
P5, P7, P9, P29, P31, P33	0 degrees	Epoxy impregnated graphite tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 4299
P38	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-139, Type 120	LINE NUMBERS 001 THROUGH 4299
P39, P40, P41, P42, P43	Optional	Fiberglass prepreg as given in BMS 8-139, Class 1, Style 1581. Optional to use BMS 8-139, Class 1, Style 7781.	LINE NUMBERS 1762 THROUGH 4299

54-30-01

IDENTIFICATION 2

Page 29

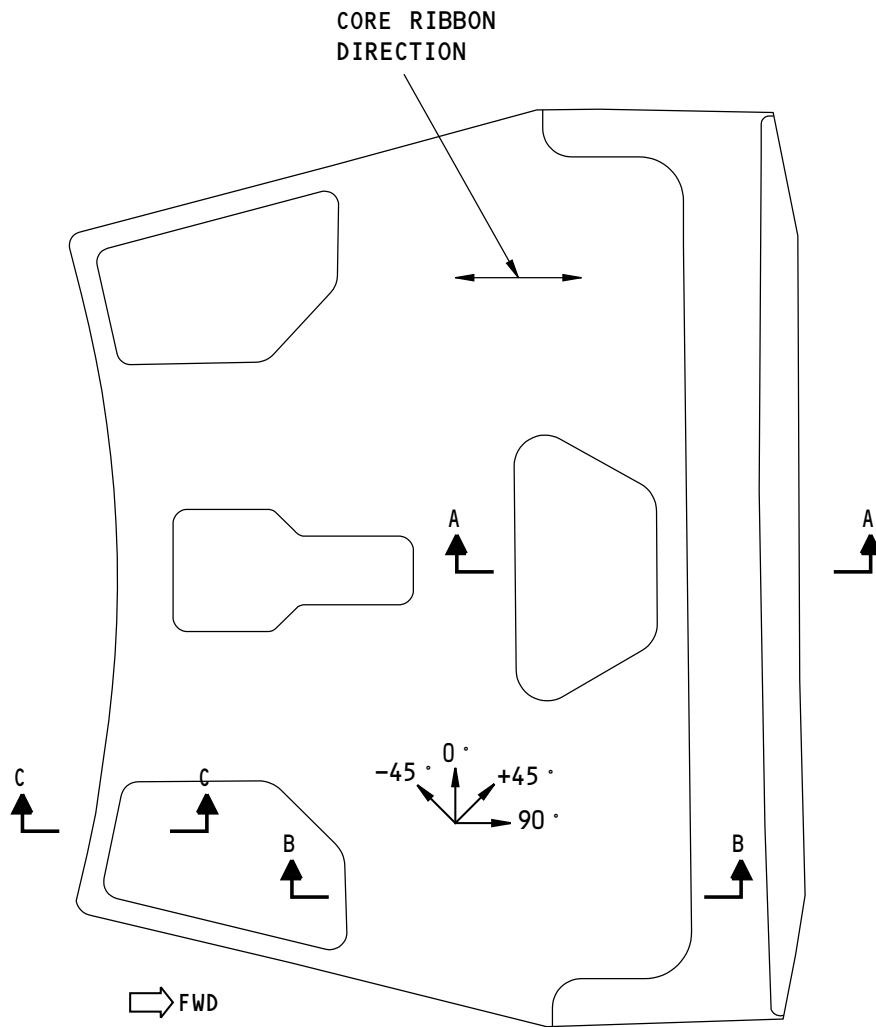
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737-800
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THE VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP AND CORE RIBBON DIRECTION

(A)

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION, AND THE CORE RIBBON DIRECTION.
- REFER TO FIGURE 11, SECTIONS A-A, B-B AND C-C FOR THE PLY SEQUENCE AT THOSE LOCATIONS.
- REFER TO FIGURE 11, TABLE 11 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN SECTIONS A-A, B-B AND C-C.

F39347 S0006591832_V2

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Common Blocker Door Panel Figure 2,
Item [3]
Figure 11 (Sheet 1 of 3)

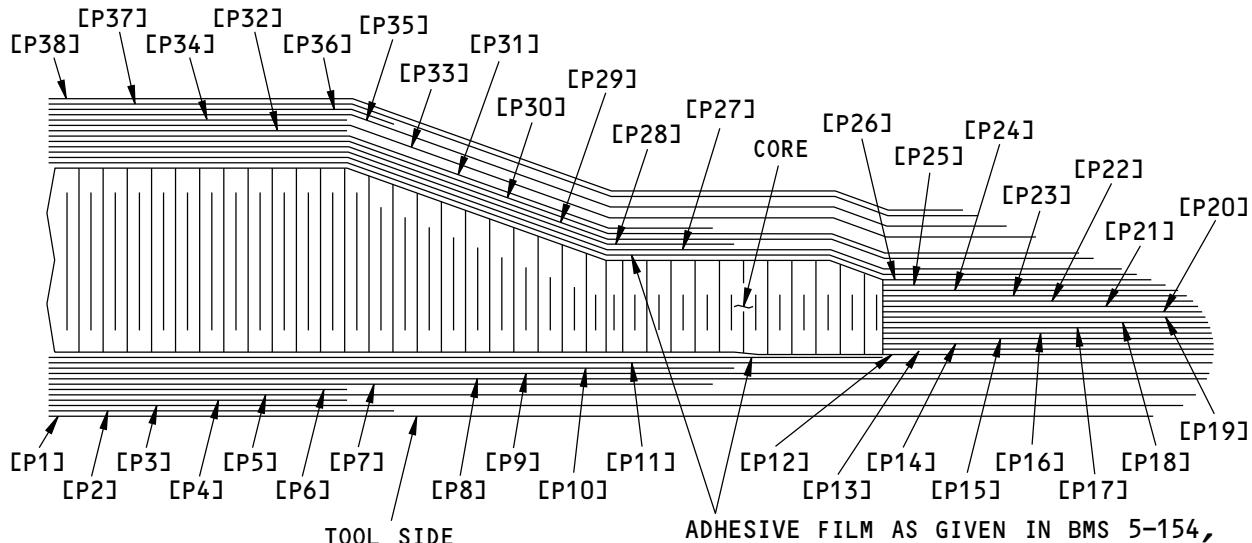
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IDENTIFICATION 2
Page 30

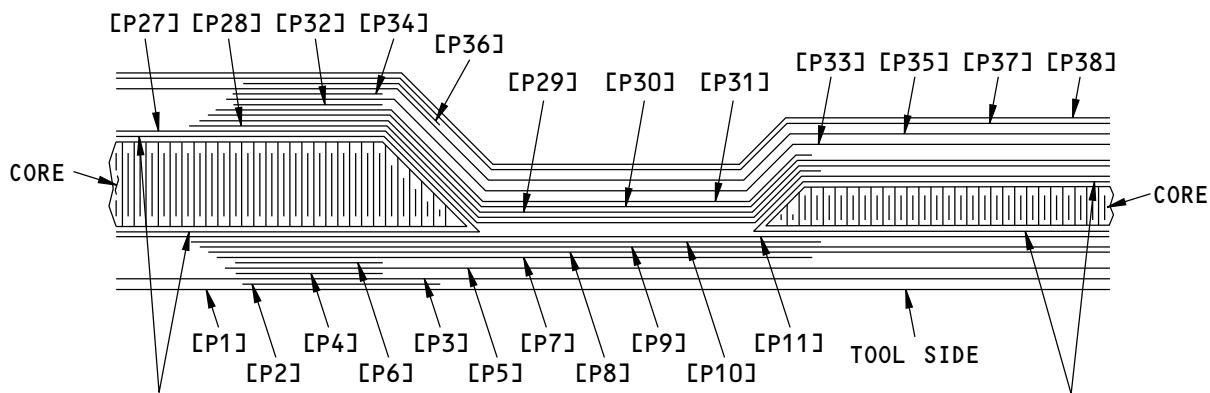
Nov 10/2015

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**737-800
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ADHESIVE FILM AS GIVEN IN BMS 5-154,
TYPE II, CLASS 1, GRADE 5. OPTIONAL
SURFACER AS GIVEN IN D800-10908-1,
TYPE 1, IS RECOMMENDED. YOU CAN USE
BMS 8-341, TYPE III AS AN ALTERNATIVE
FOR D-800-10908-1, TYPE 1.

PLY SEQUENCE
A-A


ADHESIVE FILM AS GIVEN IN BMS 5-154,
TYPE II, CLASS 1, GRADE 5. OPTIONAL
SURFACER AS GIVEN IN D800-10908-1,
TYPE 1, IS RECOMMENDED. YOU CAN USE
BMS 8-341, TYPE III AS AN ALTERNATIVE
FOR D-800-10908-1, TYPE 1.

ADHESIVE FILM AS GIVEN IN BMS 5-154,
TYPE II, CLASS 1, GRADE 5. OPTIONAL
SURFACER AS GIVEN IN D800-10908-1,
TYPE 1, IS RECOMMENDED. YOU CAN USE
BMS 8-341, TYPE III AS AN ALTERNATIVE
FOR D-800-10908-1, TYPE 1.

PLY SEQUENCE
B-B

F46387 S0006591833_V2

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Common Blocker Door Panel Figure 2,
Item [3]**
Figure 11 (Sheet 2 of 3)

54-30-01
IDENTIFICATION 2

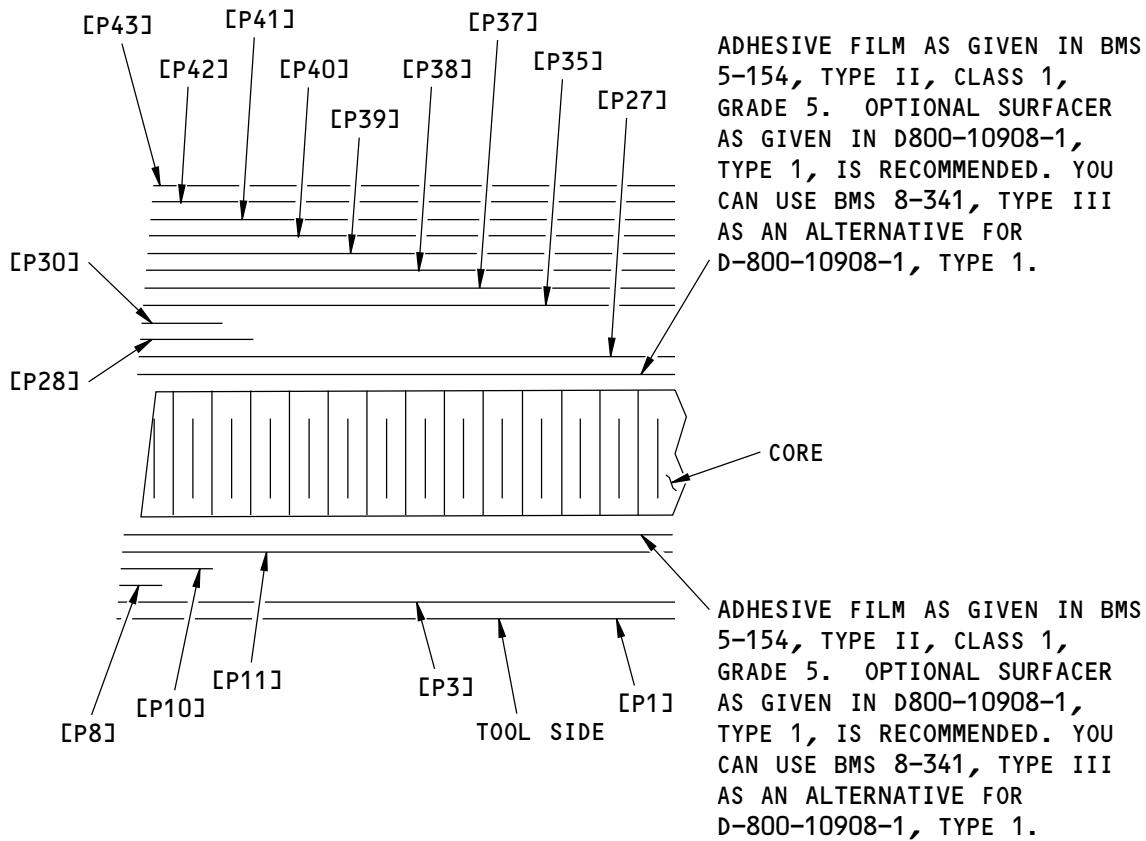
Page 31

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



PLY SEQUENCE
C-C

2454428 S0000570280_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Common Blocker Door Panel Figure 2,
Item [3]
Figure 11 (Sheet 3 of 3)

54-30-01
IDENTIFICATION 2
Page 32
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 11:

PLY MATERIAL AND DIRECTION FOR FIGURE 11, SECTIONS A-A, B-B and C-C			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P2, P3, P11, P13, P15, P17, P19, P21, P23, P25, P27, P35, P36	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 001 THROUGH 4299
P1, P4, P6, P8, P10, P12, P14, P16, P18, P20, P22, P24, P26, P28, P30, P32, P34, P37	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Class 2, Type IV, Style 3K-70-PW	LINE NUMBERS 001 THROUGH 4299
P5, P7, P9, P29, P31, P33	0 degrees	Epoxy impregnated graphite tape as given in BMS 8-297, Class 1, Type III, Grade 190	LINE NUMBERS 001 THROUGH 4299
P38	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-139, Type 120	LINE NUMBERS 001 THROUGH 4299
P39, P40, P41, P42, P43	Optional	Fiberglass prepreg as given in BMS 8-139, Class 1, Style 1581. Optional to use BMS 8-139, Class 1, Style 7781.	LINE NUMBERS 1762 THROUGH 4299

54-30-01

IDENTIFICATION 2

Page 33

Nov 10/2015

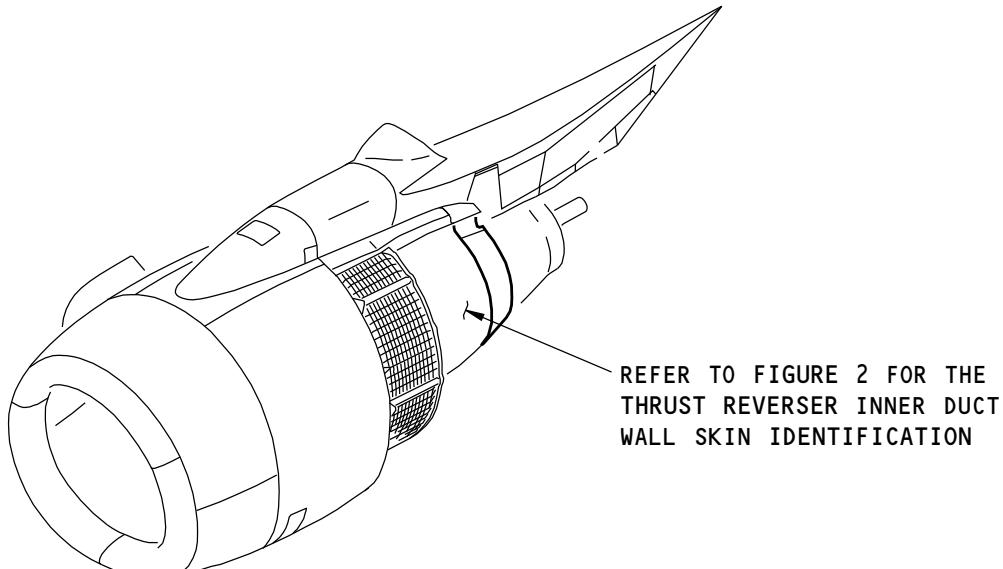
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 3 - THRUST REVERSER INNER DUCT WALL SKIN



NOTES

- REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.
- THE TRANSLATING SLEEVE IS NOT SHOWN.

F13274 S0006591836_V1

Thrust Reverser Inner Duct Wall Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
300A2020	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2178	Wall Assembly
315A2101	Fan Duct Inner Wall Bond Panel Assembly - L.H.
315A2102	Fan Duct Inner Wall Bond Panel Assembly - R.H.
315A2007	Thrust Reverser Interchangeability Installation

54-30-01

IDENTIFICATION 3

Page 1

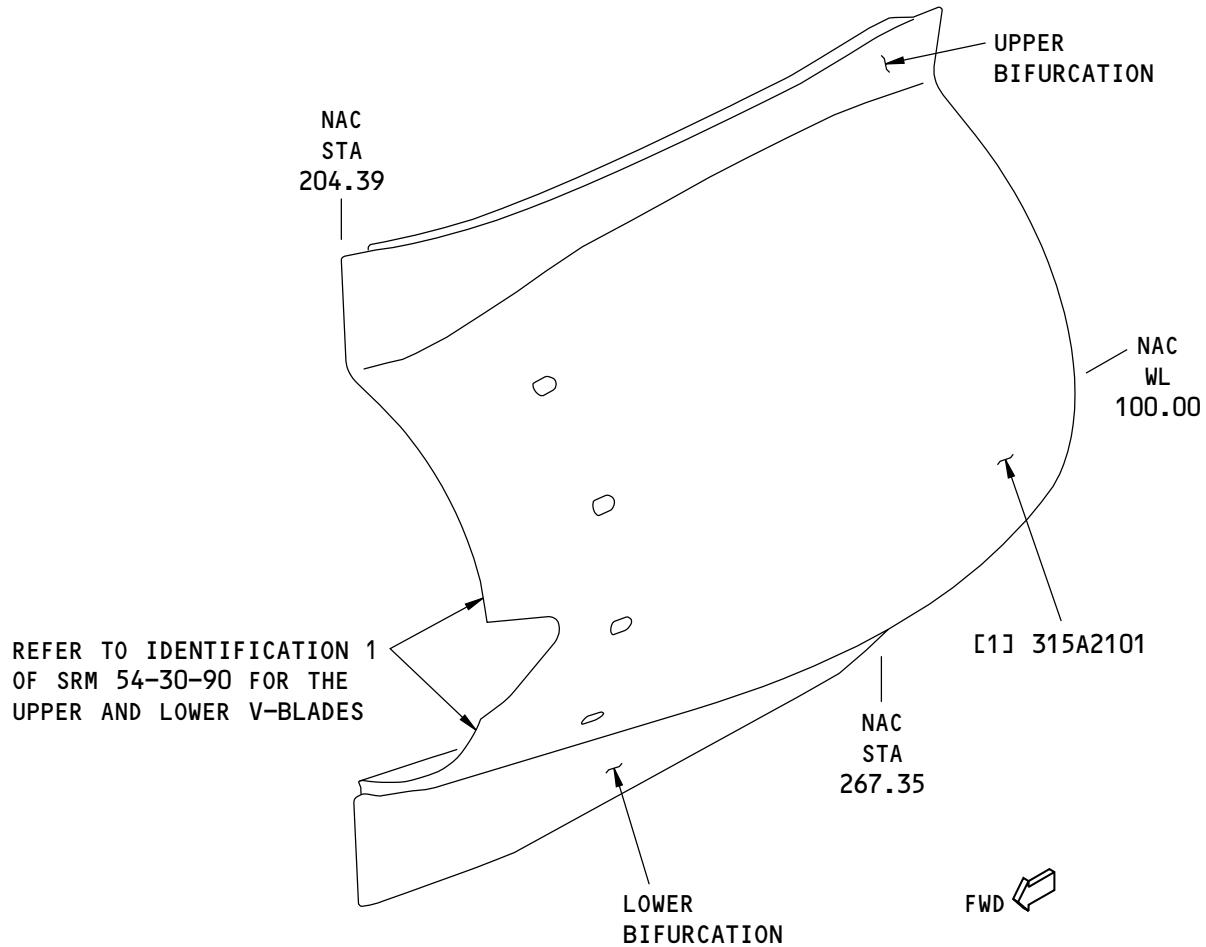
Nov 10/2015

D634A210

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737-800
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT INNER DUCT WALL BOND PANEL IS SHOWN,
RIGHT INNER DUCT WALL BOND PANEL IS ALMOST THE SAME

F13313 S0006591838_V1

Thrust Reverser Inner Duct Wall Skin Identification
Figure 2

54-30-01
IDENTIFICATION 3
Page 2
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Inner Duct Wall Assembly - Bonded Part		Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich and Glass Fiber Reinforced Plastic (GFRP) isolation plies.	
	Skin		Refer to Figure 3.	
	Core	0.96 in. (24.38 mm)	Carbon fiber honeycomb as given in BMS 8-339, Type 6, Class III or V, Grade 5.4. Refer to Figure 3/IDENTIFICATION 3 for the core ribbon direction.	LINE NUMBERS 001 THROUGH 514
			Optional to use BMS 8-124, Type III, Class 1, Grade 6.0.	LINE NUMBERS 485 THROUGH 514
		0.96 in. (24.38 mm)	Aluminum honeycomb as given in BMS 4-25, Type 6-30, Class 3, Grade I.	LINE NUMBERS 515 AND ON
		0.96 in. (24.38 mm)	Fiberglass honeycomb as given in BMS 8-124, Type I, Class 7, Grade 16.0.	LINE NUMBERS 2230 THROUGH 2348
	Core Septum		As given in BMS 5-114, Grade 17.	
	Core	0.47 in. (11.94 mm)	Carbon fiber honeycomb as given in BMS 8-342, Type 3, Class II, Grade 15.0. Refer to Figure 3/IDENTIFICATION 3 for the core ribbon direction.	LINE NUMBERS 001 THROUGH 514
		0.91 in. (23.11 mm)		
		1.00 in. (25.40 mm)		
		0.91 in. (23.11 mm)	Non-metallic honeycomb as given in BMS 8-124, Type I, Class 7, Style C, Grade 16.0.	LINE NUMBERS 515 AND ON
		1.00 in. (25.40 mm)		
		0.47 in. (11.94 mm)	Non-metallic honeycomb as given in BMS 8-125, Type III, Class 2, Grade 19.5. Used with D800-10757-1.	LINE NUMBERS 515 THROUGH 1455
		0.47 in. (11.94 mm)	Non-metallic honeycomb as given in BMS 8-125, Type III, Class 2, Grade 19.5.	LINE NUMBERS 515 THROUGH 1455
		0.47 in. (11.94 mm)	Non-metallic honeycomb as given in BMS 8-125, Type III, Class 2, Grade 17.5.	LINE NUMBERS 1456 AND ON

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

54-30-01

IDENTIFICATION 3

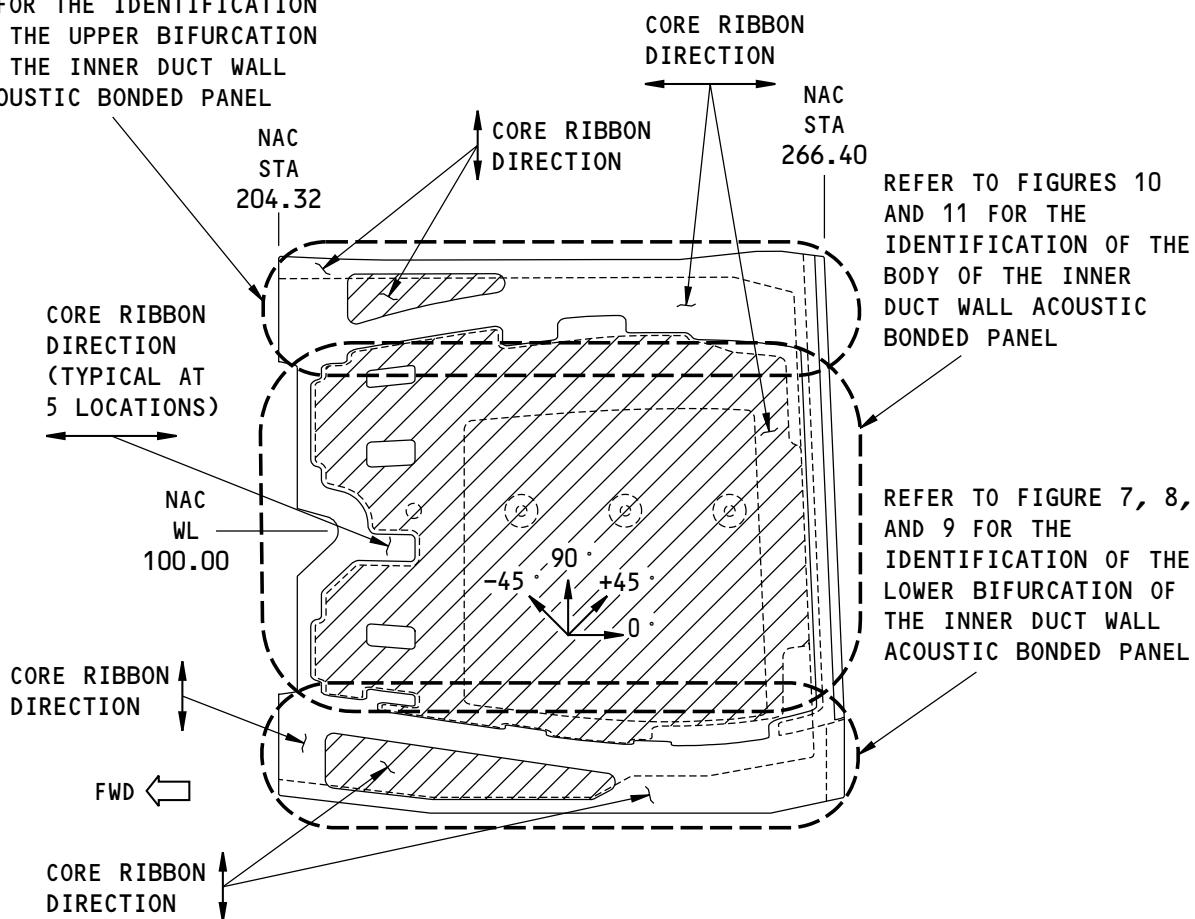
Page 3

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

REFER TO FIGURE 4, 5, AND 6 FOR THE IDENTIFICATION OF THE UPPER BIFURCATION OF THE INNER DUCT WALL ACOUSTIC BONDED PANEL



(VIEW IN THE INBOARD DIRECTION)

(LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME)

A

NOTES

- THE SHADED AREAS SHOW THE LOCATIONS OF PERFORATED ACOUSTIC SKIN.
- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A FOR THE 0 DEGREE PLY DIRECTION.

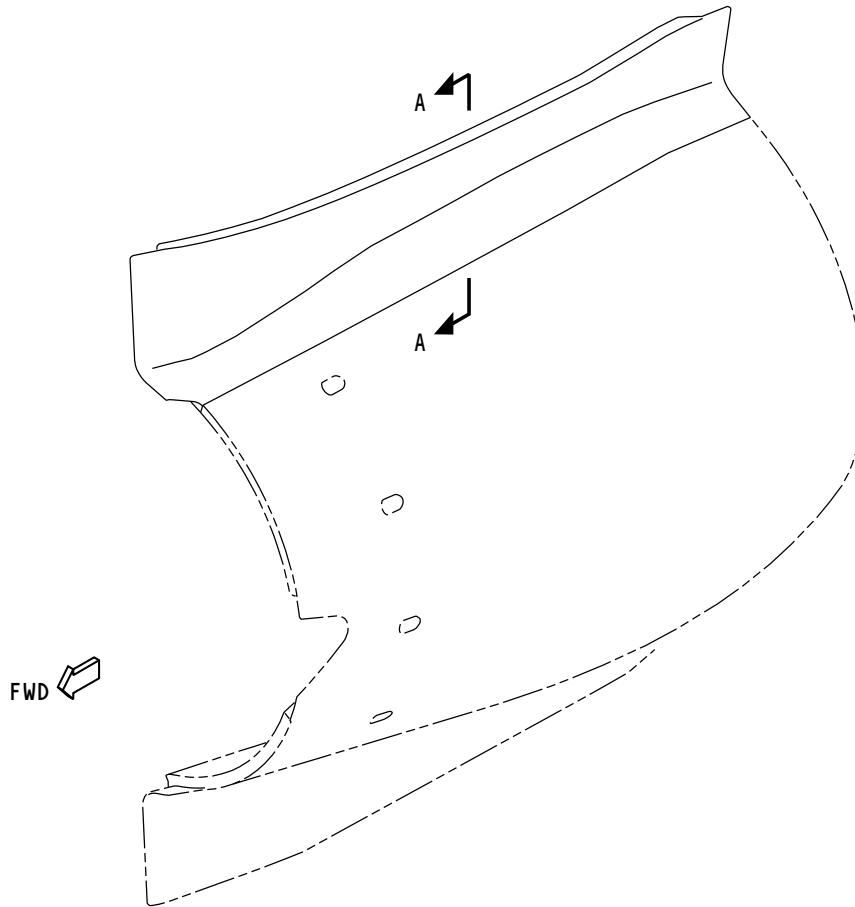
F13472 S0006591840_V2

Ply Direction and Core Ribbon Direction for the Inner Duct Wall Panel, Figure 2, Item [1]
Figure 3

54-30-01
IDENTIFICATION 3
Page 4
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- REFER TO FIGURE 3 FOR THE 0 DEGREE PLY DIRECTION AND CORE RIBBON DIRECTION.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL A.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL B.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL C.

F13333 S0006591841_V2

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 1 of 5)

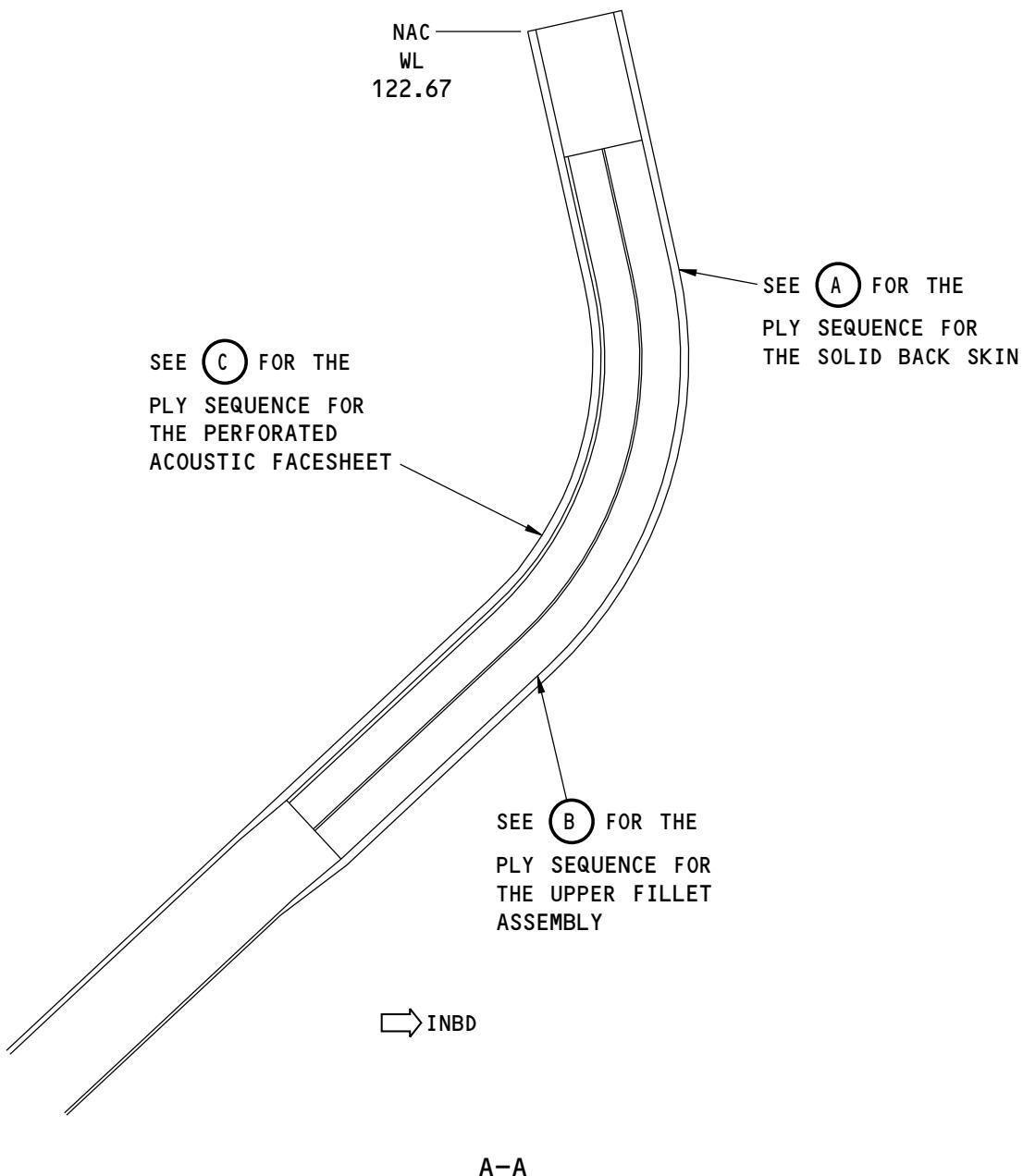
54-30-01
IDENTIFICATION 3
Page 5
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



F13994 S0006591842_V1

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 2 of 5)

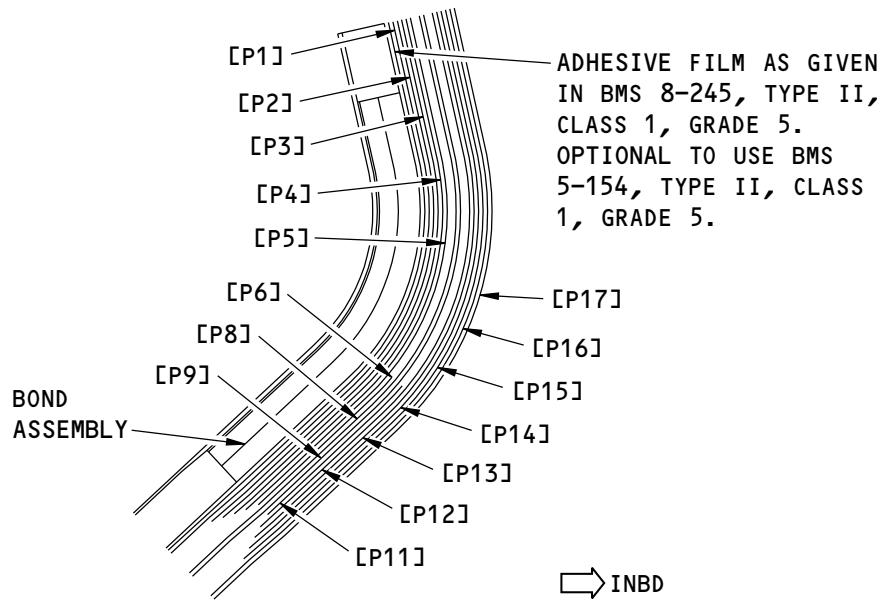
54-30-01
IDENTIFICATION 3
Page 6
Nov 10/2015

D634A210

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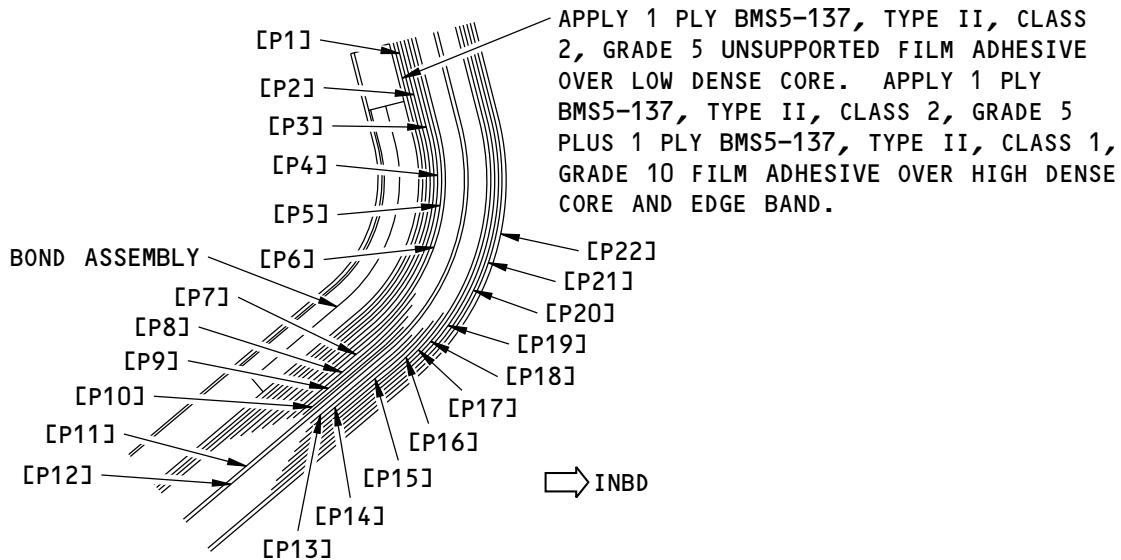


737-800
STRUCTURAL REPAIR MANUAL



SOLID BACK SKIN PLY SEQUENCE
(FOR LINE NUMBERS 001 THROUGH 514)

A



SOLID BACK SKIN PLY SEQUENCE
(FOR LINE NUMBERS 515 THROUGH 771)

A

F13985 S0006591843_V2

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 3 of 5)

54-30-01

IDENTIFICATION 3

Page 7

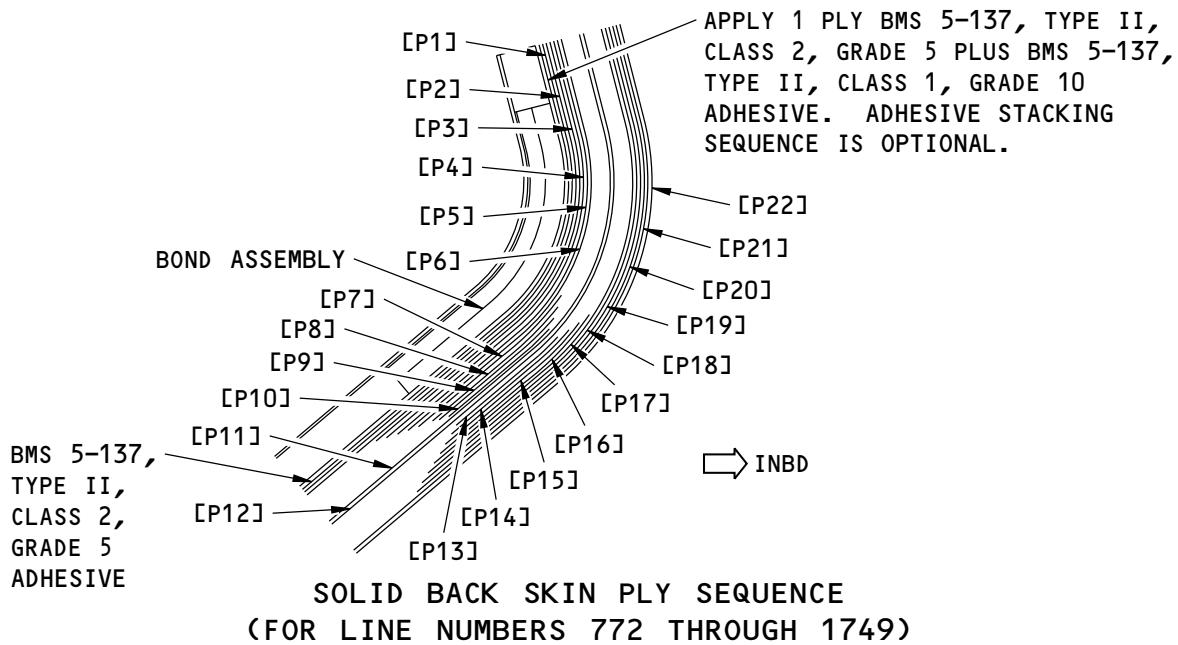
Nov 10/2015

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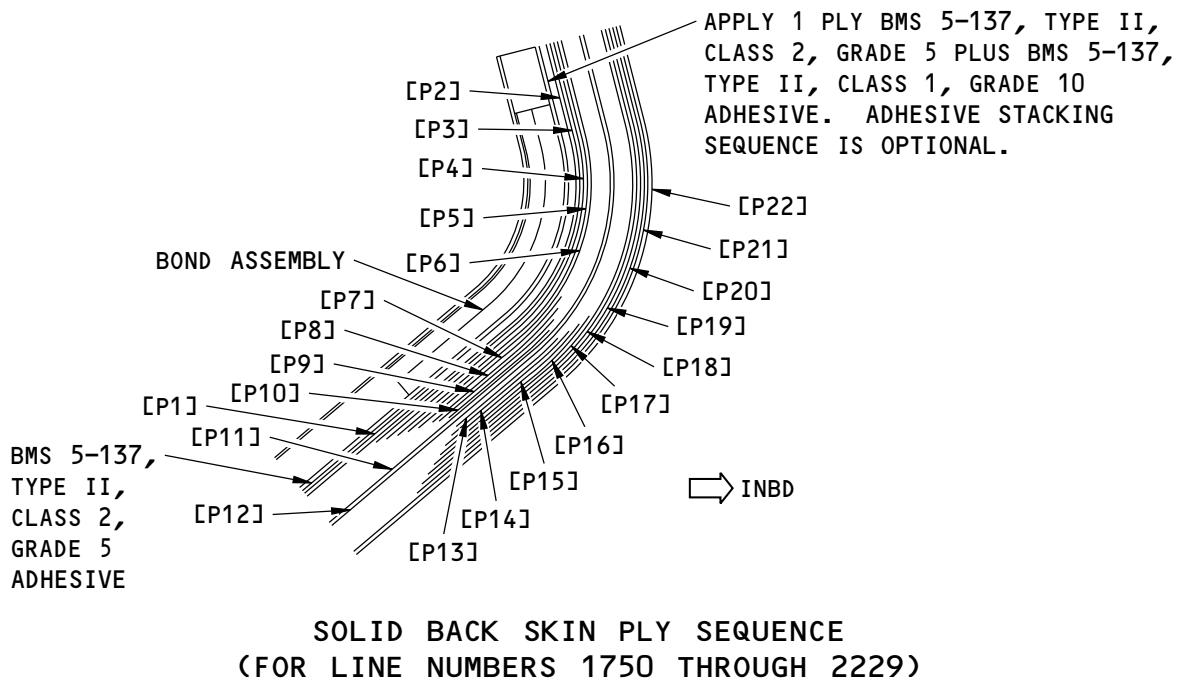
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737-800
STRUCTURAL REPAIR MANUAL



A



A

2372203 S0000542825_V1

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 4 of 5)

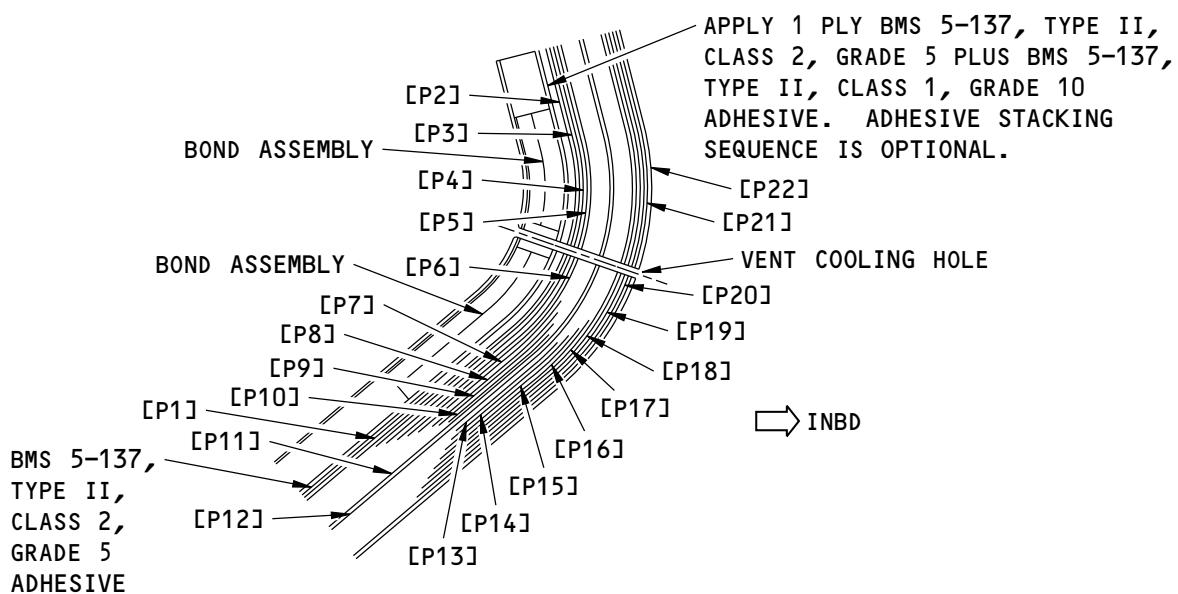
54-30-01
IDENTIFICATION 3
Page 8
Nov 10/2015

D634A210

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737-800
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NOTE: THE VENT COOLING HOLE IS LOCATED
AT NACELLE STATION - 246.00.

SOLID BACK SKIN PLY SEQUENCE
(FOR LINE NUMBERS 2230 AND ON)

A

2372204 S0000542826_V1

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 4 (Sheet 5 of 5)

54-30-01
IDENTIFICATION 3
Page 9
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, DETAIL A			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P1, P3, P5, P12, P14, P16	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 001 THROUGH 514
P2, P4, P6, P8, P9, P11, P13, P15	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 001 THROUGH 514
P17	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 001 THROUGH 514
P1	+ or -45 degrees	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 515 THROUGH 771
P2, P4, P6, P8, P10, P13, P15, P17, P19, P21	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 515 THROUGH 771
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	+ or -45 degrees	Epoxy impregnated bias woven graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX.	LINE NUMBERS 515 THROUGH 771
P22	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 515 THROUGH 771
P1, P22	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 772 AND ON
P2, P4, P6, P8, P10, P13, P15, P17, P19, P21	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 772 AND ON
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	+ or -45 degrees	Epoxy impregnated bias woven graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX.	LINE NUMBERS 772 AND ON

54-30-01

IDENTIFICATION 3

Page 10

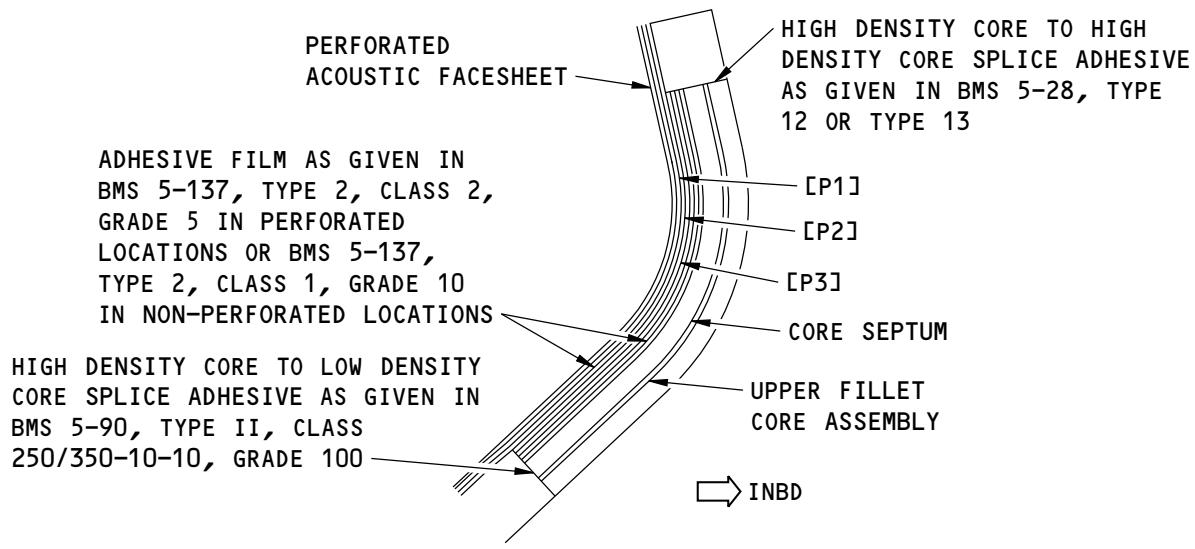
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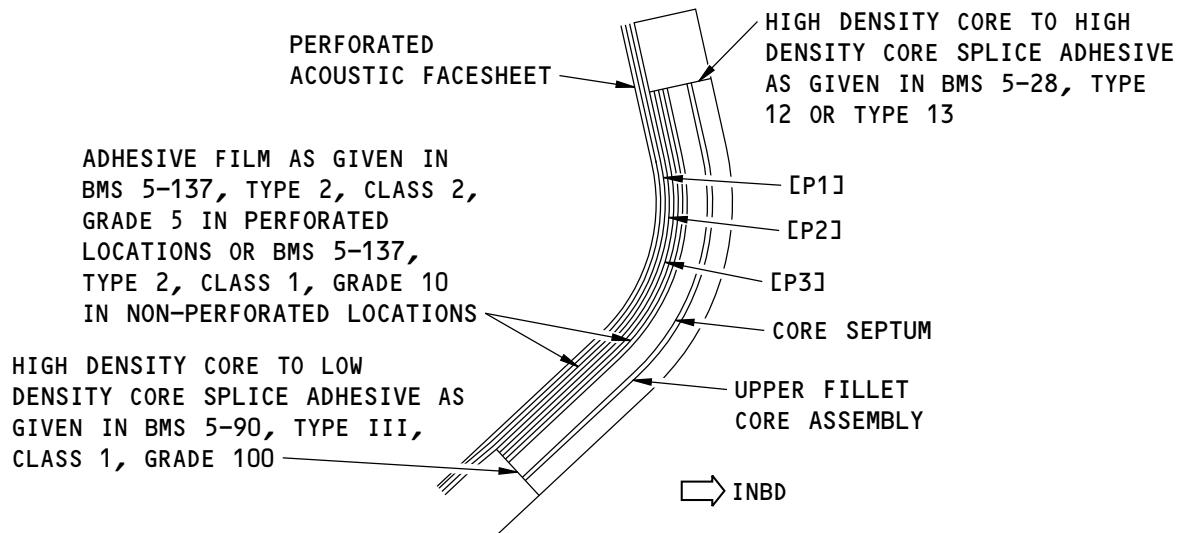


737-800
STRUCTURAL REPAIR MANUAL



UPPER FILLET ASSEMBLY PLY SEQUENCE
(FOR LINE NUMBERS 001 THROUGH 514)

(B)



UPPER FILLET ASSEMBLY PLY SEQUENCE
(FOR LINE NUMBERS 515 THROUGH 771)

(B)

2372724 S0000542827_V1

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 5 (Sheet 1 of 2)

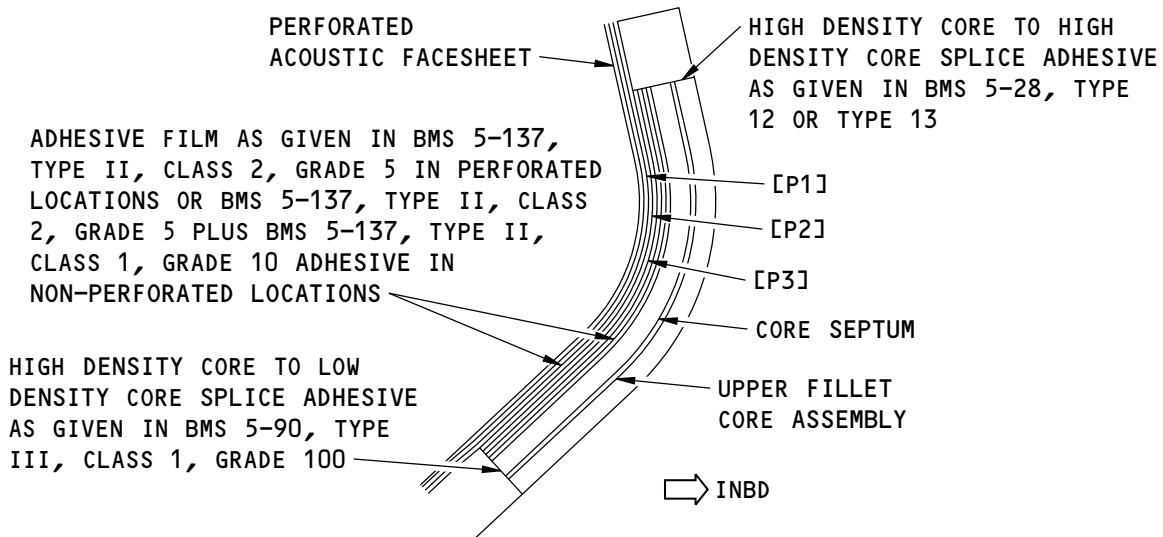
54-30-01
IDENTIFICATION 3
Page 11
Nov 10/2015

D634A210

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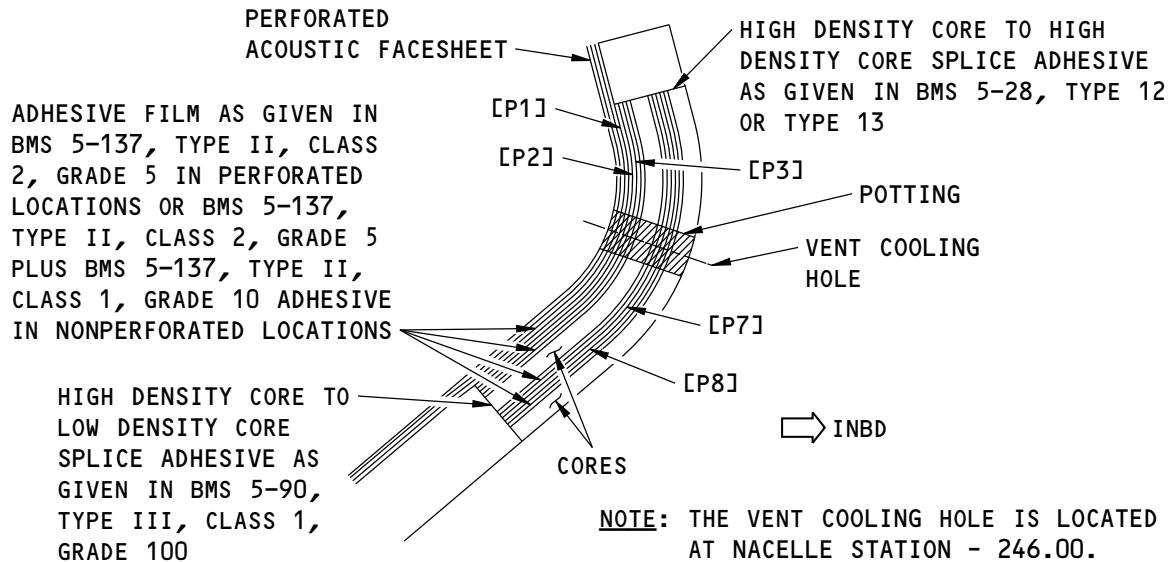


737-800
STRUCTURAL REPAIR MANUAL



UPPER FILLET ASSEMBLY PLY SEQUENCE
(FOR LINE NUMBERS 772 THROUGH 2348)

(B)



NOTE: THE VENT COOLING HOLE IS LOCATED
AT NACELLE STATION - 246.00.

PLY SEQUENCE
(FOR LINE NUMBERS 2349 AND ON)

(B)

2372736 S0000542829_V1

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 5 (Sheet 2 of 2)

54-30-01
IDENTIFICATION 3
Page 12
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 5, DETAIL B			
PLY	DIRECTION	MATERIAL	Effectivity
Perforated Acoustic Facesheet		Fabricate as given in BAC 5317-6, Stage I. Refer to Figure 4, Detail C for Perforated Acoustic Facesheet plies.	
P2	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H.	
P1, P3	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H.	
P7	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 2349 AND ON
P8	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 2349 AND ON

54-30-01

IDENTIFICATION 3

Page 13

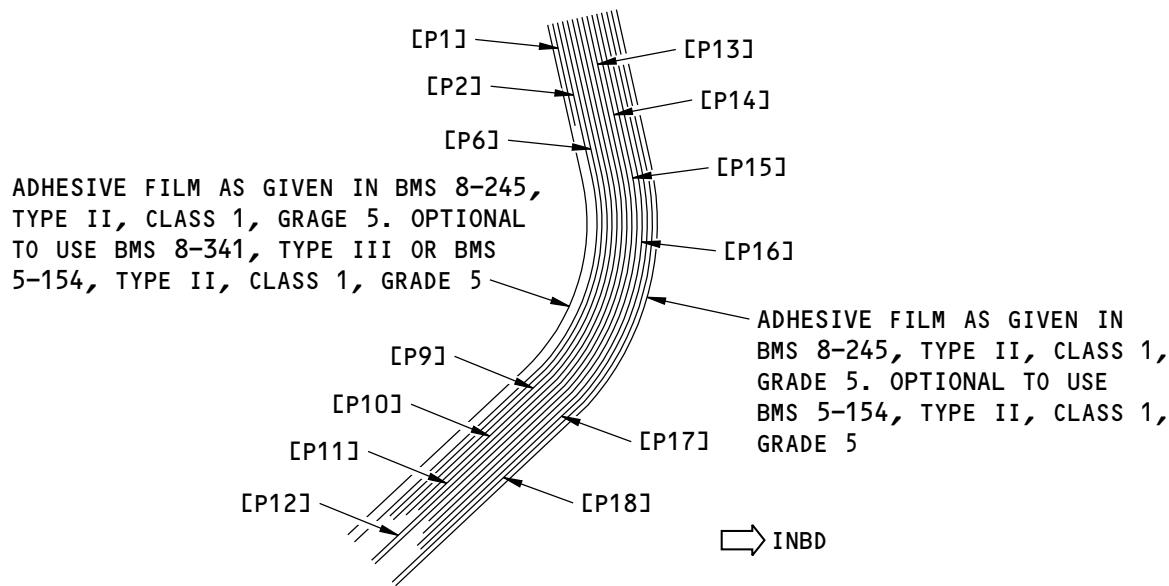
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737-800
STRUCTURAL REPAIR MANUAL



PERFORATED ACOUSTIC
FACESHEET PLY SEQUENCE

(C)

F13496 S0006591847_V2

Ply Sequence for the Inner Duct Wall Skin - Upper Bifurcation
Figure 6

54-30-01
IDENTIFICATION 3
Page 14
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 6, DETAIL C		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.
P2, P9, P11, P14, P16, P18	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.
P6, P10, P12, P13, P15, P17	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.

54-30-01

IDENTIFICATION 3

Page 15

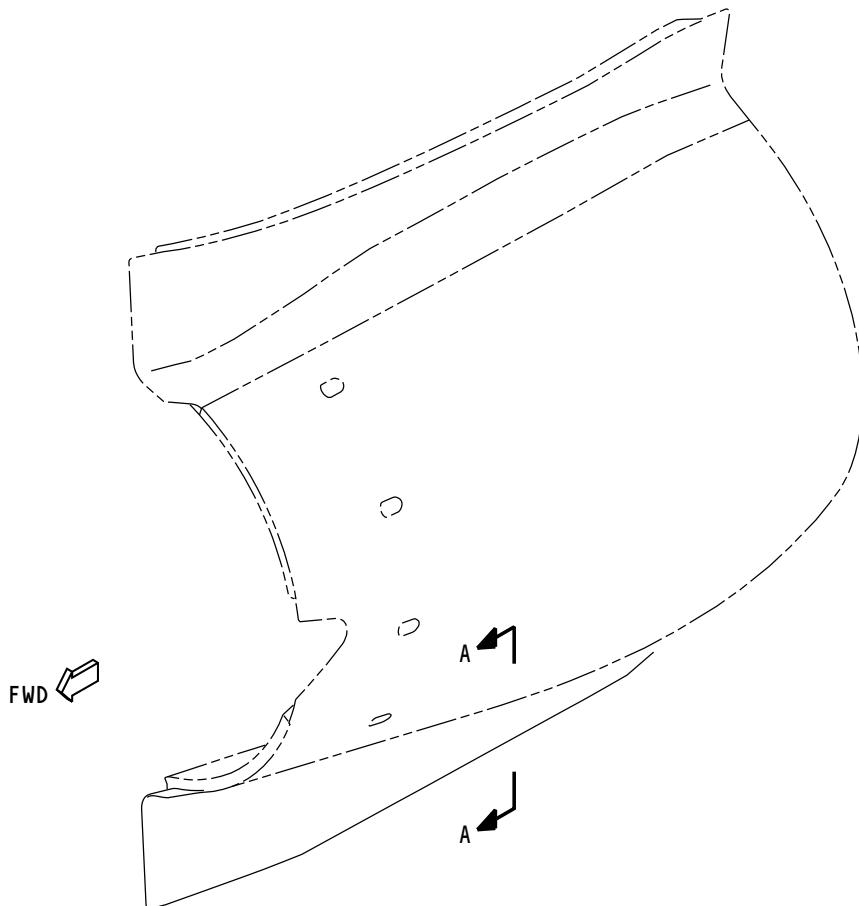
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**737-800
STRUCTURAL REPAIR MANUAL**



NOTES

- REFER TO FIGURE 3 FOR THE 0 DEGREE PLY DIRECTION AND CORE RIBBON DIRECTION.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL A.
- REFER TO TABLE 7 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL B.
- REFER TO TABLE 8 FOR THE DIRECTION AND MATERIAL OF THE PLIES SHOWN IN DETAIL C.

F14003 S0006591849_V1

**Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 1 of 4)**

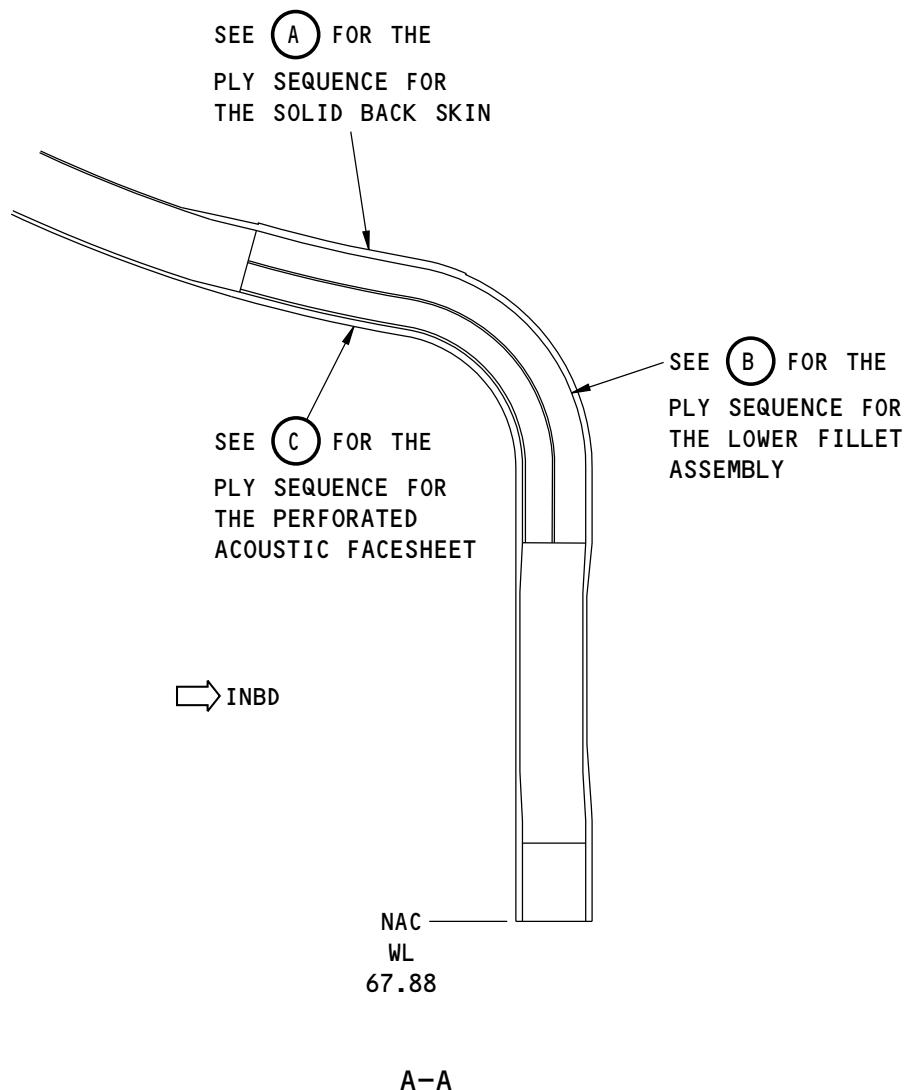
54-30-01
IDENTIFICATION 3
Page 16
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



A-A

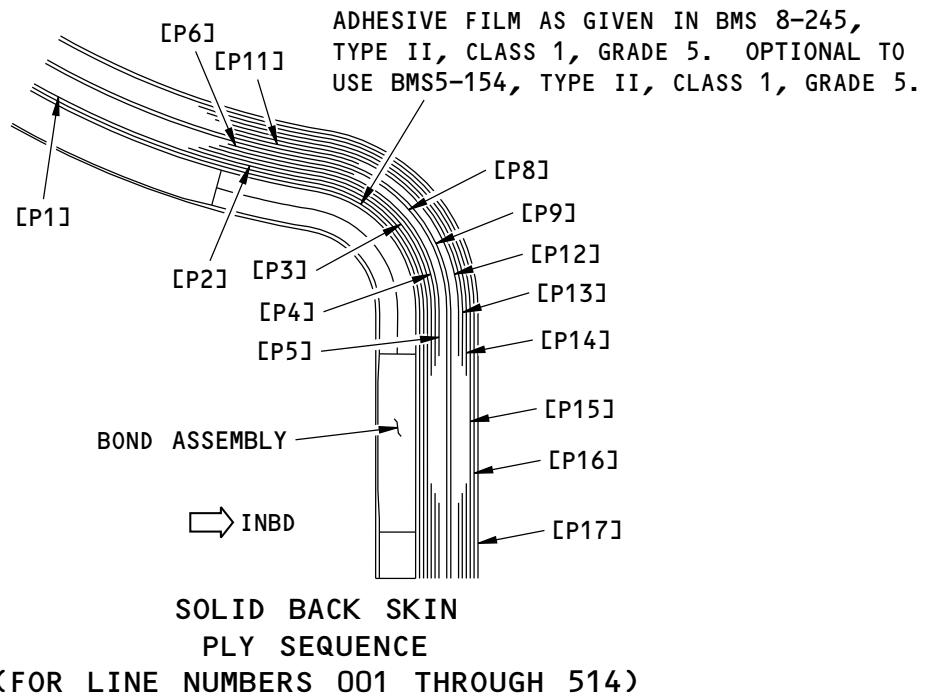
F14126 S0006591850_V1

Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 2 of 4)

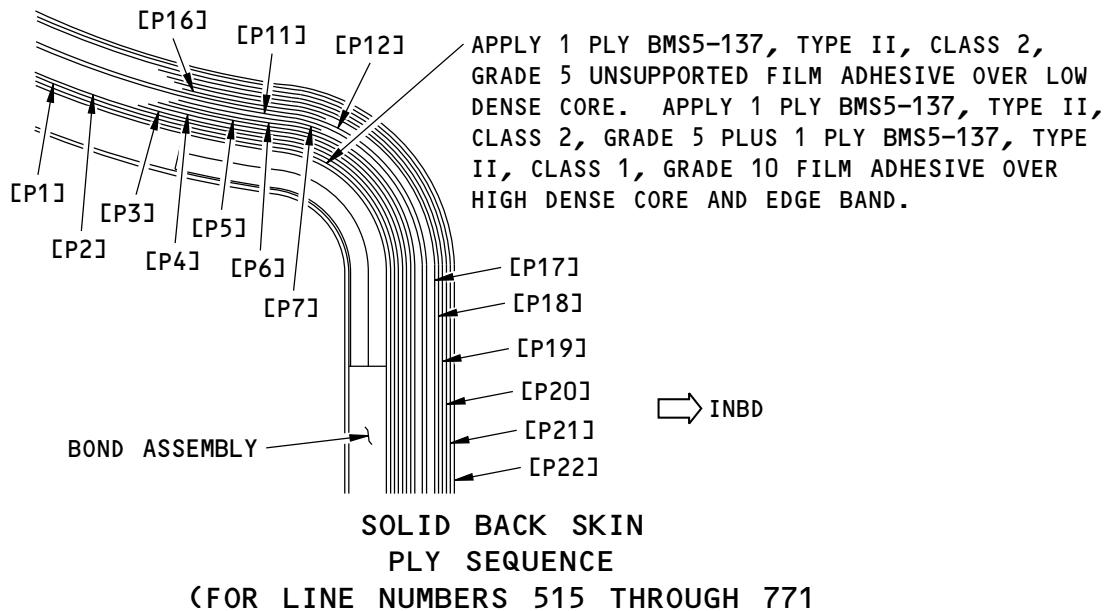
54-30-01
IDENTIFICATION 3
Page 17
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



A



A

2373012 S0000542831_V1

Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 3 of 4)

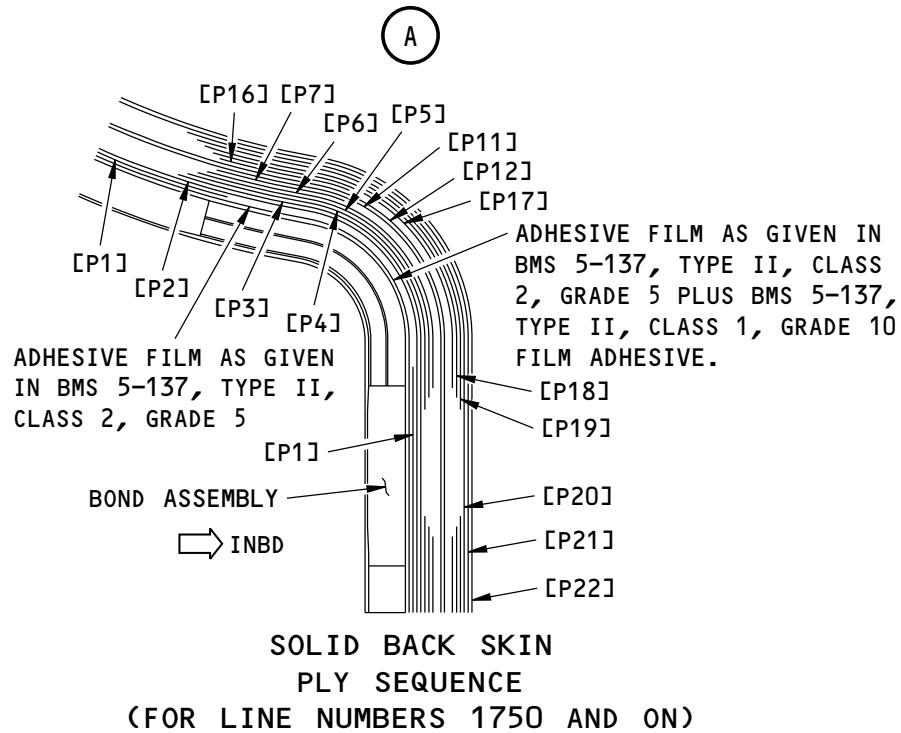
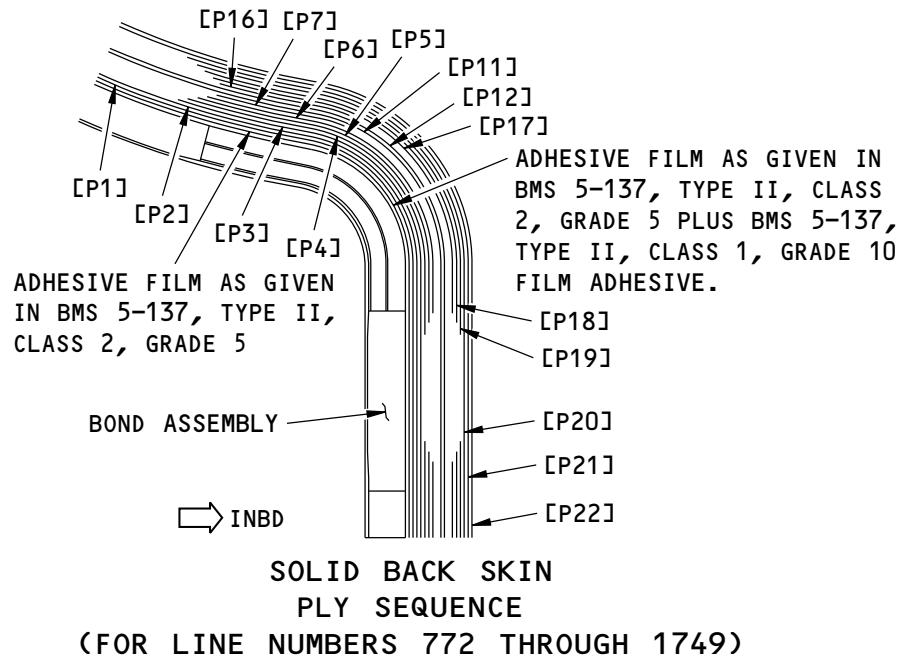
54-30-01
IDENTIFICATION 3
Page 18
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



2374101 S0000542832_V1

Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 7 (Sheet 4 of 4)

54-30-01
IDENTIFICATION 3
Page 19
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 7, DETAIL A			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P1, P3, P5, P12, P14, P16	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 001 THROUGH 514
P2, P4, P6, P8, P9, P11, P13, P15	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 001 THROUGH 514
P17	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 001 THROUGH 514
P1	+ or - 45 degrees	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 515 THROUGH 771
P3, P5, P7, P11, P12, P16, P18, P20	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX.	LINE NUMBERS 515 AND ON
P2, P4, P6, P17, P19, P21	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 515 AND ON
P22	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 515 AND ON
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 772 AND ON

54-30-01

IDENTIFICATION 3

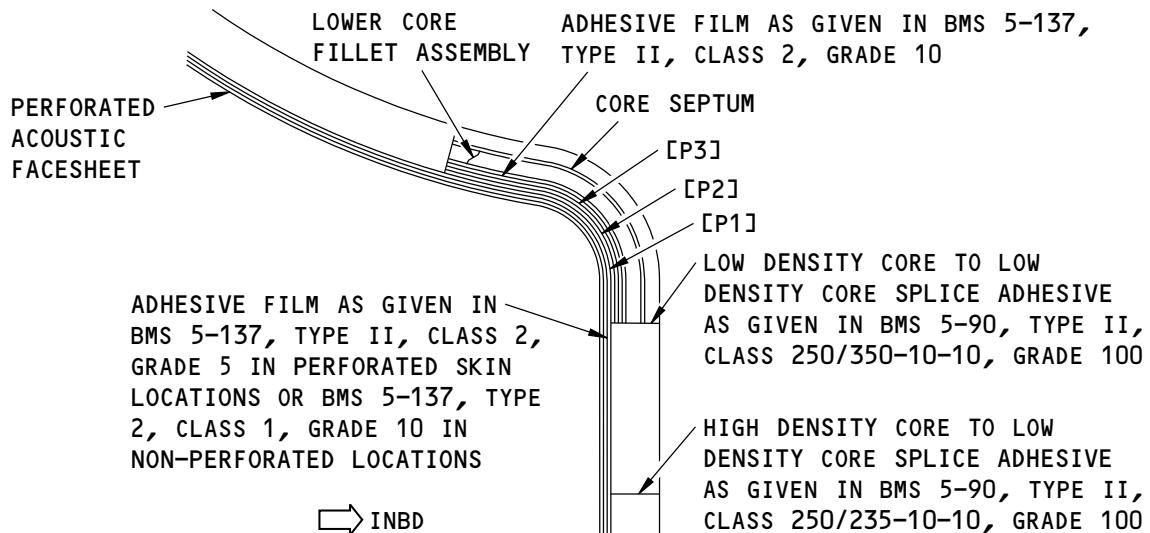
Page 20

Nov 10/2015

D634A210

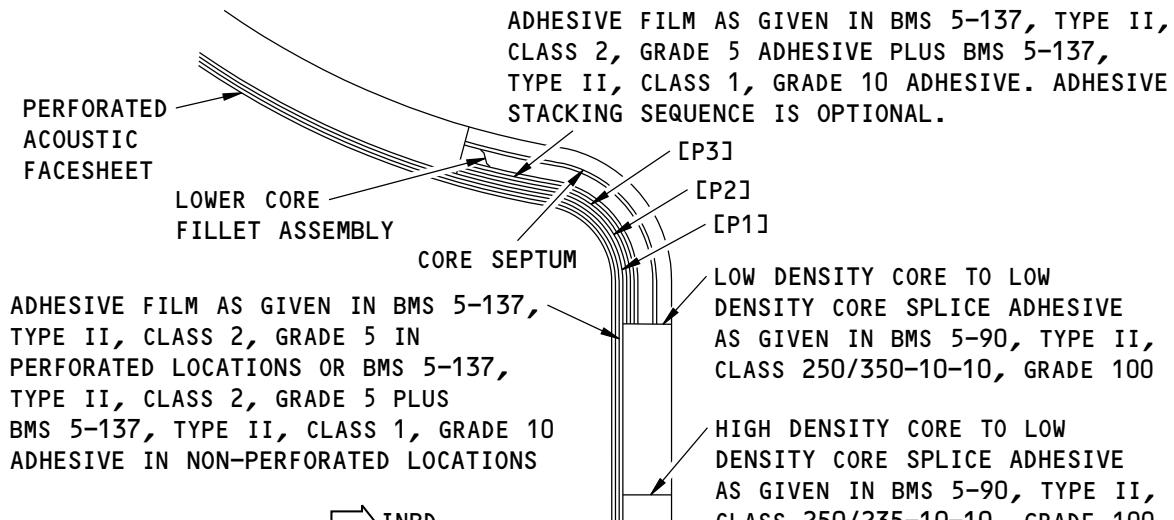
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**737-800
STRUCTURAL REPAIR MANUAL**



**LOWER FILLET ASSEMBLY
PLY SEQUENCE
(FOR LINE NUMBERS 001 THROUGH 771)**

(B)



**LOWER FILLET ASSEMBLY
PLY SEQUENCE
(FOR LINE NUMBERS 772 THROUGH 2348)**

(B)

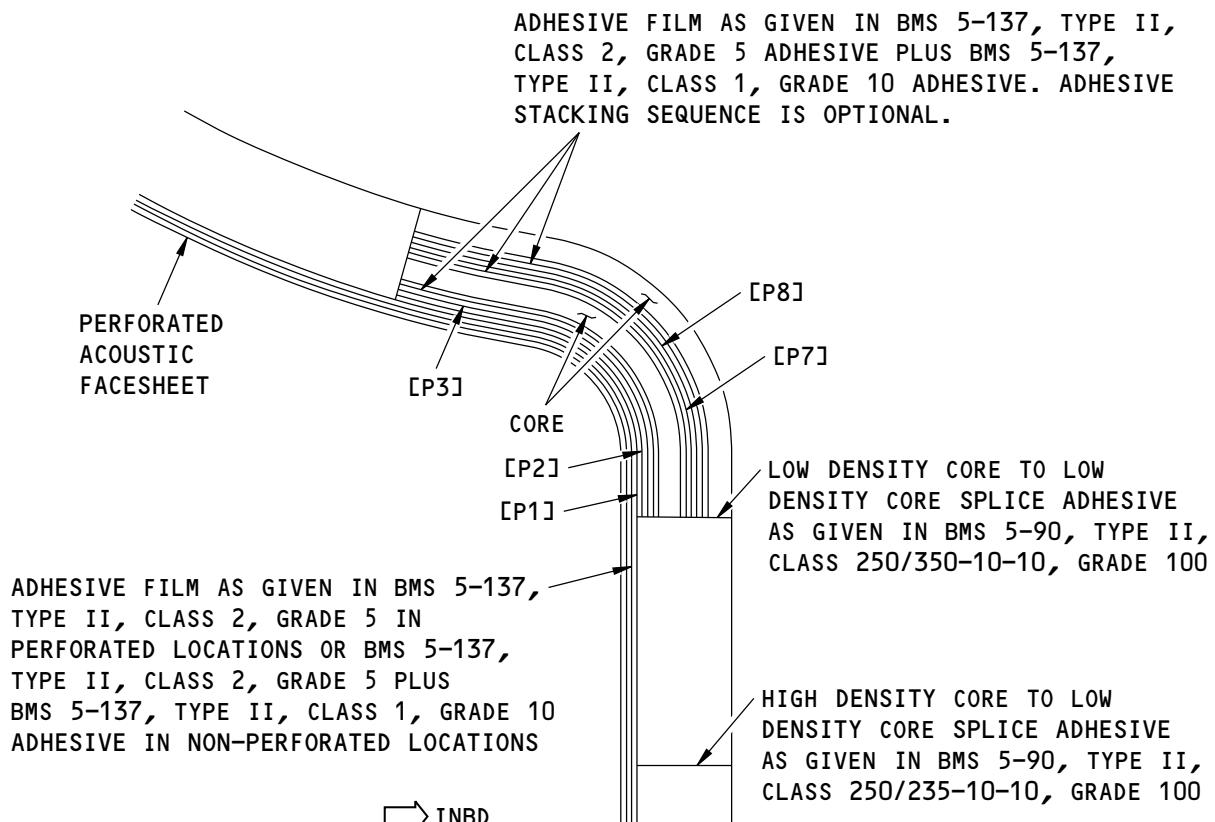
2374254 S0000542833_V1

**Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 8 (Sheet 1 of 2)**

54-30-01
IDENTIFICATION 3
Page 21
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



LOWER FILLET ASSEMBLY
PLY SEQUENCE
(FOR LINE NUMBERS 2349 AND ON)

B

2374267 S0000542835_V1

Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 8 (Sheet 2 of 2)

54-30-01
IDENTIFICATION 3
Page 22
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 7:

PLY MATERIAL AND DIRECTION FOR FIGURE 8, DETAIL B			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
Perforated Acoustic Facesheet		Fabricate as given in BAC 5317-6, Stage I. Refer to Figure 4, Detail C for Perforated Acoustic Facesheet plies.	
P2	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type 3, Class 2, Style 3K-135-8H.	
P1, P3	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type 3, Class 2, Style 3K-135-8H.	
P7	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 2349 AND ON
P8	+ or -45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 2349 AND ON

54-30-01

IDENTIFICATION 3

Page 23

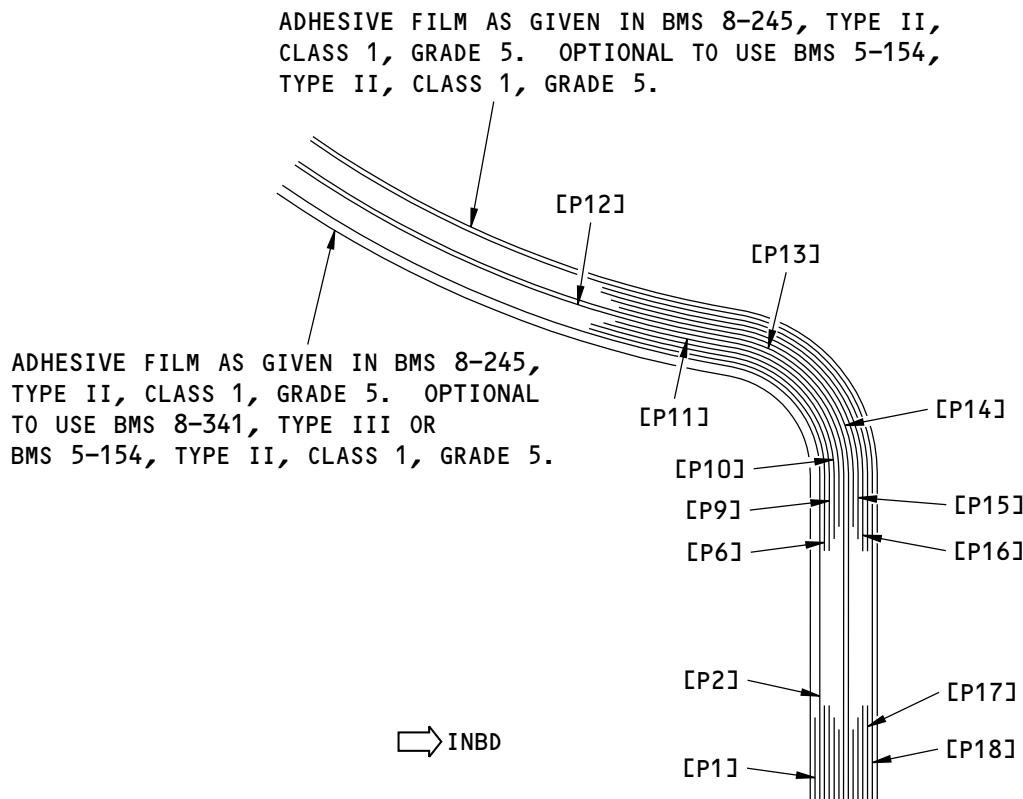
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737-800
STRUCTURAL REPAIR MANUAL



PERFORATED ACOUSTIC
FACESHEET PLY SEQUENCE

F14015 S0006591855_V2

Ply Sequence for the Inner Duct Wall Skin - Lower Bifurcation
Figure 9

54-30-01
IDENTIFICATION 3
Page 24
Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

Table 8:

PLY MATERIAL AND DIRECTION FOR FIGURE 9, DETAIL C		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.
P2, P9, P11, P14, P16, P18	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.
P6, P10, P12, P13, P15, P17	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class I, Style 3K-70-PW.

54-30-01

IDENTIFICATION 3

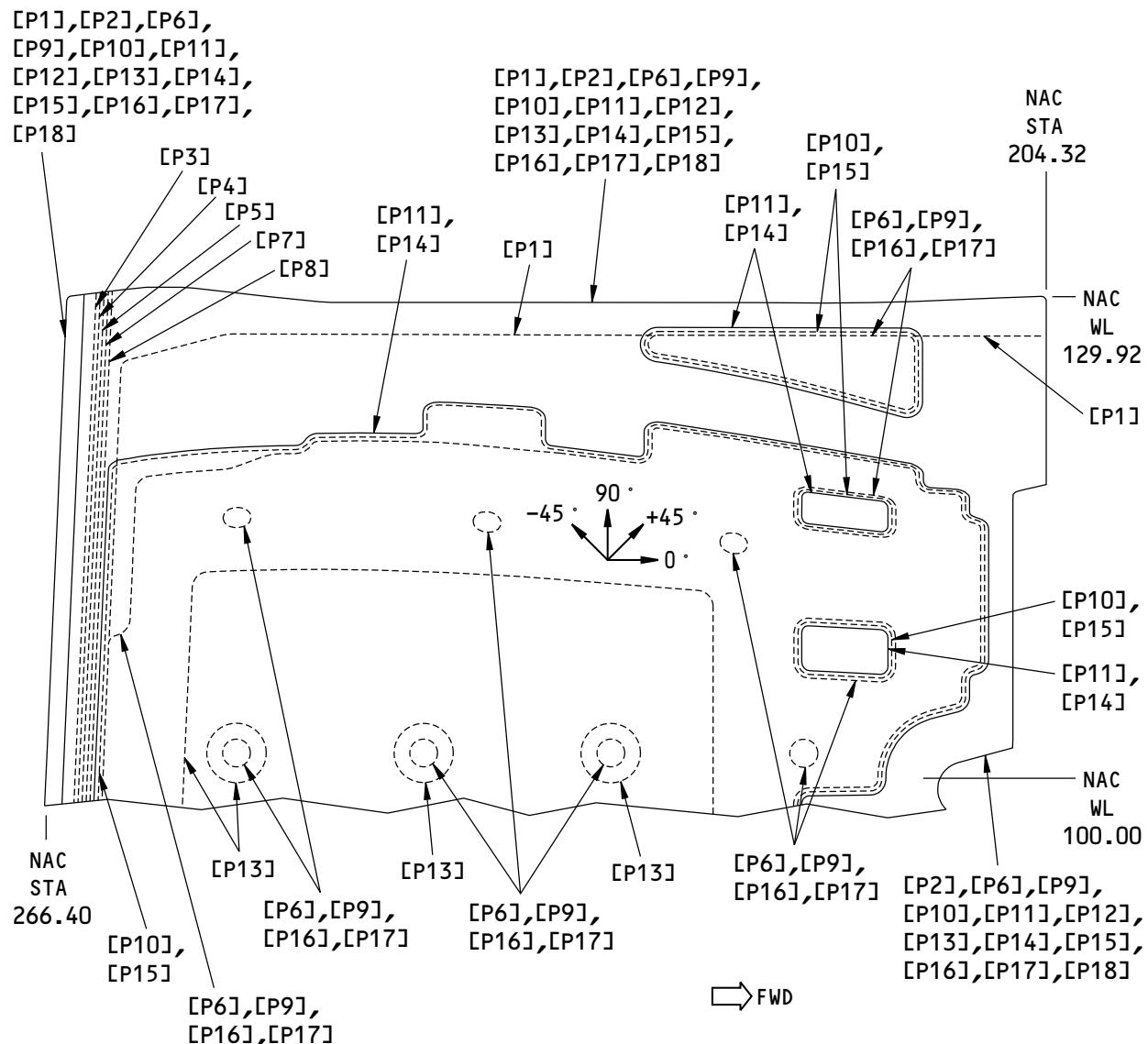
Page 25

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



(VIEW IN THE OUTBOARD DIRECTION ABOVE NAC WL 100.00)

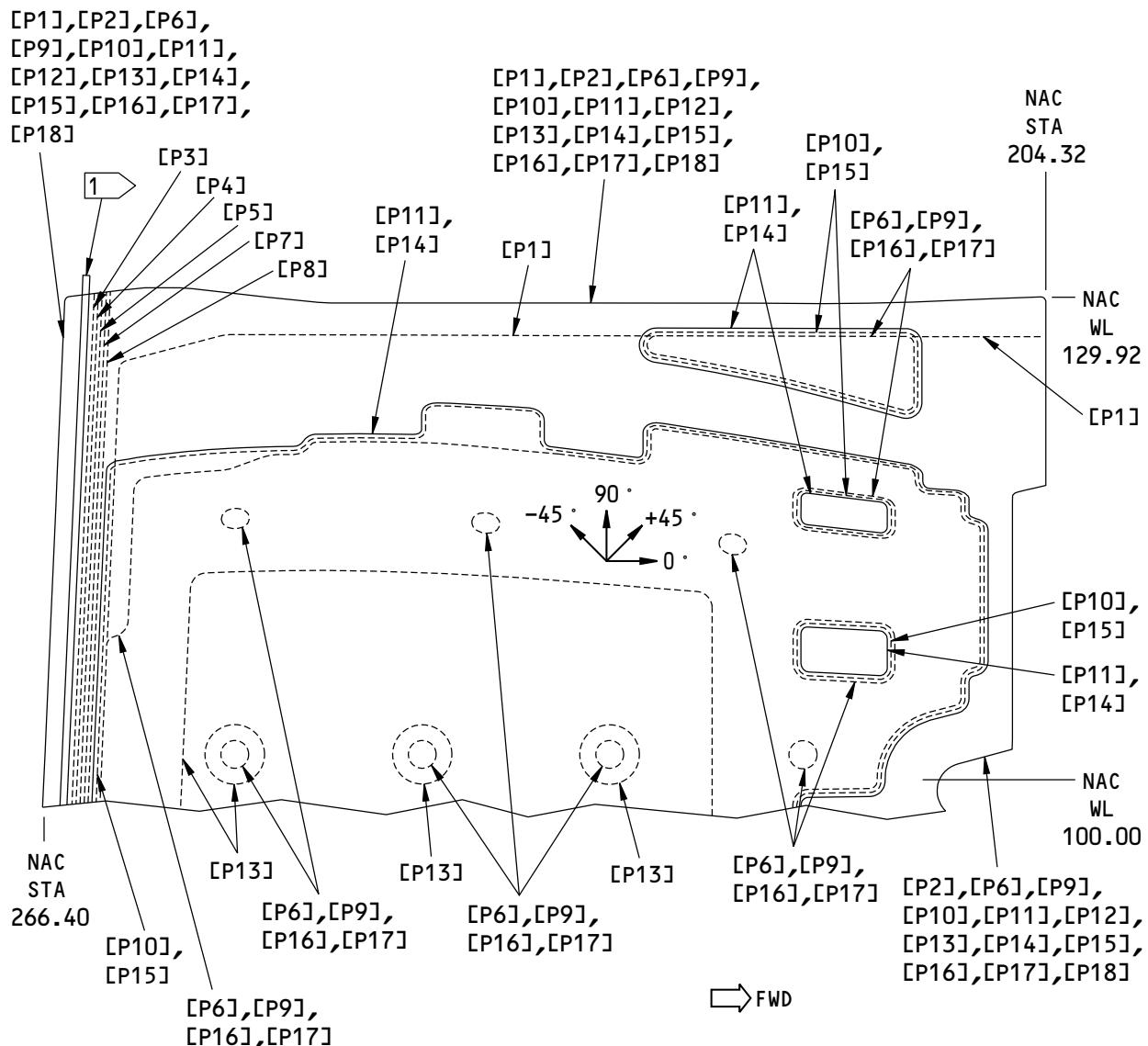
FOR LINE NUMBERS 001 THROUGH 17

K05350 S0006591857_V2

Ply Orientation and Ply Sequence for the Inner Duct Wall Acoustic Skin
Figure 10 (Sheet 1 of 4)

54-30-01
IDENTIFICATION 3
Page 26
Nov 10/2015

**737-800
STRUCTURAL REPAIR MANUAL**



NOTES

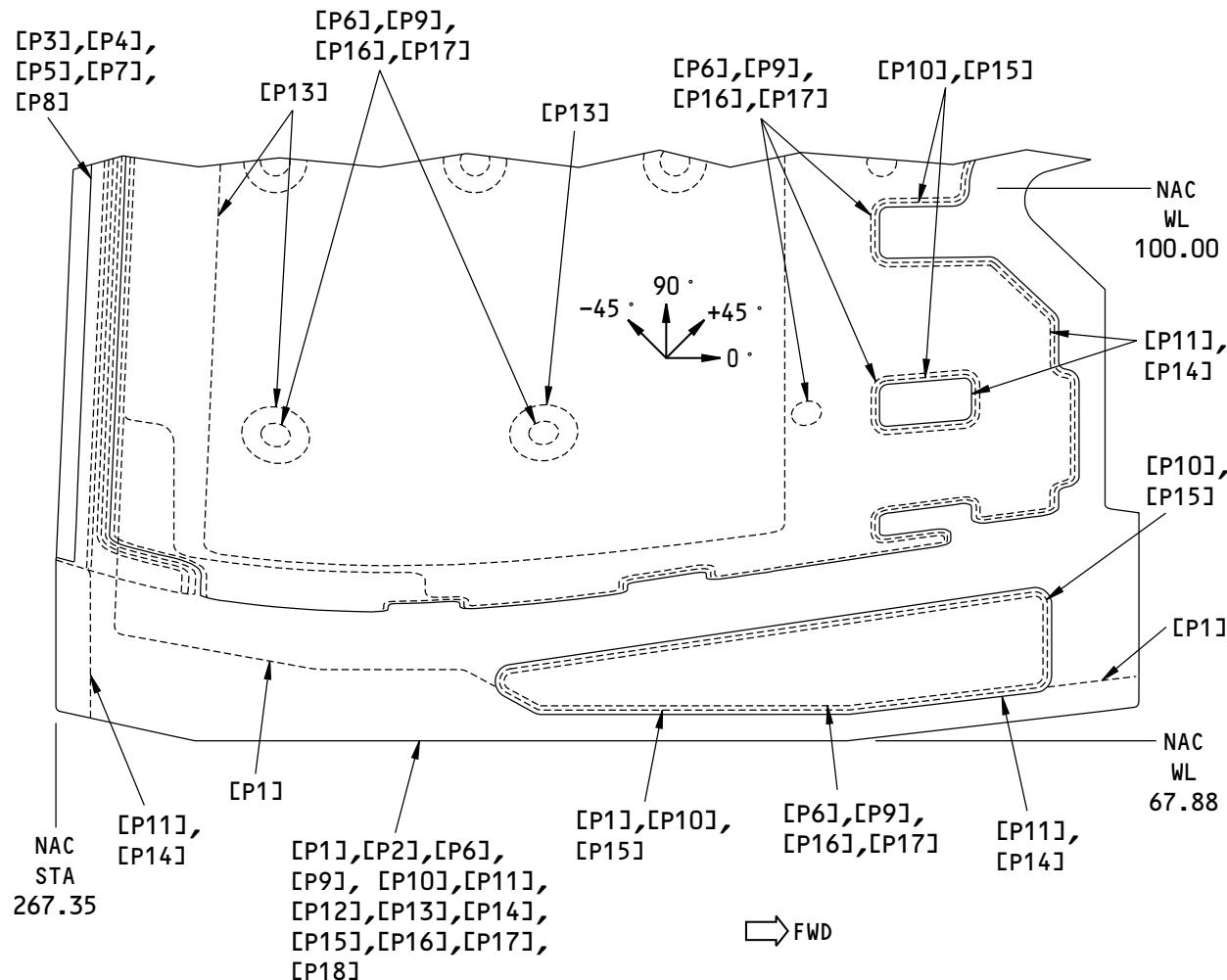
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(VIEW IN THE OUTBOARD DIRECTION ABOVE NAC WL 100.00)
FOR LINE NUMBERS 18 AND ON

2374300 S0000542838_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Acoustic Skin
Figure 10 (Sheet 2 of 4)

54-30-01
IDENTIFICATION 3
Page 27
Nov 10/2015



(VIEW IN THE OUTBOARD DIRECTION BELOW NAC WL 100.00)

FOR LINE NUMBERS 001 THROUGH 17

K05451 S0006591858_V2

Ply Orientation and Ply Sequence for the Inner Duct Wall Acoustic Skin
Figure 10 (Sheet 3 of 4)

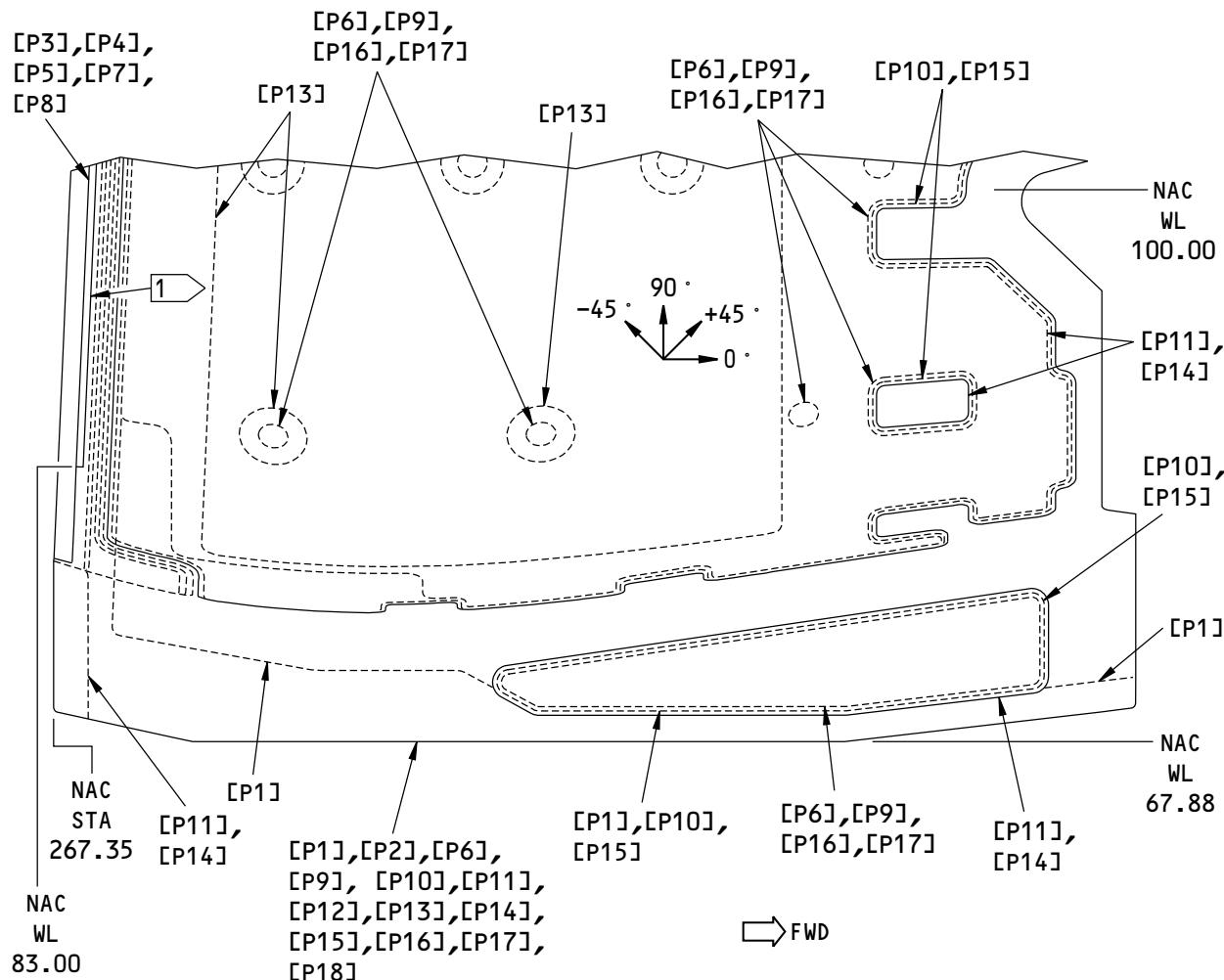
54-30-01

IDENTIFICATION 3

Page 28

Nov 10/2015

D634A210



NOTES

- 1 → OPTIONAL TO FILL IN DEPRESSIONS WITH MORE PLIES OF BMS 8-139, STYLE 1581 IF NECESSARY IN THIS AREA.

(VIEW IN THE OUTBOARD DIRECTION BELOW NAC WL 100.00)
FOR LINE NUMBERS 18 AND ON

2374304 S0000542853_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Acoustic Skin
Figure 10 (Sheet 4 of 4)

54-30-01
IDENTIFICATION 3
Page 29
Nov 10/2015



**737-800
STRUCTURAL REPAIR MANUAL**

Table 9:

PLY MATERIAL AND DIRECTION FOR FIGURE 10		
PLY	DIRECTION	MATERIAL
P1	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.
P2, P9, P11, P14, P16, P18	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.
P6, P10, P12, P13, P15, P17	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.
P3, P4, P5, P7, P8	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type III, Class 2, Style 3K-135-8H.

54-30-01

IDENTIFICATION 3

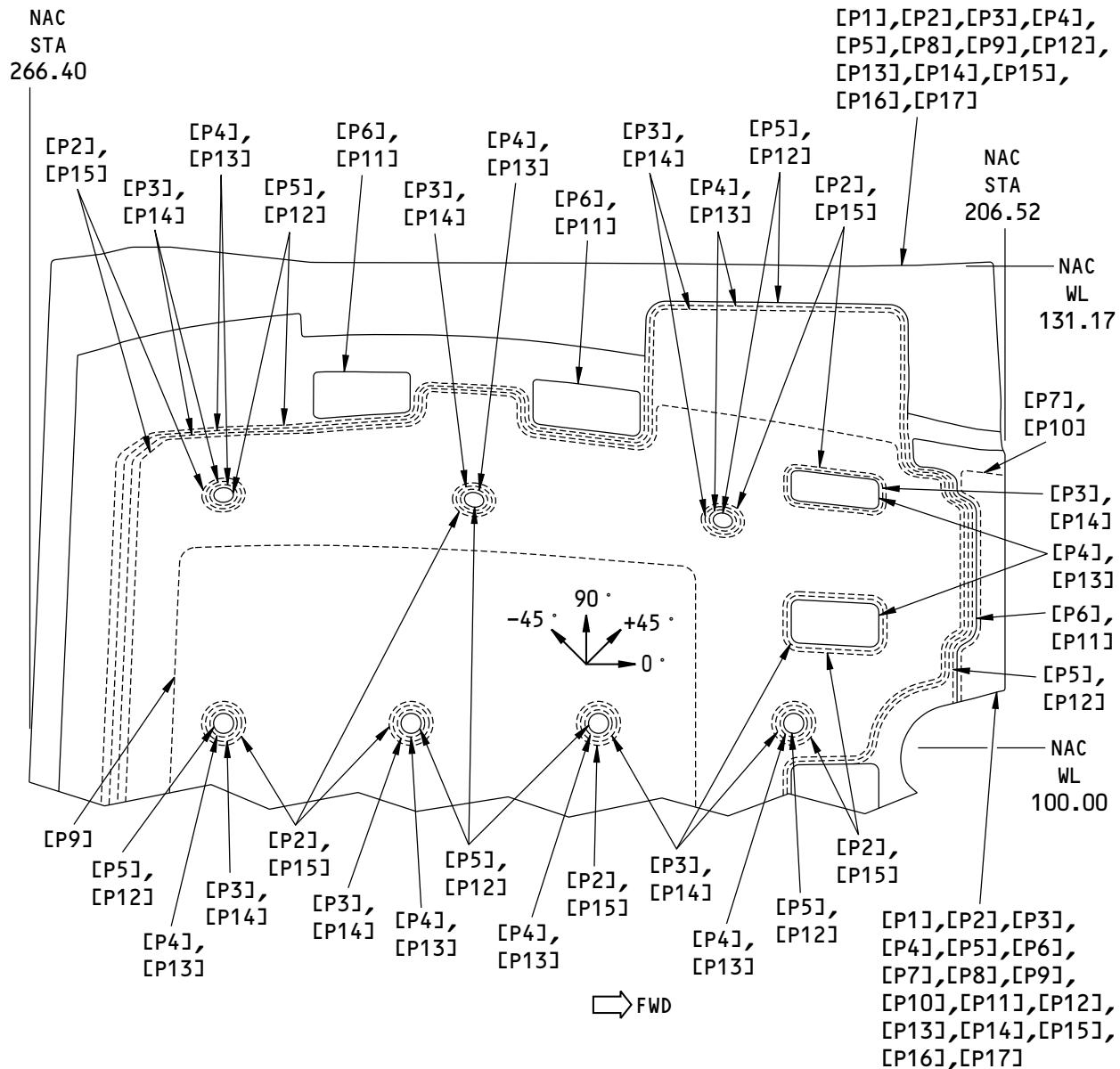
Page 30

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



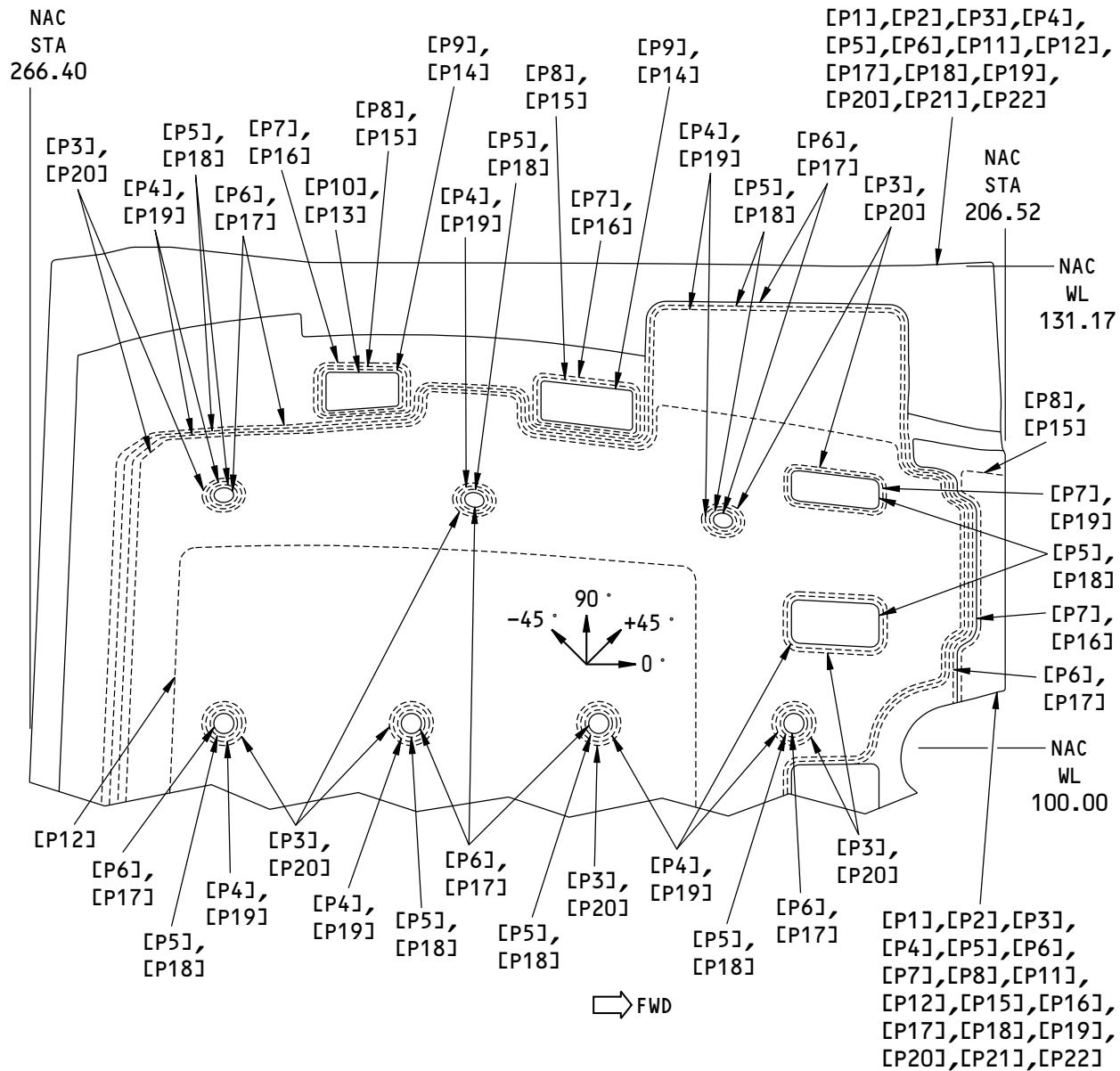
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FOR LINE NUMBERS 001 THROUGH 514

K05890 S0006591860_V2

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
 Figure 11 (Sheet 1 of 8)

54-30-01
 IDENTIFICATION 3
 Page 31
 Nov 10/2015



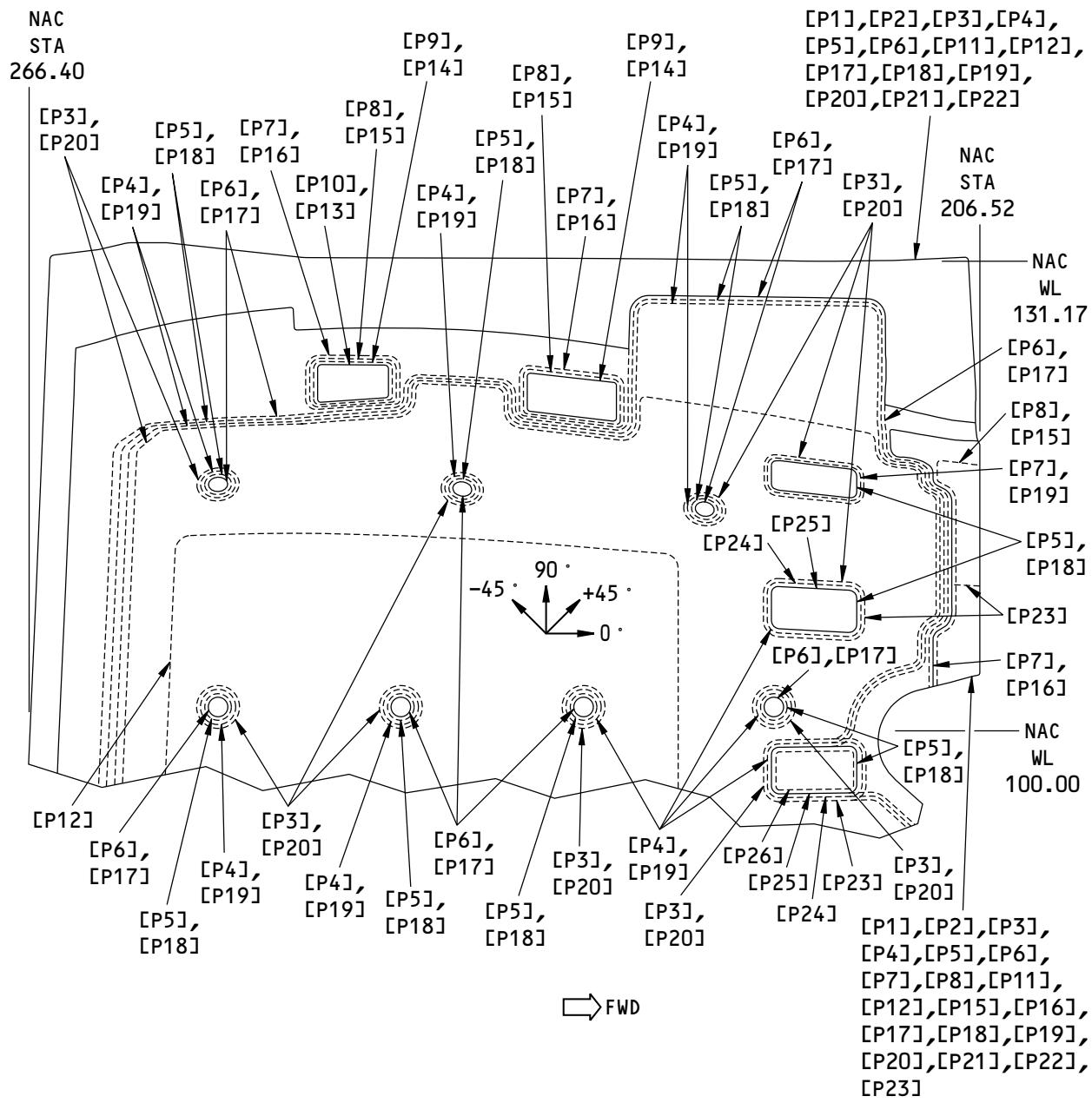
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FOR LINE NUMBERS 515 THROUGH 1312

2374426 S0000542856_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 2 of 8)

54-30-01
IDENTIFICATION 3
Page 32
Nov 10/2015



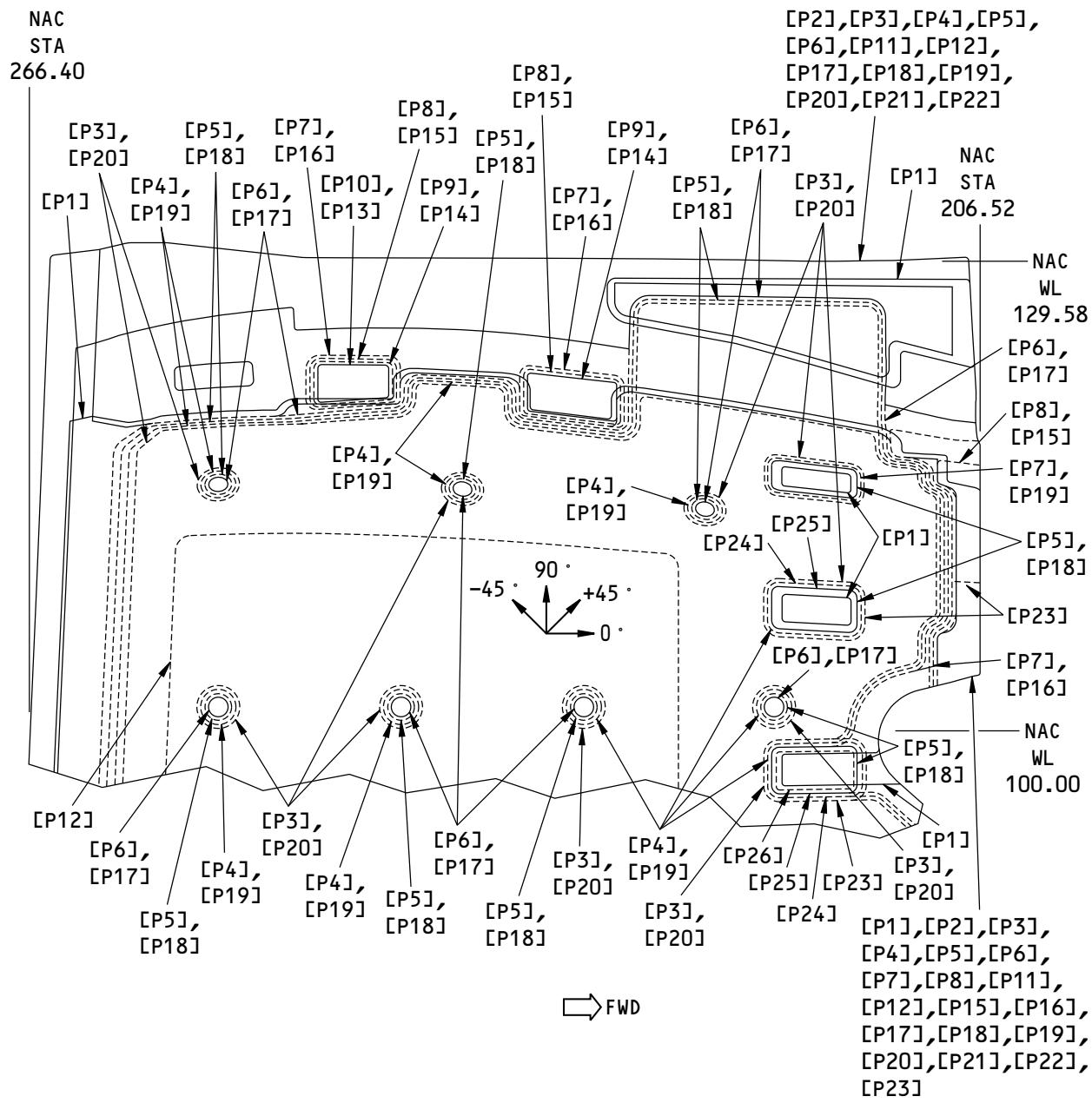
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FOR LINE NUMBERS 1313 THROUGH 1749

2374512 S0000542858_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 3 of 8)

54-30-01
IDENTIFICATION 3
Page 33
Nov 10/2015



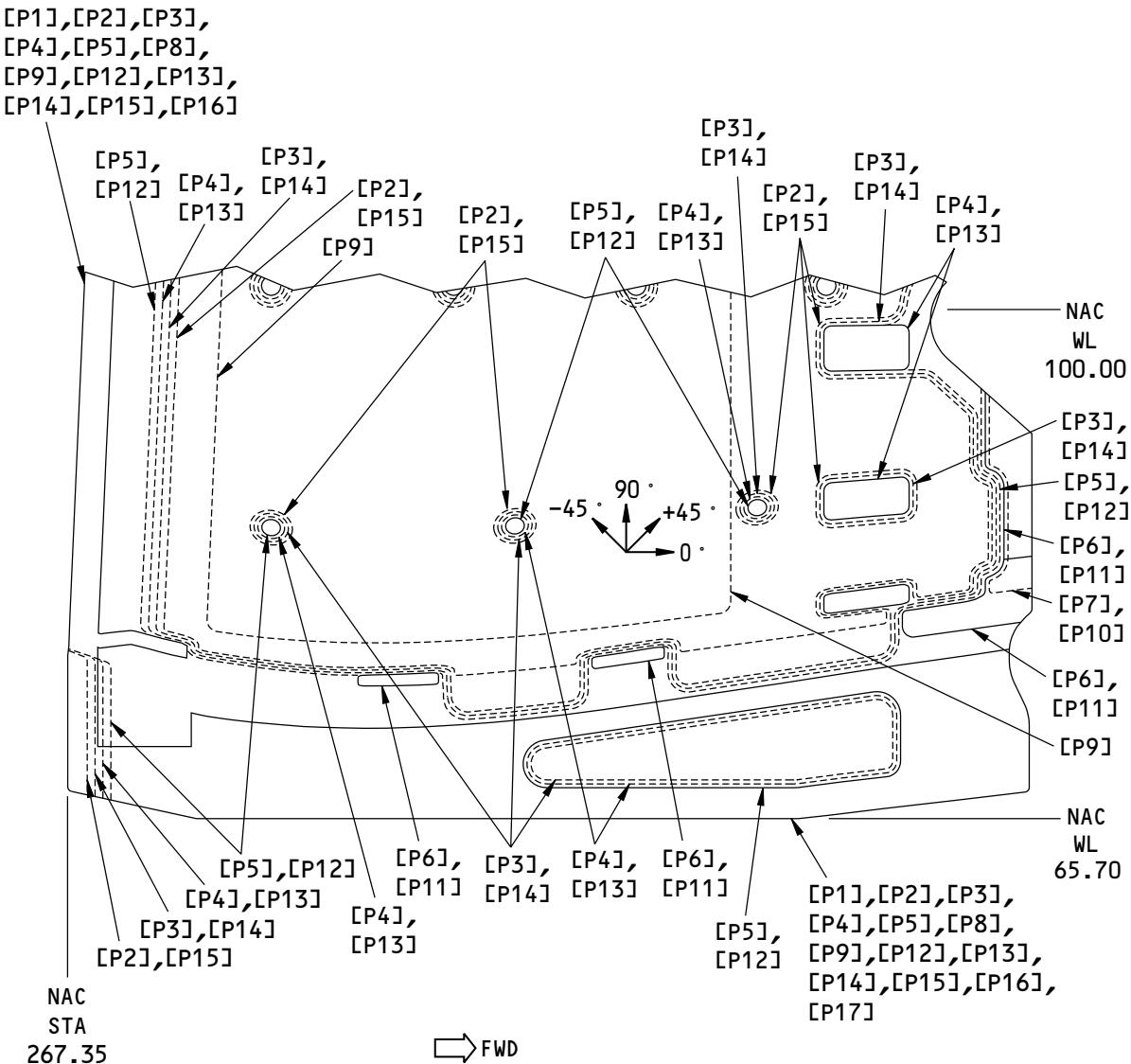
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FOR LINE NUMBERS 1750 AND ON

2374575 S0000542859_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 4 of 8)

54-30-01
IDENTIFICATION 3
Page 34
Nov 10/2015



(VIEW IN THE OUTBOARD DIRECTION BELOW NAC WL 100.00)
FOR LINE NUMBERS 001 THROUGH 514

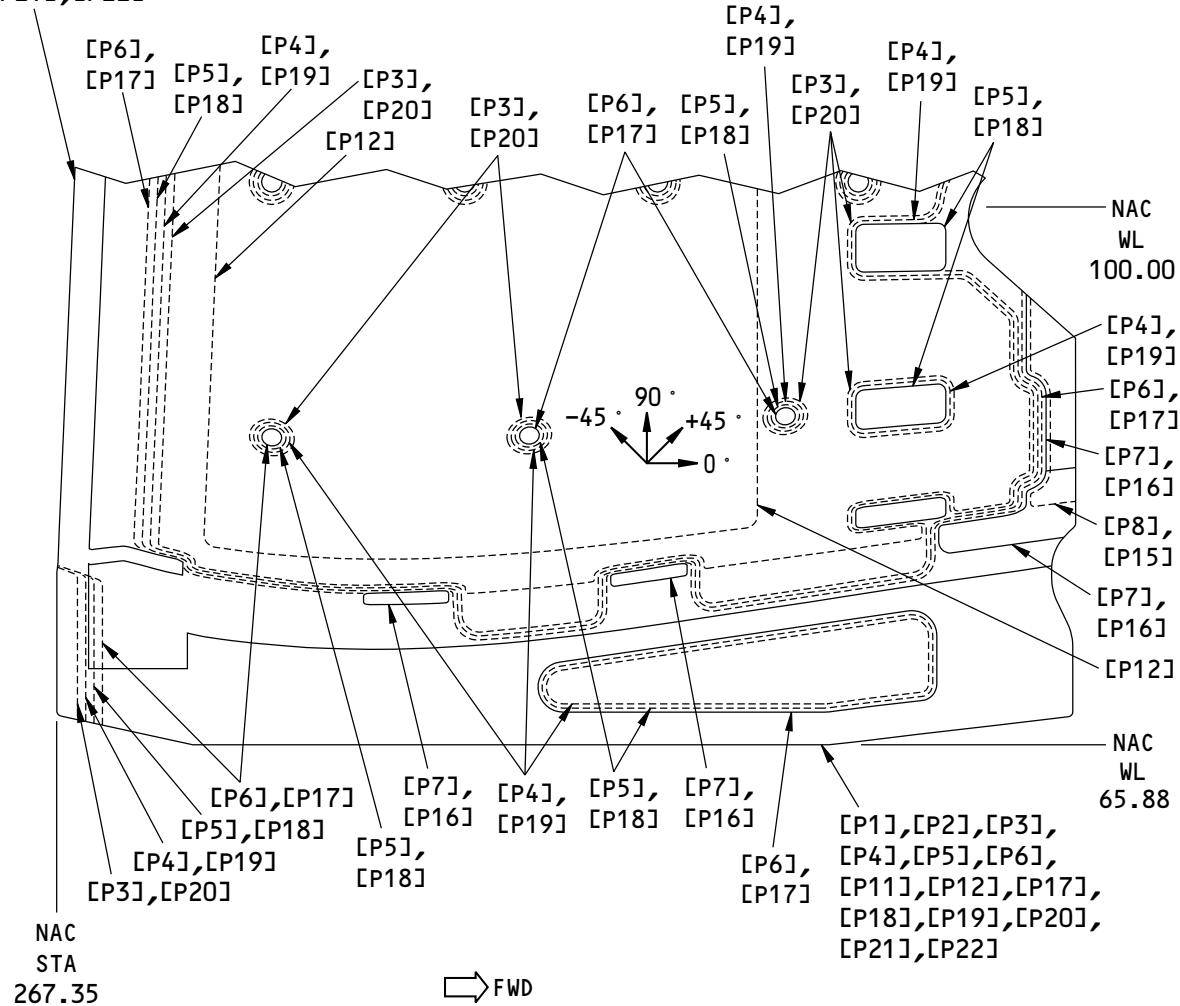
K05940 S0006591861_V2

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 5 of 8)

54-30-01
IDENTIFICATION 3
Page 35
Nov 10/2015

**737-800
STRUCTURAL REPAIR MANUAL**

[P1],[P2],[P3],
[P4],[P5],[P6],
[P11],[P12],[P17],
[P18],[P19],[P20],
[P21],[P22]

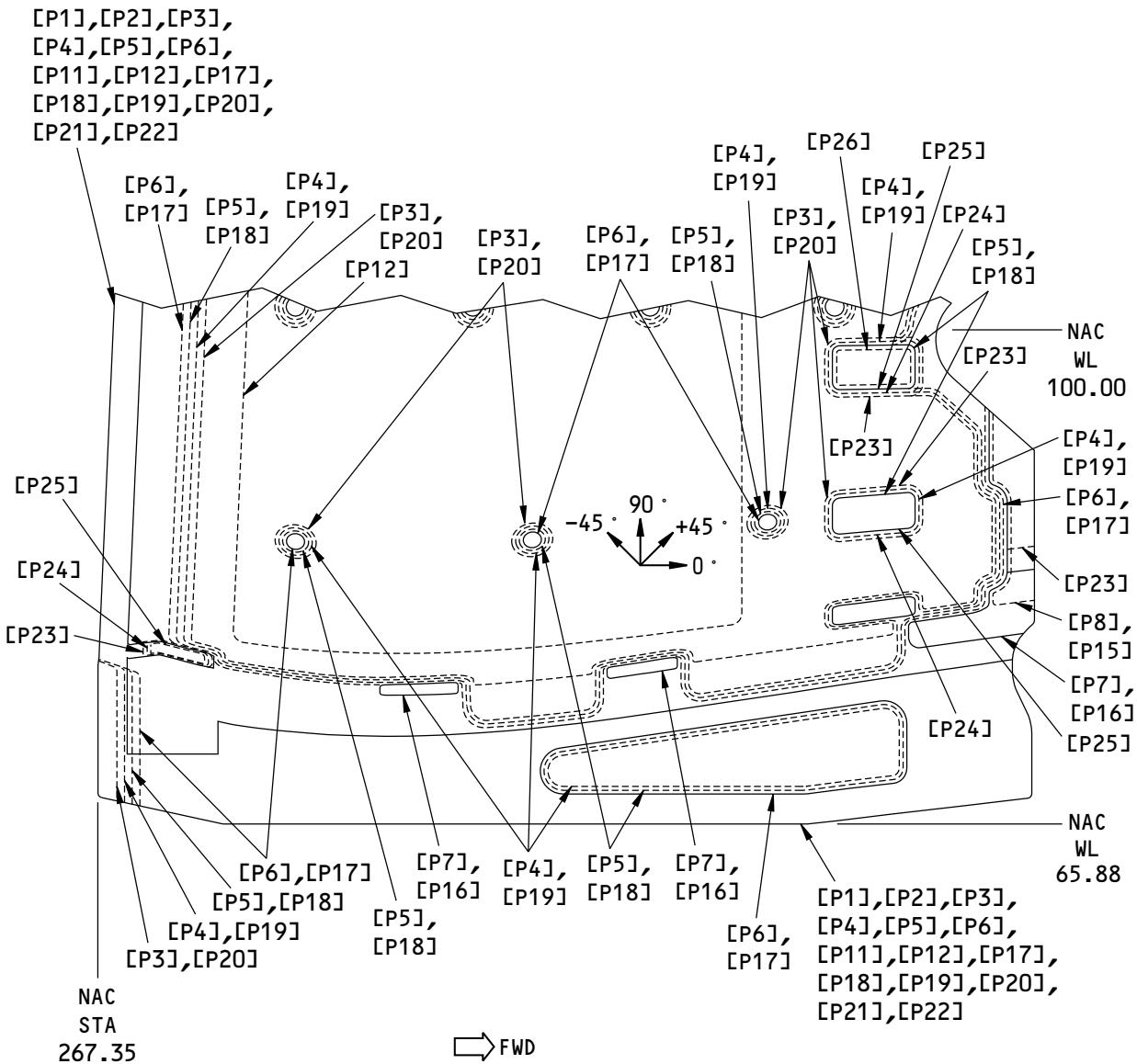


(VIEW IN THE OUTBOARD DIRECTION BELOW NAC WL 100.00)
FOR LINE NUMBERS 515 THROUGH 1312

2374738 S0000542865_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 6 of 8)

54-30-01
IDENTIFICATION 3
Page 36
Nov 10/2015

**737-800
STRUCTURAL REPAIR MANUAL**


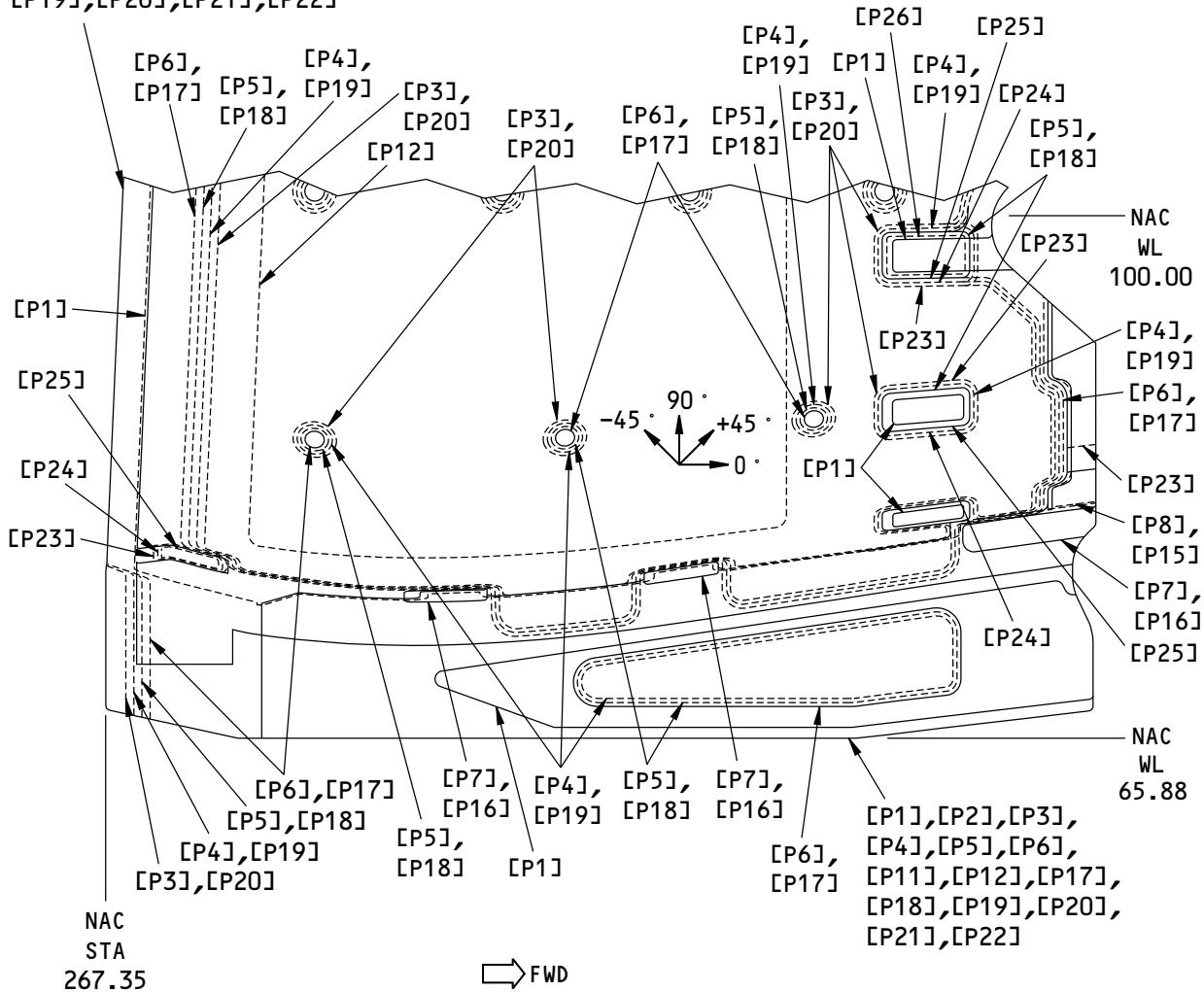
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FOR LINE NUMBERS 1313 THROUGH 1749

2374762 S0000542866_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 7 of 8)

54-30-01
IDENTIFICATION 3
Page 37
Nov 10/2015

[P2],[P3],[P4],
[P5],[P6],[P11],
[P12],[P17],[P18],
[P19],[P20],[P21],[P22]



(VIEW IN THE OUTBOARD DIRECTION BELOW NAC WL 100.00)

FOR LINE NUMBERS 1750 AND ON

2374827 S0000542868_V1

Ply Orientation and Ply Sequence for the Inner Duct Wall Back Skin
Figure 11 (Sheet 8 of 8)

54-30-01
IDENTIFICATION 3
Page 38
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 10:

PLY MATERIAL AND DIRECTION FOR FIGURE 11			
PLY	DIRECTION	MATERIAL	EFFECTIVITY
P17	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 001 THROUGH 514
P1, P3, P5, P7, P10, P12, P14, P16	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 001 THROUGH 514
P2, P4, P6, P8, P9, P11, P13, P15	+ or - 45 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 001 THROUGH 514
P1	+ or -45 degrees	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 515 THROUGH 771
P22	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 515 THROUGH 771
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	+ or -45 degrees	Epoxy impregnated bias woven graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX.	LINE NUMBERS 515 THROUGH 771
P2, P4, P6, P8, P10, P13, P15, P17, P19, P21	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 515 THROUGH 771
P1, P22	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 772 THROUGH 1312
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	+ or -45 degrees	Epoxy impregnated bias woven graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX.	LINE NUMBERS 772 THROUGH 1312
P2, P4, P6, P8, P10, P13, P15, P17, P19, P21	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 772 THROUGH 1312
P1, P22	Optional	Epoxy impregnated fiberglass cloth as given in BMS 8-139, Class 3, Style 108.	LINE NUMBERS 1313 AND ON
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	+ or -45 degrees	Epoxy impregnated bias woven graphite fabric as given in BMS 8-297-2, Type IV, Class 2, Style 3K-70-PX.	LINE NUMBERS 1313 AND ON
P2, P4, P6, P8, P10, P13, P15, P17, P19, P21	0 or 90 degrees	Epoxy impregnated woven graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW.	LINE NUMBERS 1313 AND ON
P23, P24, P25, P26	Optional	Fiberglass prepreg BMS 8-139, Class 2, Style 1581.	LINE NUMBERS 1313 AND ON

54-30-01

IDENTIFICATION 3

Page 39

Nov 10/2015

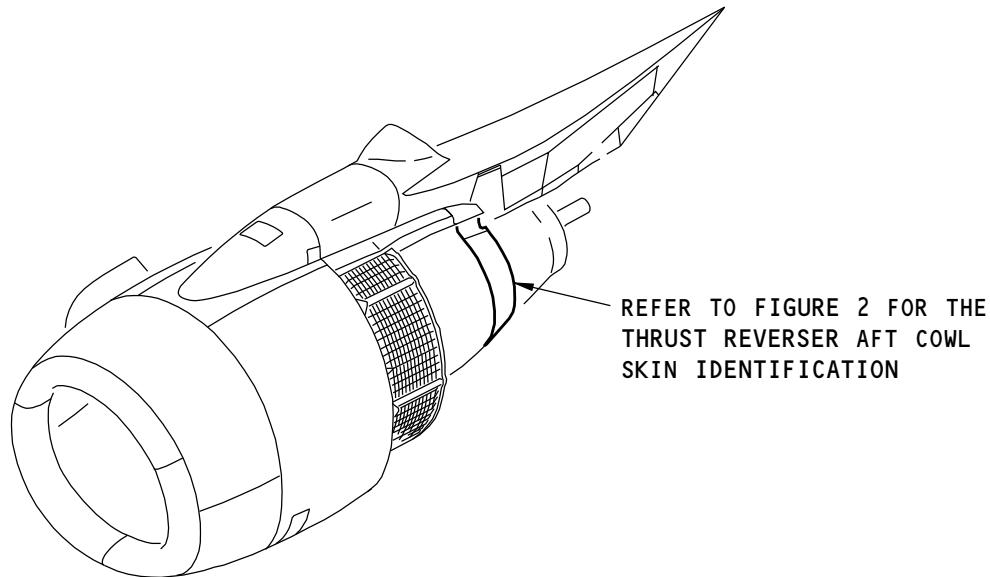
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 4 - THRUST REVERSER AFT COWL SKIN



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F15449 S0006591864_V1

Thrust Reverser Aft Cowl Skin Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2104	Aft Cowl Panel Assembly
315A2007	Thrust Reverser Interchangeability Installation

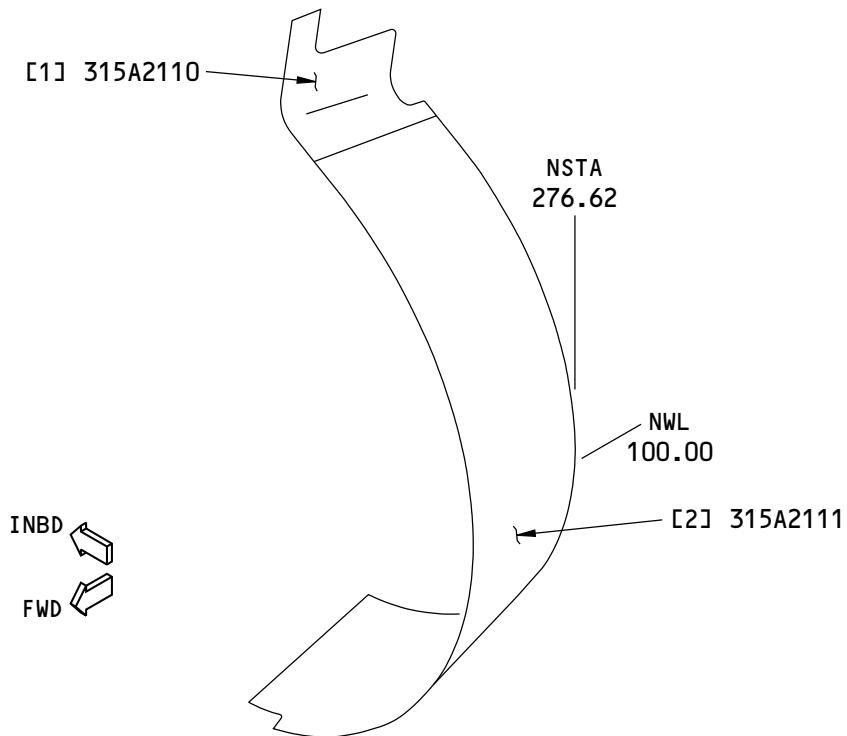
54-30-01
IDENTIFICATION 4
Page 1
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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

LEFT SIDE AFT COWL SKIN IS SHOWN, RIGHT
SIDE AFT COWL SKIN IS OPPOSITE

F15695 S0006591866_V2

Thrust Reverser Aft Cowl Skin Identification
Figure 2

54-30-01
IDENTIFICATION 4
Page 2
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Aft Cowl Skin - Upper	0.071 (1.80)	2219-T31 sheet as given in QQ-A-250/30, Heat Treat to T81	
[2]	Aft Cowl Skin - Lower	0.071 (1.80)	2219-T31 sheet as given in QQ-A-250/30, Heat Treat to T81	

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

54-30-01

IDENTIFICATION 4

Page 3

Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - THRUST REVERSER TRANSLATING SLEEVE OUTER SKIN

1. Applicability

- A. This subject gives the allowable damage limits for the part of the Thrust Reverser Translating Sleeve Outer Skin Panel that follow (Refer to Thrust Reverser Translating Sleeve Outer Skin, Figure 101/ ALLOWABLE DAMAGE 1):
 - (1) The Outer Cowl Panel
 - (2) The Actuator Access Doors

2. General

- A. The composite structure allowable damage limits are applicable only if the damage is cleaned as given in Paragraph 2.B.(3), and sealed as given in Paragraph 2.B.(4).
- B. If there is damage to the composite parts, do as follows:
 - (1) Do an inspection of the damaged area to find the length, width, and depth of the damage. Boeing recommends the use of 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.

- (a) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 1 for the definitions of the length, width, and depth of the damage for the translating sleeve outer skin panel.
 - (b) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 1 for the definitions of the facesheets of a honeycomb core area.
 - (c) Refer to Figure 104/ALLOWABLE DAMAGE 1 for definitions of the zones.
- (2) Remove all of the contamination and water from the part.
 - (a) Refer to 51-70-04 for the damage removal procedures.
 - (b) Refer to 51-30-05 for possible sources of the tools and equipment that can be used to remove the damage.
- (3) Clean the damaged area as follows:
 - (a) Remove all dust from the damaged area with a vacuum cleaner.
 - (b) Clean the surfaces of the repair area with a cloth moist with Methyl IsoButyl Ketone (MIBK) or Acetone. Refer to SOPM 20-30-03 for general cleaning procedures. Clean the surface again until a new moist cloth is clean after it is used. Remove the solvent before it can dry and remove the remaining film before the next step.
- (4) Seal all the permitted damage areas on the parts. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 1. Seal the damage with one of the three methods that follows:
 - (a) For the epoxy/glass sheet actuator access doors, make a permanent seal with one of the two materials that follows:
 - 1) BMS 5-92, Type I or Type III epoxy resin.
 - 2) BMS 5-123 adhesive.
 - (3) Cure the compound as follows:
 - a) Cure the BMS 5-92 epoxy resin at 75°F (24°C) for 24 hours.
 - b) Cure the BMS 5-123 adhesive at 75°F (24°C) for 1 hour.

54-30-01

ALLOWABLE DAMAGE 1

Page 101

Nov 10/2015

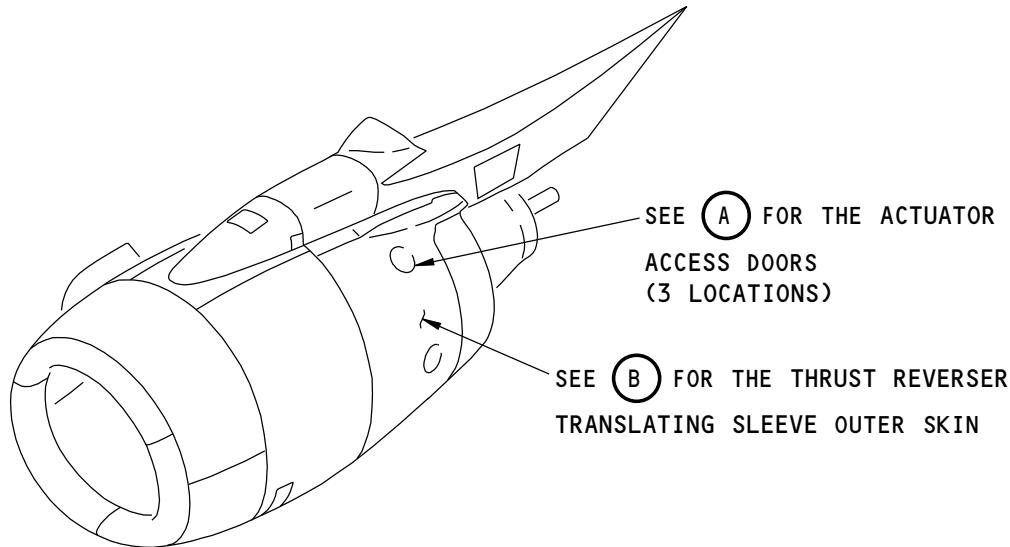
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737-800
STRUCTURAL REPAIR MANUAL

- (b) For the damage to the translating sleeve outer skin that does not cause damage to the fibers, 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 III, or BMS 10-103, Type I 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 51-21-00/701.
- (c) Seal all of the damage areas of the translating sleeve outer cowl skin that causes damage to the fibers. Refer to the allowable damage limits given in Paragraph 4./ ALLOWABLE DAMAGE 1. Seal the damage as follows:
- 1) Use a vacuum and heat, as necessary, 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 of the damage.
 - 4) Repair the damage at or before 400 flight hours or 60 days, whichever comes first, from the time the seal was made.



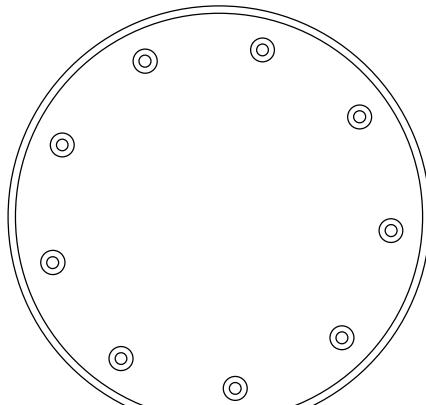
K36876 S0006591870_V1

Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 1 of 4)

54-30-01
ALLOWABLE DAMAGE 1
Page 102
Nov 10/2015

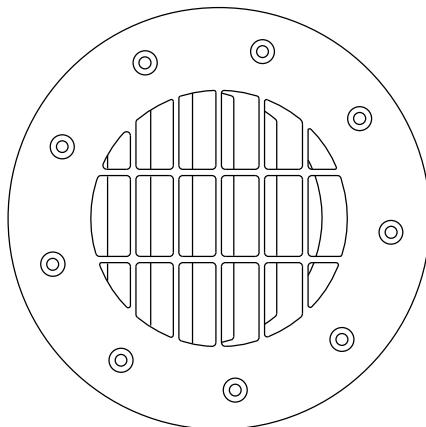


**737-800
STRUCTURAL REPAIR MANUAL**



FWD ↵

**ACTUATOR ACCESS DOOR (WITHOUT VENTS)
EPOXY/GLASS SHEET MOLDING**



FWD ↵

**VENTED ACTUATOR ACCESS DOOR
EPOXY/GLASS SHEET MOLDING**

ACTUATOR ACCESS DOORS

(A)

K36877 S0006591871_V1

**Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 2 of 4)**

54-30-01

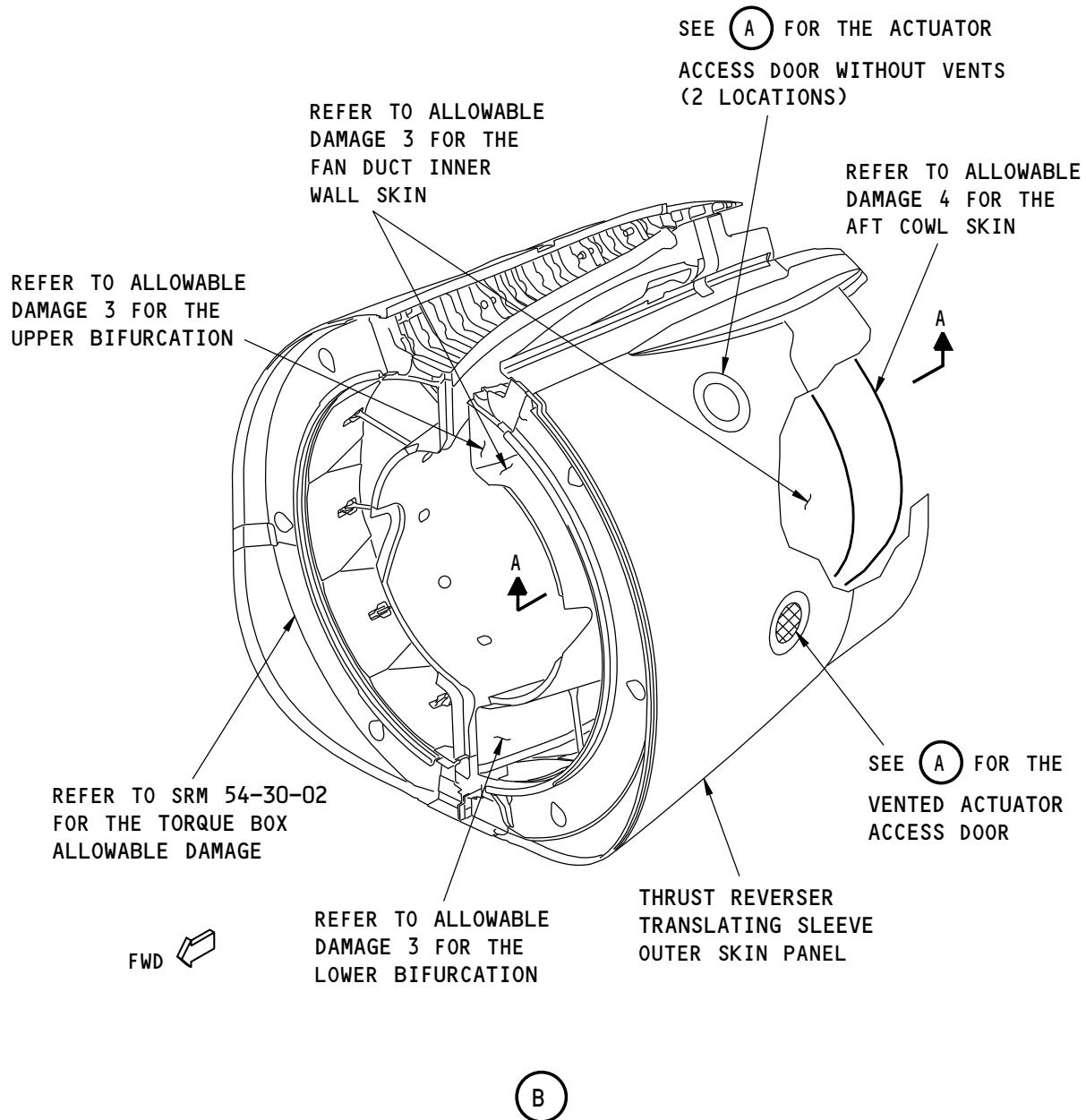
ALLOWABLE DAMAGE 1

Page 103

Nov 10/2012

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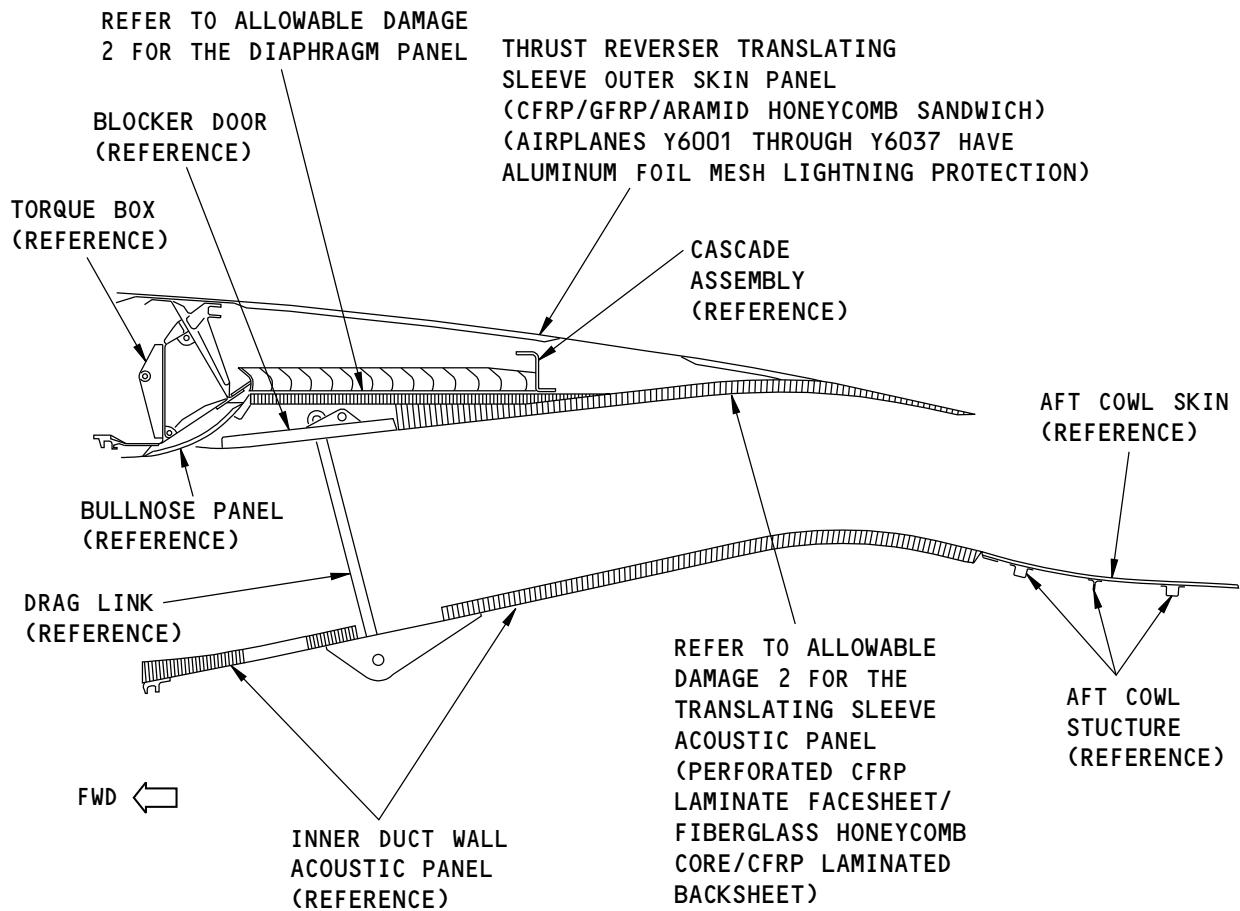
Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 3 of 4)

54-30-01**ALLOWABLE DAMAGE 1**

Page 104

Jul 10/2013

D634A210



K36879 S0006591873_V2

Thrust Reverser Translating Sleeve Outer Skin
Figure 101 (Sheet 4 of 4)

54-30-01**ALLOWABLE DAMAGE 1**

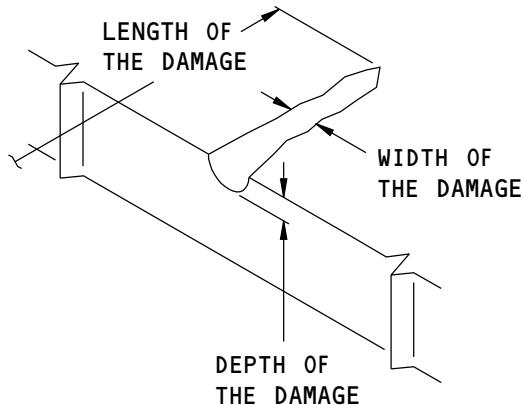
Page 105

Nov 10/2015

D634A210

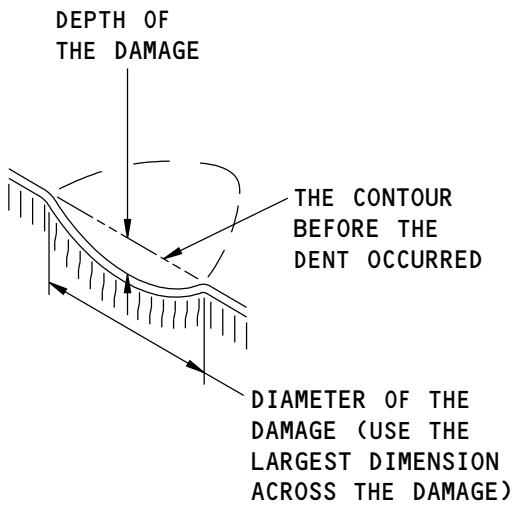


737-800
STRUCTURAL REPAIR MANUAL



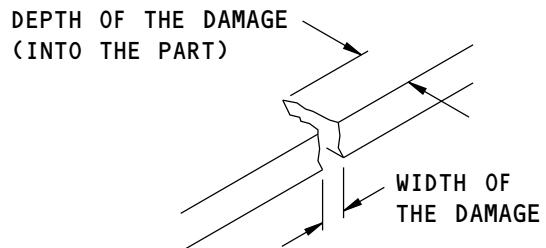
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 102

54-30-01

ALLOWABLE DAMAGE 1

Page 106

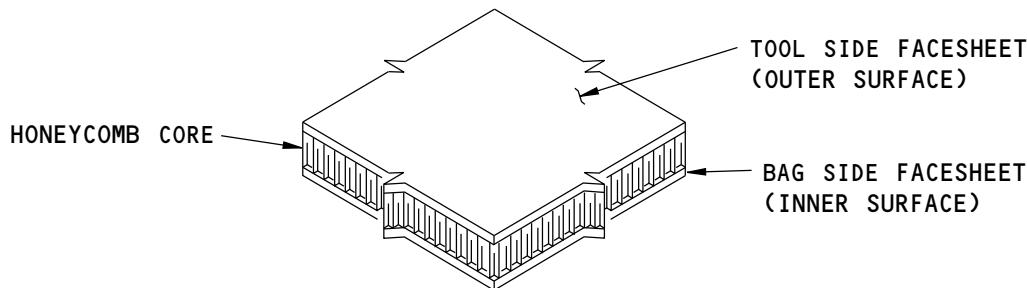
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737-800 STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 103

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
51-30-03	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 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-30-03	General Cleaning Procedures
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. Actuator Access Doors

- (1) Cracks:
 - (a) Remove edge damage as given in Figure 105/ALLOWABLE DAMAGE 1, Details A , B , and C .
- (2) Nicks, Gouges, and Scratches:
 - (a) Removal of the damage is permitted as shown in Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , and D if it is:
 - 1) A minimum of 4D (D = the diameter of the damage) away from other damage, the nearest hole, or the edge of the part.
- (3) Dents:
 - (a) Dents usually result in cracks. Use the limits given for cracks.
- (4) Holes and Punctures are not permitted.
- (5) Delaminations are not permitted.
- (6) Edge Crushing and Edge Erosion:

54-30-01

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Remove Edge Crushing damage as shown in Figure 105/ALLOWABLE DAMAGE 1, Details A , B , and C .
- (b) Remove the Edge Erosion damage as shown in Figure 105/ALLOWABLE DAMAGE 1, Detail E .

B. Translating Sleeve Outer Skin - Edgeband

- (1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.
 - (a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.B.(3) and 2.B.(4)(b).
- (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 as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 106/ALLOWABLE DAMAGE 1, Detail A if they are:
 - (a) Blended as given in Figure 105/ALLOWABLE DAMAGE 1, Detail D and cleaned and sealed as given in Paragraph 2.B.(3) and 2.B.(4)(c).
 - (b) A maximum of 4 plies deep on the tool side in Zones 1, 2, 5, and 7 of the forward edge band. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (c) A maximum of 3 plies deep on the tool side in Zone 10b of the aft edge band, within 3D away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (d) A maximum of 5 plies deep on the tool side in Zone 10b of the aft edge band, 3D or more away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (e) A maximum of 6 plies deep on the bag side in Zone 10b of the aft edge band, 3D or more away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (f) A combined maximum of 2 plies deep on the bag side and 4 plies deep on the tool side in Zone 10b of the aft edge band, 3D or more away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
- (4) Dents are not permitted.
- (5) Holes and Punctures are not permitted.
- (6) Delaminations are not permitted.
- (7) Edge Damage is permitted if it is:
 - (a) A maximum of 0.20 inch (5.1 mm) in depth (even if it causes fastener e/D more than 3.00). Refer to Figure 102/ALLOWABLE DAMAGE 1, Detail C for definition of depth of damage.
 - (b) Blended as given in Figure 105/ALLOWABLE DAMAGE 1, Detail C.
 - (c) Cleaned and sealed as given in Paragraph 2.B.(3) and 2.B.(4).
 - (d) Repaired by 5000 flight hours or 18 months, whichever comes first.
- (8) Edge Erosion is permitted as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 106/ALLOWABLE DAMAGE 1, Detail B if it is repaired by 5000 flight hours or 18 months, whichever comes first.

C. Translating Sleeve Outer Skin - Honeycomb Panel Area

- (1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.
 - (a) If the damage goes through only the glass fibers and does not cause damage to the carbon fibers below, clean and seal the damage as given in 2.B.(3) and 2.B.(4)(b).
- (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon fibers are permitted.

54-30-01

ALLOWABLE DAMAGE 1

Page 108

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 107/ALLOWABLE DAMAGE 1, Detail A and Table 101/ALLOWABLE DAMAGE 1 if they are:
- (a) Blended as given in Figure 105/ALLOWABLE DAMAGE 1, Detail D and cleaned and sealed as given in Paragraph 2.B.(3) and 2.B.(4)(c).
 - (b) A maximum of 10 plies deep on the tool side in Zone 10a of the aft edge band, within 3D away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (c) A maximum of 10 plies deep on the tool side in Zone 10a of the aft edge band, 3D or more away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (d) A maximum of 8 plies deep on the bag side in Zone 10a of the aft edge band, 3D or more away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (e) A combined maximum of 6 plies deep on the bag side and 8 plies deep on the tool side in Zone 10a of the aft edge band, 3D or more away from a fastener. Refer to Figure 104/ALLOWABLE DAMAGE 1.
 - (f) For other zones, damage is limited to one structural ply.
- (4) Dents are permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 107/ALLOWABLE DAMAGE 1, Detail A and Table 101/ALLOWABLE DAMAGE 1 if they are:
- (a) A maximum of 0.05 inch (1.27 mm) in depth.
 - (b) Cleaned and sealed as given in 2.B.(3) and 2.B.(4)(b) or 2.B.(3) and 2.B.(4)(c).
- (5) Holes and Punctures are permitted on the two sides of the skin as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 107/ALLOWABLE DAMAGE 1, Detail A and Table 101/ALLOWABLE DAMAGE 1 if:
- (a) Cleaned and sealed as given in 2.B.(3) and 2.B.(4)(b) or 2.B.(3) and 2.B.(4)(c).
- (6) Delaminations up to 0.25 in. (6.35 mm) are permitted as shown in Allowable Damage Limits - Translating Sleeve Outer Skin, Figure 107/ALLOWABLE DAMAGE 1, Detail A if they are cleaned and sealed as given in 2.B.(3) and 2.B.(4)(b) or 2.B.(3) and 2.B.(4)(c).
- (7) Edge damage of 0.2 in. (5.1 mm) in Zone 10a is permitted for the outer skin only, if blended as given in Figure 105/ALLOWABLE DAMAGE 1, Detail C. Refer to Figure 104/ALLOWABLE DAMAGE 1.
- (8) Edge Erosion in Zone 10a is permitted as given in Paragraph 4.C.(3)(b). Refer to Figure 104/ALLOWABLE DAMAGE 1.

Table 101: Allowable Damage Limits for Honeycomb Panel Area

Zone	Hole Diameter (inch) ^[1]
2, 6 through 9	D ≤ 0.25
1, 3, 5, 10A	Not permitted

^[1][1] D = Maximum dimension of damage plus cleanup

54-30-01

ALLOWABLE DAMAGE 1

Page 109

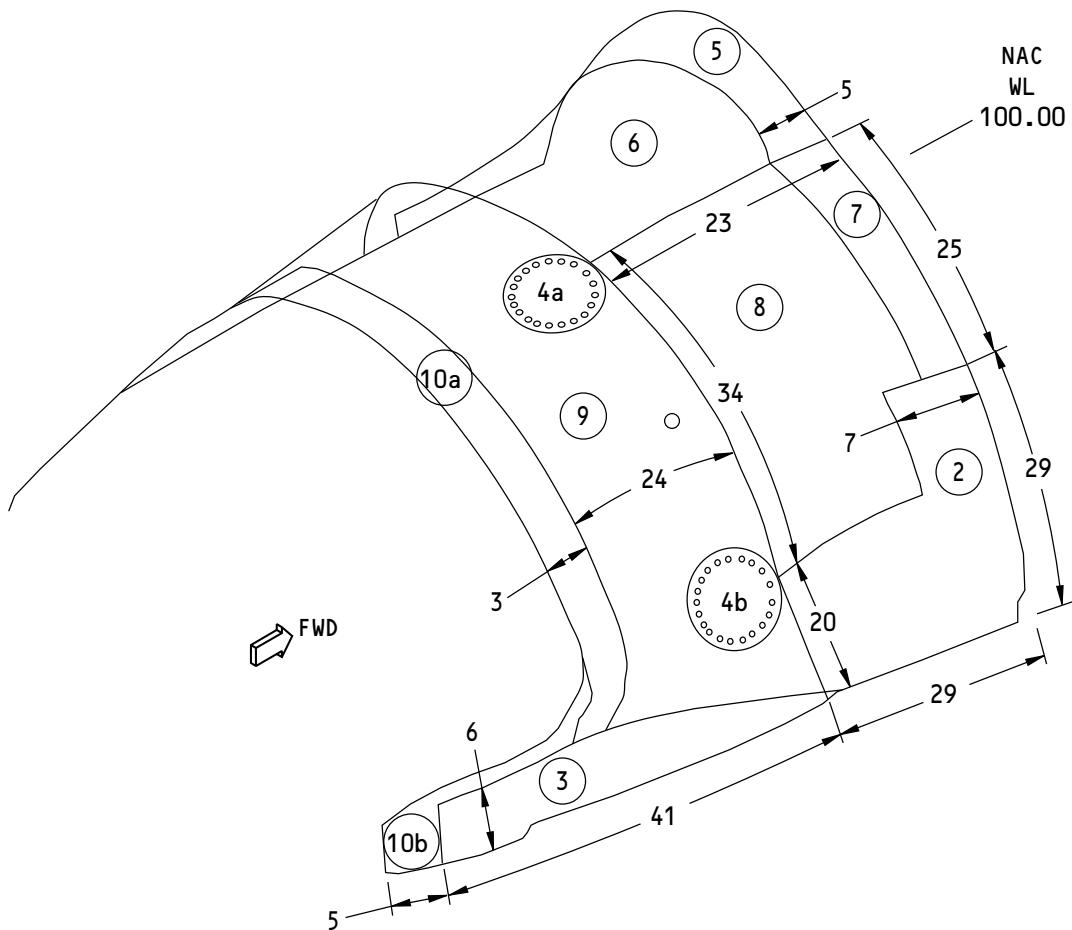
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737-800
STRUCTURAL REPAIR MANUAL



RIGHT SIDE
TRANSLATING SLEEVE OUTER SKIN

NOTE: ALL DIMENSIONS ARE IN INCHES.

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Allowable Damage Limits - Definition of Zones
Figure 104 (Sheet 1 of 2)

54-30-01

ALLOWABLE DAMAGE 1

Page 110

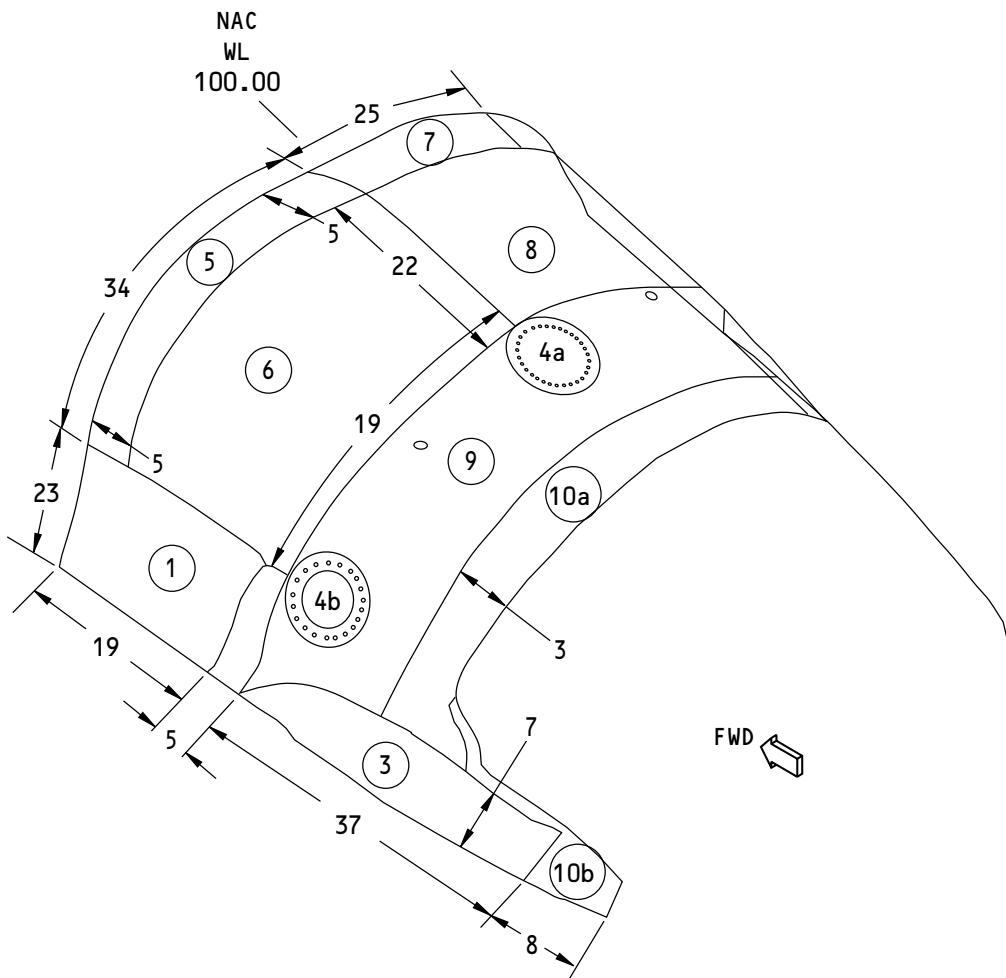
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LEFT SIDE
TRANSLATING SLEEVE OUTER SKIN

NOTE: ALL DIMENSIONS ARE IN INCHES.

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Allowable Damage Limits - Definition of Zones
Figure 104 (Sheet 2 of 2)

54-30-01

ALLOWABLE DAMAGE 1

Page 111

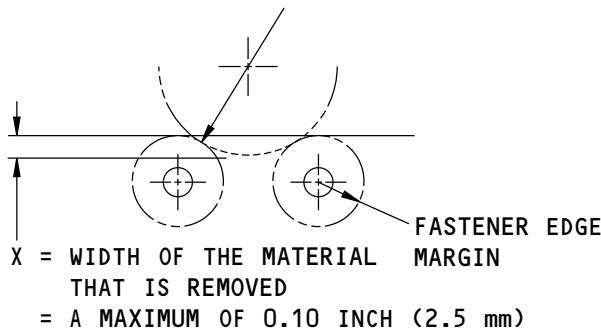
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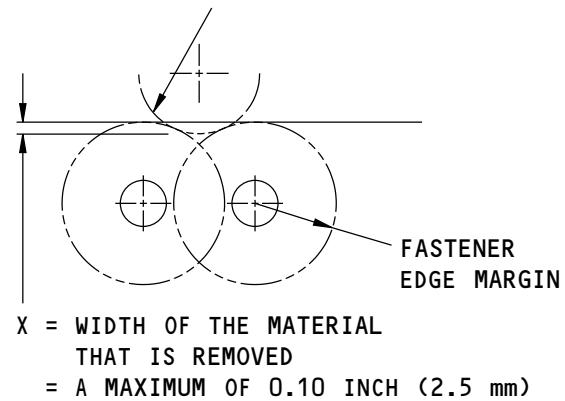
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REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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 DO NOT HAVE AN OVERLAP

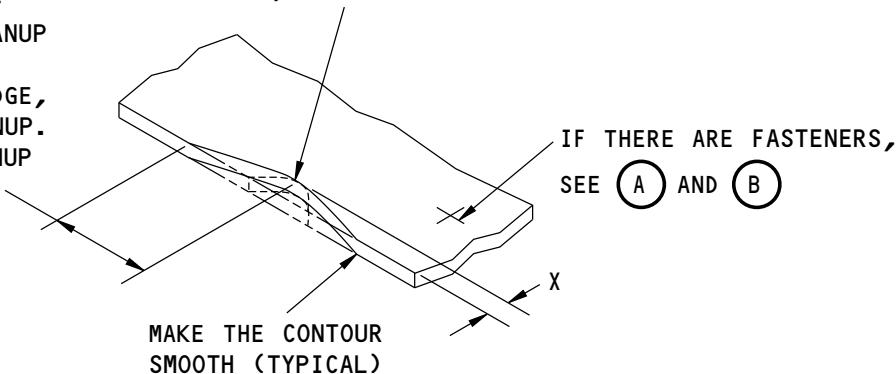
(A)

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

(B)

TAPER TO A MINIMUM OF
20X. EDGE OF THE CLEANUP
MUST NOT INTERSECT A
PART EDGE, FILLET EDGE,
OR OTHER DAMAGE CLEANUP.
THE EDGE OF THE CLEANUP
MUST BE 2.5D MINIMUM
AWAY FROM A HOLE.

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.4 mm), THEN TAPER AS SHOWN



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.5 mm)
D = HOLE DIAMETER

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

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Allowable Damage Limits - Translating Sleeve Outer Skin
Figure 105 (Sheet 1 of 2)

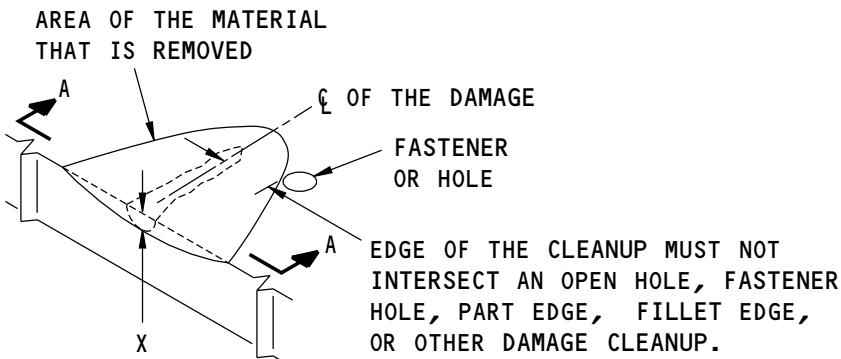
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ALLOWABLE DAMAGE 1

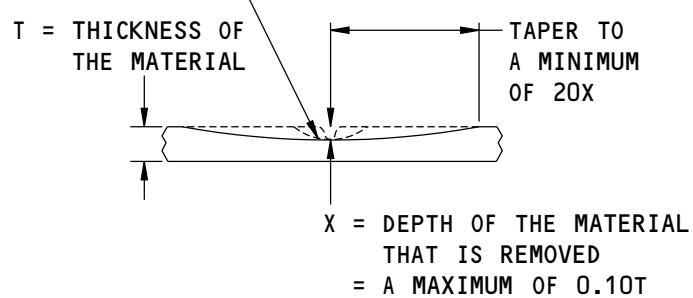
Page 112

Nov 10/2015

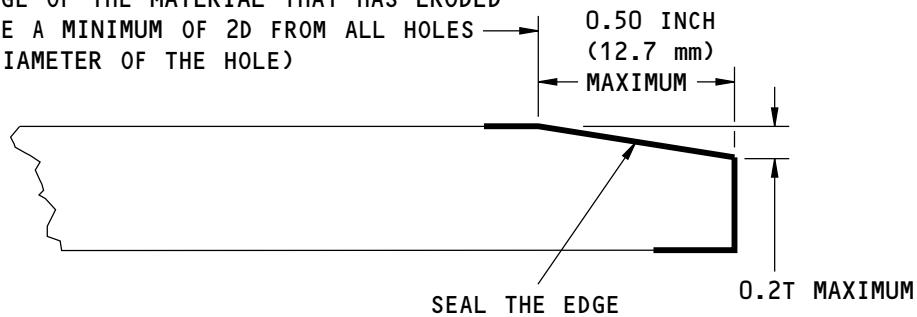
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**737-800
STRUCTURAL REPAIR MANUAL**

REMOVAL OF DAMAGED MATERIAL ON A SURFACE
(D)

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.4 mm), THEN TAPER AS SHOWN


A-A

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
(E)

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Allowable Damage Limits - Translating Sleeve Outer Skin
Figure 105 (Sheet 2 of 2)

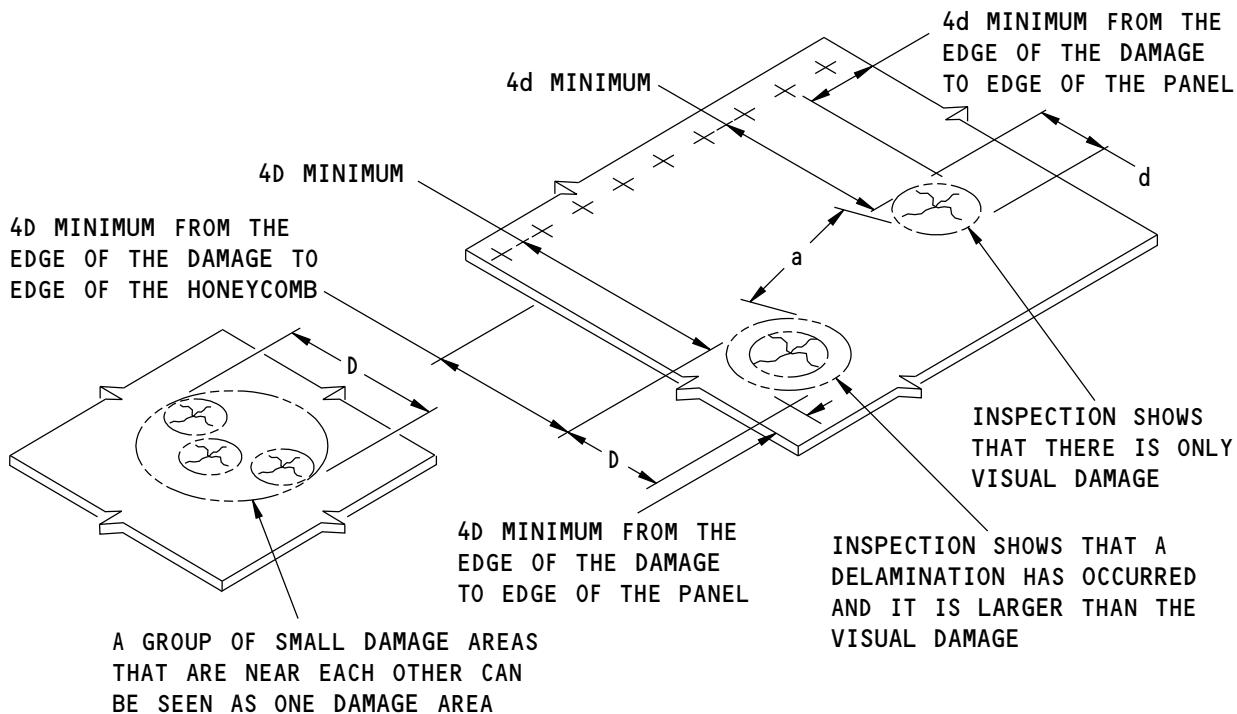
54-30-01
ALLOWABLE DAMAGE 1

Page 113

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, NONDESTRUCTIVE INSPECTION PROCEDURES CAN BE USED.
(REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS $6D$ (ON THE TWO SIDES OF THE PANEL)

e IS THE EDGE MARGIN (THE DISTANCE FROM THE CENTER OF A HOLE TO THE NEAREST EDGE OF THE MATERIAL).

A

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Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 106 (Sheet 1 of 2)

54-30-01

ALLOWABLE DAMAGE 1

Page 114

Nov 10/2015

D634A210

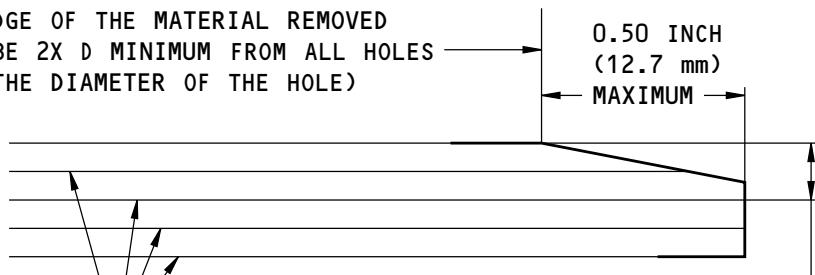


737-800
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THE EDGE OF THE MATERIAL REMOVED
MUST BE 2X D MINIMUM FROM ALL HOLES
(D = THE DIAMETER OF THE HOLE)

0.50 INCH
(12.7 mm)

MAXIMUM



MAXIMUM PERMITTED MATERIAL REMOVAL:

- 4 PLIES ON THE TOOL SIDE OF THE FWD EDGE-BAND
- 5 PLIES ON THE TOOL SIDE OF THE AFT EDGE-BAND
- 6 PLIES ON THE BAG SIDE OF THE AFT EDGE-BAND
- COMBINED 2 PLIES ON THE BAG SIDE AND 4 PLIES
ON THE TOOL SIDE OF THE AFT EDGE BAND

NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
 - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
 - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
- SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
 - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
 1. KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION BEFORE EACH 400 FLIGHT HOURS OR 60 DAYS, WHICHEVER COMES FIRST.
 2. REPLACE THE TAPE IF DETERIORATION IS FOUND.
 3. REPAIR THE DAMAGE BEFORE 5,000 FLIGHT HOURS OR 2 YEARS, WHICHEVER COMES FIRST.
 - B. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
 - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR TYPE III ADHESIVE AT 75 °F (24 °C) FOR 24 HOURS.
 - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75 ° (24 °C) FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE AND A TEMPORARY OR
PERMANENT REPAIR TO SEAL THE EDGE

B

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Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 106 (Sheet 2 of 2)

54-30-01

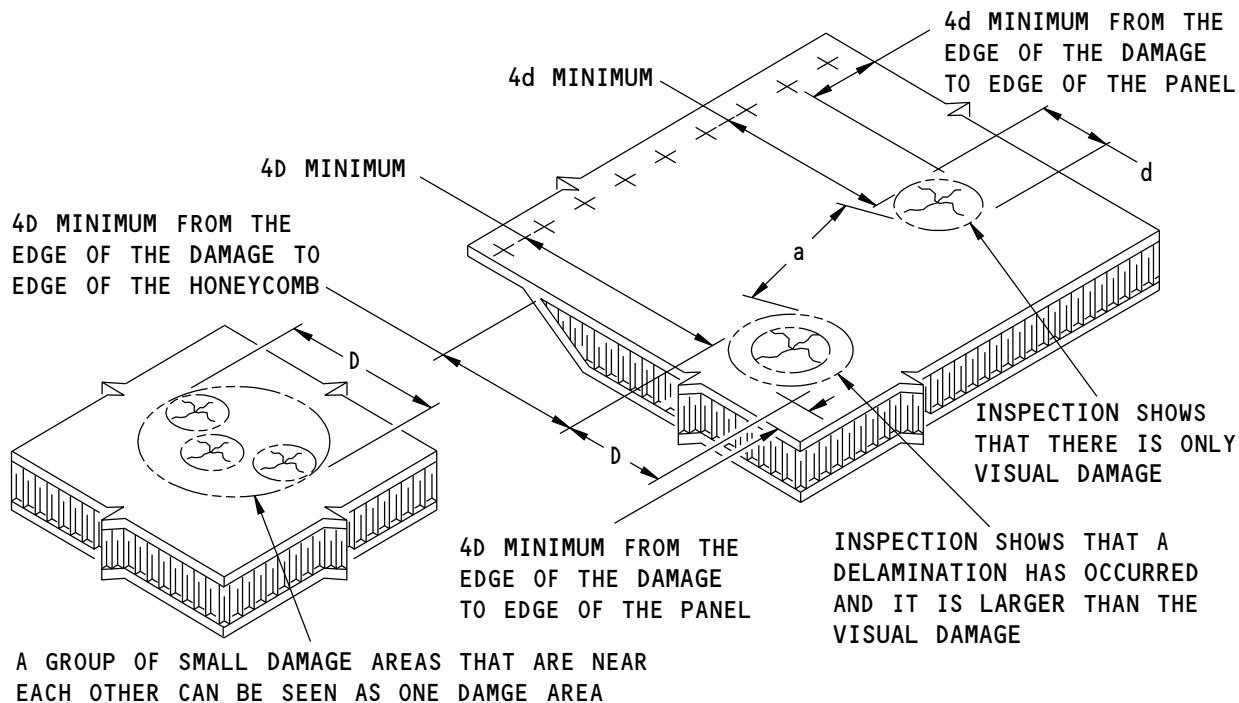
ALLOWABLE DAMAGE 1

Page 115

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- A CRACK
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

TO FIND DELAMINATION, NONDESTRUCTIVE INSPECTION PROCEDURES CAN BE USED.
(REFER TO NDT PART 1, 51-01-02)

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL)

**DAMAGE SIZE AND SPACING DATA FOR COMPOSITE PANELS
REQUIREMENTS - HONEYCOMB CORE AREA OF THE BOND PANEL**

(A)

K36889 S0006591880_V2

Allowable Damage Limits - Translating Sleeve Outer Skin
Figure 107

54-30-01

ALLOWABLE DAMAGE 1

Page 116

Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - THRUST REVERSER TRANSLATING SLEEVE DIAPHRAGM ACOUSTIC PANEL

1. Applicability

- A. This subject gives the allowable damage limits for the Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel shown in Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Location, Figure 101/ALLOWABLE DAMAGE 2.
- B. This allowable damage is permitted in only areas common to the inner facesheet of the diaphragm acoustic panel. Contact The Boeing Company for damage to the outer facesheet diaphragm acoustic panel.

2. General

- A. For damage to the composite parts, do as follows:

- (1) 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 inspections procedures.

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

- (a) For the honeycomb core areas, the tap test is an alternative procedure to instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the procedures.
 - (b) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 2 for the definitions of the length, width, and depth of the damage.
 - (c) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 2 for the definitions of the facesheets of a honeycomb core area.
 - (d) Refer to Allowable Damage Zones for the Diaphragm Acoustic Panel, Figure 104/ALLOWABLE DAMAGE 2 for the allowable damage zones and related damage dimensions.

- (2) Remove all of the contamination and water from the diaphragm acoustic panel. Refer to 51-70-04.
 - (a) Refer to 51-70-04 for the damage removal procedures.
 - (b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.
 - (3) Refer to 54-00-01 for the data about acoustic panel loss limits.
 - (a) Use the maximum loss limits given in 54-00-01 unless given differently.
 - (4) Make a seal of all the areas where damage is permitted with one of the two methods that follows (Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2):

NOTE: Damage which causes fiber damage is structural damage, and the two seal methods that follow are temporary. Damage which does not cause fiber damage is non-structural and the seal methods that follow are temporary or permanent.

- (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape).
 - 2) Keep a record of the location of the damage.
 - 3) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or 2 months, whichever comes first or more frequently.
 - 4) Do a permanent repair of the damage at or before 5000 flight hours or 18 months, whichever comes first from the time the seal was made.

54-30-01

ALLOWABLE DAMAGE 2

Page 101

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (b) Make a temporary seal for areas with structural damage or a permanent seal for areas with non-structural damage.
- 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 III or BMS 10-103, Type I primer. Refer to SOPM 20-44-04.
 - 3) Apply one layer of BMS 10-60, Type II enamel to the internal surfaces sealed with epoxy resin. Refer to AMM 51-21-00/701.
 - 4) Repair the damage at or before 5000 flight hours or 18 months, whichever comes first from the time the seal was made.

B. For lightning strike damage, do as follows:

- (1) (1) Do an inspection of the damaged area to find the length, width, and depth of the damage using. Refer to 737 NDT Part 1, 51-01-03 for inspection procedures.
 - (a) For the honeycomb core areas, the tap test is an alternative procedure to instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the procedures.

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

 - (b) Refer to Lightning Strike Allowable Damage Zones for the Diaphragm Acoustic Panel, Figure 104 (Sheet 2), Detail B for the allowable damage zones and related damage dimensions.
- (2) Make a seal of all the areas where damage is permitted with the method that follows (Refer to the allowable damage limits given in Paragraph Paragraph 4.C./ALLOWABLE DAMAGE 2):
 - (a) Keep a record of the location of the damage.
 - (b) Carefully sand damaged area to remove rough edges.
 - Sand in a circular pattern.
 - Use 80 grit sand paper.
 - (c) Solvent wipe and allow to dry (15 minutes) or dry using a cloth.
 - (d) If necessary, insert a temporary filler such as foam in the damaged hole.
 - (e) Apply aluminum speed tape such that it completely covers the sanded area.
 - (f) Make sure that the tape is in satisfactory condition after each 1 day interval.
 - (g) Do a permanent repair of the damage at or before 10 days from the time the seal was made.

54-30-01

ALLOWABLE DAMAGE 2

Page 102

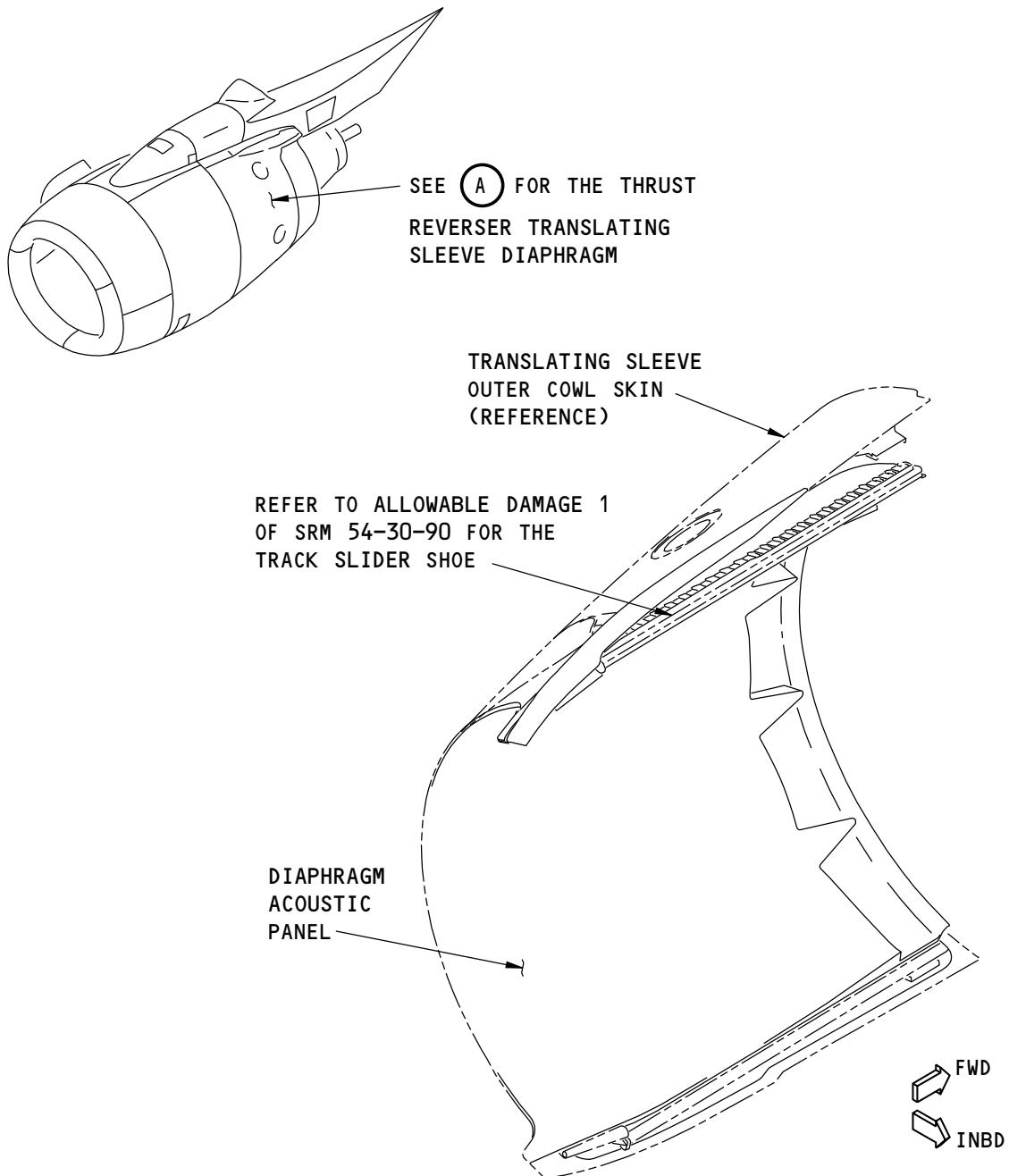
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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

A

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Thrust Reverser Translating Sleeve Diaphragm Acoustic Panel Location
Figure 101

54-30-01

ALLOWABLE DAMAGE 2

Page 103

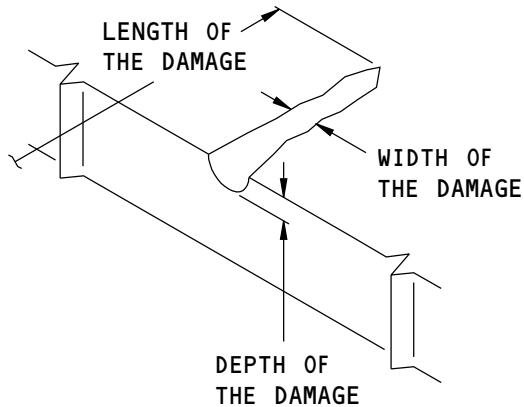
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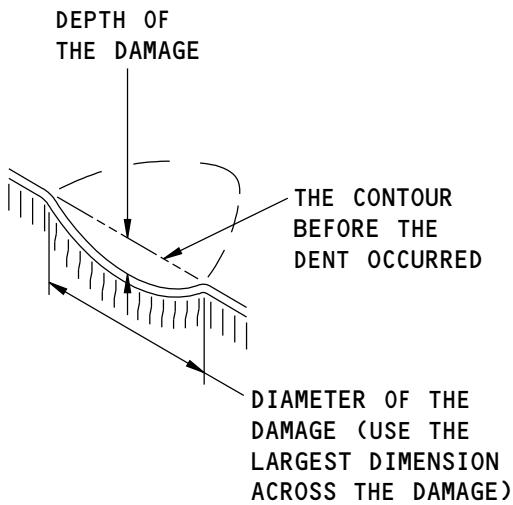


**737-800
STRUCTURAL REPAIR MANUAL**



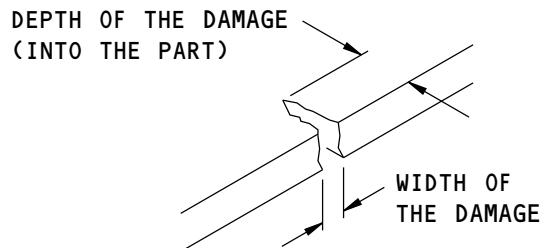
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



**SIZE DEFINITIONS FOR
DENT DAMAGE**

(B)



**SIZE DEFINITIONS FOR
EDGE DAMAGE**

(C)

K36893 S0006591883_V1

**Definitions of the Damage Size
Figure 102**

54-30-01

ALLOWABLE DAMAGE 2

Page 104

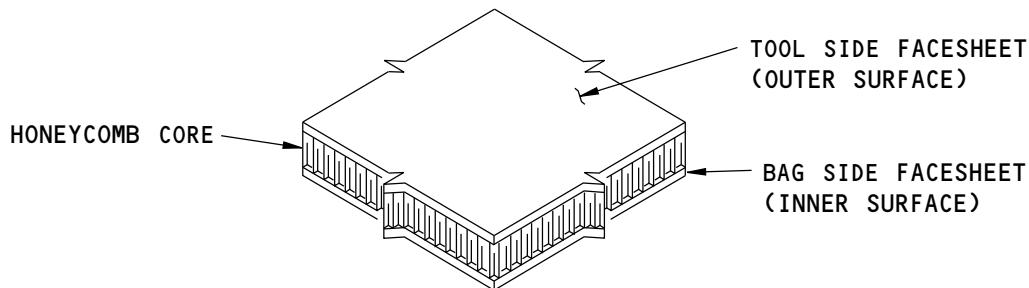
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737-800 STRUCTURAL REPAIR MANUAL



K36897 S0006591884_V1

Definitions of the Facesheets
Figure 103

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
51-30-03	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
54-00-01	NACELLES/PYLONS - GENERAL
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

NOTE: The allowable damage limits that follow are applicable to all allowable damage zones. Refer to Allowable Damage Zones for the Diaphragm Acoustic Panel, Figure 104/ALLOWABLE DAMAGE 2 for the locations and the maximum damage dimensions of each zone.

A. Solid Laminate Areas

- (1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.
 - (a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 2
- (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon plies are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail A if they are:
 - (a) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2
- (4) Dents are not permitted.

54-30-01

ALLOWABLE DAMAGE 2

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (5) Holes and Punctures are not permitted.
- (6) Delaminations are not permitted.
- (7) Edge Damage is permitted if it is:
 - (a) Outside of the keep out zone shown in Figure 110
 - (b) A maximum of 0.20 inch (5.1 mm) in depth
 - (c) A maximum of 0.50 inch (12.7 mm) in width
 - (d) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2
 - (e) Repaired by 5000 flight hours or 18 months, whichever comes first.
- (8) Edge Erosion is permitted as shown in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail B if it is repaired by 5000 flight hours or 18 months, whichever comes first.

B. Honeycomb Core Areas.

NOTE: The total area of damage on a panel must not be more than 3.0 inches² (58.0 cm²).

- (1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.
 - (a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 2.
- (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon plies are permitted.
- (3) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if:
 - (a) Outside of the keep out zone shown in Figure 107
 - (b) A maximum of one ply in depth
 - (c) Use the limits for holes and punctures if it is more than one ply in depth
 - (d) The damage is cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2
- (4) Dents are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if they are:
 - (a) Outside of the keep out zone shown in Figure 108
 - (b) A maximum of 0.05 inch (1.8 mm) in depth
 - (c) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2
 - (d) No breakage of carbon fibers.
- (5) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if:
 - (a) Outside of the keep out zone shown in Figure 109
 - (b) They are a maximum of one facesheet and the core in depth
 - (c) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 2
 - (d) They are a maximum of 0.25 inch (6.4 mm) in diameter.
- (6) Delaminations are permitted as shown in Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail A if they are:
 - (a) Cleaned and sealed as given in Paragraph 4./ALLOWABLE DAMAGE 2
 - (b) A maximum of 0.50 inch (12.7 mm) in diameter.
- (7) Edge Damage is not permitted.
- (8) Edge Erosion is not permitted.

54-30-01

ALLOWABLE DAMAGE 2

Page 106

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

C. Lightning Strike Damage.

NOTE: The area of damage on a panel must not be more than that shown in Figure 104 (Sheet 2) Detail B.

- (1) Nicks, Gouges, and Scratches that cause damage to the carbon fibers are permitted if:
 - (a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.
 - (b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.
- (2) Dents are permitted if:
 - (a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.
 - (b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.
- (3) Holes and Punctures are permitted as shown in Allowable Damage Limits if:
 - (a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.
 - (b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.
- (4) Delaminations are permitted as shown in Allowable Damage Limits if:
 - (a) They are no more than the limits shown in Figure 104 (Sheet 2), Detail B and as shown in Figure 106 (Sheet 2), Detail B.
 - (b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.
- (5) Edge Damage is permitted if:
 - (a) They are no more than the limits shown in Figure 106 (Sheet 2)Figure 106/ALLOWABLE DAMAGE 2, Detail B.
 - (b) The damage is cleaned and sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 2.

54-30-01

ALLOWABLE DAMAGE 2

Page 107

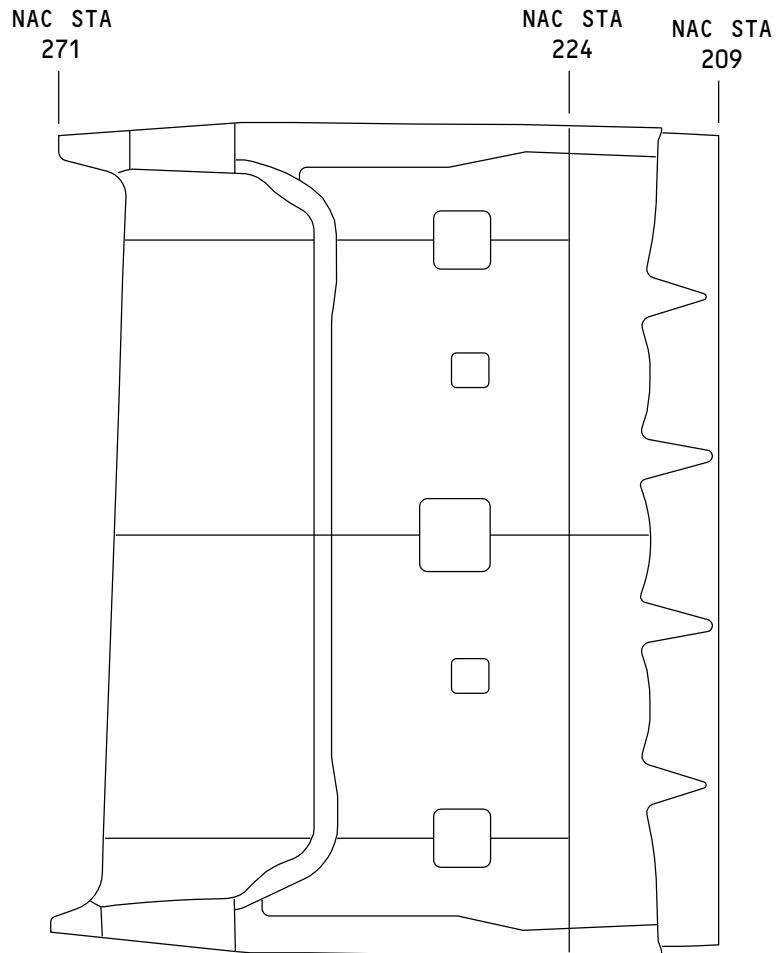
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737-800
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VIEW IS ON THE INNER (AERODYNAMIC) SURFACE

(A)

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Allowable Damage Zones for the Diaphragm Acoustic Panel
Figure 104 (Sheet 1 of 2)

54-30-01

ALLOWABLE DAMAGE 2

Page 108

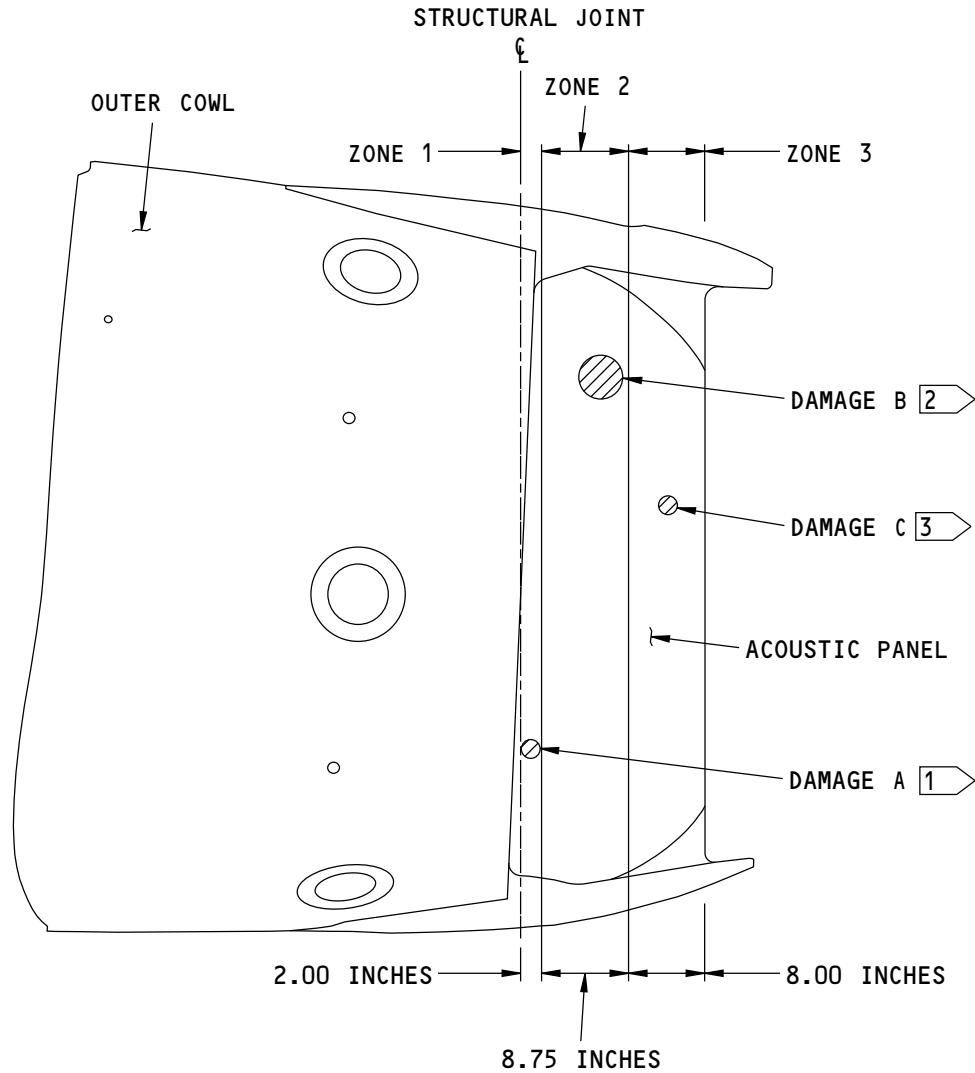
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737-800
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NOTES

- ONLY ONE DAMAGE AREA IS PERMITTED FOR EACH ZONE ON ONE PANEL
- [1] 2.0 INCH DIAMETER MAXIMUM DAMAGE PERMITTED WITH NO MORE THAN 3 FASTENERS BEING DAMAGED.
- [2] 4.0 INCH DIAMETER MAXIMUM DAMAGE PERMITTED.
- [3] 2.0 INCH DIAMETER MAXIMUM DAMAGE PERMITTED.

B

J89186 S0000182308_V2

Allowable Damage Zones for the Diaphragm Acoustic Panel
Figure 104 (Sheet 2 of 2)

54-30-01

ALLOWABLE DAMAGE 2

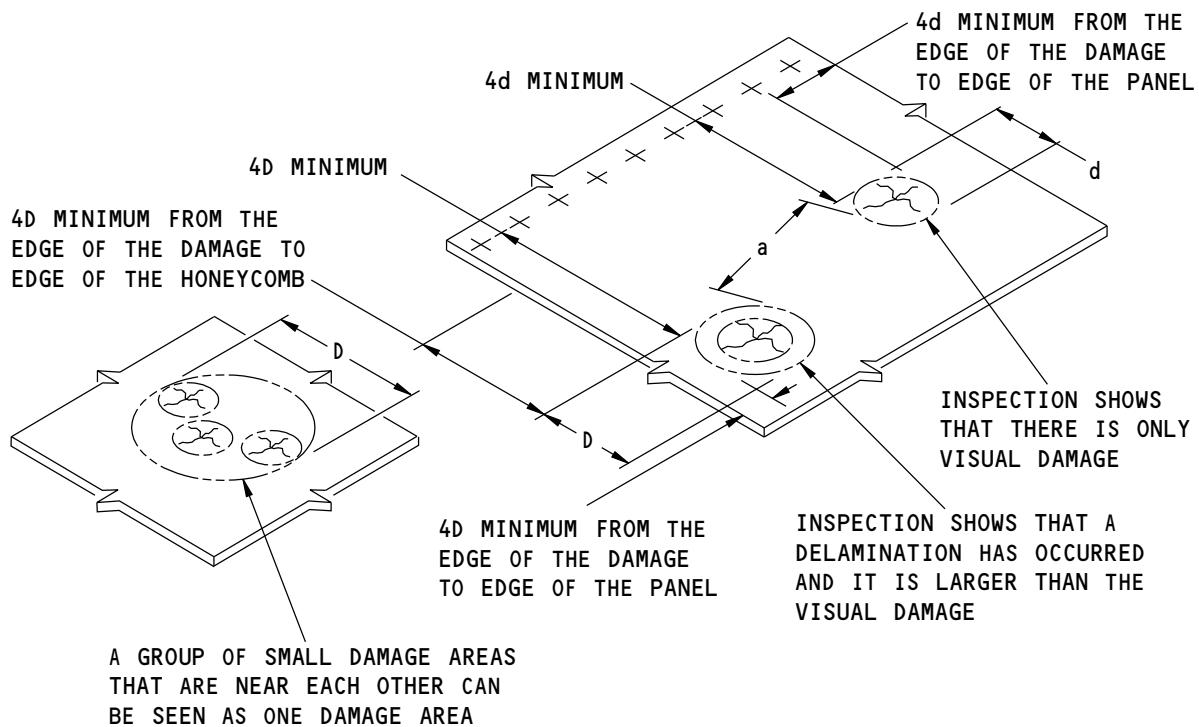
Page 109

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

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

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON ONE OR BOTH SIDES OF THE PANEL).

(A)

K36899 S0006591886_V1

Allowable Damage Limits
Figure 105 (Sheet 1 of 2)

54-30-01

ALLOWABLE DAMAGE 2

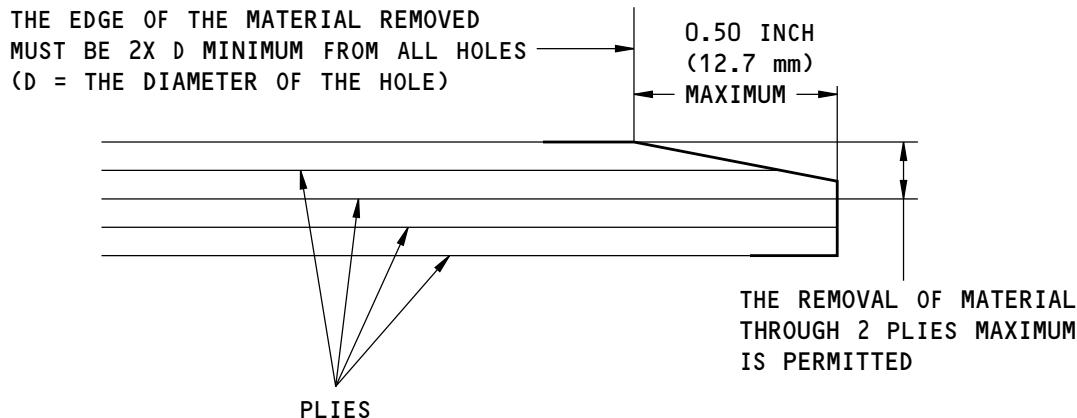
Page 110

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
 - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
 - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
- SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
 - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
 1. KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION BEFORE EACH 400 FLIGHT HOURS.
 2. REPLACE THE TAPE IF YOU FIND DETERIORATION.
 3. REPAIR THE DAMAGE BEFORE 5,000 FLIGHT HOURS OCCURS.
 - B. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
 - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR TYPE III ADHESIVE AT 75 °F (24 °C) FOR 24 HOURS.
 - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75 ° (24 °C)FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE AND
A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE

(B)

K36900 S0006591887_V1

Allowable Damage Limits
Figure 105 (Sheet 2 of 2)

54-30-01

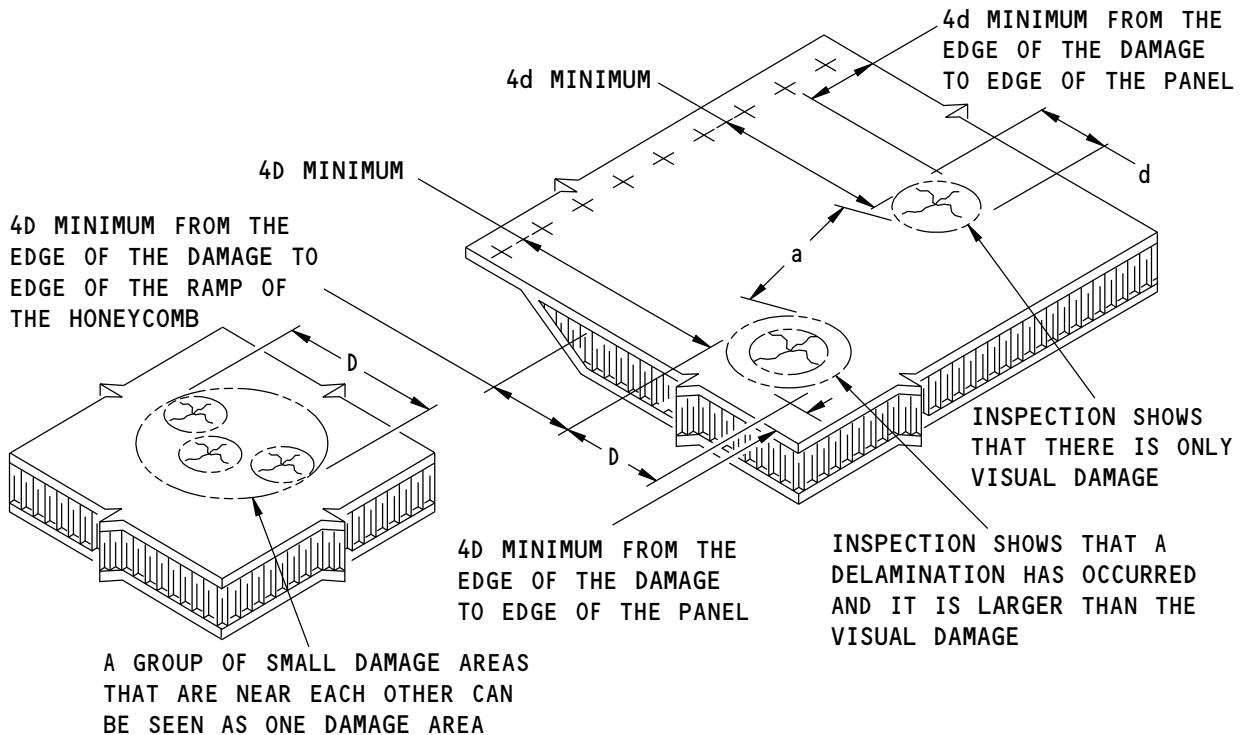
ALLOWABLE DAMAGE 2

Page 111

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

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

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON ONE OR BOTH SIDES OF THE PANEL).

(A)

K36923 S0006591888_V2

Allowable Damage Limits
Figure 106 (Sheet 1 of 2)

54-30-01

ALLOWABLE DAMAGE 2

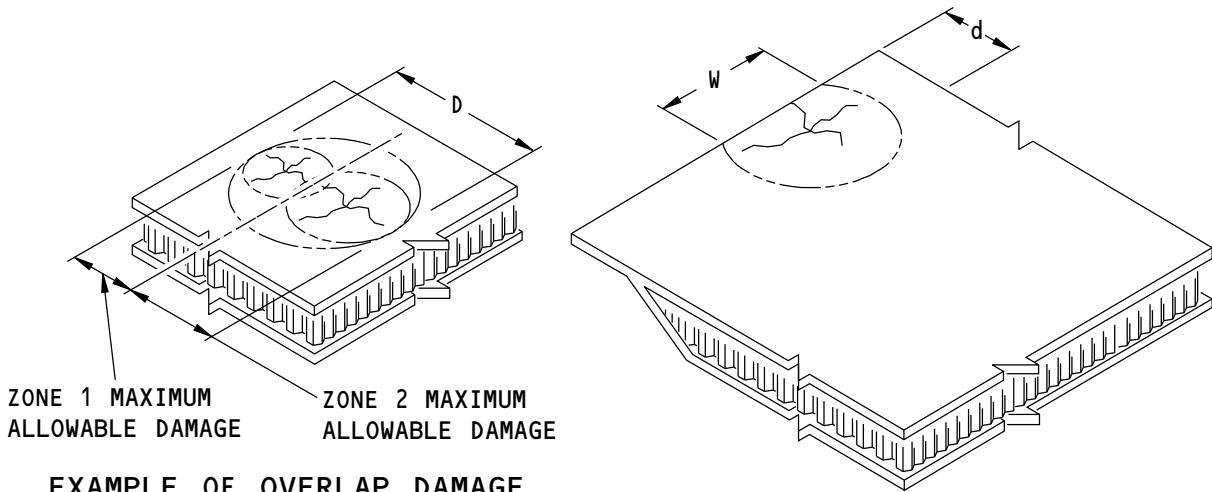
Page 112

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



EXAMPLE OF OVERLAP DAMAGE
BETWEEN ZONES 1 AND 2

NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

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

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS
THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D = TOTAL OVERLAP DAMAGE BETWEEN ZONES WHERE THE DAMAGE IS NO MORE THAN THE
TOTAL ALLOWABLE DAMAGE FOR EACH INDIVIDUAL ZONE.

W = MAXIMUM EDGE DAMAGE WIDTH = 2 INCHES.

d = MAXIMUM EDGE DAMAGE DEPTH = 1 INCH.

B

J89149 S0000182232_V2

Allowable Damage Limits
Figure 106 (Sheet 2 of 2)

54-30-01

ALLOWABLE DAMAGE 2

Page 113

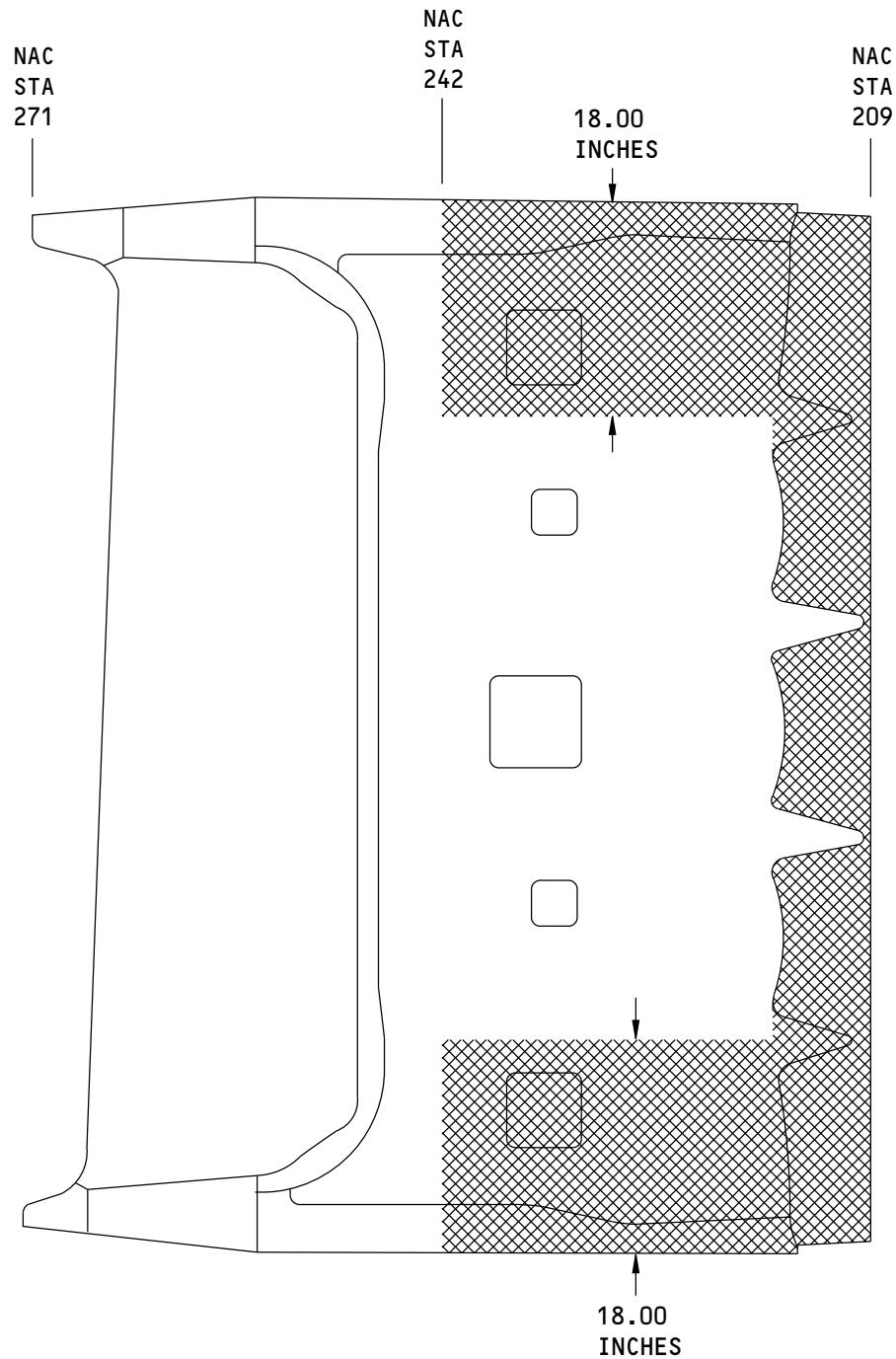
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737-800
STRUCTURAL REPAIR MANUAL



2456420 S0000570993_V1

Inner Facesheet Keep Out Zone for Nicks, Gouges, and Scratches
Figure 107

54-30-01

ALLOWABLE DAMAGE 2

Page 114

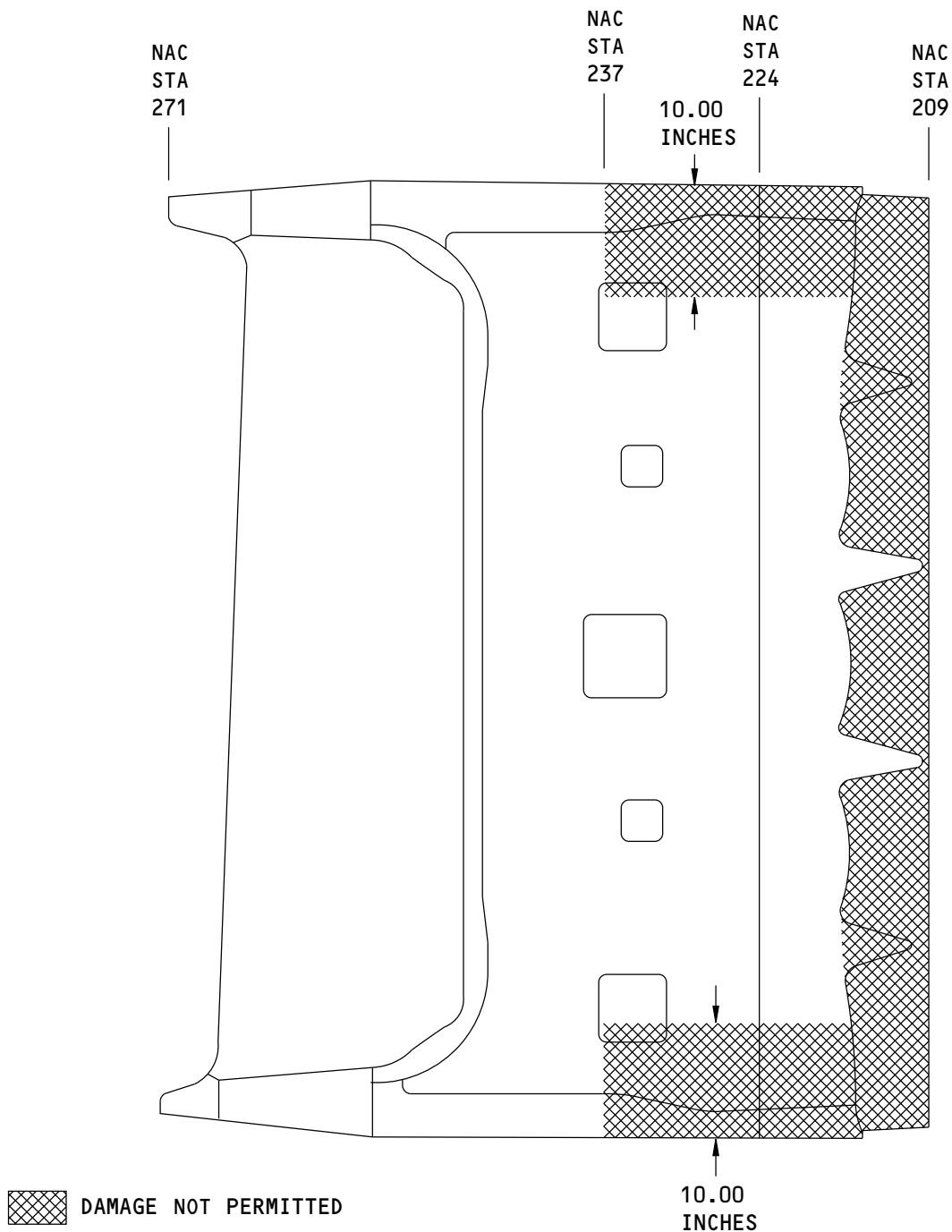
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Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



2456483 S0000570994_V1

Inner Facesheet Keep Out Zone for Dents
Figure 108

54-30-01

ALLOWABLE DAMAGE 2

Page 115

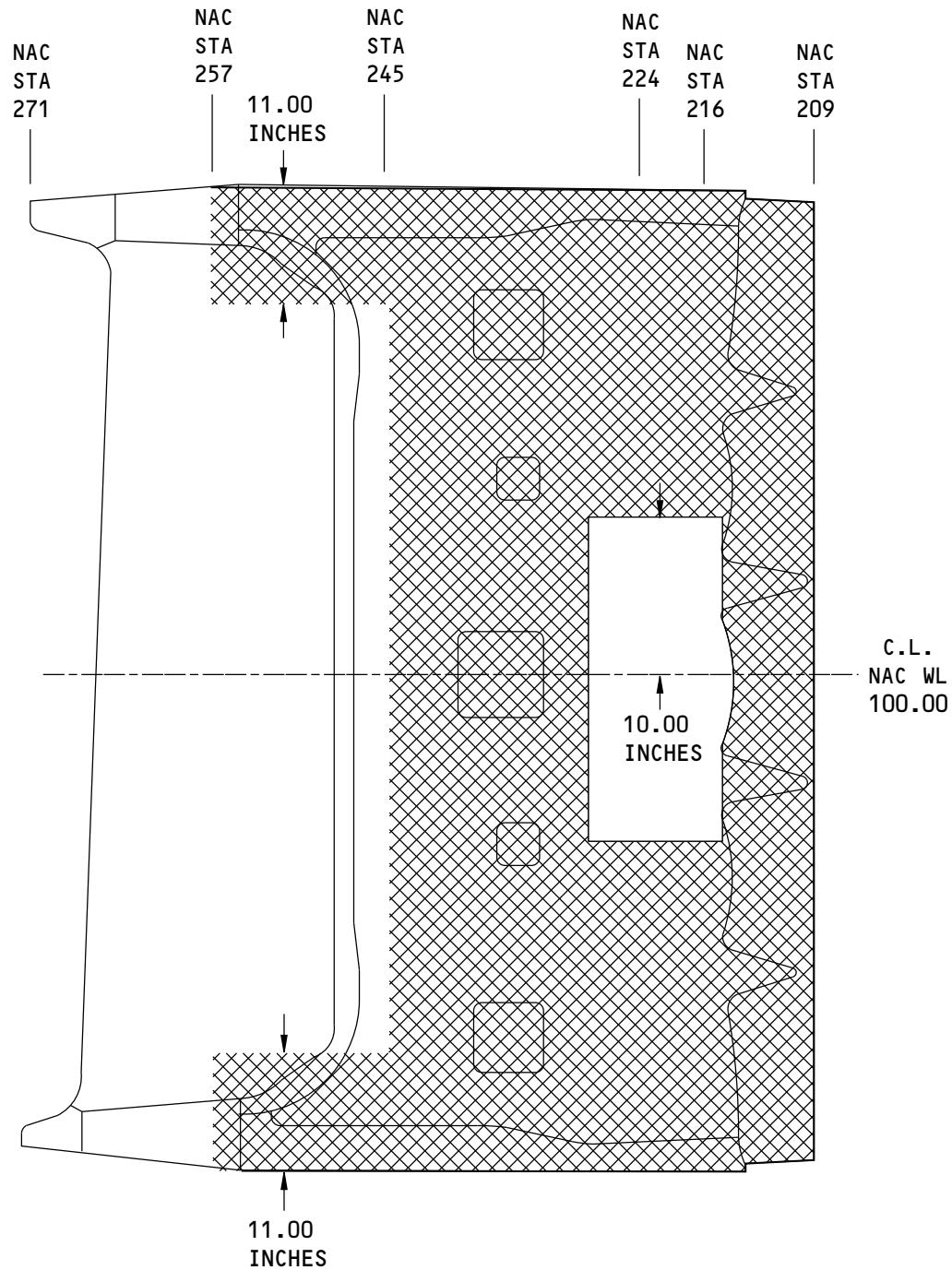
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737-800
STRUCTURAL REPAIR MANUAL



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Inner Facesheet Keep Out Zone for 0.25 inch Holes/Punctures
Figure 109

54-30-01

ALLOWABLE DAMAGE 2

Page 116

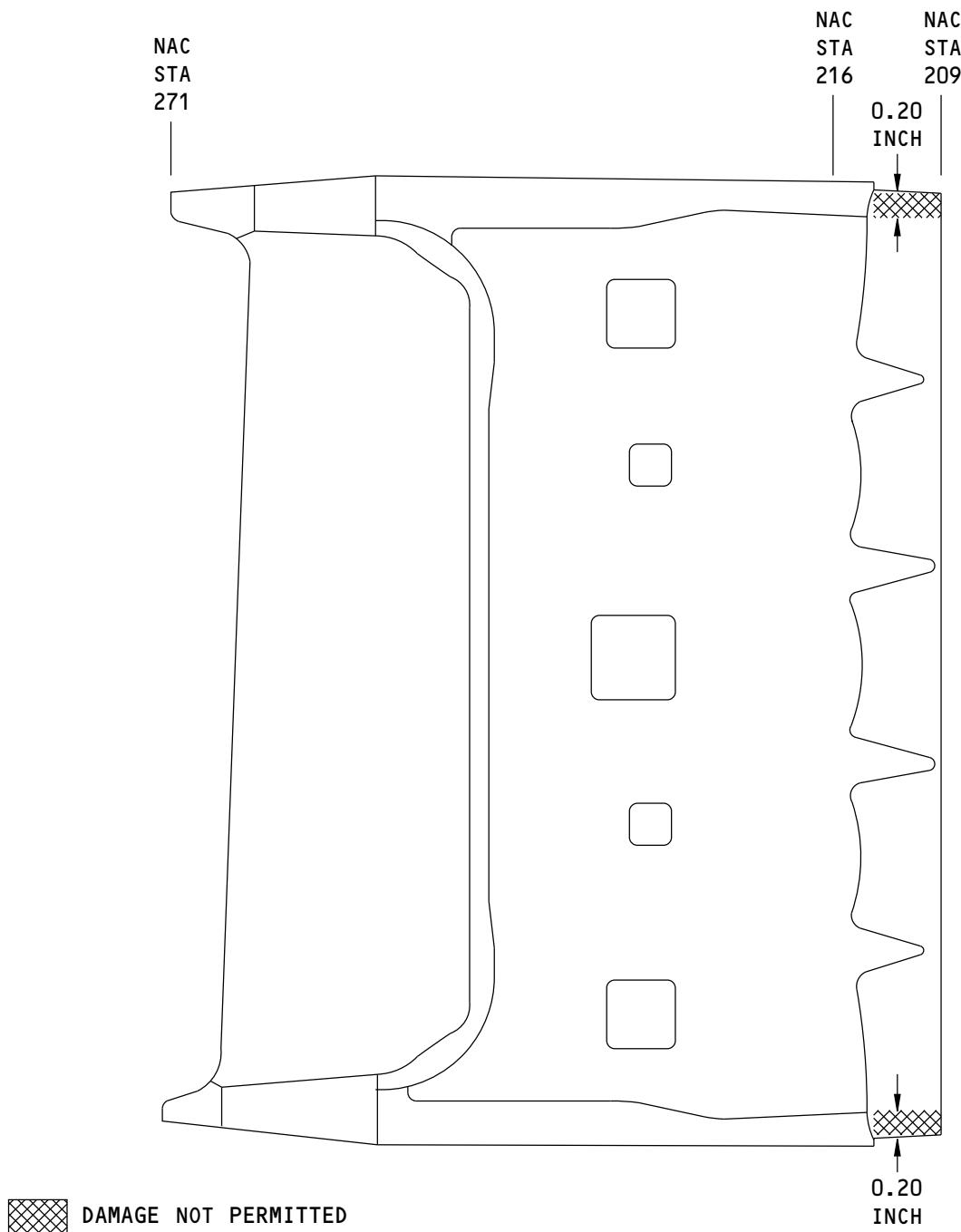
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737-800
STRUCTURAL REPAIR MANUAL



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Inner Facesheet Keep Out Zone for Edge Damage
Figure 110

54-30-01

ALLOWABLE DAMAGE 2

Page 117

Nov 10/2015

D634A210

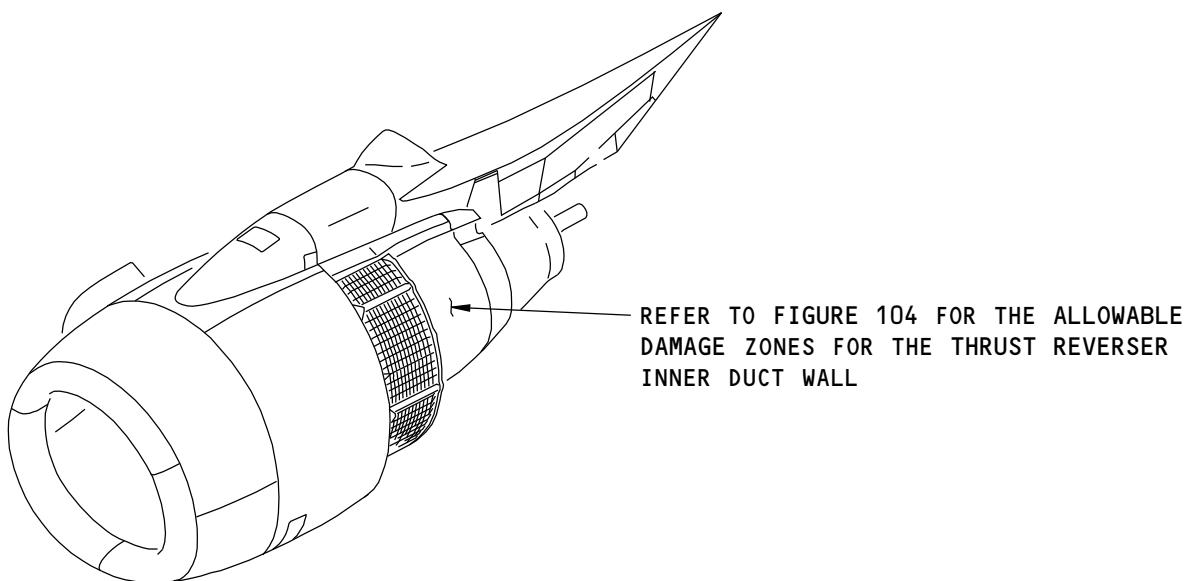


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 3 - THRUST REVERSER INNER DUCT WALL SKIN PANEL

1. Applicability

- A. This subject gives the allowable damage limits for the Thrust Reverser Inner Duct Wall Acoustic Panel for the CFM56-7 engine nacelle shown in Thrust Reverser Inner Duct Wall Location, Figure 101/ALLOWABLE DAMAGE 3.



