Cessna
A Textron Company

Maintenance Manual

1976
Thru
1985

MODEL 421C
GOLDEN EAGLE

Member of GAMA

FAA APPROVAL HAS BEEN OBTAINED ON TECHNICAL DATA IN THIS PUBLICATION THAT AFFECTS AIRPLANE TYPE DESIGN.

REVISION 23 TO THE BASIC MANUAL IS BEING SUPPLIED TO PROVIDE ADDITIONAL INFORMATION NECESSARY TO MAINTAIN THE AIRPLANE AND INCORPORATES THE SUPPLEMENTAL INSPECTION DOCUMENT (SID), DATED 06 JANUARY 2003.

1 NOVEMBER 1975

D2515-23-13

Revision 23

06 January 2003

TEMPORARY REVISION NUMBER 13

DATED May 30, 2005

MANUAL TITLE Model 421C Series Service Manual

MANUAL NUMBER - PAPER COPY D2515-23-13

MANUAL NUMBER - AEROFICHE D2515-23-13AF

TEMPORARY REVISION NUMBER D2515-23TR13

MANUAL DATE 1 November 1975 **REVISION NUMBER** 23 **DATE** 6 January 2003

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
2-30	1	2/G01			
2-30	2	2/G02			
2-30	3	2/G03			

REASON FOR TEMPORARY REVISION

1. To add replacement time limits for the vacuum system manifold check valves.
2. To add overhaul time limits for the flap actuator gearbox.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

1. For Paper Publications, file this cover sheet behind the publication's title page to identify the inclusion of the Temporary Revision into the manual. Insert the new pages into the publication at the appropriate locations and remove and discard the superseded pages.

2. For Aerofiche Publications, draw a line with permanent red ink marker, through any aerofiche frame (page) affected by the Temporary Revision. This will be a visual identifier that the information on the frame (page) is no longer valid and the Temporary Revision should be referenced. For "added" pages in a Temporary Revision, draw a vertical line between the applicable frames. Lines should be wide enough to show on the edges of the pages. Temporary Revisions should be collected and maintained in a notebook or binder near the aerofiche library for quick reference.

3. For CD publications, mark the temporary revision part number on the CD label with permanent red marker. This will be a visual identifier that the temporary revision must be referenced when the content of the CD is being used. Temporary revisions should be collected and maintained in a notebook or binder near the CD library for quick reference.

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TEMPORARY REVISION NUMBER 11

DATED 2 AUGUST 2004

MANUAL TITLE	Model 421C (1976 thru 1985) Maintenance Manual
MANUAL NUMBER - PAPER COPY	D2515-23-13
MANUAL NUMBER - AEROFICHE	D2515-23-13AF
TEMPORARY REVISION NUMBER	D2515-23TR11

MANUAL DATE 1 November 1975 **REVISION NUMBER** 23 **DATE** 6 January 2003

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

CHAPTER/ SECTION/ SUBJECT	PAGE	AEROFICHE FICHE/FRAME	CHAPTER/ SECTION/ SUBJECT	PAGE	AEROFICHE FICHE/FRAME
SID Sec. II	1	1/B20	2–20	11	2/F6
SID Sec. II	2	1/B21	2–20	12	2/F7
SID Sec. II	3	1/B22	2–20	13	2/F8
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SID Sec. II	5	1/B24	2–20	15	2/F10
SID Sec. II	6	1/C1	2–20	16	2/F11
SID Sec. III, 57–10–15	1	1/B20	2–20	17	2/F12
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2–20	4	2/E23	2–20	22	2/F17
2–20	5	2/E24	2–20	23	Deleted
2–20	6	2/F1	2–20	24	Deleted
2–20	7	2/F2	2–20	25	Deleted
2–20	8	2/F3	2–20	26	Deleted
2–20	9	2/F4	2–20	27	Deleted
2–20	10	2/F5	2–20	28	Deleted

REASON FOR TEMPORARY REVISION

1. To revise serialization of the 15,000 hour initial inspection in Section II
2. To revise the Initial Compliance statement of SID inspections 57-10-15 and 57-10-16.
3. To revise the cleaning interval of the engine fuel injection nozzles.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

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TEMPORARY REVISION NUMBER 12