NOTE: THRUST REVERSER TRANSLATING SLEEVE IS NOT SHOWN.

Thrust Reverser Inner Duct Wall Location
Figure 101

K36901 S0006591890_V1

2. General

- A. If there is damage to the composite parts, do as follows:

- (1) 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 inspections procedures.

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

54-30-01

ALLOWABLE DAMAGE 3

Page 101

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

- (a) For the honeycomb core areas, the tap test is an alternative procedure to instrumented NDT. Refer to 737 NDT Part 1, 51-05-01 for the procedures.
 - (b) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 3 for the definitions of the length, width, and depth of the damage.
 - (c) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.
 - (d) Refer to Figure 104/ALLOWABLE DAMAGE 3 for the allowable damage zones and related damage dimensions.
- (2) Remove all of the contamination and water from the inner duct wall panel. Refer to 51-70-04.
- (a) Refer to 51-70-04 for the damage removal procedures.
 - (b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.
- (3) Refer to 54-00-01 for the data about acoustic panel loss limits.
- (a) Use the maximum loss limits given in 54-00-01 unless given differently.
- (4) Clean the damaged area as follows:
- (a) Remove all dust from the component with a vacuum cleaner.
 - (b) Clean the surfaces of the repair area with a cloth moist with Methyl IsoButyl Ketone (MIBK) or Acetone. Refer to SOPM 20-30-03 for the general cleaning procedures. Clean the surface again until a new moist cloth is clean after you use the cloth. Remove the solvent before it can dry and remove the remaining film before you continue with the sealing.
- (5) Make a seal of all the areas where damage is permitted with one of the two methods that follows (Refer to the allowable damage limits in Paragraph 4./ALLOWABLE DAMAGE 3).

NOTE: Damage which causes fiber damage is structural damage, and the two seal methods that follow are temporary. Damage which does not cause fiber damage is non-structural and the seal methods that follow are temporary or permanent.

- (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape).
 - 2) Keep a record of the location of the damage.
 - 3) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.
 - 4) Do a permanent repair of the damage at or before 5000 flight hours from the time the seal was made.
- (b) Make a temporary seal for areas with structural damage or a permanent seal for areas with non-structural damage.
 - 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 III or BMS 10-103, Type I 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 51-21-00/701.
 - 4) Repair the damage at or before 5000 flight hours from the time the seal was made.

54-30-01

ALLOWABLE DAMAGE 3

Page 102

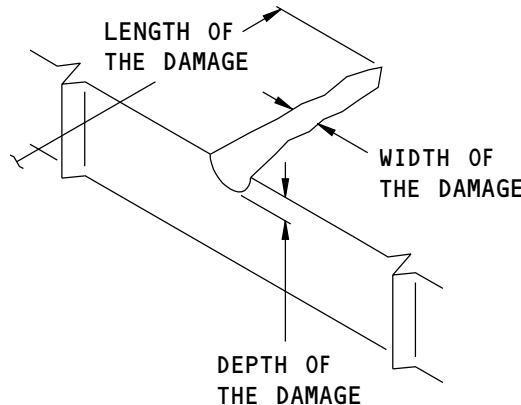
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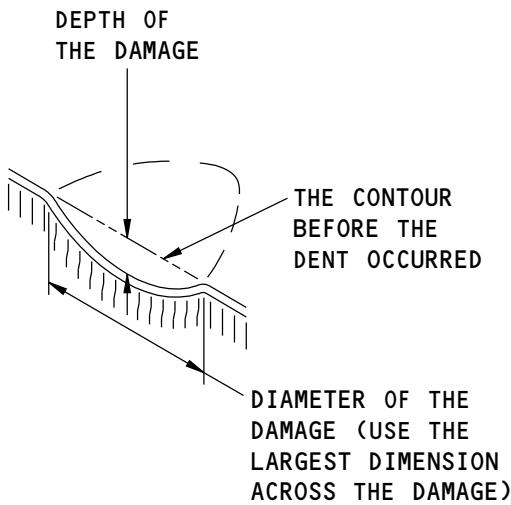


737-800
STRUCTURAL REPAIR MANUAL



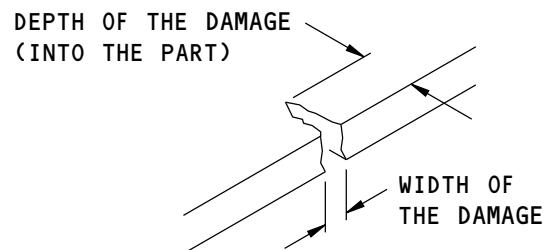
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

K36902 S0006591891_V1

Definitions of the Damage Size
Figure 102

54-30-01

ALLOWABLE DAMAGE 3

Page 103

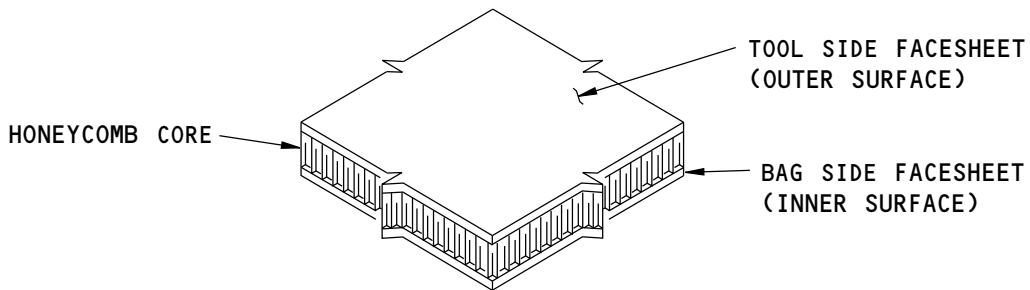
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737-800 STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 103

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
51-30-03	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
54-00-01	NACELLES/PYLONS - GENERAL
AMM 51-21-00/701	Interior And Exterior Finishes - Cleaning/Painting
SOPM 20-30-03	General Cleaning Procedures
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, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

NOTE: The allowable damage limits that follow are applicable to the tool side (outer face sheet) only.

A. Solid Laminate Areas:

- (1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.
 - (a) If the fibers go through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
- (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 as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 106/ALLOWABLE DAMAGE 3, Detail A if they are:
 - (a) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
 - (b) A maximum of 1 ply damage on the tool side.
- (4) Dents are not permitted.

54-30-01

ALLOWABLE DAMAGE 3

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (5) Holes and Punctures are not permitted.
- (6) Delaminations are not permitted.
- (7) Edge Damage is permitted if it is:
 - (a) A maximum of 0.20 inch (5.1 mm) in depth
 - (b) A maximum of 0.50 inch (12.7 mm) in width
 - (c) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
 - (d) Repaired by 5000 flight hours or 18 months, whichever comes first.
- (8) Edge Erosion is permitted as shown in Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel, Figure 106/ALLOWABLE DAMAGE 3, Detail B if it is:
 - (a) Repaired by 5000 flight hours or 18 months, whichever comes first.
 - (b) Not in the keep out zone for edge erosion as shown in Figure 105/ALLOWABLE DAMAGE 3.

B. Honeycomb Core Areas:

NOTE: The total area of damage must not be more than 2.0 inches² (25.8 cm²) if:

- By 400 flight hours or 2 months, whichever comes first, you make a repair that fits in a diameter of more than 0.50 inch (12.7 mm) and less than 0.75 inch (19.1 mm).
 - By 25 flight hours or 5 days, whichever comes first, you make a repair that fits in a diameter of more than 0.75 inch (19.1 mm).
- (1) Nicks, Gouges, and Scratches that cause damage to the isolation ply are permitted.
 - (a) If the damage goes through the glass fibers to the carbon fibers below, clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
 - (2) Nicks, Gouges, and Scratches that do not cause damage to the carbon plies are permitted.
 - (3) Nicks, Gouges, and Scratches that cause damage to the carbon plies are permitted as shown in Allowable Damage Limits - Inner Duct Wall, Figure 107/ALLOWABLE DAMAGE 3, Detail A if:
 - (a) It is a maximum of 1 ply damage
 - (b) The damage is equal to or less than the limits for Zones 1 through 7 as shown in Figure 104/ALLOWABLE DAMAGE 3 and given in Table 101/ALLOWABLE DAMAGE 3.
 - (c) You clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
 - (4) Dents are permitted as shown in Allowable Damage Limits - Inner Duct Wall, Figure 107/ALLOWABLE DAMAGE 3, Detail A if they are:
 - (a) A maximum of 0.05 inch (1.27 mm) in depth
 - (b) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
 - (5) Holes and Punctures are permitted on the toolside (outer) skin as shown in Allowable Damage Limits - Inner Duct Wall, Figure 107/ALLOWABLE DAMAGE 3, Detail A if:
 - (a) They are a maximum of one facesheet and the core in depth
 - (b) Cleaned and sealed as given in Paragraph 2.A./ALLOWABLE DAMAGE 3
 - (c) The damage is equal to or less than the limits for Zones 1 through 7 as shown in Figure 104/ALLOWABLE DAMAGE 3 and given in Table 101/ALLOWABLE DAMAGE 3.
 - (6) Delaminations are permitted with a 0.5 in. (12.7 mm) maximum limit if you clean and seal the damage as given in Paragraph 2.A./ALLOWABLE DAMAGE 3.

54-30-01

ALLOWABLE DAMAGE 3

Page 105

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (7) Edge Damage is not permitted.
- (8) Edge Erosion is not permitted.

Table 101: Allowable Damage Limits for Carbon Fiber Ply in Zones 1 through 7

TYPE OF DAMAGE	LIMIT DESCRIPTION	OUTER SURFACE MAXIMUM DAMAGE LIMITS						
		ZONE 1	ZONE 2	ZONE 3	ZONE 4	ZONE 5	ZONE 6	ZONE 7
Nicks, Gouges, and Scratches ^{*[1]}	- Length in inches (mm)	Not Permitted	1.00 (25.4)	1.00 (25.4)	0.75 (19.0)	0.50 (12.7)	0.375 (9.525)	0.25 (6.35)
	- Depth in plies		One carbon ply					
	- Damage Spacing		Refer to Figure 106/ALLOWABLE DAMAGE 3, Detail A Refer to Figure 107/ALLOWABLE DAMAGE 3, Detail A					
Holes and Punctures ^{*[1]*[2]*[3]}	- Diameter in inches (mm)	Not Permitted		0.25 (6.35)				

*[1] This damage is only applicable to the outer aero face sheet.

*[2] Holes and punctures must be cleaned to circular holes before a temporary or permanent seal is applied.

*[3] Holes and punctures in the edge-band solid laminate are not permitted.

54-30-01

ALLOWABLE DAMAGE 3

Page 106

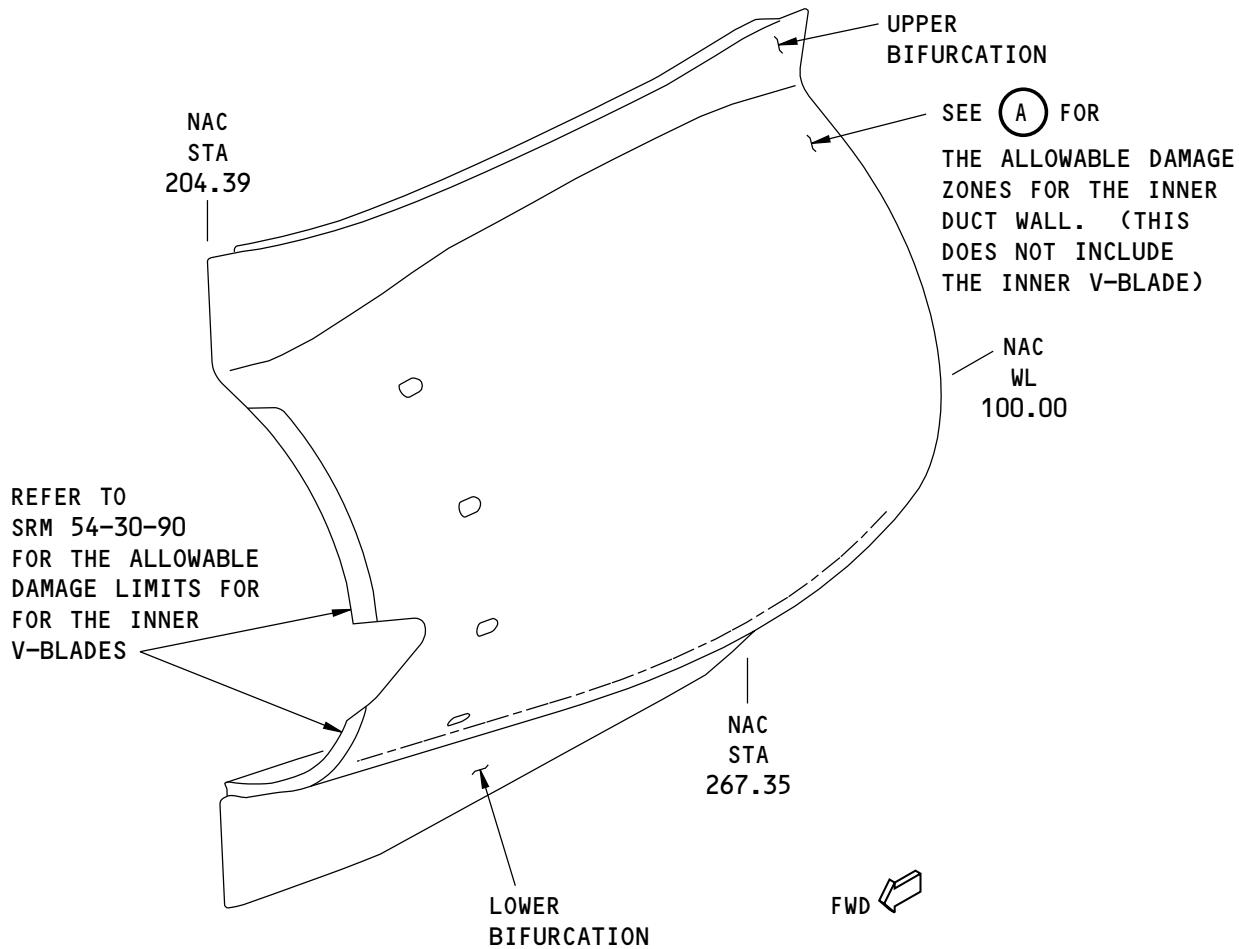
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



LEFT INNER DUCT WALL BOND PANEL IS SHOWN,
RIGHT INNER DUCT WALL BOND PANEL IS ALMOST THE SAME

K36904 S0006591893_V2

Allowable Damage Zones for the Composite Panels
Figure 104 (Sheet 1 of 2)

54-30-01

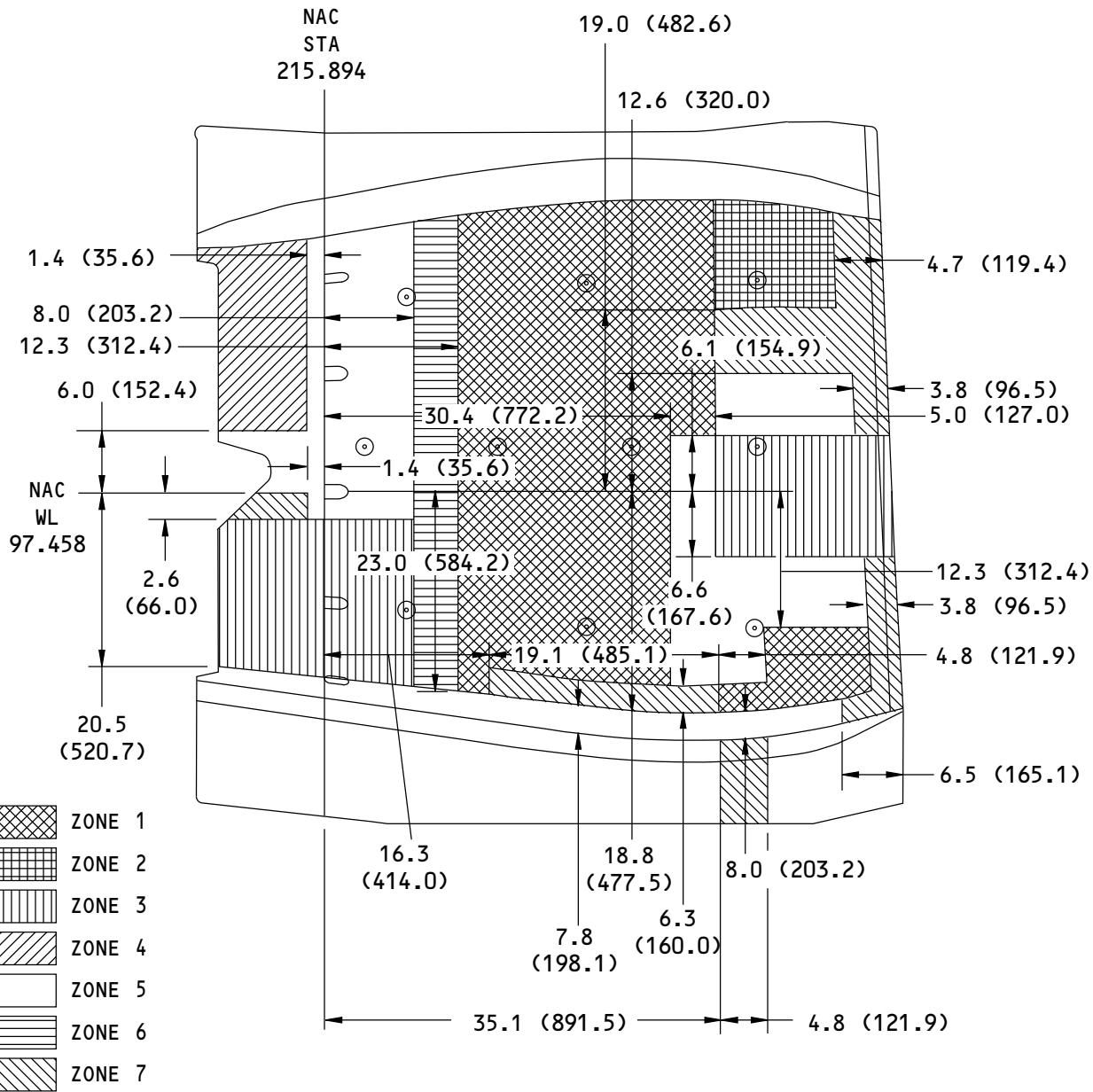
ALLOWABLE DAMAGE 3

Page 107

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



NOTES

- ALL DIMENSIONS ARE IN INCHES (mm).
- ALL THE DIMENSIONS ARE ALONG THE CONTOUR OF THE PANEL ON THE TOOL SIDE (OUTER FACE SHEET).

A

2455990 S0000571020_V1

**Allowable Damage Zones for the Composite Panels
Figure 104 (Sheet 2 of 2)**

54-30-01

ALLOWABLE DAMAGE 3

Page 108

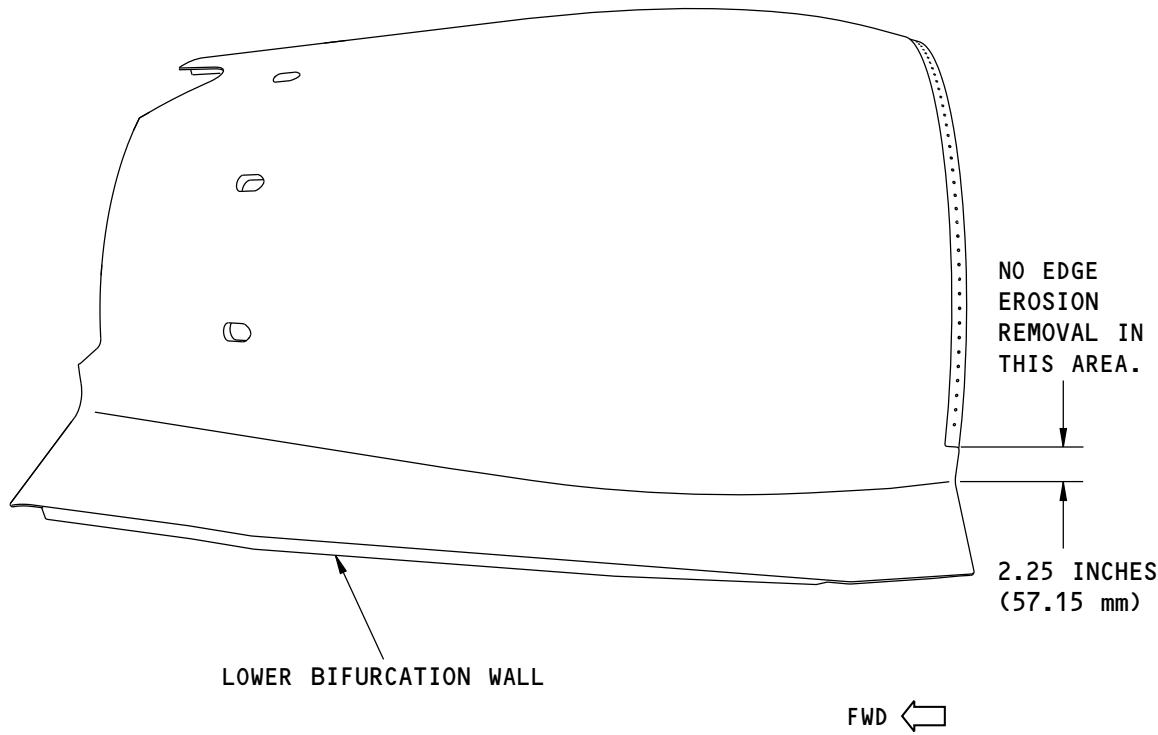
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737-800
STRUCTURAL REPAIR MANUAL



2456098 S0000571022_V1

Allowable Damage Zone Limit for Edge Erosion - Solid Laminate Areas of the Bonded Panel
Figure 105

54-30-01

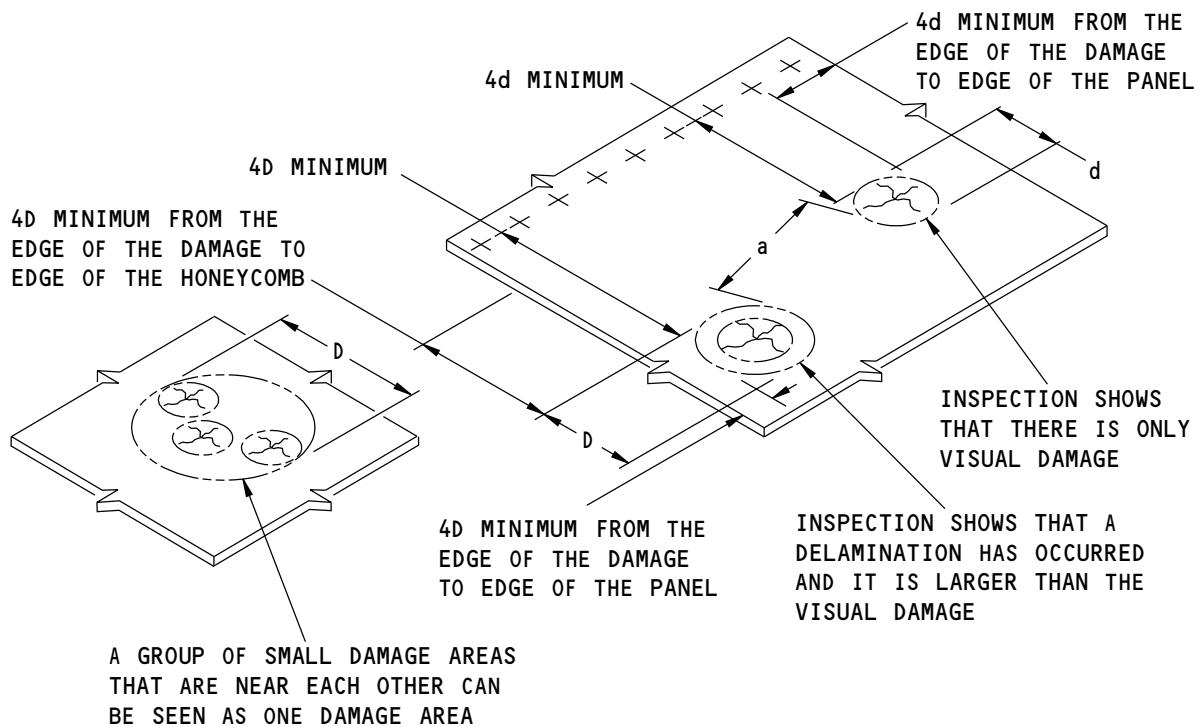
ALLOWABLE DAMAGE 3

Page 109

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- NICKS, GOUGES, AND SCRATCHES
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

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

THE DIAMETER OF A DAMAGE AREA IS THE LARGER DIAMETER OF THE TWO CONDITIONS THAT FOLLOW:

- THE DIAMETER OF THE VISUAL DAMAGE OR
- THE DIAMETER OF THE DELAMINATION.

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS.

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL).

(A)

K36908 S0006591896_V1

Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 106 (Sheet 1 of 2)

54-30-01

ALLOWABLE DAMAGE 3

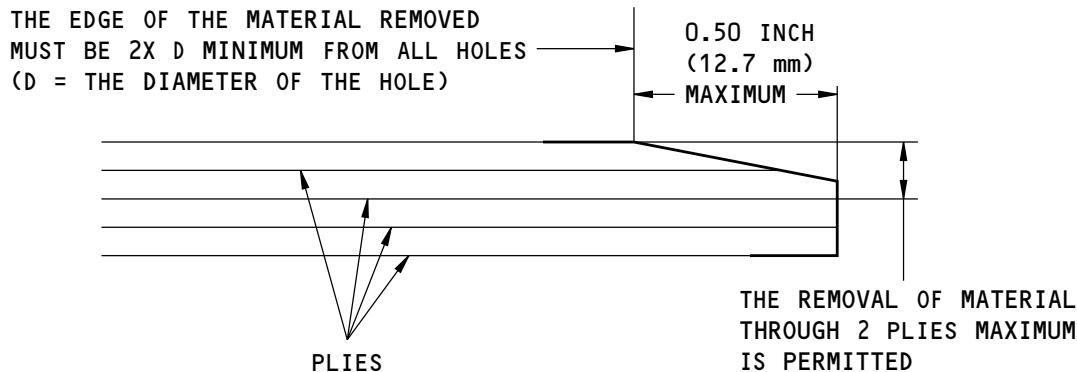
Page 110

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
 - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
 - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
- SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
 - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
 1. KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION BEFORE EACH 400 FLIGHT HOURS.
 2. REPLACE THE TAPE IF YOU FIND DETERIORATION.
 3. REPAIR THE DAMAGE BEFORE 5,000 FLIGHT HOURS OCCURS.
 - B. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
 - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR TYPE III ADHESIVE AT 75 °F (24 °C) FOR 24 HOURS.
 - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75 ° (24 °C)FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE AND A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE OF SOLID LAMINATE AREAS

(B)

K36910 S0006591897_V1

Allowable Damage Limit Requirements - Solid Laminate Areas of the Bonded Panel
Figure 106 (Sheet 2 of 2)

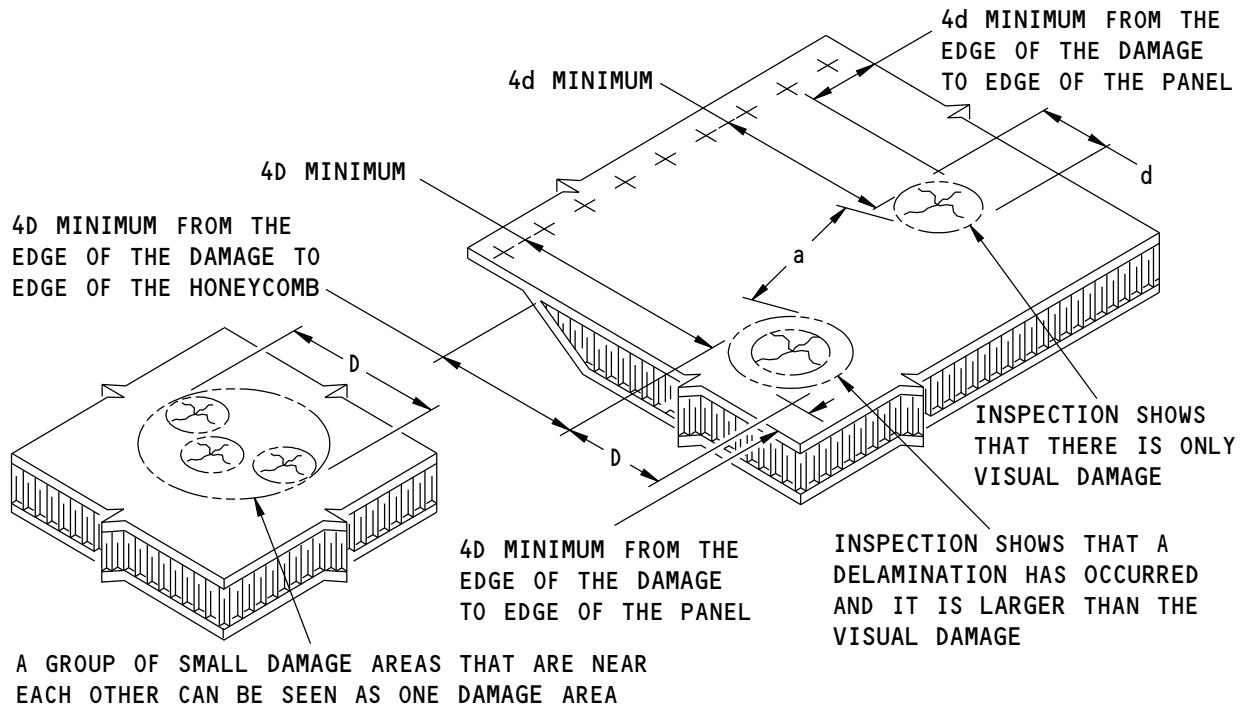
54-30-01

ALLOWABLE DAMAGE 3

Page 111

Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**


NOTE: A DAMAGED AREA CAN INCLUDE THE TYPES OF DAMAGE WHICH FOLLOW:

- A CRACK
- A DENT
- A DELAMINATION
- A HOLE OR PUNCTURE

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

D IS THE LARGER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

d IS THE SMALLER DIAMETER OF TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS

a IS THE DISTANCE BETWEEN TWO ADJACENT DAMAGE AREAS AND/OR AREAS WITH INTERIM REPAIRS.

THE MINIMUM a THAT IS PERMITTED IS 6D (ON THE TWO SIDES OF THE PANEL)

(A)

K36912 S0006591898_V2

Allowable Damage Limits - Inner Duct Wall
Figure 107

54-30-01

ALLOWABLE DAMAGE 3

Page 112

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 4 - THRUST REVERSER AFT COWL SKIN

1. Applicability

- A. This subject gives the allowable damage limits for the Thrust Reverser Aft Cowl Skin as shown in Figure 101/ALLOWABLE DAMAGE 4.

2. General

- A. Refer to Paragraph 4./ALLOWABLE DAMAGE 4 for the allowable damage limits.
- B. After you remove the damage, do the steps that follow:
 - (1) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
 - (2) Apply one layer of DeSoto Hi-Temperature Polyurethane Primer, Base 825-009, Catalyst 910-175, and Thinner 020-044 as given in BAC 5710, Type 51. Refer to SOPM 20-44-01.
 - (a) Apply the material to a dry film thickness of 0.002 inch to 0.003 inch (0.051 mm to 0.0765 mm).
- C. Refer to 51-30-03 for the possible sources of the abrasive and other materials you can use to remove the damage.
- D. Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

54-30-01

ALLOWABLE DAMAGE 4

Page 101

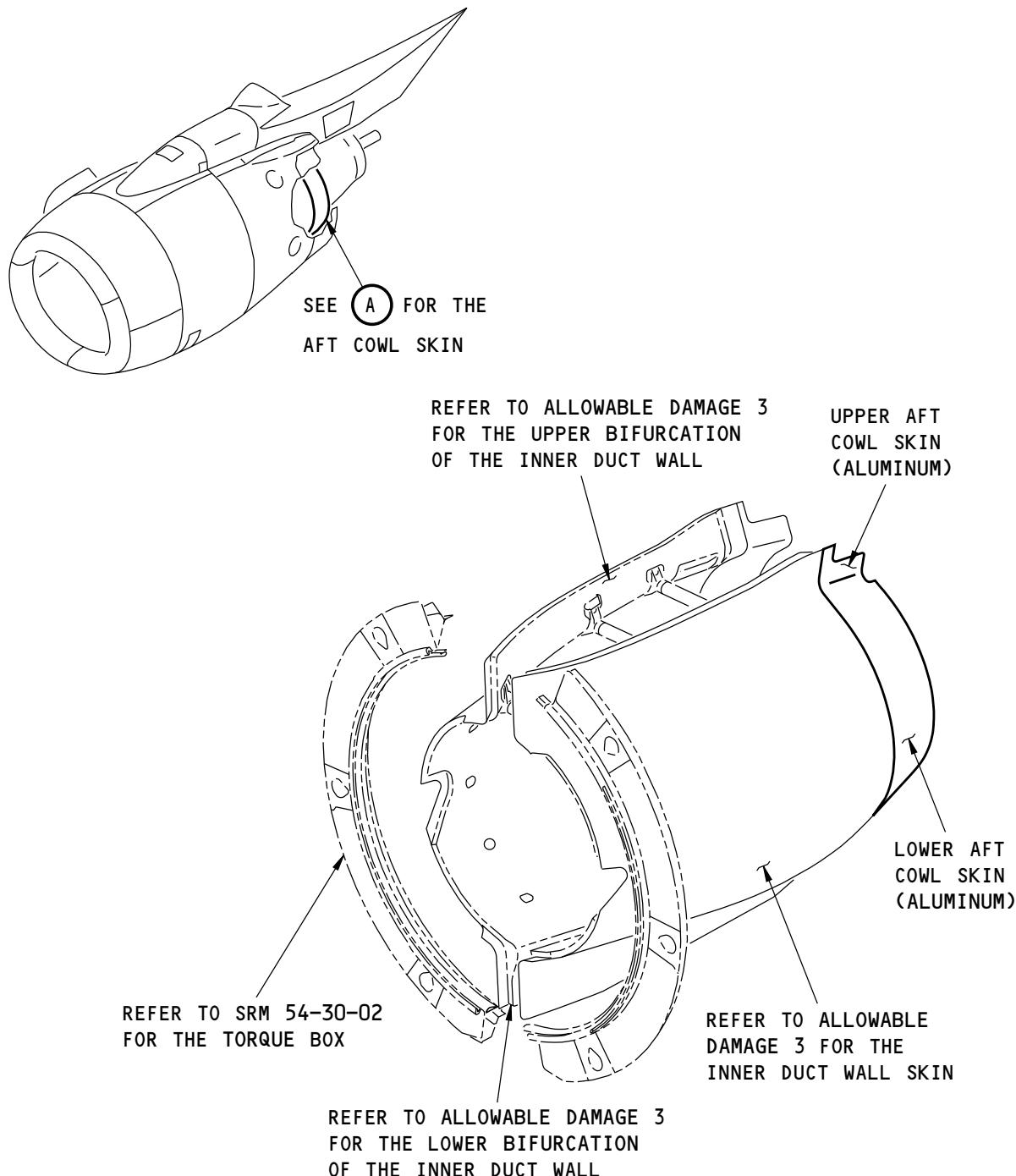
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737-800
STRUCTURAL REPAIR MANUAL



A

K33842 S0006591900_V1

Thrust Reverser Aft Cowl Skin Location
Figure 101

54-30-01

ALLOWABLE DAMAGE 4

Page 102

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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	REPAIR SEALING
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes

4. Allowable Damage Limits

A. Aft Cowl Skins - Upper and Lower

- (1) Cracks:
 - (a) Remove edge damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 4, Details A , B , and F .
- (2) Nicks, Gouges, and Scratches, and Corrosion:
 - (a) Remove damage as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 4, Details A , B , C , E , and F .
- (3) Dents:
 - (a) Damage is permitted as shown in Allowable Damage Limits, Figure 102/ALLOWABLE DAMAGE 4, Detail D if it is:
 - 1) A maximum diameter of 1.5 inches (38.1 mm) in each square foot (929 cm²) of area
 - 2) A minimum of 6.0 inches (152.4 mm) from other damage
 - 3) A minimum of 1.0 inch (25.4 mm) from a hole or the edge of the part.
- (4) Holes and Punctures:
 - (a) Damage is permitted if:
 - 1) You remove the damage to a maximum diameter of 0.25 inch (6.4 mm)
 - 2) It is a minimum of 1.0 inch (25.4 mm) from a hole, other damage, or the edge of the part
 - 3) You install a 2117-T3 or 2117-T4 protruding head rivet with BMS 5-63 sealant.

54-30-01

ALLOWABLE DAMAGE 4

Page 103

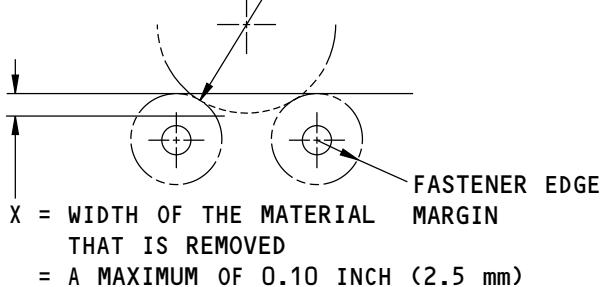
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**737-800
STRUCTURAL REPAIR MANUAL**

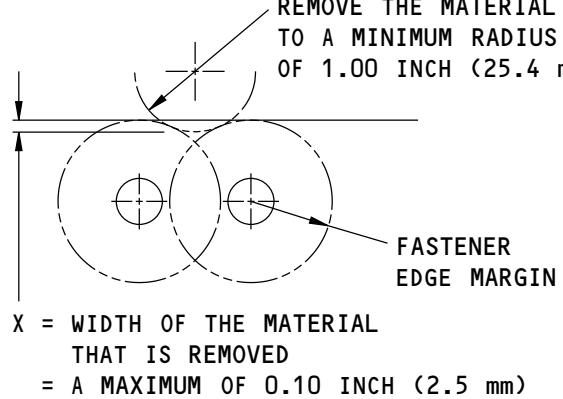
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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

(A)

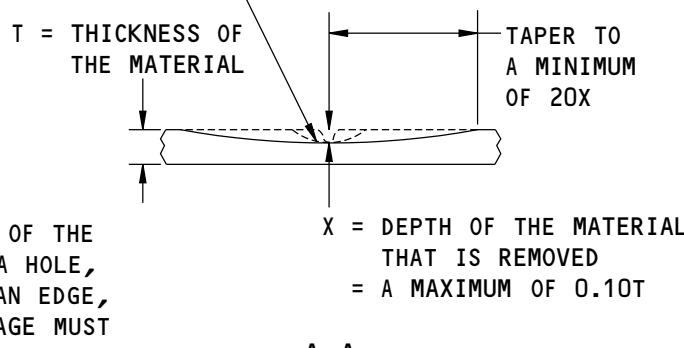
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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

(B)

REMOVE THE MATERIAL TO A MINIMUM
RADIUS OF 1.00 INCH (25.4 mm),
THEN TAPER AS SHOWN



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

(C)

K33843 S0006591901_V1

Allowable Damage Limits
Figure 102 (Sheet 1 of 3)

54-30-01

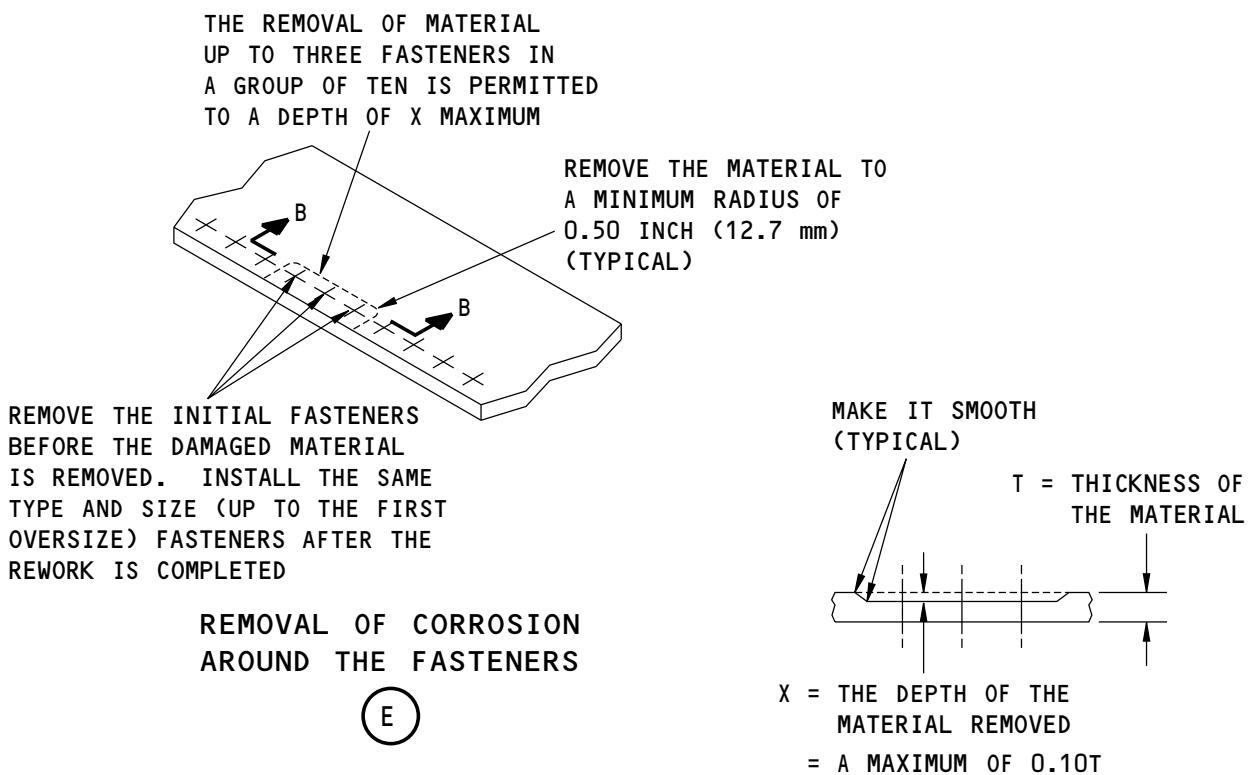
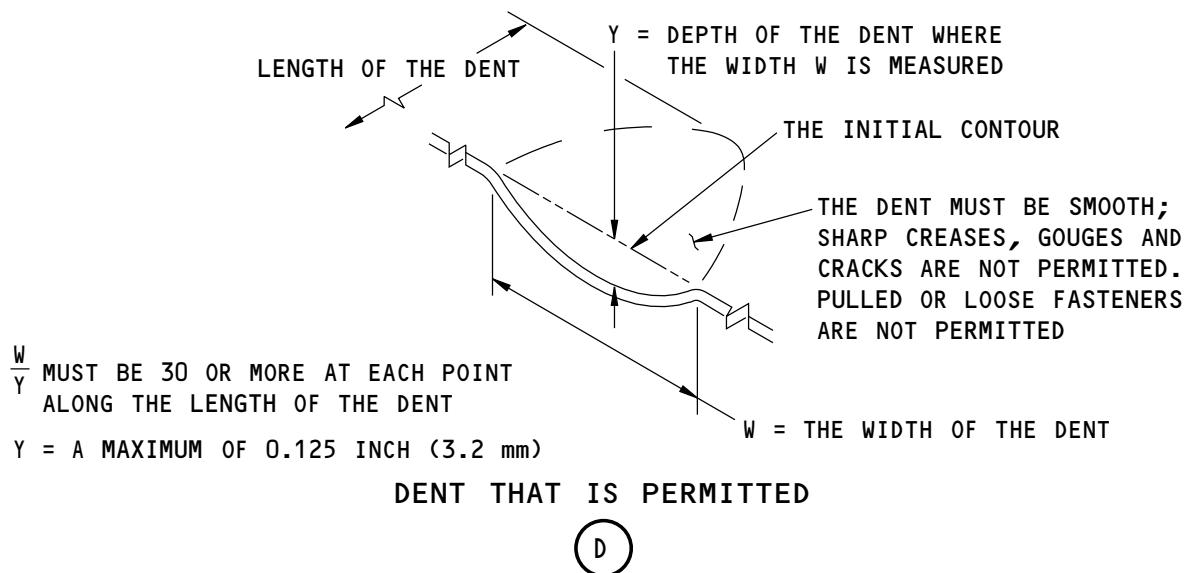
ALLOWABLE DAMAGE 4

Page 104

Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL



B-B K33845 S0006591902_V1

Allowable Damage Limits
Figure 102 (Sheet 2 of 3)

54-30-01

ALLOWABLE DAMAGE 4
Page 105
Nov 10/2012

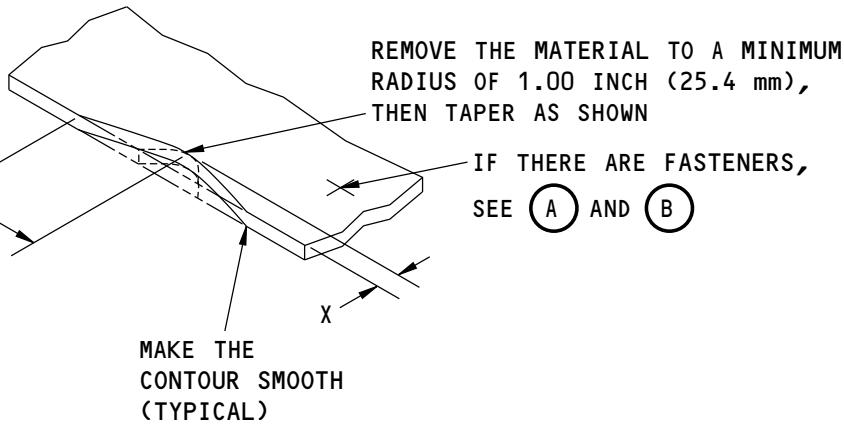
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737-800
STRUCTURAL REPAIR MANUAL

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 THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.5 mm)

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

(F)

K33846 S0006591903_V1

Allowable Damage Limits
Figure 102 (Sheet 3 of 3)

54-30-01

ALLOWABLE DAMAGE 4

Page 106

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 5 - THRUST REVERSER BLOCKER DOORS

1. Applicability

- A. This subject gives the allowable damage limits for the Thrust Reverser Blocker Doors shown in Thrust Reverser Blocker Door Locations, Figure 101/ALLOWABLE DAMAGE 5.

2. General

- A. The composite structure allowable damage limits are applicable only if the damage is sealed as given in Paragraph 2.B./ALLOWABLE DAMAGE 5 and Paragraph 4.B./ALLOWABLE DAMAGE 5, as applicable.

- B. If you have damage to the composite parts, do as follows:

- (1) Do an inspection of the damaged 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 for inspections procedures.

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

- (a) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 5 for the definitions of the length, width, and depth of the damage.
 - (b) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 5 for the definitions of the facesheets of a honeycomb core area.
- (2) Remove all of the contamination and water from the part.
 - (a) Refer to 51-70-04 for the damage removal procedures.
 - (b) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.
- (3) Seal all the permitted damage areas on the parts. Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 5 Paragraph 4.
 - (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 each 400 flight hour interval or more frequently.
 - 4) Do a permanent repair of the damage at or before 5000 flight hours from the time the seal was made.
 - (b) Make a permanent seal.
 - 1) Apply BMS 8-207, Type I, Class 2 as given in 51-70-08 or BMS 8-301, Class 2 as given in 51-70-06, repair 15.
 - 2) Mix, apply, and cure aluminized epoxy primer as given in BAC 5755, Type 10.

54-30-01

ALLOWABLE DAMAGE 5

Page 101

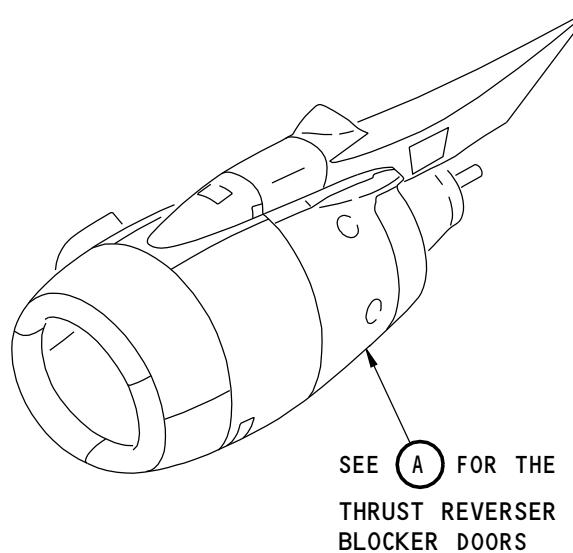
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**737-800
STRUCTURAL REPAIR MANUAL**



Thrust Reverser Blocker Door Locations
Figure 101 (Sheet 1 of 2)

H42489 S0006591905_V1

54-30-01

ALLOWABLE DAMAGE 5

Page 102

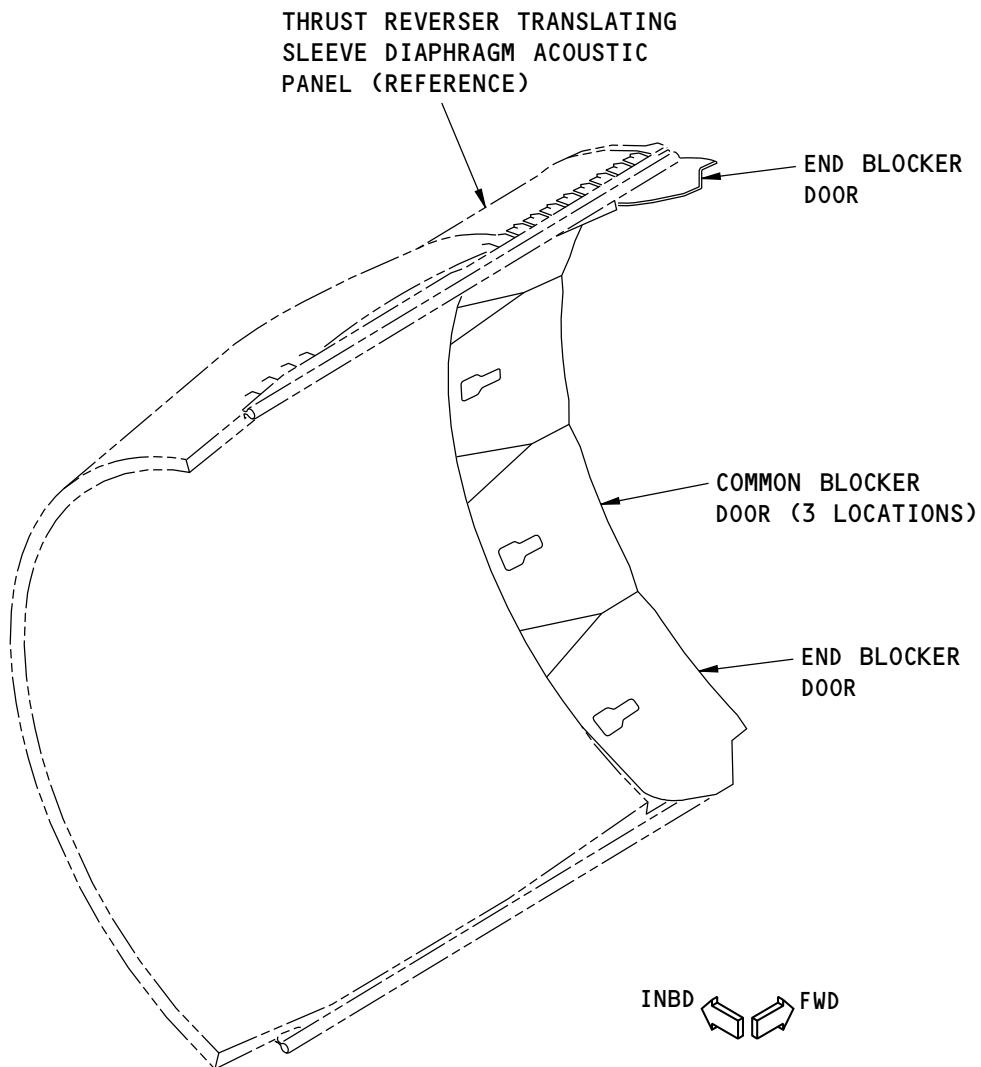
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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

(A)

H42494 S0006591906_V1

Thrust Reverser Blocker Door Locations
Figure 101 (Sheet 2 of 2)

54-30-01

ALLOWABLE DAMAGE 5

Page 103

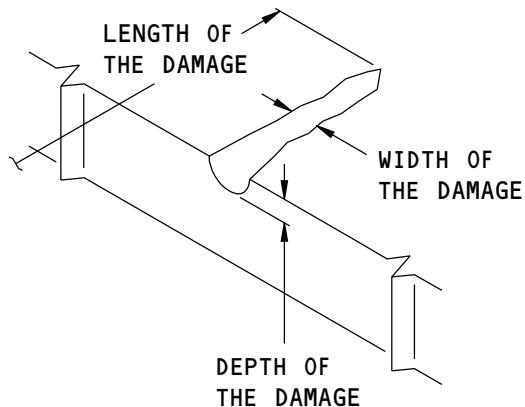
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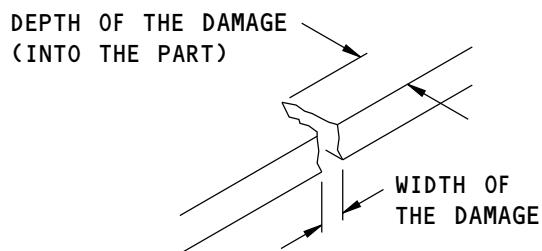


**737-800
STRUCTURAL REPAIR MANUAL**



SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



**SIZE DEFINITIONS FOR
EDGE DAMAGE**

(B)

W31252 S0006591907_V1

**Definitions of the Damage Size
Figure 102**

54-30-01

ALLOWABLE DAMAGE 5

Page 104

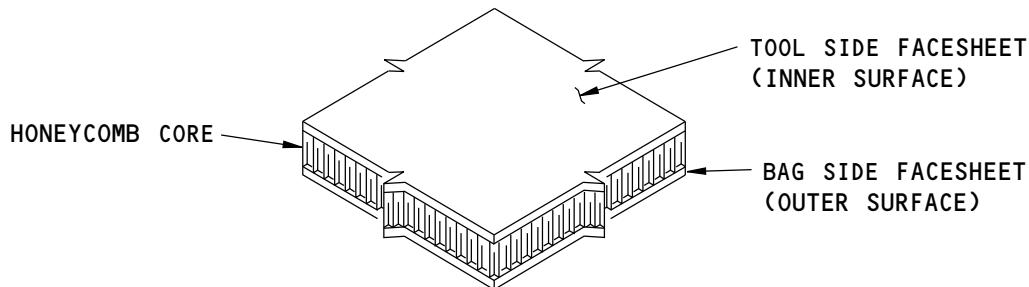
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737-800
STRUCTURAL REPAIR MANUAL



H42498 S0006591908_V1

Definitions of the Facesheets
Figure 103

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
51-30-03	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 51-21-00	INTERIOR AND EXTERIOR FINISHES
SOPM 20-44-04	Application of Urethane Compatible Primer
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. Allowable Damage Limits

A. Thrust Reverser Blocker Doors - Solid Laminate Edgeband Edges

NOTE: The sum of all areas of allowable damage is a maximum of 1.0 square inches (645.2 square mm).

(1) Cracks:

54-30-01

ALLOWABLE DAMAGE 5

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) For damage less than or equal to 0.03 inch (0.76 mm) in depth as shown in Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 5, Detail B , or less than or equal to 10 percent of the thickness as shown in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Detail D as follows:
 - 1) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , C , and D .
 - 2) Seal the damage location as given in Paragraph 2.B./ALLOWABLE DAMAGE 5.
 - (2) Nicks, Gouges, Scratches, and Laminate Edge Abrasions:
 - (a) If there is no fiber damage then seal the damage as given in Paragraph 2.B./ALLOWABLE DAMAGE 5.
 - (b) If there is fiber damage and the damage is less than or equal to the dimensions given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , C , and D then do as follows:
 - 1) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , C , and D .
 - 2) Seal the damage location as given in Paragraph 2.B./ALLOWABLE DAMAGE 5.
 - (3) Edge Erosion:
 - (a) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Detail E and do as follows:
 - 1) Seal the damage location as given in Paragraph 2.B./ALLOWABLE DAMAGE 5.
 - (4) Dents are not permitted.
 - (5) Holes and Punctures:
 - (a) For damage less than or equal to 0.03 inch (0.76 mm) in depth as shown in Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 5, Detail B do as follows:
 - 1) Remove the damage as given in Allowable Damage Limits - Thrust Reverser Blocker Doors, Figure 104/ALLOWABLE DAMAGE 5, Details A , B , and C .
 - 2) Seal the damage location as given in Paragraph 2.B./ALLOWABLE DAMAGE 5.
 - (6) Edge Delamination is not permitted.
- B. Thrust Reverser Blocker Doors - Honeycomb Core Areas
- (1) Edge Potting Cracks:
 - (a) Apply BMS 5-92, Type I adhesive to seal hairline cracks.
 - (2) Nicks, Gouges, and Scratches:
 - (a) Fiber damage is not permitted.
 - (b) If there is no fiber damage then seal the damage location 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:
 - (a) If the damage is less than or equal to 10 percent of the facesheet thickness then seal the damage as given in Paragraph 2.B./ALLOWABLE DAMAGE 5.

54-30-01

ALLOWABLE DAMAGE 5

Page 106

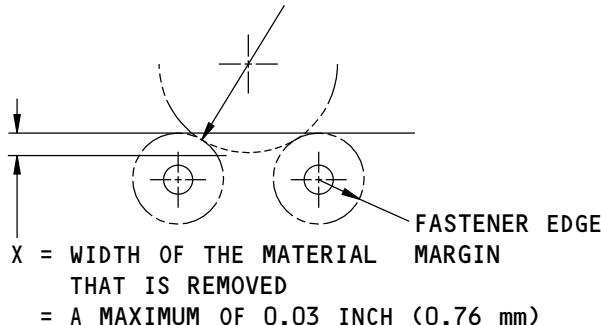
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**737-800
STRUCTURAL REPAIR MANUAL**

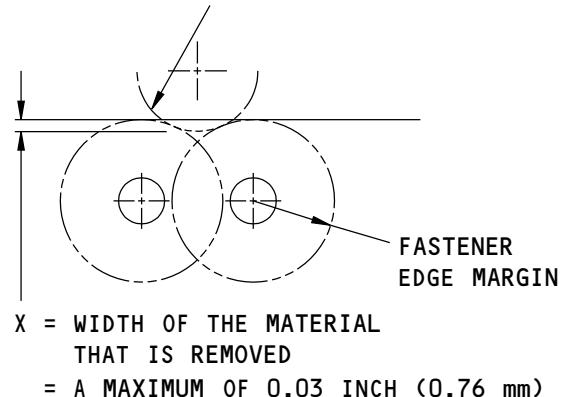
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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

(A)

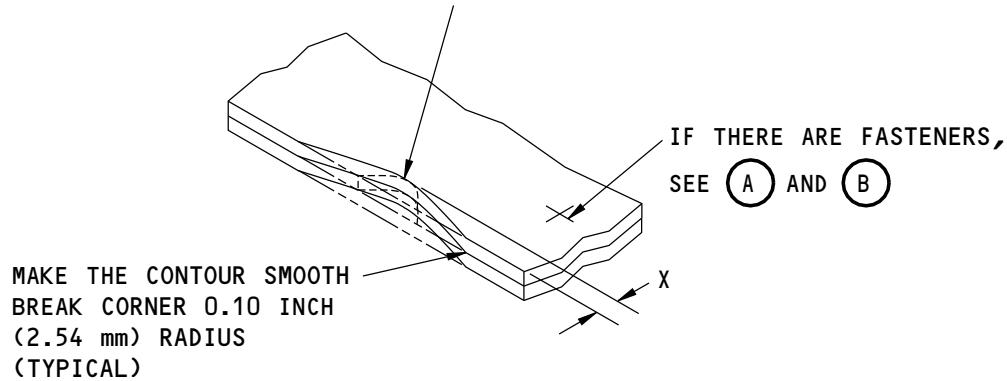
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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

(B)

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



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.03 INCH (0.76 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

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Allowable Damage Limits - Thrust Reverser Blocker Doors
Figure 104 (Sheet 1 of 3)

54-30-01

ALLOWABLE DAMAGE 5

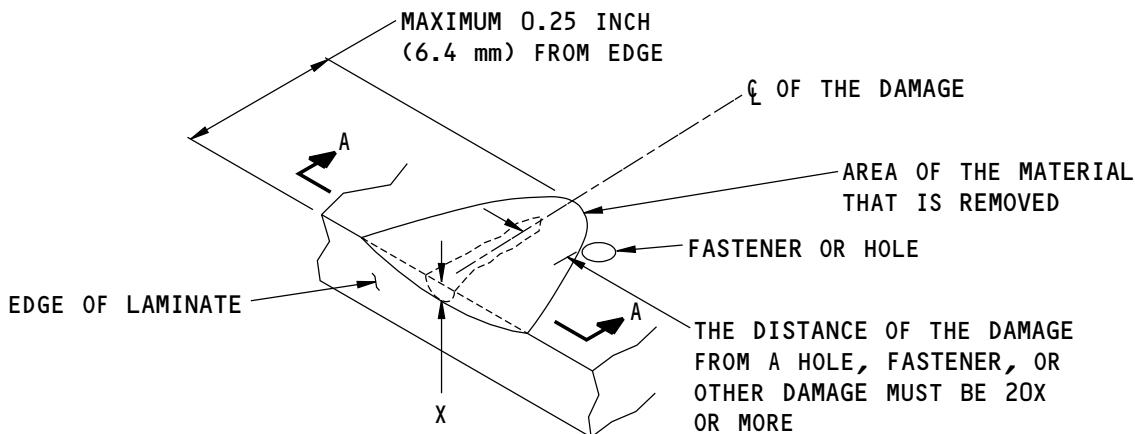
Page 107

Nov 10/2012

D634A210



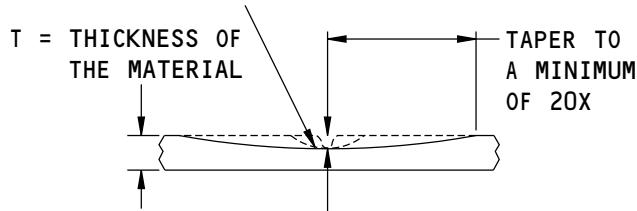
737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL ON A SURFACE AT AN EDGE

(D)

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.4 mm), THEN TAPER AS SHOWN



= A MAXIMUM OF 0.10T OF LAMINATE

A-A

W31214 S0006591910_V1

Allowable Damage Limits - Thrust Reverser Blocker Doors
Figure 104 (Sheet 2 of 3)

54-30-01

ALLOWABLE DAMAGE 5

Page 108

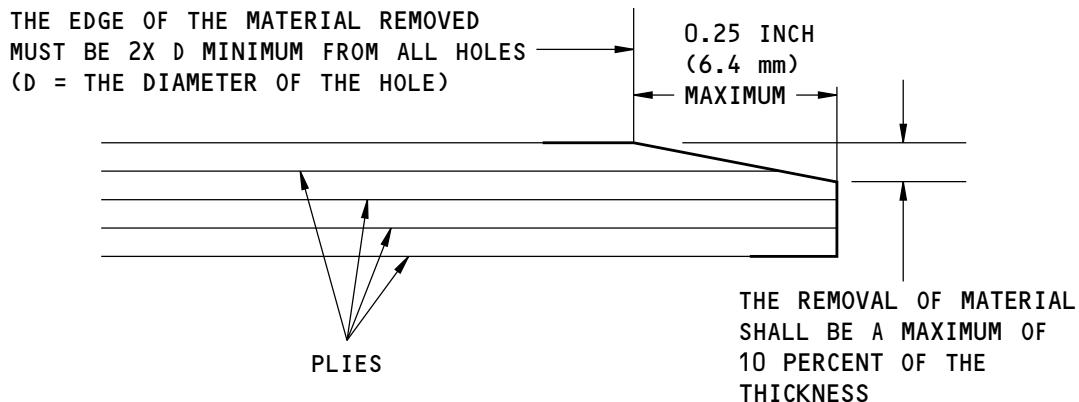
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STRUCTURAL REPAIR MANUAL



NOTES

- CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
- MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
 - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
 - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.

REMOVAL OF EROSION AT AN EDGE AND A TEMPORARY OR PERMANENT REPAIR TO SEAL THE EDGE OF SOLID LAMINATE AREAS

(E)

W31215 S0006591911_V1

Allowable Damage Limits - Thrust Reverser Blocker Doors
Figure 104 (Sheet 3 of 3)

54-30-01

ALLOWABLE DAMAGE 5

Page 109

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - THRUST REVERSER TRANSLATING SLEEVE OUTER COWL SKIN

1. Applicability

- A. Repair 1 is applicable to damage on the parts that follow: (Refer to Thrust Reverser Translating Sleeve Assembly, Figure 201/REPAIR 1)
 - (1) Vented and Non-Vented Actuator Access Doors
 - (2) Translating Sleeve Outer Skin Panel

2. General

- A. Get access to the damaged area.
 - (1) Remove the applicable translating sleeve assembly, if necessary. Refer to AMM 78-31-02/401.
 - (a) Refer to 51-40-02, GENERAL for fastener removal.
- B. Do an inspection of the damaged area to find the dimensions of the damage. The Boeing Company 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 inspection methods that have been examined and found to be satisfactory by the operator can be used.

- C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 1 for the definitions of the length, width, and depth of damage.
- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.
- E. On airplanes Y6001 through Y6037, the Glass Fiber Reinforced Plastic (GFRP) panels of the Translating Sleeve Outer Skin have BMS 8-336 expanded aluminum foil mesh and BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:
 - (1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh and the aluminum foil.
 - (2) Seal the damage as given in 51-70-14.
- F. Do the repair as given in Paragraph 4./REPAIR 1
- G. Put the translating sleeve outer skin panel back to the initial condition, as applicable.
 - (1) Install the translating sleeve as given in AMM 78-31-02/401, if it was removed.
 - (a) Refer to 51-40-02, GENERAL for fastener installation.
 - (2) 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, GENERAL.
- H. Refer to Table 201/REPAIR 1 for the repair references for the components of the thrust reverser translating sleeve assembly.

Table 201: REPAIR REFERENCES FOR THE THRUST REVERSER TRANSLATING SLEEVE ASSEMBLY

COMPONENT	REPAIR
Translating Sleeve Outer Cowl Skin - Bonded Panel	Refer to Paragraph 4
Vented and Non-Vented Actuator Access Doors	The Boeing Company has not found it necessary to supply repairs for these parts. If the damage to the structure is more than the limits given in SRM 54-30-01, Allowable Damage 1, then replace the damaged part.

54-30-01

REPAIR 1
Page 201

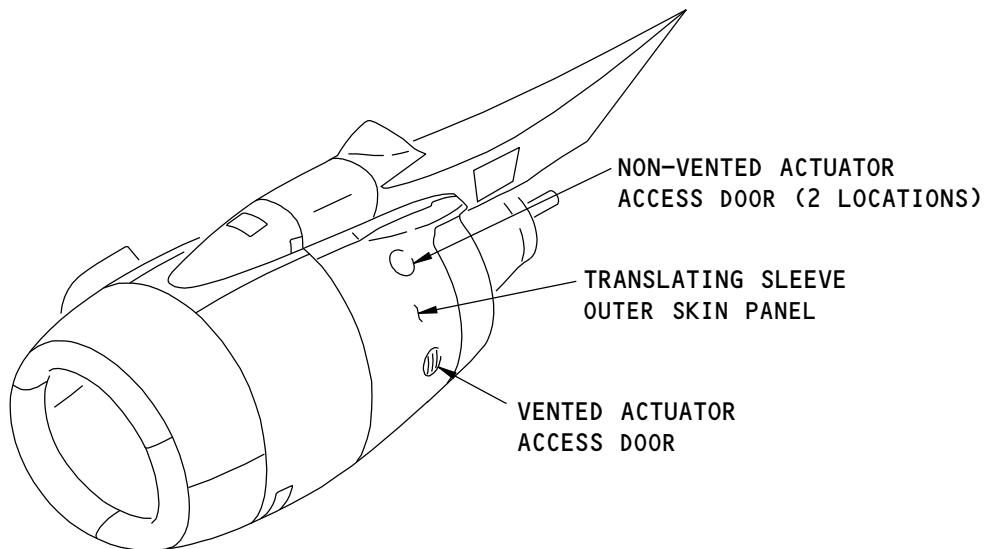
Nov 10/2014

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737-800
STRUCTURAL REPAIR MANUAL



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Thrust Reverser Translating Sleeve Assembly
Figure 201

54-30-01

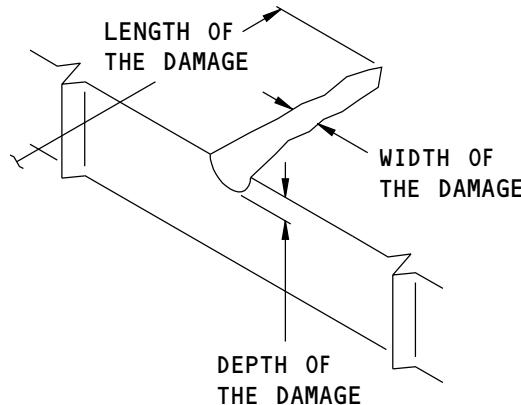
REPAIR 1
Page 202
Jul 10/2014

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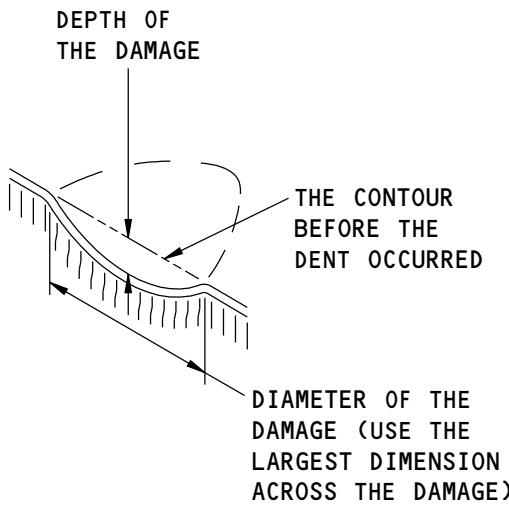


737-800
STRUCTURAL REPAIR MANUAL



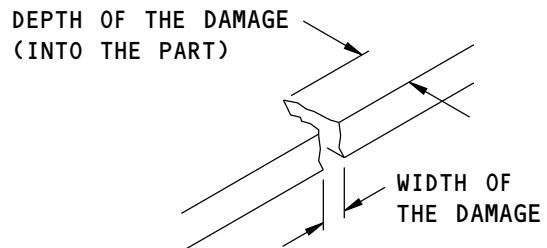
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

G78153 S0006591916_V1

Definitions of the Damage Size
Figure 202

54-30-01

REPAIR 1
Page 203

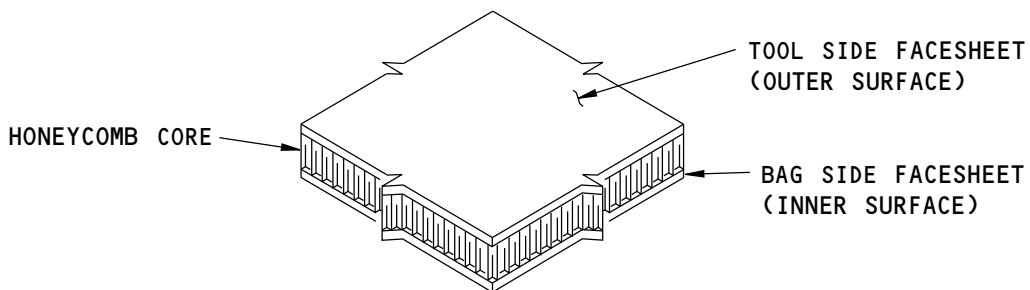
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737-800 STRUCTURAL REPAIR MANUAL



G78155 S0006591917_V1

Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05	REPAIR SEALING
51-40-02, GENERAL	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	ROOM TEMPERATURE CURE REPAIRS
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 78-31-02/401	Translating Sleeve - 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
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

- A. Refer to Translating Sleeve Outer Cowl Panel Repair Data, Figure 204/REPAIR 1, Table A for the repair data that is applicable to damage to the translating sleeve outer cowl skin panel.
- B. Do a Permanent repair with preimpregnated wet layup materials and cured at 350°F (177°C), refer to 51-70-05, REPAIR GENERAL.
- C. Do an Interim repair with wet layup materials and cured at 200°F (93°C) or 150°F (66°C) refer to 51-70-04 or 51-70-06.
 - (1) Examine an Interim repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, The Boeing Company recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

- (a) If deterioration is found, replace an Interim repair with a Permanent repair.

54-30-01

REPAIR 1
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

DAMAGE	INTERIM REPAIRS		PERMANENT REPAIRS
	WET LAYUP 150 °F (66 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	WET LAYUP 200 ° (93 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350 °F (177 °C) CURE REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLDS	REPAIRS ARE PERMITTED AS SHOWN IN FIGURE 205. THE MAXIMUM REPAIR SIZE LIMIT IS EQUAL TO THE ALLOWABLE DAMAGE LIMIT FOR THE LOCATION OF THE REPAIR ON THE PANEL. REFER TO THE APPLICABLE ALLOWABLE DAMAGE LIMITS FOR THE SPECIFIED COMPONENT		NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	IF THERE IS NO FIBER DAMAGE, FILL THE NICKS OR GOUGES WITH SEALING RESIN IF THERE IS FIBER DAMAGE, CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE EDGE DELAMINATIONS ARE LIMITED TO A MAXIMUM LENGTH OF 0.25 INCH (6.35 mm) WITH ONE REPAIR IN EACH LINEAR FOOT (30.5 cm)		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN		IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN

TABLE A

H00629 S0006591918_V2

Translating Sleeve Outer Cowl Panel Repair Data
Figure 204 (Sheet 1 of 2)

54-30-01

REPAIR 1
Page 205
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

NOTES

- 1 ➤ MAKE A NONDESTRUCTIVE INSPECTION (NDI) OF AN INTERIM REPAIR AT EACH 400 FLIGHT CYCLE INTERVAL OR MORE FREQUENTLY. REFER TO NDT PART 1, 51-01-01. A PERMANENT REPAIR IS NECESSARY IF THERE IS ANY DETERIORATION.
THESE REPAIRS HAVE FAA APPROVAL IF THE INSPECTIONS ARE ACCOMPLISHED AT THE SPECIFIED INTERVALS.
- 2 ➤ FOR REPAIRS THAT ARE LESS THAN OR EQUAL TO 0.25 INCH (6.35 mm) IN DIAMETER, FOUR REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.
FOR REPAIRS THAT ARE MORE THAN 0.25 INCH (6.35 mm) AND LESS THAN OR EQUAL TO 0.50 INCH (12.7 mm) IN DIAMETER, THREE REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.
FOR REPAIRS THAT ARE MORE THAN 0.50 INCH (12.7 mm) AND LESS THAN OR EQUAL TO 1.00 INCH (25.4 mm) IN DIAMETER, TWO REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.
FOR REPAIRS THAT ARE MORE THAN 1.00 INCH (25.4 mm) IN DIAMETER, ONE REPAIR IS PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.
THE MAXIMUM AREA OF TOTAL ALLOWABLE DAMAGE AND/OR REPAIRS IS 4.0 SQUARE INCHES (103.22 cm²) IN EACH PANEL.

H00727 S0006591919_V1

Translating Sleeve Outer Cowl Panel Repair Data
Figure 204 (Sheet 2 of 2)

54-30-01

REPAIR 1
Page 206

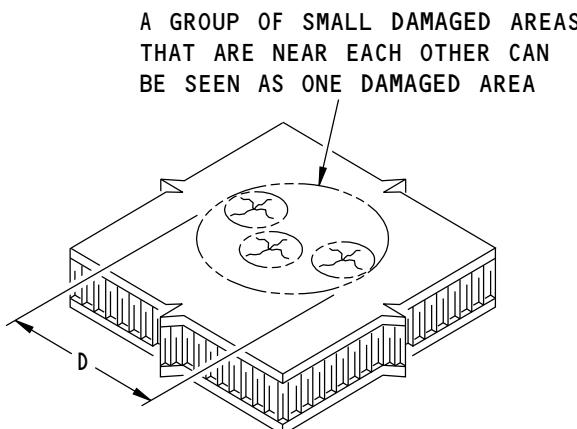
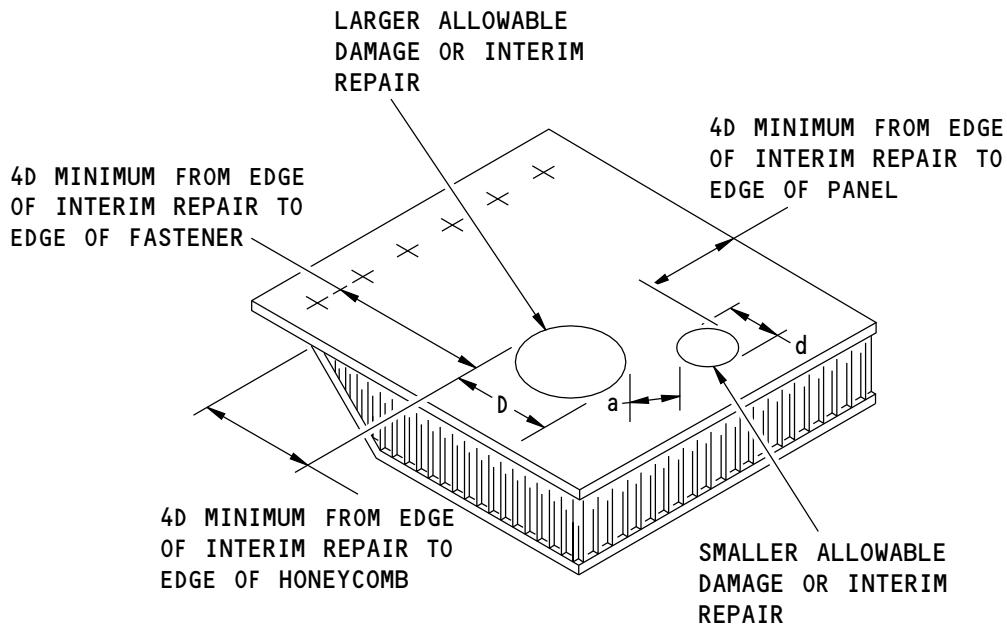
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



NOTES

- $-D-$ IS THE LARGER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- $-d-$ IS THE SMALLER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- $-a-$ IS THE DISTANCE BETWEEN ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- THE MINIMUM $-a-$ THAT IS PERMITTED IS $6D$ (ON ONE SIDE OF THE PANEL OR THE OTHER).

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Interim Repair Spacing Data for Composite Panels
Figure 205

54-30-01

REPAIR 1
Page 207
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - THRUST REVERSER TRANSLATING SLEEVE ACOUSTIC PANELS

1. Applicability

- A. Repair 2 is applicable to damage on the acoustic panels of the thrust reverser translating sleeve. Refer to Thrust Reverser Translating Sleeve Acoustic Panel Location, Figure 201/REPAIR 2.

2. General

- A. Get access to the damaged area.
 - (1) Remove the applicable translating sleeve assembly, if necessary. Refer to AMM 78-31-02/401.
 - (a) Refer to 51-40-02, GENERAL for fastener removal.
 - B. 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 inspection methods that have been examined and found to be satisfactory by the operator can be used.
- C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 2 for the definitions of the length, width, and depth of damage.
 - D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 2 for the definitions of the facesheets of a honeycomb core area.
 - E. Do the repair as given in Paragraph 4./REPAIR 2
 - F. Put the translating sleeve acoustic panel back to the initial condition, as applicable.
 - (1) Install the translating sleeve as given in AMM 78-31-02/401, if it was removed.
 - (a) Refer to 51-40-02, GENERAL for fastener installation.
 - (2) 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.

54-30-01

REPAIR 2

Page 201

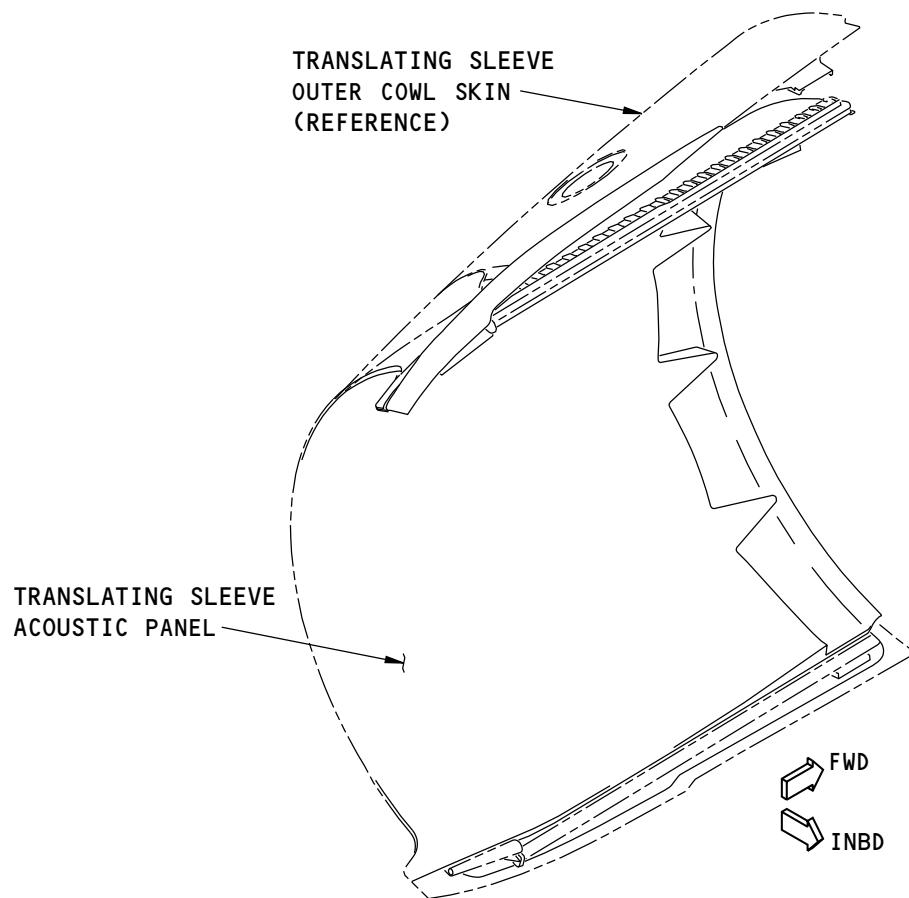
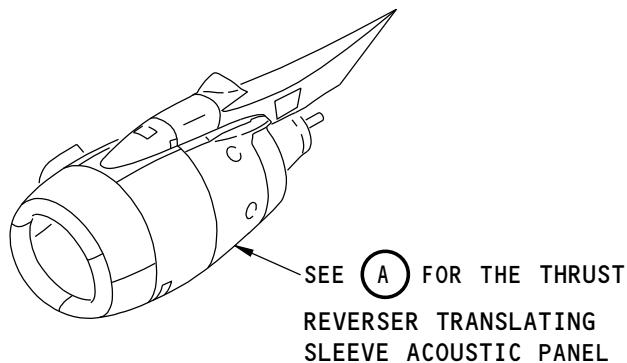
Jul 10/2014

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737-800
STRUCTURAL REPAIR MANUAL



LEFT TRANSLATING SLEEVE ACOUSTIC PANEL IS SHOWN,
RIGHT TRANSLATING SLEEVE ACOUSTIC PANEL IS OPPOSITE

A

H00372 S0006591922_V1

Thrust Reverser Translating Sleeve Acoustic Panel Location
Figure 201

54-30-01

REPAIR 2
Page 202

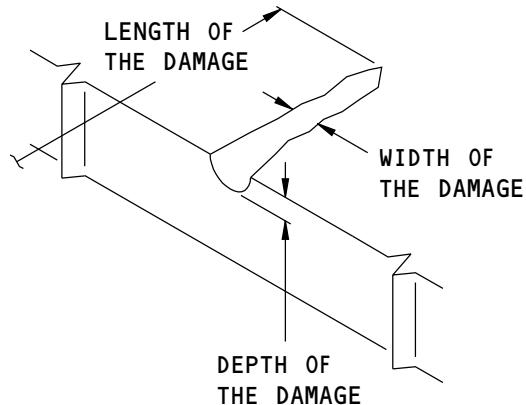
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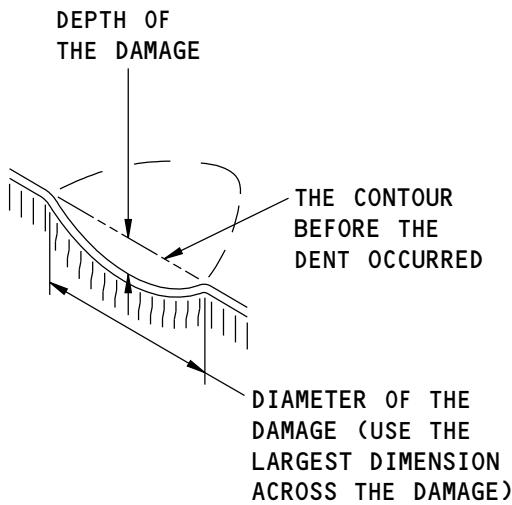


737-800
STRUCTURAL REPAIR MANUAL



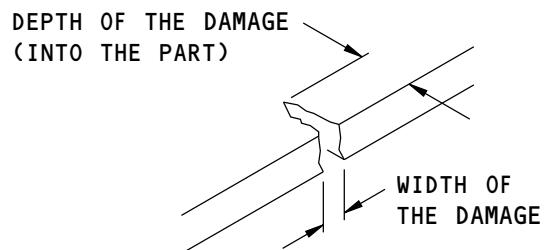
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

H00378 S0006591923_V1

Definitions of the Damage Size
Figure 202

54-30-01

REPAIR 2
Page 203

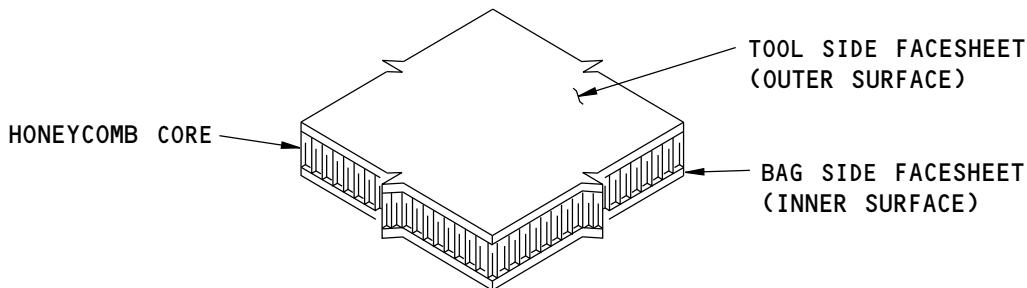
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737-800 STRUCTURAL REPAIR MANUAL



H00379 S0006591924_V1

Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06, GENERAL	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, GENERAL	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	ROOM TEMPERATURE CURE REPAIRS
AMM 51-21-00 P/B 701	INTERIOR AND EXTERIOR FINISHES - CLEANING/PAINTING
AMM 78-31-02/401	Translating Sleeve - 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
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

- A. Refer to Translating Sleeve Acoustic Panel Repair Data, Figure 204/REPAIR 2, Table A for the repair data that is applicable to damage to the translating sleeve acoustic panels.
- B. Do a Permanent repair with preimpregnated wet layup materials and cured at 350°F (177°C), refer to 51-70-05, REPAIR GENERAL.
- C. Do an Interim repair with wet layup materials and cured at 200°F (93°C) or 150°F (66°C), refer to 51-70-04 or 51-70-06.
 - (1) Examine an Interim repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after you do the tap test.

- (a) If deterioration is found, replace an Interim repair with a Permanent repair.

54-30-01

REPAIR 2
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

DAMAGE	INTERIM REPAIRS		PERMANENT REPAIRS
	WET LAYUP 150 °F (66 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	WET LAYUP 200 ° (93 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350 °F (177 °C) CURE REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLDS	REPAIRS ARE PERMITTED AS SHOWN IN FIGURE 205. THE MAXIMUM REPAIR SIZE LIMIT IS EQUAL TO THE ALLOWABLE DAMAGE LIMIT FOR THE LOCATION OF THE REPAIR ON THE PANEL. REFER TO THE APPLICABLE ALLOWABLE DAMAGE LIMITS FOR THE SPECIFIED COMPONENT		NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	IF THERE IS NO FIBER DAMAGE, FILL THE NICKS OR GOUGES WITH SEALING RESIN IF THERE IS FIBER DAMAGE, CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE EDGE DELAMINATIONS ARE LIMITED TO A MAXIMUM LENGTH OF 0.25 INCH (6.35 mm) WITH ONE REPAIR IN EACH LINEAR FOOT (30.5 cm)		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN		IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN

TABLE A

H00735 S0006591925_V2

Translating Sleeve Acoustic Panel Repair Data
Figure 204 (Sheet 1 of 2)

54-30-01

REPAIR 2

Page 205

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

NOTES

- 1 ➤ MAKE A NONDESTRUCTIVE INSPECTION (NDI) OF AN INTERIM REPAIR AT EACH 400 FLIGHT CYCLE INTERVAL OR MORE FREQUENTLY. REFER TO NDT PART 1, 51-01-01. A PERMANENT REPAIR IS NECESSARY IF THERE IS ANY DETERIORATION.

THESE REPAIRS HAVE FAA APPROVAL IF THE INSPECTIONS ARE ACCOMPLISHED AT THE SPECIFIED INTERVALS.
- 2 ➤ FOR REPAIRS THAT ARE LESS THAN OR EQUAL TO 0.25 INCH (6.35 mm) IN DIAMETER, FOUR REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 0.25 INCH (6.35 mm) AND LESS THAN OR EQUAL TO 0.50 INCH (12.7 mm) IN DIAMETER, THREE REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 0.50 INCH (12.7 mm) AND LESS THAN OR EQUAL TO 1.00 INCH (25.4 mm) IN DIAMETER, TWO REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 1.00 INCH (25.4 mm) IN DIAMETER, ONE REPAIR IS PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

THE MAXIMUM AREA OF TOTAL ALLOWABLE DAMAGE AND/OR REPAIRS IS 4.0 SQUARE INCHES (103.2 cm²) ON EACH PANEL.

H00739 S0006591926_V1

Translating Sleeve Acoustic Panel Repair Data
Figure 204 (Sheet 2 of 2)

54-30-01

REPAIR 2
Page 206

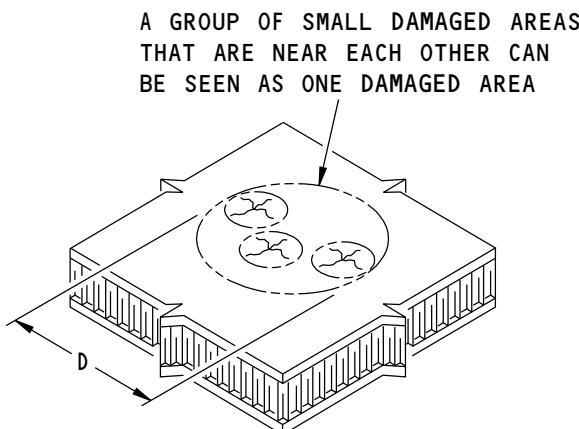
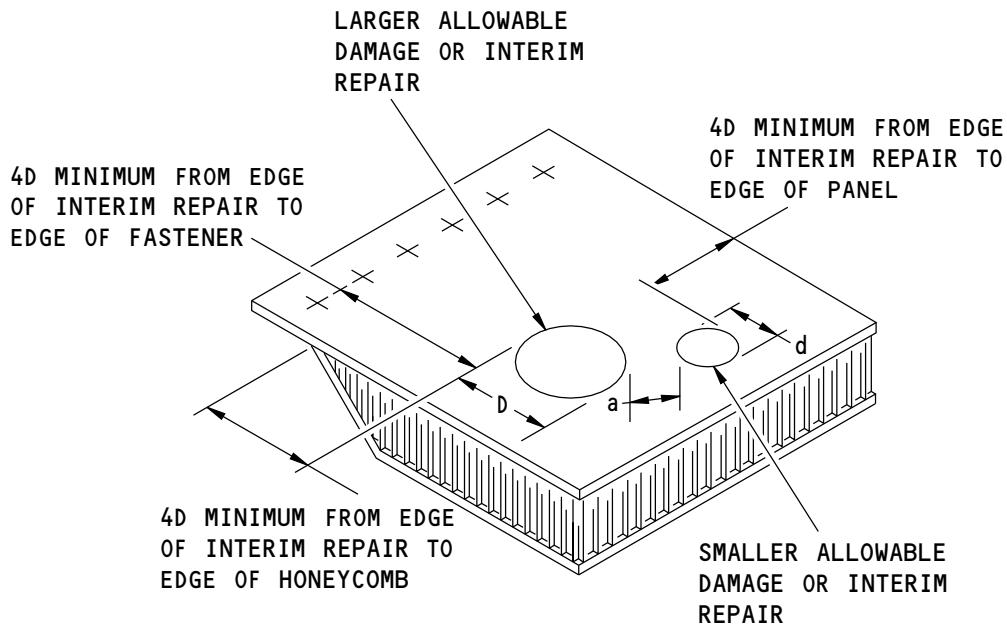
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



NOTES

- $-D-$ IS THE LARGER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- $-d-$ IS THE SMALLER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- $-a-$ IS THE DISTANCE BETWEEN ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- THE MINIMUM $-a-$ THAT IS PERMITTED IS $6D$ (ON ONE SIDE OF THE PANEL OR THE OTHER).

H00747 S0006591927_V2

Interim Repair Spacing Data for Composite Panels
Figure 205

54-30-01

REPAIR 2
Page 207
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 3 - THRUST REVERSER INNER DUCT WALL ACOUSTIC PANEL

1. Applicability

- A. Repair 3 is applicable to damage on the acoustic panel of the thrust reverser inner duct wall. Refer to Thrust Reverser Inner Duct Wall Acoustic Panel Location, Figure 201/REPAIR 3.

2. General

- A. Get access to the damaged area.
 - (1) Remove the applicable translating sleeve assembly, if necessary. Refer to AMM 78-31-02/401.
 - (a) Refer to 51-40-02, GENERAL for fastener removal.
- B. 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 inspection methods that have been examined and found to be satisfactory by the operator can be used.
- C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 3 for the definitions of the length, width, and depth of damage.
- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 3 for the definitions of the facesheets of a honeycomb core area.
- E. Do the repair as given in Paragraph 4./REPAIR 3
- F. Put the translating sleeve acoustic panel back to the initial condition, as applicable.
 - (1) Install the translating sleeve as given in AMM 78-31-02/401, if it was removed.
 - (a) Refer to 51-40-02, GENERAL for fastener installation.
 - (2) 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, GENERAL.

54-30-01

REPAIR 3
Page 201

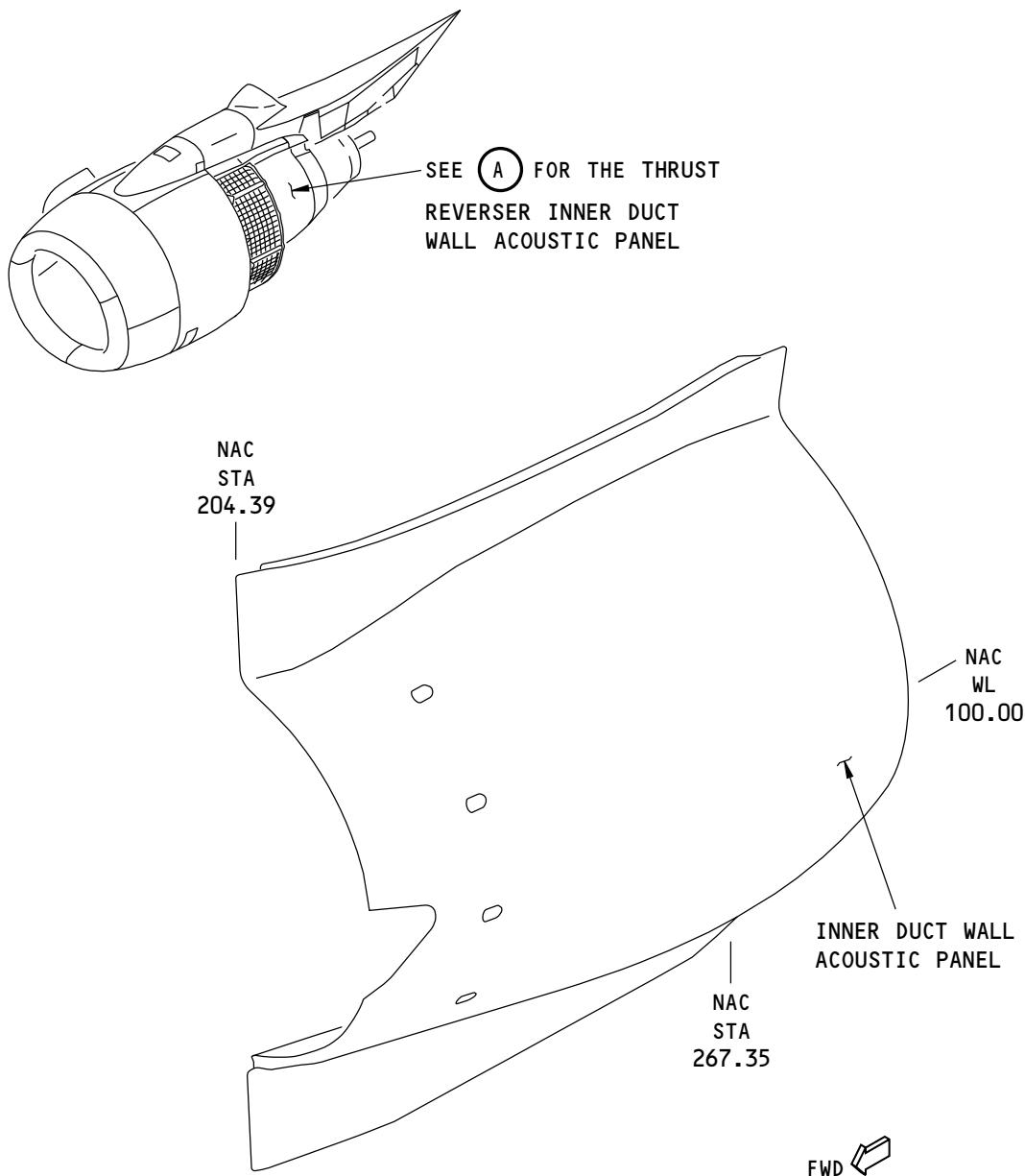
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737-800
STRUCTURAL REPAIR MANUAL



LEFT INNER DUCT WALL ACOUSTIC PANEL IS SHOWN,
RIGHT INNER DUCT WALL ACOUSTIC PANEL IS ALMOST THE SAME

(A)

H00387 S0006591929_V1

Thrust Reverser Inner Duct Wall Acoustic Panel Location
Figure 201

54-30-01

REPAIR 3
Page 202

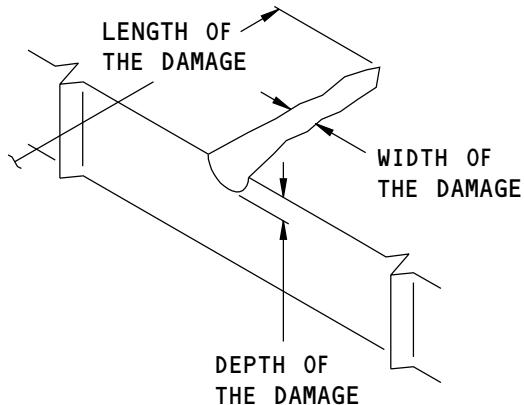
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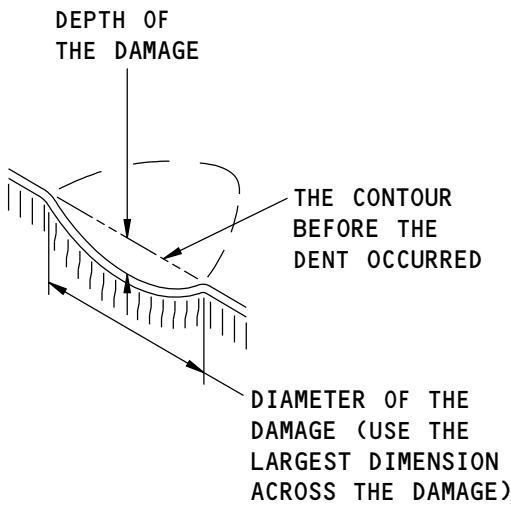


737-800
STRUCTURAL REPAIR MANUAL



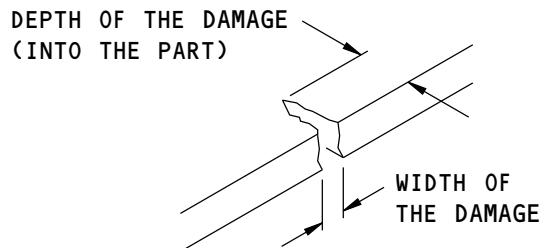
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 202

54-30-01

REPAIR 3
Page 203

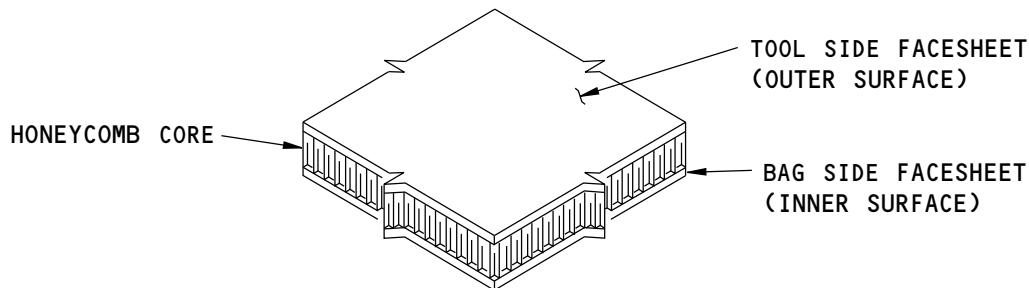
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737-800 STRUCTURAL REPAIR MANUAL



H00399 S0006591931_V1

Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05	REPAIR SEALING
51-40-02, GENERAL	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	ROOM TEMPERATURE CURE REPAIRS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 78-31-02/401	Translating Sleeve - 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
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

- A. Refer to Thrust Reverser Inner Duct Acoustic Panel Repair Data, Figure 204/REPAIR 3, Table A for the repair data that is applicable to damage to the translating sleeve acoustic panels.
- B. Do a Permanent repair with preimpregnated wet layup materials and cured at 350°F (177°C), refer to 51-70-05, REPAIR GENERAL.
- C. Do an Interim repair with wet layup materials and cured at 200°F (93°C) or 150°F (66°C), refer to 51-70-04 or 51-70-06.
 - (1) Examine an Interim repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, The Boeing Company recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after you do the tap test.

- (a) If deterioration is found, replace a an Interim repair with a Permanent repair.

54-30-01

REPAIR 3
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

DAMAGE	INTERIM REPAIRS		PERMANENT REPAIRS
	WET LAYUP 150 °F (66 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	WET LAYUP 200 °F (93 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350 °F (177 °C) CURE REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLES	REPAIRS ARE PERMITTED AS SHOWN IN FIGURE 205. THE MAXIMUM REPAIR SIZE LIMIT IS EQUAL TO THE ALLOWABLE DAMAGE LIMIT FOR THE LOCATION OF THE REPAIR ON THE PANEL. REFER TO THE APPLICABLE ALLOWABLE DAMAGE LIMITS FOR THE SPECIFIED COMPONENT		NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	IF THERE IS NO FIBER DAMAGE, FILL THE NICKS OR GOUGES WITH SEALING RESIN IF THERE IS FIBER DAMAGE, CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE EDGE DELAMINATIONS ARE LIMITED TO A MAXIMUM LENGTH OF 0.25 INCH (6.35 mm) WITH ONE REPAIR IN EACH LINEAR FOOT (30.5 cm)		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE		CUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN		IF THE DAMAGE IS LESS THAN 10 PERCENT OF THE THICKNESS, APPLY A SEALING RESIN

TABLE A

H00741 S0006591932_V2

Thrust Reverser Inner Duct Wall Acoustic Panel Repair Data
Figure 204 (Sheet 1 of 2)

54-30-01

REPAIR 3

Page 205

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

NOTES

- 1 ➤ MAKE A NONDESTRUCTIVE INSPECTION (NDI) OF AN INTERIM REPAIR AT EACH 400 FLIGHT CYCLE INTERVAL OR MORE FREQUENTLY. REFER TO NDT PART 1, 51-01-01. A PERMANENT REPAIR IS NECESSARY IF THERE IS ANY DETERIORATION.

THESE REPAIRS HAVE FAA APPROVAL IF THE INSPECTIONS ARE ACCOMPLISHED AT THE SPECIFIED INTERVALS.
- 2 ➤ FOR REPAIRS THAT ARE LESS THAN OR EQUAL TO 0.25 INCH (6.35 mm) IN DIAMETER, FOUR REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 0.25 INCH (6.35 mm) AND LESS THAN OR EQUAL TO 0.50 INCH (12.7 mm) IN DIAMETER, THREE REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 0.50 INCH (12.7 mm) AND LESS THAN OR EQUAL TO 1.00 INCH (25.4 mm) IN DIAMETER, TWO REPAIRS ARE PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

FOR REPAIRS THAT ARE MORE THAN 1.00 INCH (25.4 mm) IN DIAMETER, ONE REPAIR IS PERMITTED IN EACH SQUARE FOOT (929.0 cm²) OF AREA.

THE MAXIMUM AREA OF TOTAL ALLOWABLE DAMAGE AND/OR REPAIRS IS 4.0 SQUARE INCHES (103.22 cm²) ON EACH PANEL.

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Thrust Reverser Inner Duct Wall Acoustic Panel Repair Data
Figure 204 (Sheet 2 of 2)

54-30-01

REPAIR 3
Page 206

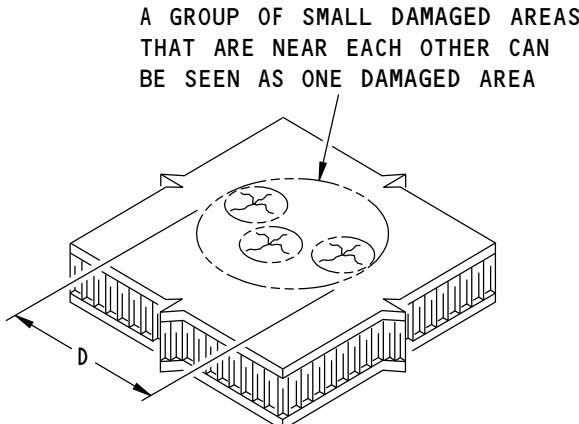
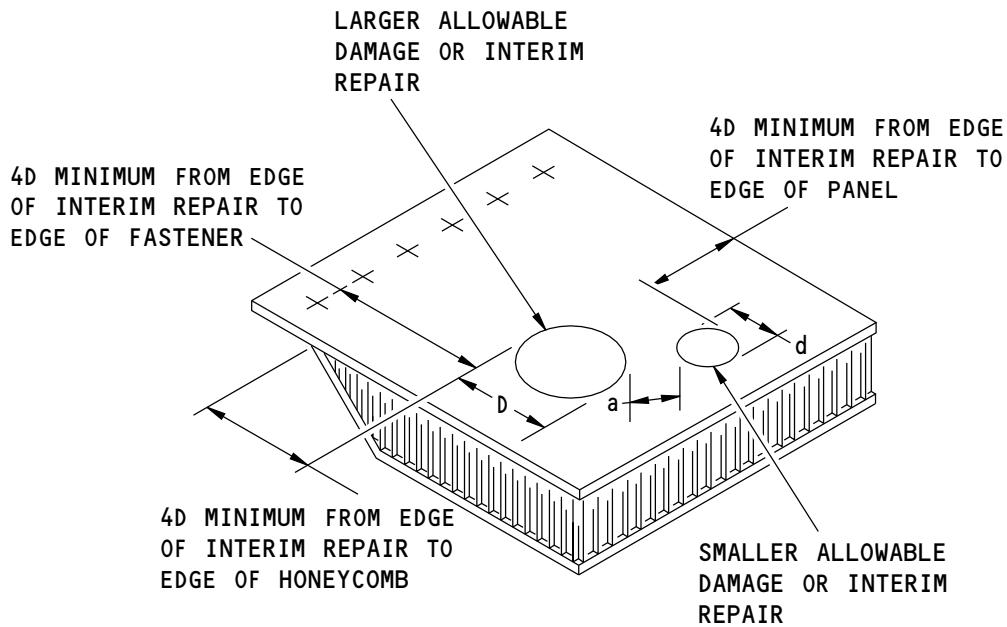
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTES

- $-D-$ IS THE LARGER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- $-d-$ IS THE SMALLER DIAMETER OF ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- $-a-$ IS THE DISTANCE BETWEEN ANY TWO ADJACENT ALLOWABLE DAMAGE AND/OR INTERIM REPAIR AREAS.
- THE MINIMUM $-a-$ THAT IS PERMITTED IS $6D$ (ON ONE SIDE OF THE PANEL OR THE OTHER).

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Interim Repair Spacing Data for Composite Panels
Figure 205

54-30-01

REPAIR 3
Page 207
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - THRUST REVERSER BLOCKER DOOR PANELS

1. Applicability

- A. Repair 4 is applicable to damage on the thrust reverser blocker doors shown in Thrust Reverser Blocker Door Locations, Figure 201/REPAIR 4.

2. General

- A. Get access to the damaged area.
 - (1) Remove the applicable translating sleeve if necessary. Refer to AMM 78-31-02/401.
 - (a) Refer to 51-40-02 for fastener removal.
 - (2) Remove the applicable thrust reverser blocker door if necessary. Refer to AMM 78-31-06/401.
 - (a) Refer to 51-40-02, GENERAL for fastener removal.
- B. 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 inspection methods that have been examined and found to be satisfactory by the operator can be used.

- C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 4 for the definitions of the length, width, and depth of damage.
- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 4 for the definitions of the facesheets of a honeycomb core area.
- E. Do the repair as given in Paragraph 4./REPAIR 4
- F. Put the blocker door back to the initial condition, as applicable.
 - (1) Install the thrust reverser blocker door as given in AMM 78-31-06/401, if it was removed.
 - (a) Refer to 51-40-02, GENERAL for fastener installation.
 - (2) Install the thrust reverser translating sleeve as given in AMM 78-31-02/401, if it was removed.
 - (a) Refer to 51-40-02, GENERAL for fastener installation.
 - (3) 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.

54-30-01

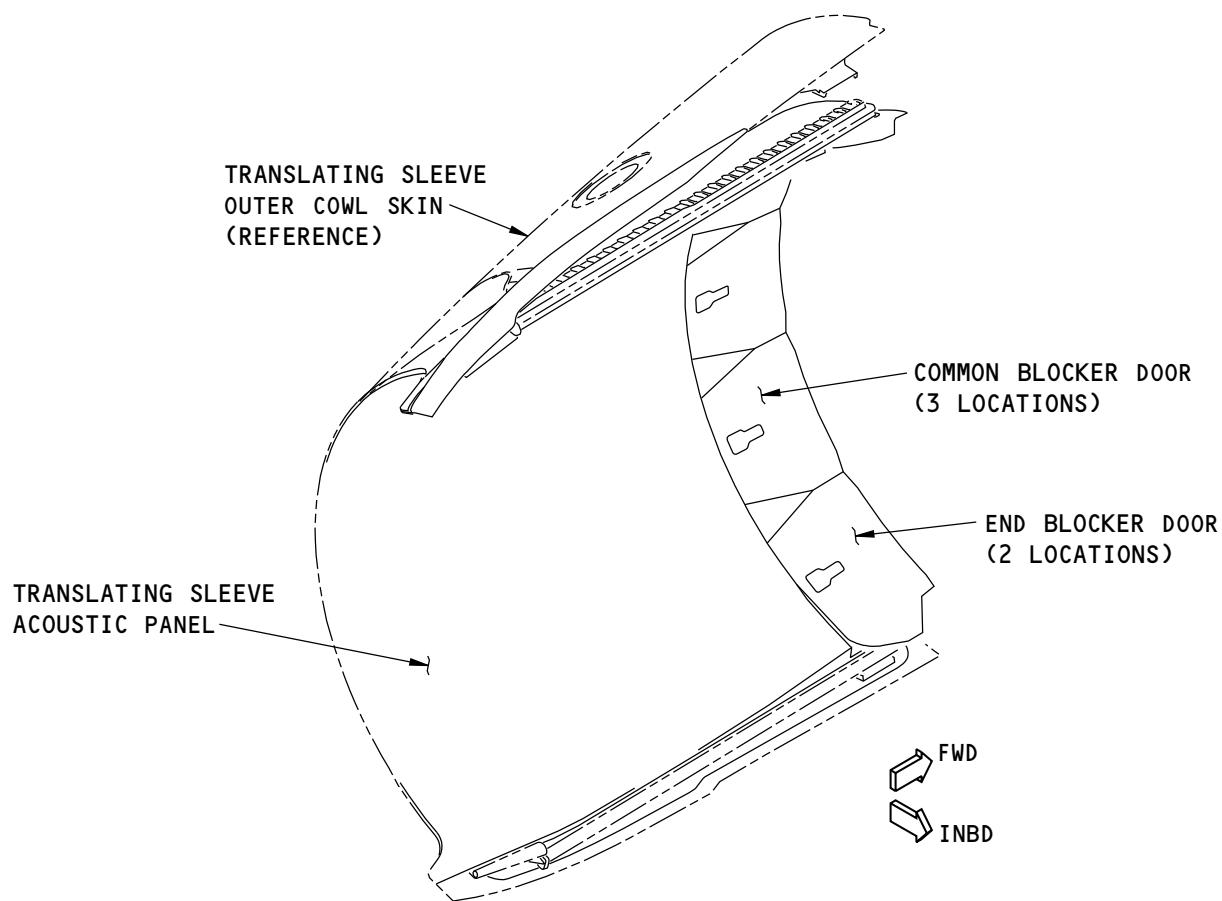
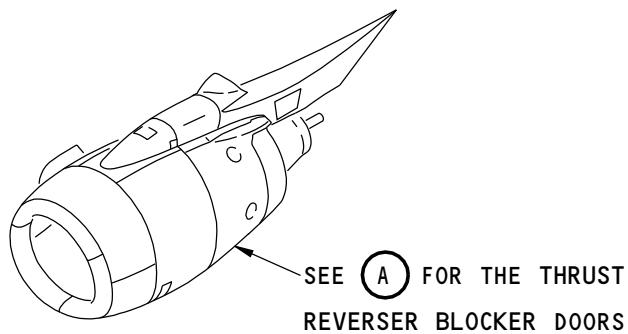
REPAIR 4
Page 201
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT THRUST REVERSER BLOCKER DOORS ARE SHOWN,
RIGHT THRUST REVERSER BLOCKER DOORS ARE OPPOSITE

(A)

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Thrust Reverser Blocker Door Locations
Figure 201

54-30-01

REPAIR 4
Page 202

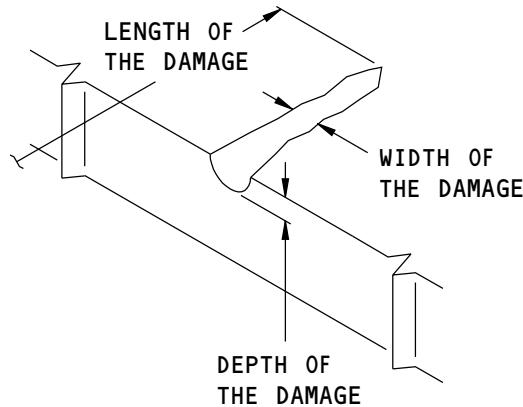
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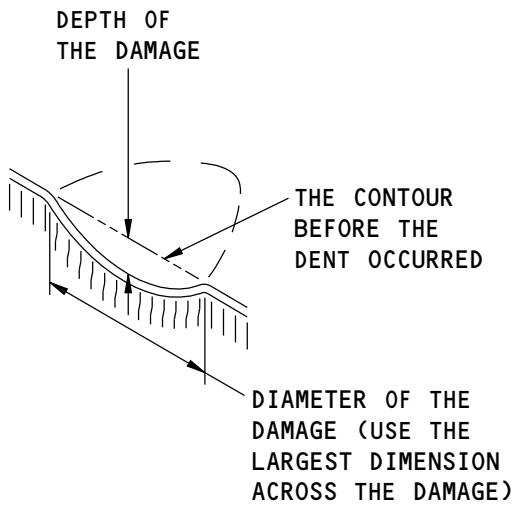


737-800
STRUCTURAL REPAIR MANUAL



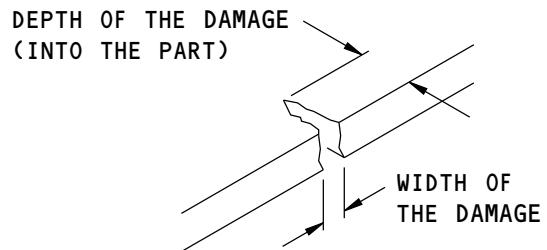
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 202

54-30-01

REPAIR 4
Page 203

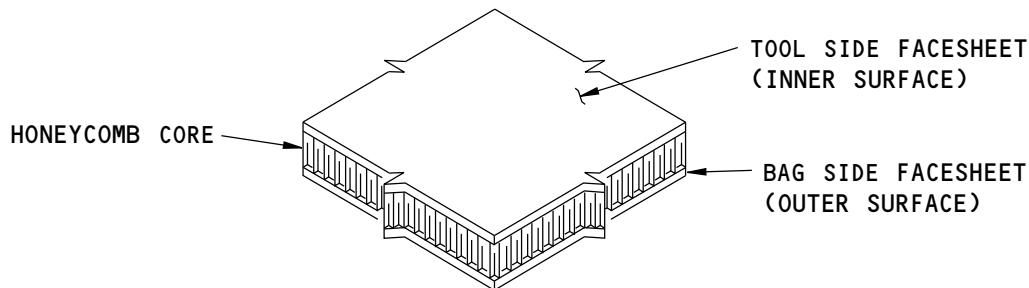
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737-800 STRUCTURAL REPAIR MANUAL



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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
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05	REPAIR SEALING
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-02, GENERAL	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	ROOM TEMPERATURE CURE REPAIRS
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
AMM 78-31-02/401	Translating Sleeve - Removal/Installation
AMM 78-31-06/401	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
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

- A. Refer to Thrust Reverser Blocker Door Panel Repair Data, Figure 204/REPAIR 4 for the repair data that is applicable to damage to the thrust reverser blocker doors.
- B. Do a Permanent repair with preimpregnated layup materials and cured at 350°F (177°C), refer to 51-70-05, REPAIR GENERAL.
- C. Do an Interim repair with wet layup materials and cured at 200°F (93°C) or 150°F (66°C), refer to 51-70-04 or 51-70-06.
 - (1) Examine an Interim repair after 400 flight cycles. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

- (a) If deterioration is found, replace an Interim repair with a Permanent repair.

54-30-01

REPAIR 4
Page 204

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (b) If deterioration is not found, examine an Interim repair after each interval of 1000 flight cycles or more frequently.
- (c) These repairs have FAA approval if the inspections are accomplished at the specified intervals.

54-30-01

REPAIR 4

Page 205

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

	INTERIM REPAIRS 1	PERMANENT REPAIRS
DAMAGE	WET LAYUP 150 °F (66 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	PREIMPREGNATED LAYUP 350 °F (177 °C) CURE 2 REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
	WET LAYUP 200 °F (93 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES	
HOLES AND PUNCTURES	REPAIRS ARE PERMITTED ON CLEANED UP DAMAGE UP TO A MAXIMUM DIAMETER OF 0.25 INCH (6.35 mm) AND NOT NEARER THAN 1.0 INCH (25.4 mm) (EDGE TO EDGE) TO ANY FASTENER HOLE OR MATERIAL EDGE	CUT AND REMOVE THE DAMAGE ADD EXTRA REPAIR PLY AS GIVEN IN SRM 51-70-05 NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO A HOLE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	EDGE EROSION IS NOT PERMITTED	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE

HONEYCOMB CORE AREAS

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Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 1 of 8)

54-30-01

REPAIR 4
Page 206
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

	INTERIM REPAIRS	PERMANENT REPAIRS
DAMAGE		CURE FOR 8 HOURS MINIMUM AT ROOM TEMPERATURE PLUS 1.5 HOURS AT 260° ±15°F (OR 1 HOUR AT 350° ±15°F).
EDGE POTTING CRACKS AND DEFECTS	EDGE POTTING CRACKS ARE NOT PERMITTED.	IF POTTING IS MISSING OR DAMAGED, REMOVE THE DEFECT BY MECHANICAL MEANS. MAXIMUM DEPTH OF REWORK IS NOT TO EXCEED 0.190 INCH INTO EDGE OF PANEL. DO NOT DAMAGE FACE SHEETS. RE-POT THE DAMAGED AREA USING BMS 5-28, TYPE 26 FLEXIBLE EDGE POTTING. UP TO 5 PERCENT BY WEIGHT OF CAB-O-SIL MAY BE MIXED WITH THE BLENDED BMS 5-28, TYPE 26. SEAL REPAIR USING BMS 5-92, TYPE I.

HONEYCOMB CORE EDGE POTTING

W34956 S0006591940_V2

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 2 of 8)

54-30-01

REPAIR 4
Page 207
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

	INTERIM REPAIRS [1]	PERMANENT REPAIRS
DAMAGE	WET LAYUP 200 °F (93 °C) CURE REFER TO SRM 51-70-04 FOR THE REPAIR PROCEDURES EXCEPT AS NOTED BELOW [3]	PREIMPREGNATED LAYUP 350 °F (177 °C) CURE [2] REFER TO SRM 51-70-05 FOR THE REPAIR PROCEDURES
HOLES AND PUNCTURES	HOLES ARE NOT PERMITTED REFER TO FIGURE 204, DETAILS A, B, C, AND D FOR EDGE PUNCTURE DAMAGE LIMITS AND DAMAGE REMOVAL DEFINITION REFER TO FIGURE 204, DETAIL E AND SRM 51-70-04, REPAIR 9 FOR REPAIR PROCEDURE USING CHOPPED FIBER AND RESIN MIX, AND TWO BMS 9-3, TYPE D FIBERGLASS REPAIR PLIES	CUT AND REMOVE THE DAMAGE ADD EXTRA REPAIR PLY AS GIVEN IN SRM 51-70-05 NO SIZE LIMIT
CRACKS	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO AN EDGE PUNCTURE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
NICKS AND GOUGES	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS AND PROCEDURES THAT ARE APPLICABLE TO AN EDGE PUNCTURE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DELAMINATIONS	REFER TO FIGURE 204, DETAIL F FOR EDGE DELAMINATION LIMITS REFER TO SRM 51-70-04 REPAIR 13 FOR THE REPAIR PROCEDURE	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
DENTS	DENTS ARE NOT PERMITTED	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE
EDGE EROSION	EDGE EROSION IS NOT PERMITTED	CUT OUT AND REMOVE THE DAMAGE. USE THE REPAIR LIMITS THAT ARE APPLICABLE TO A HOLE

SOLID LAMINATE EDGEBAND AREAS

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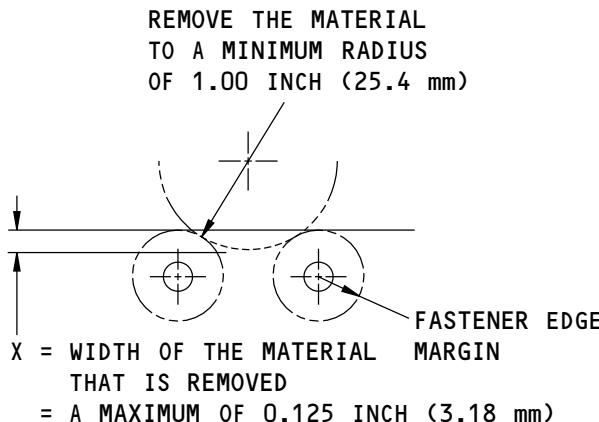
Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 3 of 8)

54-30-01

REPAIR 4
Page 208
Jul 10/2014

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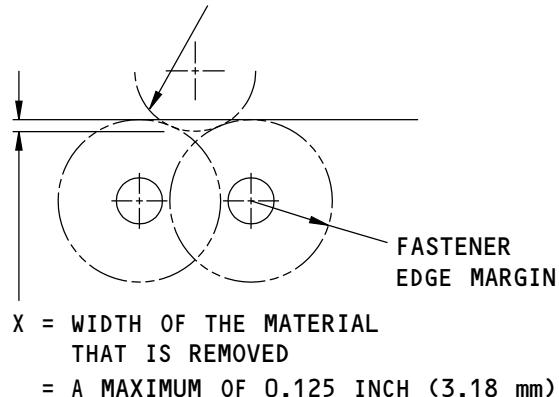
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**737-800
STRUCTURAL REPAIR MANUAL**


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

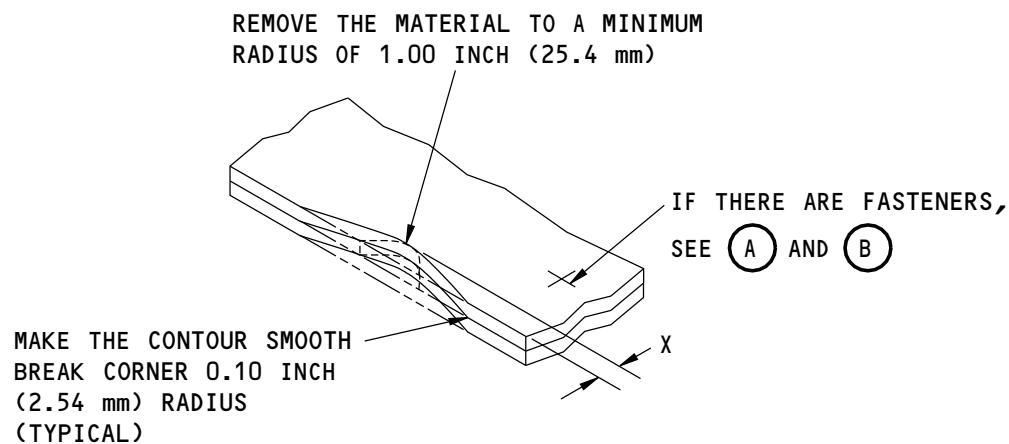
(A)

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

(B)



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.125 INCH (3.18 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

W35105 S0006591942_V1

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 4 of 8)

54-30-01

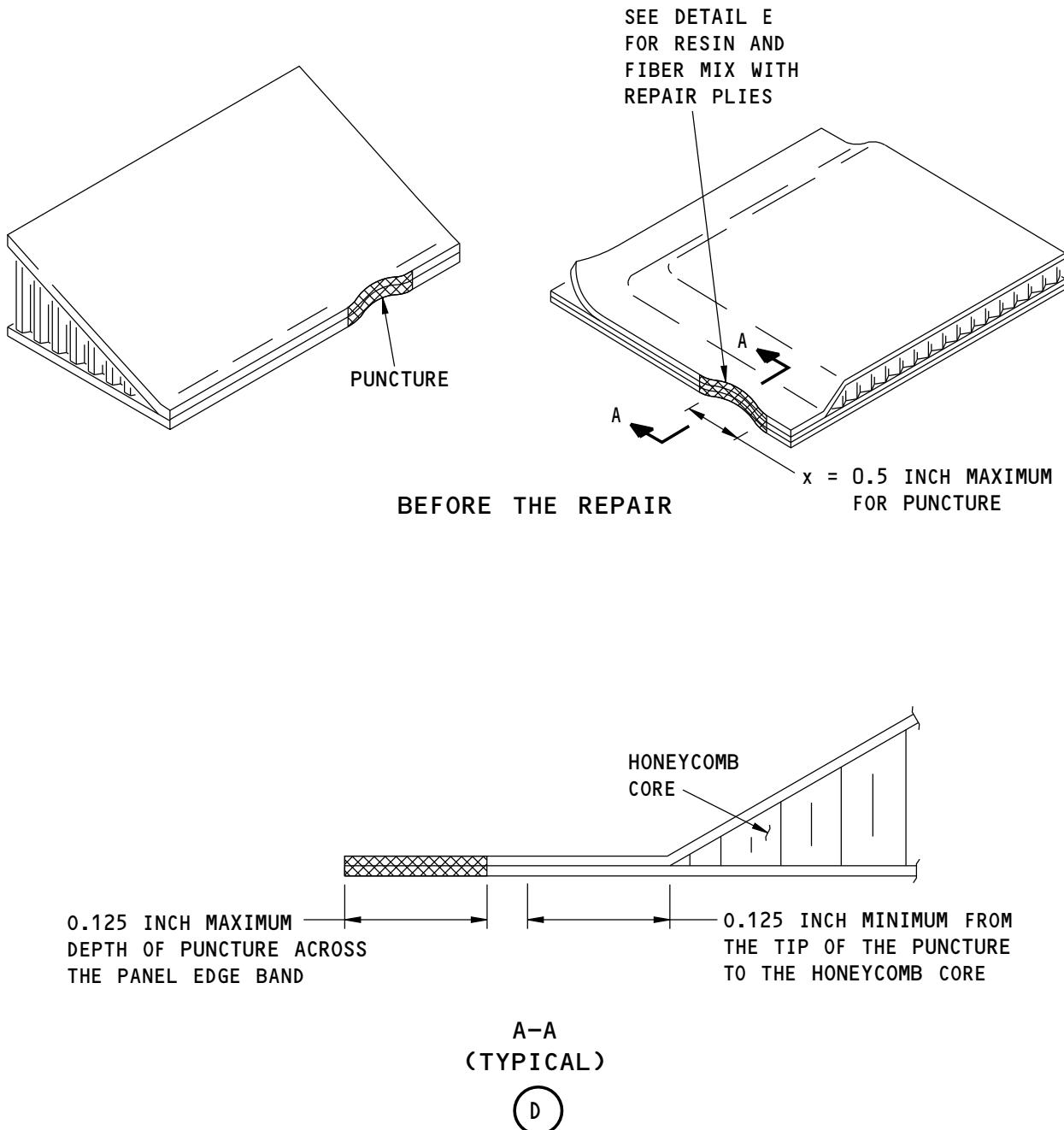
REPAIR 4
Page 209

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 5 of 8)

54-30-01

REPAIR 4
Page 210

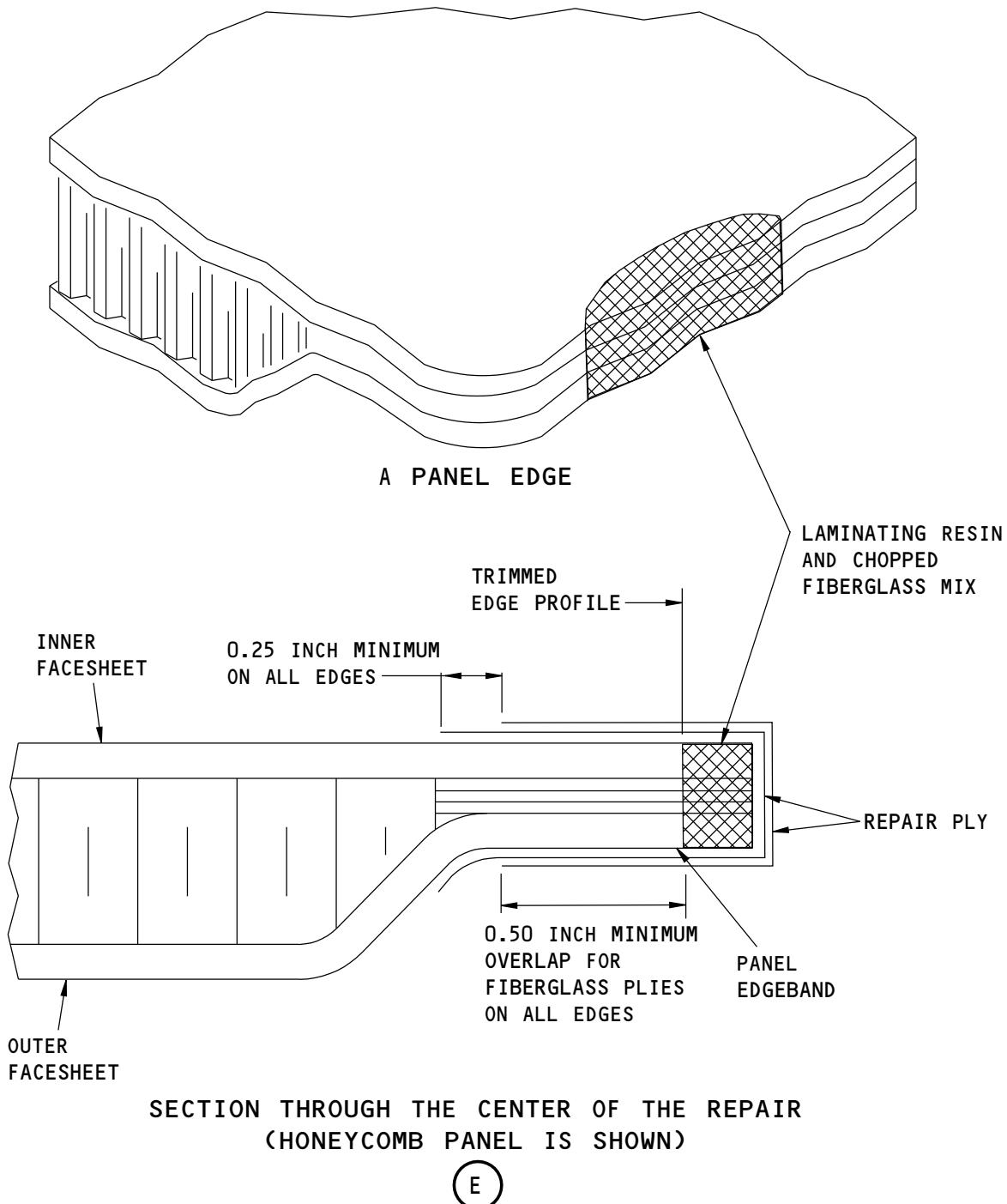
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737-800
STRUCTURAL REPAIR MANUAL



W33218 S0006591944_V1

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 6 of 8)

54-30-01

REPAIR 4
Page 211

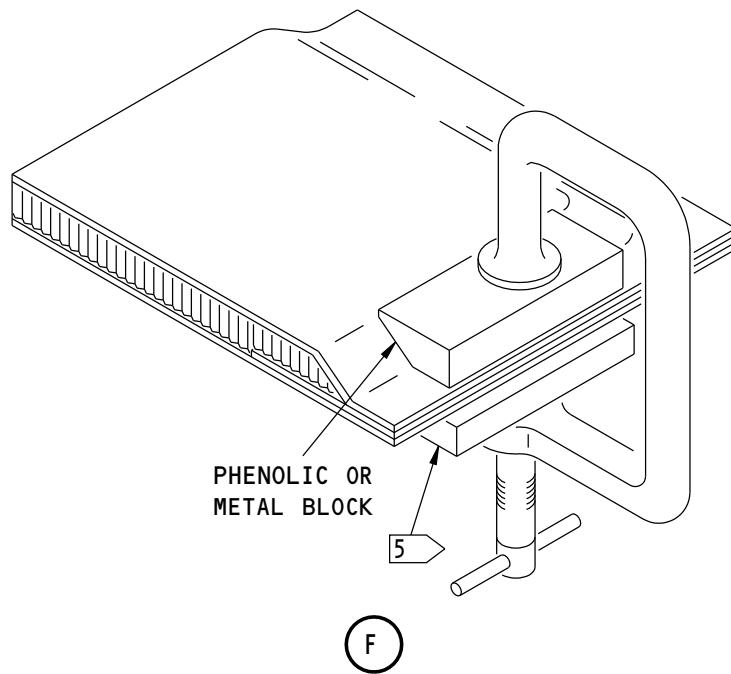
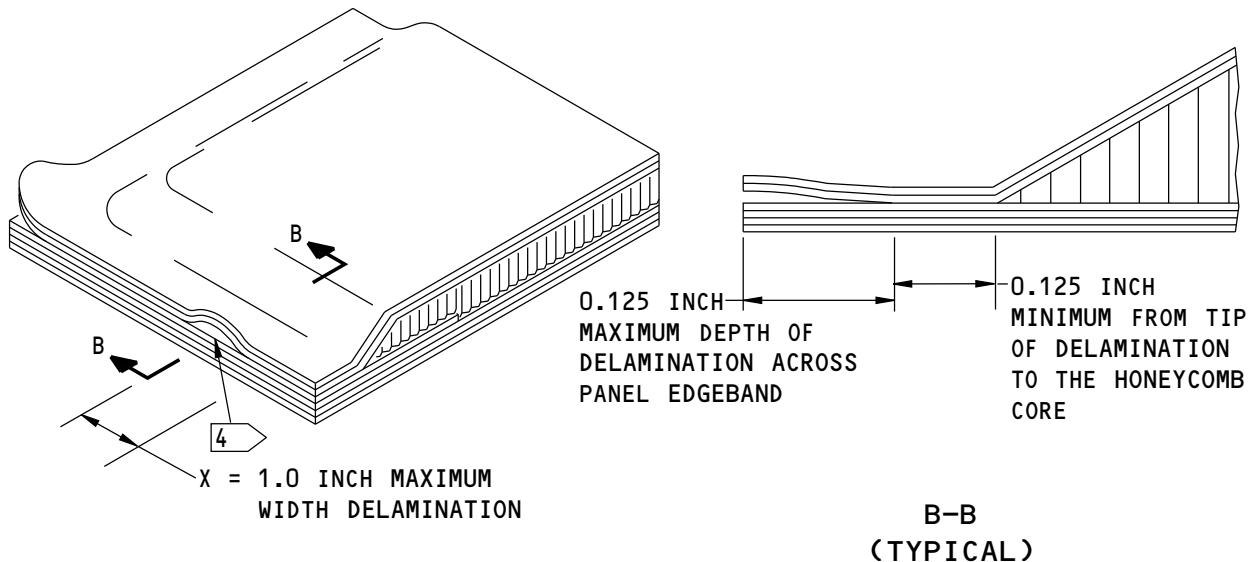
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737-800
STRUCTURAL REPAIR MANUAL



W33143 S0006591945_V1

Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 7 of 8)

54-30-01

REPAIR 4
Page 212

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

NOTES

- [1] > THE SUM OF ALL THE AREAS OF INTERIM REPAIRS IN HONEYCOMB CORE AREAS IS A MAXIMUM OF 1.0 INCH BY 1.0 INCH (25.4 mm BY 25.4 mm). THE SUM OF ALL AREAS OF LAMINATE EDGEBAND INTERIM REPAIRS IS A MAXIMUM OF 1.0 INCH BY 1.0 INCH (25.4 mm BY 25.4 mm). INTERIM REPAIRS SHALL NOT BE NEARER THAN 1.5 INCHES (38.1 mm) (EDGE TO EDGE) FROM ANY OTHER DAMAGE OR INTERIM REPAIRS ON ONE SIDE OF THE PANEL OR THE OTHER.**
- [2] > 250 °F CURE PERMANENT REPAIRS ARE NOT PERMITTED.**
- [3] > 150 °F CURE INTERIM REPAIRS ARE NOT PERMITTED.**
- [4] > USE FORCE TO PUSH THE INJECTION RESIN INTO THE DELAMINATION.**
- [5] > USE A CLAMP TO KEEP THE PLIES TOGETHER.**

W34706 S0006591946_V2

**Thrust Reverser Blocker Door Panel Repair Data
Figure 204 (Sheet 8 of 8)**

54-30-01

**REPAIR 4
Page 213
Jul 10/2014**

D634A210

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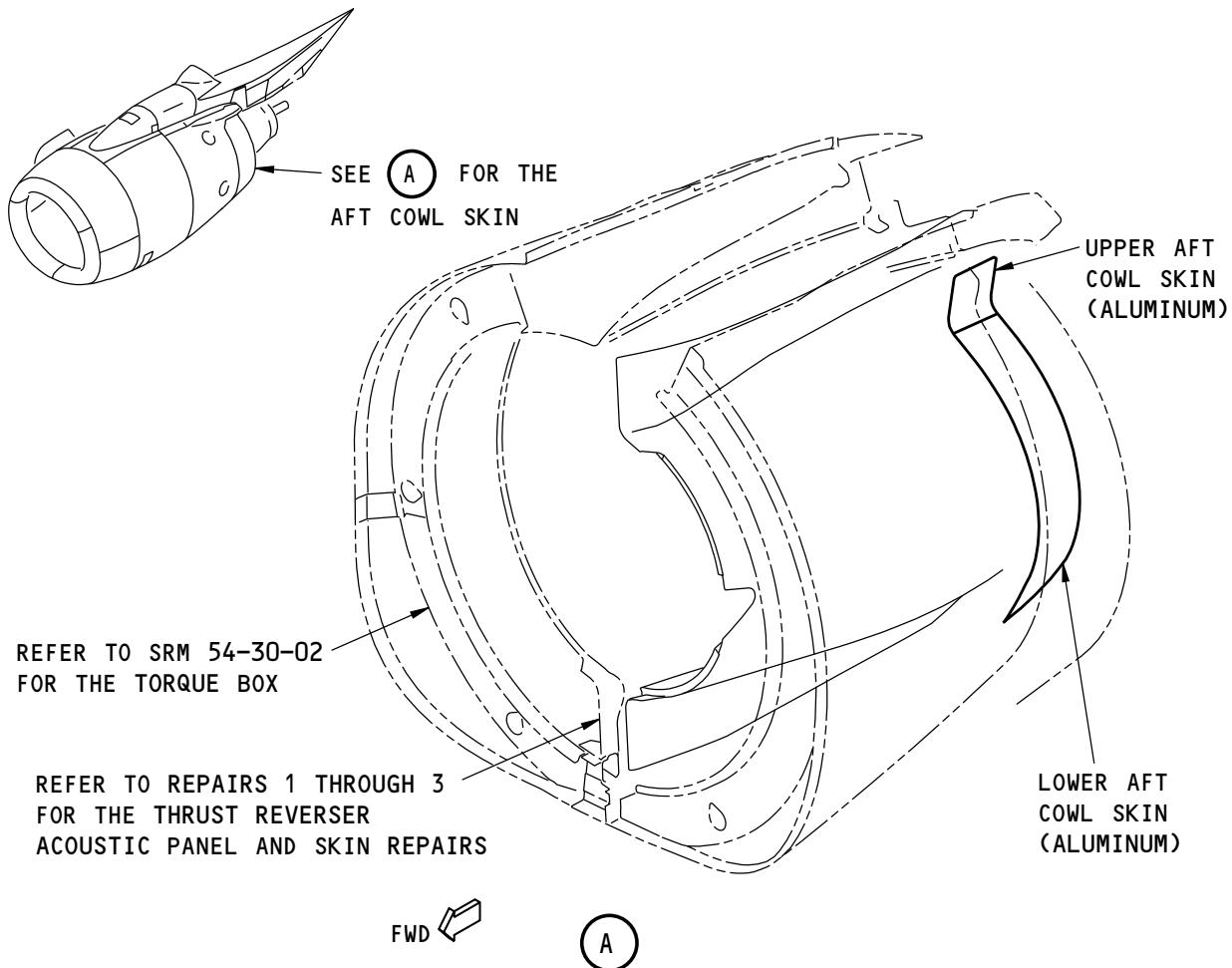


737-800
STRUCTURAL REPAIR MANUAL

REPAIR 5 - THRUST REVERSER AFT COWL SKIN

1. Applicability

- A. There are no repairs for these parts in the structural repair manual at this time.



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

Aft Cowl Skin Location

Figure 201

H01031 S0006591948_V3

2. General

- A. There are no repairs for these parts in the structural repair manual at this time.

3. Repair Instructions

- A. There are no repairs for these parts in the structural repair manual at this time.

54-30-01

REPAIR 5
Page 201

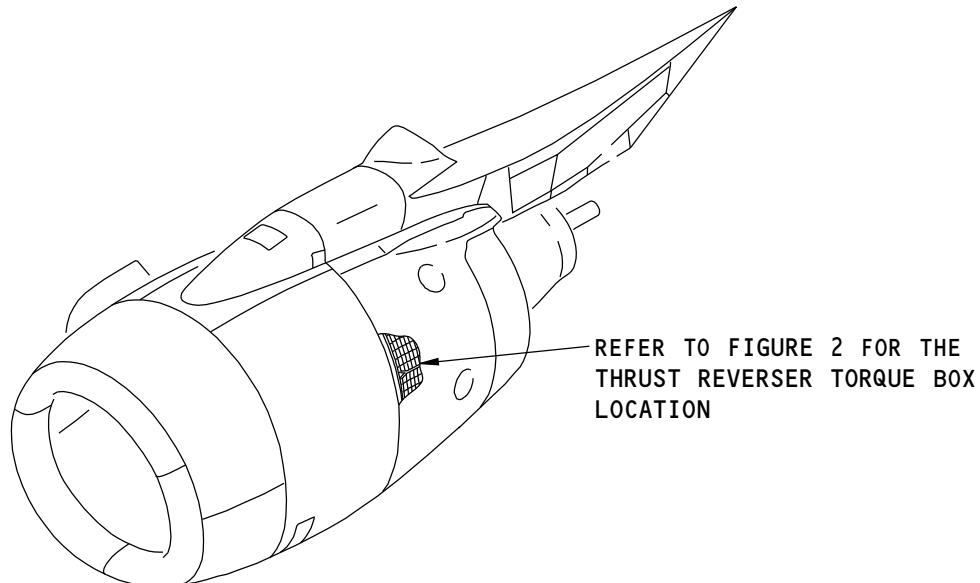
Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - THRUST REVERSER TORQUE BOX STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F13224 S0006591953_V1

Thrust Reverser Torque Box Structure

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
315A2202	Torque Box Installation
315A2231	Torque Box Structural Assembly
315A2232	Torque Box Assembly

54-30-02

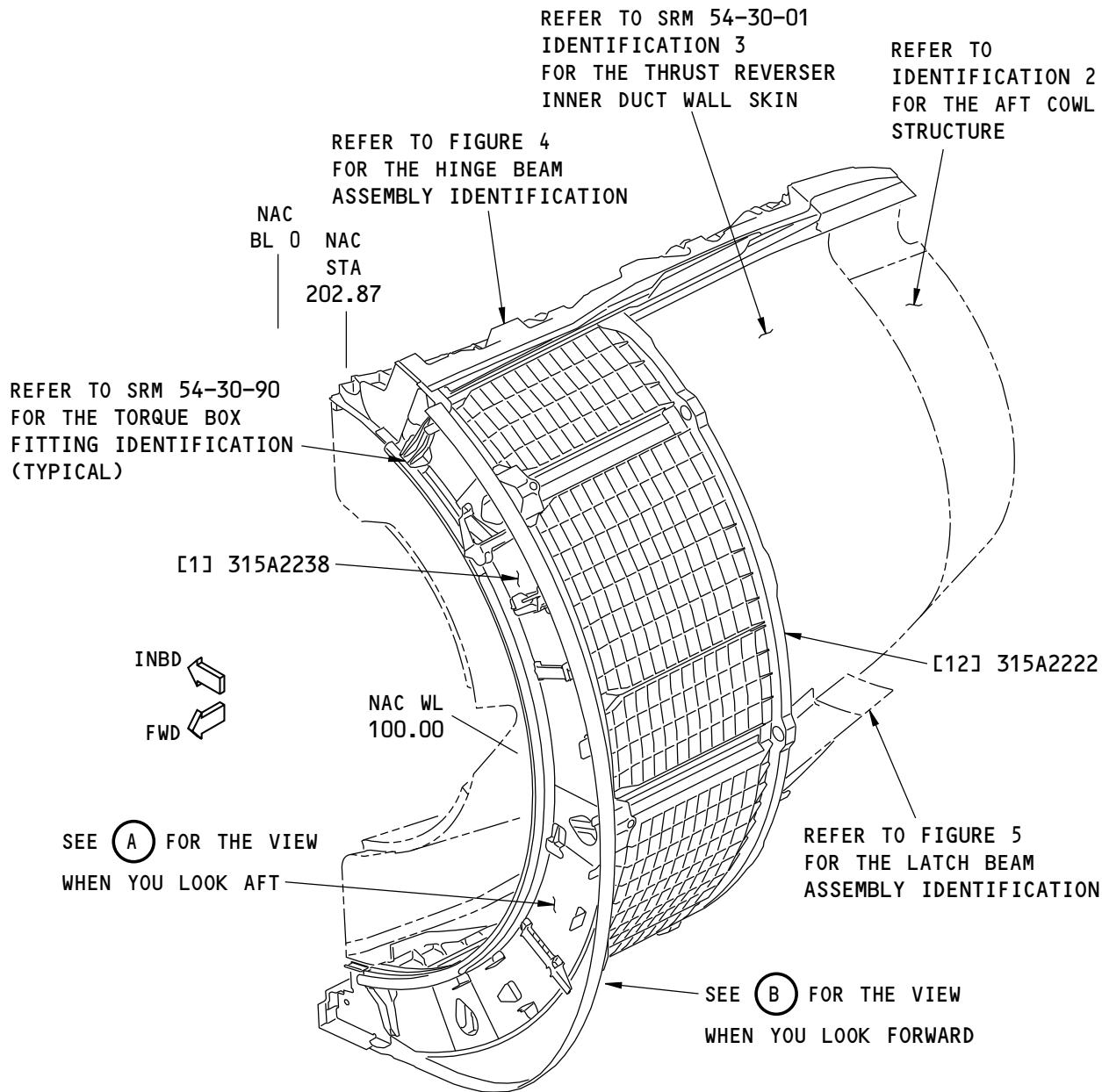
IDENTIFICATION 1

Page 1

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F12145 S0006591955_V2

**Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 1 of 8)**

54-30-02

IDENTIFICATION 1

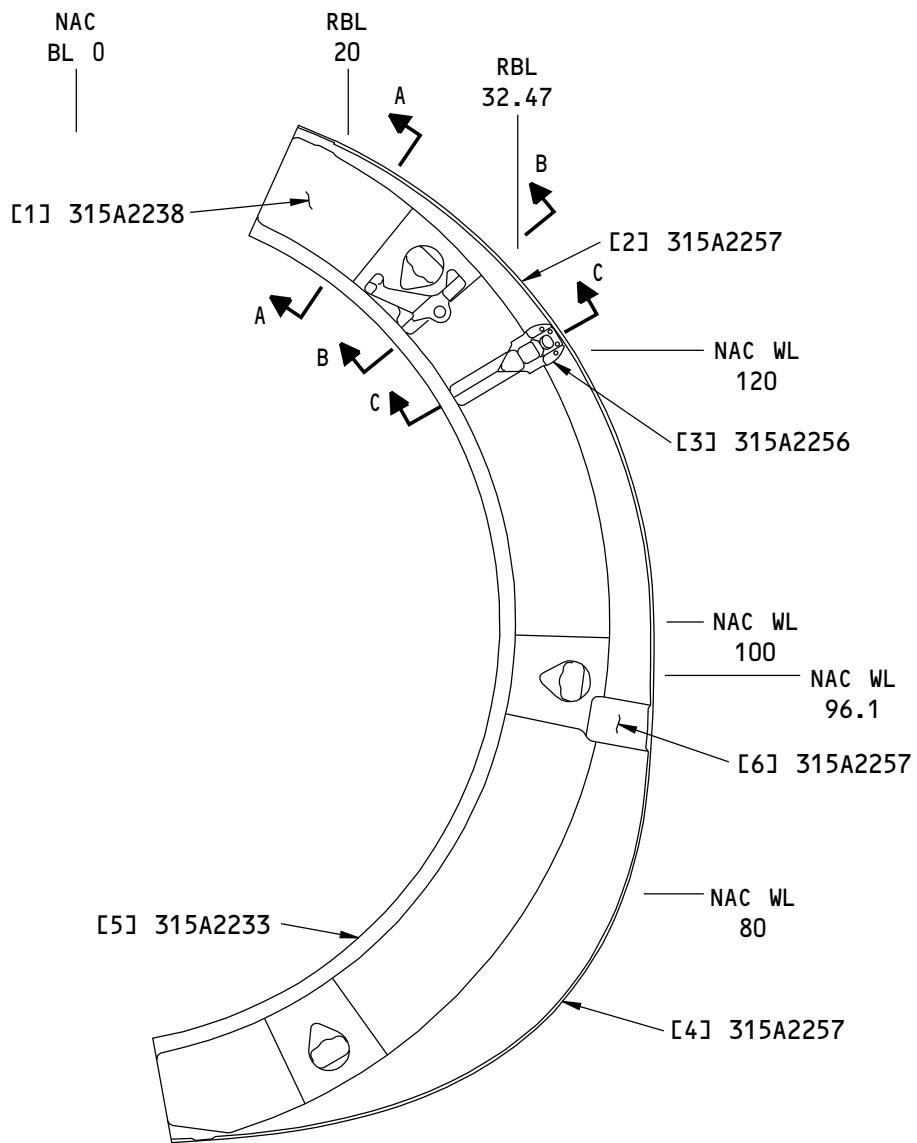
Page 2

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE
VIEW WHEN YOU LOOK AFT

(A)

F12766 S0006591956_V1

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 2 of 8)

54-30-02

IDENTIFICATION 1
Page 3

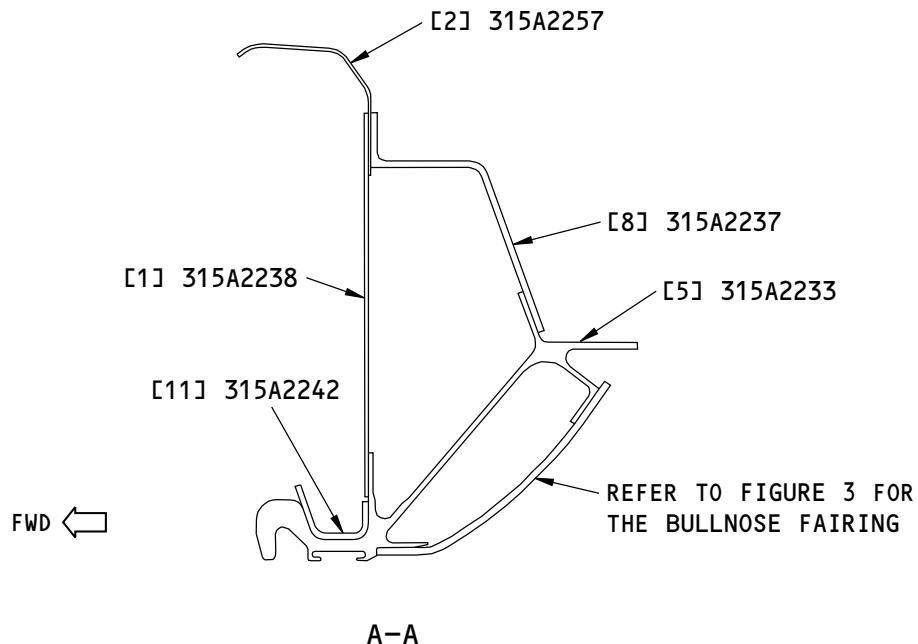
Nov 10/2012

D634A210

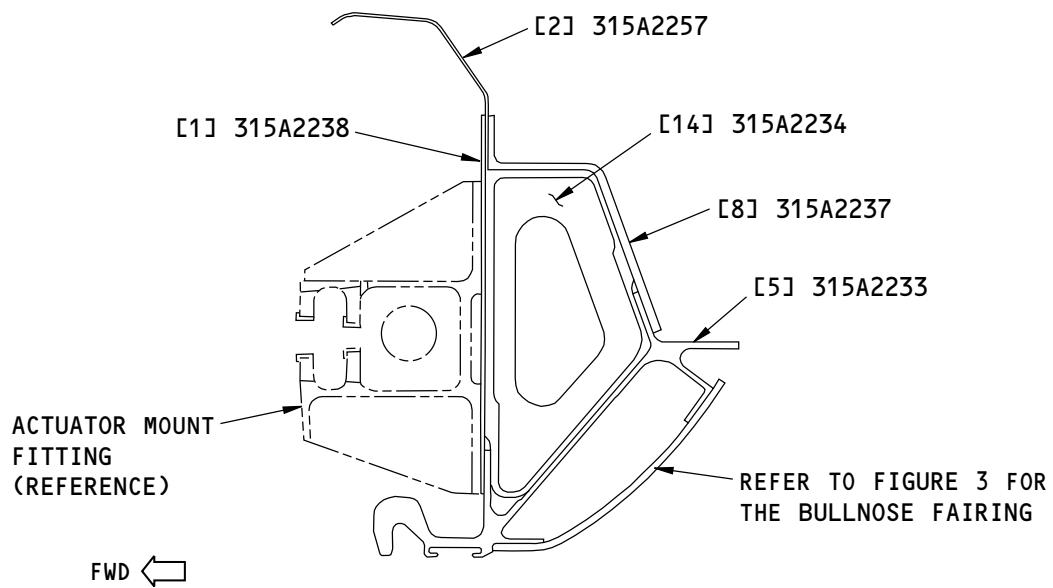
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737-800
STRUCTURAL REPAIR MANUAL



A-A



B-B

G41633 S0006591957_V2

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 3 of 8)

54-30-02

IDENTIFICATION 1
Page 4

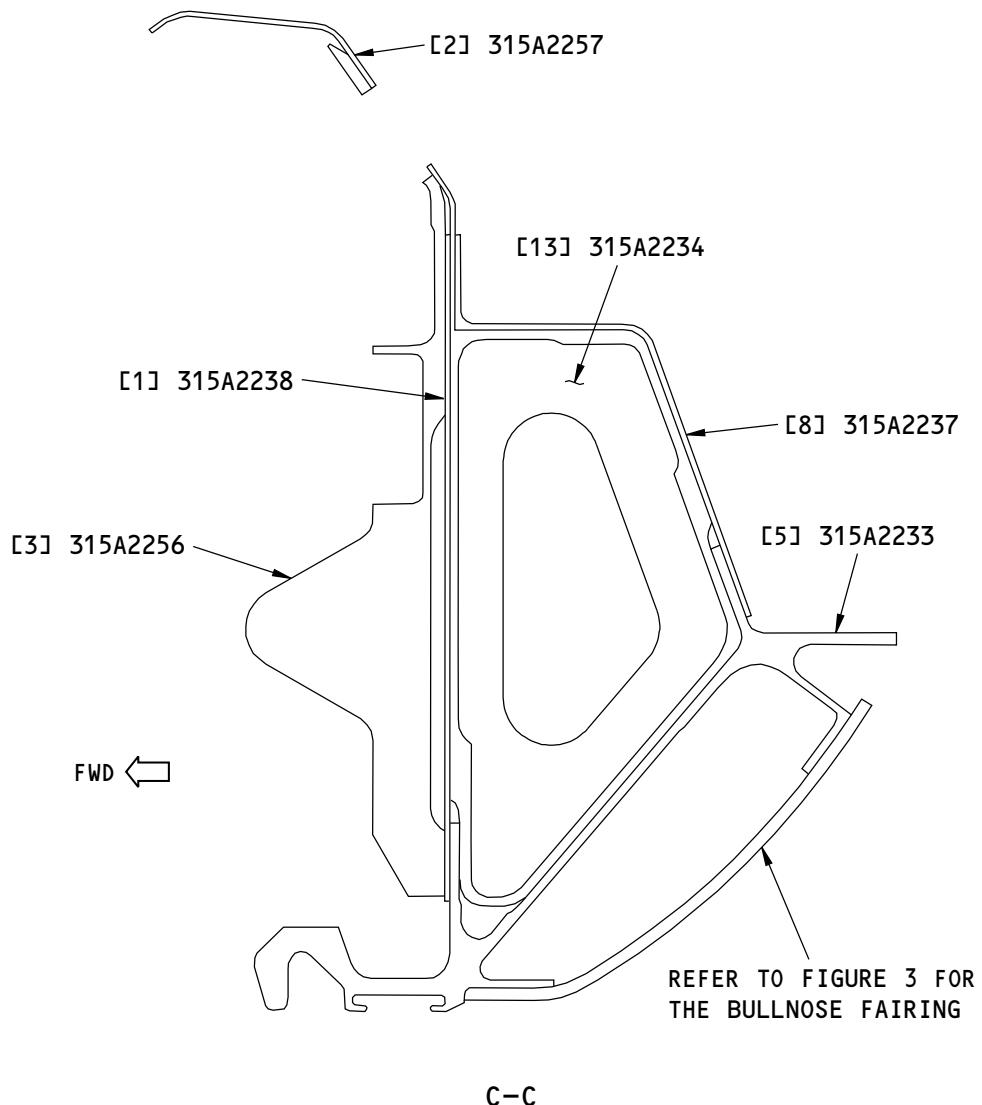
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737-800
STRUCTURAL REPAIR MANUAL



G55776 S0006591958_V1

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 4 of 8)

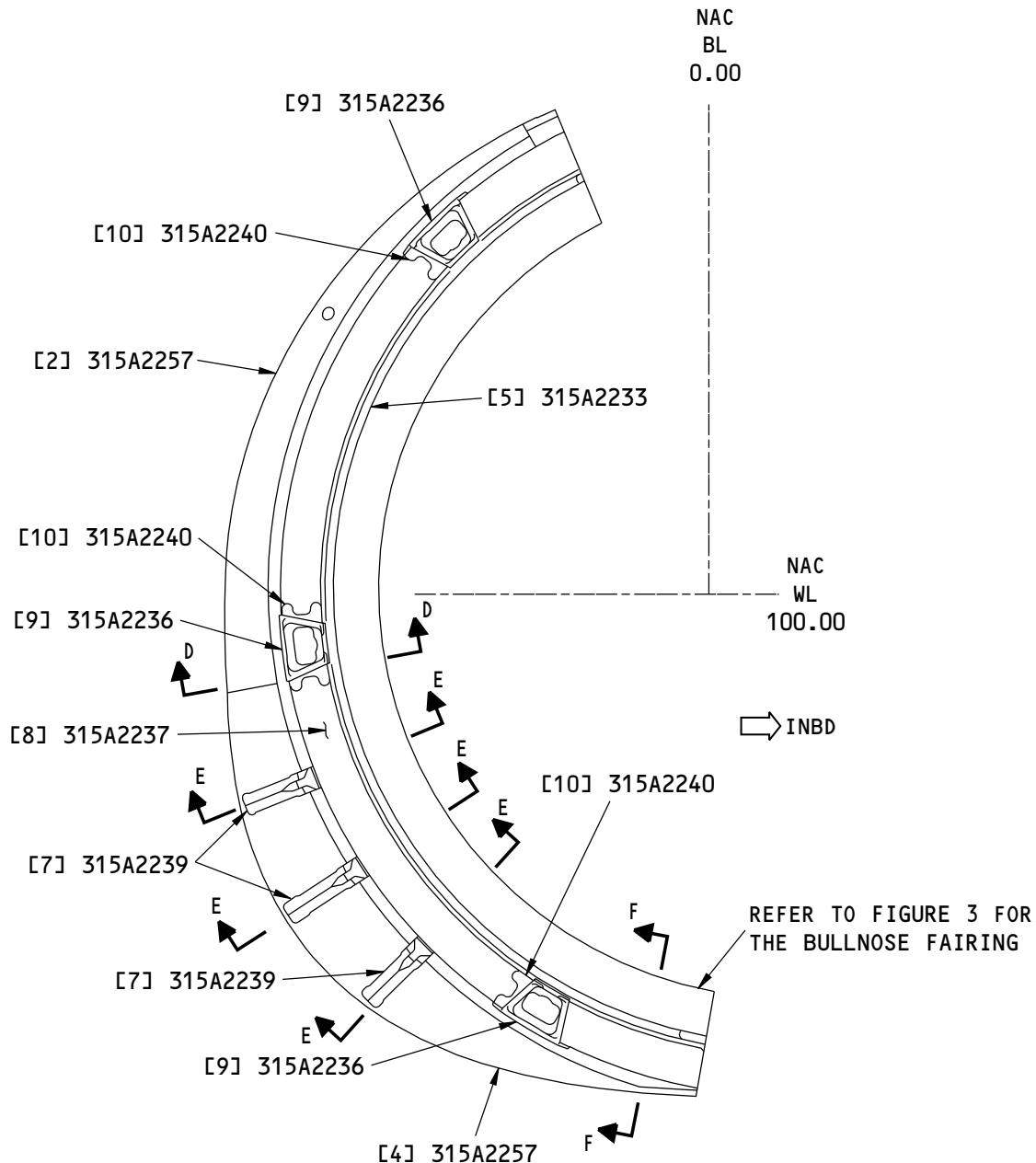
54-30-02
IDENTIFICATION 1
Page 5
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE
VIEW WHEN YOU LOOK FORWARD

(B)

F12816 S0006591959_V2

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 5 of 8)

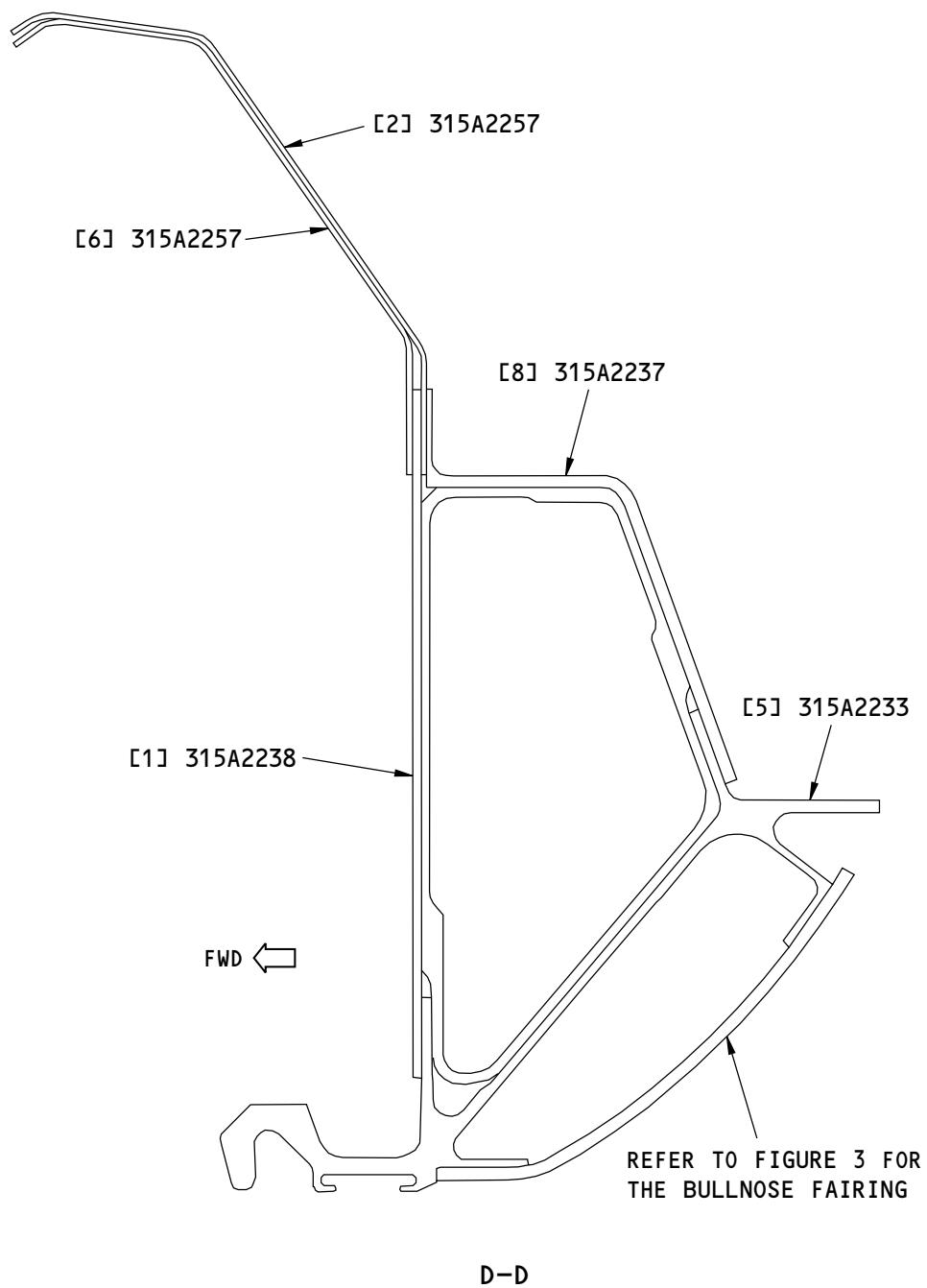
54-30-02
IDENTIFICATION 1
Page 6
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



G55777 S0006591960_V1

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 6 of 8)

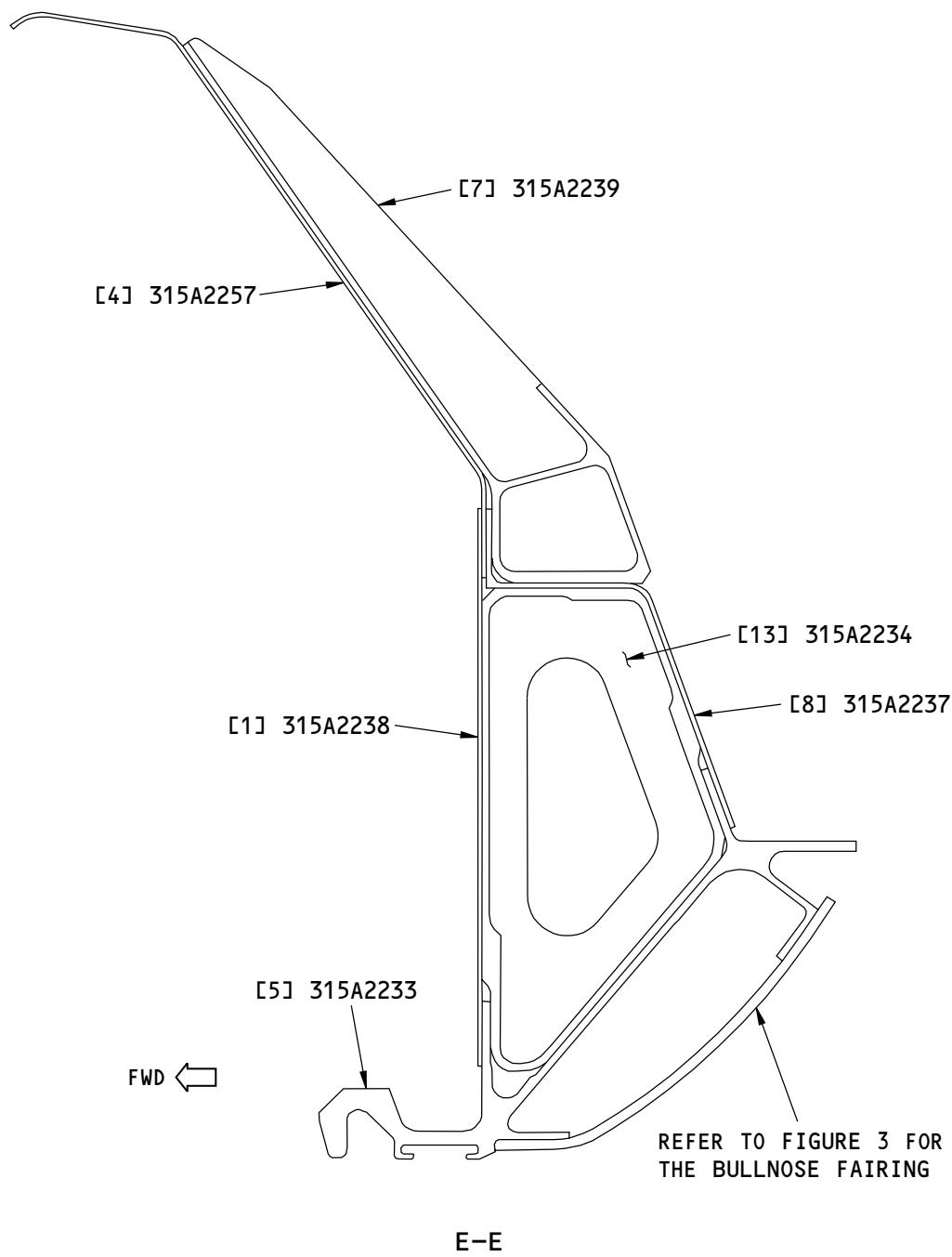
54-30-02
IDENTIFICATION 1
Page 7
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



G55778 S0006591961_V1

Thrust Reverser Torque Box Structure Identification
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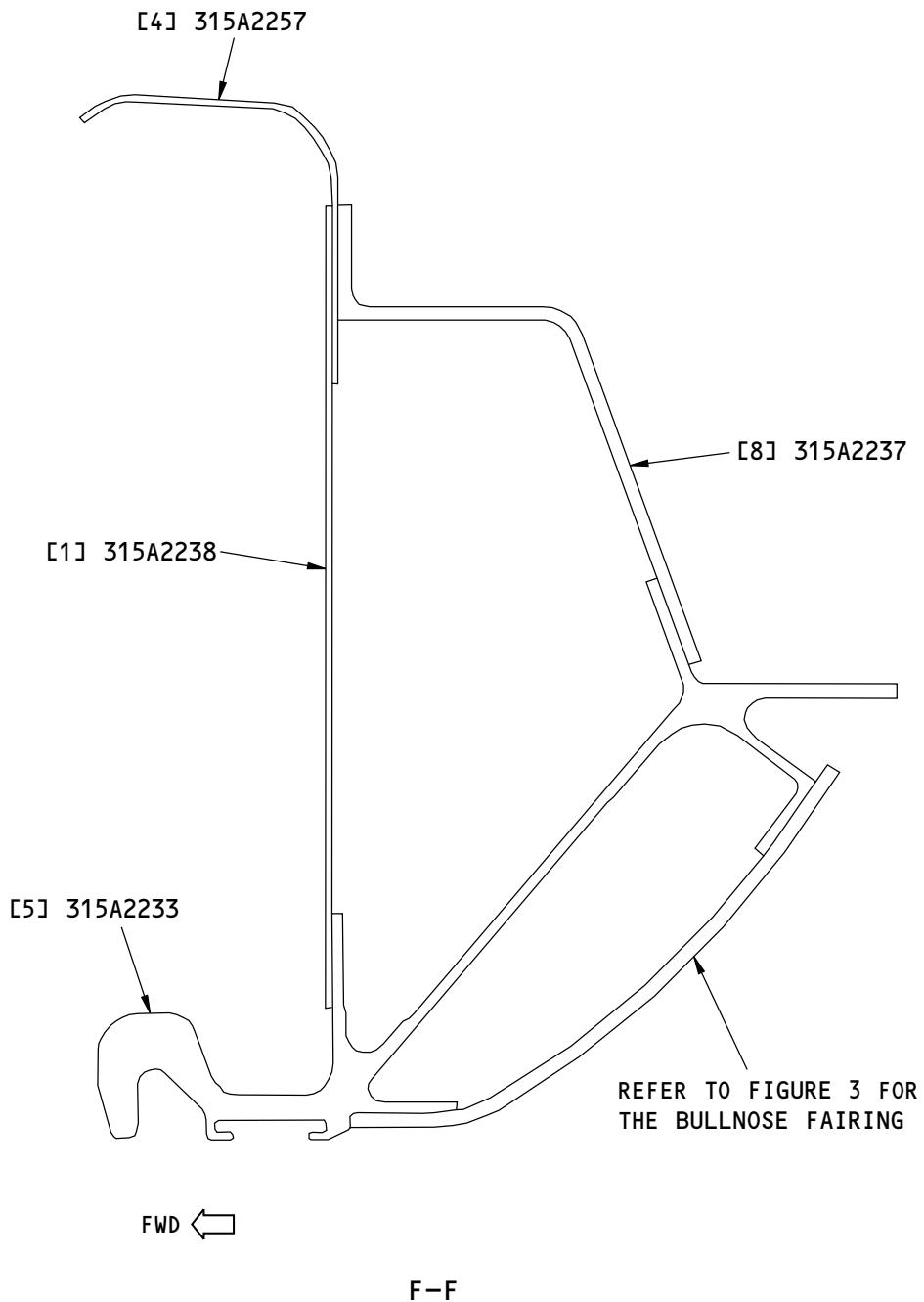
54-30-02
IDENTIFICATION 1
Page 8
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



G55779 S0006591962_V1

Thrust Reverser Torque Box Structure Identification
Figure 2 (Sheet 8 of 8)

54-30-02
IDENTIFICATION 1
Page 9
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Forward Web - Torque Box	0.080 (2.03)	Ti-6Al-4V titanium as given in MIL-T-9046 or AMS-T-9046, Code AB-1, in the annealed condition	
[2]	Outer Web - Upper		Ti-6Al-4V titanium sheet as given in MIL-T-9046 or AMS-T-9046, Code AB-1 in the annealed condition	
[3]	Mount Sleeve - Stow Sensor	2.25 (57.15)	7075-T73 die forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[4]	Outer Web - Lower		Ti-6Al-4V titanium sheet as given in MIL-T-9046 or AMS-T-9046, Code AB-1 in the annealed condition	
[5]	Outer V-Blade		7050-T7452 forged ring as given in BMS 7-214 7050-T7452 forged ring as given in BMS 7-214 (Optional: 7075-T73 aluminum extrusion as given in QQ-A-200/11, heat treated to T73)	Y6001 to Y6249 Y6250 and on
[6]	Outer Web - Splice		Ti-6Al-4V titanium sheet as given in MIL-T-9046 or AMS-T-9046, Code AB-1 in the annealed condition	
[7]	Gusset - Torque Box (3 locations)		7075-T73 die forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[8]	Aft Web - Torque Box		2024-T62 sheet as given in QQ-A-250/4 7050-T7452 rolled ring as given in BMS 7-214 (Optional: 7075-T73 Aluminum Extrusion as given in QQ-A-200/11 or AMS-QQ-A-200/11)	Y6001 to Y6017 Y6018 and on
[9]	Actuator Attach Fitting (3 locations)	4.0 (101.6)	7075-O1 forged block as given in BMS 7-186, heat treated to T73 15-5PH CRES bar as given in AMS 5659, heat treated to 150 to 170 KSI	Y6001 to Y6005 Y6006 and on
[10]	Doubler - Aft Web Cutout	0.050 (1.27) 0.063 (1.60) 0.071 (1.80)	2024-T62 bare aluminum sheet as given in QQ-A-250/4 2024-3 clad sheet as given in QQ-A-250/5, heat treated to T81 2024-T81 clad sheet as given in QQ-A-250/5	Y6001 to Y6017 Y6001 to Y6017 Y6001 to Y6017
[11]	V-Blade Fireshield	0.016 (0.41)	Commercially pure titanium, as given in MIL-T-9046 or AMS-T-9046, in the annealed condition	Y6001 to Y6249
[12]	Cascade Support Ring		7075-T73 forged ring as given in BMS 7-186 (Optional: 7075-O1 forged ring as given in BMS 7-186, heat treated to T73)	
[13]	Frame (11 locations)	2.00 (50.80)	7075-T73 aluminum die forging as given in BMS 7-186 (Optional: 7075-T73 forged block as given in BMS-7-186) (Optional: 7075-T73 hand forging as given in BMS 7-186)	
[14]	Frame (1 location)	2.25 (57.15)	7075-T73 forged block as given in BMS 7-186 (Optional: 7075-T73 hand forging as given in BMS 7-186)	

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

54-30-02

IDENTIFICATION 1

Page 10

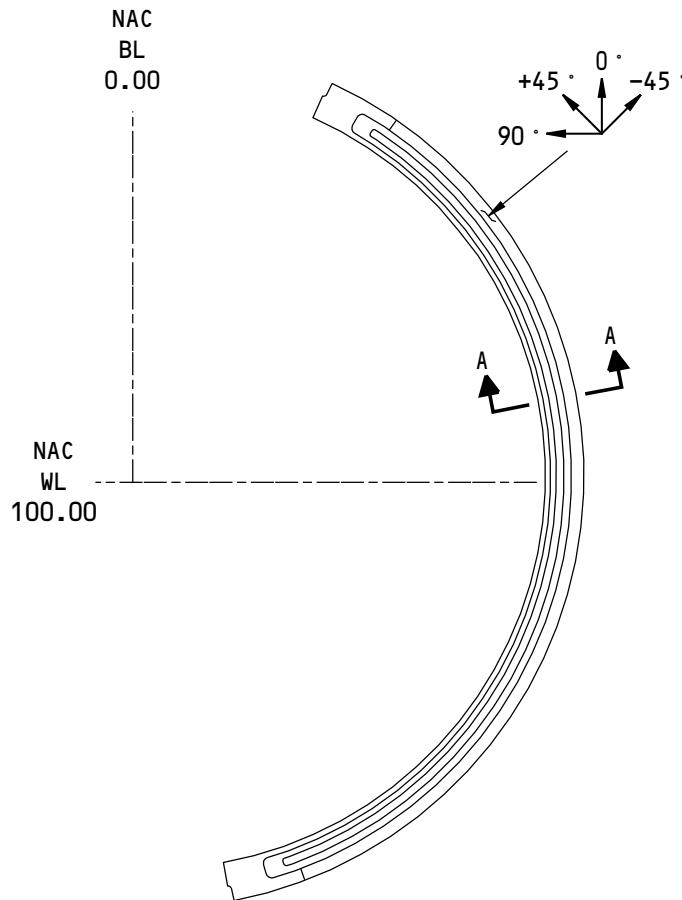
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737-800
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LEFT BULLNOSE ASSEMBLY IS SHOWN,
RIGHT BULLNOSE ASSEMBLY IS THE SAME

VIEW WHEN YOU LOOK AFT
VIEW IS ON THE TOOLSIDE (AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION

NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO THE VIEW SHOWN ABOVE FOR THE 0 DEGREE PLY DIRECTION.
- REFER TO SECTION A-A FOR THE PLY SEQUENCE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F12834 S0006591964_V2

Ply Direction and Ply Sequence for the Torque Box Bullnose Assembly
Figure 3 (Sheet 1 of 2)

54-30-02

IDENTIFICATION 1

Page 11

Nov 10/2014

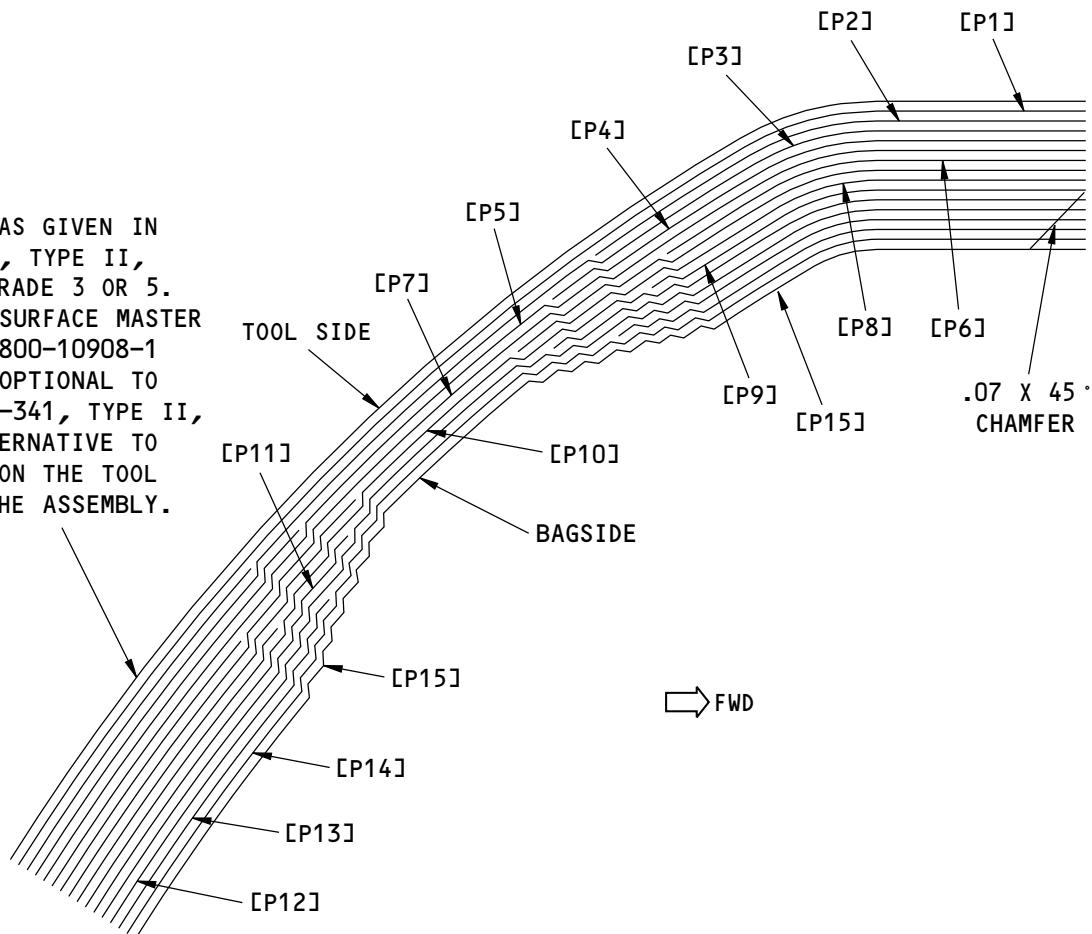
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737-800
STRUCTURAL REPAIR MANUAL

ADHESIVE AS GIVEN IN
BMS 5-154, TYPE II,
CLASS 1, GRADE 3 OR 5.
OPTIONAL SURFACE MASTER
905 PER D800-10908-1
TYPE 1. OPTIONAL TO
USE BMS 8-341, TYPE II,
AS AN ALTERNATIVE TO
ADHESIVE ON THE TOOL
SIDE OF THE ASSEMBLY.



PLY SEQUENCE
A-A

F12899 S0006591965_V2

Ply Direction and Ply Sequence for the Torque Box Bullnose Assembly
Figure 3 (Sheet 2 of 2)

54-30-02

IDENTIFICATION 1

Page 12

Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTION A-A		
PLY	DIRECTION	MATERIAL
P1, P4, P7, P8, P11, P14	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW, nominal thickness 0.0083 inch (0.21 mm). Limit the supplier to FIBERITE CORPORATION only.
P2, P3, P5, P6, P9, P10, P12, P13	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW, nominal thickness 0.0083 inch (0.21 mm). Limit the supplier to FIBERITE CORPORATION only.
P15	+ or - 45 degrees	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108, Class 3, nominal thickness 0.0025 inch (0.06 mm)

54-30-02

IDENTIFICATION 1

Page 13

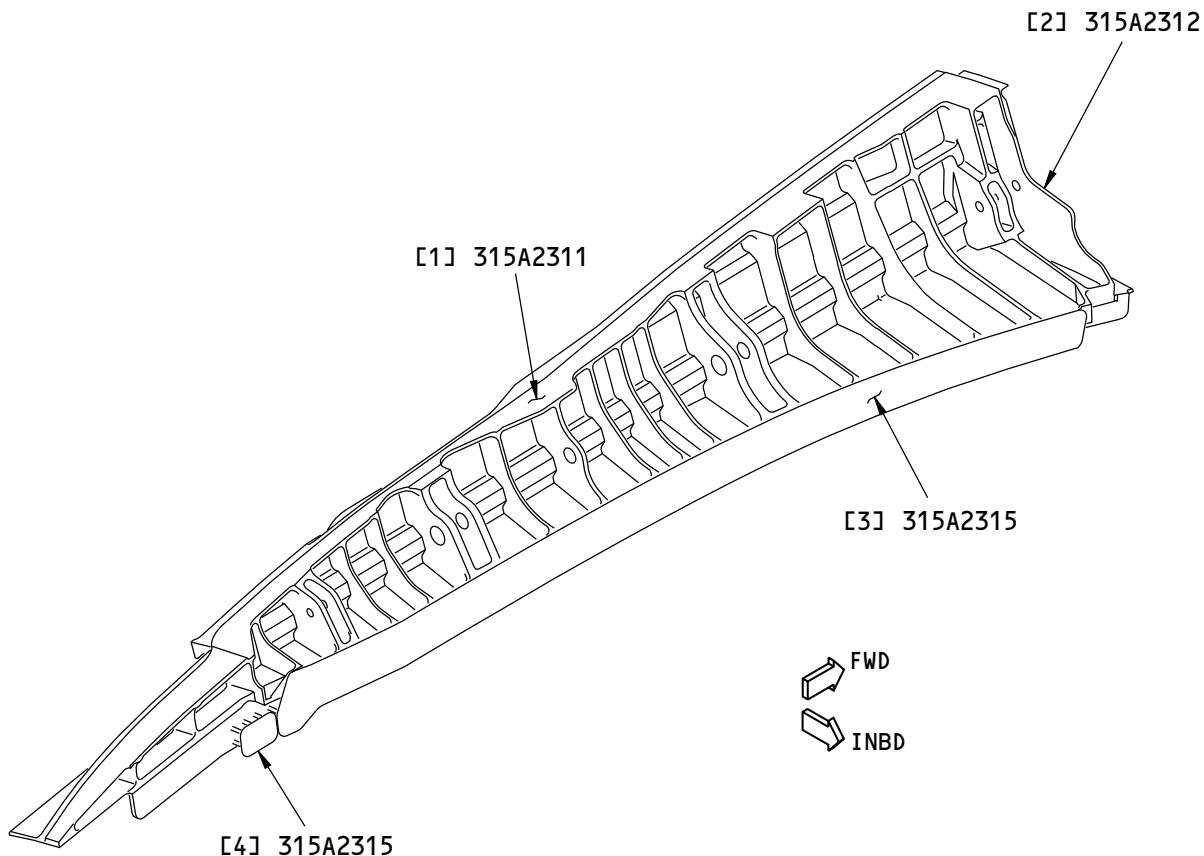
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

LEFT HINGE BEAM IS SHOWN, RIGHT HINGE BEAM IS OPPOSITE

F12726 S0006591967_V1

Thrust Reverser Hinge Beam Assembly Identification
Figure 4

54-30-02

IDENTIFICATION 1

Page 14

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Hinge Beam		7075-O1 die forging as given in BMS 7-186, heat treated to T73. (Optional: 7075-T73 forged block as given in BMS 7-186)	
[2]	Forward Firewall	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046 or AMS-T-9046, Code AB-1 in the annealed condition	
[3]	Splice Plate	0.071 (1.80)	2024-T81 clad sheet as given in QQ-A-250/5	
[4]	Splice Strap	0.050 (1.27)	2024-T81 clad sheet as given in QQ-A-250/5	

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

54-30-02

IDENTIFICATION 1

Page 15

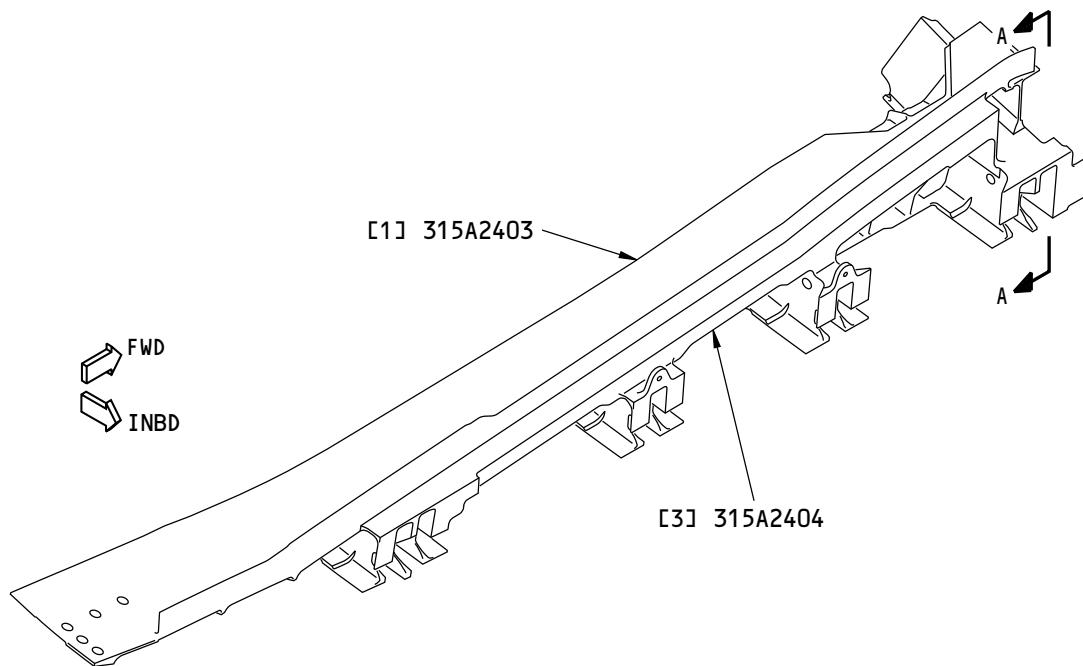
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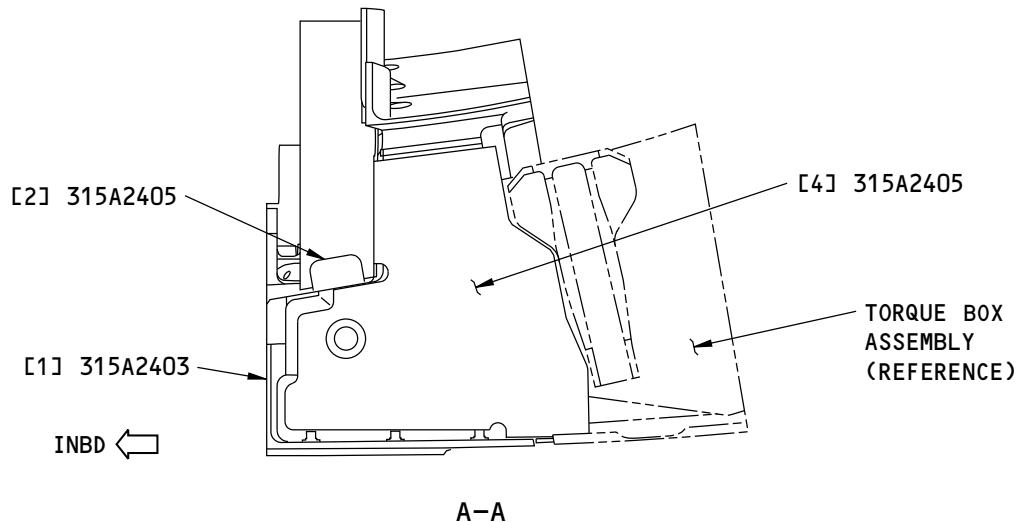
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737-800
STRUCTURAL REPAIR MANUAL



LEFT LATCH BEAM IS SHOWN, RIGHT LATCH BEAM IS OPPOSITE



NOTES

- REFER TO TABLE 5 FOR THE LIST OF MATERIALS.

F13176 S0006591969_V1

Thrust Reverser Latch Beam Assembly Identification
Figure 5

54-30-02

IDENTIFICATION 1

Page 16

Nov 10/2012

D634A210



**737-800
STRUCTURAL REPAIR MANUAL**

Table 5:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Latch Beam		7075-O1 die forging as given in BMS 7-186, heat treated to T73 (Optional: 7075-T73 forged block as given in BMS 7-186)	Y7908 and on
[2]	Fire Shield, Latch Housing	0.040 (1.02)	625 nickel alloy sheet as given in AMS 5599, in the annealed condition	
[3]	Splice Plate	0.071 (1.80)	2024-T81 bare sheet as given in QQ-A-250/4	
[4]	Fire Shield	0.032 (0.81)	Ti-6Al-4V titanium sheet as given in MIL-T-9046 or AMS-T-9046, Code AB-1 in the annealed condition	

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

54-30-02

IDENTIFICATION 1

Page 17

Nov 10/2014

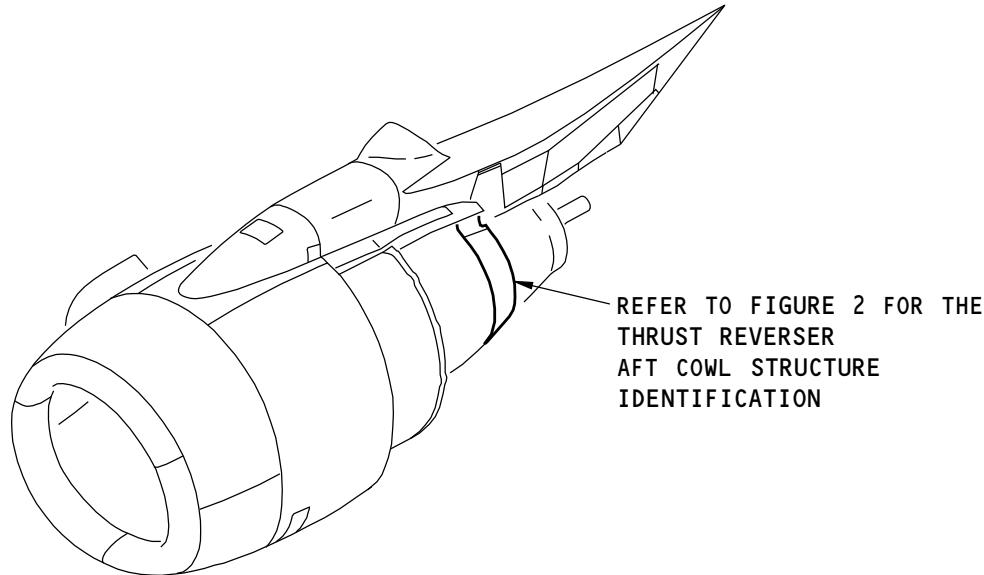
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - THRUST REVERSER AFT COWL STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F14703 S0006591972_V1

Thrust Reverser Aft Cowl Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2103	Aft Cowl Panel Installation
315A2104	Aft Cowl Panel Assembly
315A2007	Thrust Reverser Interchangeability Installation

54-30-02

IDENTIFICATION 2

Page 1

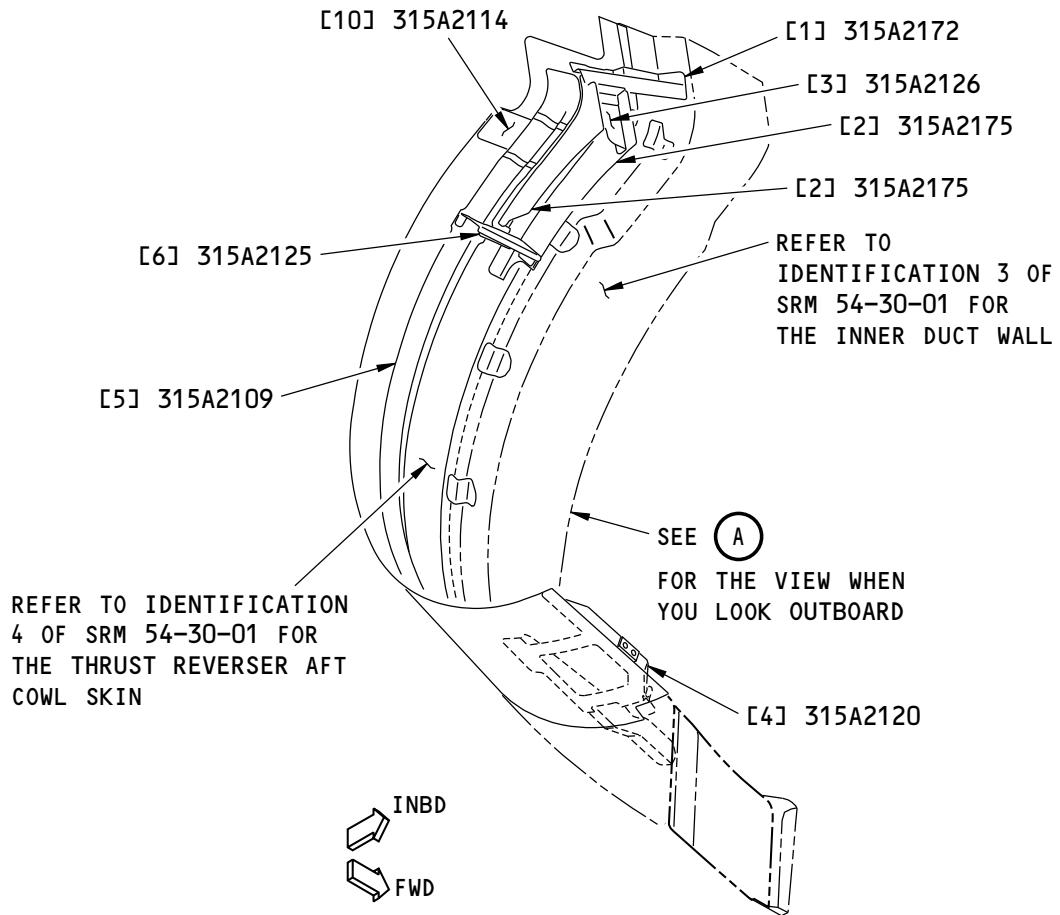
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737-800
STRUCTURAL REPAIR MANUAL



LEFT AFT COwl IS SHOWN,
RIGHT AFT COwl IS OPPOSITE
(FOR LINE NUMBERS 1 THROUGH 39)

NOTE:

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

F14697 S0006591974_V2

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 1 of 9)

54-30-02

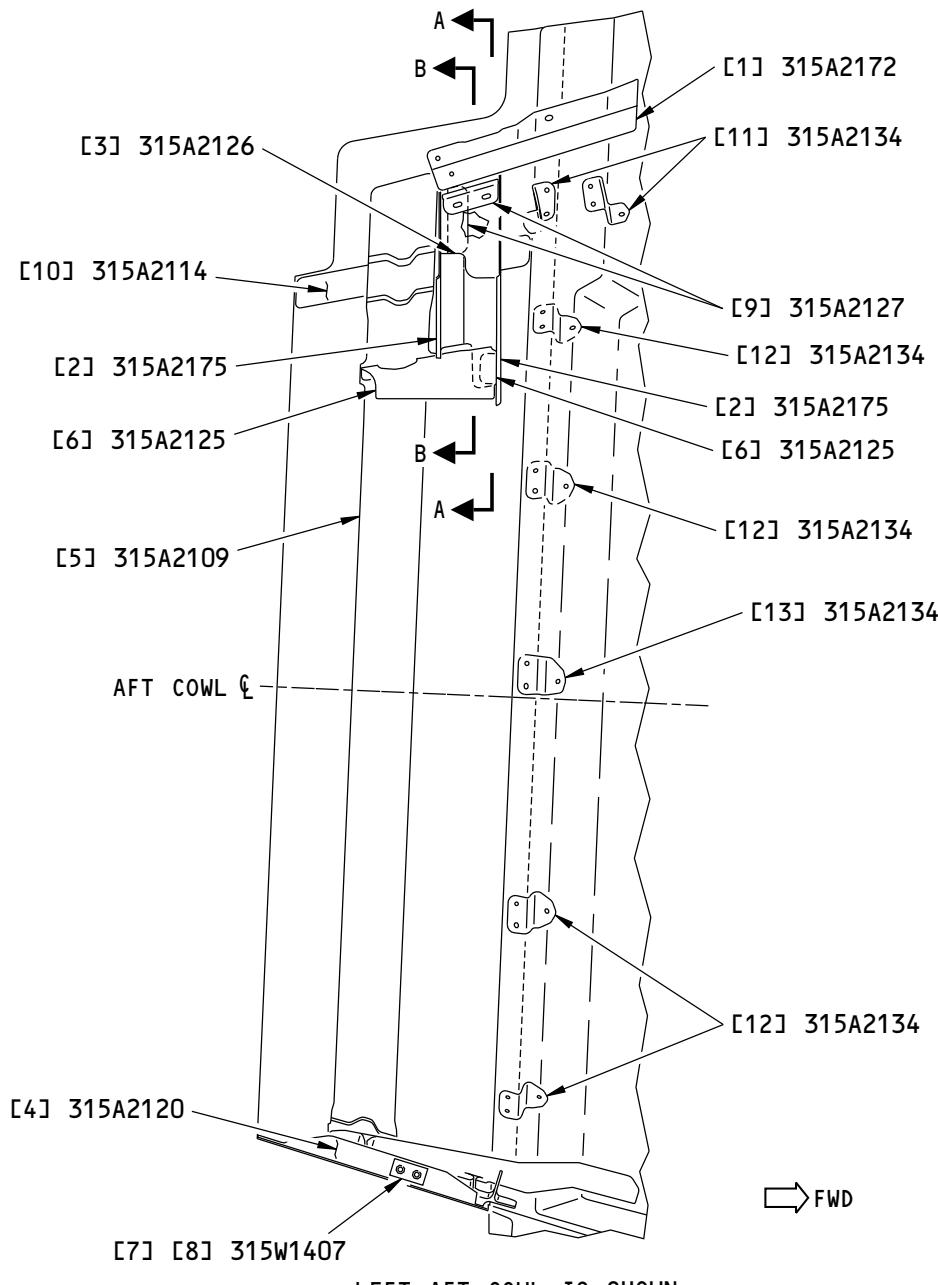
IDENTIFICATION 2

Page 2

Nov 10/2015

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


LEFT AFT COWL IS SHOWN,
RIGHT AFT COWL IS OPPOSITE
(VIEW LOOKING OUTBOARD)
(FOR LINE NUMBERS 1 THROUGH 39)

A

G47647 S0006591975_V2

**Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 2 of 9)**

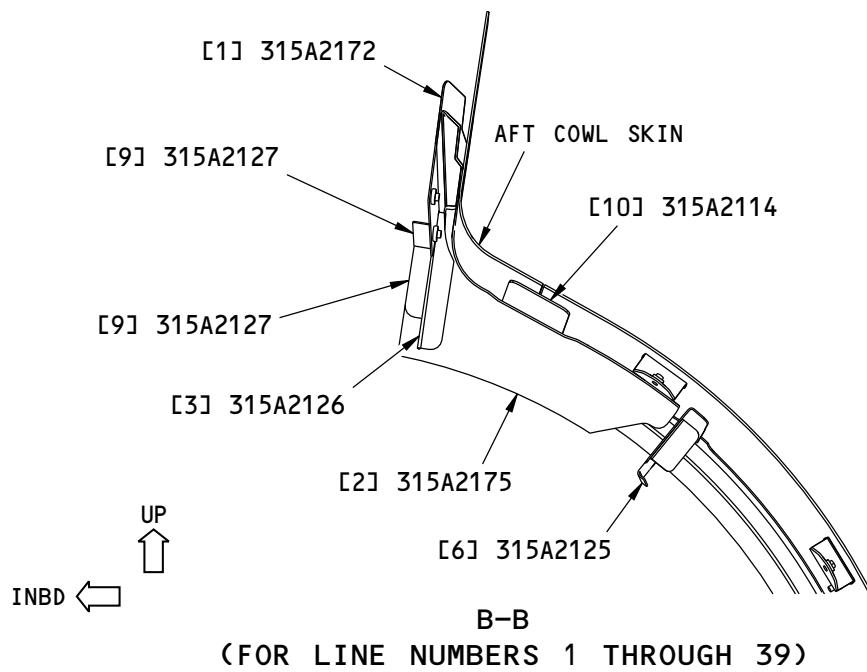
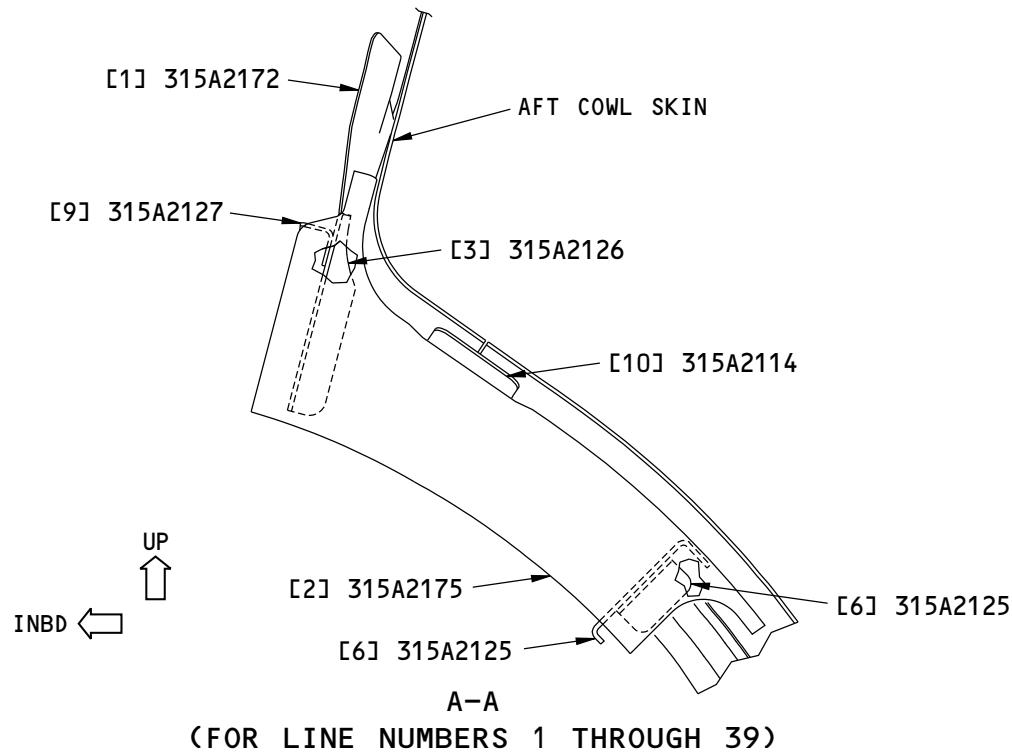
54-30-02
IDENTIFICATION 2
Page 3
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



G48101 S0006591976_V2

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 3 of 9)

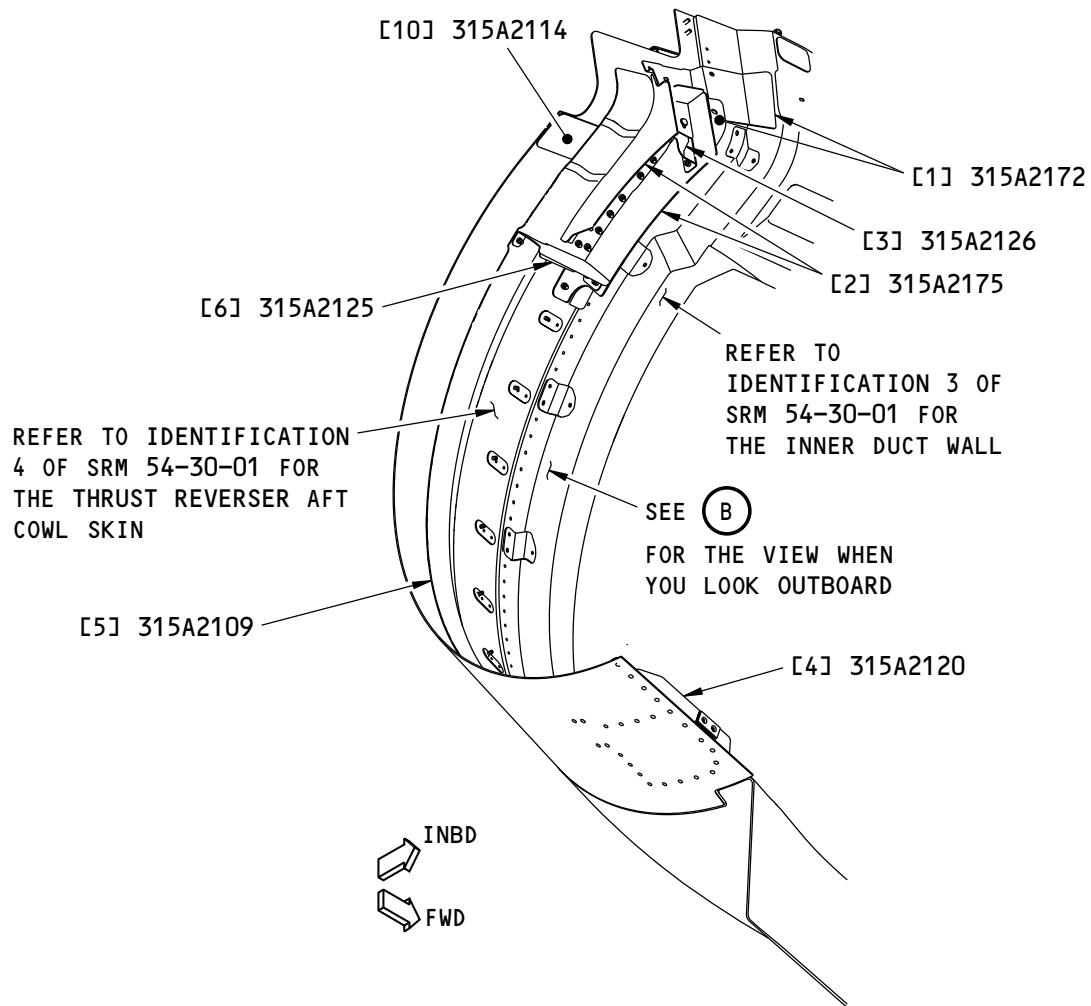
54-30-02
IDENTIFICATION 2
Page 4
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT AFT COWL IS SHOWN,
RIGHT AFT COWL IS OPPOSITE
(FOR LINE NUMBERS 40 THROUGH 495)

NOTE:

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

2435920 S0000563669_V1

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 4 of 9)

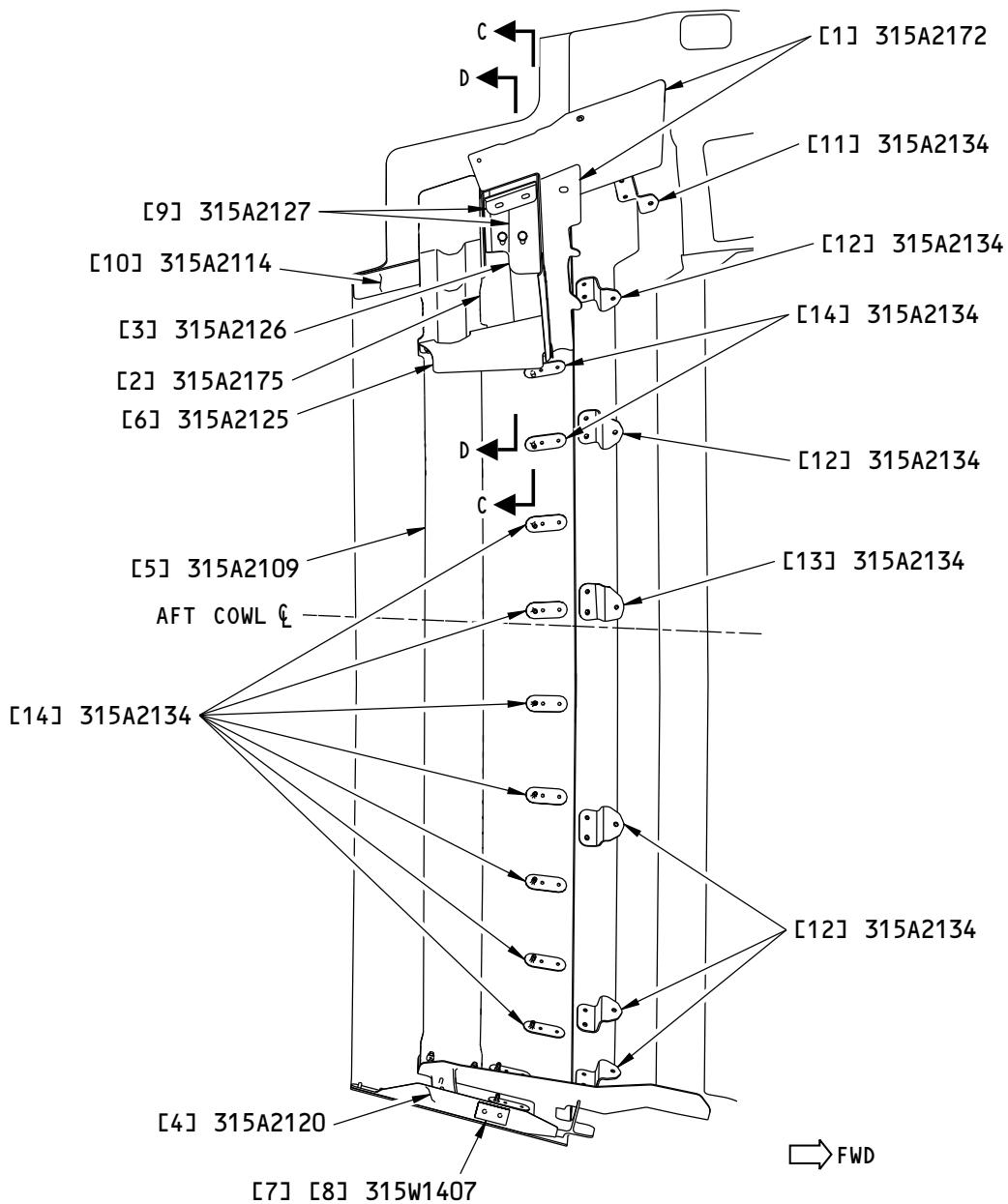
54-30-02
IDENTIFICATION 2
Page 5
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT AFT COWL IS SHOWN,
RIGHT AFT COWL IS OPPOSITE
(VIEW LOOKING OUTBOARD)
(FOR LINE NUMBERS 40 THROUGH 495)

B

2435980 S0000563671_V1

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 5 of 9)

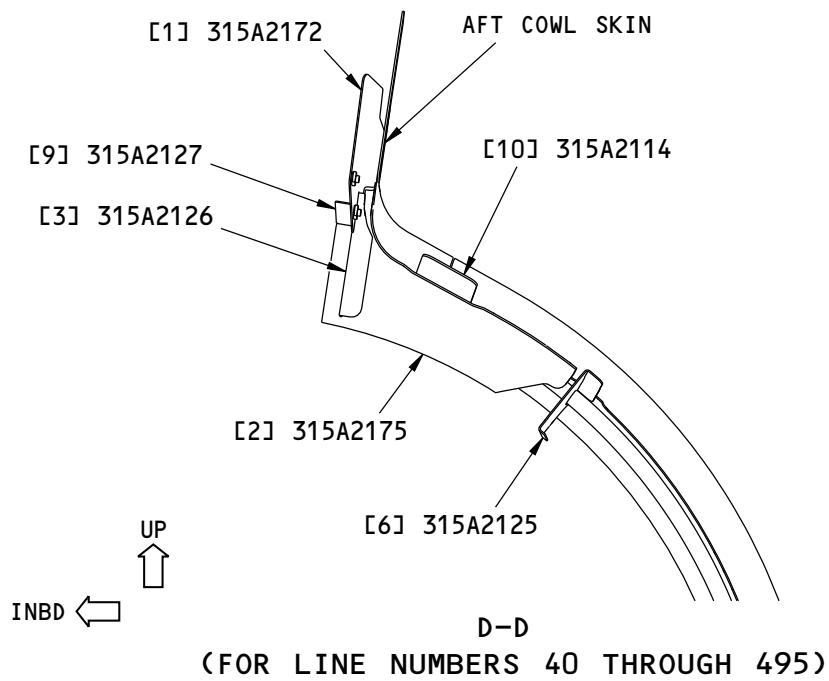
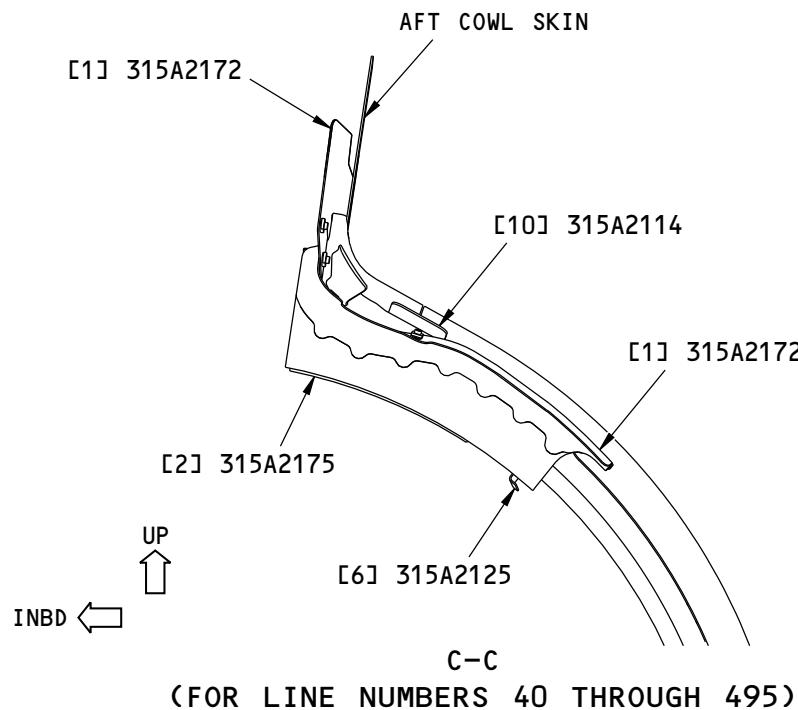
54-30-02
IDENTIFICATION 2
Page 6
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



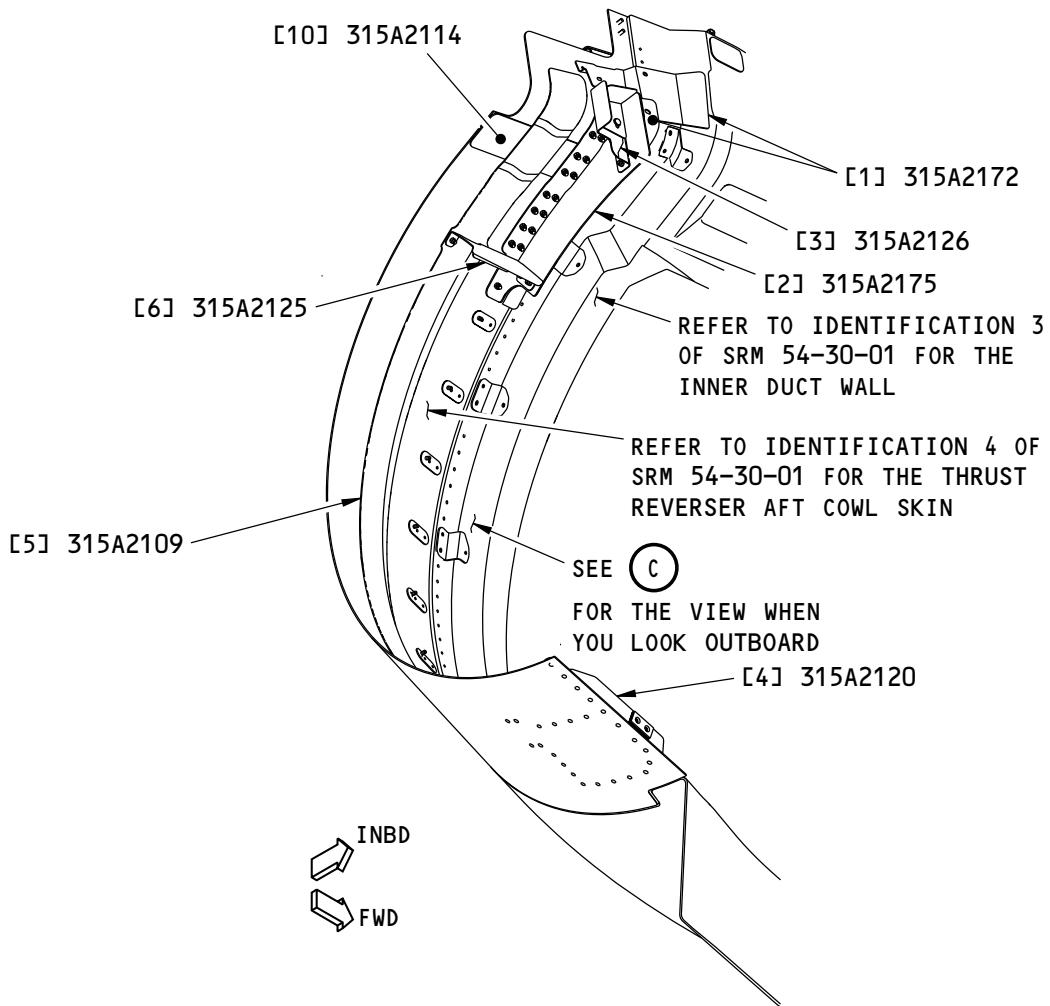
2436155 S0000563673_V1

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 6 of 9)

54-30-02
IDENTIFICATION 2
Page 7
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



LEFT AFT COOL IS SHOWN,
RIGHT AFT COOL IS OPPOSITE
(FOR LINE NUMBERS 496 AND ON)

NOTE:

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

2435932 S0000563670_V1

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 7 of 9)

54-30-02

IDENTIFICATION 2

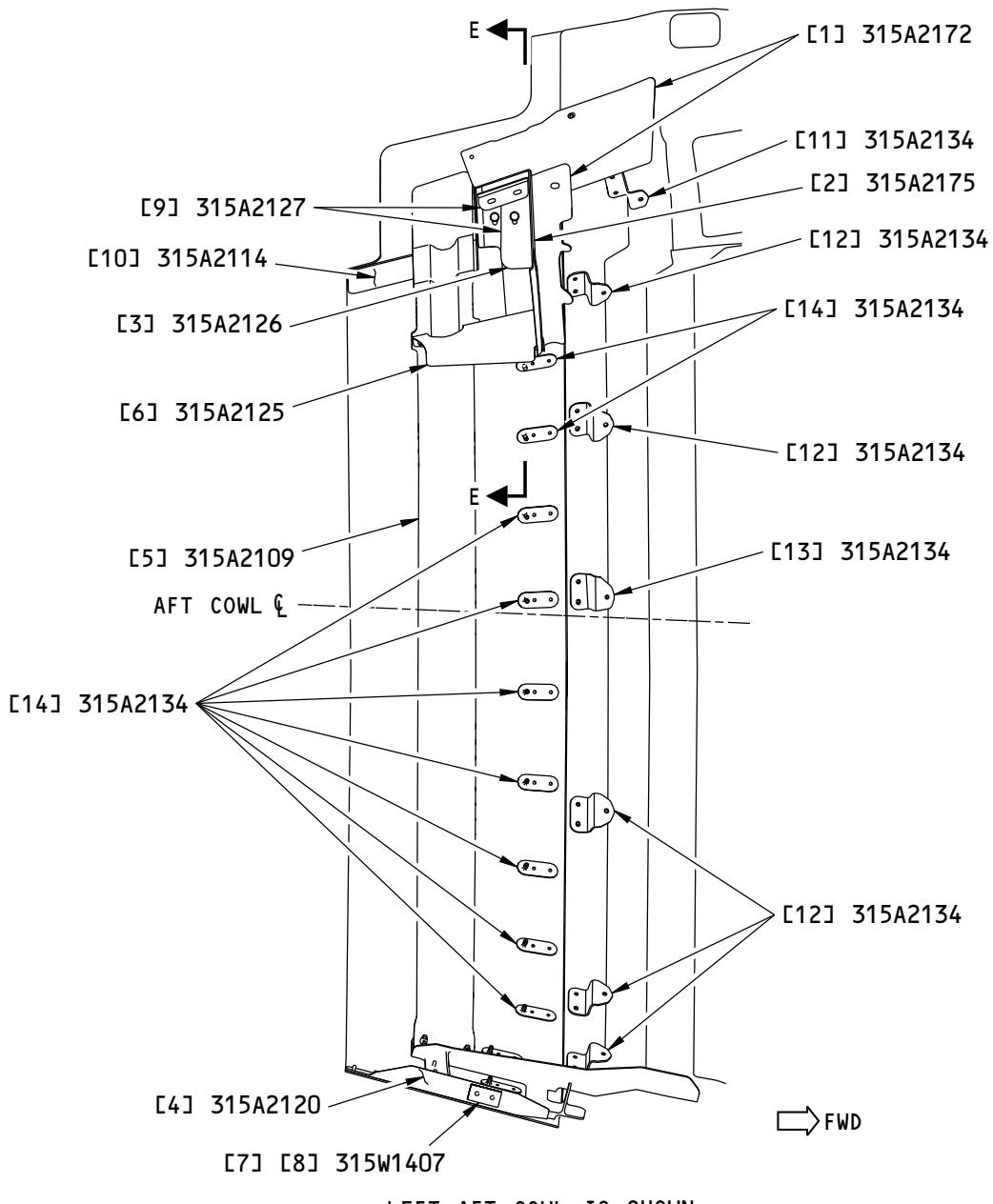
Page 8

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



C

2436020 S0000563672_V1

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 8 of 9)

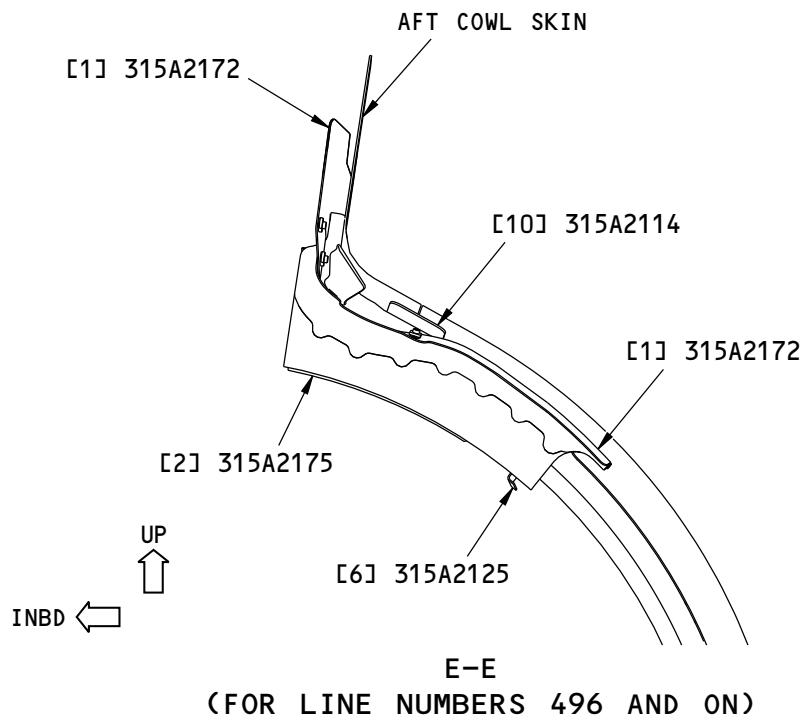
54-30-02
IDENTIFICATION 2
Page 9
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



2436156 S0000563674_V1

Thrust Reverser Aft Cowl Structure Identification
Figure 2 (Sheet 9 of 9)

54-30-02
IDENTIFICATION 2
Page 10
Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Fireseal - Support Bracket	0.050 (1.27)	Nickel Alloy 625 sheet as given in AMS 5599, in the annealed condition	
[2]	Fire Barrier - Upper	0.063 (1.60)	Nickel Alloy 625 sheet as given in AMS 5599, in the annealed condition	Line Number 1 through 495
		0.071 (1.80)	Nickel Alloy 625 sheet as given in AMS 5599, in the annealed condition	Line Number 496 and on
[3]	Standoff - Lower Fire Seal	0.040 (1.02)	Nickel Alloy 625 sheet as given in AMS 5599, in the annealed condition	
[4]	Lower Closeout Fitting	2.5 (63.5)	Ti-6Al-2Sn-4Zr-2Mo titanium plate as given in AMS-T-9046, Code AB-4, condition DA (Optional: Ti-6Al-2Sn-4Zr-2Mo bar as given in AMS-T-9047, condition DA)	Line Number 1 through 5330
		2.5 (63.5)	Ti-6Al-4V titanium plate as given in AMS 4911, in the annealed condition	Line Number 5331 and on
[5]	Frame - Aft Cowl Trailing Edge	0.050 (1.27)	Ti-6Al-2Sn-4Zr-2Mo titanium sheet as given in AMS-T-9046, composition AB-4, condition DA	
[6]	Lower Fire Barrier - Aft Cowl	0.050 (1.27)	Nickel Alloy 625 sheet as given in AMS 5599, in the annealed condition	
[7]	Wear Plate	0.100 (2.54)	2024-O bare sheet as given in AMS-QQ-A-250/4, heat treat to T62	
[8]	Spacer	0.016 (0.41)	2024-T81 clad sheet as given in AMS-QQ-A-250/5	
[9]	Clip - Fire Seal	0.040 (1.02)	Nickel Alloy 625 sheet as given in AMS 5599, in the annealed condition	
[10]	Splice Plate	0.071 (1.80)	2219-T81 bare sheet as given in AMS-QQ-A-250/30	
[11]	Inner Wall Blanket Support - Bracket Assembly	0.063 (1.60)	Nickel Alloy 625 as given in AMS 5599	
[12]	Inner Wall Blanket Support - Bracket Assembly	0.071 (1.80)	301 sheet as given in AMS 5517	
[13]	Inner Wall Blanket Support - Bracket Assembly	0.063 (1.60)	301 sheet as given in AMS 5517	Line Number 1 through 39
		0.071 (1.80)	301 sheet as given in AMS 5517	Line Number 40 and on
[14]	Inner Wall Blanket Support - Bracket Assembly	0.050 (1.27)	Ti-6Al-4V sheet as given in AMS-T-9046, composition AB-1, condition A	Line Number 40 and on

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

54-30-02

IDENTIFICATION 2

Page 11

Nov 10/2015

D634A210

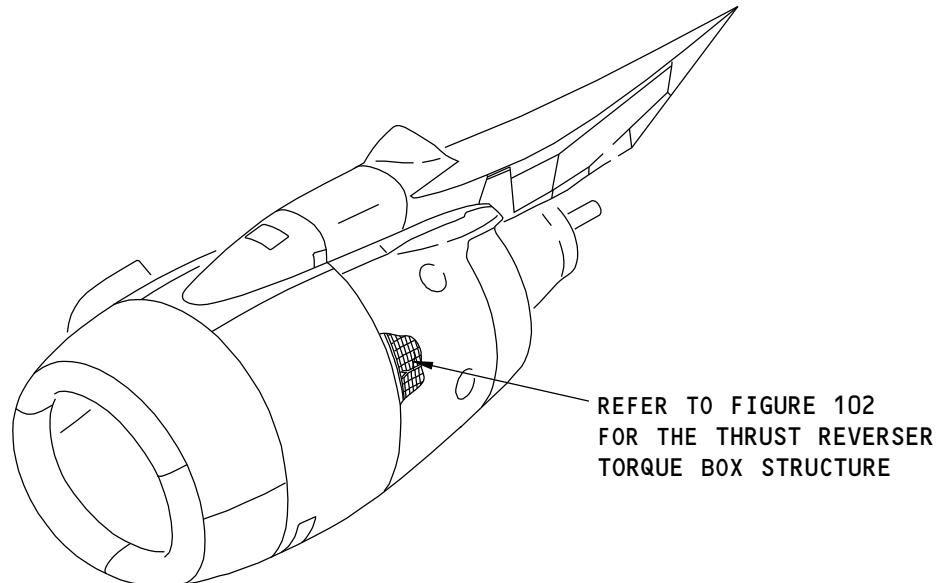


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - THRUST REVERSER TORQUE BOX STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the thrust reverser torque box structure shown in Thrust Reverser Torque Box Structure Location, Figure 101/ALLOWABLE DAMAGE 1.



G41604 S0006591980_V1

Thrust Reverser Torque Box Structure Location
Figure 101

54-30-02

ALLOWABLE DAMAGE 1

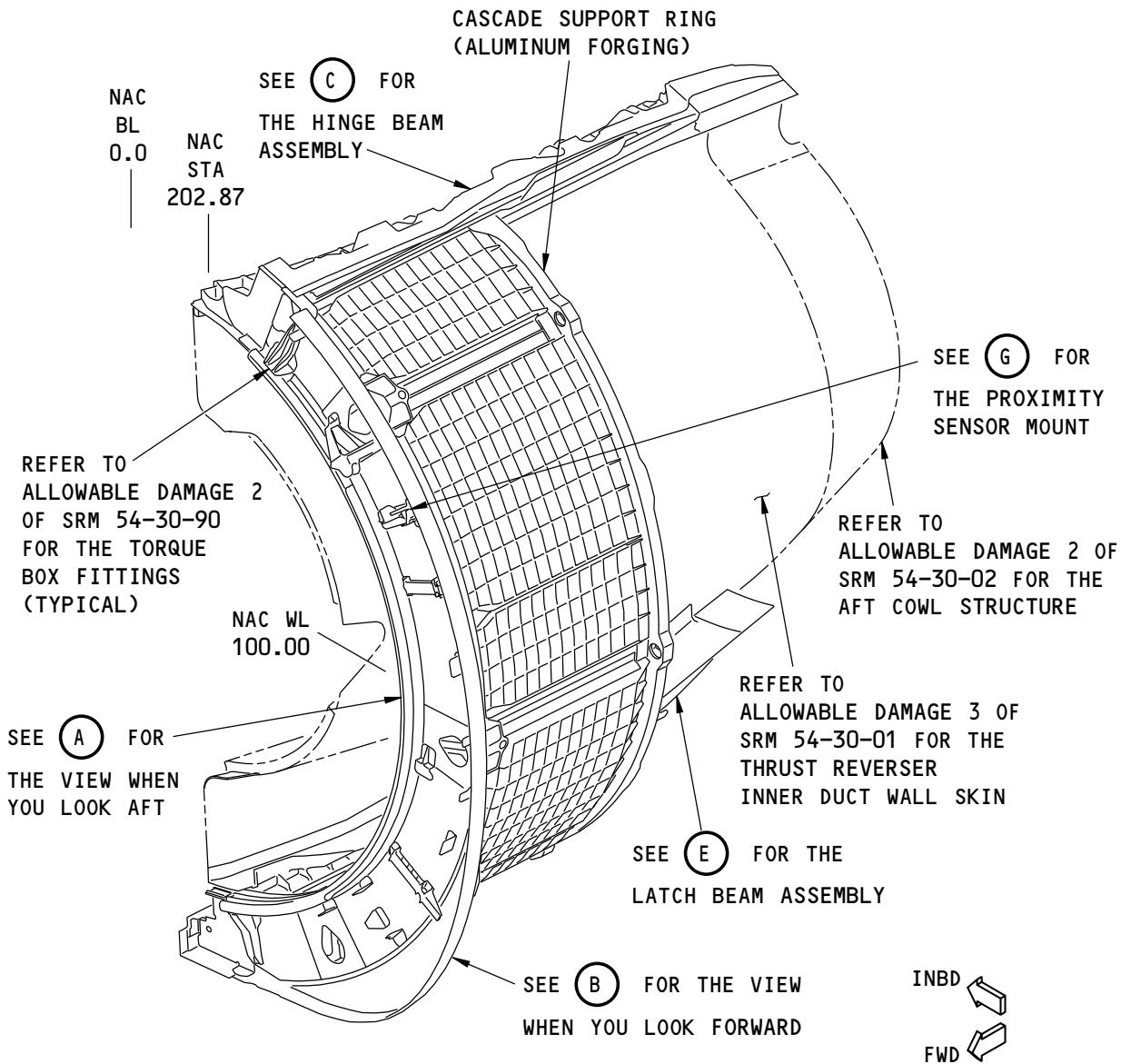
Page 101

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

G41609 S0006591981_V2

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 1 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 102

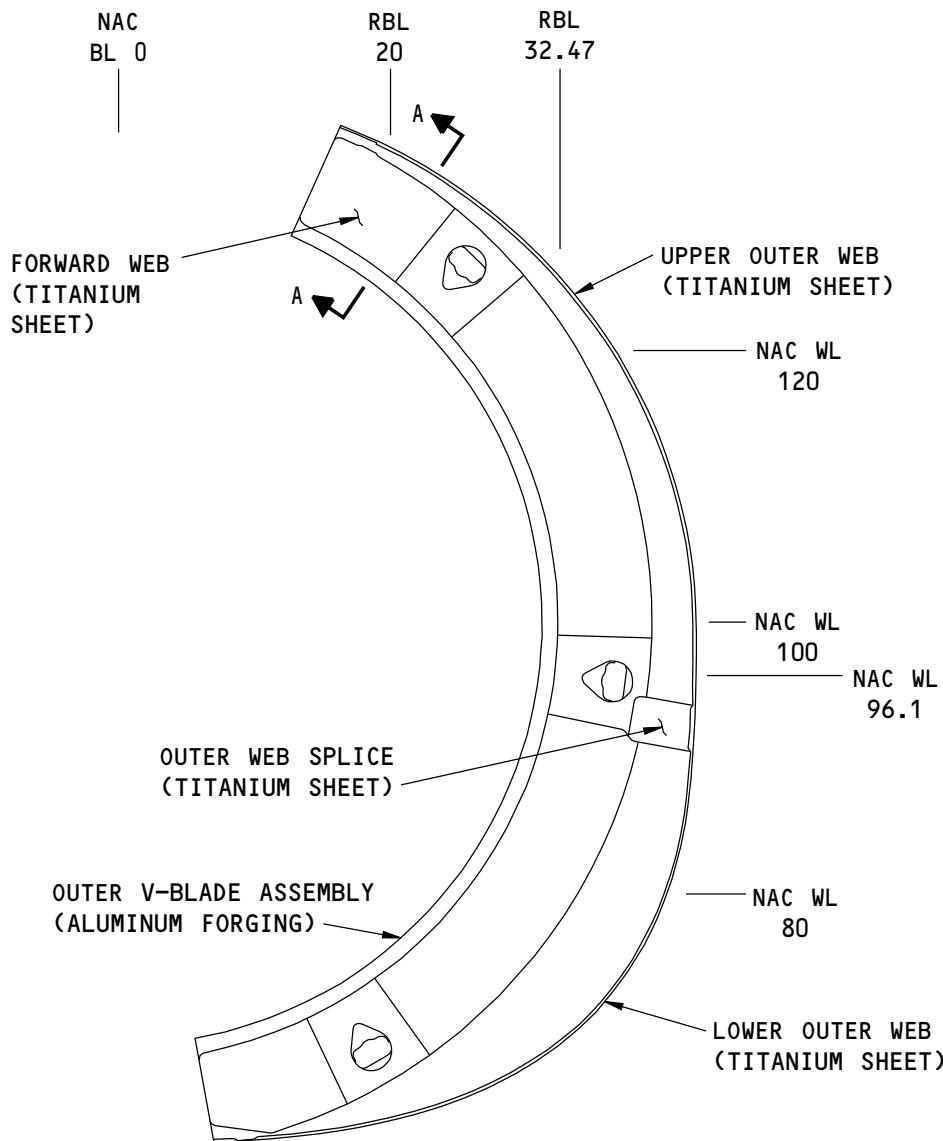
Mar 10/2016

D634A210

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737-800
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LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE
VIEW WHEN YOU LOOK AFT

(A)

G55497 S0006591982_V1

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 2 of 10)

54-30-02

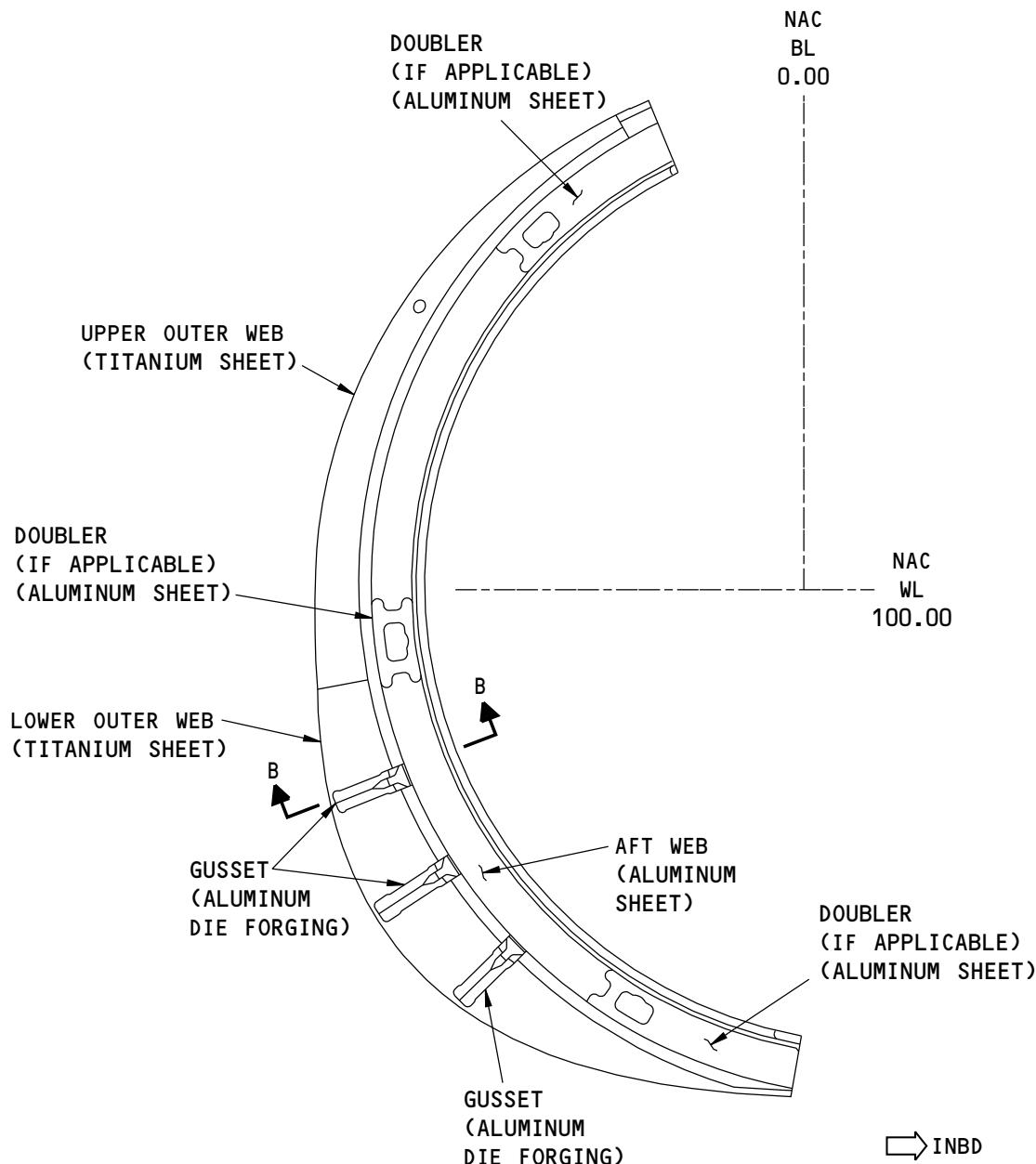
ALLOWABLE DAMAGE 1

Page 103

D634A210

Mar 10/2016

737-800
STRUCTURAL REPAIR MANUAL



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE
 VIEW WHEN YOU LOOK FORWARD

B

G55506 S0006591983_V2

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 3 of 10)

54-30-02

ALLOWABLE DAMAGE 1

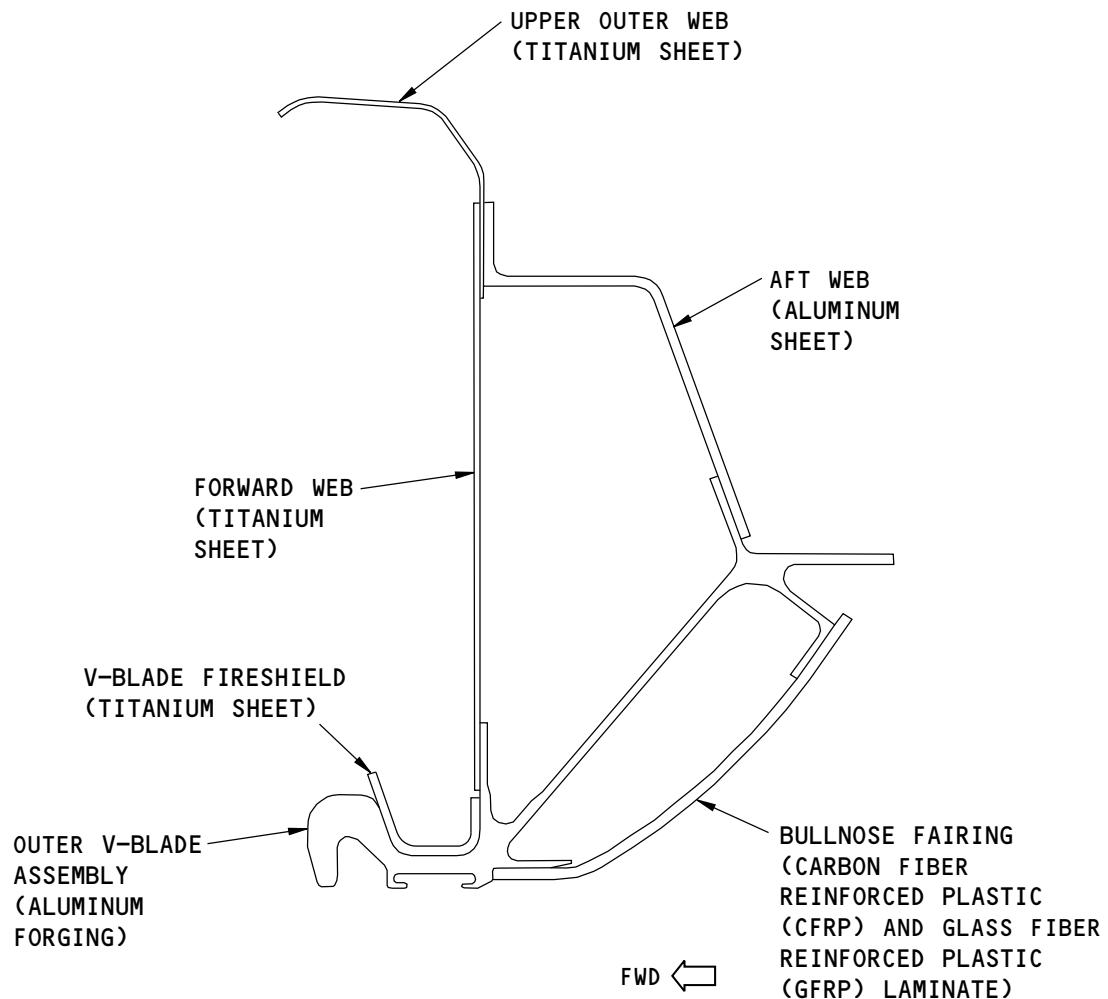
Page 104

D634A210

Mar 10/2016



737-800
STRUCTURAL REPAIR MANUAL



A-A

G55520 S0006591984_V2

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 4 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 105

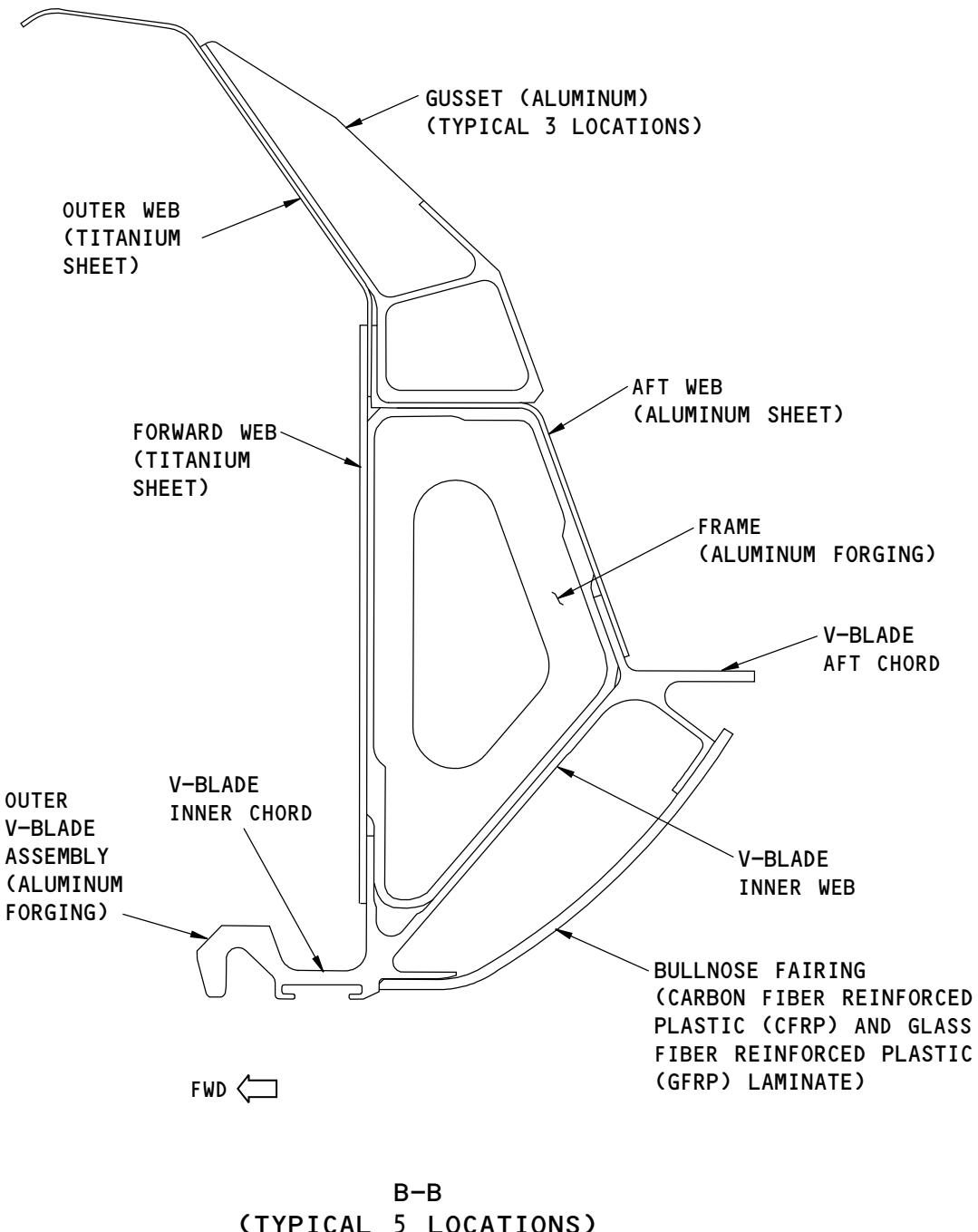
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737-800
STRUCTURAL REPAIR MANUAL



G55532 S0006591985_V1

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 5 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 106

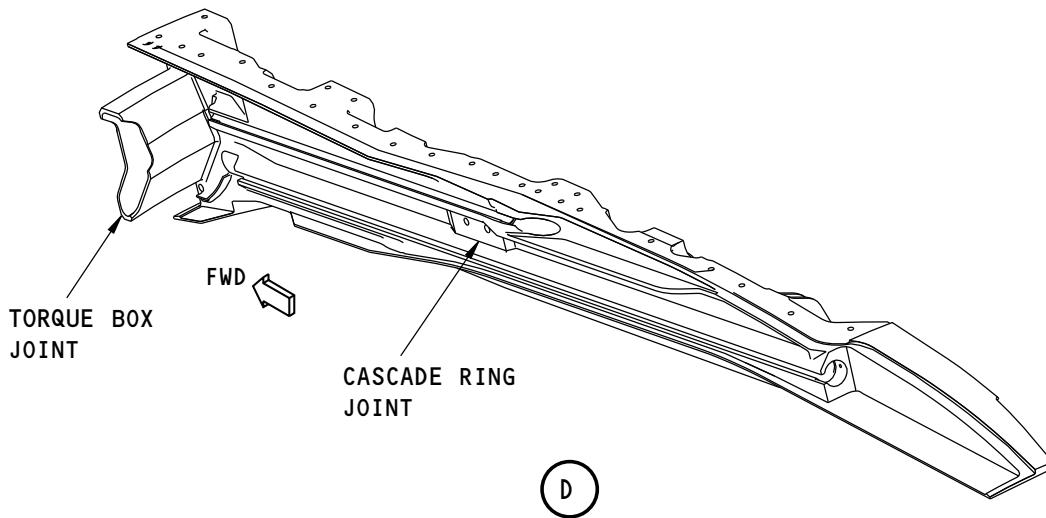
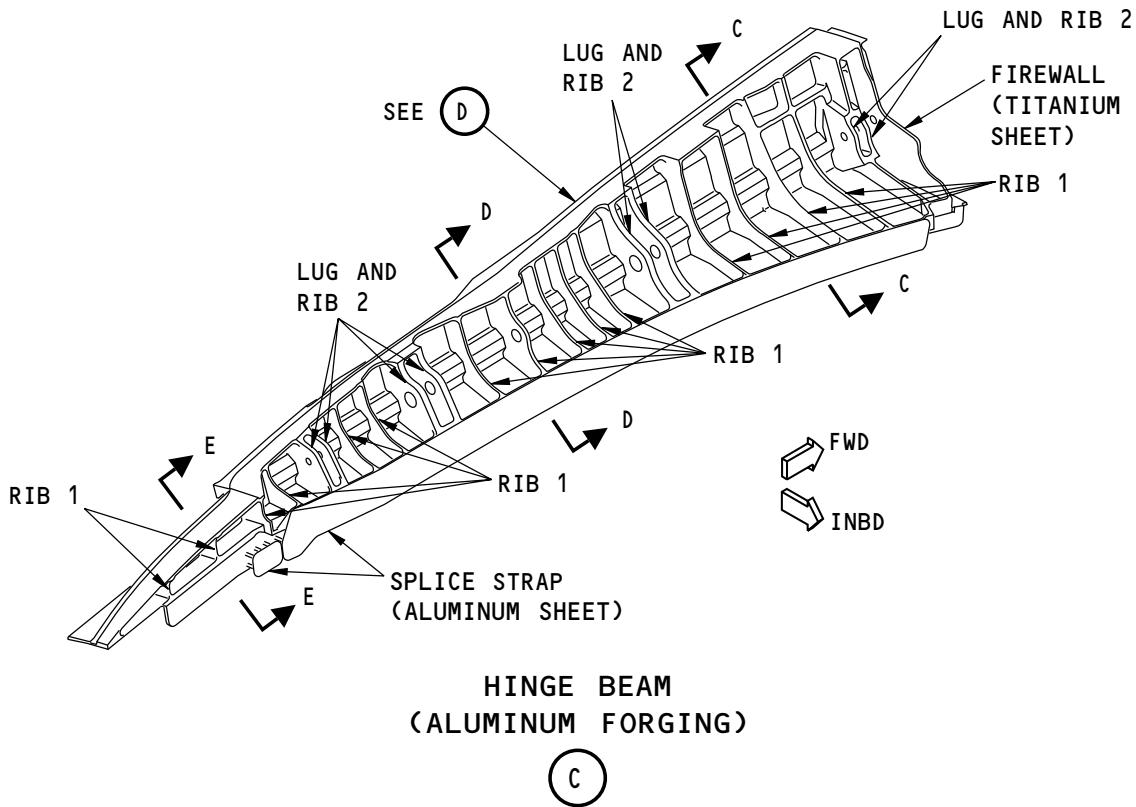
Mar 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



G43474 S0006591986_V2

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 6 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 107

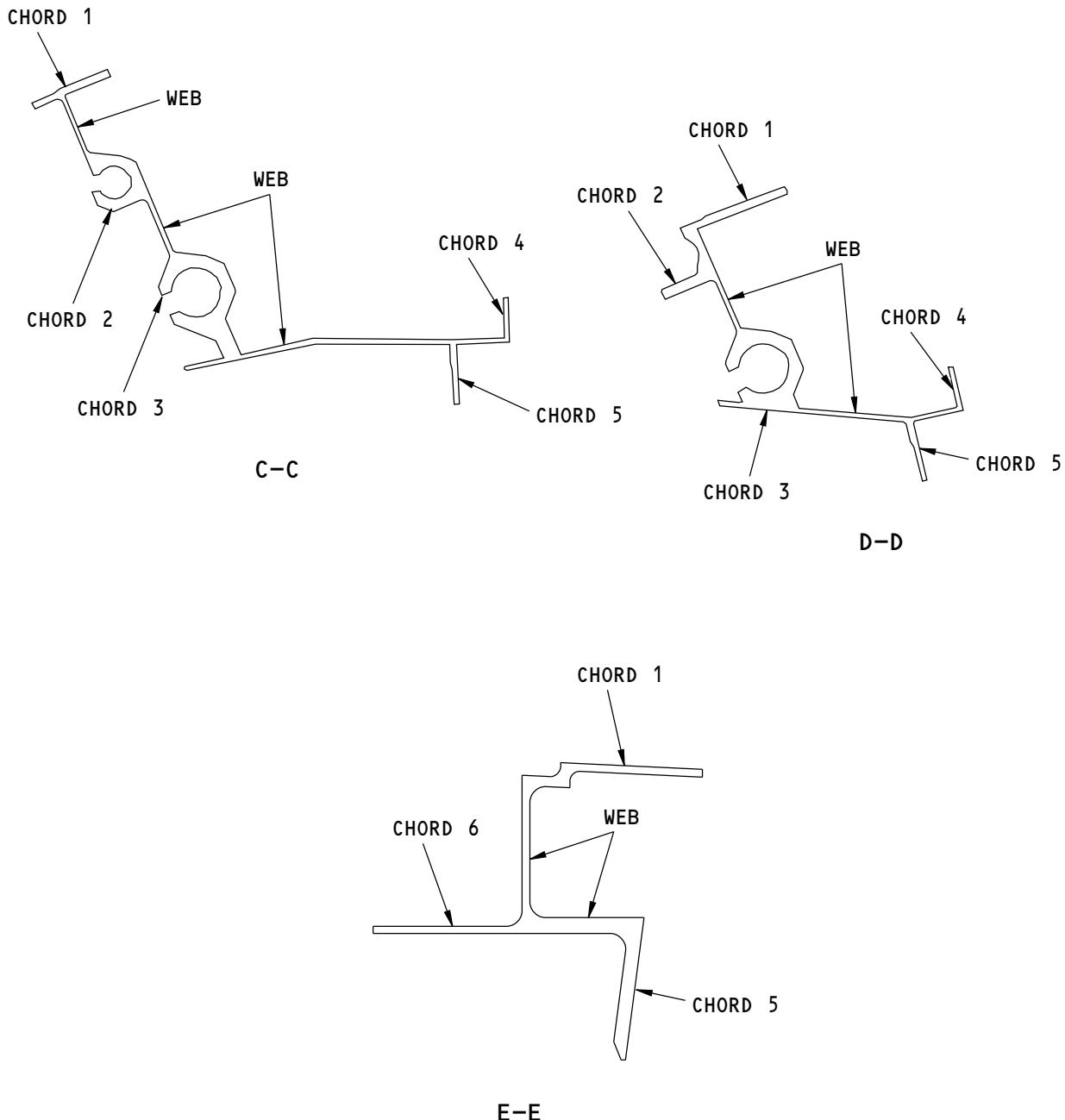
Mar 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



2469591 S0000578107_V1

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 7 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 108

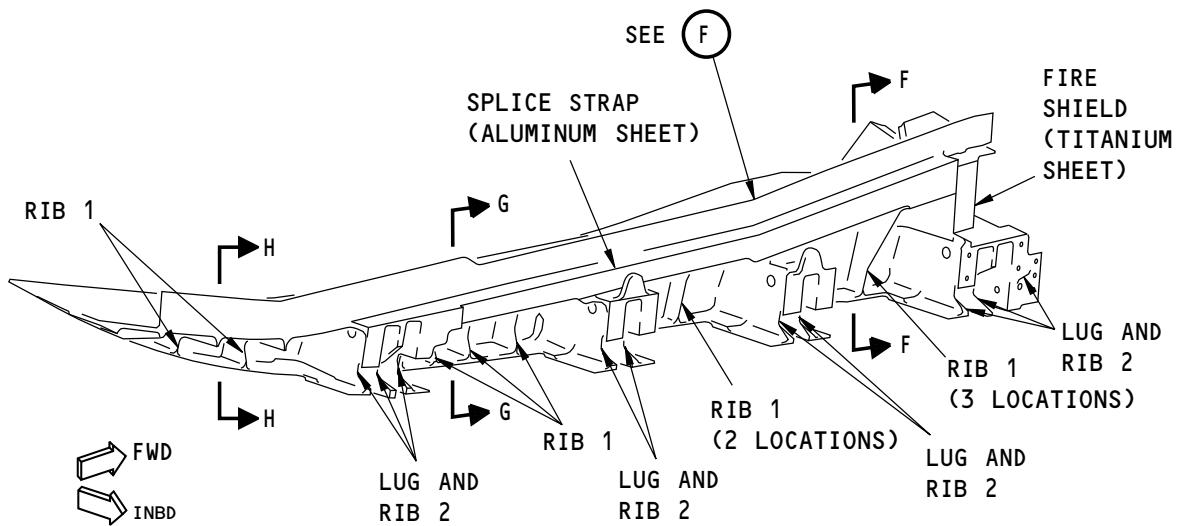
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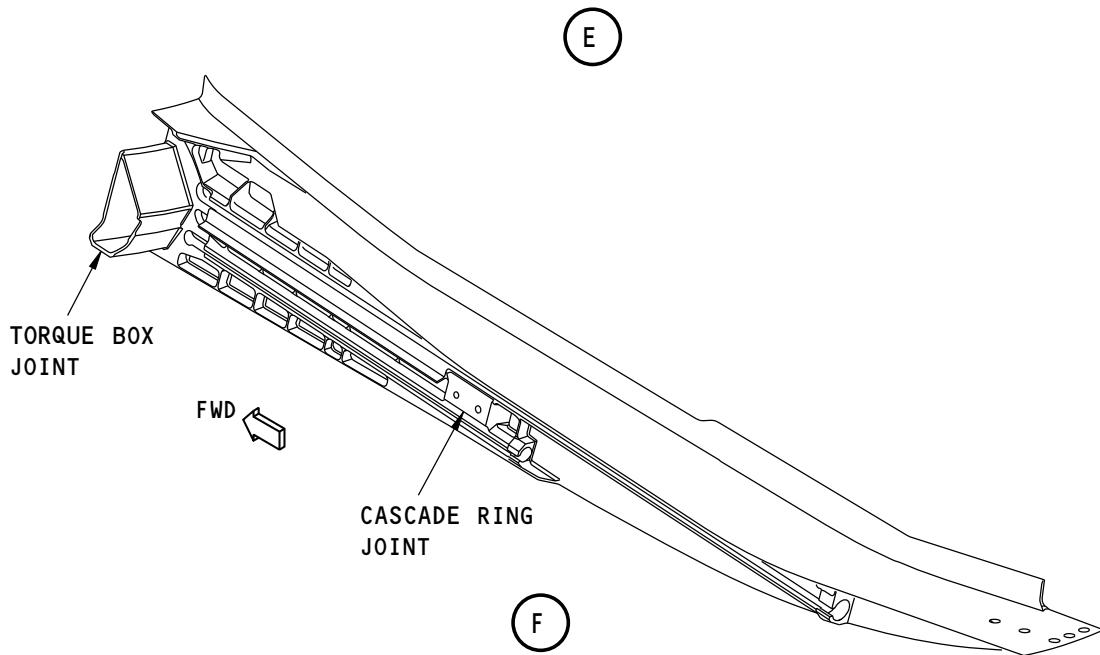
Mar 10/2016



737-800
STRUCTURAL REPAIR MANUAL



LATCH BEAM
(ALUMINUM FORGING)



G43476 S0006591987_V2

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 8 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 109

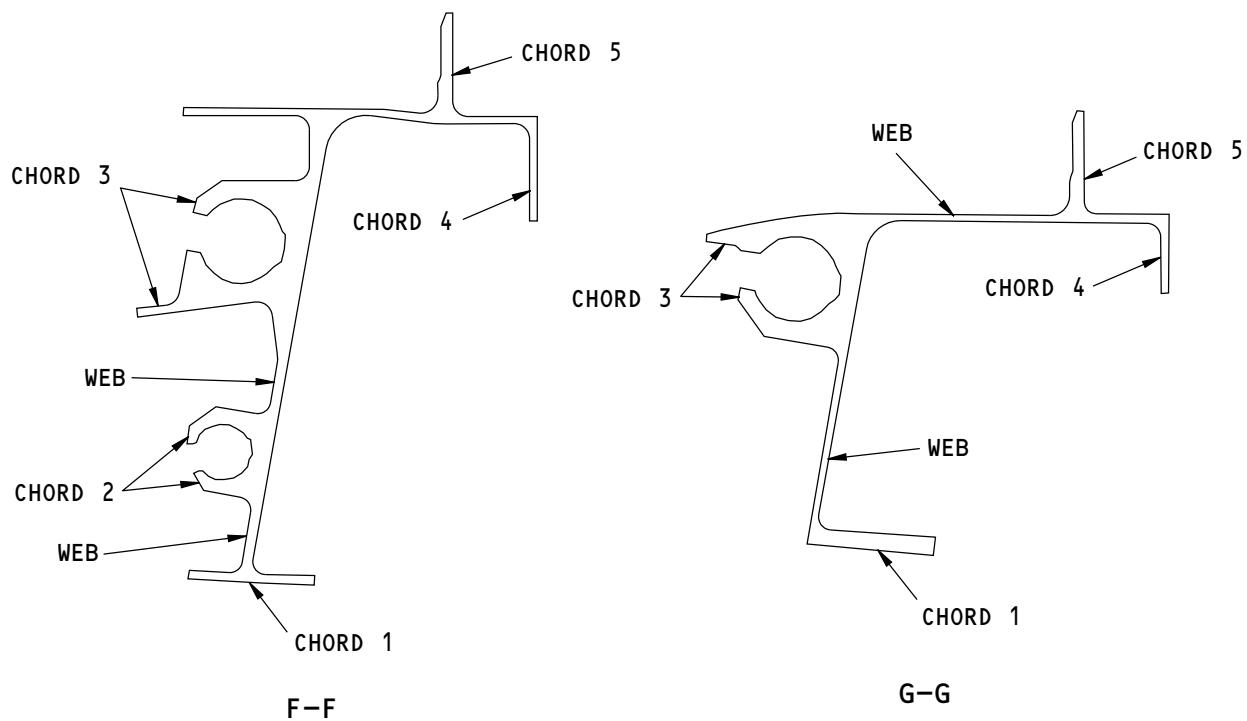
Mar 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



2469608 S0000578108_V1

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 9 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 110

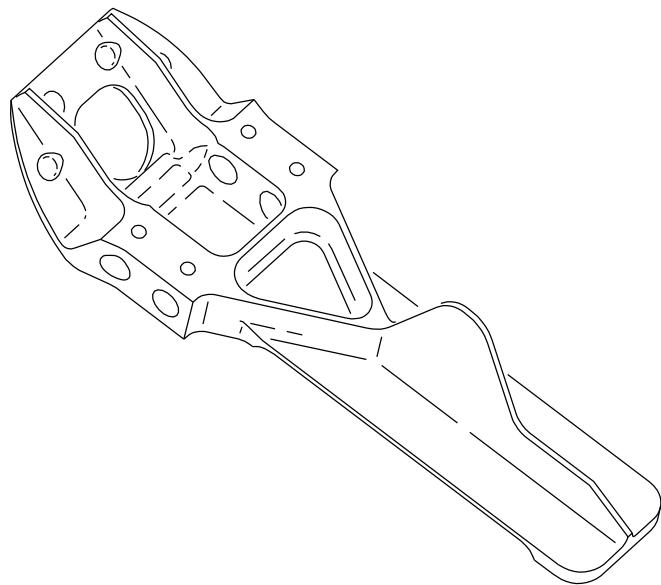
Mar 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



SENSOR MOUNT - SLEEVE STOW
(ALUMINUM FORGING)

G

2457027 S0000571950_V1

Thrust Reverser Torque Box Structure
Figure 102 (Sheet 10 of 10)

54-30-02

ALLOWABLE DAMAGE 1

Page 111

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

2. General

A. Do the steps that follow if you have damage to the metal parts.

- (1) Remove the damaged material as necessary.

WARNING: SMALL PARTICLES 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 (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

- (a) Refer to SOPM 20-10-07 when you work with titanium.
 - (b) Refer to 51-10-02 for the removal procedures.
 - (c) Refer to 51-30-03 for possible sources of nonmetallic materials you can use to remove the damage.
 - (d) Refer to 51-30-05 for possible sources of equipment you can use to remove the damage.
 - (e) Refer to Allowable Damage Limits - Metallic Structure, Figure 104/ALLOWABLE DAMAGE 1 for the references for the allowable damage limits.
- (2) After you remove the damage, do as follows:
 - (a) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.
 - (b) Apply the finishes to the aluminum parts as follows: (Refer to SOPM 20-41-02)
 - 1) Apply two layers of BMS 10-11, Type I primer to the bare surfaces of:
 - a) V-Blade Support Fittings
 - b) Thrust Reverser Opening Actuator Attachment Fittings
 - 2) Apply one layer of BMS 10-11, Type I primer to the bare surfaces of:
 - a) Torque Box Actuator Attach Fittings
 - b) Aft Web Cutout Doublers
 - c) Hinge Beam Forward Firewall
 - 3) Apply one layer of BMS 10-11, Type I primer and one layer of BMS 10-11, Type II enamel to the bare surfaces of:
 - a) Hinge Beam Splice Plates
 - b) Latch Beam Fire Shields
 - 4) Apply one layer of BMS 10-79, Type III primer to the bare surfaces of:
 - a) Hinge Beam
 - b) Latch Beam
- B. Do the steps that follow if you have damage to bullnose fairing made of Carbon Fiber Reinforced Plastic (CFRP).
- (1) Seal the damage that is not more than one ply in depth and that agrees with the allowable damage limits in Paragraph 4./ALLOWABLE DAMAGE 1
 - (a) Make a temporary seal.
 - 1) Apply aluminum foil tape (speed tape) to the damaged area.
 - 2) Keep a record of the location.

54-30-02

ALLOWABLE DAMAGE 1

Page 112

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 3) Make sure the tape is in satisfactory condition at each 400 flight hour interval or 2 months, whichever comes first, or more frequently.
- 4) Make a permanent seal no later than 5000 flight hours or 18 months, whichever comes first.
 - (b) Make a permanent seal.
 - 1) Apply BMS 8-207 or BMS 8-301 epoxy resin to the damaged area as given in SRM 51-70-08 .
 - 2) Apply one layer of BMS 10-79, Type III, or BMS 10-103, Type I primer on the aerodynamic surfaces of the bullnose fairing.

Table 101:

ALLOWABLE DAMAGE LIMITS PARAGRAPH REFERENCE	
COMPONENT	PARAGRAPH
Chords, Frames, V-Blade Ring, Cascade Support Ring, and Stow Sensor Mount Fitting	4.A
Webs	4.B
Hinge Beam, Latch Beam, and Splice Plate/Strap	4.C
Bullnose Fairing	4.D
Fire Wall/Shield	4.E

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
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
SOPM 20-10-07	Machining of Titanium
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. Frames, V-Blade Ring, Cascade Support Ring, and Stow Sensor Mount Fitting

- (1) Frames and Stow Sensor Mount Fitting
 - (a) Cracks (edge cracks only):
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, G, and H
 - (b) Nicks, Scratches, Gouges, and Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, E, F, G, and H.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (2) V-Blade Ring
 - (a) Cracks (edge cracks only):

54-30-02

ALLOWABLE DAMAGE 1

Page 113

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, G, and H. Cracks are not permitted in Zone 2. Refer to Figure 103/ALLOWABLE DAMAGE 1, Detail A.
 - (b) Nicks, Scratches, Gouges, and Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, E, F, G, and H. Nicks, gouges, scratches, and corrosion are not permitted in Zone 2. Refer to Figure 103/ALLOWABLE DAMAGE 1, Detail A.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (3) Cascade Support Ring
 - (a) Cracks (edge cracks only):
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, G, and H.
 - (b) Nicks, Scratches, Gouges, and Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, E, F, G, and H.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- B. Webs and Doublers
- (1) Forward Web and Outer Web
 - (a) Cracks are not permitted.
 - (b) Nicks, Scratches, and Gouges (non-edge damage only):
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, and H.
 - (c) Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail F.
 - (d) Dents (non-edge dents only) are permitted as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail D if:
 - 1) The damage is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - 2) The edge of the damage is a minimum of 1.00 in. (25.4 mm) away from a fastener hole or the edge of the part.
 - (e) Holes and punctures are permitted if:
 - 1) The damage is removed to a maximum diameter of 0.25 in. (6.35 mm).
 - 2) The damage is a minimum of 1.00 in. (25.4 mm) away from a fastener hole or the edge of the part.
 - 3) The damage is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - 4) You install a cadmium plated monel 400 rivet wet with BMS 5-63 sealant.
 - (2) Aft Web and Doublers
 - (a) Cracks (edge cracks only):
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, and H.

54-30-02

ALLOWABLE DAMAGE 1

Page 114

D634A210

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Mar 10/2016



737-800
STRUCTURAL REPAIR MANUAL

- 2) Cracks in Zone 1 are not permitted. Refer to Figure 103/ALLOWABLE DAMAGE 1, Detail B.
- (b) Nicks, Scratches, Gouges, and Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, F, and H.
 - 2) Surface nicks, gouges, scratches, and corrosion in Zone 2 of the Aft Web are not permitted. Refer to Figure 103/ALLOWABLE DAMAGE 1, Detail B.
- (c) Dents
 - 1) Dents are permitted as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail D.
 - 2) Dents are permitted if the dent is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - 3) Dents are not permitted in Zone 1. Refer to Figure 103/ALLOWABLE DAMAGE 1, Detail B.
- (d) Holes and Punctures are permitted if:
 - 1) The damage is removed to a maximum diameter of 0.25 in. (6.35 mm).
 - 2) The damage is a minimum of 1.00 in. (25.4 mm) away from a fastener hole or the edge of the part.
 - 3) The damage is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - 4) You install a 2117-T3 aluminum alloy rivet or 2117-T4 aluminum alloy rivet wet with BMS 5-63 sealant.

C. Hinge Beam, Latch Beam, and Splice Plate/Strap

(1) Hinge Beam and Latch Beam

NOTE: Refer to Table 102/ALLOWABLE DAMAGE 1 for locations where damage is not permitted.

Table 102: Hinge and Latch Beam Non-Permitted Damage Locations

Location	Hinge Beam	Latch Beam
Chords	Surface damage is not permitted on Chord 5 between NAC STA 215.5 to NAC STA 228.0 and NAC STA 252.5 to NAC STA 259.5.	No damage is permitted on Chord 3 lower (main slider track) between NAC STA 244 to NAC STA 255. No damage is permitted on Chord 4 and Chord 5.
Torque Box Joint	No damage is permitted.	No damage is permitted.
Ribs 1 (Intermediate ribs – Non Lug locations)	No damage is permitted.	No damage is permitted.

(a) Chords

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

(b) Lugs

54-30-02

ALLOWABLE DAMAGE 1

Page 115

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 1) Cracks (edge cracks only):
 - a) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail I.
 - 2) Nicks, Gouges, Scratches, and Corrosion:
 - a) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details C and J.
 - b) Dents are not permitted.
 - c) Holes and Punctures are not permitted.
 - (c) Ribs and Webs
 - 1) Cracks (edge cracks only):
 - a) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, and H.
 - 2) Nicks, Gouges, Scratches, and Corrosion:
 - a) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details, A, B, C, G, and H.
 - 3) Dents are not permitted.
 - 4) Holes and Punctures only in the webs are permitted if:
 - a) You remove the damage to a maximum diameter of 0.25 in. (6.35 mm).
 - b) The damage is a minimum of 1.00 in. (25.4 mm) away from a fastener hole or the edge of the part.
 - c) The damage is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - d) You install a 2117-T3 aluminum alloy rivet or 2117-T4 aluminum alloy rivet wet with BMS 5-63 sealant.
 - (2) Splice Plate/Strap
 - (a) Cracks (edge cracks only):
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, G, and H.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, E, F, G, and H.
 - 2) Corrosion is not permitted on the latch beam splice plate.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- D. Bullnose Fairing
- NOTE:** Refer to Figure 105/ALLOWABLE DAMAGE 1, Details A , B , and C for the definitions of the length, width, and diameter of damage.
- (1) Nicks, Gouges, and Scratches that do not cause damage to the fibers are permitted.
 - (2) Nicks, Gouges, and Scratches that do cause damage to the 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 3.0 inches (76.2 mm) in length.

54-30-02

ALLOWABLE DAMAGE 1

Page 116

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (c) A maximum of 0.25 inch (6.4 mm) in width.
 - (d) A minimum of 3.0 inches (76.2 mm) away from other damage.
- (3) Dents are permitted if:
- NOTE:** Dents usually cause fiber damage or a delamination which may not be apparent with the use of visual or tap test examination procedures.
- (a) Dents are permitted as shown in Figure 106/ALLOWABLE DAMAGE 1, Detail C.
 - (b) If the fibers are damaged, use the limits for a hole and do the steps that follow:
 - 1) Remove the moisture from the damaged area.
 - 2) Apply sealing resin to the damaged area as given in 51-70-04.
 - 3) Apply aluminum foil tape to the damaged area.
 - 4) Keep a record of the location of the damage.
 - 5) Do an inspection of the aluminum foil tape every 10 flight cycles or daily, or more frequently. Replace the aluminum foil tape if there is deterioration.
 - 6) Make a permanent repair of the damage:
 - a) If the panel shows deterioration.
 - b) Before 400 flight cycles occurs or 2 months, whichever comes first, after the application of the aluminum foil tape.
 - (c) If the fibers are not damaged, do the steps that follow:
 - 1) Apply aluminum foil tape to the damaged area.
 - 2) Keep a record of the location of the damage.
 - 3) Do an inspection of the aluminum foil tape every 400 flight cycles or 2 months, whichever comes first, or more frequently. Replace the aluminum foil tape if there is deterioration.
 - 4) Make a permanent repair of the damage:
 - a) If the panel shows deterioration.
 - b) Before 5000 flight cycles occurs or 18 months, whichever comes first, after the application of the aluminum foil tape.
- (4) Holes and Punctures are not permitted.
- (5) Delaminations are permitted if:
- (a) They are a maximum of 0.25 inch (6.35 mm) in diameter
 - (b) They are a minimum of 1.0 inch (25.4 mm) away from a hole or the edge of the material
 - (c) They are a minimum of 3.0 inches (76.2 mm) away from other damage.
- (6) Edge Damage
- (a) Edge damage is permitted as shown in Allowable Damage Limits - Composite Structure, Figure 106/ALLOWABLE DAMAGE 1, Detail A if it is:
 - 1) A maximum of 0.10 inch (2.54 mm) in depth.
 - 2) A maximum of 0.25 inch (6.35 mm) in width.
- (7) Edge Erosion is permitted as shown in Allowable Damage Limits - Composite Structure, Figure 106/ALLOWABLE DAMAGE 1, Detail B .

E. Fire Wall/Shield

- (1) V-Blade Fire Shield

54-30-02

ALLOWABLE DAMAGE 1

Page 117

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Cracks are not permitted.
- (b) Nicks, Gouges, Scratches, and Corrosion are not permitted.
- (c) Dents are not permitted.
- (d) Holes and Punctures are not permitted.
- (2) Hinge Beam and Latch Beam Fire Wall/Shield
 - (a) Cracks are not permitted.
 - (b) Nicks, Scratches, and Gouges (non-edge damage only):
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details, A, B, C, and H.
 - (c) Corrosion:
 - 1) Remove the damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail F.
 - (d) Dents (non-edge dents only) are permitted as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail D if:
 - 1) The damage is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - 2) The edge of the damage is a minimum of 1.00 in. (25.4 mm) away from a fastener hole or the edge of the part.
 - (e) Holes and Punctures are permitted if:
 - 1) You remove the damage to a maximum diameter of 0.25 in. (6.35 mm).
 - 2) The damage is a minimum of 1.00 in. (25.4 mm) away from a fastener hole or the edge of the part.
 - 3) The damage is a minimum of 6.00 in. (152.4 mm) away from other damage.
 - 4) You install a monel 400 rivet wet with BMS 5-63 sealant.

54-30-02

ALLOWABLE DAMAGE 1

Page 118

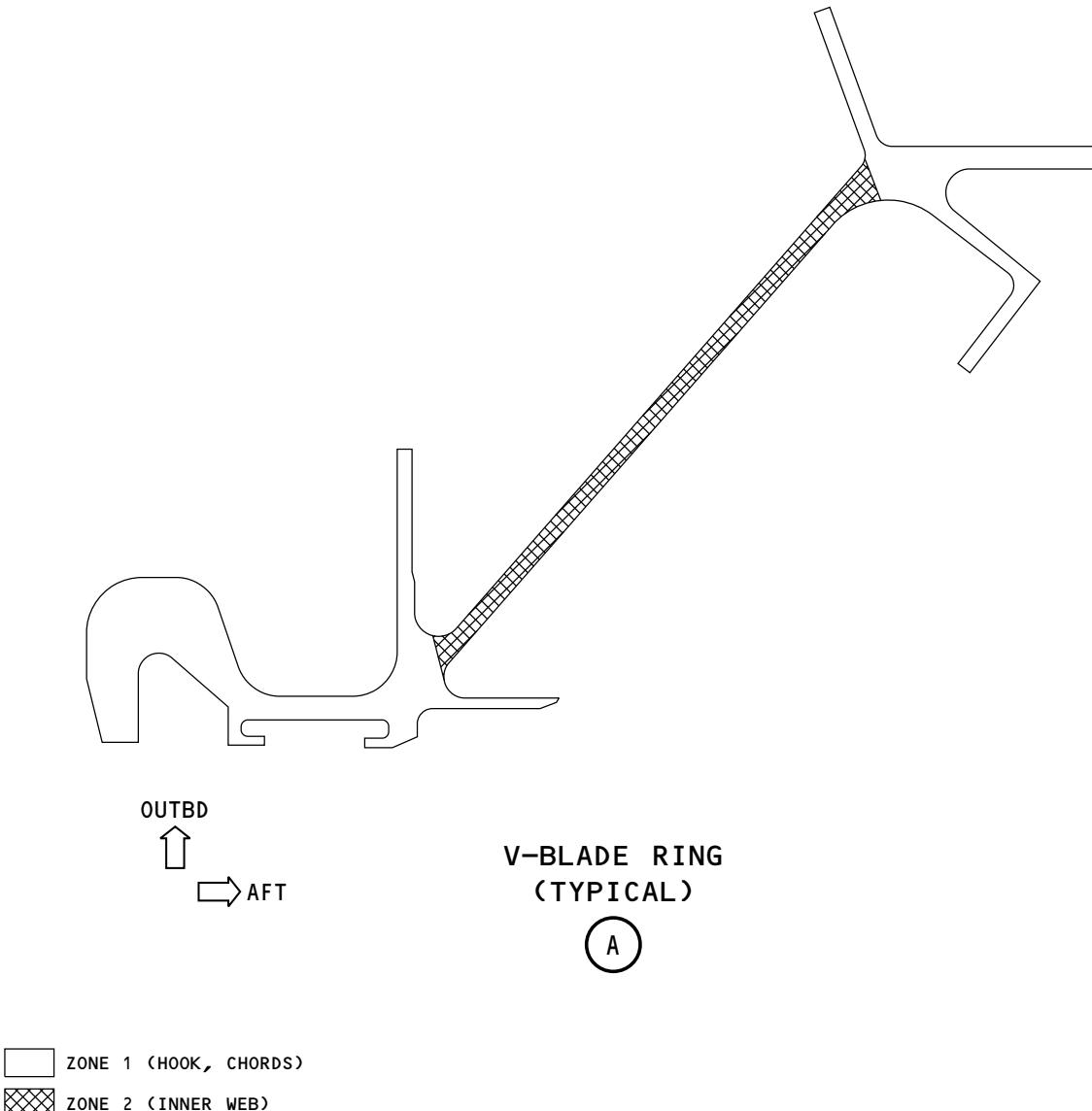
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737-800
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2457038 S0000571951_V1

Allowable Damage Limits - Definition of Zones
Figure 103 (Sheet 1 of 2)

54-30-02

ALLOWABLE DAMAGE 1

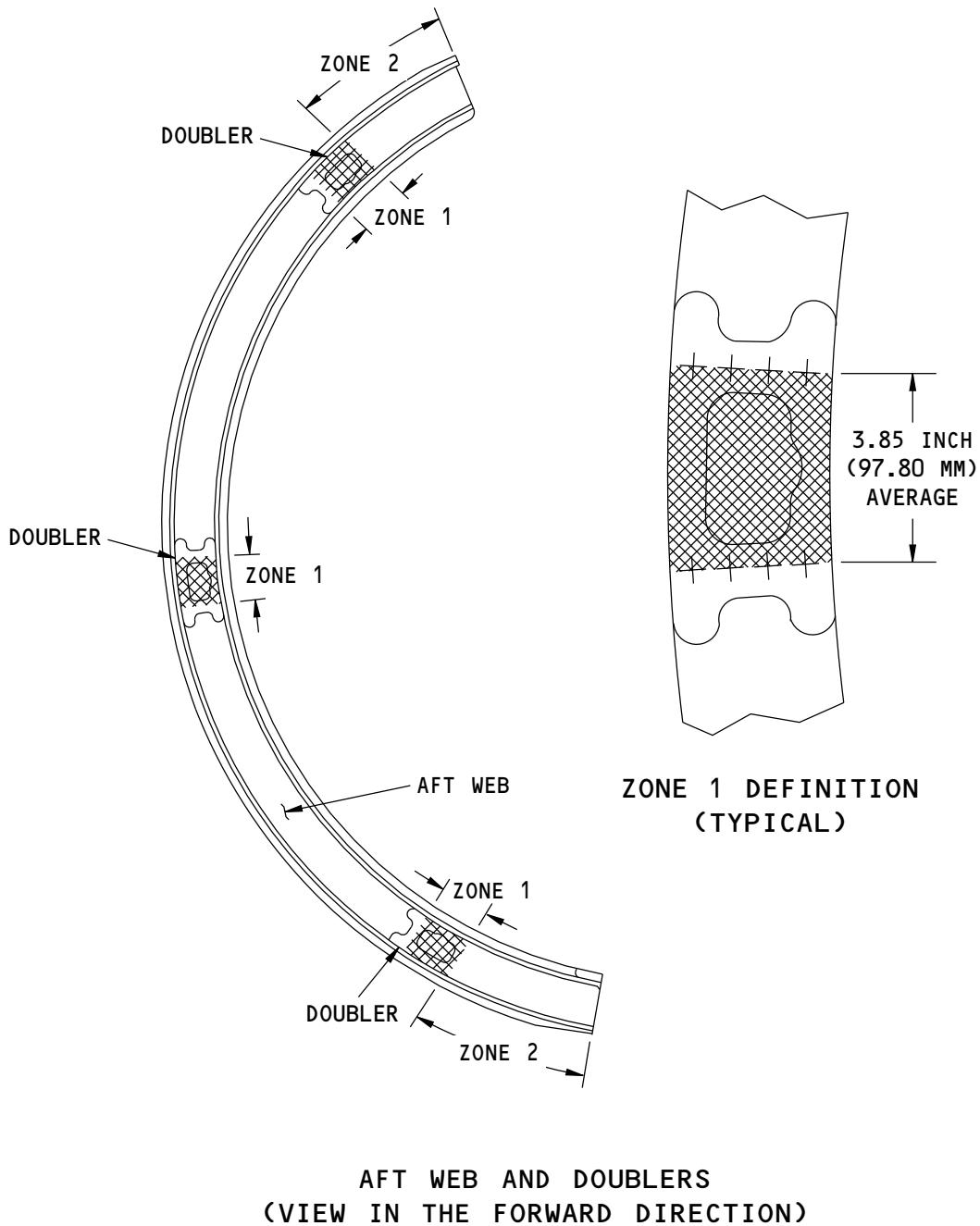
Page 119

D634A210

Mar 10/2016



737-800
STRUCTURAL REPAIR MANUAL



2457031 S0000571952_V1

Allowable Damage Limits - Definition of Zones
Figure 103 (Sheet 2 of 2)

54-30-02

ALLOWABLE DAMAGE 1

Page 120

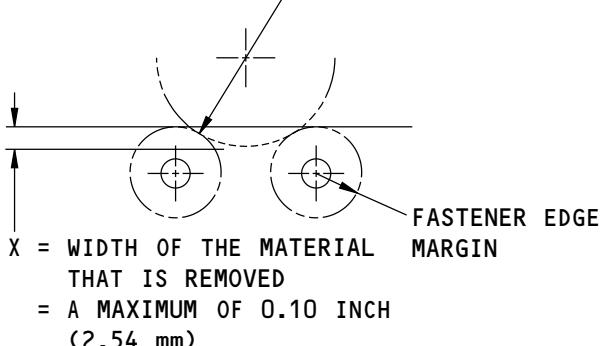
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**737-800
STRUCTURAL REPAIR MANUAL**

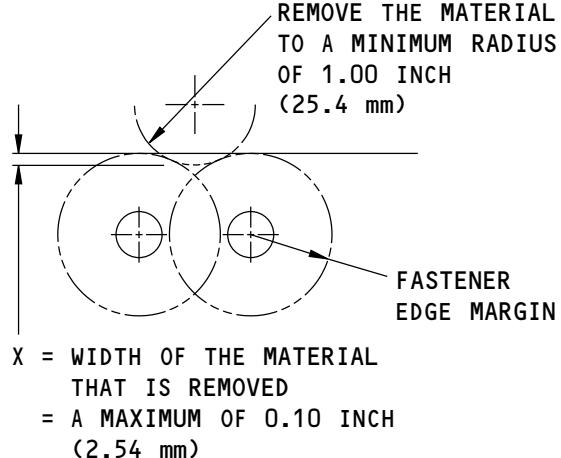
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm)



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

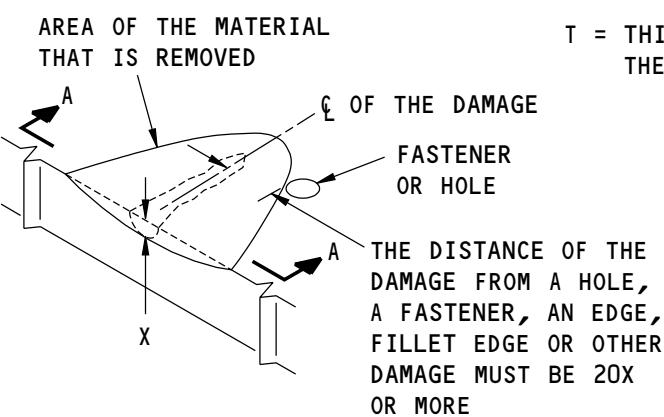
(A)

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

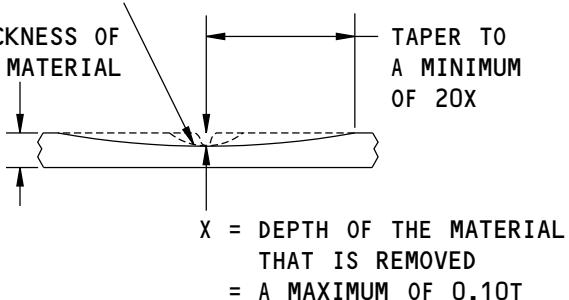
(B)



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

(C)

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.4 mm), THEN TAPER AS SHOWN



A-A

G41636 S0006591989_V2

Allowable Damage Limits - Metallic Structure
Figure 104 (Sheet 1 of 6)

54-30-02

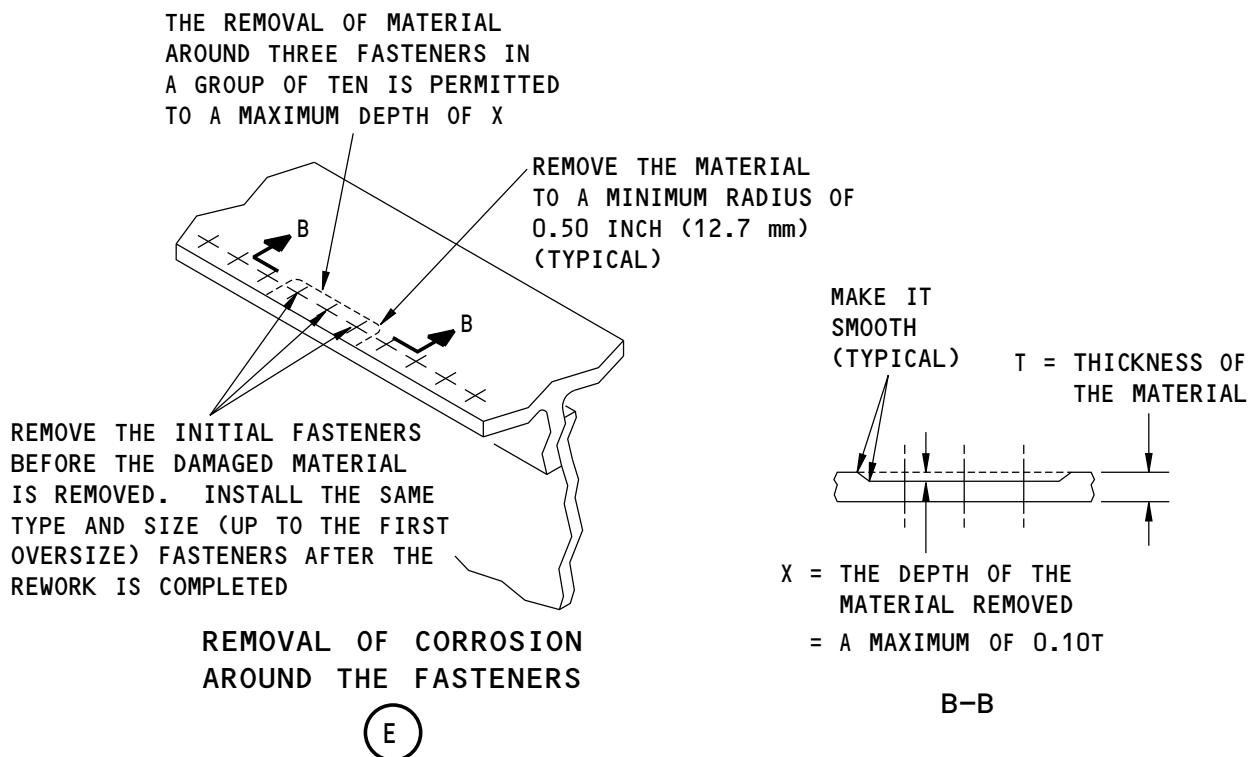
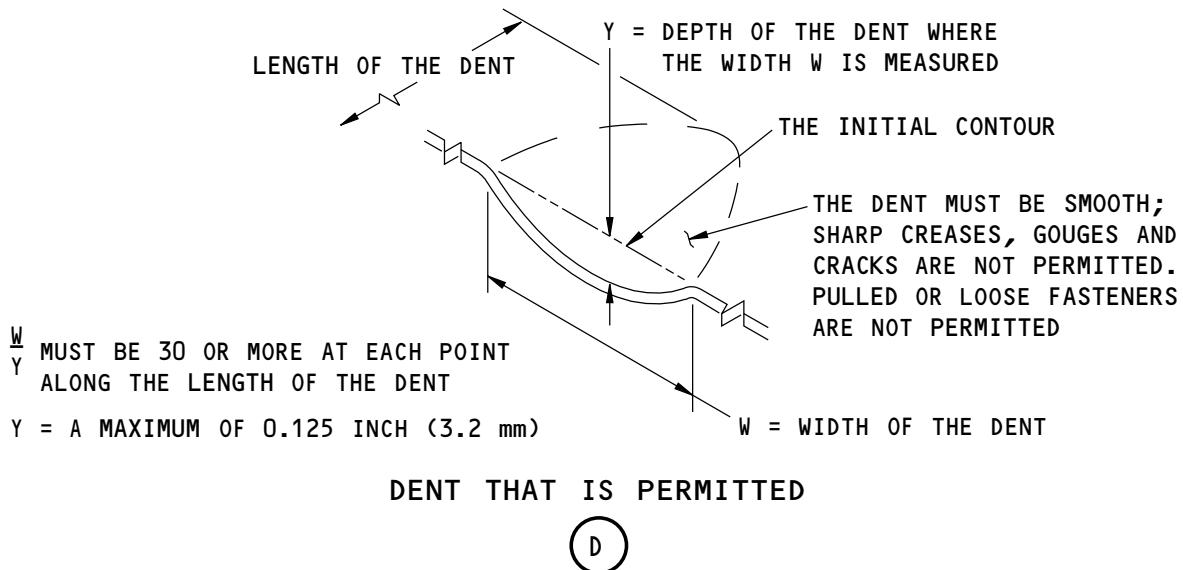
ALLOWABLE DAMAGE 1

Page 121

Mar 10/2016



737-800
STRUCTURAL REPAIR MANUAL



G41643 S0006591990_V1

Allowable Damage Limits - Metallic Structure
Figure 104 (Sheet 2 of 6)

54-30-02

ALLOWABLE DAMAGE 1

Page 122

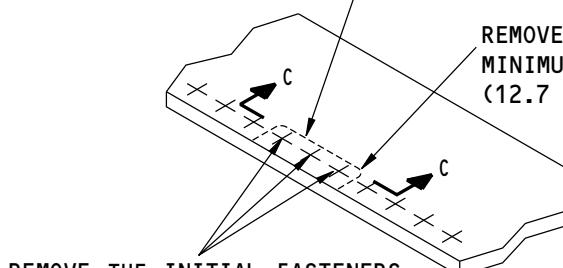
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**737-800
STRUCTURAL REPAIR MANUAL**

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



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**

(F)

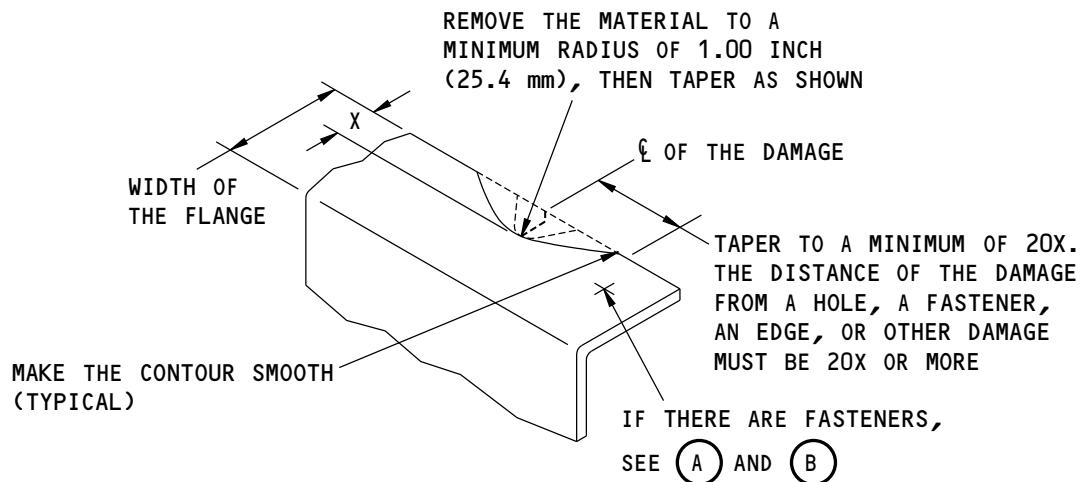
REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 0.50 INCH
(12.7 mm) (TYPICAL)

MAKE IT
SMOOTH
(TYPICAL) T = THICKNESS OF
THE MATERIAL

X = THE DEPTH OF THE
MATERIAL REMOVED

= A MAXIMUM OF 0.10T

C-C



X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE OR 0.10 INCH (2.54 mm)

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(G)

G41645 S0006591991_V1

Allowable Damage Limits - Metallic Structure
Figure 104 (Sheet 3 of 6)

54-30-02

ALLOWABLE DAMAGE 1

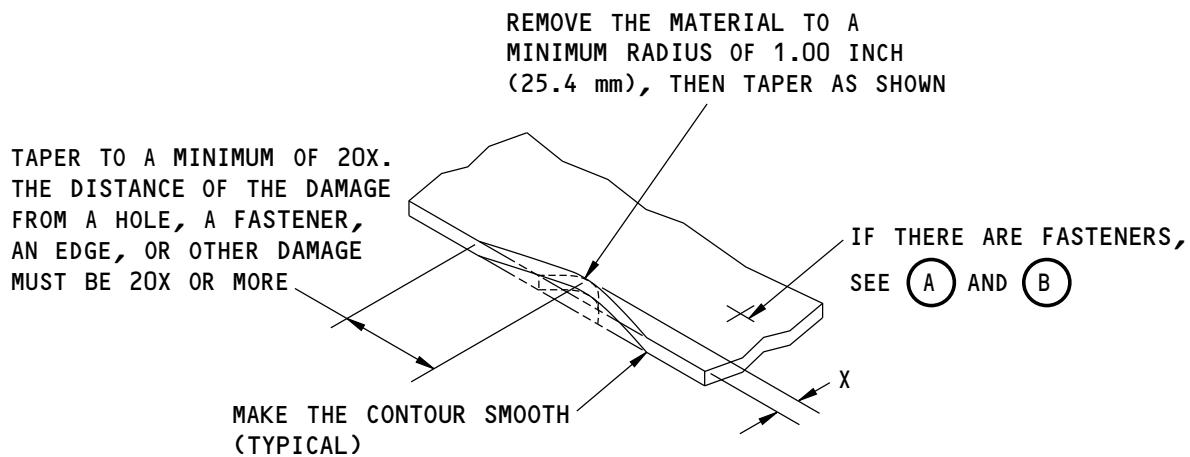
Page 123

Mar 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



X = DEPTH 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



G41649 S0006591992_V2

Allowable Damage Limits - Metallic Structure
Figure 104 (Sheet 4 of 6)

54-30-02

ALLOWABLE DAMAGE 1

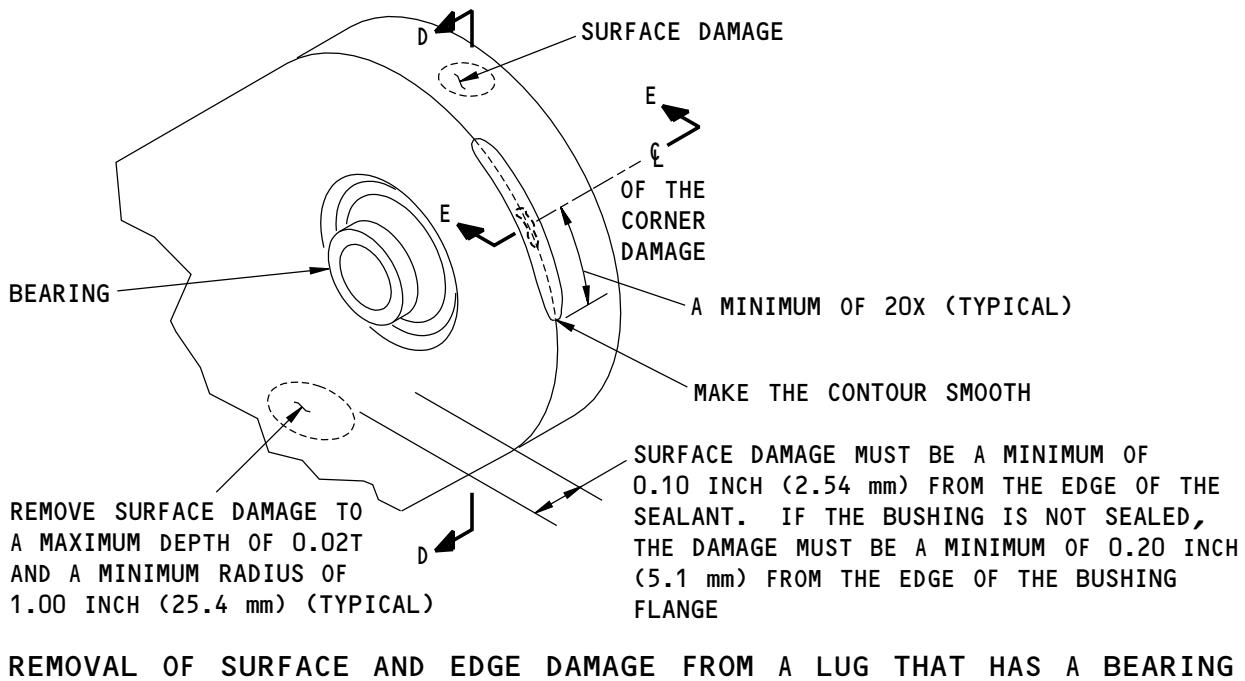
Page 124

Mar 10/2016

D634A210

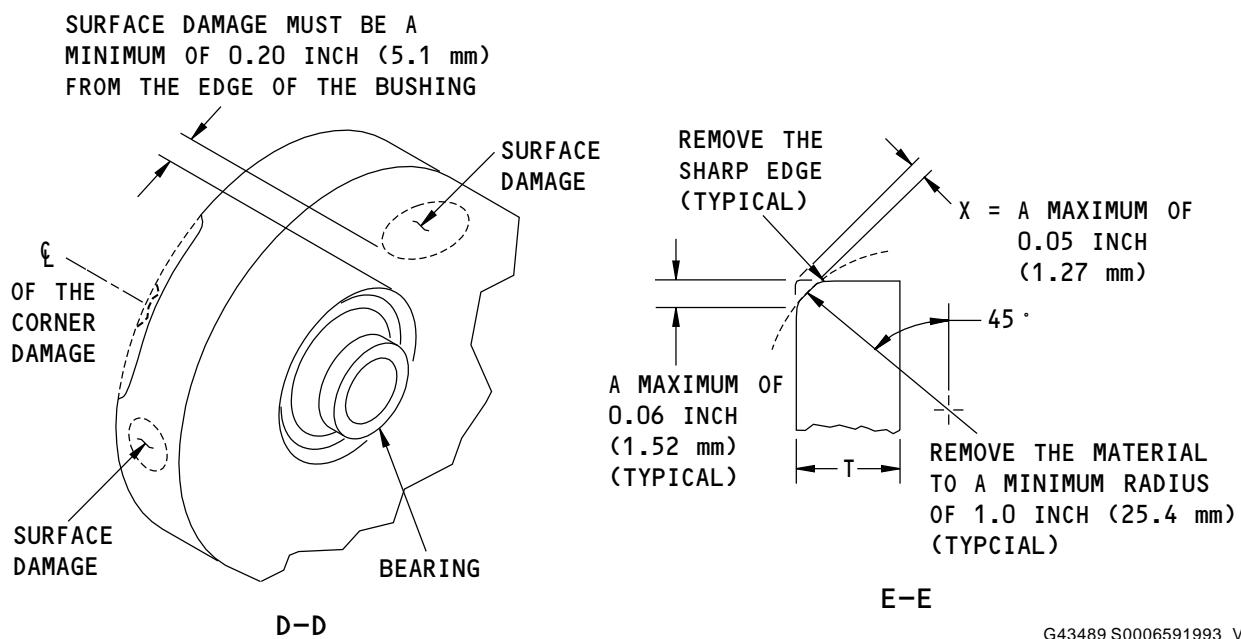
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REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BEARING

(I)



E-E

G43489 S0006591993_V2

Allowable Damage Limits - Metallic Structure
Figure 104 (Sheet 5 of 6)

54-30-02

ALLOWABLE DAMAGE 1

Page 125

Mar 10/2016

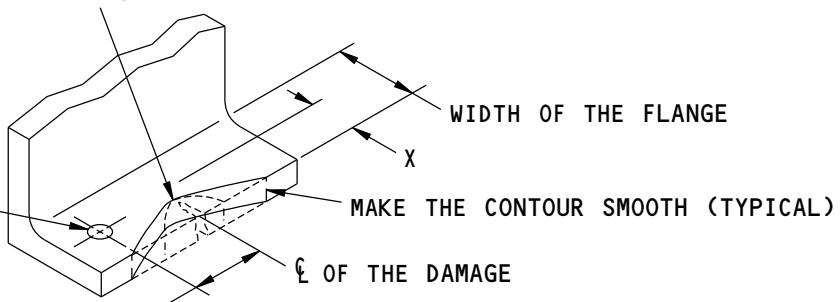
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737-800
STRUCTURAL REPAIR MANUAL

REMOVE THE MATERIAL TO A MINIMUM RADIUS
OF 1.00 INCH (25.4 mm), 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 OR 0.05 INCH (1.27 mm) THAT WHICH IS LESS

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(J)

G43494 S0006591994_V2

Allowable Damage Limits - Metallic Structure
Figure 104 (Sheet 6 of 6)

54-30-02

ALLOWABLE DAMAGE 1

Page 126

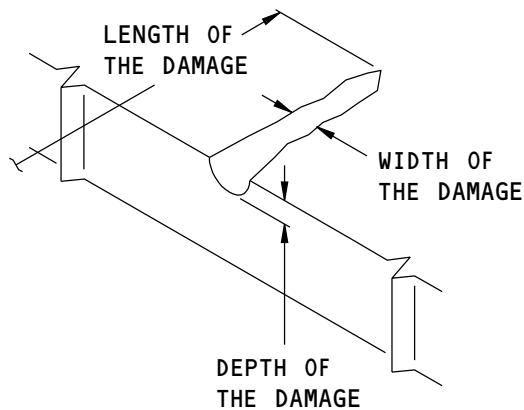
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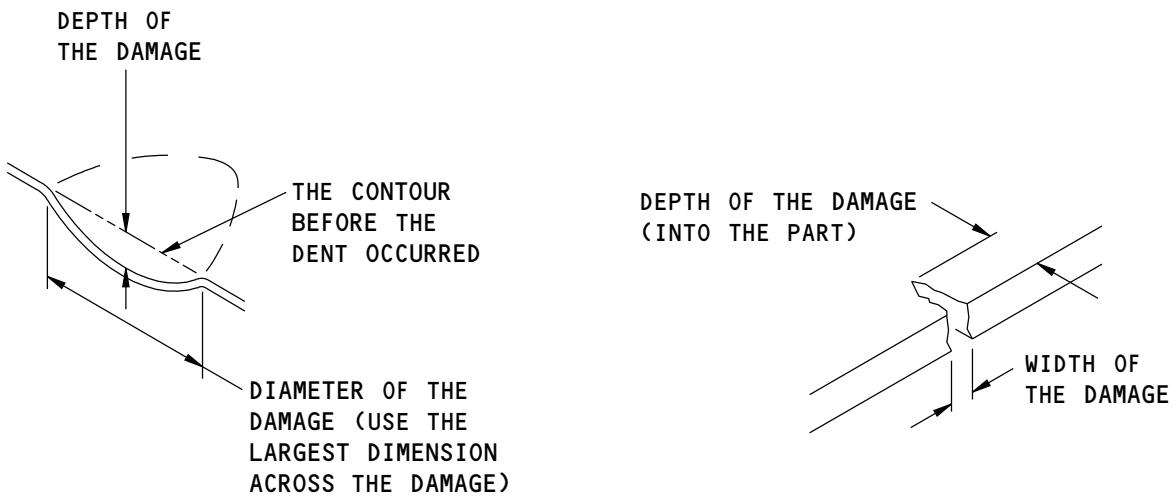


737-800
STRUCTURAL REPAIR MANUAL



SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)

SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

G55541 S0006591995_V1

Definitions of the Damage Size
Figure 105

54-30-02

ALLOWABLE DAMAGE 1

Page 127

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), TAPER AS SHOWN,
AND SEAL THE EDGE

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

MAKE THE CONTOUR SMOOTH
(TYPICAL)

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

(A)

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

REMOVAL OF DAMAGED MATERIAL ON AN EDGE OF COMPOSITE PARTS

G59014 S0006591996_V1

Allowable Damage Limits - Composite Structure
Figure 106 (Sheet 1 of 3)

54-30-02

ALLOWABLE DAMAGE 1

Page 128

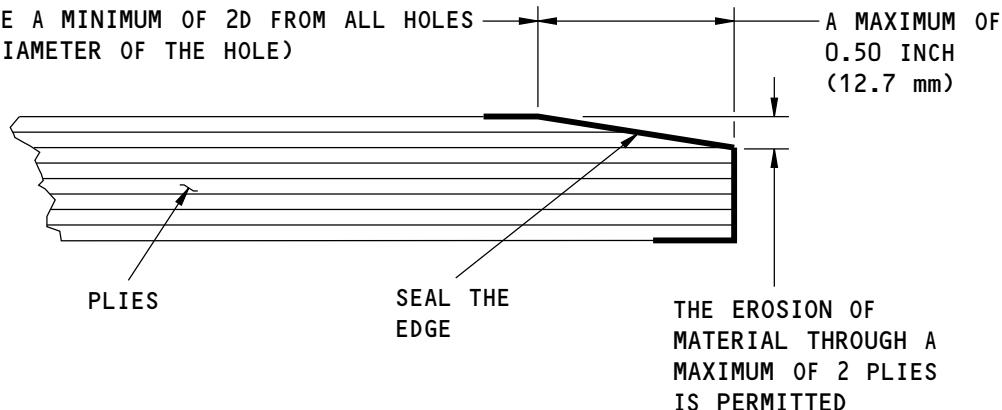
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737-800 STRUCTURAL REPAIR MANUAL

THE EDGE OF THE MATERIAL THAT HAS ERODED
MUST BE A MINIMUM OF 2D FROM ALL HOLES —
(D = DIAMETER OF THE HOLE)



REPAIR INSTRUCTIONS:

1. CLEAN THE DAMAGED AREA AS GIVEN IN SRM 51-10-02.
 2. MAKE A CHAMFER ON THE EDGE, UP TO THE MAXIMUM DIMENSIONS SHOWN, TO REMOVE THE DAMAGED MATERIAL.
 - A. DO NOT MAKE A CHAMFER THAT GOES THROUGH THE EDGE OF A COUNTERSINK AT A FASTENER LOCATION.
 - B. REMOVE ALL BURRS TO MAKE THE CONTOUR SMOOTH.
 3. SEAL THE DAMAGED AREA WITH ONE OF THE METHODS THAT FOLLOWS:
 - A. MAKE A TEMPORARY REPAIR WITH ALUMINUM FOIL TAPE (SPEED TAPE).
 - 1) KEEP A RECORD OF THE LOCATION AND DO AN INSPECTION EVERY 400 FLIGHT HOURS OR 2 MONTHS, WHICHEVER COMES FIRST, OR MORE FREQUENTLY.
 - 2) REPLACE THE TAPE IF YOU FIND DETERIORATION.
 - 3) REPAIR THE DAMAGE BEFORE 5000 FLIGHT CYCLES OCCURS OR 18 MONTHS, WHICHEVER COMES FIRST.
 4. MAKE A PERMANENT REPAIR WITH ONE OF THE ADHESIVES THAT FOLLOWS:
 - BMS 5-92, TYPE I OR TYPE III ADHESIVE. CURE BMS 5-92, TYPE I OR III ADHESIVE AT 75° (24°C) FOR 24 HOURS.
 - BMS 5-123 ADHESIVE. CURE BMS 5-123 ADHESIVE AT 75°F (24°C) FOR 1 HOUR.

REMOVAL OF EROSION AT AN EDGE

B

G86948 S0006591997 V2

Allowable Damage Limits - Composite Structure

Figure 106 (Sheet 2 of 3)

54-30-02

ALLOWABLE DAMAGE 1

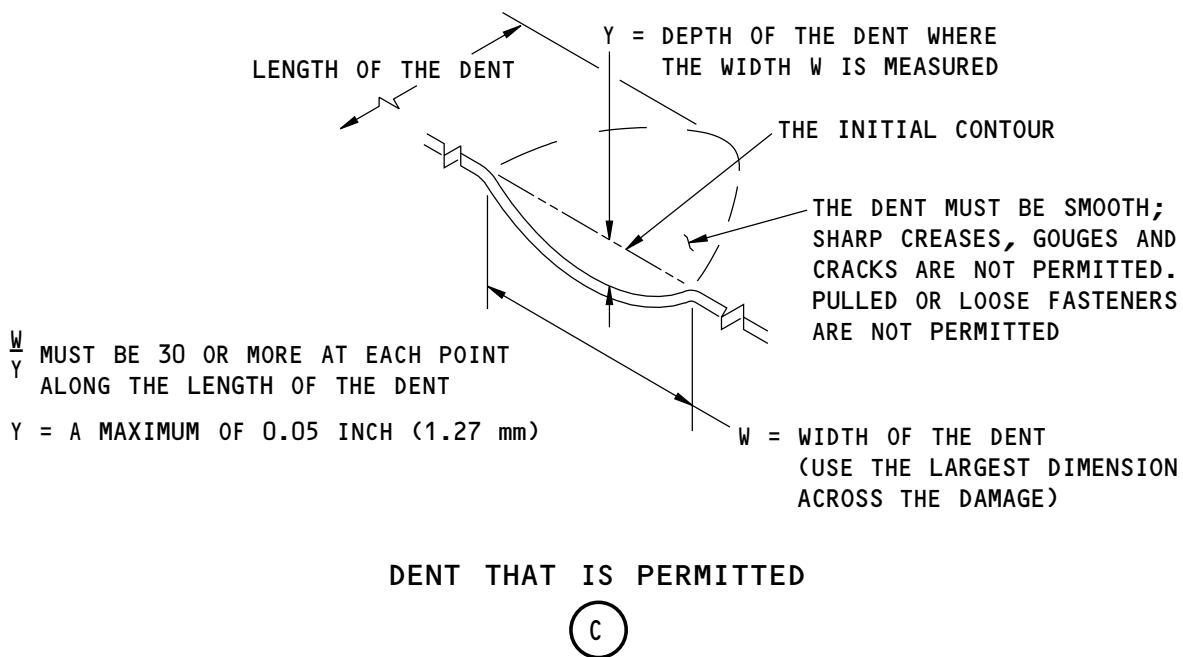
Page 129

Page 125
Mar 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



2457036 S0000571953_V1

Allowable Damage Limits - Composite Structure
Figure 106 (Sheet 3 of 3)

54-30-02

ALLOWABLE DAMAGE 1

Page 130

Mar 10/2016

D634A210

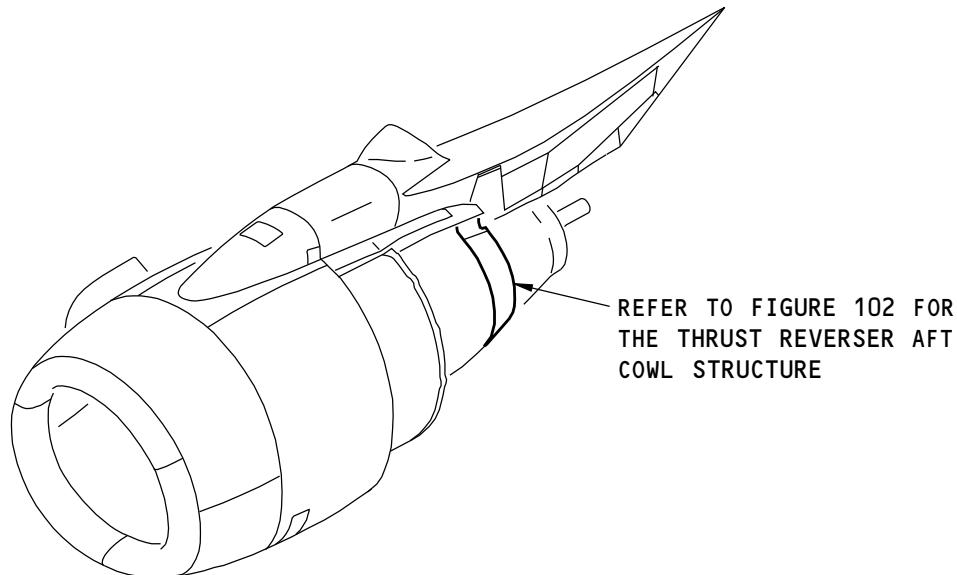


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - THRUST REVERSER AFT COWL STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the Aft Cowl structure of the Thrust Reverser shown in Thrust Reverser Aft Cowl Structure Location, Figure 101/ALLOWABLE DAMAGE 2.



G41665 S0006591999_V1

Thrust Reverser Aft Cowl Structure Location
Figure 101

54-30-02

ALLOWABLE DAMAGE 2

Page 101

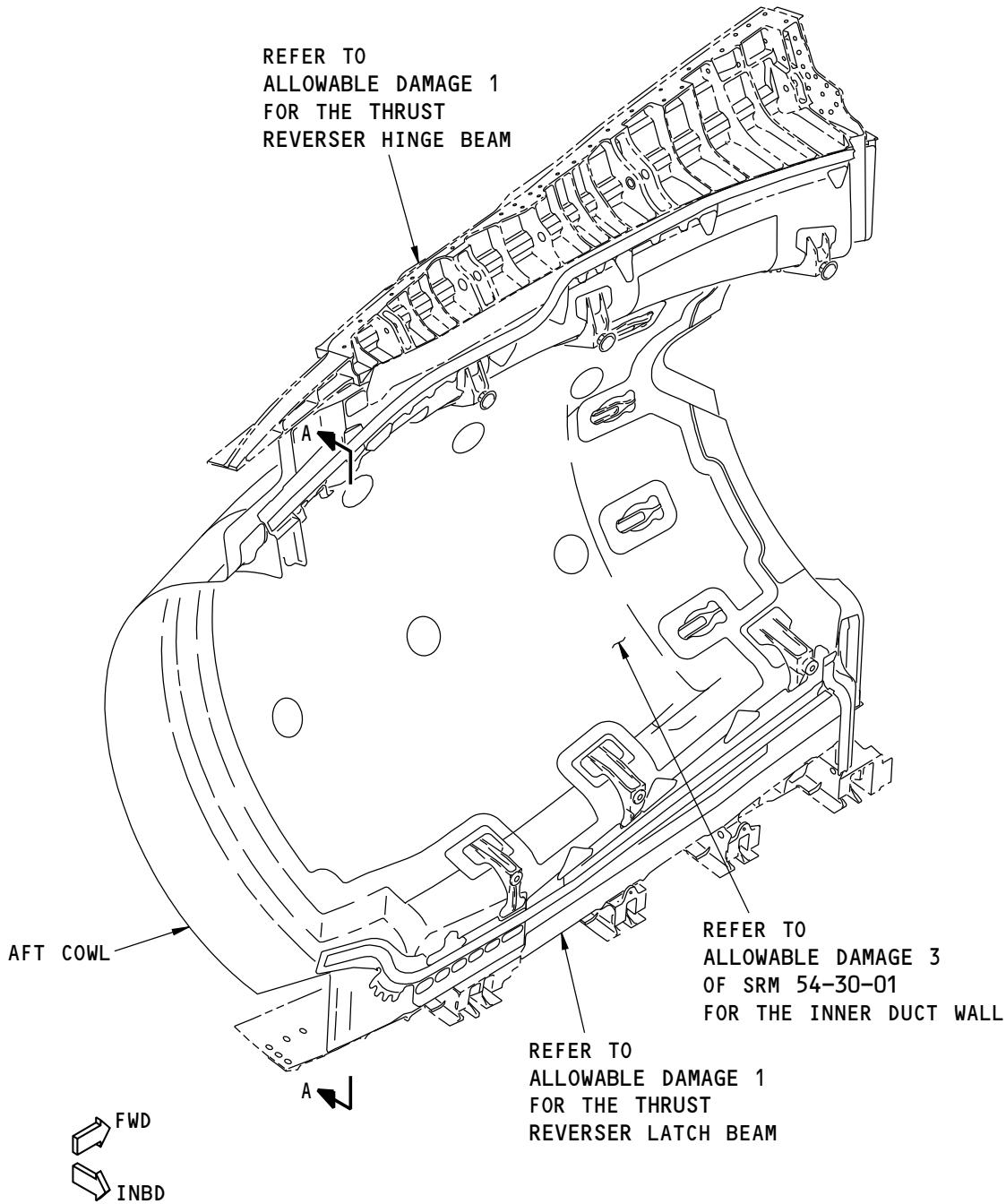
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737-800
STRUCTURAL REPAIR MANUAL



G41819 S0006592000_V1

Thrust Reverser Aft Cowl Structure
Figure 102 (Sheet 1 of 2)

54-30-02

ALLOWABLE DAMAGE 2

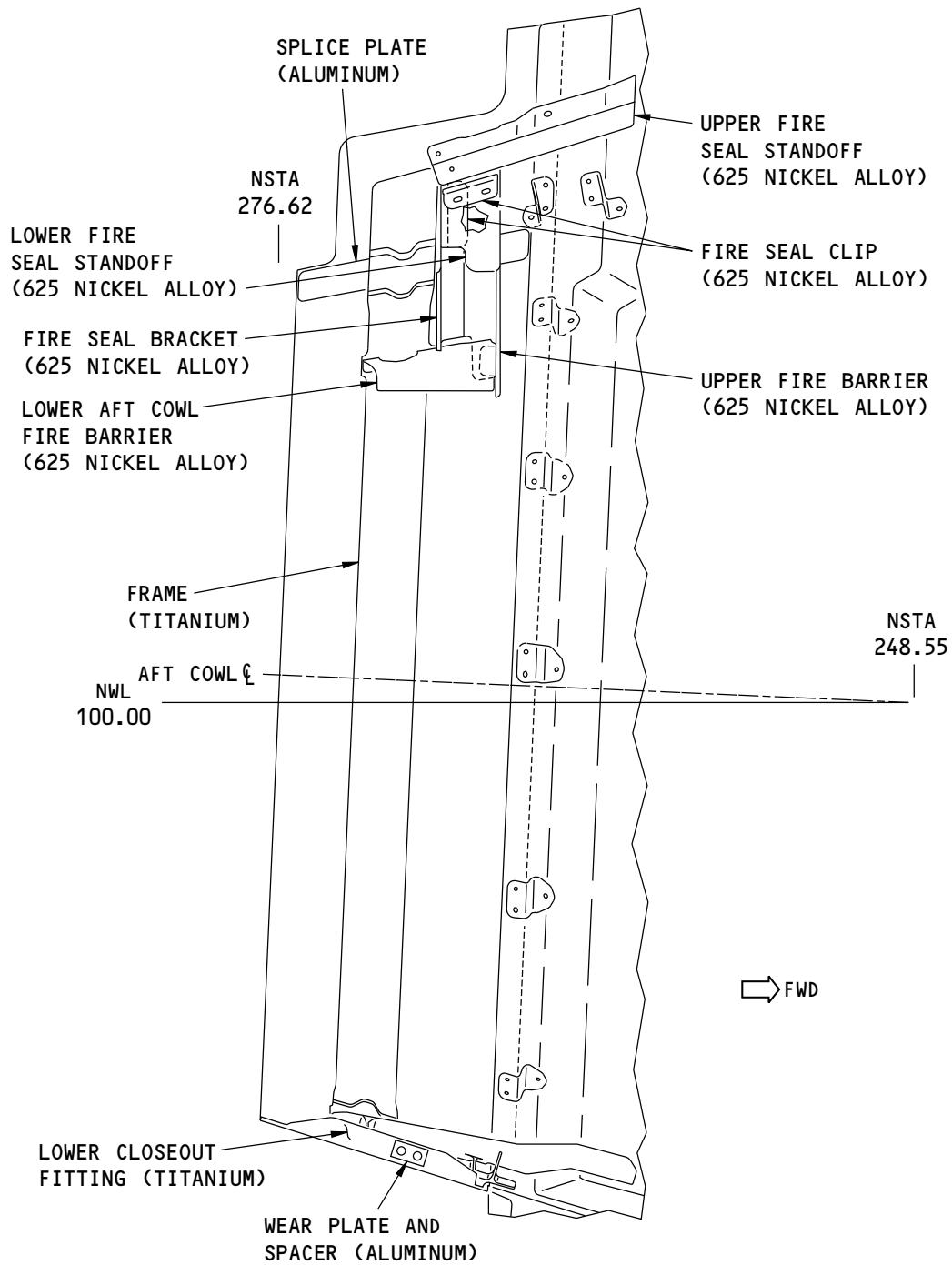
Page 102

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



A-A

G55466 S0006592001_V1

Thrust Reverser Aft Cowl Structure
Figure 102 (Sheet 2 of 2)

54-30-02**ALLOWABLE DAMAGE 2**

Page 103

Nov 10/2012

D634A210



737-800 STRUCTURAL REPAIR MANUAL

2. General

- A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES 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 (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

- (1) Refer to SOPM 20-10-07 when you work with titanium.
 - (2) Refer to 51-10-02 for the removal procedures.
 - (3) Refer to 51-30-03 for possible sources of nonmetallic materials you can use to remove the damage.
 - (4) Refer to 51-30-05 for possible sources of equipment you can use to remove the damage.
 - (5) Refer to Table 101/ALLOWABLE DAMAGE 2 for the references for the allowable damage limits.
- B. After you remove the damage, do as follows:
- (1) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-11, Type I primer to the bare surfaces of the aluminum parts. Refer to SOPM 20-41-02.
 - (3) Apply one layer of BMS 10-79, Type III primer to the bare surfaces of the 625 nickel alloy parts. Refer to SOPM 20-41-02.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS FOR THE AFT COWL STRUCTURE	
COMPONENT	PARAGRAPH
Frames and Splice Plate	4.A
Fire Barrier, Standoff, Clips, and Brackets	4.B
Closeout Fitting	4.C

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
SOPM 20-10-07	Machining of Titanium
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

- A. Frame and Splice Plate

- (1) Cracks:

54-30-02

ALLOWABLE DAMAGE 2

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , F , 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 , C , E , F , and G . Nicks, Gouges, Scratches, and Corrosion on the frame are not permitted.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- B. Fire Barriers, Standoff, Clips, and Brackets
- (1) Cracks are not permitted.
 - (2) Nicks, Gouges, Scratches, and Corrosion (Surface Damage Only):
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , E , F , and G .
 - (b) Edge damage(s) is not permitted.
 - (c) Damage is not permitted on 315A2175 Fire Barrier.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are permitted if:
 - (a) You remove the damage to a maximum diameter of 0.25 inch (6.35 mm)
 - (b) The damage is a minimum of 1.00 inch (25.40 mm) away from a fastener hole, bend radii, or the edge of the part
 - (c) The damage is a minimum of 3.00 inches (76.20 mm) away from other damage
 - (d) You install a monel rivet wet with BMS 5-63 sealant.
- C. Closeout Fitting
- (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.

54-30-02

ALLOWABLE DAMAGE 2

Page 105

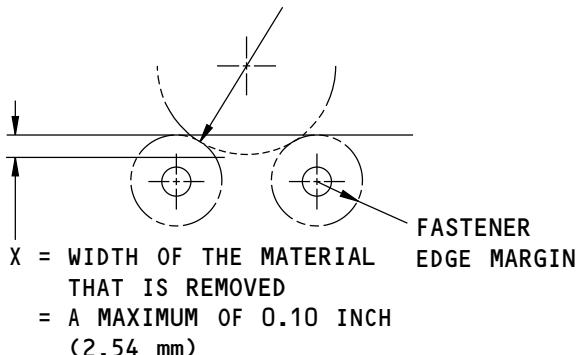
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737-800
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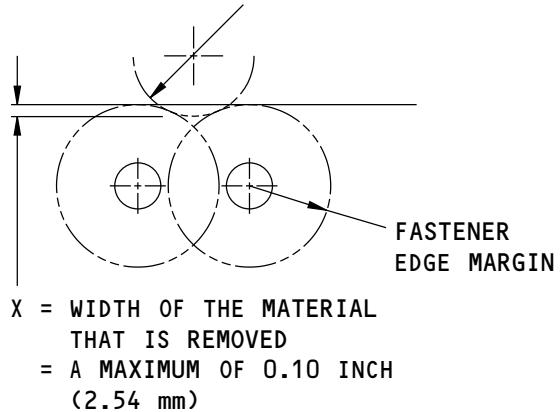
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)



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

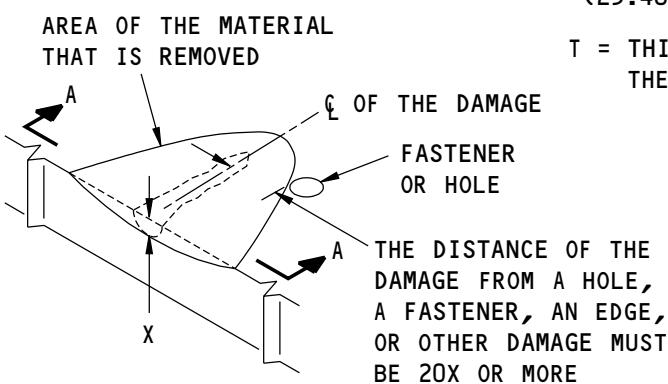
A

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm)

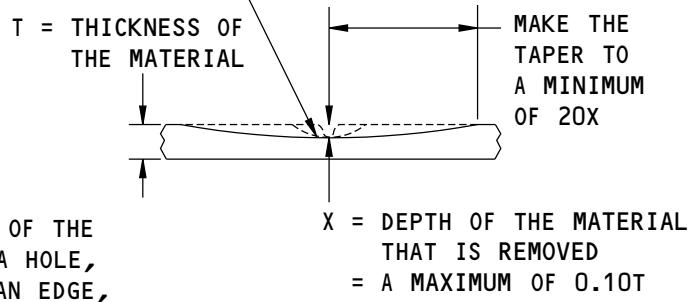


REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

B



REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

C

G42559 S0006592003_V1

Allowable Damage Limits
Figure 103 (Sheet 1 of 3)

54-30-02

ALLOWABLE DAMAGE 2

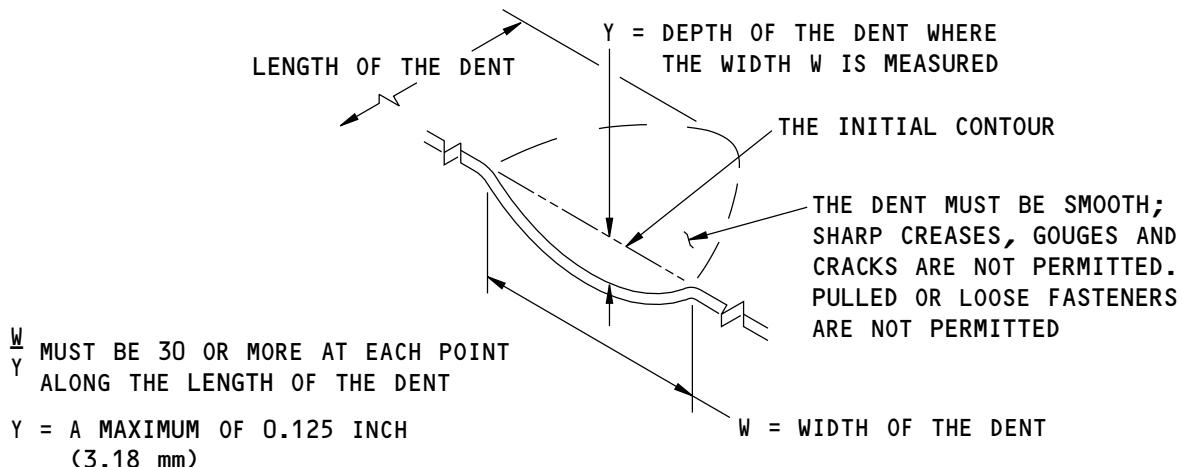
Page 106

Nov 10/2012

D634A210

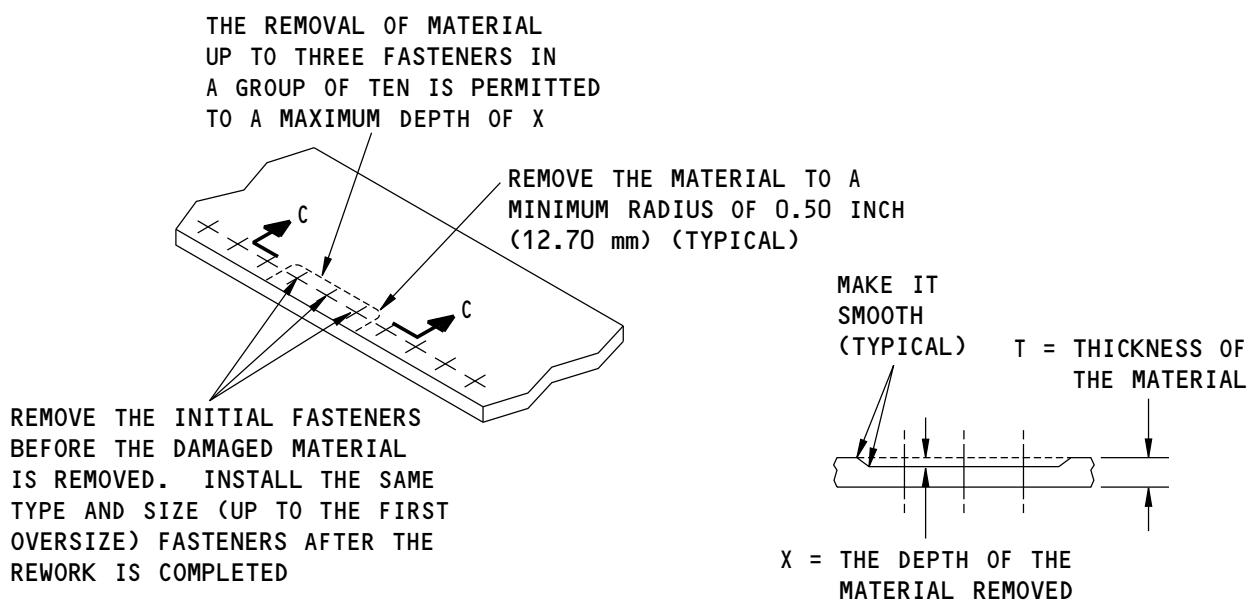


737-800
STRUCTURAL REPAIR MANUAL



DENT THAT IS PERMITTED

(D)



(E)

G42560 S0006592004_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 3)

54-30-02

ALLOWABLE DAMAGE 2

Page 107

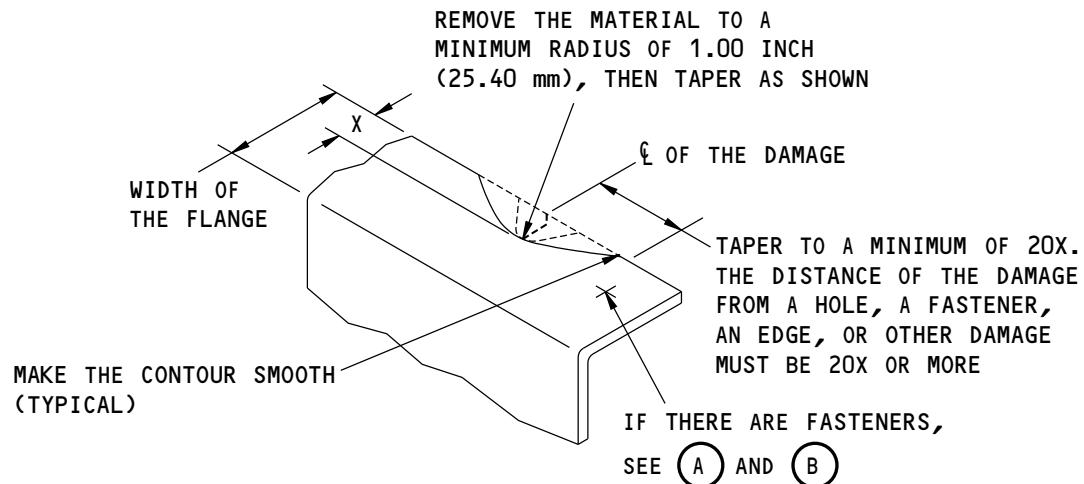
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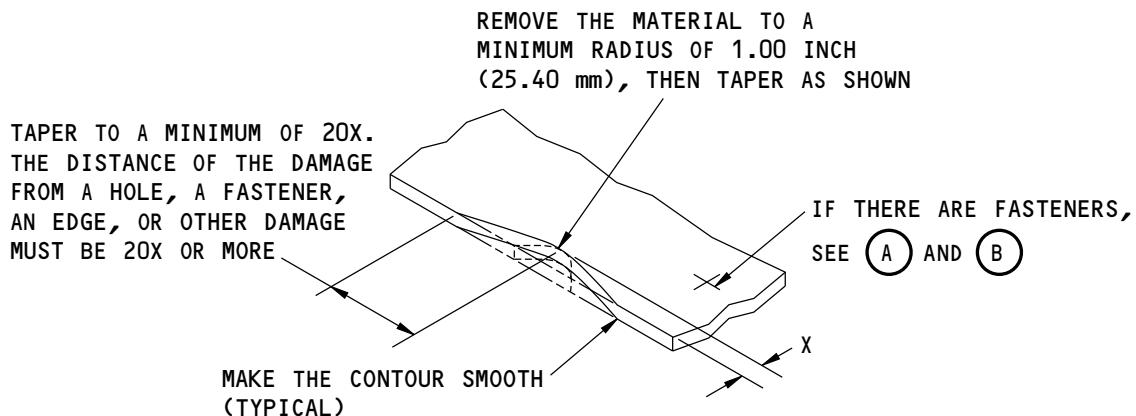
737-800
STRUCTURAL REPAIR MANUAL



X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE
OR A MAXIMUM OF 0.10 INCH (2.54 mm) THAT WHICH IS LESS

REMOVAL OF DAMAGED MATERIAL ON AN EDGE

(F)



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

(G)

G42562 S0006592005_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

54-30-02

ALLOWABLE DAMAGE 2

Page 108

Nov 10/2012

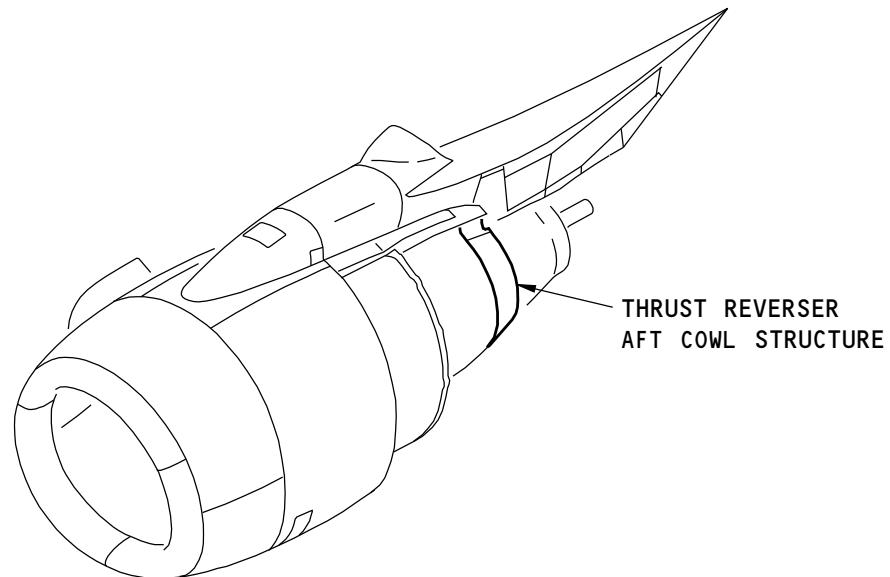
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - THRUST REVERSER AFT COWL STRUCTURE



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

Thrust Reverser Aft Cowl Structure Location
Figure 201

G45334 S0006592008_V2

54-30-02

REPAIR 2
Page 201

Nov 10/2012

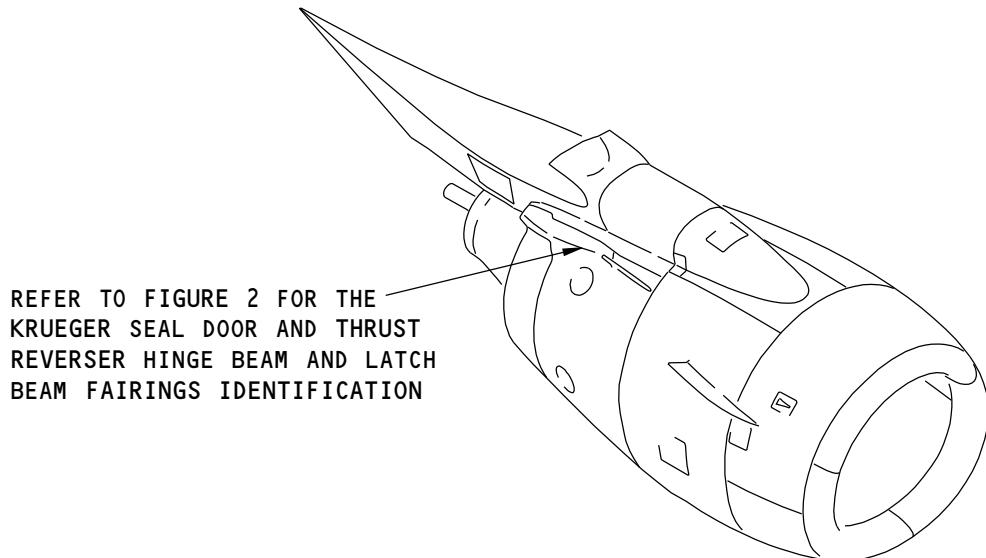
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM
AND LATCH BEAM FAIRINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G23637 S0006592012_V1

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
315A2000	Fan Duct Cowl and Thrust Reverser Installation
315A2007	Thrust Reverser Interchangeability Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2320	FWD Hinge Beam Fairing Assembly
315A2321	AFT Hinge Beam Fairing Assembly
315A2430	Fairing and Details Installation - Latch Beam
315A2565	Krueger Seal Door Deflector and Fairing Installation

54-30-70

IDENTIFICATION 1

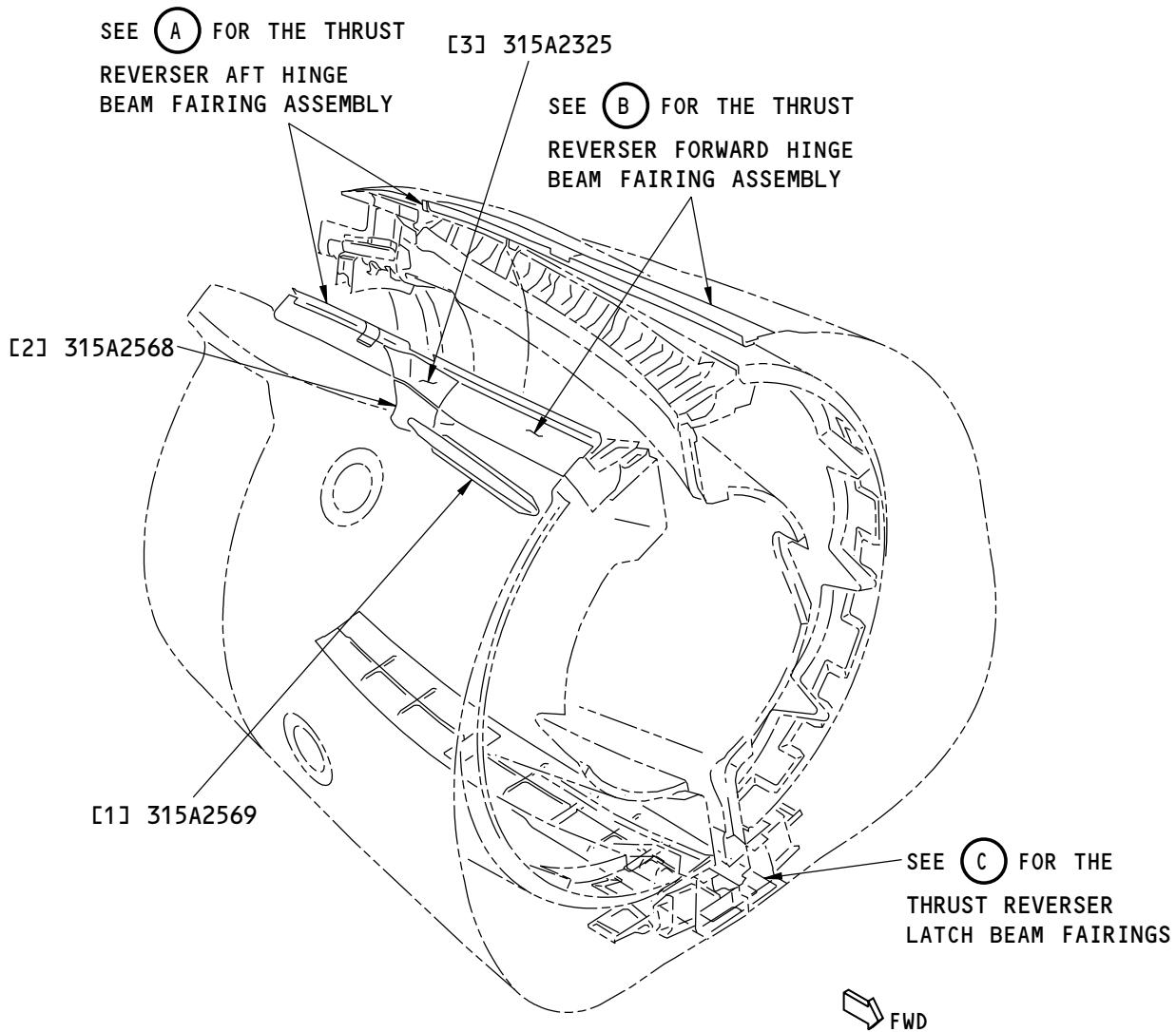
Page 1

Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

G39171 S0006592014_V1

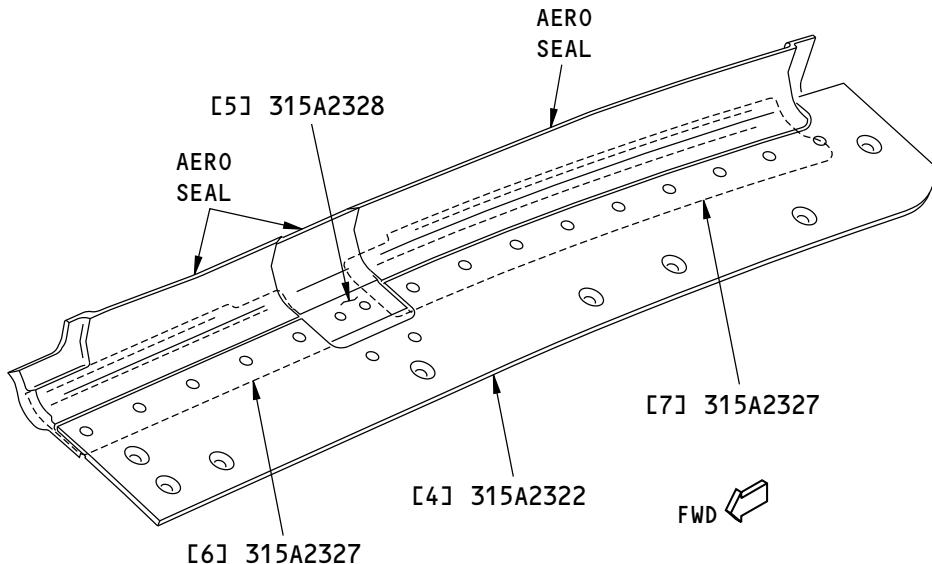
Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Identification
Figure 2 (Sheet 1 of 3)

54-30-70
IDENTIFICATION 1
Page 2
Nov 10/2012

D634A210

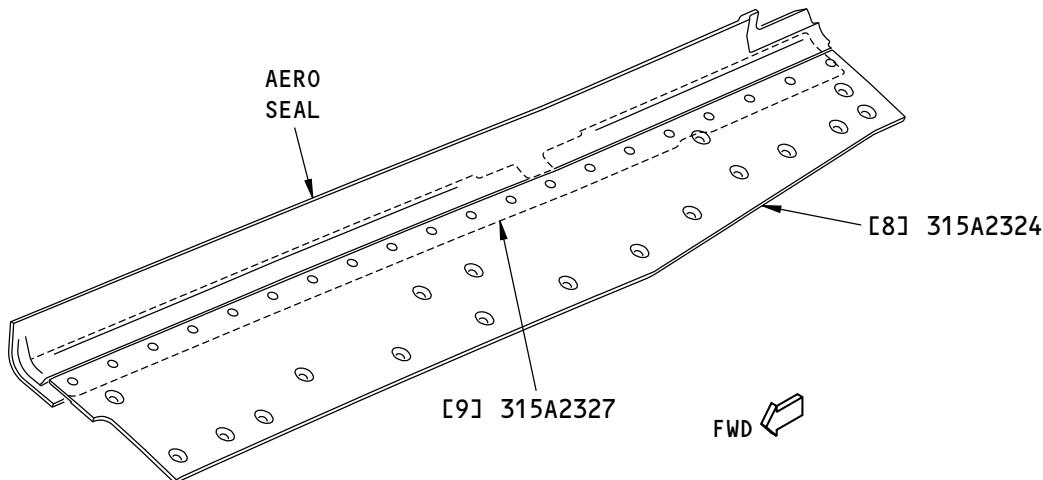


737-800
STRUCTURAL REPAIR MANUAL



LEFT AFT HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT AFT HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

(A)



LEFT FORWARD HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT FORWARD HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

(B)

G45638 S0006592015_V1

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Identification
Figure 2 (Sheet 2 of 3)

54-30-70

IDENTIFICATION 1

Page 3

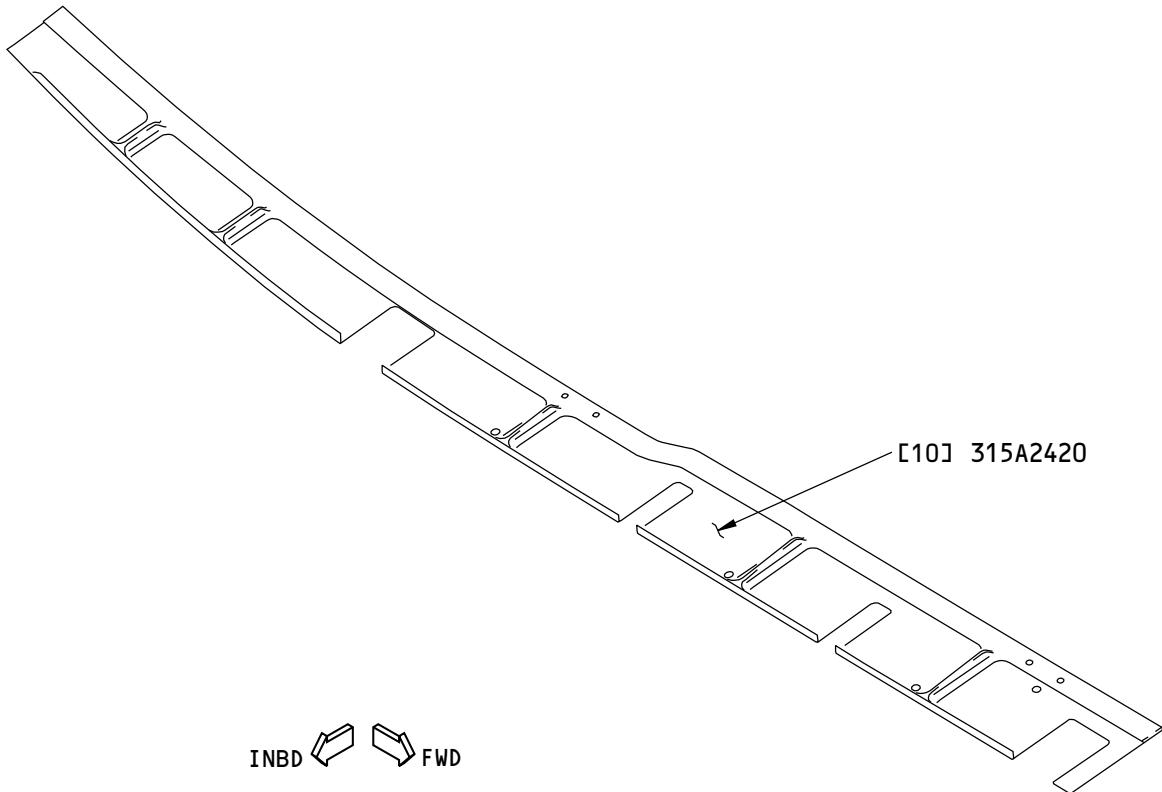
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT LATCH BEAM FAIRING IS SHOWN,
RIGHT LATCH BEAM FAIRING IS ALMOST THE SAME

(C)

G72133 S0006592016_V1

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Identification
Figure 2 (Sheet 3 of 3)

54-30-70
IDENTIFICATION 1
Page 4
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Deflector Molding		Polyamide 6/12 injection molding as given in BMS 8-323, Type I, Class 3, Form B, Grade 30	
[2]	Seal Door Fairing		Polyetherimide injection molding as given in BMS 8-293, Type II, Form R, Grade 20 (Optional: Polyether Ether Ketone (PEEK) as given in BMS 8-317, Type V, Class 1, Form B, Grade 30)	
[3]	Krueger Bump Fairing		Epoxy/glass sheet molding compound as given in BMS 8-327, Type I	
[4]	Aft Hinge Beam Fairing		Epoxy/glass sheet molding compound as given in BMS 8-327, Type I	
[5]	Seal Retainer	0.040 (1.02)	301 CRES sheet or strip as given in AMS 5518	
[6]	Seal Retainer	0.040 (1.02)	Nickel alloy 625 sheet or strip as given in AMS 5599	
[7]	Seal Retainer	0.040 (1.02)	Nickel alloy 625 sheet or strip as given in AMS 5599	
[8]	Forward Hinge Beam Fairing		Epoxy/glass sheet molding compound as given in BMS 8-327, Type I	
[9]	Seal Retainer	0.040 (1.02)	Nickel alloy 625 sheet or strip as given in AMS 5599	
[10]	Latch Beam Fairing		Epoxy/glass sheet molding compound as given in BMS 8-327, Type I	

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

54-30-70

IDENTIFICATION 1

Page 5

Nov 10/2014

D634A210

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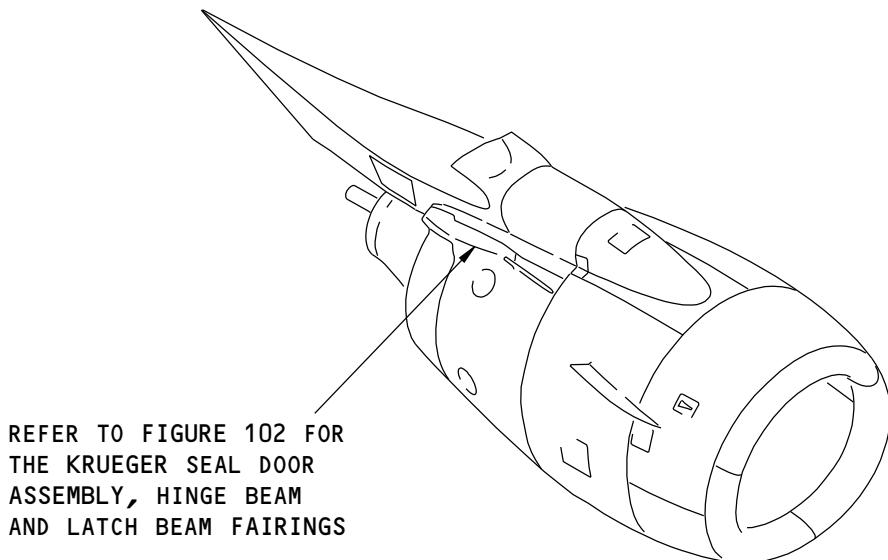


737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM AND LATCH BEAM FAIRINGS

1. Applicability

- A. This subject gives the allowable damage limits for the structures shown in Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location, Figure 101/ ALLOWABLE DAMAGE 1:
- (1) The Krueger Seal Door Assembly:
 - (a) Krueger Door Seal Deflector.
 - (b) Krueger Door Seal Fairing.
 - (c) Krueger Bump/Seal Fairing.
 - (2) The Hinge Beam Fairings:
 - (a) Fwd Hinge Beam Fairing.
 - (b) Aft Hinge Beam Fairing.
 - (c) Seal Retainers.
 - (3) The Latch Beam Fairing.



Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location
Figure 101

G40256 S0006592020_V2

54-30-70

ALLOWABLE DAMAGE 1

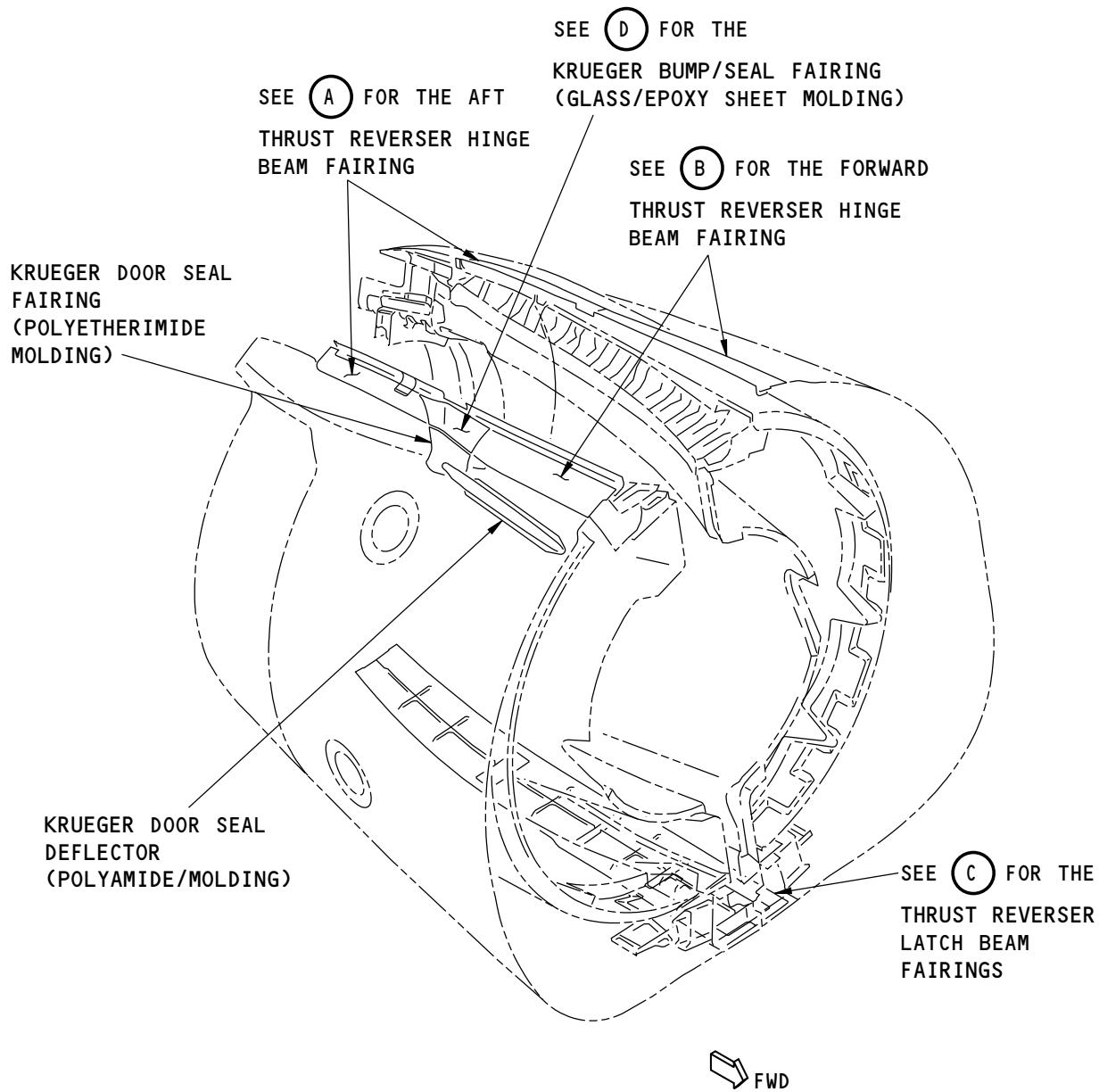
Page 101

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE
 (SEAL RETAINERS NOT SHOWN)

G40267 S0006592021_V2

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 1 of 4)

54-30-70

ALLOWABLE DAMAGE 1

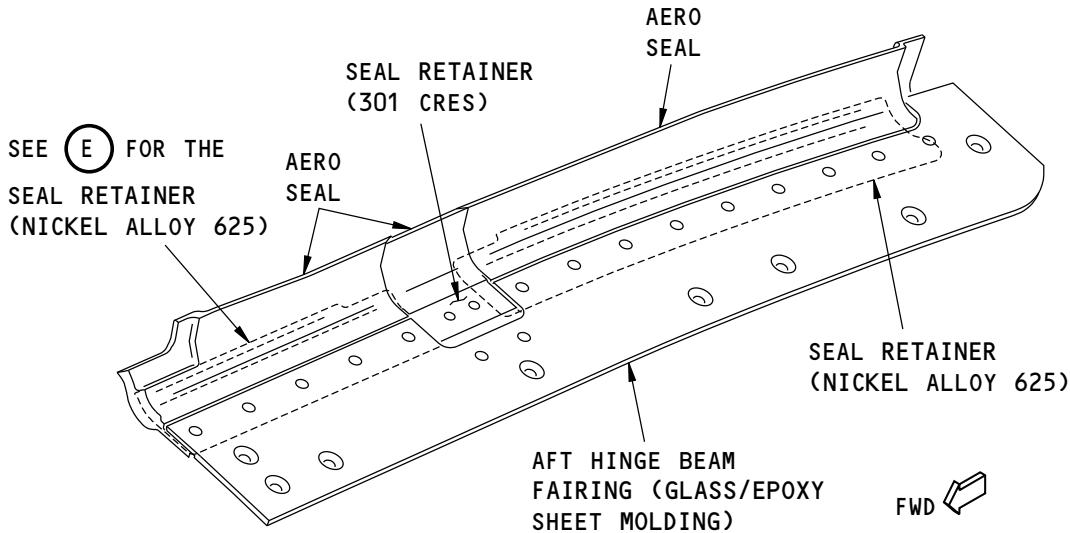
Page 102

Nov 10/2015

D634A210

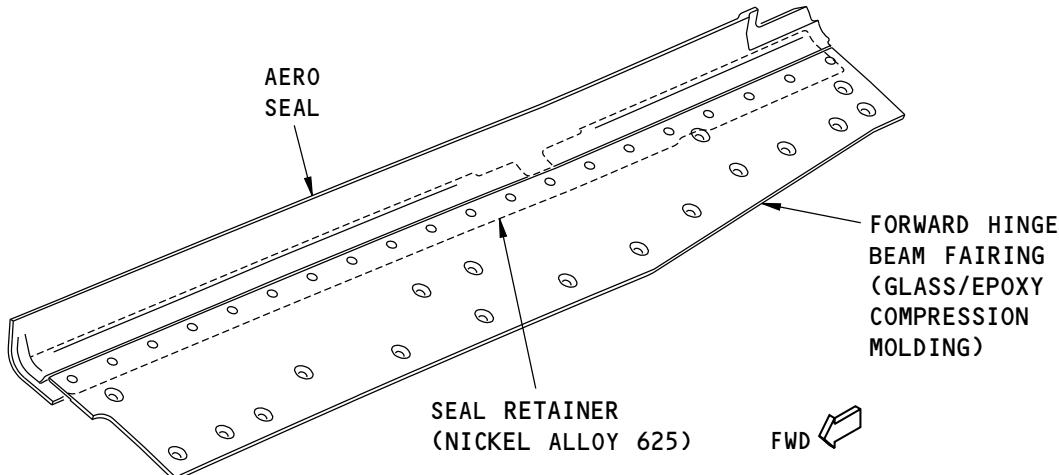


737-800
STRUCTURAL REPAIR MANUAL



LEFT AFT HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT AFT HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

(A)



LEFT FORWARD HINGE BEAM FAIRING ASSEMBLY IS SHOWN,
RIGHT FORWARD HINGE BEAM FAIRING ASSEMBLY IS OPPOSITE

(B)

G55804 S0006592022_V2

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 2 of 4)

54-30-70

ALLOWABLE DAMAGE 1

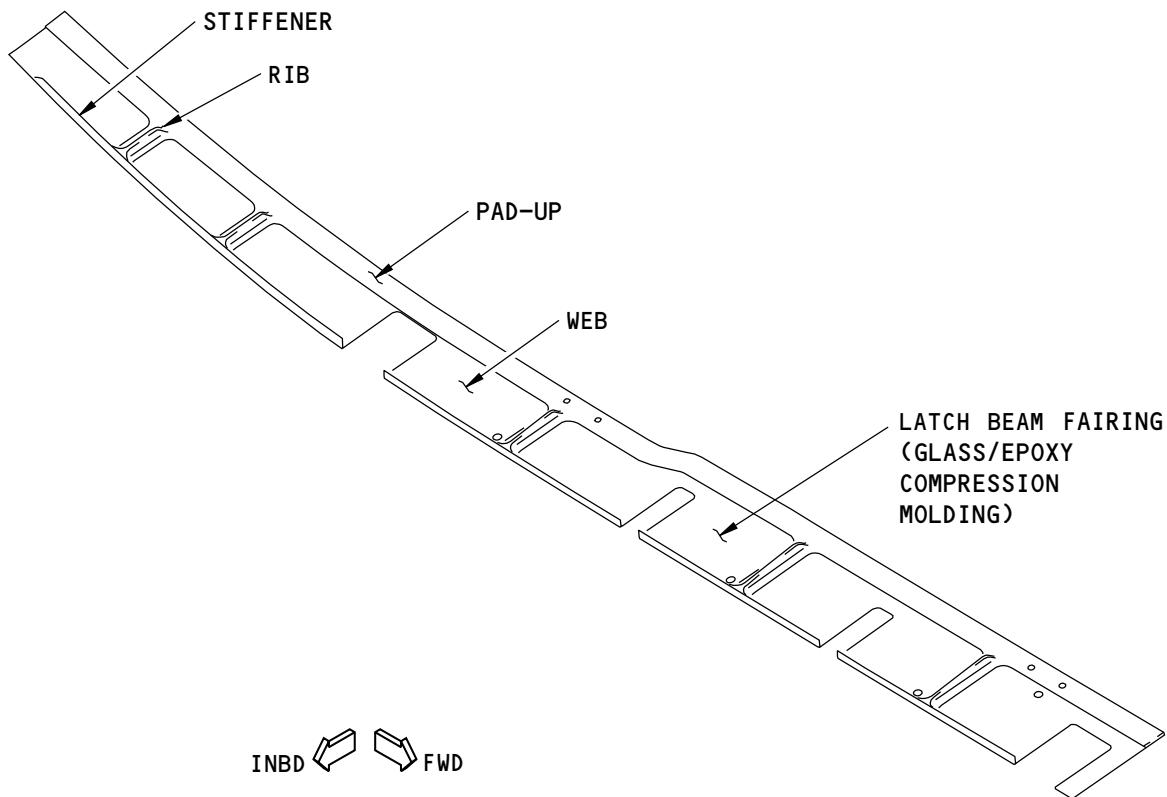
Page 103

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT LATCH BEAM FAIRING IS SHOWN,
RIGHT LATCH BEAM FAIRING IS ALMOST THE SAME

(C)

G72236 S0006592023_V2

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 3 of 4)

54-30-70

ALLOWABLE DAMAGE 1

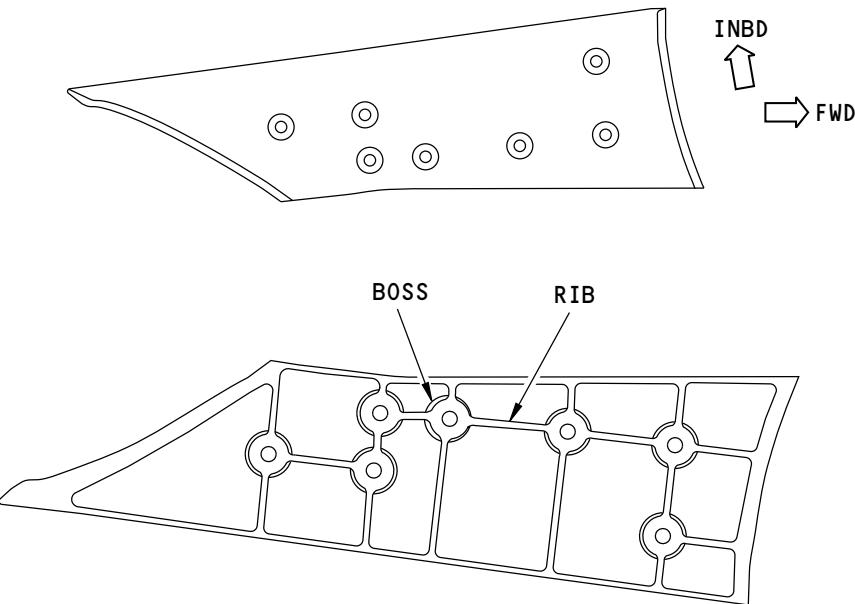
Page 104

D634A210

Nov 10/2015

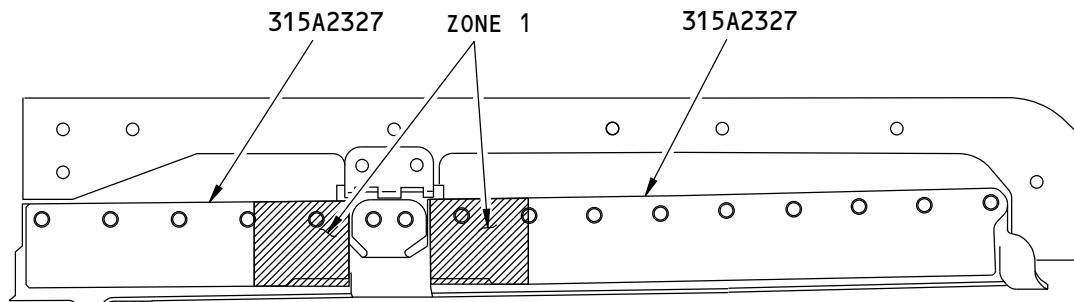


737-800
STRUCTURAL REPAIR MANUAL



KRUEGER BUMP/SEAL FAIRING
(GLASS/EPOXY COMPRESSION MOLDING)

D



SEAL RETAINERS AT AFT HINGE BEAM FAIRING
(INCONEL 625 SHEET OR STRIP)

E

2444199 S0000568117_V1

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings
Figure 102 (Sheet 4 of 4)

54-30-70

ALLOWABLE DAMAGE 1

Page 105

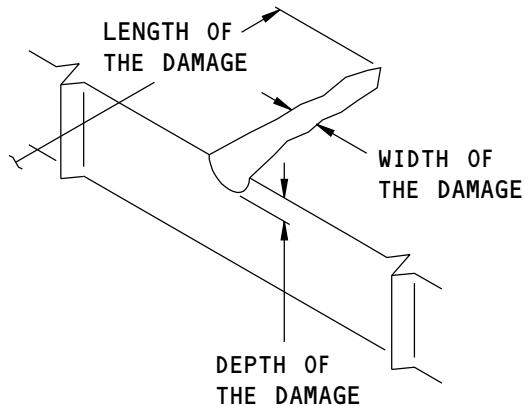
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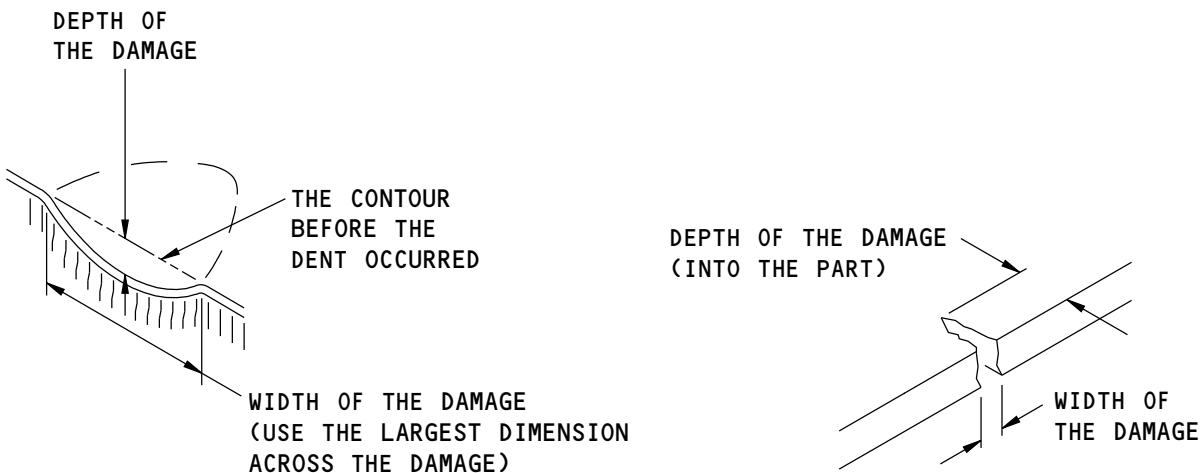


737-800
STRUCTURAL REPAIR MANUAL



SIZE DEFINITIONS FOR SURFACE DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)

SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

2444137 S0000568178_V1

Definitions of Damages
Figure 103

54-30-70

ALLOWABLE DAMAGE 1

Page 106

Nov 10/2015

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

2. General

- A. Remove the damage as necessary from the parts made of plastic or epoxy/glass sheet moldings:
 - (1) Do an inspection of the damaged area to find the length, width, and depth of the damage.
 - (a) Refer to Definitions of Damages, Figure 103/ALLOWABLE DAMAGE 1
 - (b) Refer to Allowable Damage Limits, Section 4 and Figure 104/ALLOWABLE DAMAGE 1
 - (2) Remove all of the contamination and water from the part.
 - (a) Refer to 51-70-04 for the damage removal procedures.
 - (b) Refer to 51-30-05 for possible sources of the equipment to remove the damage.
 - (3) Seal all the permitted damage areas with one of the two methods that follow:
 - (a) Make a temporary seal with aluminum foil tape (speed tape).
 - 1) Keep a record of the location.
 - 2) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or 60 days, whichever comes first, or more frequently.
 - 3) Make a permanent seal at or before 5000 flight hours or 2 years, whichever comes first, from the time the seal was made.
 - (b) Make a permanent seal with one of the two adhesive compounds that follow:
 - 1) BMS 5-92, Type I or Type III epoxy resin
 - 2) BMS 5-123 adhesive.
 - 3) Cure the adhesive compounds as follows:
 - a) Cure the BMS 5-92 epoxy resin at 75°F (24°C) for 24 hours.
 - b) Cure the BMS 5-123 adhesive at 75°F (24°C) for 1 hour.
- B. For the seal retainers made of 301 CRES or nickel alloy 625, do as follows:
 - (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-30-03 for possible sources of abrasive materials that can be used to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of the equipment that can be used to remove the damage.

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	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
AMM 51-21-99	DECORATIVE EXTERIOR PAINT SYSTEM
SOPM 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

- A. Krueger Seal Door Assembly

54-30-70

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

- (1) Krueger Door Seal Deflector and Krueger Door Seal Fairing
 - (a) Cracks:
 - 1) Damage other than at the edge is not permitted.
 - 2) Remove edge damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, and Scratches:
 - 1) Remove the damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D .
 - 2) Damage is permitted if it is a minimum of 4D (D = diameter of the "damage plus cleanup") away from:
 - a) Other damage.
 - b) The nearest hole.
 - c) The edge of the part.
 - (c) Dents:
 - 1) Dents usually result in cracks. Use the limits for cracks.
 - (d) Holes and Punctures are not permitted.
 - (e) Edge Erosion and Edge Crushing:
 - 1) For edge crushing see damage limit for edge cracks.
 - 2) Remove the edge erosion damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail E.
 - (f) Holes and Punctures are not permitted.
- (2) Krueger Bump/Seal Fairing
 - (a) No damage in ribs and bosses permitted (See Figure 102/ALLOWABLE DAMAGE 1, Detail D.)
 - (b) Cracks:
 - 1) Damage other than at the edge is not permitted.
 - 2) Remove edge damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (c) Nicks, Gouges, and Scratches:
 - 1) Remove the damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D .
 - 2) Damage is permitted if it is a minimum of 4D (D = diameter of the "damage plus cleanup") away from:
 - a) Other damage
 - b) The nearest hole
 - c) The edge of the part.
 - (d) Dents:
 - 1) Dents usually result in cracks. Use the limits for cracks.
 - (e) Holes and Punctures:
 - 1) Damage to a maximum of 0.25 in. (6.35 mm) is permitted if it is a minimum of 4D (D = diameter of the damage) away from:
 - a) Other "damage plus cleanup"

54-30-70

ALLOWABLE DAMAGE 1

Page 108

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- b) The nearest hole.
 - c) The edge of the part.
 - d) Fillet edge.
 - (f) Edge Erosion and Edge Crushing:
 - 1) For edge crushing see damage limit for edge cracks.
 - 2) Remove the edge erosion damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Detail E.
- B. Fwd and Aft Hinge Beam Fairings
- (1) Cracks:
 - (a) Damage other than at the edge is not permitted.
 - (b) Remove edge damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and C.
 - (2) Nicks, Gouges, and Scratches:
 - (a) Remove the damage as shown in Allowable Damage Limits - Composite Parts, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , C , and D.
 - (b) Damage is permitted if it is a minimum of 4D (D = diameter of the "damage plus cleanup") away from:
 - 1) Other damage.
 - 2) The nearest hole (by at least 0.75 in. (19.05 mm) or 4D, whichever is larger).
 - 3) The edge of the part.
 - (3) Dents:
 - (a) Dents usually result in cracks. Use the limits for cracks.
 - (4) Holes and Punctures:
 - (a) Damage to a maximum of 0.25 in. (6.35 mm) is permitted if it is a minimum of 4D (D = diameter of the "damage plus cleanup") away from:
 - 1) Other "damage plus cleanup"
 - 2) The nearest hole (by at least 0.75 in. (19.05 mm) or 4D, whichever is larger).
 - 3) The edge of the part.
 - 4) Fillet edge.
 - (5) Edge Erosion and Edge Crushing:
 - (a) For edge crushing see damage limit for edge cracks.
 - (b) Remove the edge erosion damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail E.
- C. Latch Beam Fairing
- (1) Refer to Figure 102/ALLOWABLE DAMAGE 1, Detail C.
 - (2) Crack:
 - (a) Damage other than at the edge is not permitted.
 - (b) Edge damage is permitted only on the ribs and pad-ups.
 - (c) Remove edge damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B and C.

54-30-70

ALLOWABLE DAMAGE 1

Page 109

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Nicks, Gouges and Scratches:
 - (a) Damage is not permitted on the stiffeners and the webs.
 - (b) Remove damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Details A, B, C, and D.
 - (c) Damage is permitted if "damage plus cleanup" is a minimum of 4D away from holes, edge of part or any other "damage plus cleanup."
 - (4) Dents:
 - (a) Dents usually result in cracks. Use the limits for cracks.
 - (5) Holes and Punctures:
 - (a) Damage to a maximum of 0.25 in. (6.35 mm) is permitted if it is a minimum of 4D (D = hole diameter) away from:
 - 1) Other "damage plus cleanup".
 - 2) The nearest hole.
 - 3) The edge of the part.
 - 4) Fillet edge.
 - (6) Edge Erosion and Edge Crushing:
 - (a) For edge crushing see damage limit for edge cracks.
 - (b) Remove the edge erosion damage as shown in Figure 104/ALLOWABLE DAMAGE 1, Detail E.
- D. Seal Retainers (Nickel or CRES)
- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits - Seal Retainers, 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 - Seal Retainers, Figure 105/ALLOWABLE DAMAGE 1, Details A , B , C , D and E .
 - (3) Dents:
 - (a) Not permitted on Flapper Door Retainer (315A2328 - CRES).
 - (b) For other retainers (315A2327 - Nickel Alloy 625), dents are permitted as shown in Figure 105/ALLOWABLE DAMAGE 1, Detail F if they are:
 - 1) Not in Zone 1 as shown in Figure 102/ALLOWABLE DAMAGE 1, Detail E.
 - 2) A minimum of 4D (D = dimension of the damage, edge to edge) from other damage, hole, fillet edge or part edge.
 - (4) Holes and Punctures:
 - (a) Not permitted on Flapper Door Retainer (315A2328 - CRES).
 - (b) For other retainers (315A2327 - Nickel Alloy 625), holes and punctures are permitted if they are:
 - 1) Not in Zone 1 as shown in Figure 102/ALLOWABLE DAMAGE 1, Detail E.
 - 2) A maximum of 0.25 in. (6.35 mm) in diameter.
 - 3) A minimum of 4D (D = diameter of damage) from other damage, hole, fillet edge or part edge.

54-30-70

ALLOWABLE DAMAGE 1

Page 110

Nov 10/2015

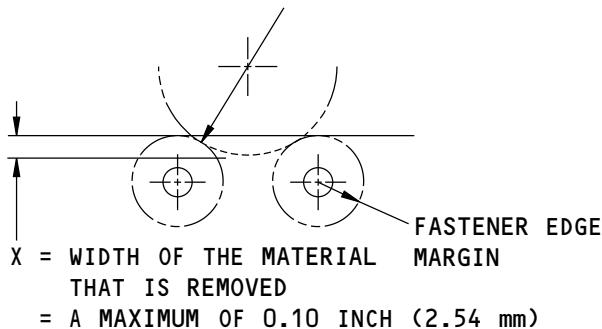
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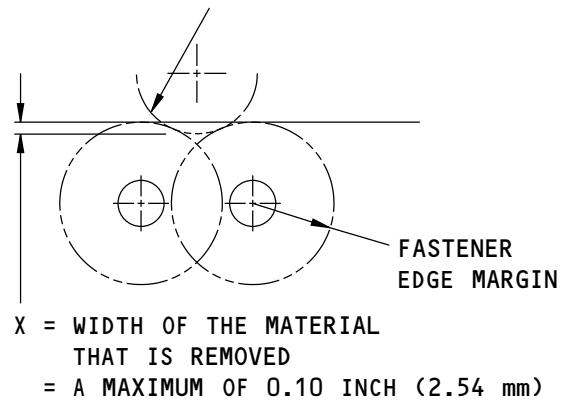


737-800
STRUCTURAL REPAIR MANUAL

REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)



REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)



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

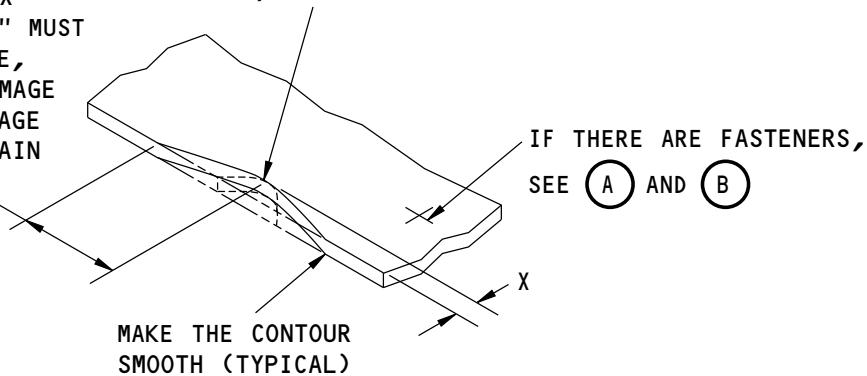
(A)

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

(B)

TAPER TO A MINIMUM OF 20X
THE "DAMAGE PLUS CLEANUP" MUST
NOT INTERSECT A PART EDGE,
FILLET EDGE OR OTHER "DAMAGE
PLUS CLEANUP". THE "DAMAGE
PLUS CLEANUP" MUST MAINTAIN
FASTENER EDGE DISTANCE.

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= 10% of WIDTH (MAXIMUM OF 0.10 INCH (2.54 mm))

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

G73174 S0006592024_V2

Allowable Damage Limits - Composite Parts
Figure 104 (Sheet 1 of 2)

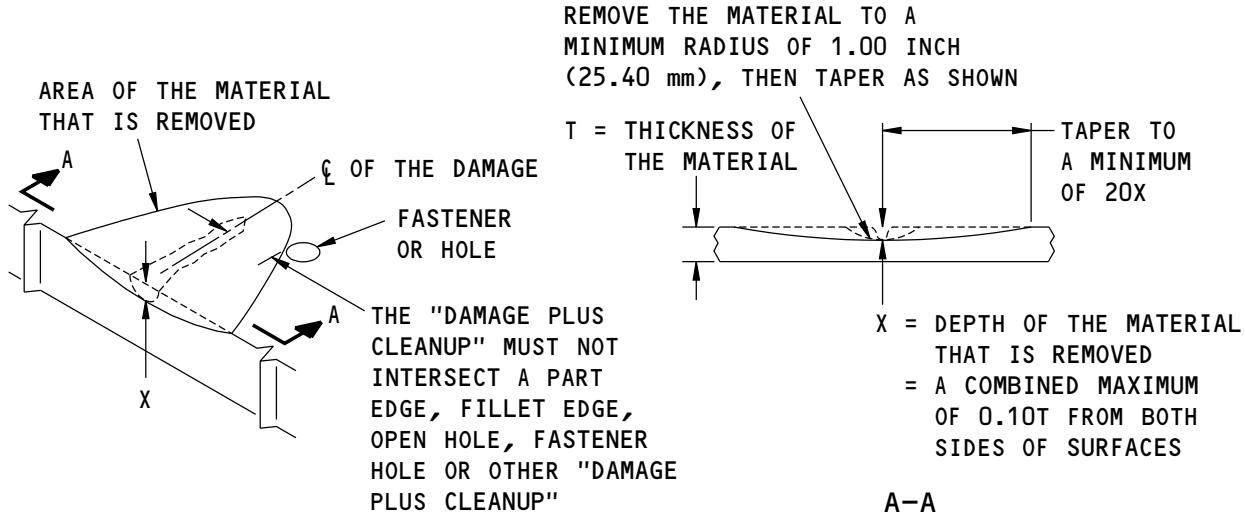
54-30-70

ALLOWABLE DAMAGE 1

Page 111

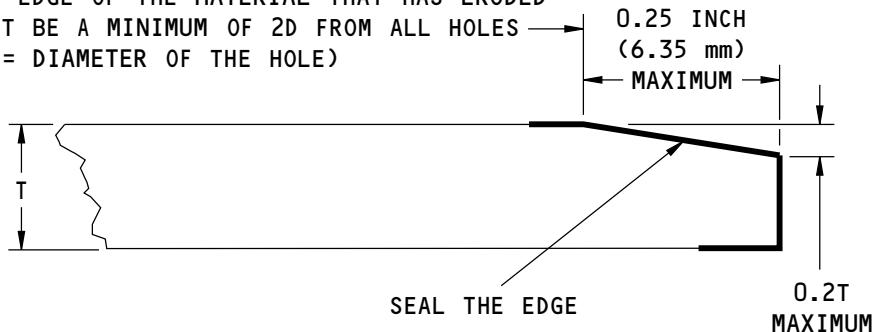
Nov 10/2015

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**737-800
STRUCTURAL REPAIR MANUAL**

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)

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 A COMPOSITE PART

(E)

G73182 S0006592025_V2

Allowable Damage Limits - Composite Parts
Figure 104 (Sheet 2 of 2)

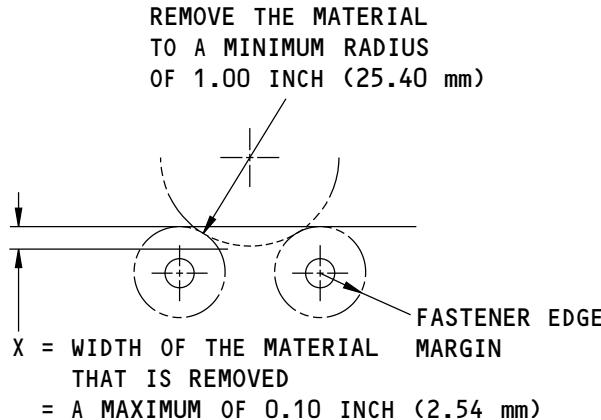
54-30-70

ALLOWABLE DAMAGE 1

Page 112

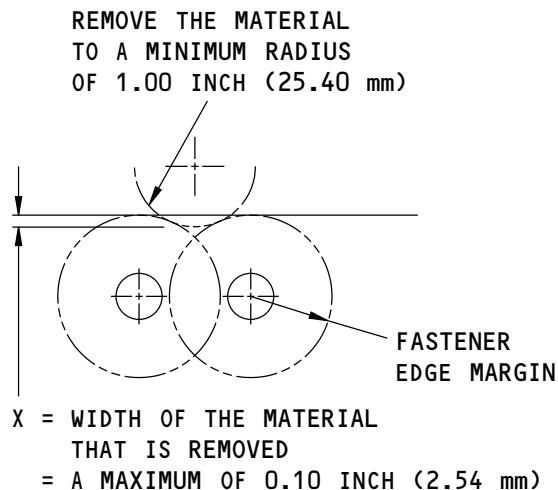
Nov 10/2015

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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)

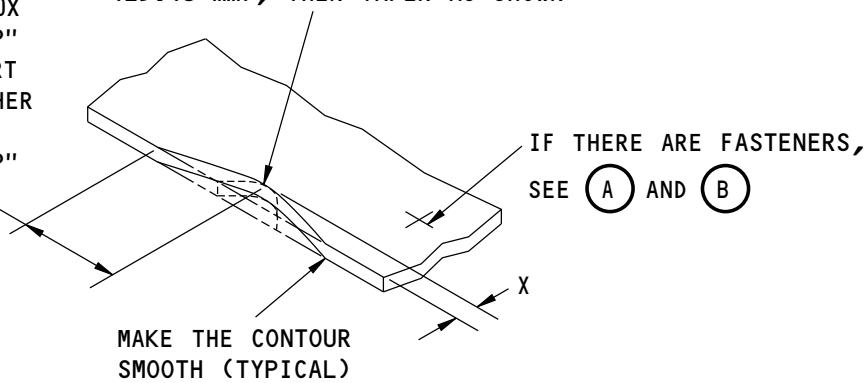


REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)

TAPER TO A MINIMUM OF 20X THE "DAMAGE PLUS CLEANUP" MUST NOT INTERSECT A PART EDGE, FILLET EDGE OR OTHER "DAMAGE PLUS CLEANUP". THE "DAMAGE PLUS CLEANUP" MUST MAINTAIN FASTENER EDGE DISTANCE.

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= 10% OF WIDTH (MAXIMUM OF 0.10 INCH (2.54 mm))

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

G40281 S0006592026_V2

Allowable Damage Limits - Seal Retainers
Figure 105 (Sheet 1 of 3)

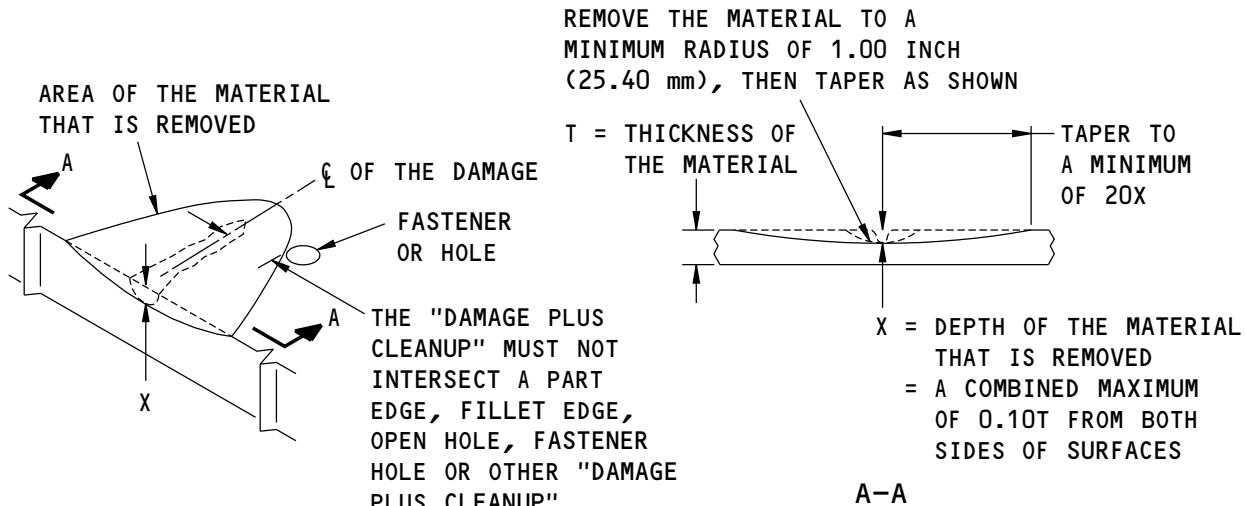
54-30-70

ALLOWABLE DAMAGE 1

Page 113

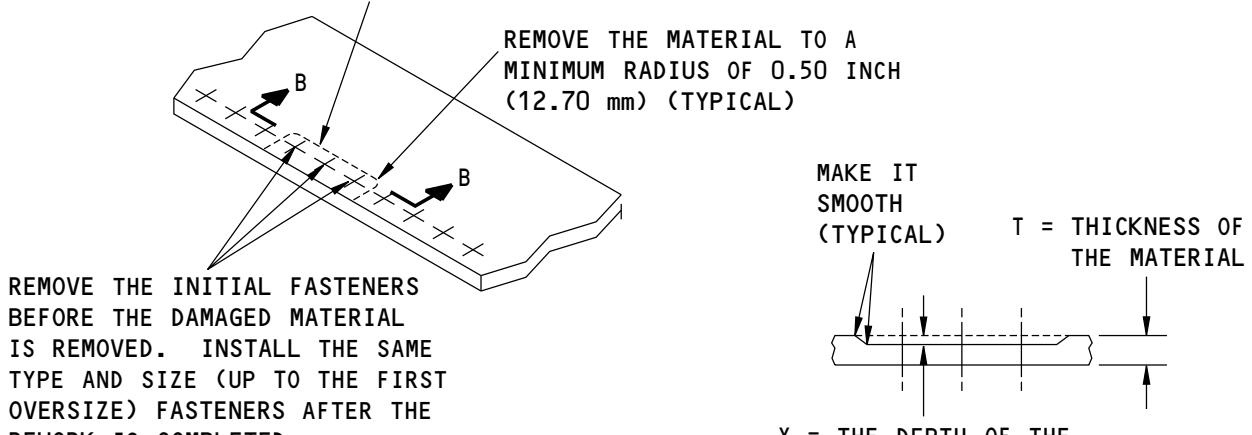
Nov 10/2015

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

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



MAKE IT SMOOTH (TYPICAL) T = THICKNESS OF THE MATERIAL

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

REMOVAL OF CORROSION AROUND THE FASTENERS

(E)

B-B

G40292 S0006592027_V2

Allowable Damage Limits - Seal Retainers
Figure 105 (Sheet 2 of 3)

54-30-70

ALLOWABLE DAMAGE 1

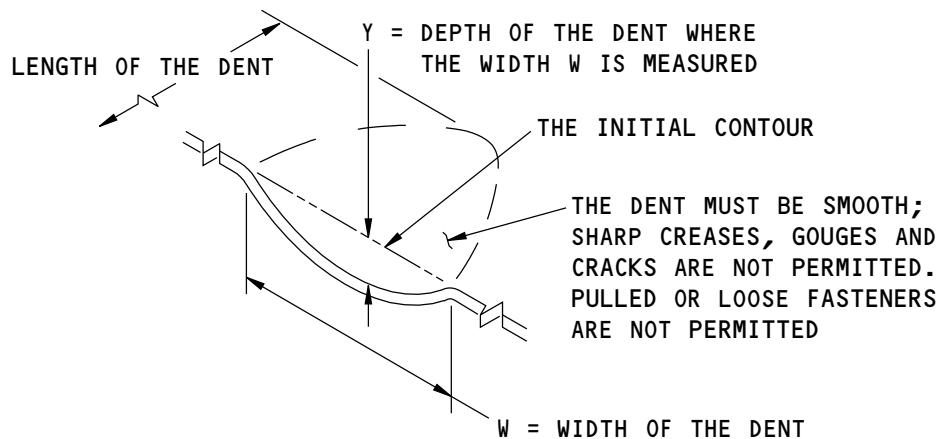
Page 114

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



$\frac{W}{Y}$ MUST BE 30 OR MORE AT EACH POINT
ALONG THE LENGTH OF THE DENT

Y = A MAXIMUM OF 0.125 INCH (3.18 mm)

DENT THAT IS PERMITTED



G55833 S0006592028_V1

Allowable Damage Limits - Seal Retainers
Figure 105 (Sheet 3 of 3)

54-30-70

ALLOWABLE DAMAGE 1

Page 115

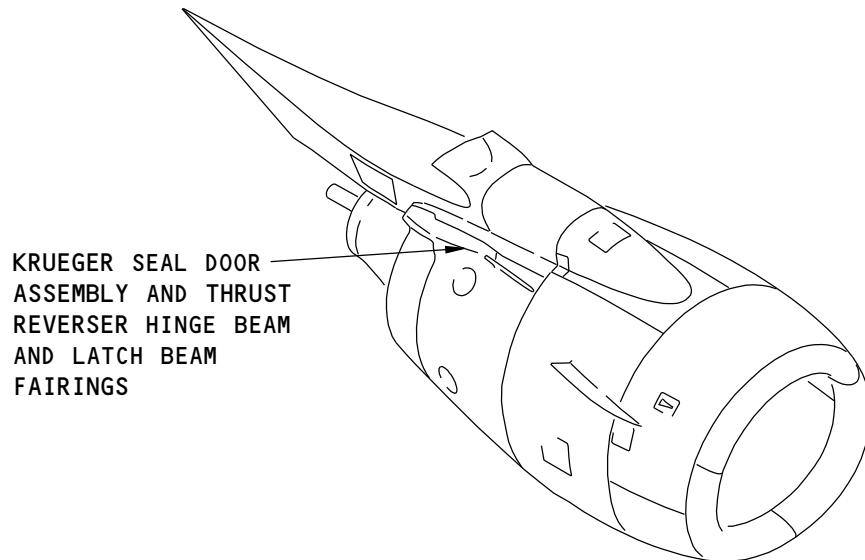
Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - KRUEGER SEAL DOOR ASSEMBLY AND THRUST REVERSER HINGE BEAM AND LATCH BEAM FAIRINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME. IF DAMAGE TO THE STRUCTURE IS MORE THAN THE LIMITS GIVEN IN SRM 54-30-70, ALLOWABLE DAMAGE 1, THEN REPLACE THE DAMAGED PART.

LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

Krueger Seal Door Assembly and Thrust Reverser Hinge Beam and Latch Beam Fairings Location
Figure 201

G42632 S0006592031_V2

54-30-70

REPAIR 1
Page 201

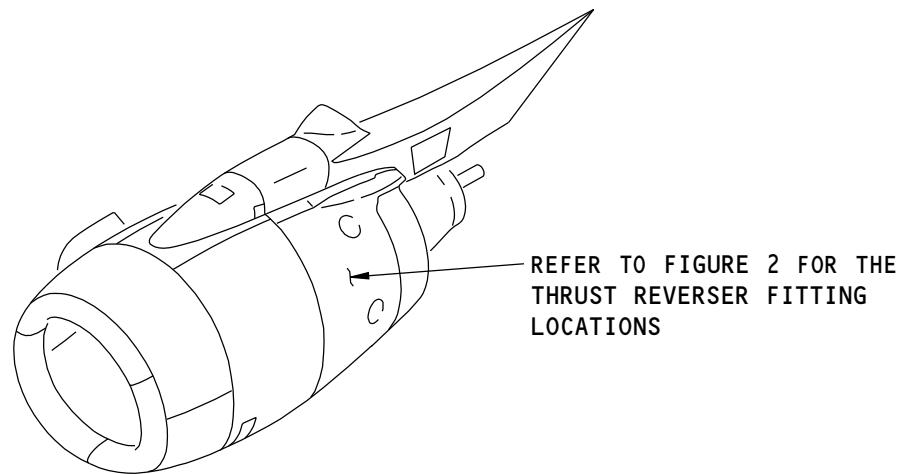
Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - THRUST REVERSER FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

H19412 S0006592035_V1

Thrust Reverser Fittings

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
300A2020	Engine Fan Duct Cowl and Thrust Reverser Installation
315A2295	Fan Duct Cowl and Thrust Reverser Assembly
315A2500	Thrust Reverser Translating Sleeve Assembly
315A2501	Acoustic Panel Assembly - Translating Sleeve
315A2007	Thrust Reverser Interchangeability Installation

54-30-90

IDENTIFICATION 1

Page 1

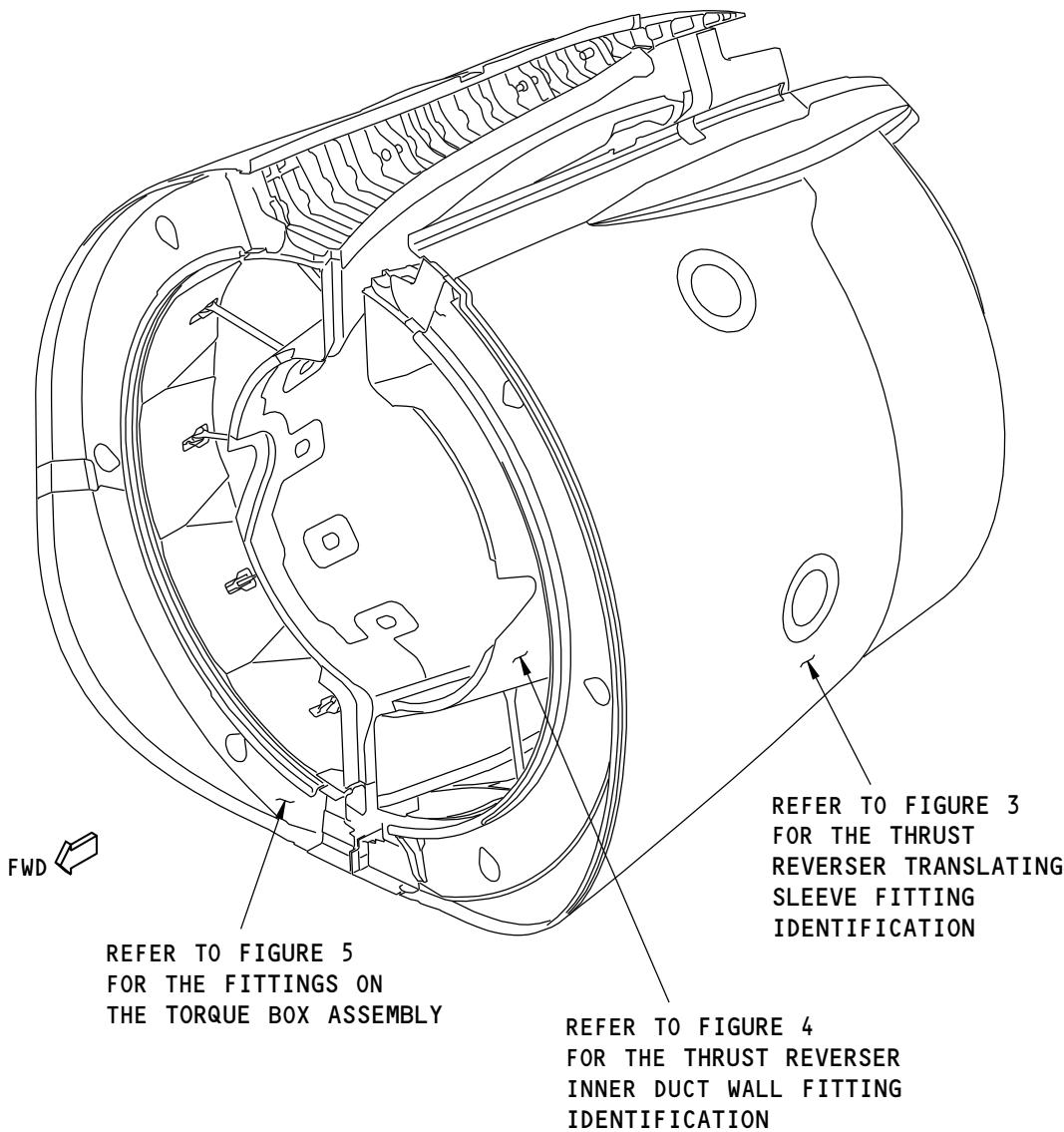
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737-800
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LEFT THRUST REVERSER ASSEMBLY IS SHOWN,
RIGHT THRUST REVERSER ASSEMBLY IS OPPOSITE

H13375 S0006592037_V1

Thrust Reverser Fitting Locations
Figure 2

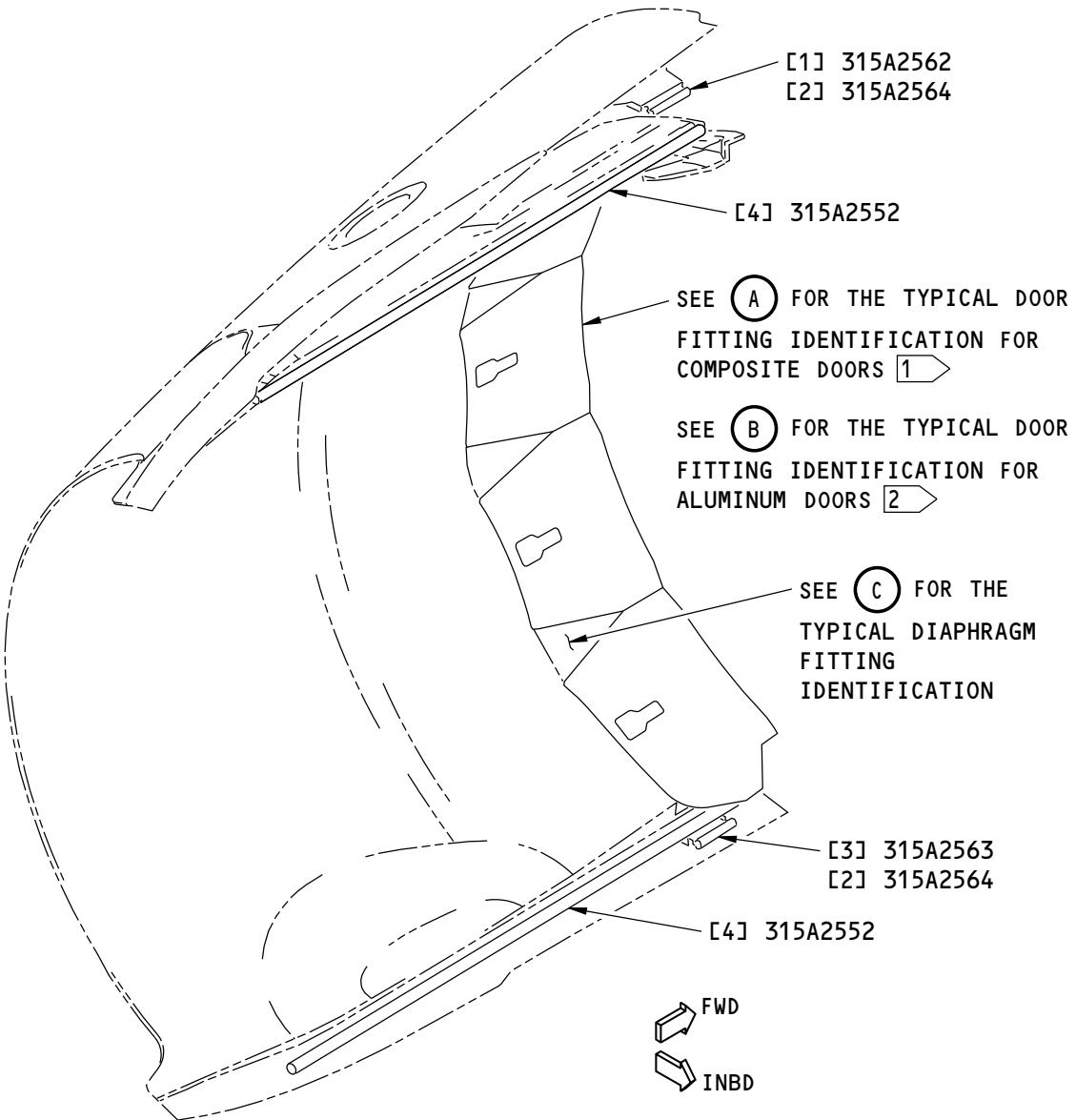
54-30-90
IDENTIFICATION 1
Page 2
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT TRANSLATING SLEEVE IS SHOWN,
RIGHT TRANSLATING SLEEVE IS OPPOSITE

NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

[1] LINE NUMBER 1 THRU 4299

[2] LINE NUMBER 4300 AND ON

F31854 S0006592038_V2

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 1 of 5)

54-30-90

IDENTIFICATION 1

Page 3

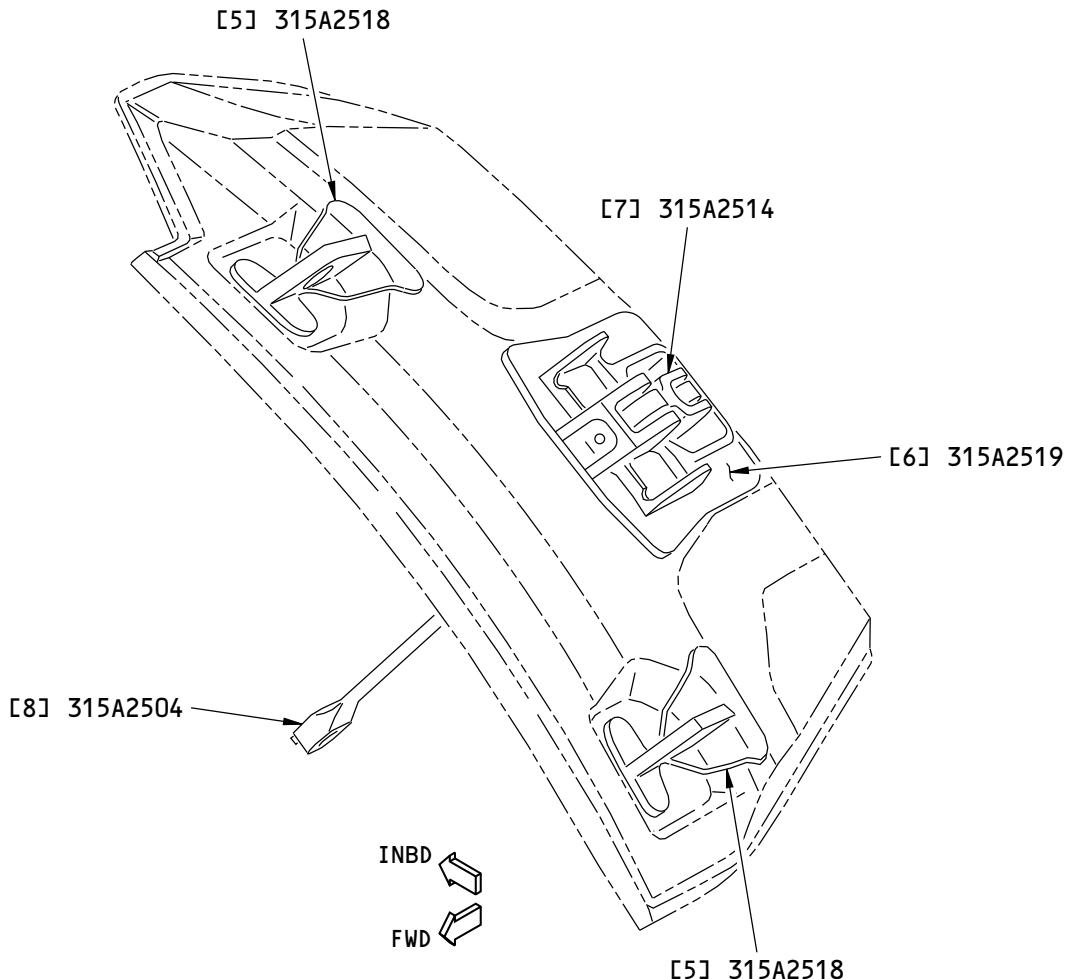
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737-800
STRUCTURAL REPAIR MANUAL



COMPOSITE BLOCKER DOOR
FITTINGS ON THE UPPER END BLOCKER DOOR ARE SHOWN,
FITTINGS ON ALL COMPOSITE BLOCKER DOORS ARE THE SAME
VIEW IS ON THE NON-AERODYNAMIC SURFACE

(A)

F31871 S0006592039_V2

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 2 of 5)

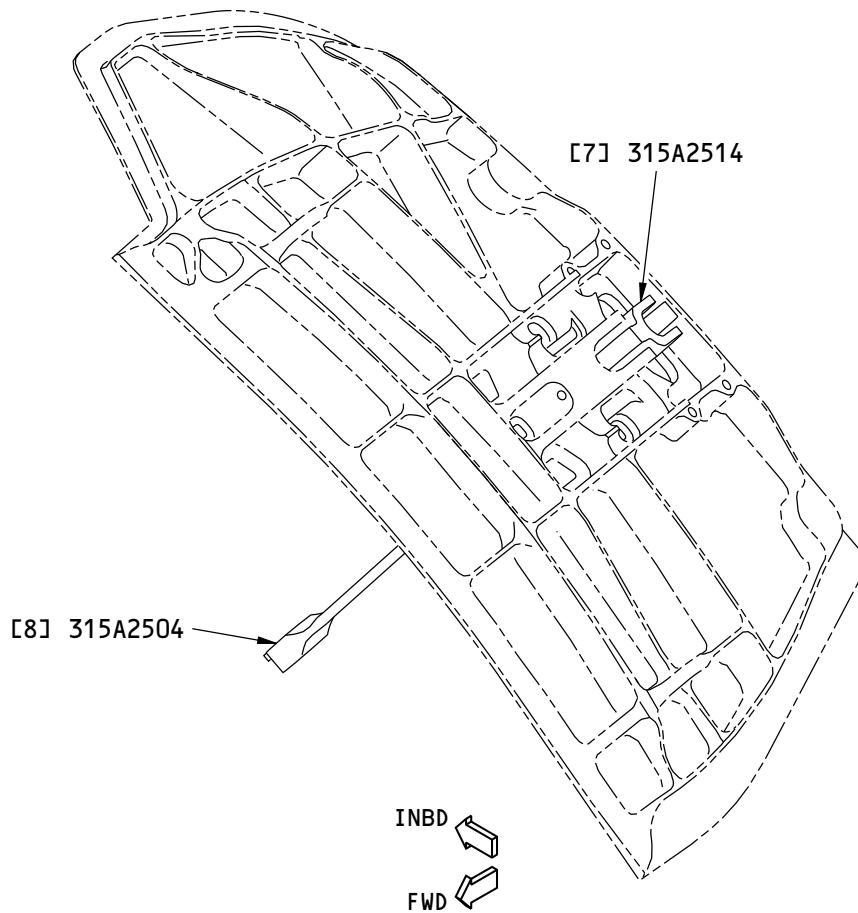
54-30-90
IDENTIFICATION 1
Page 4
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



ALUMINUM BLOCKER DOOR
FITTINGS ON THE UPPER END BLOCKER DOOR ARE SHOWN,
FITTINGS ON ALL ALUMINUM BLOCKER DOORS ARE THE SAME

VIEW IS ON THE NON-AERODYNAMIC SURFACE

B

2324843 S0000526897_V1

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 3 of 5)

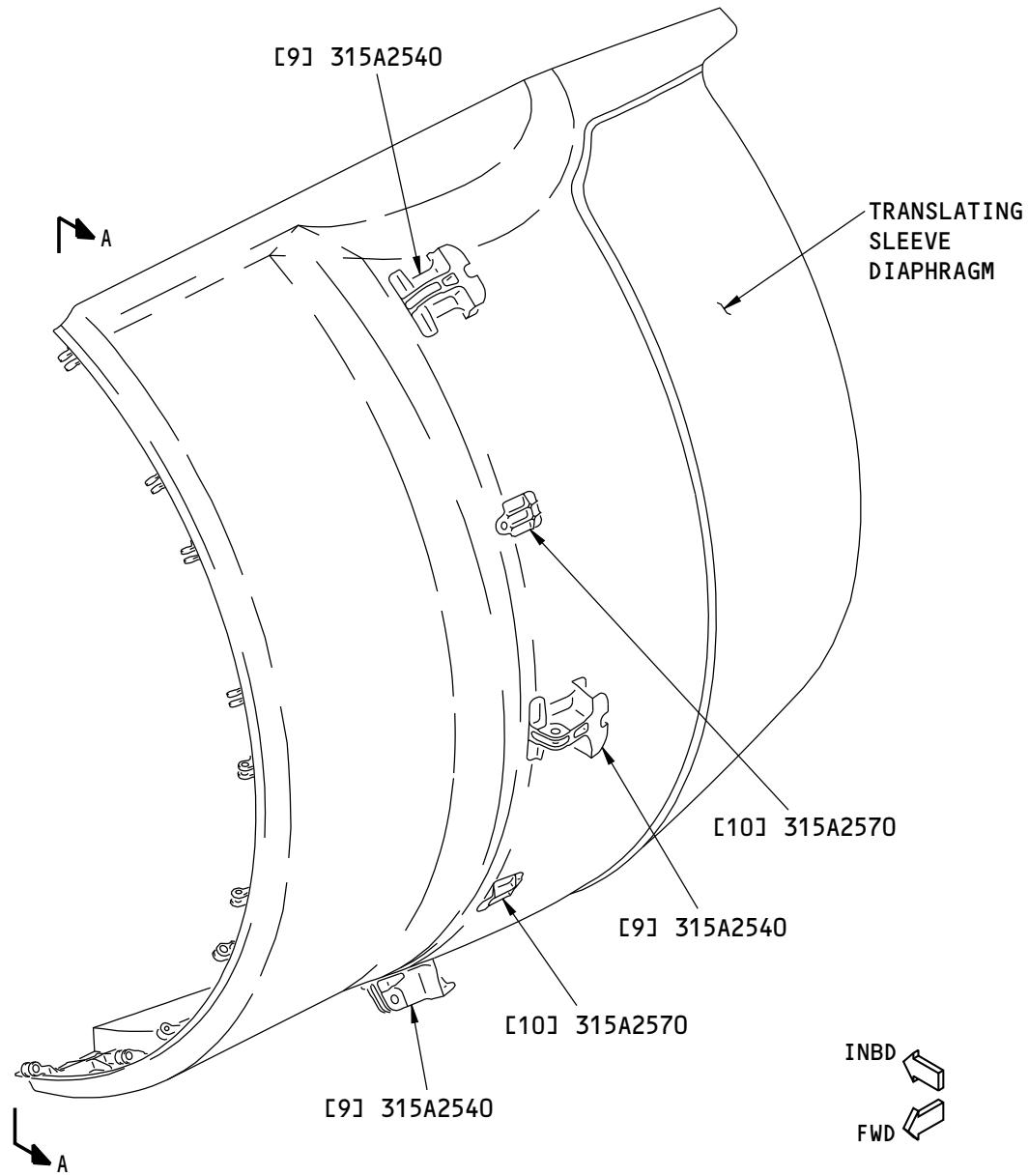
54-30-90
IDENTIFICATION 1
Page 5
Nov 10/2014

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737-800
STRUCTURAL REPAIR MANUAL



LEFT TRANSLATING SLEEVE DIAPHRAGM IS SHOWN,
RIGHT TRANSLATING SLEEVE DIAPHRAGM IS OPPOSITE

C

F31901 S0006592040_V2

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 4 of 5)

54-30-90

IDENTIFICATION 1

Page 6

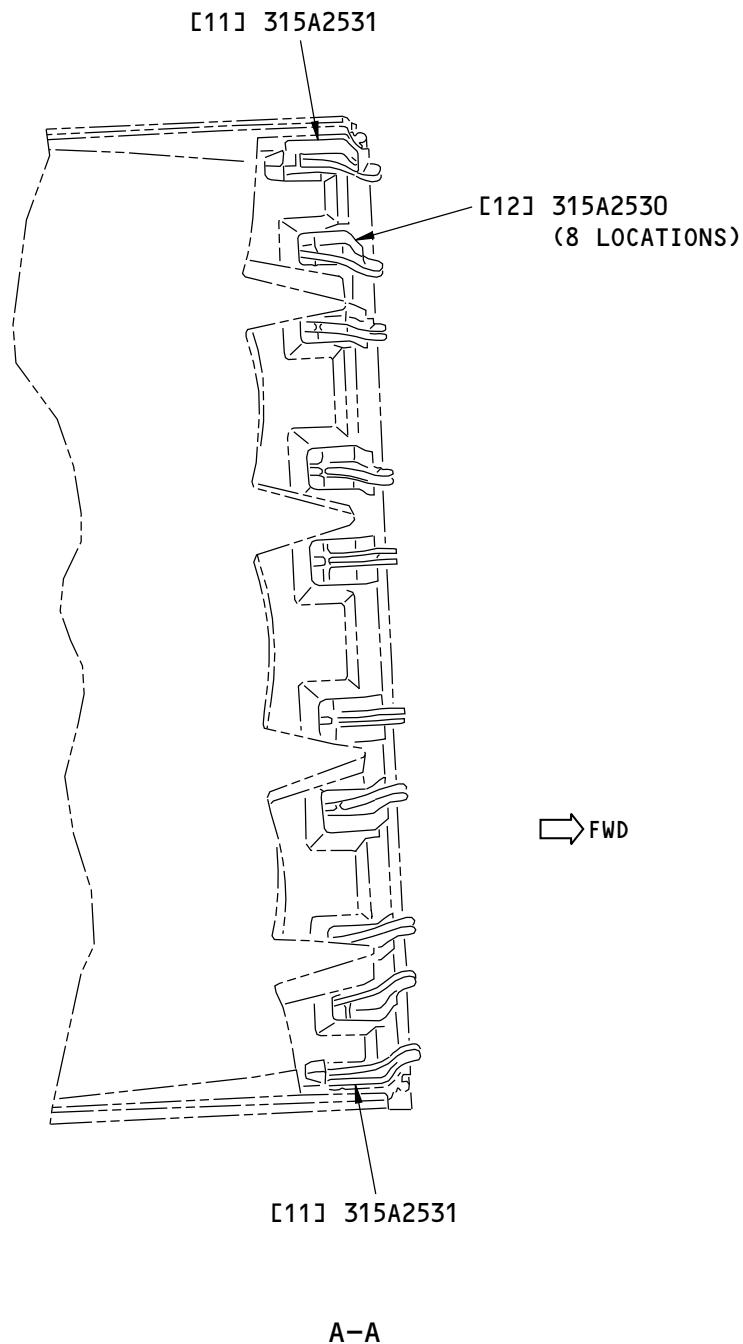
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737-800
STRUCTURAL REPAIR MANUAL



H13980 S0006592041_V1

Thrust Reverser Translating Sleeve Fitting Identification
Figure 3 (Sheet 5 of 5)

54-30-90
IDENTIFICATION 1
Page 7
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Auxiliary Track Slider Attach Fitting	3.4 (86.4)	7050-T7451 aluminum plate as given in BMS 7-323, (Optional: 7075-O1 forged aluminum block as given in BMS 7-186, heat treated to -T73 as given in BAC5602 after rough machining all section thicknesses to less than 3 inches)	
[2]	Auxiliary Track Slider	0.750 (19.1)	15-5PH CRES bar as given in AMS 5659, heat treated to 150-170 ksi as given in BAC5619 (Optional: 15-5PH CRES plate as given in BMS 7-240, Type I)	
[3]	Lower Auxiliary Track Slider Attach Fitting	2.5 (63.5)	7075-T7451 aluminum plate as given in AMS 4050 (Optional: 7075-O1 forged aluminum block as given in BMS 7-186, heat treated to -T73 as given in BAC5602 after rough machining all section thicknesses to 3 inches or less)	
[4]	Main Track Slider Shoe	0.500 (12.7)	2024-T8511 extruded bar as given in QQ-A-200/3	
[5]	Hinge Fitting		7075-T73 die forging as given in BMS 7-186	Line Number 1 thru 4299
[6]	Link Attach Fitting		7075-T73 die forging as given in BMS 7-186	Line Number 1 thru 4299
[7]	Control Link	0.9 (22.9)	7075-T7351 bar as given in QQ-A-225/9	
[8]	Drag Link	0.50 (12.7)	15-5PH CRES bar as given in AMS 5659, heat treated to 150-170 ksi as given in BAC5619	
[9]	Actuator Attach Fitting	3.0 (76.2)	7075-T7451 aluminum plate as given in AMS 4050 (Optional: 7075-T73 forged aluminum block as given in BMS 7-186)	
[10]	Deactivation Fitting	1.00 (25.40)	7075-T7351 machined plate as given in QQ-A-250/12 (Optional: 7075-T73 forged block as given in BMS 7-186)	
[11]	End Diaphragm Hinge Fitting (2)		7075-T73 forged aluminum bar as given in BMS 7-186	
[12]	Common Diaphragm Hinge Fitting (8)		7075-T73 die forging as given in BMS 7-186	

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

54-30-90

IDENTIFICATION 1

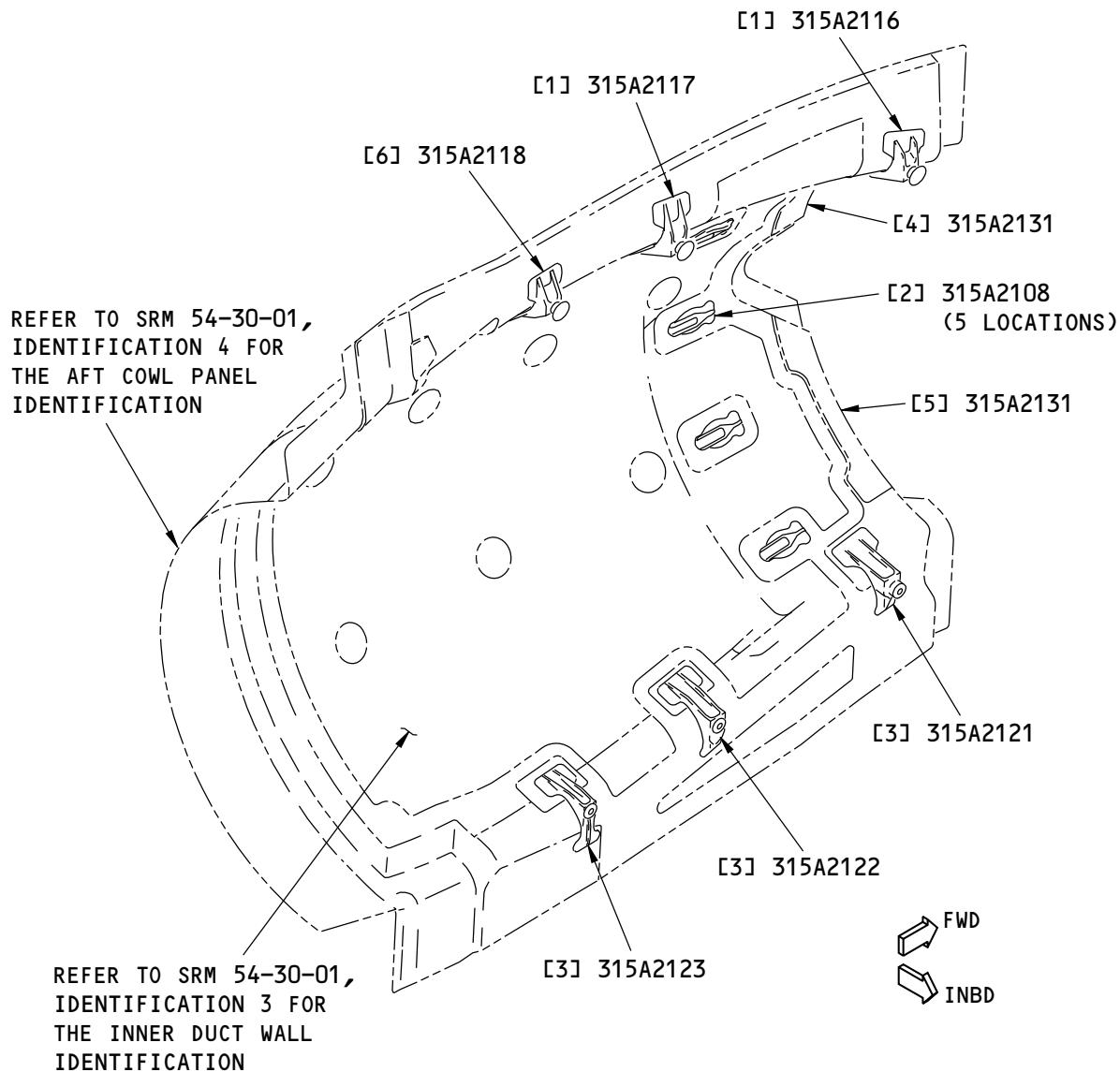
Page 8

Nov 10/2014

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737-800
STRUCTURAL REPAIR MANUAL



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

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F32343 S0006592043_V2

Thrust Reverser Inner Duct Wall Fitting Identification
Figure 4

54-30-90
IDENTIFICATION 1
Page 9
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Compression Pad		7075-T73 precision forging as given in BMS 7-186	
[2]	Drag Link Anchor Fitting		7075-T73 precision forging as given in BMS 7-186	
[3]	Lower Compression Pad		7075-T73 precision forging as given in BMS 7-186 (Optional: 7075-O1 forged aluminum block as given in BMS 7-186, heat treated to -T73 as given in BAC5602 after rough machining all section thicknesses to less than 3 inches)	
[4]	Upper Inner V-Blade Fitting		7075-T73 forged ring as given in BMS 7-186	
[5]	Lower Inner V-Blade Fitting		7075-T73 forged ring as given in BMS 7-186	
[6]	Upper Compression Pad		7075-T73 precision forging as given in BMS 7-186 (Optional: 7075-O1 as given in BMS 7-186 heat treated to -T73 as given in BAC5602) Ti-6Al-2Sn-4Zr-2Mo bar as given in AMS6905, in the duplex annealed condition 7075-T73 precision forging as given in BMS 7-186 (Optional: 7075-O1 as given in BMS 7-186 heat treated to -T73 as given in BAC5602) (Optional: Ti-6Al-2Sn-4Zr-2Mo bar as given in AMS-T-9047, in the duplex annealed condition)	Line Number 1 thru 1455 Line Number 1456 thru 3156 Line Number 3157 and on

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

54-30-90

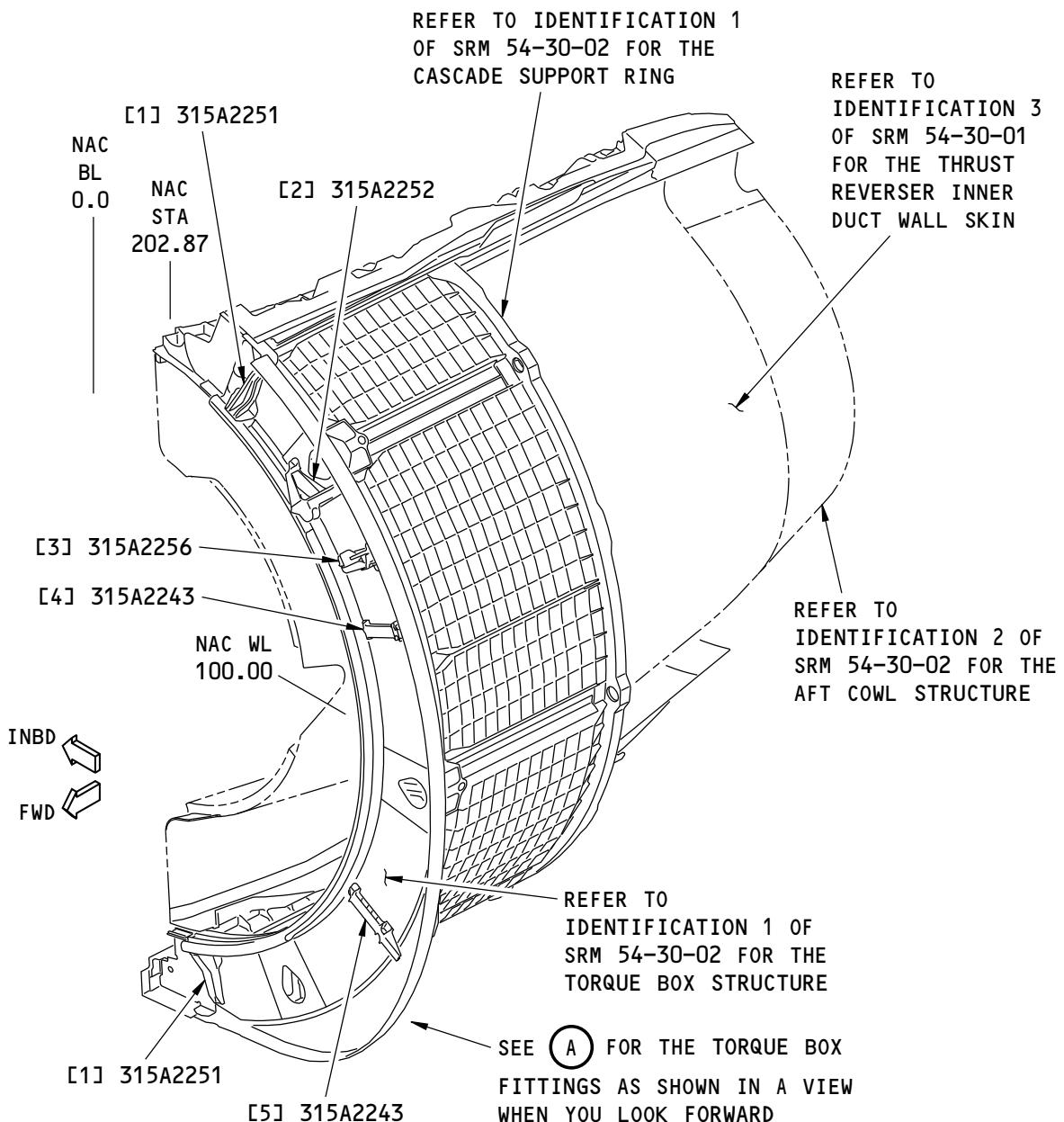
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Page 10

Nov 10/2014

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE

NOTES

- REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

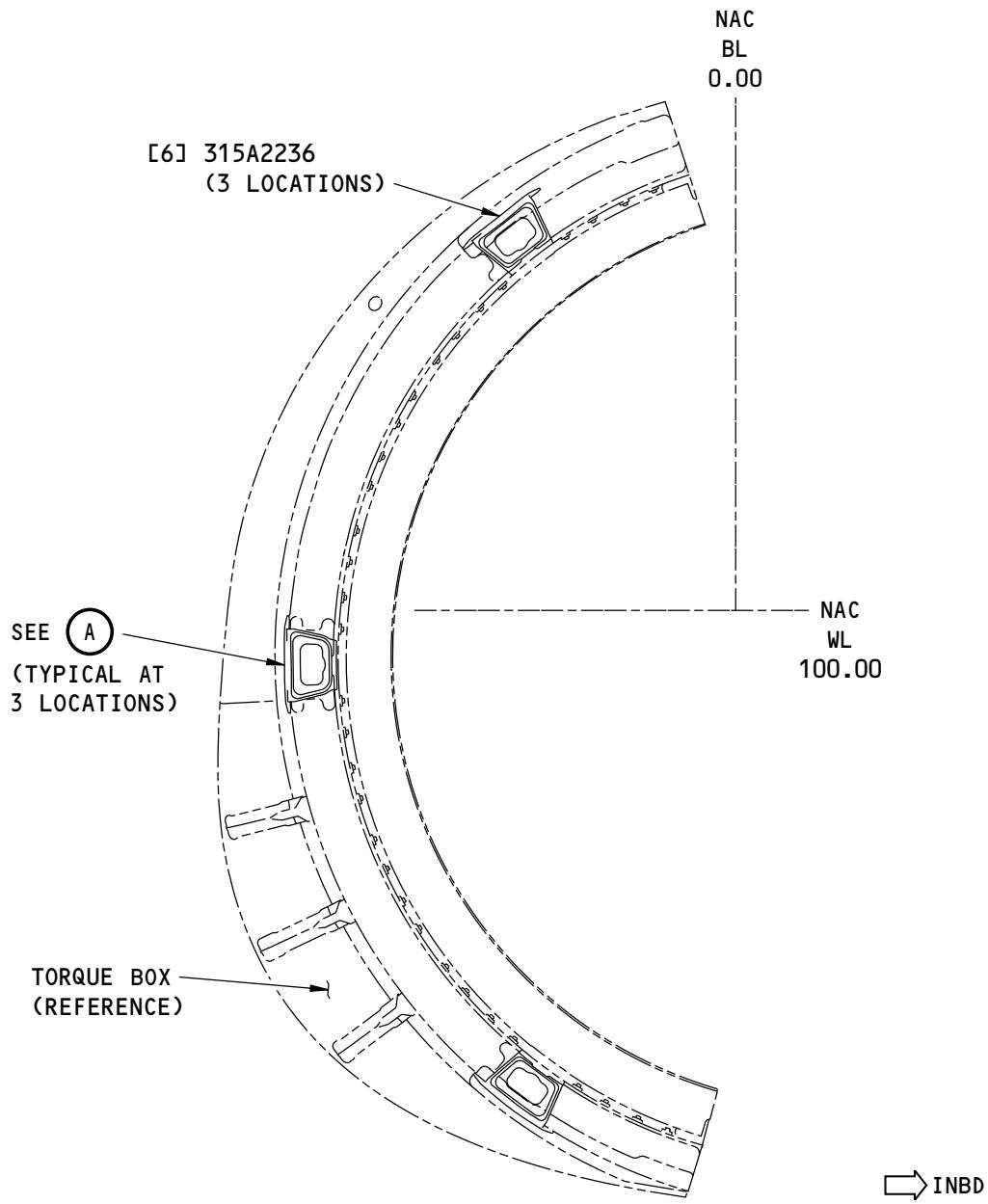
G93056 S0006592045_V2

**Thrust Reverser Torque Box Fittings
Figure 5 (Sheet 1 of 3)**

54-30-90
IDENTIFICATION 1
Page 11
Nov 10/2014



737-800
STRUCTURAL REPAIR MANUAL



LEFT TORQUE BOX IS SHOWN, RIGHT TORQUE BOX IS OPPOSITE
VIEW WHEN YOU LOOK FORWARD

(A)

G93085 S0006592046_V2

Thrust Reverser Torque Box Fittings
Figure 5 (Sheet 2 of 3)

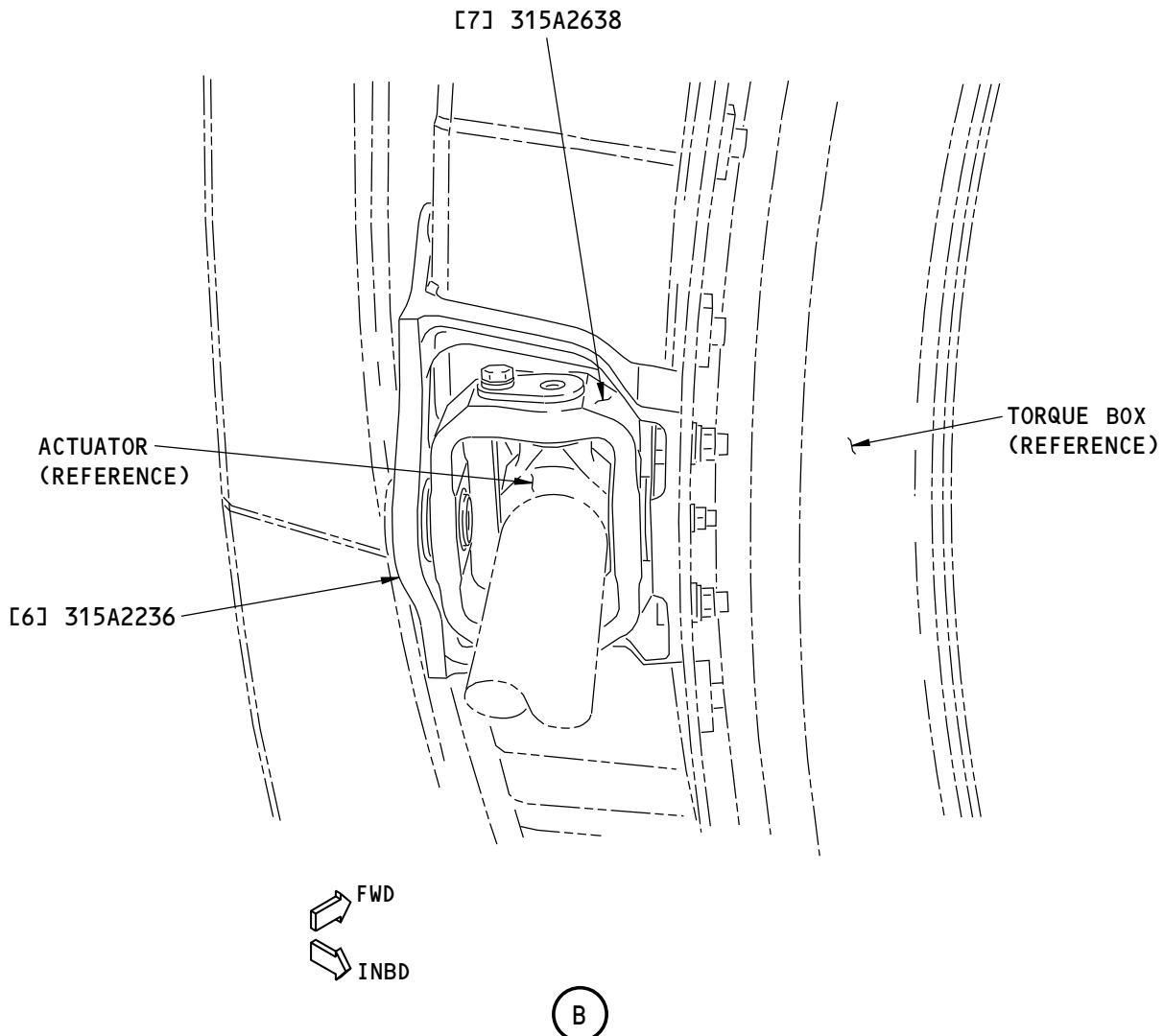
54-30-90
IDENTIFICATION 1
Page 12
Nov 10/2014

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737-800
STRUCTURAL REPAIR MANUAL



H14337 S0006592047_V2

Thrust Reverser Torque Box Fittings
Figure 5 (Sheet 3 of 3)

54-30-90
IDENTIFICATION 1
Page 13
Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

LIST OF MATERIALS FOR FIGURE 5				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	V-Blade Support Fitting (2)		7050-T7452 die forging as given in BMS 7-214 (Optional: 7050-T7451 plate as given in AMS 4050 that is 1.95 inches (49.5 mm) thick)	
[2]	Opening Actuator Fitting (3)	4.00 (101.6)	7050-T7452 forging as given in BMS 7-214	
[3]	Mount Sleeve - Stow Sensor		7075-T73 die forging as given in BMS 7-186	
[4]	Tube Support Fitting		7075-T73 forged block as given in BMS 7-186	
[5]	Tube Support Fitting	0.8 (20.32)	7075-T73 forged block as given in BMS 7-186 7050-T7451 plate as given in AMS 4050 (Optional: 7075-T73 forged block as given in BMS 7-186)	Line Number 1 thru 4926 Line Number 4927 and on
[6]	Actuator Attach Fitting (3)	4.00 (101.6)	15-5PH bar as given in AMS 5659	
[7]	Gimbal Ring (3)		Ti-6Al-4V forged titanium bar as given in MIL-T-9047, in the annealed condition	

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

54-30-90

IDENTIFICATION 1

Page 14

Nov 10/2014

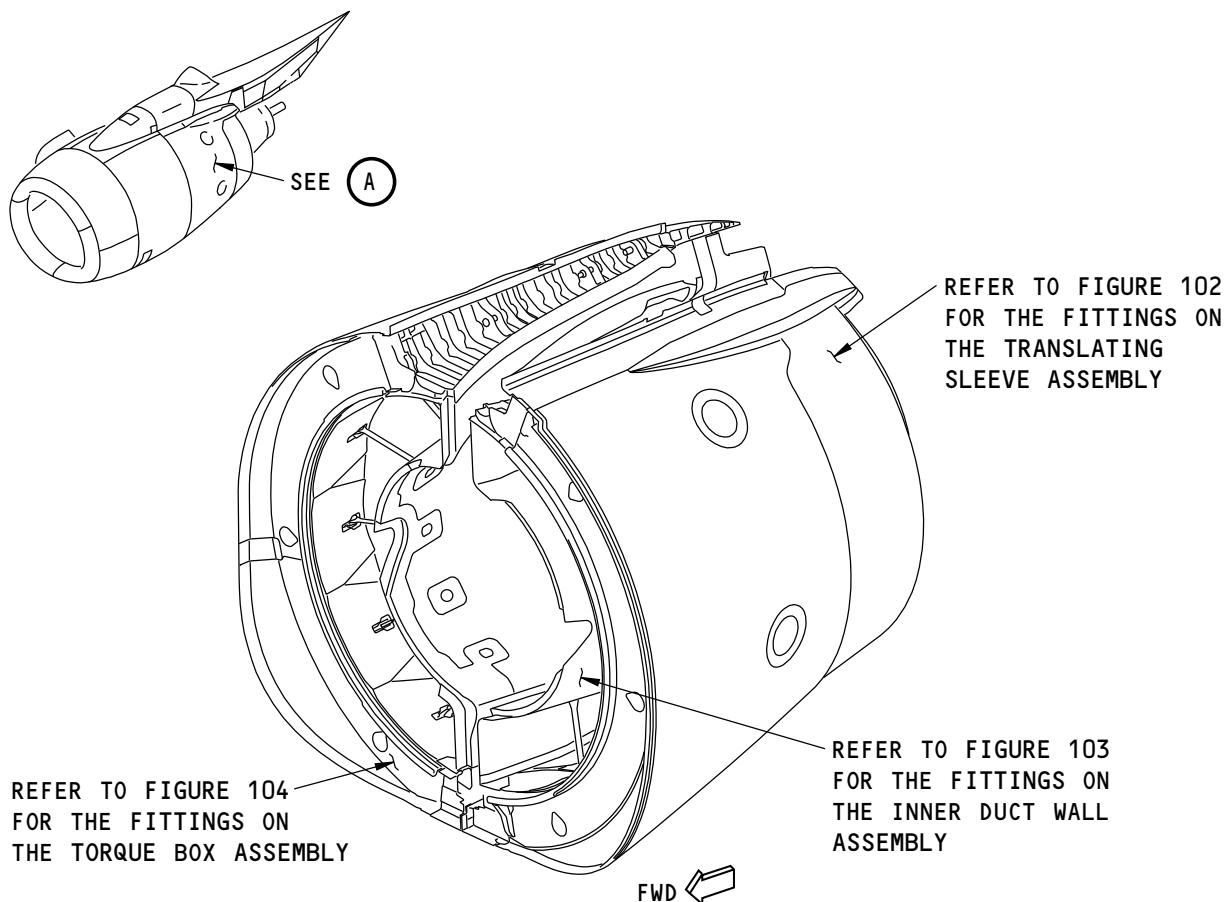
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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - THRUST REVERSER FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the fittings on the thrust reverser assemblies shown in Thrust Reverser Fittings Location, Figure 101/ALLOWABLE DAMAGE 1.