DATED 1 March 2004

MANUAL TITLE Model 421C Series Service Manual

MANUAL NUMBER - PAPER COPY D2515-23-13

MANUAL NUMBER - AEROFICHE D2515-23-13AF

TEMPORARY REVISION NUMBER D2515-23TR12

MANUAL DATE 1 November 1975 **REVISION NUMBER** 23 **DATE** 6 January 2003

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

SECTION	PAGE	AEROFICHE FICHE/FRAME	SECTION	PAGE	AEROFICHE FICHE/FRAME
3-30	1	3/F19			
3-30	2	3/F20			
3-30	4	3/G02			

REASON FOR TEMPORARY REVISION

1. To revise the notes for required materials to accomplish the Inspection of Acrylic Windshield and Windows.
2. To clarify that no cracks are allowed in the windshield or crew side windows.
3. To add a Warning statement to not operate the airplane in a pressurized mode if a windshield or window replacement is necessary.
4. To revise a step in the Optical Prism Inspection for Acrylic Windshields and Windows, to remove the windshield retainer if a clear view of a windshield fastener hole cannot be obtained by using a prism.

FILING INSTRUCTIONS FOR THIS TEMPORARY REVISION

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TEMPORARY REVISION NUMBER 10

DATED 2 September 2003

MANUAL TITLE Model 421C Service Manual

MANUAL NUMBER - PAPER COPY D2515-23-13

MANUAL NUMBER - AEROFICHE D2515-23-13AF

TEMPORARY REVISION NUMBER D2515-23TR10

MANUAL DATE 1 November 1975 **REVISION NUMBER** 23 **DATE** 6 January 2003

This Temporary Revision consists of the following pages, which affect and replace existing pages in the paper copy manual and supersede aerofiche information.

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421C SID Introduction	1	1/B11	2-20	23	2/F18
421C SID Introduction	2	1/B12	2-20	24	2/F19
421C SID Introduction	3	1/B13	2-20	28	2/F23
421C SID Introduction	4	1/B14	3-30	1	3/F19
421C SID Introduction	5	1/B15	3-30	2	3/F20
421C SID Introduction	6	1/B16	3-30	2A/Deleted	3/F21
421C SID Introduction	7	1/B17	3-30	2B/Deleted	3/F22
421C SID Introduction	8	Added	3-30	2C/Deleted	3/F23
421C SID Introduction	9	Added	3-30	2D/Deleted	3/F24
421C SID Section II	1	1/B20	3-30	3	3/G01
421C SID Section II	2	1/B21	3-30	4	3/G02
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421C SID Section II	4	1/B23	3-30	6	3/G04
421C SID Section II	5	1/B24	3-30	7	Added
421C SID Section II	6	1/C01	3-30	8	Added
421C SID Section III 56-10-01	1	1/C16	3-30	9	Added
421C SID Section III 56-10-02	1	Added	3-30	10	Added
421C SID Section IV 56-10-01	1	1/I14	3-30	11	Added
421C SID Section IV 56-10-01	2	1/I15	3-30	12	Added
421C SID Section IV 56-10-01	3	1/I16	3-30	13	Added
421C SID Section IV 56-10-01	4	1/I17			
421C SID Section IV 56-10-01	5	1/I18			
421C SID Section IV 56-10-01	6	Added			

REASON FOR TEMPORARY REVISION

1. To add a table of typical examples of principal structural elements and revise the Repair Information/Modifications section in the Introduction section in the Supplemental Inspection Document.
2. To revise the Initial and Repeat inspection times for Supplemental Inspection Number 56-10-01 in Section II and Section III of the 421C Supplemental Inspection Document.
3. To add Supplemental Inspection Number 56-10-02 in Section III of the 421C Supplemental Inspection Document.

4. To correct the part number called out for an optical prism in Section IV of the 421C Supplemental Inspection Document, Paragraph 7., Supplemental Inspection Number 56-10-01.
5. To revise the Inspection Time Limits Chart, for the windshield, cockpit side windows and cabin windows, Section 2-20 page 23.
6. To revise Section 3-30, Windows to add additional information concerning the inspection and repair of acrylic windshields and windows.