LEFT THRUST REVERSER ASSEMBLY IS SHOWN,
 RIGHT THRUST REVERSER ASSEMBLY IS OPPOSITE

(A)

Thrust Reverser Fittings Location
Figure 101

G65689 S0006592051_V1

54-30-90

ALLOWABLE DAMAGE 1

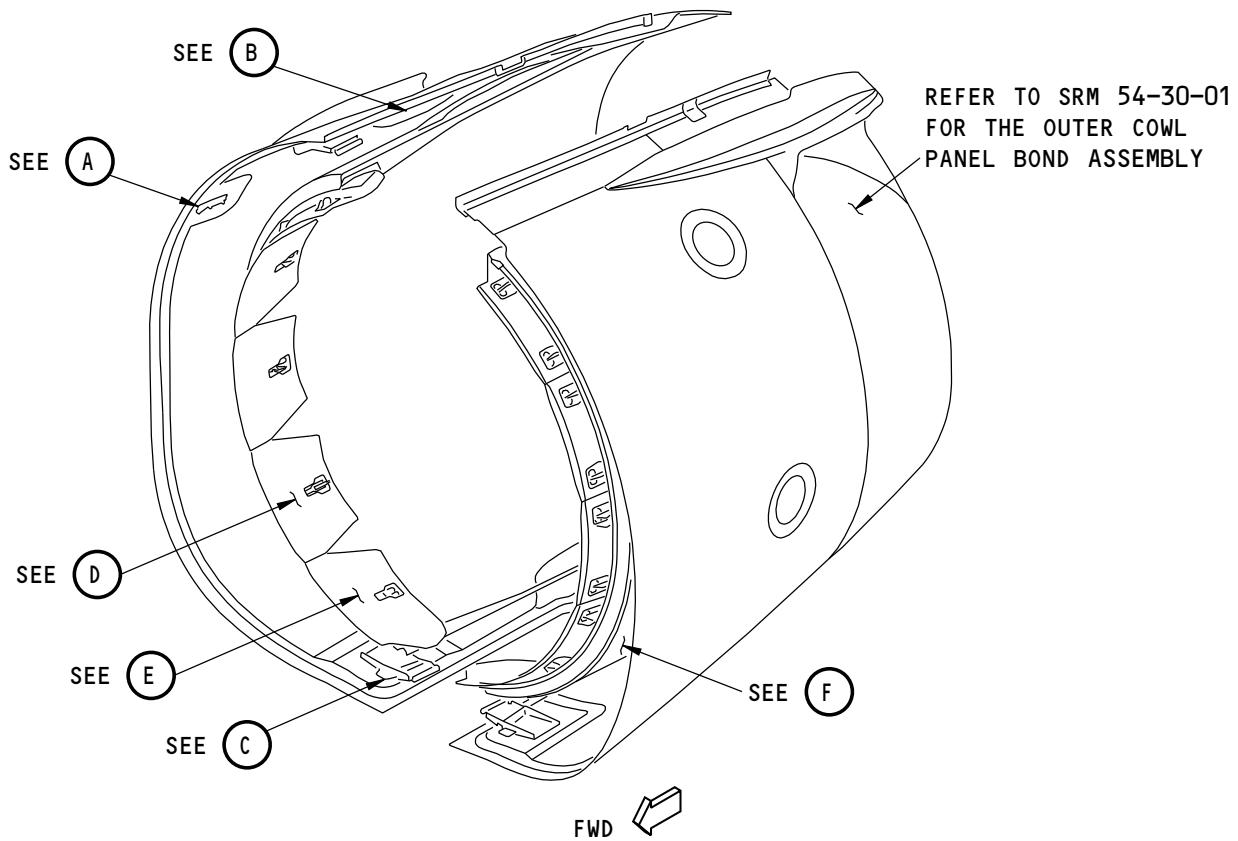
Page 101

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



G65717 S0006592052_V1

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 1 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 102

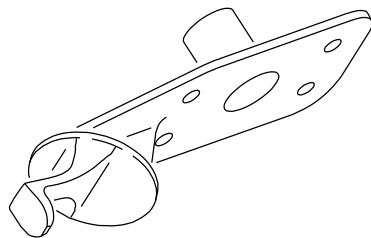
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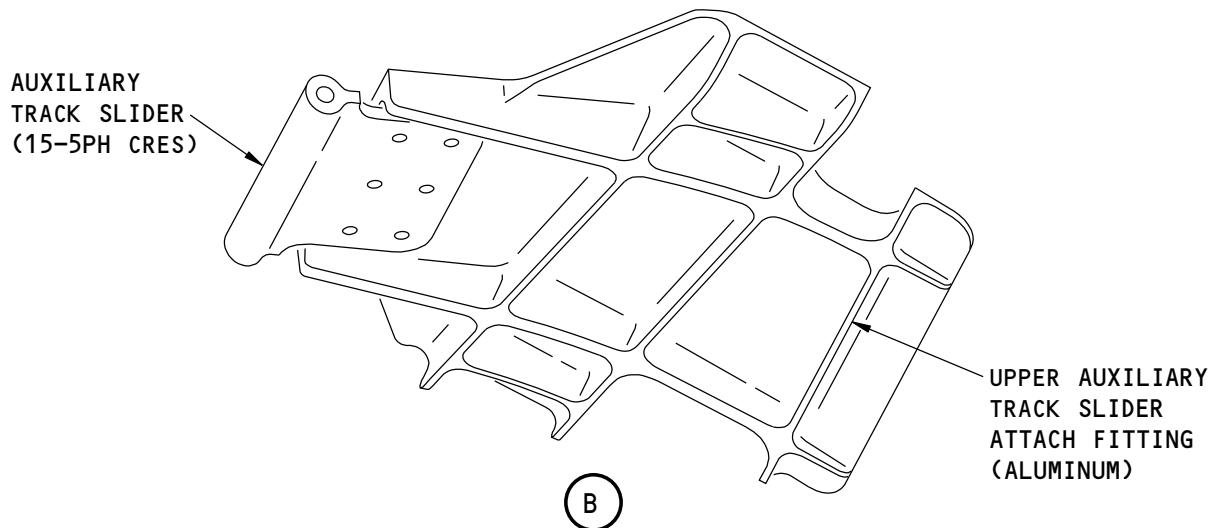


737-800
STRUCTURAL REPAIR MANUAL

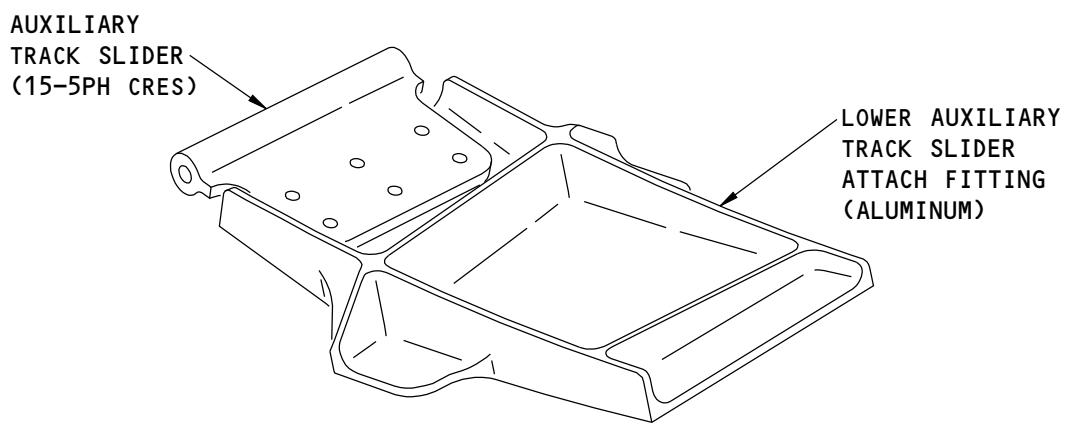


PLUNGER FITTING
(TITANIUM)

A



B



C

G65727 S0006592053_V1

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 2 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 103

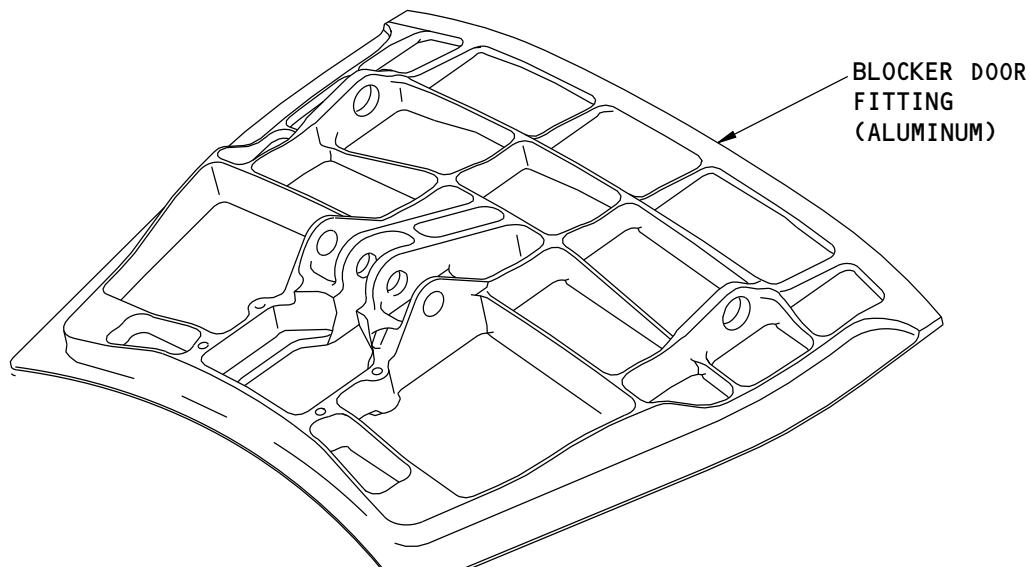
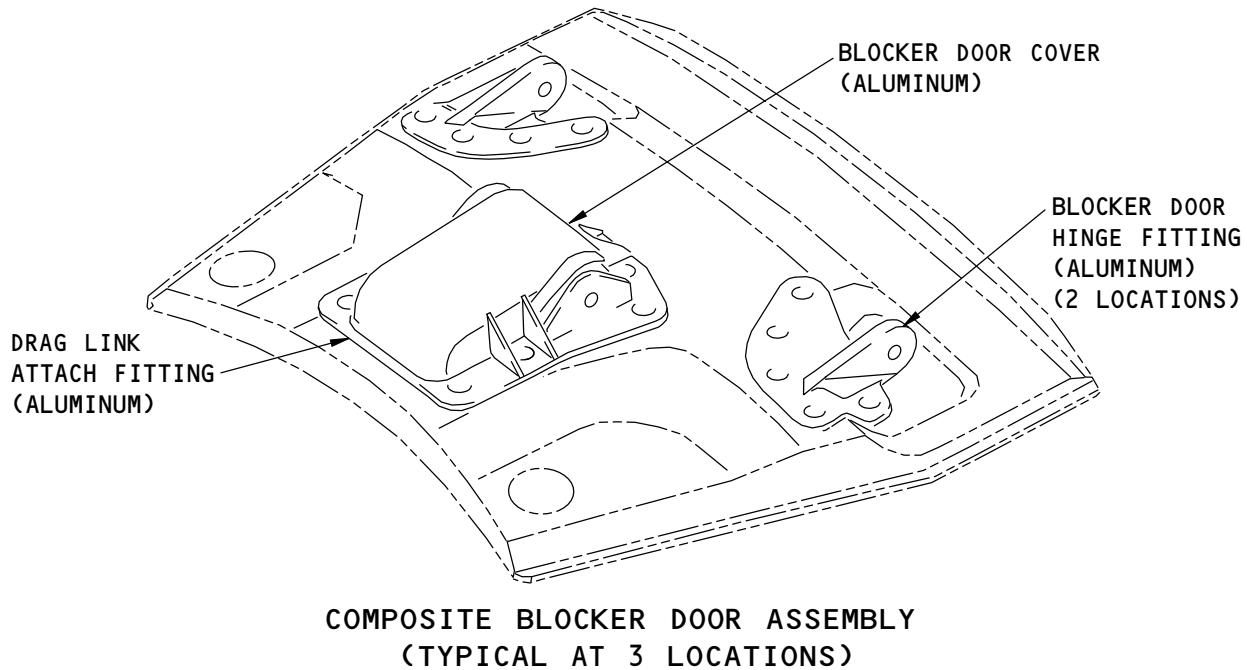
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737-800
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ALUMINUM BLOCKER DOOR ASSEMBLY (TYPICAL AT 3 LOCATIONS)

D

G65763 S0006592054_V3

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 3 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 104

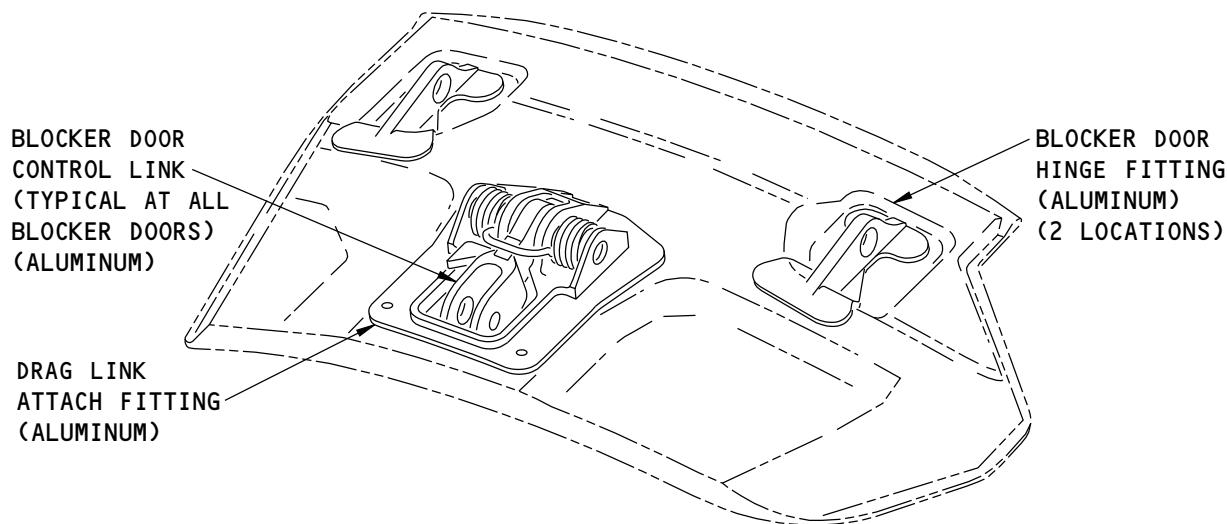
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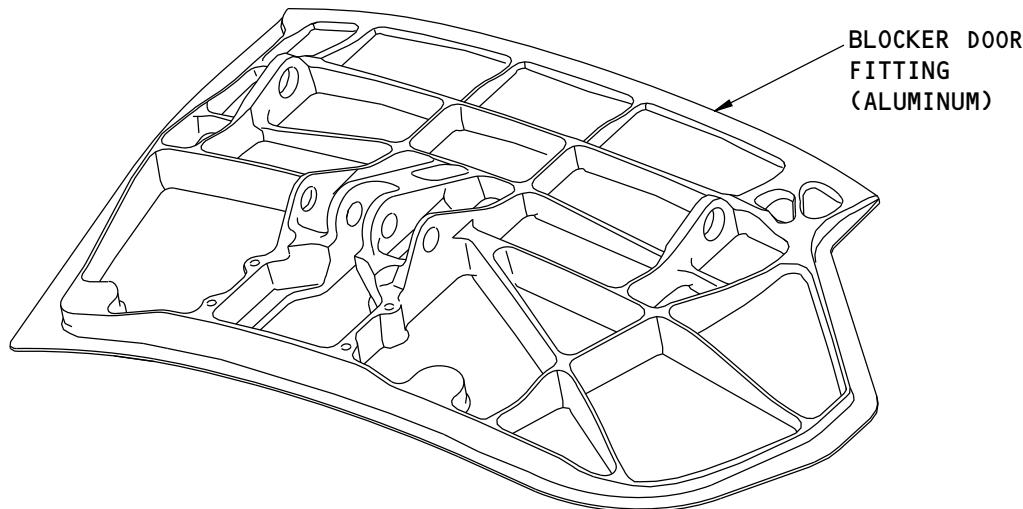
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737-800
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COMPOSITE END BLOCKER DOOR ASSEMBLY
(COVER REMOVED)
(TYPICAL AT 2 LOCATIONS)



ALUMINUM END BLOCKER DOOR ASSEMBLY
(TYPICAL AT 2 LOCATIONS)

E

2456392 S0000570442_V1

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 4 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 105

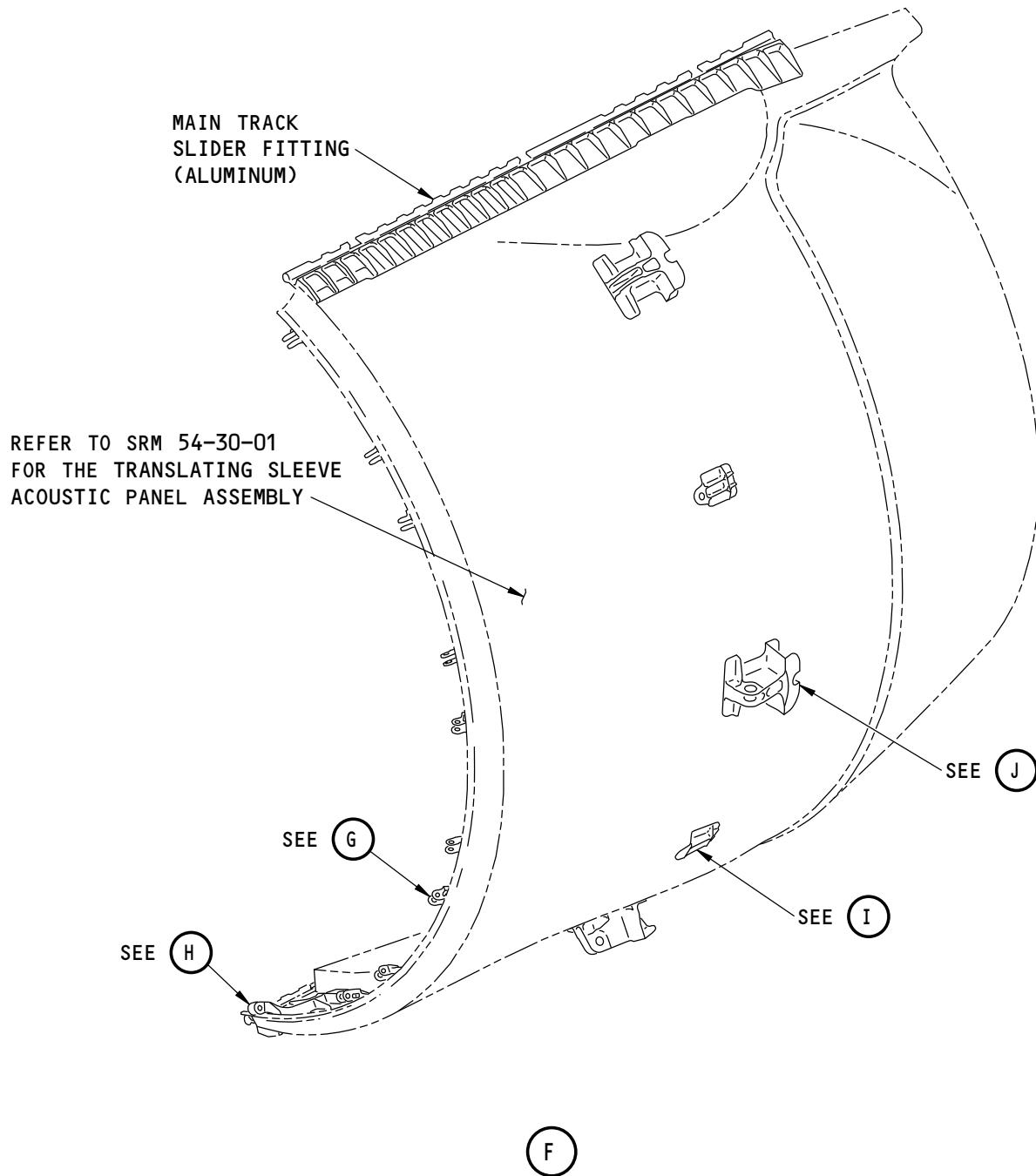
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737-800
STRUCTURAL REPAIR MANUAL



G65777 S0006592055_V1

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 5 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 106

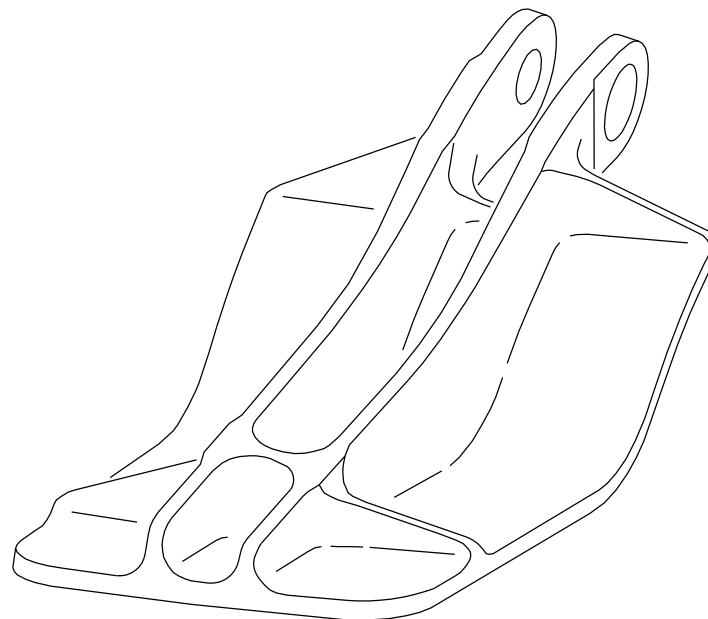
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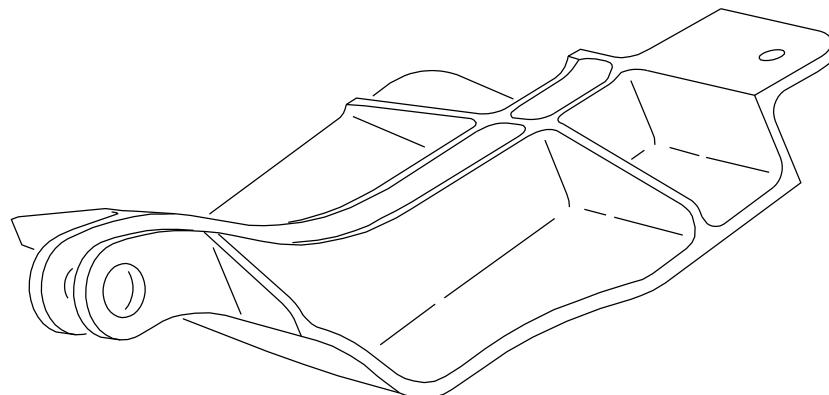


737-800
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COMMON DIAPHRAGM HINGE FITTING
(ALUMINUM)
(8 LOCATIONS)

(G)



END DIAPHRAGM HINGE FITTING
(ALUMINUM)
(2 LOCATIONS)

(H)

G65786 S0006592056_V1

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 6 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 107

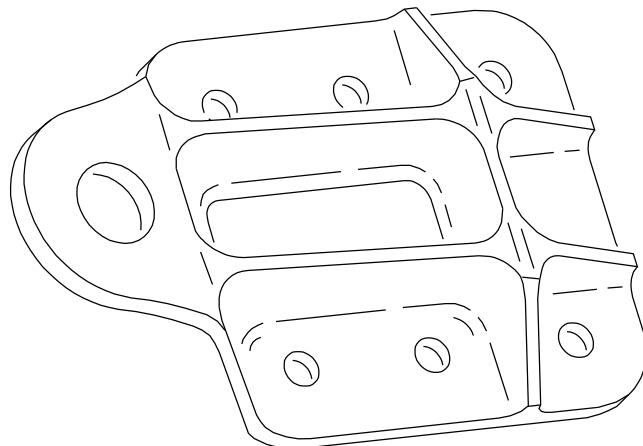
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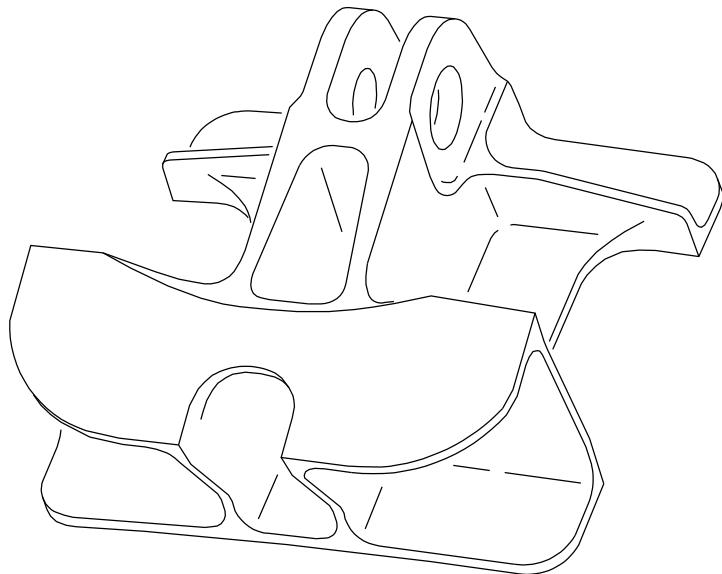


737-800
STRUCTURAL REPAIR MANUAL



**DEACTIVATION FITTING
(ALUMINUM)
(2 LOCATIONS)**

I



**ACTUATOR ATTACH FITTING
(ALUMINUM)
(3 LOCATIONS)**

J

G65802 S0006592057_V1

Thrust Reverser Translating Sleeve Fittings
Figure 102 (Sheet 7 of 7)

54-30-90

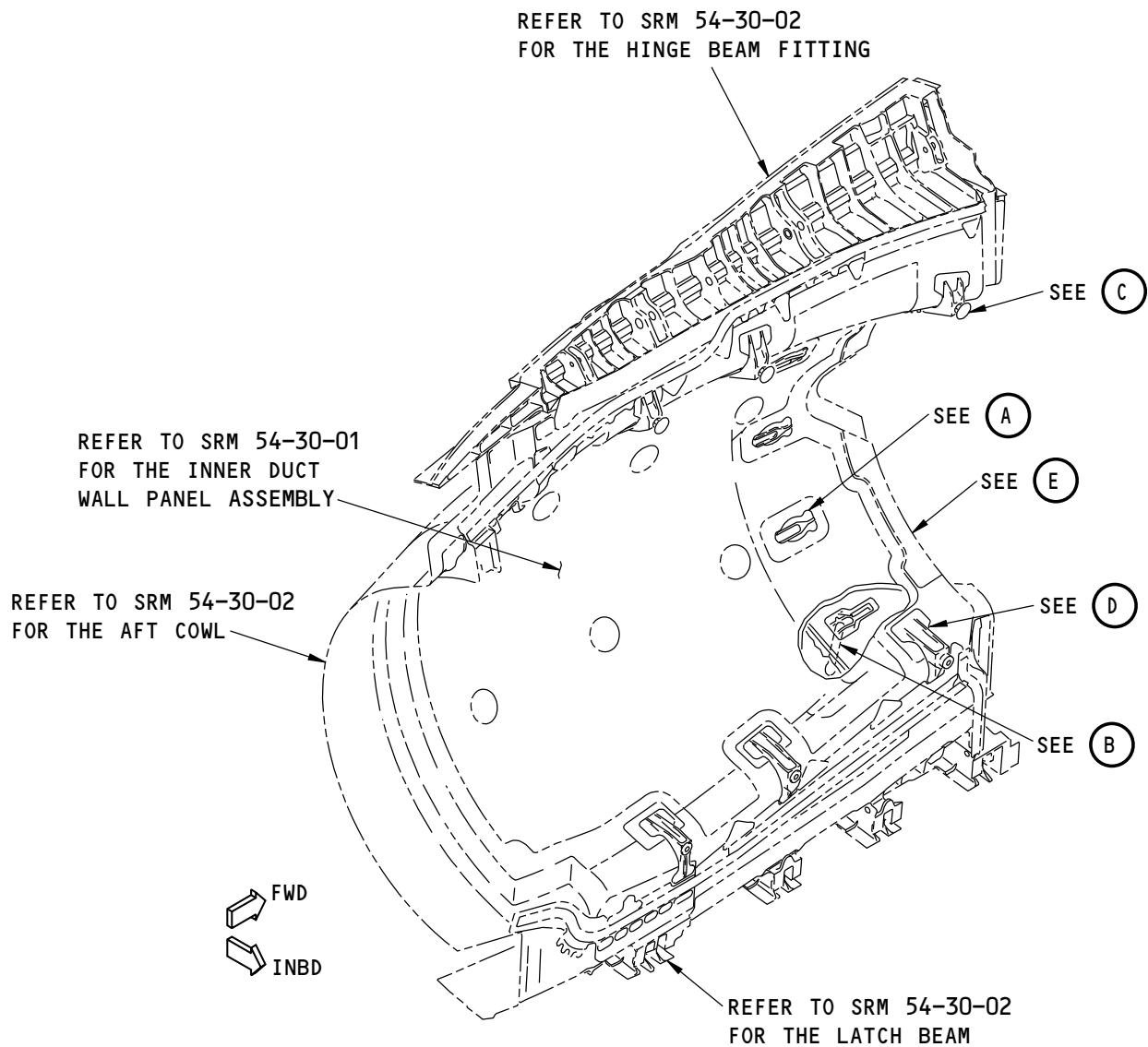
ALLOWABLE DAMAGE 1

Page 108

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

G65850 S0006592058_V1

Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 1 of 4)

54-30-90**ALLOWABLE DAMAGE 1**

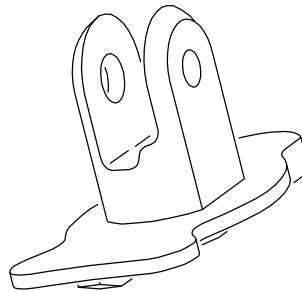
Page 109

Nov 10/2015

D634A210

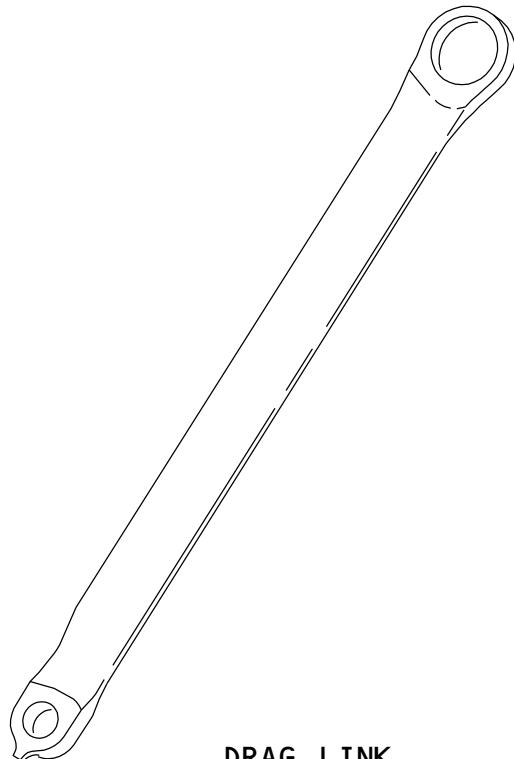


737-800
STRUCTURAL REPAIR MANUAL



DRAG LINK ANCHOR FITTING
(ALUMINUM)
(TYPICAL AT 5 LOCATIONS)

(A)



DRAG LINK
(15-5PH CRES)
(TYPICAL AT 5 LOCATIONS)

(B)

G65843 S0006592059_V1

Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 2 of 4)

54-30-90

ALLOWABLE DAMAGE 1

Page 110

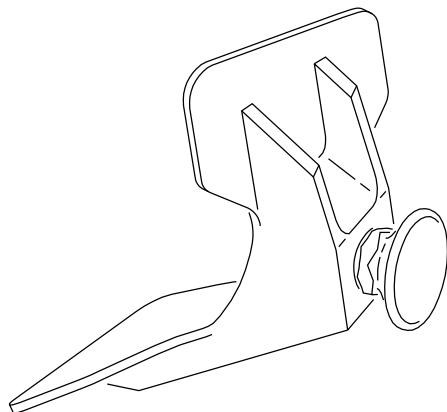
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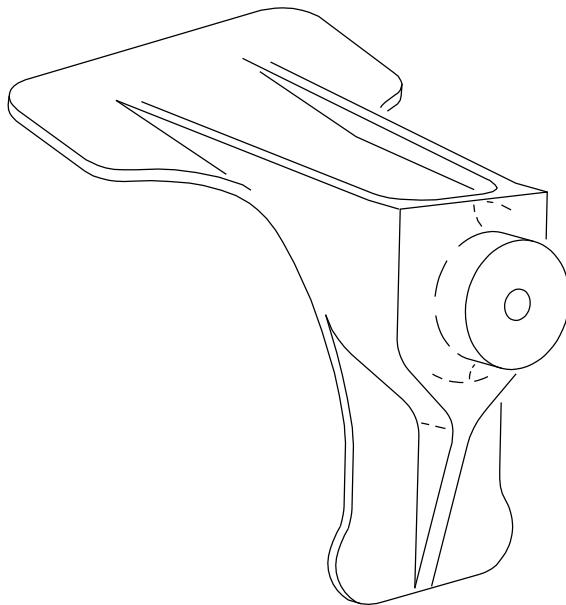


737-800
STRUCTURAL REPAIR MANUAL



UPPER FORWARD COMPRESSION PAD IS SHOWN, (ALUMINUM)
(THE UPPER CENTER AND REAR COMPRESSION
PADS ARE SIMILAR, REAR COMPRESSION PAD HAS TITANIUM OPTION)

(C)



LOWER FORWARD COMPRESSION PAD IS SHOWN, (ALUMINUM)
(THE LOWER CENTER AND REAR COMPRESSION
PADS ARE SIMILAR)

(D)

G65842 S0006592060_V2

Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 3 of 4)

54-30-90

ALLOWABLE DAMAGE 1

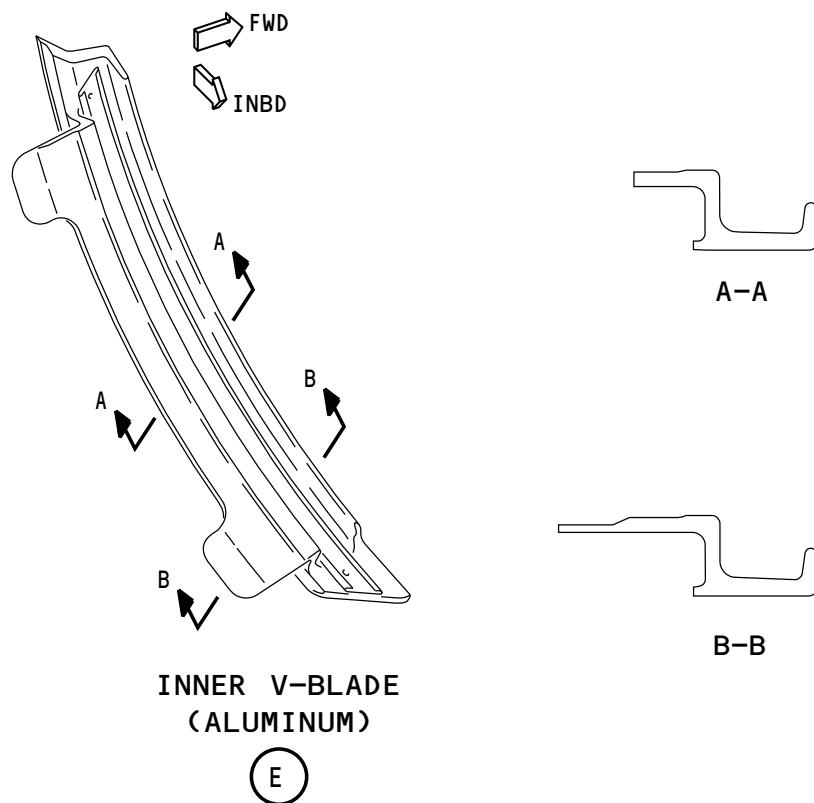
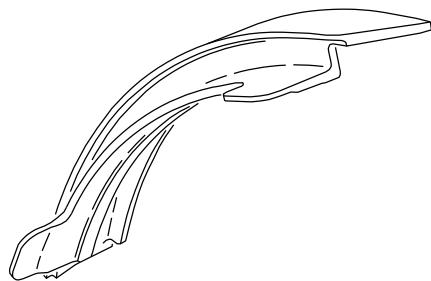
Page 111

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL



G65967 S0006592061_V1

Thrust Reverser Inner Duct Wall Fittings
Figure 103 (Sheet 4 of 4)

54-30-90

ALLOWABLE DAMAGE 1

Page 112

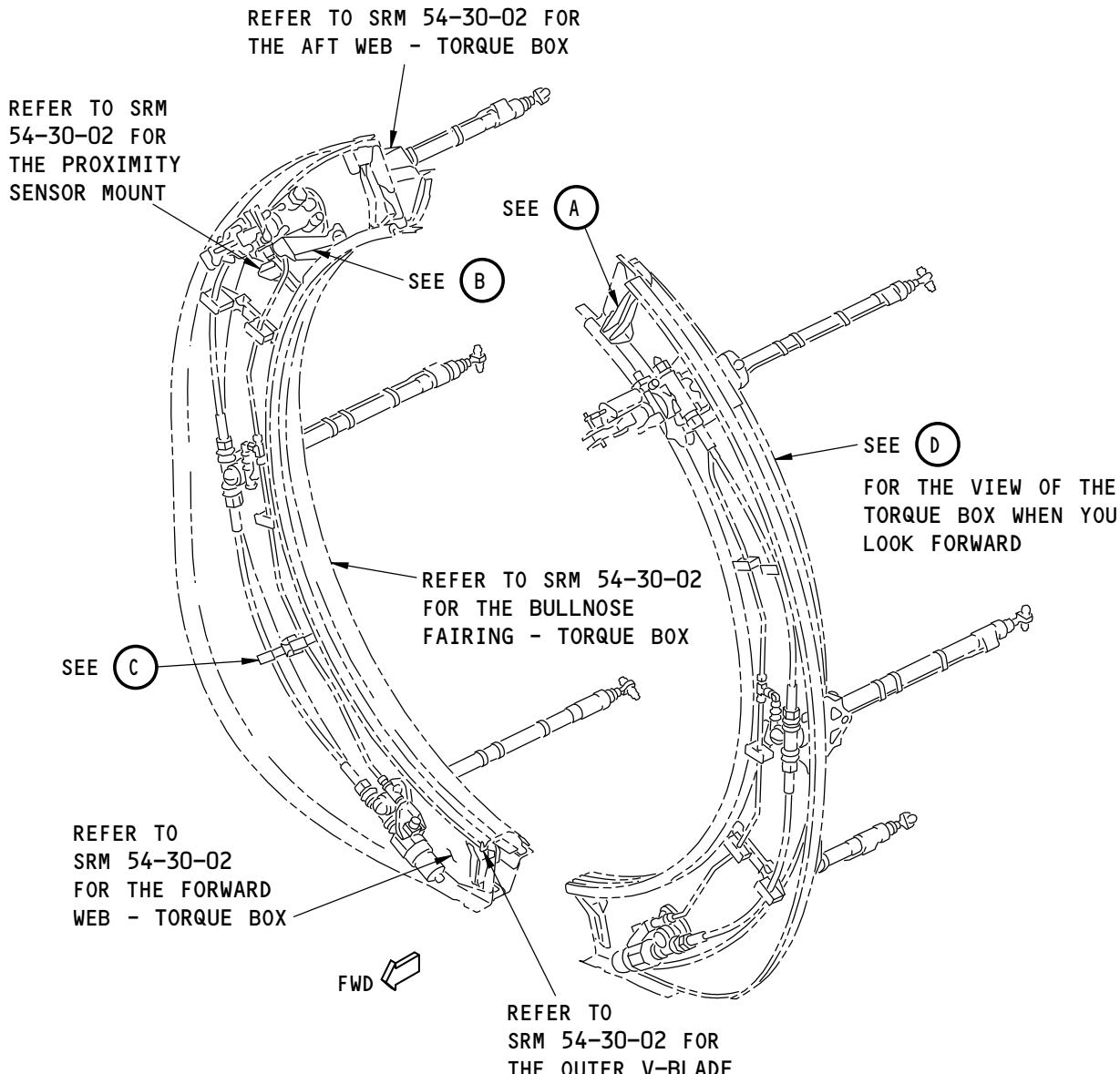
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737-800
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THE VIEW WHEN YOU LOOK TO THE REAR

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Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 1 of 5)

54-30-90

ALLOWABLE DAMAGE 1

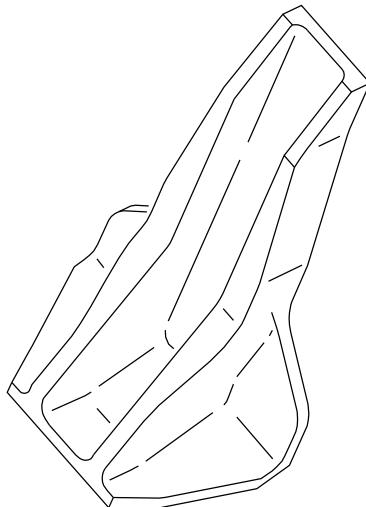
Page 113

Nov 10/2015

D634A210

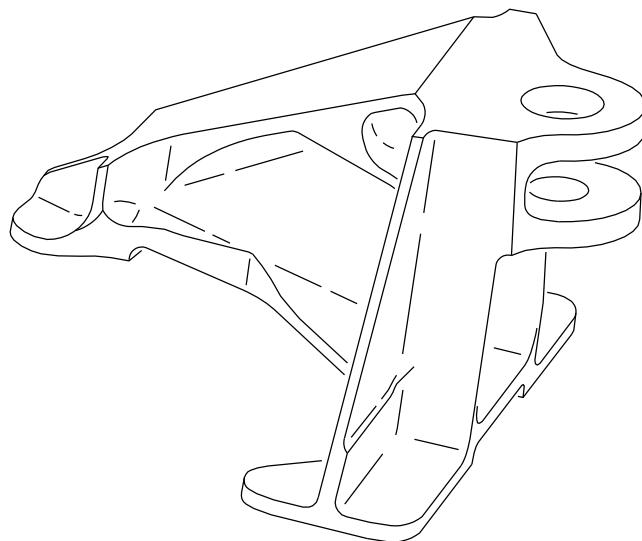


737-800
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OUTER V-BLADE SUPPORT FITTING
(ALUMINUM)

(A)



ATTACH FITTING - THRUST REVERSER
OPENING ACTUATOR
(ALUMINUM)

(B)

G65998 S0006592063_V1

Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 2 of 5)

54-30-90

ALLOWABLE DAMAGE 1

Page 114

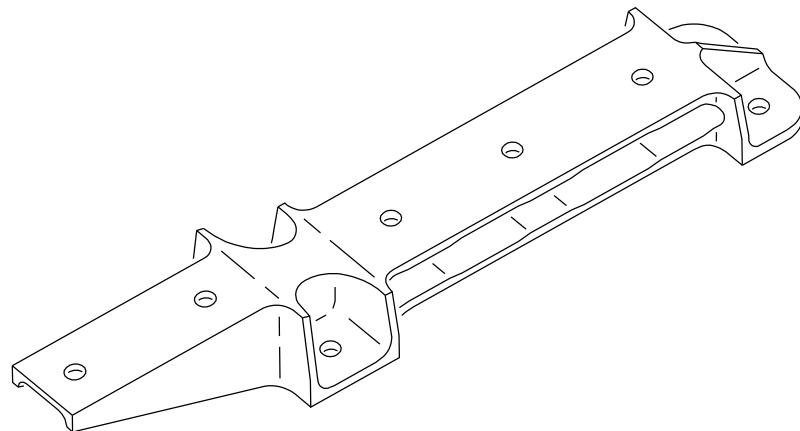
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737-800
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TUBE SUPPORT FITTINGS
(ALUMINUM)

(C)

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Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 3 of 5)

54-30-90

ALLOWABLE DAMAGE 1

Page 115

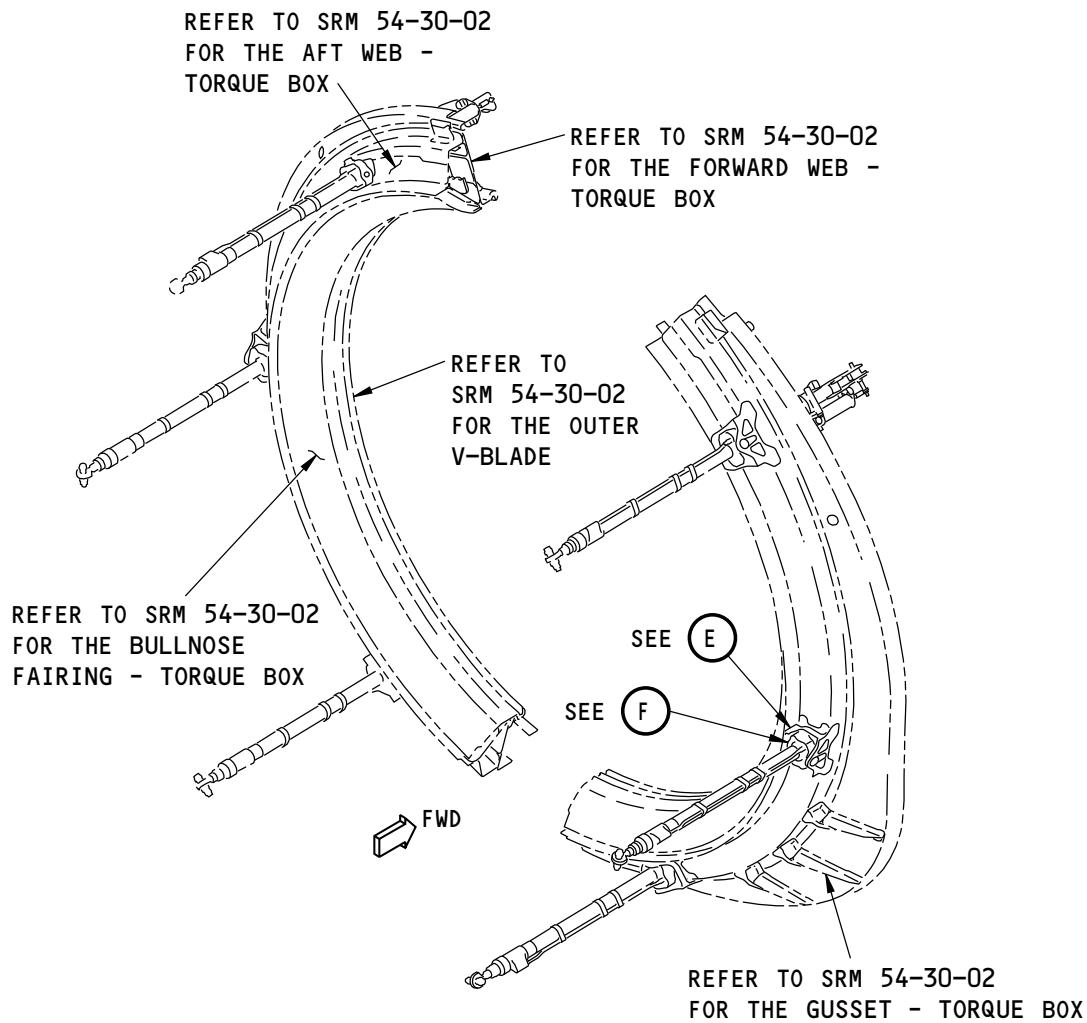
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737-800
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VIEW WHEN YOU LOOK FORWARD

(D)

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Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 4 of 5)

54-30-90

ALLOWABLE DAMAGE 1

Page 116

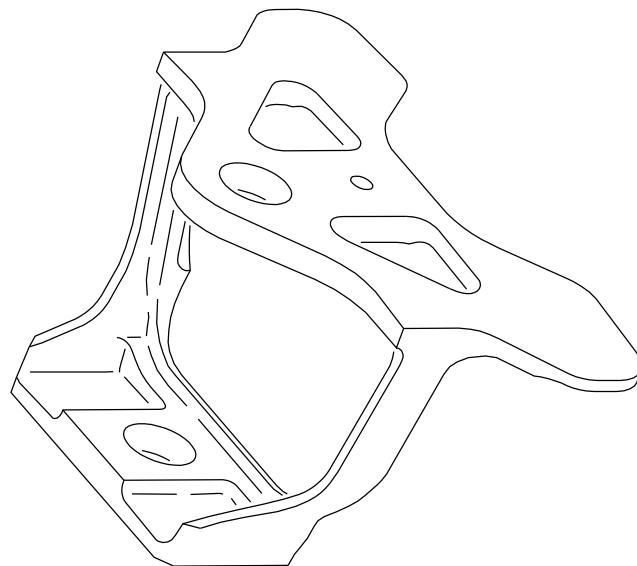
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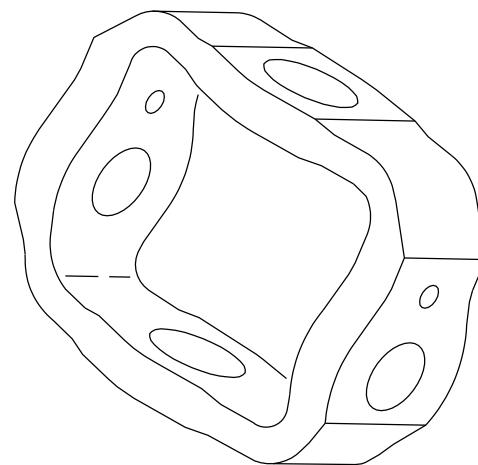


737-800
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**ACTUATOR FITTING
(15-5PH CRES)**

E



**GIMBAL RING
(TITANIUM)**

F

G66020 S0006592066_V2

Thrust Reverser Torque Box Assembly Fittings
Figure 104 (Sheet 5 of 5)

54-30-90

ALLOWABLE DAMAGE 1

Page 117

D634A210

Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL

2. General

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

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA		
SUBJECT	PARAGRAPH	FIGURE NO.
Translating Sleeve Outer Cowl Panel Fittings - Auxiliary Track Slider Fittings, and Upper/Lower Auxiliary Track Slider Attach Fittings, and Plunger Fitting	4.A	102
Translating Sleeve Diaphragm Fittings - Main Track Slider Fittings, Diaphragm Hinge Fittings, Deactivation Fittings, and Actuator Attach Fittings	4.A	102
Translating Sleeve Blocker Door Fittings - Control Links, Drag Link Attach Fittings, Hinge Fittings, Blocker Door Fittings, and Blocker Door Covers	4.A	102
Inner Duct Wall Fittings - Drag Link Anchor Fittings, Drag Links, Compression Pads, and Inner V-Blade	4.B	103
Torque Box Fittings - V-Blade Support Fittings, Opening Actuator Fittings, Tube Support Fittings, Actuator Fittings, and Gimbal Rings	4.C	104

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

- 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 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 (0.003 mm) Ra or better on the reworked areas.
 - (5) Refer to SOPM 20-20-02 for the penetrant inspection procedures.
 - (6) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.

- C. After the damage is removed, 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 all fittings.

NOTE: The flap peen or shot peen procedures do not include:

- Translating Sleeve Common Diaphragm Fittings
- Inner Duct Wall Fittings
- Compression Pads
- Torque Box Fittings.

- (a) Refer to 51-20-06 for shot peen intensity and shot number.

54-30-90

ALLOWABLE DAMAGE 1

Page 118

Nov 10/2015

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

- (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 aluminum parts. Refer to 51-20-01.
 - (3) Apply 2 layers of BMS 10-11, Type I primer to the surfaces of the reworked aluminum parts. Refer to SOPM 20-41-02.
- D. If you have damage to the V-Blades, do as follows:
- (1) Remove the damage as given in Paragraph 4.B./ALLOWABLE DAMAGE 1
 - (2) After you remove the damage, do as follows:
- WARNING:** MAKE SURE THAT YOU USE EYE PROTECTION WHEN YOU USE THE FLAP PEEN WHEEL. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.
- (a) Flap peen or shot peen the reworked areas of the V-Blade.
 - 1) Refer to 51-20-06 for the shot peen intensity and shot number.
 - 2) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.
 - (b) Apply a chemical conversion coating to the reworked areas of the V-Blade.
 - (c) Apply one layer of BMS 10-11, Type I primer to the reworked areas. Refer to SOPM 20-41-02.
 - (d) Apply one layer of BMS 10-11, Type II enamel 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
AMM 51-21-00	INTERIOR AND EXTERIOR FINISHES
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-07	Machining of Titanium
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
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Allowable Damage Limits

- A. Thrust Reverser Translating Sleeve - Outer Cowl, Acoustic Panel, and Blocker Door Fittings:
- (1) Plunger Fitting, Auxiliary Track Slider Fittings, Upper Auxiliary Track Slider Attach Fitting, and Main Track Slider Fittting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:

54-30-90

ALLOWABLE DAMAGE 1

Page 119

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (2) Lower Auxiliary Track Slider Attach Fitting (Refer to Figure 105/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C . Damage is not permitted in Zone 2.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I . Damage is not permitted in Zone 2.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (3) Blocker Door Cover (Refer to Figure 106/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 1 and Zone 2 locations, remove the damage as shown in Figure 112/ ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I . Damage is not permitted in Zone 2.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (4) Blocker Door Hinge Fitting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , and G .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , G , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (5) Blocker Door Control Link:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details C and F .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details C , D , E , F , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.

54-30-90

ALLOWABLE DAMAGE 1

Page 120

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (6) Blocker Door - Drag Link Attach Fitting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (7) Blocker Door Assembly and End Blocker Door Assembly (Aluminum Doors only):
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , F , and G .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , G , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (8) Common and End Diaphragm Hinge Fitting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , and F .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (9) Deactivation Fitting (Refer to Figure 107/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , and H . Damage is not permitted in Zone 2.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , H , and I . Damage is not permitted in Zone 2.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (10) Actuator Attach Fitting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , and F .
 - (b) Nicks, Gouges, Scratches, and Corrosion:

54-30-90

ALLOWABLE DAMAGE 1

Page 121

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- B. Thrust Reverser Inner Duct Wall Fittings:
 - (1) Drag Link Anchor Fitting (Refer to Figure 108/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 2 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , and F . Damage is not permitted in Zone 1.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 2 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and I . Damage is not permitted in Zone 1.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (2) Drag Link:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , F , and G .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , G , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (3) Upper Forward Compression Pad (Refer to Figure 109/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C . Damage is not permitted in Zone 2.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I . Damage is not permitted in Zone 2.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (4) Upper Middle and Aft Compression Pads (Aluminum and Titanium):
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I .
 - (c) Dents are not permitted.

54-30-90

ALLOWABLE DAMAGE 1

Page 122

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (d) Holes and Punctures are not permitted.
 - (5) Lower Forward and Aft Compression Pads:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (6) Lower Middle Compression Pad (Refer to Figure 110/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C . Damage is not permitted in Zone 2.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I . Damage is not permitted in Zone 2.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (7) Inner V-Blade:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- C. Thrust Reverser Torque Box Fittings:
- (1) Outer V-Blade Support Fitting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.

54-30-90

ALLOWABLE DAMAGE 1

Page 123

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (2) Thrust Reverser Opening Actuator - Attach Fitting:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (3) Tube Support Fittings:
 - (a) Cracks (Edge Cracks only):
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , and I .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (4) Actuator Attach Fitting (Refer to Figure 111/ALLOWABLE DAMAGE 1 for the allowable damage zones):
 - (a) Cracks (Edge Cracks only):
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , and F . Damage is not permitted in Zone 2.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) For Zone 1 locations, remove the damage as shown in Figure 112/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and I . Damage is not permitted in Zone 2.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
- (5) Gimbal Ring:
 - (a) Cracks are not permitted.
 - (b) Nicks, Gouges, Scratches, and Corrosion are not permitted.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.

54-30-90

ALLOWABLE DAMAGE 1

Page 124

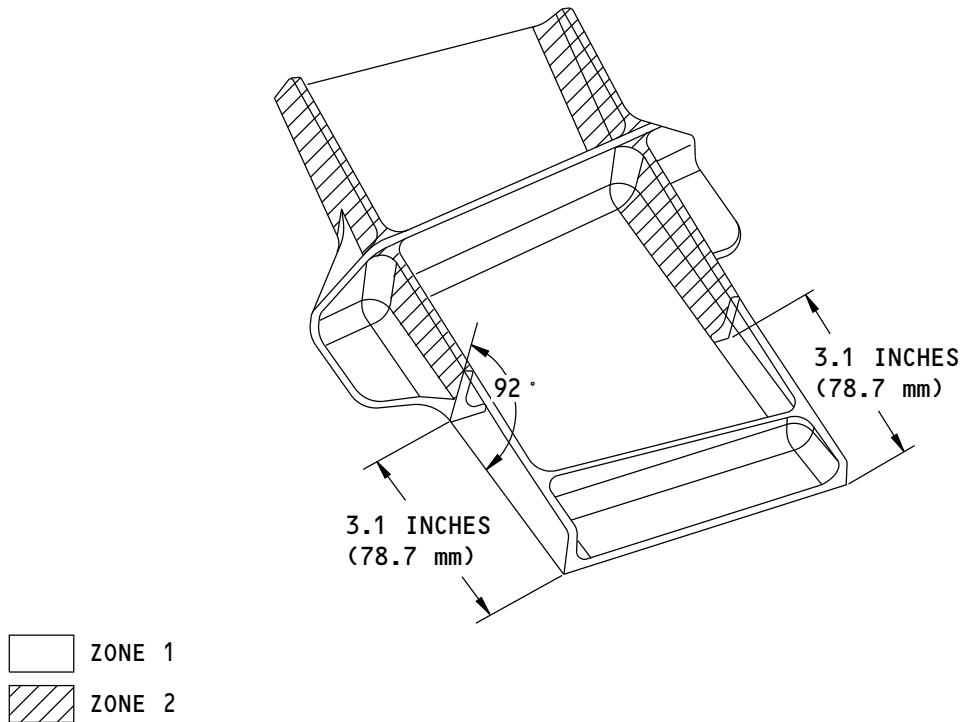
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LOWER AUXILIARY TRACK SLIDER ATTACH FITTING

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Lower Auxiliary Track Slider Attach Fitting Allowable Damage Zones
Figure 105

54-30-90

ALLOWABLE DAMAGE 1

Page 125

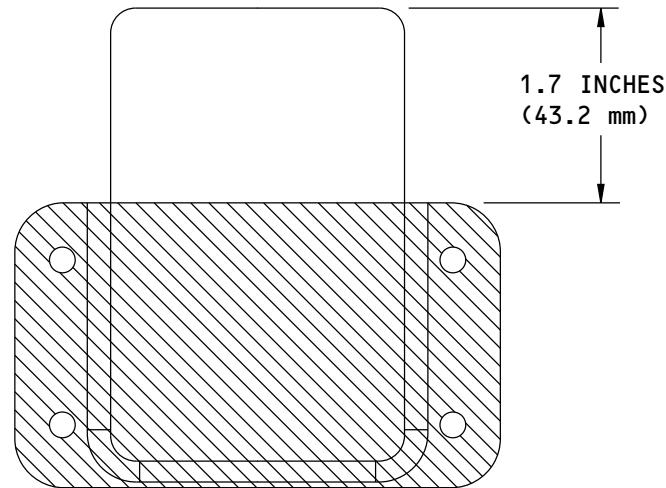
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737-800
STRUCTURAL REPAIR MANUAL



ZONE 1

ZONE 2

BLOCKER DOOR COVER

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Blocker Door Cover Allowable Damage Zones
Figure 106

54-30-90

ALLOWABLE DAMAGE 1

Page 126

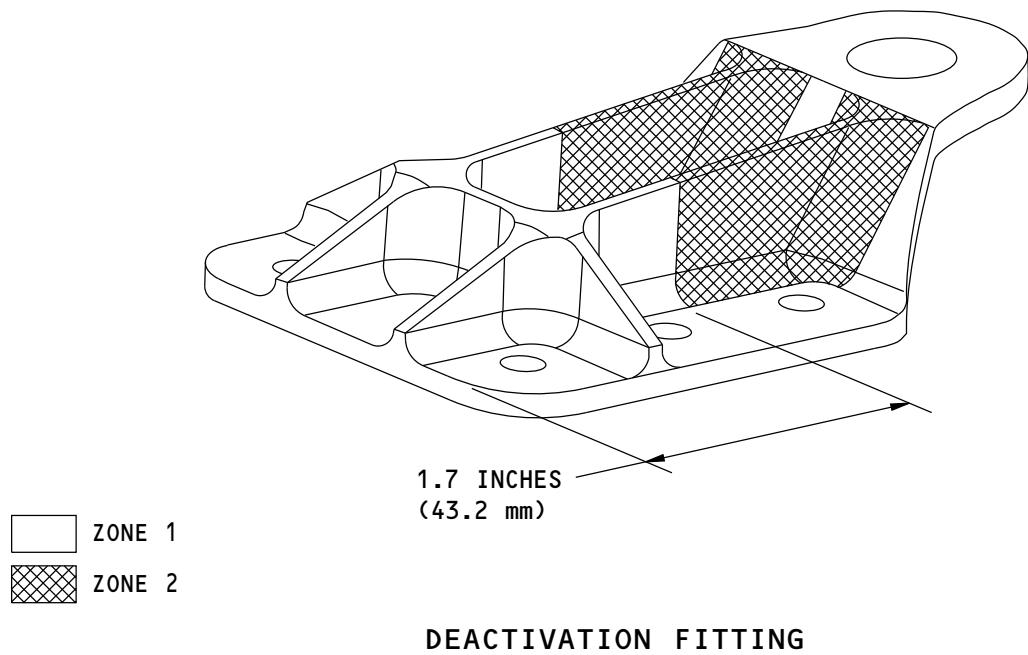
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737-800
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Deactivation Fitting Allowable Damage Zones
Figure 107

54-30-90

ALLOWABLE DAMAGE 1

Page 127

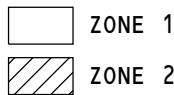
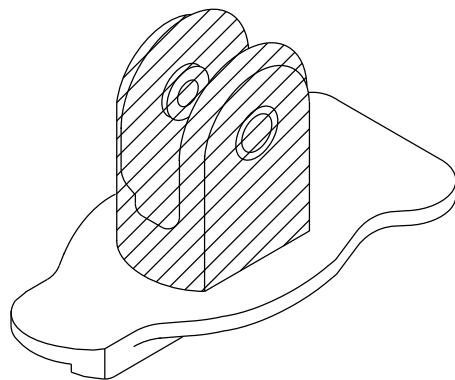
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737-800
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DRAG LINK ANCHOR FITTING

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Drag Link Anchor Fitting Allowable Damage Zones
Figure 108

54-30-90

ALLOWABLE DAMAGE 1

Page 128

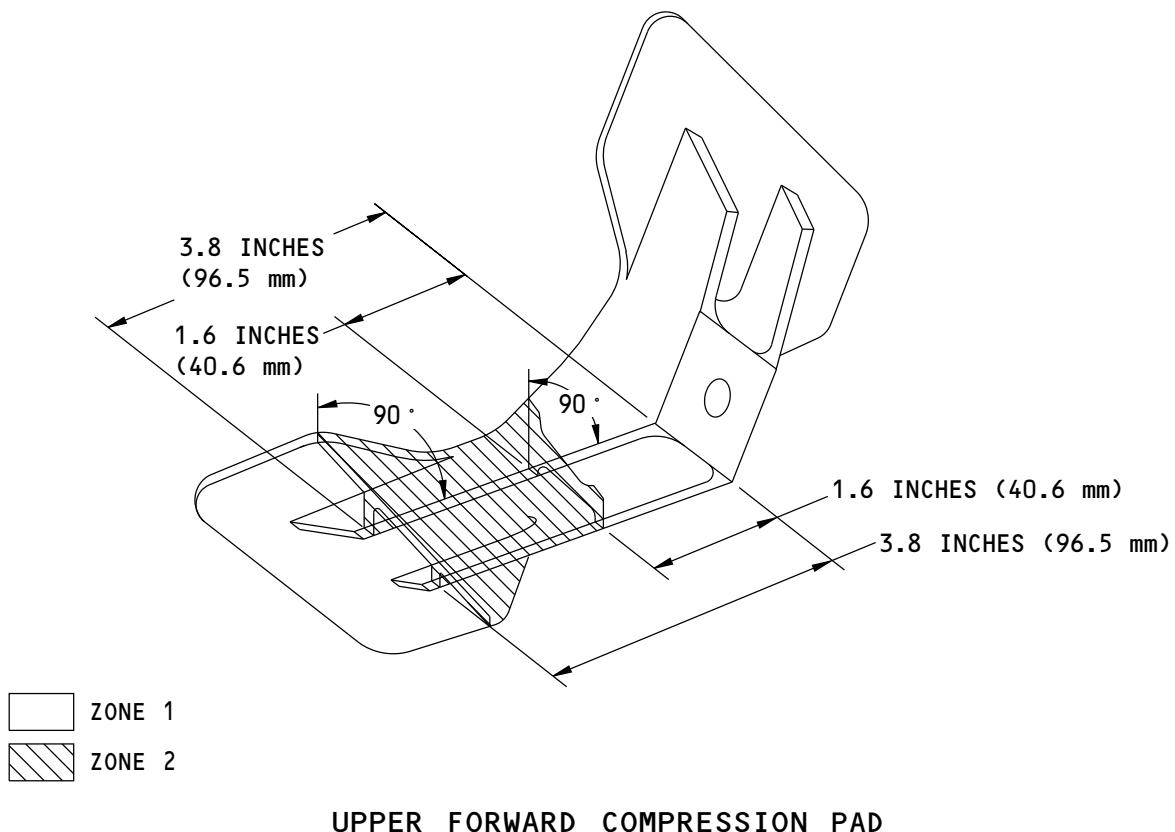
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737-800
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Upper Forward Compression Pad Allowable Damage Zones
Figure 109

54-30-90

ALLOWABLE DAMAGE 1

Page 129

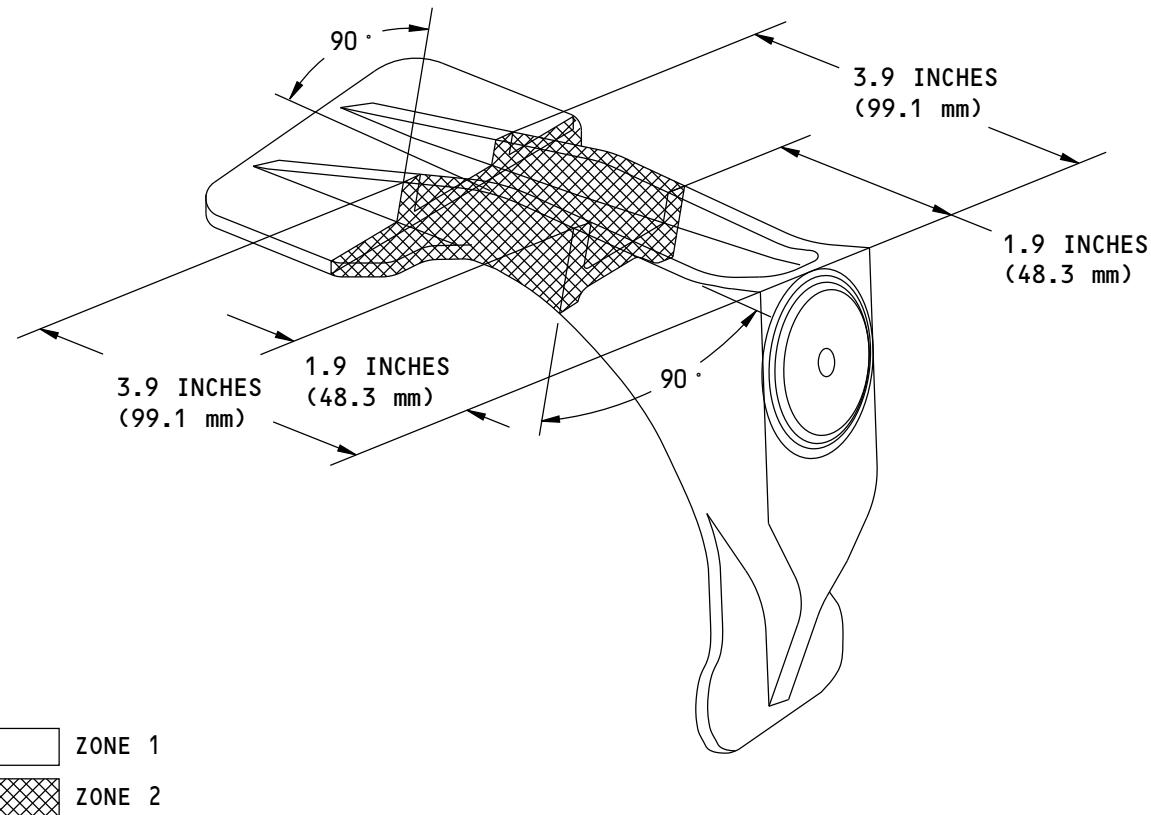
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737-800
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LOWER MIDDLE COMPRESSION PAD

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Lower Middle Compression Pad Allowable Damage Zones
Figure 110

54-30-90

ALLOWABLE DAMAGE 1

Page 130

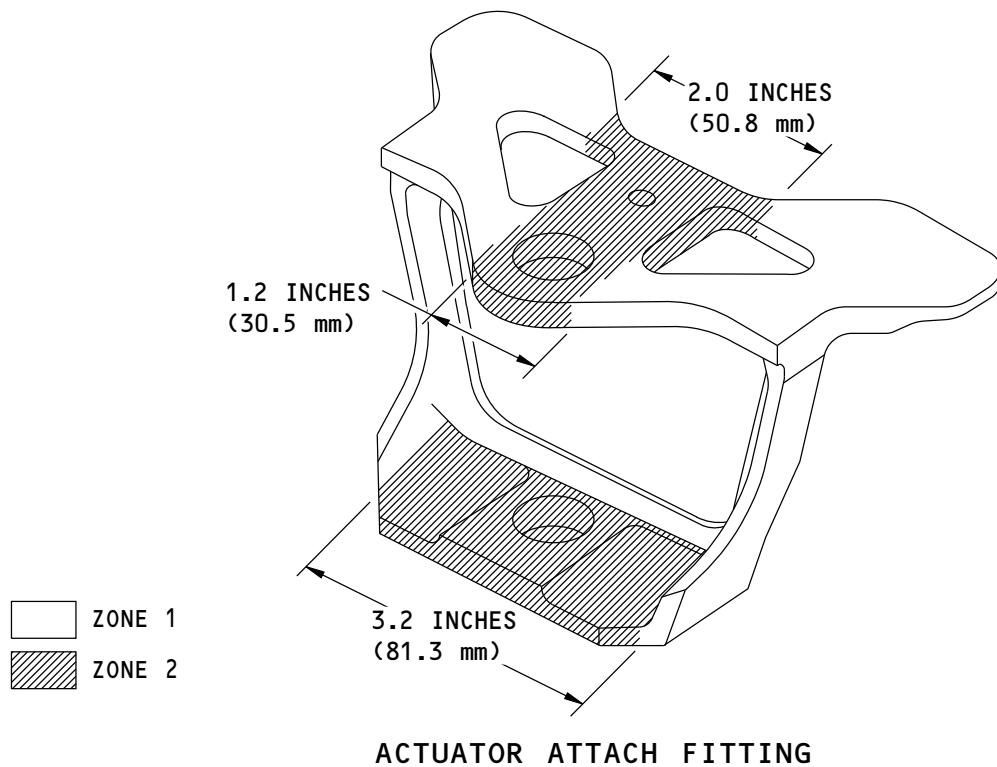
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737-800
STRUCTURAL REPAIR MANUAL



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Actuator Attach Fitting Allowable Damage Zones
Figure 111

54-30-90

ALLOWABLE DAMAGE 1

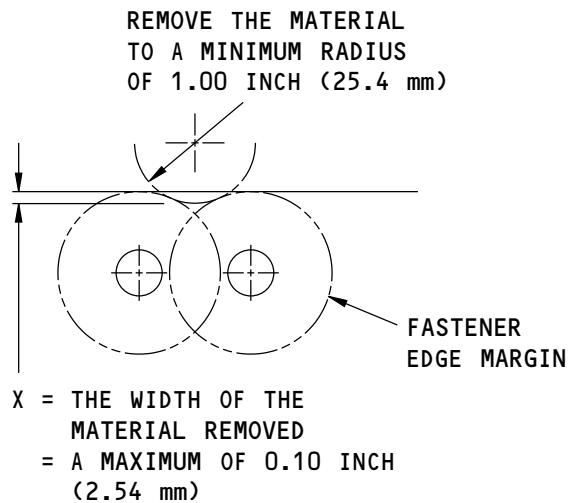
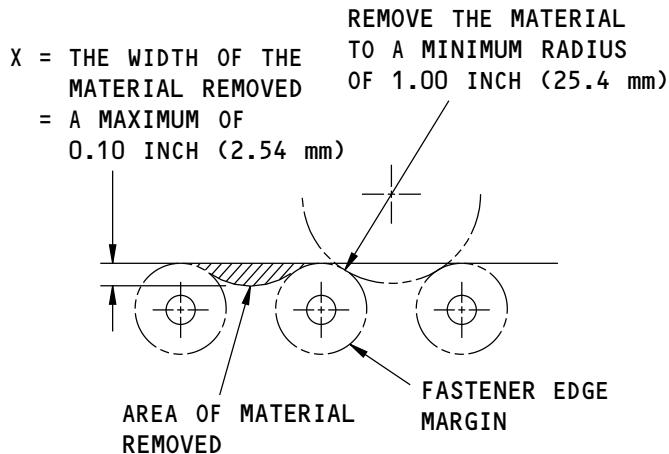
Page 131

Nov 10/2015

D634A210

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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)

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.4 mm), THEN TAPER AS SHOWN

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

X = A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE OR 0.10 INCH (2.54 mm) THAT WHICH IS LESS

MAKE THE CONTOUR SMOOTH (TYPICAL)

£ OF THE DAMAGE

**TAPER TO A MINIMUM OF 20X.
THE DISTANCE OF THE DAMAGE FROM AN EDGE OR OTHER DAMAGE MUST BE 20X OR MORE**

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(C)

G66413 S0006592068_V1

**Allowable Damage Limits
Figure 112 (Sheet 1 of 7)**

54-30-90

ALLOWABLE DAMAGE 1

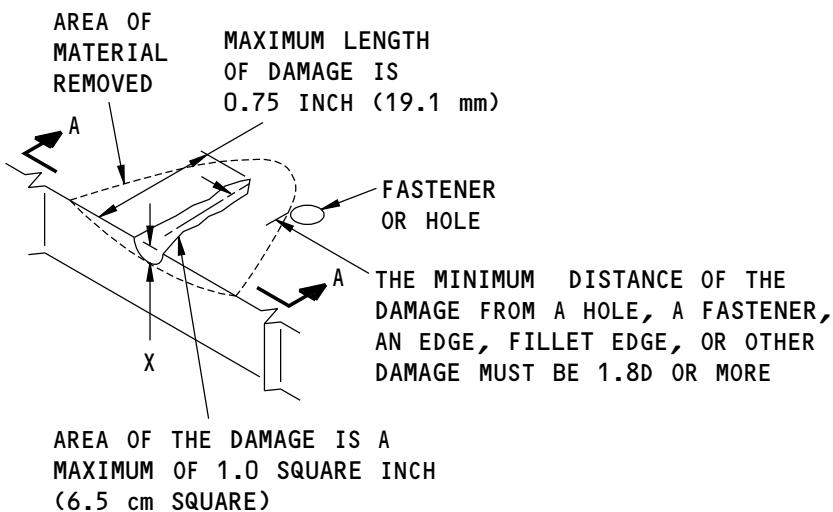
Page 132

Nov 10/2015

D634A210

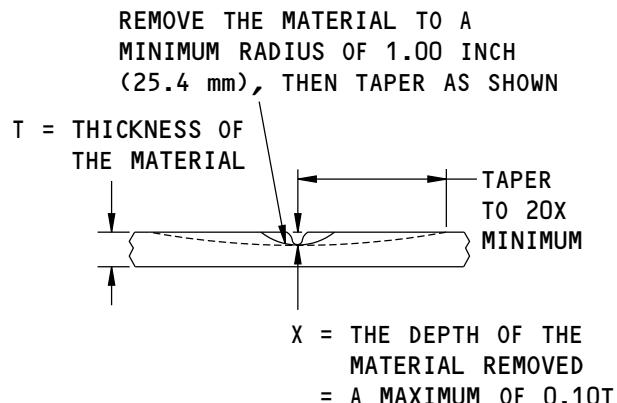


737-800
STRUCTURAL REPAIR MANUAL



**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(D)



A-A

G66415 S0006592069_V2

Allowable Damage Limits
Figure 112 (Sheet 2 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 133

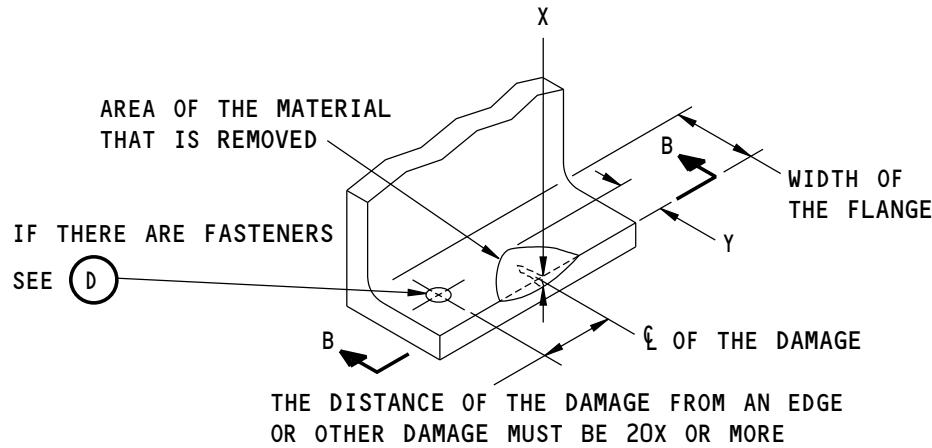
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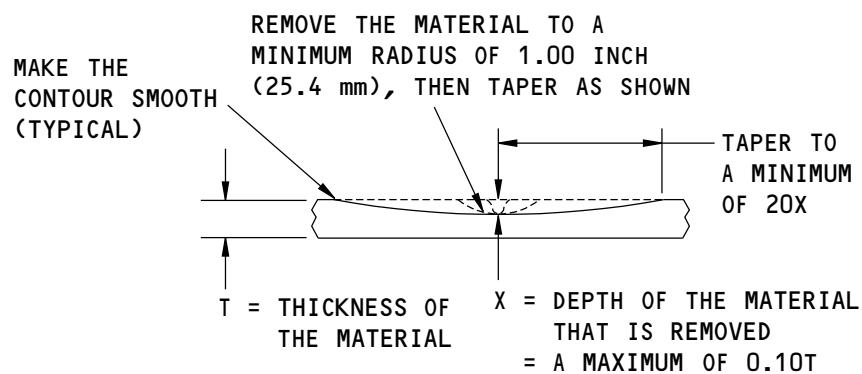


737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(E)



B-B

H09769 S0006592070_V1

Allowable Damage Limits
Figure 112 (Sheet 3 of 7)

54-30-90

ALLOWABLE DAMAGE 1

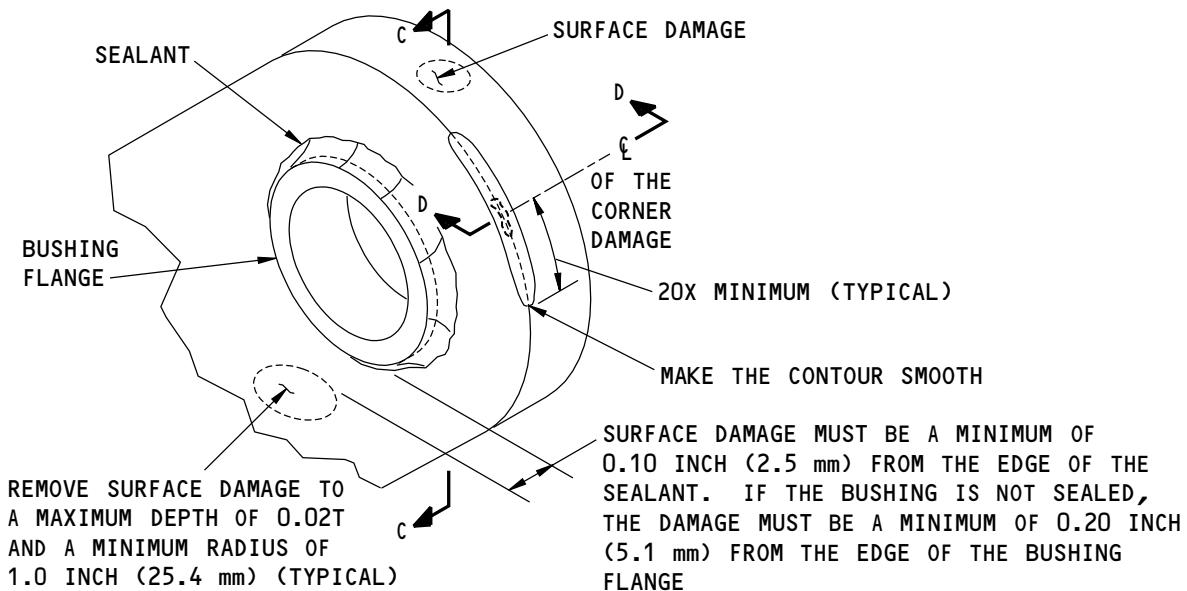
Page 134

Nov 10/2015

D634A210

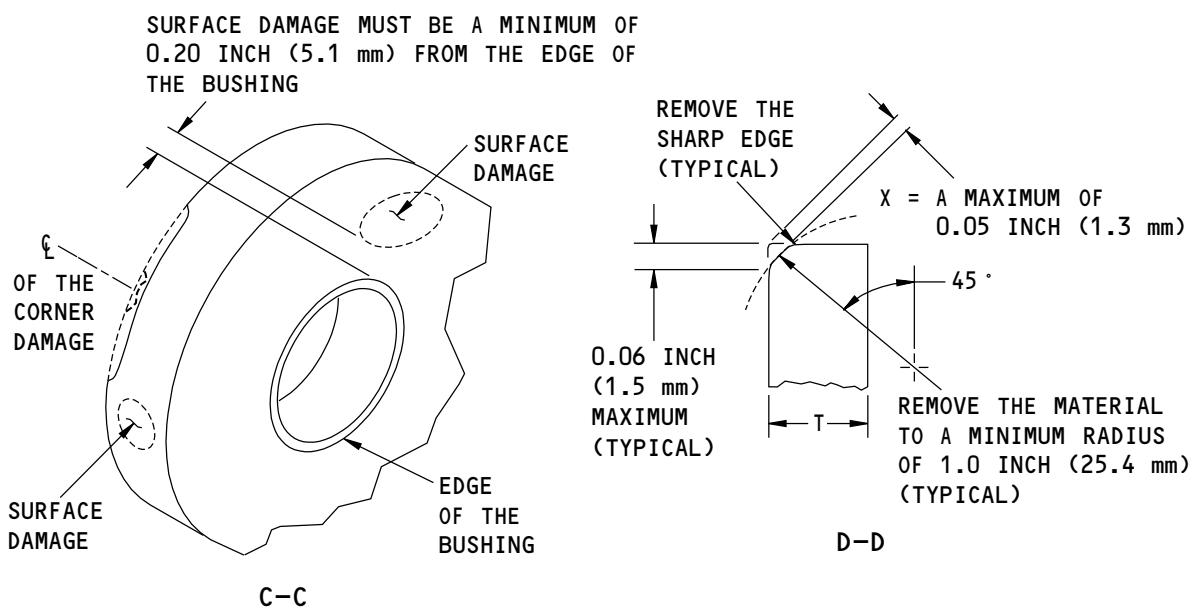
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STRUCTURAL REPAIR MANUAL**



REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BUSHING

(F)



H09773 S0006592071_V1

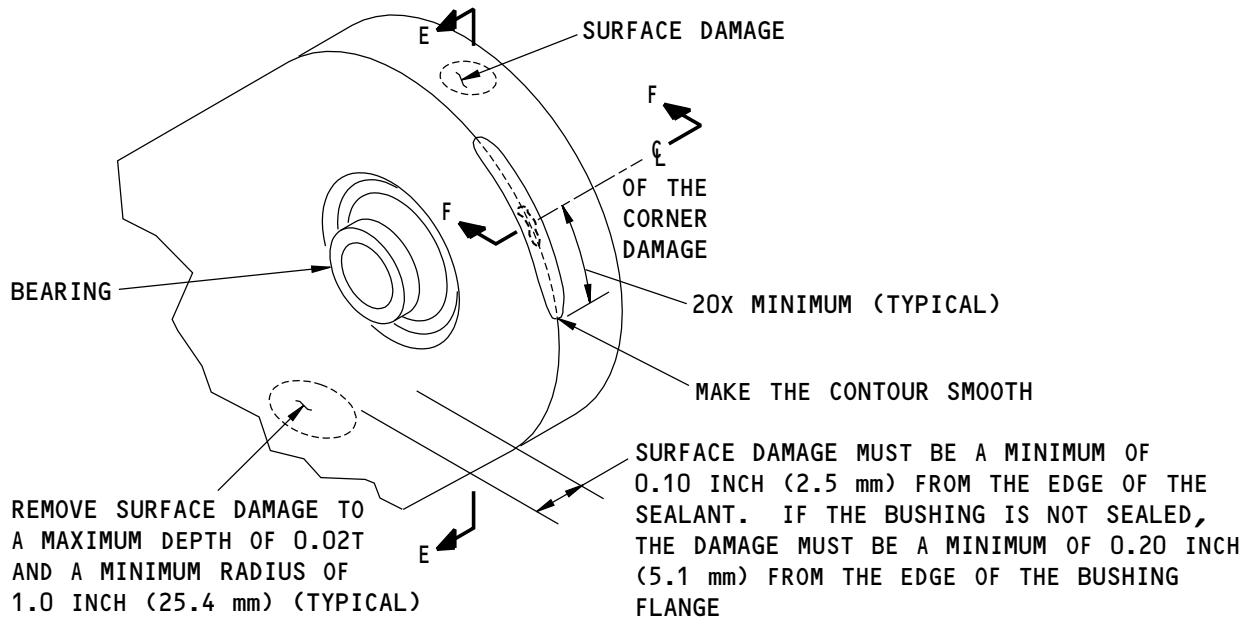
**Allowable Damage Limits
Figure 112 (Sheet 4 of 7)**

54-30-90

ALLOWABLE DAMAGE 1

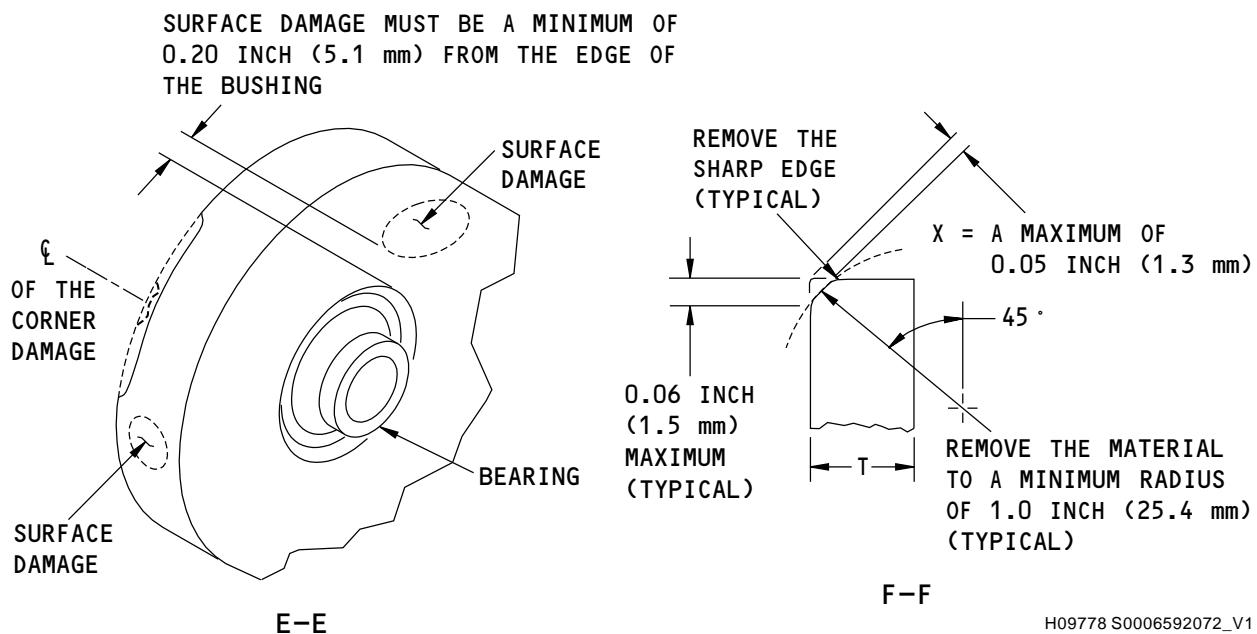
Page 135

Nov 10/2015

**737-800
STRUCTURAL REPAIR MANUAL**


REMOVAL OF SURFACE AND EDGE DAMAGE FROM A LUG THAT HAS A BEARING

(G)



H09778 S0006592072_V1

**Allowable Damage Limits
Figure 112 (Sheet 5 of 7)**

54-30-90

ALLOWABLE DAMAGE 1

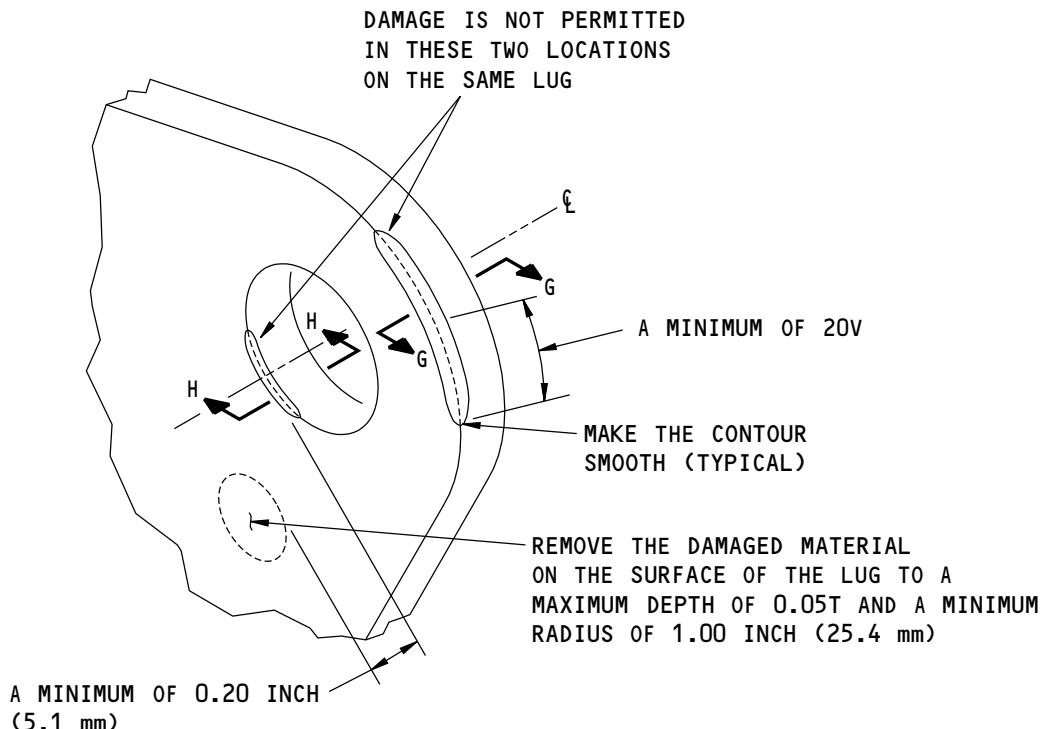
Page 136

Nov 10/2015

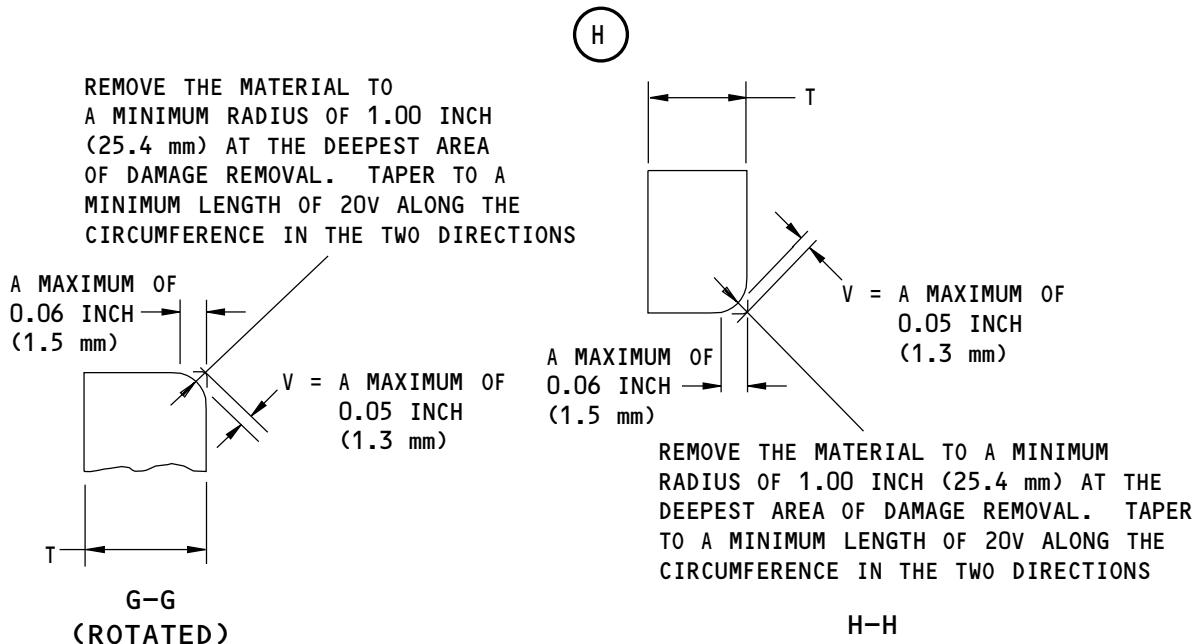
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**737-800
STRUCTURAL REPAIR MANUAL**



REMOVAL OF DAMAGED MATERIAL ON A LUG WITHOUT BUSHINGS



H09785 S0006592073_V1

**Allowable Damage Limits
Figure 112 (Sheet 6 of 7)**

54-30-90

ALLOWABLE DAMAGE 1

Page 137

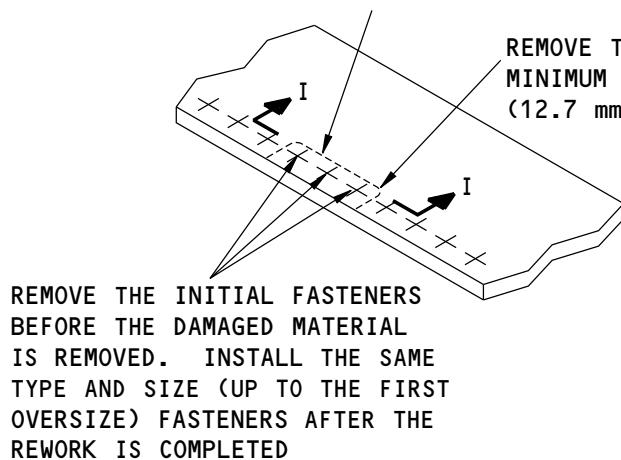
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL

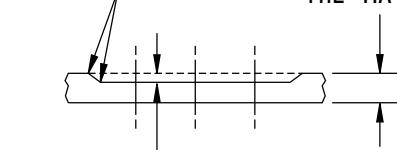
THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN A
GROUP OF TEN IS PERMITTED
TO A MAXIMUM DEPTH OF X



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 0.50 INCH
(12.7 mm) (TYPICAL)

MAKE IT
SMOOTH
(TYPICAL)

T = THICKNESS OF
THE MATERIAL



X = THE DEPTH OF THE
MATERIAL REMOVED

= A MAXIMUM OF 0.10T

I-I

REMOVAL OF CORROSION
AROUND THE FASTENERS



2458401 S0000572508_V1

Allowable Damage Limits
Figure 112 (Sheet 7 of 7)

54-30-90

ALLOWABLE DAMAGE 1

Page 138

Nov 10/2015

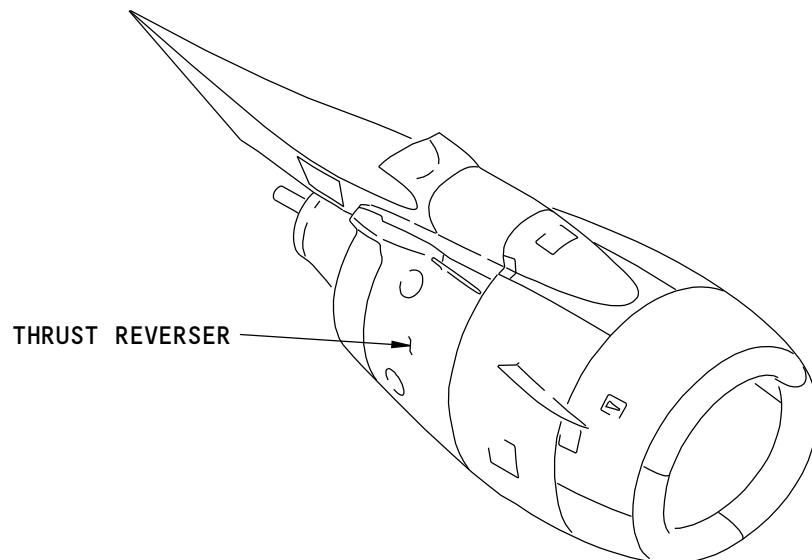
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - THRUST REVERSER FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT ENGINE IS SHOWN, RIGHT ENGINE IS OPPOSITE

Fan Duct Cowl and Thrust Reverser Hinge Fittings Location
Figure 201

G59812 S0006592076_V2

54-30-90

REPAIR 1
Page 201

Nov 10/2012

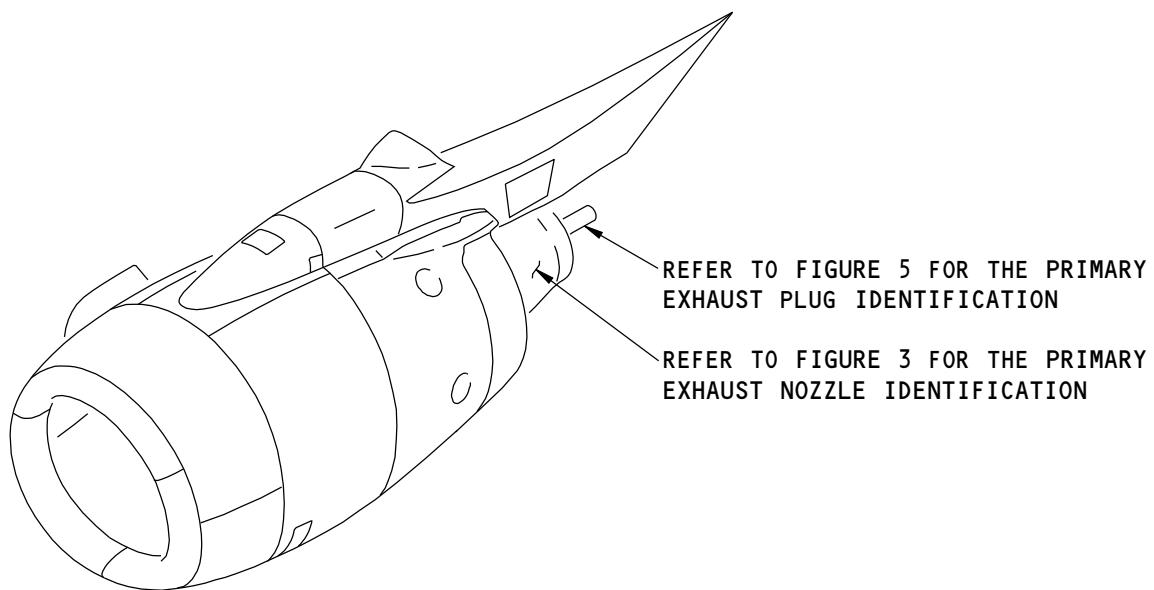
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - PRIMARY EXHAUST SYSTEM



NOTES: 1. REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F14509 S0006592081_V2

Primary Exhaust Nozzle and Plug Location
Figure 1

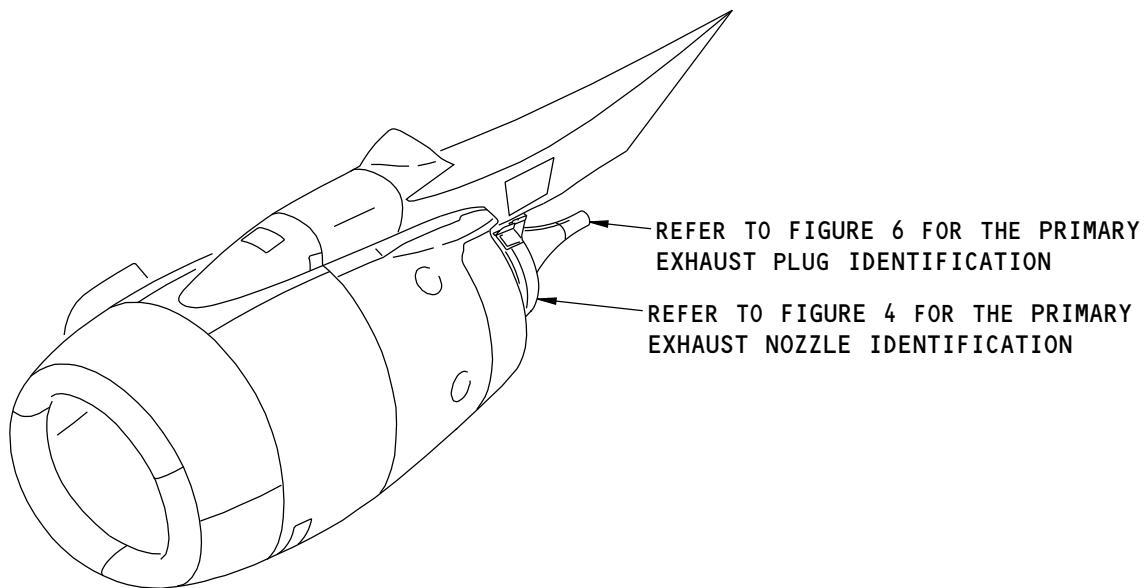
54-40-02
IDENTIFICATION 1
Page 1
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



NOTES: 1. REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

2005015 S0000393401_V1

Primary Exhaust Nozzle and Plug Location - Performance Improvement Package
Figure 2

54-40-02
IDENTIFICATION 1
Page 2
Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

Table 1:

LIST OF REFERENCE DRAWINGS FOR Figure 1 (Sheet 1) AND Figure 2 (Sheet 1)		
DRAWING NUMBER	TITLE	LINE NUMBERS EFFECTIVITY
300A2020	Management Collector - 737 CFM56-7 EBU End Item - Propulsion System Basic	All
333A2100	Exhaust Installation	All
314A2610	Primary Nozzle Assembly	L/N 1- 3761
314A2620	Primary Plug Assembly	L/N 1- 3761
314A2630	Primary Nozzle Assembly (Performance Improvement Package)	L/N 3762 and on
314A2640	Primary Plug Assembly (Performance Improvement Package)	L/N 3762 and on

54-40-02

IDENTIFICATION 1

Page 3

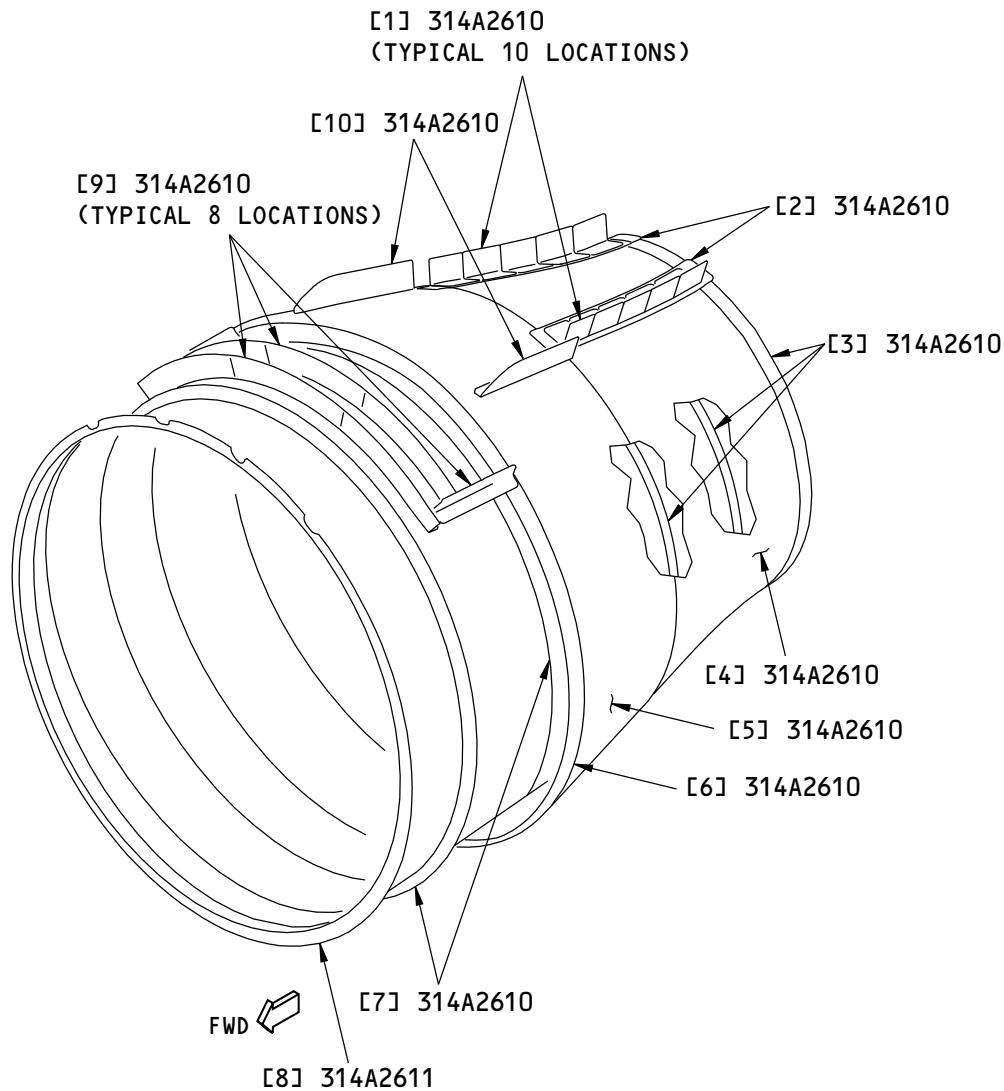
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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

F14474 S0006592083_V3

Primary Exhaust Nozzle Identification
Figure 3

54-40-02
IDENTIFICATION 1
Page 4
Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR Figure 3 (Sheet 1)				
ITEM	DESCRIPTION	T*[1]	MATERIAL	LINE NUMBER EFFECTIVITY
[1]	Nozzle Fence (10 locations)	0.050 (1.27)	A286 CRES sheet as given in AMS 5525	L/N 1 - 3761
[2]	Fence Doubler (2 locations)	0.050 (1.27)	A286 CRES sheet as given in AMS 5525	L/N 1 - 3761
[3]	Inner Sleeve Doubler (3 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[4]	Inner Sleeve Skin	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[5]	Fairing Skin	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[6]	Leading Edge Fairing Stiffener	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[7]	Hat Stiffener (2 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[8]	Nozzle Attach Ring		Nickel alloy 625 bar as given in AMS 5666, annealed	L/N 1 - 3761
[9]	Labyrinth Detail (8 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[10]	Nozzle Fence (2 locations)	0.050 (1.27)	A286 CRES sheet as given in AMS 5525, or Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761

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

54-40-02

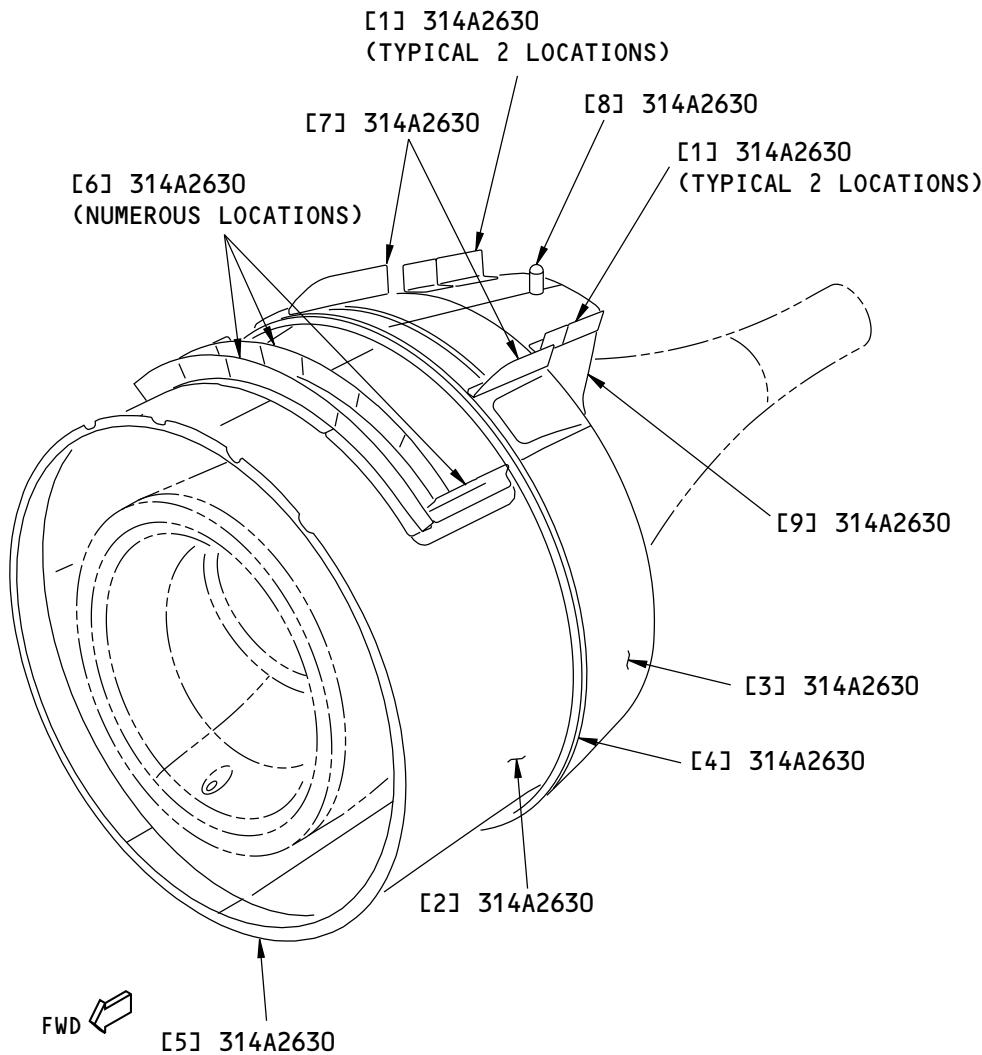
IDENTIFICATION 1

Page 5

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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

2005296 S0000393411_V2

Primary Exhaust Nozzle Identification - Performance Improvement Package
Figure 4

54-40-02
IDENTIFICATION 1
Page 6
Jul 10/2016



737-800
STRUCTURAL REPAIR MANUAL

Table 3:

LIST OF MATERIALS FOR Figure 4 (Sheet 1) - Performance Improvement Package				
ITEM	DESCRIPTION	T*[1]	MATERIAL	LINE NUMBER EFFECTIVITY
[1]	Nozzle Fence (4 locations)	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[2]	Acoustic Honeycomb Panel	0.020 (0.51)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[3]	Fairing Skin	0.080 (2.03)	Nickel alloy 625 sheet as given in AMS 5599, annealed. Thickness varies to 0.051 min after processing.	L/N 3762 and on
[4]	Leading Edge Fairing Stiffener	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[5]	Nozzle Attach Ring	N/A	Nickel alloy 625 ring forging as given in AMS 5666	L/N 3762 and on
[6]	Labyrinth Detail (4 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 to L/N 4334
	Labyrinth Detail (9 locations)	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 4335 and on
[7]	Nozzle Fence (2 locations)	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[8]	Interference Pin	N/A	Nickel alloy 625 bar as given in AMS 5666, annealed	L/N 3762 and on
[9]	Shelf	0.250	Nickel alloy 625 ring forging as given in AMS 5666. Thickness varies to 0.063 min after processing.	L/N 3762 and on

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

54-40-02

IDENTIFICATION 1

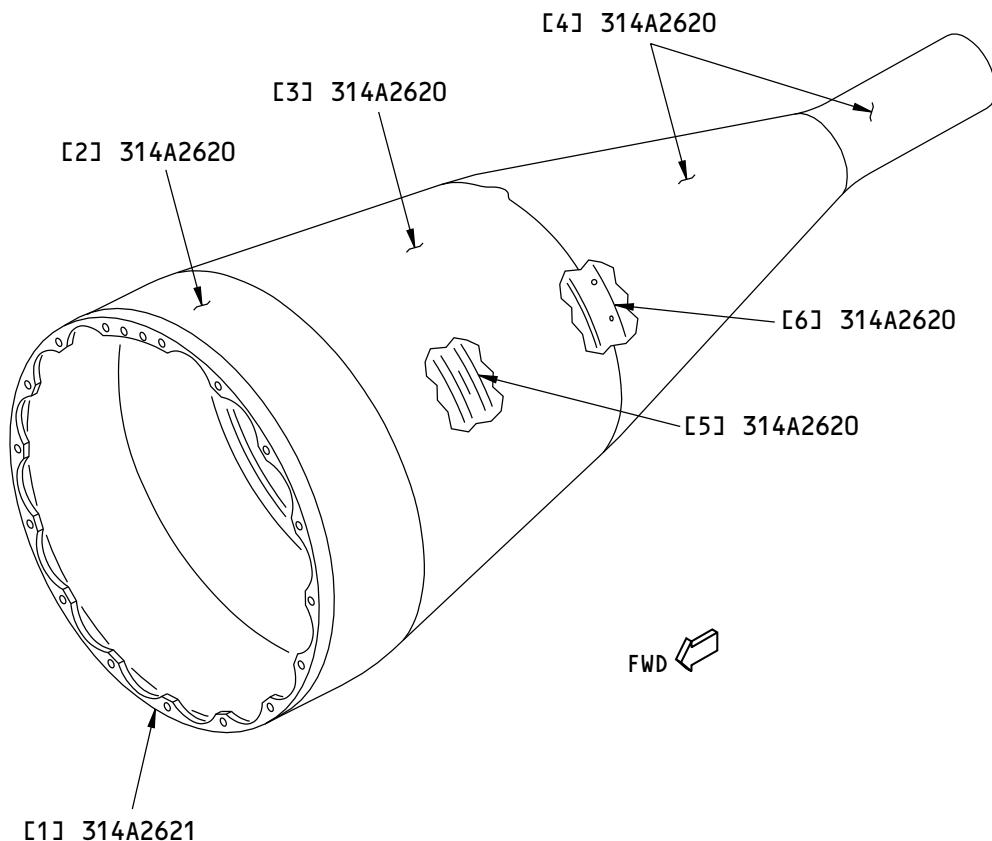
Page 7

Jul 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 4 FOR THE LIST OF MATERIALS.

F14486 S0006592085_V2

Primary Exhaust Plug Identificaton
Figure 5

54-40-02
IDENTIFICATION 1
Page 8
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

LIST OF MATERIALS FOR Figure 5 (Sheet 1)				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Attach Ring - Forward Plug		Nickel alloy 625 bar as given in AMS 5666, annealed	L/N 1 - 3761
[2]	Forward Skin - Forward Plug	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[3]	Mid Skin - Forward Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[4]	Aft Skin - Aft Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[5]	Stiffener - Forward Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761
[6]	Splice Stiffener - Forward Plug	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 1 - 3761

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

54-40-02

IDENTIFICATION 1

Page 9

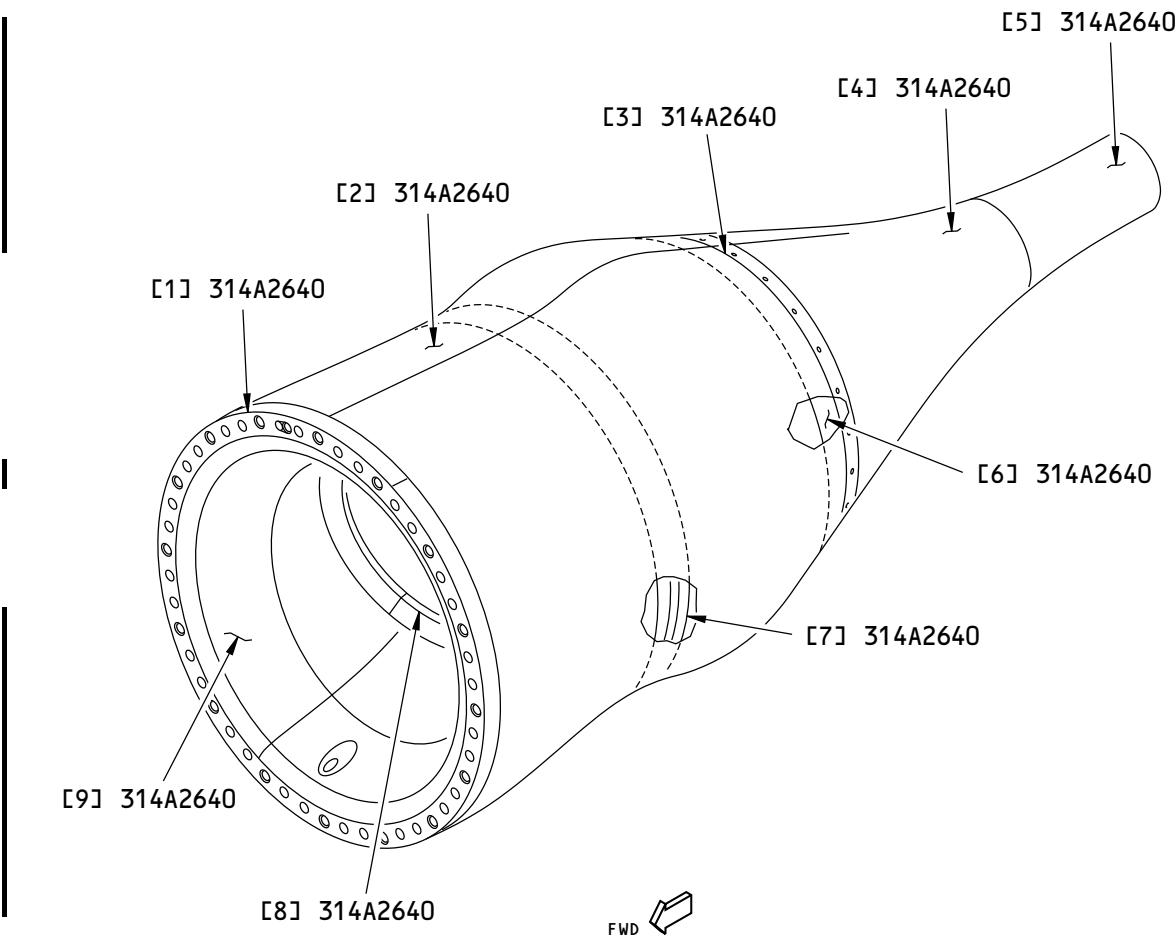
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737-800
STRUCTURAL REPAIR MANUAL



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

2005285 S0000393426_V2

Primary Exhaust Plug Identification - Performance Improvement Package
Figure 6

54-40-02
IDENTIFICATION 1
Page 10
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 5:

LIST OF MATERIALS FOR Figure 6 (Sheet 1) - Performance Improvement Package				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Attach Ring - Forward Plug		Nickel alloy 625 ring forging as given in AMS 5666, annealed	L/N 3762 and on
[2]	Forward Skin - Forward Plug	0.058 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed. Thickness varies to 0.047 min after processing.	L/N 3762 and on
[3]	Tail Ring	0.056 (1.42)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[4]	Aft Skin	0.035 (0.90)	Nickel alloy 625 sheet as given in AMS 5599, annealed. Thickness varies to 0.028 min after processing.	L/N 3762 and on
[5]	Tail Pipe	0.034 (0.86)	Nickel alloy 625 sheet as given in AMS 5599, annealed. Thickness varies to 0.028 min after processing.	L/N 3762 and on
[6]	Stiffener - Forward Plug	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[7]	Hat Stiffener	0.050 (1.27)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[8]	Drain Pan Stiffener	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed	L/N 3762 and on
[9]	Drain Pan	0.040 (1.02)	Nickel alloy 625 sheet as given in AMS 5599, annealed. Thickness varies to 0.028 (0.71) min after processing for -23 marked parts only. Thickness varies to 0.023 (0.58) min after processing for -39 marked parts only.	L/N 3762 and on

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

54-40-02

IDENTIFICATION 1

Page 11

Jul 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - PRIMARY EXHAUST SYSTEM

1. Applicability

- A. This subject gives the allowable damage limits for the primary exhaust system for the CFM56-7 engine. The primary exhaust system has two components. These are the nozzle and the plug as shown in Allowable Damage - Primary Exhaust Nozzle and Plug Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Refer to 51-10-01 for the Aerodynamic Smoothness Requirements.
- B. Refer to CMM 78-11-37 for weld repairs for the primary nozzle.
- C. Refer to CMM 78-11-38 for weld repairs for the primary plug.
- D. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.
- E. These Allowable Damage Limits for the primary exhaust nozzle and plug have FAA approval only if the inspections given in this subject are completed at the specified times.
- F. Do the steps that follow if you have damage to the Corrosion Resistant Steel (A286) or nickel alloy 625 parts:
- (1) Remove the damage.
- (a) Refer to 51-10-02 for the inspection and removal of damage.
- (b) Refer to 51-30-03 for possible sources of abrasive 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.
- G. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage data for the different parts.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE	
PART	PARAGRAPH
PRIMARY NOZZLE	4.A
Attach Ring	4.A.(1)
Inner Sleeve Skin	4.A.(2)
Fairing Skin	4.A.(3)
Stiffeners and Doublers	4.A.(4)
Fences (12)	4.A.(5)
Labyrinth Seals (8)	4.A.(6)
PRIMARY PLUG	4.B
Attach Ring	4.B.(1)
Forward Skin, Mid Skin, and Aft Plug	4.B.(2)
Aft Skin	4.B.(3)
Stiffeners	4.B.(4)

54-40-02

ALLOWABLE DAMAGE 1

Page 101

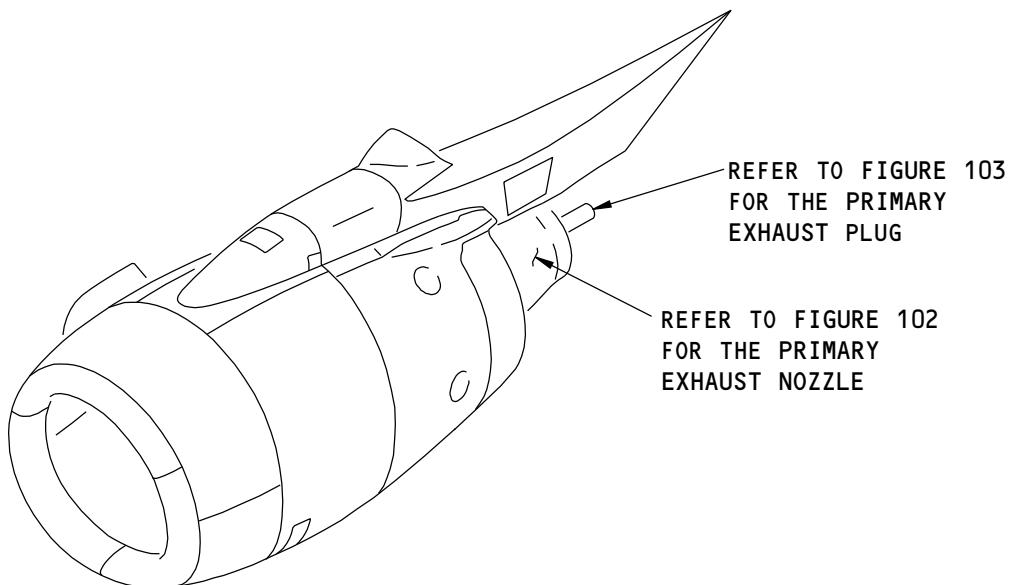
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737-800
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F19258 S0006592090_V1

Allowable Damage - Primary Exhaust Nozzle and Plug Location
Figure 101

54-40-02

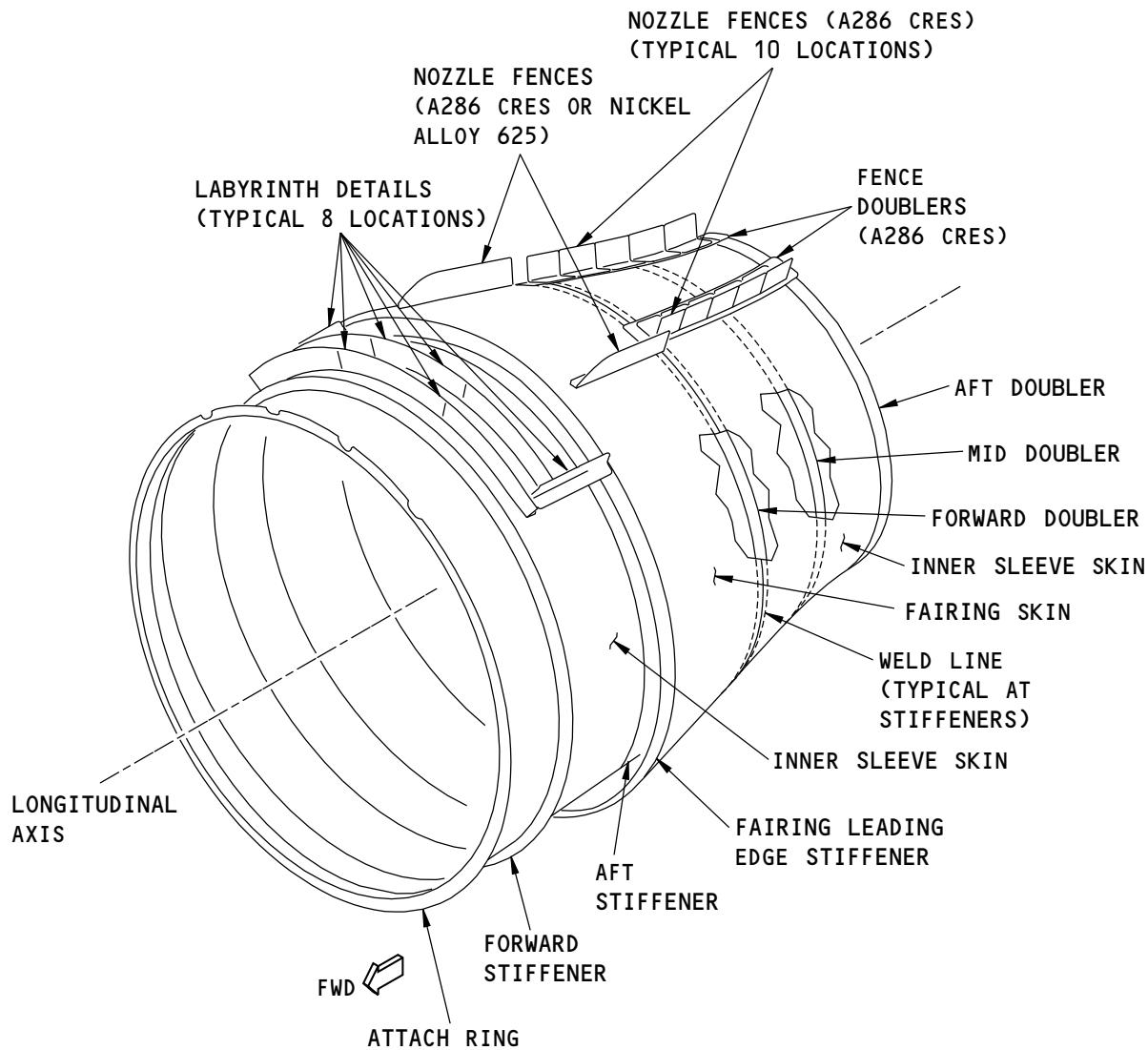
ALLOWABLE DAMAGE 1

Page 102

Nov 10/2012

D634A210

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NOTE: ALL PARTS ARE MADE FROM NICKEL ALLOY 625 MATERIAL, UNLESS SPECIFIED DIFFERENTLY.

G55795 S0006592091_V2

Primary Exhaust Nozzle
Figure 102

54-40-02

ALLOWABLE DAMAGE 1

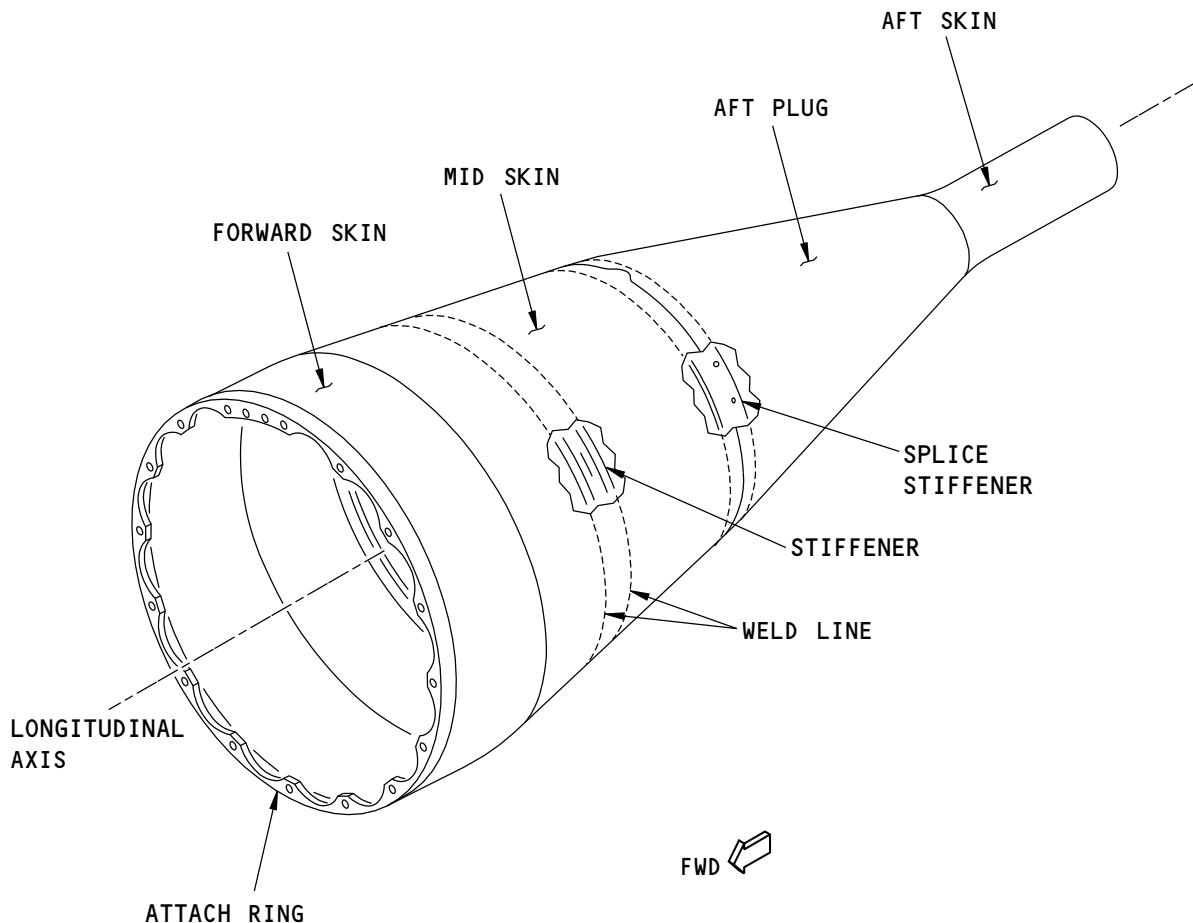
Page 103

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTE: ALL PARTS ARE MADE OF NICKEL ALLOY 625 MATERIAL.

G55799 S0006592092_V2

Primary Exhaust Plug
Figure 103

54-40-02

ALLOWABLE DAMAGE 1
Page 104
Jul 10/2013

D634A210



737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 78-11-37,	Primary Nozzle
CMM 78-11-38,	Primary Plug

4. Allowable Damage Limits

A. Primary Nozzle

- (1) Attach Ring
 - (a) Cracks are not permitted.
 - (b) Nicks, Gouges, and Scratches:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Remove the damage to the flanges of the attach ring as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .
 - a) The maximum permitted length or diameter of the cleanup is 0.50 inch (12.7 mm).
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

(2) Inner Sleeve Skin

- (a) Cracks:
 - 1) Remove the edge damage as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1 Details A , B , and D .
 - 2) Damage up to a maximum length of 1.50 inches (38.1 mm) is permitted if:
 - a) The crack has no more than two ends
 - b) There is a maximum of four cracks
 - c) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack
 - d) The crack goes across a weld at a right angle
 - e) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld
 - f) The damage is a minimum of 1.00 inch (25.4 mm) away from stiffeners and doublers
 - g) The damage is a minimum of 3.00 inches (76.2 mm) away from other cracks or dents
 - h) The damage is a minimum of 2.00 inches (50.8 mm) away from:
 - Fasteners
 - Fences
 - Labyrinth seals
 - Forward attach ring
 - The aft edge of the inner sleeve.

54-40-02

ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- i) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
 - Do a repair as given in CMM 78-11-37 if the damage shows an increase in length.
 - (b) Nicks, Gouges, and Scratches:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail C .
 - a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).
 - (c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:
 - 1) A minimum of 3.00 inches (76.2 mm) away from a crack
 - 2) A minimum of 6.00 inches (152.4 mm) away from other dents
 - 3) A minimum of 1.00 inch (25.4 mm) away from stiffeners and doublers
 - 4) A minimum of 2.00 inches (50.8 mm) away from:
 - a) Fasteners
 - b) Fences
 - c) Labyrinth seals
 - d) Forward attach ring
 - e) The aft edge of the inner sleeve.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.
- NOTE:** This is not applicable to stop drill holes.
- (3) Fairing Skin
- (a) Cracks:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1 Details A , B , and D .
 - 2) Damage up to a maximum length of 1.50 inches (38.1 mm) is permitted if:
 - a) The crack has no more than two ends
 - b) There is a maximum of four cracks
 - c) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack
 - d) The crack goes across a weld at a right angle
 - e) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld
 - f) The damage is a minimum of 3.00 inches (76.2 mm) away from a crack or a dent
 - g) The damage is a minimum of 2.00 inches (50.8 mm) away from a fastener
 - h) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
 - Do a repair as given in CMM 78-11-37 if the damage shows an increase in length.

54-40-02

ALLOWABLE DAMAGE 1

Page 106

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (b) Nicks, Gouges, and Scratches:
- 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail C .
 - a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).
- (c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:
- 1) A minimum of 3.00 inches (76.2 mm) away from a crack
 - 2) A minimum of 6.00 inches (152.4 mm) away from other dents
 - 3) A minimum of 2.00 inches (50.8 mm) away from fasteners.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.
- NOTE:** This is not applicable to stop drill holes.
- (4) Stiffeners and Doublers
- (a) Cracks:
- 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
- (b) Nicks, Gouges, Scratches, and Corrosion:
- 1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , C , and D .
- (c) Dents are not permitted.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.
- (5) Fences (12 locations)
- (a) Cracks:
- 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Damage up to a maximum length of 1.00 inch (25.4 mm) in a fence segment is permitted if:
 - a) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack
 - b) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
 - Replace the fence as given in CMM 78-11-37 if the damage shows an increase in length.
- (b) Nicks, Gouges, Scratches, and Corrosion:
- 1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , C , and D .
- (c) Dents are not permitted.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.
- NOTE:** This is not applicable to stop drill holes.
- (6) Labyrinth Seals (8 locations)
- (a) Cracks:

54-40-02

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

- 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
- 2) Two cracks up to a maximum length of 1.00 inch (25.4 mm) are permitted in a seal segment if:
 - a) The cracks are a minimum of 3.00 inches (76.2 mm) away from each other
 - b) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack
 - c) You examine the damage at every 50 flight cycles to find if there is an increase in the length of the crack.
 - Replace the seal segment as given in CMM 78-11-37 if the damage shows an increase in length.
- (b) Nicks, Gouges, and Scratches:
 - 1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , C , and D .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-37.

NOTE: This is not applicable to stop drill holes.

B. Primary Plug

- (1) Attach Ring
 - (a) Cracks are not permitted.
 - (b) Nicks, Gouges, and Scratches:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail D .
 - 2) Remove other damage to the flanges of the attach ring as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail C .
 - a) The maximum permitted length or diameter of the cleanup is 0.50 inch (12.7 mm).
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.
- (2) Forward Skin, Mid Skin, and Aft Plug
 - (a) Cracks:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Damage up to a maximum length of 1.50 inches (38.1 mm) is permitted if:
 - a) The crack has no more than two ends
 - b) There is a maximum of four cracks in the primary plug
 - c) There is a maximum of two cracks in the aft plug
 - d) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack
 - e) The crack goes across a weld at a right angle
 - f) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld
 - g) The damage is a minimum of 3.00 inches (76.2 mm) away from other cracks or dents

54-40-02

ALLOWABLE DAMAGE 1

Page 108

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- h) The damage is a minimum of 2.00 inches (50.8 mm) away from:
 - Fasteners
 - Forward attach ring.
 - i) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
 - Do a repair as given in CMM 78-11-38 if the damage shows an increase in length.
- (b) Nicks, Gouges, and Scratches:
- 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail C .
 - a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).
- (c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:
- 1) A minimum of 3.00 inches (76.2 mm) away from a crack
 - 2) A minimum of 6.00 inches (152.4 mm) away from other dents
 - 3) A minimum of 2.00 inches (50.8 mm) away from:
 - a) Fasteners
 - b) Forward attach ring.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.
- NOTE:** This is not applicable to stop drill holes.
- (3) Aft Skin
- (a) Cracks:
- 1) Remove the damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail D .
 - 2) Damage up to a maximum length of 1.00 inch (25.4 mm) is permitted if:
 - a) The crack has no more than two ends
 - b) There is a maximum of two cracks in the aft skin
 - c) You stop drill 0.19 inch (4.8 mm) diameter holes at the ends of the crack
 - d) The crack goes across a weld at a right angle
 - e) The damage is a minimum of 0.50 inch (12.7 mm) away from a weld if it is parallel to the weld
 - f) The damage is a minimum of 3.00 inches (76.2 mm) away from other cracks or dents
 - g) The damage is a minimum of 2.00 inches (50.8 mm) away from the aft edge of the aft skin.
 - h) You examine the damage at every 125 flight cycles to find if there is an increase in the length of the crack.
 - Do a repair as given in CMM 78-11-38 if the damage shows an increase in length.
- (b) Nicks, Gouges, and Scratches:

54-40-02

ALLOWABLE DAMAGE 1

Page 109

Jul 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail D .
 - 2) Remove the surface damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail C .
 - a) The maximum permitted length or diameter of the cleanup is 2.00 inches (50.8 mm).
 - (c) Dents are permitted as shown in Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1, Detail E if the edges of the dent are:
 - 1) A minimum of 3.00 inches (76.2 mm) away from a crack or other dent
 - 2) A minimum of 2.00 inches (50.8 mm) away from the aft edge of the aft skin.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.

NOTE: This is not applicable to stop drill holes.
- (4) Stiffeners
- (a) Cracks:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove edge damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Details A , B , and D .
 - 2) Remove other damage as shown in Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail C .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-38.

54-40-02

ALLOWABLE DAMAGE 1

Page 110

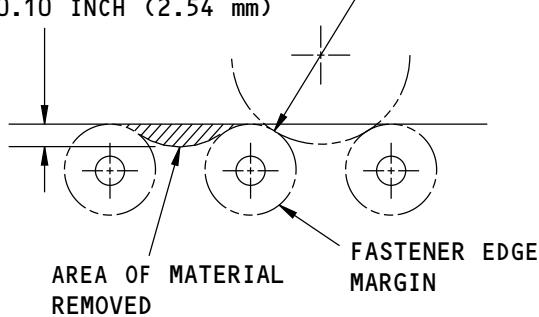
Jul 10/2013

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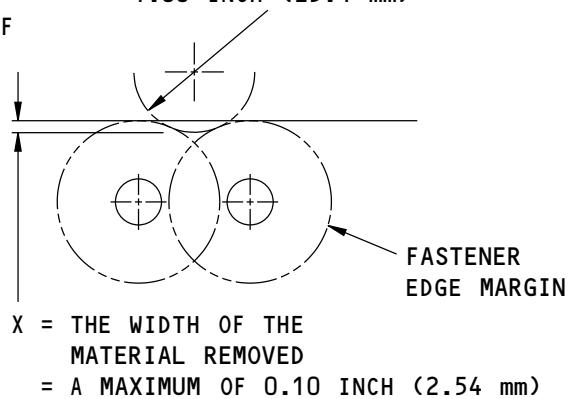
**737-800
STRUCTURAL REPAIR MANUAL**

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



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

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



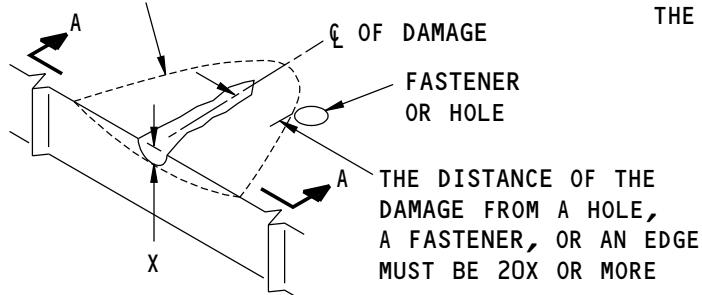
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)

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

(B)

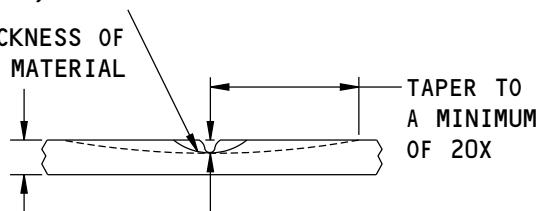
AREA OF MATERIAL THAT IS REMOVED. A MAXIMUM OF 0.50 INCH (12.7 mm)
FOR ATTACH RINGS



THE DISTANCE OF THE DAMAGE FROM A HOLE, A FASTENER, OR AN EDGE MUST BE 20X OR MORE

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.4 mm), THEN TAPER AS SHOWN

T = THICKNESS OF THE MATERIAL



X = THE DEPTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 0.05T

A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

F19261 S0006592093_V1

Allowable Damage Limits
Figure 104 (Sheet 1 of 2)

54-40-02

ALLOWABLE DAMAGE 1

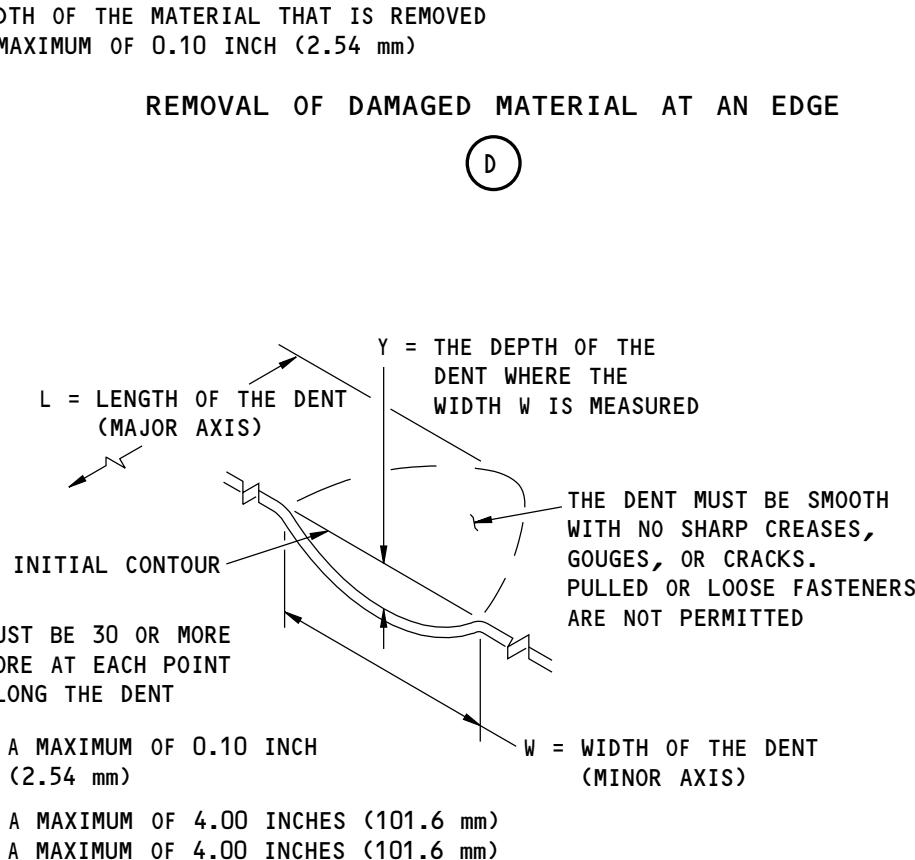
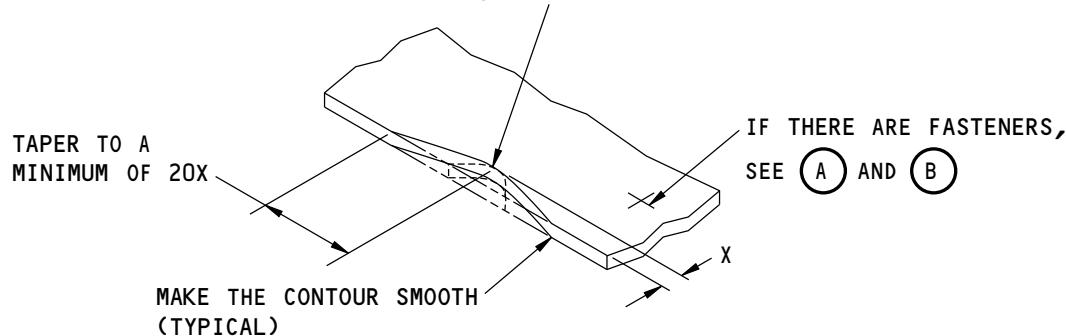
Page 111

Nov 10/2012



737-800 STRUCTURAL REPAIR MANUAL

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.4 mm), THEN TAPER AS SHOWN



A DENT THAT IS PERMITTED



G55808 S0006592094_V1

Allowable Damage Limits
Figure 104 (Sheet 2 of 2)

54-40-02

ALLOWABLE DAMAGE 1

Page 112

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - PRIMARY EXHAUST - PERFORMANCE IMPROVEMENT PACKAGE

1. Applicability

- A. This subject gives the allowable damage limits for the primary exhaust system for the CFM56-7 engine with the Performance Improvement Package nozzle and plug. The two primary exhaust system components, the nozzle and plug, are shown in Figure 101/ALLOWABLE DAMAGE 2.

NOTE: The Performance Improvement Package nozzle and plug are installed during production for aircraft line numbers 3762 and on.

2. General

- A. Refer to AERODYNAMIC SMOOTHNESS, 51-10-01 for the Aerodynamic Smoothness Requirements.
- B. Refer to CMM 78-11-39 for weld repairs for the primary nozzle.
- C. Refer to CMM 78-11-40 for weld repairs for the primary plug.
- D. Refer to Paragraph 4./ALLOWABLE DAMAGE 2 for the allowable damage limits.
- E. Do the steps that follow if you have damage to the Corrosion Resistant Steel (A286) or nickel alloy 625 parts:
- (1) Remove the damage
- (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 abrasive 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.
- F. Refer to Table 101/ALLOWABLE DAMAGE 2 for the allowable damage paragraph references of the nozzle and plug components.

Table 101: Paragraph References for the Allowable Damage

Part	Paragraph
PRIMARY NOZZLE	4.A
Attach Ring	4.A.(1)
Trailing Edge Ring	4.A.(1)
Aft Closeout Ring	4.A.(1)
Solid Back Panel Skin	4.A.(2)
Perforated Face Skin	4.A.(2)
Honeycomb Core	4.A.(3)
Fairing Skin	4.A.(4)
Leading Edge Stiffener	4.A.(4)
Aft Main Wall	4.A.(5)
Fences	4.A.(6)
Support Brackets	4.A.(7)
Labyrinth Seals	4.A.(8)

54-40-02

ALLOWABLE DAMAGE 2

Page 101

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 101: Paragraph References for the Allowable Damage (Continued)

Part	Paragraph
Shelf	4.A.(9)
PRIMARY PLUG	4.B
Attach Ring	4.B.(1)
Foward Skin	4.B.(2)
Tail Pipe	4.B.(2)
Tail Ring	4.B.(3)
Drain Pan Stiffener	4.B.(4)
Hat Stiffener	4.B.(4)
Splice Stiffener	4.B.(4)
Drain pan	4.B.(5)

54-40-02

ALLOWABLE DAMAGE 2

Page 102

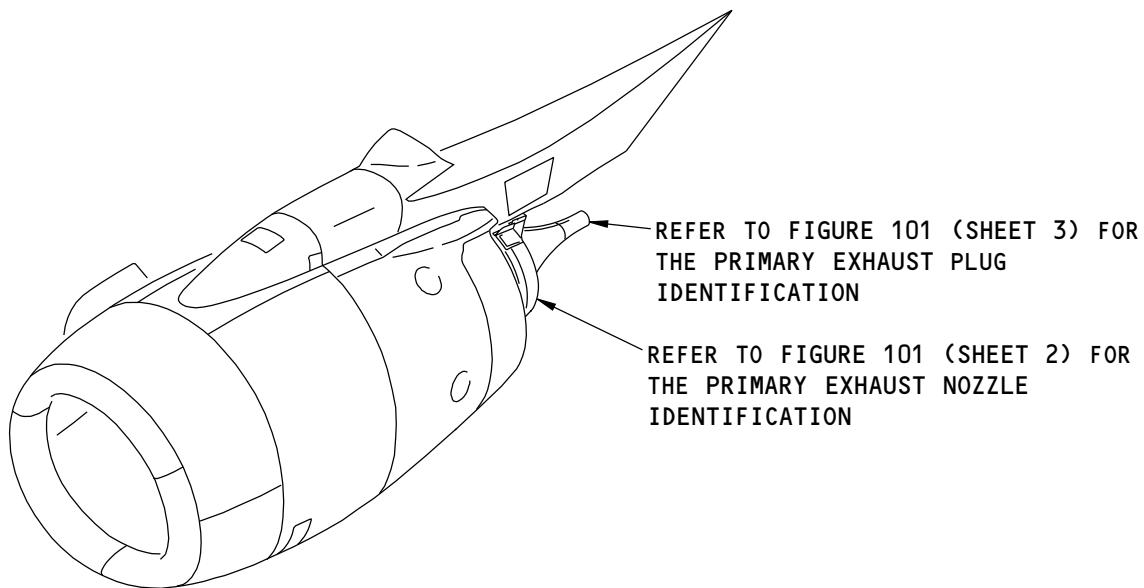
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737-800
STRUCTURAL REPAIR MANUAL



2101257 S0000445580_V1

Allowable Damage - Primary Exhaust Nozzle and Plug Location
Figure 101 (Sheet 1 of 3)

54-40-02

ALLOWABLE DAMAGE 2

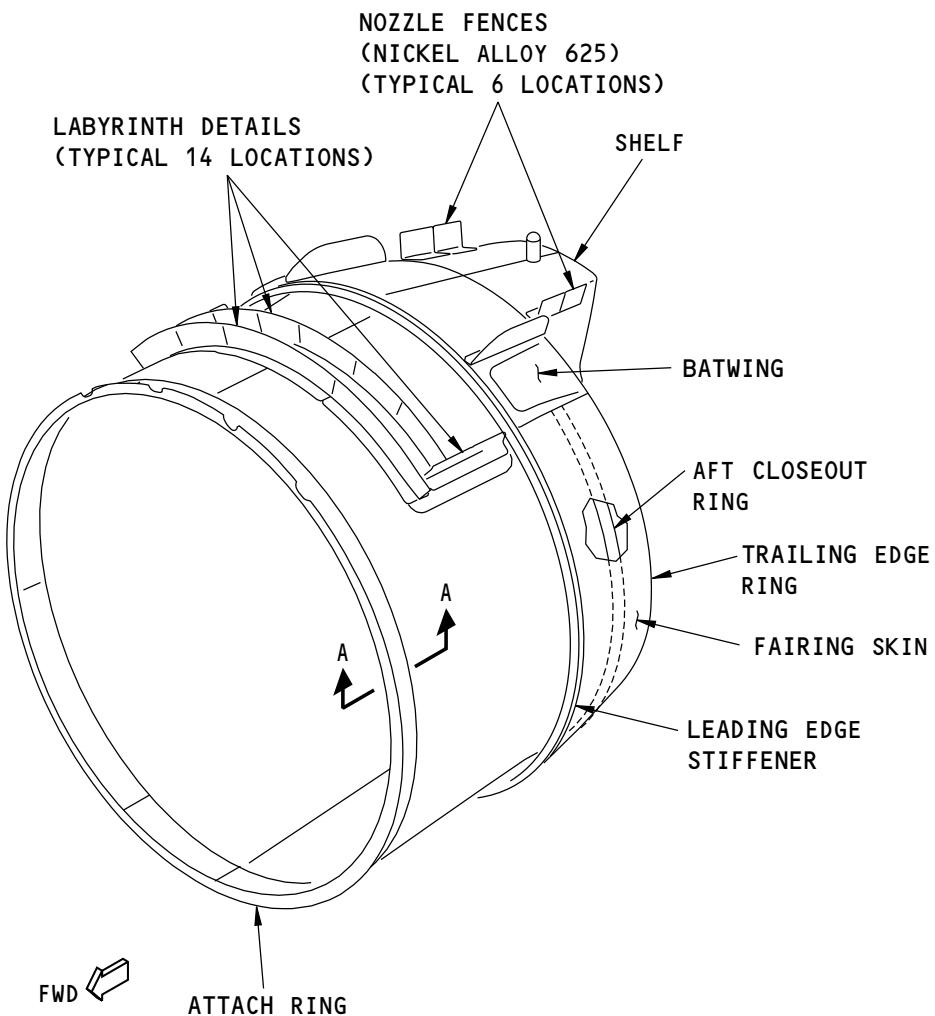
Page 103

Nov 10/2012

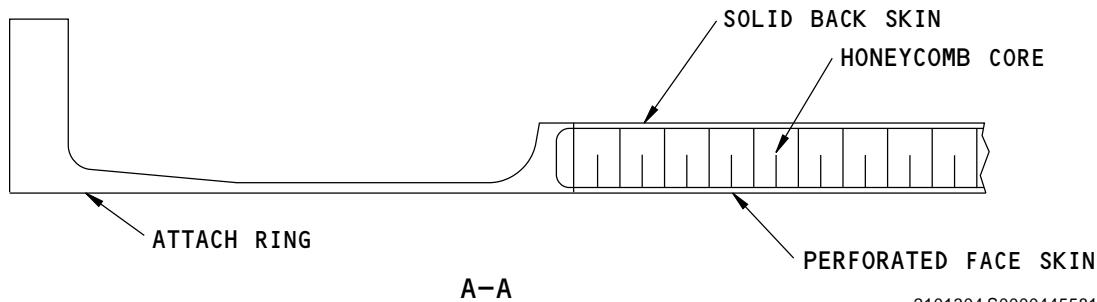
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: ALL PARTS ARE MADE FROM NICKEL ALLOY 625 MATERIAL, UNLESS SPECIFIED DIFFERENTLY.



2101304 S0000445581_V1

Allowable Damage - Primary Exhaust Nozzle and Plug Location
Figure 101 (Sheet 2 of 3)

54-40-02

ALLOWABLE DAMAGE 2

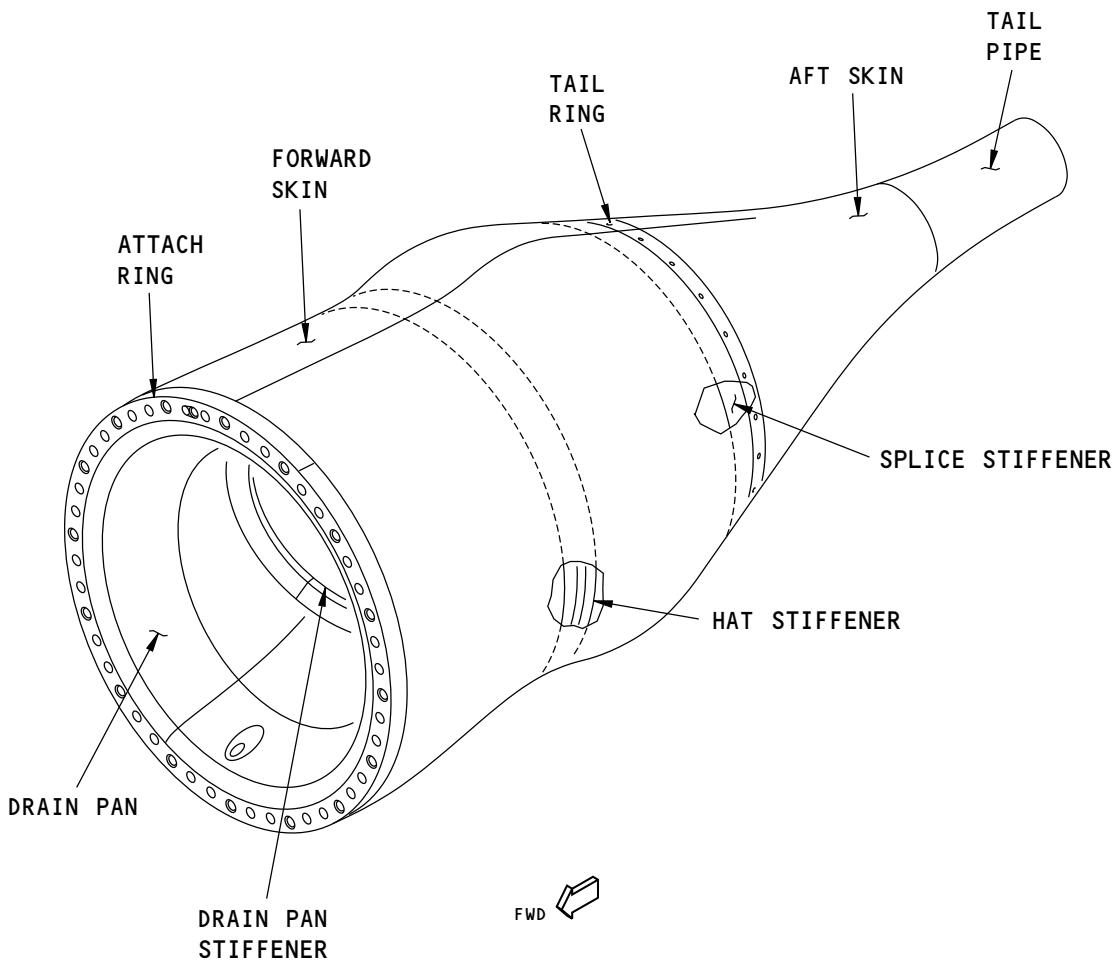
Page 104

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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

2101321 S0000445587_V1

Allowable Damage - Primary Exhaust Nozzle and Plug Location
Figure 101 (Sheet 3 of 3)

54-40-02

ALLOWABLE DAMAGE 2

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
51-40-03	FASTENER SUBSTITUTION

4. Allowable Damage Limits

A. Primary Nozzle

- (1) Attach Ring, Trailing Edge Ring, and Aft Closeout Ring
- (a) Cracks are not permitted.
 - (b) Nicks, Gouges, and Scratches are not permitted.
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-39 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (2) Sandwich Panel Skins - Solid Back Skin and Perforated Face Skin

(a) Cracks:

- 1) Cracks are not permitted. Refer to CMM 78-11-39 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

(b) Nicks, Gouges, and Scratches:

- 1) Remove the surface damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C.

(c) Dents are permitted if:

- 1) The length or diameter of the dent is less than or equal to 1.00 in. (25.40 mm)
- 2) The depth of the dent is less than or equal to 0.015 in. (0.381 mm)
- 3) There is a maximum of 5 dents.
- 4) The dents are greater than or equal to 2.00 in. (50.80 mm) away from:
 - a) Other dents
 - b) Crushed core areas
 - c) Disbonded areas
 - d) Labyrinth seals
 - e) Welds

- (3) Honeycomb Core

(a) Disbonded areas between the Perforated Skin and the Honeycomb Core are permitted if:

- 1) The damage length or diameter is less than or equal to 1.0 in. (25.4 mm)
- 2) There are a maximum of five disbonded areas
- 3) Greater than or equal to 2.0 in. (50.8 mm) away from:
 - a) Other disbonded areas
 - b) Dents
 - c) Crushed core areas

54-40-02

ALLOWABLE DAMAGE 2

Page 106

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- d) Labyrinth seals
 - e) Welds
- (b) Crushed core is permitted if:
- 1) The length or diameter of the damage is less than or equal to 1.0 in. (25.4 mm)
 - 2) There are no more than five crushed core areas
 - 3) The damage is located greater than or equal to 2.0 in. (50.8 mm) away from:
 - a) Other crushed core damage
 - b) Dents
 - c) Disbond damage
 - d) Labyrinth seals
 - e) Welds
- (c) Holes and punctures are not permitted. Refer to CMM 78-11-39 for weld repair only.
- NOTE:** Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
- (4) Fairing Skin and Leading Edge Stiffener
- (a) Cracks:
 - 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
 - 2) Cracks at other locations are not permitted. Refer to CMM 78-11-39 for weld repair only.
- NOTE:** Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
- (b) Nicks, Gouges, and Scratches:
 - 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
 - 2) Remove surface damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C.
 - a) The maximum permitted length or diameter of the cleanup is 2.0 in. (50.8 mm).
- (c) Dents are permitted as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail E if the edges of the dent are:
- 1) Greater than or equal to 6.0 in. (152.4 mm) away from other dents.
 - 2) Greater than or equal to 2.0 in. (50.8 mm) away from fasteners.
 - 3) Greater than or equal to 2.0 in. (50.8 mm) away from batwings.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-39 for weld repair only.
- NOTE:** Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
- (5) Aft Main Wall
- (a) Cracks are not permitted. Refer to CMM 78-11-39 for weld repair only.
- NOTE:** Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
- (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C.
 - (c) Dents are not permitted.

54-40-02

ALLOWABLE DAMAGE 2

Page 107

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (d) Holes and Punctures are not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (6) Fences (6 locations)

- (a) No damage is permitted on the forward two fences in the corner radii between the radius tangent points. Refer to Figure 102/ALLOWABLE DAMAGE 2, Detail F.

- (b) Cracks:

- 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
- 2) Cracks at other locations are not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (c) Nicks, Gouges, Scratches, and Corrosion:

- 1) Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, and D.

- (d) Dents are not permitted.

- (e) Holes and Punctures are not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (7) Support Brackets (24 locations)

- (a) Cracks are not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (b) Nicks, Gouges, Scratches, and Corrosion:

- 1) Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, and D.

- (c) Dents are not permitted.

- (d) Holes and Punctures are not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (8) Labyrinth Seals (14 locations):

- (a) Cracks:

- 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
- 2) Cracks at other locations is not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (b) Nicks, Gouges, and Scratches:

- 1) Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, C, and D.

- (c) Dents are not permitted.

- (d) Holes and Punctures are not permitted. Refer to CMM 78–11–39 for weld repair only.

NOTE: Refer toFASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

- (9) Shelf

54-40-02

ALLOWABLE DAMAGE 2

Page 108

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

(a) Cracks:

- 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D only if the edges of the damage are more than 1.0 in. (25.4 mm) away from any weld lines.

- 2) Cracks at other locations are not permitted.

(b) Nicks, Gouges, and Scratches:

- 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2 A, B, and D only if the edges of the damage are more than 1.0 in. (25.4 mm) away from any weld lines.

- 2) Remove the surface damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C.

(c) Dents are permitted as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail E if the edges of the dents are:

- 1) Greater than or equal to 2.0 in. (50.8 mm) away from weld lines.

- 2) Greater than or equal to 6.0 in. (152.4 mm) away from other dents.

- 3) Greater than or equal to 2.0 in. (50.8 mm) away from fasteners.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-39 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

B. Primary Plug

(1) Attach Ring

(a) Cracks are not permitted.

(b) Nicks, Gouges, and Scratches are not permitted.

(c) Dents are not permitted.

(d) Holes and Punctures are not permitted. Refer to CMM 78-11-40 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

(2) Forward Skin and Aft Skin

(a) Cracks:

- 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.

- 2) Cracks at other locations are not permitted. Refer to CMM 78-11-40 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

(b) Nicks, Gouges, and Scratches:

- 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.

- 2) Remove the surface damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C if the edges of the damage are:

- a) The length or diameter of the cleanup is less than or equal to 2.0 in. (50.8 mm).

- b) Greater than or equal to 1.0 in. (25.4 mm) away from drain tube support bracket fasteners.

- c) Greater than or equal to 1.0 in. (25.4 mm) away from drain tube exit fitting weld.

54-40-02

ALLOWABLE DAMAGE 2

Page 109

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- d) Greater than or equal to 1.3 in. (33.0 mm) aft of the aft skin attachment bolts.
 - (c) Dents are permitted as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail E if the edges of the dent are:
 - 1) Greater than or equal to 6.0 in. (152.4 mm) away from other dents
 - 2) Greater than or equal to 2.0 in. (50.8 mm) away from:
 - a) Fasteners
 - b) Forward attach ring
 - 3) Greater than or equal to 1.0 in. (25.4 mm) away from drain tube exit fitting welds.
NOTE: No dents are allowed on the drain tube exit fitting.
 - 4) Greater than or equal to 1.3 in. (33.0 mm) aft of the aft skin attachment bolts.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-40 for weld repair only.
NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
- (3) Tail Ring
- (a) Cracks:
 - 1) Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail D.
 - 2) Cracks at other locations are not permitted. Refer to CMM 78-11-40 for weld repair only.
NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
 - (b) Nicks, Gouges, and Scratches:
 - 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail D.
 - 2) Remove the surface damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C.
 - a) The length or diameter of the cleanup must be less than or equal to 2.0 in. (50.8 mm).
 - (c) Dents are permitted as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail E if the edges of the dent are:
 - 1) Greater than or equal to 3.0 in. (76.2 mm) away from other dents.
 - 2) Greater than or equal to 2.0 in. (50.8 mm) away from the aft edge of the tail ring.
 - (d) Holes and Punctures are not permitted. Refer to CMM 78-11-40 for weld repair only.
NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
- (4) Drain Pan Stiffener, Hat Stiffener, and Splice Stiffener
- (a) Cracks:
 - 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
 - 2) Cracks at other locations are not permitted. Refer to CMM 78-11-40 for weld repair only.
NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
 - 2) Remove other damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Detail C.

54-40-02

ALLOWABLE DAMAGE 2

Page 110

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 3) The length or diameter of the cleanup must be less than or equal to 2.00 in.
(50.80 mm)
- (c) Dents are not permitted.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-40 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

(5) Drain Pan

- (a) Cracks:
 - 1) Remove edge damage as shown in Figure 102/ALLOWABLE DAMAGE 2, Details A, B, and D.
 - 2) Cracks at other locations are not permitted.
- (b) Nicks, Gouges, and Scratches are not permitted.
- (c) Dents are not permitted.
- (d) Holes and Punctures are not permitted. Refer to CMM 78-11-40 for weld repair only.

NOTE: Refer to FASTENER SUBSTITUTION, 51-40-03 for fastener substitution.

54-40-02

ALLOWABLE DAMAGE 2

Page 111

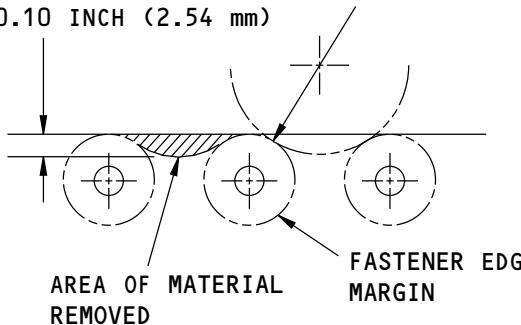
Nov 10/2012

D634A210

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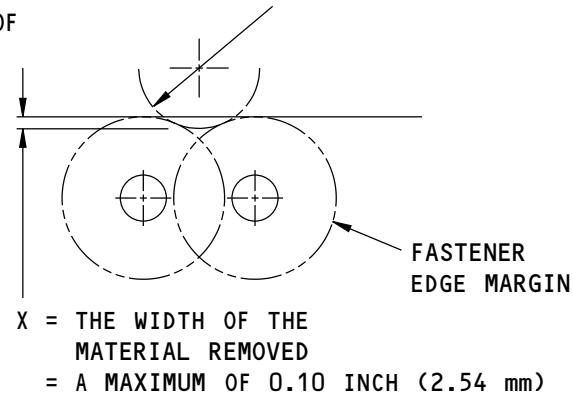
**737-800
STRUCTURAL REPAIR MANUAL**

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



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

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



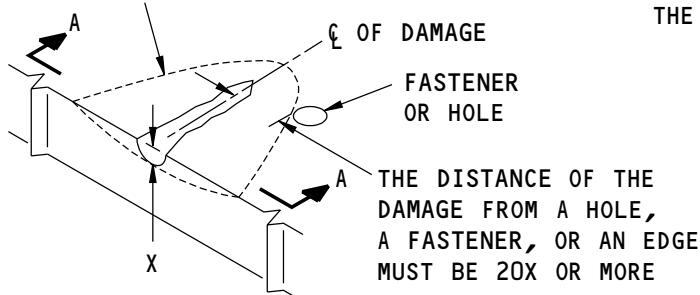
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)

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

(B)

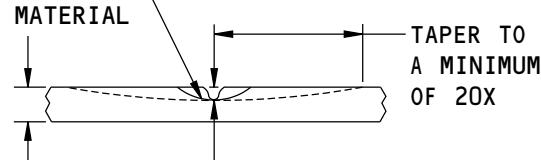
AREA OF MATERIAL THAT IS REMOVED. A MAXIMUM OF 0.50 INCH (12.7 mm) FOR ATTACH RINGS



ℓ OF DAMAGE
FASTENER OR HOLE
 A THE DISTANCE OF THE DAMAGE FROM A HOLE, A FASTENER, OR AN EDGE MUST BE 20X OR MORE

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.4 mm), THEN TAPER AS SHOWN

T = THICKNESS OF THE MATERIAL



X = THE DEPTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 0.05 T

A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

2101251 S0000445574_V1

Allowable Damage Limits
Figure 102 (Sheet 1 of 3)

54-40-02

ALLOWABLE DAMAGE 2

Page 112

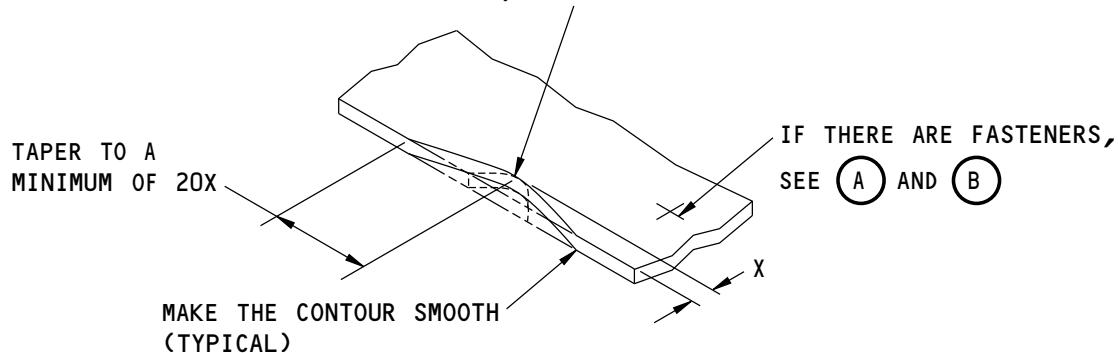
Nov 10/2012

D634A210



737-800 STRUCTURAL REPAIR MANUAL

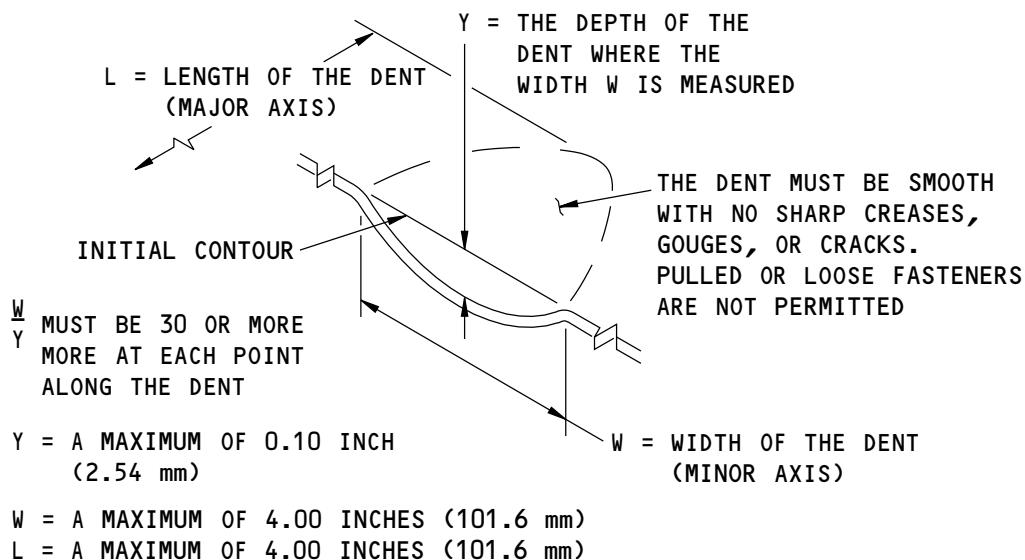
REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.4 mm), THEN TAPER AS SHOWN



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

D



A DENT THAT IS PERMITTED

E

2101254 S0000445576_V1

Allowable Damage Limits
Figure 102 (Sheet 2 of 3)

54-40-02

ALLOWABLE DAMAGE 2

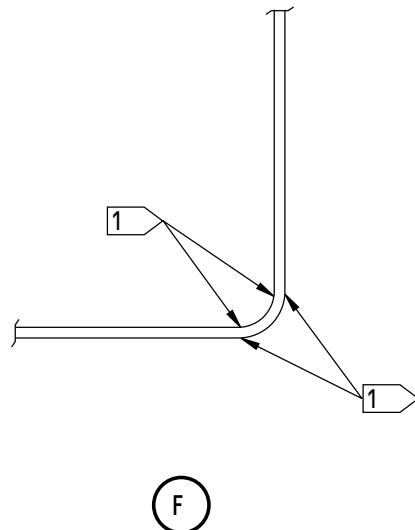
Page 113

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



NOTES

- 1 DAMAGE IS NOT PERMITTED IN THE CORNER RADII BETWEEN THE RADIUS TANGENT POINTS

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Allowable Damage Limits
Figure 102 (Sheet 3 of 3)

54-40-02

ALLOWABLE DAMAGE 2

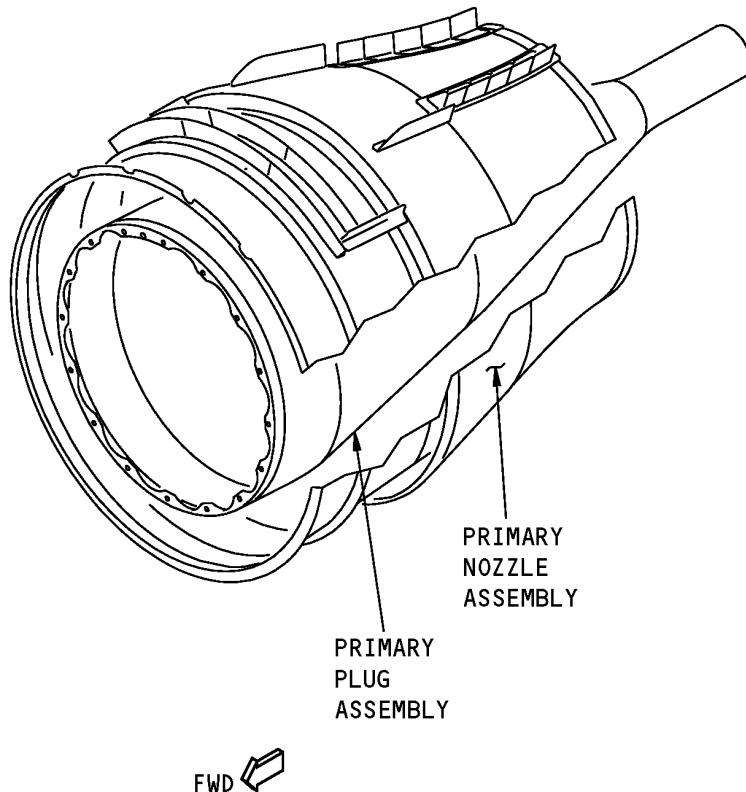
Page 114

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL
REPAIR 1 - PRIMARY EXHAUST SYSTEM



NOTE: REFER TO THE COMPONENT MAINTENANCE MANUALS THAT FOLLOW FOR THE WELD REPAIRS:

- CMM 78-11-37 FOR THE PRIMARY NOZZLE ASSEMBLY
- CMM 78-11-38 FOR THE PRIMARY PLUG ASSEMBLY

Repair - Primary Exhaust System
Figure 201

54-40-02

REPAIR 1

Page 201

Nov 10/2012

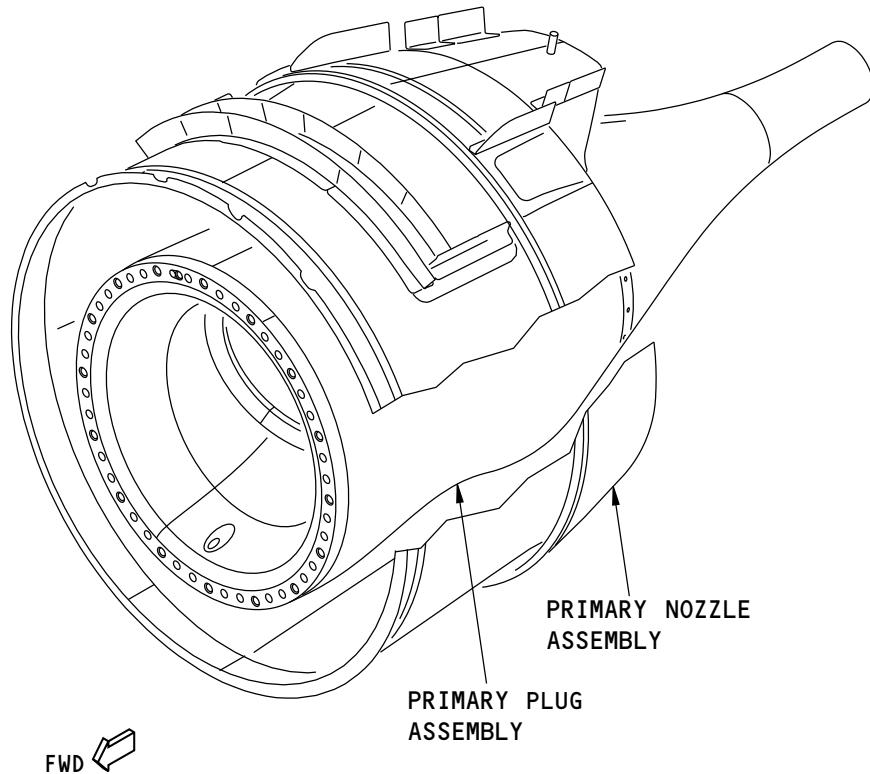
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - PRIMARY EXHAUST SYSTEM - PERFORMANCE IMPROVEMENT PACKAGE



NOTES

- REFER TO SRM 51-40-03 FOR FASTENER SUBSTITUTION
- REFER TO THE SRM REPAIRS THAT FOLLOW FOR THE WELD REPAIRS:
 - SRM 54-40-02 REPAIR 3, REPAIR 4, AND REPAIR 5 FOR THE HONEYCOMB SANDWICH PANEL ASSEMBLY FOR THE PRIMARY NOZZLE ASSEMBLY
- REFER TO THE COMPONENT MAINTENANCE MANUALS THAT FOLLOW FOR THE WELD REPAIRS:
 - CMM 78-11-39 FOR THE PRIMARY NOZZLE ASSEMBLY
 - CMM 78-11-40 FOR THE PRIMARY PLUG ASSEMBLY

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Repair - Primary Exhaust System
Figure 201

54-40-02

REPAIR 2
Page 201

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

**REPAIR 3 - PRIMARY EXHAUST SYSTEM - PERFORMANCE IMPROVEMENT PACKAGE - WELD
PIN REPAIR OF DENTS AND PUNCTURES ON THE HONEYCOMB SANDWICH PANEL ASSEMBLY
FOR THE PRIMARY NOZZLE ASSEMBLY**

1. Applicability

- A. Repair 3 is applicable to the 314A2630 Primary Nozzle Assembly as shown in Figure 201/REPAIR 3.
- B. Repair 3 is not applicable to the doubler/labyrinth area of the Primary Nozzle Assembly as shown in Figure 201/REPAIR 3.
- C. Repair 3 is applicable to smooth dent damage that is equal to or less than 0.08 in. (2.03 mm) in depth and a diameter or major axis that is equal to or less than 1.00 in. (25.40 mm).
- D. Repair 3 is applicable to sharp dents and small punctures with a diameter that is equal to or less than 0.25 in. (6.35 mm) as measured on the surface of the panel.
- E. Repair 3 is applicable to dents and punctures that:
 - (1) Is a minimum of 2.00 in. (50.80 mm) away from the foot of the labyrinth, an edge of the panel, or the weld line between the fishmouth and the honeycomb as shown in Figure 201/REPAIR 3.
 - (2) Can have only one repair for each 50 in² (323 cm²) of panel area.
 - (3) Is a minimum of 6.0 in. (152 mm) distance between each repair area.
 - (4) Must have no cracks, sharp edges or wrinkles.

2. General

- A. Repair 3 is a permanent repair. Refer to 51-00-06 for the definitions of the different categories of repairs.
- B. All dimensions are in inches, unless they are shown differently.
- C. The materials that follow are necessary to complete this repair:
 - (1) AS90-4030-14 Weld Repair Pin. Refer to Figure 203/REPAIR 3.

NOTE: The use of the AS90 weld repair pin is to give a structural tie between the two face sheets of a brazed panel assembly. Do this by fusion welding each end of the weld repair pin to the face sheet and plug welding the open ends of the weld repair pin. Get the AS90 weld repair pin from Magellan Aerospace Corporation, 1712 Germantown Road, Middletown, OH 45042; Phone (513)-422-2751 (V80512).

- (2) Solid rod with a diameter of 0.250 in. (6.350 mm) \pm 0.005 in. (0.127 mm).
- (3) Phenolic block with a shape to match the necessary contour.
- (4) Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-13, GENERAL	Surface Roughness Finish Requirements
BAC 5975	Boeing Process Specification for Fusion Welding of Metal
SOPM 20-20-02	Penetrant Methods of Inspection
737 NDT Part 1, 51-02-00	X-Ray, General Radiographic Practices

54-40-02

**REPAIR 3
Page 201**

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

4. Repair Instructions

- A. Get access to the damaged area.
 - B. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - C. Drill a 0.090 in. (2.29 mm) diameter hole through the center of the dent damage. Make sure to drill fully through the panel. Refer to Figure 202/REPAIR 3.
 - D. Back drill and increase the diameter of the hole between 0.245 in. (6.223 mm) and 0.255 in. (6.477 mm) only from the opposite side of the dent to within 0.010 in. (0.254 mm) of the inner dent surface. Refer to Figure 202/REPAIR 3.
 - E. Put a solid rod with diameter between 0.245 in. (6.223 mm) and 0.255 in. (6.477 mm) into the hole specified in Paragraph 4.D./REPAIR 3. Put the phenolic block where the dent is located to use as a backup and force the dent to within 0.010 in. (0.254 mm) flushness of the initial contour. Refer to Figure 202/REPAIR 3.
 - F. Drill the hole specified in Paragraph 4.D./REPAIR 3 fully through the panel. Refer to Figure 202/REPAIR 3.
 - (1) Do not get lubricant on the two sides of the hole because this will affect the weld.
 - (2) Do a penetrant inspection of the hole to make sure that there are no cracks. Refer to SOPM 20-20-02.
 - G. Install the weld repair pin in the drilled hole until the weld repair pin end on the solid face sheet of the panel is within +0.020 in. (0.508 mm)/-0.000 in. (0.000 mm) flushness. The weld repair pin end on the perforated face sheet of the panel must be above the face sheet surface by a minimum of 0.060 in. (1.524 mm). Refer to Figure 202/REPAIR 3.
 - H. Keep the weld repair pin in the panel by increasing the weld repair pin end on the perforated face sheet side within the drilled hole with a drift pin and a backup block on the opposite side of the panel. Refer to Figure 202/REPAIR 3.
 - I. Weld around the circumference of the weld repair pin on the two sides of the panel as given in BAC 5975, Class A fusion weld. Refer to Figure 202/REPAIR 3.
 - J. Weld the open end of the weld repair pin on the perforated face sheet side of the panel closed with Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3. Refer to Figure 202/REPAIR 3.
 - K. At the center of the weld repair pin on the perforated face sheet side of the panel, drill a 0.050 in. (1.270 mm) diameter vent hole through the closed end of the weld repair pin specified in Paragraph 4.J./REPAIR 3.
 - L. Weld the open end of the weld repair pin on the solid face sheet side of the panel closed with Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3. Refer to Figure 202/REPAIR 3.
 - M. On the two sides of the panel, grind the welds to a +0.005 in. (0.127 mm)/-0.000 in. (0.000 mm) flushness of the panel surfaces and make sure that there is a 32 microinches Ra or smoother surface finish as given in 51-20-13, GENERAL.
- NOTE:** Do not grind into the base material.
- N. Do a penetrant inspection of the welds and the vent hole to make sure that there are no cracks. Refer to SOPM 20-20-02.
 - O. Do a radiographic inspection of all welds as given in 737 NDT Part 1, 51-02-00.
 - P. Re-install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.

54-40-02

REPAIR 3
Page 202

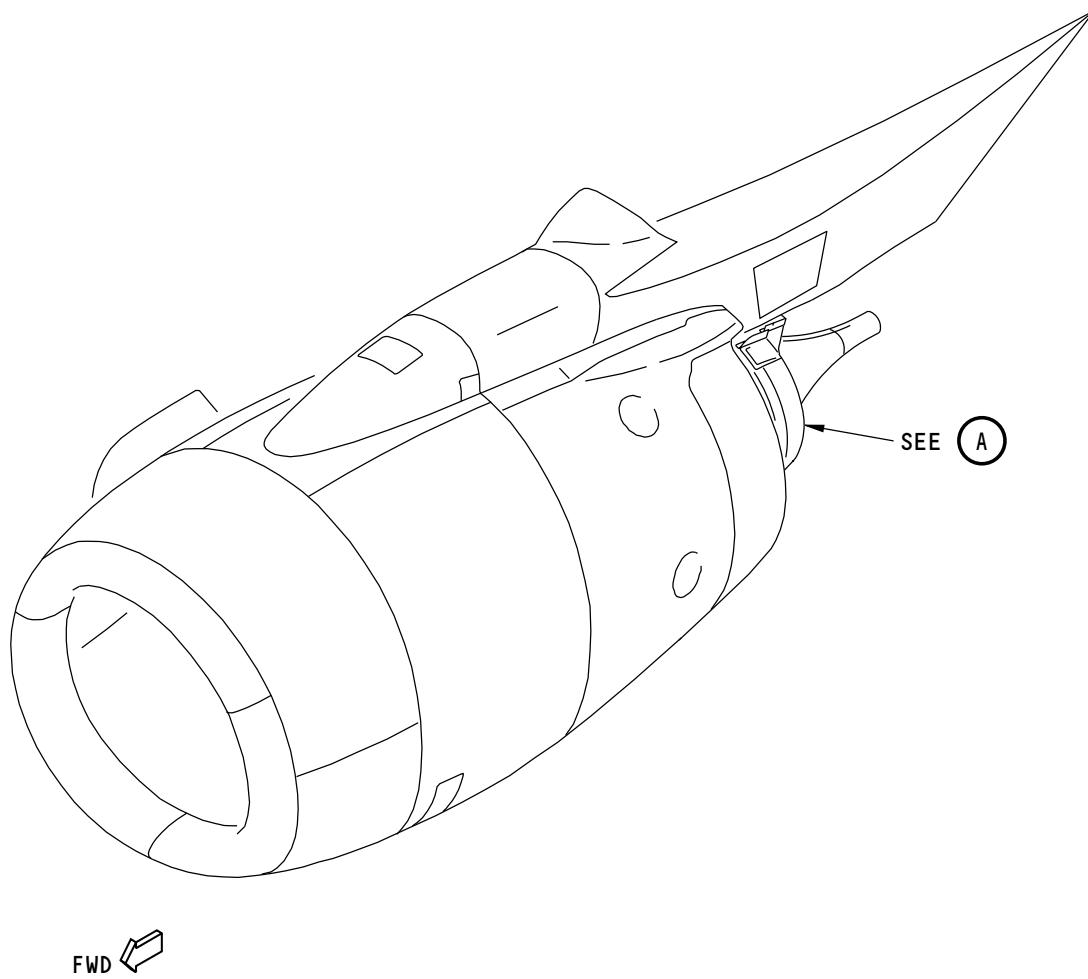
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737-800
STRUCTURAL REPAIR MANUAL



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Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 1 of 3)

54-40-02

REPAIR 3
Page 203

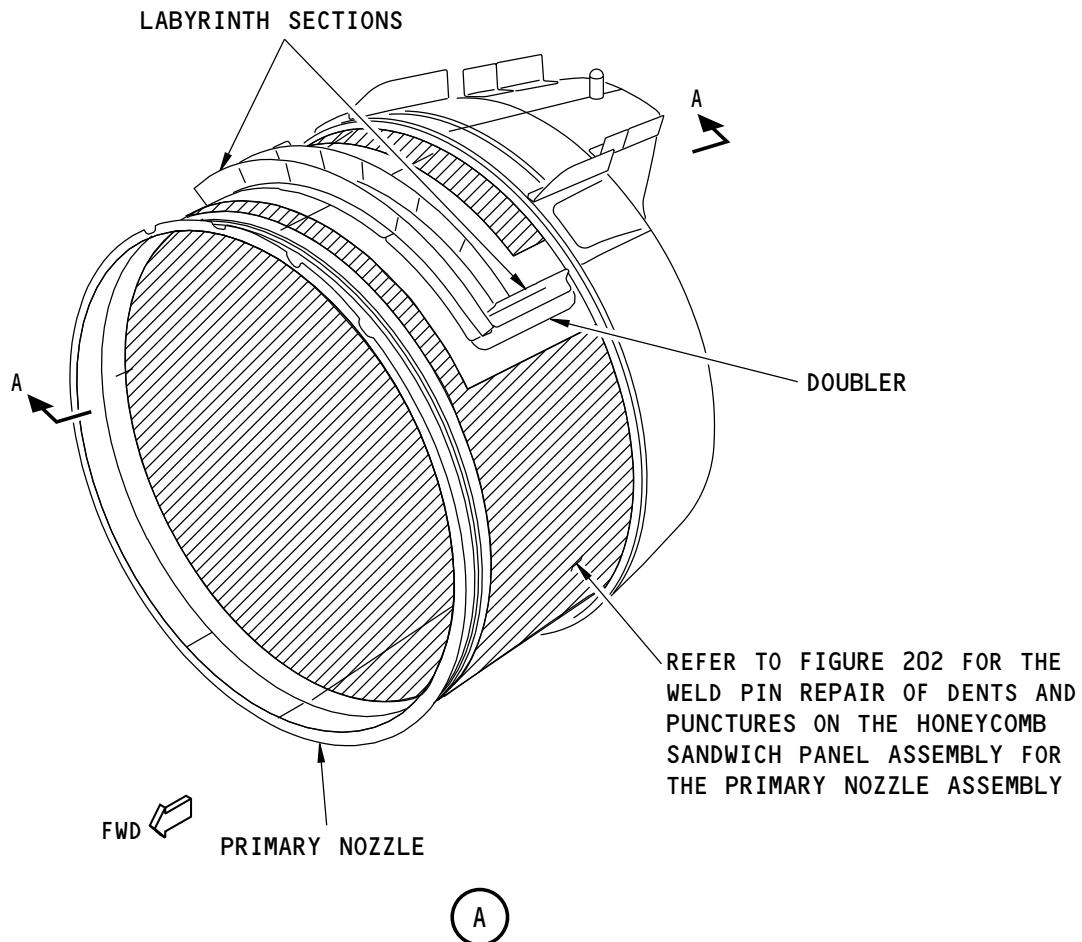
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737-800
STRUCTURAL REPAIR MANUAL



DENT AND PUNCTURE PERMITTED
IN THIS AREA ONLY

2436002 S0000564083_V1

Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 2 of 3)

54-40-02

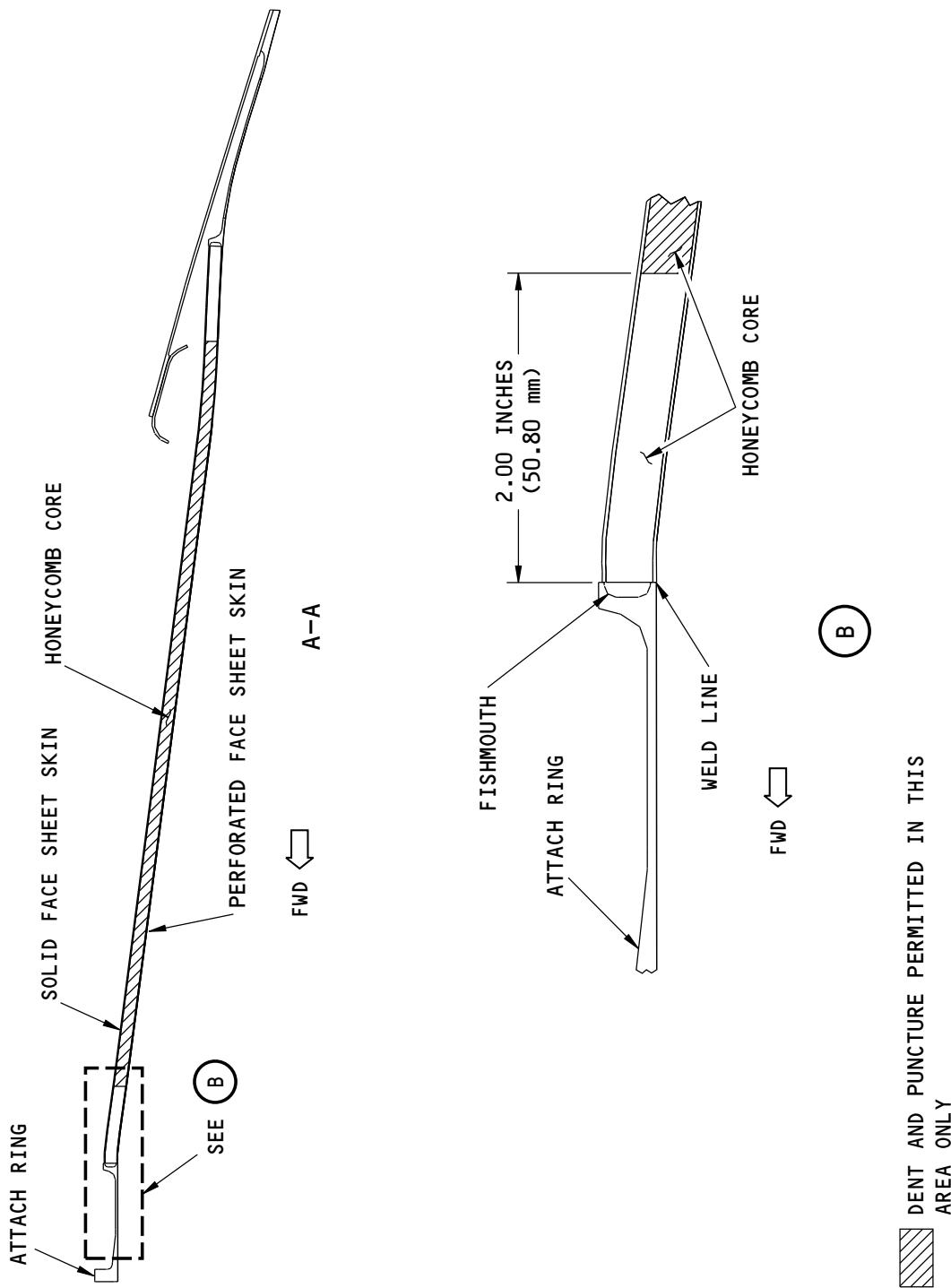
REPAIR 3
Page 204

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 3 of 3)

54-40-02

REPAIR 3

Page 205

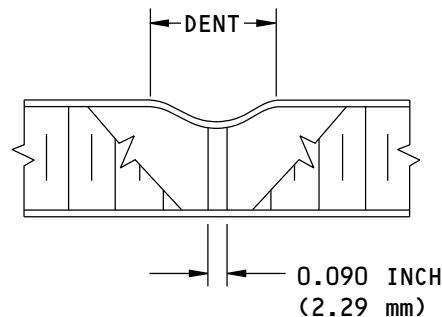
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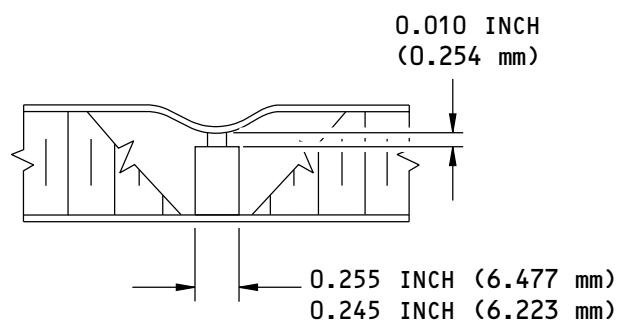
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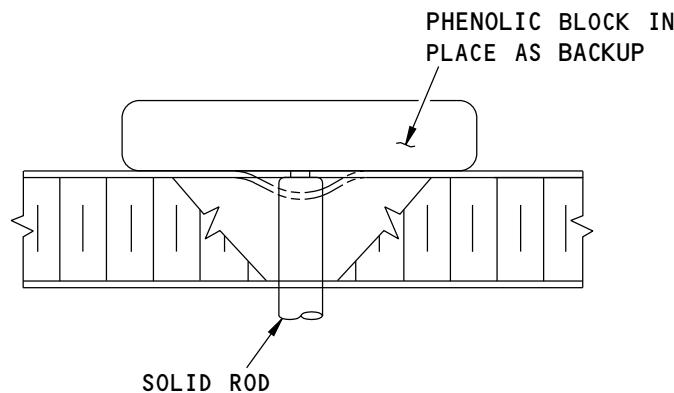
737-800
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DRILL A HOLE THROUGH THE CENTER OF A DENT



**BACK DRILL A HOLE THROUGH THE OPPOSITE
SIDE OF A DENT**



REMOVE THE DENT

2435754 S0000564085_V1

**Weld Pin Repair of Dents and Punctures on the Honeycomb Sandwich Panel Assembly for the Primary
Nozzle Assembly**
Figure 202 (Sheet 1 of 2)

54-40-02

REPAIR 3
Page 206

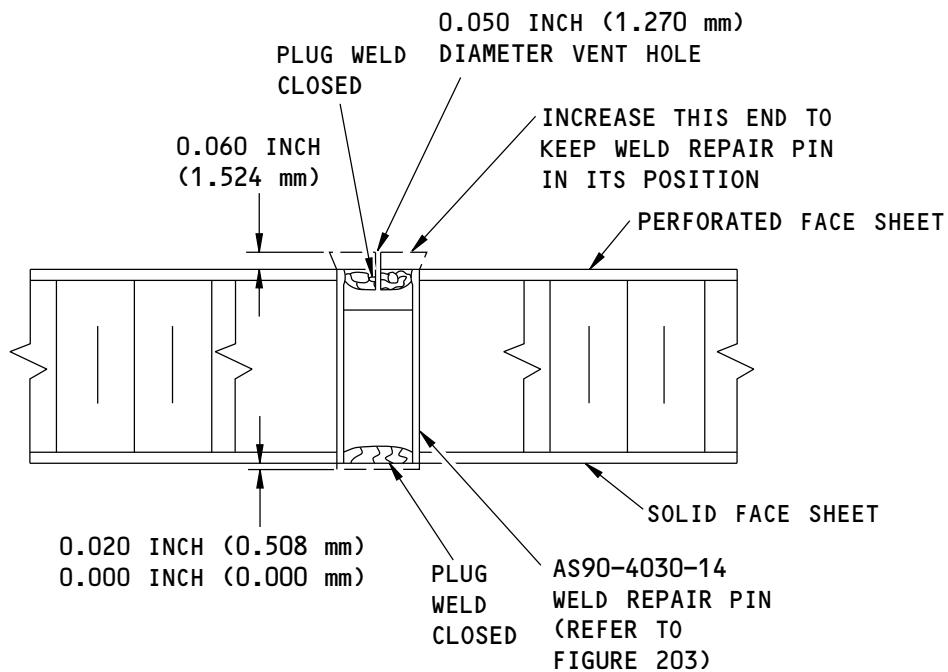
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737-800
STRUCTURAL REPAIR MANUAL



INSTALLATION OF THE WELD REPAIR PIN

2435791 S0000564086_V1

Weld Pin Repair of Dents and Punctures on the Honeycomb Sandwich Panel Assembly for the Primary Nozzle Assembly
Figure 202 (Sheet 2 of 2)

54-40-02

REPAIR 3
Page 207

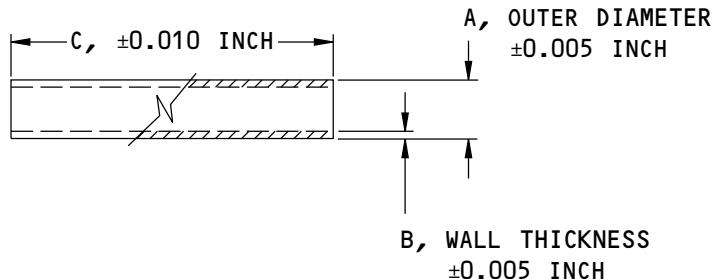
Mar 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



AS90 WELD REPAIR PIN

EXPLANATION OF PART CALLOUT =

AS90-4030-14
C, LENGTH IN 1/32 INCH INCREMENT = 7/16
B, WALL THICKNESS IN 0.000 INCH = 0.030
A, OUTER DIAMETER IN 1/16 INCH INCREMENT = 1/4 (0.250)
TUBULAR REPAIR PIN

MATERIAL: NICKEL ALLOY 625 BAR PER AMS 5666.

FINISH: ALL MACHINED SURFACES (INNER AND OUTER) TO A 63
MICROINCHES Ra OR SMOOTHER FINISH.

2435799 S0000564087_V1

Weld Repair Pin
Figure 203

54-40-02

REPAIR 3
Page 208

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - PRIMARY EXHAUST SYSTEM - PERFORMANCE IMPROVEMENT PACKAGE - PIN
REPAIR OF CORE TO FACE SHEET DISBOND ON THE HONEYCOMB SANDWICH PANEL
ASSEMBLY FOR THE PRIMARY NOZZLE ASSEMBLY

1. Applicability

- A. Repair 4 is applicable to the 314A2630 Primary Nozzle Assembly as shown in Figure 201/REPAIR 4.
- B. Repair 4 is not applicable to the doubler/labyrinth area of the Primary Nozzle Assembly as shown in Figure 201/REPAIR 4.
- C. Repair 4 is applicable to disbond damage in the 12 o'clock area that is a maximum dimension of 2.50 in. (63.50 mm) by 1.80 in. (45.72 mm) as shown in Figure 201/REPAIR 4, Detail C.
- D. Repair 4 is applicable to disbond damage not in the 12 o'clock area that is a maximum dimension of 3.00 in. (76.20 mm) by 3.00 in. (76.20 mm) as shown in Figure 201/REPAIR 4.
- E. Repair 4 is applicable to disbond damage that:
 - (1) Is a minimum of 2.00 in. (50.80 mm) away from the foot of the labyrinth, an edge of the panel, or the weld line between the fishmouth and the honeycomb as shown in Figure 201/REPAIR 4.
 - (2) Can have a maximum of two pin repair areas for each honeycomb panel.
 - (3) Has a minimum of 6.0 in. (152 mm) distance between each repair area.
 - (4) Can have a maximum quantity of 10 weld repair pins for one repair area.
 - (5) Must have a minimum 3D (D= weld repair pin diameter) distance between weld repairs pins and a maximum 4D distance between weld repair pins in a repair area as shown in Figure 202/REPAIR 4.

2. General

- A. Repair 4 is a permanent repair. Refer to 51-00-06 for the definitions of the different categories of repairs.
- B. D = weld repair pin diameter.
- C. All dimensions are in inches, unless they are shown differently.
- D. The materials that follow are necessary to complete this repair:
 - (1) AS90-3030-14 Weld Repair Pin. Refer to Figure 205/REPAIR 4.

NOTE: The use of the AS90 weld repair pin is to give a structural tie between the two face sheets of a brazed panel assembly. Do this by fusion welding each end of the weld repair pin to the face sheet and plug welding the open ends of the weld repair pin. Get the AS90 weld repair pin from Magellan Aerospace Corporation, 1712 Germantown Road, Middletown, OH 45042; Phone (513)-422-2751 (V80512).

- (2) Phenolic block with a shape to match the necessary contour.
- (3) Lint-free cloth.
- (4) ASTM D740 (MEK) solvent. Refer to SOPM 20-30-03.
- (5) O-A-51 solvent.
- (6) Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS

54-40-02

REPAIR 4
Page 201

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-13, GENERAL	Surface Roughness Finish Requirements
BAC 5975	Boeing Process Specification for Fusion Welding of Metal
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures
737 NDT Part 1, 51-02-00	X-Ray, General Radiographic Practices
737 NDT Part 4, 51-00-05	Bondline Delamination Inspection in Honeycomb Structure

4. Repair Instructions

- A. Get access to the damaged area.
- B. Do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02.
 - (1) Use reference standard NDT1106 and the 0.050 in. (1.270 mm) thick step as given in 737 NDT Part 4, 51-00-05 to find the dimensions of the disbond area. Calibrate the instrument with the bag side defect.
 - (2) Identify the disbond area with a marker on the surface of the panel.
- NOTE:** If disbond is on the two sides (inner and outer surfaces) of the panel and the disbond on one of the sides is adjacent to or overlaps the disbond on the other side, use the side with the larger of the two disbond areas.
- C. Layout the weld repair pin pattern with a marker on the surface of the panel as necessary.
- D. If a replacement for the initial solid face sheet and perforated face sheet is not necessary, go to step Paragraph 4.H./REPAIR 4. If a replacement is necessary, do the steps that follow:
 - (1) Remove the initial solid face sheet and/or the perforated face sheet in the disbond area. Do not damage the core.
 - (2) Make a patch of the solid face sheet and/or the perforated face sheet from a good area of a spare face sheet for the disbond area. The space between the edge of the patch and the initial face sheet must not be more than 0.010 in. (0.254 mm).
 - (3) Do a penetrant inspection of the patch to make sure that there are no cracks. Refer to SOPM 20-20-02.
 - (4) Tack weld around the circumference of the patch in position to the initial face sheet as given in BAC 5975.
- NOTE:** In disbond area, make sure that the face sheet is against the core before welding to prevent face sheet wrinkle between the pins. Weld in an alternative manner and supply sufficient copper chill adjacent to the weld area.
- E. If there is no patch for the perforated face sheet of the panel, go to step Paragraph 4.F./REPAIR 4. If there is a patch for the perforated face sheet, do the steps that follow:
 - (1) Do an inspection of the repair area to find the location of the perforations where plug weld closure is necessary as shown in Figure 203/REPAIR 4. Figure 203/REPAIR 4 shows the limits of the perforation plug weld repair for closing all perforations in the perforated sheet of the brazed panel assembly.
 - (2) Clean the area fully to remove surface layers with a lint-free cloth soaked with ASTM D74 (MEK) or O-A051 solvent.

54-40-02

REPAIR 4
Page 202

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

(3) Close all perforations within 0.15 in. (3.81 mm) of the circumference of the patch by plug welding the perforation closed as given in BAC 5975 with nickel alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3. Refer to Figure 203/REPAIR 4.

(4) Grind the weld to +0.020 in. (0.508 mm)/-0.000 in. (0.000 mm) flushness of the material surface and make sure that there is a 32 microinches Ra or smoother surface finish as given in 51-20-13, GENERAL.

NOTE: Do not grind into the base material.

(5) Do a penetrant inspection of all plug welds to make sure that there are no cracks. Refer to SOPM 20-20-02.

(6) Do a radiographic inspection of all plug welds as given in 737 NDT Part 1, 51-02-00.

F. Fusion weld around the circumference of the patch to the initial face sheet as given in BAC 5975, Class A fusion weld.

NOTE: In disbond area, make sure that the face sheet is against the core before welding to prevent face sheet wrinkle between the pins. Weld in an alternative manner and supply sufficient copper chill adjacent to the weld area.

G. Do a penetrant inspection of the weld in step Paragraph 4.F./REPAIR 4 to make sure that there are no cracks. Refer to SOPM 20-20-02.

H. For each of the weld repair pin locations identified in the weld repair pin layout, do the steps that follow:

(1) Drill a 0.1875 in. (4.7625 mm) diameter hole fully through the panel. Refer to Figure 204/REPAIR 4.

(a) Do not get lubricant on the two sides of the hole because this will affect the weld.

(b) Do a penetrant inspection of the hole to make sure that there are no cracks. Refer to SOPM 20-20-02.

(2) Install the weld repair pin in the drilled hole until the weld repair pin end on the solid face sheet of the panel is within +0.020 in. (0.508 mm)/-0.000 in. (0.000 mm) flushness. The weld repair pin end on the perforated face sheet of the panel must be above the face sheet surface by a minimum of 0.060 in. (1.524 mm). Refer to Figure 204/REPAIR 4.

(3) Keep the weld repair pin in its position in the panel by increasing the weld repair pin end on the perforated face sheet side within the drilled hole with a drift pin and a backup block on the opposite side of the panel. Refer to Figure 204/REPAIR 4.

(4) Weld around the circumference of the weld repair pin on the two sides of the panel as given in BAC 5975, Class A fusion weld. Refer to Figure 204/REPAIR 4.

(5) Weld the open end of the weld repair pin on the perforated face sheet side of the panel closed with Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3. Refer to Figure 204/REPAIR 4.

(6) At the center of the weld repair pin on the perforated face sheet side of the panel, drill a 0.050 in. (1.270 mm) diameter vent hole through the closed end of the weld repair pin. Refer to Figure 204/REPAIR 4.

(7) Weld the open end of the weld repair pin on the solid face sheet side of the panel closed with Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3. Refer to Figure 204/REPAIR 4.

54-40-02

REPAIR 4
Page 203

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (8) On the two sides of the panel, grind the welds to a +0.005 in. (0.127 mm)/-0.000 in. (0.000 mm) flushness of the panel surfaces and make sure that there is a 32 microinches Ra or smoother surface finish as given in 51-20-13, GENERAL.

NOTE: Do not grind into the base material.

- I. Do a penetrant inspection of all the welds and the vent holes to make sure that there are no cracks. Refer to SOPM 20-20-02.
- J. Do a radiographic inspection of all welds as given in 737 NDT Part 1, 51-02-00.
- K. Re-install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.