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LIST OF CHAPTERS

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Original	0	November	1975	Revision	13	November	1981
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Revision	2	October	1976	Revision	15	October	1982
Revision	3	February	1977	Revision	16	October	1983
Revision	4	November	1977	Revision	17	March	1984
Revision	5	May	1978	Revision	18	November	1984
Revision	6	November	1978	Revision	19	April	1985
Revision	7	March	1979	Revision	20	August	1997
Revision	8	November	1979	Revision	21	October	1998
Revision	9	March	1980	Revision	22	March	2000
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Revision	12	June	1981				

CHAPTER/ SECTION	PAGE	DATE	CHAPTER/ SECTION	PAGE	DATE	CHAPTER/ SECTION	PAGE	DATE
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Effectivity	5	Jan/03	1-20	2	Nov/75	1-80	2C	Apr/85
Effectivity	6	Jan/03	1-30	1	Oct/82	1-80	2D	Apr/85
Effectivity	7	Jan/03	1-30	2	Nov/79	1-80	2E	Apr/85
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Contents	3	Mar/2000	1-50	2	Nov/84	1-80	6A	Nov/81
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Introduction	2	Mar/2000	1-60	3	Oct/83	1-80	6D	Nov/81
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Introduction	5	Mar/2000	1-60	6	Oct/83	1-80	8	Nov/80
Introduction	6	Mar/2000	1-60	7	Oct/83	1-80	9	Oct/98
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1-00	3	Nov/84	1-70	4	Apr/85	1-80	20	Oct/98
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1-90	7	Oct/82	2-41	10	Mar/84	2-50	10	Mar/84
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Contents-2	2	Mar/2000	2-42	8	Oct/98	2-50	19	Mar/84
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3-11	12	Oct/83
3-11	13	Oct/83
3-11	14	Oct/83
3-11	15	Oct/83
3-11	16	Oct/83
3-11	17	Oct/83
3-12	1	Nov/81
3-12	2	May/78
3-12	3/4	Nov/75
3-13	1	Nov/75
3-13	2	Oct/82
3-13	3	Oct/82
3-13	4	Nov/81
3-13	5	Oct/82
3-13	6	Oct/82
3-13	7/8	Oct/82
3-14	1	Oct/98
3-14	2	Nov/81
3-14	3	Apr/85
3-14	4	Apr/85
3-14	5/6	Apr/85
3-15	1	Mar/81
3-15	2	Nov/75
3-16	1	Mar/81
3-16	2	Nov/80
3-16	3	Nov/80
3-16	4	Nov/80
3-16	5/6	Mar/81
3-20	1/2	Feb/76
3-21	1	Nov/75
3-21	2	Nov/77
3-21	3/4	Nov/75