54-40-02

REPAIR 4
Page 204

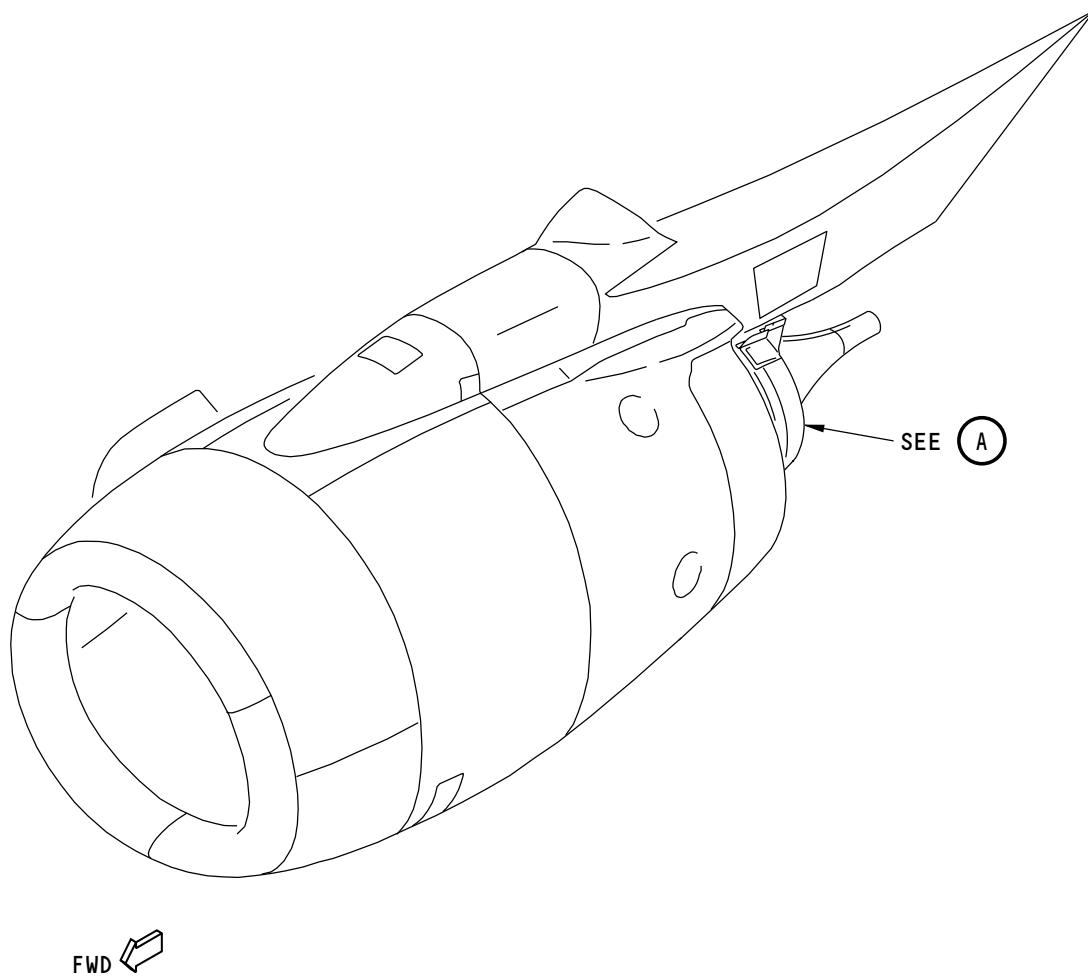
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737-800
STRUCTURAL REPAIR MANUAL



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Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 1 of 4)

54-40-02

REPAIR 4
Page 205

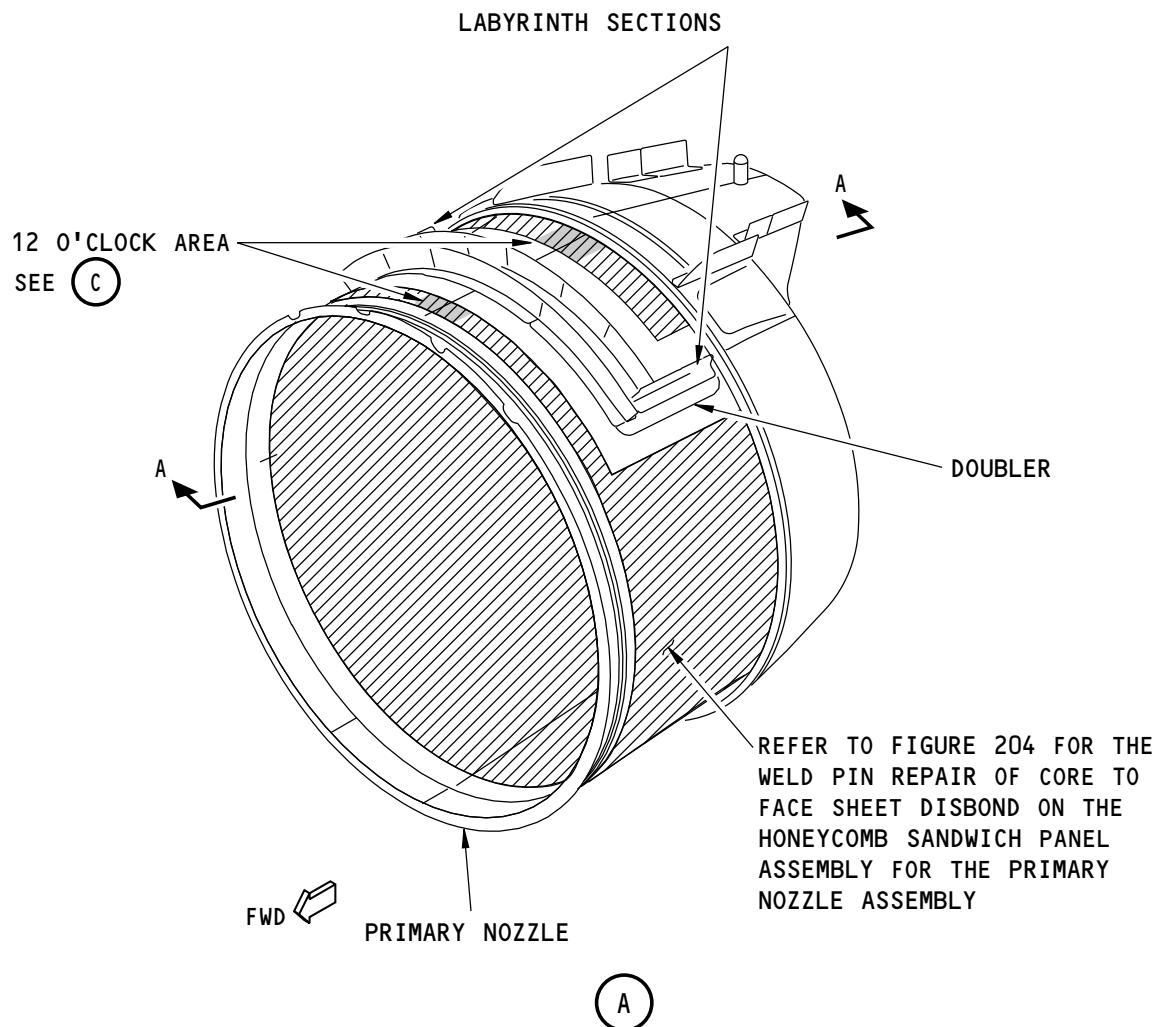
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737-800
STRUCTURAL REPAIR MANUAL



DISBOND PERMITTED IN THIS AREA ONLY

2436245 S0000564767_V1

Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 2 of 4)

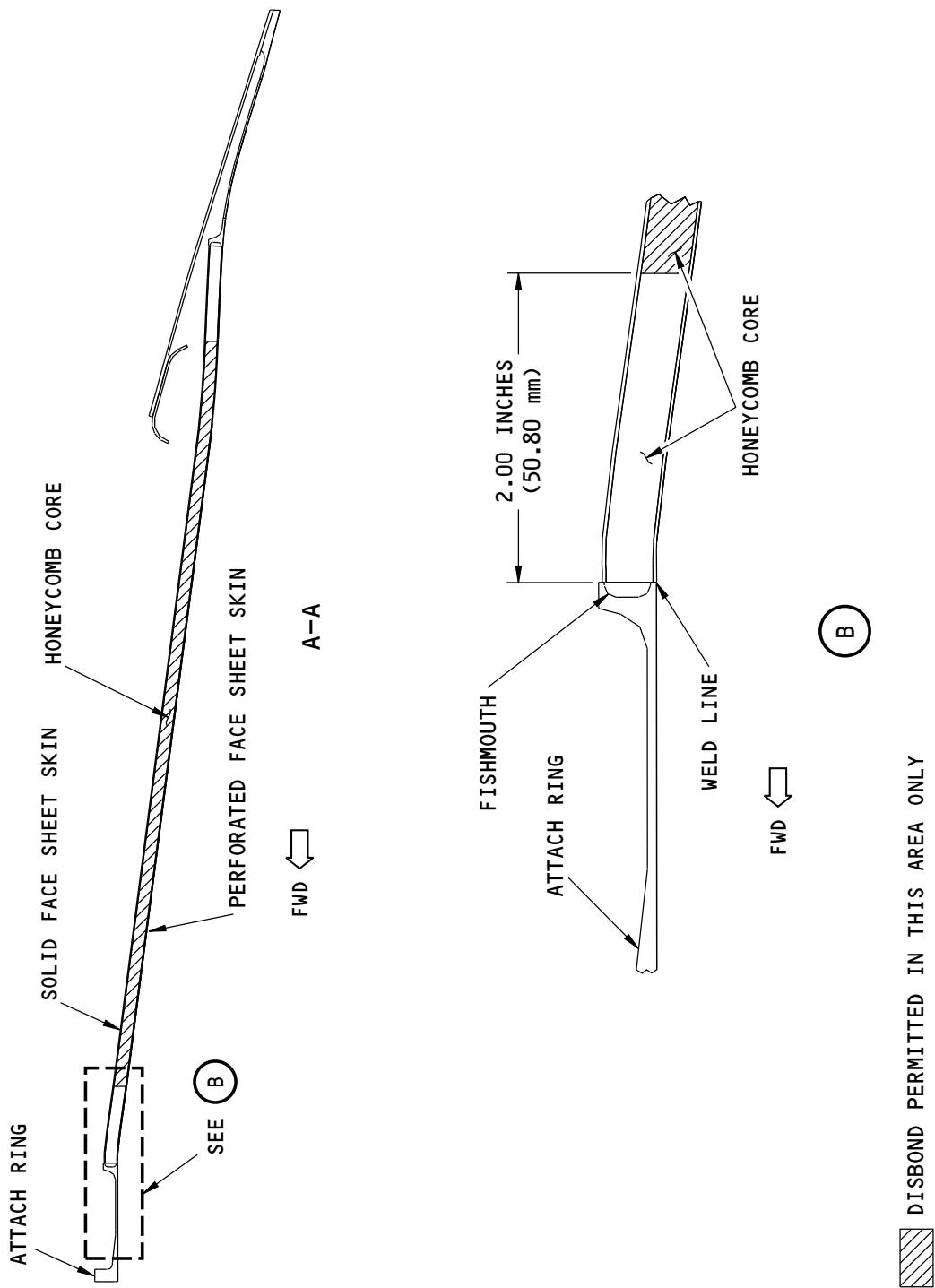
54-40-02

REPAIR 4
Page 206

Mar 10/2016

D634A210

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Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 3 of 4)

54-40-02

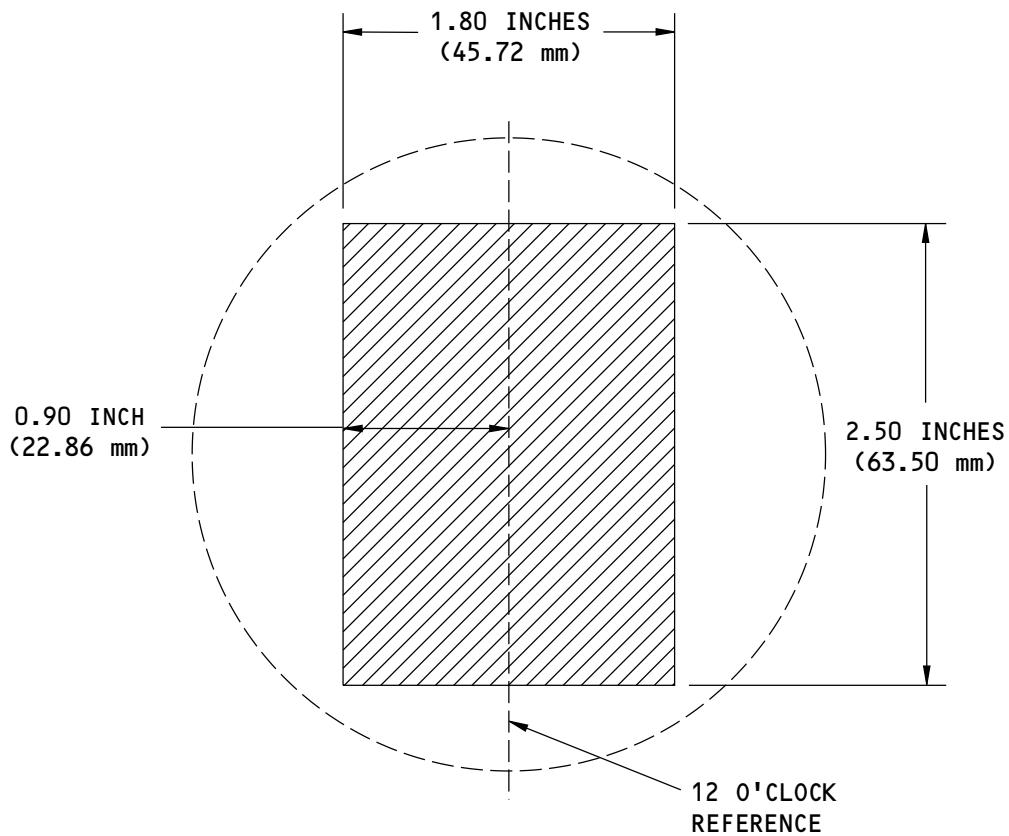
REPAIR 4
 Page 207

Mar 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



DISBOND PERMITTED
IN THIS AREA ONLY

(MAXIMUM DIMENSIONS FOR DISBOND
IN 12 O'CLOCK AREA)

C

2437089 S0000564772_V1

Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 4 of 4)

54-40-02

REPAIR 4
Page 208

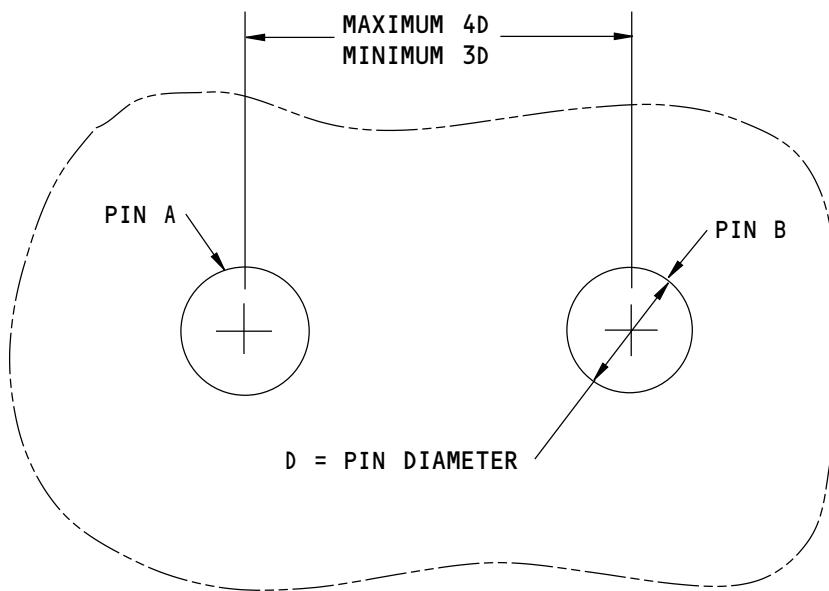
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737-800
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MINIMUM AND MAXIMUM SPACING OF WELD REPAIRS PINS IN
A REPAIR AREA (TYPICAL)

2437663 S0000564777_V1

Minimum and Maximum Spacing of Weld Repair Pins in a Repair Area
Figure 202

54-40-02

REPAIR 4
Page 209

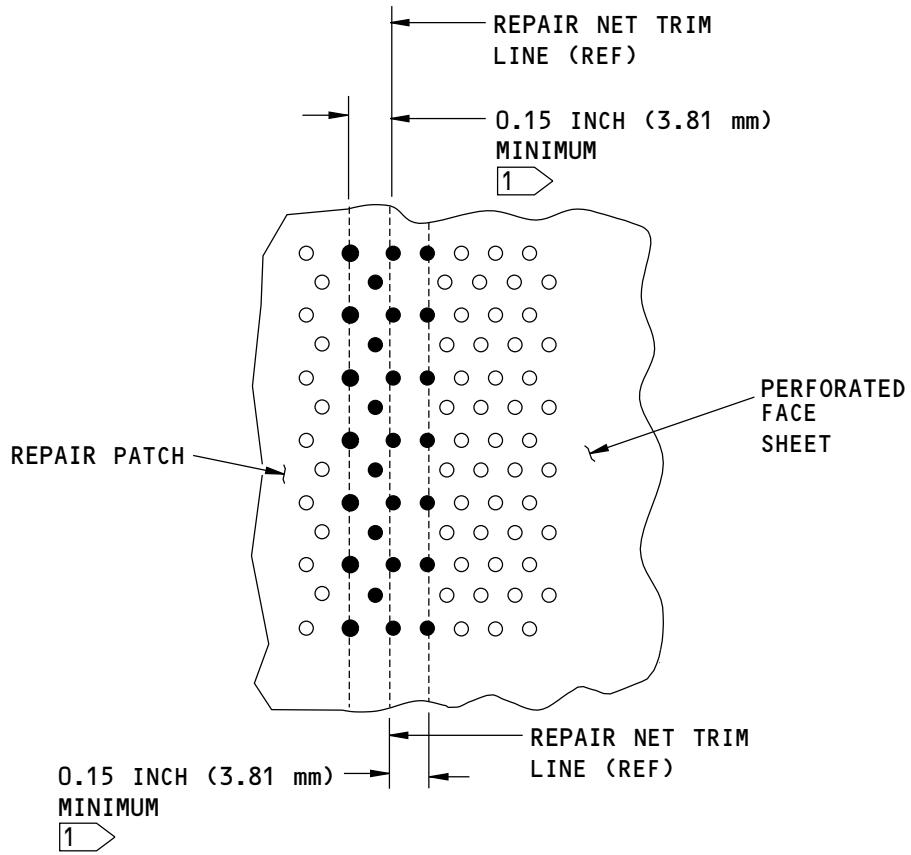
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737-800
STRUCTURAL REPAIR MANUAL



PATCH REPAIR SECTION
(TYPICAL)

NOTES

- = PLUG WELD
- 1 PLUG WELD ALL PERFORATIONS WITHIN
0.15 INCH (3.81 mm) OF REPAIR
NET TRIM LINE

2435716 S0000564779_V1

Plug Weld Repair of Face Sheet Perforation Holes in Patch Repair Section
Figure 203

54-40-02

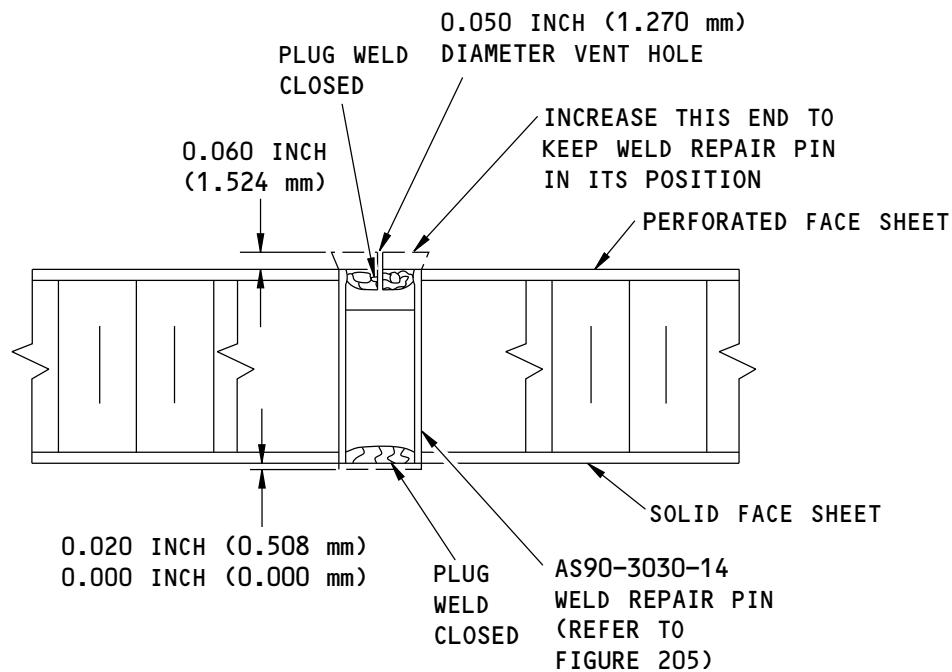
REPAIR 4
Page 210

Mar 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



INSTALLATION OF THE WELD REPAIR PIN

2435792 S0000564784_V1

Weld Pin Repair of Core to Face Sheet Disbond on the Honeycomb Sandwich Panel Assembly for the Primary Nozzle Assembly

Figure 204

54-40-02

REPAIR 4
Page 211

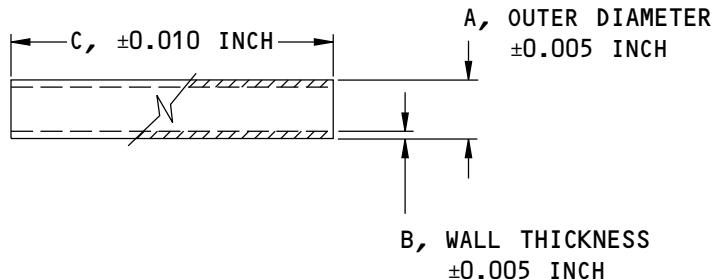
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737-800
STRUCTURAL REPAIR MANUAL



AS90 WELD REPAIR PIN

EXPLANATION OF PART CALLOUT =

AS90-3030-14
C, LENGTH IN 1/32 INCH INCREMENT = 7/16
B, WALL THICKNESS IN 0.000 INCH = 0.030
A, OUTER DIAMETER IN 1/16 INCH INCREMENT = 3/16 (0.1875)
TUBULAR REPAIR PIN

MATERIAL: NICKEL ALLOY 625 BAR PER AMS 5666.

FINISH: ALL MACHINED SURFACES (INNER AND OUTER) TO A 63
MICROINCHES Ra OR SMOOTHER FINISH.

2435801 S0000564786_V1

Weld Repair Pin
Figure 205

54-40-02

REPAIR 4
Page 212

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 5 - PRIMARY EXHAUST SYSTEM - PERFORMANCE IMPROVEMENT PACKAGE - PANEL
SECTION REPAIR/REPLACEMENT OF DAMAGED AREAS ON THE HONEYCOMB SANDWICH
PANEL ASSEMBLY FOR THE PRIMARY NOZZLE ASSEMBLY

1. Applicability

- A. Repair 5 is applicable to the 314A2630 Primary Nozzle Assembly as shown in Figure 201/REPAIR 5.
- B. Repair 5 is not applicable to the doubler/labyrinth area of the Primary Nozzle Assembly as shown in Figure 201/REPAIR 5.
- C. Repair 5 is applicable to damage that:
 - (1) Is a minimum of 2.00 in. (50.80 mm) away from the foot of the labyrinth, an edge of the panel, or the weld line between the fishmouth and the honeycomb as shown in Figure 201/REPAIR 5.
 - (2) Can have a maximum of two panel section repairs for each honeycomb panel.
 - (3) Has a minimum of 6.0 in. (152 mm) distance between each panel section repair.
 - (4) Is a maximum of 4.0 in. (101.6 mm) in diameter.
 - (5) Does not have sharp corners in the prepared panel cutout area.

2. General

- A. Repair 5 is a permanent repair. Refer to 51-00-06 for the definitions of the different categories of repairs.
- B. All dimensions are in inches, unless they are shown differently.
- C. The materials that follow are necessary to complete this repair:
 - (1) A spare exhaust nozzle to get a honeycomb replacement panel section.

NOTE: Get the repair inserts and support rings from Exotic Metals Forming Company LLC, 5411 South 226th Street, Kent, WA 98032; Phone (253)-395-3710; Fax (253)-872-8033; Website: www.ExoticMetals.com.

- (2) Radiac cutter or plasma arc cutter (recommended).
- (3) Lint-free cloth.
- (4) ASTM D740 (MEK) solvent.
- (5) O-A-51 solvent.
- (6) Nickel Alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3.
- (7) Nickel Alloy 625 sheet [between 0.020 in. (0.508 mm) and 0.032 in. (0.813 mm) thickness] as given in AMS 5599.

3. References

Reference	Title
51-00-06	STRUCTURAL REPAIR DEFINITIONS
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-13, GENERAL	Surface Roughness Finish Requirements
BAC 5975	Boeing Process Specification for Fusion Welding of Metal
SOPM 20-20-02	Penetrant Methods of Inspection
737 NDT Part 1, 51-02-00	X-Ray, General Radiographic Practices
737 NDT Part 4, 51-00-05	Bondline Delamination Inspection in Honeycomb Structure

54-40-02

REPAIR 5
Page 201

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

4. Repair Instructions

- A. Get access to the damaged area.
- B. If necessary, do an inspection of the repair area to find the dimensions of the damage. Refer to 51-10-02. Use reference standard NDT1106 and the 0.050 in. (1.270 mm) thick step as given in 737 NDT Part 4, 51-00-05 to find the dimensions of the damage area. Calibrate the instrument with the bag side defect.
- C. Identify the damaged area with a marker on the surface of the panel that deviates from the nominal surface with a marker.
- D. Cover the layout of the damaged area on the panel with mylar film or other transparent media. Make sure to set the film in its position and then mark the damaged area with a marker on the film.

NOTE: With the film set in its position, make special notes about the position, the dimensional location to an applicable part, and other important information that is necessary to install the replacement section. This data will be necessary to get the replacement section that aligns with the initial contour.

- E. Remove the film from the panel and find the center location of the damaged area, and the limit points of the cutout area necessary to remove the damaged area.
- F. Move the layout of the cutout to the panel surface and remove the damaged area with the use of a radiac cutter, or cut a hole to a smaller diameter line with a plasma arc cutter and then grind to the accurate line. Clean the trimmed edge of the cutout to remove burrs and blend smoothly. Examine this edge for defects and repair as necessary. The prepared panel cutout area must contain no sharp corners. Refer to Figure 202/REPAIR 5.
- G. Do a penetrant inspection of the cutout to make sure that there are no cracks. Refer to SOPM 20-20-02.
- H. Make a weld support ring to install in the cutout area in the panel. Refer to Figure 202/REPAIR 5.
 - (1) Make the weld support ring from nickel alloy 625 sheet as given in AMS 5599 with a thickness between 0.020 in. (0.508 mm) and 0.032 in. (0.813 mm).
 - (2) The gap between the weld support ring and the panel or between the weld support ring and the panel section replacement must not be more than 0.010 in. (0.254 mm).
- I. Put the weld support ring into the cutout, and trim to align the inner and outer panel contour with an additional 0.030 in. (0.762 mm) to 0.010 in. (0.254 mm) projection of the support ring above the panel surface on each side of the weld melt-down attachment. Refer to Figure 202/REPAIR 5.
- J. Do a penetrant inspection of the weld support ring to make sure that there are no cracks. Refer to SOPM 20-20-02.
- K. Tack weld the weld support ring in its position as given in BAC 5975. Refer to Figure 202/REPAIR 5.
- L. Use the film layout of the cutout section for the dimensions, the location and the position to get an equivalent panel section replacement from a good brazed area of a spare panel assembly. Trim the panel section replacement to align with the inner side of the weld support ring.
- M. Do a penetrant inspection of the panel section replacement to make sure that there are no cracks. Refer to SOPM 20-20-02.
- N. Do an inspection of the panel section replacement using reference standard NDT1106 and the 0.050 in. (1.270 mm) thick step as given in 737 NDT Part 4, 51-00-05 to make sure that there is no disbond. Calibrate the instrument using the bag side defect.

54-40-02

REPAIR 5
Page 202

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- O. Tack weld the panel section replacement in its position as given in BAC 5975. Make sure to keep a gap that is not more than 0.020 in. (0.508 mm) between the panel section replacement and the basic panel. Refer to Figure 202/REPAIR 5.
- P. Do the steps that follow to close the perforation holes around the weld support ring:
 - (1) Do an inspection of the repair area to find the location of the perforations where plug weld closure is necessary as shown in Figure 203/REPAIR 5. Figure 203/REPAIR 5 shows the limits of the perforation plug weld repair for closing all perforations in the perforated sheet of the brazed panel assembly.
 - (2) Clean the area fully to remove surface layers with a lint-free cloth soaked with ASTM D74 (MEK) or O-A051 solvent.
 - (3) Close all perforations within 0.15 in. (3.81 mm) of the circumference of the trim around the support ring by plug welding the perforation closed as given in BAC 5975 with nickel alloy 625 filler wire as given in AMS 5837 or AWS AS.14, Class ERNiCrMo-3. Refer to Figure 203/REPAIR 5.
 - (4) Grind the weld to +0.020 in. (0.508 mm)/-0.000 in. (0.000 mm) flushness of the material surface and make sure that there is a 32 microinches Ra or smoother surface finish as given in 51-20-13, GENERAL.
NOTE: Do not grind into the base material.
 - (5) Do a penetrant inspection of all plug welds to make sure that there are no cracks. Refer to SOPM 20-20-02.
 - (6) Do a radiographic inspection of all plug welds as given in 737 NDT Part 1, 51-02-00.
- Q. Fusion weld around the circumference of the weld support ring to the inner and outer surfaces of the basic panel and the panel section replacement with the two circumferential melt-through welds on the attachment as given in BAC 5975, Class A fusion weld. A maximum contour mismatch (except at welded edges) of 0.010 in. (0.254 mm) between the inner and outer surfaces of the basic panel and replacement section is permitted. Refer to Figure 202/REPAIR 5.
- R. On the two sides of the panel, grind the welds to a +0.005 in. (0.127 mm)/-0.000 in. (0.000 mm) flushness with the panel surfaces and make sure that there is a 32 microinches Ra or smoother surface finish as given in 51-20-13, GENERAL.
NOTE: Do not grind into the base material.
- S. Do a penetrant inspection of the welds to make sure that there are no cracks. Refer to SOPM 20-20-02.
- T. Do a radiographic inspection of all welds as given in 737 NDT Part 1, 51-02-00.
- U. Re-install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.

54-40-02

REPAIR 5
Page 203

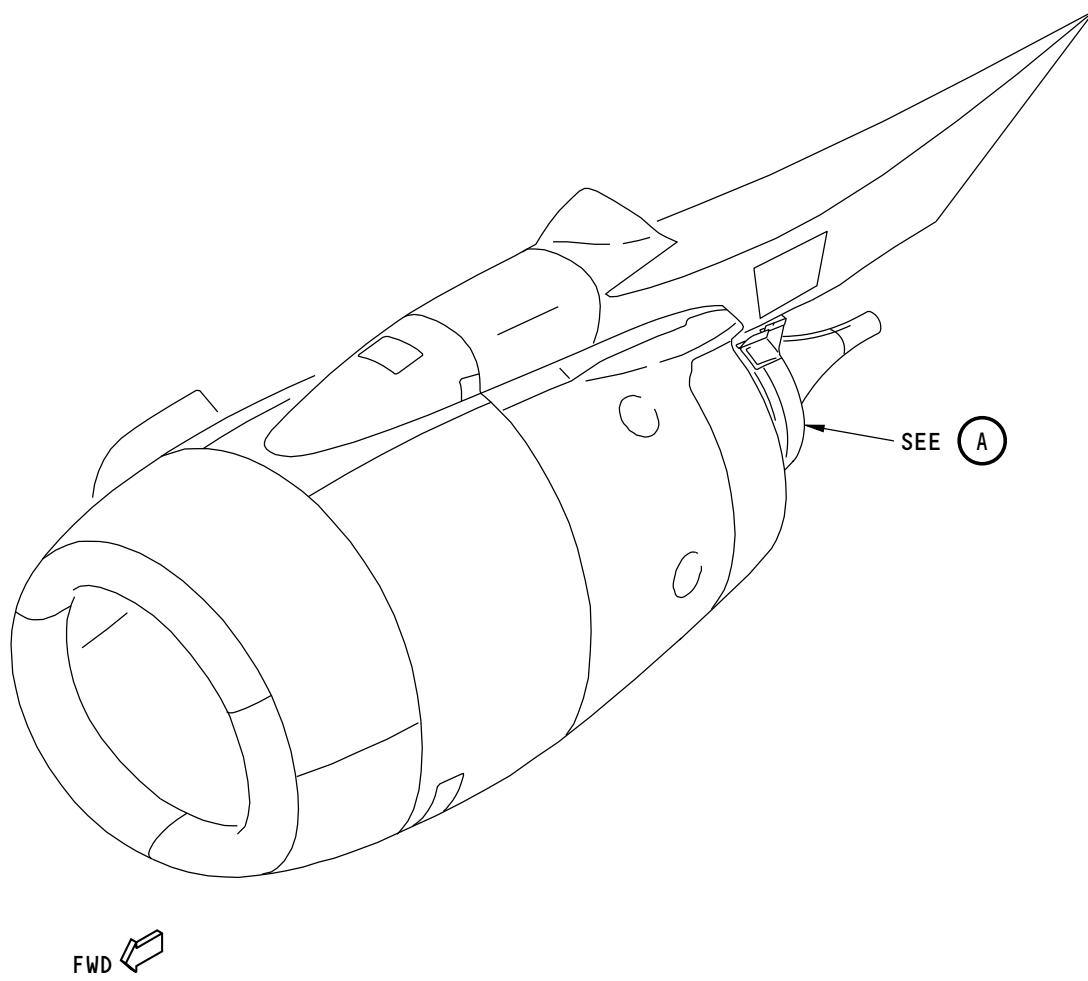
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737-800
STRUCTURAL REPAIR MANUAL



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Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 1 of 3)

54-40-02

REPAIR 5
Page 204

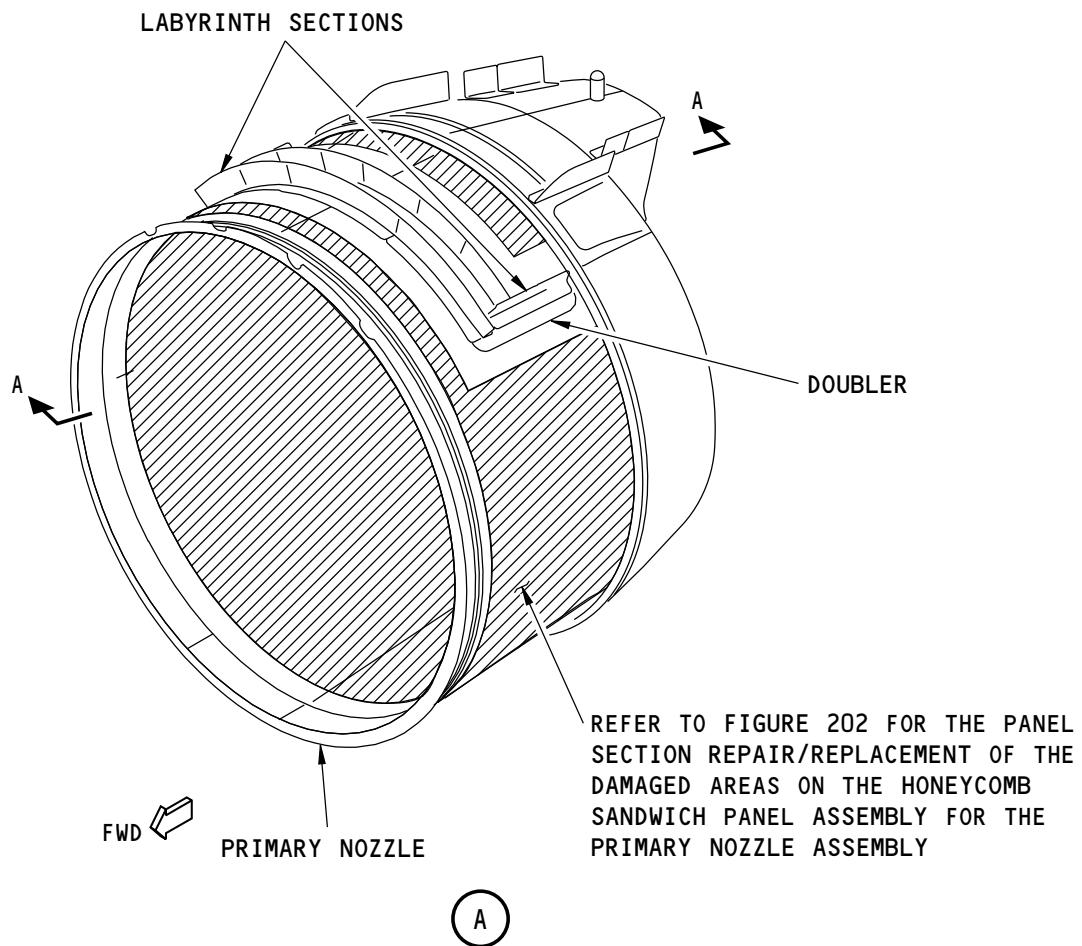
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737-800
STRUCTURAL REPAIR MANUAL



DAMAGE PERMITTED IN THIS
AREA ONLY

2436255 S0000564840_V1

Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 2 of 3)

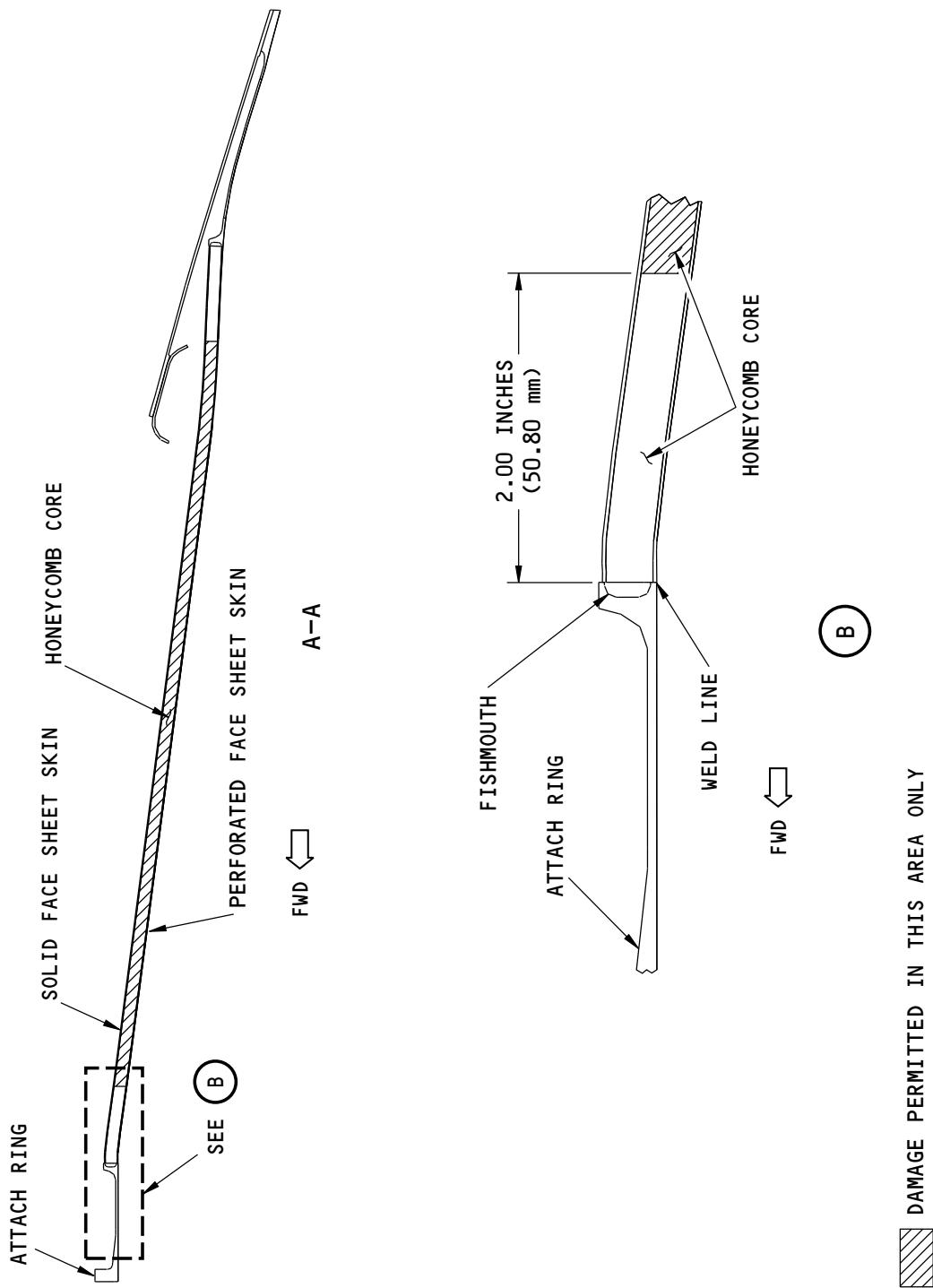
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REPAIR 5
Page 205

Mar 10/2016

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Honeycomb Panel Repair Area on the Primary Nozzle Assembly
Figure 201 (Sheet 3 of 3)

54-40-02

REPAIR 5

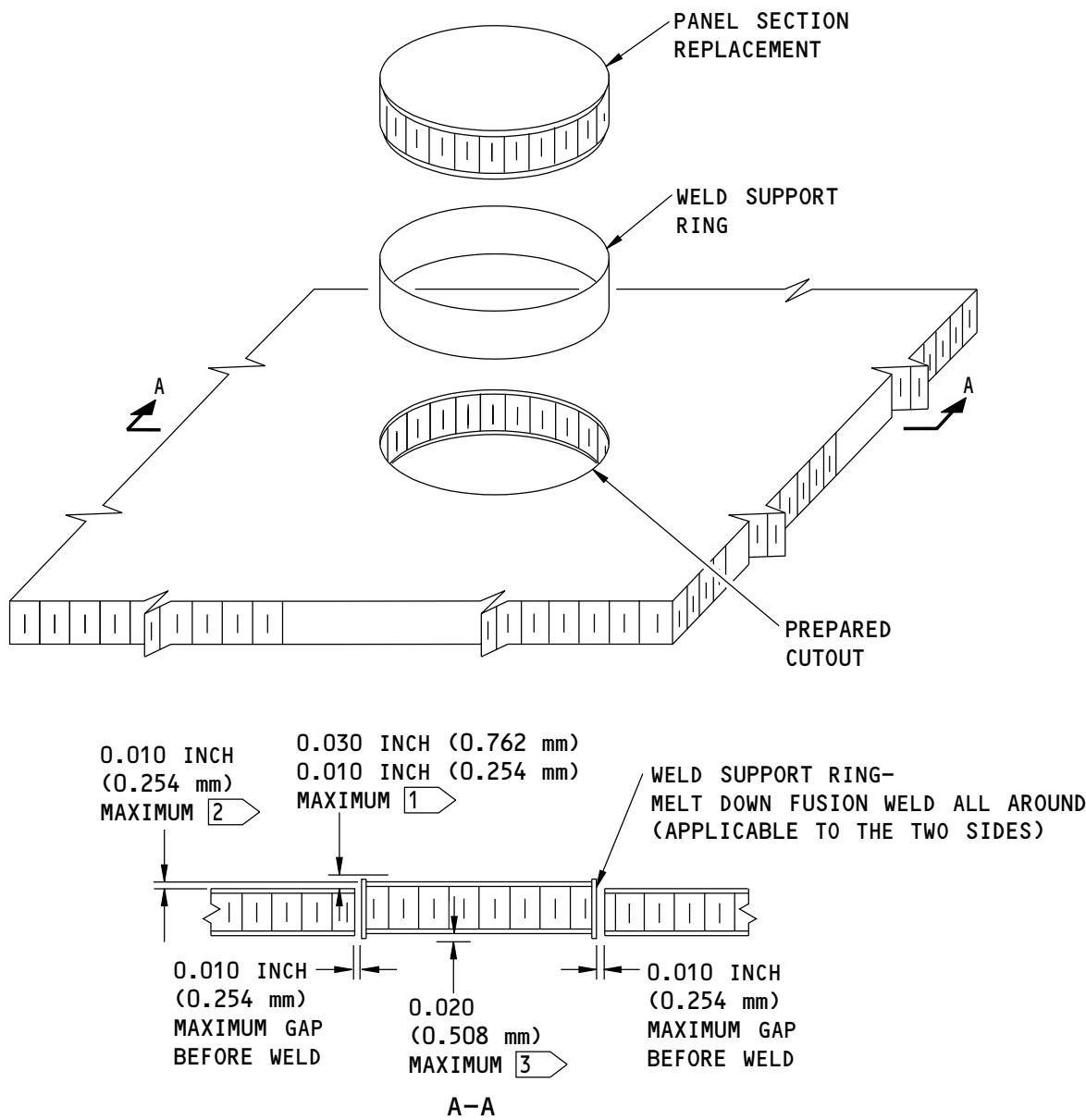
Page 206

Mar 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



- [1] PROJECTION OF WELD SUPPORT RING AFTER TRIM, BEFORE WELD (APPLICABLE TO THE TWO SIDES)
- [2] BETWEEN PANEL SECTION REPLACEMENT AND BASIC PANEL AFTER WELD, PERFORATION SIDE ONLY - NOT APPLICABLE AT WELD EDGES
- [3] BETWEEN PANEL SECTION REPLACEMENT AND BASIC PANEL BEFORE WELD

2435805 S0000564842_V1

Panel Section Repair/Replacement of Damaged Areas on the Honeycomb Sandwich Panel Assembly
for the Primary Nozzle Assembly

Figure 202

54-40-02

REPAIR 5
Page 207

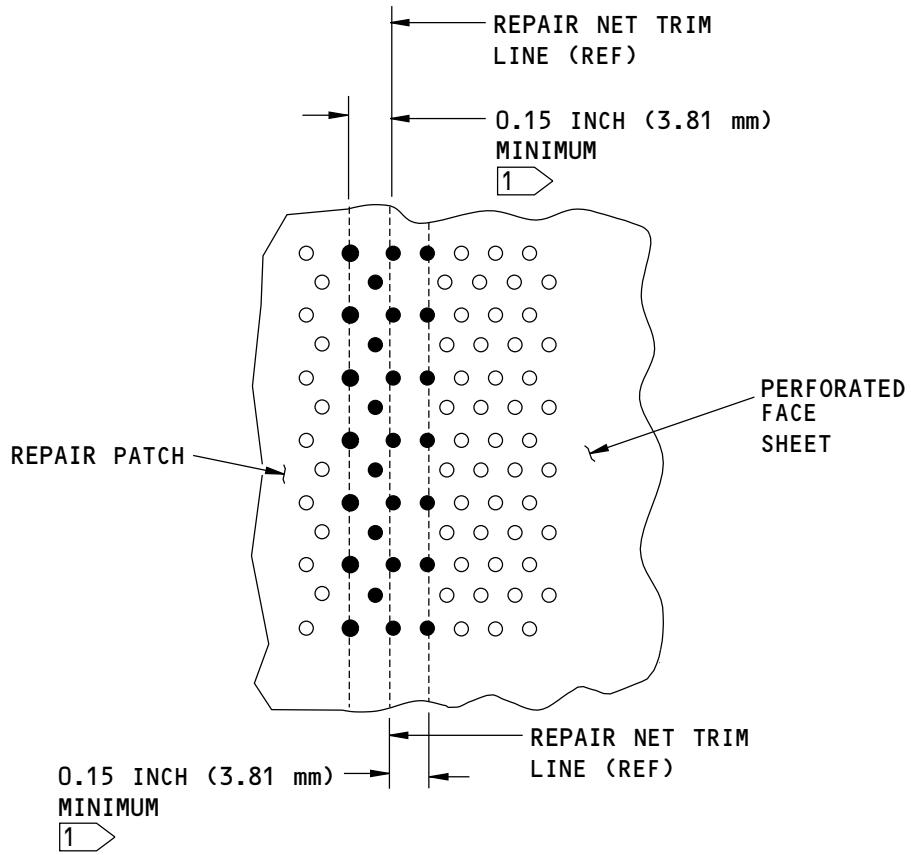
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737-800
STRUCTURAL REPAIR MANUAL



PATCH REPAIR SECTION
(TYPICAL)

NOTES

- = PLUG WELD
- 1 PLUG WELD ALL PERFORATIONS WITHIN
0.15 INCH (3.81 mm) OF REPAIR
NET TRIM LINE

2435717 S0000564843_V1

Plug Weld Repair of Face Sheet Perforation Holes in Panel Section Repair
Figure 203

54-40-02

REPAIR 5
Page 208

Mar 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

**REPAIR 6 - PRIMARY EXHAUST SYSTEM - EXHAUST NOZZLE FENCE AND DOUBLER
ELONGATED FASTENER HOLE REPAIR**

1. Applicability

- A. Repair 6 is applicable to damage on the 314A2610-1, -62, and -68 Primary Exhaust Nozzle Assemblies as shown in Figure 201/REPAIR 6.
- B. Repair 6 is applicable to damage on the left hand side and right hand side of the Exhaust Nozzle Fences and Fence Doublers on the Primary Exhaust Nozzle Assembly. Damage can be on the left hand side and right hand side of the Primary Exhaust Nozzle Assembly at the same time.
- C. Repair 6 is not applicable if you have a missing fastener in the Primary Exhaust Nozzle fastener Zone A through Zone D locations as shown in Figure 201/REPAIR 6, Detail B.

2. General

- A. Repair 6 has five repair procedures (Refer to Figure 201/REPAIR 6 for the Zone locations):
 - (1) Procedure 1: This procedure is for the Zone A location that is for the two fastener holes at the aft end of the 314A2610-59 and 314A2610-60 Fence Doublers. Refer to Paragraph 4.A./REPAIR 6 for the Procedure 1.
 - (2) Procedure 2: This procedure is for the Zone B location that is for the two fastener holes at the forward end of the 314A2610-59 and 314A2610-60 Fence Doublers. Refer to Paragraph 4.B./REPAIR 6 for the Procedure 2.
 - (3) Procedure 3: This procedure is for the Zone C location that is for the aft fastener hole of the 314A2610-47 and 314A2610-48 Long Nozzle Fences. This Procedure 3 for Zone C is only applicable for the 314A2610-1 Primary Exhaust Nozzle Assembly. Refer to Paragraph 4.C./REPAIR 6 for the Procedure 3.
 - (4) Procedure 4: This procedure is for the Zone D location that is for the fastener holes in the Nozzle Fences (314A2610-49 through 314A2610-58). Refer to Paragraph 4.D./REPAIR 6 for the Procedure 4.
 - (5) Procedure 5: This procedure is for the Zone A, Zone B, Zone C and Zone D locations. Refer to Paragraph 4.E./REPAIR 6 for the Procedure 5.
- B. Repair Categorization (Refer to Figure 201/REPAIR 6 for the Zone locations):
 - (1) Repair 6 is a Time-Limited Repair as given in Procedure 1 of this repair for the Zone A location. Refer to 51-00-06, GENERAL for repair categories and definitions. This Time-Limited Repair Procedure 1 must be replaced with a Permanent Repair within the limits as given in Paragraph 4.A./REPAIR 6.
 - (2) Repair 6 is a Time-Limited Repair as given in Procedure 2 of this repair for the Zone B location. Refer to 51-00-06, GENERAL for repair categories and definitions. This Time-Limited Repair Procedure 2 must be replaced with a Permanent Repair within the limits as given in Paragraph 4.B./REPAIR 6.
 - (3) Repair 6 is a Time-Limited Repair as given in Procedure 3 of this repair for the Zone C location. Refer to 51-00-06, GENERAL for repair categories and definitions. This Time-Limited Repair Procedure 3 must be replaced with a Permanent Repair within the limits as given in Paragraph 4.C./REPAIR 6.
 - (4) Repair 6 is a Time-Limited Repair as given in Procedure 4 of this repair for the Zone D location. Refer to 51-00-06, GENERAL for repair categories and definitions. This Time-Limited Repair Procedure 4 must be replaced with a Permanent Repair within the limits as given in Paragraph 4.D./REPAIR 6.

54-40-02

REPAIR 6
Page 201
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (5) Repair 6 is a Permanent Repair as given in Procedure 5 of this repair for the Zone A, Zone B, Zone C, and Zone D locations. Refer to 51-00-06, GENERAL for repair categories and definitions. Refer to Paragraph 4.E./REPAIR 6 for the Permanent Repair Procedure 5.
- (a) Procedure 5 replaces the Time-Limited Repair Procedure 1 for the Zone A location with a Permanent Repair.
 - (b) Procedure 5 replaces the Time-Limited Repair Procedure 2 for the Zone B location with a Permanent Repair.
 - (c) Procedure 5 replaces the Time-Limited Repair Procedure 3 for the Zone C location with a Permanent Repair.
 - (d) Procedure 5 replaces the Time-Limited Repair Procedure 4 for the Zone D location with a Permanent Repair.

54-40-02

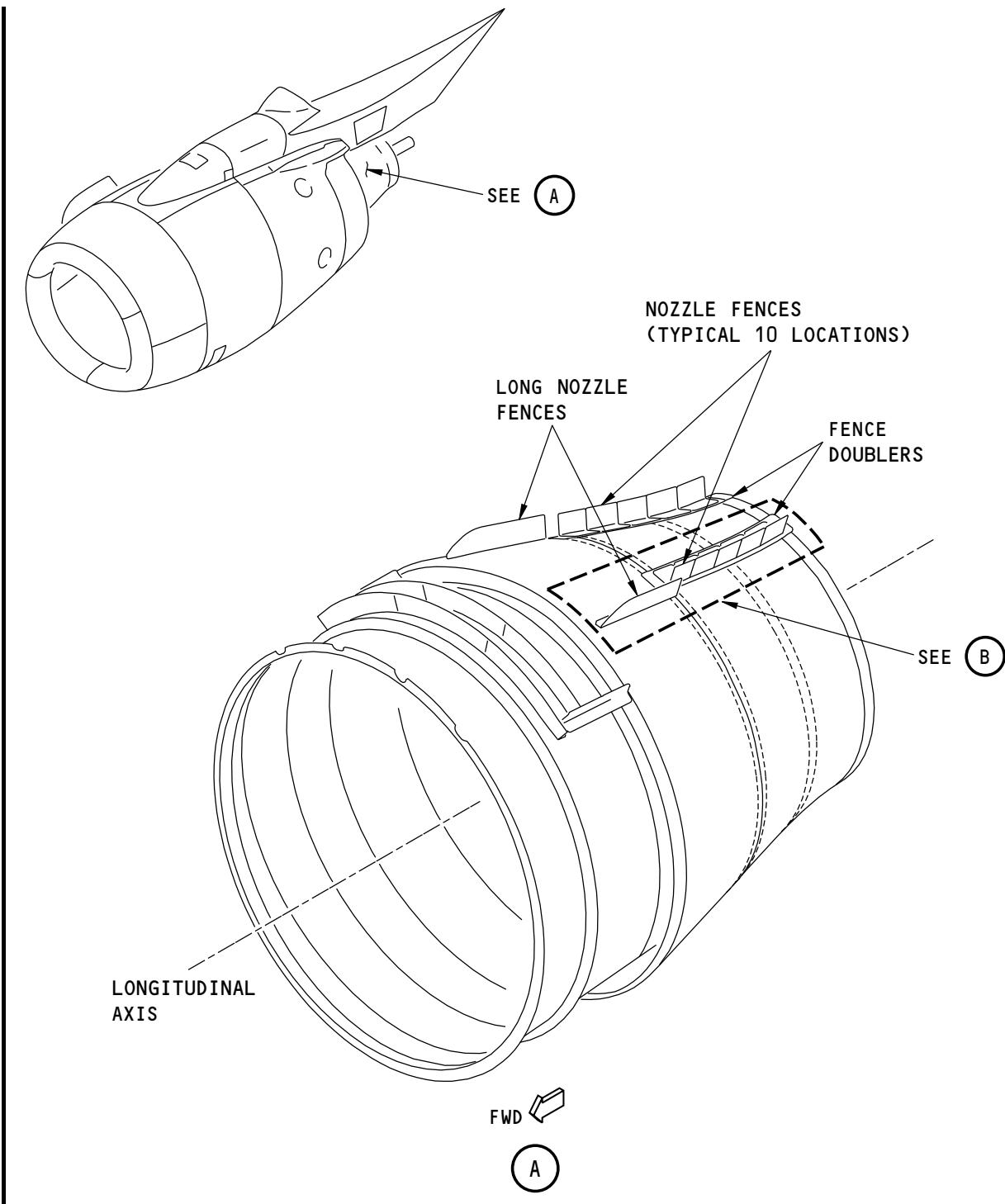
REPAIR 6

Page 202

Jul 10/2016

D634A210

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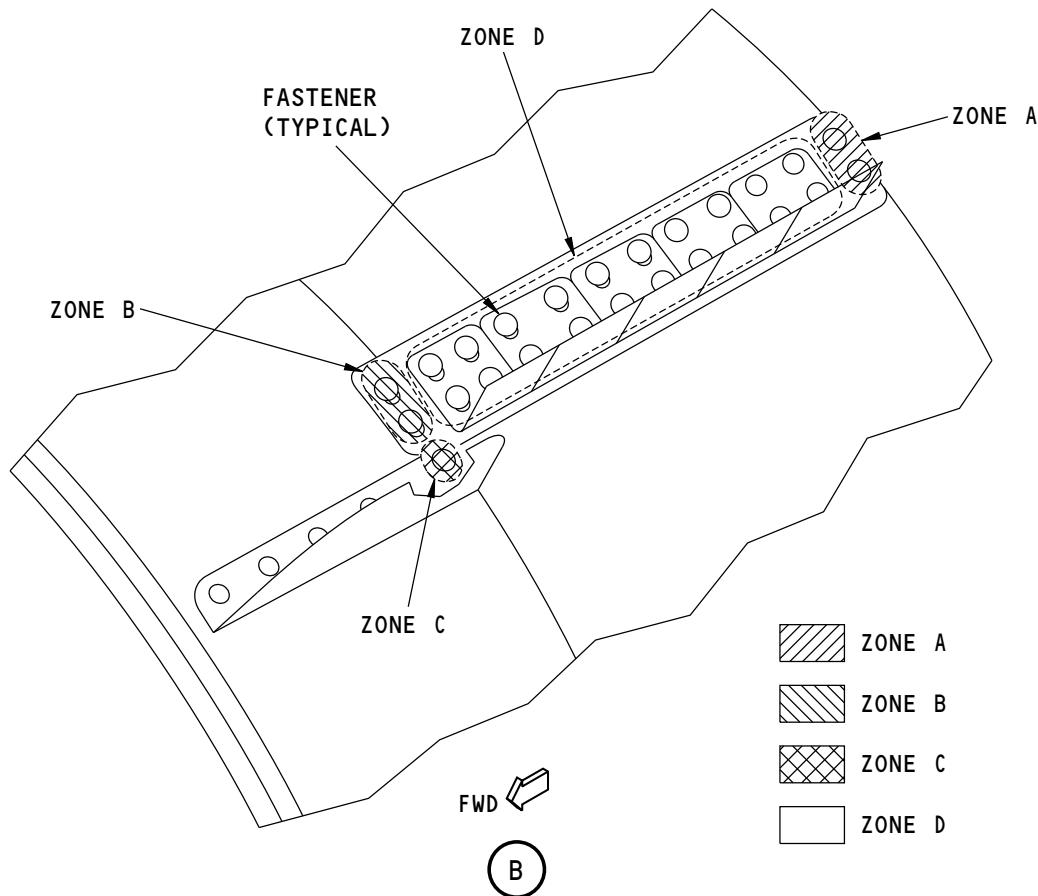
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Exhaust Nozzle Fence and Doubler Elongated Fastener Hole Repair
Figure 201 (Sheet 1 of 2)

54-40-02

REPAIR 6
Page 203
Jul 10/2016

D634A210



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Exhaust Nozzle Fence and Doubler Elongated Fastener Hole Repair
Figure 201 (Sheet 2 of 2)

54-40-02**REPAIR 6**
Page 204
Jul 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
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
51-40-05, GENERAL	Fastener Hole Sizes
51-40-06, GENERAL	Fastener Edge Margins
737 NDT Part 6, 51-00-00, Procedure 17	Open Hole Inspection of Titanium and Other Low Conductivity Materials

4. Repair Instructions

A. Procedure 1: Time-Limited Repair for Zone A:

- (1) For one elongated fastener hole damage in Zone A, do the following:
 - (a) Get access to the damaged area.
 - (b) Remove the initial fastener. Refer to 51-40-02, GENERAL.
 - (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener hole to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.
 - (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener hole is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener hole to the sleeve's aft edge is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.

NOTE: If damage is more than the limits, contact The Boeing Company.
 - (e) Install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
 - (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.
 - (g) Do a DVI of the elongation of the fastener hole at each 10 day interval after repair installation and make sure that there is no more damage.
 - (h) Replace this repair with a Permanent Repair as given in Paragraph 4.E./REPAIR 6 within 90 days after repair installation.
- (2) For damage that is for two elongated fastener holes in Zone A, do the following:
 - (a) Get access to the damaged area.
 - (b) Remove the initial fasteners. Refer to 51-40-02, GENERAL.
 - (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener holes to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.

54-40-02

REPAIR 6
Page 205
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener holes is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener holes to the sleeve's aft edge is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.

NOTE: If damage is more than the limits, contact The Boeing Company.

- (e) For each elongated fastener hole, install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
- (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.
- (g) Do a DVI of the elongation of the fastener hole at each 1 day interval after repair installation and make sure that there is no more damage.
- (h) Replace this repair with a Permanent Repair as given in Paragraph 4.E./REPAIR 6 within 10 days after repair installation.

B. Procedure 2: Time-Limited Repair for Zone B:

- (1) For one elongated fastener hole damage in Zone B, do the following:

- (a) Get access to the damaged area.
- (b) Remove the initial fastener. Refer to 51-40-02, GENERAL.
- (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener hole to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.

- (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener hole is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener hole to all the edges of the doublers and the fairing is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.

NOTE: If damage is more than the limits, contact The Boeing Company.

- (e) Install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
- (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.
- (g) Do a DVI of the elongation of the fastener hole at each 10 day interval after repair installation and make sure that there is no more damage.
- (h) Replace this repair with a permanent repair as given in Paragraph 4.E./REPAIR 6 within 90 days after repair installation.

- (2) For damage that is for two elongated fastener holes in Zone B, do the following:

- (a) Get access to the damaged area.

54-40-02

REPAIR 6
Page 206

Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (b) Remove the initial fasteners. Refer to 51-40-02, GENERAL.
- (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener holes to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.

- (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener holes is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener holes to all the edges of the doublers and the fairing is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.

NOTE: If damage is more than the limits, contact The Boeing Company.

- (e) For each elongated fastener hole, install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
- (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.
- (g) Do a DVI of the elongation of the fastener hole at each 1 day interval after repair installation and make sure that there is no more damage.
- (h) Replace this repair with a Permanent Repair as given in Paragraph 4.E./REPAIR 6 within 10 days after repair installation.

C. Procedure 3: Time-Limited Repair for Zone C (This procedure for Zone C is only applicable for the 314A2610-1 Primary Exhaust Nozzle Assembly):

- (1) For elongated fastener hole damage in Zone C, do the following:

- (a) Get access to the damaged area.
- (b) Remove the initial fastener. Refer to 51-40-02, GENERAL.
- (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener hole to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.

- (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener hole is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener hole to all the edges of the doubler, the fairing and the long nozzle fence is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.

NOTE: If damage is more than the limits, contact The Boeing Company.

- (e) Install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
- (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.

54-40-02

REPAIR 6
Page 207

Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (g) Do a DVI of the elongation of the fastener hole at each 10 day interval after repair installation and make sure that there is no more damage.
- (h) Replace this repair with a Permanent Repair as given in Paragraph 4.E./REPAIR 6 within 90 days after repair installation.

D. Procedure 4: Time-Limited Repair for Zone D:

- (1) For one elongated fastener hole damage at only one fence location in Zone D, do the following:
 - (a) Get access to the damaged area.
 - (b) Remove the initial fastener. Refer to 51-40-02, GENERAL.
 - (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener hole to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.
 - (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener hole is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener hole of the fence and adjacent fastener holes is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.
 - NOTE:** If damage is more than the limits, contact The Boeing Company.
 - (e) Install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
 - (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.
 - (g) Do a DVI of the elongation of the fastener hole at each 10 day interval after repair installation and make sure that there is no more damage.
 - (h) Replace this repair with a Permanent Repair as given in Paragraph 4.E./REPAIR 6 within 90 days after repair installation.
- (2) For one elongated fastener hole damage at one fence that is found in more than one fence location in Zone D; you are permitted to have a maximum of 2 fences with one elongated fastener hole at each row and a maximum of 4 fences at each side of the Primary Exhaust Nozzle. For the repair installation, do the following:
 - (a) Get access to the damaged area.
 - (b) Remove the initial fasteners. Refer to 51-40-02, GENERAL.
 - (c) Do a Detailed Visual Inspection (DVI) of the elongated fastener holes to make sure that there are no cracks.

NOTE: It is not necessary to use non-destructive testing inspections to make sure that there are no cracks.

54-40-02

REPAIR 6
Page 208
Jul 10/2016

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

- (d) Measure the elongated fastener hole on the two sides of the nozzle (inner side and outer side) and use the larger elongation length. The maximum allowable length of the elongated fastener holes is 0.250 in. (6.350 mm). Make sure that the minimum edge distance from the edge of the elongated fastener holes of the fence and adjacent fastener holes is 0.300 in. (7.620 mm). Refer to 51-40-06, GENERAL.

NOTE: If damage is more than the limits, contact The Boeing Company.

- (e) For each elongated fastener hole, install a new fastener that is the same as the initial fastener or re-install the initial fastener with a new collar. Make sure that the elongated fastener hole is fully covered by the fastener head or collar. If necessary, move the fastener to the center of the elongated fastener hole. The fastener head diameter is 0.295 in. (7.493 mm) and the collar minimum diameter is 0.303 in. (7.696 mm). Refer to 51-40-02, GENERAL.
- (f) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.
- (g) Do a DVI of the elongation of the fastener hole at each 1 day interval after repair installation and make sure that there is no more damage.
- (h) Replace this repair with a Permanent Repair as given in Paragraph 4.E./REPAIR 6 within 10 days after repair installation.

E. Procedure 5: Permanent Repair that replaces the Time-Limited Repair for Zones A, B, C or D.

- (1) Get access to the damaged area.
- (2) Remove the initial fastener. Refer to 51-40-02, GENERAL.
- (3) Do an inspection of the repair area to find the dimensions of the damage. Visually inspect the Exhaust Nozzle fence and doubler for damage. No other damage is permitted. Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02.

NOTE: Make sure to measure the hole diameter and edge distances on each side of the inner and outer surfaces of the nozzle at the maximum hole dimension and use the larger elongated hole dimension. If other damage is found, contact The Boeing Company.

- (4) Refer to 51-30-03, GENERAL for possible sources of non-metallic materials to remove the damage.
- (5) Refer to 51-30-05, GENERAL for possible sources of equipment to remove the damage.

Table 201: Hole Size and Repair Fastener/Collar Type

CLASS III HOLE SIZE - INCH (mm)		REPAIR FASTENER TYPE	REPAIR COLLAR TYPE
MINIMUM	MAXIMUM		
0.218 (5.537)	0.229 (5.817)	BACB30FM6A()SU or BACB30FM6A()U	BACC30AB6S
0.231 (5.867)	0.242 (6.147)	BACB30MC6A()SU or BACB30MC6A()U ^[1]	BACC30AB6SY
0.247 (6.274)	0.258 (6.553)	BACB30MD6A()SU or BACB30MD6A()U ^[2]	BACC30AB6SY
0.279 (7.087)	0.291 (7.391)	BACB30FM8A()SU or BACB30FM8A()U	BACC30AB8S

*[1] Use a 1/64-inch diameter oversize fastener.

*[2] Use a 1/32-inch diameter oversize fastener.

54-40-02

REPAIR 6
Page 209

Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (6) Increase the elongated fastener hole size to the next larger allowable hole size as given in Table 201/REPAIR 6 that is up to a maximum diameter of 0.291 in. (7.391 mm). Put the new larger repair fastener hole to the center of the elongated fastener hole damage. Make sure to ream the new larger repair fastener hole in the Primary Exhaust Nozzle skin, fairing, doublers and fences at the same time. Make sure that the minimum edge distance from the edge of the elongated fastener hole to the edge of the part, seam joint, edge of the doubler, and adjacent edges of fastener holes is 0.300 in. (7.620 mm). Refer to 51-40-05, GENERAL and 51-40-06, GENERAL.

NOTE: Do not center the new larger repair fastener hole on the initial fastener centerline.

If damage is more than the limits, contact The Boeing Company.

- (7) Make sure that the reworked fastener hole is smooth and round.
- (8) Do a High Frequency Eddy Current (HFEC) inspection of the reworked fastener hole to make sure that all damage has been removed. Refer to 737 NDT Part 6, 51-00-00, Procedure 17.
- (9) Install the fastener. Refer to Table 201/REPAIR 6 and 51-40-02, GENERAL.
- (10) Do steps Paragraph 4.E.(2)/REPAIR 6 through Paragraph 4.E.(9)/REPAIR 6 for each elongated fastener hole.
- (11) Re-Install all the parts removed for access as necessary and put the Primary Nozzle Assembly back to the initial condition.

54-40-02

REPAIR 6

Page 210

Jul 10/2016

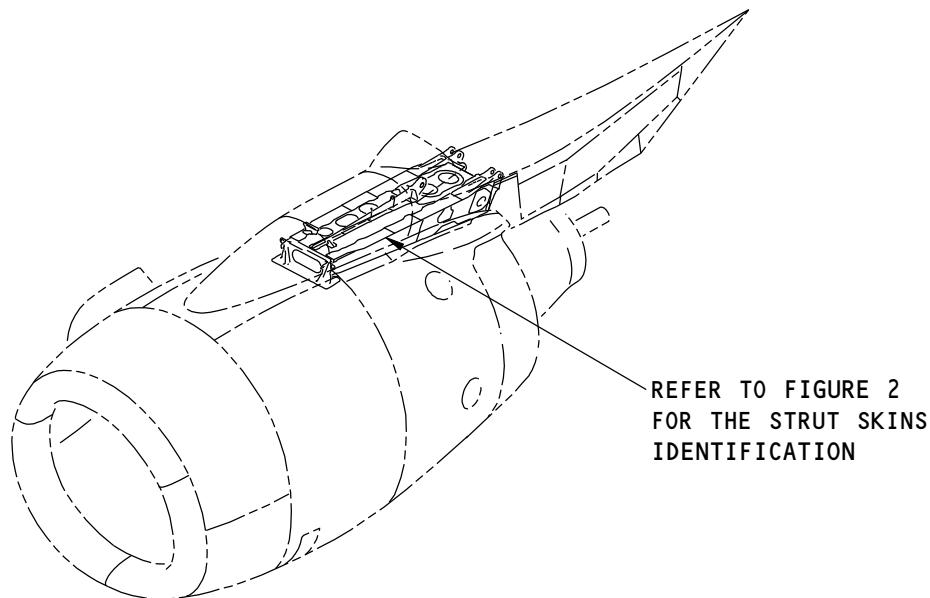
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ENGINE STRUT SIDE SKINS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Engine Strut Skins Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2007	Structure Assembly Collector - Strut
311A2101	Torque Box Assembly - Strut
311A2400	Skin Installation - Strut

54-50-01

IDENTIFICATION 1

Page 1

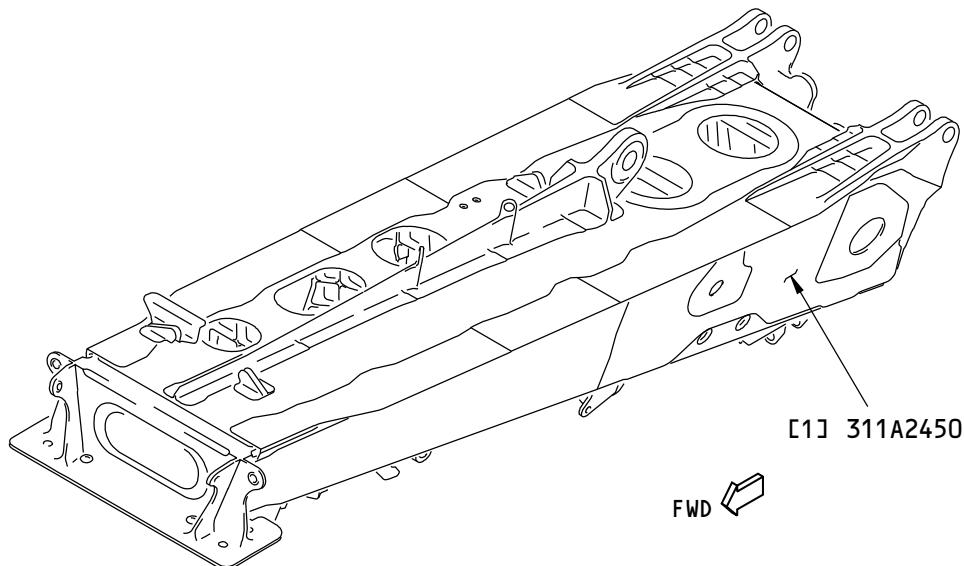
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737-800
STRUCTURAL REPAIR MANUAL



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

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Engine Strut Skins Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Side Skin	0.275 (6.99)	Ti-6Al-4V titanium plate, Code AB-1, annealed condition	

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

54-50-01

IDENTIFICATION 1

Page 2

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ENGINE STRUT SIDE SKINS

1. Applicability

- A. This subject gives the allowable damage limits for the side skins of the CFM56-7 engine strut as shown in Engine Strut Side Skin Allowable Damage, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES 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 (12.70 MM) ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

- (1) Refer to SOPM 20-10-07 when you work with titanium.
 - (2) Refer to 51-10-02 for the damage removal procedures.
 - (3) Refer to 51-30-03 for the possible sources of the abrasive materials you can use to remove the damage.
 - (4) Refer to 51-30-05 for the possible sources of the equipment and tools you can use to remove the damage.
- B. After you remove the damage from titanium parts, do as follows:
- (1) Do a penetrant inspection to make sure that all the damage is removed. Refer to SOPM 20-20-02.
 - (2) At the edges of the access holes, make sure there is a complete seal around the perimeter of the access door. If there is a leakage, then apply a fillet seal around the edge of the access hole.
- C. Refer to Table 101/ALLOWABLE DAMAGE 1 for the references for the allowable damage zones for the engine strut side skins.
- D. Refer to Engine Strut Side Skin Zone Locations, Figure 102/ALLOWABLE DAMAGE 1 for the allowable damage zones for the engine strut side skins.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE	
ZONE LOCATION	PARAGRAPH
1	4.A
2	4.B
3	4.C
4	4.D

54-50-01

ALLOWABLE DAMAGE 1

Page 101

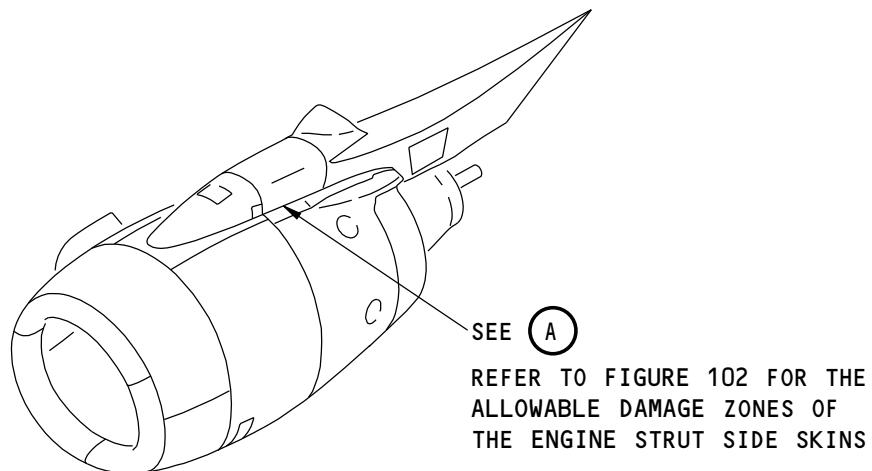
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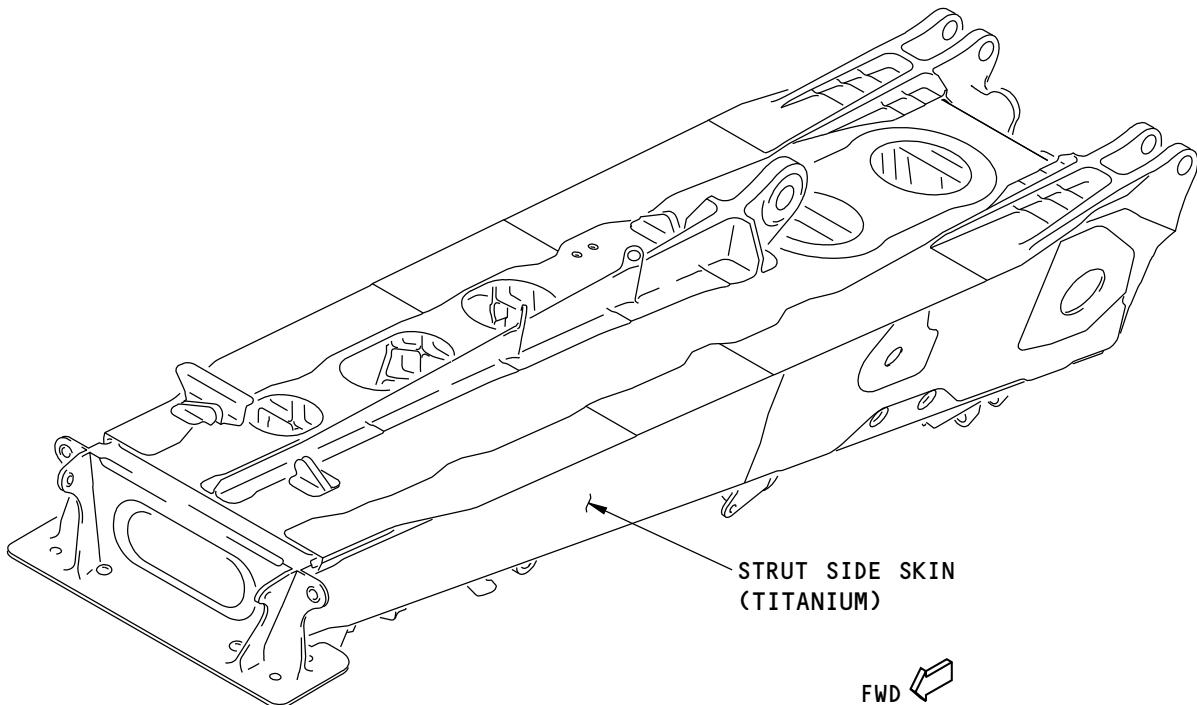
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737-800
STRUCTURAL REPAIR MANUAL



REFER TO FIGURE 102 FOR THE
ALLOWABLE DAMAGE ZONES OF
THE ENGINE STRUT SIDE SKINS



FWD

THE LEFT SIDE IS SHOWN
THE RIGHT SIDE IS OPPOSITE

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Engine Strut Side Skin Allowable Damage
Figure 101

54-50-01

ALLOWABLE DAMAGE 1

Page 102

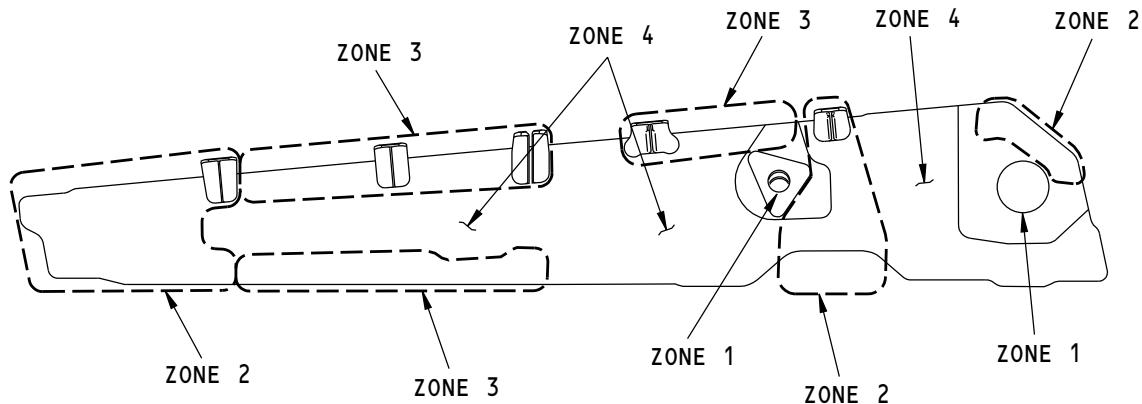
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: REFER TO TABLE 1 FOR THE PARAGRAPH REFERENCE FOR THE ALLOWABLE DAMAGE LIMITS OF THE APPLICABLE STRUT SIDE SKIN ZONE.

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Engine Strut Side Skin Zone Locations
Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-01	PROTECTIVE TREATMENT OF METALLIC AND COMPOSITE MATERIALS
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Zone 1 - Area Around Access Holes and Tie Rod Holes

(1) Cracks:

- (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail A . Refer to SOPM 20-10-07.

(2) Nicks, Gouges, Scratches, and Corrosion:

- (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail A .
- (b) The length of the damage along the edge must not be more than the length found in 45 degrees of arc of the circumference of the hole.

B. Zone 2 - Strut Side Skin Locations Adjacent to the Engine Mount Bulkheads

54-50-01

ALLOWABLE DAMAGE 1

Page 103

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , D , and E . Refer to SOPM 20-10-07.
 - (b) The damage must be a minimum of 2D (D = fastener diameter) from a fastener hole.
 - (c) The material removed must not be less than 1.7D (D = the largest damage dimension) to more than one fastener.
 - (d) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , D , E , and K .
 - (b) The damage must be more than 2D (D = fastener diameter) from a fastener.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .
- (4) Holes and Punctures:
 - (a) Remove the damaged material to a maximum diameter of 0.25 inch (6.35 mm). Refer to SOPM 20-10-07.
 - (b) The damage must be a minimum of 4D (D = fastener diameter) from an adjacent hole or other damage.
 - (c) The damage must be a minimum of 1.5D (D = fastener diameter) from the edge of the hole to the edge of the part.
 - (d) Install a copper-nickel alloy blind rivet in the hole without sealant.

C. Zone 3 - Side Skin Along Chords

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , F , and G . Refer to SOPM 20-10-07.
 - (b) The damage must be more than 2D (D = fastener diameter) from a fastener hole.
 - (c) The material removed must not be less than 1.7D (D = the largest damage dimension) from more than one fastener.
 - (d) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , F , G , and K .
 - (b) The damage must not be less than 2D (D = fastener diameter) from a fastener hole.
 - (c) The material removed must not be less than 1.7D (D = the largest damage dimension) from more than one fastener.
 - (d) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener hole.
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .
- (4) Holes and Punctures:

54-50-01

ALLOWABLE DAMAGE 1

Page 104

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Remove the damaged material to a maximum diameter of 0.25 inch (6.35 mm). Refer to SOPM 20-10-07.
 - (b) The damage must be a minimum of 1.5D (D = fastener diameter) from the edge of the hole to the edge of the part.
 - (c) Install a copper-nickel alloy blind rivet in the hole without sealant.
- D. Zone 4 - All Strut Side Skin Locations not found in Zones 1, 2, or 3.
- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , H , and I . Refer to SOPM 20-10-07.
 - (b) Damage is permitted if:
 - 1) The material removed is more than 2D (D = fastener diameter) from the nearest fastener hole
 - 2) The material removed is not less than 2.0D (D = fastener diameter) from more than two adjacent fasteners
 - 3) The material removed is not nearer than 1.7D (D = the largest damage dimension) to more than three fasteners.
 - (c) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details B , C , H , and I , and K .
 - (b) Damage is permitted if:
 - 1) The material removed is a minimum of 2D (D = fastener diameter) from more than two adjacent fasteners
 - 2) The material removed is not less than 1.7D (D = the largest damage dimension) to more than three fasteners
 - 3) The material removed is more than 2D (D = fastener diameter) from three or more fasteners in ten.
 - (c) Install a different freeze plug in each part (skin, chord, or frame) attached by a fastener if the material removed is less than 1.5D (D = fastener diameter) from a fastener.
 - (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .
 - (4) Holes and Punctures:
 - (a) Remove the damaged material to a maximum diameter of 0.25 inch (6.35 mm). Refer to SOPM 20-10-07.
 - (b) The damaged material removed must be a minimum of 4D (D = fastener diameter) from an adjacent hole or other damage.
 - (c) The damage removed must be a minimum of 1.5D (D = fastener diameter) from the edge of the hole to the edge of the part.
 - (d) Install a copper-nickel alloy blind rivet in the hole without sealant.

54-50-01

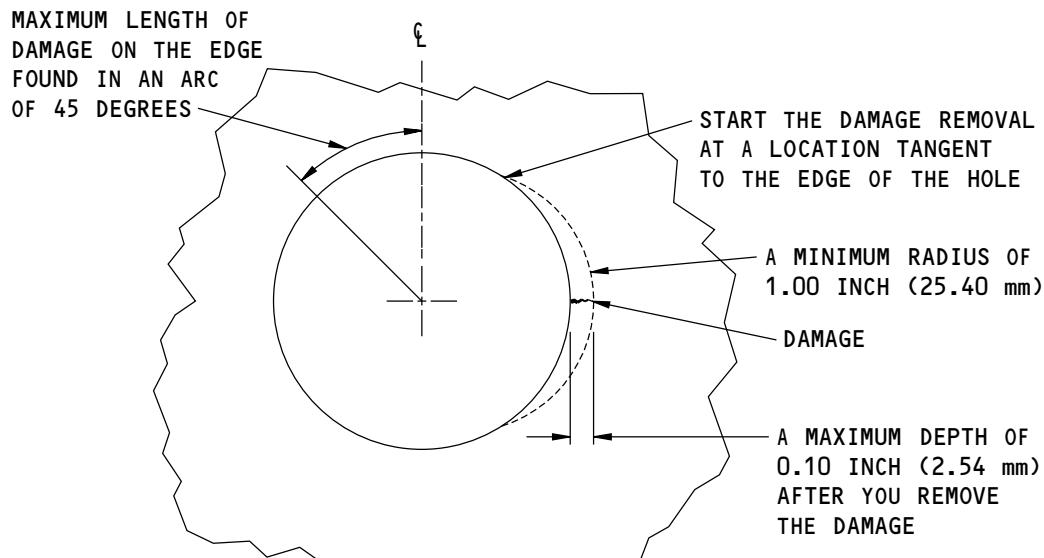
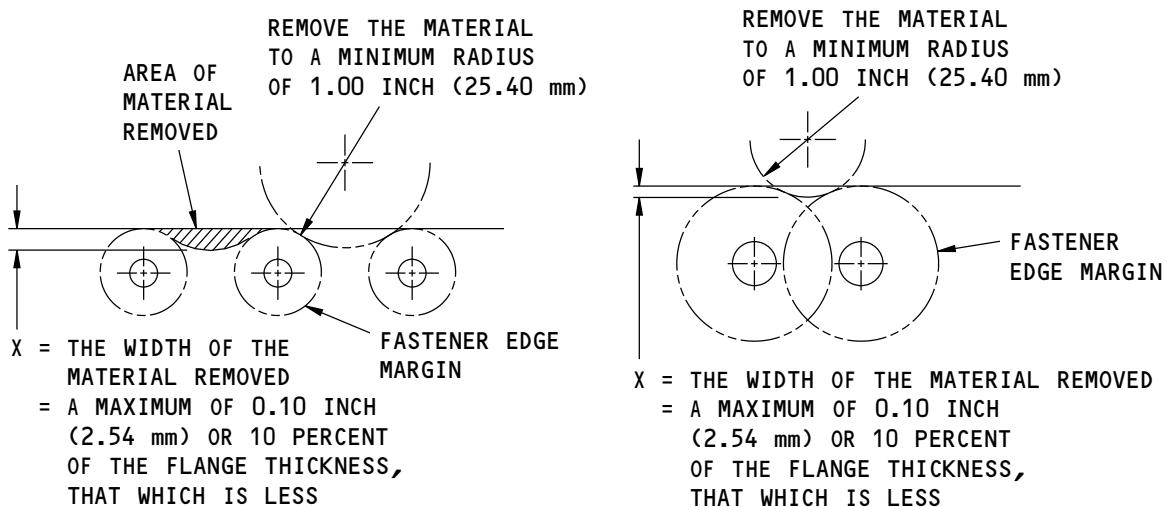
ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

REMOVAL OF DAMAGED MATERIAL IN ZONE 1
(A)

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)

F61354 S0006592111_V1

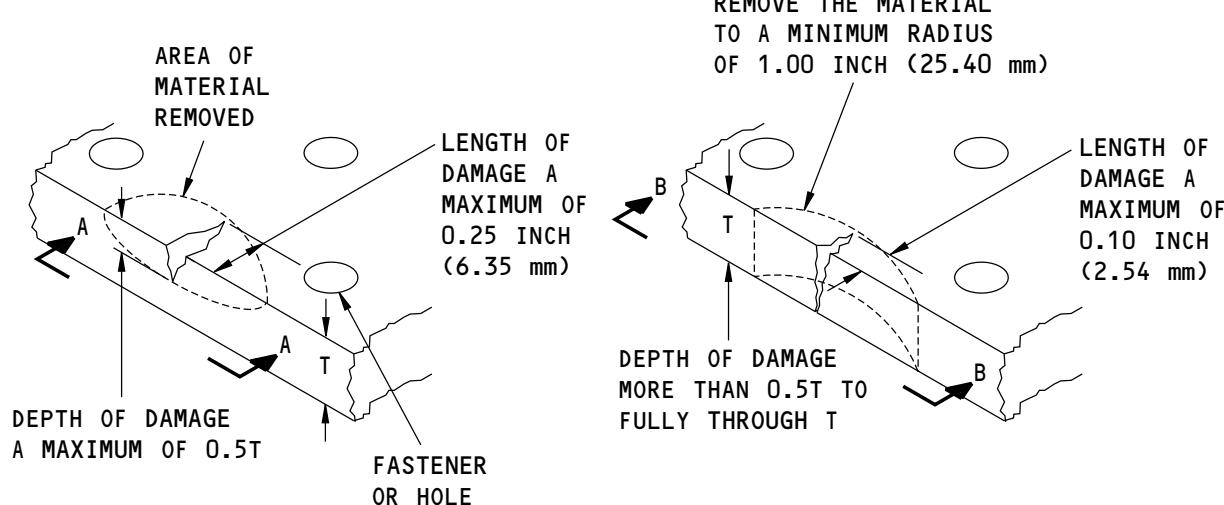
**Allowable Damage Limits
Figure 103 (Sheet 1 of 8)**
54-50-01
ALLOWABLE DAMAGE 1

Page 106

Nov 10/2012

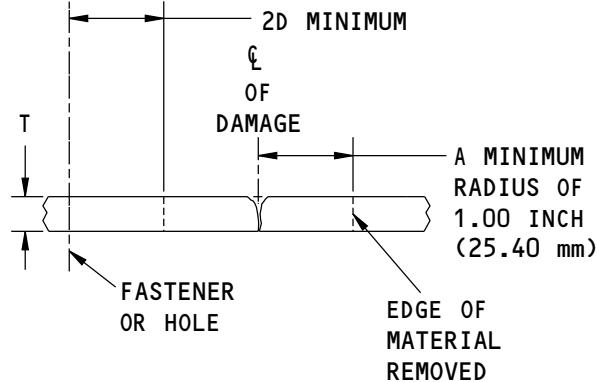
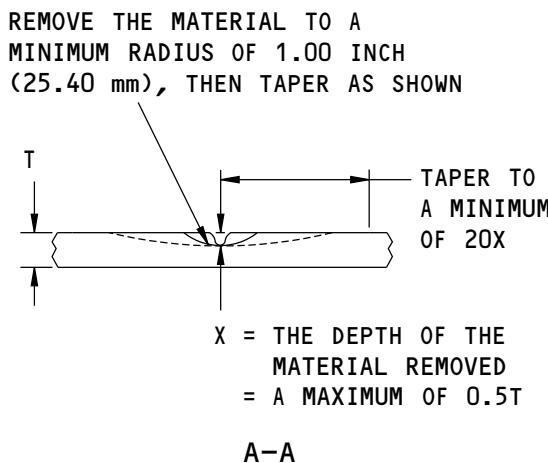
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**737-800
STRUCTURAL REPAIR MANUAL**



REMOVAL OF DAMAGED MATERIAL AT AN EDGE IN ZONE 2

(D)



NOTES

- T = THE THICKNESS OF THE MATERIAL

F61475 S0006592112_V1

**Allowable Damage Limits
Figure 103 (Sheet 2 of 8)**

54-50-01

ALLOWABLE DAMAGE 1

Page 107

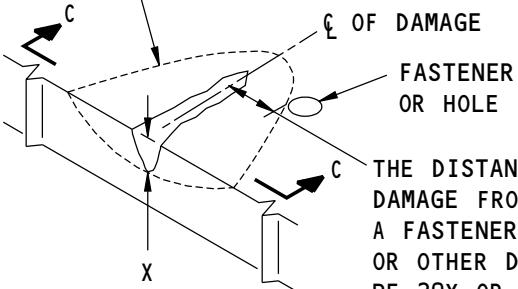
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL

AREA OF MATERIAL REMOVED

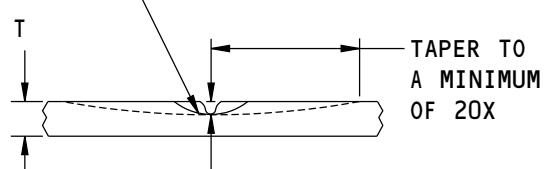


C OF DAMAGE
FASTENER OR HOLE
THE DISTANCE OF THE DAMAGE FROM A HOLE, A FASTENER, AN EDGE, OR OTHER DAMAGE MUST BE 20X OR MORE

REMOVAL OF DAMAGED MATERIAL ON A SURFACE IN ZONE 2

E

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



TAPER TO A MINIMUM OF 20X

X = THE DEPTH OF THE MATERIAL REMOVED
= A MAXIMUM OF 0.5T

C-C

F65495 S0006592113_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 8)

54-50-01

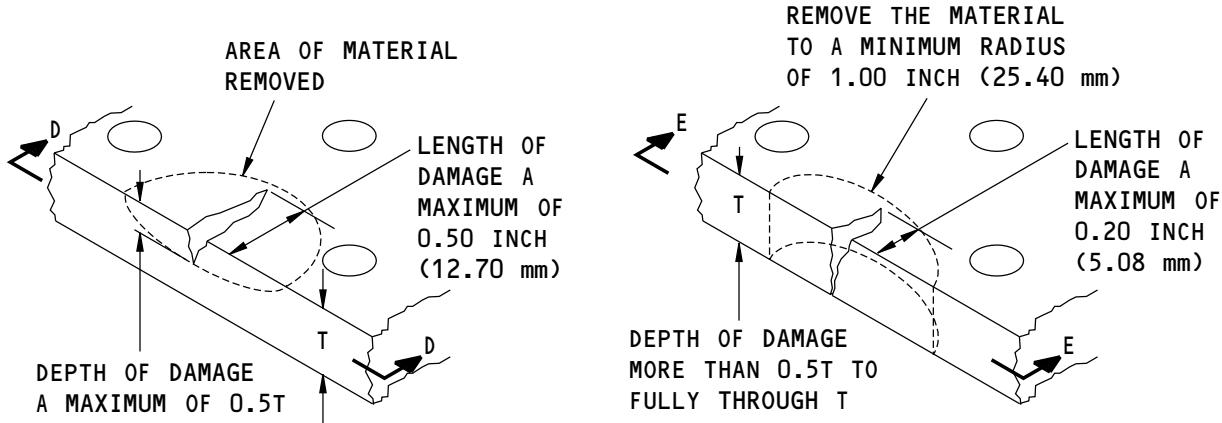
ALLOWABLE DAMAGE 1

Page 108

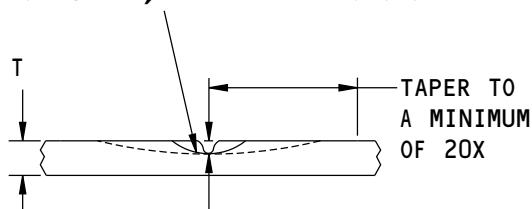
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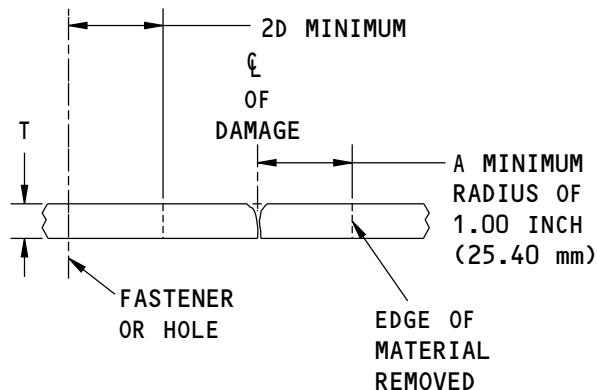
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REMOVAL OF DAMAGED MATERIAL AT AN EDGE IN ZONE 3
(F)

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



X = THE DEPTH OF THE MATERIAL REMOVED = A MAXIMUM OF 0.5T

D-D

E-E

F65500 S0006592114_V1

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

54-50-01
ALLOWABLE DAMAGE 1

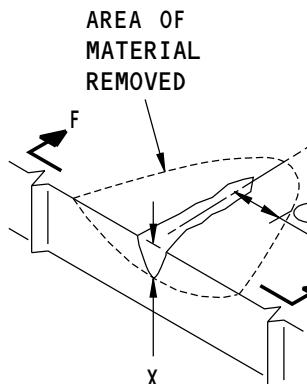
Page 109

Nov 10/2012

D634A210

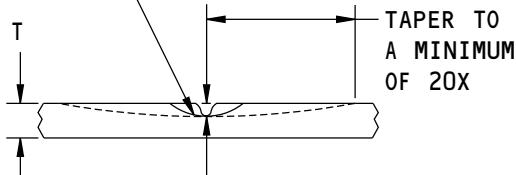


737-800
STRUCTURAL REPAIR MANUAL



THE DISTANCE OF THE DAMAGE AFTER CLEANUP MUST NOT BE LESS THAN 1.7D FROM MORE THAN ONE FASTENER, HOLE, AN EDGE, OR OTHER DAMAGE.
 $D = \text{THE LARGEST DIMENSION OF THE DAMAGE}$

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



$X = \text{THE DEPTH OF THE MATERIAL REMOVED} = \text{A MAXIMUM OF } 0.5\text{ INCH}$

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE IN ZONE 3



F61542 S0006592115_V1

Allowable Damage Limits
Figure 103 (Sheet 5 of 8)

54-50-01

ALLOWABLE DAMAGE 1

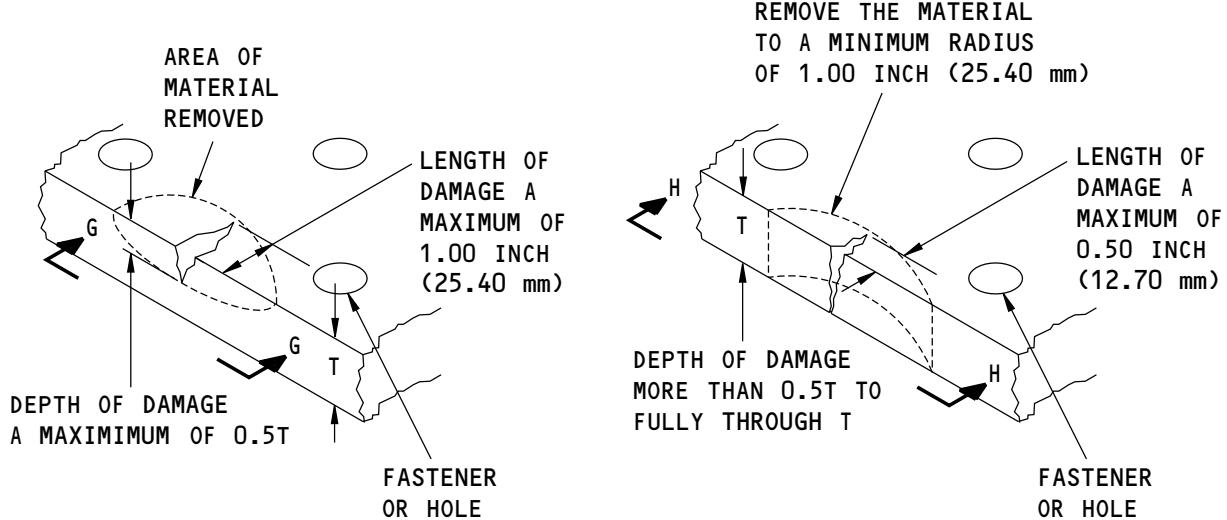
Page 110

Nov 10/2012

D634A210

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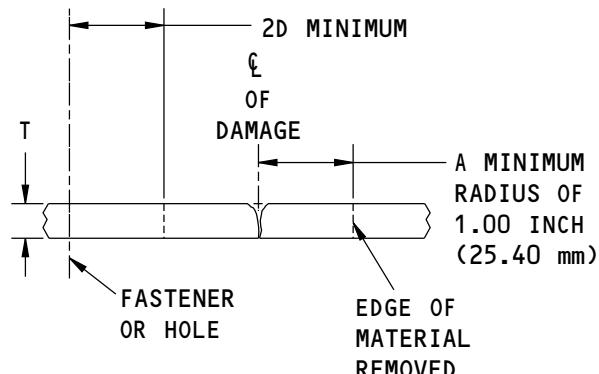
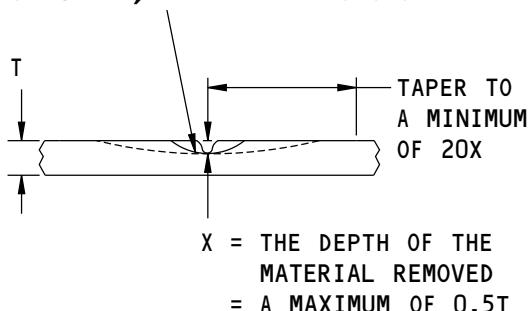
**737-800
STRUCTURAL REPAIR MANUAL**



REMOVAL OF DAMAGED MATERIAL AT AN EDGE IN ZONE 4



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



F62190 S0006592116_V1

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

54-50-01

ALLOWABLE DAMAGE 1

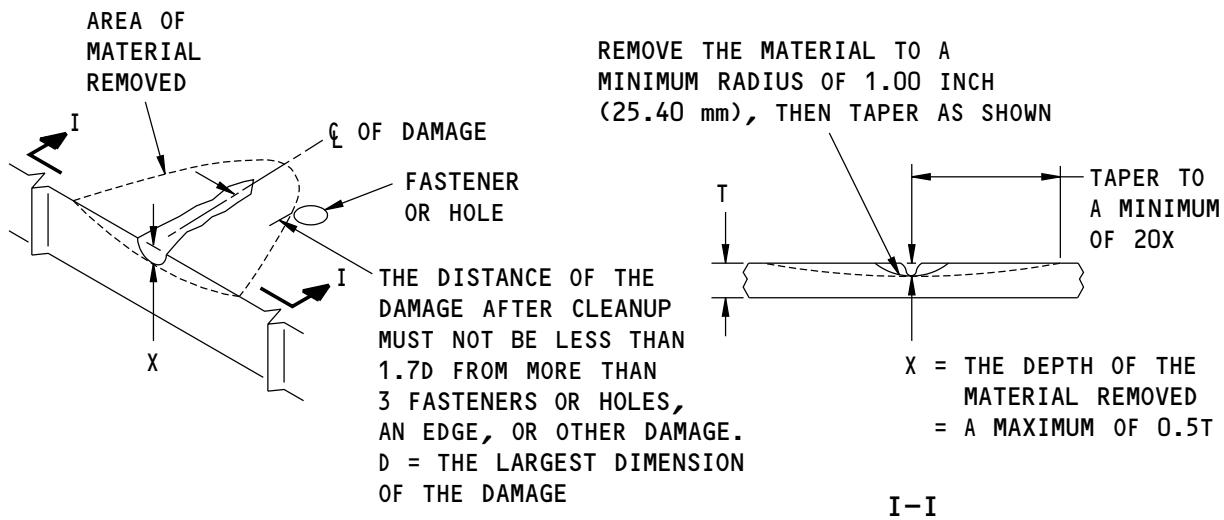
Page 111

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE IN ZONE 4

(I)

F65512 S0006592117_V1

Allowable Damage Limits
Figure 103 (Sheet 7 of 8)

54-50-01

ALLOWABLE DAMAGE 1

Page 112

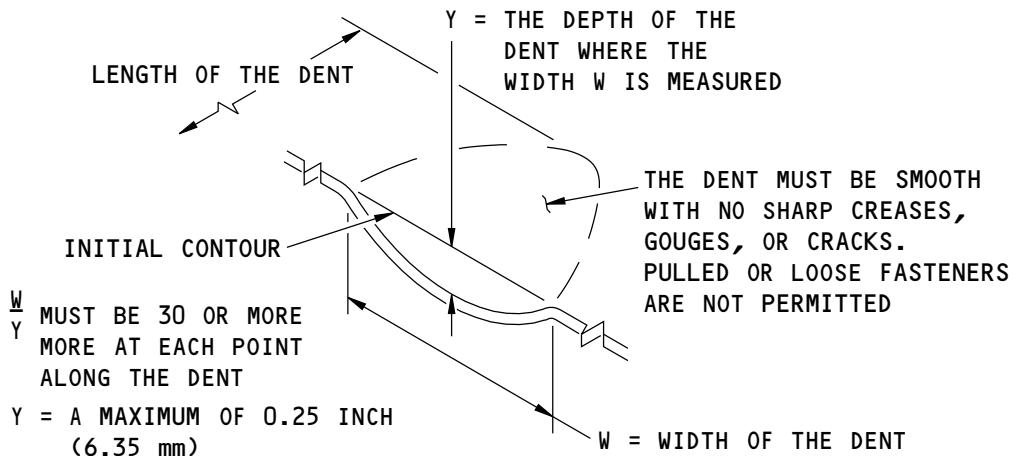
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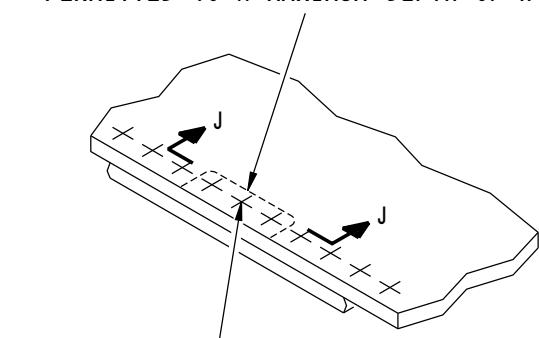
737-800 STRUCTURAL REPAIR MANUAL



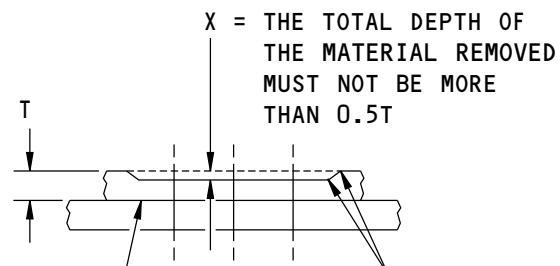
A DENT THAT IS PERMITTED



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



REMOVAL OF CORROSION DAMAGE AROUND THE FASTENERS



REMOVE CORROSION ON THE MATING SURFACE TO THE MAXIMUM DEPTH PERMITTED AND FILL WITH AN ALUMINUM SHIM

NOTE: IF MATERIAL IS REMOVED FROM TWO SIDES, THE TOTAL REMOVED MUST NOT BE MORE THAN 0.5T.

J-J

F61566 S0006592118_V2

Allowable Damage Limits
Figure 103 (Sheet 8 of 8)

54-50-01

ALLOWABLE DAMAGE 1

Page 113

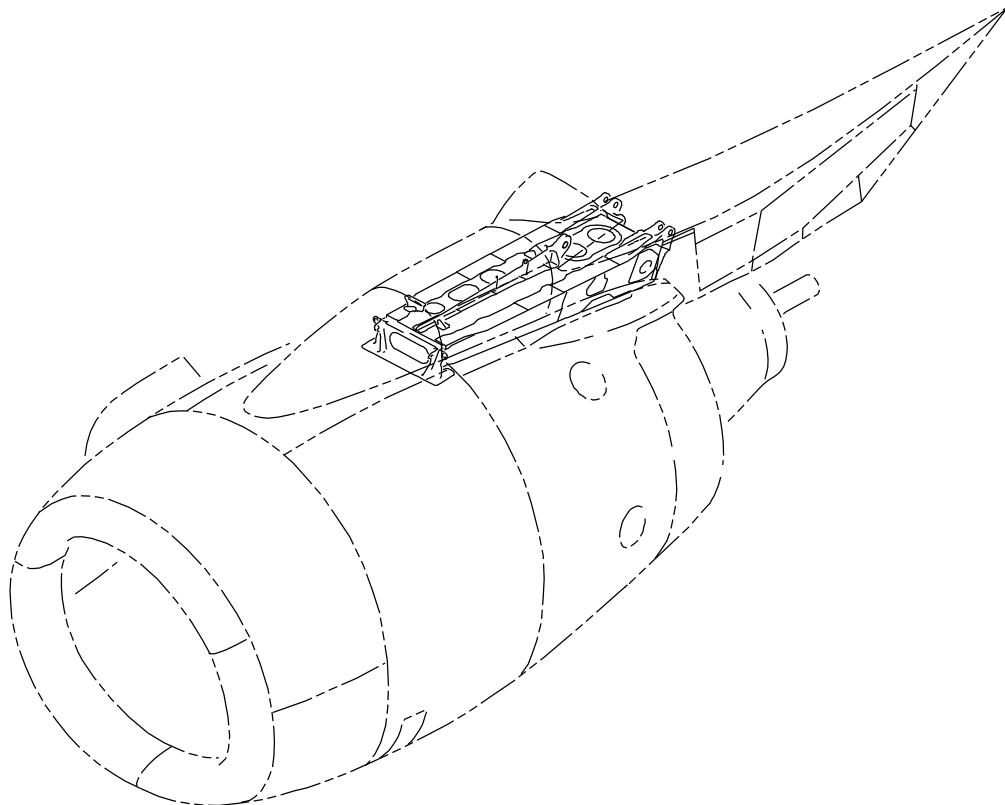
Jul 10/2014

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737-800
STRUCTURAL REPAIR MANUAL
REPAIR 1 - ENGINE STRUT SIDE SKINS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

G44446 S0006592121_V3

Engine Strut Skins Location
Figure 201

54-50-01
REPAIR 1
Page 201
Mar 10/2014

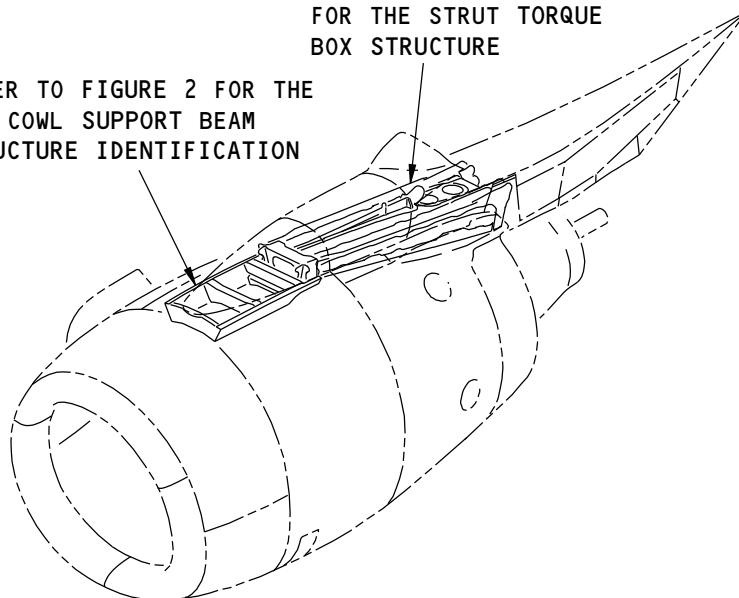


737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - FAN COWL SUPPORT BEAM STRUCTURE

REFER TO IDENTIFICATION 2
FOR THE STRUT TORQUE
BOX STRUCTURE

REFER TO FIGURE 2 FOR THE
FAN COWL SUPPORT BEAM
STRUCTURE IDENTIFICATION



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F18003 S0006592125_V1

Fan Cowl Support Beam Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2510	Fan Cowl Support Beam Installation
311A2511	Fan Cowl Support Beam Assembly

54-50-02

IDENTIFICATION 1

Page 1

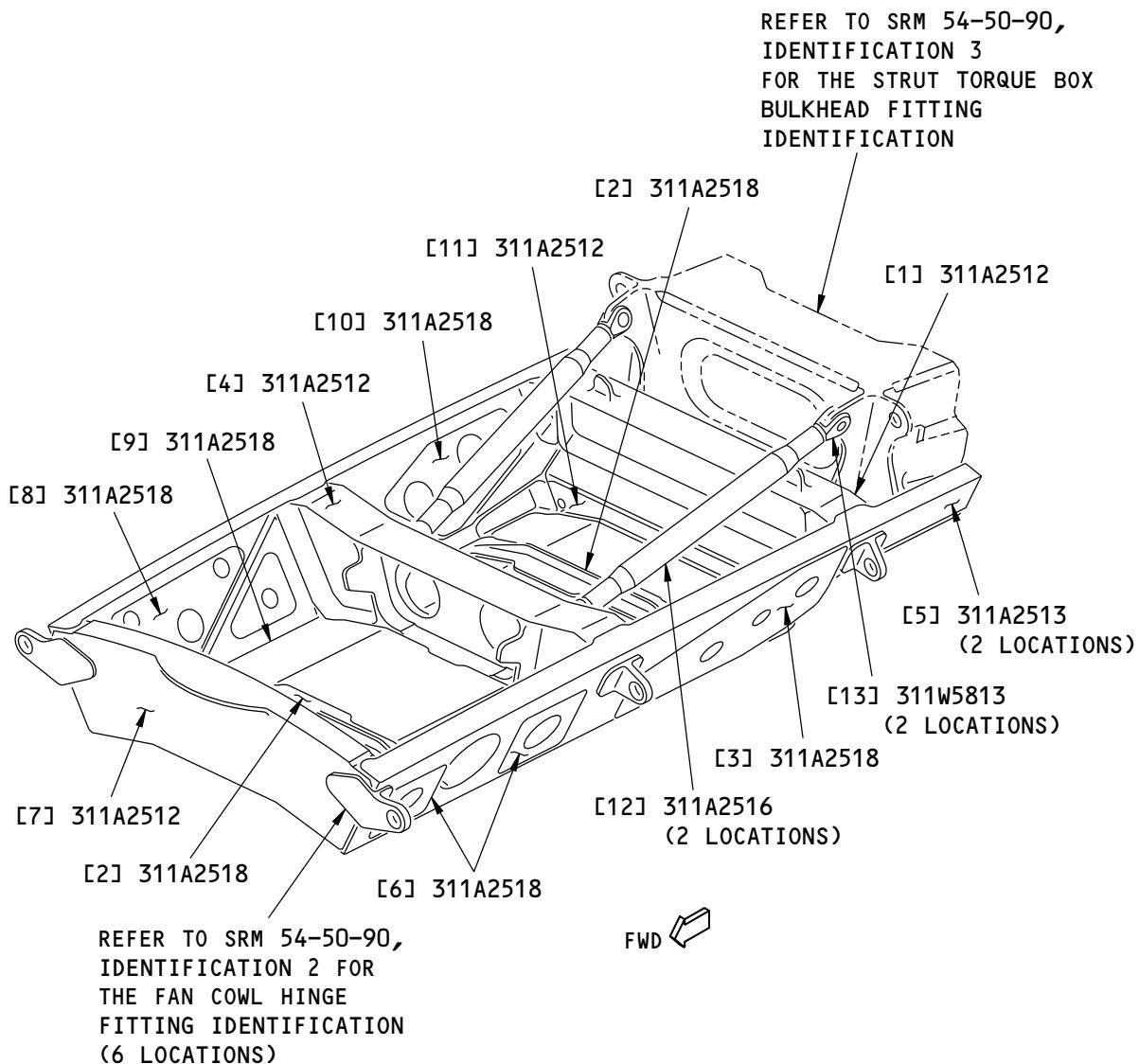
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737-800
STRUCTURAL REPAIR MANUAL



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

F18705 S0006592127_V2

Fan Cowl Support Beam Structure Identification
Figure 2

54-50-02

IDENTIFICATION 1

Page 2

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Aft Bulkhead	3.2 (81.28)	7050-T7451 machined plate as given in AMS 4050	
[2]	Stiffener		BAC1505-101094 2024-T42 extrusion as given in QQ-A-200/3	
[3]	Disconnect Panel	0.071 (1.80)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[4]	Frame	5.4 (137.2)	7050-T7451 machined plate as given in BMS 7-323	
[5]	Side Beam Fitting	2.50 (63.5)	7050-T7451 machined plate as given in AMS 4050	
[6]	Disconnect Panel	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[7]	Forward Bulkhead	2.4 (60.96)	7050-T7451 machined plate as given in AMS 4050	
[8]	Disconnect Panel	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[9]	Web	0.063 (1.60)	2024-T3 sheet as given in QQ-A-250/4	
[10]	Disconnect Panel	0.050 (1.27)	Ti-6Al-4V titanium sheet as given in MIL-T-9046, Code AB-1 in the annealed condition	
[11]	Closeout Fitting	1.7 (43.18)	7050-T7451 machined plate as given in AMS 4050	
[12]	Tube		2024-T42 tube, 1.25 inch (31.75 mm) in diameter	
[13]	Tie Rod Clevis		7075-T7351 rod as given in QQ-A-225/9	

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

54-50-02

IDENTIFICATION 1

Page 3

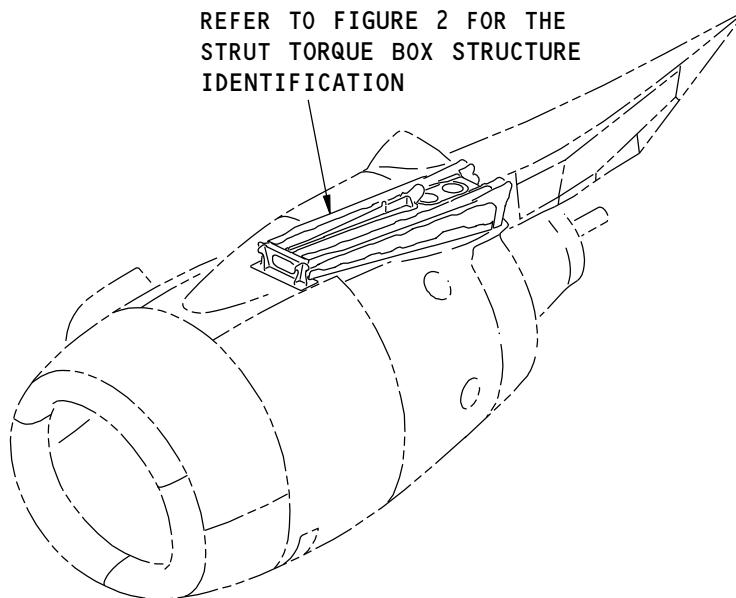
Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - ENGINE STRUT TORQUE BOX STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G27333 S0006592130_V1

Engine Strut Torque Box Structure

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2007	Strut Structure Assembly
311A2101	Strut Torque Box Assembly
311A2116	Web Assembly - Upper Spar

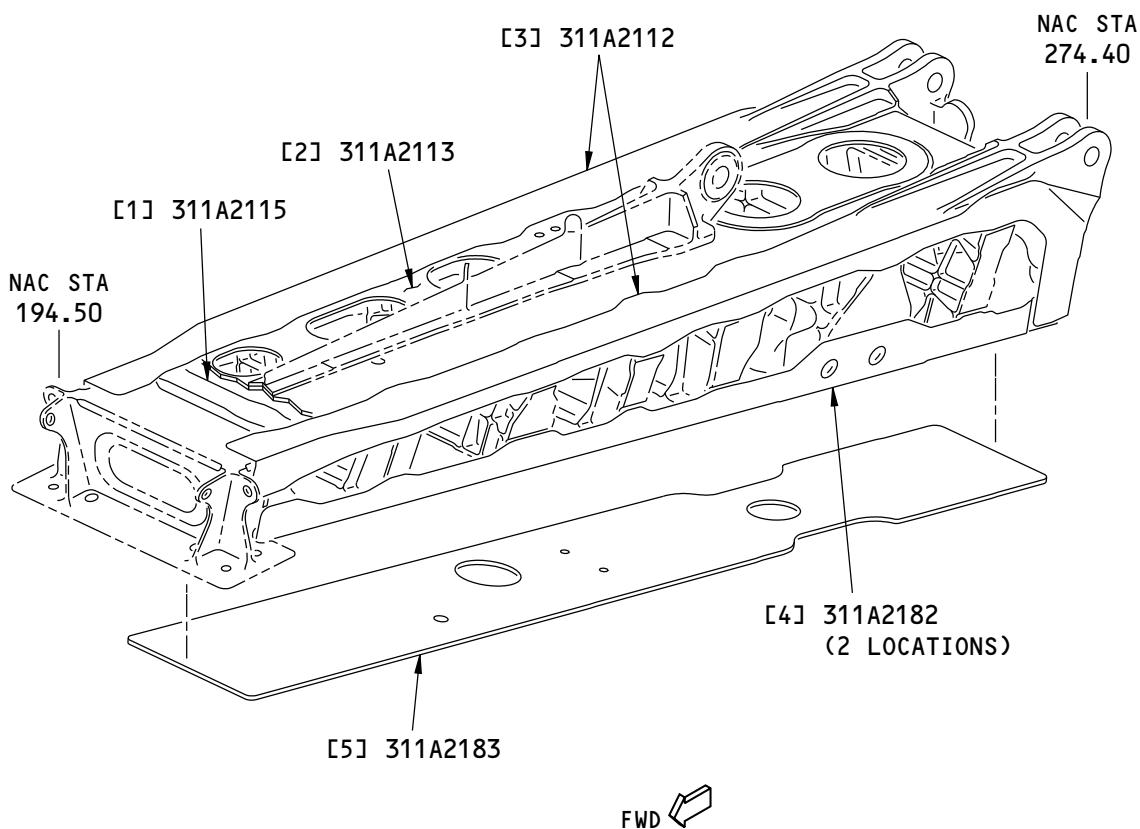
54-50-02
IDENTIFICATION 2
Page 1
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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

G27334 S0006592132_V1

Engine Strut Torque Box Identification
Figure 2

54-50-02
IDENTIFICATION 2
Page 2
Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Spar Stiffener		BAC1505-100172 2024-T8511 extrusion as given in QQ-A-200/3	
[2]	Upper Spar Web	0.32 (8.13)	2024-T851 machined plate as given in QQ-A-250/4	
[3]	Upper Spar Chord		15-5PH die forged CRES as given in AMS 5659, Type 1, solution heat treated to 180-220 KSI	
[4]	Lower Spar Chord		15-5PH die forged CRES as given in AMS 5659, Type 1, solution heat treated to 180-220 KSI	
[5]	Lower Spar Web	0.20 (5.08)	Ti-6Al-4V machined titanium plate as given in Mil-T-9046, Code AB-1, in the annealed condition	

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

54-50-02

IDENTIFICATION 2

Page 3

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - FAN COWL SUPPORT BEAM STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the fan cowl support beam shown in Fan Cowl Support Beam Structure Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES 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 (12.70 MM) OR MORE ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

- (1) Refer to SOPM 20-10-07 when you work with titanium.
 - (2) Refer to 51-10-02 for the removal procedures.
 - (3) Refer to 51-10-02 for the procedures.
 - (4) Refer to 51-30-03 for possible sources of the nonmetallic materials you can use to remove the damage.
 - (5) 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 as follows:
- (1) Apply a chemical conversion coating to the bare surfaces of the aluminum parts. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-11, Type I primer to the bare surfaces of the aluminum parts. Refer to SOPM 20-41-02.
 - (3) Apply one layer of BMS 10-11, Type I primer to the bare surfaces of the titanium parts. Refer to SOPM 20-41-02.

54-50-02

ALLOWABLE DAMAGE 1

Page 101

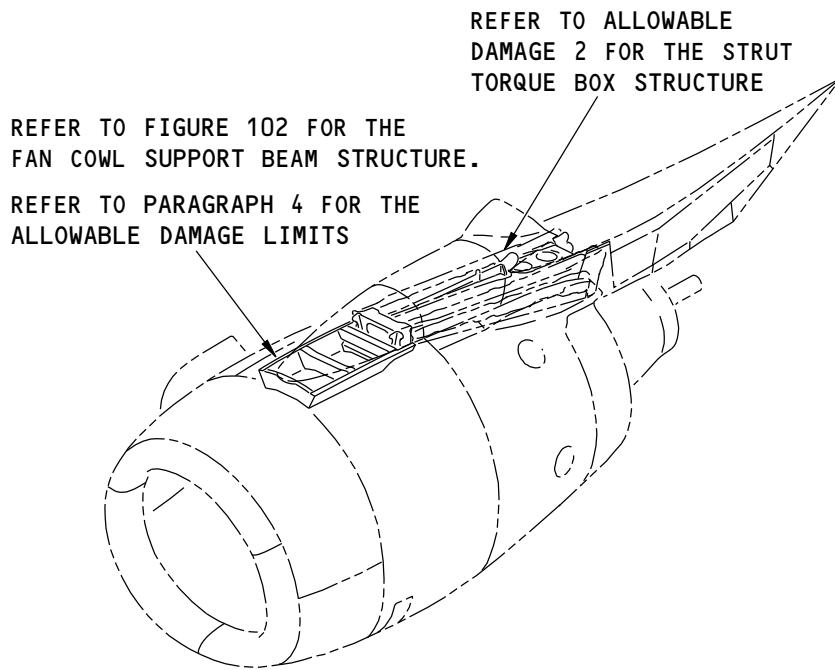
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737-800
STRUCTURAL REPAIR MANUAL



F20450 S0006592136_V1

Fan Cowl Support Beam Structure Location
Figure 101

54-50-02

ALLOWABLE DAMAGE 1

Page 102

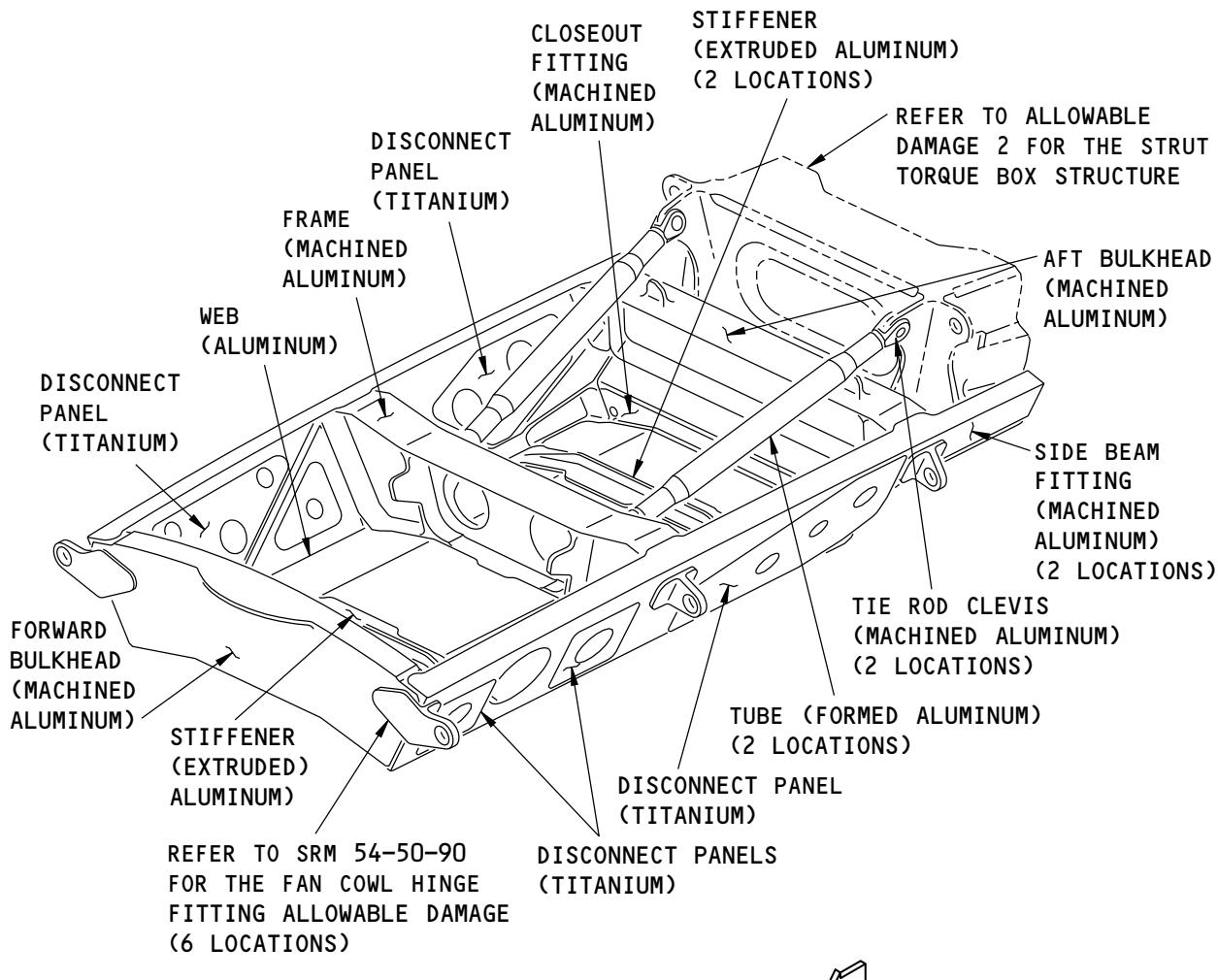
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737-800
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F19480 S0006592137_V1

Fan Cowl Support Beam Structure
Figure 102

54-50-02

ALLOWABLE DAMAGE 1

Page 103

Nov 10/2012

D634A210

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737-800
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
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-07	Machining of Titanium
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Bulkheads, Frame, Stiffeners, and Fittings

- (1) Cracks:
 - (a) Remove the edge damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , and E .
- (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 H .
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

B. Webs and Disconnect Panels

- (1) Cracks:
 - (a) Remove the edge damage as shown in Allowable Damage Limits, Figure 103/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 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , and F .
- (3) Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail G .
- (4) Holes and Punctures are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail I .

C. Tie Rod Clevis:

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 0.875 inch (22.23 mm)
- If there is no damage on the edge of the lug.

- (1) Cracks:
 - (a) Remove the damage to a corner of the lug as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail J .
- (3) Dents are not permitted.

54-50-02

ALLOWABLE DAMAGE 1

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (4) Holes and Punctures are not permitted.

D. Tubes

- (1) Cracks are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail K .
- (2) Nicks, Gouges, Scratches, and Corrosion are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail K .
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

54-50-02

ALLOWABLE DAMAGE 1

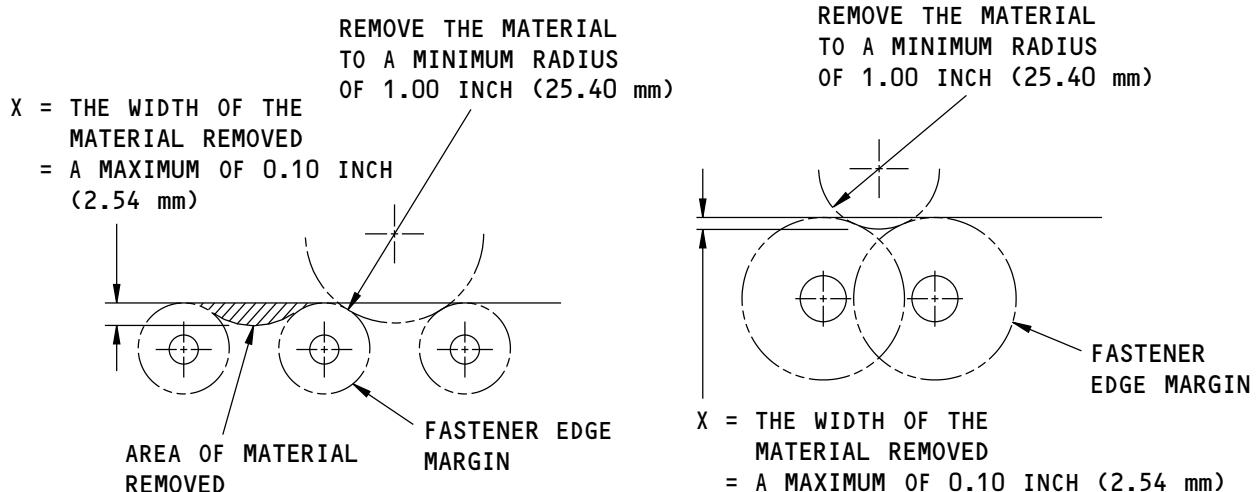
Page 105

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

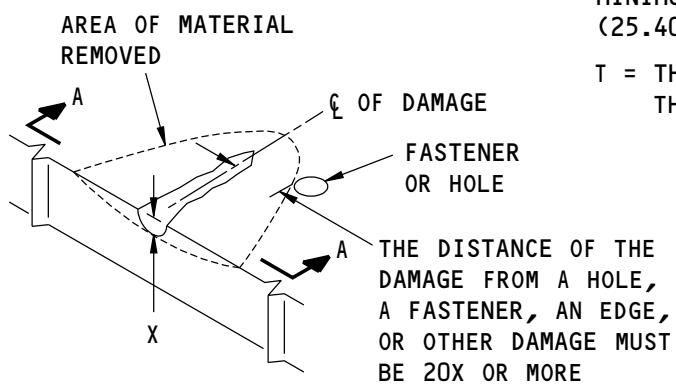


REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)

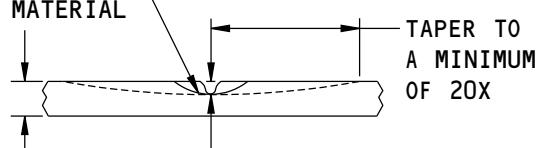
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN

T = THICKNESS OF THE MATERIAL



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

A-A

REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)

F20451 S0006592138_V1

**Allowable Damage Limits
Figure 103 (Sheet 1 of 7)**

54-50-02

ALLOWABLE DAMAGE 1

Page 106

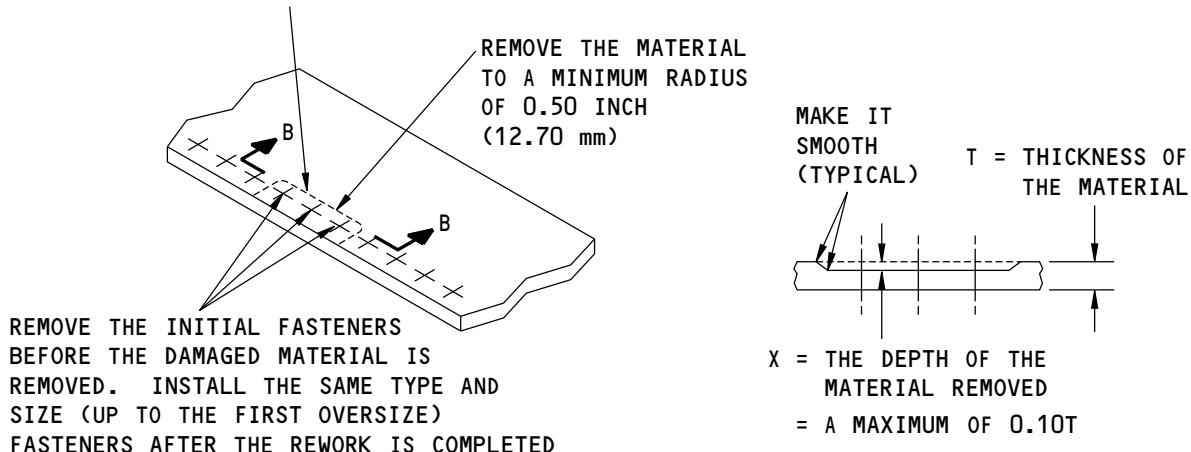
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D634A210



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

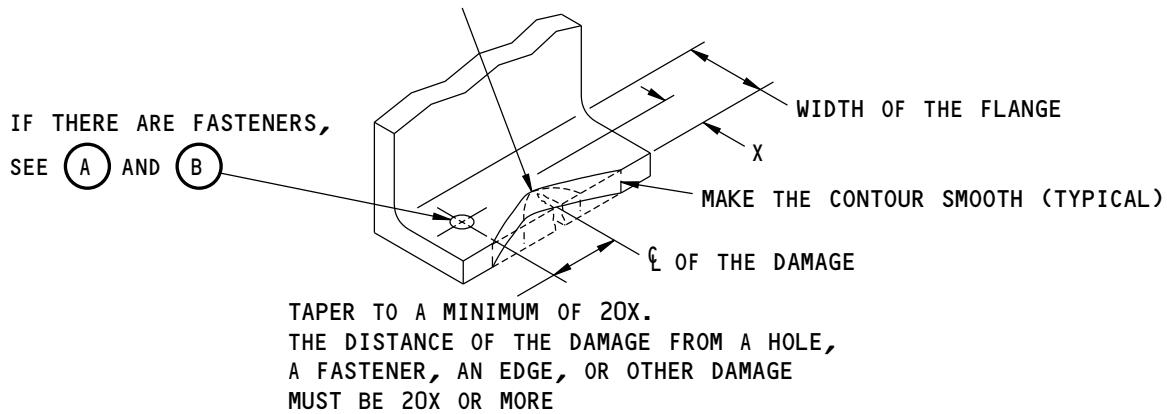


REMOVAL OF CORROSION AROUND THE FASTENERS

B-B

(D)

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 OF A MACHINED OR EXTRUDED PART

(E)

F20453 S0006592139_V1

Allowable Damage Limits Figure 103 (Sheet 2 of 7)

54-50-02

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2012

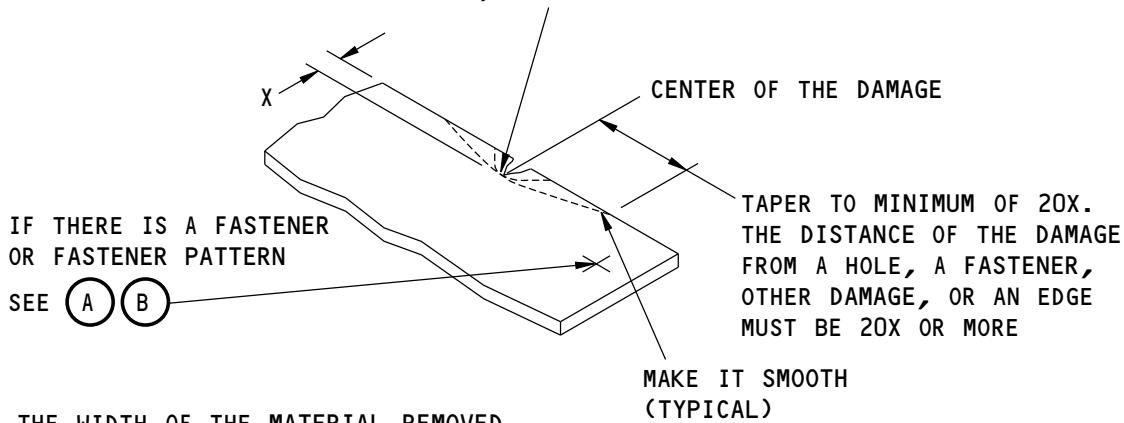
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737-800
STRUCTURAL REPAIR MANUAL

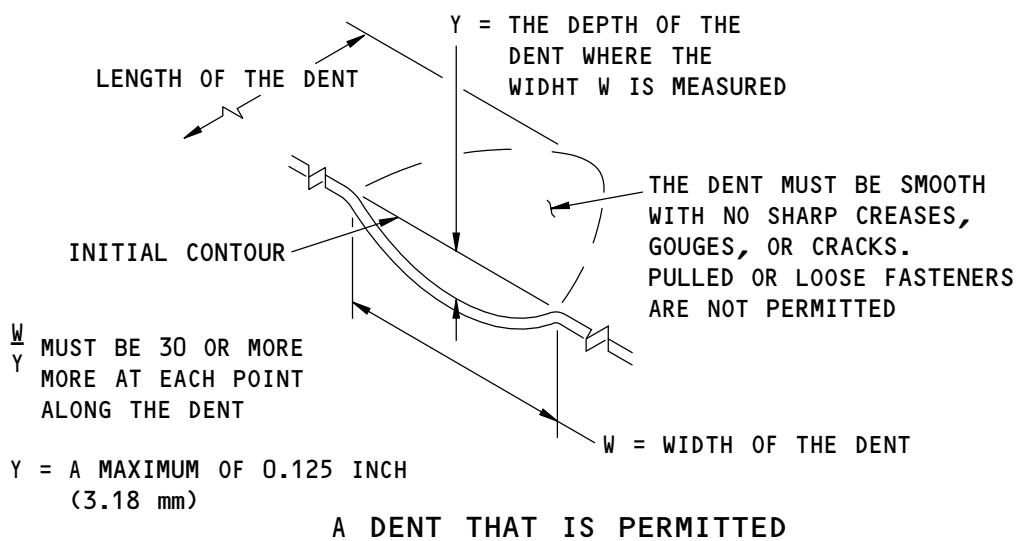
REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(F)



A DENT THAT IS PERMITTED

(G)

F20455 S0006592140_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 7)

54-50-02

ALLOWABLE DAMAGE 1

Page 108

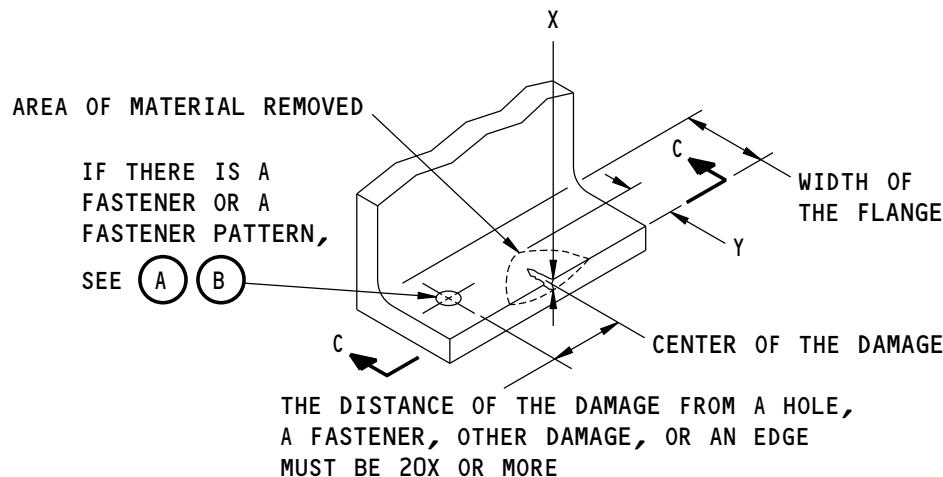
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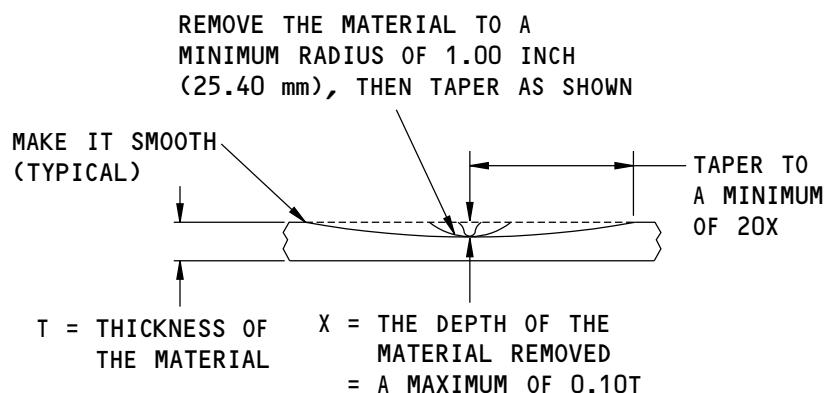
737-800
STRUCTURAL REPAIR MANUAL



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

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(H)



F20454 S0006592141_V1

Allowable Damage Limits
Figure 103 (Sheet 4 of 7)

54-50-02

ALLOWABLE DAMAGE 1

Page 109

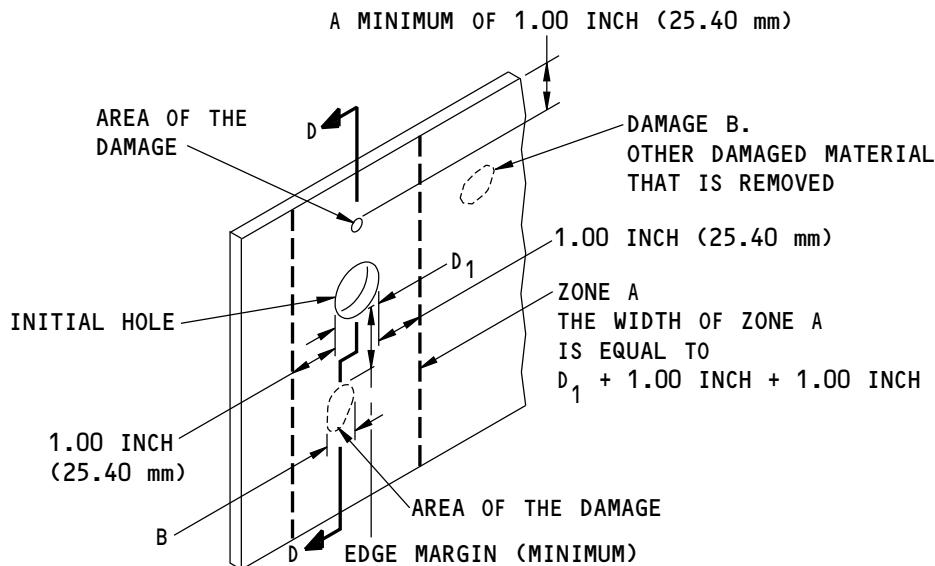
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NOTE: DAMAGE B IS NOT LOCATED IN ZONE A AND SHOULD NOT BE INCLUDED IN THE CALCULATION OF THE TOTAL CROSS-SECTIONAL AREA SHOWN IN D-D.

REMOVAL OF DAMAGE FROM A WEB

(I)

D_1 = DIAMETER OF THE INITIAL HOLE

D_2 = DIAMETER OF THE HOLE DAMAGE

H = HEIGHT OF THE WEB

T = THICKNESS OF THE WEB

A_i = INITIAL NET AREA

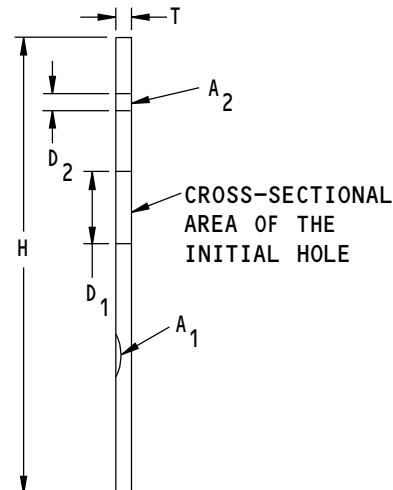
= TOTAL CROSS-SECTIONAL AREA MINUS THE
CROSS-SECTIONAL AREA OF THE INITIAL HOLES
= $HT - D_1 T$

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

A_2 = CROSS-SECTIONAL AREA OF THE DAMAGE
THAT IS REMOVED FROM LOCATION 2
= $D_2 T$

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

$$= 10 \text{ PERCENT MAXIMUM}$$



D-D

F20456 S0006592142_V1

**Allowable Damage Limits
Figure 103 (Sheet 5 of 7)**

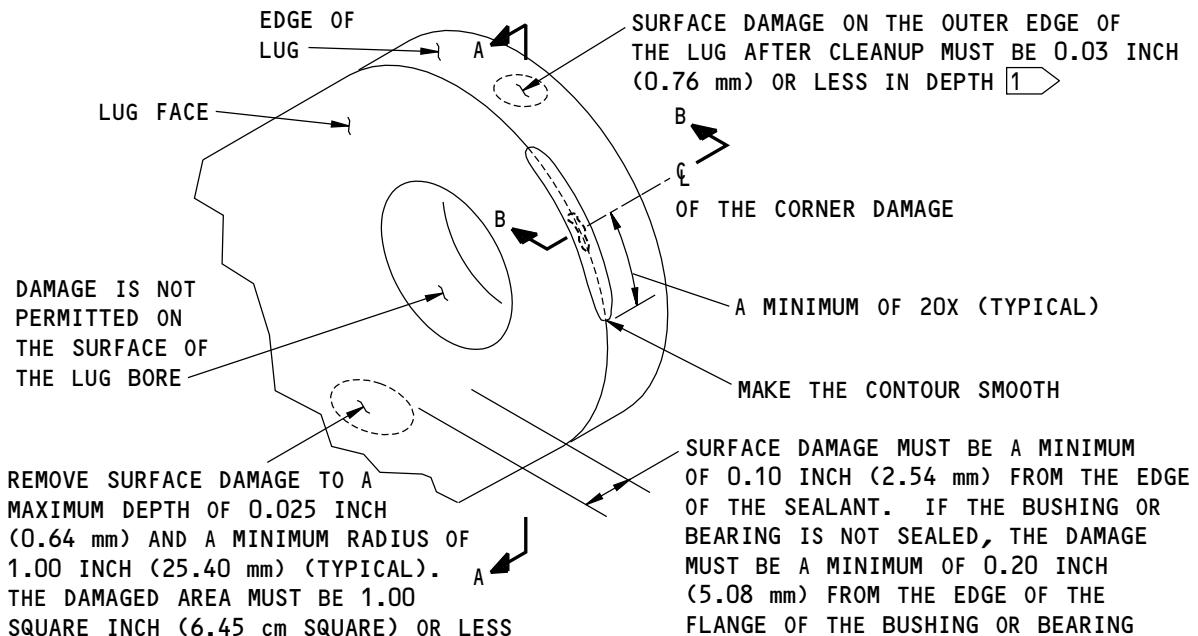
54-50-02

ALLOWABLE DAMAGE 1

Page 110

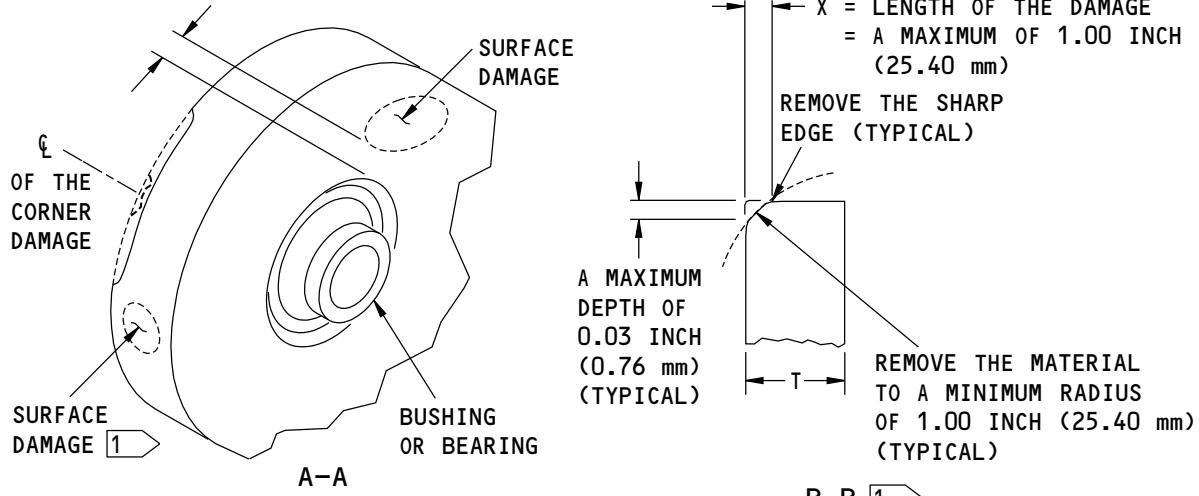
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**737-800
STRUCTURAL REPAIR MANUAL**

REMOVAL OF SURFACE AND EDGE DAMAGE

J

SURFACE DAMAGE MUST BE A MINIMUM OF 0.20 INCH (5.08 mm) FROM THE EDGE OF THE BUSHING OR BEARING


NOTES

- [1] THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY IF THE BORE OF THE LUG HAS NOT BEEN OVERSIZED. IF THE BORE IS OVERSIZED, THEN ONLY SURFACE DAMAGE IS PERMITTED AS SHOWN.

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Allowable Damage Limits
Figure 103 (Sheet 6 of 7)

54-50-02

ALLOWABLE DAMAGE 1

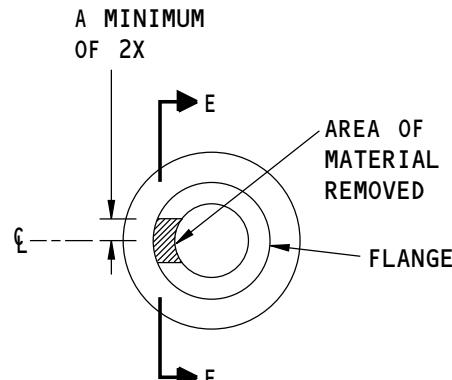
Page 111

Nov 10/2012

D634A210

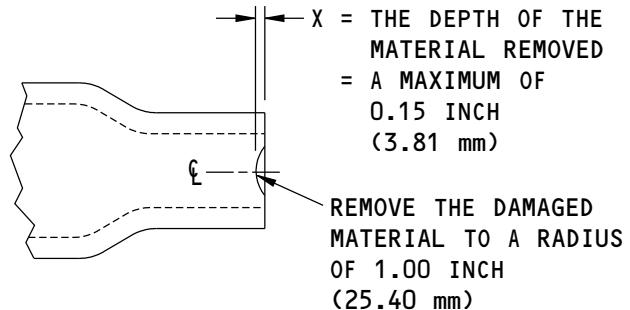


737-800
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REMOVAL OF DAMAGED MATERIAL
AT AN EDGE OF A FLANGED HOLE

K



E-E

F20457 S0006592144_V1

Allowable Damage Limits
Figure 103 (Sheet 7 of 7)

54-50-02

ALLOWABLE DAMAGE 1

Page 112

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - ENGINE STRUT TORQUE BOX STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the engine strut torque box structure shown in Engine Strut Torque Box Structure Location, Figure 101/ALLOWABLE DAMAGE 2.

2. General

- A. Remove the damaged material as necessary.

WARNING: SMALL PARTICLES 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 (12.70 MM) OR MORE ON THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, HALON, CARBON TETRACHLORIDE, OR CARBON DIOXIDE. WATER THAT TOUCHES MOLTEN TITANIUM CAN CAUSE A STEAM EXPLOSION.

- (1) Refer to SOPM 20-10-07 when you work with titanium.
- (2) Refer to 51-10-02 for the removal procedures.
- (3) Refer to 51-30-03 for sources of the nonmetallic materials you need to remove the damage.
- (4) Refer to 51-30-05 for sources of the equipment and tools you need to remove the damage.

- B. After you remove the damage, do as follows:

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 parts made of Corrosion Resistant Steel (CRES).
 - (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 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 one layer of BMS 10-11, Type 1 primer to the surfaces of the reworked CRES and aluminum parts. Refer to SOPM 20-41-02.
 - (a) Make sure there is a complete seal between the access doors and the spar webs.
 - 1) Apply a fillet seal all around the edge of the access hole as necessary.
 - (5) Apply one layer of BMS 10-70, Type 3 primer to the reworked surfaces. Refer to SOPM 20-44-04.
- C. Refer to Table 101/ALLOWABLE DAMAGE 2 for the references for the allowable damage zones for the strut torque box structure.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE		
STRUCTURE	ZONE LOCATION	PARAGRAPH
UPPER AND LOWER SPAR CHORDS	-----	4.A
UPPER SPAR STIFFENER	-----	4.B

54-50-02

ALLOWABLE DAMAGE 2

Page 101

Nov 10/2012

D634A210

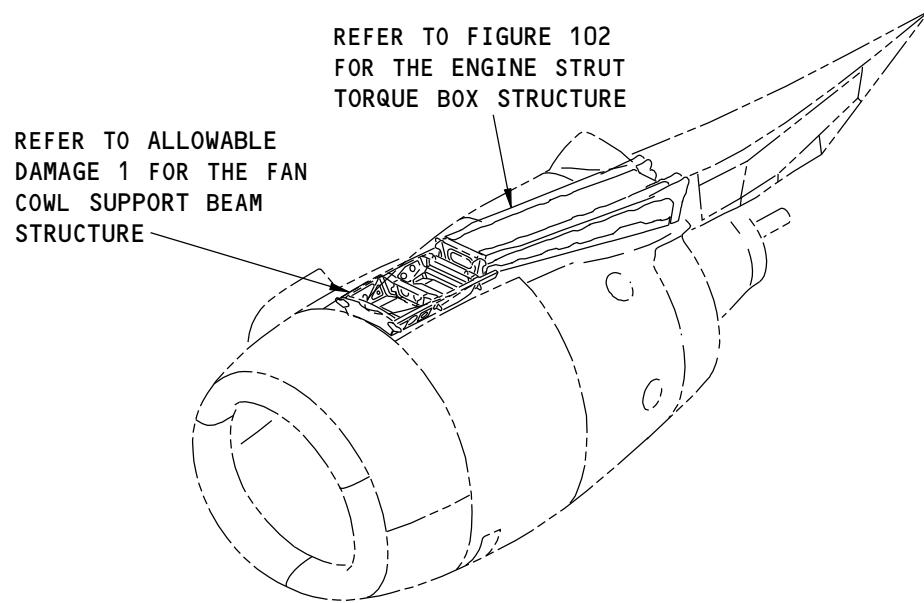
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737-800
STRUCTURAL REPAIR MANUAL

Table 101: (Continued)

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE		
STRUCTURE	ZONE LOCATION	PARAGRAPH
UPPER AND LOWER SPAR WEBS	1	4.C
	2	4.D
	3	4.E
	4	4.F



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Engine Strut Torque Box Structure Location
Figure 101

54-50-02

ALLOWABLE DAMAGE 2

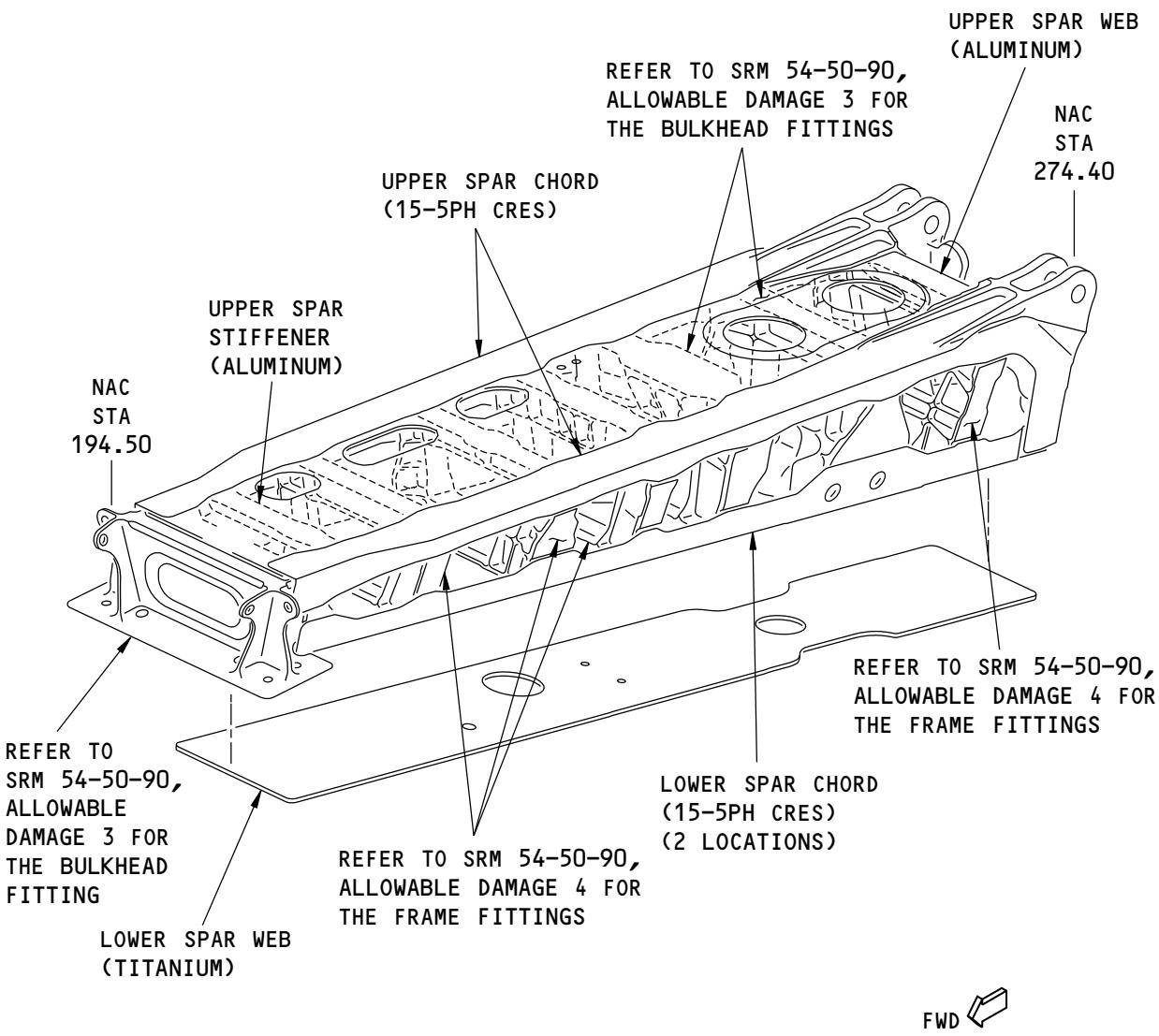
Page 102

Jul 10/2016

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**737-800
STRUCTURAL REPAIR MANUAL**



NOTE: REFER TO PARAGRAPH 4 FOR THE ALLOWABLE DAMAGE LIMITS.

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**Engine Strut Torque Box Structure
Figure 102**

54-50-02

ALLOWABLE DAMAGE 2

Page 103

Nov 10/2012

D634A210



737-800
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
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-10-07	Machining of Titanium
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 20-44-04	Application of Urethane Compatible Primer

4. Allowable Damage Limits

A. Upper and Lower Spar Chords

(1) Cracks:

- (a) Remove the damage as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , E , and F .
- (b) The damage must not be nearer than 2D (D = fastener diameter) to more than 1 fastener in 6 adjacent fasteners at frame fitting attachment locations.
- (c) For damage that is more than is permitted in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A and B , do as follows:
 - 1) Remove the fastener.
 - 2) Install a different freeze plug wet with BMS 5-63 sealant in each structural part that was joined by the fastener. Refer to 51-20-10.
 - a) Use the same material for the fastener as each initial part of the assembly.

(2) Nicks, Gouges, Scratches, and Corrosion:

- (a) Remove the damage as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , D , E , F , and G .
 - 1) The area of the damage on a surface after cleanup must not be more than 1 square inch (6.45 cm^2).
 - 2) The damage must not be nearer than 2D (D = fastener diameter) to more than 1 fastener in 6 adjacent fasteners.

(3) Dents are permitted as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail H .

(4) Holes and Punctures are not permitted.

B. Upper Spar Stiffener

(1) Cracks:

54-50-02

ALLOWABLE DAMAGE 2

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Remove the damage as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , E , and F .
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as given in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , D , E , and F .
 - (3) Dents are permitted as shown in Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail H .
 - (4) Holes and Punctures are not permitted.
- C. Upper and Lower Spar Webs (Refer to Allowable Damage Zones, Figure 104/ALLOWABLE DAMAGE 2 for the allowable damage zones)
- (1) Zone 1 - Area Around Access Holes and Tie Rod Holes
 - (a) Cracks:
 - 1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details A , B , and C .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details A , B , and C .
 - (c) Dents are not permitted.
 - (d) Holes and Punctures are not permitted.
 - (2) Zone 2
 - (a) Cracks:
 - 1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , and D .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as given in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , D , and E , and F .
 - (c) Dents are permitted as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail H .
 - (d) Holes and Punctures are not permitted.
 - (3) Zone 3
 - (a) Cracks:
 - 1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , and D .
 - (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as given in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , D , E , and F .
 - (c) Dents are permitted as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail H .
 - (d) Holes and Punctures are not permitted.
 - (4) Zone 4

54-50-02

ALLOWABLE DAMAGE 2

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Cracks:
 - 1) Remove the damage as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , and D .
- (b) Nicks, Gouges, Scratches, and Corrosion:
 - 1) Remove the damage as given in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details B , C , E and F .
 - 2) If the material removed is nearer than 1.5D (D = fastener diameter) to a fastener, then do as follows:
 - a) Remove the fastener.
 - b) Install freeze plugs as necessary. Refer to 51-20-10.
 - Install a freeze plug in the web
 - Install a different freeze plug in the structure attached to the web.
- NOTE:** Make sure the freeze plug does not join the web and the structure together.
- (c) Dents are permitted as shown in Upper and Lower Spar Web Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Detail G .
- (d) Holes and Punctures are not permitted.

54-50-02

ALLOWABLE DAMAGE 2

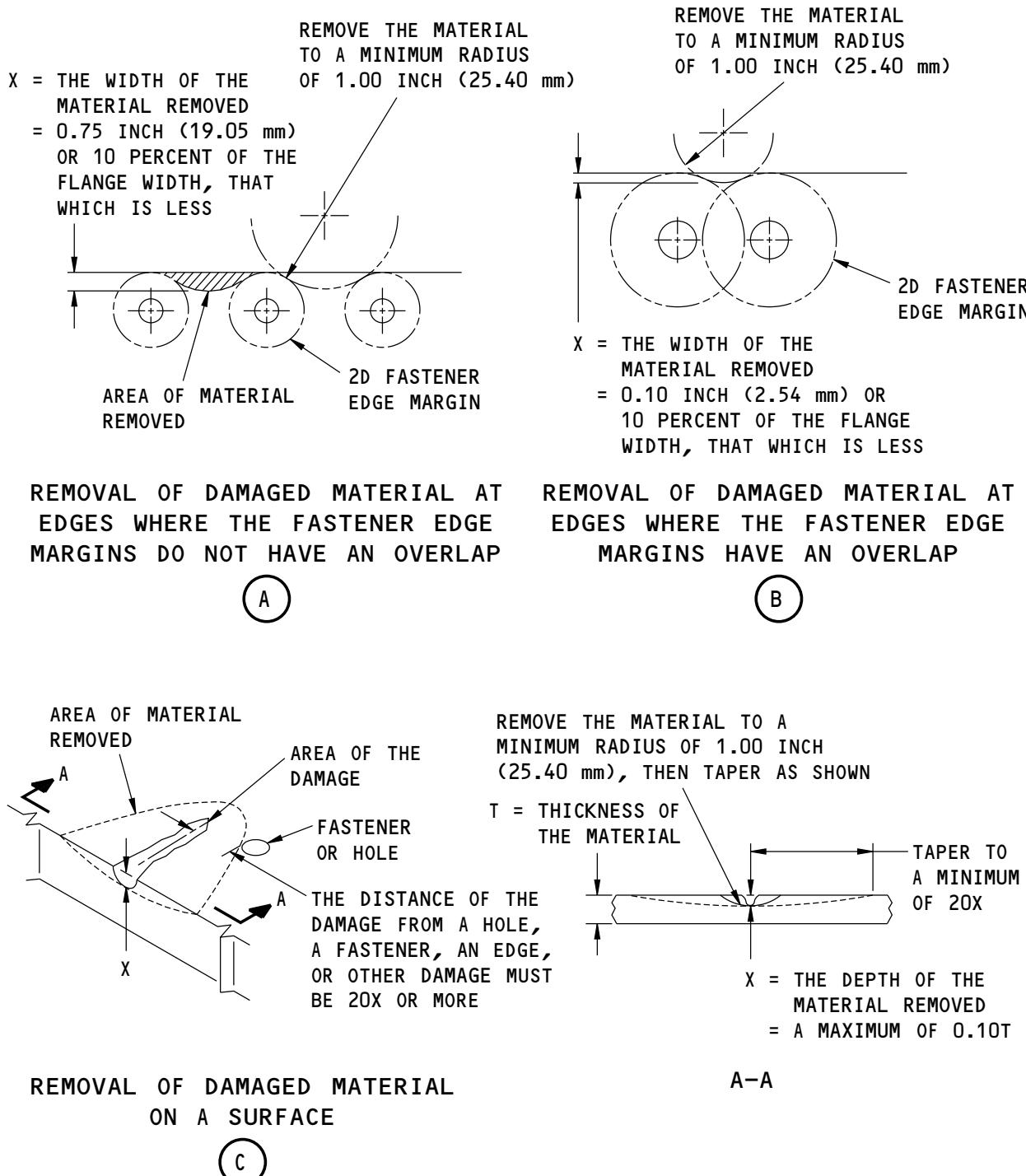
Page 106

Nov 10/2012

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**737-800
STRUCTURAL REPAIR MANUAL**



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Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 1 of 5)

54-50-02

ALLOWABLE DAMAGE 2

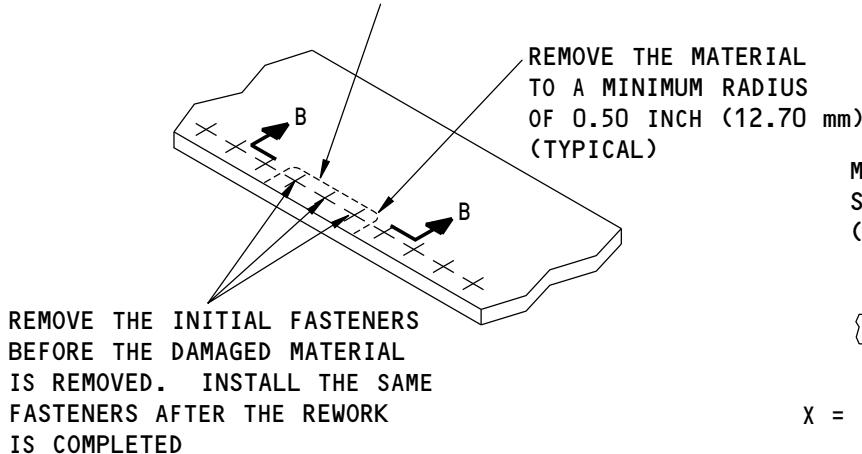
Page 107

Nov 10/2012

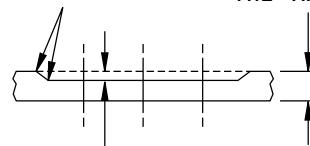


737-800 STRUCTURAL REPAIR MANUAL

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



MAKE IT SMOOTH
(TYPICAL) T = THICKNESS OF THE MATERIAL



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

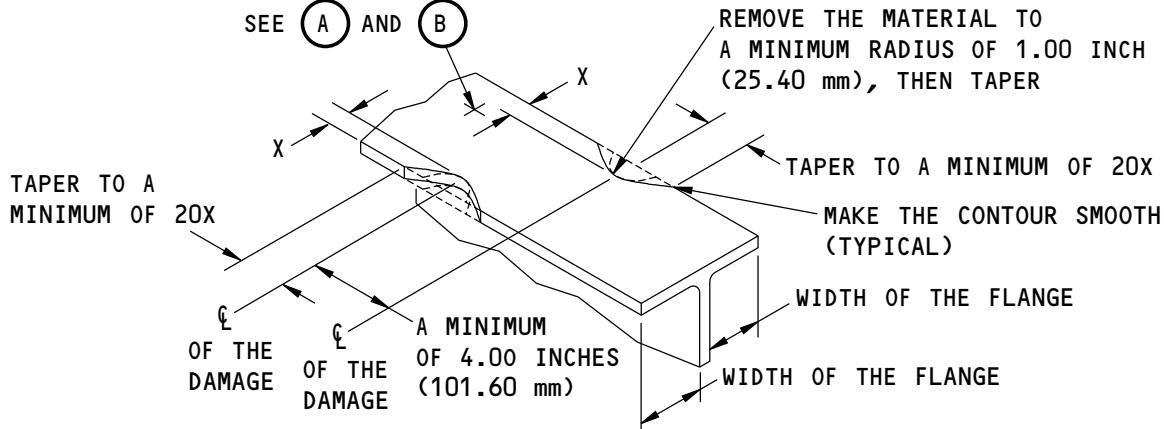
REMOVAL OF CORROSION DAMAGE



B-B

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



F19338 S0006592150_V1

Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 2 of 5)

54-50-02

ALLOWABLE DAMAGE 2

Page 108

Nov 10/2012

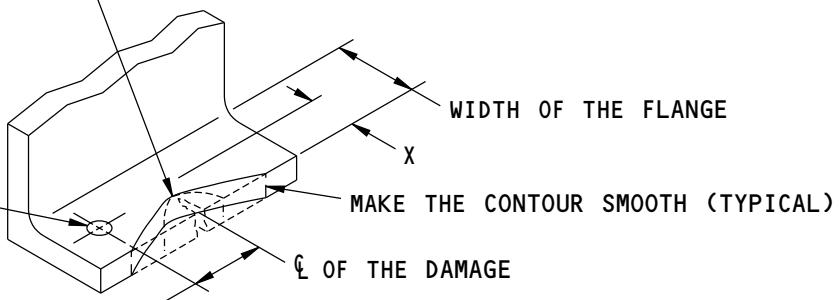
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737-800
STRUCTURAL REPAIR MANUAL

REMOVE THE MATERIAL
TO A MINIMUM RADIUS OF
OF 1.00 INCH (25.40 mm),
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



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Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 3 of 5)

54-50-02

ALLOWABLE DAMAGE 2

Page 109

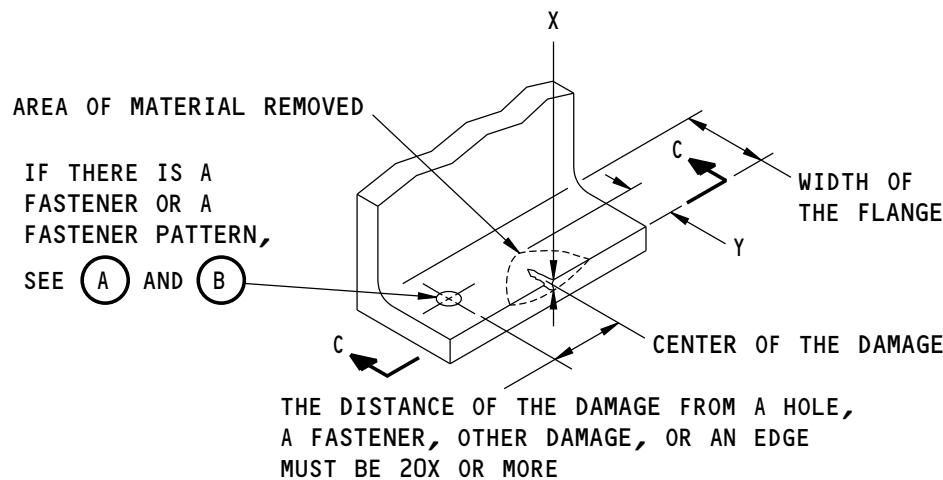
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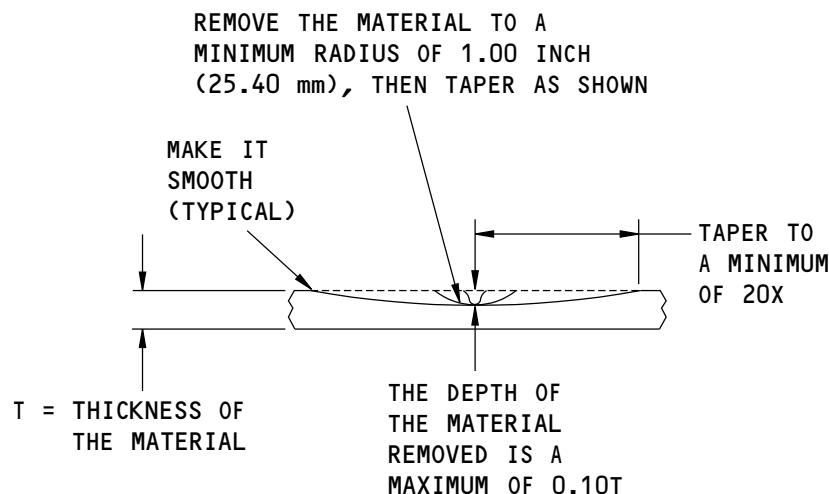
737-800
STRUCTURAL REPAIR MANUAL



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

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(G)



C-C

F19340 S0006592152_V1

Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits
Figure 103 (Sheet 4 of 5)

54-50-02

ALLOWABLE DAMAGE 2

Page 110

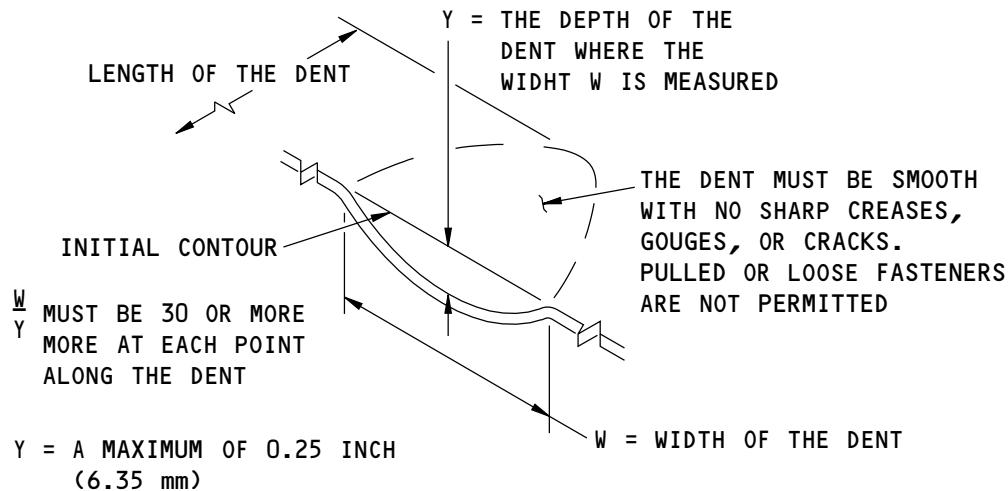
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737-800
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A DENT THAT IS PERMITTED



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Upper and Lower Spar Chords and Upper Spar Stiffener Allowable Damage Limits

Figure 103 (Sheet 5 of 5)

54-50-02

ALLOWABLE DAMAGE 2

Page 111

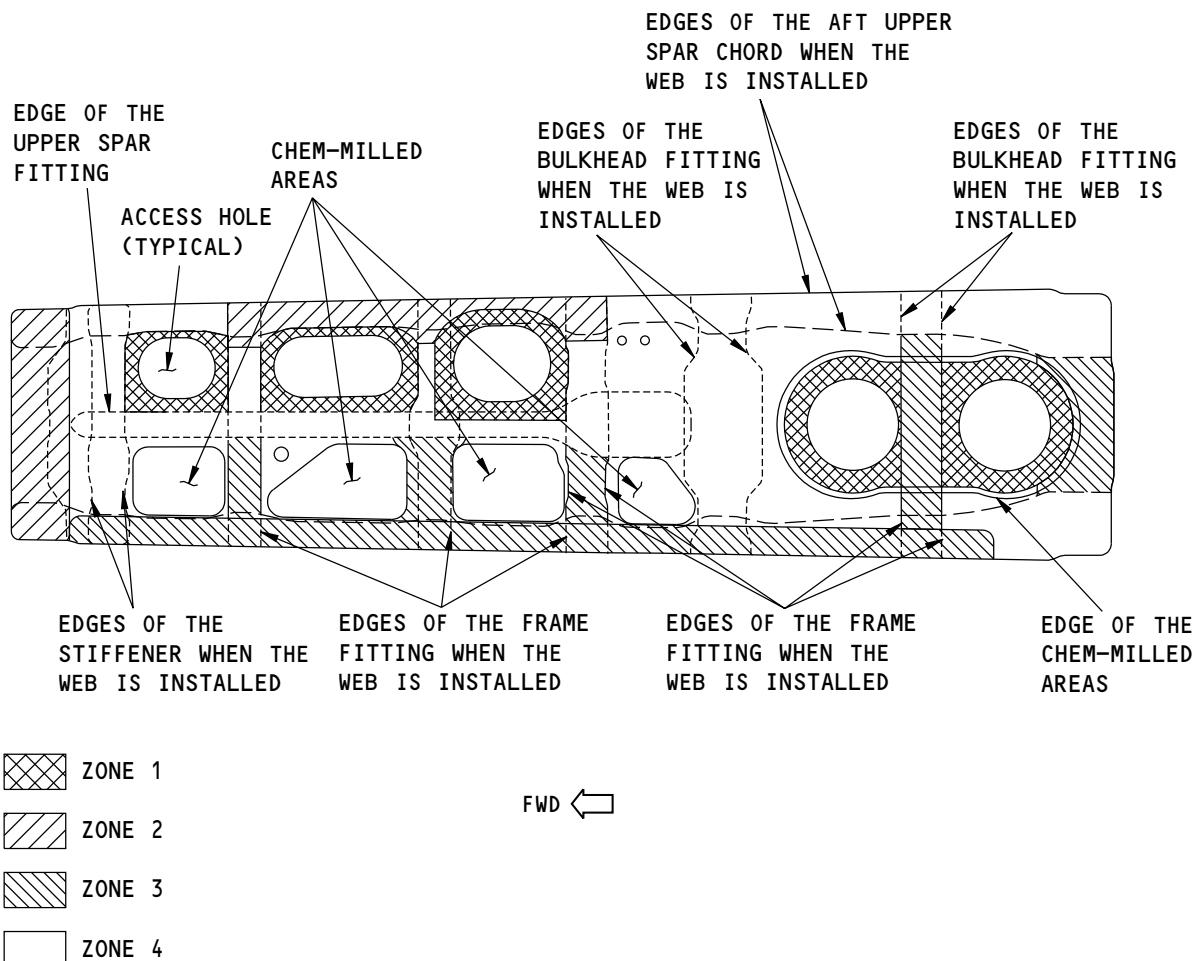
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



UPPER SPAR WEB

TOP VIEW

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Allowable Damage Zones
Figure 104 (Sheet 1 of 2)

54-50-02

ALLOWABLE DAMAGE 2

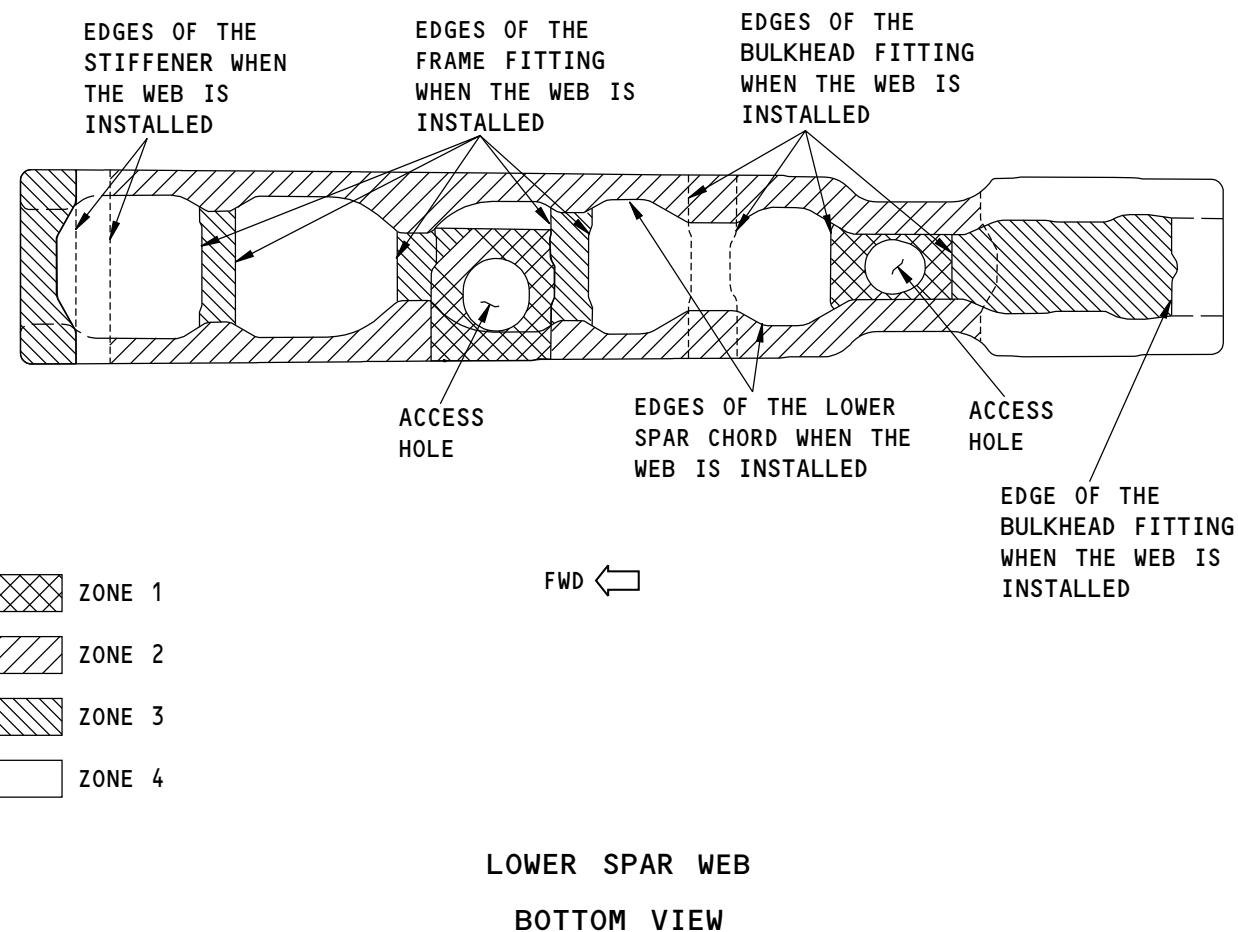
Page 112

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



G29460 S0006592155_V1

Allowable Damage Zones
Figure 104 (Sheet 2 of 2)

54-50-02

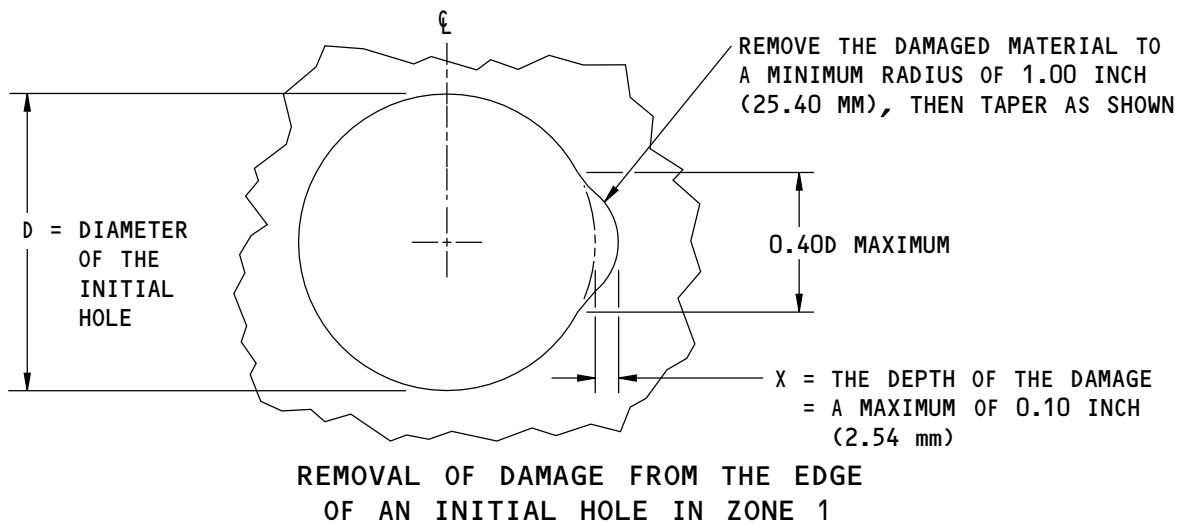
ALLOWABLE DAMAGE 2

Page 113

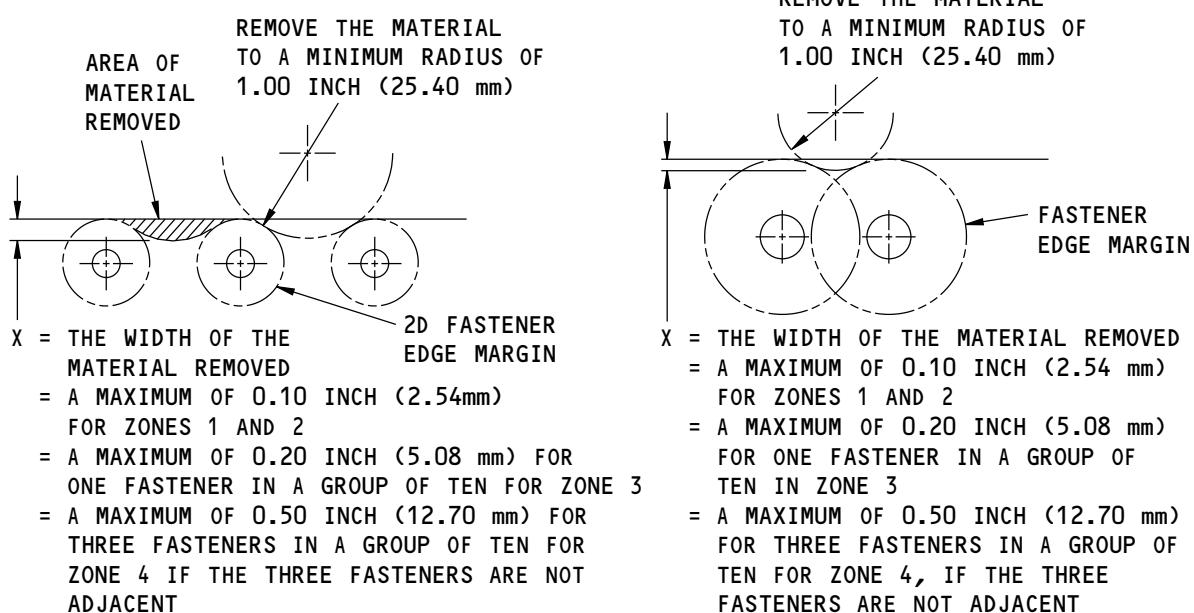
D634A210

Nov 10/2012

**737-800
STRUCTURAL REPAIR MANUAL**



A



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

G29170 S0006592156_V1

**Upper and Lower Spar Web Allowable Damage Limits
Figure 105 (Sheet 1 of 3)**

54-50-02

ALLOWABLE DAMAGE 2

Page 114

Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

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

MAKE THE CONTOUR SMOOTH
(TYPICAL)

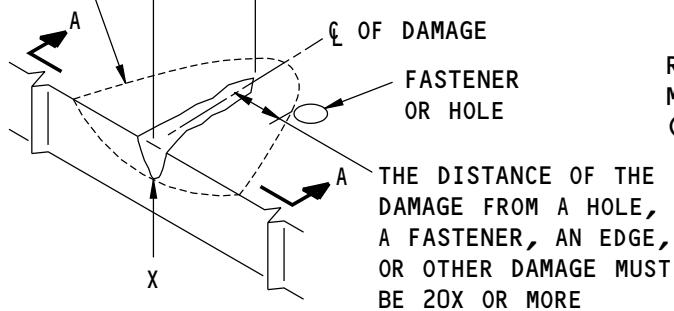
IF THERE ARE FASTENERS,
SEE (B) AND (C)

- X = THE WIDTH OF THE MATERIAL THAT IS REMOVED
 = A MAXIMUM OF 0.10 INCH (2.54 mm) FOR ZONE 2
 = A MAXIMUM OF 0.20 INCH (5.08 mm) FOR ZONE 3
 = A MAXIMUM OF 0.50 INCH (12.70 mm) FOR ZONE 4

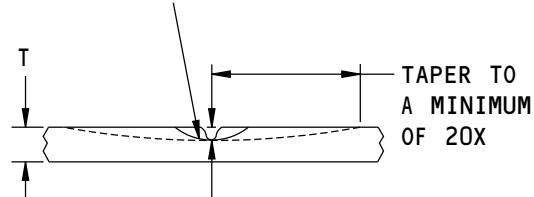
REMOVAL OF DAMAGED MATERIAL AT AN EDGE OF A METAL WEB

(D)

AREA OF MATERIAL REMOVED
 Y = THE WIDTH OF THE DAMAGE
 = A MAXIMUM OF 0.25 INCH (6.35 mm) FOR ZONE 2
 = A MAXIMUM OF 0.50 INCH (12.70 mm) FOR ZONE 3
 = A MAXIMUM OF 1.00 INCH (25.40 mm) FOR ZONE 4



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(E)

A-A

G29172 S0006592157_V1

Upper and Lower Spar Web Allowable Damage Limits
Figure 105 (Sheet 2 of 3)

54-50-02

ALLOWABLE DAMAGE 2

Page 115

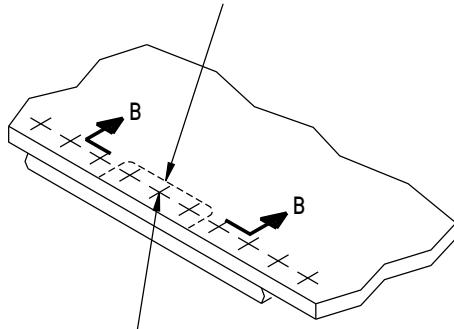
Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

THE REMOVAL OF MATERIAL IS PERMITTED
TO A MAXIMUM DEPTH OF X AROUND:

- ONE FASTENER IN A GROUP OF 10 FOR ZONE 3
- THREE FASTENERS IN A GROUP OF 10 FOR ZONE 4,
IF THE THREE FASTENERS ARE NOT ADJACENT

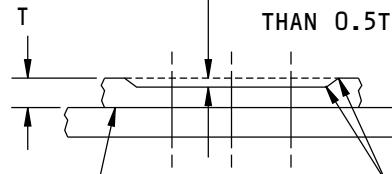


REMOVE THE FASTENERS BEFORE YOU REMOVE
THE DAMAGE. INSTALL THE FASTENERS
AFTER THE REWORK IS COMPLETED

**REMOVAL OF CORROSION DAMAGE
AROUND THE FASTENERS**

(F)

X = THE TOTAL DEPTH OF
THE MATERIAL REMOVED
MUST NOT BE MORE
THAN 0.5T

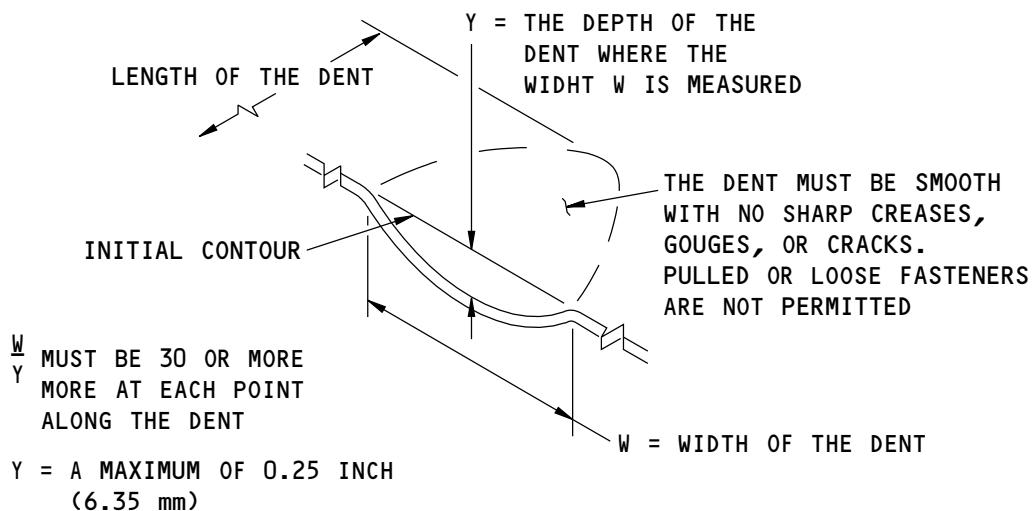


REMOVE CORROSION ON
THE MATING SURFACE
TO THE MAXIMUM DEPTH
PERMITTED AND FILL
WITH AN ALUMINUM SHIM

MAKE IT SMOOTH TO A
MINIMUM RADIUS OF
0.50 INCH (12.70 mm)

NOTE: YOU ARE PERMITTED TO REMOVE THE
MATERIAL FROM OPPOSITE SIDES OF
THE WEB IF X IS NOT MORE THAN 0.5T

B-B



A DENT THAT IS PERMITTED

(G)

G29185 S0006592158_V1

**Upper and Lower Spar Web Allowable Damage Limits
Figure 105 (Sheet 3 of 3)**

54-50-02

ALLOWABLE DAMAGE 2

Page 116

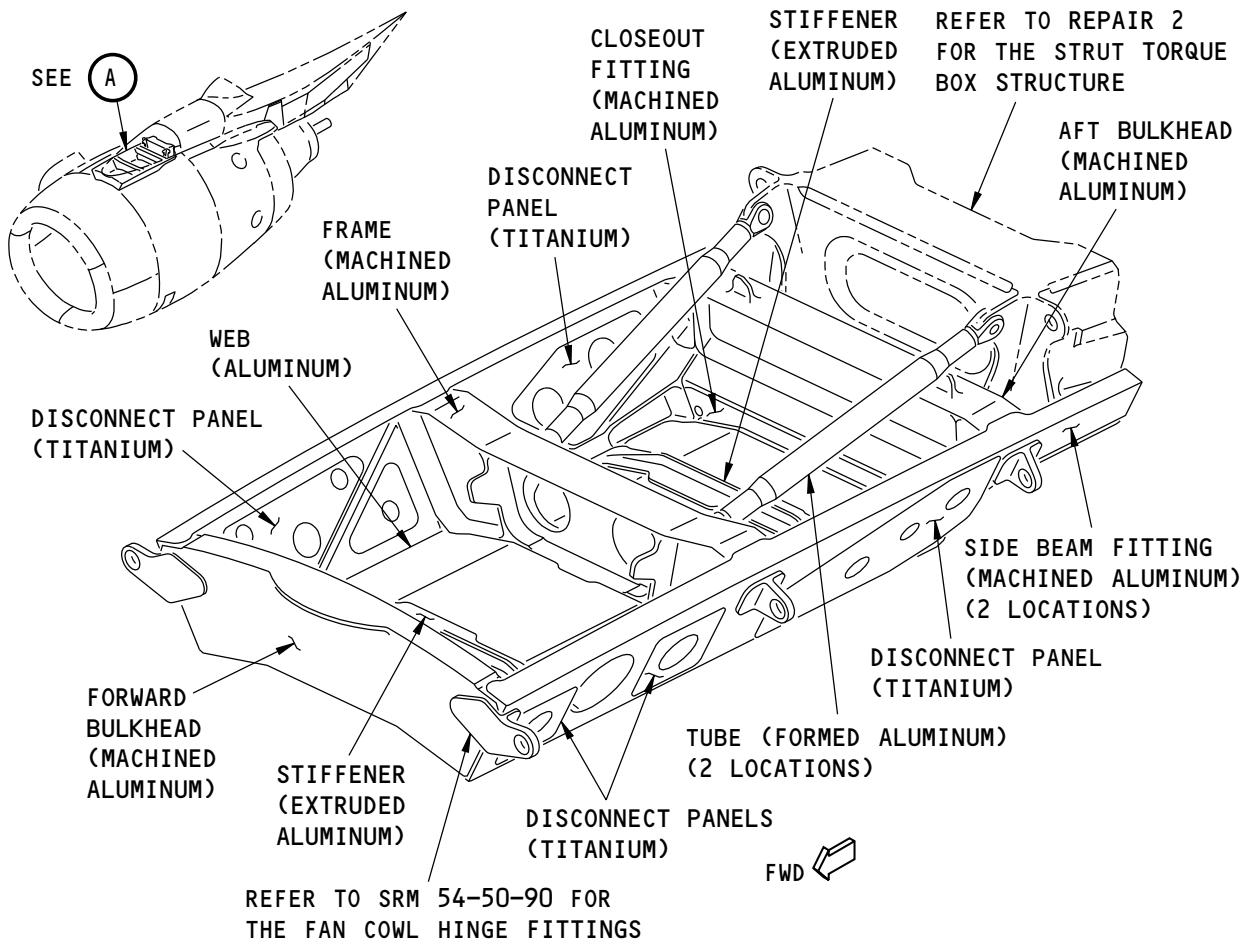
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D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - FAN COWL SUPPORT BEAM STRUCTURE



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

(A)
Fan Cowl Support Beam Structure
Figure 201

G27867 S0006592161_V2

54-50-02

REPAIR 1
Page 201

Nov 10/2012

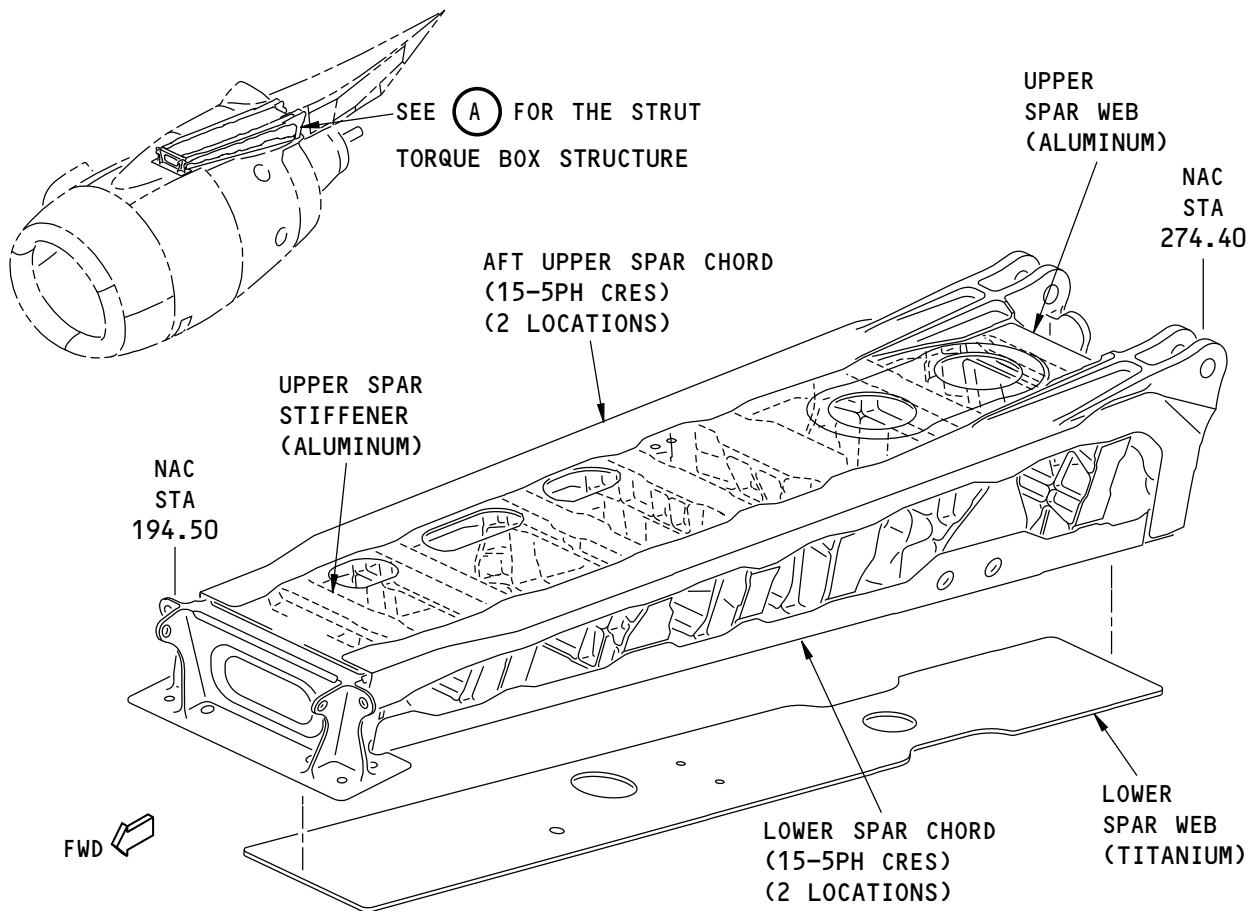
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - ENGINE STRUT TORQUE BOX STRUCTURE



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

A
Engine Strut Torque Box Structure
Figure 201

F79352 S0006592163_V2

54-50-02

REPAIR 2
Page 201

Nov 10/2012

D634A210

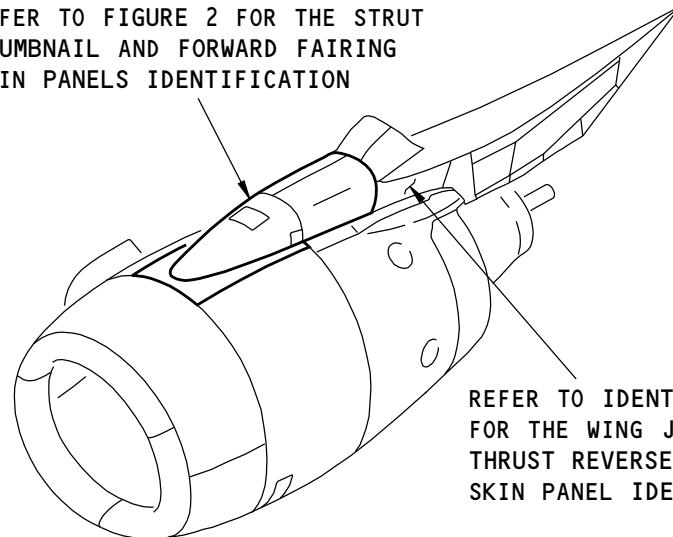
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANELS

REFER TO FIGURE 2 FOR THE STRUT
THUMBNAIL AND FORWARD FAIRING
SKIN PANELS IDENTIFICATION



REFER TO IDENTIFICATION 2
FOR THE WING JUNCTION AND
THRUST REVERSER STRUT FAIRING
SKIN PANEL IDENTIFICATION

NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F05606 S0006592167_V1

Strut Thumbnail and Forward Fairing Skin Panel Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2071	Pressure Relief Door Assembly
313A2200	Forward Fairing Installation
313A2201	Forward Fairing Installation
313A2110	Thumbnail Fairing Installation
313A2111	Thumbnail Fairing Assembly
313A2121	Forward Fairing Panel Assembly

54-50-70

IDENTIFICATION 1

Page 1

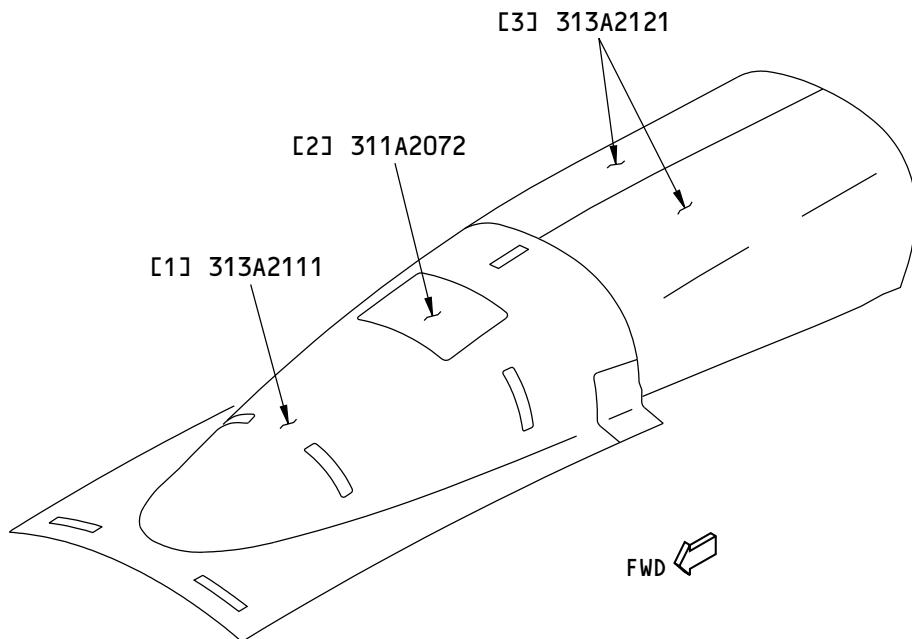
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D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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

F15742 S0006592169_V1

Strut Thumbnail and Forward Fairing Skin Panels Identification
Figure 2

54-50-70
IDENTIFICATION 1
Page 2
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Thumbnail Fairing Skin Panel Bonded Part	0.500 (12.70)	Carbon Fiber Reinforced Plastic (CFRP) honeycomb sandwich with aluminum foil mesh lightning protection and GFRP isolation plies	
	Skin		Refer to Figure 3 for the zero degree ply direction and the ply layup sequence	
	Core		Non-metallic honeycomb as given in BMS 8-124, Type V, Class IV, Grade 5.0. Refer to Figure 3 for the core ribbon direction	
[2]	Pressure Relief Door		A357.0-T6 aluminum investment casting as given in AMS 4214, strength Class 2 (Optional: 1.75 inch (44.45 mm) thick 7075-T7351 plate as given in QQ-A-250/12)	
[3]	Forward Fairing Skin Panel Bonded Part	0.500 (12.70)	Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich with aluminum foil mesh lightning protection	
	Skin		Refer to Figure 4 for the zero degree ply direction and the ply layup sequence	
	Core		Non-metallic honeycomb as given in BMS 8-124, Type V, Class IV, Grade 4.0. Refer to Figure 4 for the core ribbon direction	

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

54-50-70

IDENTIFICATION 1

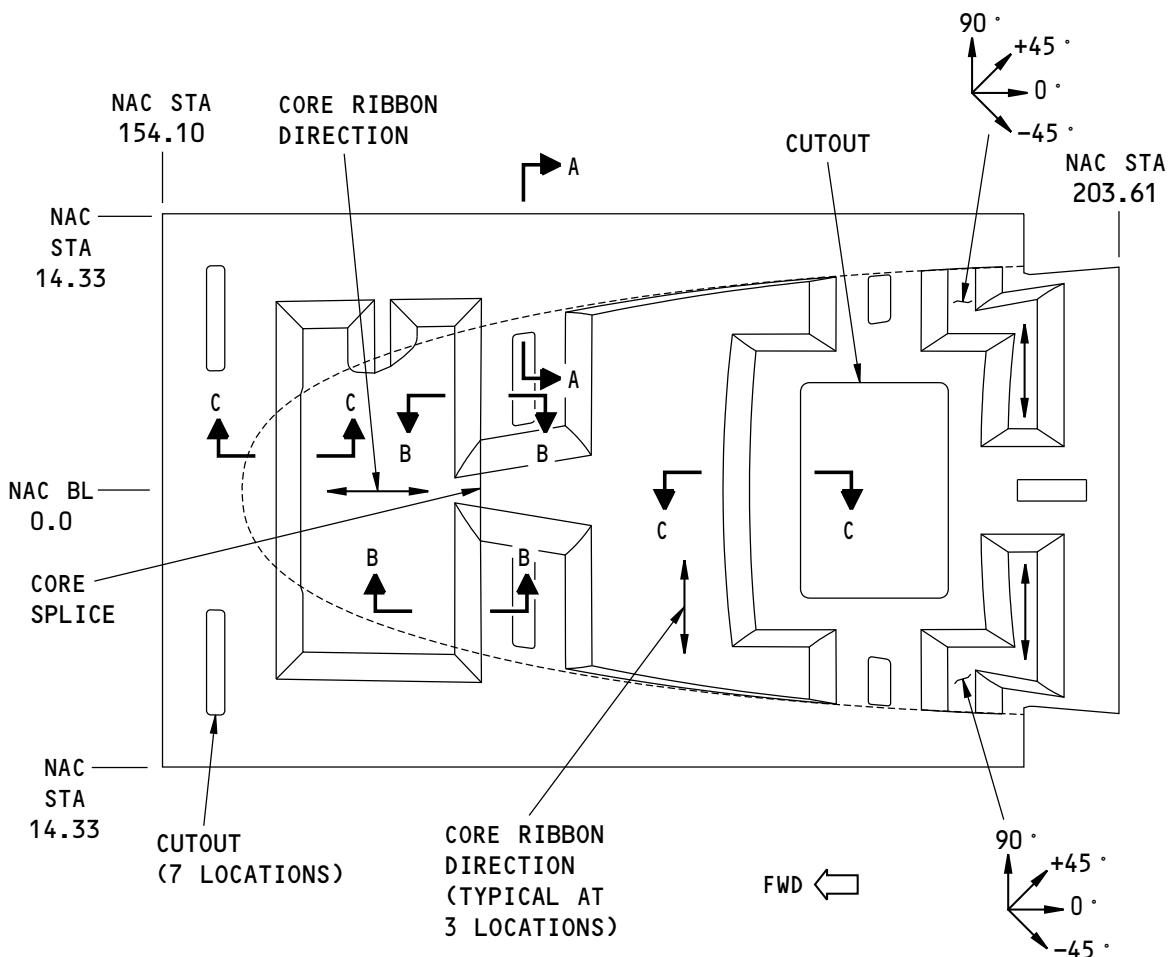
Page 3

Mar 10/2013

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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 SECTION A-A FOR THE PLY SEQUENCE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F16567 S0006592171_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 1 of 4)

54-50-70

IDENTIFICATION 1
Page 4

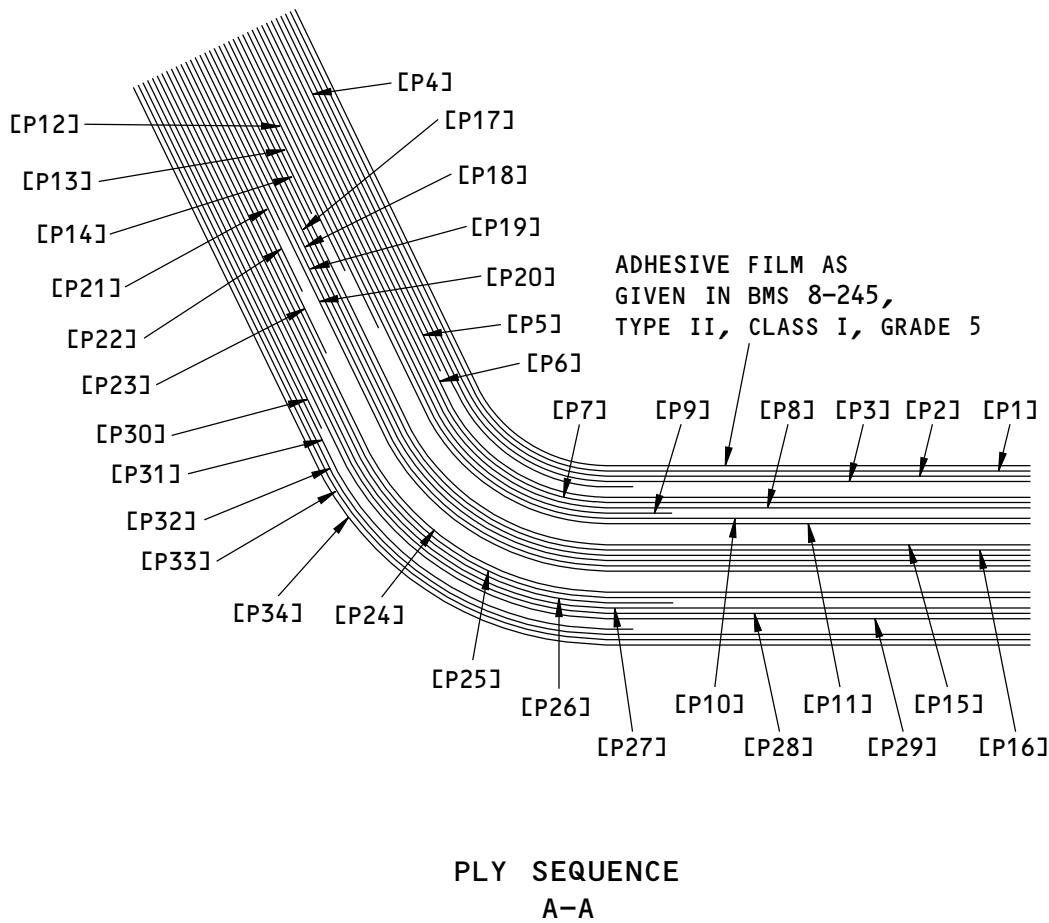
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737-800
STRUCTURAL REPAIR MANUAL



F16585 S0006592172_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 2 of 4)

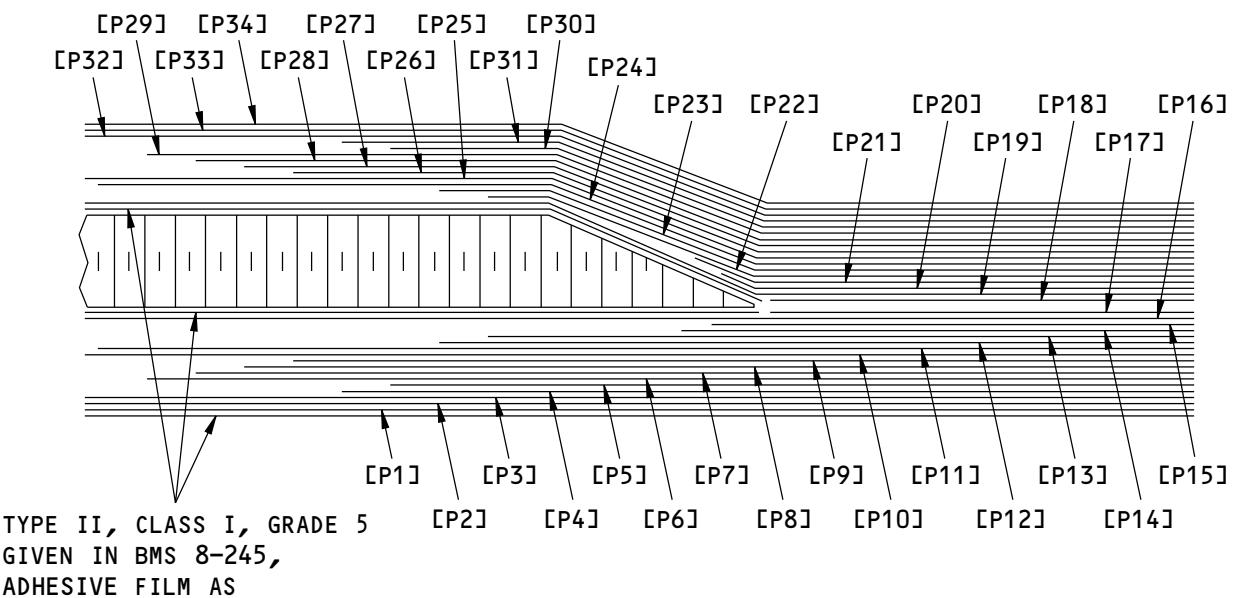
54-50-70
IDENTIFICATION 1
Page 5
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



PLY SEQUENCE
B-B

F16580 S0006592173_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 3 of 4)

54-50-70

IDENTIFICATION 1

Page 6

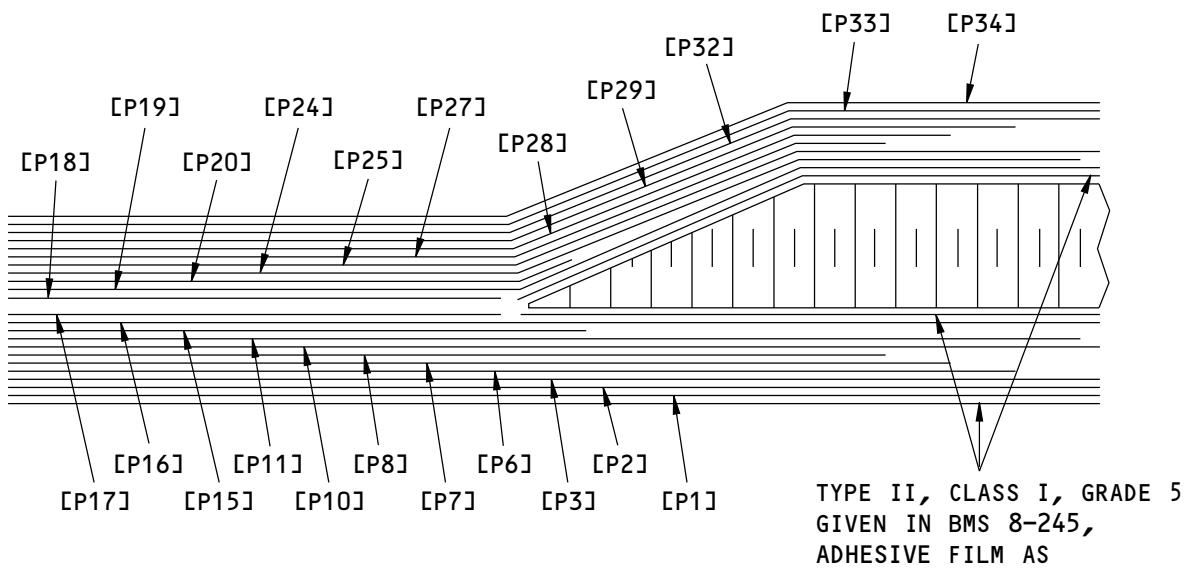
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737-800
STRUCTURAL REPAIR MANUAL



PLY SEQUENCE
C-C

F16571 S0006592174_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thumbnail Fairing Skin Panel, Figure 2,
Item [1]
Figure 3 (Sheet 4 of 4)

54-50-70
IDENTIFICATION 1
Page 7
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3, SECTIONS A-A, B-B, AND C-C		
PLY	DIRECTION	MATERIAL
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated fiberglass fabric as given in BMS 8-154, Type III, Class 1, Grade A
P3, P5, P7, P9, P11, P13, P15, P17, P18, P20, P22, P24, P26, P28, P30, P32	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P12, P14, P16, P19, P21, P23, P25, P27, P29, P31	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P33	Optional	Epoxy impregnated glass woven fabric as given in BMS 8-139, Style 108
P34	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0/350/2/1235/002 or Type 0/350/2/1100/002, Form 1

54-50-70

IDENTIFICATION 1

Page 8

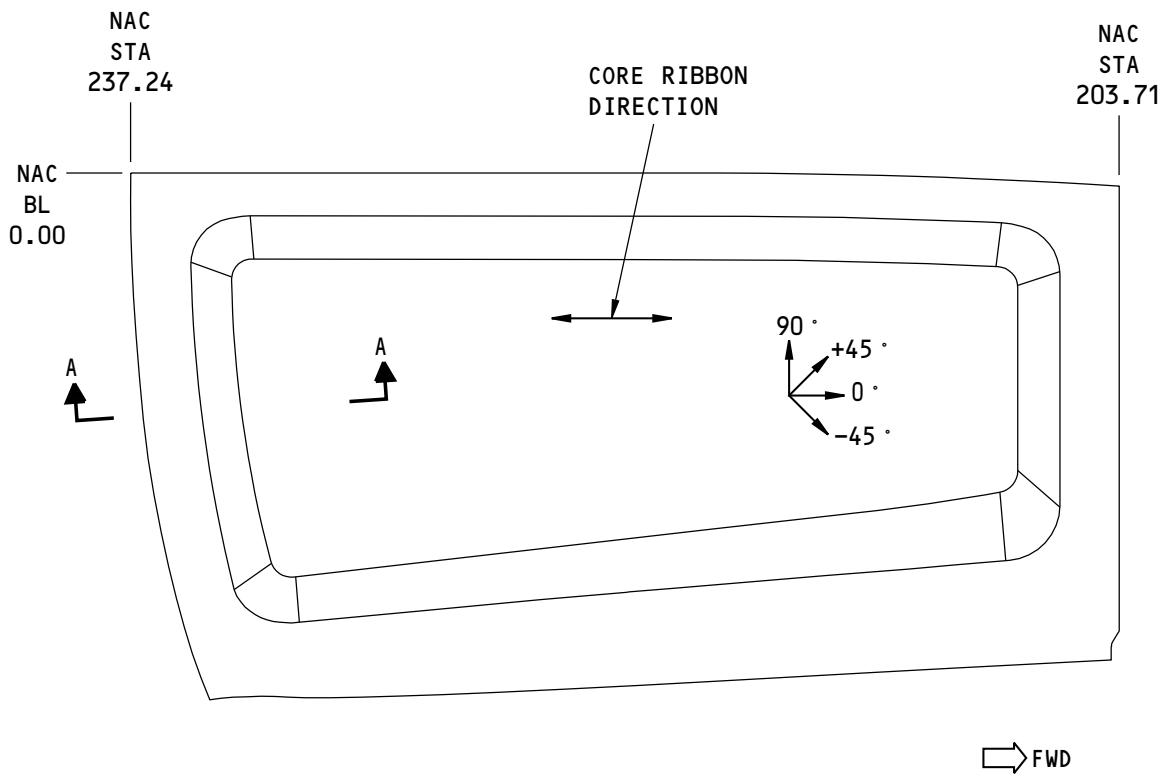
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737-800
STRUCTURAL REPAIR MANUAL



LEFT FORWARD FAIRING SKIN PANEL IS SHOWN,
RIGHT FORWARD FAIRING 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 SECTION A-A FOR THE PLY SEQUENCE.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL OF EACH PLY.

F05488 S0006592176_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Strut Forward Fairing Skin Panel, Figure 2, Item [3]
Figure 4 (Sheet 1 of 2)

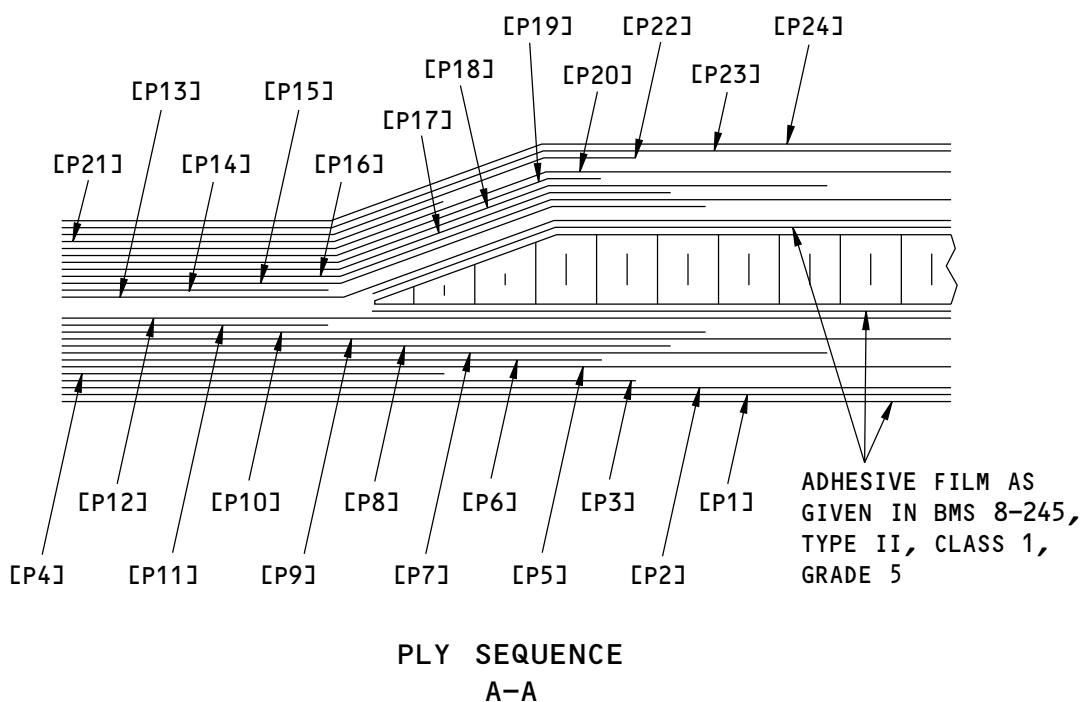
54-50-70
IDENTIFICATION 1
Page 9
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



F05599 S0006592177_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Strut Forward Fairing Skin Panel, Figure 2, Item [3]
Figure 4 (Sheet 2 of 2)

54-50-70
IDENTIFICATION 1
Page 10
Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4, SECTION A-A		
PLY	DIRECTION	MATERIAL
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type 1, Class 1, Grade 16, Form A
P2, P12, P13, P23	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class 1
P5, P9, P16, P20	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class 1
P4, P7, P10, P15, P18, P21	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, Class 1
P3, P6, P8, P11, P14, P17, P19, P22	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, Class 1
P24	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0/350/2/1100/002, Form 1

54-50-70

IDENTIFICATION 1

Page 11

Nov 10/2012

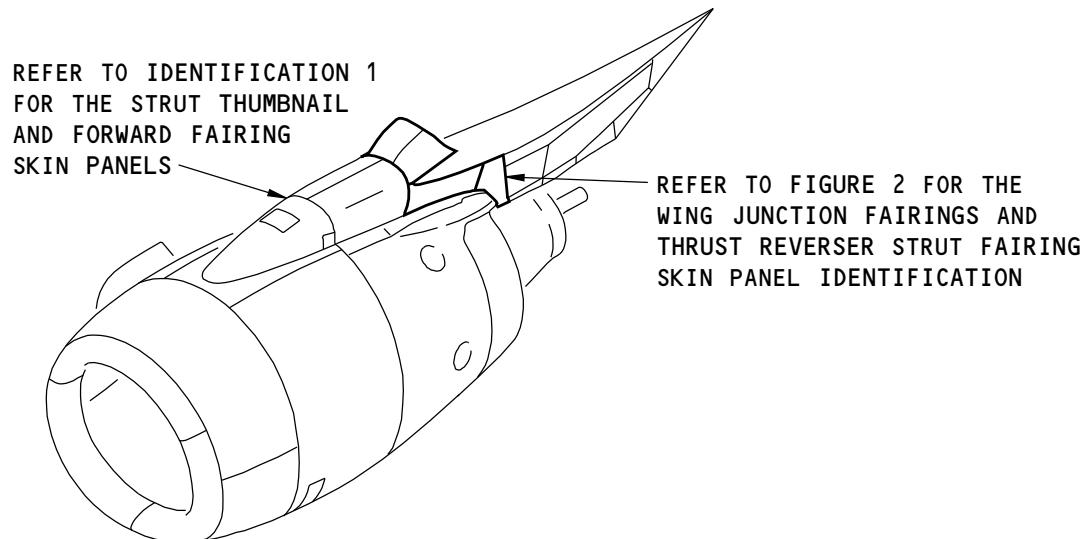
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STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - WING JUNCTION AND THRUST REVERSER STRUT FAIRING SKIN PANELS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F06909 S0006592180_V1

Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2530	Thrust Reverser Strut Fairing Installation
311A2531	Thrust Reverser Strut Fairing Assembly
313A2200	Wing Junction Fairing Installation
313A2210	Outboard Underwing Fairing Assembly
313A2220	Inboard Underwing Fairing Assembly
313A2230	Overwing Fairing Assembly

54-50-70

IDENTIFICATION 2

Page 1

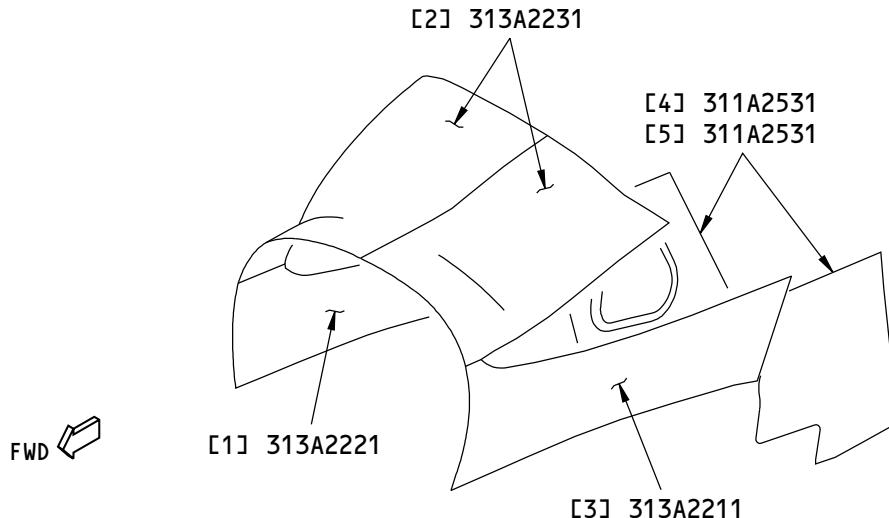
Nov 10/2012

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737-800
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

2451986 S0000568528_V1

Wing Junction and Thrust Reverser Strut Fairing Skin Panel Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Inboard Underwing Fairing Panel - Bonded Part Skin		Carbon Fiber Reinforced Plastic (CFRP) laminate with aluminum foil mesh lightning protection and Glass Fabric Reinforced Plastic (GFRP) isolation plies Refer to Figure 3	
[2]	Overwing Fairing Panel - Bonded Part Skin Core	0.50 (12.70)	CFRP honeycomb sandwich with aluminum foil mesh lightning protection and GFRP isolation plies Refer to Figure 4 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 5.0. Refer to Figure 4 for the core ribbon direction	
[3]	Outboard Underwing Fairing Panel - Bonded Part Skin		CFRP laminate with aluminum foil mesh lightning protection and GFRP isolation plies Refer to Figure 5	
[4]	Thrust Reverser Strut Fairing Panel - Bonded Part Skin Core	0.40 (10.16)	GFRP honeycomb sandwich Refer to Figure 7 Non-metallic honeycomb as given in BMS 8-124, Class IV, Type V, Grade 4.0. Refer to Figure 6 for the core ribbon direction	For Line Number 1 thru 726

54-50-70

IDENTIFICATION 2

Page 2

Jul 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL

Table 2: (Continued)

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[5]	Thrust Reverser Strut Fairing Panel		2024-T351 plate. Refer to Figure 6	For Line Number 727 and on

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

54-50-70

IDENTIFICATION 2

Page 3

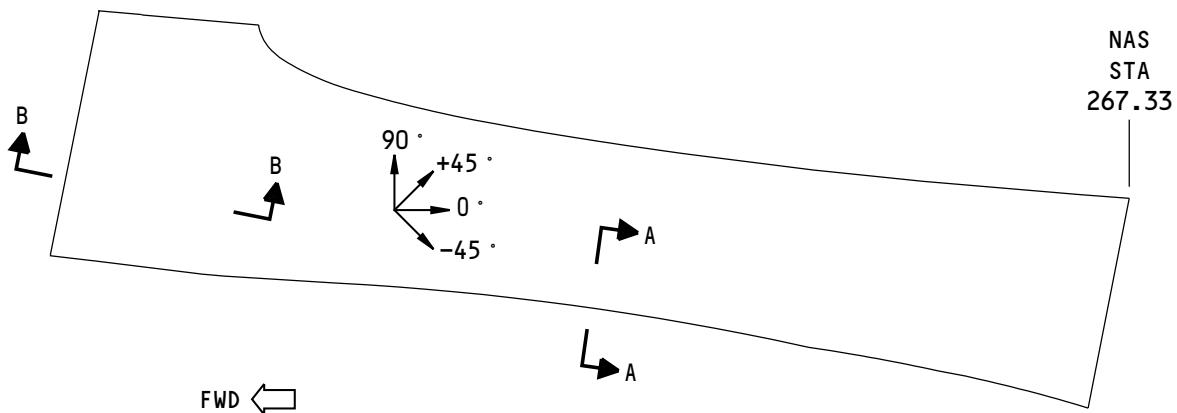
Jul 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) 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 LAYUP DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY LAYUP SEQUENCE.
- REFER TO TABLE 3 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F18743 S0006592184_V1

Ply Direction and Ply Sequence for the Inboard Underwing Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 1 of 2)

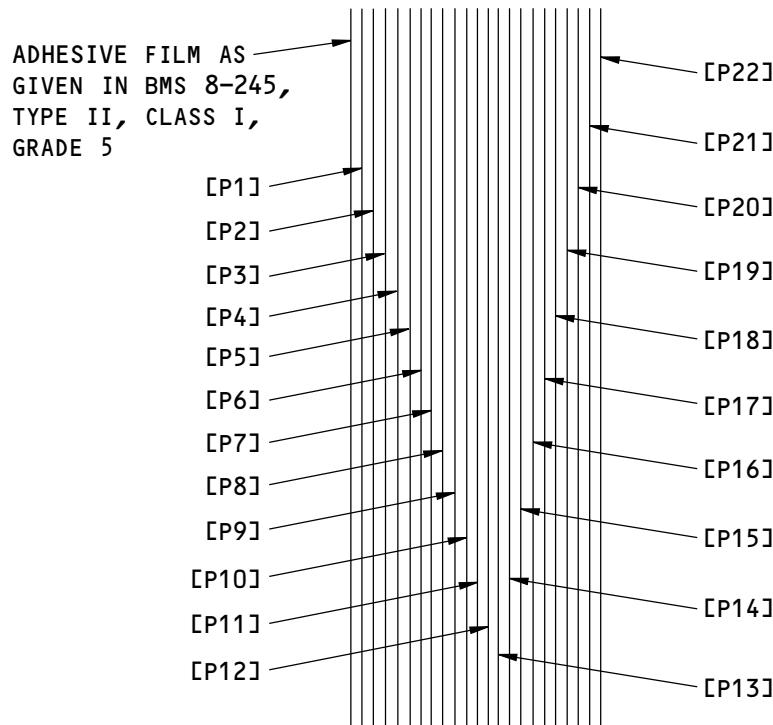
54-50-70
IDENTIFICATION 2
Page 4
Jul 10/2016

D634A210

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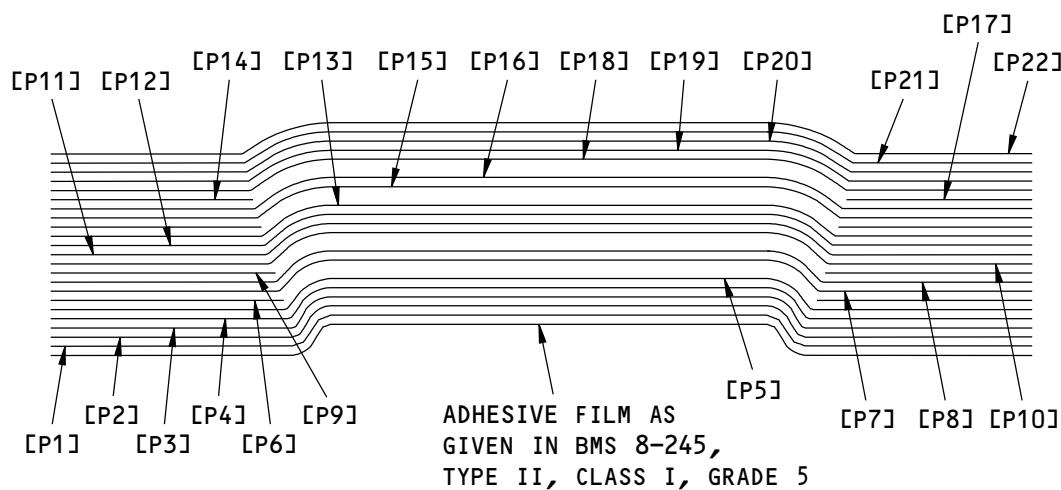


737-800
STRUCTURAL REPAIR MANUAL



PLY LAYUP SEQUENCE

A-A



PLY LAYUP SEQUENCE

B-B

F18738 S0006592185_V1

Ply Direction and Ply Sequence for the Inboard Underwing Fairing Skin Panel, Figure 2, Item [1]
Figure 3 (Sheet 2 of 2)

54-50-70
IDENTIFICATION 2
Page 5
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated glass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P13, P15, P17, P19	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P21	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108, Class III
P22	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0.350/2/1100/002, Form I

54-50-70

IDENTIFICATION 2

Page 6

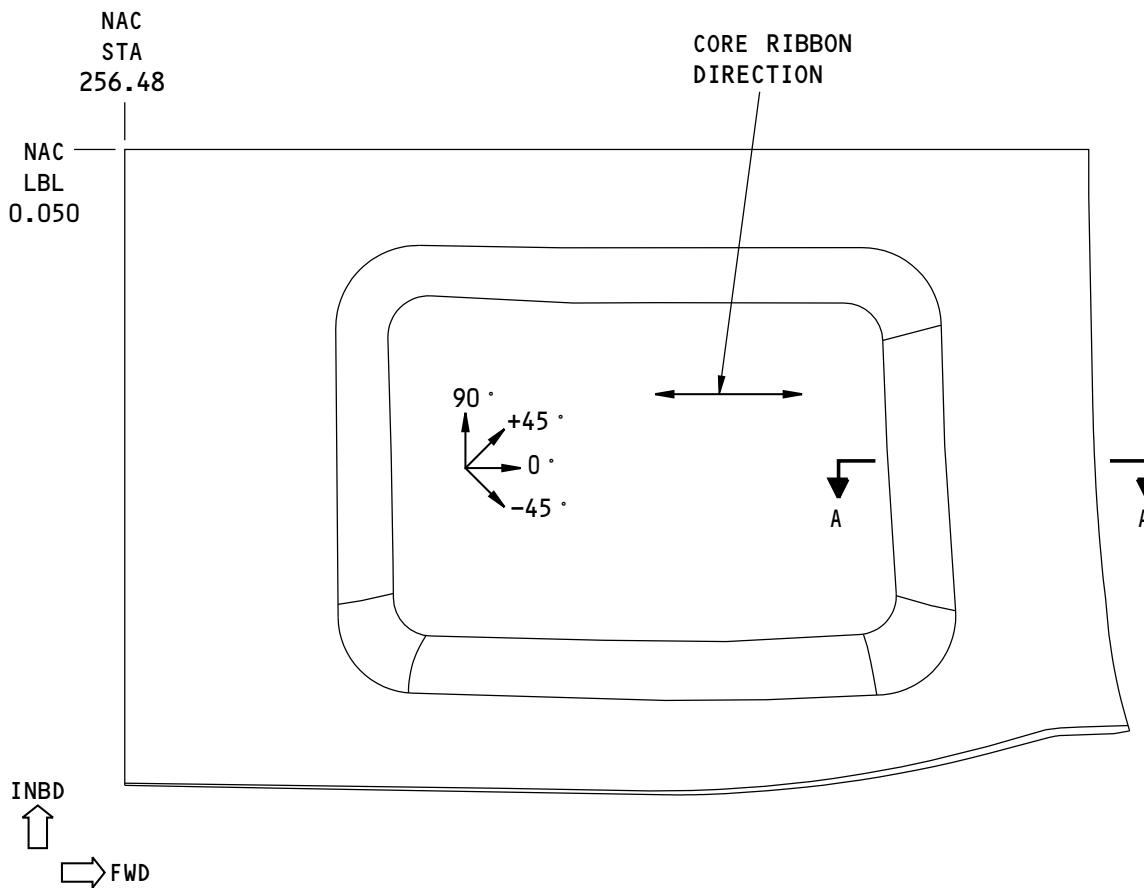
Jul 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE OUTBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE OUTBOARD OVERWING PANEL IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION



NOTES

- THE PLY DIRECTION IS THE WARP DIRECTION OF THE FABRIC. REFER TO DETAIL A AND DETAIL B FOR THE 0 DEGREE PLY LAYUP DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTION A-A FOR THE PLY LAYUP SEQUENCE OVER EACH CORE.
- REFER TO TABLE 4 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F19178 S0006592187_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Strut Overwing Fairing Skin Panel,
Figure 2, Item [2]
Figure 4 (Sheet 1 of 3)

54-50-70

IDENTIFICATION 2

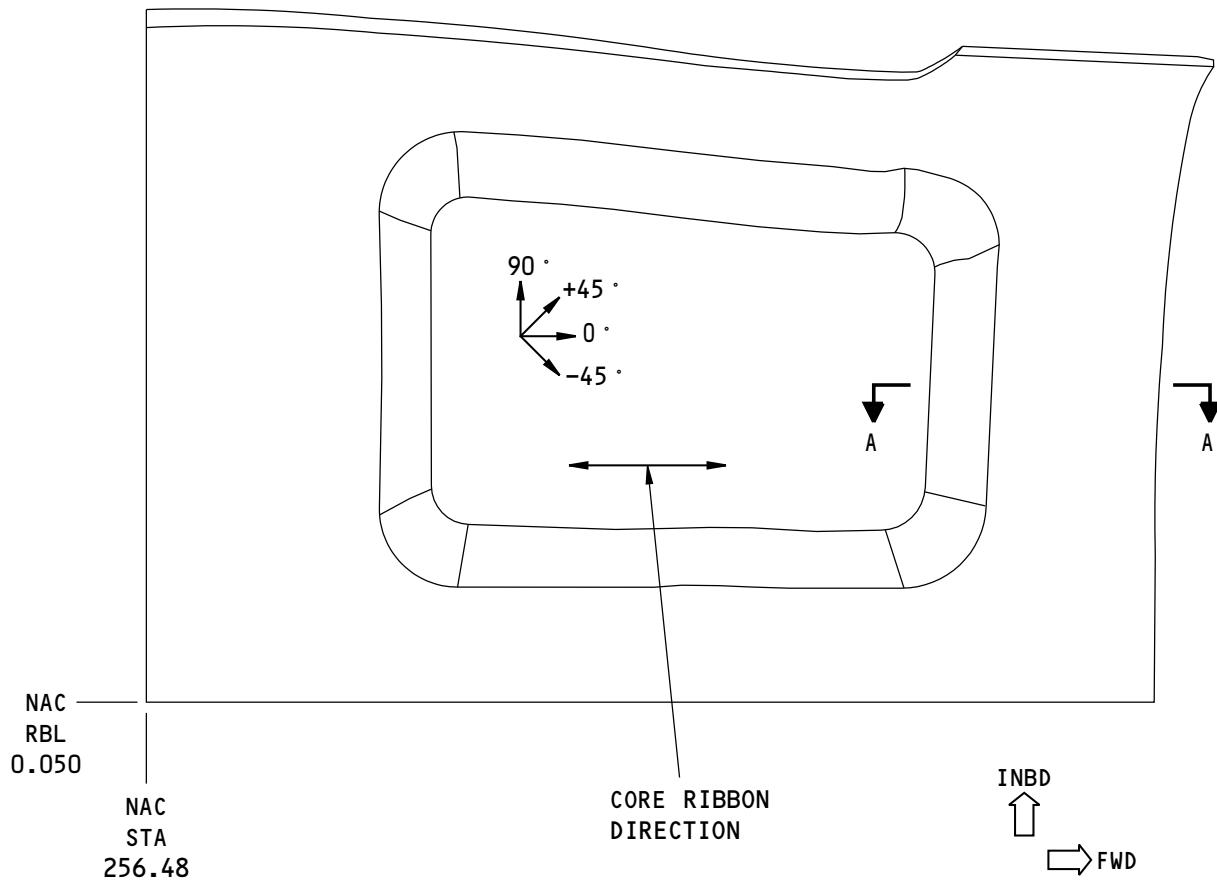
Page 7

Jul 10/2016

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE INBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE INBOARD OVERWING PANEL IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(B)

G39511 S0006592188_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Strut Overwing Fairing Skin Panel,
Figure 2, Item [2]
Figure 4 (Sheet 2 of 3)

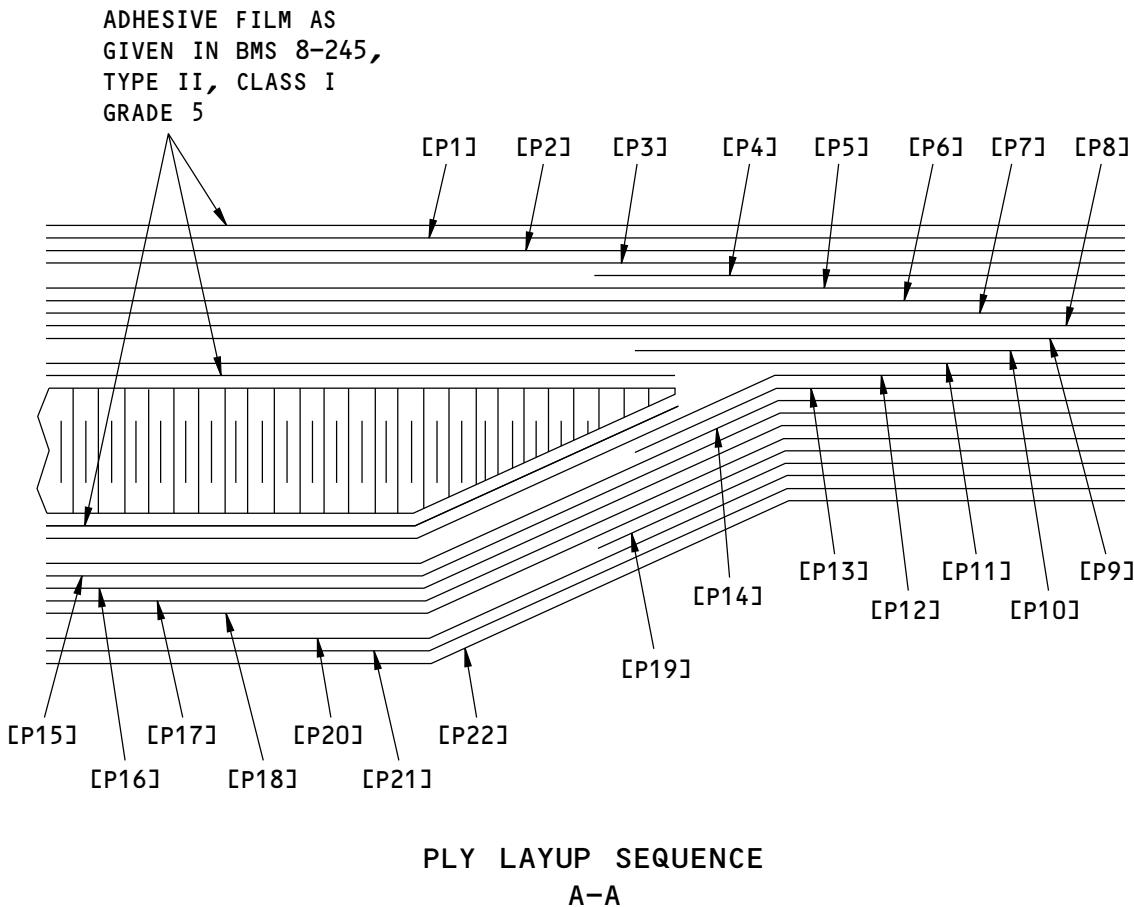
54-50-70
IDENTIFICATION 2
Page 8
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



F18713 S0006592189_V1

Ply Direction, Core Ribbon Direction and Ply Sequence for the Strut Overwing Fairing Skin Panel,
Figure 2, Item [2]
Figure 4 (Sheet 3 of 3)

54-50-70
IDENTIFICATION 2
Page 9
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated glass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P13, P15, P17, P19	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-256, Type IV, Class 2, Style 3K-70-PW
P21	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108
P22	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0/350/2/1235/002, Form 1 (Optional: Type 0/350/2/1100/002, Form 1)

54-50-70

IDENTIFICATION 2

Page 10

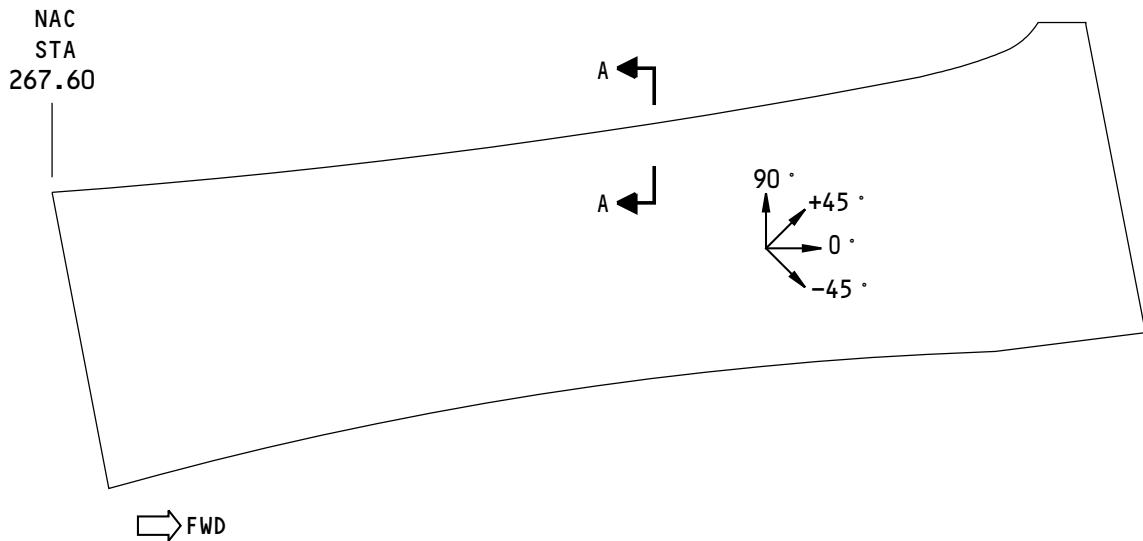
Jul 10/2016

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737-800
STRUCTURAL REPAIR MANUAL



VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) 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 LAYUP DIRECTION.
- REFER TO SECTION A-A FOR THE PLY LAYUP SEQUENCE.
- REFER TO TABLE 5 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F18700 S0006592191_V1

Ply Direction and Ply Sequence for the Outboard Underwing Fairing Skin Panel, Figure 2, Item [3]
Figure 5 (Sheet 1 of 2)

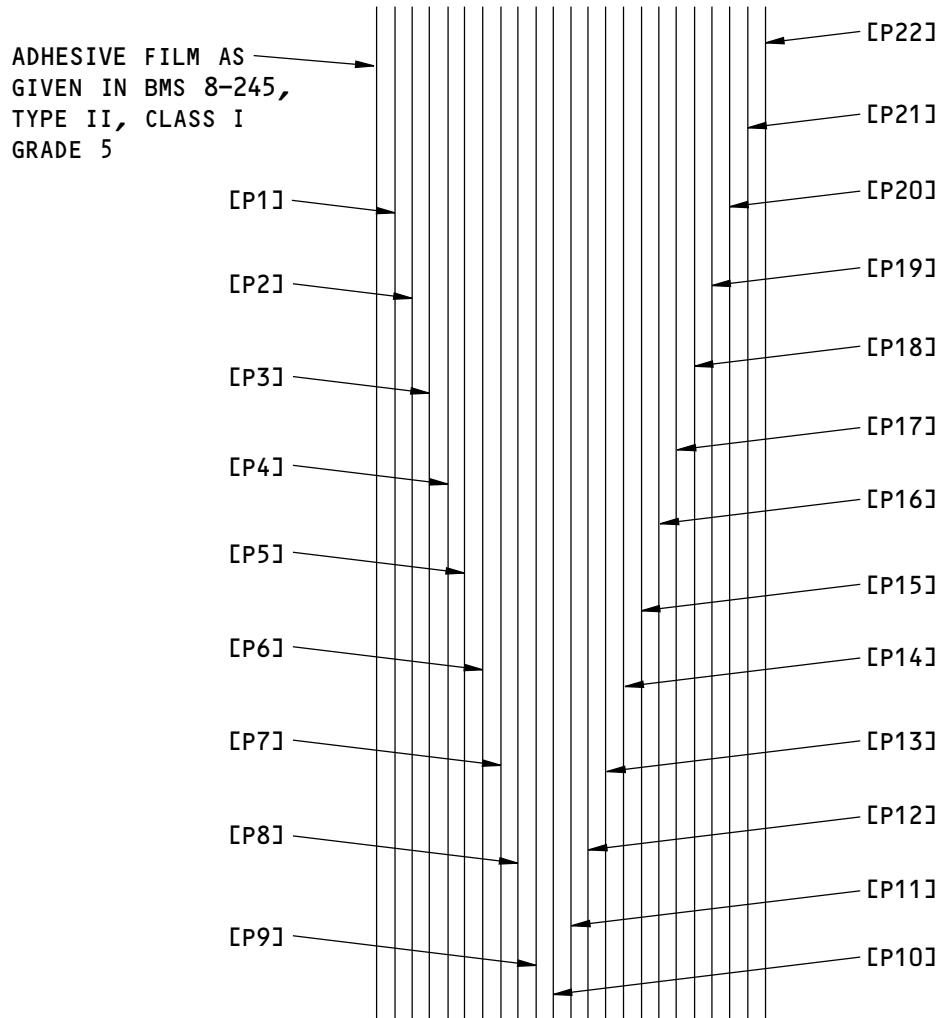
54-50-70
IDENTIFICATION 2
Page 11
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



PLY LAYUP SEQUENCE
A-A

F18692 S0006592192_V1

Ply Direction and Ply Sequence for the Outboard Underwing Fairing Skin Panel, Figure 2, Item [3]
Figure 5 (Sheet 2 of 2)

54-50-70
IDENTIFICATION 2
Page 12
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P1	Optional	Aluminum foil mesh as given in BMS 8-336, Type I, Class I, Grade 16, Form A
P2	Optional	Epoxy impregnated glass fabric as given in BMS 8-154, Type III, Class I, Grade A
P3, P5, P7, P9, P11, P12, P14, P16, P18, P20	0 or 90 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P4, P6, P8, P10, P13, P15, P17, P19	+ or - 45 degrees	Epoxy impregnated graphite fabric as given in BMS 8-297, Type IV, Class 2, Style 3K-70-PW
P21	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 108, Class III
P22	Optional	Bonded aluminum foil as given in BMS 8-289, Type 0.350/2/1100/002, Form I

54-50-70

IDENTIFICATION 2

Page 13

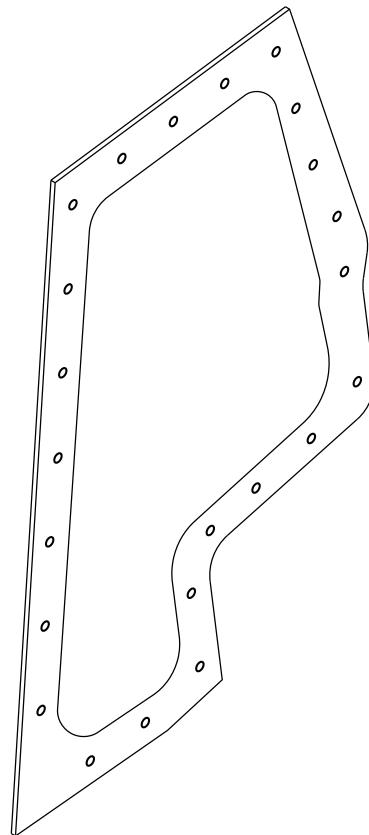
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737-800
STRUCTURAL REPAIR MANUAL



STRUT FAIRING SKIN PANEL
(MADE FROM 2024-T351 PLATE)

Thrust Reverser Strut Fairing Skin Panel
Figure 6

2375636 S0000544086_V1

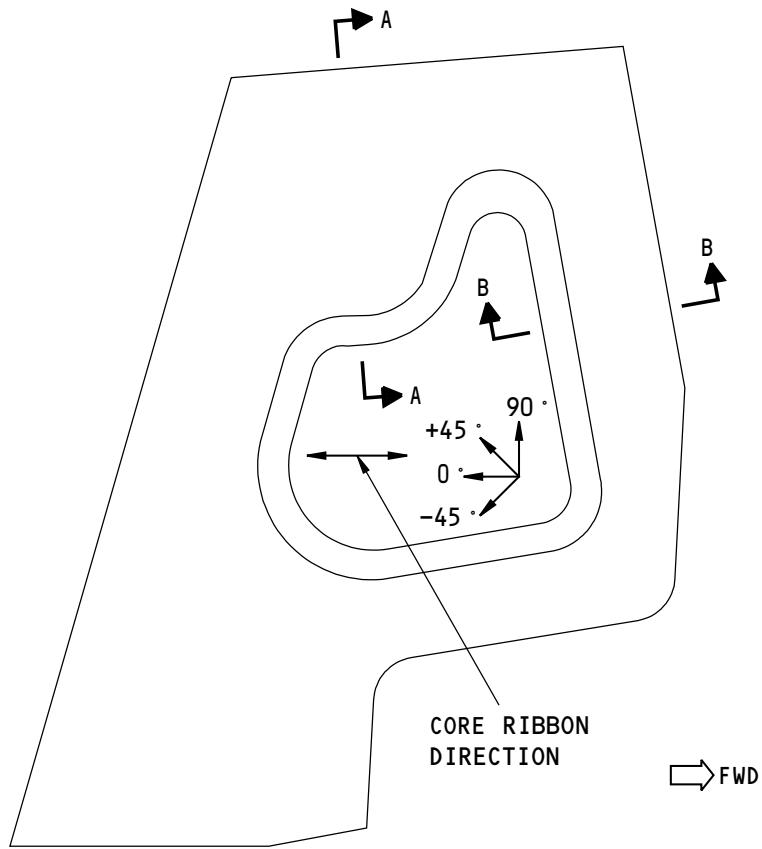
54-50-70
IDENTIFICATION 2
Page 14
Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING 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 AND DETAIL B FOR THE 0 DEGREE PLY LAYUP DIRECTION AND THE CORE RIBBON DIRECTION.
- REFER TO SECTIONS A-A AND B-B FOR THE PLY LAYUP SEQUENCE OVER EACH CORE.
- REFER TO TABLE 6 FOR THE DIRECTION AND MATERIAL FOR EACH PLY.

F07006 S0006592194_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thrust Reverser Strut Fairing Skin Panel, Figure 2, Item [4]
Figure 7 (Sheet 1 of 3)

54-50-70

IDENTIFICATION 2

Page 15

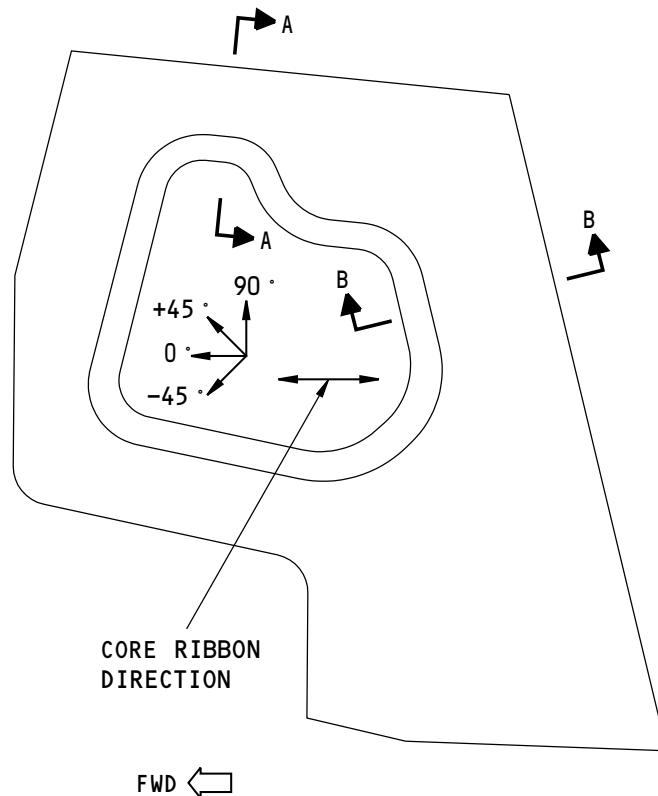
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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE
PLY LAYUP DIRECTION AND CORE RIBBON DIRECTION

(B)

G39499 S0006592195_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thrust Reverser Strut Fairing Skin
Panel, Figure 2, Item [4]
Figure 7 (Sheet 2 of 3)

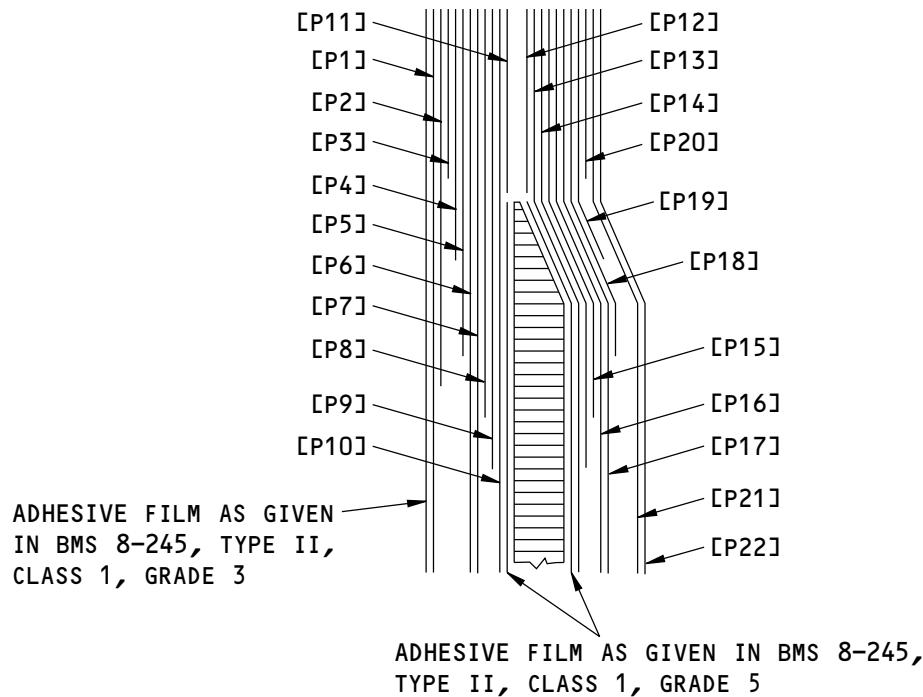
54-50-70
IDENTIFICATION 2
Page 16
Jul 10/2016

D634A210

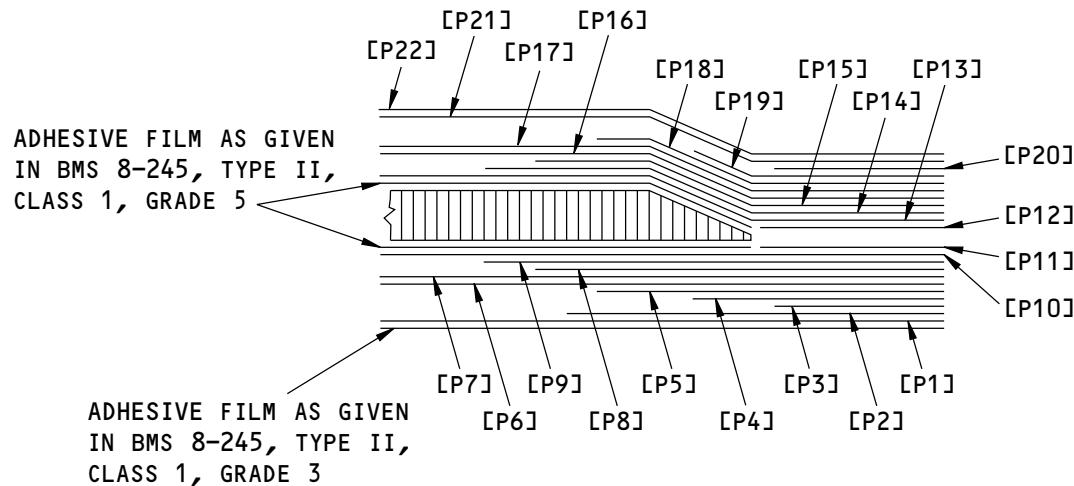
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737-800
STRUCTURAL REPAIR MANUAL



**PLY LAYUP SEQUENCE
A-A**



**PLY LAYUP SEQUENCE
B-B**

F07321 S0006592196_V1

Ply Direction, Core Ribbon Direction, and Ply Sequence for the Thrust Reverser Strut Fairing Skin Panel, Figure 2, Item [4]
Figure 7 (Sheet 3 of 3)

54-50-70

IDENTIFICATION 2

Page 17

Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P22	-45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P7, P16	+45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P10, P13	0 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P6, P17	90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, Class I
P4, P8, P15, P19	-45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I
P2, P11, P12, P21	+45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I
P5, P18	0 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I
P3, P9, P14, P20	90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, style 1581, Class I

54-50-70

IDENTIFICATION 2

Page 18

Jul 10/2016

D634A210

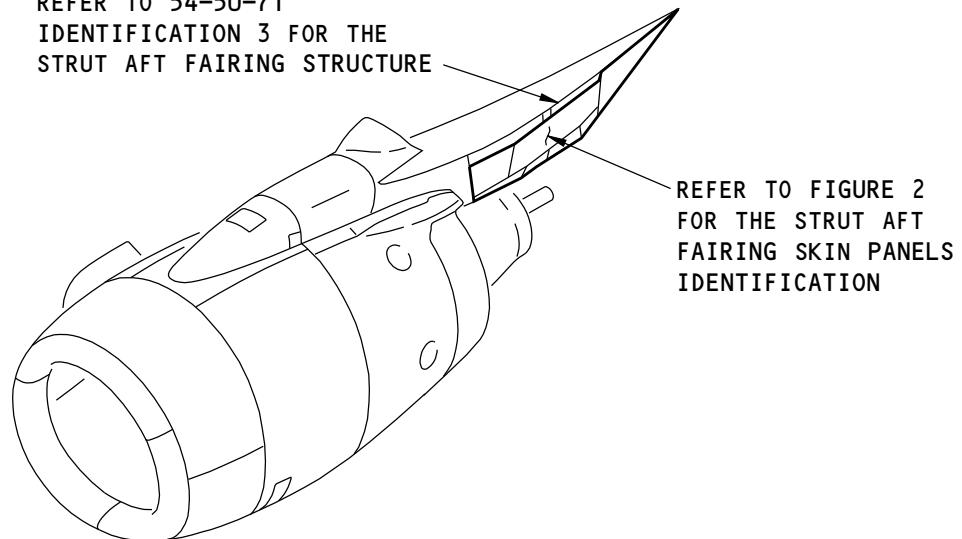
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 3 - ENGINE STRUT AFT FAIRING SKIN PANELS

REFER TO 54-50-71
IDENTIFICATION 3 FOR THE
STRUT AFT FAIRING STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

N67882 S0006592199_V1

Engine Strut Aft Fairing Skin Panel Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
313A2060	Aft Fairing End Item
313A2400	Panel Installation - Aft Fairing
313A2750	Trailing Edge Installation
313A2800	Heat Shield Installation

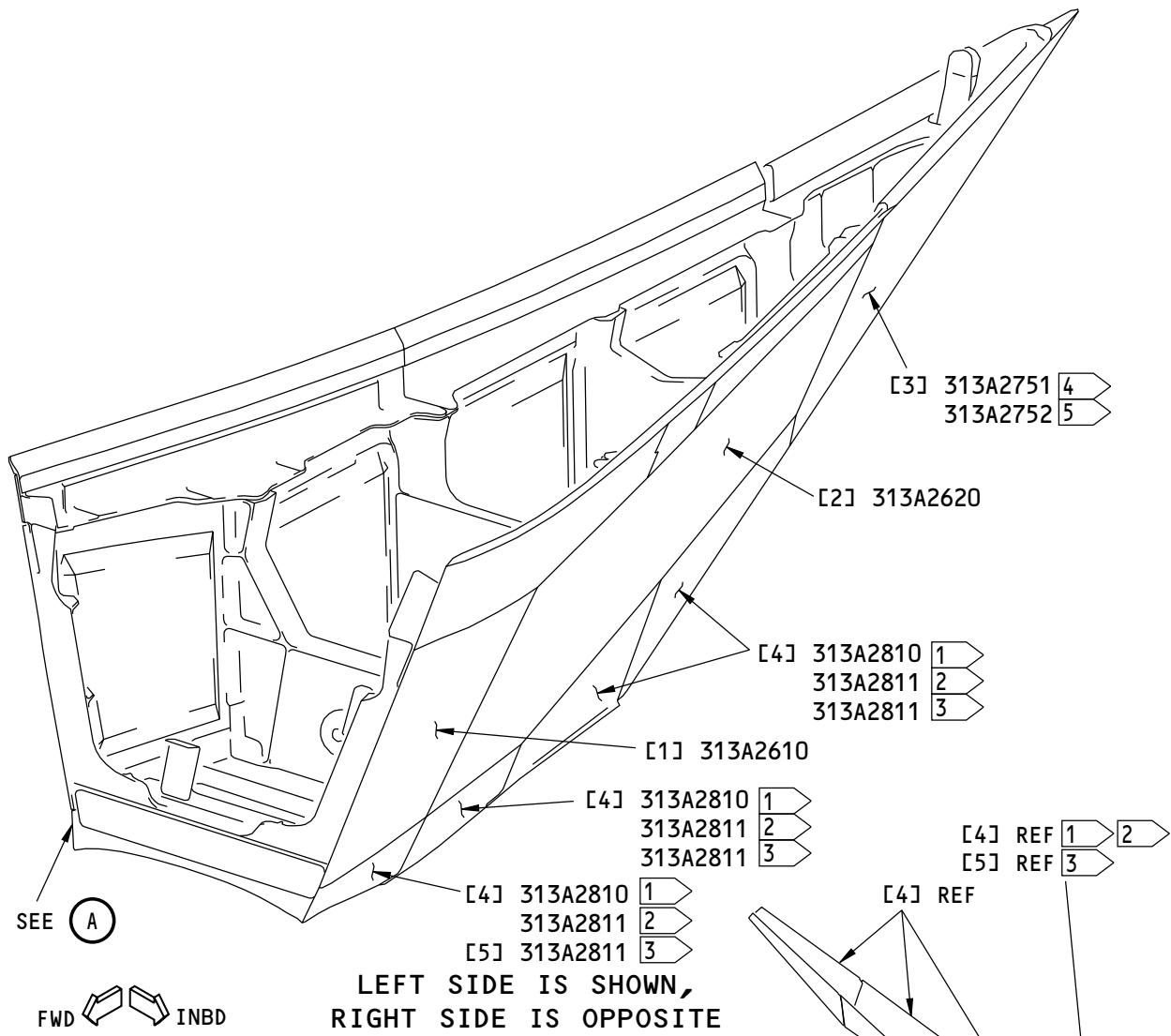
54-50-70
IDENTIFICATION 3
Page 1
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

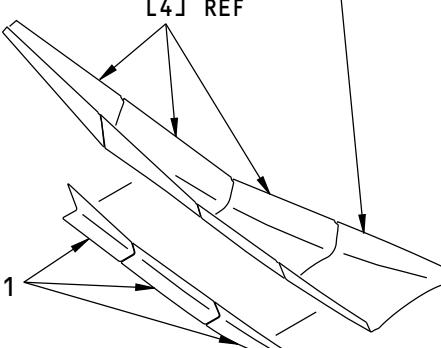


NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

- [1] AIRPLANE LINE NUMBER FROM 1 THRU 1176
- [2] AIRPLANE LINE NUMBER FROM 1177 THRU 3699
- [3] AIRPLANE LINE NUMBER 3700 AND ON
- [4] AIRPLANE LINE NUMBER FROM 1 THRU 1199
- [5] AIRPLANE LINE NUMBER 1200 AND ON

[6] 313A2811
[3]



(A) INBD FWD

N67885 S0006592201_V2

Aft Strut Fairing Skin Panel Identification
Figure 2

54-50-70
IDENTIFICATION 3
Page 2
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2						
ITEM	ASSEMBLY	MATERIAL	PART	T ^{*[1]}	MATERIAL DETAIL	EFFECTIVITY
[1]	Forward Panel Assembly Bonded Part	Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich	Skin	N/A	Refer to Figure 3 and Figure 5	
			Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class IV, Grade 4.0. Refer to Figure 3 and Figure 5 for the core ribbon direction	
[2]	Aft Panel Assembly Bonded Part	Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich	Skin	N/A	Refer to Figure 4 and Figure 6	
			Core	0.50 (12.70)	Non-metallic honeycomb as given in BMS 8-124, Type V, Class IV, Grade 4.0. Refer to Figure 4 and Figure 6 for the core ribbon direction	
[3]	Trailing Edge	Aluminum	Casting - Trailing Edge	N/A	A357.0-T6 aluminum casting as given in MIL-A-21180, strength Class 12	Airplane line number 1 thru 1199
			Plate - Trailing Edge	N/A	7075-T7351 aluminum plate as given in AMS-QQ-250/12	Airplane line number 1200 and on
[4]	Heat Shield	Titanium	Pan Casting	N/A	Titanium 6-2-4-2 casting as given in BMS 7-336	Airplane line number 1 thru 435
			Pan Casting	N/A	Titanium 6-4 casting as given in BMS 7-310	Airplane line number 436 thru 1176
			Pan	0.090 (2.386)	Titanium 6-4 sheet as given in AMS-T-9046 Cond A	Airplane line number 1177 thru 3699
			Pan	0.090 (2.386)	Titanium 6-2-4-2 sheet as given in AMS 4919	Airplane line number 3700 and on, and Airplane line number 1 thru 3699 that have incorporated SB 54-1047.
[5]	Heat Shield	Titanium	Pan	0.100 (2.540)	Titanium 6-2-4-2 sheet as given in AMS 4919	Airplane line number 3700 and on, and Airplane line number 1 thru 3699 that have incorporated SB 54-1047.
[6]	Plume Suppressor	Titanium	Plume Suppressor	0.090 (2.386)	Titanium 6-2-4-2 sheet as given in AMS 4919	Airplane line number 3700 and on, and Airplane line number 1 thru 3699 that have incorporated SB 54-1047.

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

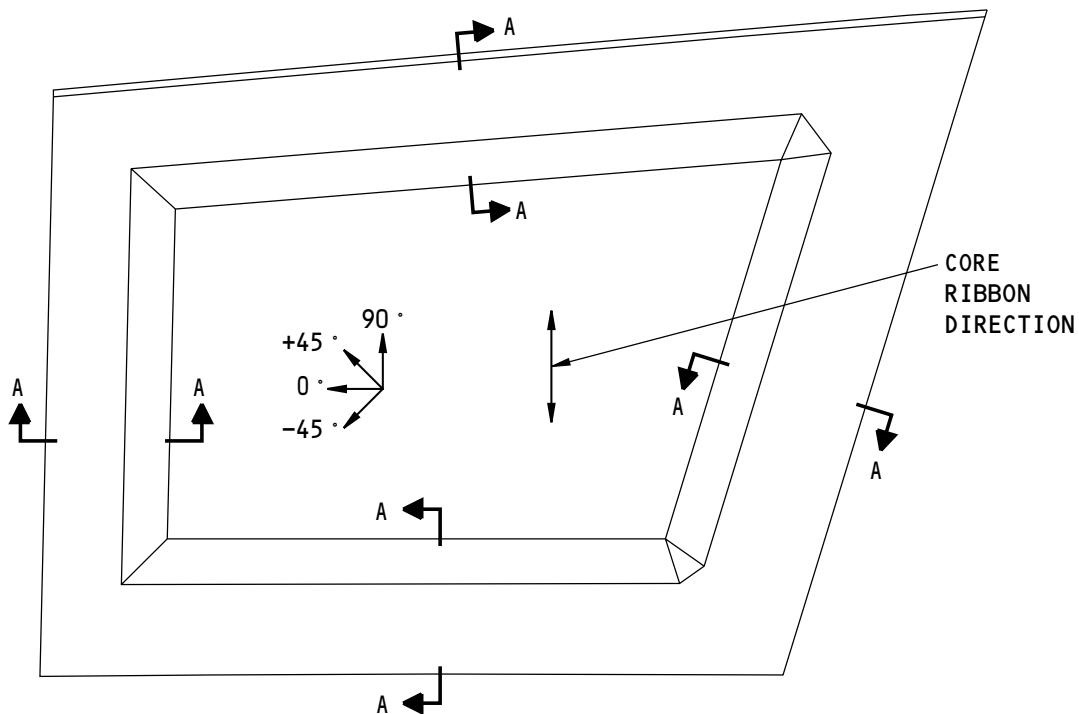
54-50-70

IDENTIFICATION 3

Page 3

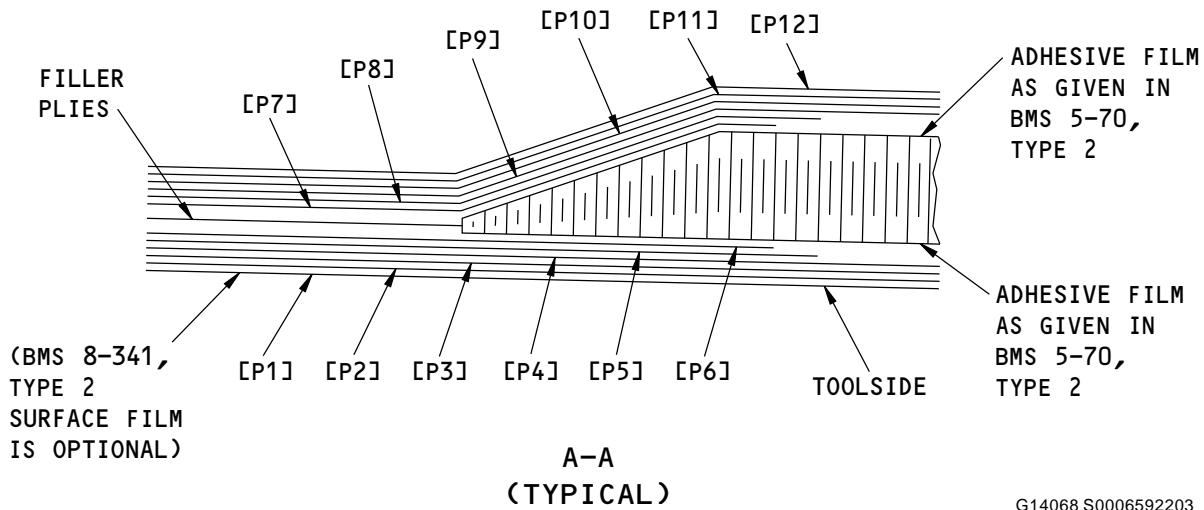
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**737-800
STRUCTURAL REPAIR MANUAL**


VIEW IS ON THE BAGSIDE

**THE LEFT SIDE FORWARD PANEL IS SHOWN,
THE RIGHT SIDE FORWARD PANEL IS OPPOSITE**



G14068 S0006592203_V1

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Forward Fairing Panel Assembly, Figure 2, Item [1]
Figure 3**

54-50-70
IDENTIFICATION 3
Page 4
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 3:

PLY MATERIAL AND DIRECTION FOR FIGURE 3		
PLY	DIRECTION	MATERIAL
P1, P3, P10, P12	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, 0.0045 in. (0.1143 mm) thick.
P2, P4, P9, P11	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, 0.0045 in. (0.1143 mm) thick.
P5, P6, P7, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781, 0.0095 in. (0.2413 mm) thick or Style 1581, 0.010 in. (0.254 mm) thick.
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, 0.010 in. (0.254 mm) thick, or Style 7781 0.0095 in. (0.2413 mm) thick, or Style 120, 0.0045 in. (0.1143 mm) thick. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings

54-50-70

IDENTIFICATION 3

Page 5

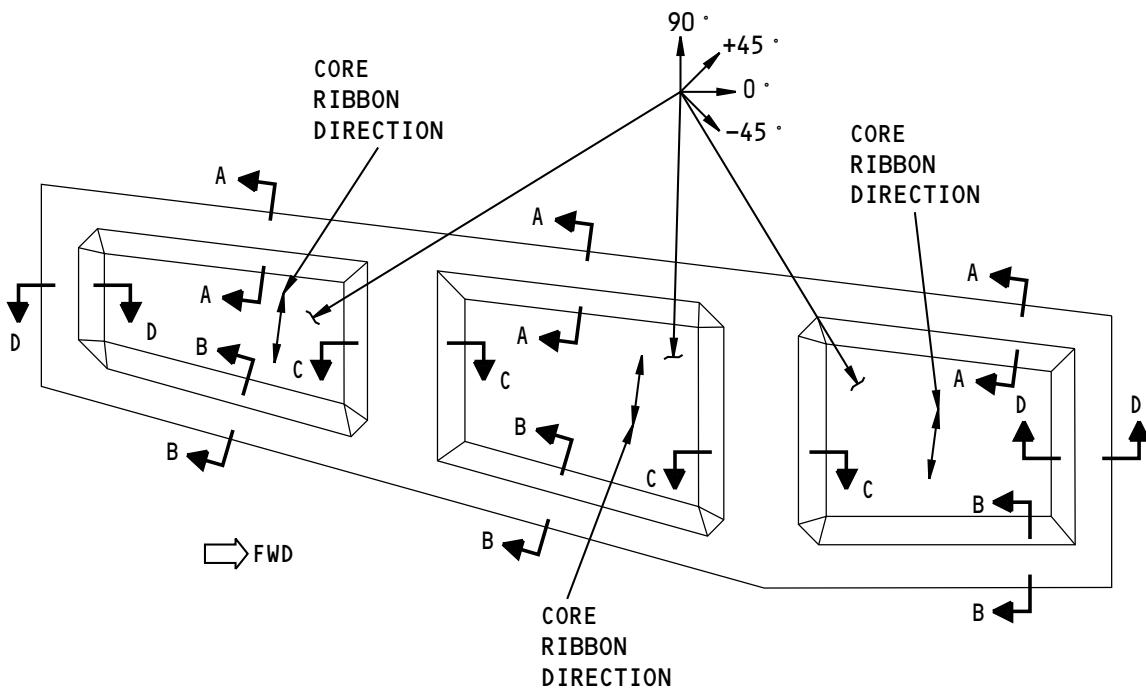
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737-800
STRUCTURAL REPAIR MANUAL



VIEW IS ON THE BAGSIDE

THE LEFT SIDE AFT PANEL IS SHOWN,
THE RIGHT SIDE AFT PANEL IS OPPOSITE

G14129 S0006592205_V1

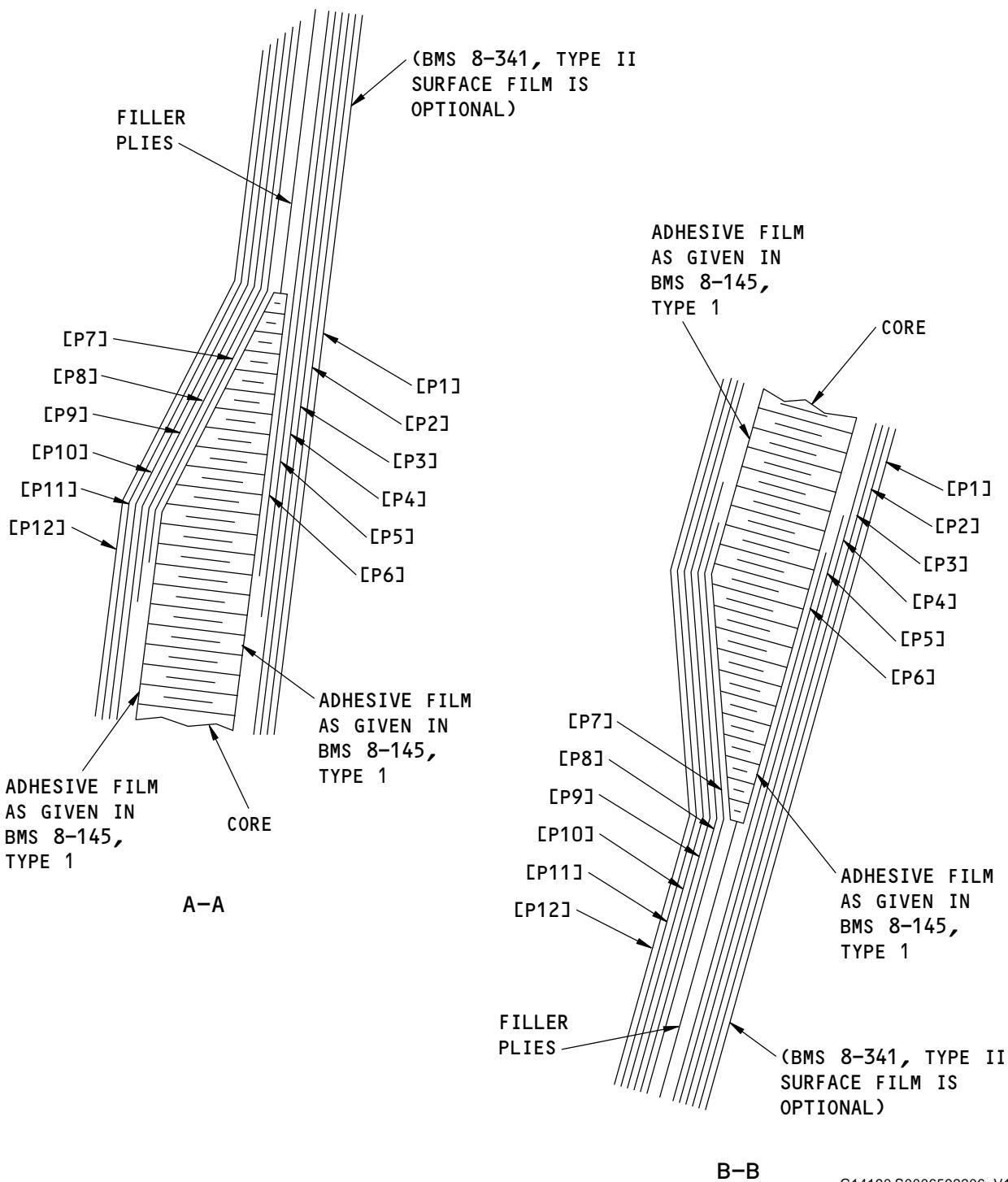
Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 1,
Item [2]
Figure 4 (Sheet 1 of 3)

54-50-70
IDENTIFICATION 3
Page 6
Nov 10/2012

D634A210

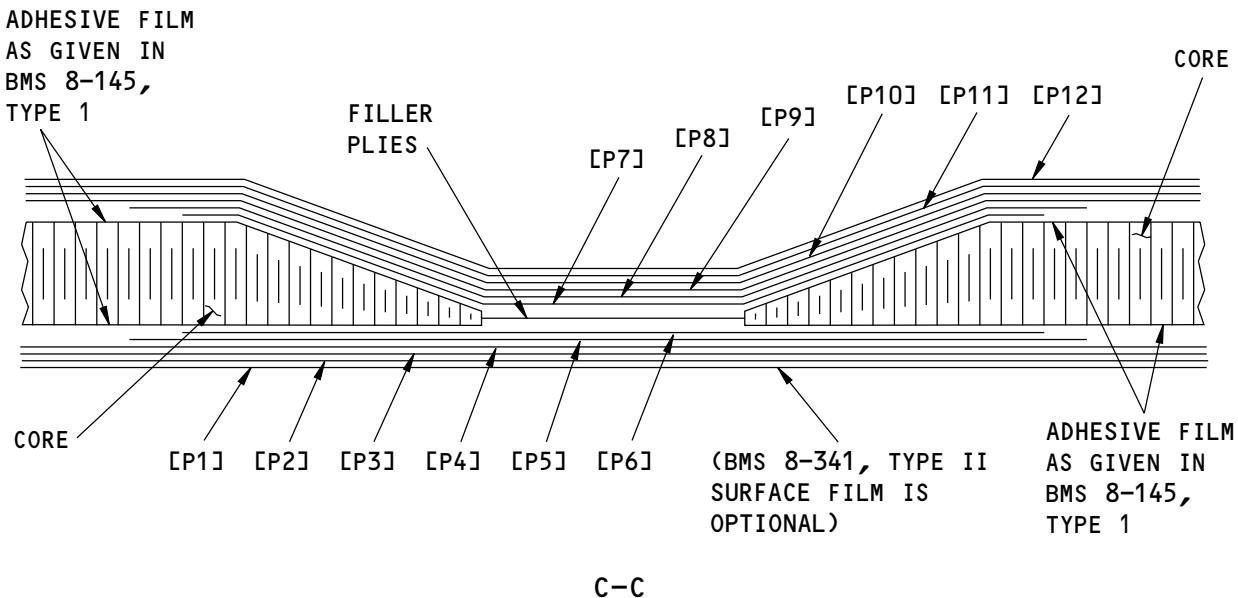
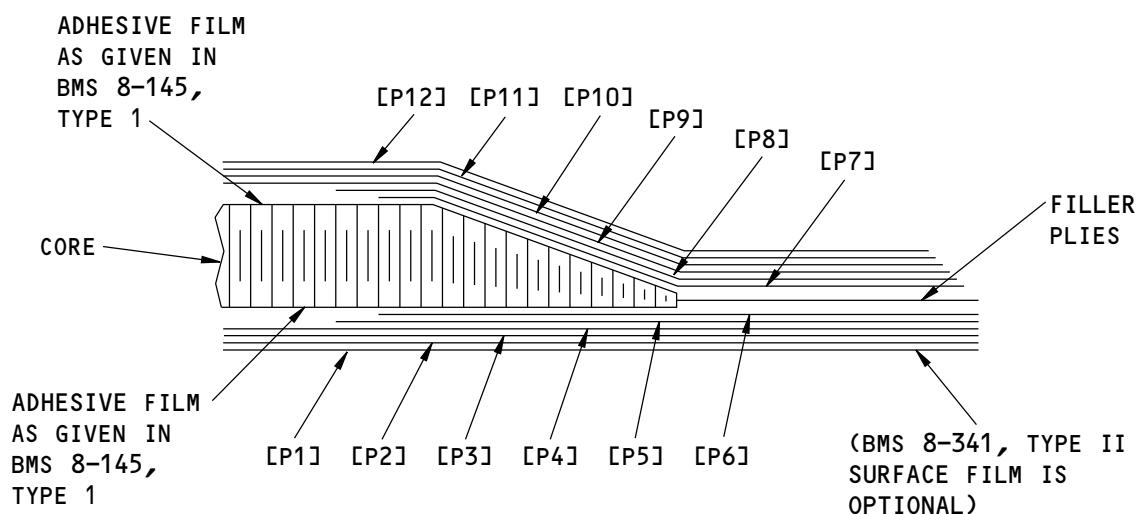
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737-800
STRUCTURAL REPAIR MANUAL



**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 1,
Item [2]
Figure 4 (Sheet 2 of 3)**

54-50-70
IDENTIFICATION 3
Page 7
Nov 10/2012

**737-800
STRUCTURAL REPAIR MANUAL**

C-C

D-D

G14220 S0006592207_V1

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 1, Item [2]
Figure 4 (Sheet 3 of 3)**

54-50-70
IDENTIFICATION 3
Page 8
Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

Table 4:

PLY MATERIAL AND DIRECTION FOR FIGURE 4		
PLY	DIRECTION	MATERIAL
P1, P3, P10, P12	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, 0.0045 in. (0.1143 mm) thick
P2, P4, P9, P11	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 120, 0.0045 in. (0.1143 mm) thick
P5, P6, P7, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781, 0.0095 in. (0.2413 mm) thick or Style 1581, 0.010 in. (0.254 mm) thick.
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, 0.010 in. (0.254 mm) thick, or Style 7781 0.0095 in. (0.2413 mm) thick, or Style 120, 0.0045 in. (0.1143 mm) thick. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings

54-50-70

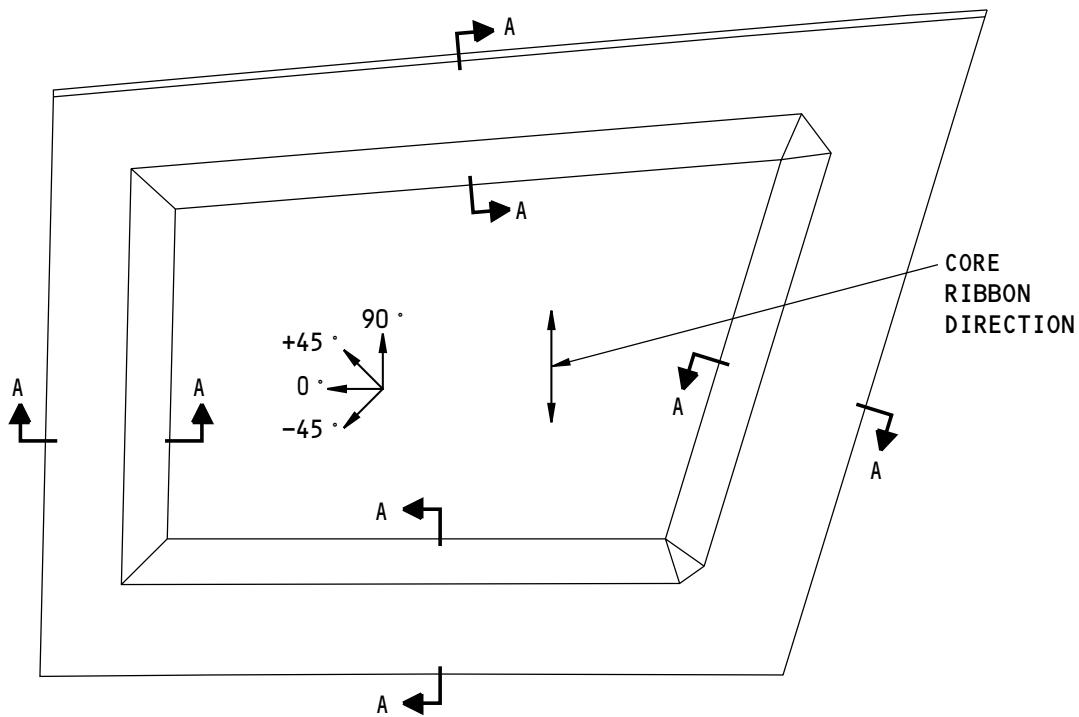
IDENTIFICATION 3

Page 9

Nov 10/2012

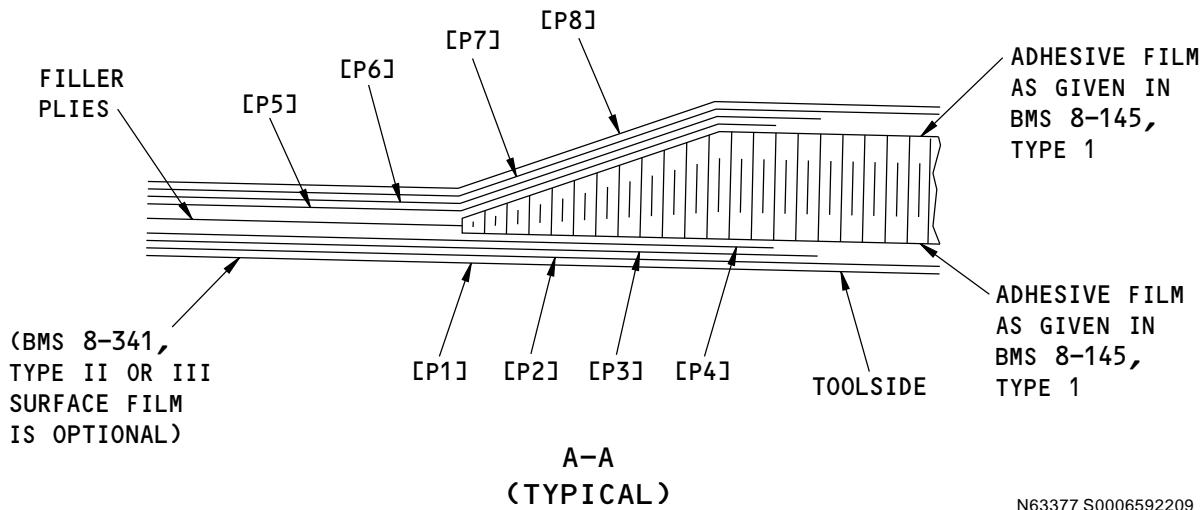
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VIEW IS ON THE BAGSIDE

**THE LEFT SIDE FORWARD PANEL IS SHOWN,
THE RIGHT SIDE FORWARD PANEL IS OPPOSITE**



N63377 S0006592209_V1

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Forward Fairing Panel Assembly, Figure 2, Item [1]
Figure 5**

54-50-70

**IDENTIFICATION 3
Page 10**

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

Table 5:

PLY MATERIAL AND DIRECTION FOR FIGURE 5		
PLY	DIRECTION	MATERIAL
P2, P7	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781, 0.0095 in. (0.2413 mm) thick or Style 1581, 0.010 in. (0.254 mm) thick.
P1, P3, P4, P5, P6, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS 8-139, Style 7781, 0.0095 in. (0.2413 mm) thick or Style 1581, 0.010 in. (0.254 mm) thick.
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, 0.010 in. (0.254 mm) thick, or Style 7781, 0.0095 in. (0.2413 mm) thick, or Style 120, 0.0045 in. (0.1143 mm) thick. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings

54-50-70

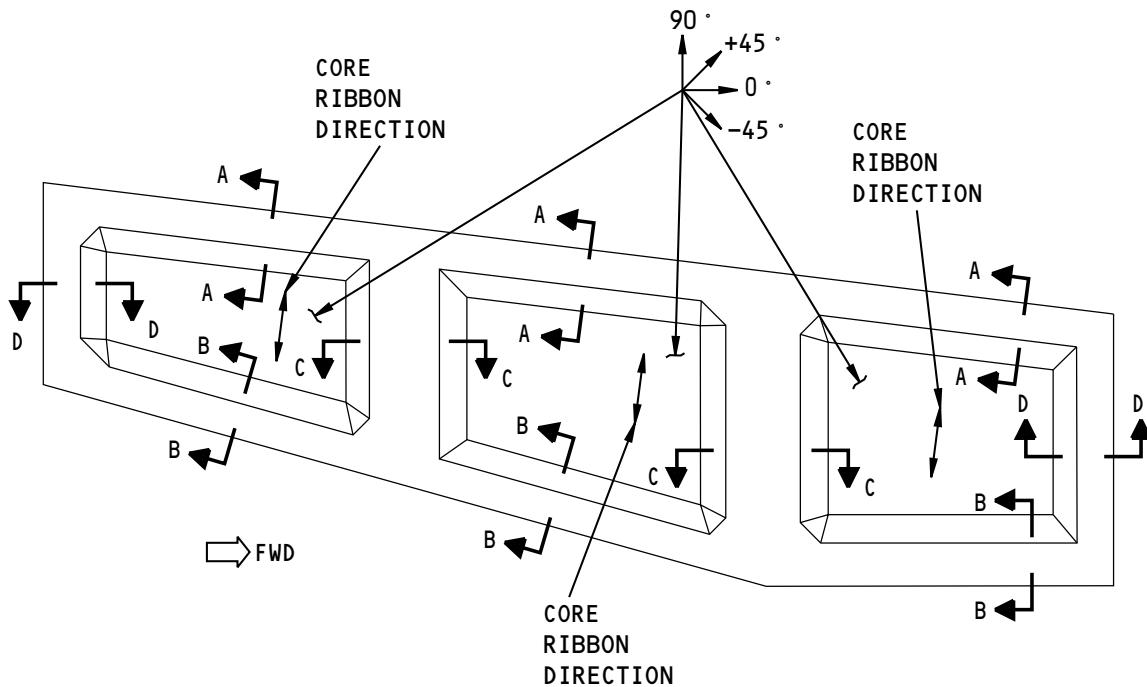
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Page 11

Nov 10/2012

D634A210

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VIEW IS ON THE BAGSIDE

**THE LEFT SIDE AFT PANEL IS SHOWN,
THE RIGHT SIDE AFT PANEL IS OPPOSITE**

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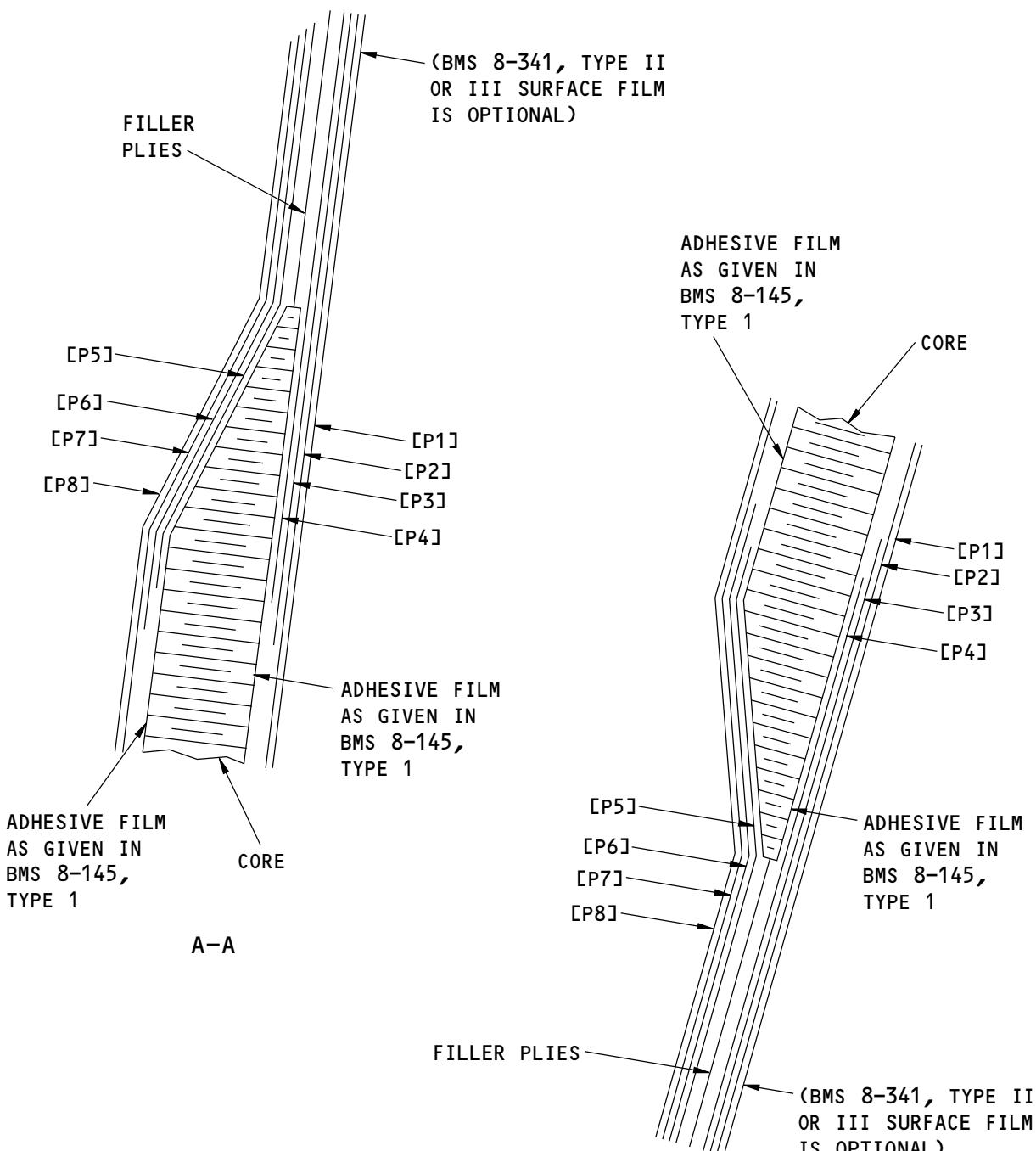
**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 2,
Item [2]
Figure 6 (Sheet 1 of 3)**

54-50-70
IDENTIFICATION 3
Page 12
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 2, Item [2]
Figure 6 (Sheet 2 of 3)

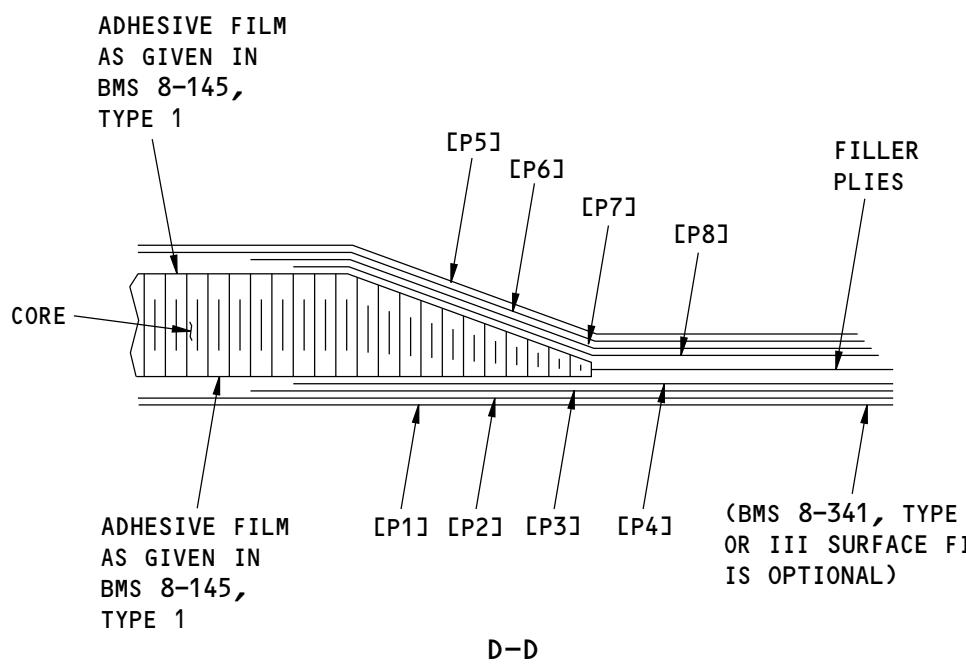
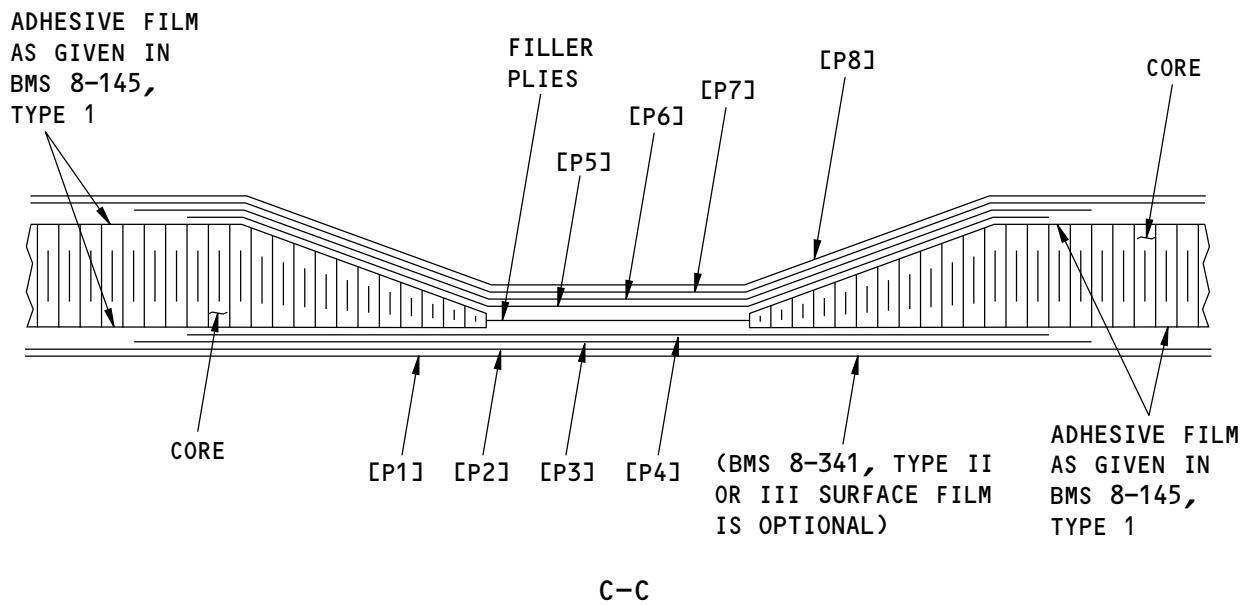
54-50-70**IDENTIFICATION 3**

Page 13

Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**



2097812 S0000439774_V1

**Ply Direction, Core Ribbon Direction, and Ply Sequence for the Aft Fairing Panel Assembly, Figure 2, Item [2]
Figure 6 (Sheet 3 of 3)**

54-50-70
IDENTIFICATION 3
Page 14
Nov 10/2012



**737-800
STRUCTURAL REPAIR MANUAL**

Table 6:

PLY MATERIAL AND DIRECTION FOR FIGURE 6		
PLY	DIRECTION	MATERIAL
P1, P3, P4, P5, P6, P8	0 or 90 degrees	Epoxy impregnated glass fabric as given in BMS B-139, Style 7781, 0.0095 in. (0.2413 mm) thick or Style 1581, 0.010 in. (0.254 mm) thick
P2, P7	+ or - 45 degrees	Epoxy impregnated glass fabric as given in BMS B-139, Style 7781, 0.0095 in. (0.2413 mm) thick or Style 1581, 0.010 in. (0.254 mm) thick
Filler Plies	Optional	Epoxy impregnated glass fabric as given in BMS 8-139, Style 1581, 0.010 in. (0.254 mm) thick, or Style 7781, 0.0095 in. (0.2413 mm) thick, or Style 120, 0.0045 in. (0.1143 mm) thick. Class 2 is an option for all filler plies. Adjust the number of plies to equal the thickness as specified in the drawings

54-50-70

IDENTIFICATION 3

Page 15

Jul 10/2013

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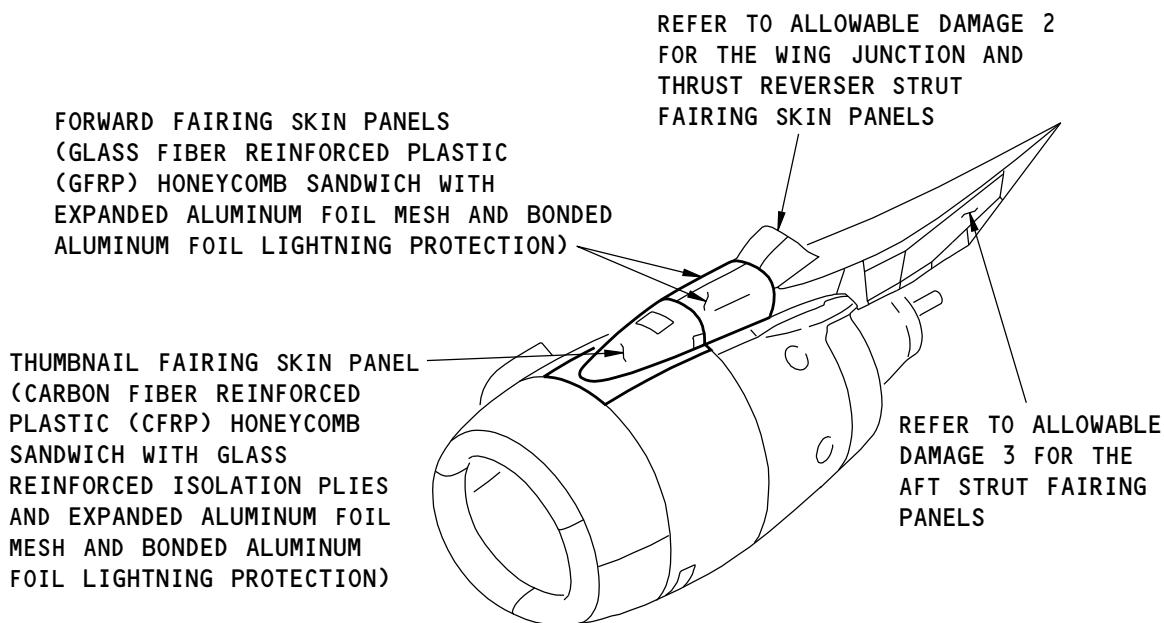
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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ENGINE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANELS

1. Applicability

- A. This subject gives the allowable damage limits for the parts of the engine strut that follow: (Refer to Strut Thumbnail and Forward Fairing Skin Panel Locations, Figure 101/ALLOWABLE DAMAGE 1)
 - (1) The Thumbnail Fairing skin panel
 - (2) The Forward Fairing skin panels
- B. The composite structure allowable damage limits are applicable only if the damage is sealed as given in 51-70-14



G09251 S0006592213_V1

Strut Thumbnail and Forward Fairing Skin Panel Locations
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 inspections 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 for the definitions of the length, width, and depth of the damage.
- (2) 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 of the contamination and water from the fairing. Refer to 51-70-04.
 - (1) Refer to 51-70-04 for the damage removal procedures.
 - (2) Refer to 51-30-05 for possible sources of the tools and equipment you can use to remove the damage.

54-50-70

ALLOWABLE DAMAGE 1

Page 101

Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

- 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 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 of the damage.
 - (c) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.
 - (d) Repair the damage at or before 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, Type II enamel to the external surfaces 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 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 of the damage.
 - (4) Repair the damage at or before 400 flight hours from the time the seal was made.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
MATERIAL	PART NAME	PARAGRAPH
CFRP HONEYCOMB SANDWICH PANEL	THUMBNAIL FAIRING HONEYCOMB CORE AREAS	4.A
CFRP HONEYCOMB SANDWICH PANEL	THUMBNAIL FAIRING SOLID LAMINATE AREAS	4.B.
GFRP HONEYCOMB SANDWICH PANEL	STRUT FORWARD FAIRINGS HONEYCOMB CORE AREAS	4.C
GFRP HONEYCOMB SANDWICH PANEL	STRUT FORWARD FAIRINGS SOLID LAMINATE AREAS	4.D.

- E. The GFRP panels of the Strut Forward Fairing have BMS 8-336 expanded aluminum foil mesh or BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:
- (1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.
 - (2) Seal the damaged area as given in 51-70-14.

54-50-70

ALLOWABLE DAMAGE 1

Page 102

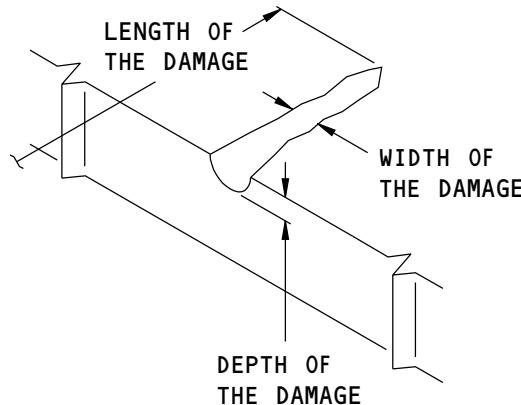
Jul 10/2013

D634A210

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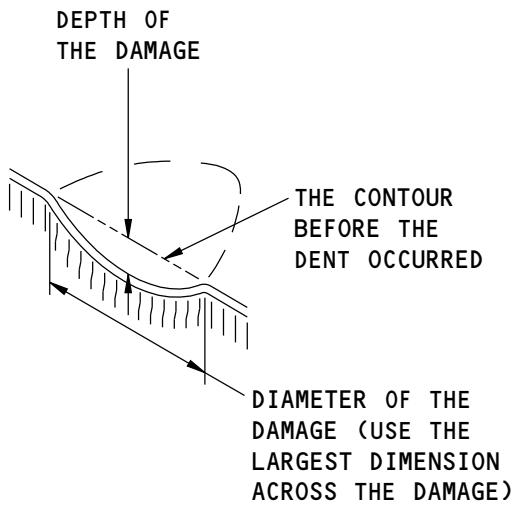


737-800
STRUCTURAL REPAIR MANUAL



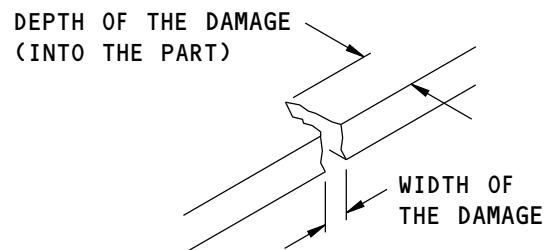
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 102

54-50-70

ALLOWABLE DAMAGE 1

Page 103

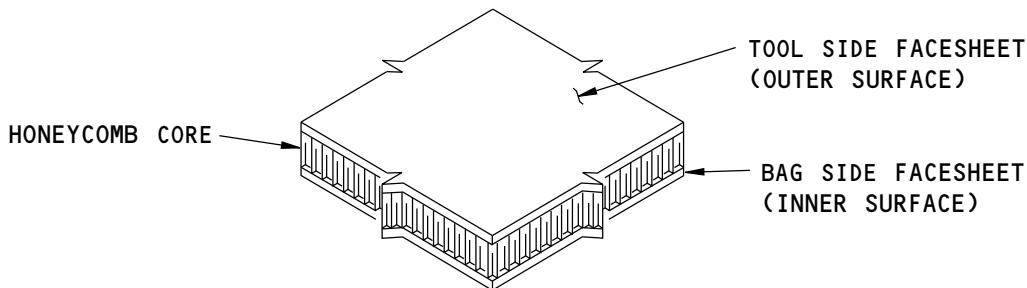
Mar 10/2013

D634A210

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737-800 STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 103

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	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
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
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, 51-05-01	Tap Test Inspection of Honeycomb Sandwich Structure

4. Allowable Damage Limits

- A. Thumbnail Fairing - Honeycomb Core Areas (Refer to Allowable Damage Zones for the Thumbnail Fairing, Figure 104/ALLOWABLE DAMAGE 1)

(1) Zone 1

- (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.
 - 2) A maximum of 0.2 inch (5.08 mm) in length
 - 3) A maximum of 0.2 inch (5.08 mm) in width
 - 4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

54-50-70

ALLOWABLE DAMAGE 1

Page 104

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 1.7 inches (43.18 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.2 inch (5.08 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.2 inch (5.08 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (2) Zone 2
- (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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
 - 2) A maximum of 0.7 inch (17.78 mm) in length
 - 3) A maximum of 0.7 inch (17.78 mm) in width
 - 4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 2.5 inches (63.5 mm) in width

54-50-70

ALLOWABLE DAMAGE 1

Page 105

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.7 inch (17.78 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.7 inch (17.78 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- B. Thumbnail Fairing - Solid Laminate Areas (Refer to Allowable Damage Zones for the Thumbnail Fairing, Figure 104/ALLOWABLE DAMAGE 1)
- (1) Zone 3
 - (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.
 - 2) A maximum of 1.7 inches (43.18 mm) in length
 - 3) A maximum of 1.7 inches (43.18 mm) in width
 - 4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 1.7 inches (43.18 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth

54-50-70

ALLOWABLE DAMAGE 1

Page 106

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 1.7 inches (43.18 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (e) Delaminations are permitted if they are:
 - 1) A maximum of 1.7 inches (43.18 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (2) Zone 4
 - (a) Damage is not permitted.
- (3) Zone 5
 - (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.
 - 2) A maximum of 0.72 inch (18.29 mm) in length
 - 3) A maximum of 0.72 inch (18.29 mm) in width
 - 4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 0.72 inch (18.29 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

54-50-70

ALLOWABLE DAMAGE 1

Page 107

Mar 10/2013



737-800
STRUCTURAL REPAIR MANUAL

- a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.72 inch (18.29 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.72 inch (18.29 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (4) Zone 6
- (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.
 - 2) A maximum of 2.5 inches (63.5 mm) in length
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 2.5 inches (63.5 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 2.5 inches (63.5 mm) in diameter

54-50-70

ALLOWABLE DAMAGE 1

Page 108

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 2.5 inches (63.5 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (5) Zone 7
- (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.
 - 2) A maximum of 0.20 inch (5.08 mm) in length
 - 3) A maximum of 0.20 inch (5.08 mm) in width
 - 4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 0.20 inch (5.08 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.20 inch (5.08 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14

54-50-70

ALLOWABLE DAMAGE 1

Page 109

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.2 inch (5.08 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- (6) Zone 8
 - (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.
 - 2) A maximum of 0.50 inch (12.70 mm) in length
 - 3) A maximum of 0.50 inch (12.70 mm) in width
 - 4) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 0.50 inch (12.70 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.50 inch (12.70 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.50 inch (12.70 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:

54-50-70

ALLOWABLE DAMAGE 1

Page 110

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
- C. Strut Forward Fairing - Honeycomb Core Areas (Refer to Allowable Damage Zones for the Strut Forward Fairing, Figure 105/ALLOWABLE DAMAGE 1)
- (1) Zone 1
 - (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.

 - 2) A maximum of 0.2 inch (5.08 mm) in length
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 0.2 inch (5.08 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.2 inch (5.08 mm) in diameter
 - 3) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.2 inch (5.08 mm) in diameter
 - 2) A minimum of 2.0D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14

- D. Strut Forward Fairing - Solid Laminate Areas (Refer to Allowable Damage Zones for the Strut Forward Fairing, Figure 105/ALLOWABLE DAMAGE 1)

54-50-70

ALLOWABLE DAMAGE 1

Page 111

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (1) Zone 2
 - (a) Damage is not permitted.
- (2) Zone 3
 - (a) Nicks, Gouges and Scratches that cause damage to the glass fibers of the GFRP isolation ply 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 depth of the damage is more than one ply.

 - 2) A maximum of 0.50 inch (12.70 mm) in length
 - 3) A maximum of 0.50 inch (12.70 mm) in width
 - 4) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
 - 1) A maximum of 0.50 inch (12.70 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (d) Holes and Punctures are permitted if they are:
 - 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.5 inch (12.70 mm) in diameter
 - 3) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14
 - (e) Delaminations are permitted if they are:
 - 1) A maximum of 0.5 inch (12.70 mm) in diameter
 - 2) A minimum of 1.5D (D = diameter of the damage area) from other Zones, other damage, a fastener hole, or the edge of the part. Other damage does not include nicks, gouges, and scratches that:
 - a) Do not cause damage to the carbon fiber plies
 - b) Are sealed as given in 51-70-14

54-50-70

ALLOWABLE DAMAGE 1

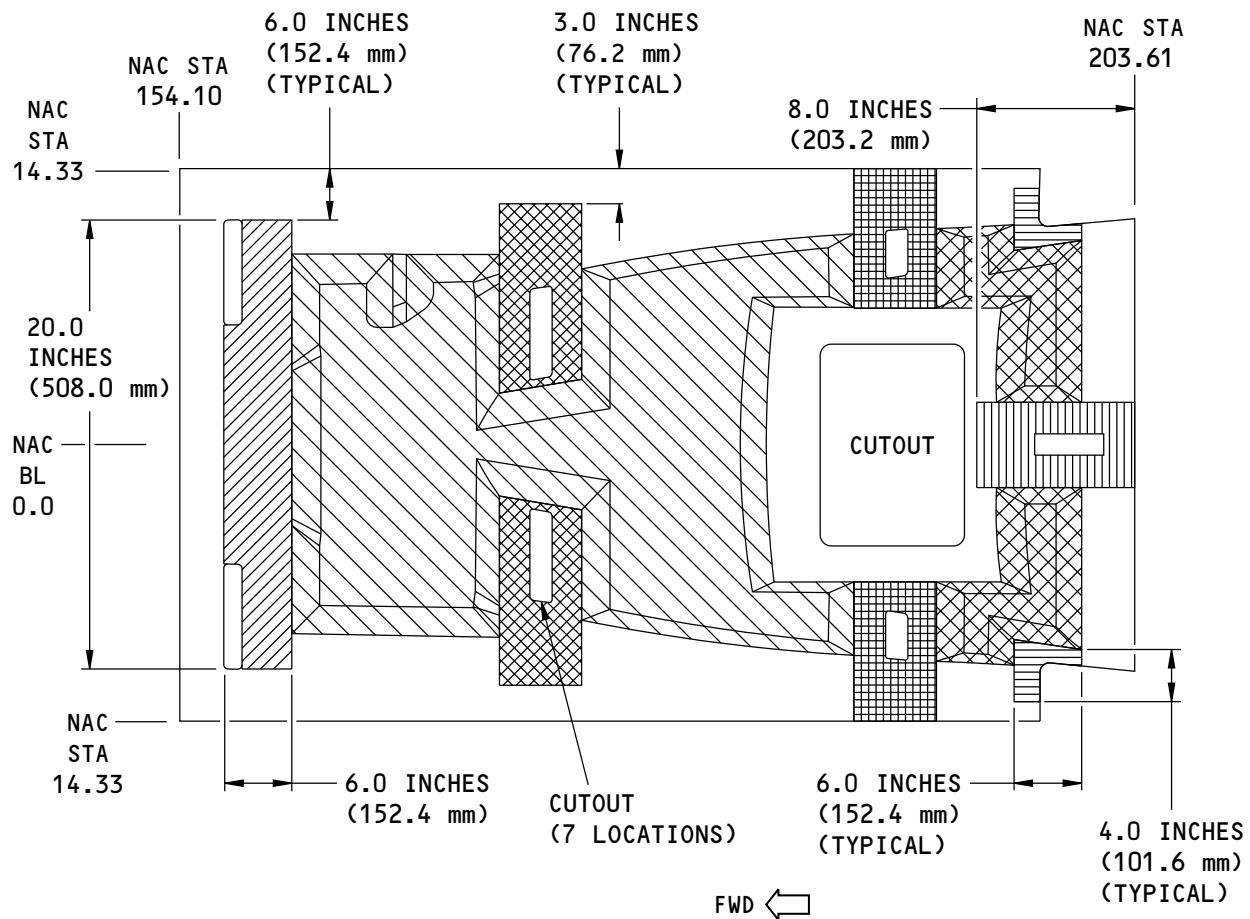
Page 112

Mar 10/2013

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



- ZONE 1 - HONEYCOMB CORE AREA
- ZONE 2 - HONEYCOMB CORE AREA
- ZONE 3 - SOLID LAMINATE AREA
- ZONE 4 - SOLID LAMINATE AREA
- ZONE 5 - SOLID LAMINATE AREA
- ZONE 6 - SOLID LAMINATE AREA
- ZONE 7 - SOLID LAMINATE AREA
- ZONE 8 - SOLID LAMINATE AREA

G21571 S0006592217_V1

**Allowable Damage Zones for the Thumbnail Fairing
Figure 104**

54-50-70

ALLOWABLE DAMAGE 1

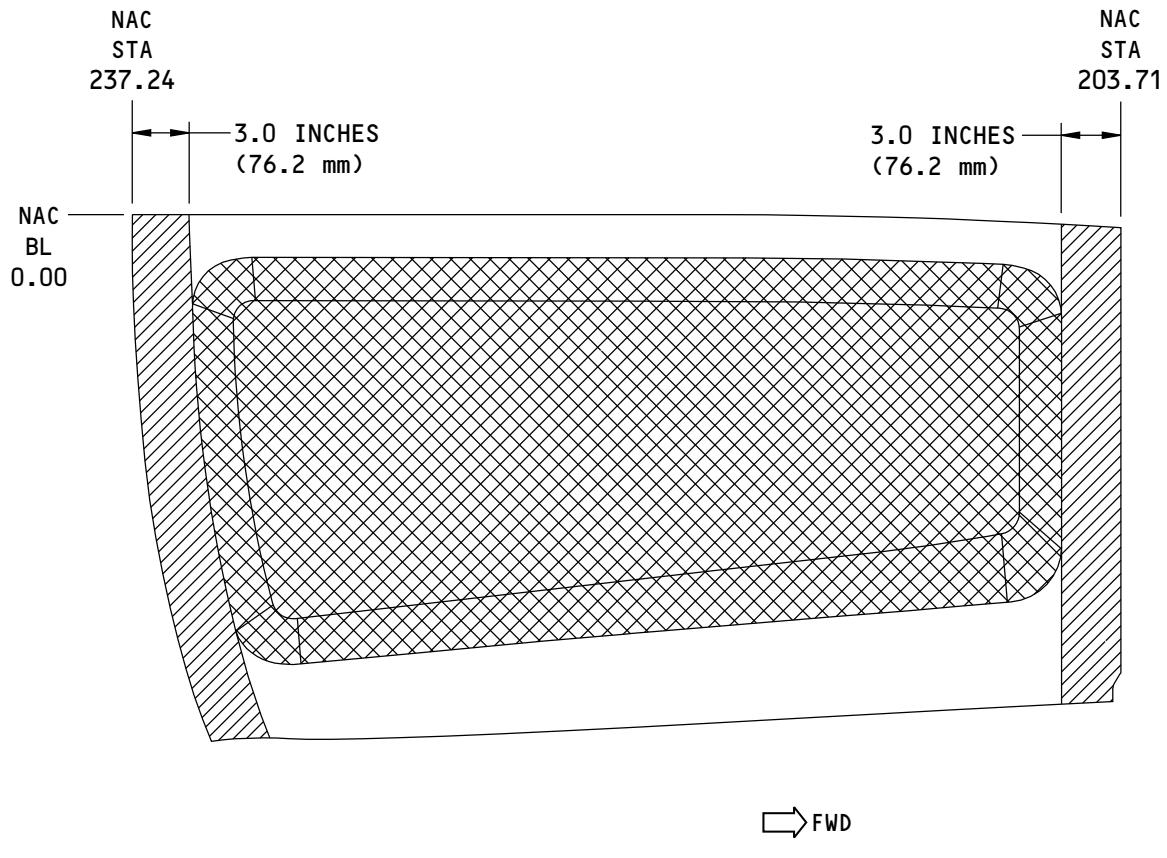
Page 113

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



- ZONE 1 - HONEYCOMB CORE AREA
- ZONE 2 - SOLID LAMINATE
- ZONE 3 - SOLID LAMINATE

LEFT STRUT FORWARD FAIRING SKIN PANEL IS SHOWN,
RIGHT STRUT FORWARD FAIRING SKIN PANEL IS OPPOSITE

G21579 S0006592218_V1

Allowable Damage Zones for the Strut Forward Fairing
Figure 105

54-50-70

ALLOWABLE DAMAGE 1

Page 114

D634A210

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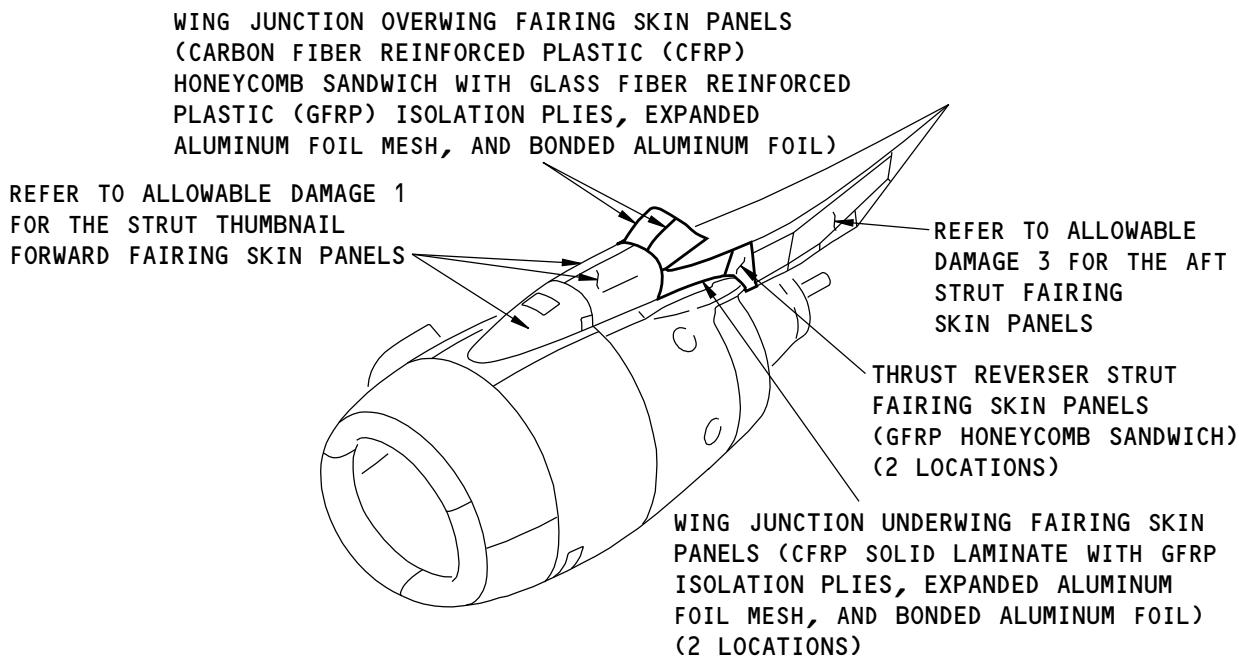
Nov 10/2012

737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - WING JUNCTION AND THRUST REVERSER STRUT FAIRING SKIN PANELS

1. Applicability

- A. This subject gives the allowable damage limits for the parts that follow (Refer to Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations, Figure 101/ALLOWABLE DAMAGE 2):
 - (1) The Wing Junction Fairing which includes:
 - (a) The left and right Strut Overwing Fairings
 - (b) The inboard and outboard Strut Underwing Fairings.
 - (2) The left and right Thrust Reverser Strut Fairings.
- B. The composite structure allowable damage limits are applicable only if the damage is sealed as given in 51-70-14



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Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations
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 inspections 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 for the definitions of the length, width, and depth of the damage.
- (2) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 2 for the definitions of the facesheets of a honeycomb core area.
- B. Remove all of the contamination and water from the fairing. Refer to 51-70-04.

54-50-70

ALLOWABLE DAMAGE 2

Page 101

Mar 10/2015



737-800
STRUCTURAL REPAIR MANUAL

- C. Refer to 51-30-03 for the possible sources of the materials you can use to remove the damage.
- D. Refer to 51-30-05 for the possible sources of the equipment you can use to remove the damage.
- E. Seal all the permitted damage areas that are not more than one ply in depth with one of the two methods that follows: (Refer to 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 of the damage.
 - (c) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.
 - (d) Repair the damage at or before 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, Type II enamel to the external surfaces sealed with epoxy resin. Refer to AMM PAGEBLOCK 51-21-99/701.
- F. Seal all of the damage areas that are more than one ply in depth as follows: (Refer to the allowable damage limits given in Paragraph 4./ALLOWABLE DAMAGE 2)
 - (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 of the damage.
 - (4) Repair the damage at or before 400 flight hours from the time the seal was made.
- G. The CFRP panels of the Wing Junction Overwing and Underwing Fairings have BMS 8-336 expanded aluminum foil mesh and BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:
 - (1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.
 - (2) Seal the damaged area as given in 51-70-14.
- H. Refer to Table 101/ALLOWABLE DAMAGE 2 for the references for the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
PART NAME	MATERIAL	PARAGRAPH
OVERWING FAIRING SKIN PANELS	CFRP HONEYCOMB SANDWICH PANEL	4.A
INBOARD AND OUT- BOARD UNDERWING FAIRING SKIN PANELS	CFRP LAMINATE PANEL	4.B
THRUST REVERSER STRUT FAIRING SKIN PANELS	GFRP HONEYCOMB SANDWICH PANEL	4.C

54-50-70

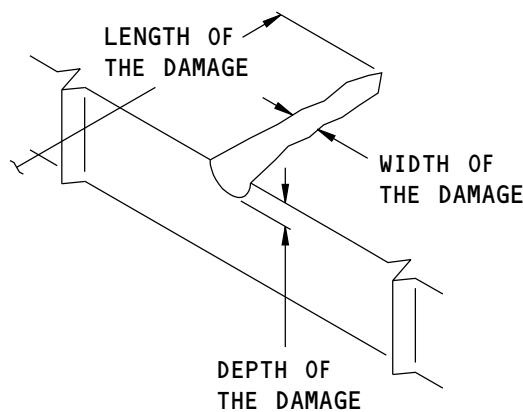
ALLOWABLE DAMAGE 2

Page 102

Mar 10/2015

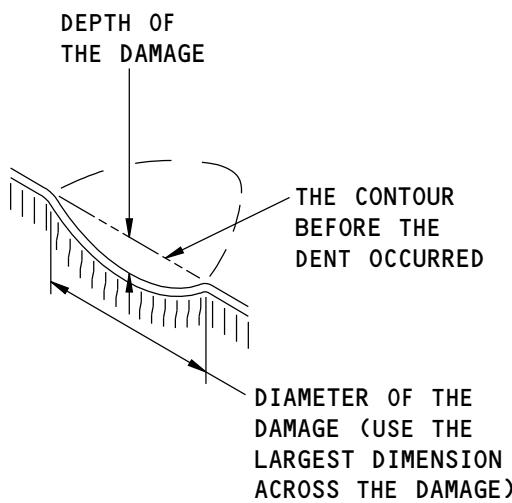


737-800
STRUCTURAL REPAIR MANUAL



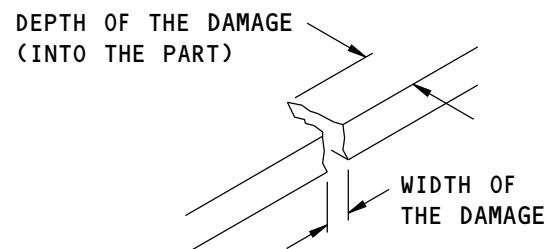
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 102

54-50-70

ALLOWABLE DAMAGE 2

Page 103

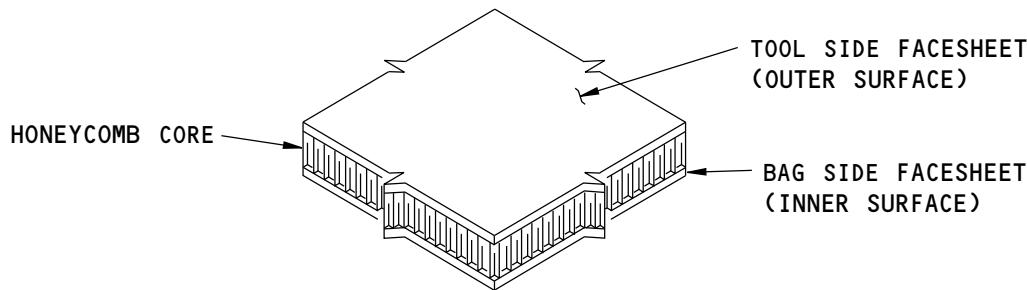
Mar 10/2013

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737-800
STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 103

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	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
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
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. Overwing Fairing Skin Panels (Refer to Allowable Damage Zones for the Overwing Fairing Skin Panels, Figure 104/ALLOWABLE DAMAGE 2)

(1) Zone 1 - Honeycomb Core Area

- (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 depth of the damage is more than one ply.

- 2) A maximum of 0.20 inch (5.08 mm) in length

- 3) A maximum of 0.20 inch (5.08 mm) in width

- 4) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.

NOTE: Other damage does not include nicks, gouges, and scratches that:

54-50-70

ALLOWABLE DAMAGE 2

Page 104

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- Do not cause damage to the carbon fiber plies
 - Are sealed as given in 51-70-14
- (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
- 1) A maximum of 0.20 inch (5.08 mm) in diameter
 - 2) A maximum of 0.20 inch (1.27 mm) in depth
 - 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.
- 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 51-70-14
- (d) Holes and Punctures are permitted if they are:
- 1) A maximum of one facesheet and the core in depth
 - 2) A maximum of 0.20 inch (5.08 mm) in diameter
 - 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.
- 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 51-70-14
- (e) Delaminations are permitted if they are:
- 1) A maximum of 0.2 inch (5.08 mm) in diameter
 - 2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Honeycomb Core Areas, Figure 105/ALLOWABLE DAMAGE 2.
- 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 51-70-14
- (2) Zone 2 - Solid Laminate Area
- (a) Edge Erosion is permitted as shown in Damage that is Permitted to the Edgeband of a Honeycomb Panel, Figure 106/ALLOWABLE DAMAGE 2.
 - (b) Other damage is not permitted.
- (3) Zone 3 - Solid Laminate Area
- (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 depth of the damage is more than one ply.

 - 2) A maximum of 0.4 inch (10.2 mm) in length
 - 3) A maximum of 0.4 inch (10.2 mm) in width

54-50-70

ALLOWABLE DAMAGE 2

Page 105

Mar 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 4) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (c) Dents that do not cause damage to the carbon fibers are permitted if they are:
- 1) A maximum of 0.4 inch (10.2 mm) in width
 - 2) A maximum of 0.05 inch (1.27 mm) in depth
 - 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (d) Holes and Punctures are permitted if they are:
- 1) A maximum of 0.4 inch (10.2 mm) in diameter
 - 2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (e) Delaminations are permitted if they are:
- 1) A maximum of 0.4 inch (10.2 mm) in diameter
 - 2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (f) Edge Erosion is permitted as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail B .

B. Inboard and Outboard Underwing Fairing Skin Panels

- (1) Nicks, Gouges, and Scratches that do not cause damage to the fibers are permitted.
- (2) Edge Erosion is permitted as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail B .

C. Thrust Reverser Strut Fairing Skin Panels (Refer to Allowable Damage Zones for the Thrust Reverser Strut Fairing Skin Panel, Figure 108/ALLOWABLE DAMAGE 2)

- (1) Zone 1 - Solid Laminate Area
 - (a) Nicks, Gouges, and Scratches are permitted if they are:

54-50-70

ALLOWABLE DAMAGE 2

Page 106

Mar 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 1) A maximum of one ply in depth

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

- 2) A maximum of 0.3 inch (7.6 mm) in length
- 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (b) Dents are permitted if they are:

- 1) A maximum of 0.3 inch (7.6 mm) in diameter
- 2) A maximum of 0.05 inch (1.27 mm) in depth
- 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (c) Holes and Punctures are permitted if they are:

- 1) A maximum of 0.3 inch (7.6 mm) in diameter
- 2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (d) Delaminations are permitted if they are:

- 1) A maximum of 0.3 inch (7.6 mm) in diameter
- 2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (2) Zone 2 - Solid Laminate and Honeycomb Core Area

- (a) Nicks, Gouges, and Scratches are permitted if they are:

- 1) A maximum of one ply in depth

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

- 2) A maximum of 0.50 inch (12.70 mm) in length

54-50-70

ALLOWABLE DAMAGE 2

Page 107

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (b) Dents are permitted if they are:

- 1) A maximum of 0.50 inch (12.70 mm) in diameter
- 2) A maximum of 0.05 inch (1.27 mm) in depth
- 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (c) Holes and Punctures are permitted in the solid laminate and honeycomb core areas if they are:

- 1) A maximum of one facesheet and the core in depth for honeycomb core areas
- 2) A maximum of 0.50 inch (12.70 mm) in diameter
- 3) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (d) Delaminations are permitted if they are:

- 1) A maximum of 0.50 inch (12.70 mm) in diameter
- 2) A minimum distance away from other Zones, other damage, a fastener hole, or the part edge as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail A .

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 51-70-14

- (e) Edge Erosion is permitted as shown in Damage that is Permitted to Solid Laminate Areas, Figure 107/ALLOWABLE DAMAGE 2, Detail B .

54-50-70

ALLOWABLE DAMAGE 2

Page 108

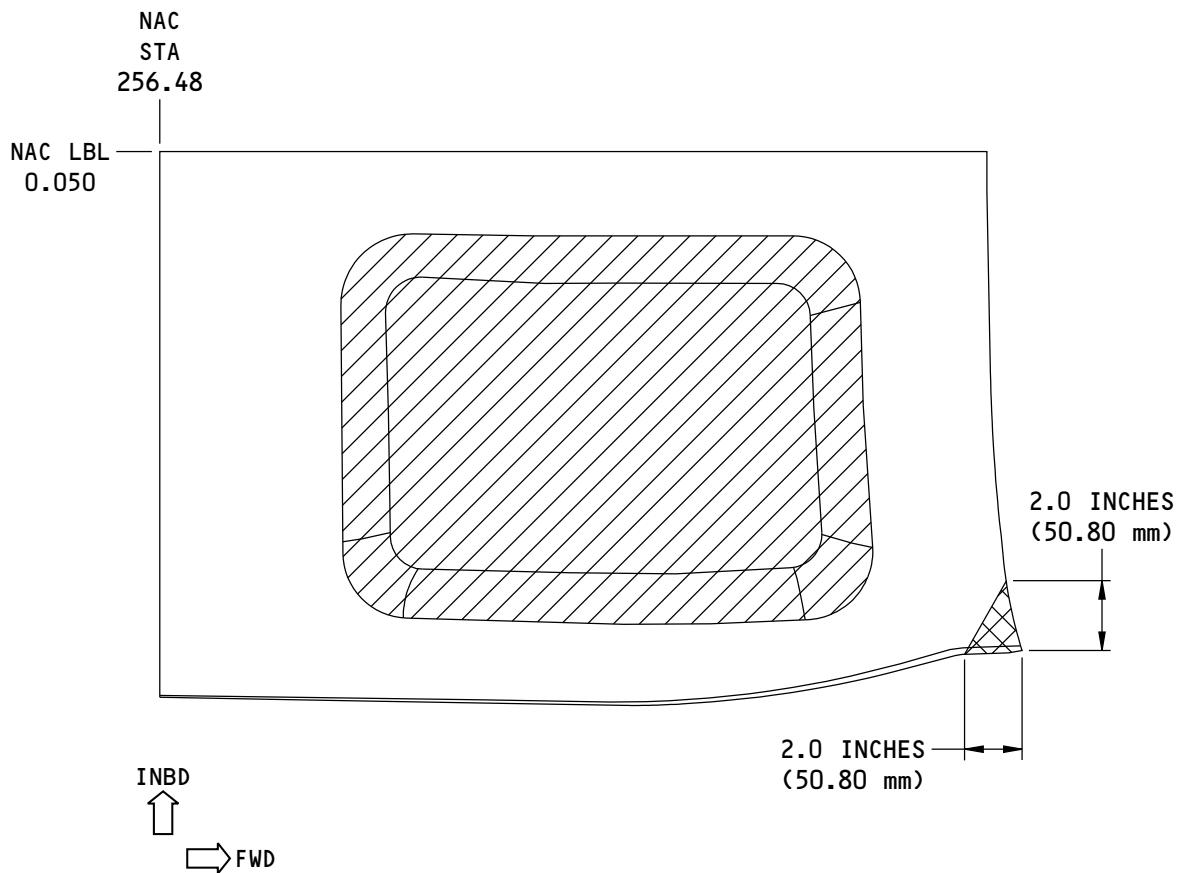
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE OUTBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE OUTBOARD OVERWING PANEL IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

- ZONE 1 - HONEYCOMB CORE AREA
- ZONE 2 - SOLID LAMINATE AREA
- ZONE 3 - SOLID LAMINATE AREA

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Allowable Damage Zones for the Overwing Fairing Skin Panels
Figure 104 (Sheet 1 of 2)

54-50-70

ALLOWABLE DAMAGE 2

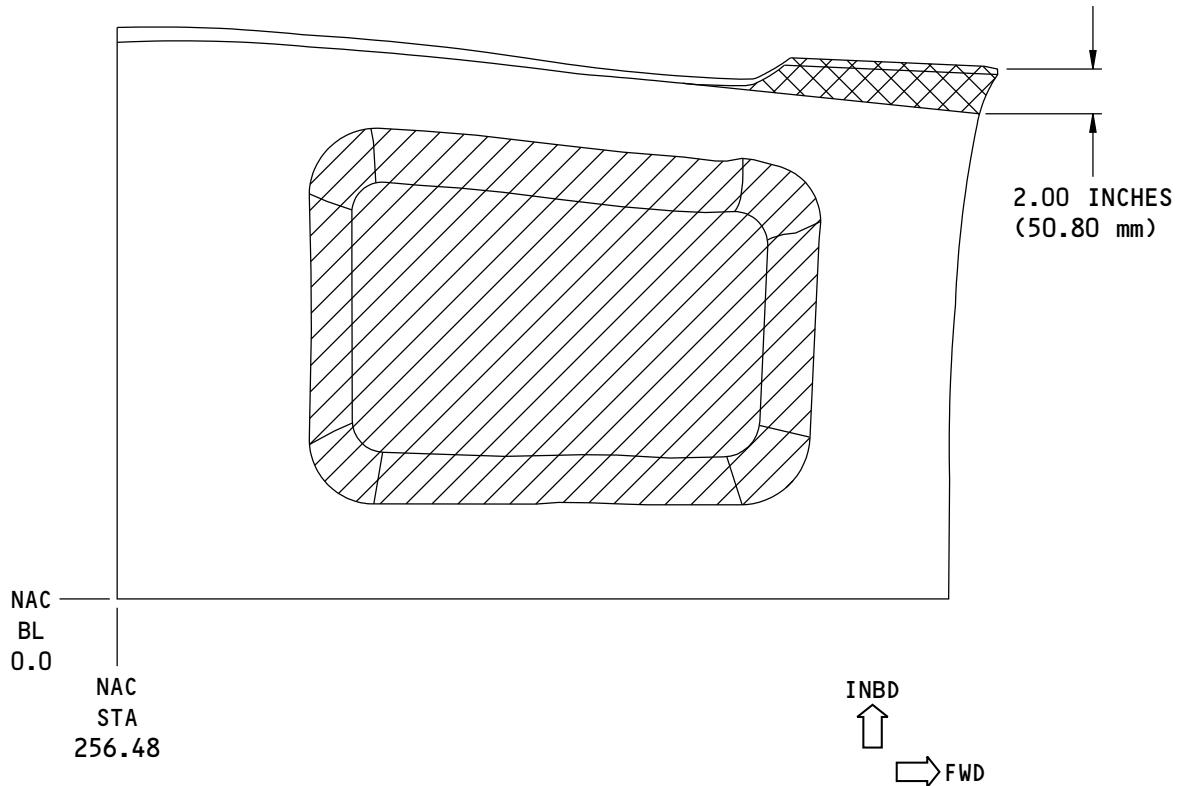
Page 109

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE INBOARD OVERWING PANEL IS SHOWN,
RIGHT ENGINE INBOARD OVERWING PANEL IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE

- ZONE 1 - HONEYCOMB CORE AREA
- ZONE 2 - SOLID LAMINATE AREA
- ZONE 3 - SOLID LAMINATE AREA

G41081 S0006592225_V1

Allowable Damage Zones for the Overwing Fairing Skin Panels
Figure 104 (Sheet 2 of 2)

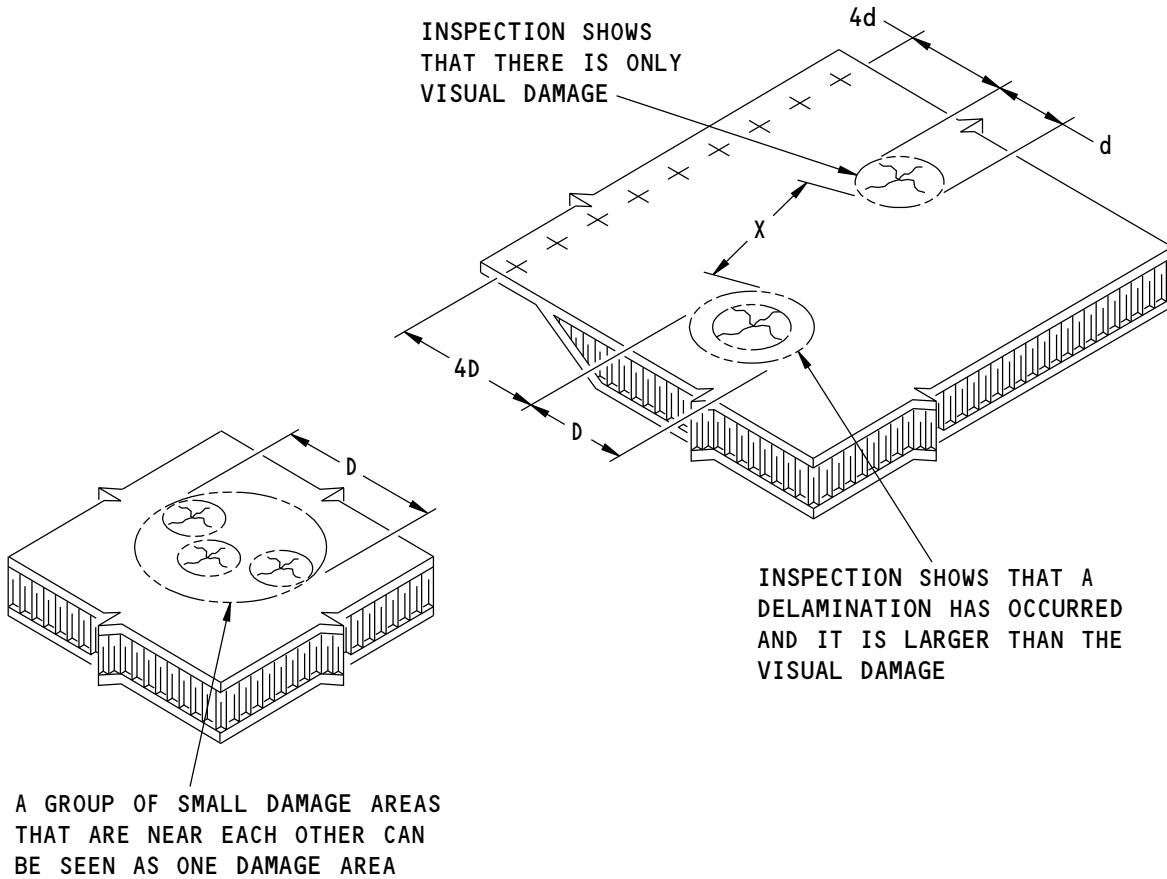
54-50-70

ALLOWABLE DAMAGE 2

Page 110

Nov 10/2012

D634A210

**737-800
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 2 INCHES (50.80 MILLIMETERS).

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 THE LARGER OF 0.75D OR 3d.

G49562 S0006592226_V1

Damage that is Permitted to Honeycomb Core Areas
Figure 105

54-50-70

ALLOWABLE DAMAGE 2

Page 111

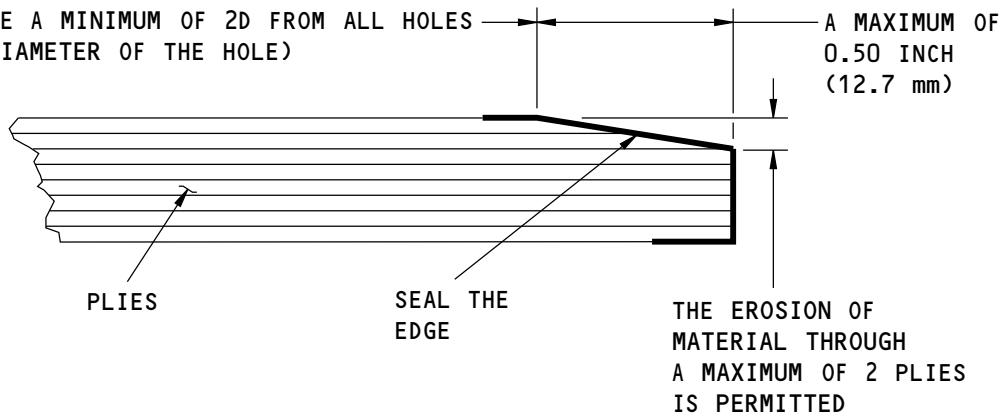
Nov 10/2012

D634A210



737-800
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)



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Damage that is Permitted to the Edgeband of a Honeycomb Panel
Figure 106

54-50-70

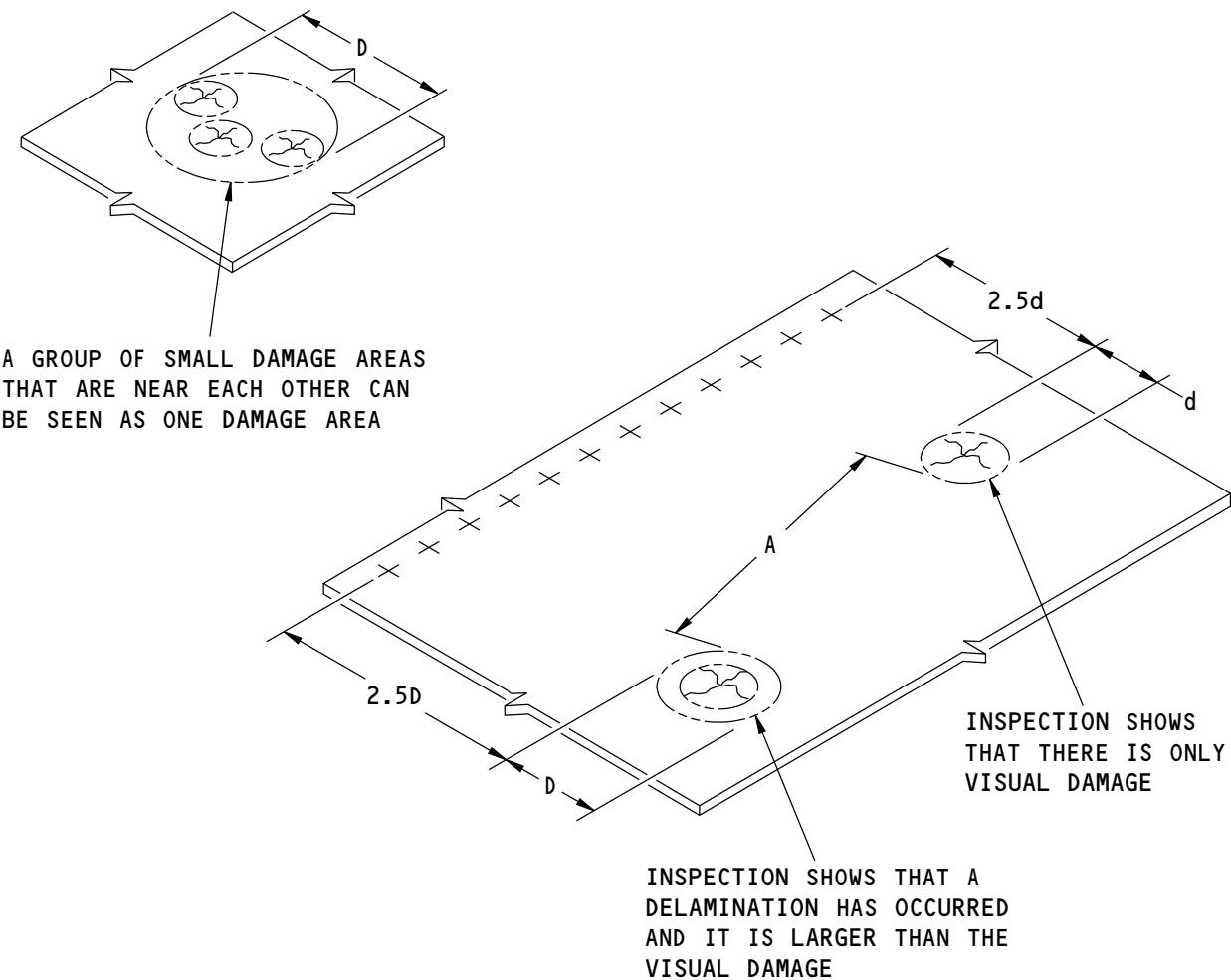
ALLOWABLE DAMAGE 2

Page 112

Nov 10/2012

D634A210

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**737-800
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.

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.

(A)

G49567 S0006592228_V1

Damage that is Permitted to Solid Laminate Areas
Figure 107 (Sheet 1 of 2)

54-50-70

ALLOWABLE DAMAGE 2

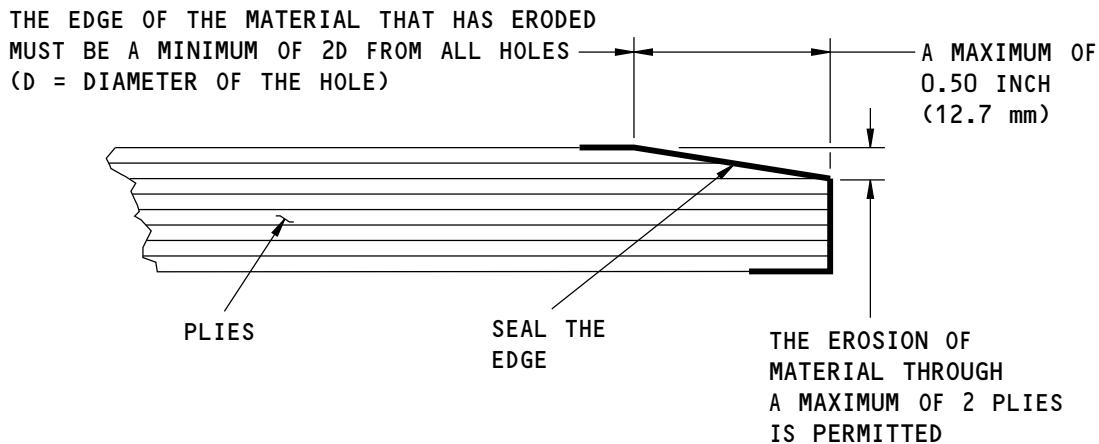
Page 113

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



B

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Damage that is Permitted to Solid Laminate Areas
Figure 107 (Sheet 2 of 2)

54-50-70

ALLOWABLE DAMAGE 2

Page 114

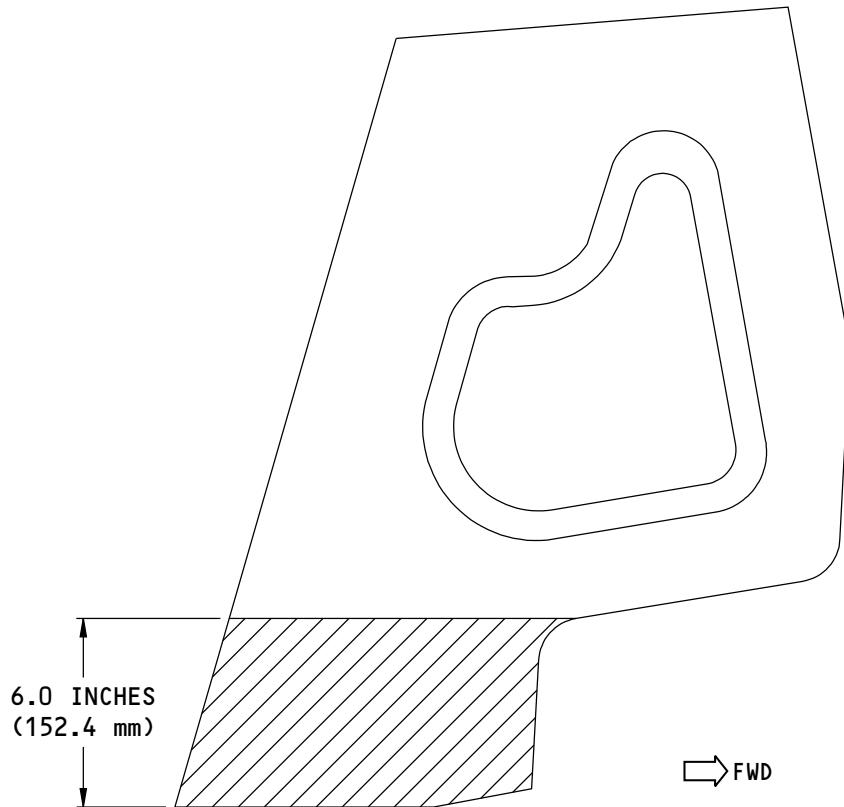
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE OUTBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE



ZONE 1 - SOLID LAMINATE AREA



ZONE 2 - SOLID LAMINATE AND HONEYCOMB CORE AREA

G41091 S0006592230_V1

Allowable Damage Zones for the Thrust Reverser Strut Fairing Skin Panel
Figure 108 (Sheet 1 of 2)

54-50-70

ALLOWABLE DAMAGE 2

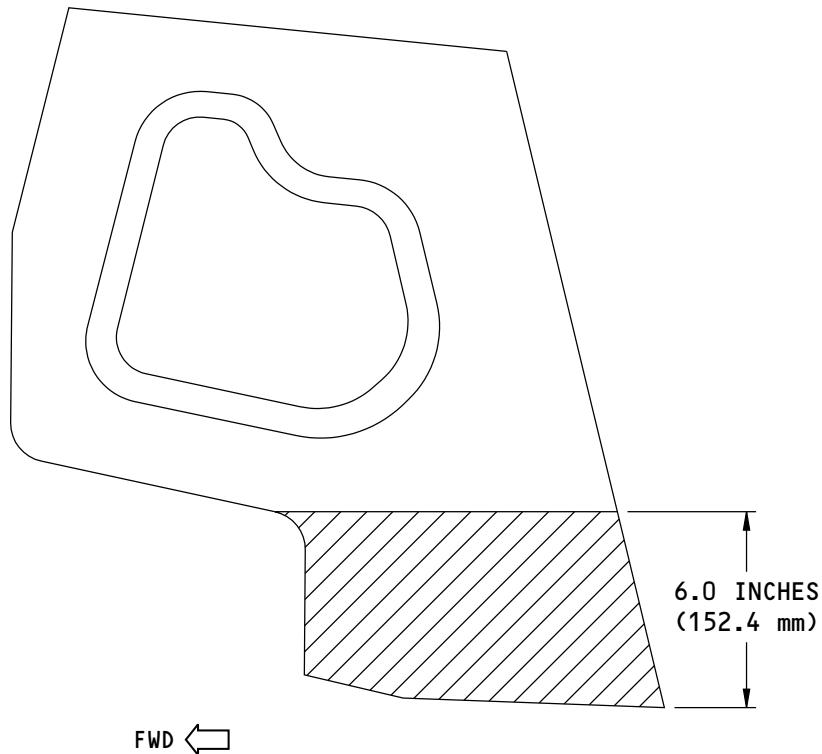
Page 115

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS SHOWN,
RIGHT ENGINE INBOARD THRUST REVERSER STRUT FAIRING IS OPPOSITE
VIEW IS ON THE BAGSIDE (NON-AERODYNAMIC) SURFACE



ZONE 1 - SOLID LAMINATE AREA



ZONE 2 - SOLID LAMINATE AND HONEYCOMB CORE AREA

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Allowable Damage Zones for the Thrust Reverser Strut Fairing Skin Panel
Figure 108 (Sheet 2 of 2)

54-50-70

ALLOWABLE DAMAGE 2

Page 116

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 3 - ENGINE STRUT AFT FAIRING SKIN PANELS

1. Applicability

- A. This subject gives the allowable damage limits for the aft strut fairing skin panels that follow: (Refer to Engine Strut Aft Fairing Skin Locations, Figure 101/ALLOWABLE DAMAGE 3)
 - (1) The forward and aft strut skins that are made of Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich material
 - (2) The heat shield skins that are made from titanium.
 - (3) The trailing edge that are made from aluminum.
- B. The composite structure allowable damage limits are applicable only if they are sealed as given in Paragraph 4./ALLOWABLE DAMAGE 3
- C. Figure 105 (Sheet 2), Detail D is not applicable to the forward edge of the Heat Shield Pans 1, 2, 3 and 4. Refer to Figure 101/ALLOWABLE DAMAGE 3, Section A-A. Contact The Boeing Company if you find damage to the forward edge of the Heat Shield Pans 1, 2, 3 and 4.

54-50-70

ALLOWABLE DAMAGE 3

Page 101

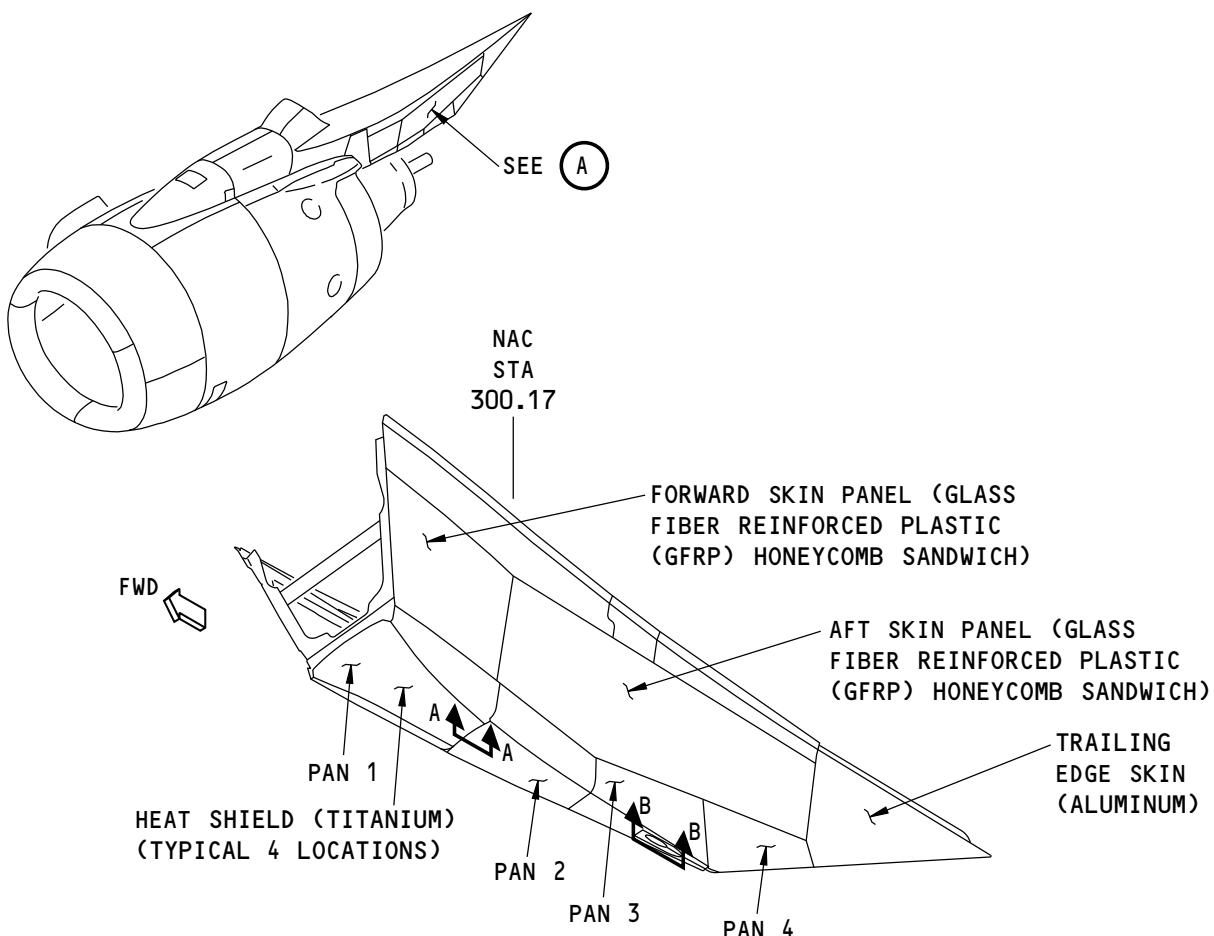
Jul 10/2014

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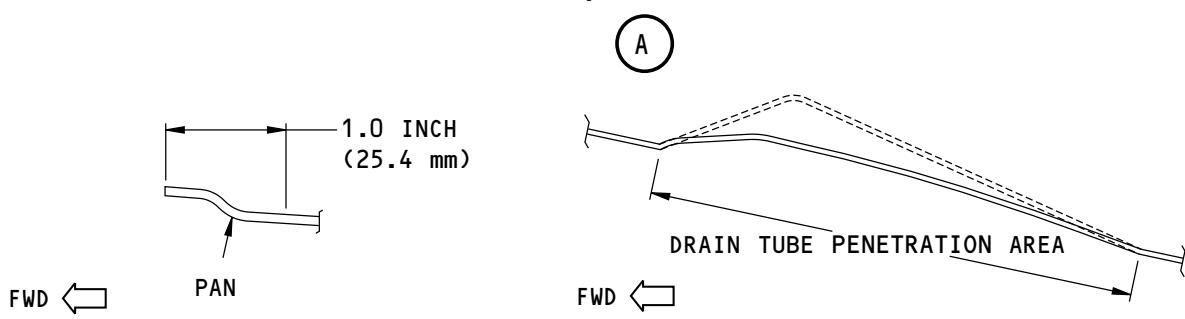
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737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE



FORWARD EDGE OF THE HEAT
SHIELD PAN
(TYPICAL)
A-A

DRAIN TUBE PENETRATION AREA
B-B

G15135 S0006592233_V3

Engine Strut Aft Fairing Skin Locations
Figure 101

54-50-70

ALLOWABLE DAMAGE 3

Page 102

Jul 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL

2. General

- A. Do the steps that follow for parts made from Glass Fiber Reinforced Plastic (GFRP) honeycomb sandwich material:

- (1) 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.

- (a) Refer to Definitions of the Damage Size, Figure 102/ALLOWABLE DAMAGE 3 for the definitions of the length, width, and depth of the damage.

- (b) Refer to Definitions of the Facesheets, Figure 103/ALLOWABLE DAMAGE 3 for the definitions of the facesheets of a honeycomb core area.

- (2) Remove all of the contamination and water from the fairing. Refer to 51-70-04.

- (3) Refer to 51-30-05 for the possible sources of the equipment 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 3 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 of the damage.
- 3) Make sure that the tape is in satisfactory condition after each interval of 400 flight hours or more frequently.
- 4) Repair the damage at or before 5000 flight hours from the time the seal was made.

- (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 51-21-00/701.

- (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 3 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 of the damage.
- (d) Repair the damage at or before 400 flight hours from the time the seal was made.

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 (12.70 MM) 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 STEAM EXPLOSION. IF YOU DO NOT OBEY, AN INJURY CAN OCCUR.

- B. Do the steps that follow for the aluminum or titanium parts.

54-50-70

ALLOWABLE DAMAGE 3

Page 103

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (1) Remove the damage as necessary.
 - (a) Refer to 51-10-02 for the investigation and cleanup procedures.
 - (b) Refer to 51-30-03 for the possible sources of the abrasive and other materials you need to remove the damage.
 - (c) Refer to 51-30-05 for the 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.
- (2) Apply a chemical conversion coating layer to the bare surfaces of the reworked aluminum areas. Refer to 51-20-01.
- (3) Apply two layers of BMS 10-11, Type I primer to the reworked aluminum areas. Refer to SOPM 20-41-02.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS		
MATERIAL	TYPE OF STRUCTURE	PARAGRAPH
GFRP HONEYCOMB SANDWICH	AFT STRUT FAIRING PANELS, FORWARD AND AFT	4.A
TITANIUM	HEAT SHIELD	4.B
ALUMINUM	TRAILING EDGE SKIN	4.C

54-50-70

ALLOWABLE DAMAGE 3

Page 104

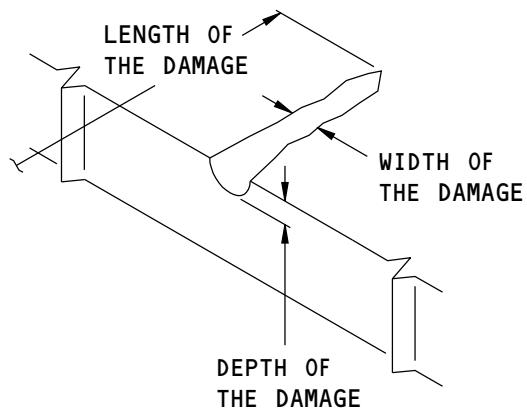
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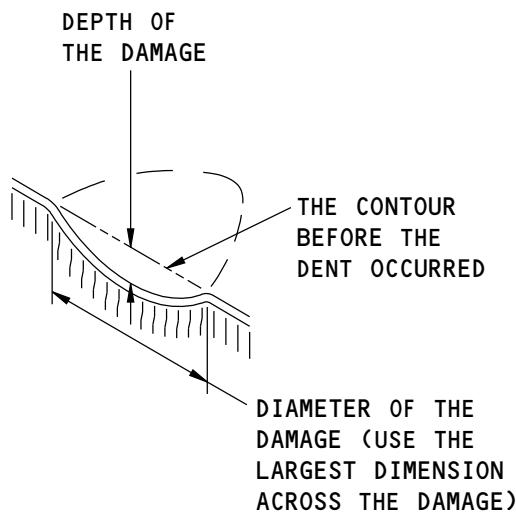


737-800
STRUCTURAL REPAIR MANUAL



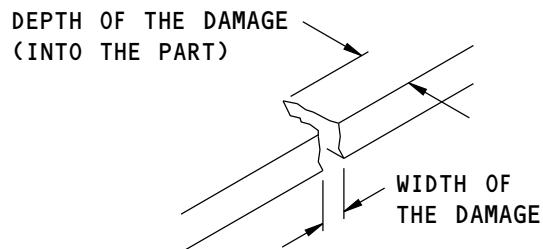
SIZE DEFINITIONS FOR NICK, GOUGE, OR SCRATCH DAMAGE

(A)



SIZE DEFINITIONS FOR
DENT DAMAGE

(B)



SIZE DEFINITIONS FOR
EDGE DAMAGE

(C)

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Definitions of the Damage Size
Figure 102

54-50-70

ALLOWABLE DAMAGE 3

Page 105

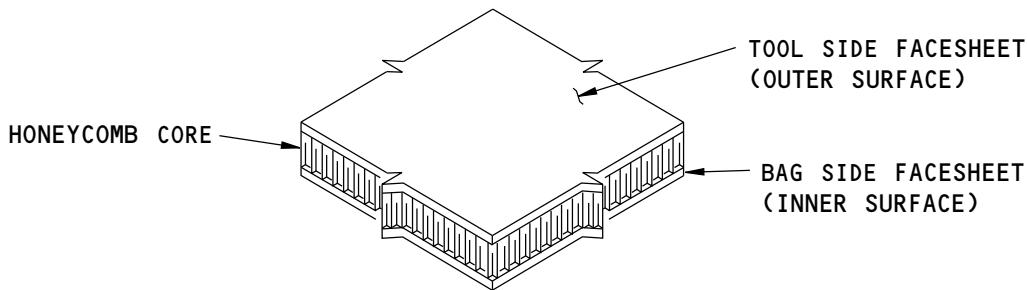
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737-800 STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 103

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	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 51-21-00/701	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. Forward and Aft Fairing Skin Panels - (GFRP Honeycomb Sandwich)

- (1) 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 2.5 inches (63.5 mm)
(c) A maximum width of 0.25 inch (6.35 mm)
(d) A minimum of 0.60 inch (15.24 mm) away from the edge of a fastener hole
(e) A minimum distance from the edge of other damage as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . 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.A.(4)/ALLOWABLE DAMAGE 3

- (2) Dents that do not cause damage to the glass fibers are permitted if they are:
(a) A maximum depth of 0.05 inch (1.27 mm)

54-50-70

ALLOWABLE DAMAGE 3

Page 106

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (b) A maximum diameter of 2.5 inches (63.5 mm)
 - (c) A minimum of 0.60 inch (15.24 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 Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . 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.A.(4)/ALLOWABLE DAMAGE 3
 - (3) Holes and Punctures are permitted if they are:
 - (a) A maximum depth of one facesheet and the honeycomb core
 - (b) A maximum diameter of 2.5 inches (63.5 mm)
 - (c) A minimum of 0.60 inch (15.24 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 Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . 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.A.(4)/ALLOWABLE DAMAGE 3
 - (4) Delaminations are permitted if they are:
 - (a) A maximum length of 2.5 inches (63.5 mm)
 - (b) A maximum width of 2.5 inches (63.5 mm)
 - (c) A minimum of 0.60 inch (15.24 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 Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail A . 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.A.(4)/ALLOWABLE DAMAGE 3
 - (5) Edge Erosion is permitted as shown in Allowable Damage Details for Composite Skin Panels, Figure 104/ALLOWABLE DAMAGE 3, Detail B .
- B. Heat Shield (Titanium)
- (1) Cracks:
 - (a) Remove the damage as given in Allowable Damage Limits, Figure 105/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 105/ALLOWABLE DAMAGE 3, Details C and D .
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- C. Trailing Edge Skin (Aluminum)
- (1) Cracks:
 - (a) Remove the damage as given in Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3, Details A , B , and C .
 - (2) Nicks, Gouges, Scratches, and Corrosion:

54-50-70

ALLOWABLE DAMAGE 3

Page 107

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Remove the damage with one of the two damage removal procedures that follows:
 - 1) Remove the damage as given in Allowable Damage Limits, Figure 105/
ALLOWABLE DAMAGE 3, Details C and D .
 - 2) Drill a hole through the part at the damage location to:
NOTE: Do not drill out the damage if it has been blended out before.
 - a) A maximum of 0.25 inch (6.35 mm) in diameter
 - b) A minimum of 1.0 inch (25.4 mm) from a fastener hole, the edge of the part, or other damage.
 - c) Fill the hole with a 2117-T3 or 2117-T4 aluminum rivet installed without sealant.
- (3) Dents are not permitted.
- (4) Holes and Punctures:
 - (a) The damage is permitted if it is:
 - 1) A maximum diameter of 0.25 inch (6.35 mm)
 - 2) A minimum of 2.0 inches (50.80 mm) away from a fastener hole, the edge of the part, or other damage.
 - 3) Filled with a 2117-T3 or 2117-T4 aluminum protruding head rivet installed without sealant.

54-50-70

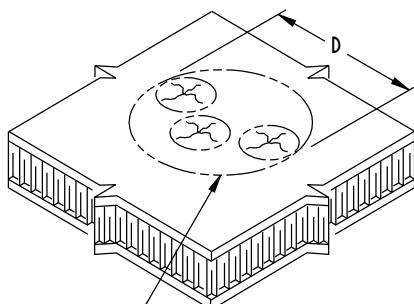
ALLOWABLE DAMAGE 3

Page 108

Jul 10/2014

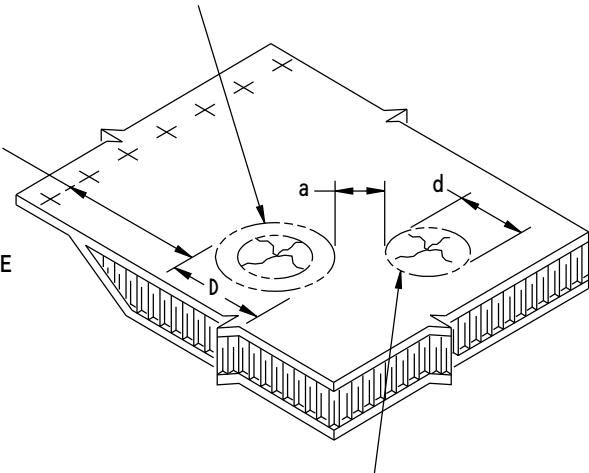
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**737-800
STRUCTURAL REPAIR MANUAL**


INSPECTION SHOWS THAT A DELAMINATION HAS OCCURRED AND IT IS LARGER THAN THE VISUAL DAMAGE

A MINIMUM OF 0.60 INCH (15.24 mm) FROM EDGE OF FASTENER HOLE


SPACING LIMITS FOR ADJACENT DAMAGE AREAS

(A)

NOTE:

- A DAMAGED AREA CAN INCLUDE ANY OF THE TYPES OF DAMAGE WHICH FOLLOW:
 - A DENT
 - A DELAMINATION
 - A HOLE OR PUNCTURE
- 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. USE THE DIAMETER OF THE LARGER DAMAGE.
- 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 THE LARGER OF 0.75D OR 2d.

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Allowable Damage Details for Composite Skin Panels
Figure 104 (Sheet 1 of 2)

54-50-70

ALLOWABLE DAMAGE 3

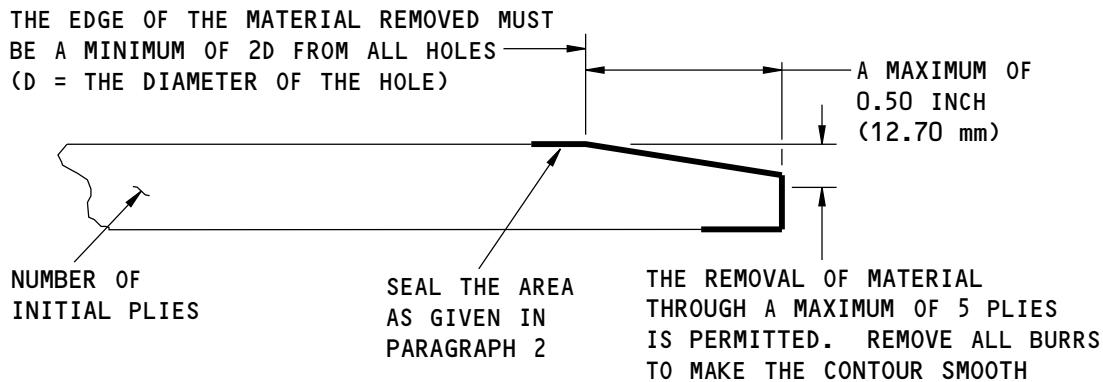
Page 109

Jul 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL



CLEANUP AND SEALING OF EDGE EROSION DAMAGE

(B)

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Allowable Damage Details for Composite Skin Panels

Figure 104 (Sheet 2 of 2)

54-50-70

ALLOWABLE DAMAGE 3

Page 110

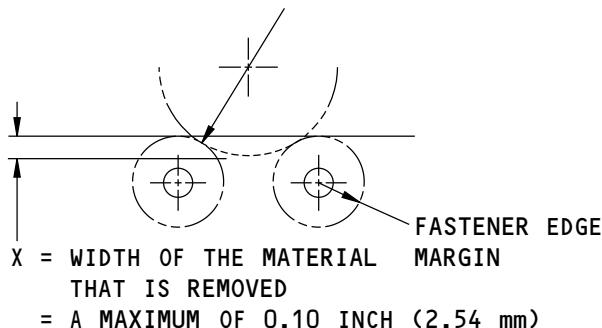
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**737-800
STRUCTURAL REPAIR MANUAL**

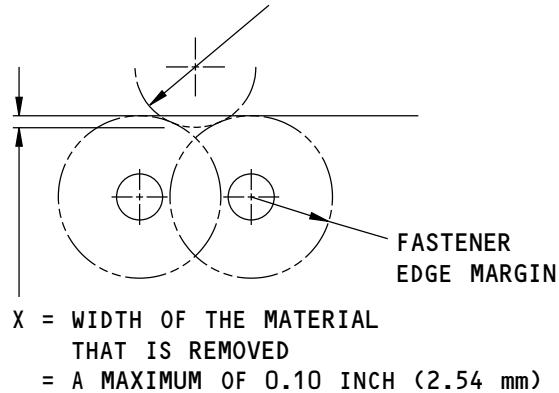
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)



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 (25.40 mm)



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

(B)

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

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

MAKE THE CONTOUR
SMOOTH (TYPICAL)

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

X

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

(C)

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**Allowable Damage Limits
Figure 105 (Sheet 1 of 2)**

54-50-70

ALLOWABLE DAMAGE 3

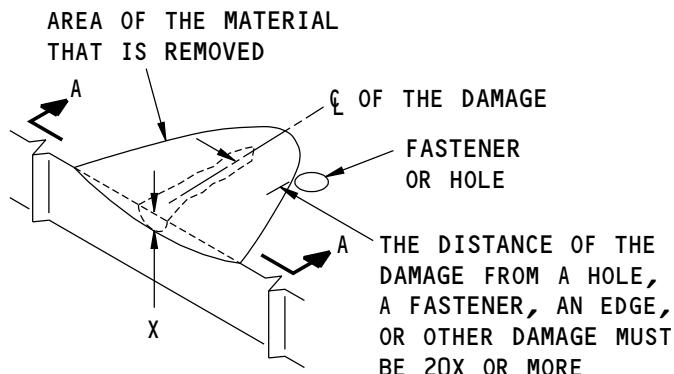
Page 111

Jul 10/2014

D634A210



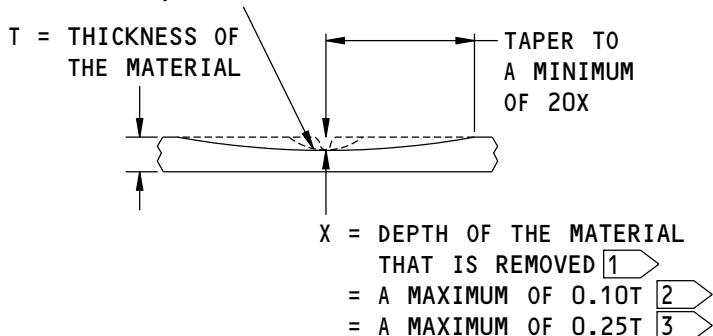
737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(D)

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



A-A

NOTES

- [1] NOT APPLICABLE TO 1.0 INCH (25.4 mm) OF THE FORWARD EDGE OF THE HEAT SHIELD PANS 1, 2, 3 AND 4, REFER TO SECTION A-A IN FIGURE 101.
- [2] APPLICABLE TO THE DRAIN TUBE PENETRATION AREA OF THE HEAT SHIELD PAN 3, REFER TO SECTION B-B IN FIGURE 101.
- [3] APPLICABLE TO THE TRAILING EDGE SKIN. APPLICABLE TO HEAT SHIELD PANS 1, 2, 3 AND 4 THAT ARE NOT IN [1] [2]. REFER TO SECTIONS A-A AND B-B IN FIGURE 101.

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Allowable Damage Limits
Figure 105 (Sheet 2 of 2)

54-50-70

ALLOWABLE DAMAGE 3

Page 112

Jul 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - ENGINE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANELS

1. Applicability

- A. Repair 1 is applicable to damage on the skin panels of: (Refer to Strut Thumbnail and Forward Fairing Skin Panel Locations, Figure 201/REPAIR 1.)
 - (1) The Strut Thumbnail Fairing
 - (2) The Forward Fairing

2. General

- A. Get access to the damaged area.
 - (1) Remove the applicable fairing panel, if necessary. Refer to AMM 54-52-01/401.
 - (a) Refer to 51-40-02, GENERAL for fastener removal.
- B. Do an inspection of the damaged area to find the dimensions of the damage. The Boeing Company 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 inspection methods that have been examined and found to be satisfactory by the operator can be used.

- C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 1 for the definitions of the length, width, and depth of damage.
- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 1 for the definitions of the facesheets of a honeycomb core area.
- E. The GFRP panels of the Strut Forward Fairing have BMS 8-336 expanded aluminum foil mesh or BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:
 - (1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.
 - (2) Seal the damage as given in 51-70-14.
- F. Do the repair as given in Paragraph 4./REPAIR 1
- G. Put the fairing panel back to the initial condition, as applicable.
 - (1) Install the fairing panel as given in AMM 54-52-01/401, if it was removed.
 - (a) Refer to 51-40-02, GENERAL for fastener installation.
 - (2) 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, GENERAL.

54-50-70

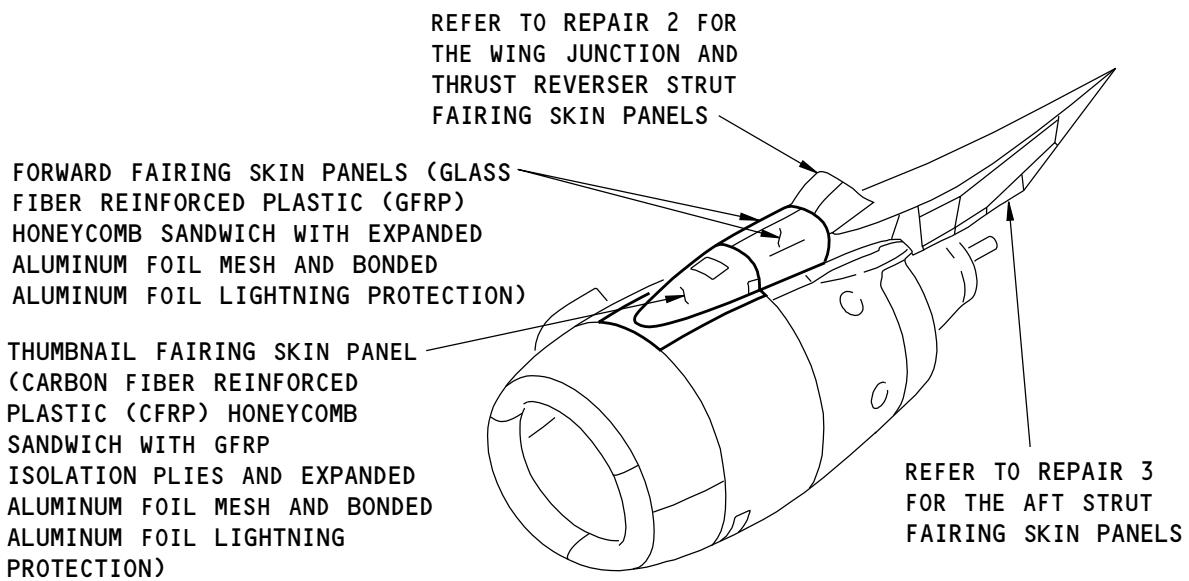
REPAIR 1
Page 201
Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



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Strut Thumbnail and Forward Fairing Skin Panel Locations
Figure 201

54-50-70

REPAIR 1
Page 202

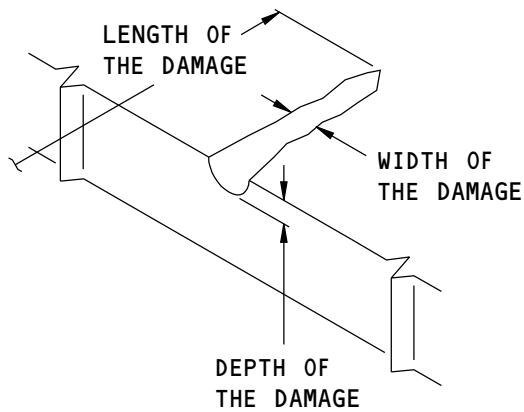
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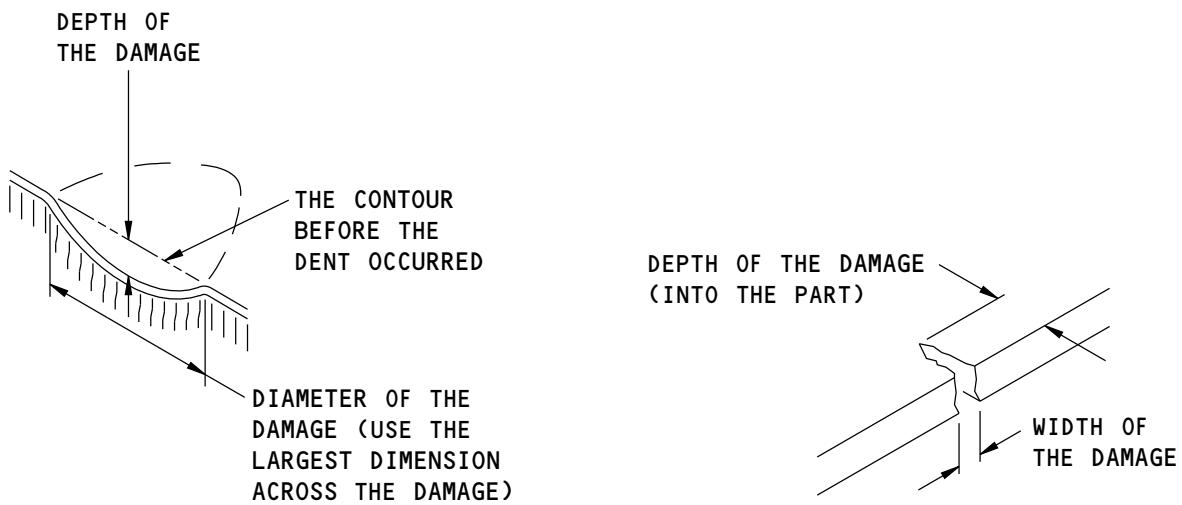


737-800
STRUCTURAL REPAIR MANUAL



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 202

54-50-70

REPAIR 1
Page 203

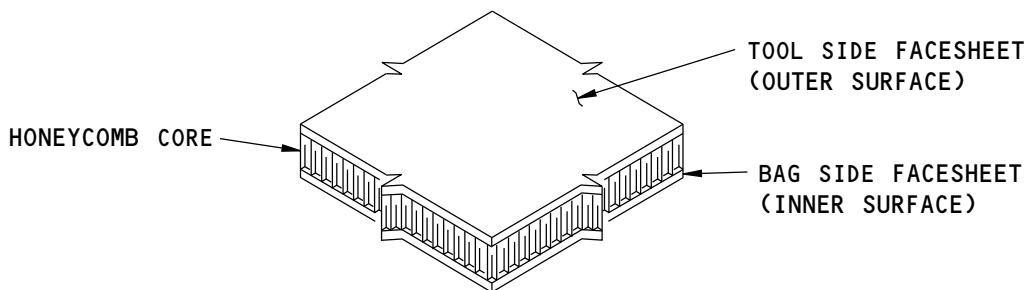
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737-800 STRUCTURAL REPAIR MANUAL



F19377 S0006592245_V1

Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-10-01, GENERAL	Aerodynamic Smoothness Requirements
51-20-05	REPAIR SEALING
51-40-02, GENERAL	Fastener Installation and Removal
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 54-52-01/401	Strut Forward Fairings - 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
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

- A. For dents that are a maximum of 2.0 in. (50.80 mm) 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. 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 the honeycomb core and the edgeband areas of the fairing skin panels.
- C. For an Interim repair made with wet layup materials and cured at 150°F (66°C), do the steps that follow:
 - (1) Use one repair ply of carbon fiber reinforced plastic (CFRP) for each initial ply that was damaged.
 - (2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

- (a) Put the first structural ply at ± 45 degrees to the core ribbon direction.
- (b) Put the second structural ply at 0 or 90 degrees.

54-50-70

REPAIR 1
Page 204

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Add one glass fabric reinforced plastic (GFRP) isolation ply.
 - (a) Ply direction is optional.
- (4) Examine an Interim repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

- (a) If deterioration is found, replace an Interim repair with a Permanent repair.

- D. For Permanent repairs made with wet layup materials and cured at 200°F (93°C), do the steps that follow:

- (1) Use one repair ply of CFRP for each initial ply that was damaged.
- (2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

- (a) Put the first structural ply at ±90 degrees to the core ribbon direction.
 - (b) Put the second structural ply at 90 degrees to the first.
- (3) Add one glass GFRP isolation ply.
 - (a) Ply direction is optional.

- E. For Permanent repairs made with preimpregnated layup materials and cured at 250°F (121°C), do the steps that follow:

- (1) Use the same material, ply direction, and number of repair plies of CFRP for each initial ply that was damaged.

Table 201: REPAIR DATA FOR THE 350°F (177°C) CURE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANEL FOR HONEYCOMB CORE AND EDGEBAND AREAS

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	ROOM TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)
REPAIR SIZE AND LIMITS	Damage that is a maximum of: - 2.0 in. (50.80 mm) in diameter - 10 percent of the smallest dimension across the panel at the damage location - One facesheet and the honeycomb core in depth One repair for each square foot (929 cm ²)	Damage that is a maximum of: - 4.0 in. (101.60 mm) in diameter - 20 percent of the smallest dimension across the panel at the damage location - One facesheet and the honeycomb core in depth One repair for each square foot (929 cm ²)	Damage that is a maximum of: - 8.0 in. (203.20 mm) in diameter - 30 percent of the smallest dimension across the panel at the damage location One repair for each square foot (929 cm ²)	There are no size limits on the dimensions of the repair

54-50-70

REPAIR 1
Page 205

Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: REPAIR DATA FOR THE 350°F (177°C) CURE STRUT THUMBNAIL AND FORWARD FAIRING SKIN PANEL FOR HONEYCOMB CORE AND EDGE BAND AREAS (Continued)

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	ROOM TEMPERATURE	150°F (66°C)	200°F (93°C)	250°F (121°C)
	6.0 in. (152.40 mm) minimum clearance from: -other repairs -fastener holes -panel edges	6.0 in. (152.40 mm) minimum clearance from: -other repairs -fastener holes -panel edges	6.0 in. (152.40 mm) minimum clearance from: -other repairs -fastener holes -panel edges	
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.D	SRM 51-70-05 and Paragraph 4.E

54-50-70

REPAIR 1
Page 206

Jul 10/2014

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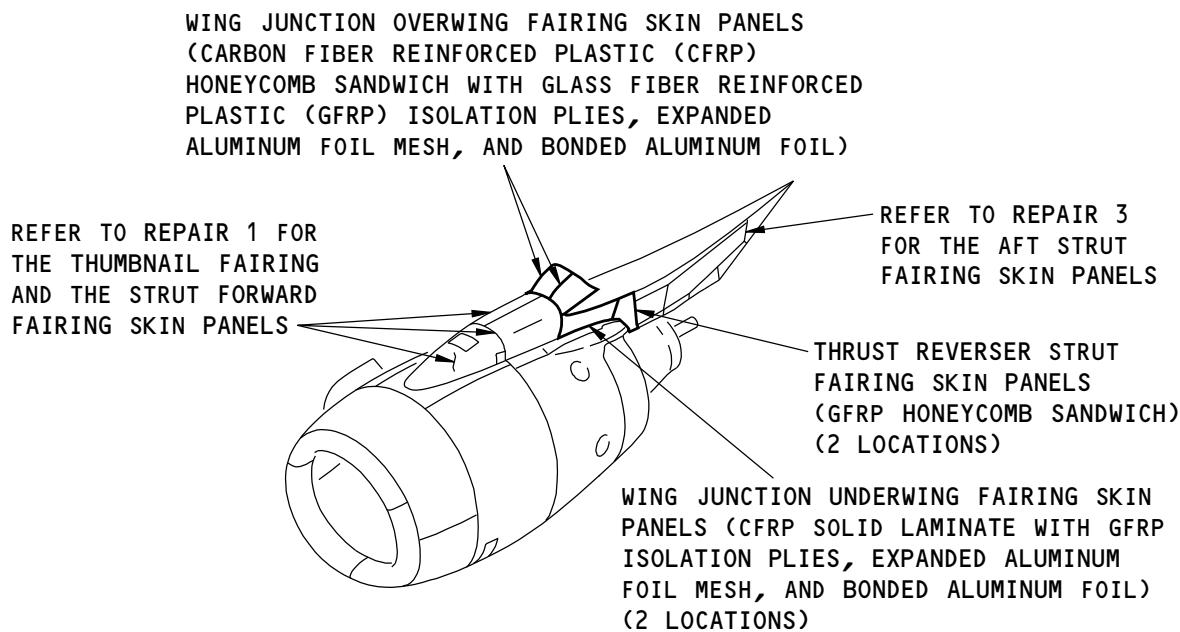
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - WING JUNCTION AND THRUST REVERSER STRUT FAIRING SKIN PANELS

1. Applicability

- A. Repair 2 is applicable to damage on the skin panels of:
 - (1) The Wing Junction Fairing which includes:
 - (a) The left and right Overwing Fairings
 - (b) The inboard and outboard Underwing Fairings.
 - (2) The left and right Thrust Reverser Strut Fairings.



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Wing Junction and Thrust Reverser Strut Fairing Skin Panel Locations
Figure 201

2. General

- A. Get access to the damaged area.
 - (1) Remove the applicable fairing panel, if necessary.
 - (a) Refer to AMM 54-52-03/401 for the Wing Junction Overwing and Underwing Fairings.
 - (b) Refer to AMM 54-53-02/401 for the Thrust Reverser Strut Fairings.
 - (c) Refer to 51-40-02, GENERAL for fastener removal.
- B. Do an inspection of the damaged area to find the dimensions of the damage. The Boeing Company 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 inspection methods that have been examined and found to be satisfactory by the operator can be used.
- C. Refer to Definitions of the Damage Size, Figure 202/REPAIR 2 for the definitions of the length, width, and depth of damage.

54-50-70

REPAIR 2
 Page 201
 Jul 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL

- D. Refer to Definitions of the Facesheets, Figure 203/REPAIR 2 for the definitions of the facesheets of a honeycomb core area.
- E. The CFRP panels of the Wing Junction Overwing and Underwing Fairings have BMS 8-336 expanded aluminum foil mesh and BMS 8-289 aluminum foil for lightning protection. If damage occurs to the expanded aluminum foil mesh or the aluminum foil, do the steps that follow:
 - (1) Refer to 51-70-14 for the allowable damage limits for the expanded aluminum foil mesh or the aluminum foil.
 - (2) Seal the damage as given in 51-70-14.
- F. Do the repair as given in Paragraph 4./REPAIR 2
- G. Put the fairing panel back to the initial condition, as applicable.
 - (1) Install the fairing panel if it was removed.
 - (a) Refer to AMM 54-52-03/401 for the Wing Junction Overwing and Underwing Fairings.
 - (b) Refer to AMM 54-53-02/401 for the Thrust Reverser Strut Fairing Panels.
 - (c) Refer to 51-40-02, GENERAL for fastener removal.
 - (2) 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.

54-50-70

REPAIR 2
Page 202

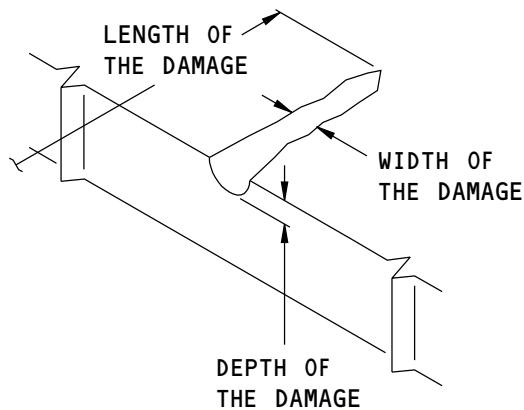
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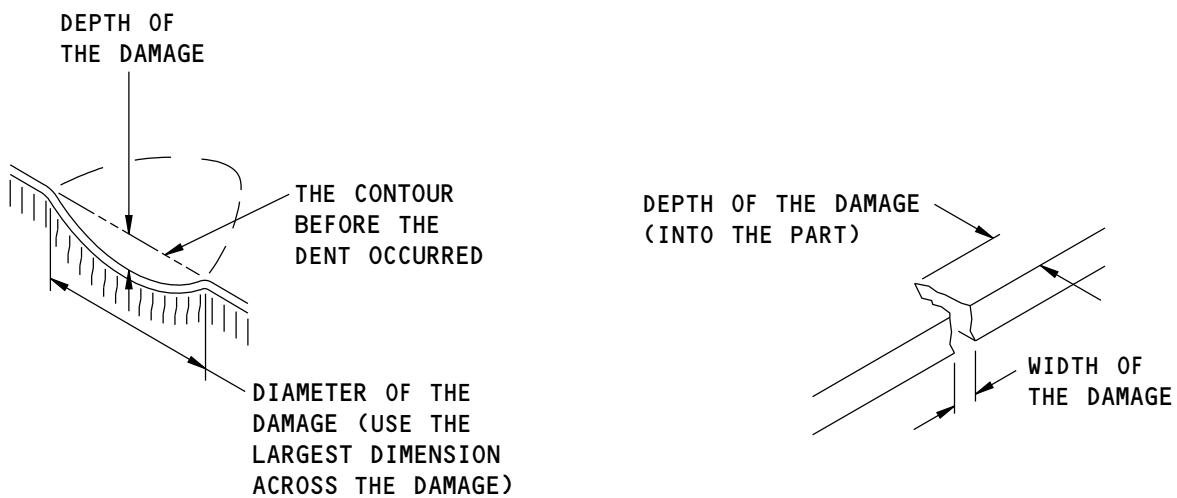


737-800
STRUCTURAL REPAIR MANUAL



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 202

54-50-70

REPAIR 2
Page 203

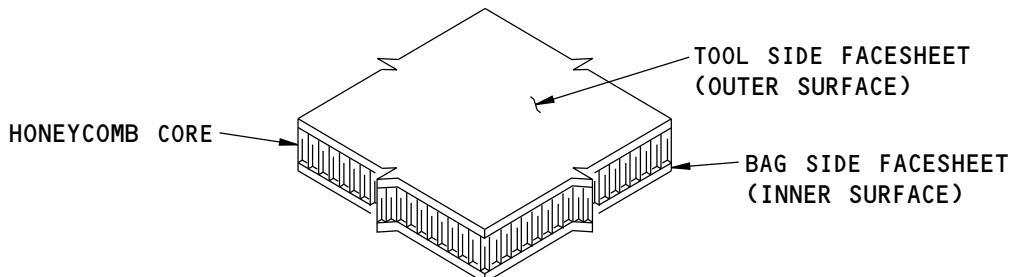
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737-800
STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-40-02, GENERAL	Fastener Installation and Removal
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPREGNATED MATERIALS
51-70-14	STRUCTURES WITH ALUMINUM COATINGS AND FOILS
AMM 54-52-03/401	Wing Junction Fairings - Removal/Installation
AMM 54-53-02/401	Strut Access Panels - 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
737 NDT Part 1, 51-01-03	NDT Assessment of Lightning Strike Damage to Graphite/Epoxy Composite Structure

4. Repair Instructions

- A. For dents that are a maximum of 2.0 in. (50.80 mm) 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. If Paragraph 4.A./REPAIR 2 is not applicable, then refer to:
 - (1) Refer to Table 201/REPAIR 2 for the repair data that is applicable to damage in the honeycomb core areas of the fairing skin panels.
 - (2) Refer to Table 202/REPAIR 2 for the repair data that is applicable to damage in the edgeband areas of honeycomb core panels.
 - (3) Refer to Table 203/REPAIR 2 for the repair data that is applicable to damage in solid laminate panels.
- C. For an Interim repair made with wet layup materials and cured at 150°F (66°C), do the steps that follow:
 - (1) Use one repair ply of carbon fiber reinforced plastic (CFRP) for each initial ply that was damaged.

54-50-70

REPAIR 2
Page 204

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

- (a) Put the first structural ply at ± 45 degrees to the core ribbon direction.
- (b) Put the second structural ply at 0 or 90 degrees.

- (3) Add one glass fabric reinforced plastic (GFRP) isolation ply. Ply direction is optional.

- (4) Examine an Interim repair after each interval of 400 flight cycles or more frequently. Refer to 737 NDT Part 1, 51-01-01 for the inspection procedures.

NOTE: Other inspection methods that have been examined and found to be satisfactory by the operator can be used. If you use the tap test method, Boeing recommends that you do an instrumented Non-Destructive Test (NDT) before 400 flight cycles occur after the tap test is done.

- (a) If deterioration is found, replace an Interim repair with a Permanent repair.

- D. For a Permanent repair made with wet layup materials and cured at 200°F (93°C), do the steps that follow:

- (1) Use one repair ply of CFRP for each initial ply that was damaged.

- (2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

- (a) Put the first structural ply at ± 45 degrees to the core ribbon direction.
- (b) Put the second structural ply at 90 degrees to the first.

- (3) Add one glass GFRP isolation ply. Ply direction is optional.

- E. For a Permanent repair made with preimpregnated layup materials and cured at 250°F (121°C), do the steps that follow:

- (1) Use one repair ply of CFRP for each initial ply that was damaged.

- (2) Add two structural plies of CFRP for each facesheet that is repaired.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

- (a) Put the first structural ply at ± 45 degrees to the core ribbon direction.
- (b) Put the second structural ply at 90 degrees to the first.

- (3) Add one glass GFRP isolation ply. Ply direction is optional.

- F. For a Permanent repair made with preimpregnated layup materials and cured at 350°F (177°C), do the steps that follow:

- (1) Use the same material, ply direction, and number of repair plies of CFRP for each initial ply that was damaged.

54-50-70

REPAIR 2
Page 205

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 201: REPAIR DATA FOR THE 350°F (177°C) CURE HONEYCOMB CORE AREAS

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREIMPREG- PREIMPREGNATED LAYUP	PERMANENT REPAIR 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: - 4.0 in. (101.60 mm) in diameter - 20 percent of the smallest dimension across the honeycomb core in the damage location - One facesheet and the honeycomb core in depth	Damage that is a maximum of: - 8.0 in. (203.20 mm) in diameter - 30 percent of the smallest dimension across the honeycomb core in the damage location	Damage that is a maximum of: -10.0 in. (254.00 mm) in diameter - 50 percent of the smallest dimension across the honeycomb core in the damage location	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	Paragraph 4.C and SRM 51-70-04	Paragraph 4.D and SRM 51-70-04	Paragraph 4.E and SRM 51-70-05	Paragraph 4.F and SRM 51-70-05

Table 202: REPAIR DATA FOR THE 350°F (177°C) CURE SOLID LAMINATE AND EDGEBOARD AREAS

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREPREGNATED LAYUP	PERMANENT REPAIR 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: - 20 percent of the length of the edgeband on a side - 20 percent of the cross-sectional area through the edgeband One repair for each square foot (0.093 m ²) of area	Damage that is a maximum of: - 30 percent of the length of the edgeband on a side - 30 percent of the cross-sectional area through the edgeband	Damage that is a maximum of: - 50 percent of the length of the edgeband on a side - 50 percent of the cross-sectional area through the edgeband	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	Paragraph 4.C and SRM 51-70-04	Paragraph 4.D and SRM 51-70-04	Paragraph 4.E and SRM 51-70-05	Paragraph 4.F and SRM 51-70-05

54-50-70

REPAIR 2
Page 206

Nov 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 203: REPAIR DATA FOR THE 350°F (177°C) CURE SOLID LAMINATE PANELS

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREIMPREGNATED LAYUP	PERMANENT REPAIR 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: - 20 percent of the length of the panel on a side - 20 percent of the cross-sectional area through the panel One repair for each square foot (0.093 m ²) of area	Damage that is a maximum of: - 30 percent of the length of the panel on a side - 30 percent of the cross-sectional area through the panel	Damage that is a maximum of: - 50 percent of the length of the panel on a side - 50 percent of the cross-sectional area through the panel	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	Paragraph 4.C and SRM 51-70-04	Paragraph 4.D and SRM 51-70-04	Paragraph 4.E and SRM 51-70-05	Paragraph 4.F and SRM 51-70-05

54-50-70

REPAIR 2
Page 207

Nov 10/2014

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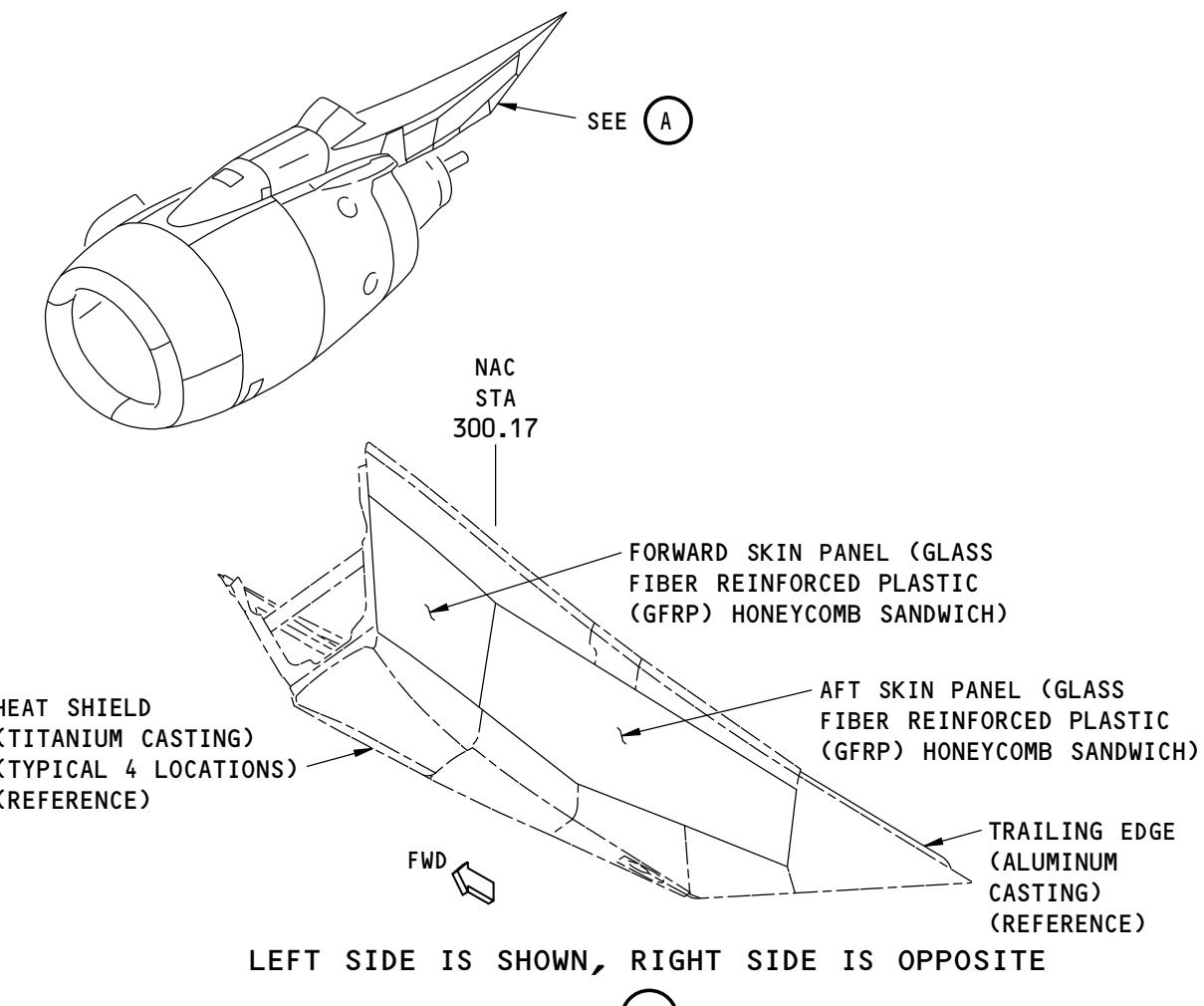


737-800
STRUCTURAL REPAIR MANUAL

REPAIR 3 - ENGINE STRUT AFT FAIRING SKIN PANELS

1. Applicability

- A. Repair 3 is applicable to damage on the forward and aft composite skin panels on the engine strut aft fairing as shown in Engine Strut Aft Fairing Skin Locations, Figure 201/REPAIR 3.
- B. Repair 3 is applicable to damage that is more than the limits permitted in Allowable Damage 3. Refer to 54-50-70, ALLOWABLE DAMAGE 3 for the type and size of damage that is permitted.



Engine Strut Aft Fairing Skin Locations
Figure 201

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2. General

- A. Get access to the damaged area.
 - (1) Remove the parts if necessary.
 - (a) Refer to AMM 54-53-03/401 for removal of the engine strut aft fairing skin panels.
 - (b) Refer to 51-40-02, GENERAL for the data on fastener removal.

54-50-70

REPAIR 3

Page 201

Jul 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL

- B. Do an inspection of the damaged area to find the dimensions of the damage. The Boeing Company 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 Figure 202/REPAIR 3 for the definitions of the length, width, and depth of damage.
- (2) Refer to Figure 203/REPAIR 3 for the definitions of the facesheets of a honeycomb core area.

- C. Do the repair as given in Paragraph 4./REPAIR 3

- D. Put the fairing skin panels back to the initial condition, as applicable.

- (1) Install the parts if they were removed.
 - (a) Refer to AMM 54-53-03/401 for installation of the aft strut fairing skin panels.
 - (b) Refer to 51-40-02, GENERAL for fastener removal and installation.
- (2) 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.

54-50-70

REPAIR 3
Page 202

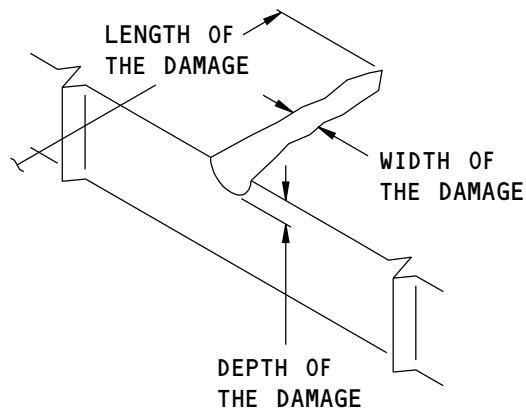
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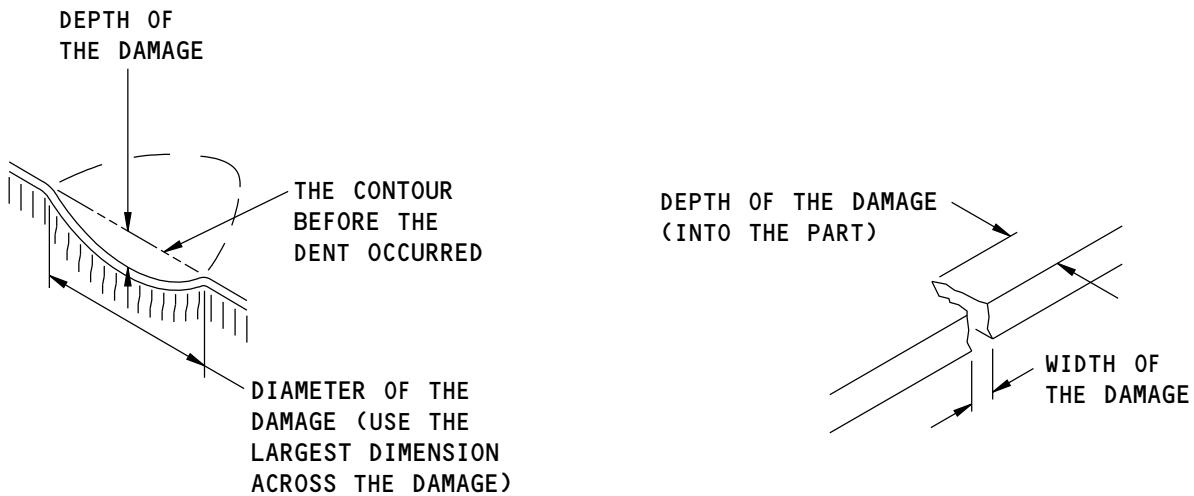


737-800
STRUCTURAL REPAIR MANUAL



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 202

54-50-70

REPAIR 3
Page 203

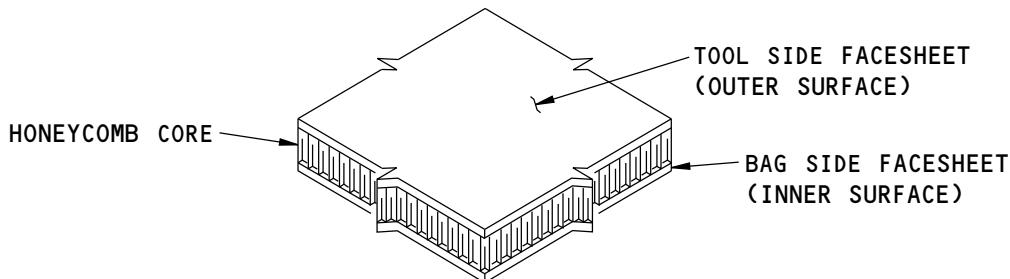
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737-800
STRUCTURAL REPAIR MANUAL



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Definitions of the Facesheets
Figure 203

3. References

Reference	Title
51-10-01	AERODYNAMIC SMOOTHNESS
51-40-02, GENERAL	Fastener Installation and Removal
51-70-04	REPAIR PROCEDURES FOR WET LAYUP MATERIALS
51-70-05	REPAIR PROCEDURES FOR PREIMPRregnATED MATERIALS
54-50-70, ALLOWABLE DAMAGE 3	Engine Strut Aft Fairing Skin Panels
AMM 54-53-03/401	Aft Strut Fairing Skin Panels - 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. For dents that are a maximum of 3.0 in. (76.20 mm) 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. If Paragraph 4.A./REPAIR 3 is not applicable, then refer to:
 - (1) Table 201/REPAIR 3 for the repair data that is applicable to damage in the honeycomb sandwich areas of the aft strut fairing skin panels
 - (2) Table 202/REPAIR 3 for the repair data that is applicable to damage in the edgeband areas of the aft strut fairing skin panels.
- C. For repairs made with wet layup materials, do that which follows, as applicable:
 - (1) Use one repair ply 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 ply at 0 or 90 degrees.

NOTE: Repair plies or added plies are not necessary in the repair of a delamination at an edge if the delamination is a minimum of 2D (D = fastener diameter) away from a fastener hole.

54-50-70

REPAIR 3
Page 204

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Examine Interim 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 the repair must be replaced with a Permanent repair.

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 350°F (177°C) CURE AFT STRUT FAIRING SKIN PANELS FOR AREAS OTHER THAN THE EDGEBANDS

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C) CURE	200°F (93°C) CURE	350°F (177°C) CURE
REPAIR SIZE AND LIMITS	<p>Damage that is a maximum of:</p> <ul style="list-style-type: none"> -5.0 in. (127.00 mm) in diameter - 30 percent of the smallest dimension across the panel at the damage location - One facesheet and honeycomb core in depth - One repair in each square foot (929 cm square) of area - 6.0 in. (152.40 mm) minimum clearance from: - other repairs - fastener holes - panel edges 	<p>Damage that is a maximum of:</p> <ul style="list-style-type: none"> -6.0 in. (152.40 mm) in diameter - 50 percent of the smallest dimension across the panel at the damage location - One repair in each square foot (929 cm square) of area -2.0 in. (50.80 mm) minimum clearance from: - other repairs - fastener holes - panel edges 	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	SRM 51-70-06 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 350°F (177°C) CURE EDGEBANDS FOR THE AFT STRUT FAIRING SKIN PANELS

REPAIR TYPE	INTERIM REPAIR WET LAYUP	PERMANENT REPAIR WET LAYUP	PERMANENT REPAIR PREIMPREGNATED LAYUP
REPAIR CURE TEMPERATURE	150°F (66°C) CURE	200°F (93°C) CURE	350°F (177°C) CURE
REPAIR SIZE AND LIMITS	<p>Damage that is a maximum of:</p> <ul style="list-style-type: none"> - 15 percent of the cross-sectional area of the edgeband at the damage location - 10 percent of length of the edgeband on the side of the damage 	There are no size limits on the dimensions of the repair	There are no size limits on the dimensions of the repair
REPAIR PROCEDURES	SRM 51-70-06 and Paragraph 4.C	SRM 51-70-04 and Paragraph 4.C	SRM 51-70-05 and Paragraph 4.D

54-50-70

REPAIR 3
Page 205

Nov 10/2014

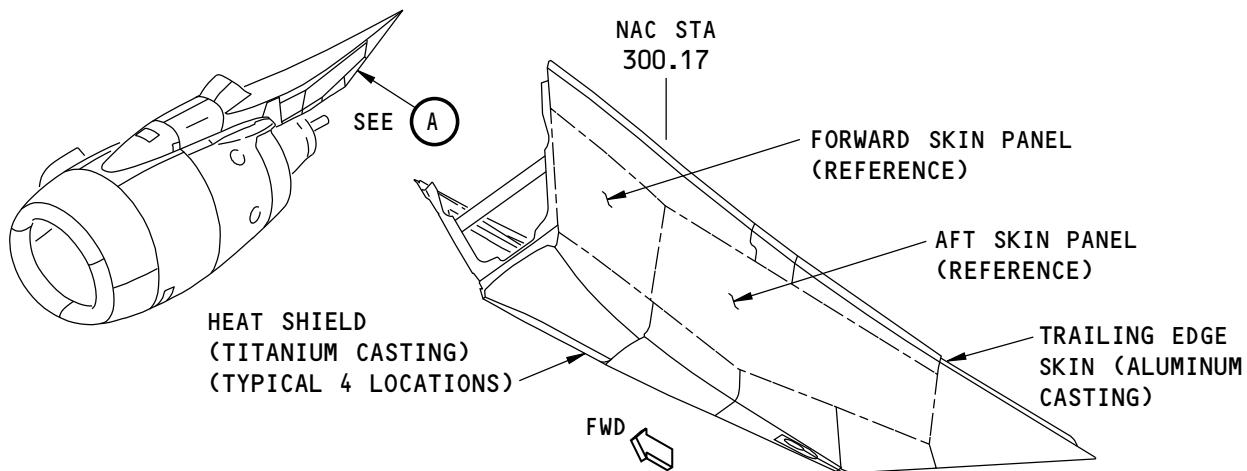
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - ENGINE STRUT AFT FAIRING - TRAILING EDGE SKIN AND HEAT SHIELD



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

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Engine Strut Aft Fairing Trailing Edge Skin and Heat Shield Locations
Figure 201

54-50-70

REPAIR 4
Page 201

Nov 10/2012

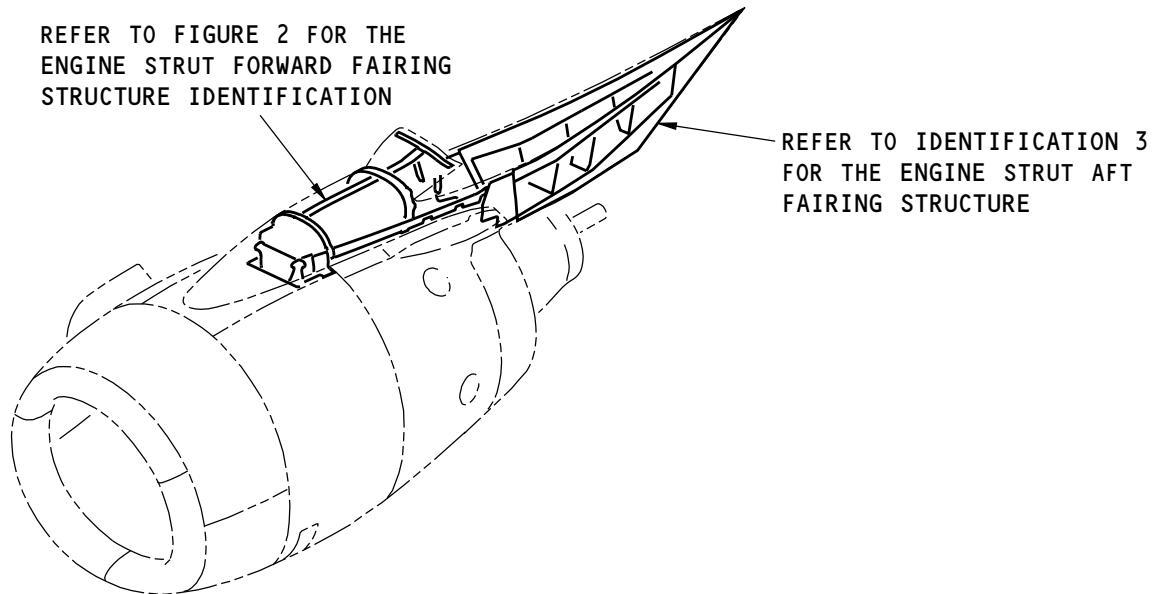
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ENGINE STRUT FORWARD FAIRING STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

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Engine Strut Forward Fairing Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
313A2143	Strut Forward Fairing Support Frame Assembly
313A2240	Wing Junction Fairing Support Installation

54-50-71

IDENTIFICATION 1

Page 1

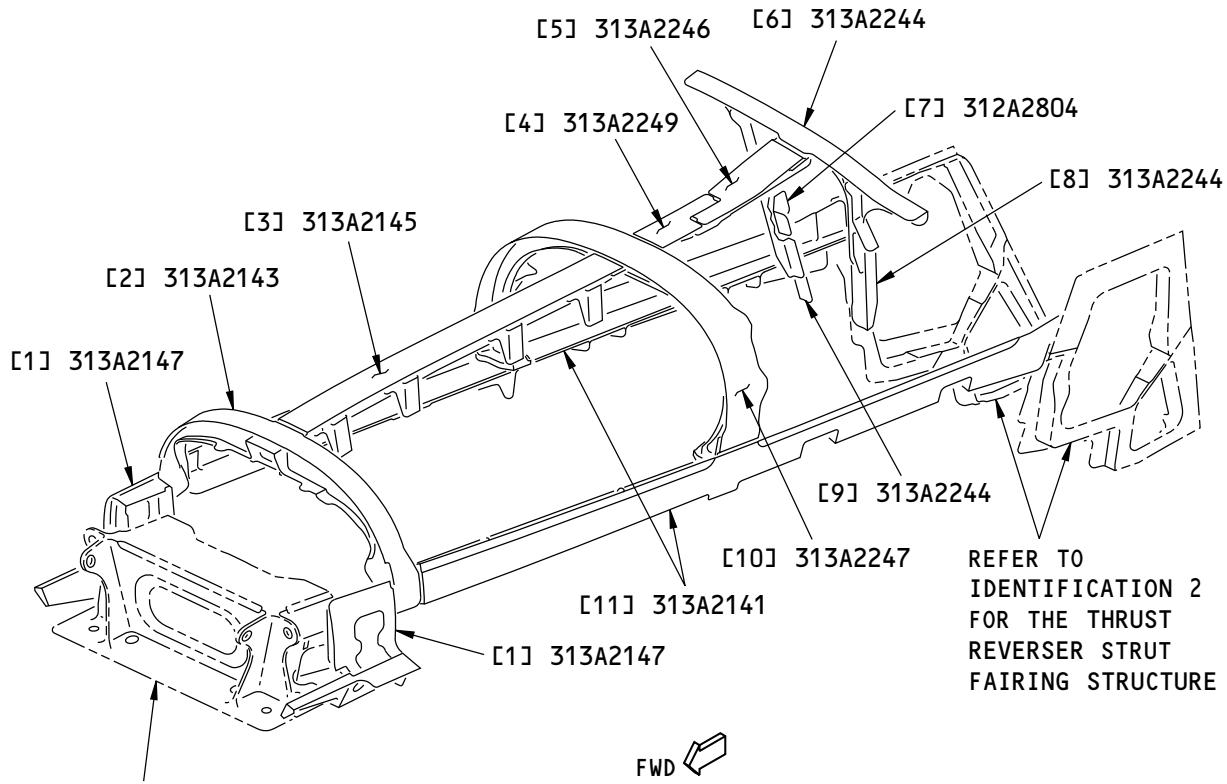
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737-800
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NOTE: REFER TO TABLE 2 FOR THE LIST OF MATERIALS.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

F05186 S0006592267_V2

Engine Strut Forward Fairing Structure Identification
Figure 2

54-50-71
IDENTIFICATION 1
Page 2
Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Support Fitting - Access Panel (2 locations)	2.7 (68.6)	2124-T851 machined plate as given in QQ-A-250/29	
[2]	Forward Frame	3.8 (96.5)	2124-T851 machined plate as given in QQ-A-250/29	
[3]	Forward Support	3.0 (76.2)	2124-T851 machined plate as given in QQ-A-250/29	
[4]	Support	3.1 (78.7)	2124-T851 machined plate as given in QQ-A-250/29	
[5]	Support	3.1 (78.7)	2124-T851 machined plate as given in QQ-A-250/29	
[6]	Upper Frame	2.00 (50.8)	2124-T851 machined plate as given in QQ-A-250/29	
[7]	Bracket	1.10 (27.9)	BAC1510-1317 2024-T8511 extrusion as given in QQ-A-200/3 (Optional: 2024-T851 machined bar as given in QQ-A-225/6, or 2124-T851 plate as given in QQ-A-250/29)	
[8]	Lower Outboard Frame (2 locations)		BAC1503-100161 2024-T8511 extrusion as given in QQ-A-200/3 (Optional: 2024-T851 machined bar as given in QQ-A-225/6, or 2124-T851 plate as given in QQ-A-250/29)	
[9]	Lower Inboard Frame (2 locations)		BAC1503-100161 2024-T8511 extrusion as given in QQ-A-200/3 (Optional: 2024-T851 machined bar as given in QQ-A-225/6, or 2124-T851 plate as given in QQ-A-250/29)	
[10]	Aft Frame	3.8 (96.5)	2124-T851 machined plate as given in QQ-A-250/29	
[11]	Skate Angle (2 locations)	3.2 (81.3)	7050-T7451 machined plate as given in AMS 4050	

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

54-50-71

IDENTIFICATION 1

Page 3

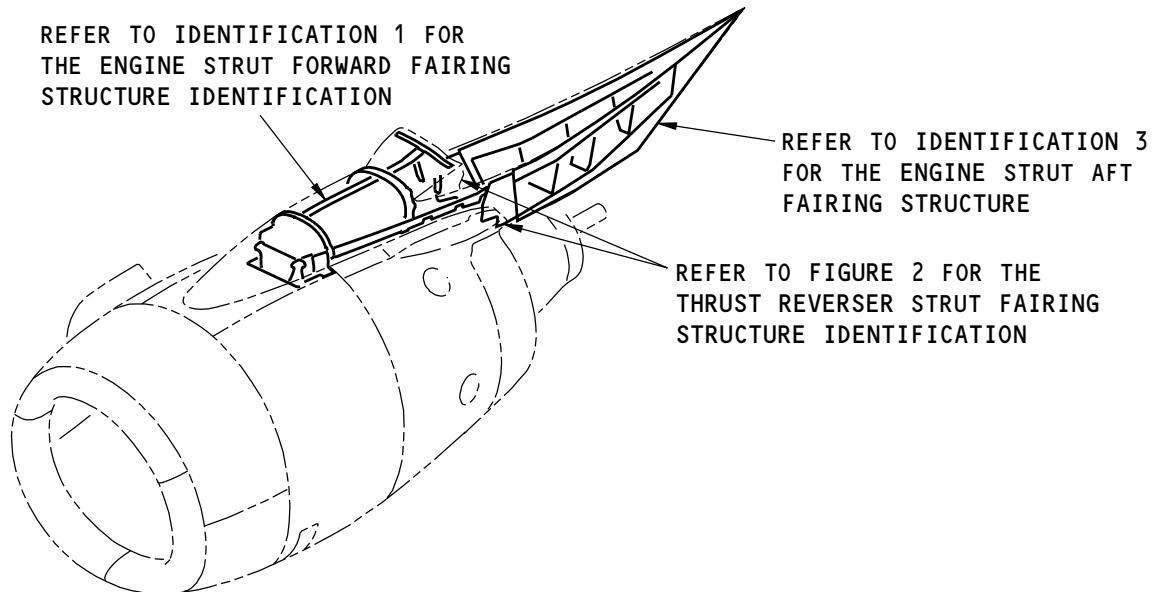
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - THRUST REVERSER STRUT FAIRING STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

G48583 S0006592270_V1

Thrust Reverser Strut Fairing Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2530	Thrust Reverser Strut Fairing Installation
311A2533	Thrust Reverser Strut Fairing Structure Assembly

54-50-71
IDENTIFICATION 2
Page 1
Nov 10/2012

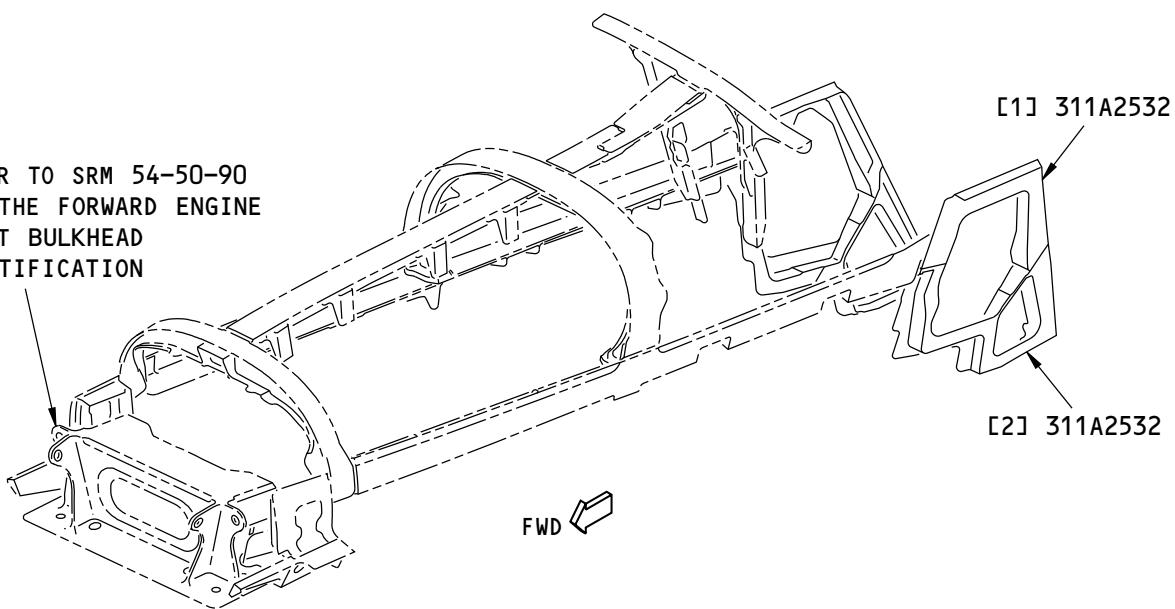
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737-800
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REFER TO SRM 54-50-90
FOR THE FORWARD ENGINE
MOUNT BULKHEAD
IDENTIFICATION



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

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

G48585 S0006592272_V1

Thrust Reverser Strut Fairing Structure Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Fitting - Thrust Reverser Strut Fairing Support		2124-T851 machined plate as given in QQ-A-250/29	
[2]	Lower Fitting - Thrust Reverser Strut Fairing Support		2124-T851 machined plate as given in QQ-A-250/29	

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

54-50-71
IDENTIFICATION 2
Page 2
Nov 10/2012

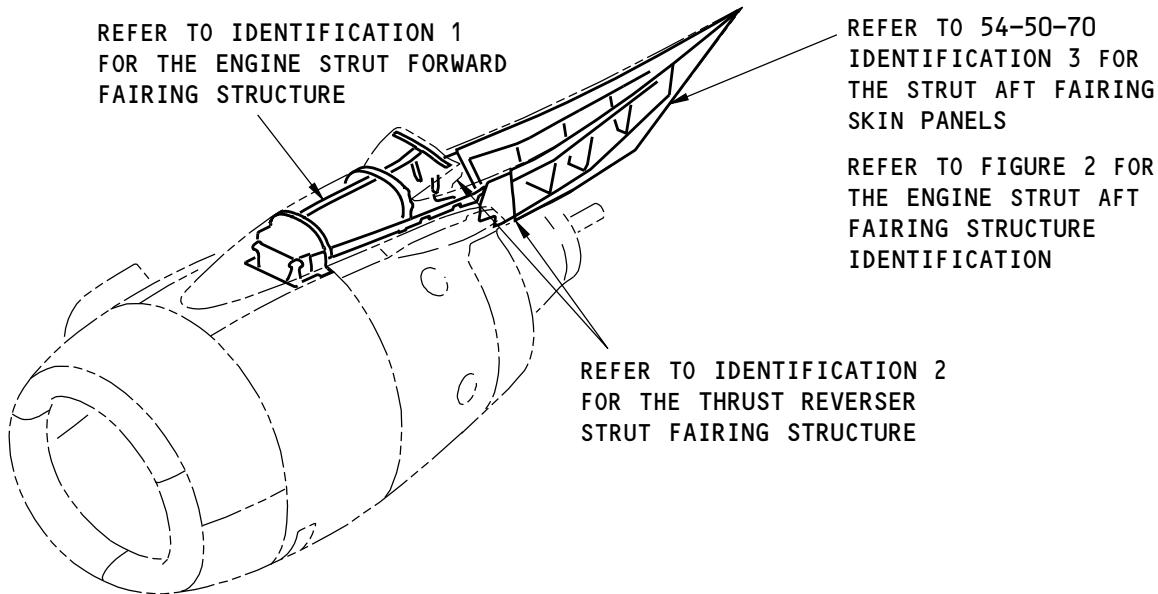
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 3 - ENGINE STRUT AFT FAIRING STRUCTURE



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

N67886 S0006592275_V1

Engine Strut Aft Fairing Structure Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2006	Strut Fairing Structure Assembly
313A2700	Strut Aft Fairing Frame and Spar Assembly

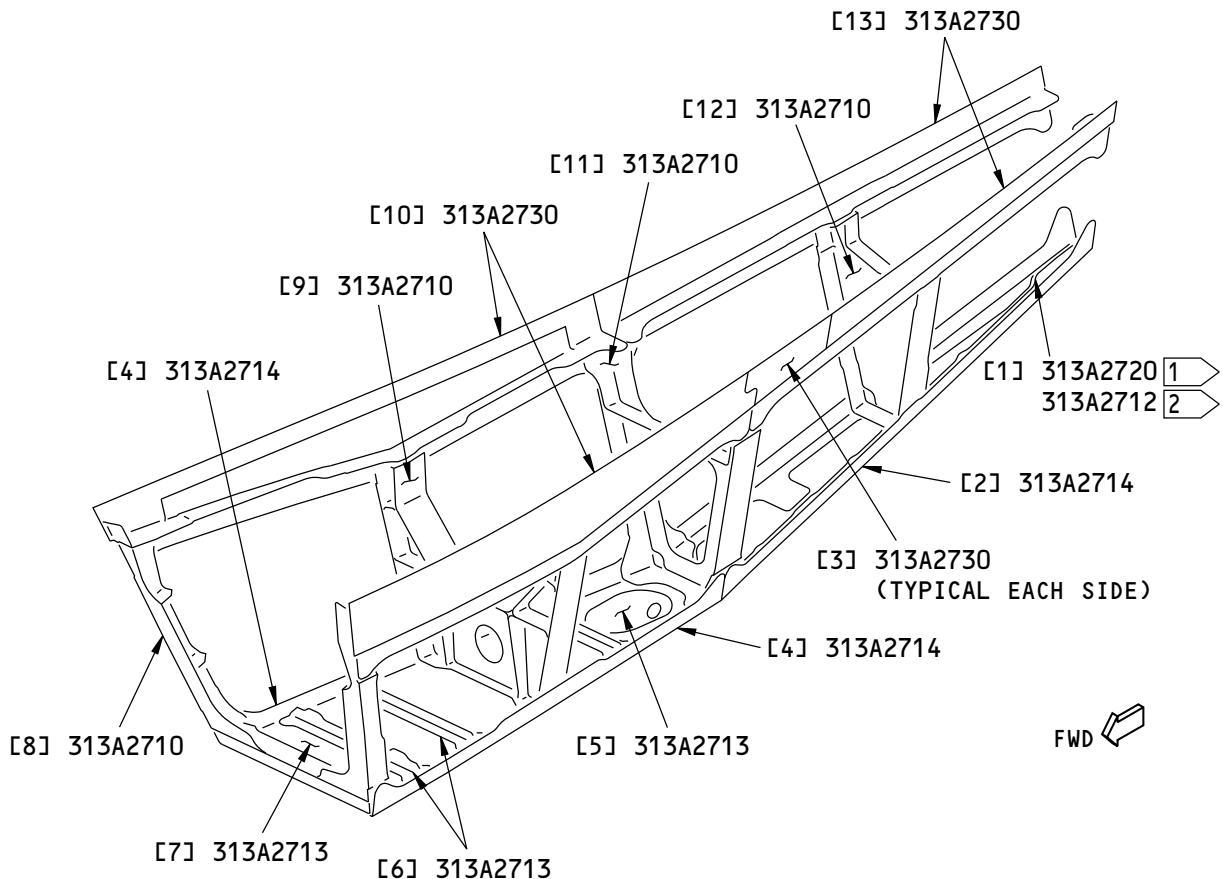
54-50-71
IDENTIFICATION 3
Page 1
Nov 10/2012

D634A210

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737-800
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NOTES

- REFER TO TABLE 2 FOR THE LIST OF MATERIALS.
- [1] CUM LINE NUMBER FROM 1 THRU 1176
- [2] CUM LINE NUMBER 1177 AND ON

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

N67889 S0006592277_V1

Engine Strut Aft Fairing Structure Identification
Figure 2

54-50-71
IDENTIFICATION 3
Page 2
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Aft Web Assembly	0.100 [2.54]	2219-T81 sheet as given in given in QQ-A-250/30 BAC1514-3065 2024-T8511 extrusion as given in QQ-A-200/3 2124-T851 machined plate as given in QQ-A-250/29	1 THRU 1176 1177 AND ON
	Aft Web			
	Lower Aft Chord RH			
[2]	Lower Aft Chord LH		BAC1514-3065 2024-T8511 extrusion as given in QQ-A-200/3	1 THRU 1176
	Lower Aft Chord LH		2219-T81 sheet as given in QQ-A-250/30	1177 AND ON
[3]	Cover Plate	0.160 (4.06)	2024-T851 machined plate as given in QQ-A-250/4	
[4]	Lower Forward Chords, LH and RH		BAC1514-3064 2024-T8511 extrusion as given in QQ-A-200/3	1 THRU 1176
	Lower Forward Chords, LH and RH		2124-T851 machined plate as given in QQ-A-250/29	1177 AND ON
[5]	Sump	0.063 (1.60)	625 nickel alloy as given in AMS 5599	
[6]	Tee		BAC1505-100416 2219-T8511 extrusion as given in BMS 7-118	
[7]	Forward Web	0.100 (2.54)	2219-T81 sheet as given in QQ-A-250/30	
[8]	Number 1 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[9]	Number 2 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[10]	Upper Forward Chords, LH and RH		2124-T851 machined plate as given in QQ-A-250/29	
[11]	Number 3 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[12]	Number 4 Frame		2124-T851 machined plate as given in QQ-A-250/29	
[13]	Upper Aft Chords LH and RH		2124-T851 machined plate as given in QQ-A-250/29	

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

54-50-71

IDENTIFICATION 3

Page 3

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

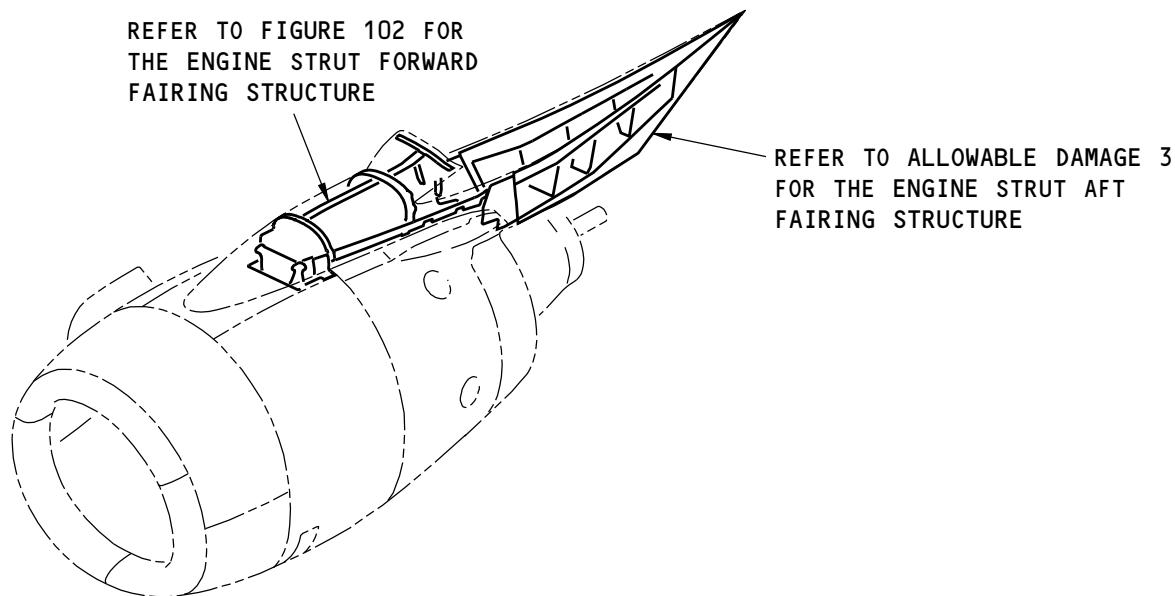
ALLOWABLE DAMAGE 1 - ENGINE STRUT FORWARD FAIRING STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the structure of the Engine Strut Forward Fairings as shown in Engine Strut Forward Fairing Structure Location, Figure 101/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 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 as follows:
- (1) Apply a chemical conversion coating to the reworked areas. Refer to 51-20-01.
 - (2) Apply the finishes that follow to the reworked surfaces:
 - (a) Apply one layer of BMS 10-11, Type I primer. Refer to SOPM 20-41-02.
 - (b) Apply one layer of BMS 10-60, Type II enamel. Refer to AMM PAGEBLOCK 51-21-99/701.
 - (c) Apply one layer of BMS 10-11, Type II enamel to the Aft Frame, Skate Frames, and Upper Frames of the Support Assembly. Refer to AMM PAGEBLOCK 51-21-99/701.



G39917 S0006592281_V1

Engine Strut Forward Fairing Structure Location
Figure 101

54-50-71

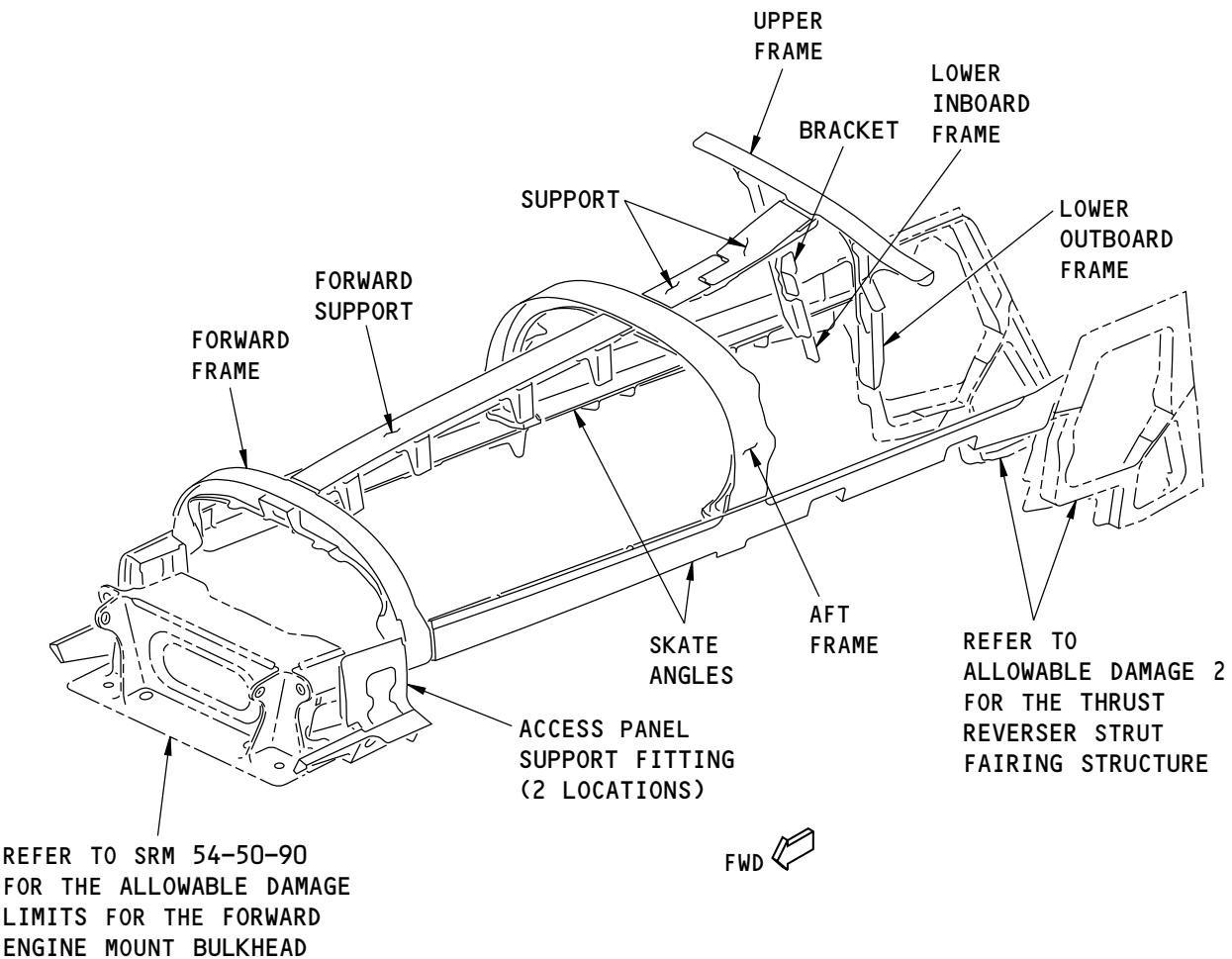
ALLOWABLE DAMAGE 1

Page 101

Nov 10/2012

D634A210

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NOTE: ALL PARTS ARE MADE OF MACHINED OR EXTRUDED ALUMINUM.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

G39920 S0006592282_V1

Engine Strut Forward Fairing Structure
Figure 102

54-50-71

ALLOWABLE DAMAGE 1

Page 102

Nov 10/2012

D634A210



737-800
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
51-30-03	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 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Cracks:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , E , and G .
 - (a) The damage must not be nearer than $2D$ (D = fastener diameter) from more than one fastener in each group of ten fasteners.

B. Nicks, Gouges, Scratches, and Corrosion:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Details A , B , C , D , E , F , and G .
 - (a) Install shim material the surface blendout areas so it will be flush with the surface of an external flange.

C. Dents are permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1, Detail H .

D. Holes and Punctures are not permitted.

54-50-71

ALLOWABLE DAMAGE 1

Page 103

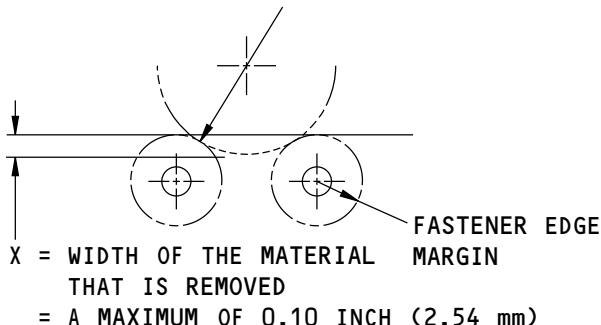
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**737-800
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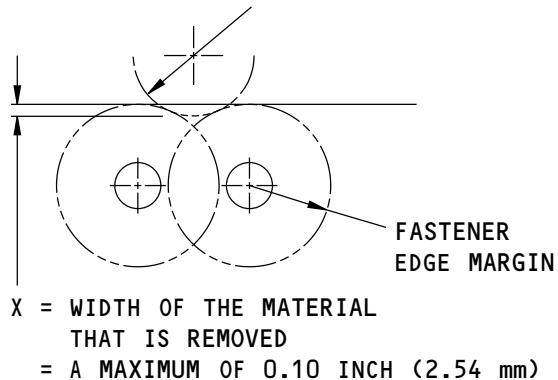
**REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)**



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

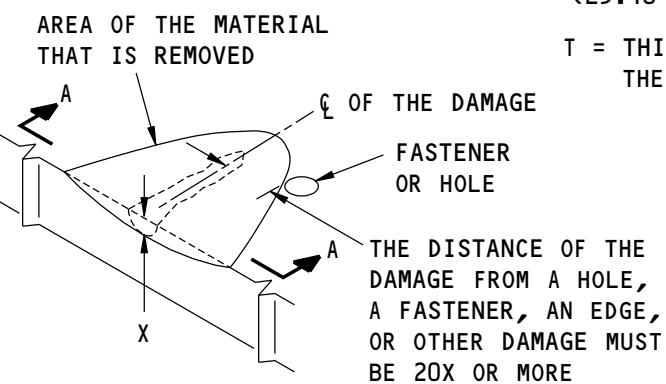
(A)

**REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)**



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

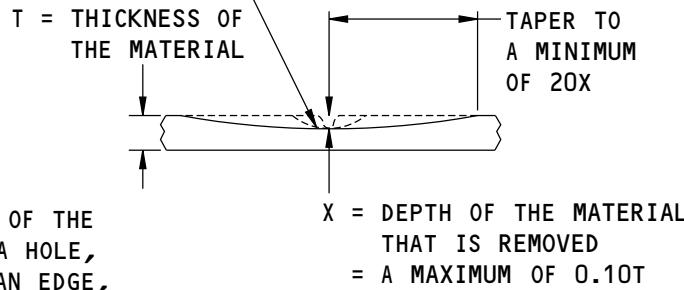
(B)



**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(C)

**REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN**



A-A

G39921 S0006592283_V1

**Allowable Damage Limits
Figure 103 (Sheet 1 of 4)**

54-50-71

ALLOWABLE DAMAGE 1

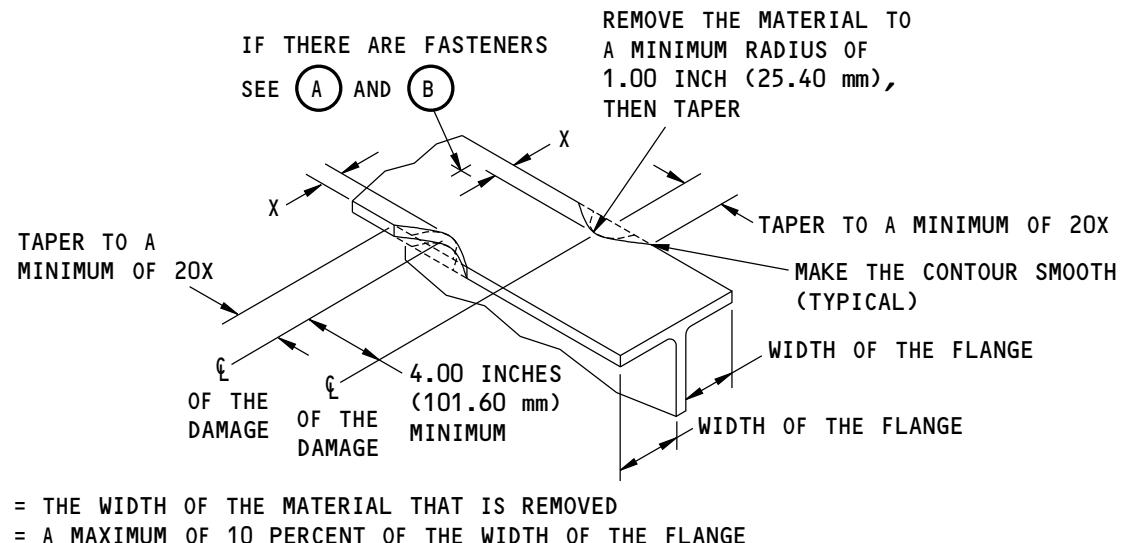
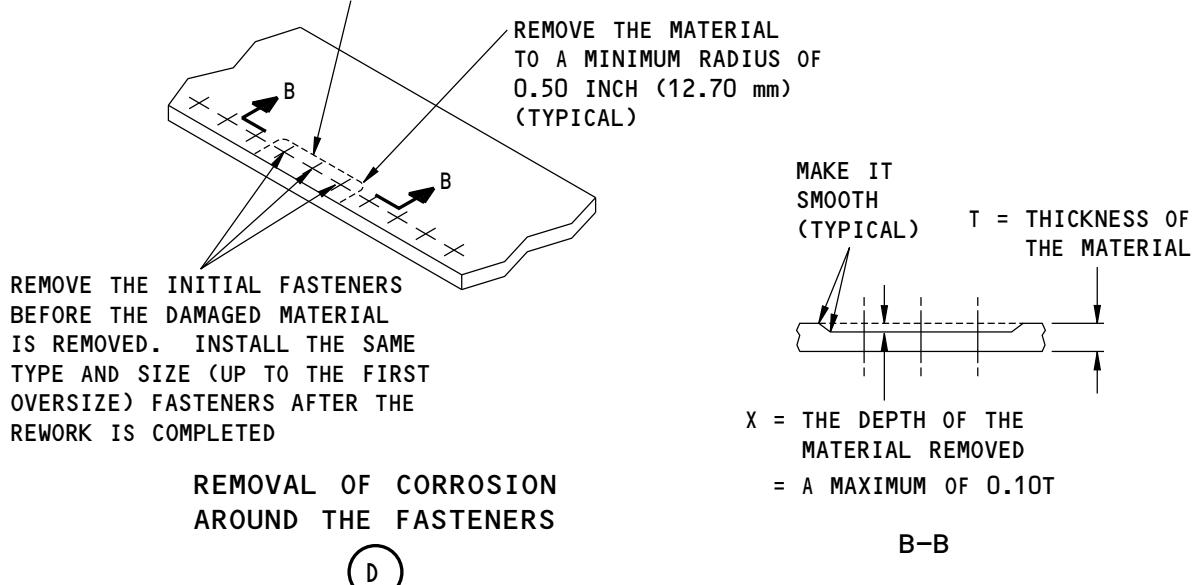
Page 104

Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**

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



G39924 S0006592284_V1

Allowable Damage Limits
Figure 103 (Sheet 2 of 4)

54-50-71

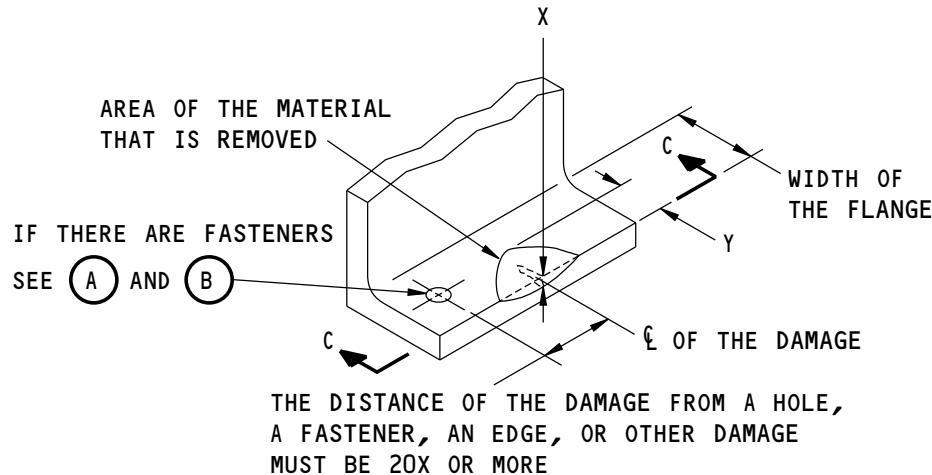
ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012



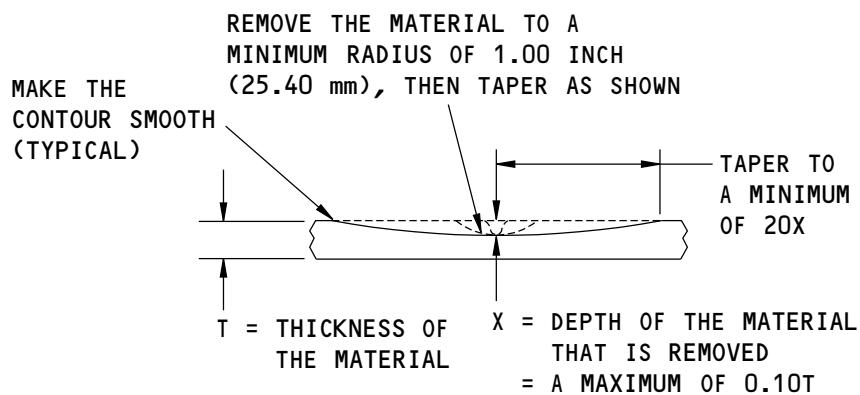
737-800
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Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 10 PERCENT OF THE WIDTH OF THE FLANGE

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(F)



G55749 S0006592285_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 4)

54-50-71

ALLOWABLE DAMAGE 1

Page 106

Nov 10/2012

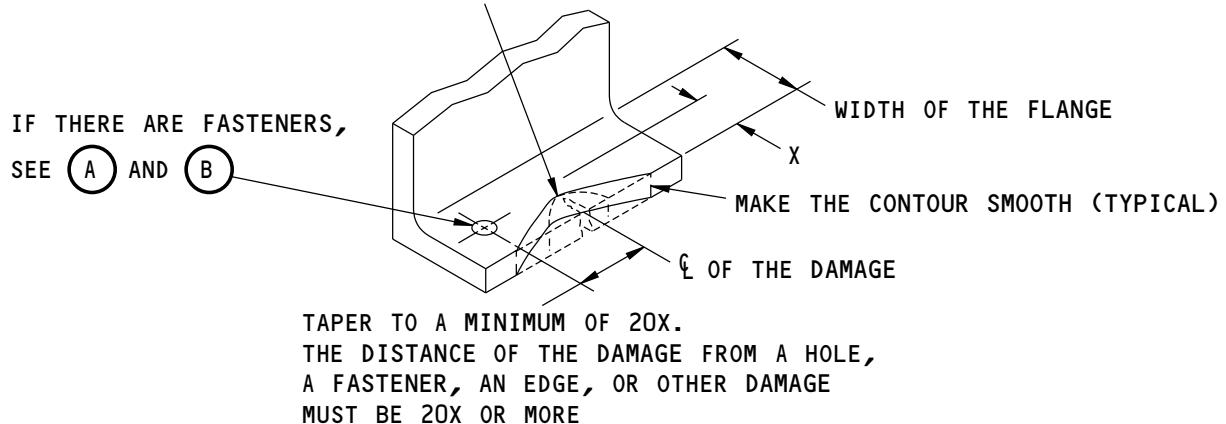
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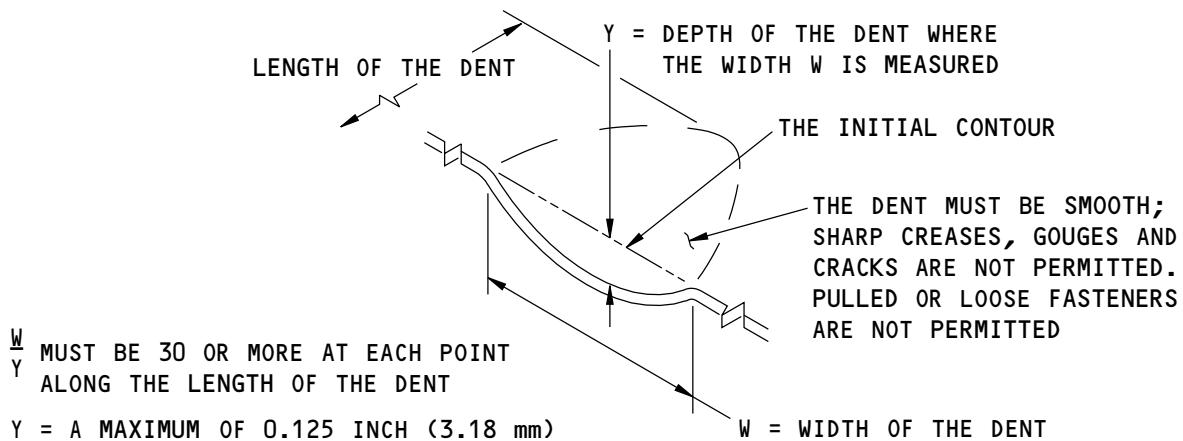
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REMOVE THE MATERIAL TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



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

REMOVAL OF DAMAGED MATERIAL AT AN EDGE



DENT THAT IS PERMITTED



G39925 S0006592286_V1

Allowable Damage Limits
Figure 103 (Sheet 4 of 4)

54-50-71

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

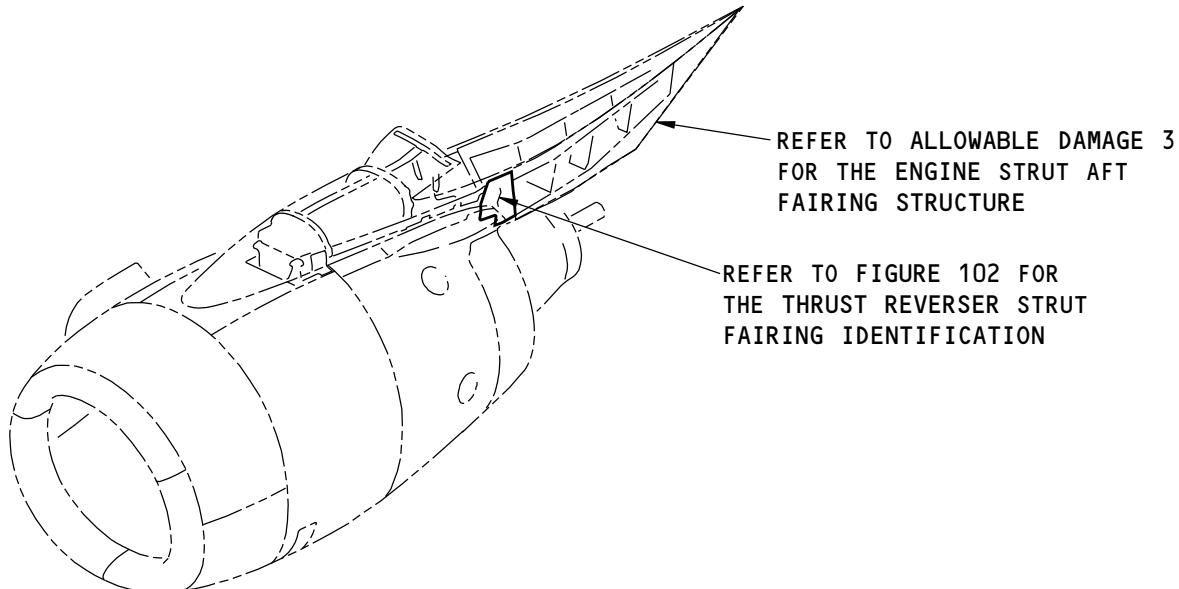
ALLOWABLE DAMAGE 2 - THRUST REVERSER STRUT FAIRING STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the structure of the Thrust Reverser Strut Fairing as shown in Thrust Reverser Strut Fairing Structure Location, Figure 101/ALLOWABLE DAMAGE 2.

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 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 (0.003 mm) Ra or better on the reworked areas.
- B. After you remove the damage, do as follows:
- (1) Apply a chemical conversion coating to the reworked surfaces. Refer to 51-20-01.
 - (2) Apply a layer of DeSoto Hi-Temperature Polyurethane Primer to the reworked surfaces. Refer to SOPM 20-44-01.



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Thrust Reverser Strut Fairing Structure Location
Figure 101

54-50-71

ALLOWABLE DAMAGE 2

Page 101

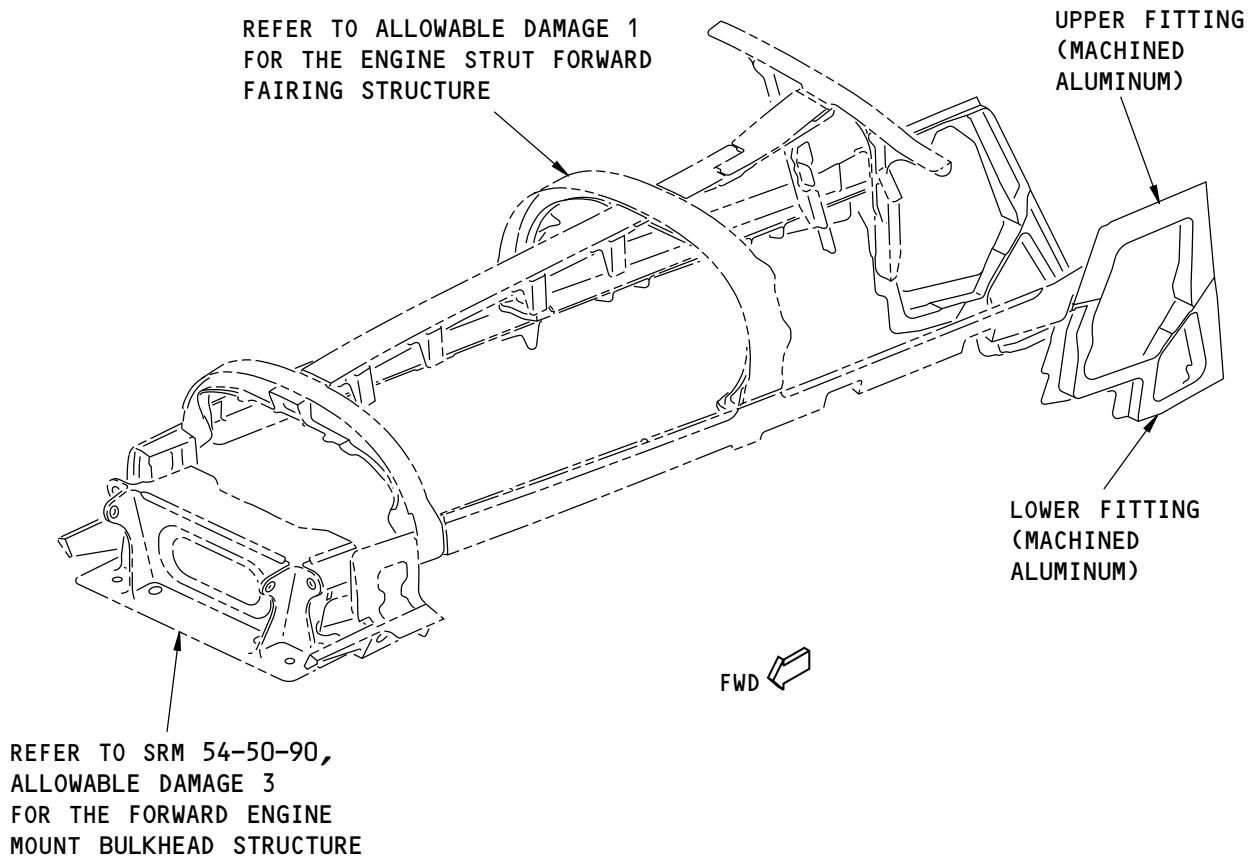
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737-800
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LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

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Thrust Reverser Strut Fairing Structure
Figure 102

54-50-71

ALLOWABLE DAMAGE 2

Page 102

Nov 10/2012

D634A210

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737-800
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
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-44-01	Application of Special Purpose Coatings and Finishes

4. Allowable Damage Limits

A. Cracks:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , and E .

B. Nicks, Gouges, Scratches, and Corrosion:

- (1) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Details A , B , C , D , and E .

C. Dents are not permitted.

D. Holes and Punctures are not permitted.

54-50-71

ALLOWABLE DAMAGE 2

Page 103

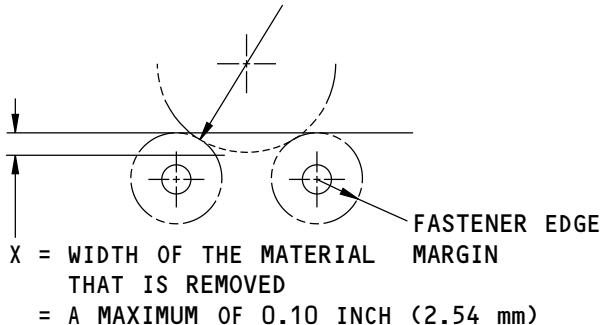
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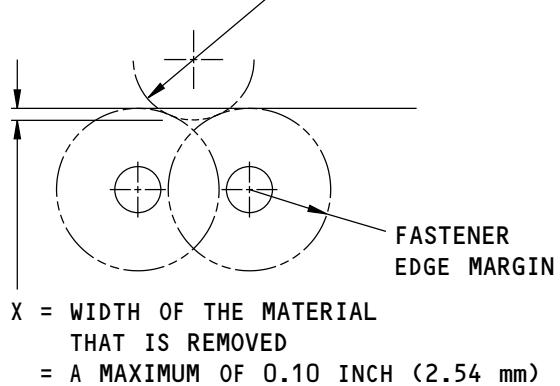
REMOVE THE MATERIAL TO
A MINIMUM RADIUS OF
1.00 INCH (25.40 mm)



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

(A)

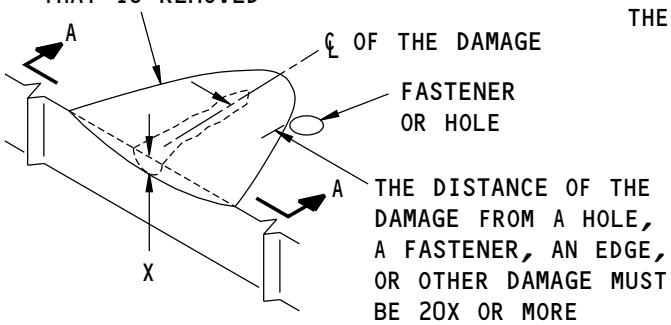
REMOVE THE MATERIAL TO
A MINIMUM RADIUS OF
1.00 INCH (25.40 mm)



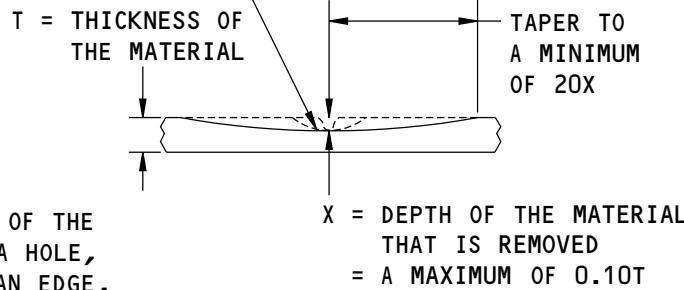
REMOVAL OF DAMAGED MATERIAL AT
EDGES WHERE THE FASTENER EDGE
MARGINS HAVE AN OVERLAP

(B)

AREA OF THE MATERIAL
THAT IS REMOVED



REMOVE THE MATERIAL TO A MINIMUM
RADIUS OF 1.00 INCH (25.40 mm),
THEN TAPER AS SHOWN



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

(C)

G47628 S0006592290_V1

**Allowable Damage Limits
Figure 103 (Sheet 1 of 2)**

54-50-71

ALLOWABLE DAMAGE 2

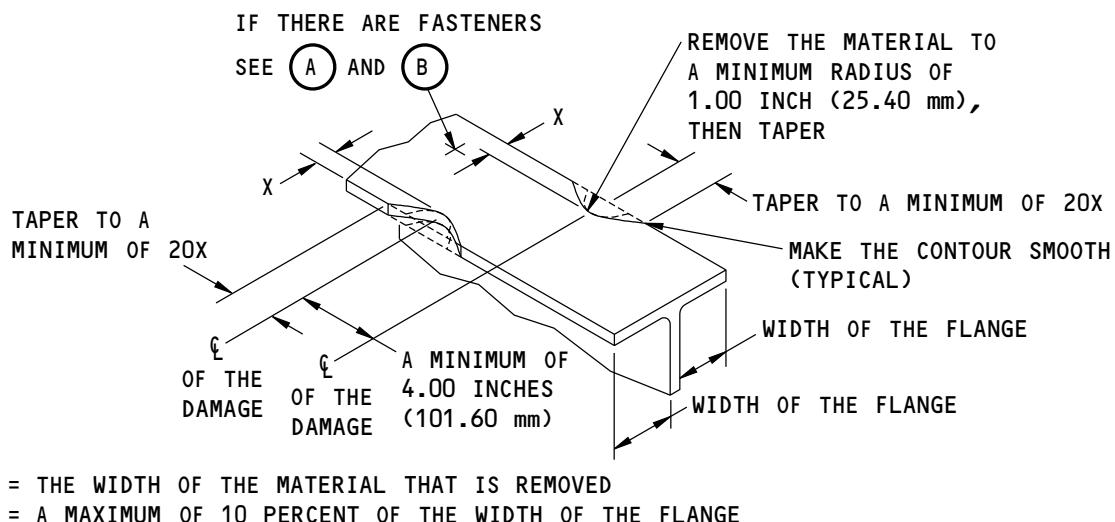
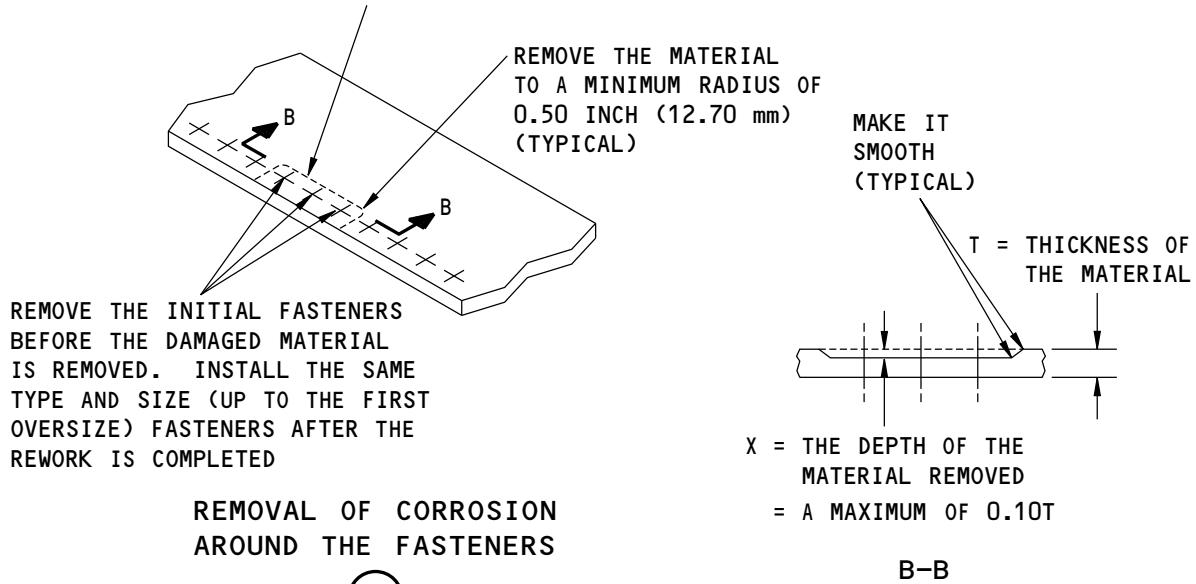
Page 104

Nov 10/2012

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**737-800
STRUCTURAL REPAIR MANUAL**

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


REMOVAL OF DAMAGED MATERIAL ON AN EDGE

E

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Allowable Damage Limits
Figure 103 (Sheet 2 of 2)

54-50-71

ALLOWABLE DAMAGE 2

Page 105

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 3 - ENGINE STRUT AFT FAIRING STRUCTURE

1. Applicability

- A. This subject gives the allowable damage limits for the structure of the engine strut aft fairing as shown in Engine Strut Aft Fairing Structure Location, Figure 101/ALLOWABLE DAMAGE 3.

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 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 (0.003 mm) Ra or better on the reworked areas.
- B. After you remove the damage, do as follows:

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 aluminum parts.
 - (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 procedures.
- (2) Apply a chemical conversion coating to the reworked areas of the aluminum parts. Refer to 51-20-01.
- (3) Apply two layers of BMS 10-11, Type I primer to the reworked areas. Refer to SOPM 20-41-02.

54-50-71

ALLOWABLE DAMAGE 3

Page 101

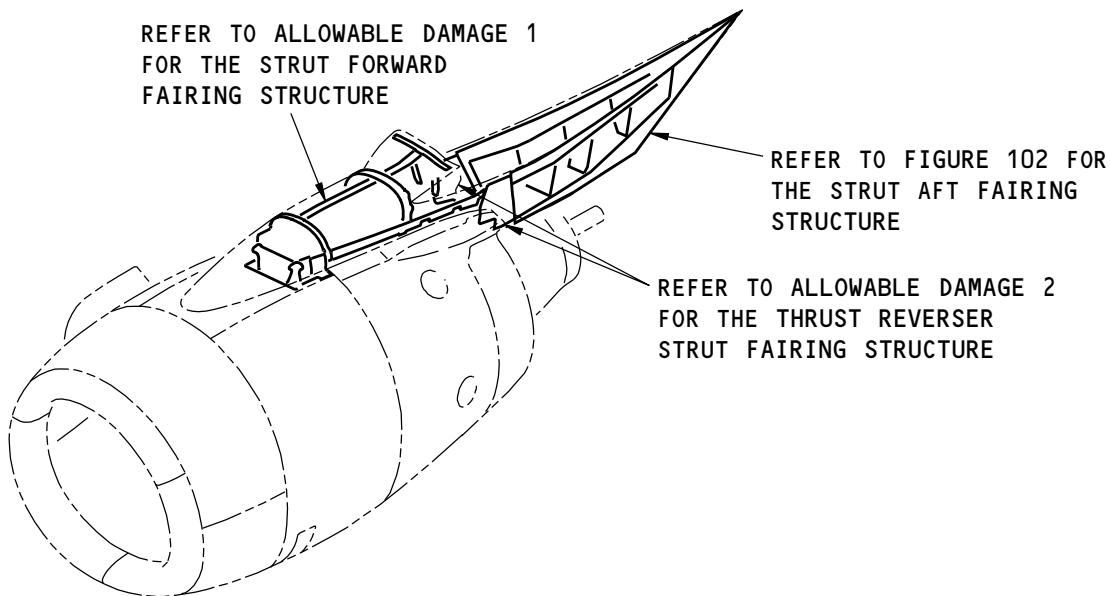
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**737-800
STRUCTURAL REPAIR MANUAL**



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**Engine Strut Aft Fairing Structure Location
Figure 101**

54-50-71

ALLOWABLE DAMAGE 3

Page 102

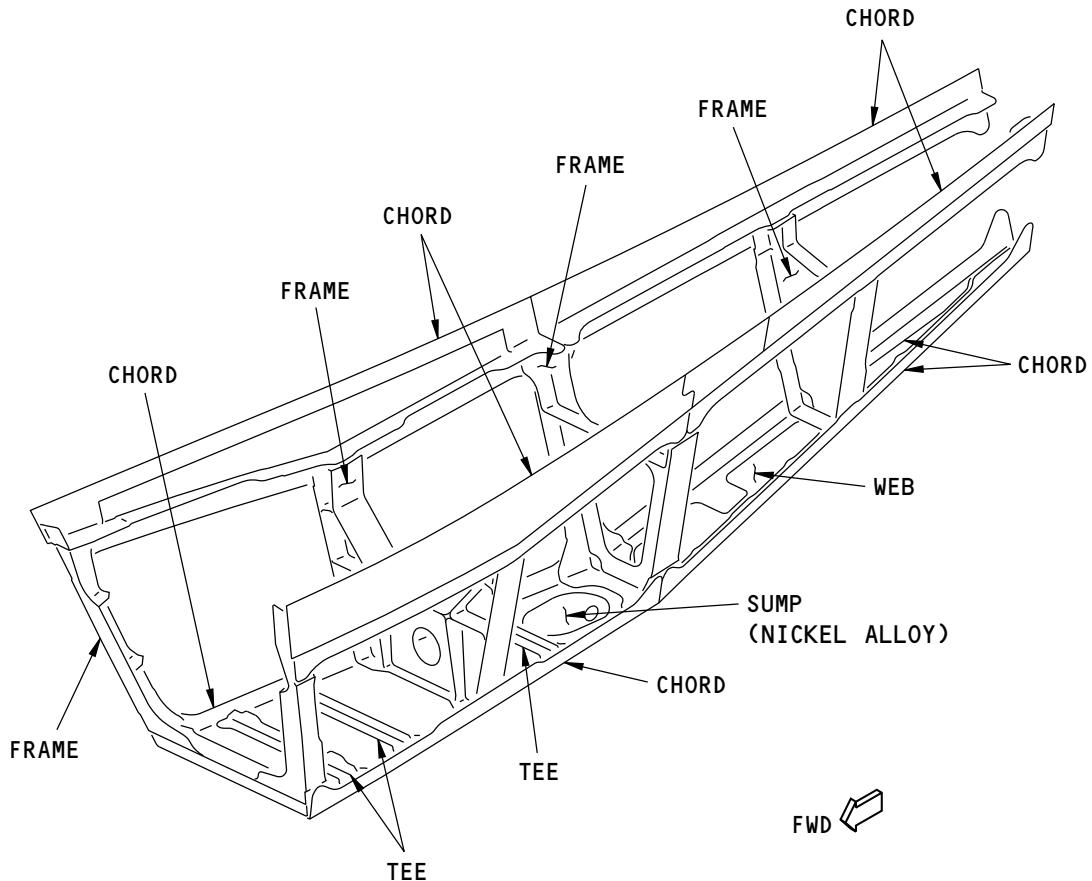
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737-800
STRUCTURAL REPAIR MANUAL



NOTE: ALL PARTS ARE MADE OF ALUMINUM UNLESS SPECIFIED DIFFERENTLY.

G22599 S0006592294_V1

Engine Strut Aft Fairing Structure
Figure 102

54-50-71

ALLOWABLE DAMAGE 3

Page 103

Nov 10/2012

D634A210

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737-800
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 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Frames, Chords, Fitting, and Cover Plate

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

B. Webs and Sump

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Details A , B , and F .
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) You are permitted to do one of the procedures that follows:
 - 1) Remove the damage as given in Allowable Damage Limits, Figure 103/ ALLOWABLE DAMAGE 3, Details A , B , C , D , and F .
 - 2) Drill out the damage as given in Holes and Punctures for the Web.

NOTE: The damage cannot be drilled out as a hole if the damage has been blended out.

- (3) Dents
 - (a) Damage is permitted as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3, Detail G .
- (4) Holes and Punctures
 - (a) Holes and punctures are permitted to a maximum diameter of 0.25 inch (6.35 mm) after cleanup if:
 - 1) The damage is a minimum of 1.0 inch (25.40 mm) away from other holes, edge of the part or other damage
 - 2) You install a 2117-T3 or 2117-T4 aluminum rivet in the hole without sealant.

C. Tees

- (1) Cracks:

54-50-71

ALLOWABLE DAMAGE 3

Page 104

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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

54-50-71

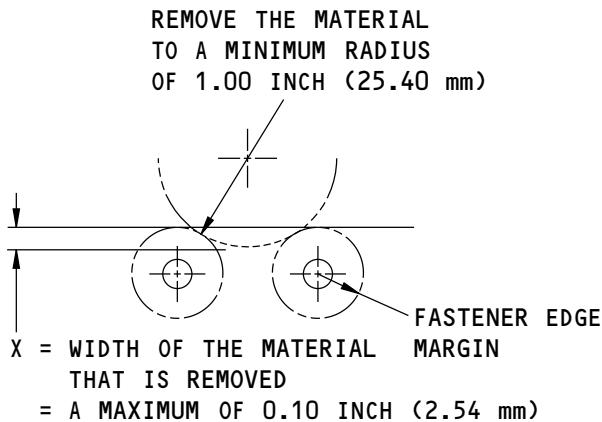
ALLOWABLE DAMAGE 3

Page 105

Nov 10/2012

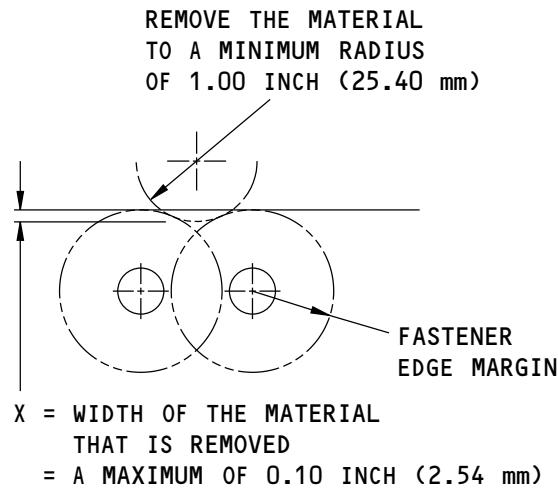
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**737-800
STRUCTURAL REPAIR MANUAL**


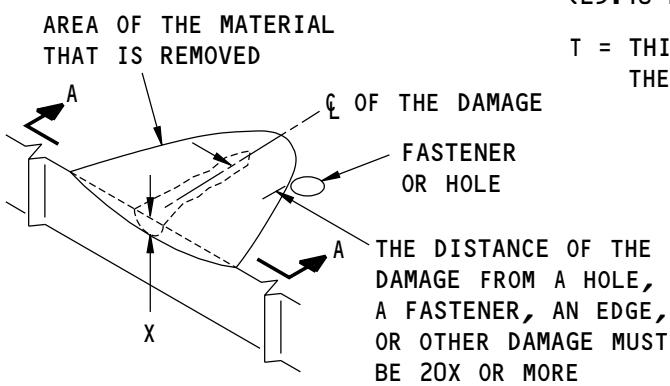
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP

(A)



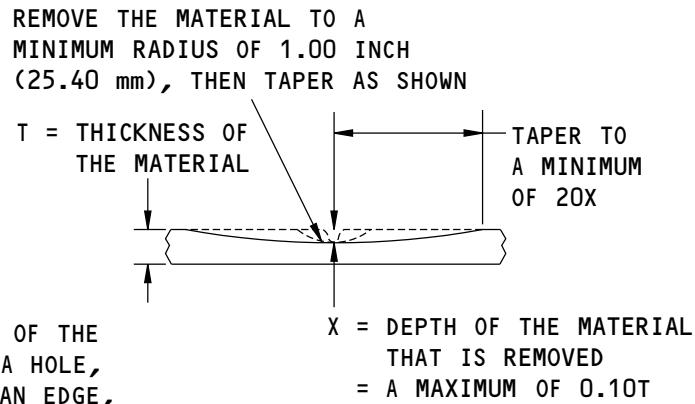
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS HAVE AN OVERLAP

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)



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**Allowable Damage Limits
Figure 103 (Sheet 1 of 3)**

54-50-71

ALLOWABLE DAMAGE 3

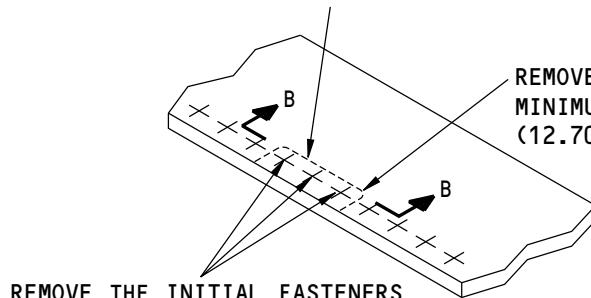
Page 106

Nov 10/2012



737-800 STRUCTURAL REPAIR MANUAL

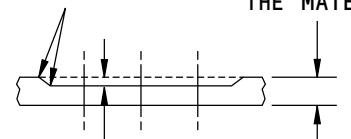
THE REMOVAL OF MATERIAL
AROUND THREE FASTENERS IN
A GROUP OF TEN IS PERMITTED
TO A MAXIMUM DEPTH OF X



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 0.50 INCH
(12.70 mm) (TYPICAL)

MAKE IT
SMOOTH
(TYPICAL) T = THICKNESS OF
THE MATERIAL



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

B-B

REMOVAL OF CORROSION AROUND THE FASTENERS

D

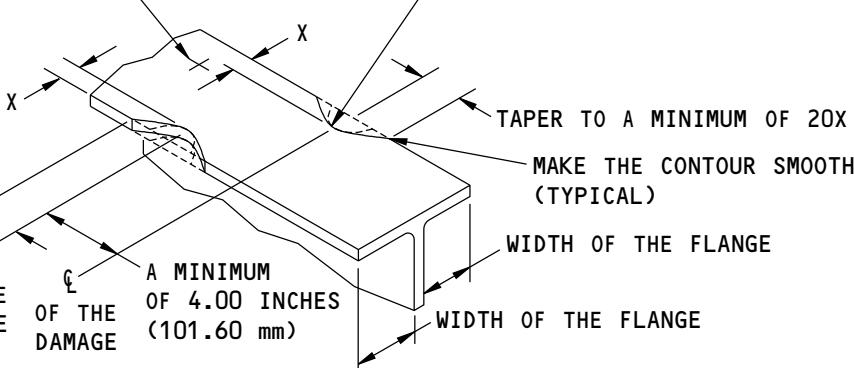
IF THERE ARE FASTENERS
SEE (A) AND (B)

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER

TAPER TO A
MINIMUM OF 20X

OF THE
DAMAGE

A MINIMUM
OF 4.00 INCHES
(101.60 mm)



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

G48165 S0006592296_V1

Allowable Damage Limits Figure 103 (Sheet 2 of 3)

54-50-71

ALLOWABLE DAMAGE 3

Page 107

Nov 10/2012

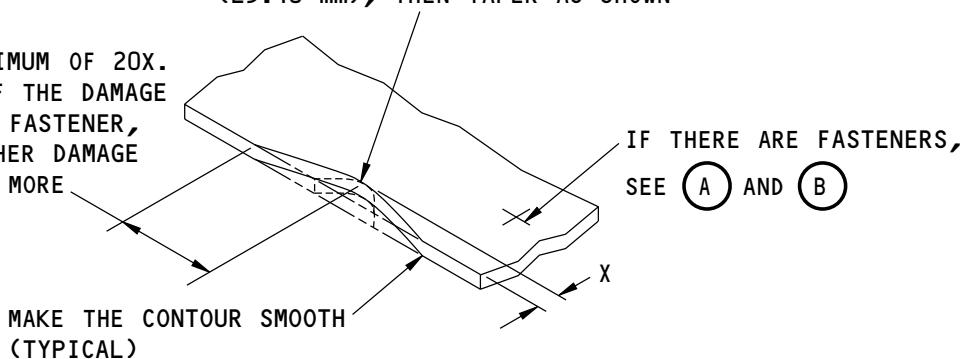
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737-800
STRUCTURAL REPAIR MANUAL

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

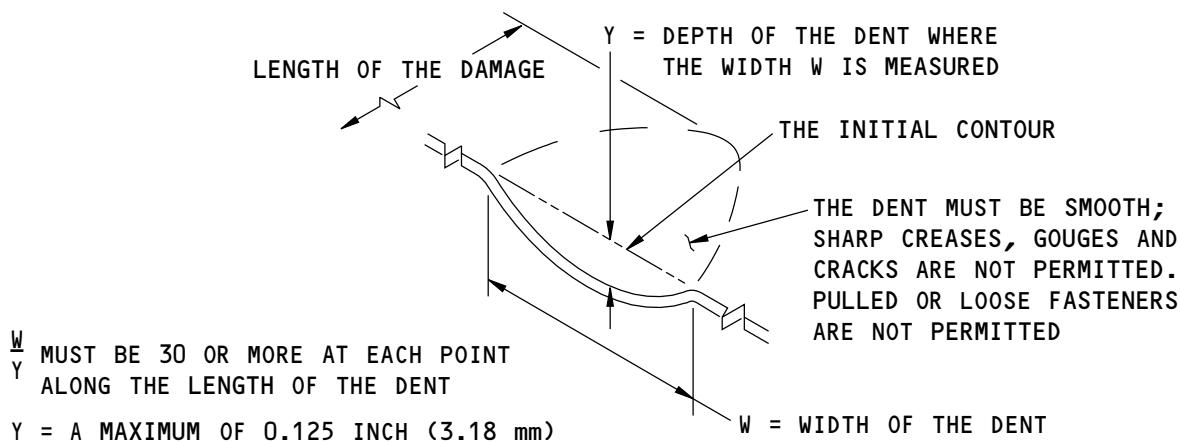
TAPER TO A MINIMUM OF 20X.
THE DISTANCE OF THE DAMAGE
FROM A HOLE, A FASTENER,
AN EDGE, OR OTHER DAMAGE
MUST BE 20X OR MORE



X = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.20 INCH (5.08 mm)

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

F



DENT THAT IS PERMITTED

G

G48166 S0006592297_V1

Allowable Damage Limits
Figure 103 (Sheet 3 of 3)

54-50-71

ALLOWABLE DAMAGE 3

Page 108

Nov 10/2012

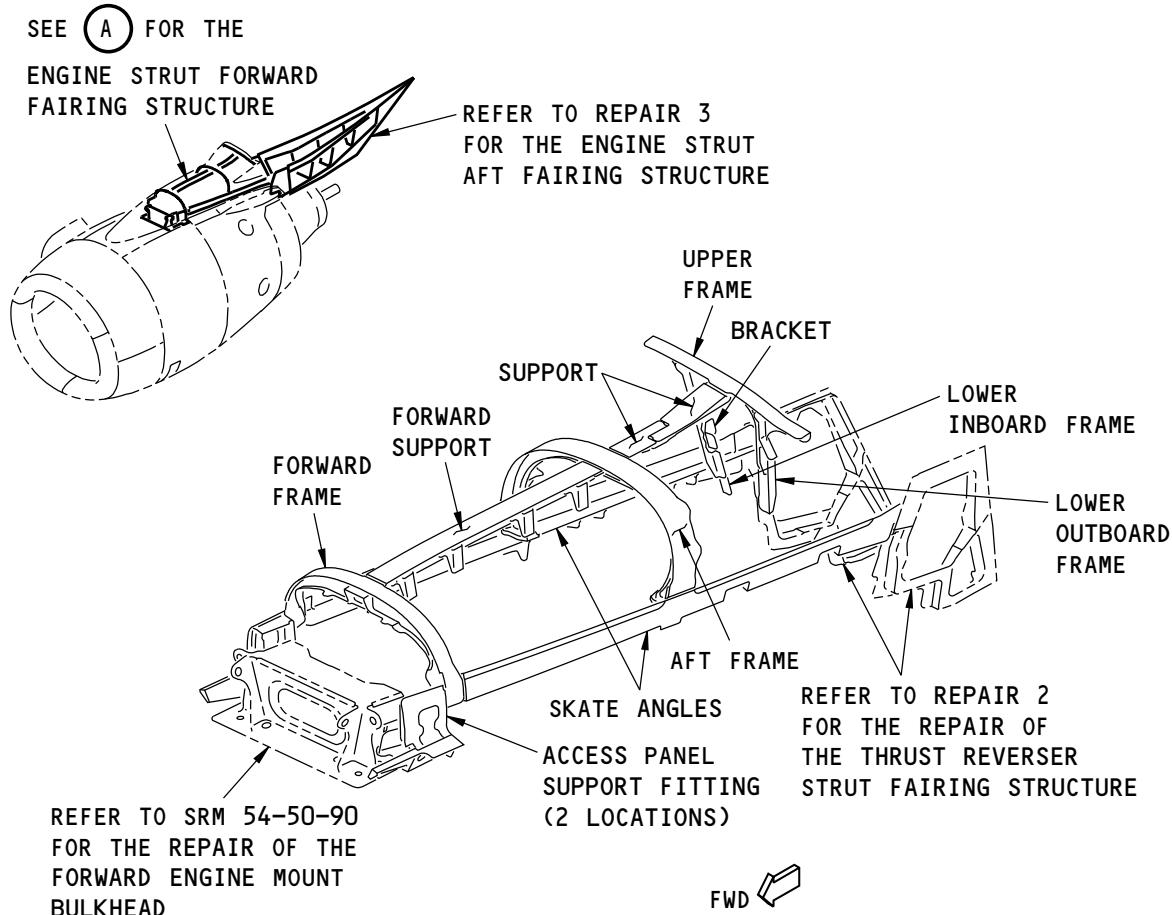
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737-800 STRUCTURAL REPAIR MANUAL

REPAIR 1 - ENGINE STRUT FORWARD FAIRING STRUCTURE

1. Applicability

- A. Repair 1 is applicable to the structure of the Engine Strut Forward Fairing as shown in Engine Strut Forward Fairing Structure Repair, Figure 201/REPAIR 1.



NOTE: ALL PARTS ARE MADE OF MACHINED OR EXTRUDED ALUMINUM.

ENGINE STRUT FORWARD FAIRING STRUCTURE

(A)

**Engine Strut Forward Fairing Structure Repair
Figure 201**

G39910 S0006592300_V1

2. General

- A. The typical repairs given in 51-70-12 can be used when applicable if:
 - (1) There is sufficient clearance between the repair parts and the adjacent structure.
- 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

54-50-71

REPAIR 1
Page 201

Nov 10/2014



737-800
STRUCTURAL REPAIR MANUAL

(Continued)

Reference	Title
54-50-71, ALLOWABLE DAMAGE 1	Engine Strut Forward Fairing Structure
54-50-71, IDENTIFICATION 1	Engine Strut Forward Fairing Structure

4. Repair Instructions

- A. Refer to Table 201/REPAIR 1 to find the applicable repairs for the engine strut forward fairing structure.

Table 201:

REPAIR REFERENCES FOR THE ENGINE STRUT FORWARD FAIRING STRUCTURE	
COMPONENT	REPAIR
Forward Support and Skate Angles	Refer to SRM 51-70-12
Forward Frame, Aft Frame, Upper and Lower Frames, Supports	There are no repairs for these components in the Structural Repair Manual at this time.
Brackets and Fittings	There are no repairs for these components in the Structural Repair Manual at this time.

54-50-71

REPAIR 1

Page 202

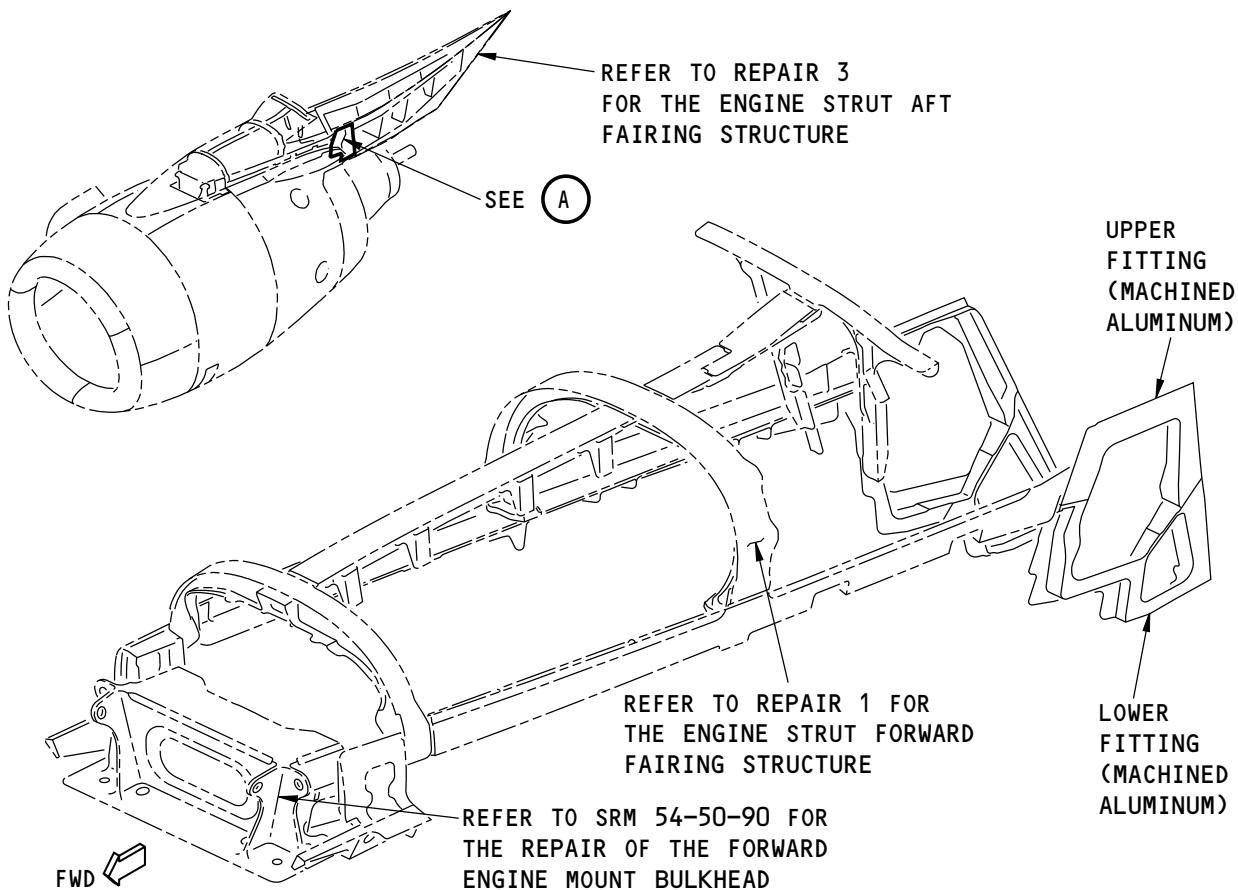
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - THRUST REVERSER STRUT FAIRING STRUCTURE



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

LEFT SIDE IS SHOWN, RIGHT SIDE IS ALMOST THE SAME

(A)

Thrust Reverser Strut Fairing Structure
Figure 201

G47634 S0006592303_V2

54-50-71

REPAIR 2
Page 201

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 3 - ENGINE STRUT AFT FAIRING STRUCTURE

1. Applicability

- A. Repair 3 is applicable to the structure of the Engine Strut Aft Fairing as shown in Engine Strut Aft Fairing Structure Repair, Figure 201/REPAIR 3.

2. General

- A. The typical repairs given in 51-70-11 and 51-70-12 can be used when applicable if:
- (1) There is sufficient clearance between the repair parts and the adjacent structure.
- B. Refer to the limits of the typical repairs given in 51-70-11 and 51-70-12 before you start a repair.

3. References

Reference	Title
51-70-11	TYPICAL FORMED SECTION REPAIRS
51-70-12	EXTRUDED SECTION REPAIRS
54-50-71, ALLOWABLE DAMAGE 3	Engine Strut Aft Fairing Structure
54-50-71, IDENTIFICATION 3	Engine Strut Aft Fairing Structure

4. Repair Instructions

- A. Refer to Table 201/REPAIR 3 to find the applicable repairs for the engine strut forward fairing structure.

Table 201:

REPAIR REFERENCES FOR THE ENGINE STRUT AFT FAIRING STRUCTURE	
COMPONENT	REPAIR
Inner Chords	Refer to SRM 51-70-12
Webs	Refer to SRM 51-70-11
Straps, Brackets, Formed Angles, and Machined Splice Angles	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 51-50-71, Allowable Damage 3, then replace the damaged part.

54-50-71

REPAIR 3
Page 201

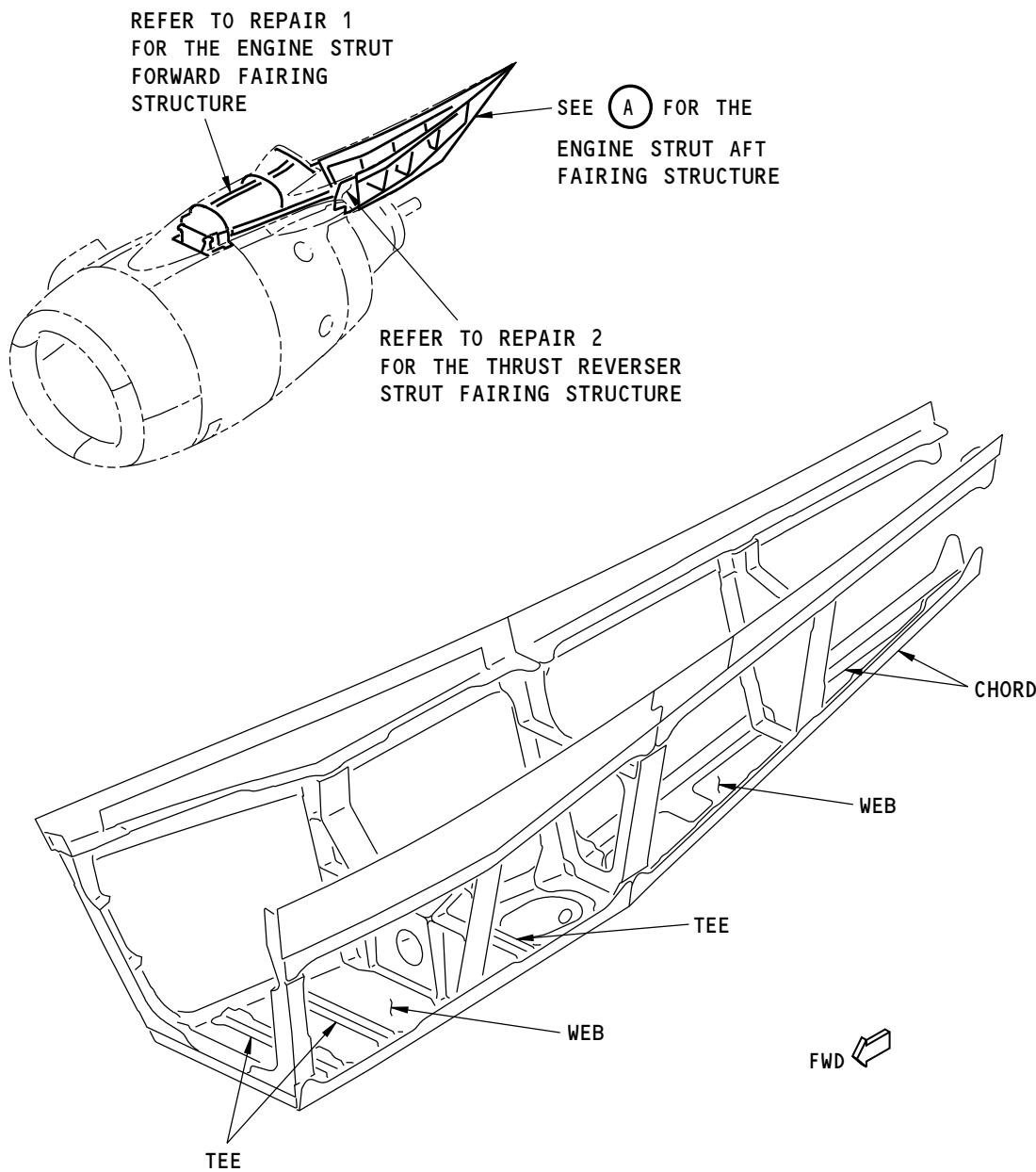
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STRUCTURAL REPAIR MANUAL



NOTE: ALL PARTS ARE MADE OF ALUMINUM.

ENGINE STRUT AFT FAIRING STRUCTURE



G22607 S0006592306_V1

Engine Strut Aft Fairing Structure Repair
Figure 201

54-50-71

REPAIR 3
Page 202

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - ENGINE STRUT FORWARD FAIRING FRAME REPAIR

1. Applicability

- A. Repair 4 is applicable to the structure of the Engine Strut Forward Fairing as shown in Figure 201/REPAIR 4.

54-50-71

REPAIR 4
Page 201

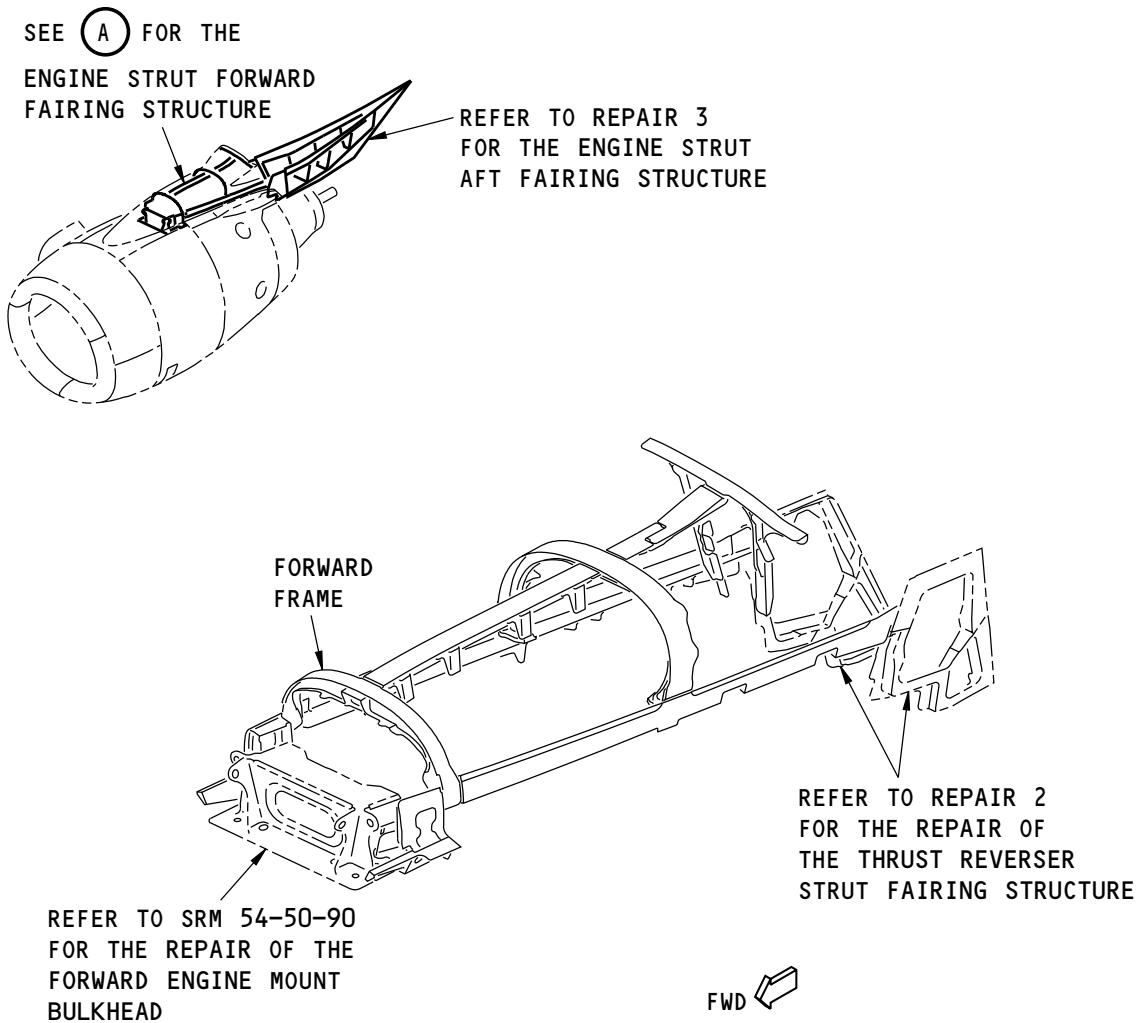
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NOTE: ALL PARTS ARE MADE OF MACHINED OR EXTRUDED ALUMINUM.

ENGINE STRUT FORWARD FAIRING STRUCTURE

(A)

2440860 S0000566694_V1

Engine Strut Forward Fairing Frame Repair
Figure 201

54-50-71

REPAIR 4
Page 202

Nov 10/2015

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

2. General

- A. The steps below apply to the Forward Frame repair.
- (1) This repair is a permanent repair. Refer to 51-00-06, GENERAL for repair categories and definitions.
 - (2) D = fastener diameter.
 - (3) Keep a 2D minimum fastener edge margin.
 - (4) All dimensions are in inches, unless they are shown differently.
 - (5) Keep a minimum of 0.50 in. (12.70 mm) corner radius of all initial and repair parts, unless they are shown differently.
 - (6) Keep a 4D to 6D fastener spacing, unless it is shown differently.
 - (7) Make sure the cut edges of the repair parts have a surface smoothness of 125 microinches Ra or smoother. Refer to SURFACE ROUGHNESS FINISH REQUIREMENTS, 51-20-13.
 - (8) Make sure the initial parts have a surface smoothness of 125 microinches Ra or smoother. Refer to SURFACE ROUGHNESS FINISH REQUIREMENTS, 51-20-13.

3. References

Reference	Title
51-00-06, GENERAL	Structural Repair Definitions
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-05, GENERAL	Repair Sealing
51-20-13	SURFACE ROUGHNESS FINISH REQUIREMENTS
51-40-02	FASTENER INSTALLATION AND REMOVAL
51-40-05, GENERAL	Fastener Hole Sizes
54-50-71, ALLOWABLE DAMAGE 1	Engine Strut Forward Fairing Structure
54-50-71, IDENTIFICATION 1	Engine Strut Forward Fairing Structure
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
SOPM 20-43-03	Chemical Conversion Coatings for Aluminum
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Repair Instructions

- A. Get access to the damaged area.
- B. Remove the necessary fasteners. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
 - (1) Remove the P/N 10-61334 latch assembly.
 - (2) Examine the pins of the latch for damages.
 - (3) Replace the latch if the pins are damaged.
- C. Remove the damage. Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02:
 - (1) Remove the damage from forward fairing support frame with a 10:1 blend ratio.
 - (2) Remove the minimum amount of material. The maximum depth of the blended area must be less than or equal to 0.080 in. (2.03 mm). Contact The Boeing Company if the damage depth is more than 0.080 in. (2.03 mm).
- D. Do a High Frequency Eddy Current (HFEC) inspection in the reworked area to make sure that there is no more damage. Refer to 737 NDT Part 6, 51-00-00, Procedure 4.

54-50-71

REPAIR 4
Page 203

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- E. Do a detailed visual inspection of the repair area to make sure there is no other damage.
- F. Make the repair parts. Refer to Table 201/REPAIR 4 and Figure 202/REPAIR 4. Make the contour of the Part [1] Plate match the contour of the frame pocket. Shape the Part [2] Filler Disc to fit the blend area.

Table 201:

REPAIR MATERIAL			
ITEM	PART	QUANTITY	MATERIAL
[1]	Plate	1	0.071 in. (1.803 mm) thick X 1.148 in. (29.159 mm) wide X 2.327 in. (59.106 mm) long CRES sheet AISI 301 as given in MIL-S-5059 1/2 hard
[2]	Filler Disc	1	0.080 in. (2.032 mm) thick AISI 301 as given in MIL-S-5059 1/2 hard

- G. Assemble the repair parts.
- H. Drill the fastener holes. Refer to 51-40-05, GENERAL and Figure 202/REPAIR 4 for the fastener locations, type and size.
- I. Disassemble the repair parts.
- J. Remove all the nicks, scratches, burrs, and sharp edges from the Part [1] Plate, Part [2] Filler Disc, and the bare surfaces of the forward fairing support frame.
- K. Finish the reworked area on forward fairing support frame with an Alodine wipe per SOPM 20-43-03 and apply two coats of BMS 10-11 Type I primer.
- L. Apply one layer of BMS 10-11, Type I primer to the Part [1] Plate and Part [2] Filler Disc. Refer to SOPM 20-41-02.
- M. Install the Part [1] Plate and Part [2] Filler Disc onto the frame with BMS 5-95 sealant between the mating surfaces. Refer to 51-20-05, GENERAL.
- N. Install the fasteners. Fasteners must be installed wet with BMS 5-95 sealant. Refer to FASTENER INSTALLATION AND REMOVAL, 51-40-02.
- O. Make sure that latch is adjusted correctly. Refer to production drawing 313A2110.

54-50-71

REPAIR 4
Page 204

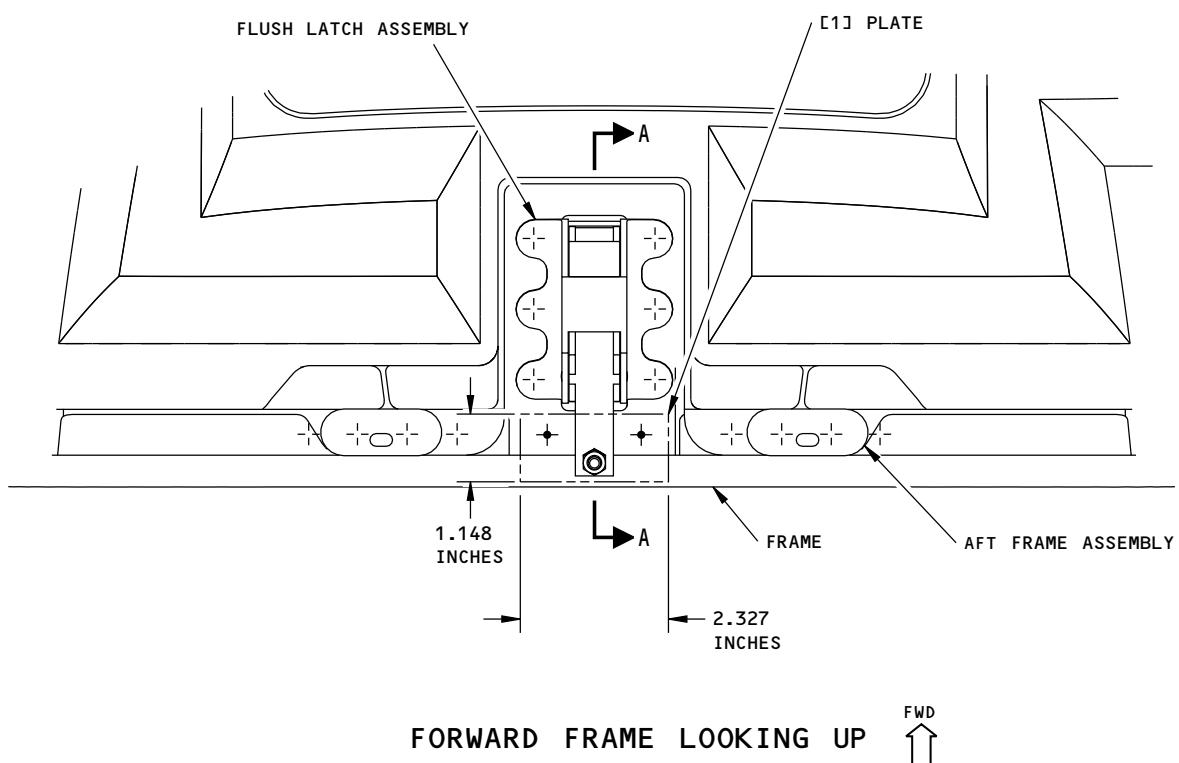
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737-800
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FASTENER SYMBOLS

- + REFERENCE FASTENER LOCATION.
- REPAIR FASTENER LOCATION. INSTALL A BACB30NW6K() OR BACB30NZ6K() HEX-DRIVE BOLT WITH A BACC30AB6S COLLAR.

2434864 S0000563979_V1

Forward Fairing Support Frame Repair
Figure 202 (Sheet 1 of 2)

54-50-71

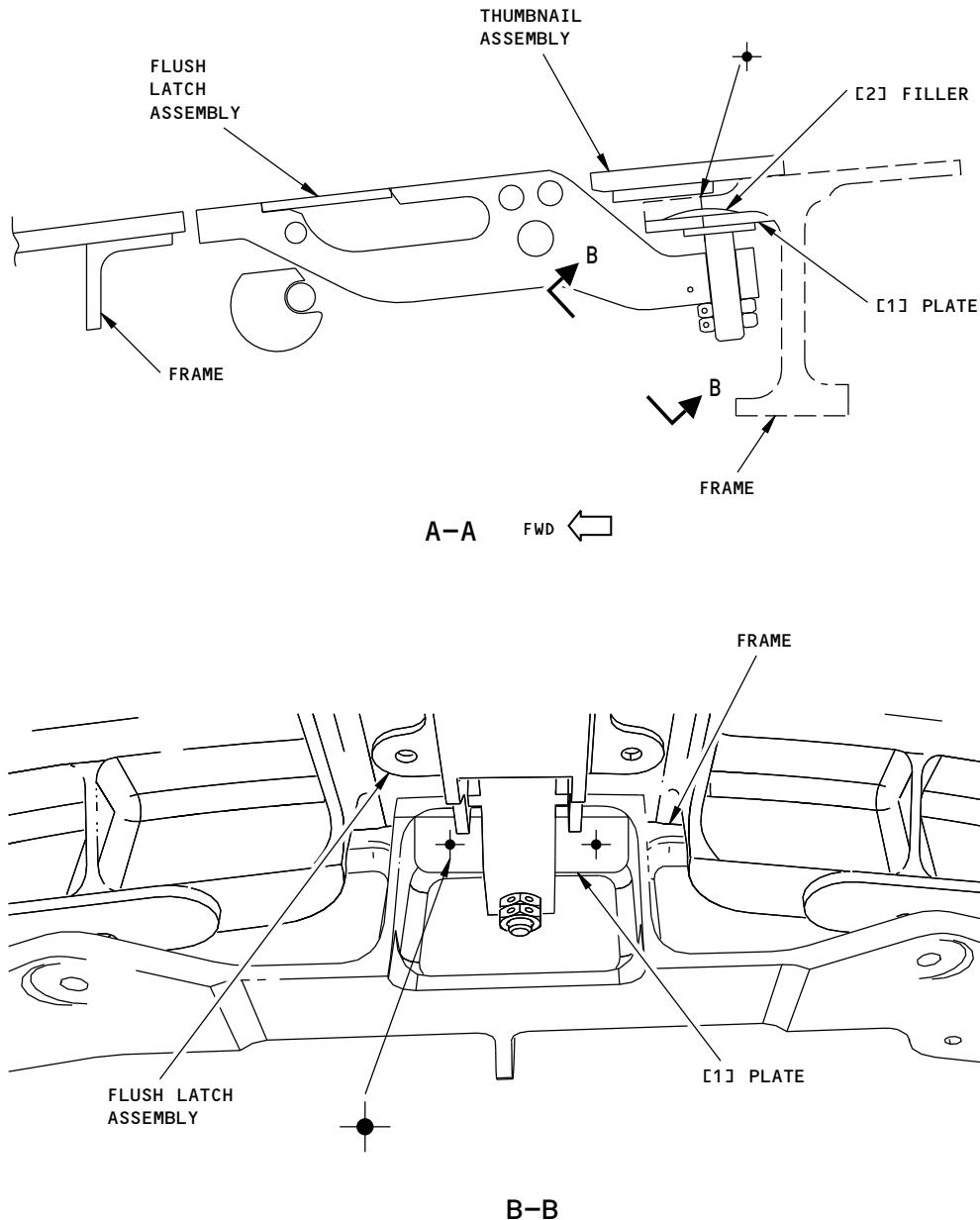
REPAIR 4
Page 205
Nov 10/2015

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737-800
STRUCTURAL REPAIR MANUAL



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Forward Fairing Support Frame Repair
Figure 202 (Sheet 2 of 2)

54-50-71

REPAIR 4
Page 206

Nov 10/2015

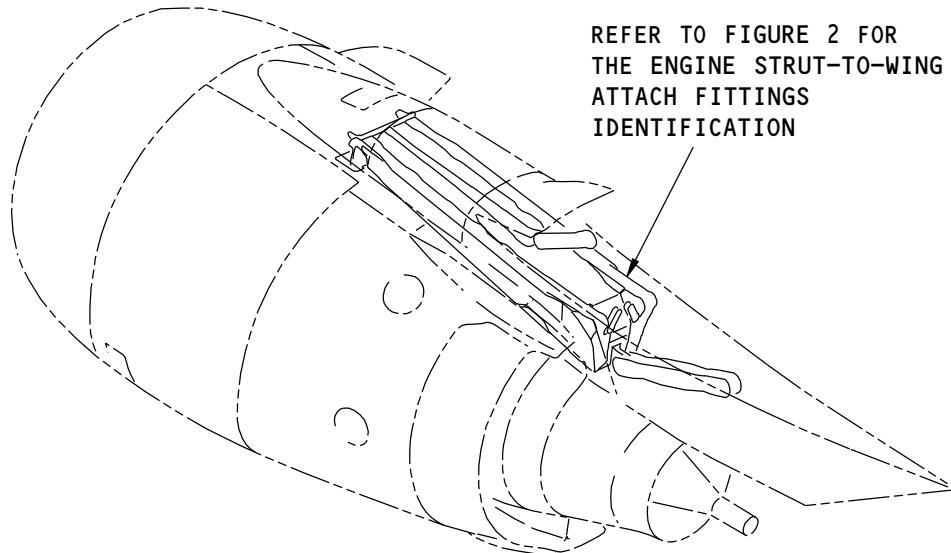
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ENGINE STRUT-TO-WING ATTACH FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F90201 S0006592310_V1

Engine Strut-to-Wing Attach Fitting Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
310A2000	Strut-to-Wing Installation - CFM56-7 Engine
311A2111	Upper Spar Fitting Assembly
311A2112	Aft Upper Spar Fitting Assembly
311A2710	Upper Link Assembly
311A2730	Diagonal Brace Assembly
311A2740	Side Link Assembly

54-50-90

IDENTIFICATION 1

Page 1

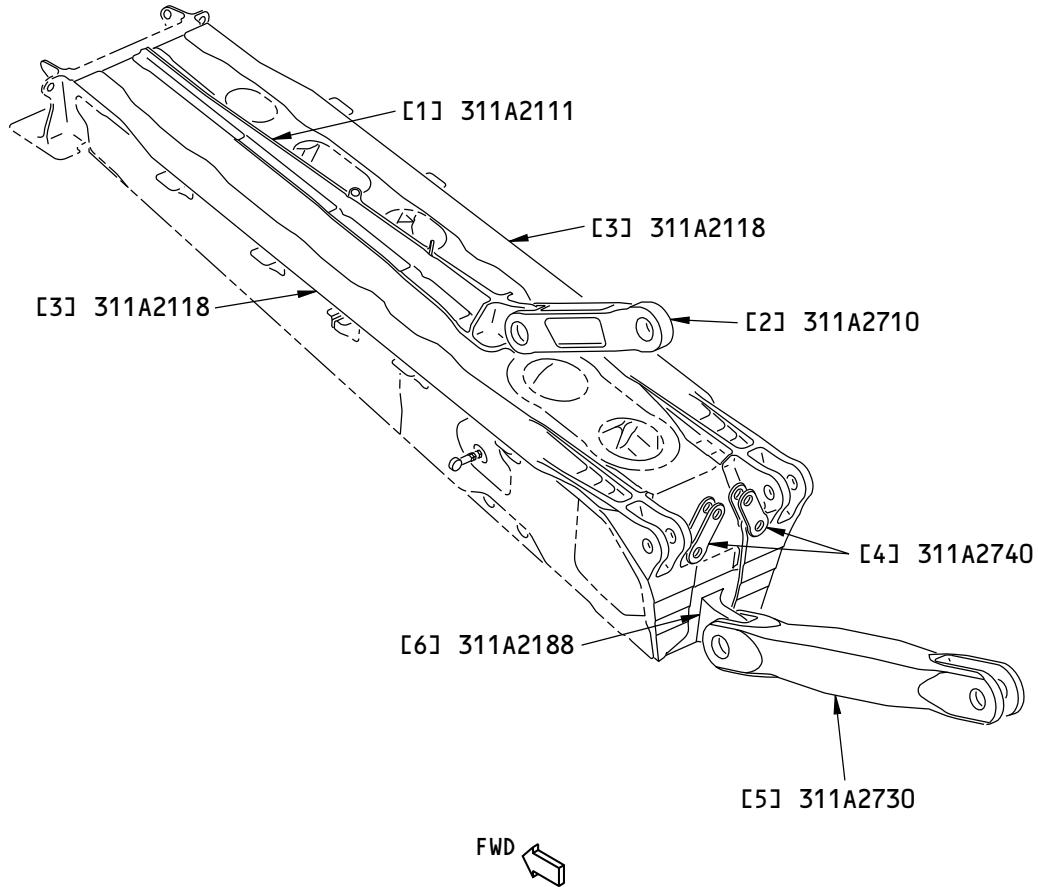
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737-800
STRUCTURAL REPAIR MANUAL



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

F90178 S0006592312_V1

Engine Strut-to-Wing Attach Fitting Identification
Figure 2

54-50-90
IDENTIFICATION 1
Page 2
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Upper Spar Fitting		Ti-6Al-4V forged titanium block in the annealed condition	
[2]	Upper Link		15-5PH CRES bar heat treated to 150-170 KSI	
[3]	Aft Upper Spar Fitting		15-5PH die forged CRES	
[4]	Side Link		Ti-6Al-4V titanium plate in the annealed condition (Optional: Ti-6Al-4V bar in the annealed condition)	
[5]	Diagonal Brace		7075-T73 extruded tubing 7050-T7451 Plate as given in BMS 7-323, Type I	For Line Numbers 1 through 1518 For Line Numbers 1519 and on
[6]	Diagonal Brace Fitting		Ti-6Al-4V titanium forging in the annealed condition	

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

54-50-90

IDENTIFICATION 1

Page 3

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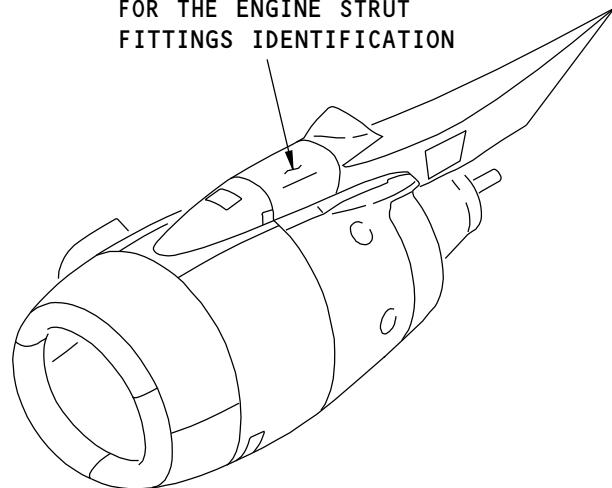
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 2 - ENGINE STRUT HINGE FITTINGS

REFER TO FIGURE 2
FOR THE ENGINE STRUT
FITTINGS IDENTIFICATION



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F91480 S0006592315_V1

Engine Strut Fitting Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2101	Torque Box Assembly
311A2050	Aft Bootstrap Fitting Assembly - GSE
311A2265	Aft Engine Mount Stop Details
311A2510	Fan Cowl Support Beam Installation
311A2550	Thrust Reverser Hinge Installation
311A2650	Precooler Support Fitting Assembly

54-50-90

IDENTIFICATION 2

Page 1

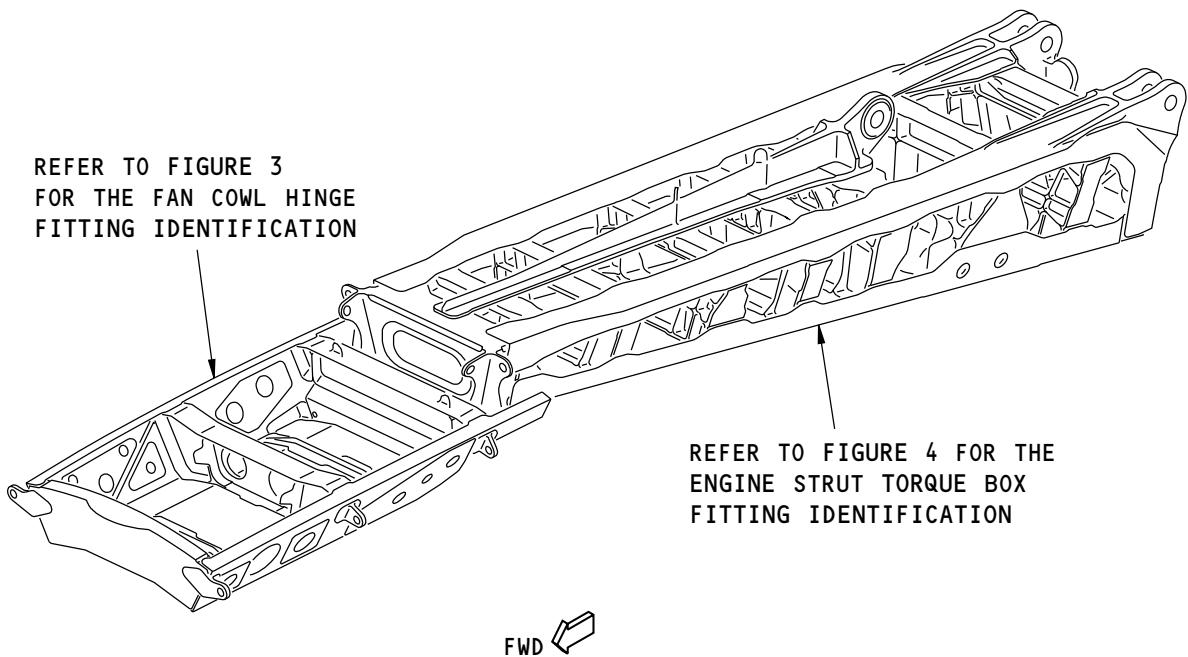
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737-800
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F91487 S0006592317_V1

Engine Strut Fitting Identification
Figure 2

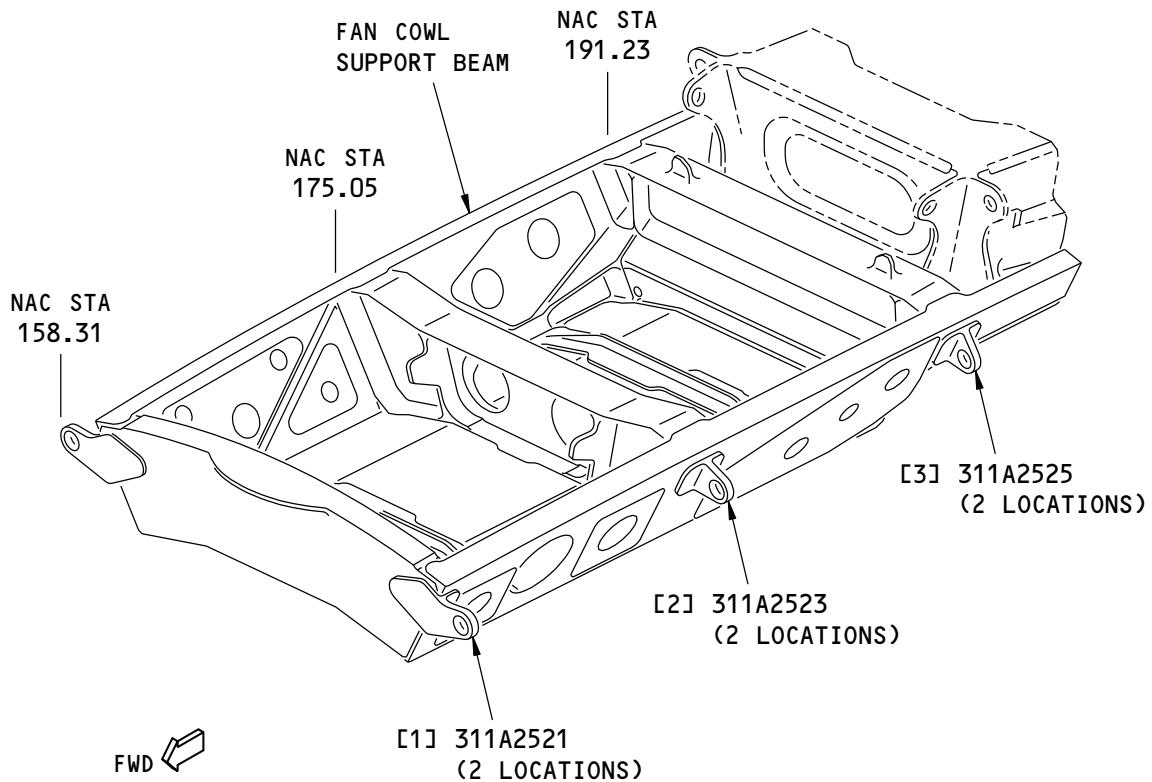
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IDENTIFICATION 2
Page 2
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



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

F91499 S0006592318_V1

Fan Cowl Hinge Fitting Identification
Figure 3

54-50-90
IDENTIFICATION 2
Page 3
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 3				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Hinge Fitting - NAC STA 158.313 NAC STA 158.313		TI-6AL-4V machined titanium plate in the annealed condition	For line numbers 1 thru 2249
			15-5PH bar as given in AMS 5659. Heat treat to 180-200 KSI as given in BAC 5619	For line numbers 2250 and on
[2]	Hinge Fitting - NAC STA 175.048 NAC STA 158.313		TI-6AL-4V machined titanium plate in the annealed condition	
[3]	Hinge Fitting - NAC STA 191.226 NAC STA 158.313		TI-6AL-4V machined titanium plate in the annealed condition	

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

54-50-90

IDENTIFICATION 2

Page 4

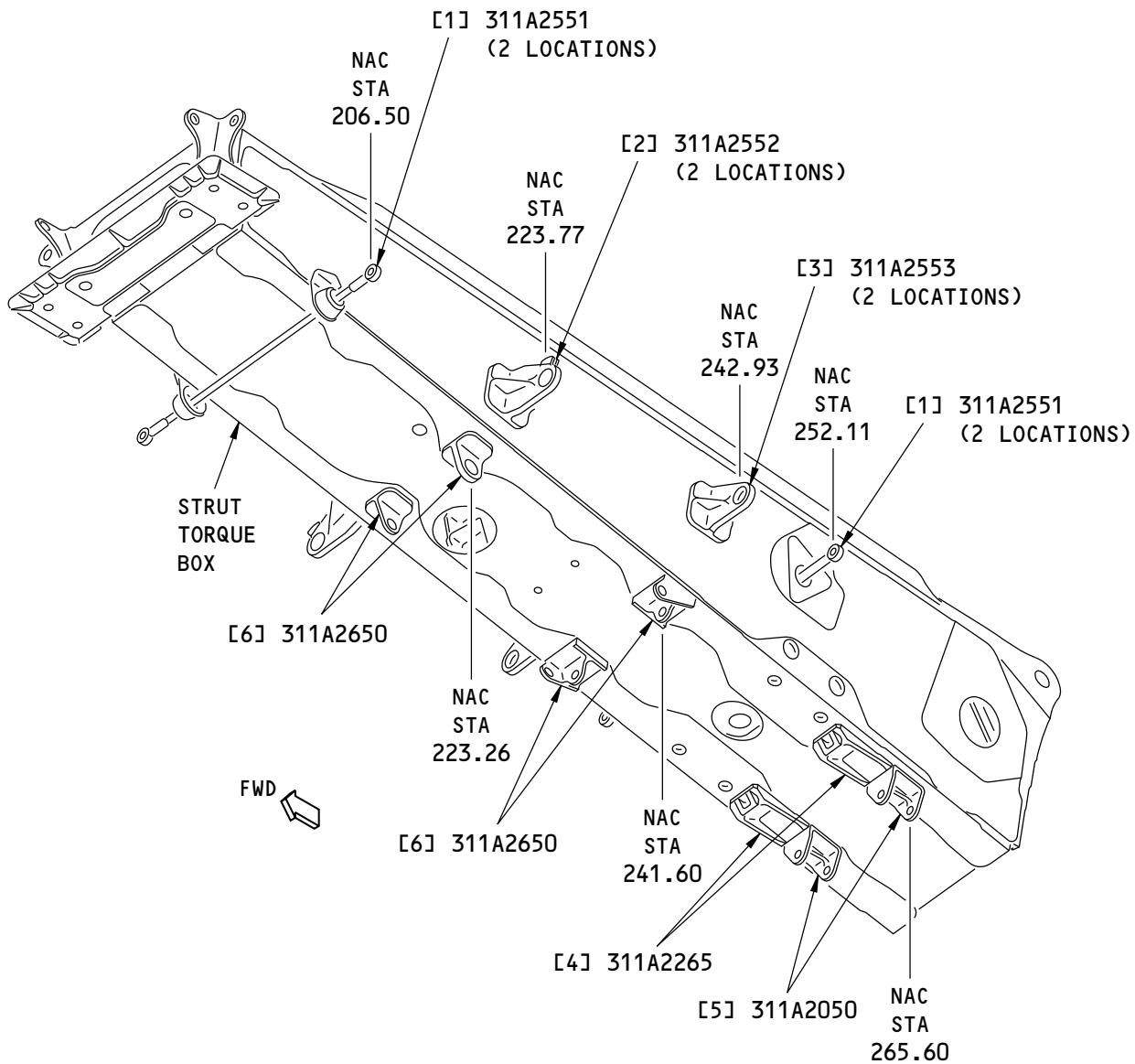
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737-800
STRUCTURAL REPAIR MANUAL



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

F92170 S0006592320_V1

Engine Strut Torque Box Fitting Identification
Figure 4

54-50-90
IDENTIFICATION 2
Page 5
Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

Table 3:

LIST OF MATERIALS FOR FIGURE 4				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Tie Rod		Ti-6Al-4V machined titanium rod as given in MIL-T-9047 in the annealed condition	
[2]	Thrust Reverser Hinge Fitting Number 2		Ti-6Al-4V forged titanium block as given in MIL-T-9047 in the annealed condition	
[3]	Thrust Reverser Hinge Fitting Number 3		Ti-6Al-4V forged titanium block as given in MIL-T-9047 in the annealed condition	
[4]	Aft Engine Mount Stop Fitting		Ti-6Al-4V machined titanium bar as given in MIL-T-9047 in the annealed condition	
[5]	GSE Aft Bootstrap Fitting		Ti-6Al-4V machined titanium bar as given in MIL-T-9047 in the annealed condition	
[6]	Precooler Support Fitting		15-5PH CRES bar heat treated to 180-200 ksi	

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

54-50-90

IDENTIFICATION 2

Page 6

Nov 10/2012

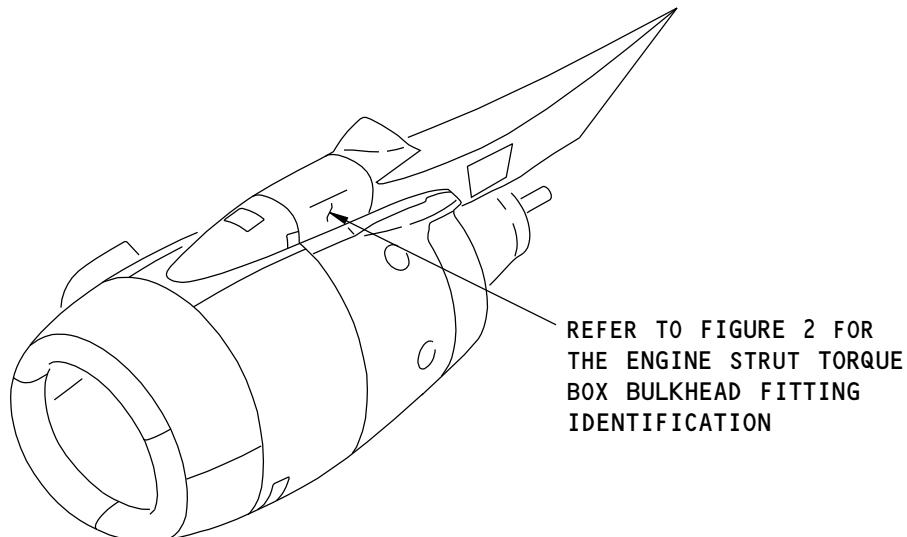
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IDENTIFICATION 3 - ENGINE STRUT BULKHEAD FITTINGS



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F93702 S0006592323_V1

Engine Strut Torque Box Bulkhead Fitting Location

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2101	Torque Box Assembly
311A2210	Forward Engine Mount Bulkhead Assembly
311A2230	Mid-Strut Bulkhead Fitting
311A2260	Aft Engine Mount Bulkhead Fitting Assembly

54-50-90

IDENTIFICATION 3

Page 1

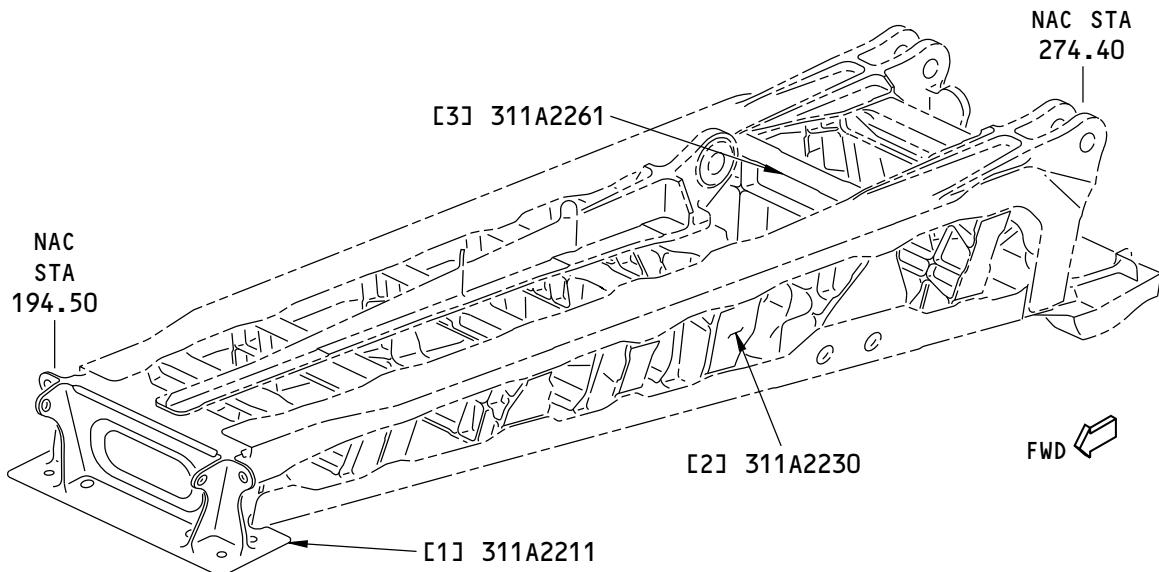
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737-800
STRUCTURAL REPAIR MANUAL



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

LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

F93721 S0006592325_V1

Engine Strut Torque Box Bulkhead Fitting Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Forward Engine Mount Bulkhead Fitting		Ti-6Al-4V forged titanium block in the annealed condition	
[2]	Mid-Strut Bulkhead Fitting		Ti-6Al-4V forged titanium block in the annealed condition	For Line Numbers 1 Thru 1312
[2]	Mid-Strut Bulkhead Fitting		7050-T7451 plate per BMS 7-323, Type I	For Line Numbers 1313 and on
[3]	Aft Engine Mount Bulkhead Fitting		Ti-6Al-4V forged titanium block in the annealed condition	

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

54-50-90

IDENTIFICATION 3

Page 2

Nov 10/2012

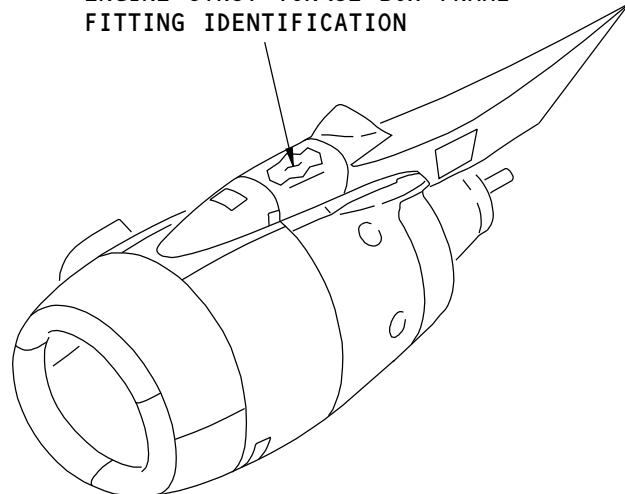
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 4 - ENGINE STRUT TORQUE BOX FRAME FITTINGS

REFER TO FIGURE 2 FOR THE
ENGINE STRUT TORQUE BOX FRAME
FITTING IDENTIFICATION



NOTE: REFER TO TABLE 1 FOR THE REFERENCE DRAWINGS.

F95118 S0006592328_V1

Engine Strut Torque Box Frame Fitting Locations

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
311A2101	Torque Box Assembly
311A2310	Frame Number 1
311A2320	Frame Number 2 Fitting
311A2330	Frame Number 3 Fitting
311A2340	Frame Number 4 Fitting

54-50-90

IDENTIFICATION 4

Page 1

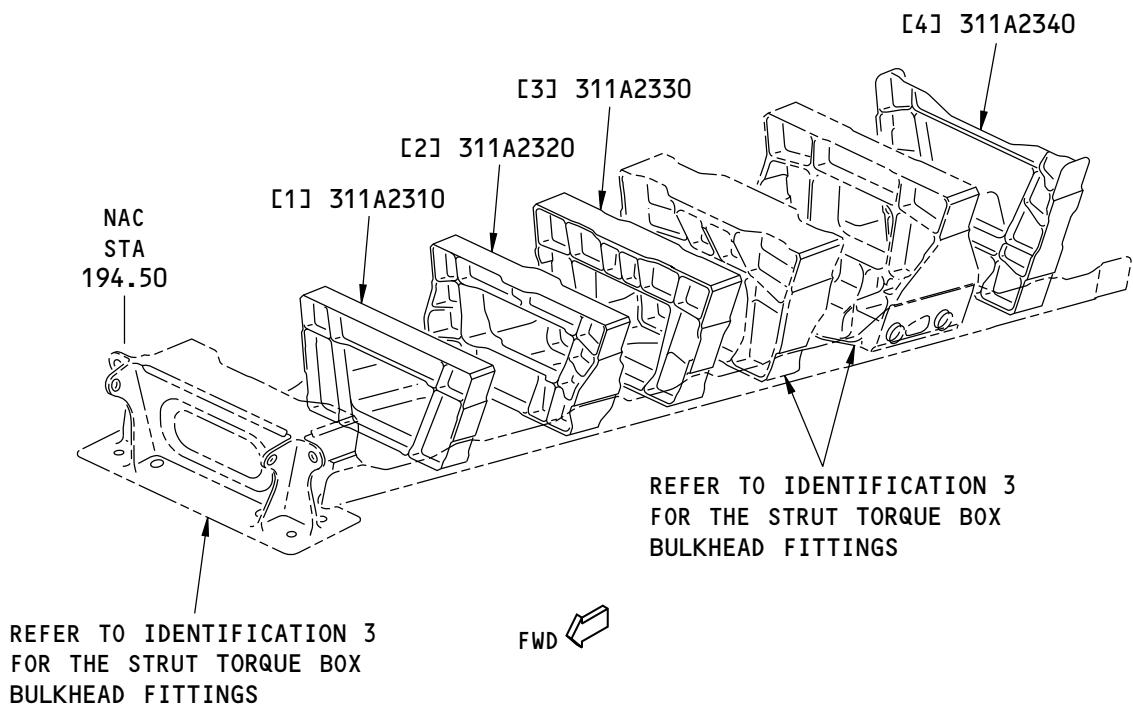
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737-800
STRUCTURAL REPAIR MANUAL



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

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Engine Strut Torque Box Frame Fitting Identification
Figure 2

54-50-90

IDENTIFICATION 4

Page 2

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^{*[1]}	MATERIAL	EFFECTIVITY
[1]	Frame Fitting Number 1	2.50 (63.5)	2219-T851 plate	
[2]	Frame Fitting Number 2	4.40 (111.8)	2219-T851 plate	
[3]	Frame Fitting Number 3	3.30 (83.8)	2219-T851 plate	
[4]	Frame Fitting Number 4	3.30 (83.8)	Ti-6Al-4V forged titanium block in the annealed condition	

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

54-50-90

IDENTIFICATION 4

Page 3

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ENGINE STRUT-TO-WING ATTACH FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the fittings that attach the CFM56-7 engine strut to the wing as shown in Engine Strut-to-Wing Attach Fitting Locations, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Remove the parts as necessary to get access to the strut-to-wing attach fittings.
- B. Refer to Engine Strut-to-Wing Attach Fitting Zones, Figure 102/ALLOWABLE DAMAGE 1 for the definitions of the different areas of the fittings covered in the allowable damage limits.
- C. Refer to Table 101/ALLOWABLE DAMAGE 1 for a list of the references for the allowable damage data.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	PARAGRAPH
Fitting Lugs	4.A
First row of fasteners adjacent to a fitting lug	4.B
Fitting	4.C
Links	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

- D. 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 abrasives and other materials you can use to remove the damage.
 - (3) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (4) Refer to SOPM 20-20-02 for the penetrant inspection procedures.
 - (5) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.
- E. After the damage is removed, 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.
 - (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 aluminum parts (diagonal brace only). Refer to 51-20-01.

54-50-90

ALLOWABLE DAMAGE 1

Page 101

Jul 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Apply 2 layers of BMS 10-11, Type I primer to the surfaces of the reworked aluminum parts (the diagonal brace) and the aft upper spar fitting. Refer to SOPM 20-41-02.
- (4) Apply a layer of phosphate-fluoride coating and a layer of high temperature polyurethane primer to the surfaces of the reworked titanium parts (the upper spar fitting and the diagonal brace fitting). Refer to SOPM 20-41-02.

54-50-90

ALLOWABLE DAMAGE 1

Page 102

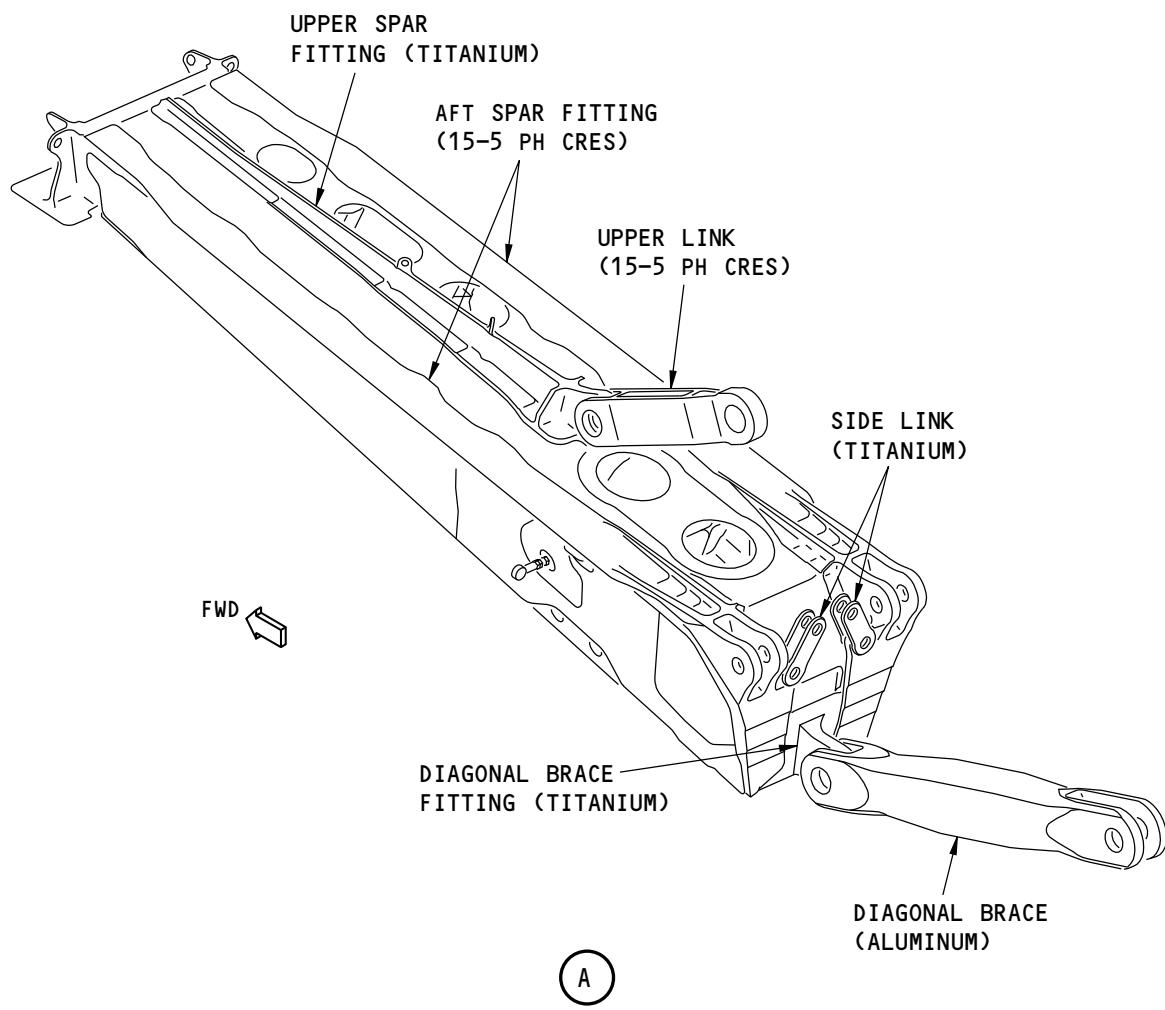
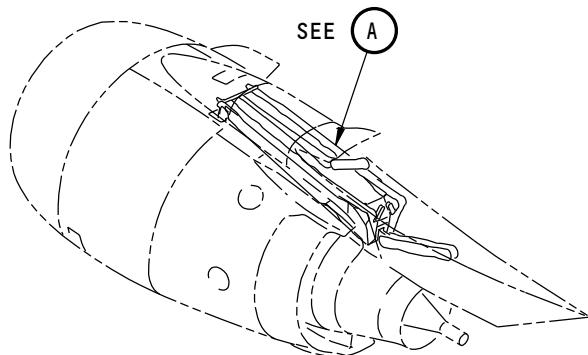
Nov 10/2012

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737-800
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Engine Strut-to-Wing Attach Fitting Locations
Figure 101

54-50-90

ALLOWABLE DAMAGE 1

Page 103

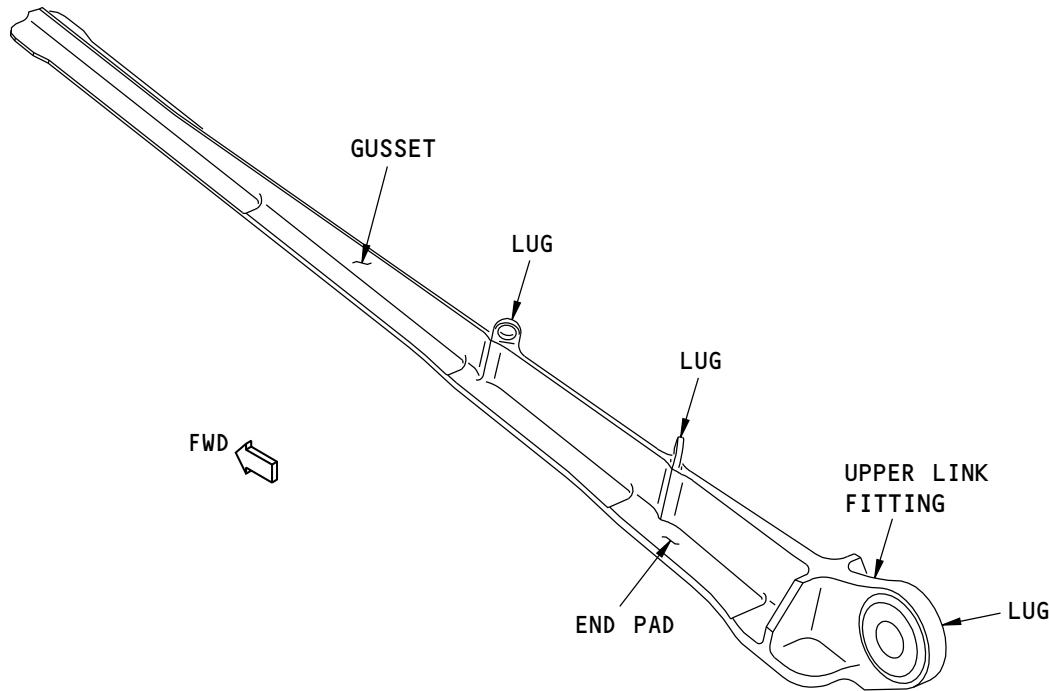
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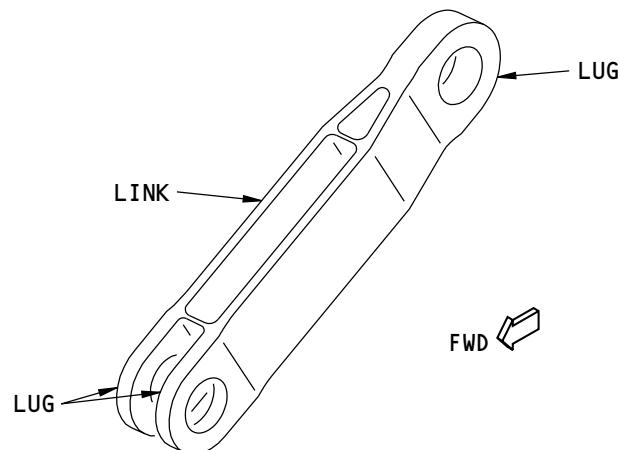


737-800
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UPPER SPAR FITTING

(A)



UPPER LINK

(B)

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Engine Strut-to-Wing Attach Fitting Zones
Figure 102 (Sheet 1 of 3)

54-50-90

ALLOWABLE DAMAGE 1

Page 104

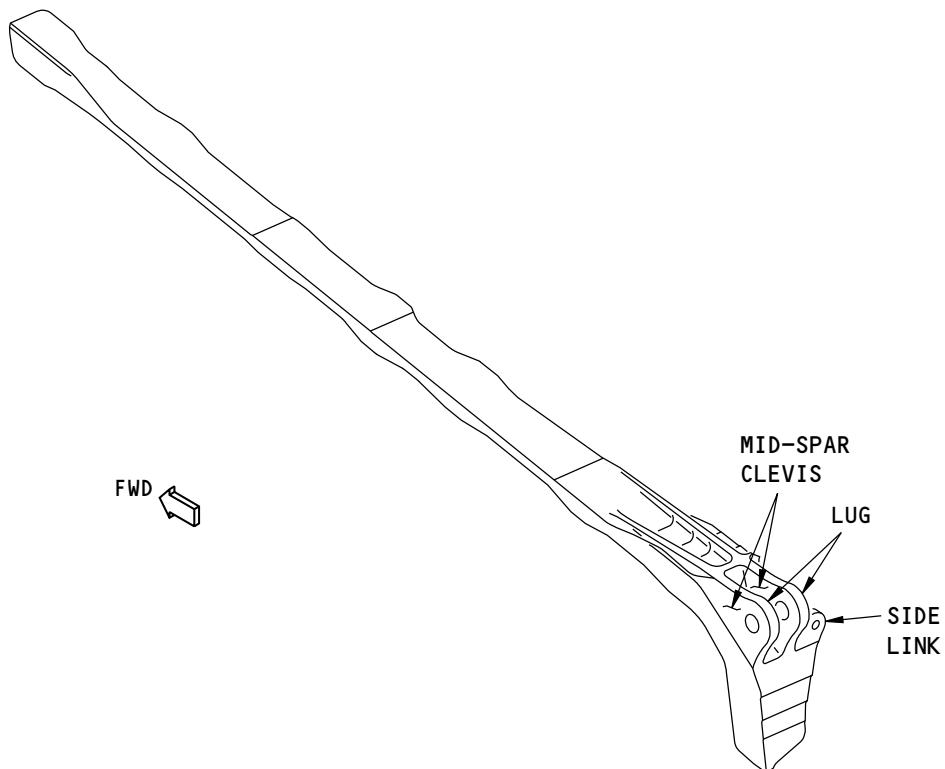
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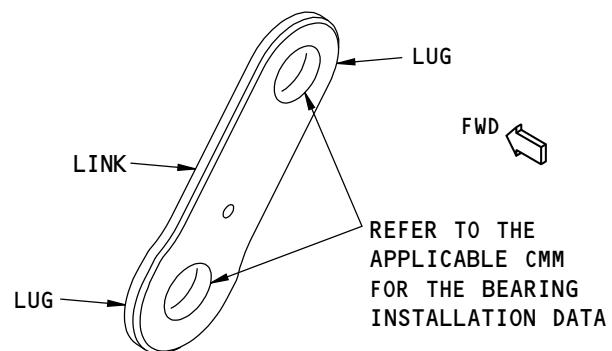


737-800
STRUCTURAL REPAIR MANUAL



AFT UPPER SPAR FITTING

(C)



SIDE LINK

(D)

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Engine Strut-to-Wing Attach Fitting Zones
Figure 102 (Sheet 2 of 3)

54-50-90

ALLOWABLE DAMAGE 1

Page 105

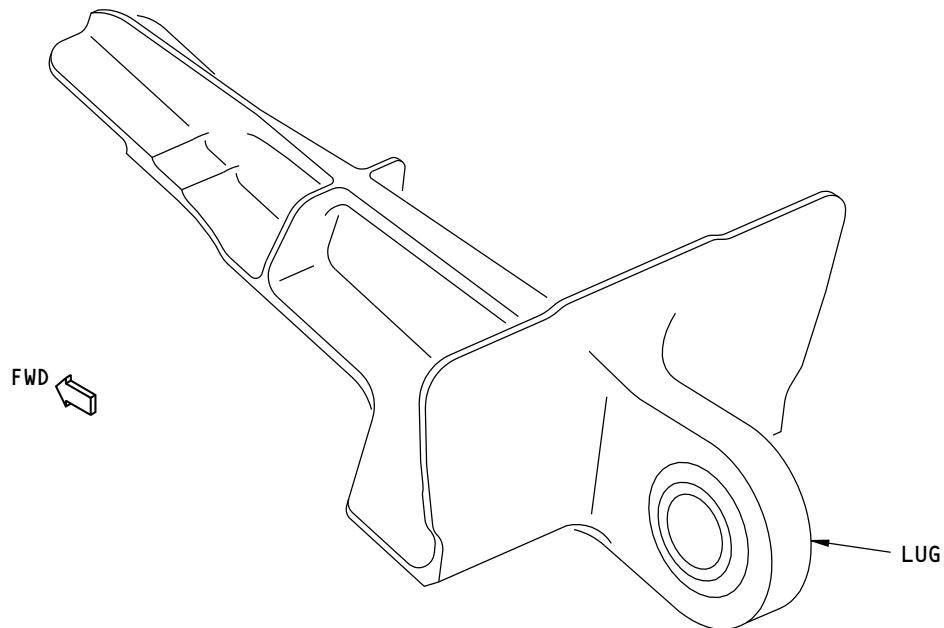
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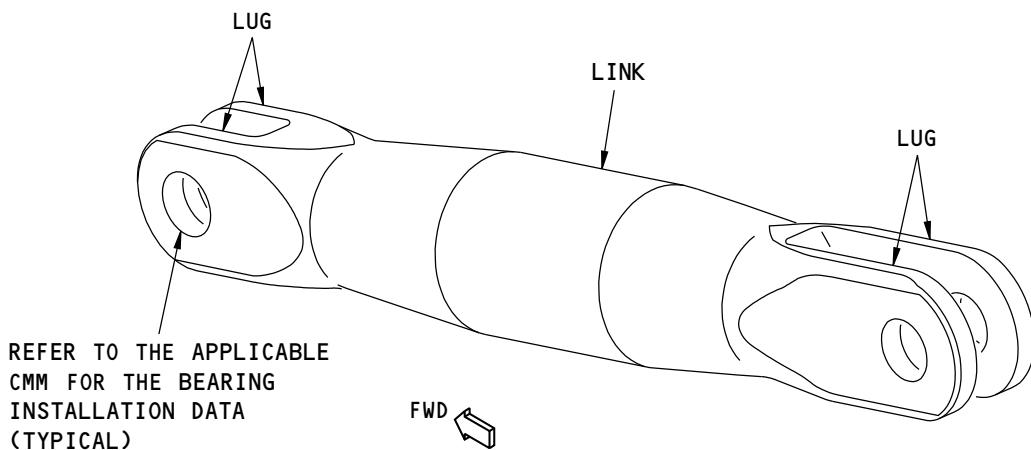


737-800
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DIAGONAL BRACE FITTING

(E)



DIAGONAL BRACE

(F)

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Engine Strut-to-Wing Attach Fitting Zones
Figure 102 (Sheet 3 of 3)

54-50-90

ALLOWABLE DAMAGE 1

Page 106

Nov 10/2012

D634A210

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737-800
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
51-20-10	FREEZE PLUG INSTALLATION
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 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Allowable Damage Limits

A. Lug Fittings:

NOTE: You can not have reworked areas of the bore and the edge on the same lug fitting. You can remove damage to the bore or to the edge, but not the two surfaces.

(1) Cracks:

- If there is no damage to the edge, you can remove the damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 1.
- If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.
- Remove the damage to the face of the lug as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.

(2) Nicks, Gouges, Scratches, and Corrosion:

- If there is no damage to the edge, you can remove the damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 1.
- If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.
- Remove the damage to the face of the lug as shown in Lug Fitting Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 1.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

Table 102:

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Upper Link Fitting	
Wing Side	2.136 (54.25)
Strut Side	2.296 (58.32)
Diagonal Brace Fitting	
Wing Side	2.151 (53.99)

54-50-90

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 102: (Continued)

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
Strut Side	2.276 (57.81)
Side Link Fitting	
Wing Side	1.061 (26.95)
Strut Side	1.061 (26.95)
Mid-Spar Clevis	1.895 (48.13)

B. The first row of fasteners adjacent to the lugs of the fitting:

(1) Cracks:

- (a) Remove the damage as shown in First Row of Fasteners Adjacent to a Fitting Lug - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1.
1) The damaged area must be 1.0 inch (25.4 mm) or less in length in all directions.

(2) Nicks, Gouges, Scratches, and Corrosion:

- (a) Remove the damage as shown in First Row of Fasteners Adjacent to a Fitting Lug - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 1.
1) The damaged area after cleanup is 1.0 inch (25.4 mm) or less in length in any direction.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

C. Fitting (This data does not include the lugs or the first fastener row adjacent to the lugs):

(1) Cracks:

- (a) Remove the damage as shown in Attach Fitting Allowable Damage Limits, Figure 105/ ALLOWABLE DAMAGE 1.
(b) The damaged area after cleanup must be 2.0 inches (50.80 mm) or less in length in all directions.
(c) If the material removed is 1.5D or less from a fastener hole do the steps that follow:
1) Remove the fastener that is less than 1.5D from the damage.
2) Install a freeze plug with BMS 5-63 sealant in the holes of the fitting and each part in the joint at that fastener location. Refer to 51-20-10.

NOTE: Use the same material for the freeze plug as the initial part in which you install it.

3) The installation of freeze plugs in adjacent fastener holes is not permitted.

(2) Nicks, Gouges, Scratches, and Corrosion:

- (a) Remove the damage as shown in Attach Fitting Allowable Damage Limits, Figure 105/ ALLOWABLE DAMAGE 1.
(b) The damaged area after cleanup must be 2.0 inches (50.80 mm) or less in length in all directions.
(c) For damage that is 1.5D or less from a fastener, do the steps that follow:
1) Remove the fastener that is less than 1.5D from the damage.

54-50-90

ALLOWABLE DAMAGE 1

Page 108

Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- 2) Install a freeze plug with BMS 5-63 sealant in the holes of the fitting and each part in the joint at that fastener location. Refer to 51-20-10.

NOTE: Use the same material for the freeze plug as the initial part in which you install it.

- 3) The installation of freeze plugs in adjacent fastener holes is not permitted.

- (3) Dents are not permitted.

- (4) Holes and Punctures are not permitted.

D. Links:

- (1) Cracks:

- (a) Remove the damage as shown in Link Allowable Damage Limits, Figure 106/
ALLOWABLE DAMAGE 1.

- (2) Nicks, Gouges, Scratches, and Corrosion:

- (a) Remove the damage as shown in Link Allowable Damage Limits, Figure 106/
ALLOWABLE DAMAGE 1.

- (3) Dents are not permitted.

- (4) Holes and Punctures are not permitted.

54-50-90

ALLOWABLE DAMAGE 1

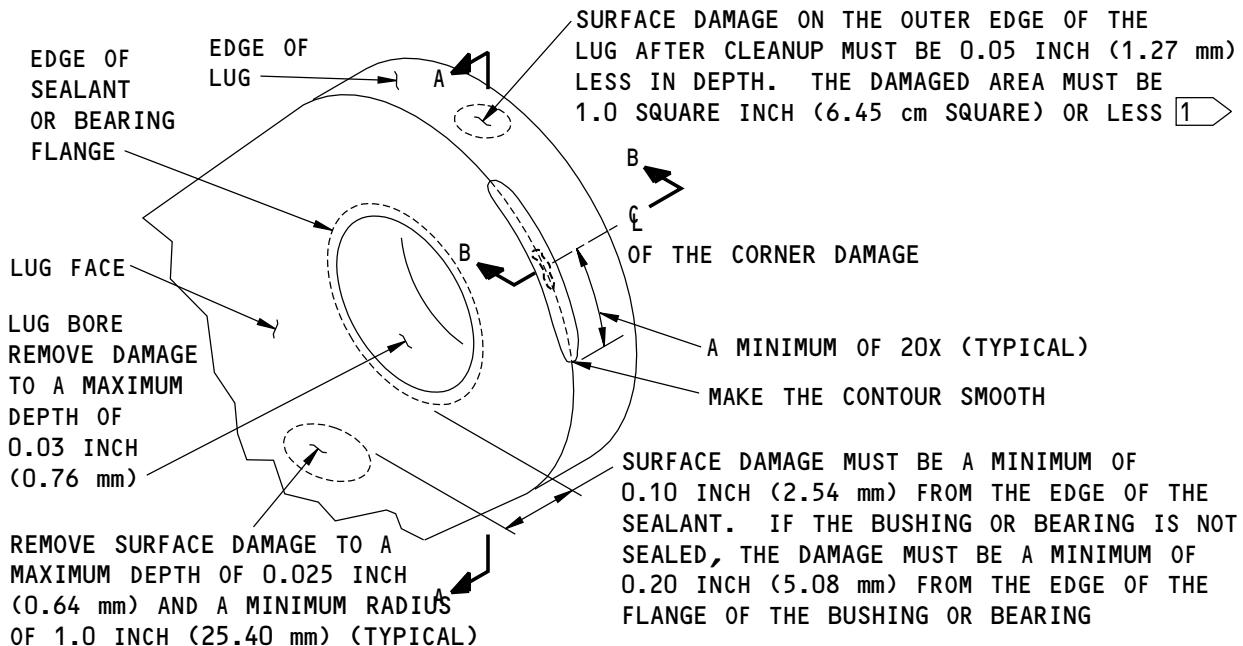
Page 109

Nov 10/2012

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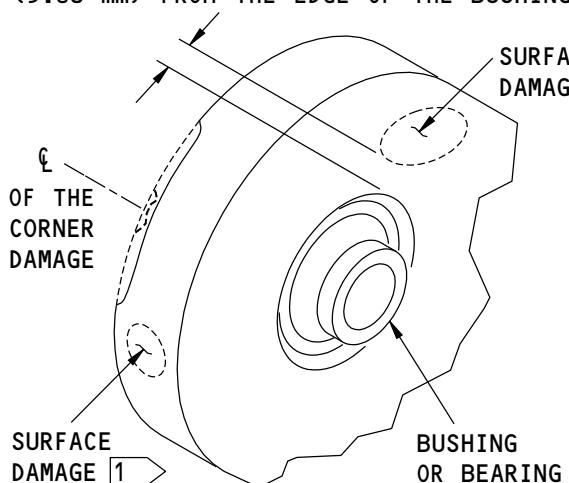
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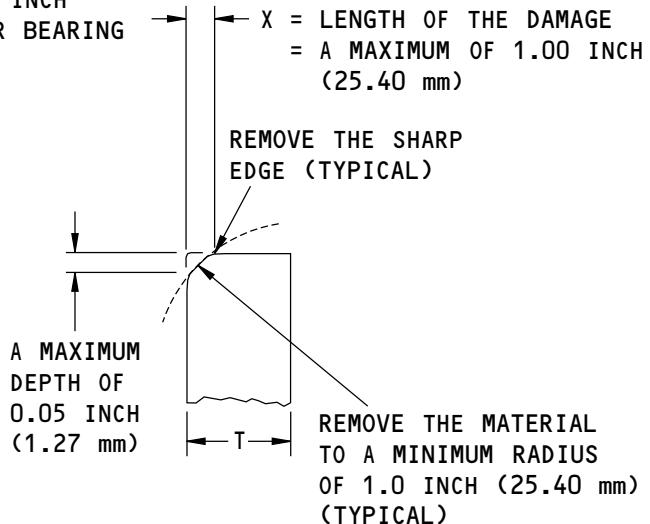
REMOVAL OF SURFACE AND EDGE DAMAGE

A

SURFACE DAMAGE MUST BE A MINIMUM OF 0.20 INCH (5.08 mm) FROM THE EDGE OF THE BUSHING OR BEARING



A-A



B-B [1]

NOTES

[1] THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY IF THERE IS NO DAMAGE IN THE BORE OF THE LUG.

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**Lug Fitting Allowable Damage Limits
Figure 103**

54-50-90

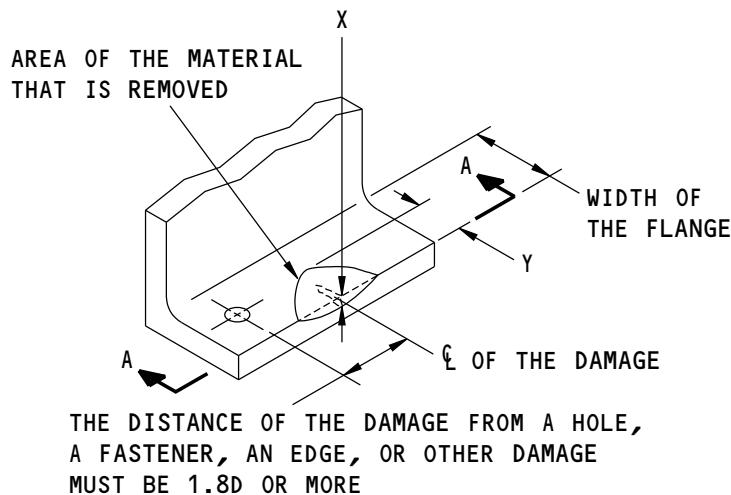
ALLOWABLE DAMAGE 1

Page 110

Nov 10/2012



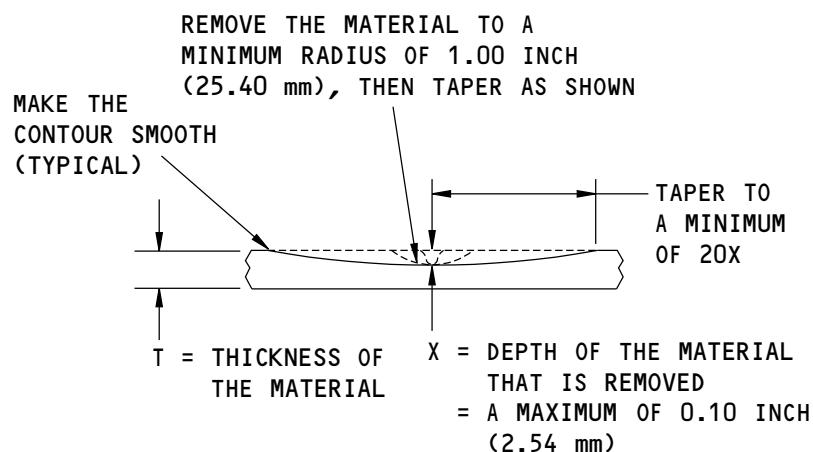
737-800
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Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 1.0 INCH (25.40 mm)

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(A)



A-A

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First Row of Fasteners Adjacent to a Fitting Lug - Allowable Damage Limits
Figure 104

54-50-90

ALLOWABLE DAMAGE 1

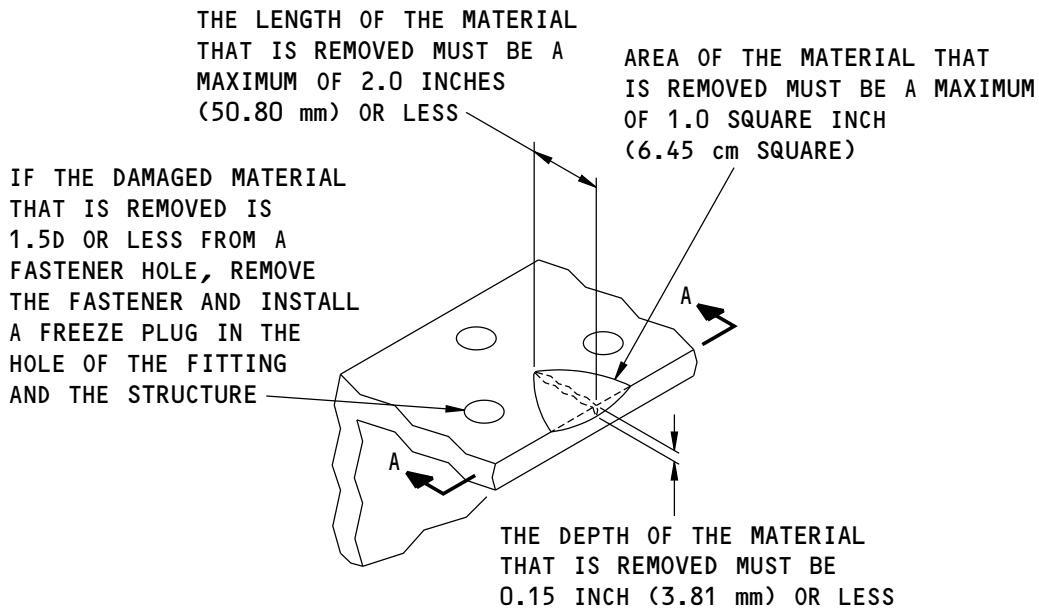
Page 111

Nov 10/2012

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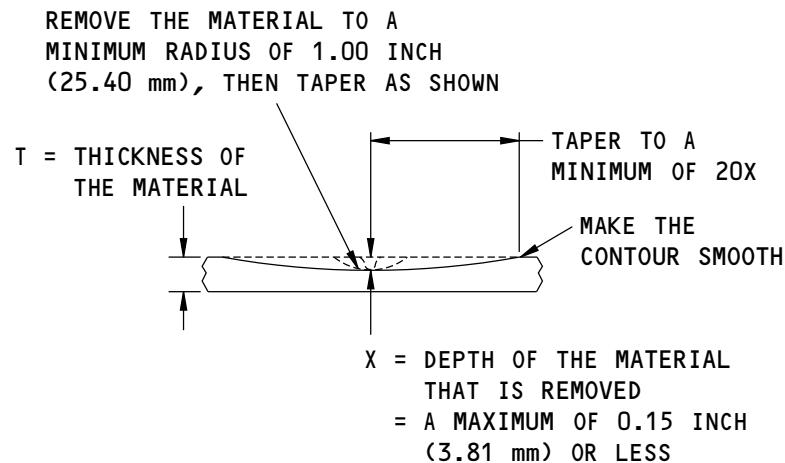
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**737-800
STRUCTURAL REPAIR MANUAL**



REMOVAL OF DAMAGED MATERIAL ON A SURFACE AT AN EDGE

(A)



A-A

NOTES

- REFER TO PARAGRAPH 4.A FOR DATA ABOUT THE LUGS OF A FITTING.
- REFER TO PARAGRAPH 4.B FOR DATA ABOUT THE FIRST ROW OF FASTENERS ADJACENT TO THE LUG OF A FITTING.

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**Attach Fitting Allowable Damage Limits
Figure 105**

54-50-90

ALLOWABLE DAMAGE 1

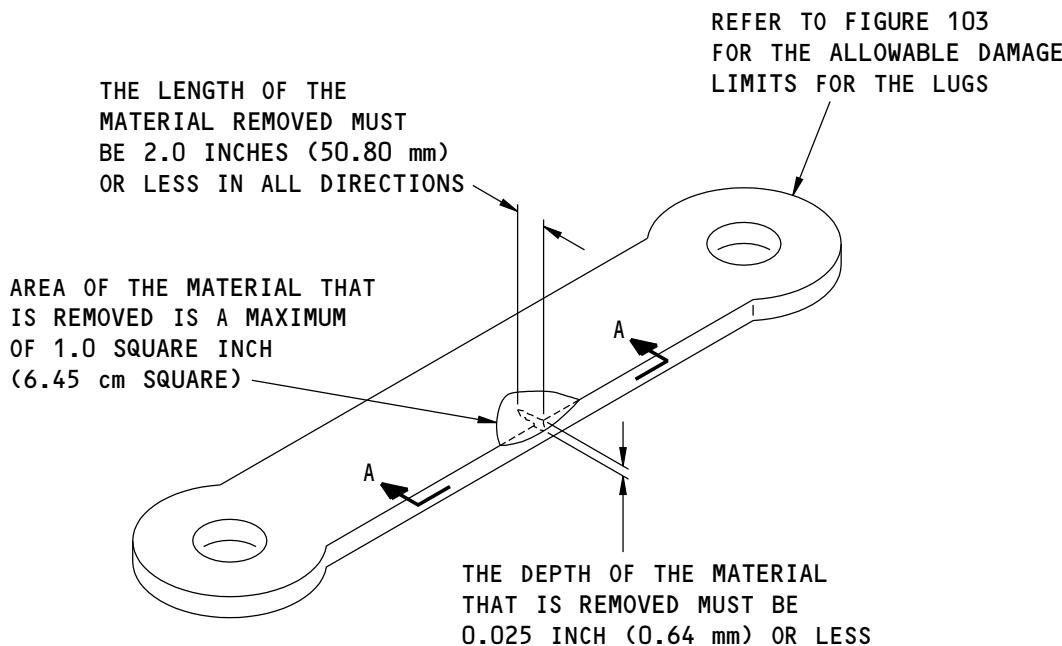
Page 112

Nov 10/2012

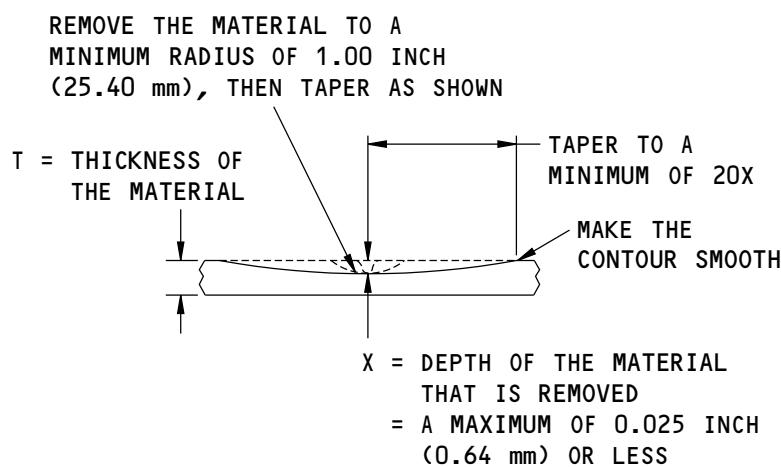
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737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL ON A SURFACE AT AN EDGE



A-A

F95170 S0006592343_V1

Link Allowable Damage Limits
Figure 106

54-50-90

ALLOWABLE DAMAGE 1

Page 113

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - ENGINE STRUT HINGE FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the strut fittings shown in Engine Strut Assembly Fitting Locations, Figure 101/ALLOWABLE DAMAGE 2.

2. General

- A. Remove the parts as necessary to get access to the strut fittings.
- B. Refer to Strut Fittings, Figure 102/ALLOWABLE DAMAGE 2 for the definitions of the different areas of the fittings covered in the allowable damage limits.
- C. Refer to Table 101/ALLOWABLE DAMAGE 2 for a list of the references for the allowable damage data.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	PARAGRAPH
Fitting Lugs and Tie Rod Ends	4.A
End Pads and Gussets	4.B
Tie Rods and Threads	4.C
Aft Engine Mount Stop Fitting	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

- D. 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 abrasives and other materials you can use to remove the damage.
- (3) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.

- E. After the damage is removed, 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 AN OCCUR.

- (1) Flap peen or shot peen the reworked areas.
 - (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 layer of phosphate-fluoride coating with one layer of BMS 10-11, Type 1 primer to the reworked areas of the Number 2 thrust reverser hinge fitting. Refer to SOPM 20-41-02.

NOTE: Do not apply the coatings to the bore of the hinge fitting.

54-50-90

ALLOWABLE DAMAGE 2

Page 101

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (3) Apply a layer of phosphate-fluoride coating with one layer of high temperature polyurethane primer to the reworked areas of the aft engine mount stop, and the aft GSE bootstrap fitting. Refer to SOPM 20-41-02.
- (4) Apply a layer of phosphate-fluoride coating on reworked areas of the tie rod, but not to the threads. Refer to SOPM 20-41-02.
- (5) Apply on layer of BMS 3-8 to the threads of the tie rod. Refer to SOPM 20-41-02.

54-50-90

ALLOWABLE DAMAGE 2

Page 102

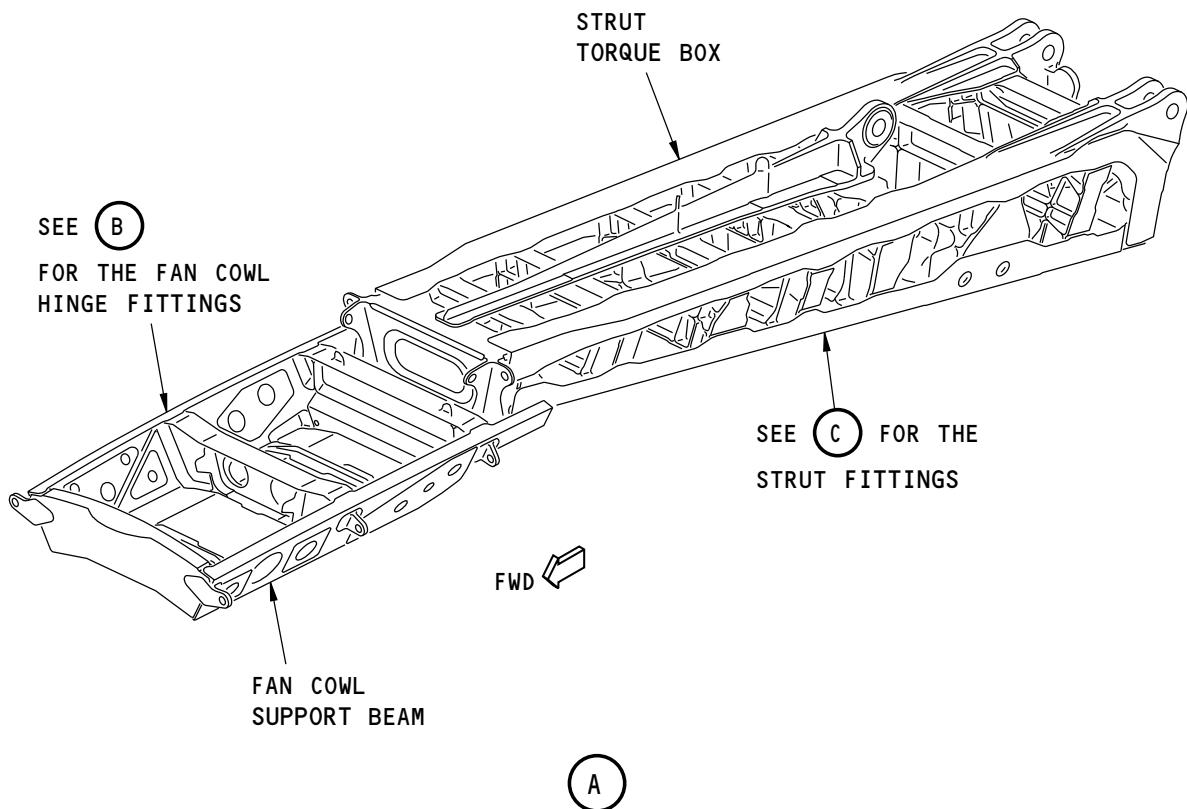
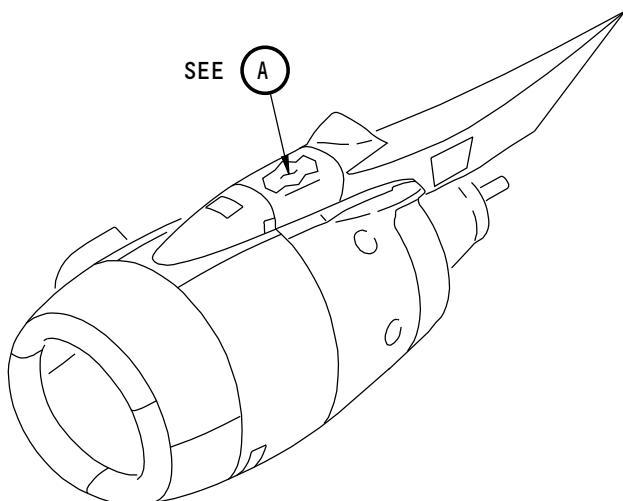
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737-800
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Engine Strut Assembly Fitting Locations
Figure 101 (Sheet 1 of 3)

54-50-90

ALLOWABLE DAMAGE 2

Page 103

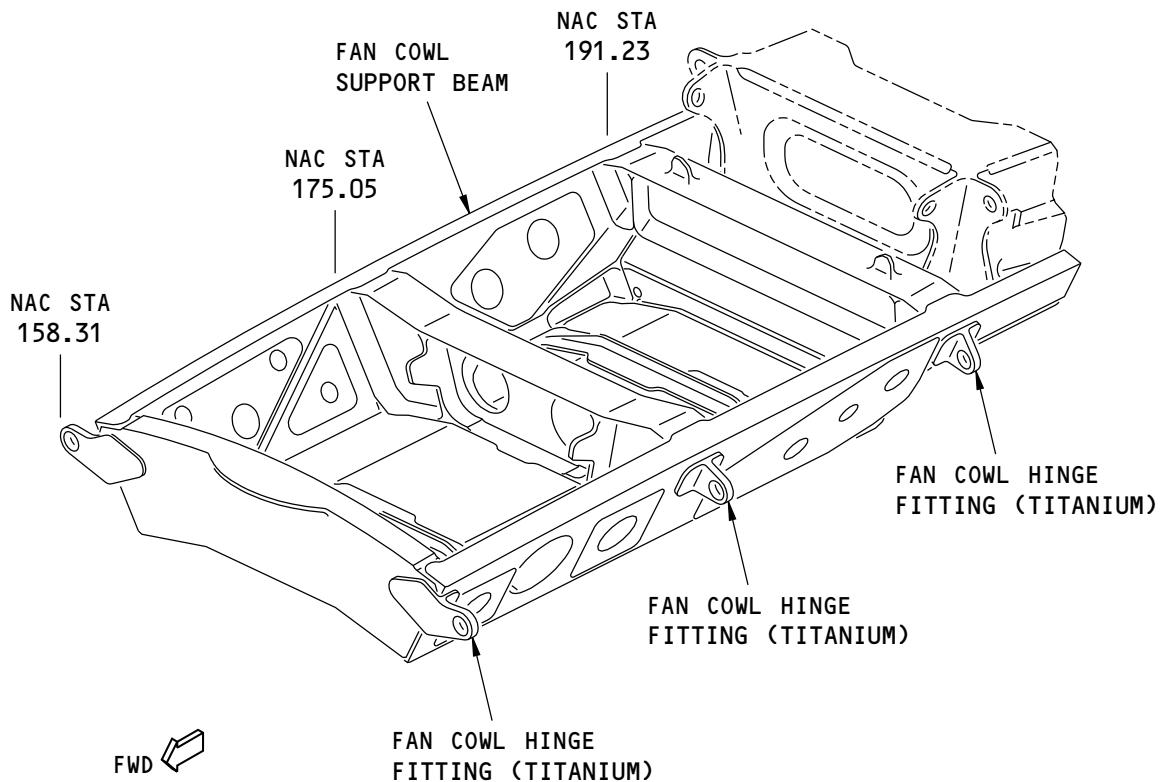
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737-800
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LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
FAN COWL HINGE FITTINGS

(B)

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Engine Strut Assembly Fitting Locations
Figure 101 (Sheet 2 of 3)

54-50-90

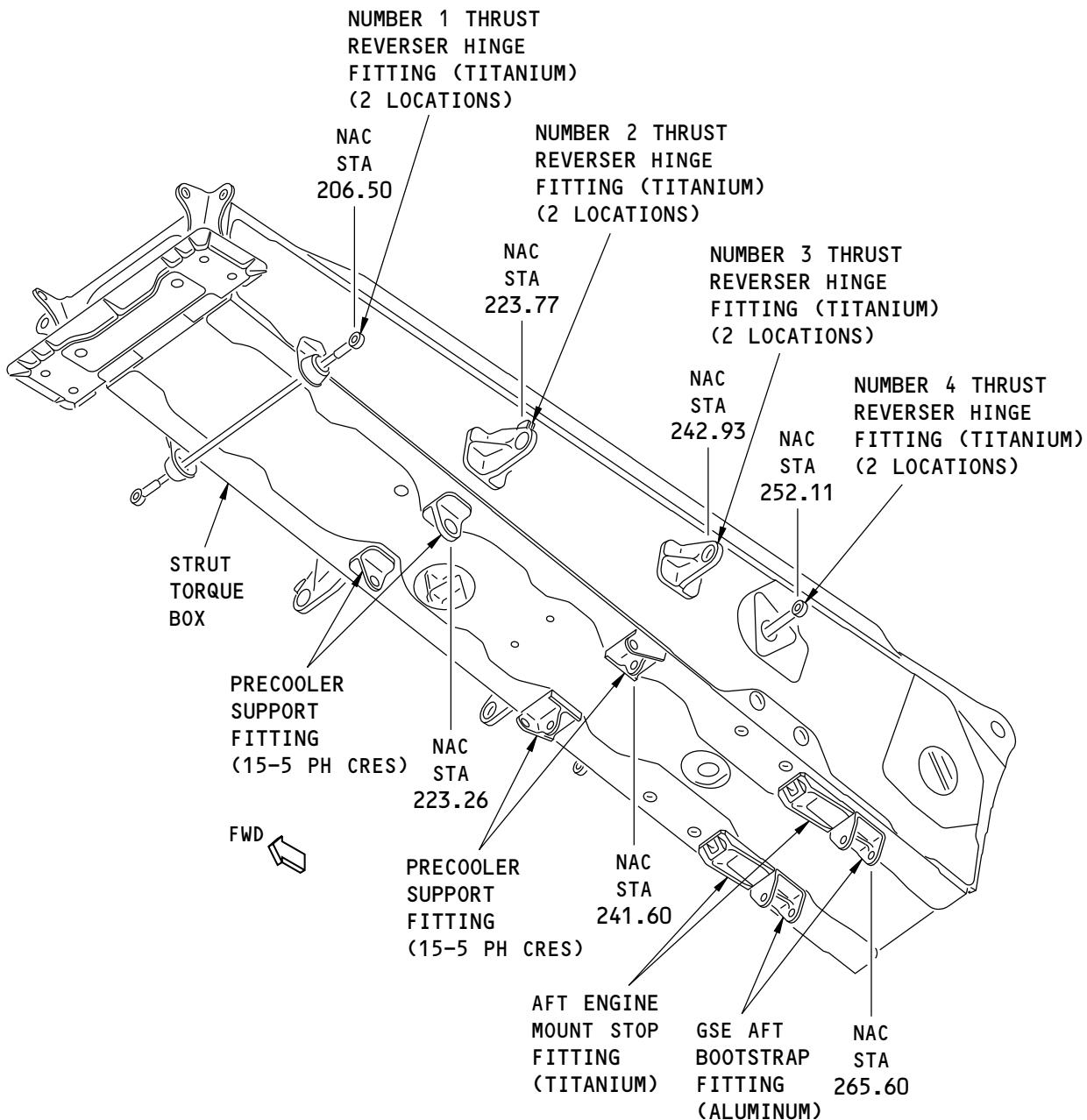
ALLOWABLE DAMAGE 2

Page 104

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

STRUT FITTINGS
C

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Engine Strut Assembly Fitting Locations
Figure 101 (Sheet 3 of 3)

54-50-90
ALLOWABLE DAMAGE 2

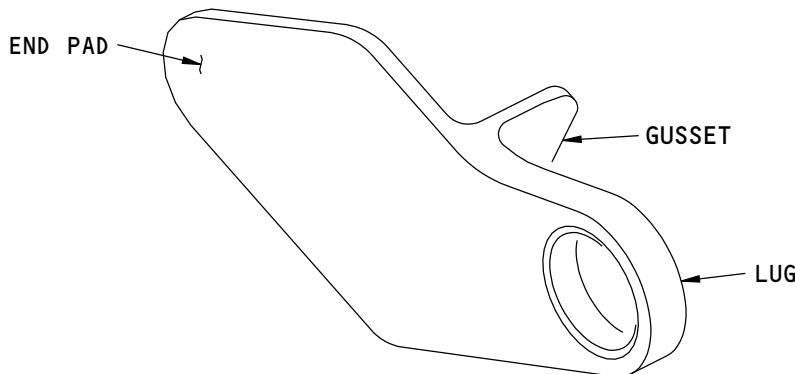
Page 105

Nov 10/2012

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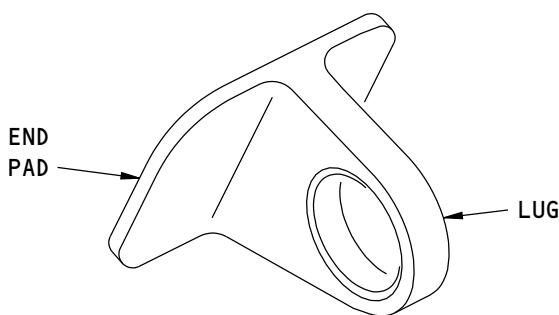


737-800
STRUCTURAL REPAIR MANUAL



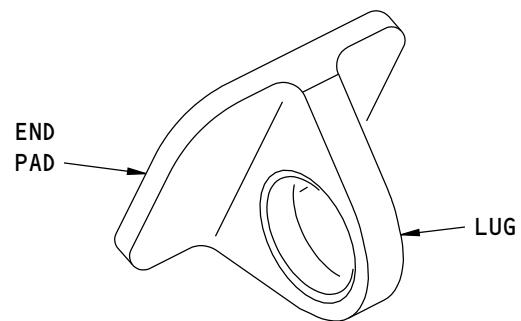
FAN COWL HINGE FITTING
NAC STA 158.31

(A)



FAN COWL HINGE FITTING
NAC STA 175.05

(B)



FAN COWL HINGE FITTING
NAC STA 191.23

(C)

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Strut Fittings
Figure 102 (Sheet 1 of 4)

54-50-90

ALLOWABLE DAMAGE 2

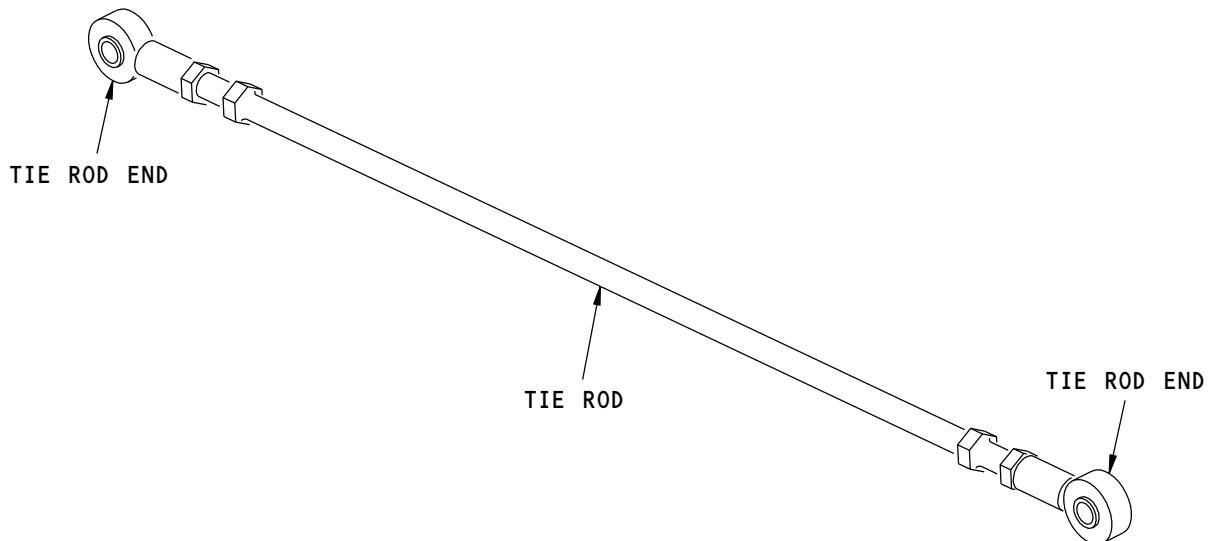
Page 106

D634A210

Nov 10/2012

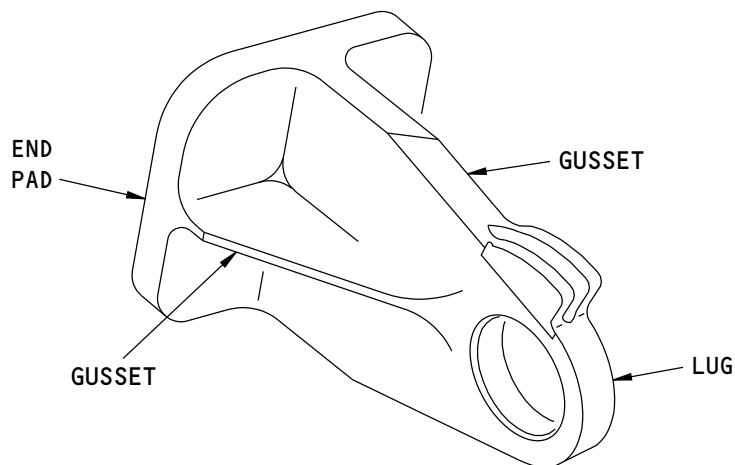


**737-800
STRUCTURAL REPAIR MANUAL**



**TIE ROD ASSEMBLY - NUMBERS 1 AND 4 THRUST REVERSER
HINGE FITTINGS AT NAC STA 206.50 AND NAC STA 252.11**

(D)



**NUMBERS 2 AND 3 THRUST REVERSER HINGE FITTINGS
TYPICAL AT NAC STA 223.77 AND NAC STA 242.93**

(E)

F92529 S0006592350_V1

**Strut Fittings
Figure 102 (Sheet 2 of 4)**

54-50-90

ALLOWABLE DAMAGE 2

Page 107

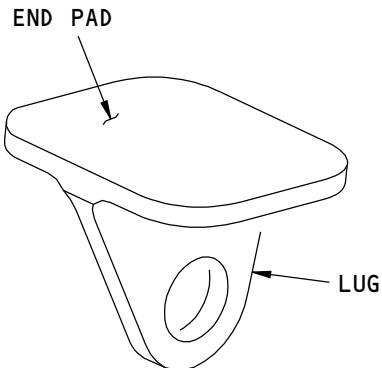
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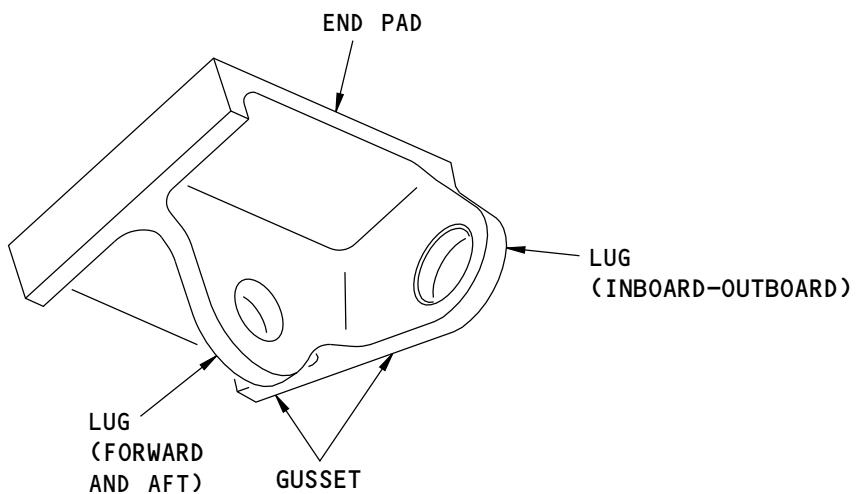


737-800
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PRECOOLER SUPPORT FITTING AT NAC STA 223.26

(F)



PRECOOLER SUPPORT FITTING AT NAC STA 241.60

(G)

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Strut Fittings
Figure 102 (Sheet 3 of 4)

54-50-90

ALLOWABLE DAMAGE 2

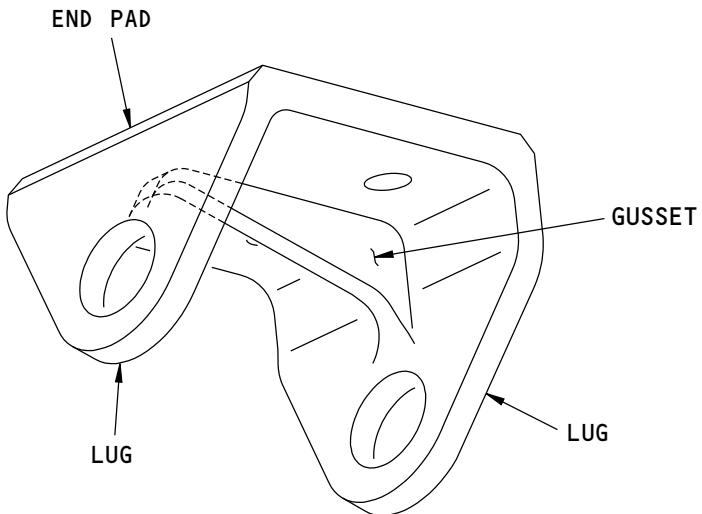
Page 108

Nov 10/2012

D634A210

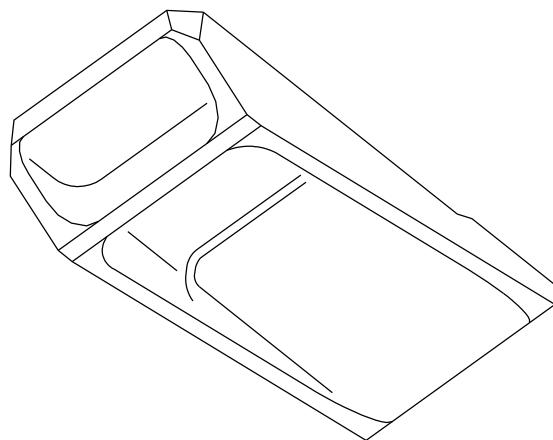


737-800
STRUCTURAL REPAIR MANUAL



GSE AFT BOOTSTRAP FITTING AT NAC STA 265.60

(H)



AFT ENGINE MOUNT STOP FITTING

(I)

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Strut Fittings
Figure 102 (Sheet 4 of 4)

54-50-90

ALLOWABLE DAMAGE 2

Page 109

Nov 10/2012

D634A210



737-800
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
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes

4. Allowable Damage Limits

A. Lug Fittings and Tie Rod Ends:

NOTE: You can not have reworked areas of the bore and the edge on the same lug fitting or tie rod end. You can remove damage to the bore or damage to the edge, but not the two surfaces.

(1) Cracks:

- If there is no damage to the edge, you can remove the damage on the bore of the lug to the diameters given in Table 102/ALLOWABLE DAMAGE 2.
- If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .
- Remove the damage on the face of the lug as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .

(2) Nicks, Gouges, Scratches, and Corrosion:

- If there is no damage to the edge, you can remove the damage on the bore of the lug to the diameters given in Table 102/ALLOWABLE DAMAGE 2.
- If there is no damage to the bore of the lug, you can remove the damage on the edge as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .
- Remove the damage on the face of the lug as shown in Fitting Lug and Tie Rod End Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 2, Detail A .

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

Table 102:

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Fan Cowl Hinge Fittings	1.063 in. (27.00 mm)
Numbers 1 and 4 Thrust Reverser Hinge Fittings	1.010 in. (25.65 mm)
Numbers 2 and 3 Thrust Reverser Hinge Fittings	1.490 in. (37.85 mm)
GSE Aft Bootstrap Fittings	0.876 in. (22.25 mm)
Precooler Support Fitting (LH at NAC STA 223.26)	1.315 in. (33.40 mm)
Precooler Support Fitting (RH at NAC STA 223.26)	0.917 in. (23.29 mm)

54-50-90

ALLOWABLE DAMAGE 2

Page 110

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

Table 102: (Continued)

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Precooler Support Fittings (forward-and-aft lugs at NAC STA 241.60)	0.866 in. (22.00 mm)
Precooler Support Fittings (inboard-and-outboard lugs at NAC STA 241.60)	0.751 in. (19.08 mm)

B. End Pads and Gussets:

- (1) Cracks:
(a) Remove the damage on an edge as shown in Fitting End Pad and Gusset Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A , B , and D .

- (2) Nicks, Gouges, Scratches, and Corrosion:
(a) Remove the damage on an edge as shown in Fitting End Pad and Gusset Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 2, Details A , B , D .
1) The length of the damage after cleanup must be 0.5 inch (12.70 mm) or less.

- (3) Dents are not permitted.

- (4) Holes and Punctures are not permitted.

C. Tie Rod - (Numbers 1 and 4 Thrust Reverser Hinge Fitting Locations):

- (1) Cracks are not permitted.
(2) Nicks, Gouges, Scratches, and Corrosion:
(a) Remove the damage as shown in Tie Rod and Thread Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 2, Details A and B .
(3) Dents are not permitted.
(4) Holes and Punctures are not permitted.

D. Aft Engine Mount Stop Fitting:

- (1) Cracks:
(a) Remove the damage as shown in Aft Engine Mount Stop Fitting Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Details A and B .
(b) For damage that is less than 1.8D (D = the largest dimension of the damage) away from a fastener hole, do the steps that follow:
1) Remove the fastener that is less than 1.8D (D = the largest dimension of the damage) from the damage.
2) Install a freeze plug with BMS 5-63 sealant in the holes of the fitting and each part of the joint at that fastener location. Refer to 51-20-10.
NOTE: Use the same material for the freeze plug as the initial part in which you install it.
3) The installation of freeze plugs in adjacent fastener holes is not permitted.

- (2) Nicks, Gouges, Scratches, and Corrosion:
(a) Remove damage on an edge as shown in Aft Engine Mount Stop Fitting Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Details A and B .
(b) Remove damage at locations other than on an edge as shown in Aft Engine Mount Stop Fitting Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 2, Detail C .

54-50-90

ALLOWABLE DAMAGE 2

Page 111

Jul 10/2016

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

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

54-50-90

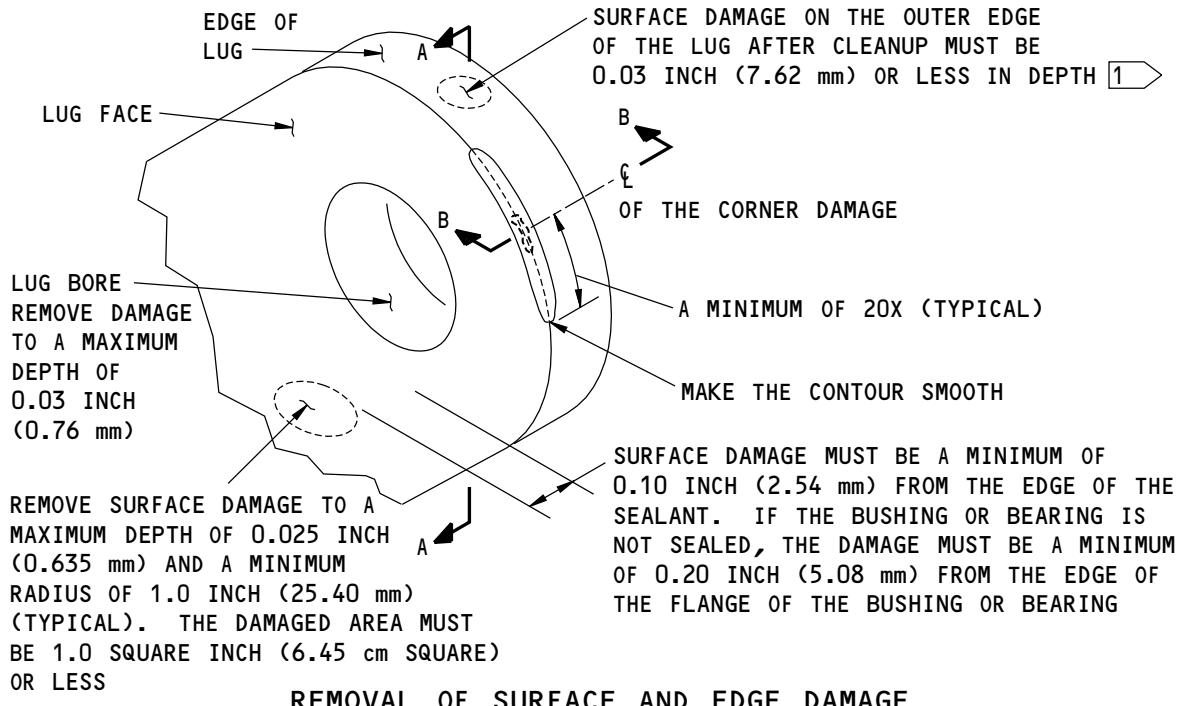
ALLOWABLE DAMAGE 2

Page 112

Jul 10/2013

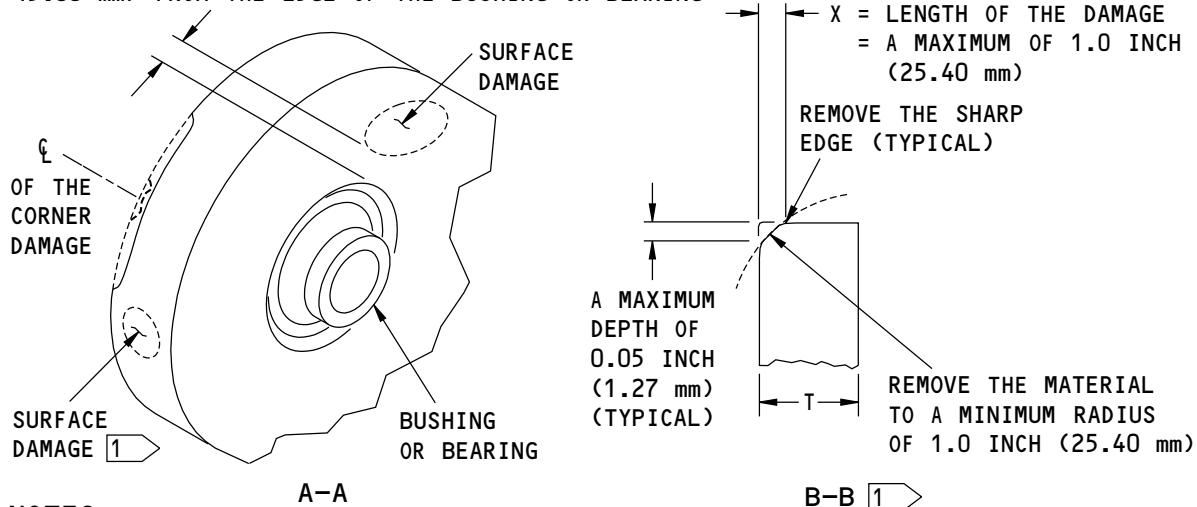
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**737-800
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REMOVAL OF SURFACE AND EDGE DAMAGE

(A)

SURFACE DAMAGE MUST BE A MINIMUM OF 0.20 INCH (5.08 mm) FROM THE EDGE OF THE BUSHING OR BEARING


NOTES

- [1] THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY IF THERE IS NO DAMAGE IN THE BORE OF THE LUG.

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Fitting Lug and Tie Rod End Allowable Damage Limits
Figure 103

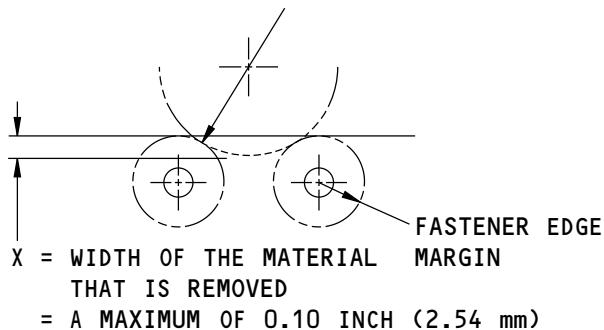
54-50-90

ALLOWABLE DAMAGE 2

Page 113

Nov 10/2012

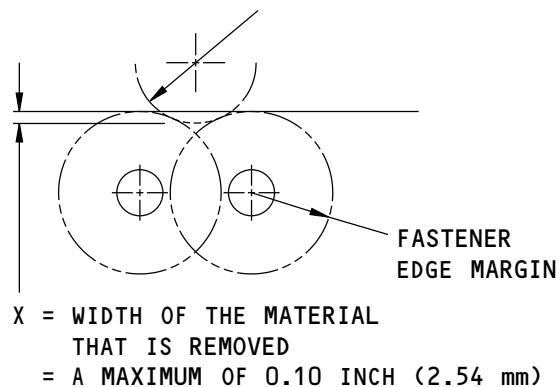
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)



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 (25.40 mm)



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

(B)

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Fitting End Pad and Gusset Allowable Damage Limits

Figure 104 (Sheet 1 of 3)

54-50-90

ALLOWABLE DAMAGE 2

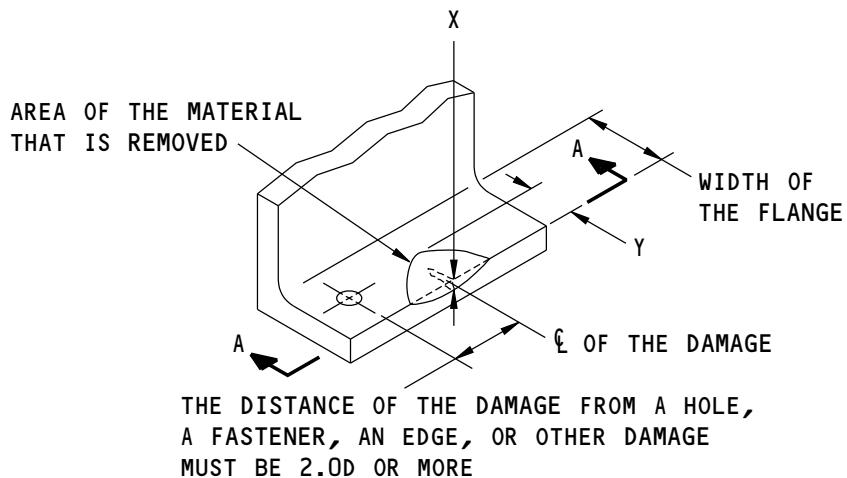
Page 114

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

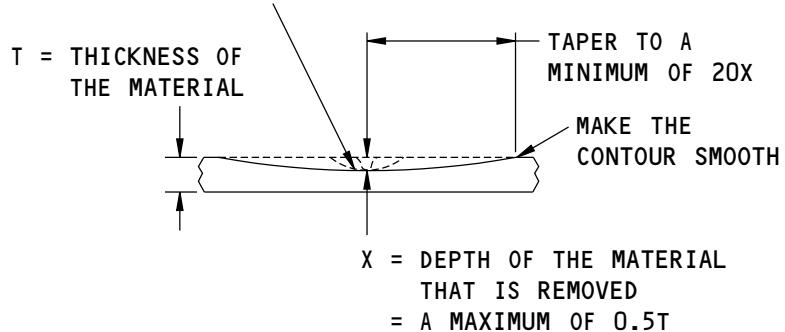


Y = WIDTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.15 INCH (3.81 mm)

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(C)

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



A-A

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Fitting End Pad and Gusset Allowable Damage Limits
Figure 104 (Sheet 2 of 3)

54-50-90

ALLOWABLE DAMAGE 2

Page 115

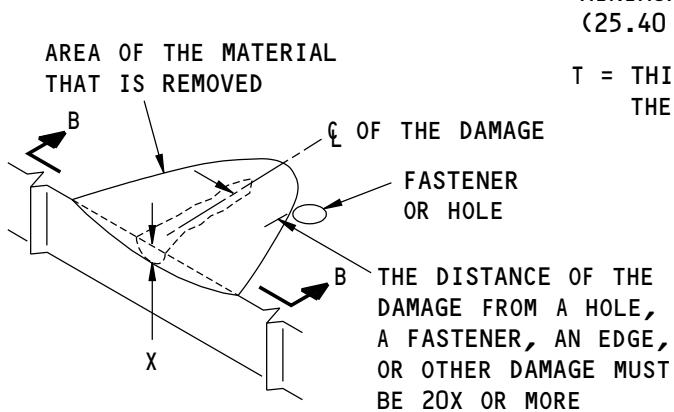
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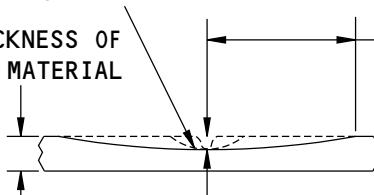


737-800
STRUCTURAL REPAIR MANUAL



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

T = THICKNESS OF
THE MATERIAL



TAPER TO
A MINIMUM
OF 20X

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

B-B

REMOVAL OF DAMAGED MATERIAL
ON A SURFACE

D

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Fitting End Pad and Gusset Allowable Damage Limits
Figure 104 (Sheet 3 of 3)

54-50-90

ALLOWABLE DAMAGE 2

Page 116

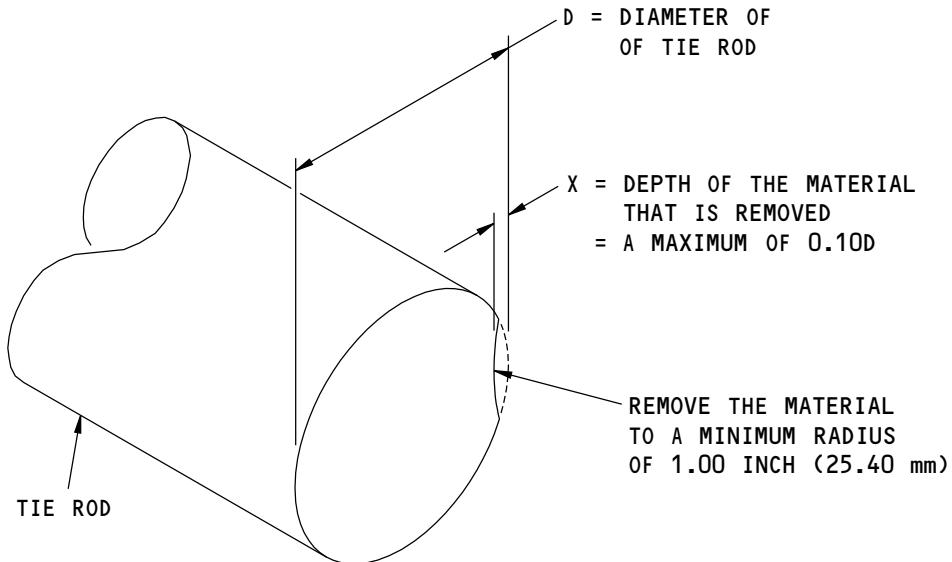
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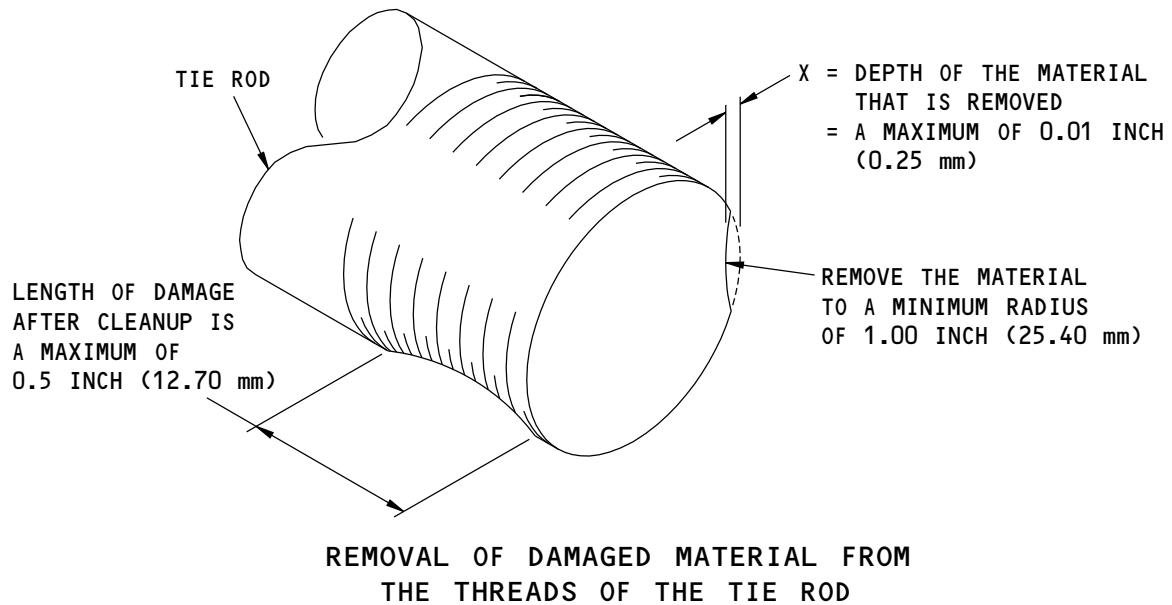
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737-800
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(A)



(B)

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Tie Rod and Thread Allowable Damage Limits
Figure 105

54-50-90

ALLOWABLE DAMAGE 2

Page 117

Nov 10/2012

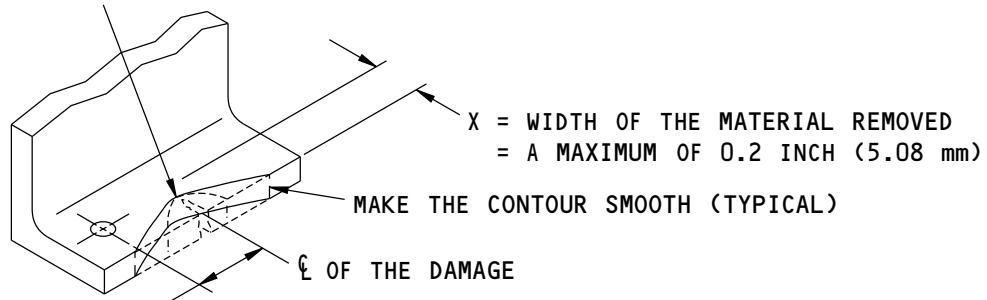
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**737-800
STRUCTURAL REPAIR MANUAL**

REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN



TAPER TO A MINIMUM OF 20X.
THE DISTANCE OF THE DAMAGE FROM A HOLE,
A FASTENER, AN EDGE, OR OTHER DAMAGE
MUST BE 1.8D OR MORE

REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(A)

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Aft Engine Mount Stop Fitting Allowable Damage Limits
Figure 106 (Sheet 1 of 3)

54-50-90

ALLOWABLE DAMAGE 2

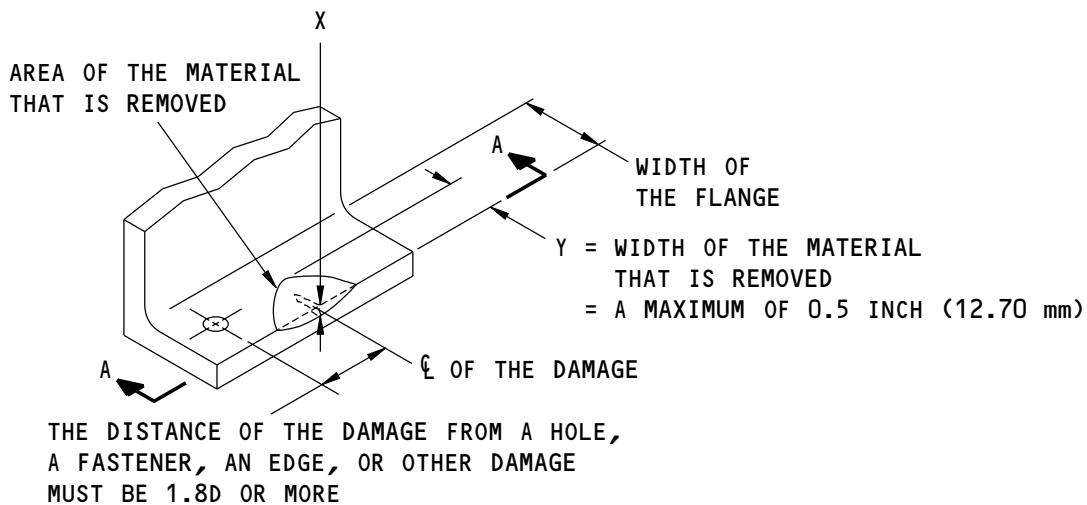
Page 118

Nov 10/2012

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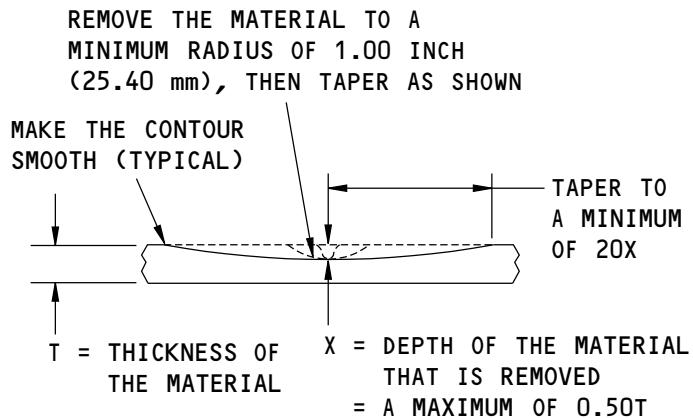


737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(B)



A-A

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Aft Engine Mount Stop Fitting Allowable Damage Limits
Figure 106 (Sheet 2 of 3)

54-50-90

ALLOWABLE DAMAGE 2

Page 119

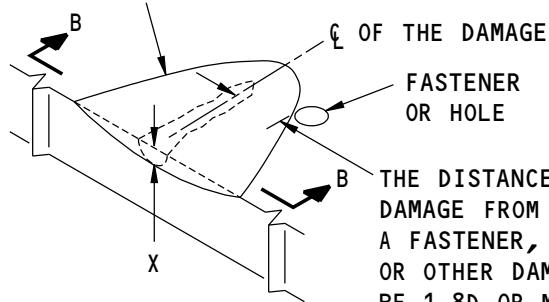
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**737-800
STRUCTURAL REPAIR MANUAL**

AREA OF THE MATERIAL
THAT IS REMOVED IS A
MAXIMUM OF 1 SQUARE INCH
(6.45 cm² SQUARE)



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

T

THICKNESS OF
THE MATERIAL

TAPER TO
A MINIMUM
OF 20X

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

B-B

**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

C

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Aft Engine Mount Stop Fitting Allowable Damage Limits
Figure 106 (Sheet 3 of 3)

54-50-90

ALLOWABLE DAMAGE 2

Page 120

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 3 - ENGINE STRUT TORQUE BOX BULKHEAD FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the torque box bulkhead fittings shown in Engine Strut Torque Box Bulkhead Fitting Locations, Figure 101/ALLOWABLE DAMAGE 3.

2. General

- A. Remove the parts as necessary to get access to the strut torque box bulkhead fittings.
- B. Refer to Table 101/ALLOWABLE DAMAGE 3 for a list of the references for the allowable damage data.
- C. Refer to Engine Strut Torque Box Bulkhead Fittings, Figure 102/ALLOWABLE DAMAGE 3 for the definitions of the different areas of the strut torque box bulkhead fittings.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	PARAGRAPH
Lugs of the Forward Engine Mount Bulkhead Fitting	4.A
Locations where the bulkhead fittings are attached to the side skins, the upper and lower spar webs, and the lower chords	4.B
Forward and Aft Engine Mount Bulkhead Fittings - Shear Pin, Engine Mount Tension Bolt Holes, and Shear Boss Locations	4.C
Bulkhead Fitting Webs	4.D
Forward Engine Mount Bulkhead Fitting - Lower Flange Gussets	4.E

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

- D. Remove the damaged material as necessary.
- (1) Refer to 51-10-02 for the inspection and removal of damage.
 - (2) Refer to 51-20-10 for freeze plug installation.
 - (3) Refer to 51-30-03 for possible sources of abrasive materials and other materials you can use to remove the damage.
 - (4) Refer to 51-30-05 for possible sources of tools and equipment you can use to remove the damage.
 - (5) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.

- E. After the damage is removed, 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.
 - (a) Refer to 51-20-06 for shot peen intensity and shot number.
 - (b) Refer to SOPM 20-10-03 for the flap peen and shot peen procedures.

54-50-90

ALLOWABLE DAMAGE 3

Page 101

Jul 10/2014



737-800
STRUCTURAL REPAIR MANUAL

- (2) Apply a chemical conversion coating to the reworked areas of the mid-strut bulkhead fitting (aluminum only). Refer to 51-20-01.
- (3) Apply two layers of BMS 10-11, Type 1 primer to the reworked areas of the mid-strut bulkhead fitting (aluminum only). Refer to SOPM 20-41-02.

NOTE: Do not apply the BMS 10-11, Type 1 primer to the holes of the fitting.

- (4) Apply a layer of phosphate-fluoride coating and a layer of BMS 10-11, Type 1 primer to the reworked areas of the forward engine mount bulkhead fitting and the mid-strut bulkhead fitting (Titanium only). Refer to SOPM 20-41-02.

NOTE: Do not apply the BMS 10-11, Type 1 primer to the holes of the fitting.

- (5) Apply a layer of phosphate-fluoride coating and a layer of high temperature polyurethane primer on the reworked areas of the aft engine mount bulkhead fitting. Refer to SOPM 20-41-02.

NOTE: Do not apply the polyurethane primer to the hole or counterbore of the fitting.

54-50-90

ALLOWABLE DAMAGE 3

Page 102

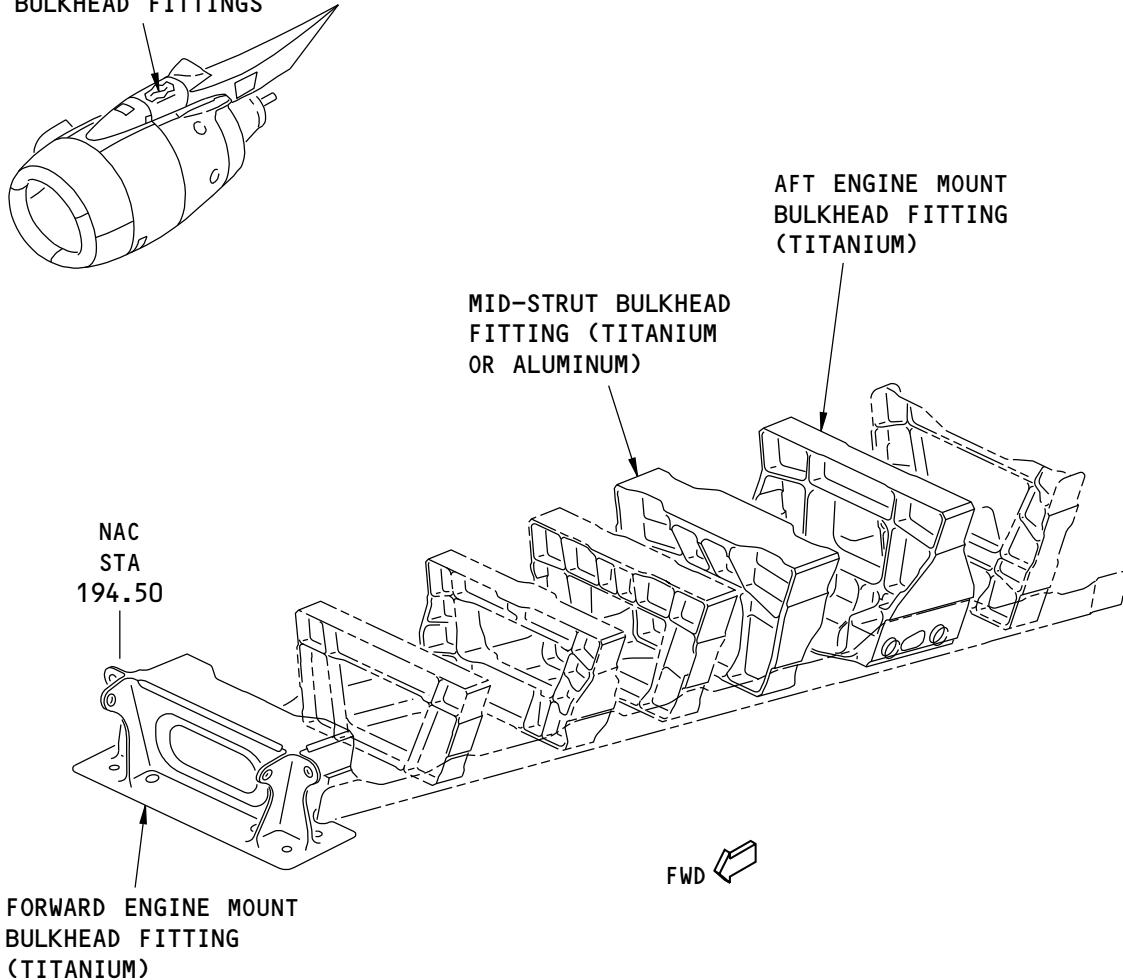
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737-800
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SEE (A)

FOR THE STRUT
TORQUE BOX
BULKHEAD FITTINGS

NOTE: REFER TO PARAGRAPH 4 FOR THE ALLOWABLE DAMAGE LIMITS.

(A)

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Engine Strut Torque Box Bulkhead Fitting Locations
Figure 101

54-50-90**ALLOWABLE DAMAGE 3**

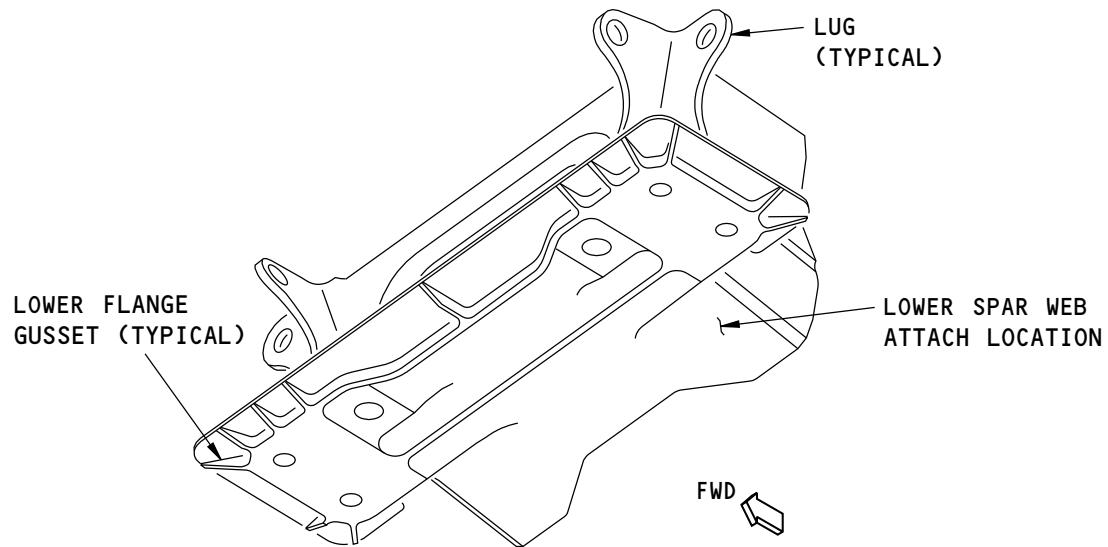
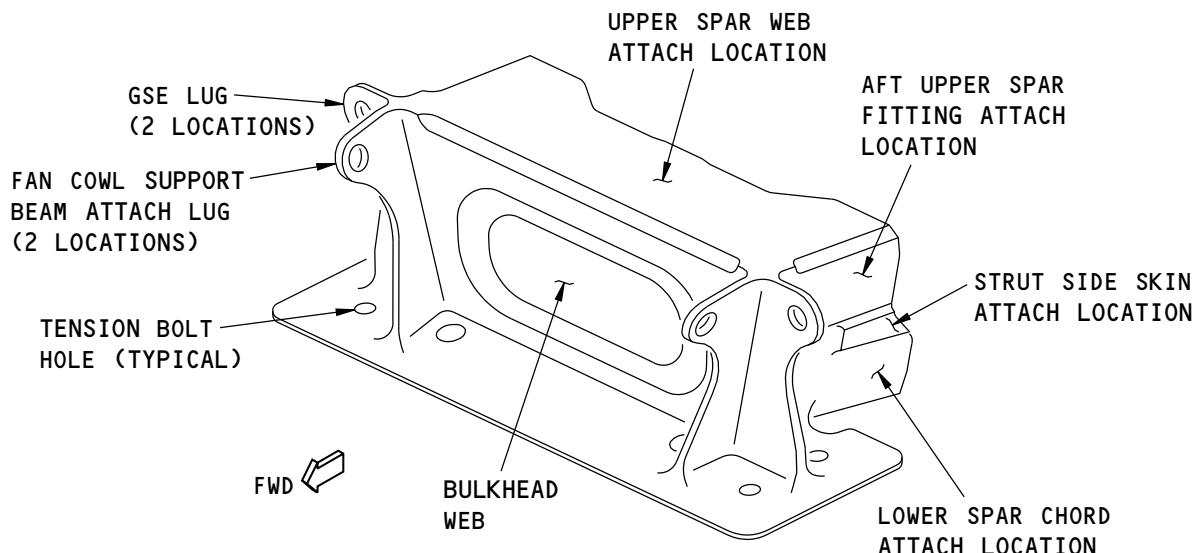
Page 103

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



FORWARD ENGINE MOUNT BULKHEAD FITTING

(A)

F95403 S0006592365_V1

Engine Strut Torque Box Bulkhead Fittings
Figure 102 (Sheet 1 of 3)

54-50-90

ALLOWABLE DAMAGE 3

Page 104

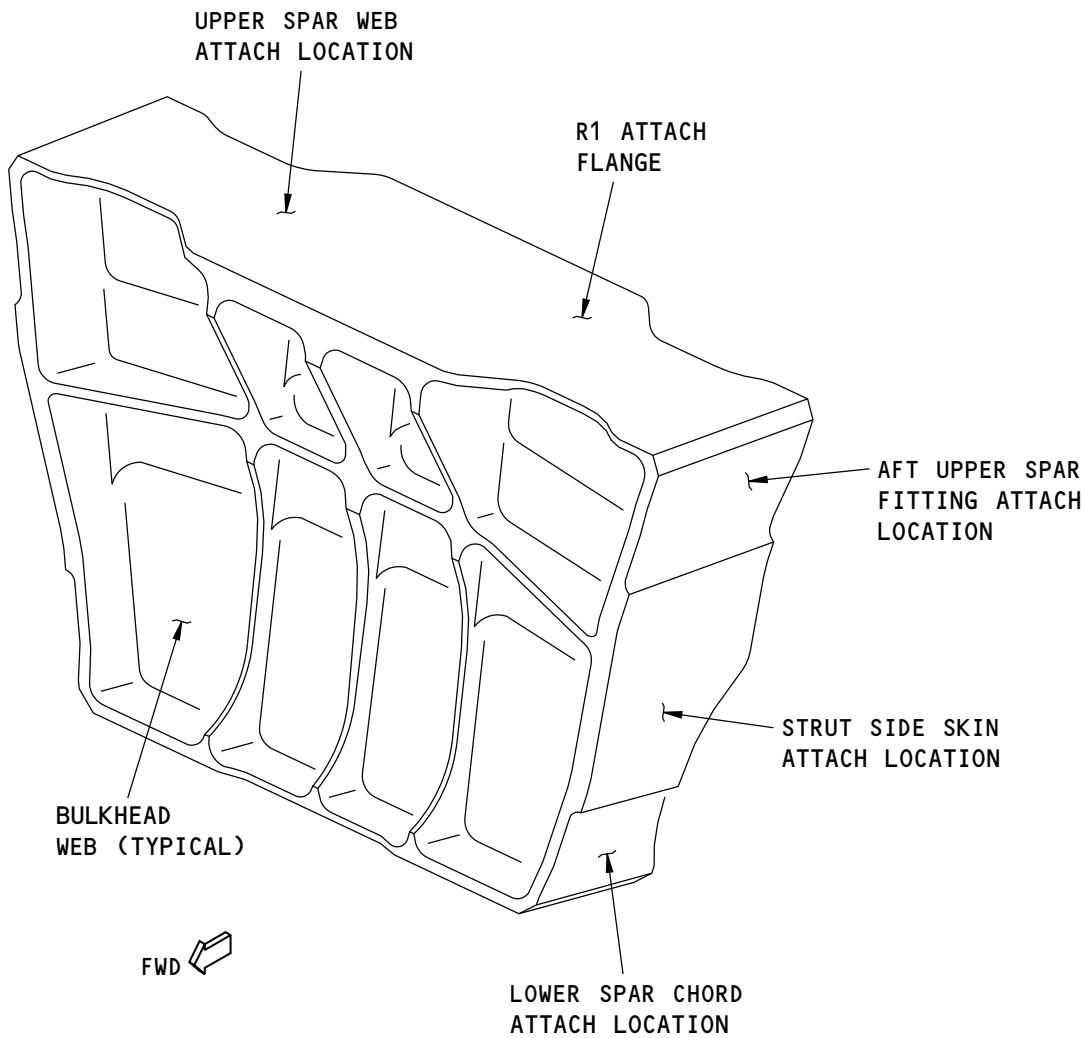
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737-800
STRUCTURAL REPAIR MANUAL



MID-STRUT BULKHEAD FITTING

(B)

F95460 S0006592366_V1

Engine Strut Torque Box Bulkhead Fittings
Figure 102 (Sheet 2 of 3)

54-50-90

ALLOWABLE DAMAGE 3

Page 105

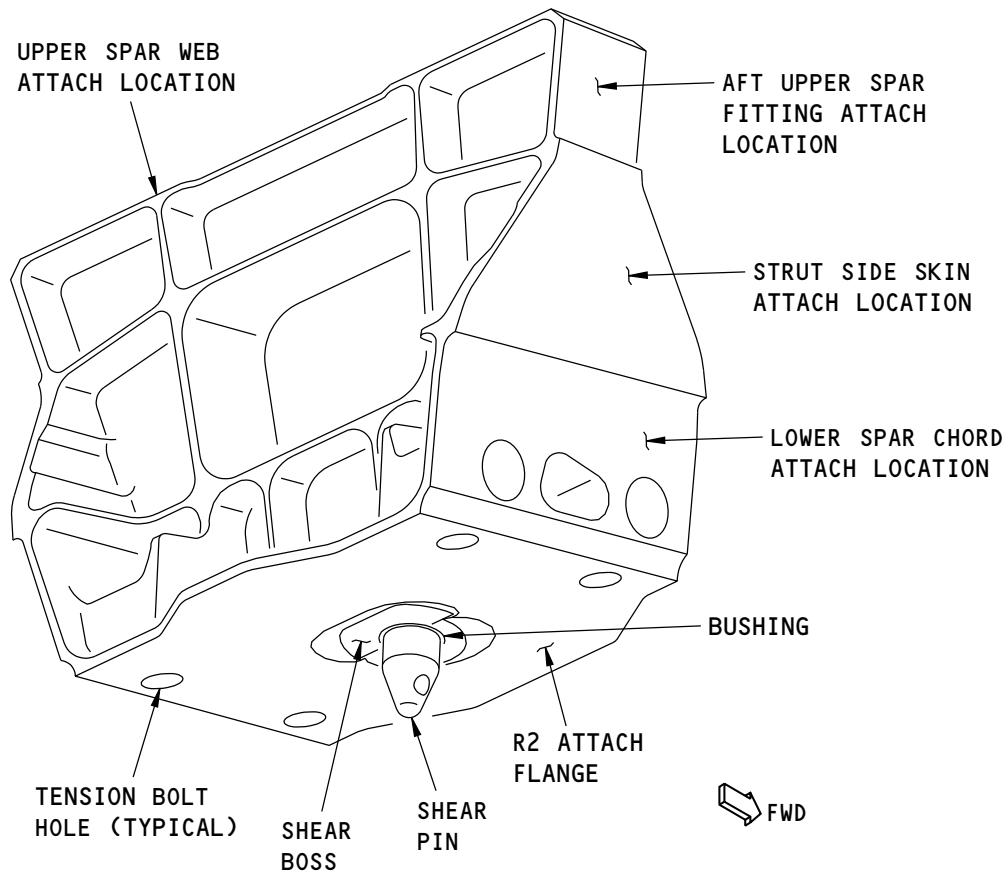
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737-800
STRUCTURAL REPAIR MANUAL



AFT ENGINE MOUNT BULKHEAD FITTING

(C)

F95552 S0006592367_V1

Engine Strut Torque Box Bulkhead Fittings
Figure 102 (Sheet 3 of 3)

54-50-90

ALLOWABLE DAMAGE 3

Page 106

Nov 10/2012

D634A210

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737-800
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
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-03	SHOT PEENING
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Allowable Damage Limits

A. Lugs of the Forward Engine Mount Bulkhead Fitting:

NOTE: You can not have reworked areas on the bore and the edge of the same lug fitting. You can remove damage on the bore or damage on the edge, but not on the two surfaces.

(1) Cracks:

- (a) If there is no damage on the edge, you can remove damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 3.
- (b) If there is no damage on the bore of the lug, you can remove the damage on the edge as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.
- (c) Remove the damage on the face of the lug as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.

(2) Nicks, Gouges, Scratches, and Corrosion:

- (a) If there is no damage on the edge, you can remove damage on the bore to the diameters given in Table 102/ALLOWABLE DAMAGE 3.
- (b) If there is no damage on the bore of the lug, you can remove the damage on the edge as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.
- (c) Remove the damage on the face of the lug as shown in Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 3.

(3) Dents are not permitted.

(4) Holes and Punctures are not permitted.

Table 102:

MAXIMUM DIAMETERS FOR LUG BORES AFTER CLEANUP	
FITTING	DIAMETER IN INCHES (mm)
Fan Cowl Support Beam Attach Lug	0.875 (22.22)
GSE Lug	0.877 (22.27)

54-50-90

ALLOWABLE DAMAGE 3

Page 107

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- B. Fitting attachment surfaces at the Strut Side Skin, Upper and Lower Spar Webs, and the Lower Spar Chords:
- (1) Cracks:
 - (a) Remove the damage as shown in Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details A , B , and C .
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage on an edge as shown in Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits, Figure 104/ALLOWABLE DAMAGE 3, Details A , B , C , and D .
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- C. Forward and Aft Engine Mount Bulkhead Fittings - Shear Pin, Engine Mount Tension Bolt Holes and Shear Boss Locations:
- (1) Cracks are not permitted.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Forward and Aft Engine Mount Bulkhead Fittings - Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 3.
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- D. Bulkhead Fitting Webs:
- (1) Cracks are not permitted.
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Engine Strut Bulkhead Fitting Webs - Allowable Damage Limits, Figure 106/ALLOWABLE DAMAGE 3, Details A and B .
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.
- E. Forward Engine Mount Bulkhead Fitting - Lower Flange Gussets:
- (1) Cracks:
 - (a) Remove the damage as given in Forward Engine Mount Fitting, Lower Flange Gussets - Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 3, Detail A .
 - (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Forward Engine Mount Fitting, Lower Flange Gussets - Allowable Damage Limits, Figure 107/ALLOWABLE DAMAGE 3, Details A and B .
 - (3) Dents are not permitted.
 - (4) Holes and Punctures are not permitted.

54-50-90

ALLOWABLE DAMAGE 3

Page 108

Jul 10/2014

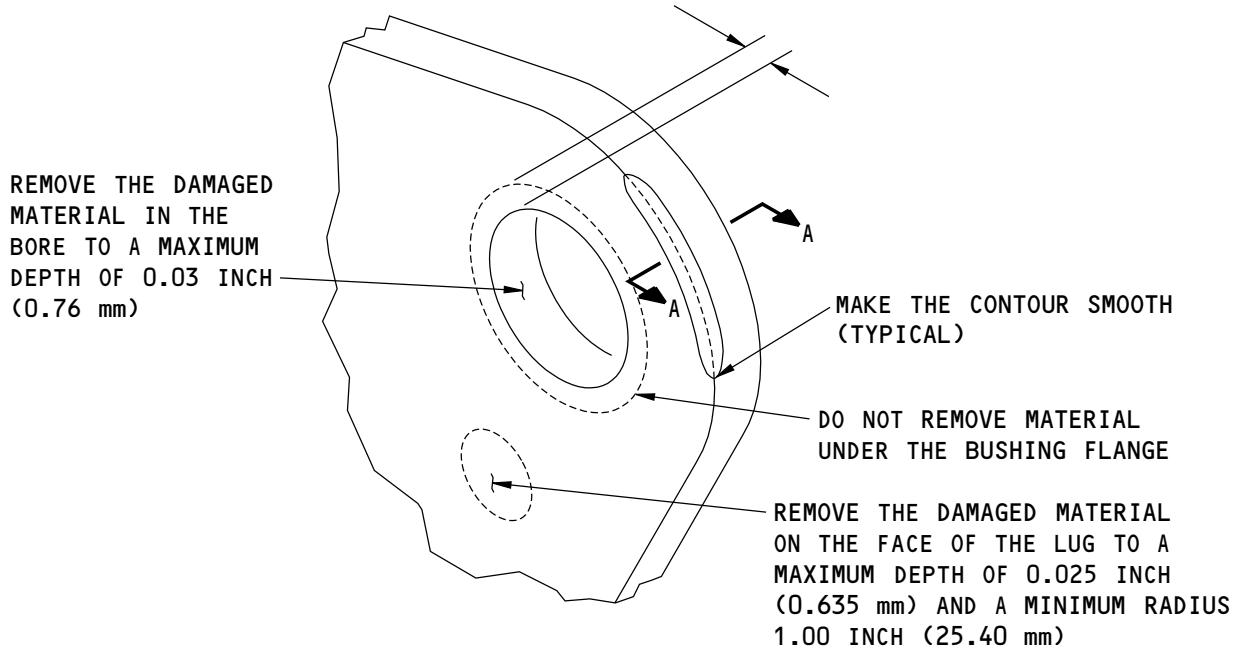
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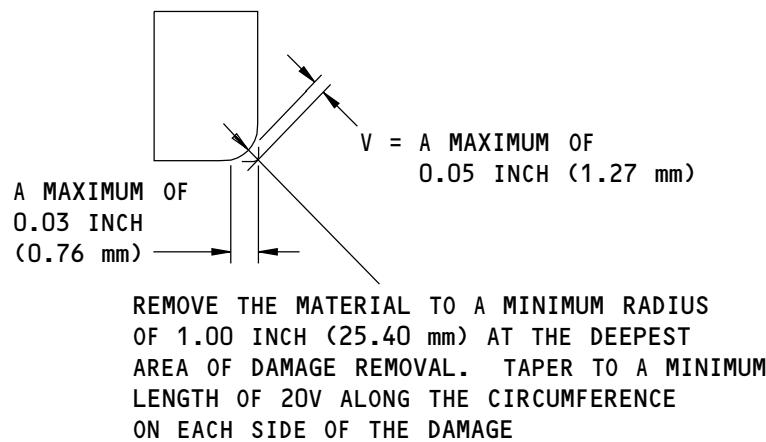


737-800
STRUCTURAL REPAIR MANUAL

0.25 INCH (6.35 mm) FOR SURFACES THAT ARE SWAGED
0.10 INCH (2.54 mm) FOR SURFACES THAT ARE NOT SWAGED



REMOVAL OF DAMAGED MATERIAL ON A LUG WITH BUSHINGS



A-A

F95619 S0006592369_V1

Lugs of the Forward Engine Mount Bulkhead Fitting - Allowable Damage Limits
Figure 103

54-50-90

ALLOWABLE DAMAGE 3

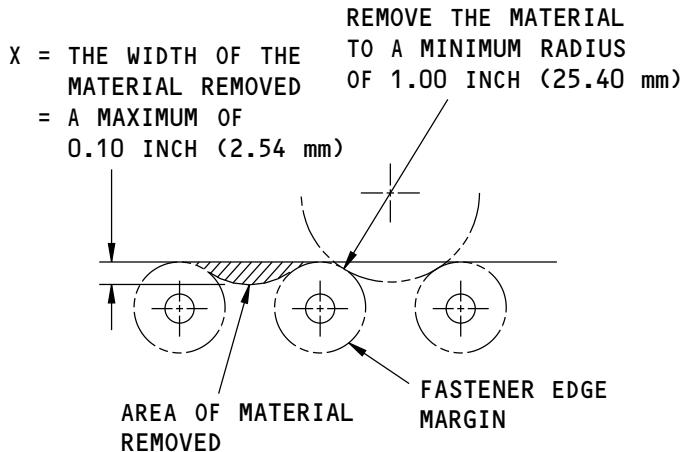
Page 109

Nov 10/2012

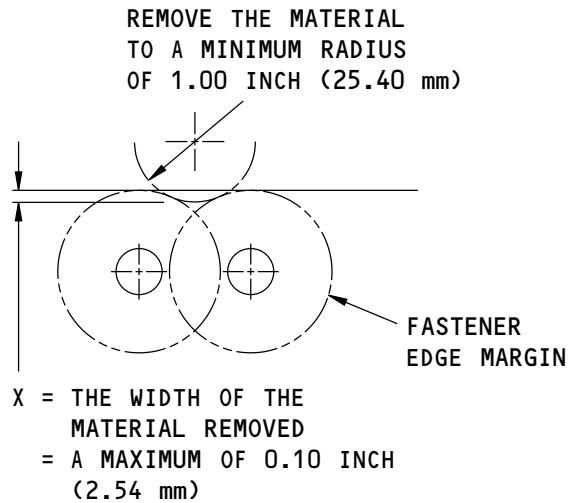
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**737-800
STRUCTURAL REPAIR MANUAL**



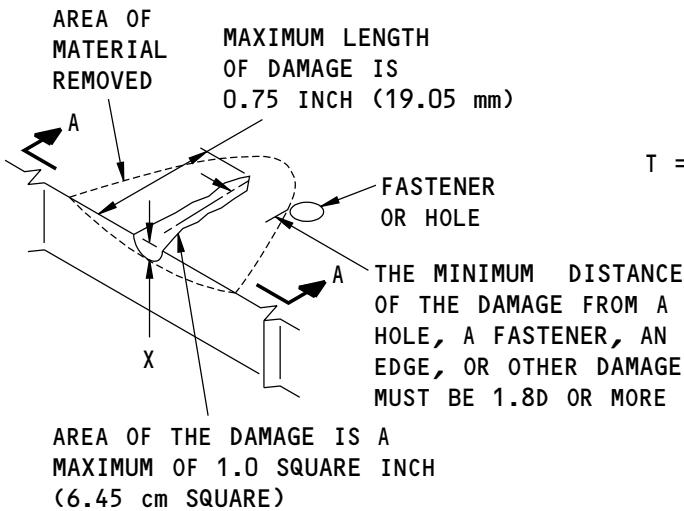
REMOVAL OF DAMAGED MATERIAL AT EDGES WHERE THE FASTENER EDGE MARGINS DO NOT HAVE AN OVERLAP



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

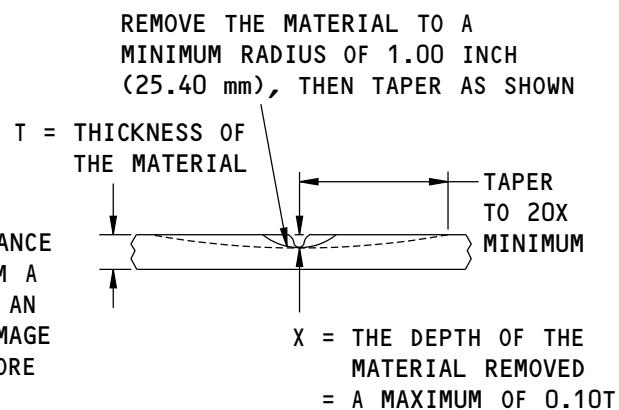
(A)

(B)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(C)



A-A

F95580 S0006592370_V1

Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords - Allowable Damage Limits
Figure 104 (Sheet 1 of 2)

54-50-90

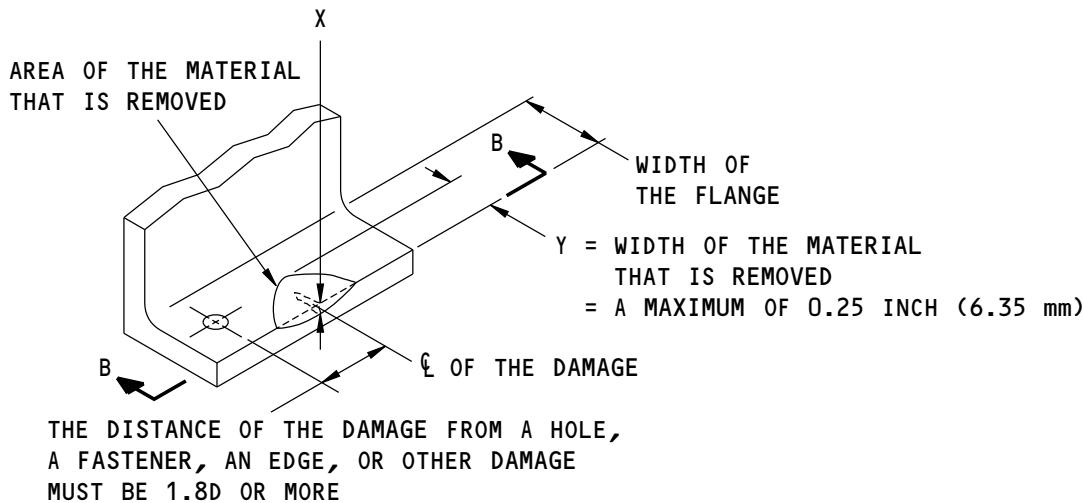
ALLOWABLE DAMAGE 3

Page 110

Nov 10/2012

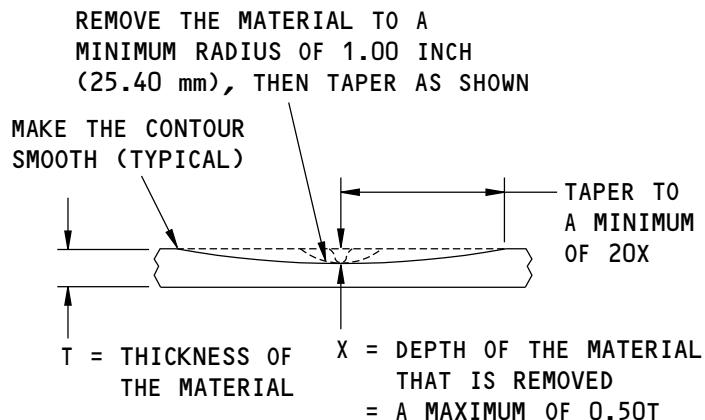


737-800
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REMOVAL OF DAMAGED MATERIAL
ON A SURFACE AT AN EDGE

(D)



F96390 S0006592371_V1

Fitting Attachments to the Engine Strut Side Skin, Upper and Lower Spar Webs and Lower Spar Chords
- Allowable Damage Limits
Figure 104 (Sheet 2 of 2)

54-50-90

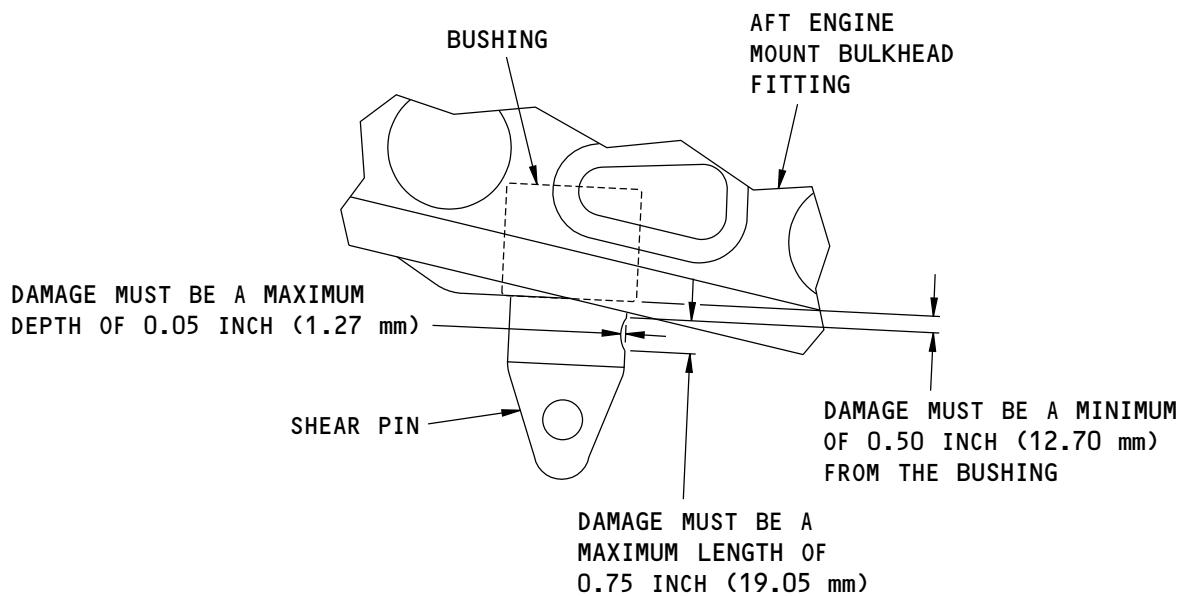
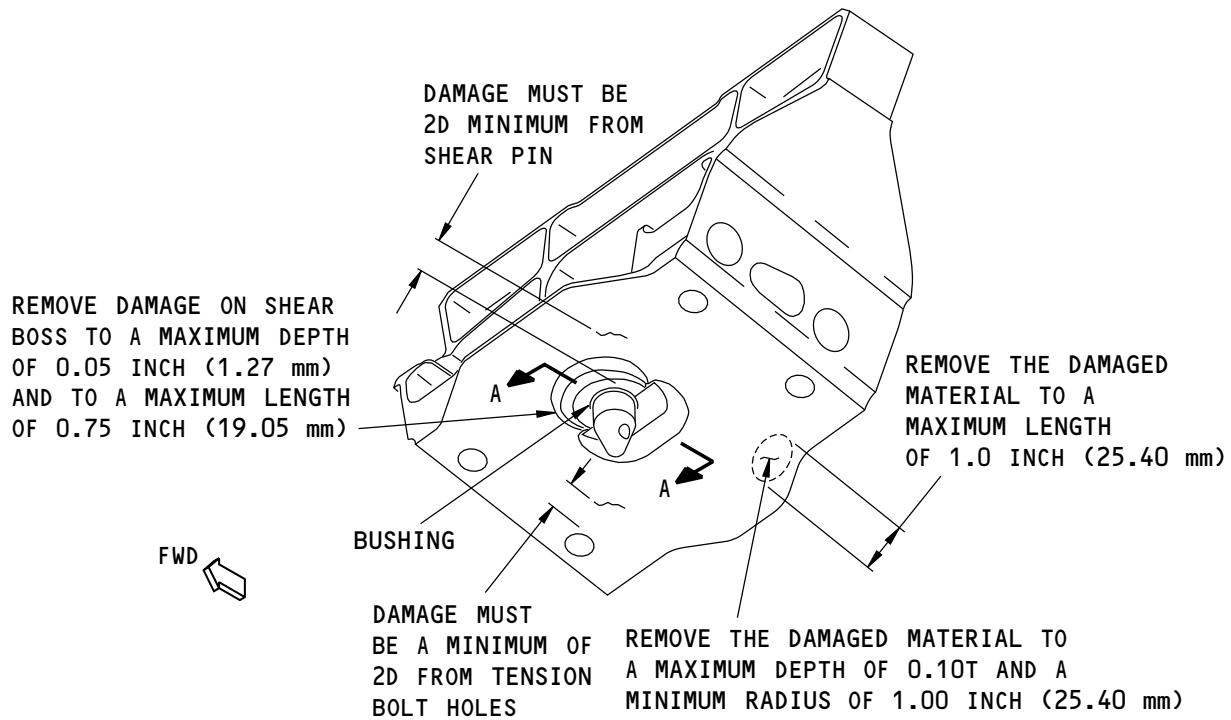
ALLOWABLE DAMAGE 3

Page 111

Nov 10/2012

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


F95697 S0006592372_V1

Forward and Aft Engine Mount Bulkhead Fittings - Allowable Damage Limits
Figure 105

54-50-90
ALLOWABLE DAMAGE 3

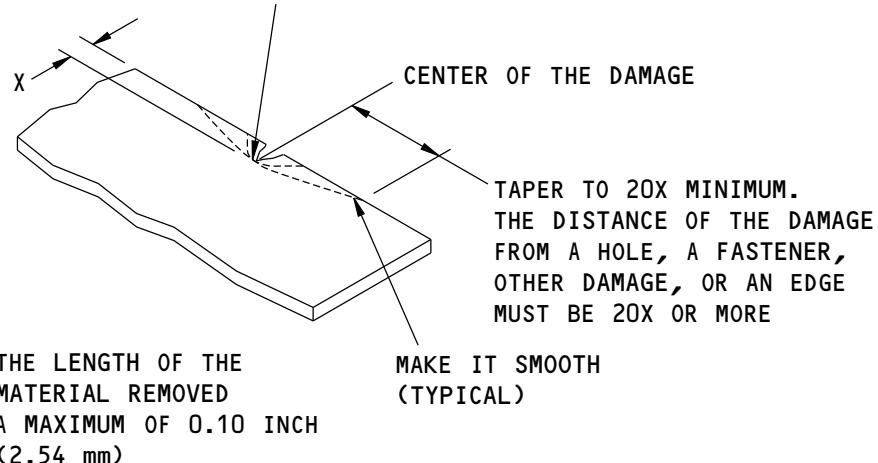
Page 112

Nov 10/2012

D634A210

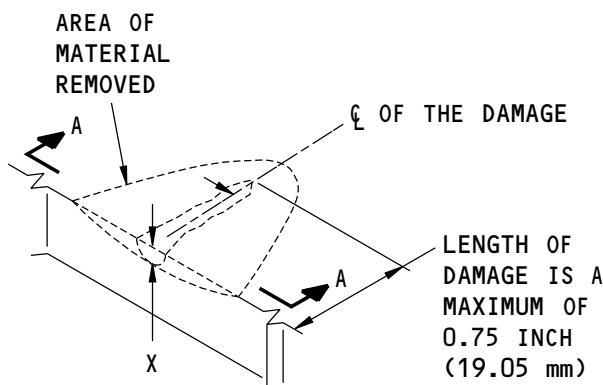
**737-800
STRUCTURAL REPAIR MANUAL**

REMOVE THE MATERIAL TO
A MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



REMOVAL OF DAMAGED MATERIAL AT AN EDGE

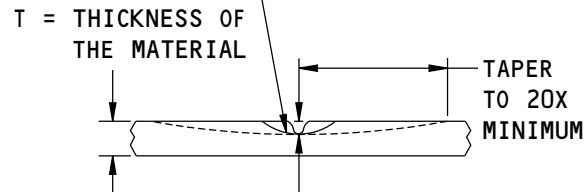
(A)



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(B)

REMOVE THE MATERIAL TO
A MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



A-A

F95602 S0006592373_V1

Engine Strut Bulkhead Fitting Webs - Allowable Damage Limits
Figure 106

54-50-90

ALLOWABLE DAMAGE 3

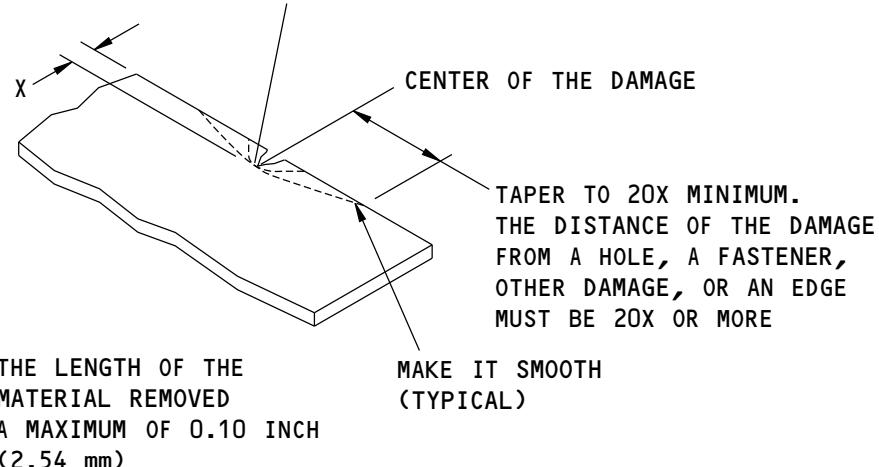
Page 113

Nov 10/2012

D634A210

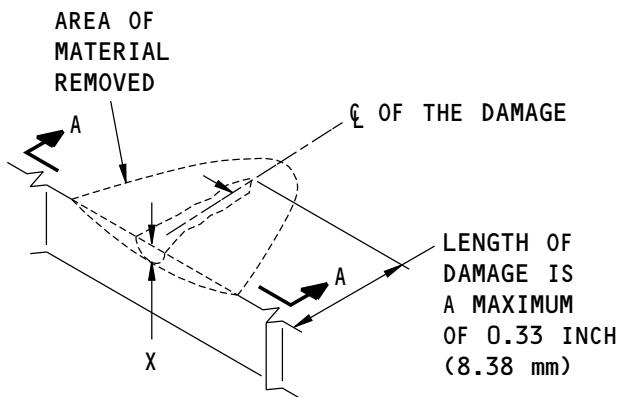
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REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN

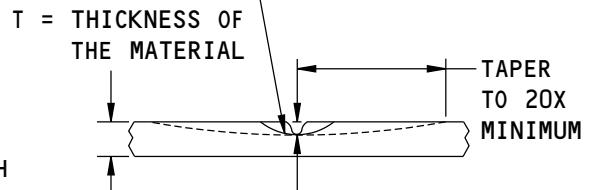


REMOVAL OF DAMAGED MATERIAL AT AN EDGE

(A)



REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



REMOVAL OF DAMAGED MATERIAL ON A SURFACE

(B)

A-A

F95904 S0006592374_V1

Forward Engine Mount Fitting, Lower Flange Gussets - Allowable Damage Limits
Figure 107

54-50-90

ALLOWABLE DAMAGE 3

Page 114

Nov 10/2012

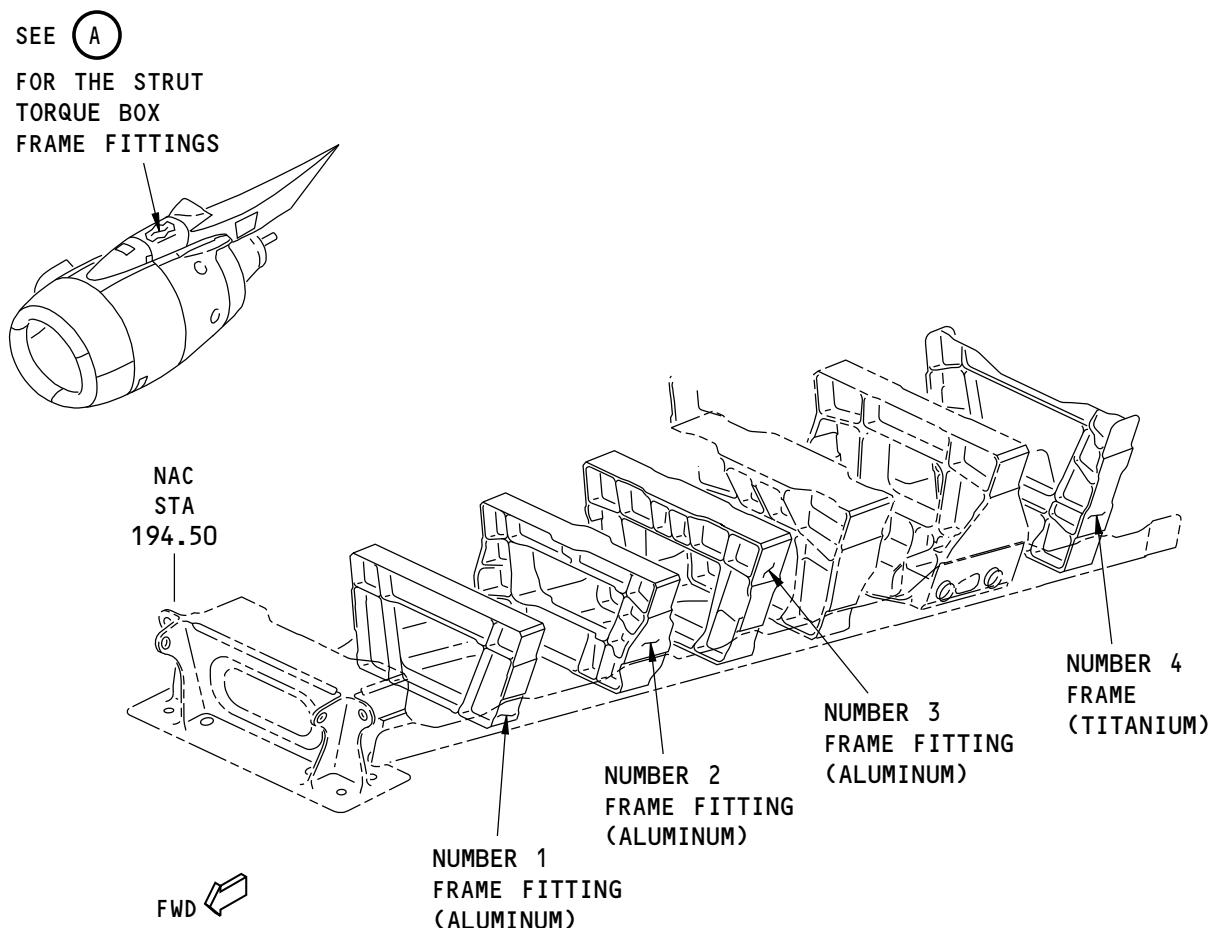
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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 4 - ENGINE STRUT TORQUE BOX FRAME FITTINGS

1. Applicability

- A. This subject gives the allowable damage limits for the frame fittings of the strut torque box shown in Engine Strut Torque Box Frame Fitting Locations, Figure 101/ALLOWABLE DAMAGE 4.



NOTE: REFER TO PARAGRAPH 4 FOR THE ALLOWABLE DAMAGE LIMITS.

(A)

Engine Strut Torque Box Frame Fitting Locations
Figure 101

F95718 S0006592376_V1

54-50-90

ALLOWABLE DAMAGE 4

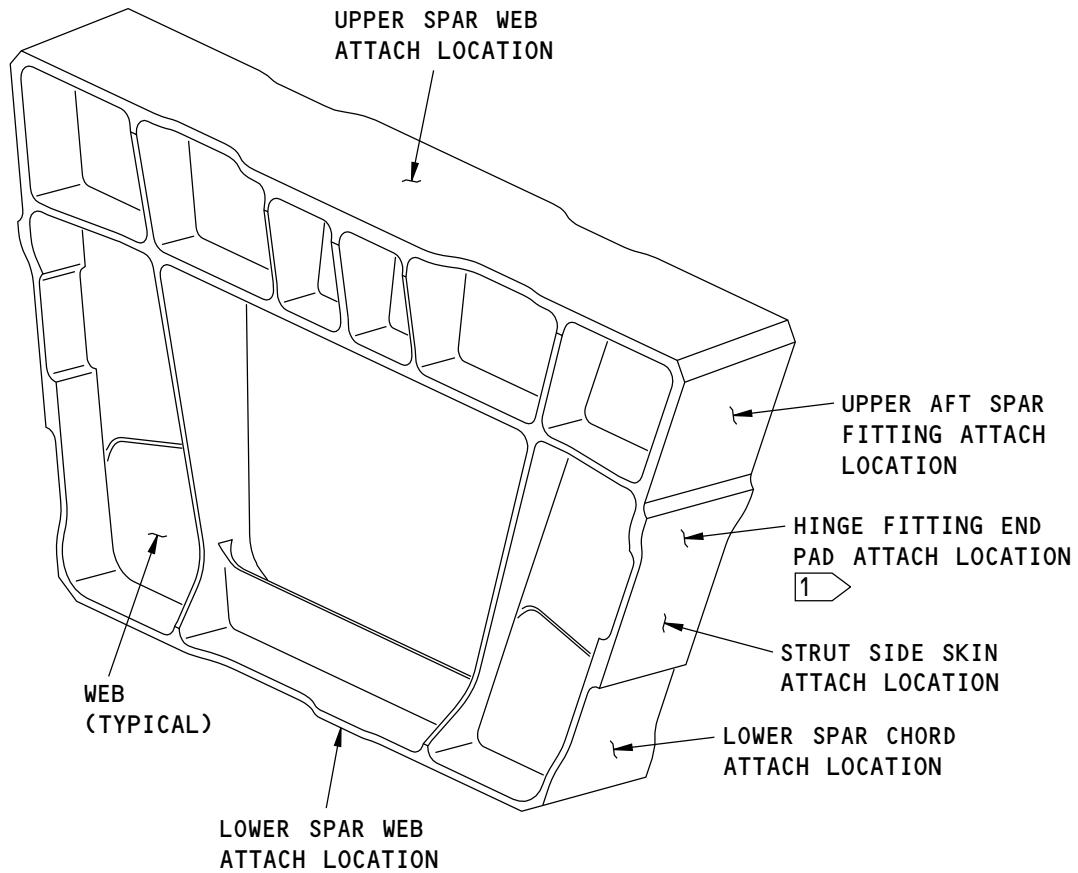
Page 101

Nov 10/2014

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE

TYPICAL ALLOWABLE DAMAGE LOCATIONS FOR
FRAME FITTINGS - NUMBERS 1 THROUGH 3

NOTES

- 1 HINGE FITTING ENDPAD ATTACH LOCATIONS ARE FOUND ON THE NUMBER 2 AND NUMBER 3 FRAME FITTINGS.

F95723 S0006592377_V1

Allowable Damage Locations - Strut Torque Box Frame Fittings
Figure 102 (Sheet 1 of 2)

54-50-90

ALLOWABLE DAMAGE 4

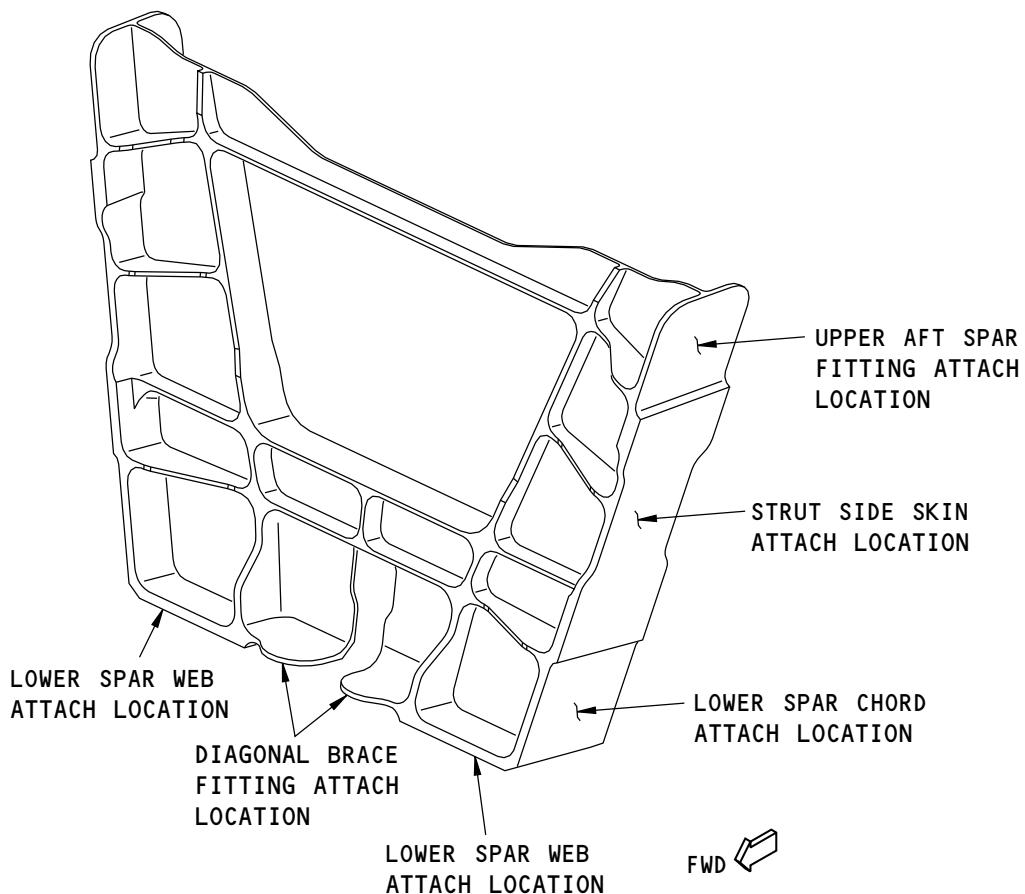
Page 102

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



LEFT SIDE IS SHOWN, RIGHT SIDE IS OPPOSITE
ALLOWABLE DAMAGE LOCATIONS FOR THE NUMBER 4 FRAME FITTING

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Allowable Damage Locations - Strut Torque Box Frame Fittings
Figure 102 (Sheet 2 of 2)

54-50-90

ALLOWABLE DAMAGE 4

Page 103

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

2. General

- A. Remove the parts as necessary to get access to the strut torque box frame fittings.
- B. Refer to Table 101/ALLOWABLE DAMAGE 4 for a list of the references for the allowable damage data.
- C. Refer to Allowable Damage Locations - Strut Torque Box Frame Fittings, Figure 102/ALLOWABLE DAMAGE 4 for the definitions of the different areas of the fittings covered in the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE DATA	
SUBJECT	PARAGRAPH
Locations of Fitting Attachments to the Side Skins, Upper and Lower Webs, Aft Upper Spar Fittings, and Lower Chords	4.A
Location of the Number 4 Frame Fitting Attachment to the Diagonal Brace Fitting	4.B
Webs of the Frame Fittings	4.C
Location of Thrust Reverser Hinge Fitting Attachment to the Endpads of the Number 2 Frame Fitting	4.D

WARNING: SMALL PARTICLES AND THIN CUTS OF TITANIUM ARE FLAMMABLE. IN A SUFFICIENT CONCENTRATION, AN EXPLOSION CAN OCCUR. EXTINGUISH ALL FIRES OF TITANIUM WITH FULLY DRY TALC, CALCIUM CARBONATE, SAND, OR GRAPHITE. APPLY THE POWDER TO A DEPTH OF 1/2 INCH (12.70 MM) OR MORE TO THE AREA THAT IS ON FIRE. DO NOT USE FOAM, WATER, CARBON TETRACHLORIDE, HALON, OR CARBON DIOXIDE. IF WATER TOUCHES TITANIUM THAT IS ON FIRE, A STEAM EXPLOSION CAN OCCUR.

- D. Remove the damaged material as necessary.
 - (1) Refer to 737 NDT Part 6, 51-00-00, Figure 4 for the eddy current inspection procedures.
 - (2) Refer to 51-10-02 for the inspection and removal of damage.
 - (3) Refer to 51-20-10 for freeze plug installation.
 - (4) Refer to 51-30-03 for possible sources of abrasive materials and other materials you can use to remove the damage.
 - (5) Refer to 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
- E. After the damage is removed, do the steps that follow:
 - (1) Apply a chemical conversion coating to the reworked areas of the aluminum frame fittings. Refer to 51-20-01.
 - (2) Apply two layers of BMS 10-11, Type I primer to the reworked areas of the aluminum parts. Refer to SOPM 20-41-02.
 - (3) Apply a layer of phosphate-fluoride coating and a layer of high temperature polyurethane primer to the reworked areas of the titanium parts (Number 4 frame fitting). Refer to SOPM 20-41-02.

54-50-90

ALLOWABLE DAMAGE 4

Page 104

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (4) Apply one layer of BMS 10-11, Type I primer to the reworked areas of the titanium parts. 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
51-20-10	FREEZE PLUG INSTALLATION
51-30-03	NON-METALLIC MATERIALS
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-41-02	Application of Chemical and Solvent Resistant Finishes
737 NDT Part 6, 51-00-00	Structures - General
737 NDT Part 6, 51-00-00, Procedure 4	Surface Inspection of Aluminum Parts (Meter Display)

4. Allowable Damage Limits

- A. Fitting attachment surfaces at the Side Skins, Upper and Lower Webs, Aft Upper Spar Fittings, and the Lower Chords:

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

- B. Location of the Number 4 Frame Fitting Attachment to the Diagonal Brace Fitting:

- (1) Cracks:
 - (a) Remove the damage as shown in Allowable Damage Limits, Figure 103/ALLOWABLE DAMAGE 4, Details A , B , and C .
 - (b) The damage on an edge must be 2D or more from all fasteners that attach the diagonal brace fitting to the web and flanges of the frame fitting.
- (2) Nicks, Gouges, Scratches, and Corrosion:
 - (a) Remove the damage as shown in Figure 104 , Details A and B .
- (3) Dents are not permitted.
- (4) Holes and Punctures are not permitted.

- C. Webs of the Frame Fittings:

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

54-50-90

ALLOWABLE DAMAGE 4

Page 105

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

D. Location of the Thrust Reverser Hinge Endpad Attachment to the Number 2 and Number 3 Frame Fittings:

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

54-50-90

ALLOWABLE DAMAGE 4

Page 106

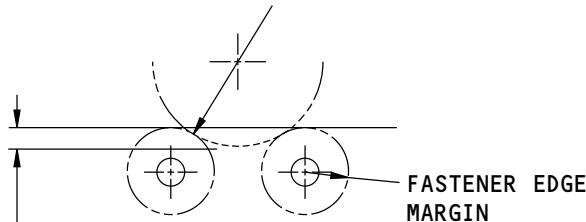
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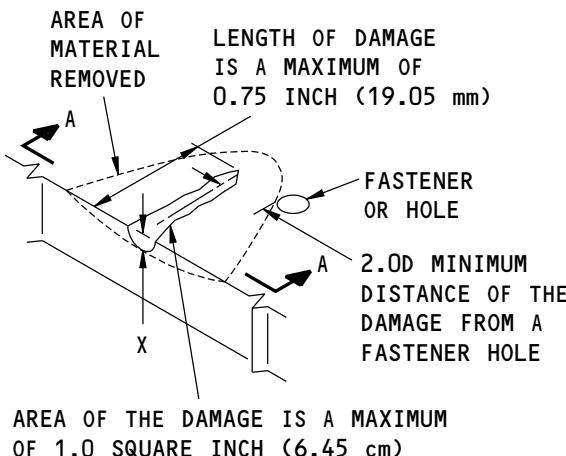
REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)



X = LENGTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)
FOR DAMAGE THAT GOES FULLY
THROUGH THE MATERIAL
= A MAXIMUM OF 0.25 INCH (6.35 mm)
FOR DAMAGE THAT IS ONE HALF THE
THICKNESS OF THE MATERIAL IN DEPTH

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

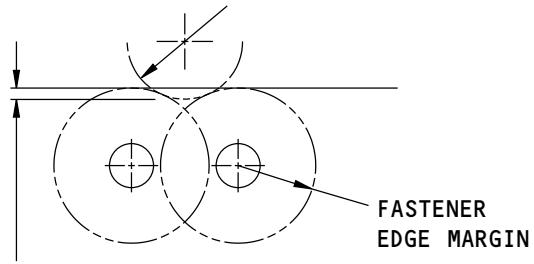
(A)



**REMOVAL OF DAMAGED MATERIAL
ON A SURFACE**

(C)

REMOVE THE MATERIAL
TO A MINIMUM RADIUS
OF 1.00 INCH (25.40 mm)

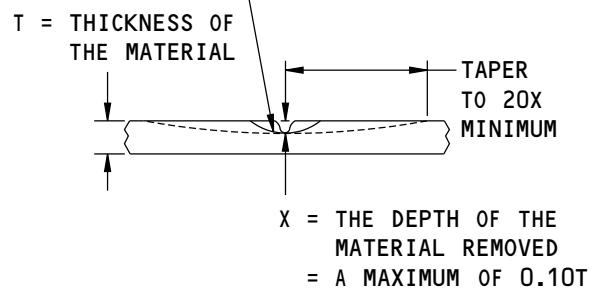


X = LENGTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.10 INCH (2.54 mm)
FOR DAMAGE THAT GOES FULLY
THROUGH THE MATERIAL
= A MAXIMUM OF 0.25 INCH (6.35 mm)
FOR DAMAGE THAT IS ONE HALF THE
THICKNESS OF THE MATERIAL IN DEPTH

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

(B)

REMOVE THE MATERIAL TO A
MINIMUM RADIUS OF 1.00 INCH
(25.40 mm), THEN TAPER AS SHOWN



A-A

F95726 S0006592380_V1

**Allowable Damage Limits
Figure 103 (Sheet 1 of 2)**

54-50-90

ALLOWABLE DAMAGE 4

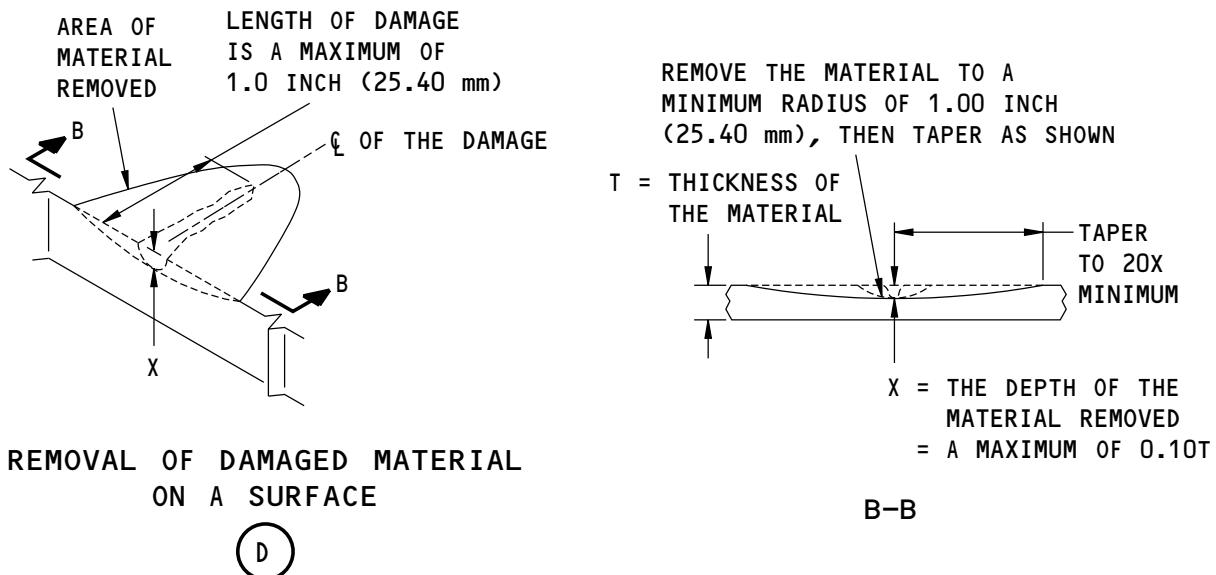
Page 107

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



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Allowable Damage Limits
Figure 103 (Sheet 2 of 2)

54-50-90

ALLOWABLE DAMAGE 4

Page 108

Nov 10/2012

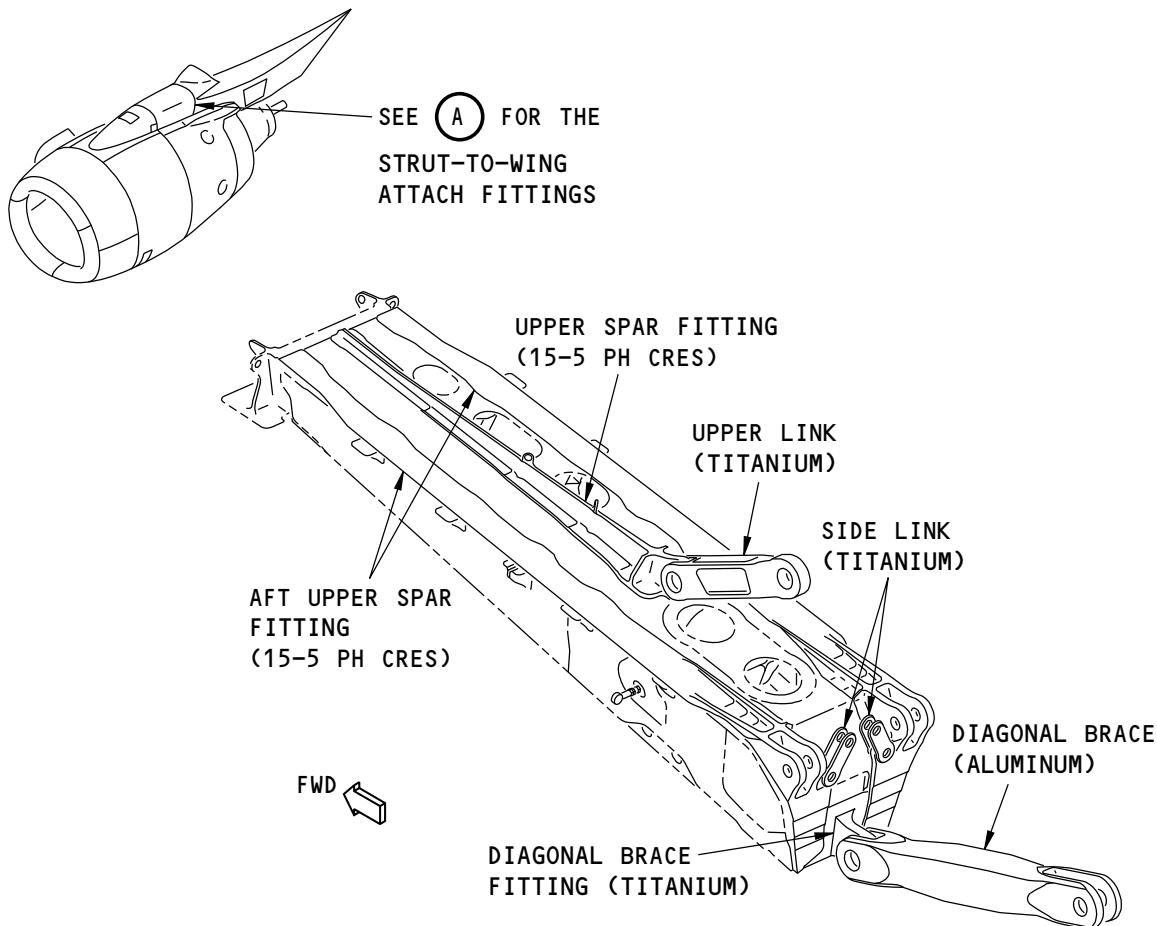
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 1 - ENGINE STRUT-TO-WING ATTACH FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

A
Engine Strut-to-Wing Attach Fitting Repair
Figure 201

F91352 S0006592384_V2

54-50-90

REPAIR 1
Page 201

Nov 10/2012

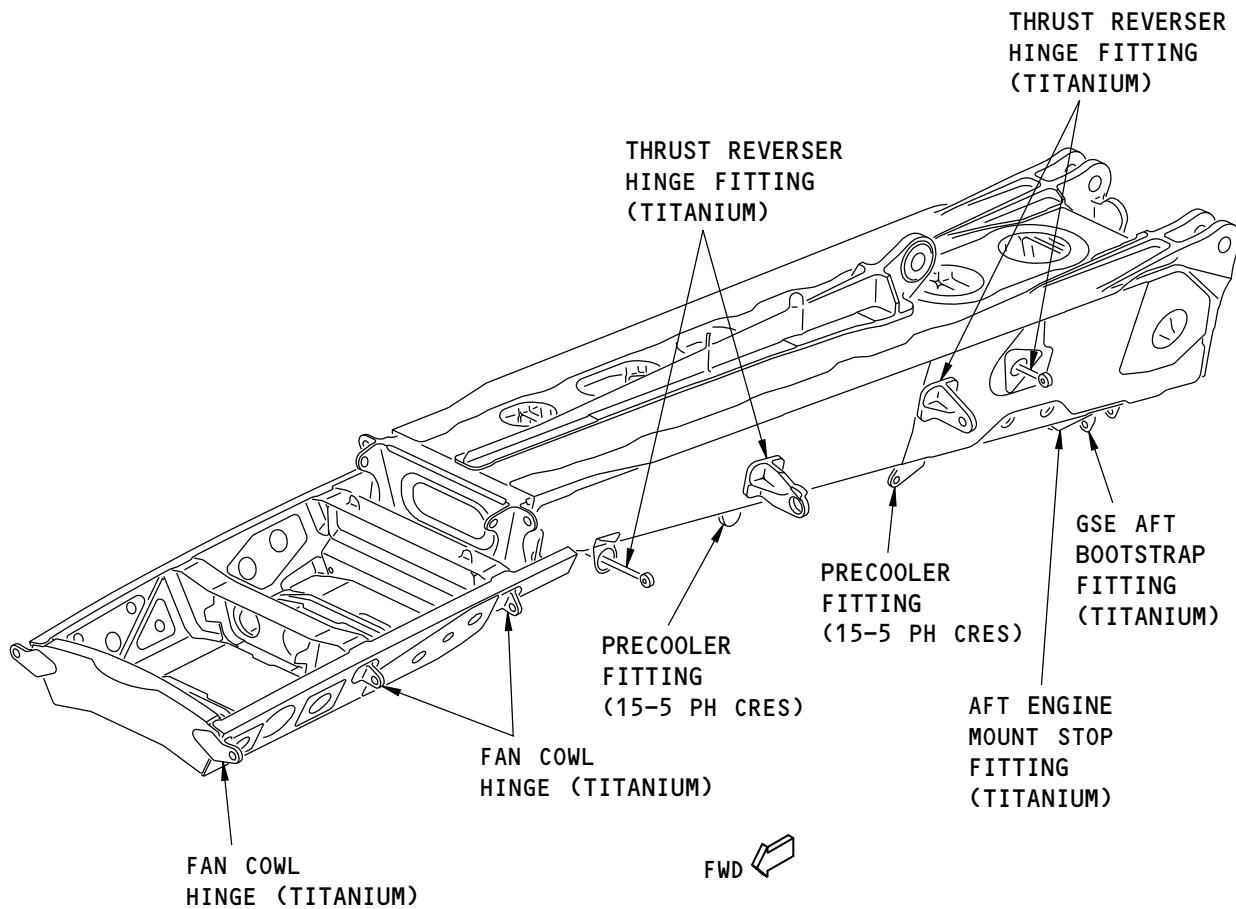
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 2 - ENGINE STRUT HINGE FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

F93476 S0006592386_V2

Engine Strut Hinge Fitting Repair
Figure 201

54-50-90

REPAIR 2
Page 201

Nov 10/2012

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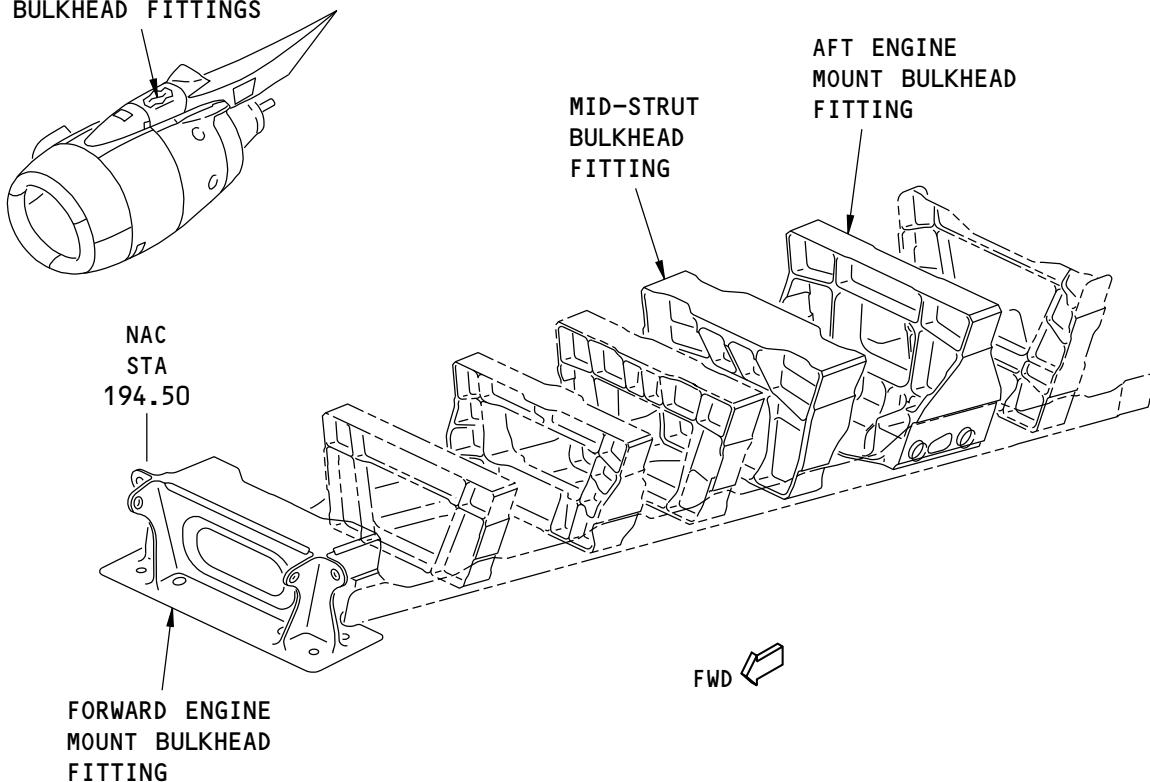


737-800
STRUCTURAL REPAIR MANUAL

REPAIR 3 - ENGINE STRUT TORQUE BOX BULKHEAD FITTINGS

SEE A

FOR THE STRUT
TORQUE BOX
BULKHEAD FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE
STRUCTURAL REPAIR MANUAL AT THIS TIME.

A

Engine Strut Torque Box Bulkhead Fitting Repair
Figure 201

F95132 S0006592388_V2

54-50-90

REPAIR 3
Page 201

Nov 10/2012

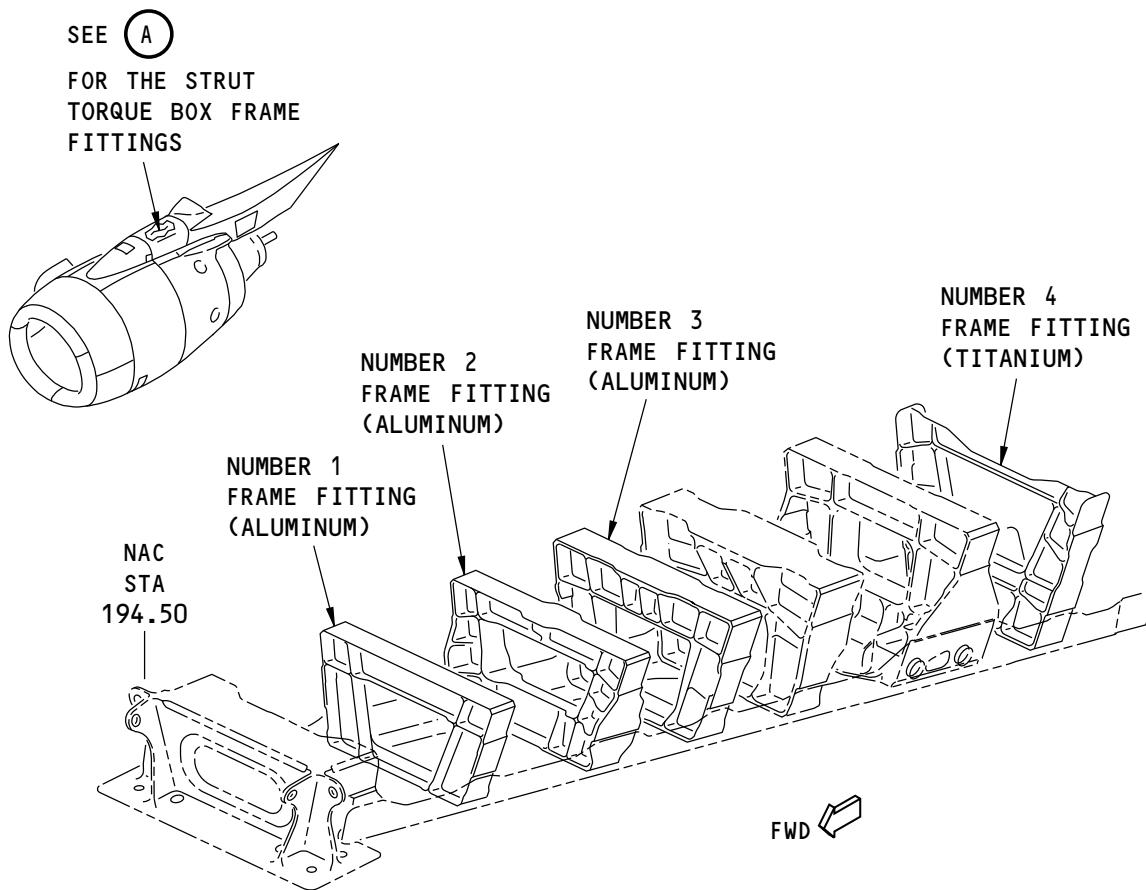
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737-800
STRUCTURAL REPAIR MANUAL

REPAIR 4 - ENGINE STRUT TORQUE BOX FRAME FITTINGS



NOTE: THERE ARE NO REPAIRS FOR THESE PARTS IN THE STRUCTURAL REPAIR MANUAL AT THIS TIME.

A
Engine Strut Torque Box Frame Fitting Repair
Figure 201

F95127 S0006592390_V2

54-50-90

REPAIR 4
Page 201

Nov 10/2012

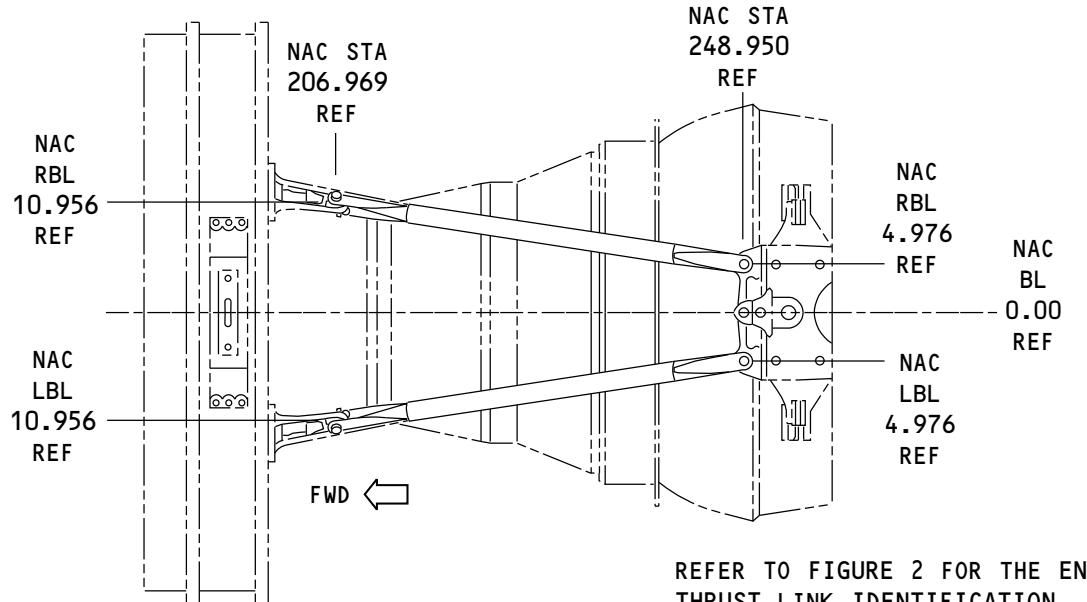
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737-800
STRUCTURAL REPAIR MANUAL

IDENTIFICATION 1 - ENGINE THRUST LINKS



NOTE: REFER TO TABLE 1 FOR REFERENCE DRAWINGS

**VIEW LOOKING DOWN
Engine Thrust Link Location**

U76132 S0000214591_V1

Figure 1

Table 1:

REFERENCE DRAWINGS	
DRAWING NUMBER	TITLE
310A2040	Thrust Link Installation - CFM56-7 Engine
310A2041	Thrust Link Assembly - CFM56-7 Engine

54-70-90

IDENTIFICATION 1

Page 1

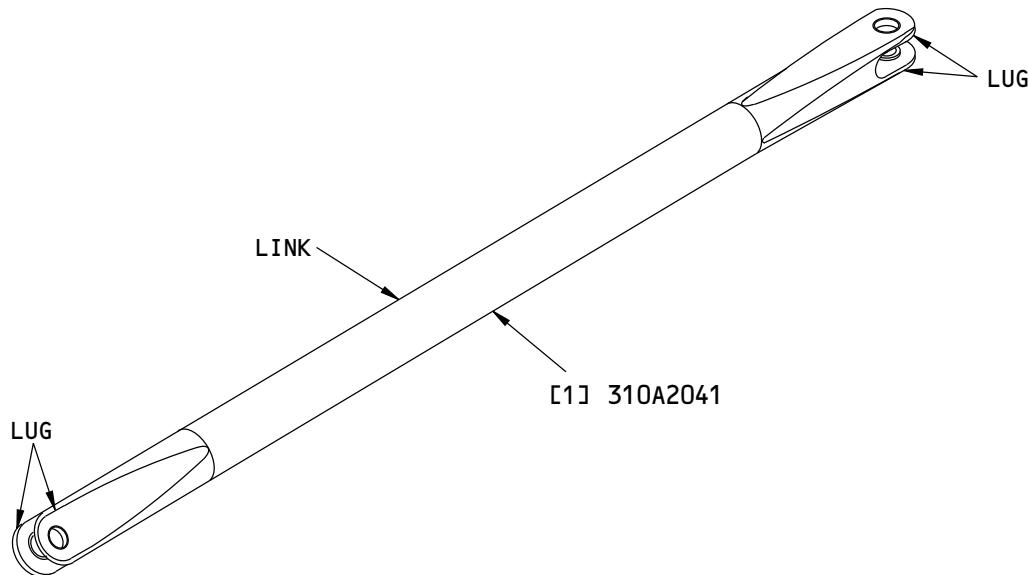
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737-800
STRUCTURAL REPAIR MANUAL



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

U88149 S0000221544_V1

Engine Thrust Link Identification

Figure 2

Table 2:

LIST OF MATERIALS FOR FIGURE 2				
ITEM	DESCRIPTION	T ^[1]	MATERIAL	EFFECTIVITY
[1]	Thrust Link	2.00 (5.08)	15-5PH Rolled Bar As Given In AMS5659	

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

54-70-90
IDENTIFICATION 1
Page 2
Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 1 - ENGINE THRUST LINKS

1. Applicability

- A. This subject gives the allowable damage limits for the CFM56-7 engine thrust links shown in Engine Thrust Link Location, Figure 101/ALLOWABLE DAMAGE 1.

2. General

- A. Refer to Allowable Damage Zones, Figure 102/ALLOWABLE DAMAGE 1 for the allowable damage zones.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 1 for the allowable damage limits.
- C. Remove the damaged material as necessary.
 - (1) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 for the inspection and removal of damage.
 - (2) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
- D. Keep a surface smoothness of 125 microinches Ra, or better.
- E. Do a magnetic particle inspection on the reworked material. Refer to SOPM 20-20-01.
- F. Passivate the reworked surface. Refer to SOPM 20-30-03.

NOTE: An alternative procedure to passivate the reworked material is to remove all contamination from the surface with scotchbrite and solvent wipes.

54-70-90

ALLOWABLE DAMAGE 1

Page 101

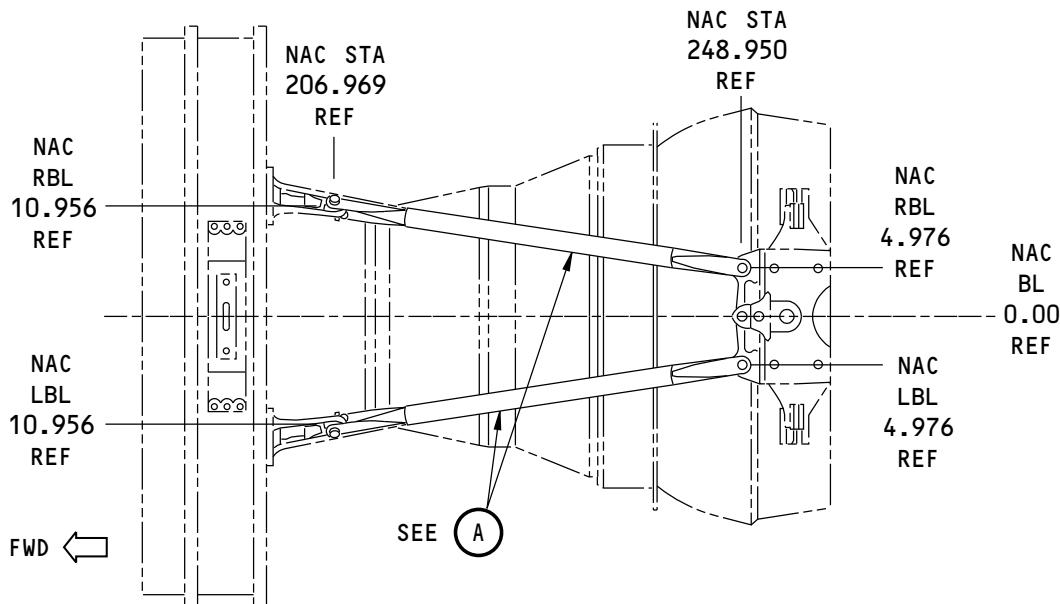
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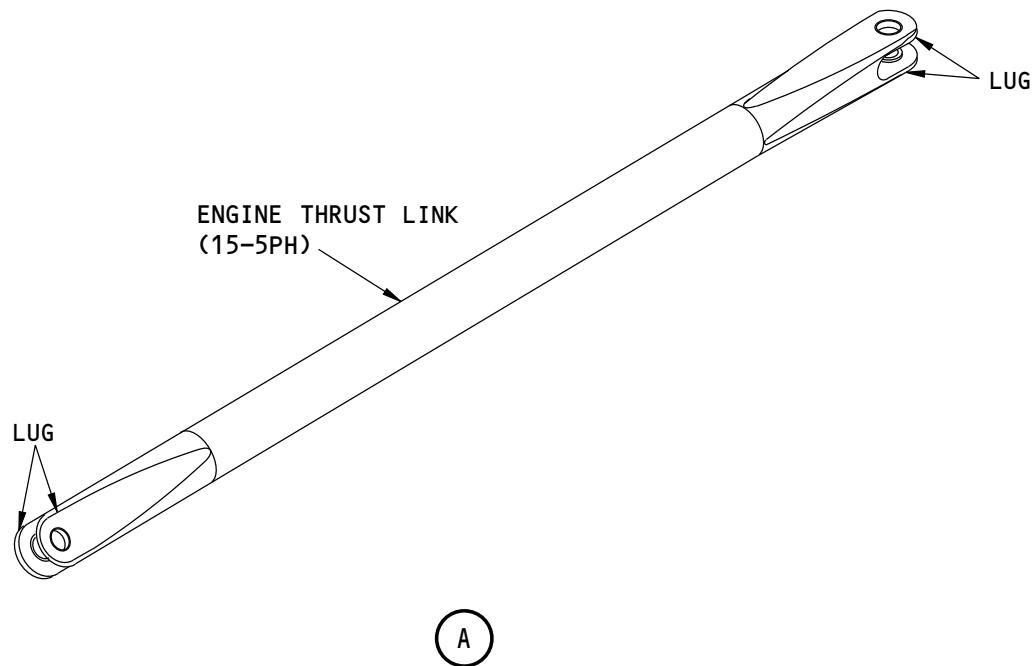
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737-800
STRUCTURAL REPAIR MANUAL



VIEW LOOKING DOWN



1301994 S0000222919_V1

Engine Thrust Link Location
Figure 101

54-70-90

ALLOWABLE DAMAGE 1

Page 102

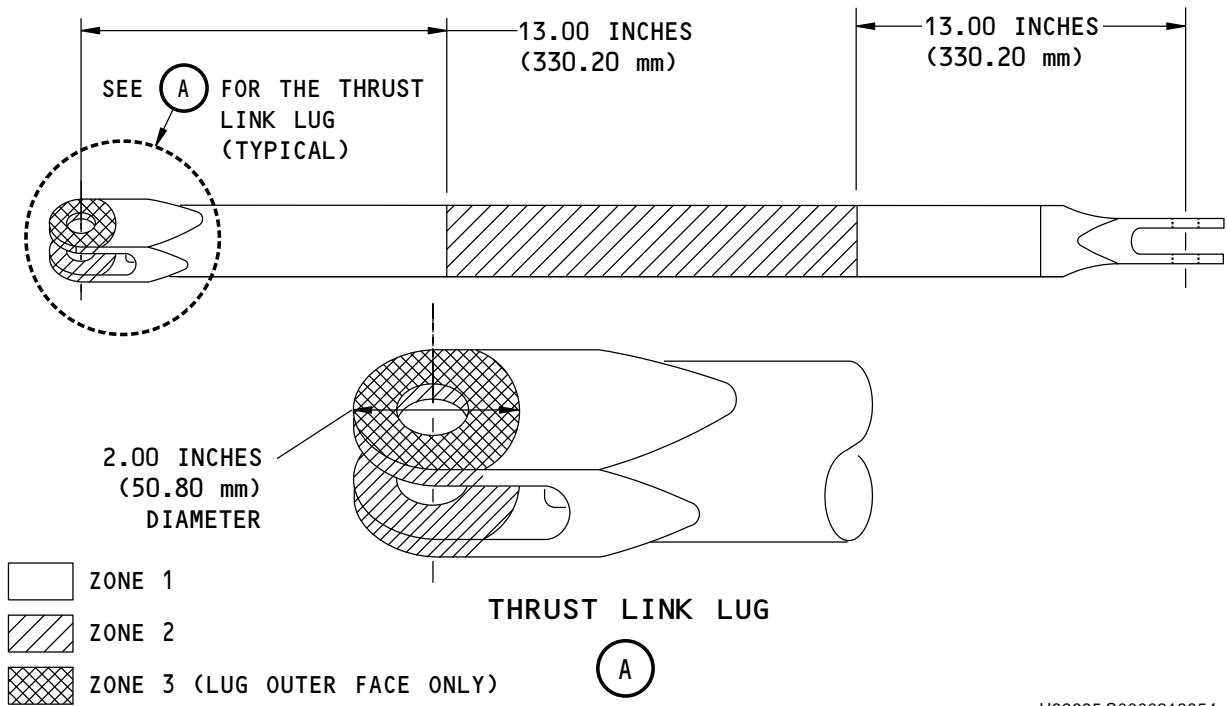
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737-800
STRUCTURAL REPAIR MANUAL



U82695 S0000218854_V2

Allowable Damage Zones

Figure 102

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 71-04-26	Component Maintenance Manual
SOPM 20-20-01	Magnetic Particle Inspection
SOPM 20-30-03	General Cleaning Procedures

4. Allowable Damage Limits for the CFM56-7 Engine Thrust Links

A. Zone 1:

(1) Link:

- (a) Remove the damage as shown in Link Allowable Damage Limits, Figure 103/ ALLOWABLE DAMAGE 1, Detail A.

(2) Lugs:

- (a) You can remove the damaged material from the areas that follow:
 - 1) The four outer corners of the lug.
 - a) Remove the damage as shown in Lug Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail A.
 - 2) The lug surface.
 - a) Remove the damage as shown in Lug Allowable Damage Limits, Figure 104/ ALLOWABLE DAMAGE 1, Detail B.

54-70-90

ALLOWABLE DAMAGE 1

Page 103

Nov 10/2015

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

B. Zone 2:

(1) Link:

- (a) Rework of damaged material is not permitted in this area. Contact The Boeing Company if you find damage.

(2) Lugs:

- (a) Rework of damaged material is not permitted in this area. A repair of the lug hole is permitted. Refer to CMM 71-04-26 for the lug hole repair procedure.

C. Zone 3:

(1) Lugs:

- (a) You can remove the damaged material from the lug outer faces only.

- 1) Remove the damage as shown in Lug Outer Face Allowable Damage Limits, Figure 105/ALLOWABLE DAMAGE 1, Detail A.

- a) Spotface the lug outer face a minimum concentric diameter of 1.40 in. (35.56 mm) flat area and use a minimum 0.25 in. (6.35 mm) fillet radius.

NOTE: Do not exceed the maximum spotface depth of 0.015 in. (0.38 mm). If the depth of damage is greater than 0.015 in. (0.38 mm), contact The Boeing Company.

- b) If you do not remove the initial bushing to spotface the lug outer face, you are permitted to machine the end of the initial bushing. Chamfer the initial bushing inner diameter to be 0.015 in. (0.38 mm) to 0.025 in. (0.635 mm) x 45°.

- c) Install a new bushing if you remove the initial bushing to spotface the lug outer face. Refer to CMM 71-04-26. Make sure that the new bushing has a reduced shank length for the thinner thrust link lug wall. Make sure that the bottom end of the new bushing is flush or no more than 0.010 in. (0.254 mm) below the machined surface of the thrust link lug outer face.

54-70-90

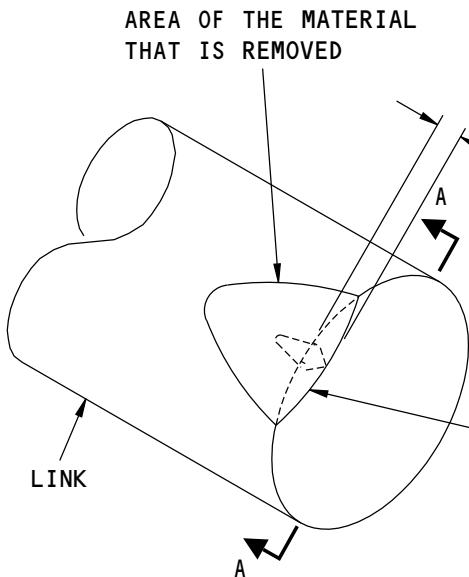
ALLOWABLE DAMAGE 1

Page 104

Nov 10/2015

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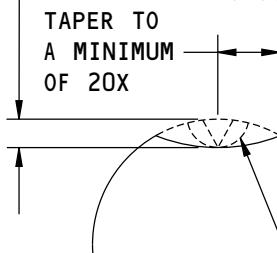


REMOVAL OF DAMAGED MATERIAL ON THE SURFACE OF THE LINK

(A)

X = DEPTH OF THE MATERIAL THAT IS REMOVED
= A MAXIMUM OF 0.015 INCH (0.38 mm)

MAKE THE CONTOUR SMOOTH (TYPICAL)



REMOVE THE MATERIAL TO A MINIMUM RADIUS OF 1.00 INCH (25.40 mm), THEN TAPER AS SHOWN

A-A

1303358 S0000223347_V1

Link Allowable Damage Limits
Figure 103

54-70-90

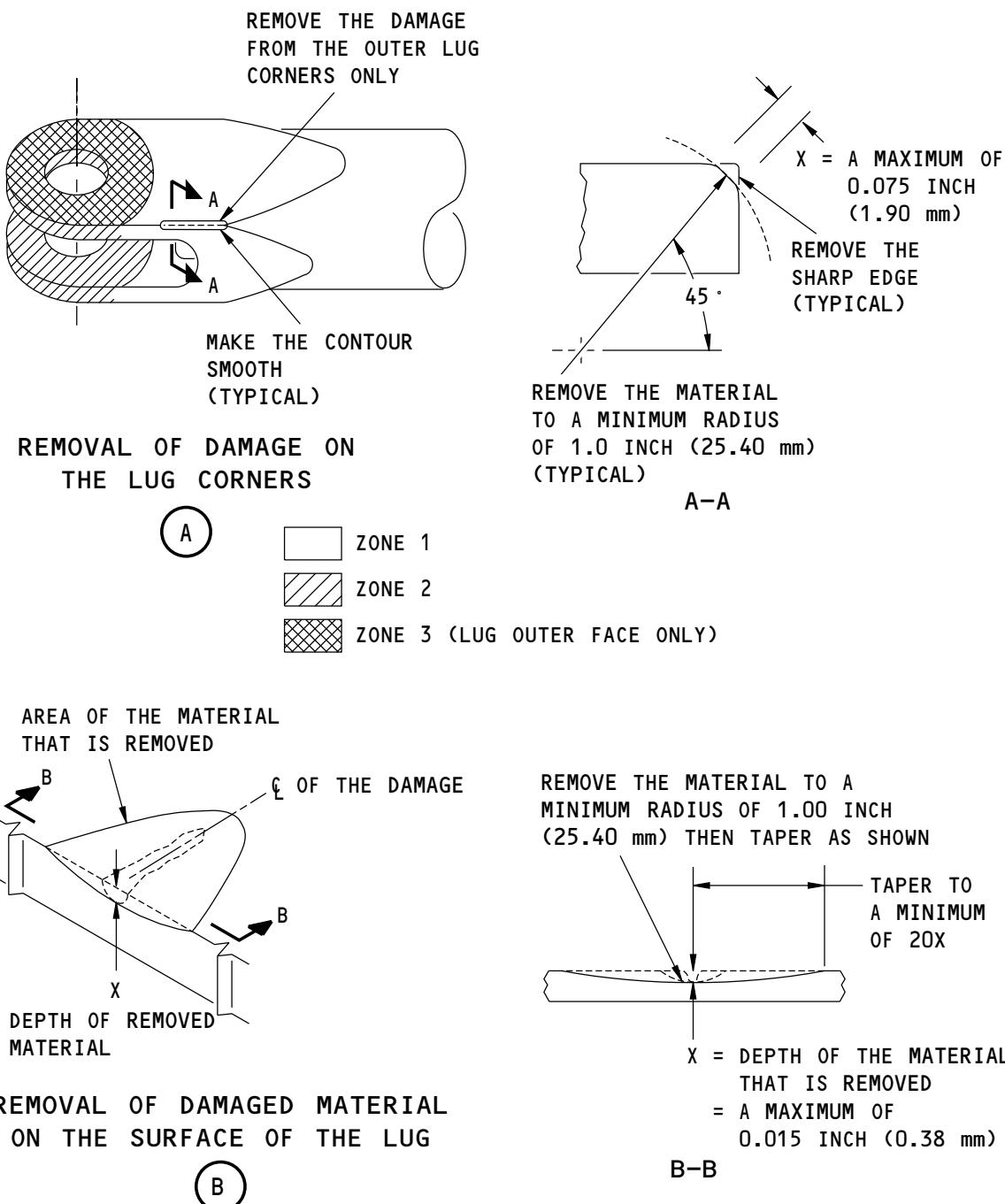
ALLOWABLE DAMAGE 1

Page 105

Nov 10/2012

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**737-800
STRUCTURAL REPAIR MANUAL**



1303373 S0000223842_V2

**Lug Allowable Damage Limits
Figure 104**

54-70-90

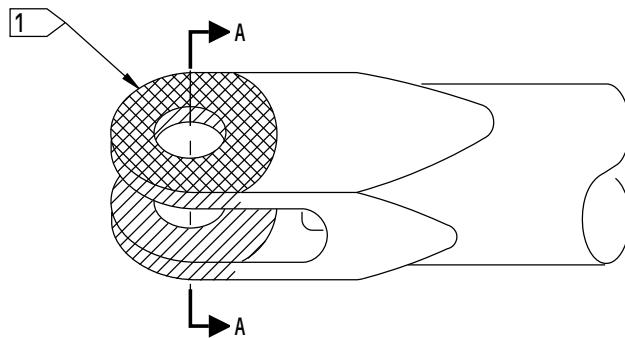
ALLOWABLE DAMAGE 1

Page 106

Nov 10/2015



737-800
STRUCTURAL REPAIR MANUAL



SPOTFACE DEPTH MUST NOT BE MORE THAN 0.015 INCH (0.38 mm)

ZONE 1

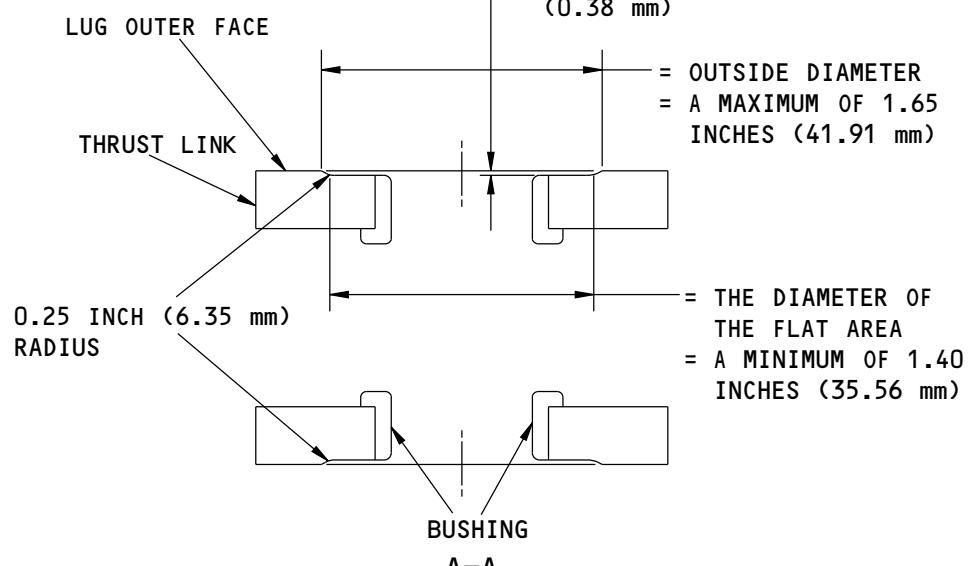
ZONE 2

ZONE 3 (LUG OUTER FACE ONLY)

REMOVAL OF DAMAGE ON
THE LUG OUTER FACE



X = DEPTH OF THE MATERIAL
THAT IS REMOVED
= A MAXIMUM OF 0.015 INCH
(0.38 mm)



2444198 S0000568379_V1

Lug Outer Face Allowable Damage Limits
Figure 105

54-70-90

ALLOWABLE DAMAGE 1

Page 107

Nov 10/2015

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 2 - AFT ENGINE MOUNT HANGER FITTING LOOP

1. Applicability

- I A. This subject gives the allowable damage limits for the 310A2031-23/-25/-27/-28 aft engine mount hanger fitting loops shown in Figure 101/ALLOWABLE DAMAGE 2.

2. General

- A. Refer to Figure 102/ALLOWABLE DAMAGE 2 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 2 for the allowable damage limits.
- C. Remove damaged material as necessary.
 - (1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.
 - (2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.
 - (3) Keep a surface smoothness of 125 microinches Ra, or better.
- D. Do a fluorescent penetrant inspection of the reworked material. Refer to SOPM 20-20-02.
- E. Boeing recommends that you install a 310A2040-7 sacrificial washer to prevent more wear. Refer to AMM 71-21-02.

54-70-90

ALLOWABLE DAMAGE 2

Page 101

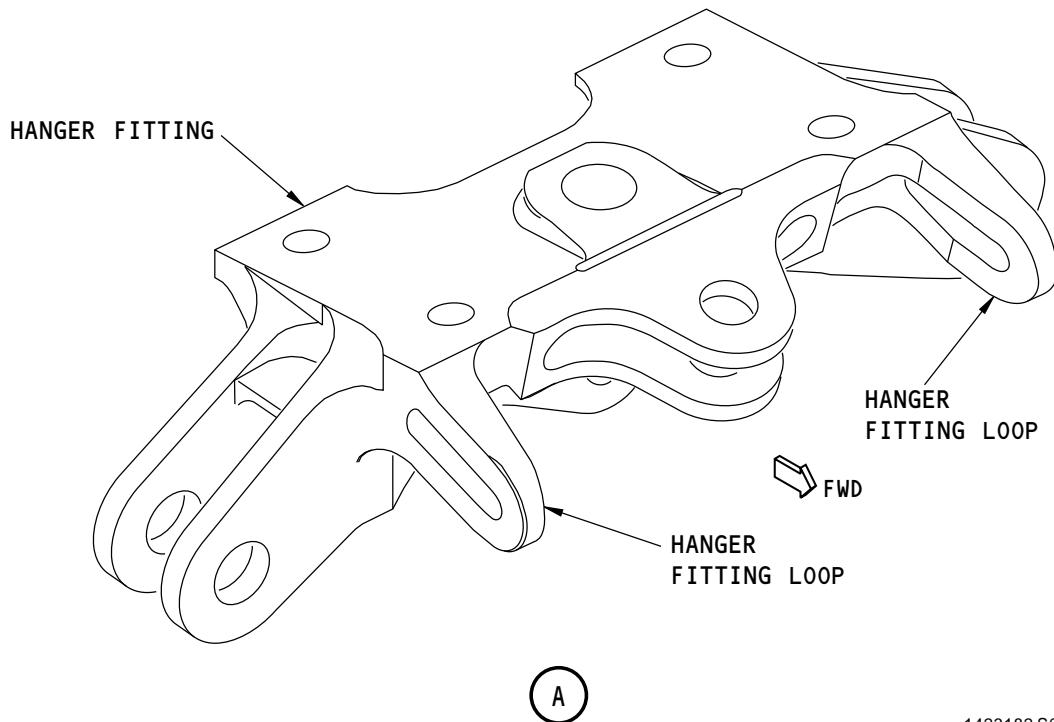
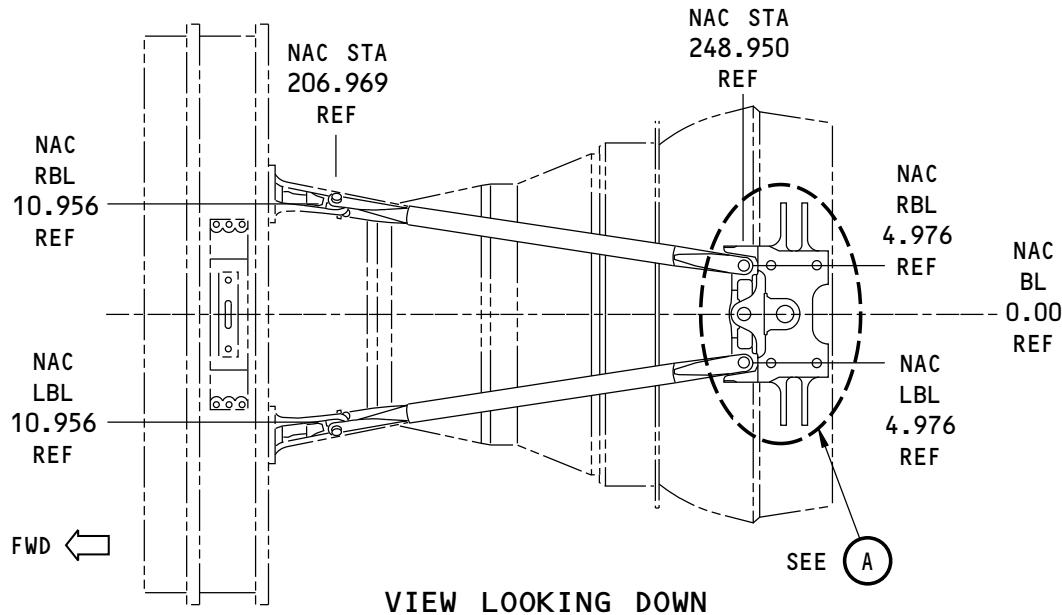
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737-800
STRUCTURAL REPAIR MANUAL



1423182 S0000255348_V1

Aft Engine Mount Hanger Fitting Loop Location
Figure 101

54-70-90

ALLOWABLE DAMAGE 2

Page 102

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-30-05, GENERAL	Equipment and Tools For Repairs
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures

4. Allowable Damage Limits for the Aft Engine Mount Hanger Fitting Loop

- A. Remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 2.
 - (1) Blend out the damage to the minimum depth necessary to remove the damage.
 - (2) The minimum loop thickness permitted at the blended area is 0.72 inch (18.29 mm).

54-70-90

ALLOWABLE DAMAGE 2

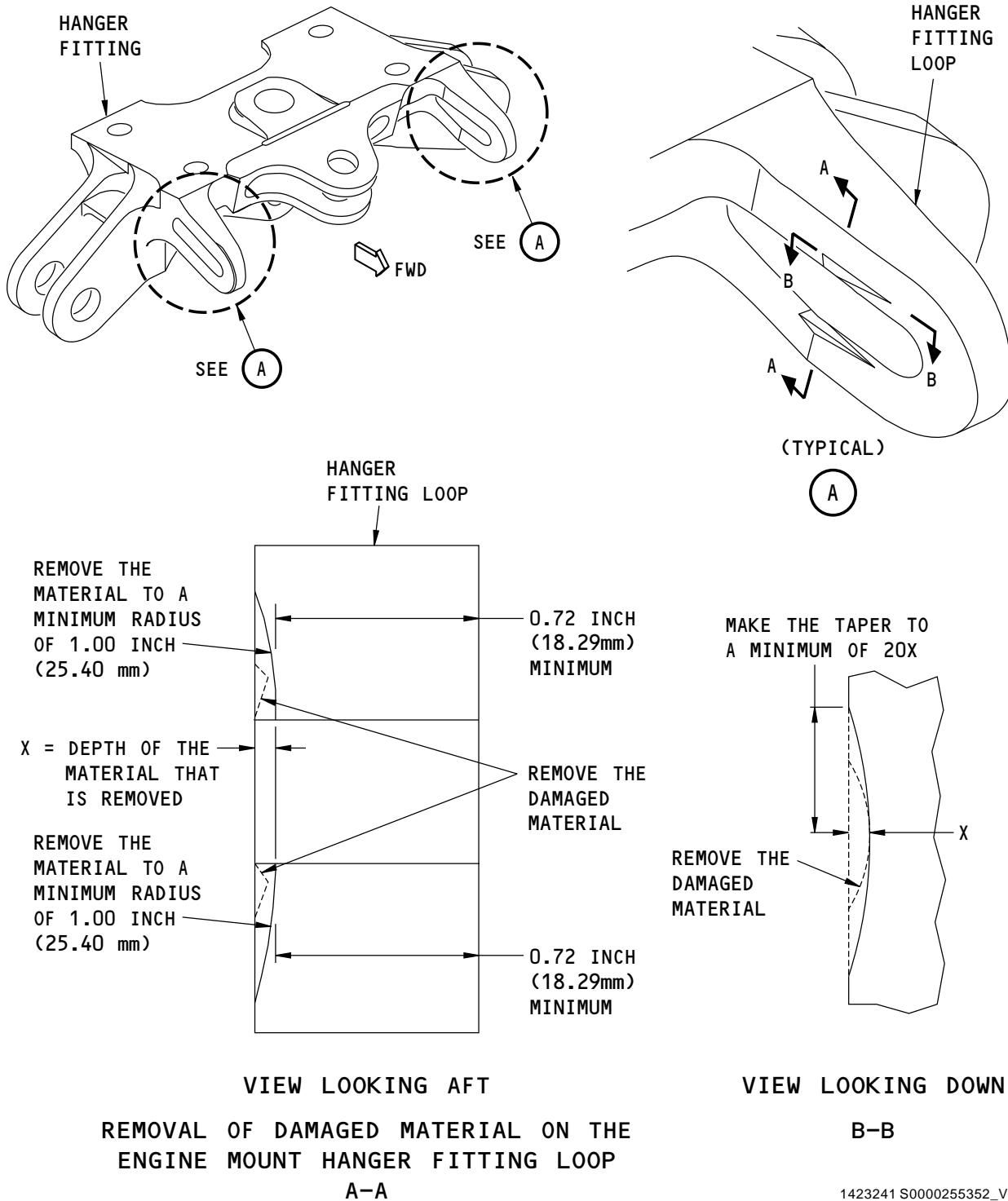
Page 103

Jul 10/2015

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**737-800
STRUCTURAL REPAIR MANUAL**



1423241 S0000255352_V1

Aft Engine Mount Hanger Fitting Loop Allowable Damage
Figure 102

54-70-90

ALLOWABLE DAMAGE 2

Page 104

Nov 10/2012



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 3 - FORWARD ENGINE MOUNT HANGER FITTING DAMAGE NEAR LINK ATTACHMENT HOLES

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2021-5/-7 forward engine mount hanger fitting near the link attachment holes shown in Figure 101/ALLOWABLE DAMAGE 3.
- B. The depth of the damage cannot be more than 0.030 in. (0.762 mm).

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 3 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 3 for the allowable damage limits.
- C. Remove the damaged material.
 - (1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.
 - (2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.
 - (3) Keep a surface roughness of 125 microinches Ra or smoother.
- D. Do a penetrant inspection of the blend area. Refer to SOPM 20-20-02.
- E. Shot peen the blend area with an intensity between 0.008A and 0.013A. When you shot peen, use 200% coverage. You can peen the blend area manually to get the intensity and the coverage necessary. Refer to 51-20-06, GENERAL.
- F. The Boeing Company recommends that you install a 310A2040-7 sacrificial washer to prevent more worn areas. If you do not install the washer, the hanger fitting will become more worn. Refer to AMM SUBJECT 71-21-01 or CMM 71-21-37.

NOTE: Do not install more than one sacrificial washer.

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-06, GENERAL	Shot Peening
51-30-05, GENERAL	Equipment and Tools For Repairs
AMM 71-21-01	FORWARD ENGINE MOUNT
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Forward Engine Mount Hanger Fitting Near Link Attachment Holes

- A. Remove the damage as shown in Figure 101/ALLOWABLE DAMAGE 3.
 - (1) Remove the damage with a 10:1 blend ratio.

54-70-90

ALLOWABLE DAMAGE 3

Page 101

Mar 10/2016

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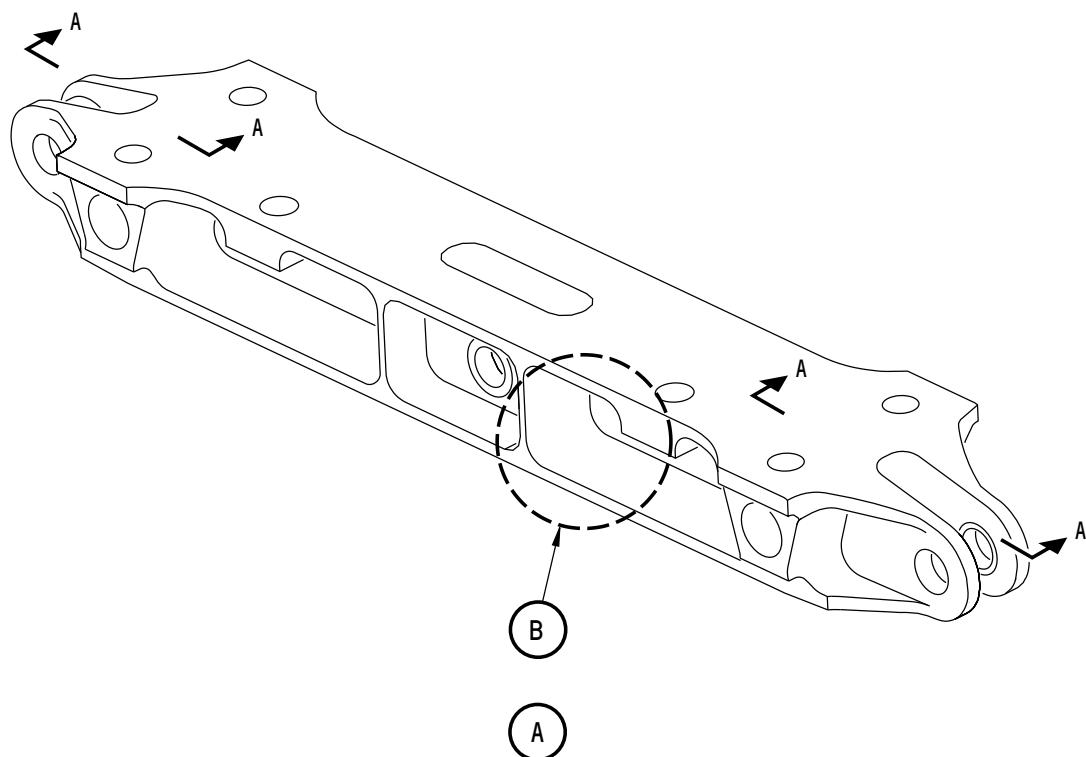
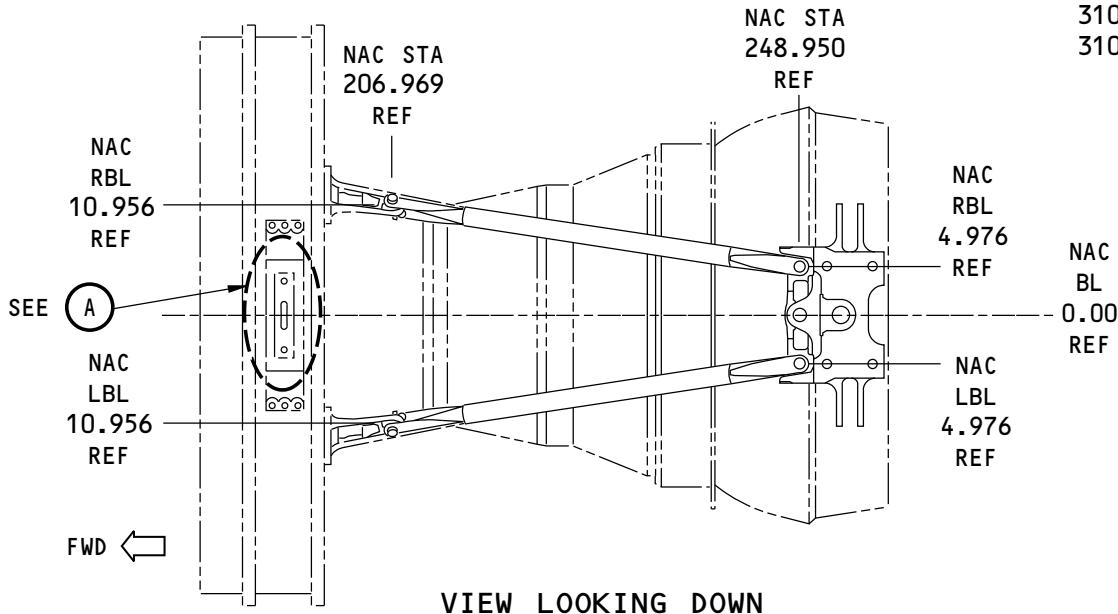


737-800
STRUCTURAL REPAIR MANUAL

REFERENCE DRAWINGS

310A2021

310A2040



1694356 S0000307880_V1

Hanger Fitting Assembly Forward Engine Mount
Figure 101 (Sheet 1 of 3)

54-70-90

ALLOWABLE DAMAGE 3

Page 102

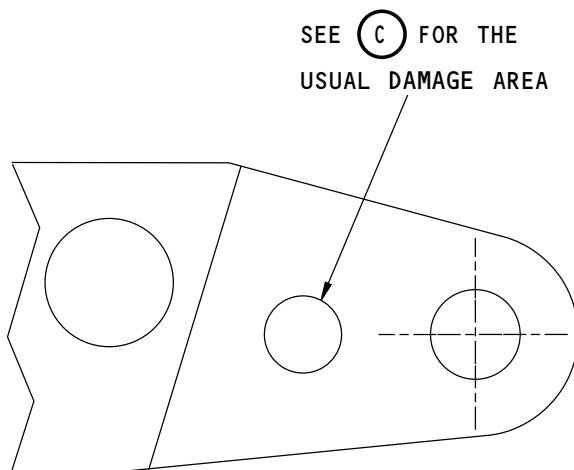
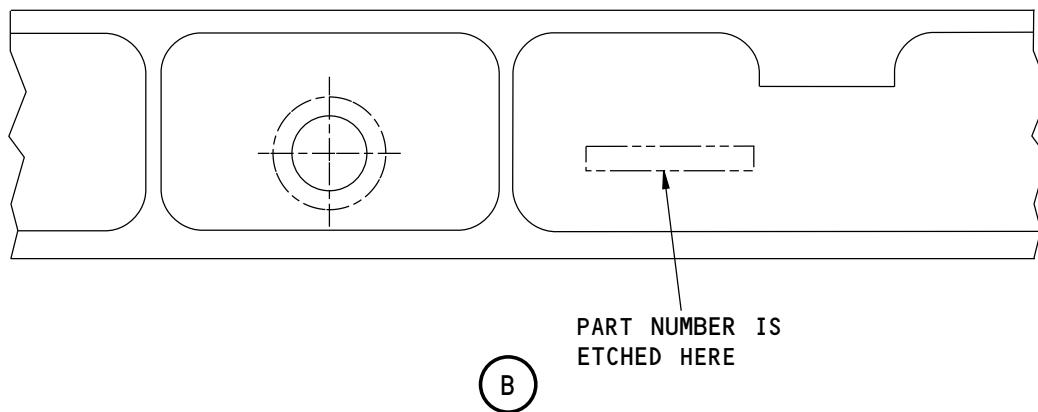
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737-800
STRUCTURAL REPAIR MANUAL

REFERENCE DRAWINGS
310A2021
310A2040



VIEW IN THE AFT DIRECTION
FORWARD VIEW OPPOSITE
A-A

1694661 S0000307881_V1

Hanger Fitting Assembly Forward Engine Mount
Figure 101 (Sheet 2 of 3)

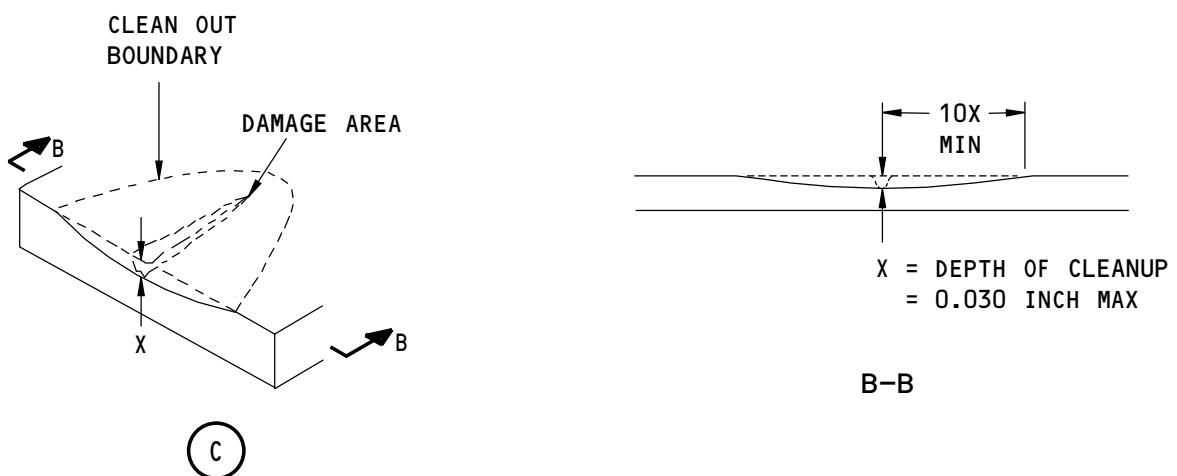
54-70-90
ALLOWABLE DAMAGE 3
Page 103
Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL



1778299 S0000318612_V1

Hanger Fitting Assembly Forward Engine Mount
Figure 101 (Sheet 3 of 3)

54-70-90

ALLOWABLE DAMAGE 3

Page 104

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 4 - FORWARD ENGINE MOUNT FAN CASE FITTING DAMAGE NEAR LINK ATTACHMENT HOLES

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2028-12/-14/-16 forward engine mount fan case fitting near the link attachment holes shown in Figure 101/ALLOWABLE DAMAGE 4.
- B. The depth of the damage cannot be more than 0.030 in. (0.762 mm).

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 4 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 4 for the allowable damage limits.
- C. Remove the damaged material.
 - (1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.
 - (2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.
 - (3) Keep a surface roughness of 125 microinches Ra or smoother.
- D. Do a penetrant inspection of the blend area. Refer to SOPM 20-20-02.
- E. Shot peen the blend area with an intensity between 0.006A and 0.011A. When you shot peen, use 200% coverage. You can peen the blend area manually to get the intensity and the coverage necessary. Refer to 51-20-06, GENERAL.
- F. The Boeing Company recommends that you install a 310A2040-7 sacrificial washer to prevent more worn areas. If you do not install the washer, the fan case fitting will become more worn. Refer to AMM SUBJECT 71-21-01 or CMM 71-21-37.

NOTE: Do not install more than one sacrificial washer.

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-20-06, GENERAL	Shot Peening
51-30-05, GENERAL	Equipment and Tools For Repairs
AMM 71-21-01	FORWARD ENGINE MOUNT
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Forward Engine Mount Fan Case Fitting Near Link Attachment Holes

- A. Remove the damage as shown in Figure 101/ALLOWABLE DAMAGE 4.
 - (1) Remove the damage with a 10:1 blend ratio.

54-70-90

ALLOWABLE DAMAGE 4

Page 101

Jul 10/2014

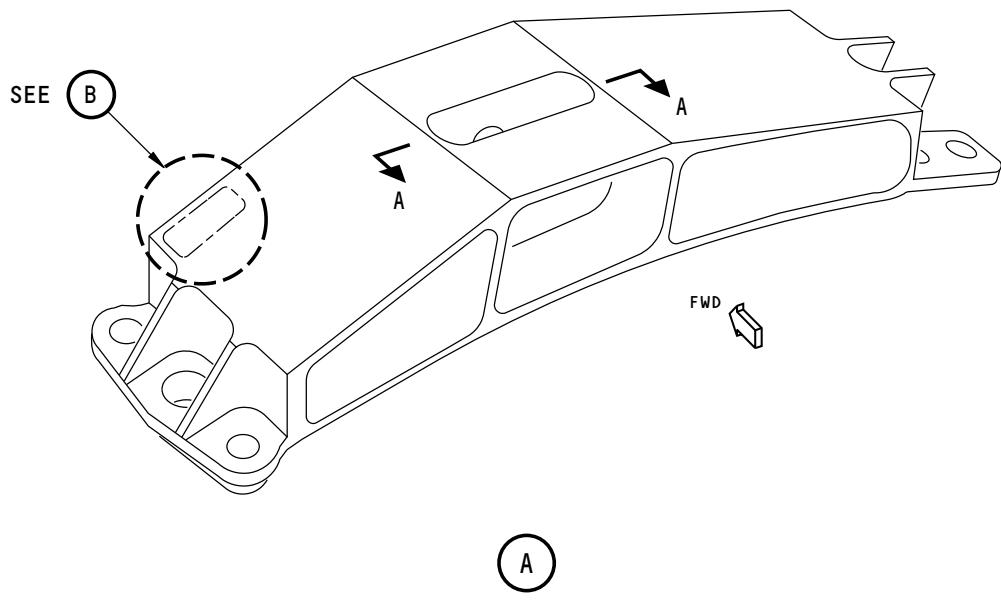
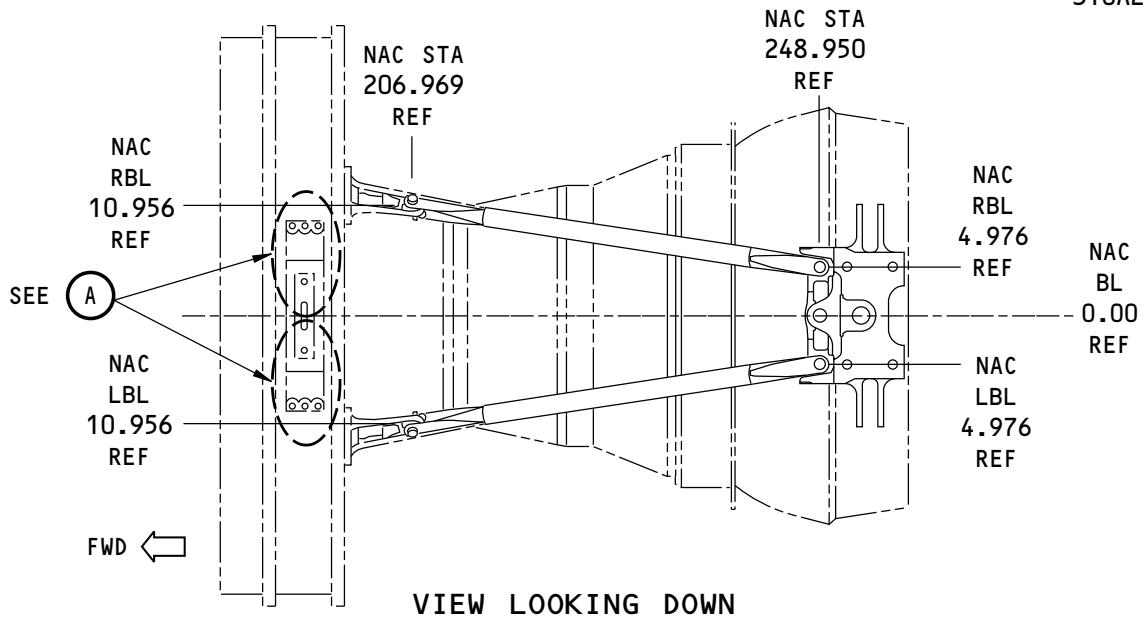
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737-800
STRUCTURAL REPAIR MANUAL

REFERENCE DRAWINGS
310A2028
310A2040



1685589 S0000307738_V1

Forward Engine Mount Fan Case Fitting
Figure 101 (Sheet 1 of 3)

54-70-90

ALLOWABLE DAMAGE 4

Page 102

Nov 10/2012

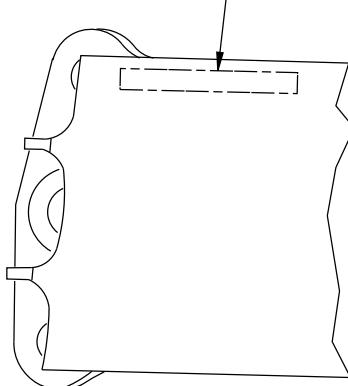
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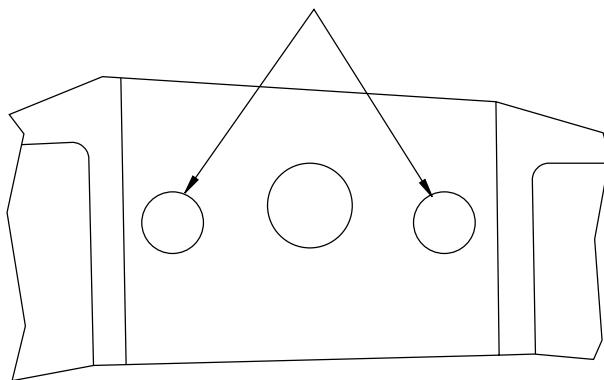
737-800
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THE PART NUMBER
IS ETCHED HERE



(B)

SEE (C) FOR THE
USUAL DAMAGE AREA



**VIEW IN THE AFT DIRECTION, FORWARD VIEW OPPOSITE
A-A**

1685758 S0000307739_V1

Forward Engine Mount Fan Case Fitting
Figure 101 (Sheet 2 of 3)

54-70-90

ALLOWABLE DAMAGE 4

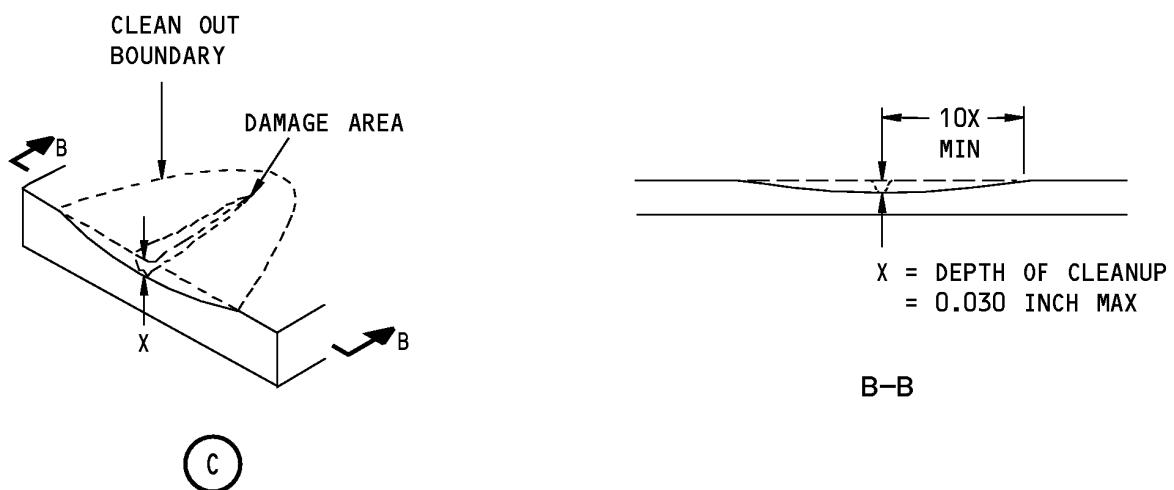
Page 103

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



1778317 S0000318626_V1

Forward Engine Mount Fan Case Fitting
Figure 101 (Sheet 3 of 3)

54-70-90

ALLOWABLE DAMAGE 4

Page 104

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 5 - AFT ENGINE MOUNT HANGER FITTING

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2031–23/-25/-27/-28 aft engine mount hanger fitting shown in Figure 101/ALLOWABLE DAMAGE 5.
- B. The depth of the damage on the top surface of the fitting cannot be more than 0.01 in. (0.254 mm). See Figure 101 (Sheet 2).
 - (1) At all 4 bolt hole locations, blends within 1 in. (25.4 mm) of bolt hole centerline may not exceed 0.0025 in. (0.0635 mm).
- C. The depth of the damage on the inside surface of the fitting cannot be more than 0.02 in. (0.508 mm). See Figure 101 (Sheet 3) and Figure 101 (Sheet 4).

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 5 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 5 for the allowable damage limits.
- C. Remove the damaged material.
 - (1) Refer to 51-10-02, GENERAL and SOPM 20-10-07 for the inspection and removal of damage.
 - (2) Refer to 51-30-05, GENERAL for possible sources of equipment and tools you can use to remove the damage.
 - (3) Keep a surface roughness of 125 microinches Ra or smoother.
- D. Do a penetrant inspection of the blend area. Refer to SOPM 20-20-02.

3. References

Reference	Title
51-10-02, GENERAL	Inspection and Removal of Damage
51-30-05, GENERAL	Equipment and Tools For Repairs
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Aft Engine Mount Hanger Fitting

- A. Remove the damage as shown in Figure 101/ALLOWABLE DAMAGE 5.
 - (1) Remove the damage with a 10:1 blend ratio.

54-70-90

ALLOWABLE DAMAGE 5

Page 101

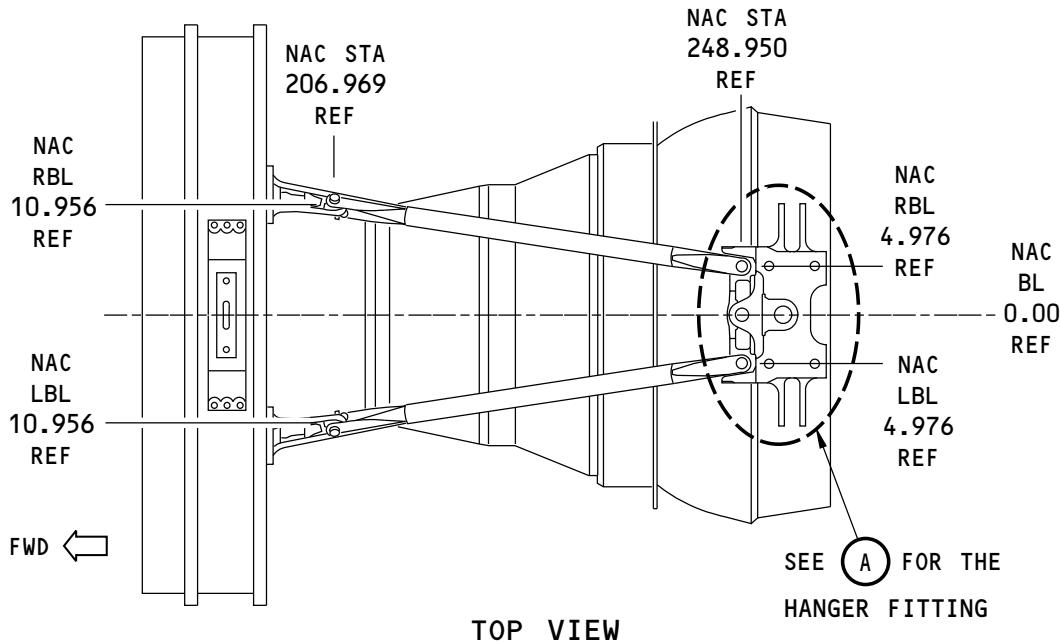
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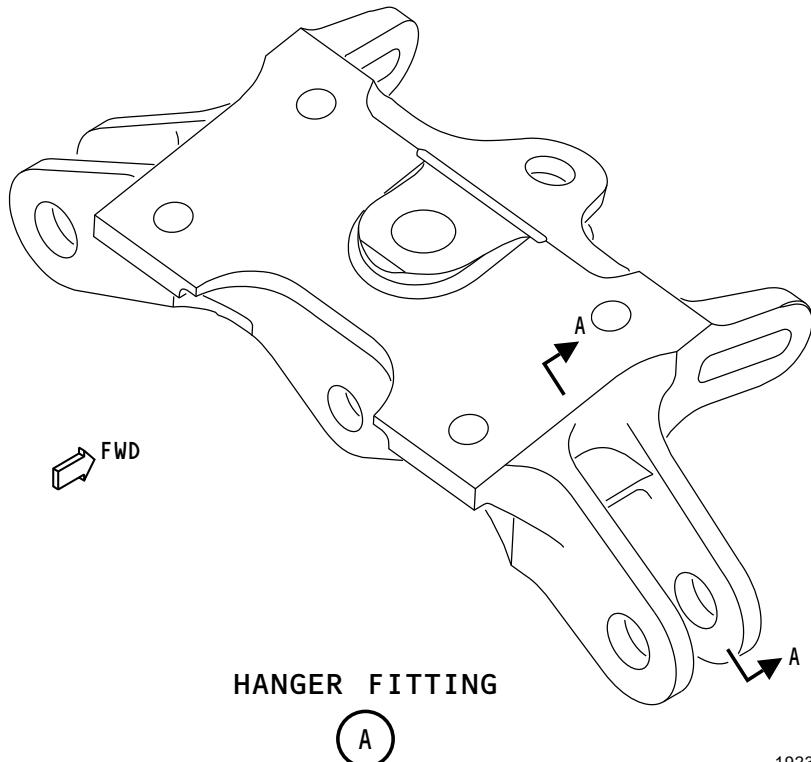
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737-800
STRUCTURAL REPAIR MANUAL



TOP VIEW



1923032 S0000355186_V1

Aft Engine Mount Hanger Fitting
Figure 101 (Sheet 1 of 4)

54-70-90

ALLOWABLE DAMAGE 5

Page 102

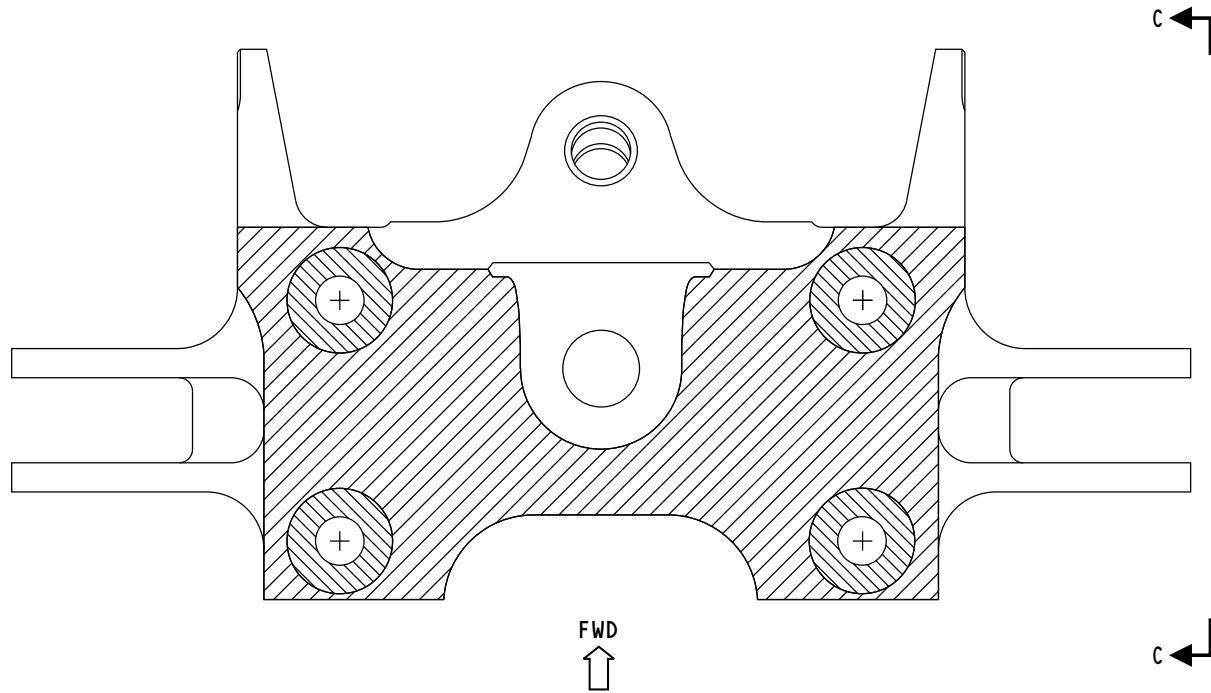
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



- UP TO 0.01 INCH DEEP BLEND ALLOWED
- UP TO 0.0025 INCH DEEP BLEND ALLOWED
WITHIN 1.0 INCH OF BOLT HOLE CENTERLINE
NO BLEND ALLOWED IN BOLT HOLE BORE

(VIEW IN THE DOWN DIRECTION)

AFT MOUNT HANGER FITTING



2075430 S0000434446_V1

Aft Engine Mount Hanger Fitting
Figure 101 (Sheet 2 of 4)

54-70-90

ALLOWABLE DAMAGE 5

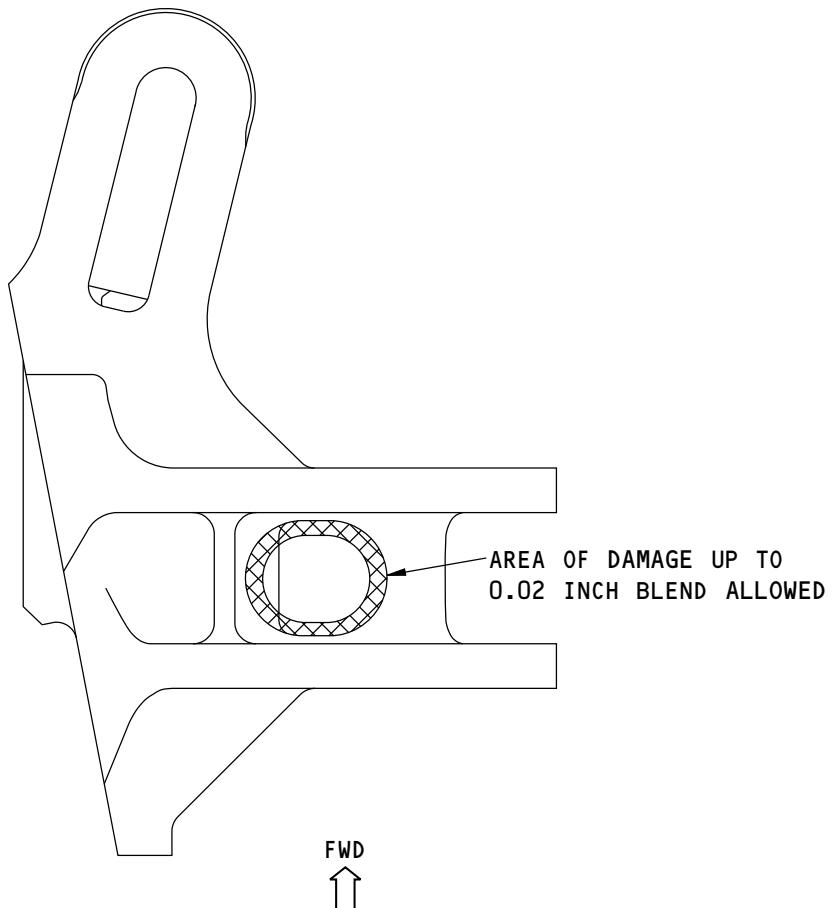
Page 103

Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



AFT MOUNT HANGER FITTING
C-C

2075471 S0000434454_V1

Aft Engine Mount Hanger Fitting
Figure 101 (Sheet 3 of 4)

54-70-90

ALLOWABLE DAMAGE 5

Page 104

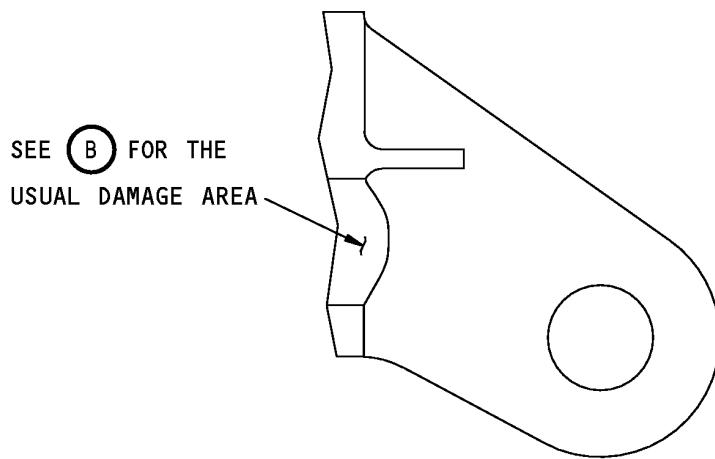
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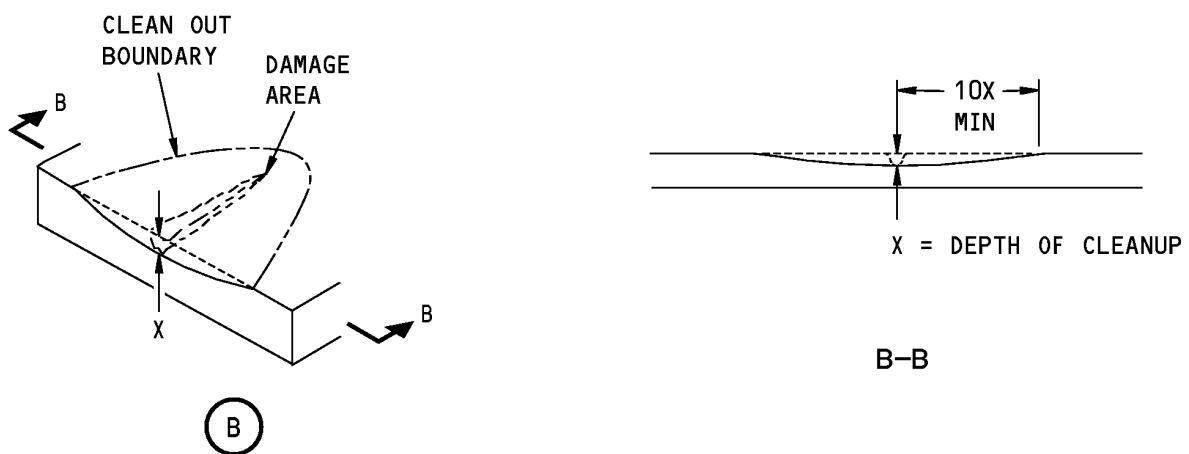
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737-800
STRUCTURAL REPAIR MANUAL



VIEW IN THE FORWARD DIRECTION
AFT VIEW OPPOSITE
A-A



1923120 S0000360085_V1

Aft Engine Mount Hanger Fitting
Figure 101 (Sheet 4 of 4)

54-70-90

ALLOWABLE DAMAGE 5

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 6 - FORWARD ENGINE MOUNT FAN CASE FITTING DAMAGE AT LINK ATTACHMENT HOLES

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2028-12/-14/-16 forward engine mount fan case fitting at the link attachment holes shown in Figure 101/ALLOWABLE DAMAGE 6.
- B. The depth of the damage cannot be more than 0.030 in. (0.762 mm).

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 6 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 6 for the allowable damage limits.
- C. Remove the bushing, if necessary.
- D. Spotface the damaged surface of the fitting. Do the steps that follow.
 - (1) Use a 1.688 in. (42.88 mm) diameter cutter with 0.250 in. (6.35 mm) fillet radius.
 - (2) Spotface to a minimum depth to remove the damage.
 - (a) If you make the rub strip from a CRES sheet, then the spotface must have a minimum depth as shown in Table 101/ALLOWABLE DAMAGE 6.
 - (b) If you make the necessary rub strip from a standard washer, then the spotface must have a minimum depth as shown in Table 102/ALLOWABLE DAMAGE 6.

NOTE: Do not exceed the maximum spotface depth of 0.030 in. (0.762 mm). If the depth of the damage is greater than 0.030 in. (0.762 mm), contact The Boeing Company.

- (3) If you do not remove the initial bushing, you are permitted to machine the end of the bushing. Chamfer the bushing inner diameter to be 0.015 in. (0.381 mm) to 0.025 in. (0.635 mm) x 45°.
- (4) Make a surface roughness of 125 microinches Ra or smoother.
- E. Do a penetrant inspection of the spotface area. Refer to SOPM 20-20-02.
- F. Shot peen the spotface area with an intensity between 0.008A and 0.011A, and 200% coverage. You can peen the reworked area manually to get the intensity and the coverage necessary. Refer to 51-20-06, GENERAL.
- G. Make the rub strip with one of the two alternatives that follow.
 - (1) Make the rub strip from a 301, 302 or 304 CRES, annealed, sheet. Refer to Table 101/ALLOWABLE DAMAGE 6 for the necessary spotface depth and the thickness of the CRES Sheet.
 - (a) Make the rub strip to an outside diameter of 1.14 in. (28.96 mm) to 1.17 inch (29.72 mm) and an inside diameter of 0.760 in. (19.30 mm) to 0.790 in. (20.07 mm).
 - (b) Remove all sharp edges.
 - (c) Make the surface roughness of 125 microinches Ra or smoother.
 - (d) Passivate the rub strip. Refer to SOPM 20-30-03.

NOTE: An alternative procedure to passivate the rub strip is to remove all contamination from the rub strip with abrasive pad and solvent wipes.

54-70-90

ALLOWABLE DAMAGE 6

Page 101

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 101:

SPOTFACE DEPTHS TO INSTALL RUB STRIPS FROM CRES SHEET		
DEPTH OF DAMAGE, D (INCH)	SPOTFACE DEPTH (INCH)	THICKNESS OF 301/302/304 CRES, ANNEALED, SHEET (INCH)
D ≤ 0.0100	0.0100	0.010
0.0100 < D ≤ 0.0160	D	0.010
0.0200 < D ≤ 0.0200	D	0.016
0.0200 < D ≤ 0.0250	D	0.020
0.0250 < D ≤ 0.0300	D	0.025

- (2) Make the rub strip from a standard washer. Refer to Table 102/ALLOWABLE DAMAGE 6 for the necessary spotface depth and the standard washer types.
 - (a) Make the rub strip to an outside diameter of 1.14 in. (28.96 mm) to 1.17 in. (29.72 mm) and an inside diameter of 0.760 in. (19.30 mm) to 0.790 in. (20.07 mm).
 - (b) Remove all sharp edges.
 - (c) Keep a surface roughness of 125 microinches Ra or smoother.
 - (d) Remove all contamination from the rub strip with scotchbrite and solvent wipes.

Table 102:

SPOTFACE DEPTHS TO INSTALL RUB STRIPS FROM STANDARD WASHERS		
DEPTH OF DAMAGE, D (INCH)	SPOTFACE DEPTH (INCH)	TYPE OF STANDARD WASHER
D ≤ 0.0160	0.0160	NAS1149C1016R OR NAS1149C1216R
0.0160 < D ≤ 0.0300	0.0300	NAS1149C1032R OR NAS1149C1232R

- H. Install a new bushing if the bushing has been removed prior to spotfacing. Refer to CMM 71-21-37.
 - (1) Make sure the new bushing has a reduced shank length to accommodate the thinner fitting wall.
 - (2) Make sure the end of the bushing should sit flush to 0.010 in. (0.254 mm) below the machined surface.
- I. Install the rub strip on the spotface of the fitting using BMS 5-45 sealant.
 - (1) Make sure that the rub strip is aligned with the bushing hole.
 - (2) Make sure the rub strip is no more than 0.007 in. (0.178 mm) above the initial machined surface of the fan case fitting.

3. References

Reference	Title
51-20-06, GENERAL	Shot Peening
CMM 71-21-37	Component Maintenance Manual
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures

4. Allowable Damage Limits for the Forward Engine Mount Fan Case Fitting at Link Attachment Holes

- A. Remove the damage from the forward engine mount fan case fitting at the link attachment holes as shown in Figure 101/ALLOWABLE DAMAGE 6.

54-70-90

ALLOWABLE DAMAGE 6

Page 102

Mar 10/2016



**737-800
STRUCTURAL REPAIR MANUAL**

- (1) The maximum diameter of the forward engine mount fan case fitting spotface is 1.425 in. (36.20 mm).
- (2) The minimum diameter of the forward engine mount flat area of the fan case fitting spotface is 1.18 in. (29.97 mm).

54-70-90

ALLOWABLE DAMAGE 6

Page 103

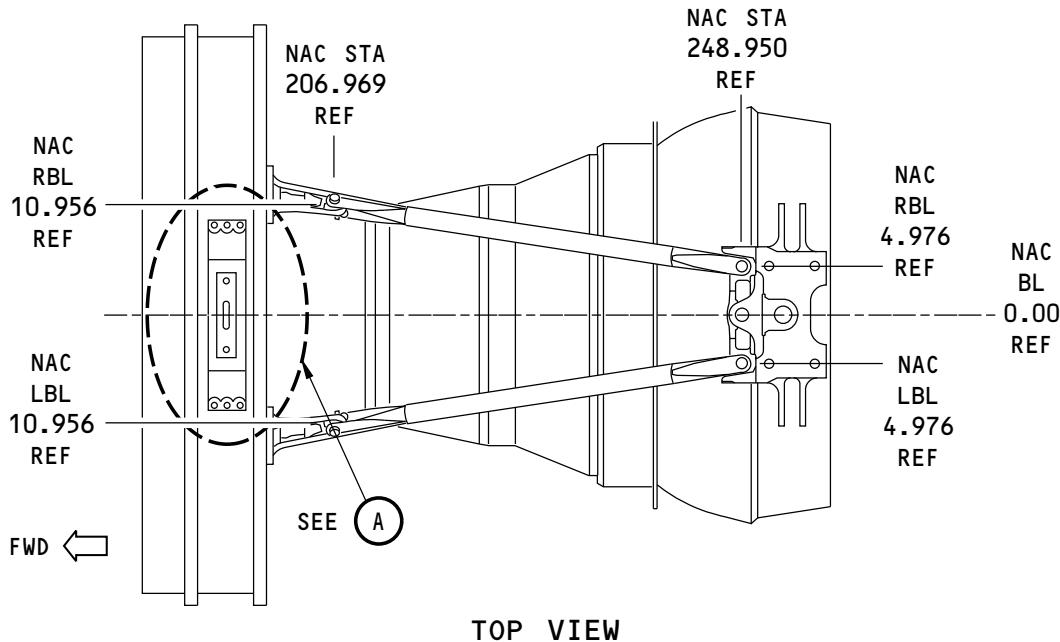
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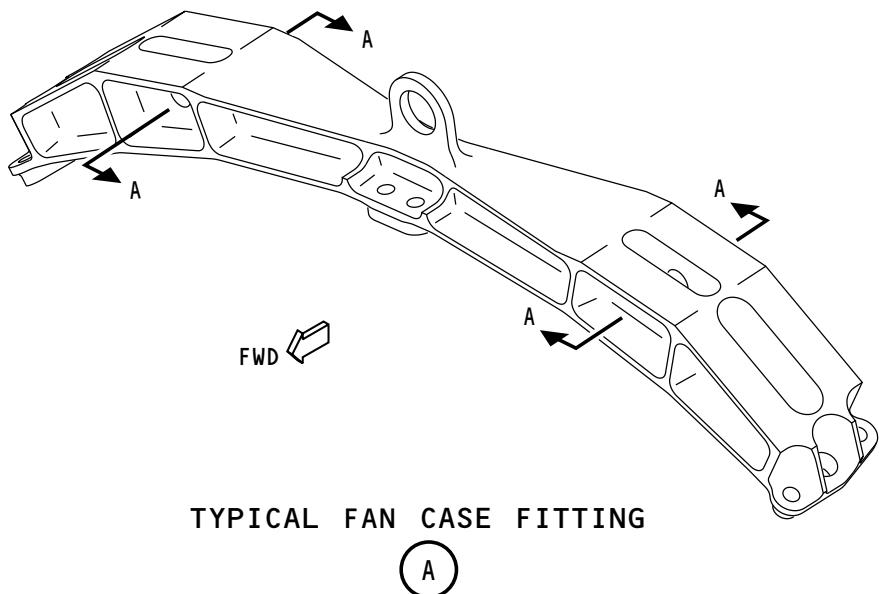
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737-800
STRUCTURAL REPAIR MANUAL



TOP VIEW



1986067 S0000384594_V1

Forward Engine Mount Fan Case Fitting at Link Attachment Holes
Figure 101 (Sheet 1 of 2)

54-70-90

ALLOWABLE DAMAGE 6

Page 104

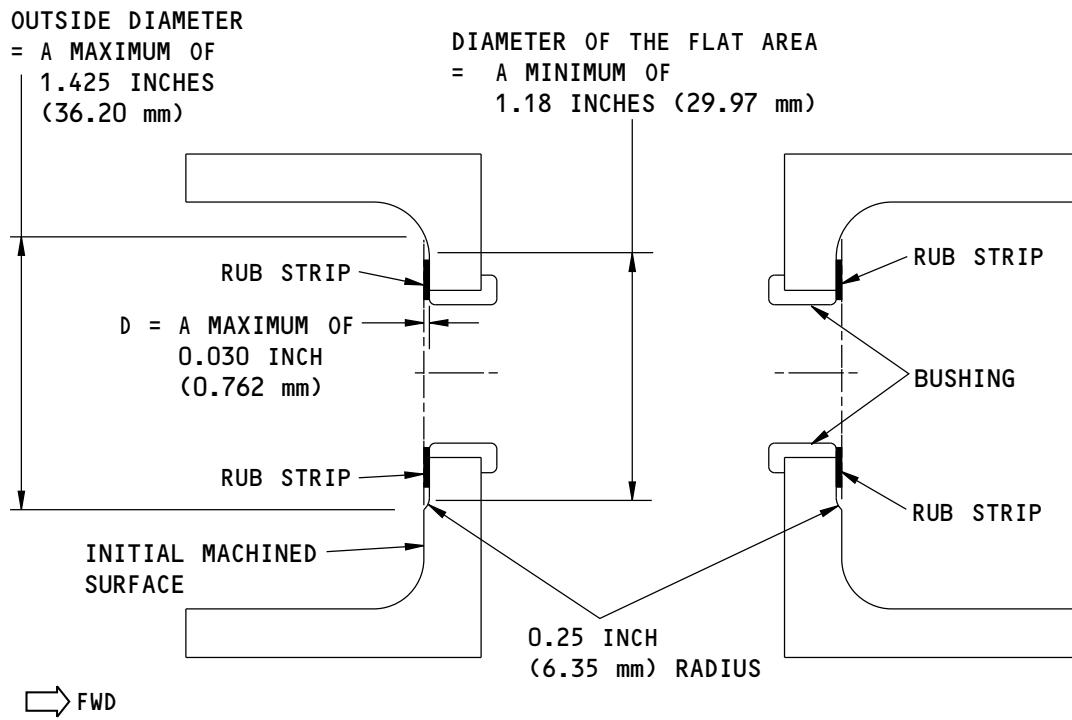
Nov 10/2012

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737-800
STRUCTURAL REPAIR MANUAL



D = DEPTH OF THE DAMAGE

A-A

1986205 S0000384595_V1

Forward Engine Mount Fan Case Fitting at Link Attachment Holes
Figure 101 (Sheet 2 of 2)

54-70-90

ALLOWABLE DAMAGE 6

Page 105

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 7 - FORWARD ENGINE MOUNT HANGER FITTING DAMAGE AT LINK ATTACHMENT HOLES

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2021-5/-7 forward engine mount hanger fitting at the link attachment holes shown in Figure 101/ALLOWABLE DAMAGE 7.
- B. The depth of the damage cannot be more than 0.030 in. (0.762 mm).

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 7 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 7 for the allowable damage limits.
- C. Remove the bushing, if necessary.
- D. Spotface the damaged surface of the fitting. Do the steps that follow.
 - (1) Use a 1.688 in. (42.88 mm) diameter cutter with 0.25 in. (6.35 mm) fillet radius.
 - (2) Spotface to a minimum depth to remove the damage.
 - (a) If you make the rub strip from a CRES sheet, then the spotface must have a minimum depth as shown in Table 101/ALLOWABLE DAMAGE 7.
 - (b) If you make the necessary rub strip from a standard washer, then the spotface must have a minimum depth as shown in Table 102/ALLOWABLE DAMAGE 7.

NOTE: Do not exceed the maximum spotface depth of 0.030 in. (0.762 mm). If the depth of the damage is greater than 0.030 in. (0.762 mm), contact The Boeing Company.

- (3) If you do not remove the initial bushing, you are permitted to machine the end of the bushing. Chamfer the bushing inner diameter to be 0.015 in. (0.381 mm) to 0.025 in. (0.635 mm) x 45°.
- (4) Make a surface roughness of 125 microinches Ra or smoother.
- E. Do a penetrant inspection of the reworked area. Refer to SOPM 20-20-02.
- F. Shot peen or flap peen the reworked area with an intensity between 0.008A and 0.011A, and 200% coverage. You can peen the reworked area manually to get the intensity and the coverage necessary. Refer to 51-20-06, GENERAL.
- G. Make a rub strip with one of the two alternatives that follow:
 - (1) Make a rub strip from a 301, 302 or 304 CRES, annealed sheet. Refer to Table 101/ALLOWABLE DAMAGE 7 for the necessary spotface depth and sheet thickness.
 - (a) Make the rub strip to have an outside diameter of 1.14 in. (28.96 mm) to 1.17 in. (29.72 mm) and an inside diameter of 0.760 in. (19.30 mm) to 0.790 in. (20.07 mm).
 - (b) Remove all sharp edges.
 - (c) Make the surface roughness 125 microinches Ra or smoother.
 - (d) Passivate the rub strip. Refer to SOPM 20-30-03.

NOTE: An alternative procedure to passivate the rub strip is to remove all contamination from the rub strip with abrasive pad and solvent wipes.

54-70-90

ALLOWABLE DAMAGE 7

Page 101

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

Table 101: Rub Strips Made From a CRES Sheet

DEPTH OF DAMAGE X (INCH)	SPOTFACE DEPTH (INCH)	THICKNESS OF 301/302/304 CRES, ANNEALED SHEET (INCH)
X ≤ 0.010	0.010	0.010
0.010 < X ≤ 0.016	X	0.010
0.016 < X ≤ 0.020	X	0.016
0.020 < X ≤ 0.025	X	0.020
0.025 < X ≤ 0.030	X	0.025

- (2) Make a rub strip from a standard washer. Refer to Table 102/ALLOWABLE DAMAGE 7 for the necessary spotface depth and standard washer types.
 - (a) Machine the outside diameter to be 1.14 in. (28.96 mm) to 1.17 in. (29.72 mm) and an inside diameter to be 0.760 in. (19.30 mm) to 0.790 in. (20.07 mm).
 - (b) Remove all sharp edges.
 - (c) Keep the surface roughness 125 microinches Ra or smoother.
 - (d) Remove all contamination from the rub strip with scotchkobrite and solvent wipes.

Table 102: Rub Strips Made From a Standard Washer

DEPTH OF DAMAGE X (INCH)	SPOTFACE DEPTH (INCH)	TYPES OF STANDARD WASHER
X ≤ 0.016	0.016	NAS1149C1016R or NAS1149C1216R
0.016 < X ≤ 0.030	0.030	NAS1149C1032R or NAS1149C1232R

- H. Install a new bushing, if you removed the initial bushing to spotface the hanger fitting. Refer to CMM 71-21-37.
 - (1) Make sure the bushing has a reduced shank length to accomodate the thinner fitting wall.
 - (2) Make sure the bottom end of the bushing is flush or no more than 0.010 in. (0.254 mm) below the machined surface of the hanger fitting.
- I. Install the rub strip on the spotface of the hanger fitting with BMS 5-45 sealant.
 - (1) Make sure the rub strip is aligned with the bushing hole.
 - (2) Make sure the rub strip is no more than 0.007 in. (0.178 mm) above the initial surface of the hanger fitting.

3. References

Reference	Title
51-20-06, GENERAL	Shot Peening
CMM 71-21-37	Component Maintenance Manual
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-30-03	General Cleaning Procedures

4. Allowable Damage Limits for the Forward Engine Mount Hanger Fitting at Link Attachment Holes

- A. Remove the damage from the forward engine mount hanger fitting at the link attachment holes as shown in Figure 101/ALLOWABLE DAMAGE 7.
 - (1) The maximum diameter of the hanger fitting spotface is 1.425 in. (36.20 mm).

54-70-90

ALLOWABLE DAMAGE 7

Page 102

Jul 10/2015



737-800
STRUCTURAL REPAIR MANUAL

- (2) The minimum diameter of the flat area of the hanger fitting spotface is 1.18 in. (29.97 mm).

54-70-90

ALLOWABLE DAMAGE 7

Page 103

Nov 10/2012

D634A210

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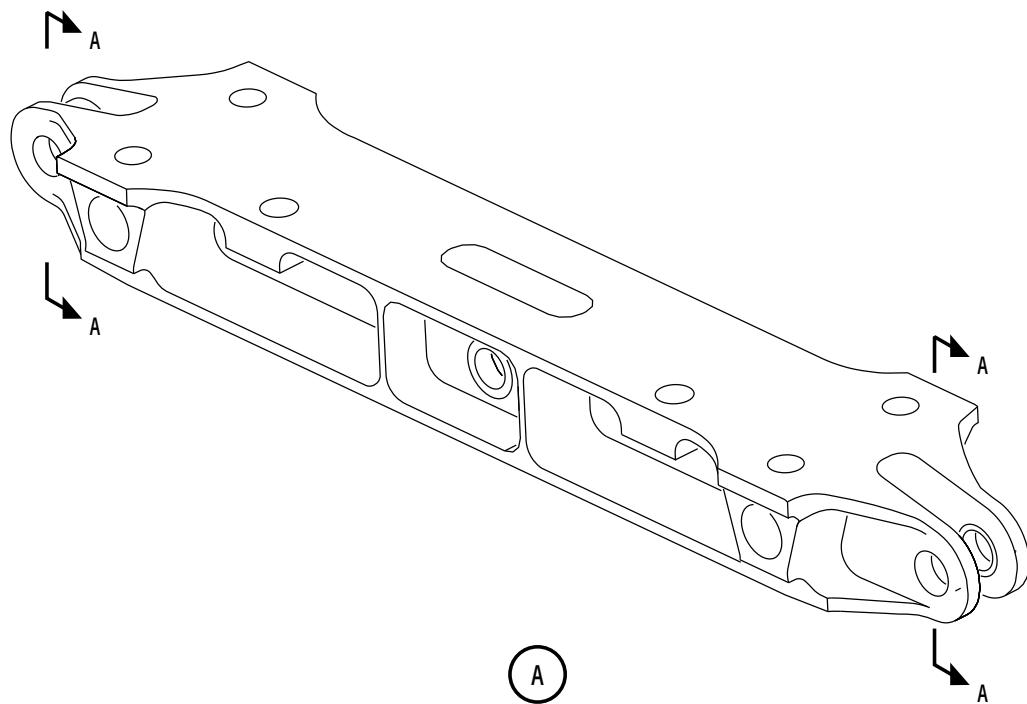
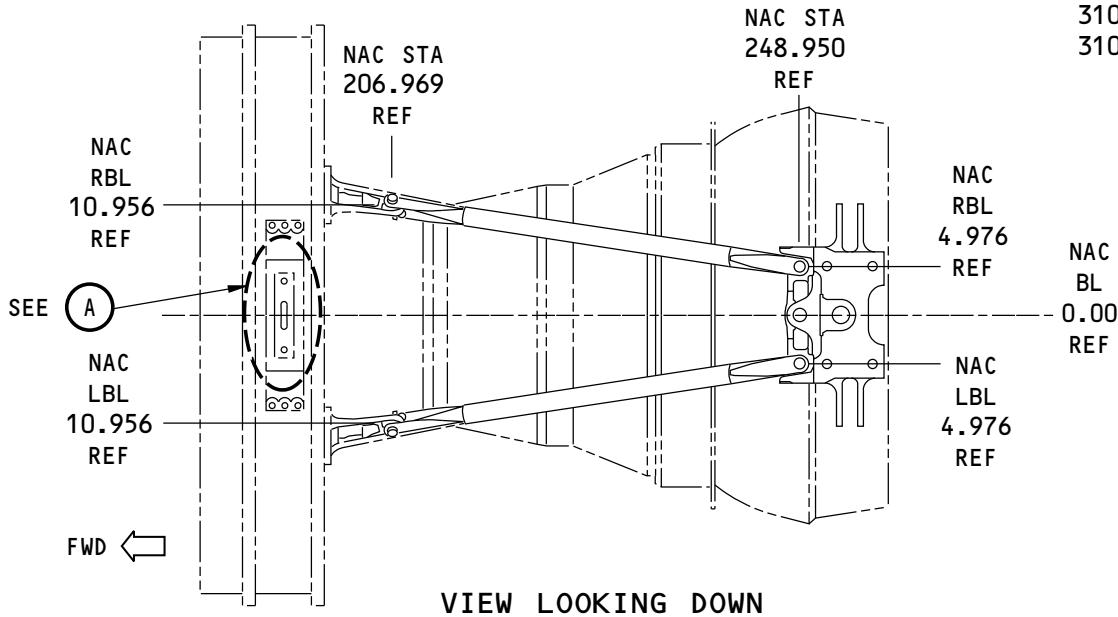


737-800
STRUCTURAL REPAIR MANUAL

REFERENCE DRAWINGS

310A2021

310A2040



1994252 S0000387049_V1

Forward Engine Mount Hanger Fitting at Link Attachment Holes
Figure 101 (Sheet 1 of 2)

54-70-90

ALLOWABLE DAMAGE 7

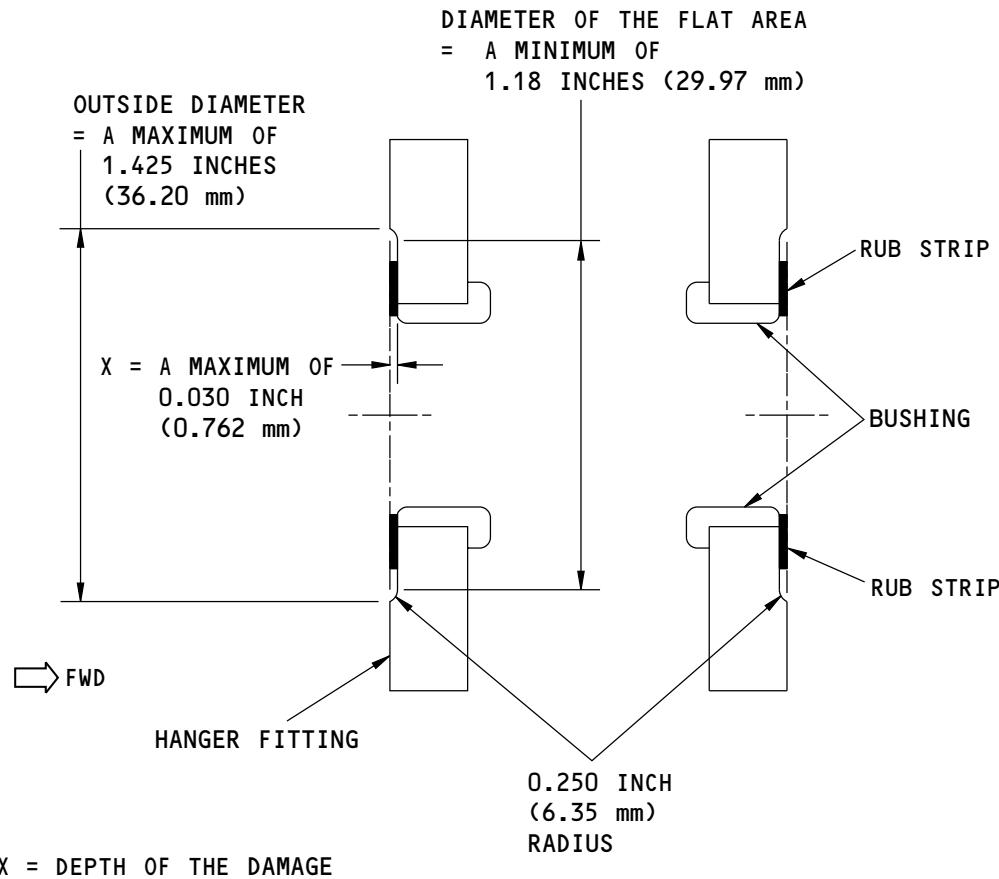
Page 104

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



A-A

1994274 S0000388167_V1

Forward Engine Mount Hanger Fitting at Link Attachment Holes
Figure 101 (Sheet 2 of 2)

54-70-90

ALLOWABLE DAMAGE 7

Page 105

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 8 - FORWARD ENGINE MOUNT LINK DAMAGE

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2022-4 forward engine mount link shown in Figure 101/ALLOWABLE DAMAGE 8.
- B. This procedure applies to all of the surfaces on the 310A2022-4 forward engine mount link except for the lug holes.

NOTE: If there is damage on the lug holes, then you must repair the lug holes. Refer to CMM 71-21-37, Repair 3-2.

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 8 for the allowable damage location.
- B. Refer to Paragraph 4./ALLOWABLE DAMAGE 8 for the allowable damage limits.
- C. Remove the damaged material.
 - (1) Mask the bearings.
 - (2) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 and SOPM 20-10-07 for the inspection and removal of damage.
 - (3) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (4) Keep a surface roughness of 125 microinches Ra or smoother.
- D. Do a penetrant inspection of the reworked areas. Refer to SOPM 20-20-02.
- E. Shot peen or flap peen the reworked areas with an intensity between 0.014A and 0.019A, and 200% coverage. You can peen the blend area manually to get the intensity and the coverage necessary. Refer to SHOT PEENING, 51-20-06.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-06	SHOT PEENING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Forward Engine Mount Link

- A. Remove the damage as shown in Figure 101/ALLOWABLE DAMAGE 8.
 - (1) Zone 1 – Forward and aft sides.
 - (a) The chamfer width cannot be more than 0.25 in. (6.4 mm).
 - (b) The chamfer depth cannot be more than 0.03 in. (0.8 mm).
 - (2) Zone 2 - All surfaces except for cross-hatched areas and lug holes.
 - (a) Remove the damage with a 10:1 blend ratio.
 - (b) The blendout depth cannot be more than 0.01 in. (0.25 mm).
 - (3) Zone 3 - Lug holes. Refer to CMM 71-21-37, Repair 3-2 for the repair of the lug holes.

54-70-90

ALLOWABLE DAMAGE 8

Page 101

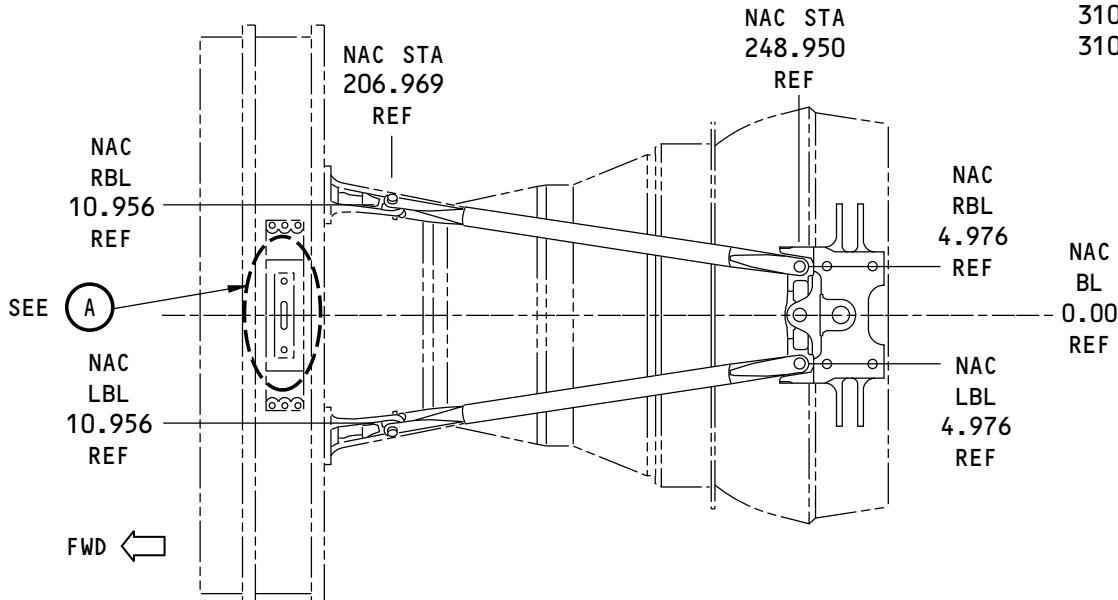
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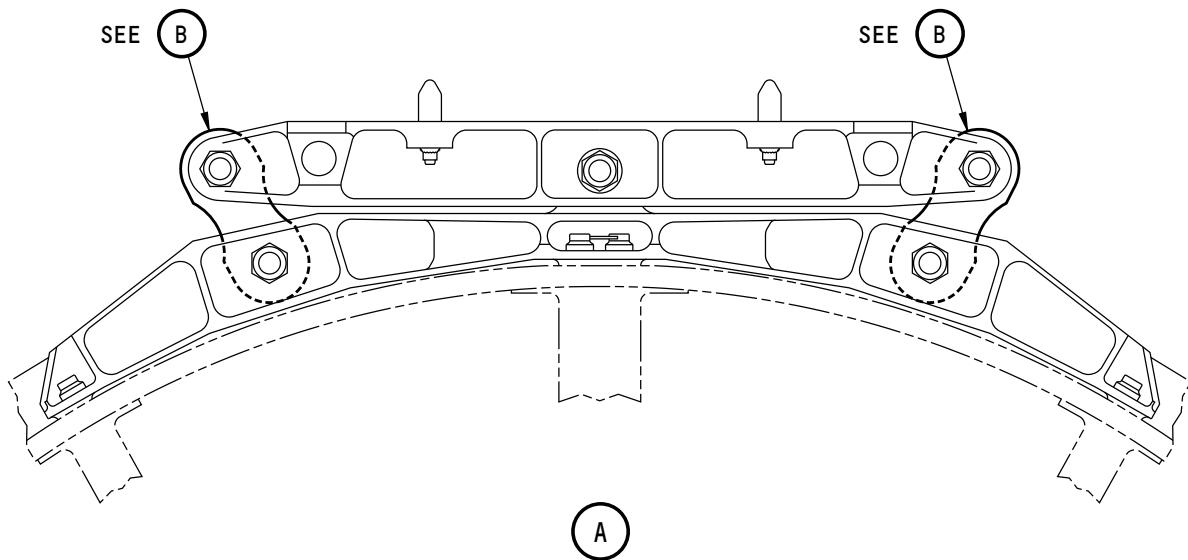
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737-800
STRUCTURAL REPAIR MANUAL

REFERENCE DRAWINGS

310A2020
310A2040

(VIEW IN THE DOWN DIRECTION)



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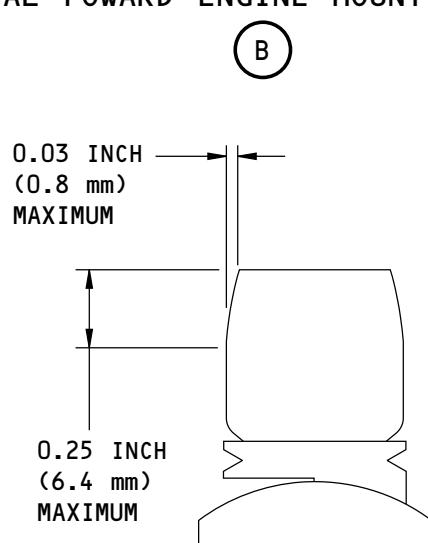
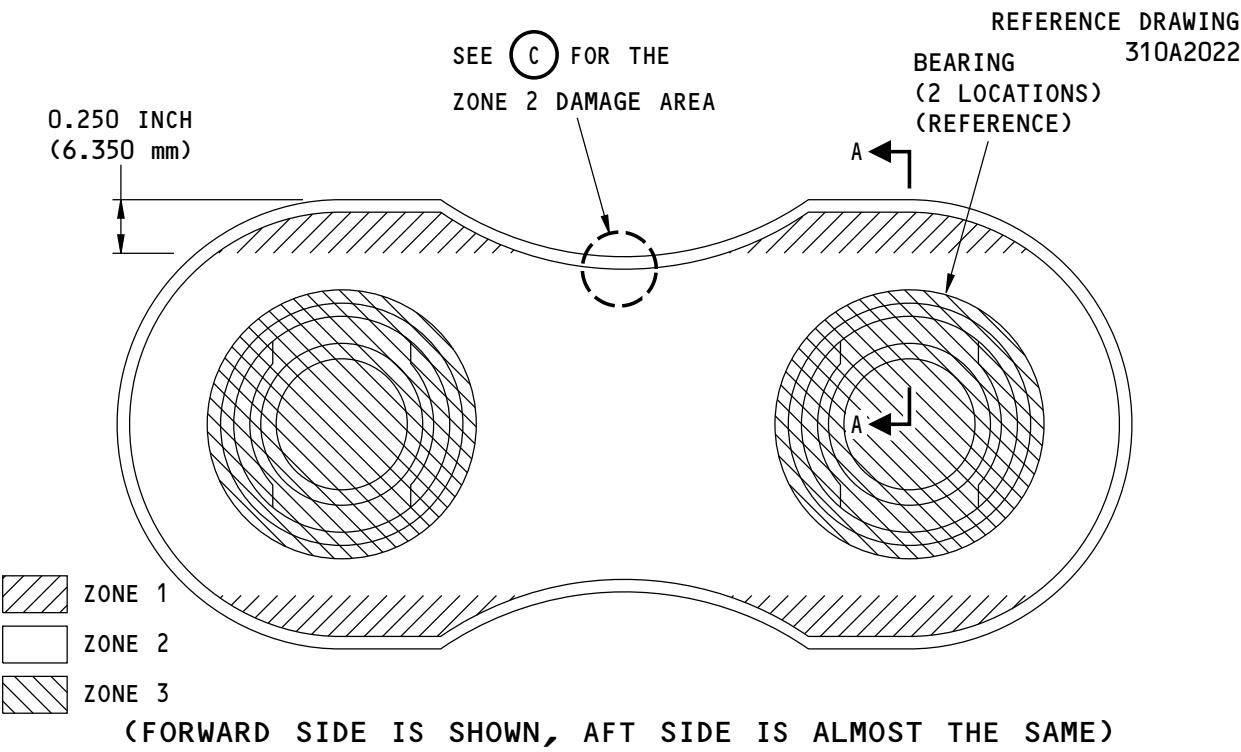
Forward Engine Mount Link
Figure 101 (Sheet 1 of 3)

54-70-90**ALLOWABLE DAMAGE 8**

Page 102

Nov 10/2012

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**


(2 LOCATIONS)
A-A

2020175 S0000400754_V1

Forward Engine Mount Link
Figure 101 (Sheet 2 of 3)

54-70-90

ALLOWABLE DAMAGE 8

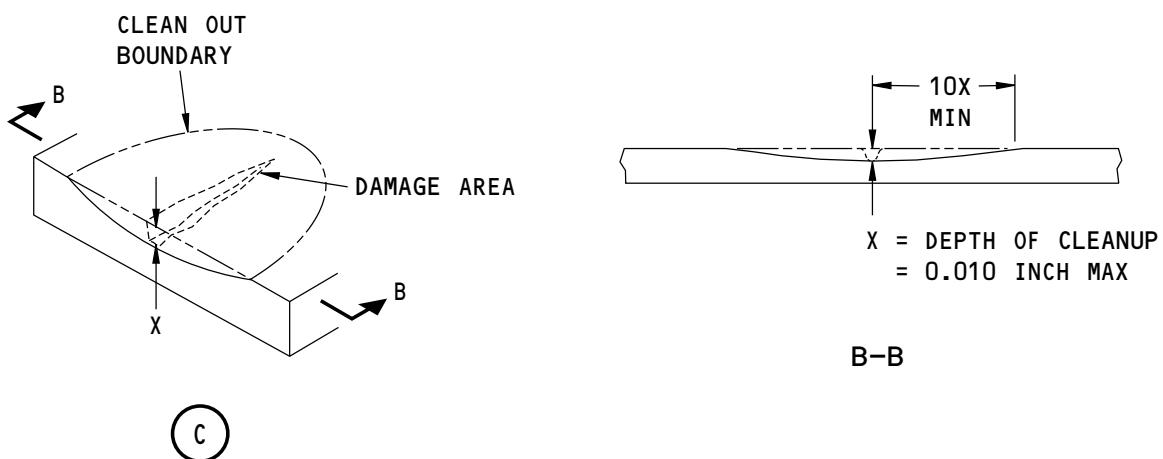
Page 103

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL



2020173 S0000400756_V1

Forward Engine Mount Link
Figure 101 (Sheet 3 of 3)

54-70-90

ALLOWABLE DAMAGE 8

Page 104

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 9 - AFT ENGINE MOUNT RIGHT LINK DAMAGE

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2035-6/-9 aft engine mount right link shown in Figure 101/ALLOWABLE DAMAGE 9.

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 9 for the allowable damage location.
B. Refer to Table 101/ALLOWABLE DAMAGE 9 for the paragraphs references for the allowable damage limits.

Table 101:

PARAGRAPH REFERENCES FOR THE ALLOWABLE DAMAGE LIMITS	
TYPE OF STRUCTURE	PARAGRAPH
FLAT SIDES OF THE PEG OF THE AFT ENGINE MOUNT RIGHT LINK	4.A
LINK POCKET OF THE AFT ENGINE MOUNT RIGHT LINK	4.B
BEARING BORE OF THE AFT ENGINE MOUNT RIGHT LINK - OVERSIZE BEARING METHOD	4.C
BEARING BORE OF THE AFT ENGINE MOUNT RIGHT LINK - SWAGED SLEEVE BUSHING METHOD	4.C
BEARING BORE OF THE AFT ENGINE MOUNT RIGHT LINK - SPLIT SLEEVE BUSHING METHOD	4.C
ALL OTHER SURFACES OF THE AFT ENGINE MOUNT RIGHT LINK, EXCEPT LINK POCKET	4.D

- C. Do the steps that follow to remove wear damage from the flat sides of the peg:

- (1) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 and SOPM 20-10-01 for the inspection and removal of damage.
- (2) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
- (3) Keep a surface roughness of 125 microinches Ra or smoother unless specified.
- (4) Do a penetrant inspection of the reworked areas. Refer to SOPM 20-20-02.

NOTE: The high frequency eddy current (HFEC) inspection procedure is a permitted alternative to the penetrant inspection. Refer to 737 NDT Part 6, 51-00-00.

- D. Do one of the methods that follow to remove wear damage in bearing bore:

- (1) Oversize Bearing Method

Table 102: Bore Diameters and Equivalent Oversized Bearings

S302T001-821 Nominal Bearing		S302T001-701 Nominal Bearing	
Bore Diameter (in.)	Oversize Bearing Part Number	Bore Diameter (in.)	Oversize Bearing Part Number
2.3658 - 2.3663	S302T001-821P05	2.3658 - 2.3663	S302T001-701P05
2.3708 - 2.3713	S302T001-821P10	2.3708 - 2.3713	S302T001-701P10
2.3808 - 2.3813	S302T001-821P20	2.3808 - 2.3813	S302T001-701P20
2.3908 - 2.3913	S302T001-821P30	2.3908 - 2.3913	S302T001-701P30
2.4208 - 2.4213	S302T001-821P60	2.4208 - 2.4213	S302T001-701P60

54-70-90

ALLOWABLE DAMAGE 9

Page 101

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

- (a) Remove all damage and oversize bore diameter as given in Table 102/ALLOWABLE DAMAGE 9.
- (b) Chamfer edges of the bore on both sides. Refer to CMM 71-21-37 Repair 11-4 and 11-6, Figure 601.
- (c) Break all sharp edges with a minimum radius of 0.003 in. (0.076 mm) and a maximum radius 0.015 in. (0.381 mm). Refer to BAC 5300, Section 11.2.3.
- (d) Install appropriate oversize bearing as given in Table 102/ALLOWABLE DAMAGE 9 and CMM 71-21-37.
- (e) Roller swage as given in SOPM 20-50-03.

NOTE: If necessary, install bearing by shrink fit method using BMS 3-24 grease.

(2) Swaged Sleeve Bushing Method

- (a) Remove all damage and oversize bore diameter to 2.4608 in. (62.5043 mm) to 2.4613 in. (62.5170 mm). Refer to Figure 101/ALLOWABLE DAMAGE 9.
- (b) Chamfer edges of bore on both sides as given in CMM 71-21-37 Repair 11-4 and Repair 11-6, Figure 601 for:
 - 1) Aft engine mount right link 310A2035-6 to 0.045 in. (1.143 mm) to 0.055 in. (1.397 mm) x 45°, and
 - 2) Aft engine mount right link 310A2035-9 to 43° to 47°. Make sure to keep bushing bore width of 0.985 in. (25.019 mm) to 1.015 in. (25.781 mm).
- (c) Make sleeve bushing.
 - 1) 718 nickel alloy sleeve bushing. Heat treat as given in BAC 5616, Condition II. Refer to Figure 101/ALLOWABLE DAMAGE 9.
 - 2) Keep a surface roughness of 63 microinches Ra or smoother.
- (d) Use shrink fit method to install sleeve bushing into the link bore as given in SOPM 20-50-03.
- (e) Swage sleeve bushing as given in SOPM 20-50-03.
- (f) Ream the inside diameter of the sleeve bushings to 2.3608 in. (59.9643 mm) to 2.3613 in. (59.9770 mm).
- (g) Keep a surface roughness of 63 microinches Ra or smoother.
- (h) Make sure the requirements in the swaged area of the sleeve bushing are as given in Paragraph 2.D.(2)(b)/ALLOWABLE DAMAGE 9.

NOTE: If necessary, restore hole chamfer.

- (i) Install bearing S302T001-821/-701 as given in CMM 71-21-37.
- (j) Install bearing by shrink fit method using BMS 3-24 grease.
- (k) Roller swage bearing as given in SOPM 20-50-03.

(3) Split Sleeve Bushing Method

- (a) Remove all damage and oversize bore diameter to 2.4608 in. (62.5043 mm) to 2.4613 in. (62.5170 mm). Refer to Figure 101/ALLOWABLE DAMAGE 9.
- (b) Chamfer edges of bore on both sides as given in CMM 71-21-37 Repair 11-4 and Repair 11-6, Figure 601 for:
 - 1) Aft engine mount right link 310A2035-6 to 0.045 in. (1.143 mm) to 0.055 in. (1.397 mm) x 45°, and
 - 2) Aft engine mount right link 310A2035-9 to 43° to 47°. Make sure to keep bushing bore width of 0.985 in. (25.019 mm) to 1.015 in. (25.781 mm).

54-70-90

ALLOWABLE DAMAGE 9

Page 102

Nov 10/2012

D634A210

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737-800 STRUCTURAL REPAIR MANUAL

- (c) Make two sleeve bushings.
 - 1) 718 nickel alloy sleeve bushing. Heat treat as given in BAC 5616, Condition II. Refer to Figure 101/ALLOWABLE DAMAGE 9.
 - 2) Keep a surface roughness of 63 microinches Ra or smoother.
- (d) Make sure the lip of bushing matches the chamfer of the link bore.
- (e) The width of each repair bushing sleeve plus a gap of 0.010 in. (0.254 mm) to 0.020 in. (0.508 mm) are as follows:
 - 1) Aft engine mount right link 310A2035-6 is 1.095 in. (27.813 mm) to 1.105 in. (28.067 mm), and
 - 2) Aft engine mount right link 310A2035-9 is 1.100 in. (27.940 mm) to 1.180 in. (29.972 mm).
- (f) Install sleeve bushings from each side of the link bore using the shrink fit method. Refer to SOPM 20-50-03 and Figure 101/ALLOWABLE DAMAGE 9.
NOTE: Make sure bushings are properly seated and a gap of 0.010 in. (0.254 mm) to 0.020 in. (0.508 mm) are between both bushings.
- (g) Ream the inside diameter of the sleeve bushings to 2.3608 in. (59.9643 mm) to 2.3613 in. (59.9770 mm).
- (h) Keep a surface roughness of 63 microinches Ra or smoother.
- (i) Make sure machined edges of the sleeve bushings match the bore chamfer in Paragraph 2.D.(3)(b)/ALLOWABLE DAMAGE 9.
- (j) Break all sharp edges with a minimum radius of 0.003 in. (0.076 mm) and a maximum radius 0.015 in. (0.381 mm). Refer to BAC 5300, Section 11.2.3.
- (k) Install bearing S302T001-821/-701 as given in CMM 71-21-37.
- (l) Install bearing by shrink fit method using BMS 3-24 grease.
- (m) Roller swage bearing as given in SOPM 20-50-03.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
BAC 5300, Section 11.2.3	Broken Edges
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-01	Repair and Refinish of High Strength Steel Parts
SOPM 20-20-02	Penetrant Methods of Inspection
SOPM 20-50-03	Bearing and Bushing Replacement
737 NDT Part 6, 51-00-00	Structures - General

4. Allowable Damage Limits for the Aft Engine Mount Right Link

- A. Flat sides of the peg of the aft engine mount right link.
 - (1) Remove the damage with a 20:1 blend ratio. The depth of the reworked area must be less than or equal to 0.02 in. (0.51 mm) on each flat side of the peg.
- B. Link pocket of the aft engine mount right link.
 - (1) Damage is not permitted in link pocket of the aft engine mount right link. Refer to Figure 101/ALLOWABLE DAMAGE 9.

54-70-90

ALLOWABLE DAMAGE 9

Page 103

Jul 10/2014

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

C. Bearing bore of the aft engine mount right link, do one of the following for the removal of damage:

(1) Oversize Bearing Method

(a) Refer to Table 102/ALLOWABLE DAMAGE 9 for maximum oversize limit of bore diameter.

(2) Swaged Sleeve Bushing Method

(a) Maximum bore diameter is 2.4608 in. (62.5043 mm) to 2.4613 in. (62.5170 mm). Refer to Figure 101/ALLOWABLE DAMAGE 9.

(3) Split Sleeve Bushing Method

(a) Maximum bore diameter is 2.4608 in. (62.5043 mm) to 2.4613 in. (62.5170 mm). Refer to Figure 101/ALLOWABLE DAMAGE 9.

D. All other surfaces of the aft engine mount right link, except link pocket.

(1) Remove the damage with a 20:1 blend ratio. The depth of the reworked area must be less than or equal to 0.01 in. (0.25 mm).

54-70-90

ALLOWABLE DAMAGE 9

Page 104

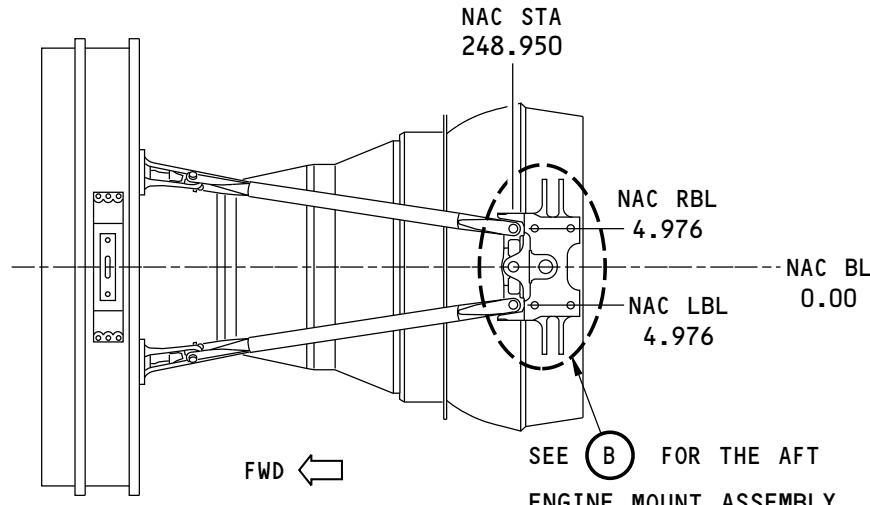
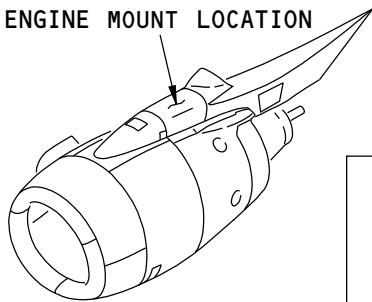
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**737-800
STRUCTURAL REPAIR MANUAL**

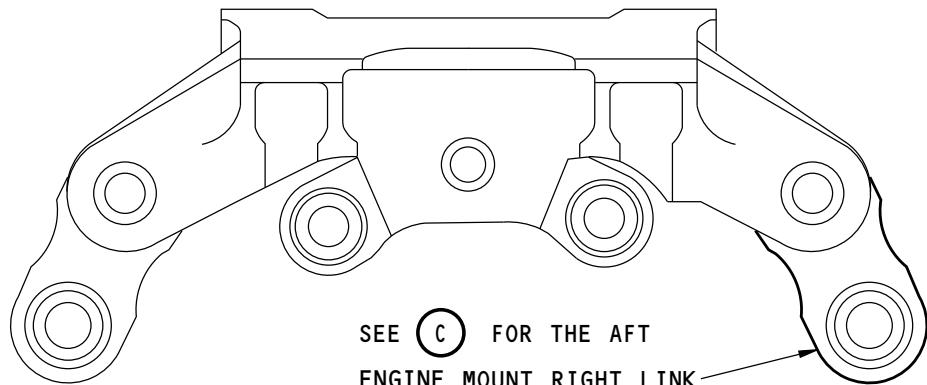
SEE **A** FOR THE AFT
ENGINE MOUNT LOCATION



(VIEW IN THE DOWN DIRECTION)

AFT ENGINE MOUNT LOCATION

A



(VIEW IN THE FORWARD DIRECTION)

AFT ENGINE MOUNT ASSEMBLY

B

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Aft Engine Mount Right Link
Figure 101 (Sheet 1 of 4)

54-70-90

ALLOWABLE DAMAGE 9

Page 105

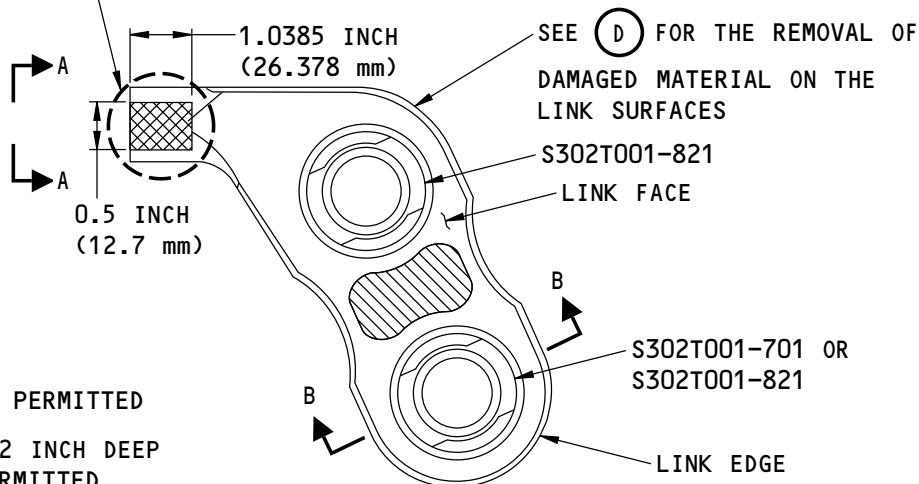
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737-800
STRUCTURAL REPAIR MANUAL

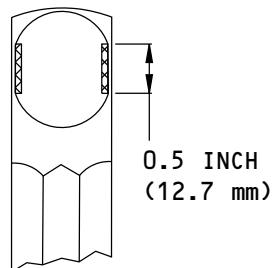
SEE (D) FOR THE REMOVAL OF
DAMAGED MATERIAL ON THE
FLAT SIDE OF THE PEG



(VIEW IN THE FORWARD DIRECTION)

AFT ENGINE MOUNT RIGHT LINK

(C)



FLAT SIDES OF THE AFT
ENGINE MOUNT RIGHT LINK PEG

A-A

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Aft Engine Mount Right Link
Figure 101 (Sheet 2 of 4)

54-70-90

ALLOWABLE DAMAGE 9

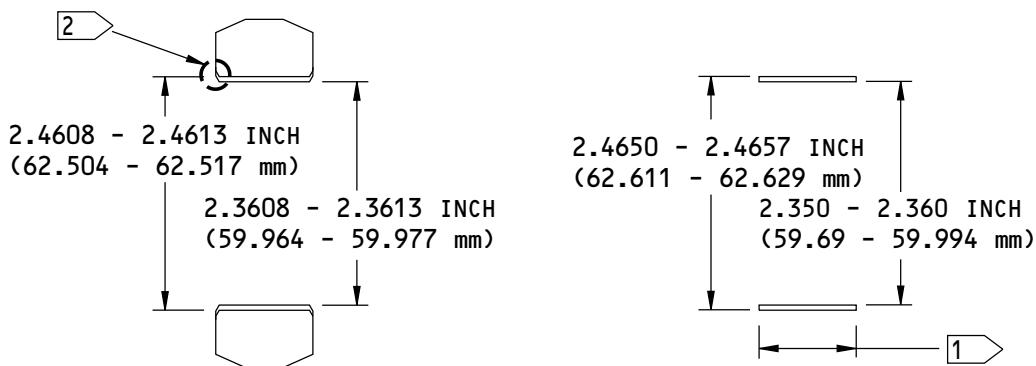
Page 106

Nov 10/2012

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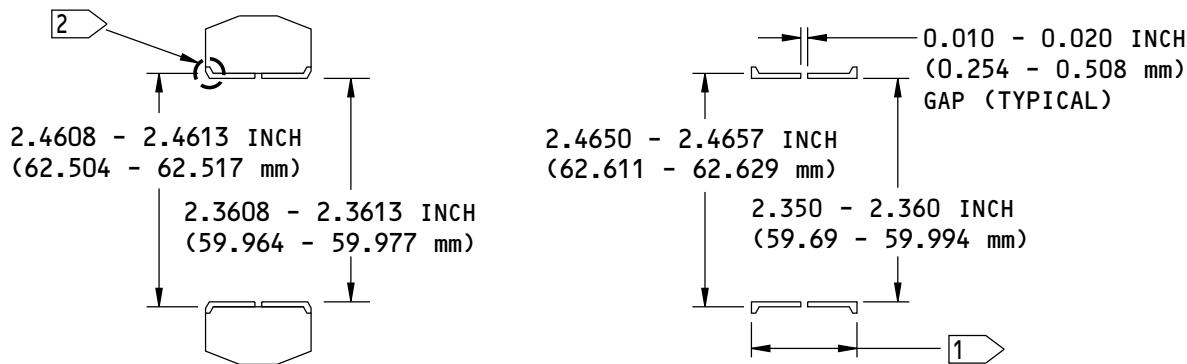


737-800
STRUCTURAL REPAIR MANUAL



SWAGE SLEEVE BUSHING METHOD

B-B



SPLIT SLEEVE BUSHING METHOD

B-B

NOTES

- [1] DIMENSION FOR -6 LINK IS 1.0950 - 1.1050 INCH (27.813 - 28.067 mm)
DIMENSION FOR -9 LINK IS 1.1000 - 1.1800 INCH (27.940 - 29.972 mm)
- [2] CHAMFER EDGES OF LINK BORE ON BOTH SIDES AS FOLLOWS:
-6 LINK 0.045 INCH (1.143 mm) TO 0.055 INCH (1.397 mm) X 45 DEGREES
-9 LINK 43 TO 47 DEGREES. MAKE SURE TO KEEP A BORE WIDTH OF 0.9850 INCH (25.019 mm) TO 1.0150 INCH (25.781 mm).

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Aft Engine Mount Right Link
Figure 101 (Sheet 3 of 4)

54-70-90

ALLOWABLE DAMAGE 9

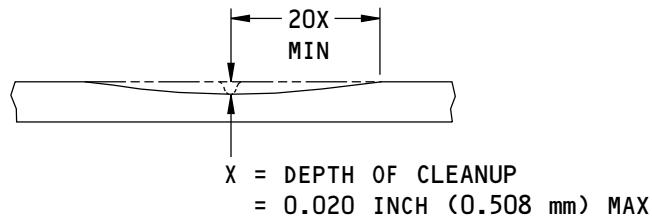
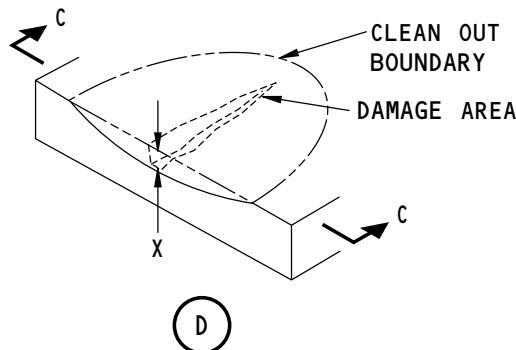
Page 107

Nov 10/2012

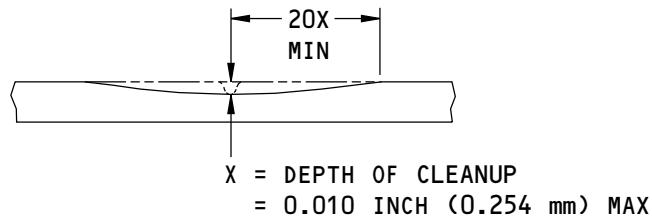
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737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL ON A FLAT SIDE OF THE PEG
C-C



REMOVAL OF DAMAGED MATERIAL ON THE LINK SURFACE
C-C

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Aft Engine Mount Right Link
Figure 101 (Sheet 4 of 4)

54-70-90

ALLOWABLE DAMAGE 9

Page 108

Nov 10/2012

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 10 - AFT ENGINE MOUNT LEFT LINK DAMAGE

1. Applicability

- A. This procedure gives the allowable damage limits for the 310A2033-4/-6/-9 aft engine mount left link as shown in Figure 101/ALLOWABLE DAMAGE 10

2. General

- A. Refer to Figure 101 (Sheet 1) for the allowable damage locations.
- B. Refer to Table 101/ALLOWABLE DAMAGE 10 and Figure 101 (Sheet 2) for the allowable damage limits.

Table 101: Paragraph References of the Allowable Damage Limits

Item *[1]	Location Description	Paragraph *[2]
[1]	Link Face	4.A
[2]	Link Edge	4.B
[3]	Link Pocket	4.C
[4]	Link Bore	4.D

*[1] See Figure 101 (Sheet 1)

*[2] See Paragraph 4./ALLOWABLE DAMAGE 10.

- C. Remove all damaged material.
- (1) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 and SOPM 20-10-01 for the inspection and removal of damage.
- (2) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
- (3) Keep a surface roughness of 125 microinches RA.
- D. Do a penetrant inspection of the blend area. Refer to SOPM 20-20-02.

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
SOPM 20-10-01	Repair and Refinish of High Strength Steel Parts
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits for the Aft Engine Mount Left Link

- A. Face of the aft engine mount left link.
- (1) Remove the damage with a 10:1 blend ratio.
- (2) The maximum depth of the blended area must be less than or equal to 0.02 in. (0.51 mm).
- (3) The minimum thickness of the link between the two faces is 1.08 in. (27.4 mm).
- B. Edge of the aft engine mount left link.
- (1) Remove the damage with a 20:1 blend ratio.
- (2) The maximum depth of the blended area must be less than or equal to 0.01 in. (0.25 mm).
- C. Pocket of the aft engine mount left link.

54-70-90

ALLOWABLE DAMAGE 10

Page 101

Jul 10/2014

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**

- (1) Damage to the pocket is not permitted.
- D. Bore of the aft engine mount left link.
 - (1) Damage to the bore is not permitted.

54-70-90

ALLOWABLE DAMAGE 10

Page 102

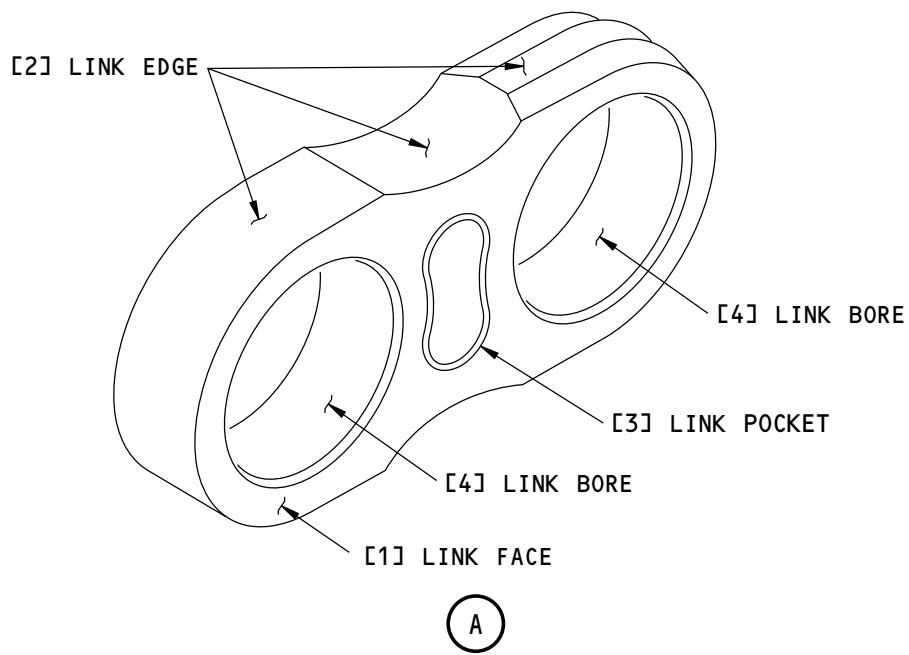
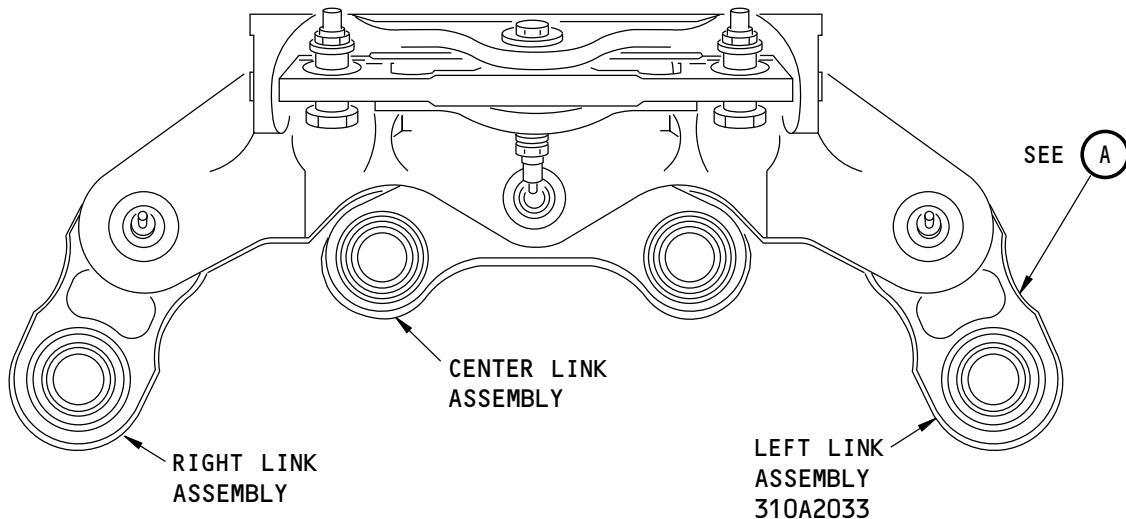
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737-800
STRUCTURAL REPAIR MANUAL



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Aft Engine Mount Left Link Allowable Damage Limits
Figure 101 (Sheet 1 of 2)

54-70-90

ALLOWABLE DAMAGE 10

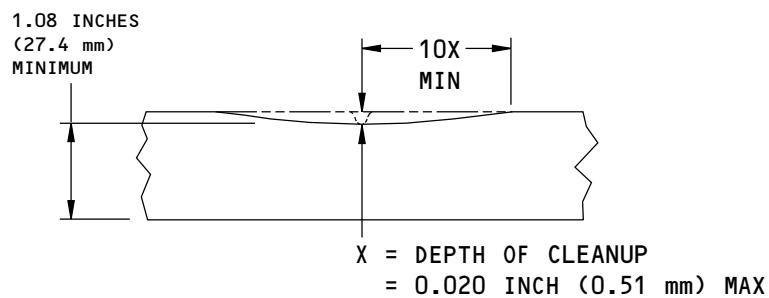
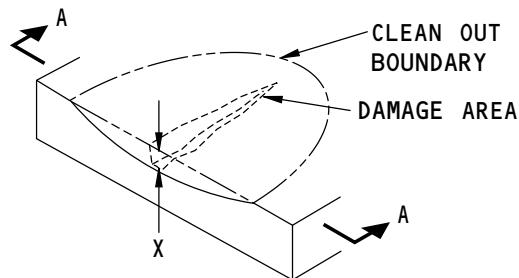
Page 103

Nov 10/2012

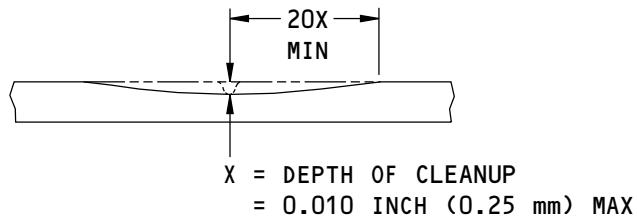
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737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF DAMAGED MATERIAL ON THE LINK FACE
A-A



REMOVAL OF DAMAGED MATERIAL ON THE LINK EDGE
A-A

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Aft Engine Mount Left Link Allowable Damage Limits
Figure 101 (Sheet 2 of 2)

54-70-90

ALLOWABLE DAMAGE 10

Page 104

Nov 10/2012

D634A210



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 11 - FORWARD FAN CASE CATCHER LUG - CFM56-7 ENGINE

1. Applicability

- A. This procedure gives the allowable damage limits for the CFM56-7 engine Fan Case Fitting, part number 310A2028-12, -14 and -16 as shown in Figure 101/ALLOWABLE DAMAGE 11.

NOTE: The Material is Titanium Ti-6AL-4V.

- B. This procedure only applies to the Catcher Lug surface and is not applicable to the lug hole or the edge surface of the lug.

NOTE: If there is damage to the lug holes, then you must repair the lug holes as given in CMM 71-21-37, Repair 4-1 and Repair 4-2.

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 11 for the allowable damage location.
- B. Refer to Paragraph 4.B./ALLOWABLE DAMAGE 11 and Paragraph 4.C./ALLOWABLE DAMAGE 11 for the allowable damage limits.
- C. Remove the damaged material.
- (1) Mask the lug holes and lug hole faces.
 - (2) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 and SOPM 20-10-07 for the inspection and removal of damage.
 - (3) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (4) Keep a surface roughness of 125 microinches R_a or smoother.
- D. Do a penetrant inspection of the reworked areas. Refer to SOPM 20-20-02.
- E. Shot peen or flap peen the reworked areas with an intensity between 0.006A and 0.011A. When you shot peen, use 200% coverage. You can peen the blend area manually to get the necessary intensity and coverage. Refer to SHOT PEENING, 51-20-06.
- F. Measure the related dimensions at the reworked areas to make sure the dimensions agree with the allowable damage limits.

54-70-90

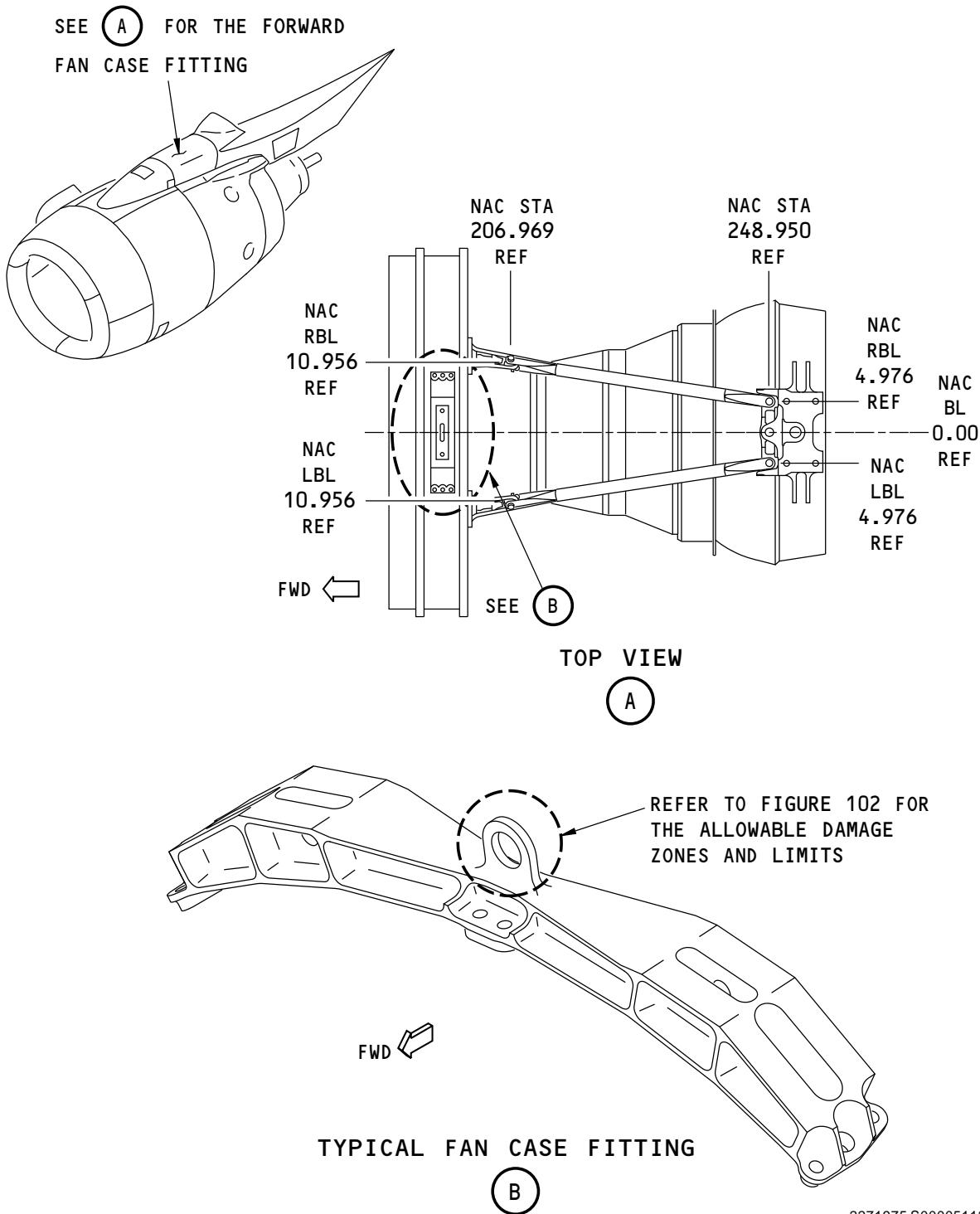
ALLOWABLE DAMAGE 11

Page 101

Nov 10/2013

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**


**Forward Fan Case Catcher Lug Location
Figure 101**

54-70-90

ALLOWABLE DAMAGE 11

Page 102

Nov 10/2013

D634A210



737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-06	SHOT PEENING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-07	Machining of Titanium
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits

- A. Refer to Table 101/ALLOWABLE DAMAGE 11 and Paragraph 4.B./ALLOWABLE DAMAGE 11 and Paragraph 4.C./ALLOWABLE DAMAGE 11 for the allowable damage limits.

Table 101: Allowable Damage Limits

DESCRIPTION	CRACKS	NICKS, GOUGES, SCRATCHES AND CORROSION	DENTS	HOLES AND PUNCTURES
Catcher Lug	Not Permitted	Refer to Figure 102/ALLOWABLE DAMAGE 11.	Not Permitted	Not Permitted
Catcher Bore	Not Permitted	Refer to CMM 71-21-37, Repair 4-1 and Repair 4-2.	Not Permitted	Not Permitted

B. Catcher Lug Damage

- (1) For damage at the edge, remove damage with a 20:1 blend ratio as shown in Figure 102/ALLOWABLE DAMAGE 11, Section A-A.
- (2) For damage on the surface, remove the damage as shown in Figure 102/ALLOWABLE DAMAGE 11, Section B-B.

C. Catcher Bore Damage

- (1) Refer to CMM 71-21-37, Repair 4-1 and Repair 4-2.

54-70-90

ALLOWABLE DAMAGE 11

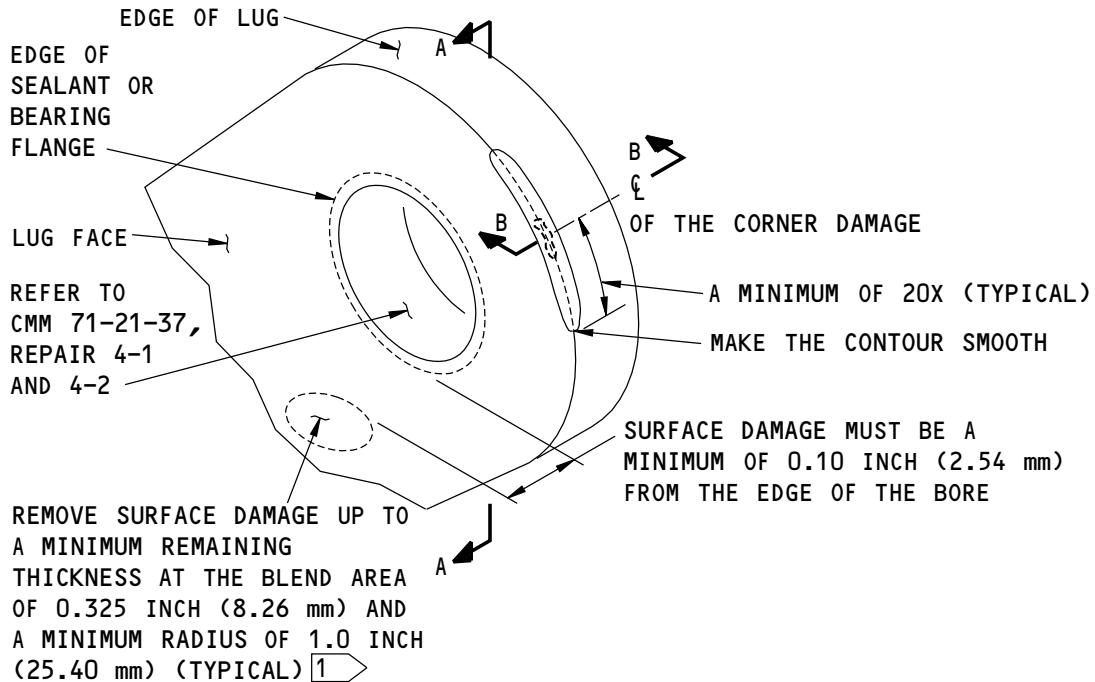
Page 103

Jul 10/2014

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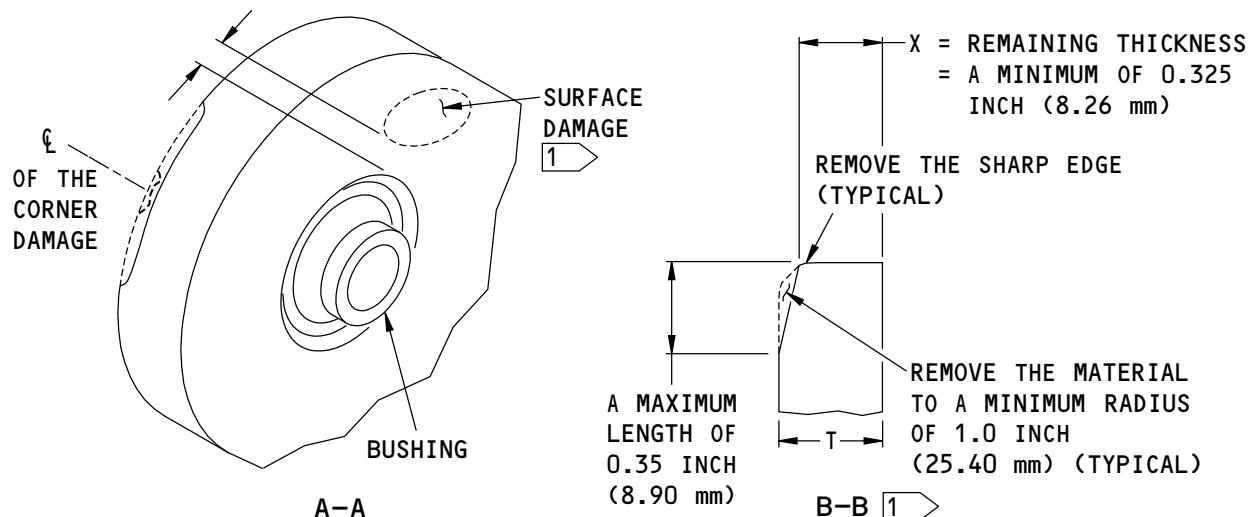
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**737-800
STRUCTURAL REPAIR MANUAL**



REMOVAL OF SURFACE AND EDGE DAMAGE

SURFACE DAMAGE MUST BE A
MINIMUM OF 0.10 INCH (2.54 mm)
FROM THE EDGE OF THE BORE



NOTES

- [1] THESE ALLOWABLE DAMAGE LIMITS ARE APPLICABLE ONLY
IF THERE IS NO DAMAGE IN THE BORE OF THE LUG.

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**Allowable Damage Zones and Limits
Figure 102**

54-70-90

ALLOWABLE DAMAGE 11

Page 104

Nov 10/2013



737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 12 - AFT ENGINE MOUNT CENTER LINK - CFM56-7 ENGINE

1. Applicability

- A. This procedure gives the allowable damage limits for the aft engine mount Center Link, part number 310A2034 -9, -11, -12, and -15 as shown in Figure 101/ALLOWABLE DAMAGE 12.

NOTE: The Material is Nickel Alloy 718.

- B. This procedure applies only to the areas shown in Figure 102/ALLOWABLE DAMAGE 12 for the 310A2034 -9, -11, -12, and -15 aft engine mount Center Link.

NOTE: If there is damage to the lug holes, then you must repair the lug holes as given in CMM 71-21-37, Assembly 10-3 and Repair 10-4.

NOTE: If there is damage to the lugs and surface around the bearing bores, then contact the Boeing Company.

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 12 for the Center Link location. Refer to Figure 102/ALLOWABLE DAMAGE 12 for the zones and allowable damage limits.
- B. Remove the damaged material.
- (1) Mask the bearings.
 - (2) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 and SOPM 20-10-01 for the inspection and removal of damage.
 - (3) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (4) Keep a surface roughness of 125 microinches R_a or smoother.
- C. Do a penetrant inspection of the reworked areas. Refer to SOPM 20-20-02.
- D. Measure the related dimensions at the reworked areas to make sure the dimensions agree with the allowable damage limits.

54-70-90

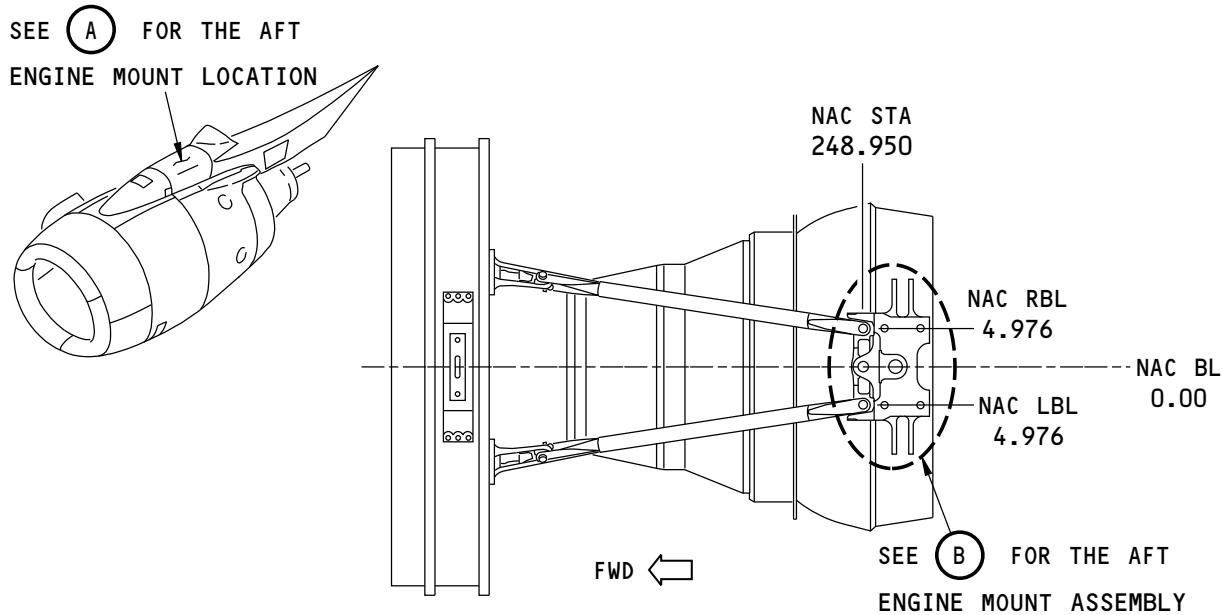
ALLOWABLE DAMAGE 12

Page 101

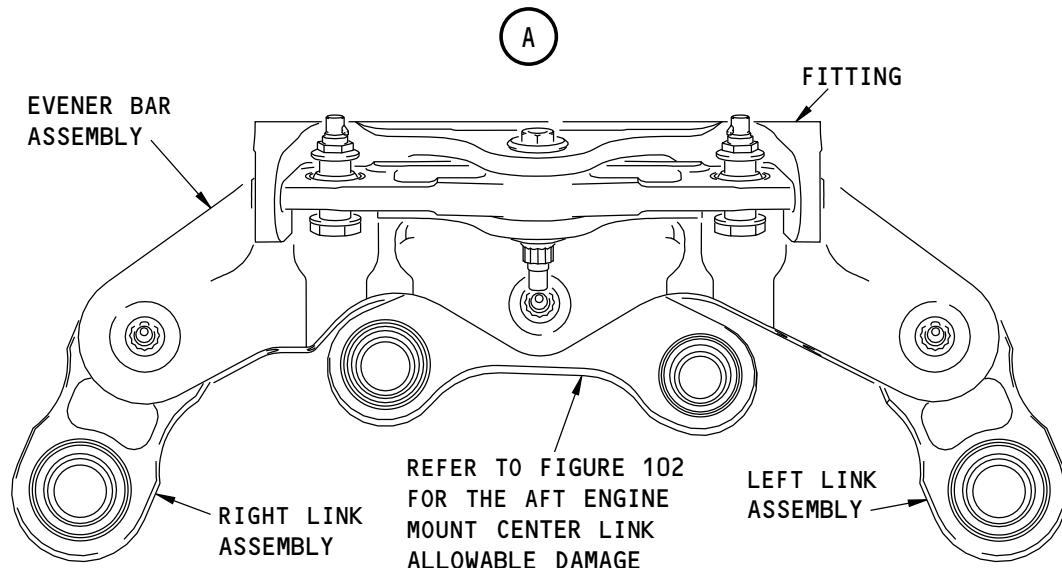
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**737-800
STRUCTURAL REPAIR MANUAL**


(VIEW IN THE DOWN DIRECTION)
AFT ENGINE MOUNT LOCATION



(VIEW IN THE FORWARD DIRECTION)
AFT ENGINE MOUNT ASSEMBLY

(B)

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Aft Engine Mount - Center Link Location
Figure 101

54-70-90

ALLOWABLE DAMAGE 12

Page 102

Nov 10/2013

D634A210



737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-01	Repair and Refinish of High Strength Steel Parts
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits

- A. Refer to Table 101/ALLOWABLE DAMAGE 12 for the allowable damage limits and Figure 102/ALLOWABLE DAMAGE 12 for the zones and allowable damage limits.

Table 101: Allowable Damage Limits

DESCRIPTION	CRACKS	NICKS, GOUGES, SCRATCHES AND CORROSION	DENTS	HOLES AND PUNCTURES
Center Link - Edges	Not Permitted	Refer to Figure 102/ALLOWABLE DAMAGE 12	Not Permitted	Not Permitted
Bearing Bores	Not Permitted	Refer to CMM 71-21-37, Assembly 10-3 and Repair 10-4	Not Permitted	Not Permitted
Lugs and Surface around Bearing Bores	Not Permitted	Contact the Boeing Company	Not Permitted	Not Permitted

B. Center Link Edge Damage

- (1) For damage at the edge, remove damage with a 20:1 blend ratio as shown in Figure 102/ALLOWABLE DAMAGE 12, Detail A.

C. Center Link Bore Damage

- (1) Refer to CMM 71-21-37, Assembly 10-3 and Repair 10-4.

D. Lug Radius and Surface around Bearing Bores

- (1) Rework of damaged material is not permitted in this area. Contact The Boeing Company if you find damage.

54-70-90

ALLOWABLE DAMAGE 12

Page 103

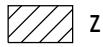
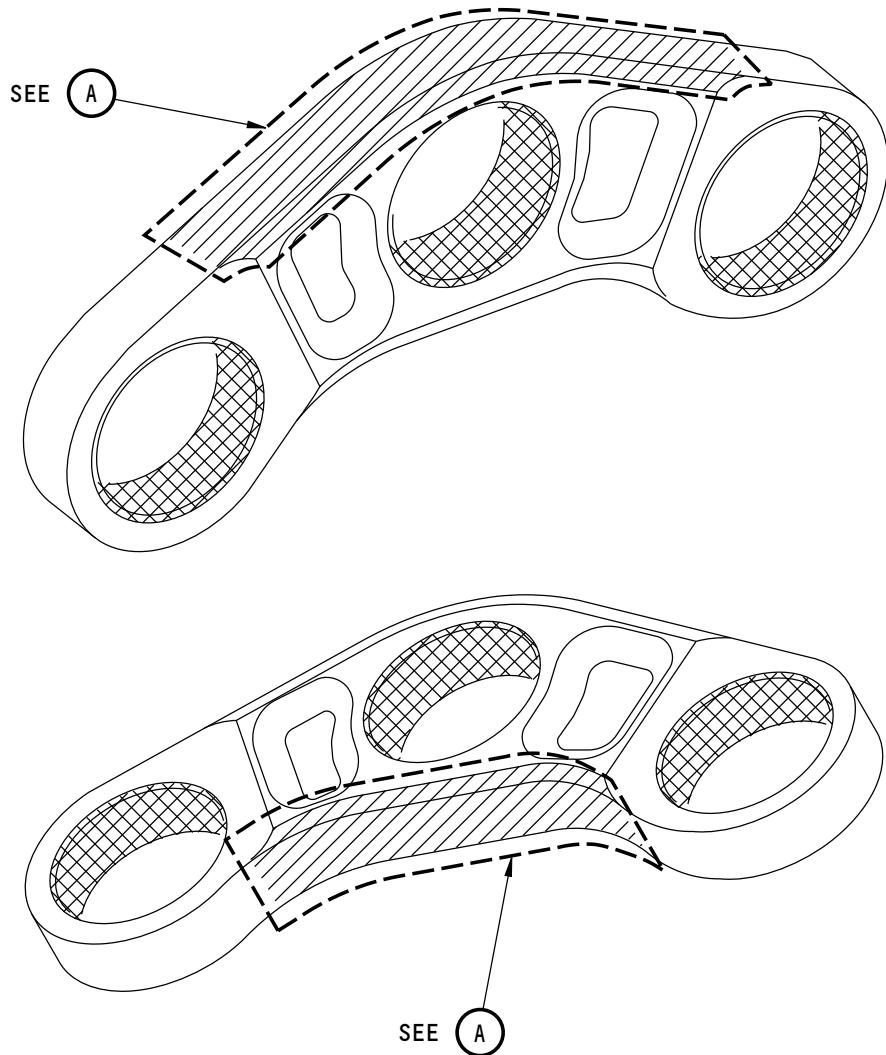
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737-800
STRUCTURAL REPAIR MANUAL



ZONE 1 - REWORK PERMITTED



ZONE 2 - REWORK NOT PERMITTED



ZONE 3 - REWORK PERMITTED AS GIVEN IN CMM 71-21-37
ASSEMBLY 10-3 AND REPAIR 10-4

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Allowable Damage Zones and Limits
Figure 102 (Sheet 1 of 2)

54-70-90

ALLOWABLE DAMAGE 12

Page 104

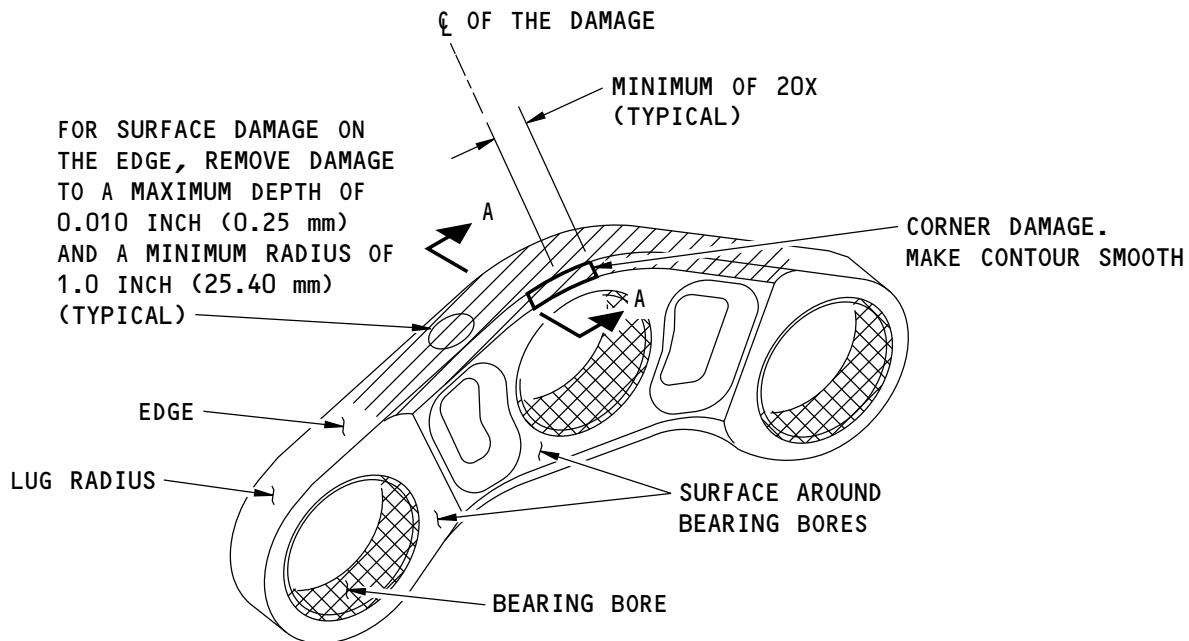
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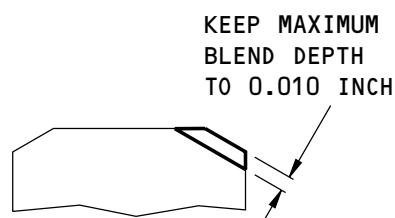


737-800
STRUCTURAL REPAIR MANUAL



REMOVAL OF EDGE AND CORNER DAMAGE

(A)



A-A

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Allowable Damage Zones and Limits
Figure 102 (Sheet 2 of 2)

54-70-90

ALLOWABLE DAMAGE 12

Page 105

Nov 10/2013

D634A210

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737-800
STRUCTURAL REPAIR MANUAL

ALLOWABLE DAMAGE 13 - AFT ENGINE MOUNT EVENER BAR - CFM56-7 ENGINE

1. Applicability

- A. This procedure gives the allowable damage limits for the aft engine mount Evener Bar, part number 310A2036-9 as shown in Figure 102/ALLOWABLE DAMAGE 13.

NOTE: The Material is Nickel Alloy 718.

- B. This procedure applies only to the areas shown in Figure 102 (Sheet 1) for the 310A2036-9 aft engine mount Evener Bar.

NOTE: If there is damage to the lug holes, then you must repair the lug holes as given in CMM 71-21-37, Repair 7-3 and Repair 7-4.

NOTE: If there is damage to the surface around the bearing bores as shown in Figure 102/ ALLOWABLE DAMAGE 13, then contact the Boeing Company.

2. General

- A. Refer to Figure 101/ALLOWABLE DAMAGE 13 for the Evener Bar location. Refer to Figure 102/ ALLOWABLE DAMAGE 13 for the zones and allowable damage limits.
- B. Remove the damaged material.
- (1) Mask the bearings.
 - (2) Refer to INSPECTION AND REMOVAL OF DAMAGE, 51-10-02 and SOPM 20-10-01 for the inspection and removal of damage.
 - (3) Refer to EQUIPMENT AND TOOLS FOR REPAIRS, 51-30-05 for possible sources of equipment and tools you can use to remove the damage.
 - (4) Keep a surface roughness of 125 microinches R_a or smoother.
- C. Do a penetrant inspection of the reworked areas. Refer to SOPM 20-20-02.
- D. Shot peen or flap peen the reworked areas with an intensity between 0.006A and 0.011A. When you shot peen, use 200% coverage. You can peen the blend area manually to get the necessary intensity and coverage. Refer to SHOT PEENING, 51-20-06.
- (1) Mask the lugs and surfaces around the bearing bores. Do not do rework to these surfaces. If there is damage to these surfaces, then contact the Boeing Company.
- E. Measure the related dimensions at the reworked areas to make sure the dimensions agree with the allowable damage limits.

54-70-90

ALLOWABLE DAMAGE 13

Page 101

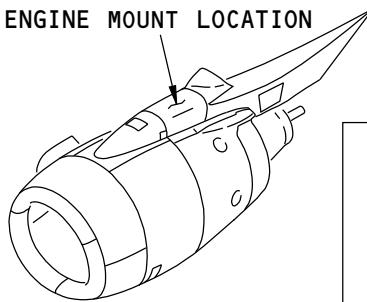
Nov 10/2013

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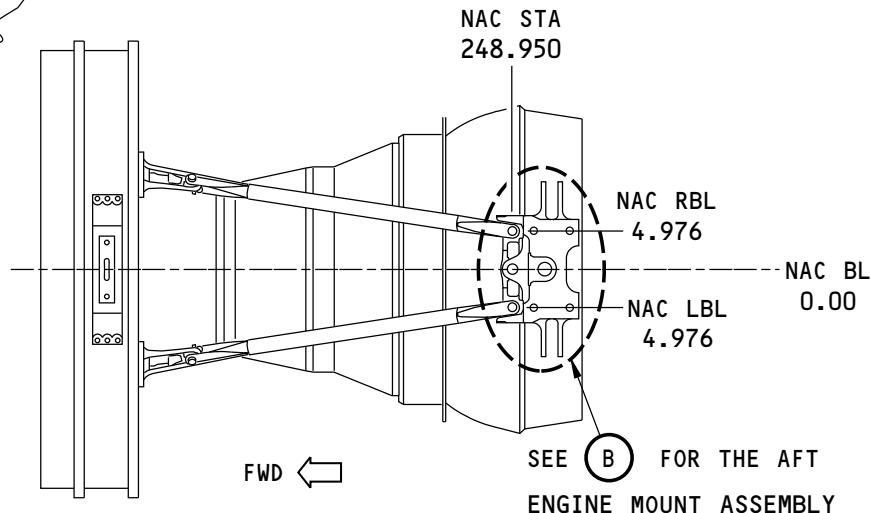
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**737-800
STRUCTURAL REPAIR MANUAL**

SEE **A** FOR THE AFT
ENGINE MOUNT LOCATION



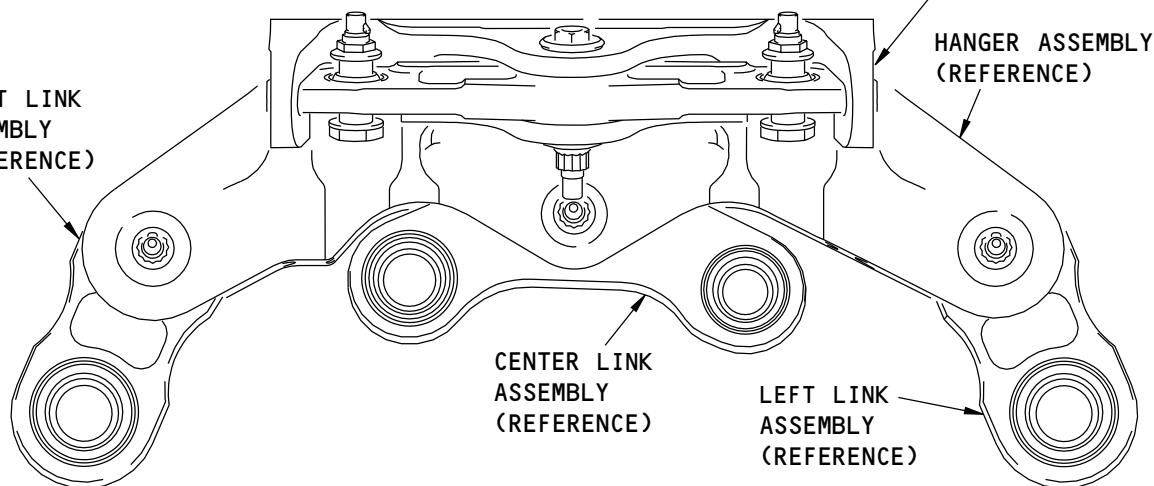
REFERENCE DRAWINGS
310A2020
310A3020
310A2036



(VIEW IN THE DOWN DIRECTION)
AFT ENGINE MOUNT LOCATION

A

RIGHT LINK
ASSEMBLY
(REFERENCE)



(VIEW IN THE FORWARD DIRECTION)
AFT ENGINE MOUNT ASSEMBLY

B

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Aft Engine Mount - Evener Bar Location
Figure 101

54-70-90

ALLOWABLE DAMAGE 13

Page 102

Nov 10/2013



737-800
STRUCTURAL REPAIR MANUAL

3. References

Reference	Title
51-10-02	INSPECTION AND REMOVAL OF DAMAGE
51-20-06	SHOT PEENING
51-30-05	EQUIPMENT AND TOOLS FOR REPAIRS
CMM 71-21-37	Component Maintenance Manual
SOPM 20-10-01	Repair and Refinish of High Strength Steel Parts
SOPM 20-20-02	Penetrant Methods of Inspection

4. Allowable Damage Limits

- A. Refer to Table 101/ALLOWABLE DAMAGE 13 for the allowable damage limits and Figure 102/ALLOWABLE DAMAGE 13 for the zones and allowable damage limits.

Table 101: Allowable Damage Limits

DESCRIPTION	CRACKS	NICKS, GOUGES, SCRATCHES AND CORROSION	DENTS	HOLES AND PUNCTURES
Evener Bar - Zone 1	Not Permitted	Refer to Figure 102/ALLOWABLE DAMAGE 13.	Not Permitted	Not Permitted
Bushing / Bearing Bores - Zone 2	Not Permitted	Refer to CMM 71-21-37, Repair 7-3 and Repair 7-4.	Not Permitted	Not Permitted
Surface around Bushing / Bearing Bores - Zone 3	Not Permitted	Contact the Boeing Company.	Not Permitted	Not Permitted

B. Evener Bar Damage

(1) Zone 1

- Dimensions of the reworked part must not be more than the minimum dimensions as shown in Figure 102 (Sheet 2), Detail A.
- For damage at the edge, remove damage with a 20:1 blend ratio. Refer to Figure 102 (Sheet 3), Detail B.
- For damage on the surface, remove the damage as shown in Figure 102 (Sheet 3), Detail C.

(2) Zone 2

- Refer to CMM 71-21-37, Repair 7-3 and Repair 7-4 for bushing / bearing and bore repairs.

(3) Zone 3

- Rework of damaged material is not permitted in this area. Contact The Boeing Company if you find damage.

54-70-90

ALLOWABLE DAMAGE 13

Page 103

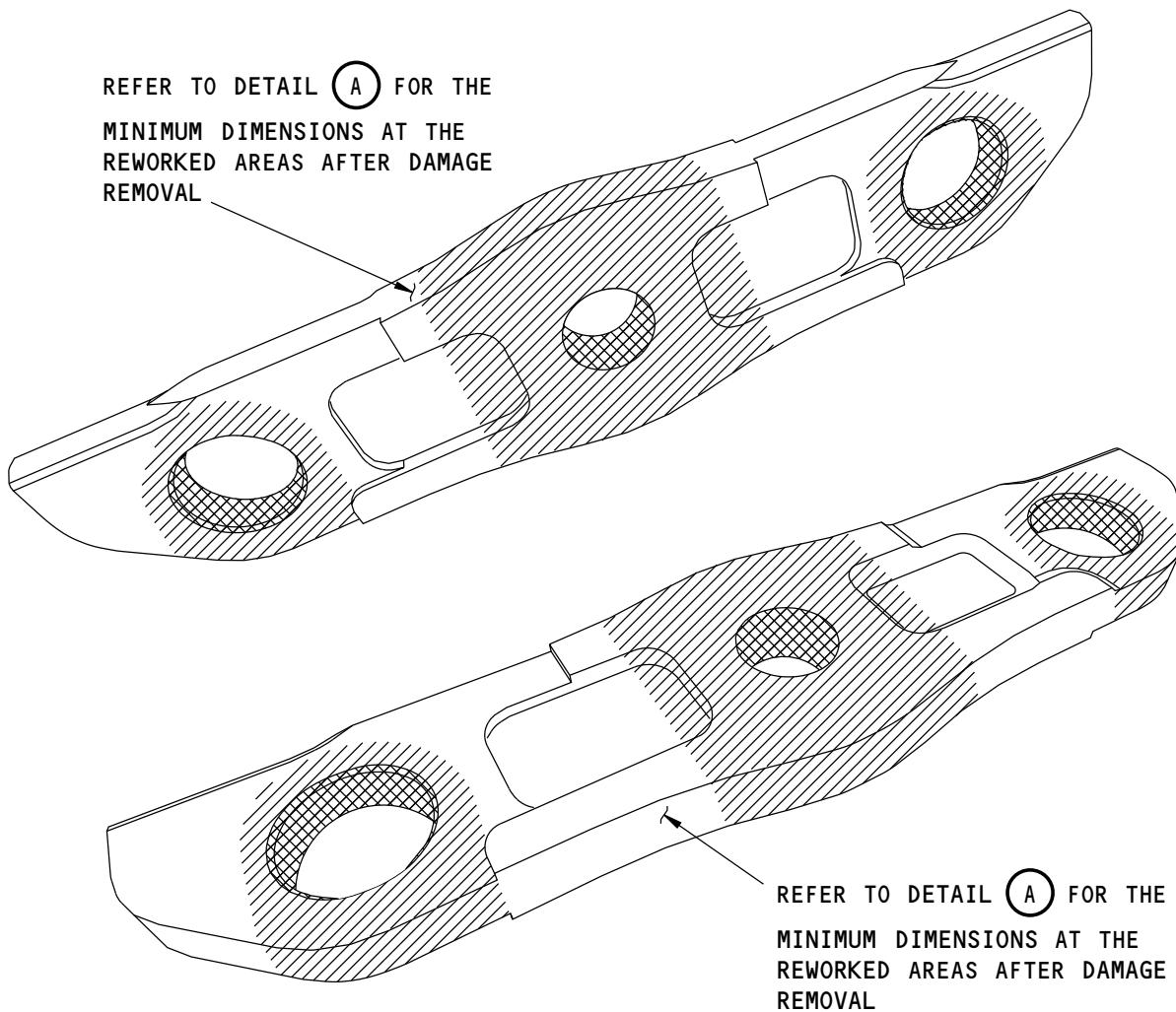
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737-800
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ALLOWABLE DAMAGE ZONES - CFM56-7 ENGINE EVENER BAR

ZONE 1 - REWORK PERMITTED

ZONE 2 - REWORK PERMITTED AS GIVEN IN
CMM 71-21-37 REPAIR 7-3 AND
REPAIR 7-4

ZONE 3 - REWORK NOT PERMITTED

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Allowable Damage Zones and Limits
Figure 102 (Sheet 1 of 3)

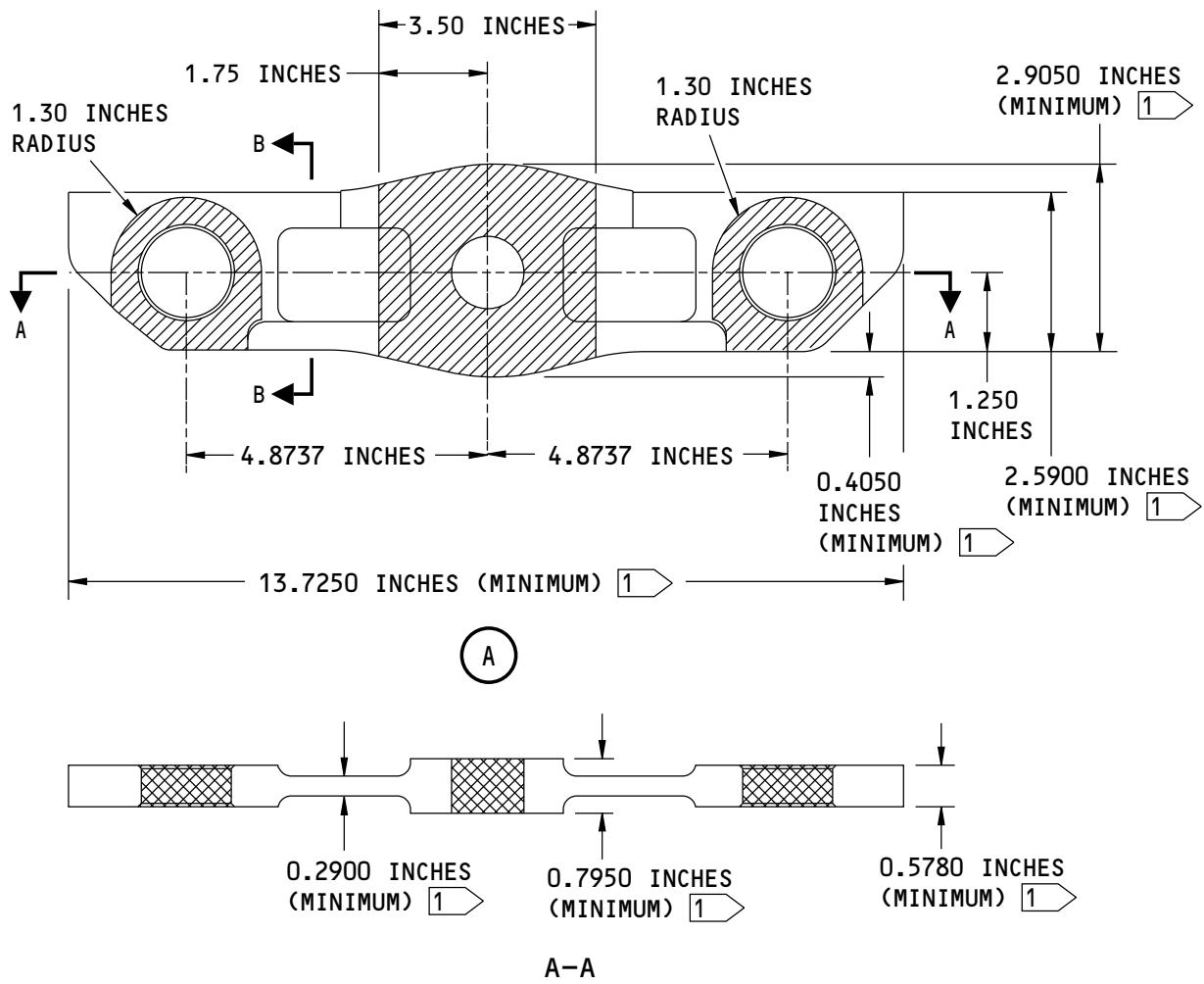
54-70-90

ALLOWABLE DAMAGE 13
Page 104
Nov 10/2013

D634A210

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**737-800
STRUCTURAL REPAIR MANUAL**



NOTES

MINIMUM DIMENSION AT THE REWORKED AREA AFTER DAMAGE REMOVAL

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**Allowable Damage Zones and Limits
Figure 102 (Sheet 2 of 3)**

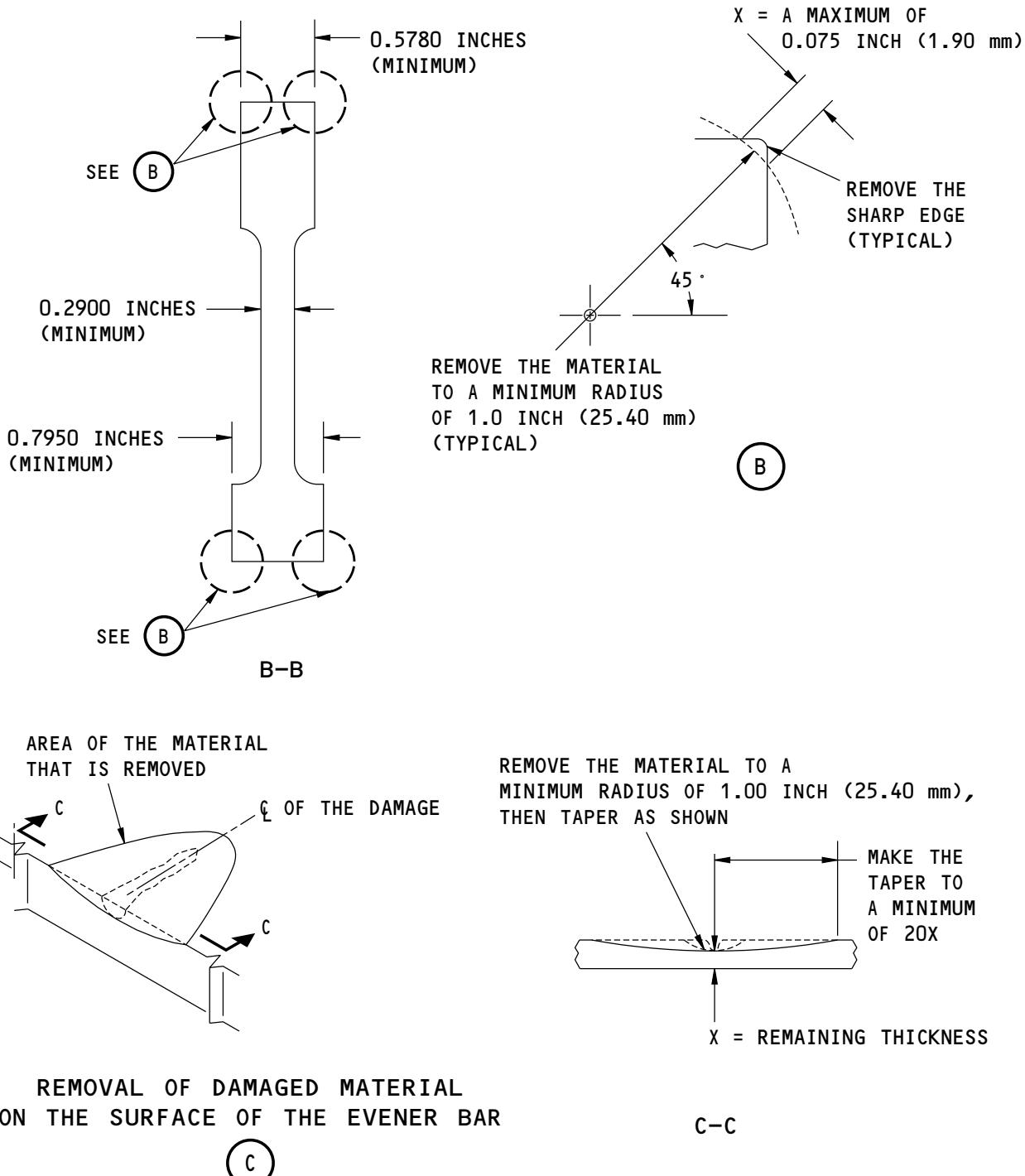
54-70-90

ALLOWABLE DAMAGE 13

Page 105

Nov 10/2013

D634A210

**737-800
STRUCTURAL REPAIR MANUAL**


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Allowable Damage Zones and Limits
Figure 102 (Sheet 3 of 3)

54-70-90
ALLOWABLE DAMAGE 13

Page 106

Nov 10/2013

D634A210