CHAPTER/ SECTION	PAGE	DATE
3-22	1	Nov/75
3-22	2	Nov/75
3-22	3	Nov/75
3-22	4	Nov/75
3-23	1	Nov/75
3-23	2	Mar/80
3-30	1	Mar/84
3-30	2	Mar/2000
3-30	2A	Mar/2000
3-30	2B	Mar/2000
3-30	2C	Mar/2000
3-30	2D	Mar/2000
3-30	3	Oct/98
3-30	4	Oct/98
3-30	5	Nov/84
3-30	6	Nov/84
3-31	1	Oct/98
3-31	2	Mar/84
3-31	3	Feb/77
3-31	4	Mar/84
3-31	5	Mar/84
3-31	6	Feb/77
3-31	7	Feb/77
3-31	8	Mar/84
3-31	9	Mar/84
3-31	10	Mar/84
3-31	11	Mar/84
3-31	12	Mar/84
3-31	13	Mar/84
3-31	14	Mar/84
3-31	15	Mar/84
3-31	16	Oct/82
3-31	17	Mar/84
3-31	18	Mar/84
3-31	19	Aug/97
3-31	20	Aug/97
3-31	21	Aug/97
3-31	22	Aug/97
3-31	23/24	Aug/97
3-32	1	Oct/98
3-32	2	Oct/98
3-32	3	Nov/80
3-32	4	Apr/85
3-32	5	Nov/84
3-32	6	Apr/85
3-40	1	Feb/76
3-40	2	Nov/75
3-40	3	Nov/75
3-40	4	Nov/80
3-50	1	Mar/81
3-50	2	Oct/82
3-50	3	Oct/82
3-50	4	Oct/82
3-50	5	Oct/82
3-50	6	Oct/82
3-50	7	Oct/98
3-50	8	Oct/82
3-51	1	Oct/76
3-51	2	Oct/76
3-52	1	Oct/76
3-52	2	Oct/76
Chapter 4		
Contents-4	1	Apr/85
Contents-4	2	Apr/85
Contents-4	3/4	Apr/85
Components Location-4	1/2	Nov/80
4-00	1	Nov/80
4-00	2	Nov/80
4-00	3	Aug/97
4-00	4	Aug/97
4-00	4A/B	Nov/84
4-00	5	Nov/80
4-00	6	Nov/80
4-00	7	Oct/76
4-00	8	Nov/80
4-00	8A	Nov/80
4-00	8B	Mar/2000
4-00	9	Apr/85
4-00	10	Apr/85
4-00	11	Apr/85
4-00	12	Apr/85
4-10	1	Aug/97
4-10	2	Aug/97
4-10	3	Aug/97
4-10	4	Aug/97
4-10	5	Aug/97
4-10	6	Aug/97
4-10	7/8	Aug/97
4-11	1 Nov/79	
4-11	2	Nov/79
4-11	3	Nov/79
4-11	4	Oct/83
4-11	5	Nov/79
4-11	6	Jun/81
4-11	7	Oct/98
4-11	8	Apr/85
4-11	9	Oct/82
4-11	10	Apr/85
4-20	1	Oct/98
4-20	2	Oct/82
4-20	3	Oct/82
4-20	4	Oct/82
4-20	4A/B	Oct/82
4-20	5	Oct/83
4-20	6	Oct/82
4-20	7	Oct/82
4-20	8	Oct/82
4-20	8A/B	Oct/82
4-21	1	Nov/75
4-21	2	Nov/75
4-21	3	Nov/75
4-21	4	Nov/75
4-30	1	Oct/82
4-30	2	Oct/82
4-30	2A	Oct/82
4-30	2B	Oct/82
4-30	3	May/78
4-30	4	Nov/75
4-30	5/6	Oct/82
4-31	1	Oct/82
4-31	2	Jun/81
4-31	3	Oct/82
4-31	4	Oct/82
4-32	1	Nov/75
4-32	2	Oct/82
4-32	3/4	Nov/75
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4-33	3	Nov/75
4-33	4	Nov/75
4-33	5	Oct/83
4-33	6	Oct/82
4-34	1	Jun/81
4-34	2	Nov/81
4-40	1/2	Nov/80
4-41	1	Nov/81
4-41	2	Nov/75
4-41	3	Nov/84
4-41	4	Nov/84
4-42	1	Mar/81
4-42	2	May/78
4-42	3	Nov/75
4-42	4	Mar/81
4-43	1	Nov/77
4-43	2	Nov/79
4-43	3	Nov/75
4-43	4	Apr/85
4-43	4A/B	Apr/85
4-43	5	Nov/80
4-43	6	Nov/79
4-43	7	Apr/85
4-43	8	Nov/79
4-43	9	Nov/79
4-43	10	Feb/77
4-43	11	Feb/77
4-43	12	Oct/98
4-43	13	Nov/77
4-43	14	Nov/80
4-43	14A/B	Nov/80
4-43	15	Mar/81
4-43	16	Oct/83
4-43	17/18	Mar/81
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4-50	1	Nov/77
4-50	2	Nov/75
4-50	3	Nov/79
4-50	4	Nov/79
4-60	1	Apr/85
4-60	2	Nov/84
4-60	3/4	Aug/97
4-70	1	May/78

CHAPTER/ SECTION	PAGE	DATE
4-70	2	Apr/85
4-70	3	Apr/85
4-70	4	Apr/85
4-70	4A	Apr/85
4-70	4B	Apr/85
4-70	4C	Apr/85
4-70	4D	Apr/85
4-70	5	Apr/85
4-70	6	Nov/79
4-70	7	Apr/85
4-70	8	Nov/79
4-70	9	Oct/82
4-70	10	Nov/75
4-70	11	Oct/98
4-70	12	Oct/82
Chapter-5		
Contents-5	1	Apr/85
Contents-5	2	Apr/85
Contents-5	3/4	Apr/85
Components Location-5	1/2	Oct/82
5-00	1	Mar/80
5-00	2	Mar/80
5-10	1	Aug/97
5-10	2	Apr/85
5-10	2A	Apr/85
5-10	2B	Apr/85
5-10	2C	Apr/85
5-10	2D	Apr/85
5-10	3	Apr/85
5-10	4	Nov/80
5-10	5	Oct/83
5-10	6	Oct/83
5-10	7	Oct/83
5-10	8	Nov/81
5-10	9	Mar/80
5-10	10	Mar/80
5-10	11	Nov/79
5-10	12	Oct/83
5-10	13	Oct/83
5-10	14	Nov/79
5-10	15	Nov/75
5-10	16	Nov/78
5-10	16A	Nov/80
5-10	16B	Nov/80
5-10	17	Nov/80
5-10	18	Oct/76
5-10	19	Oct/76
5-10	20	Nov/80
5-20	1	Apr/85
5-20	2	Apr/85
5-20	2A	Apr/85
5-20	2B	Apr/85
5-20	2C	Apr/85
5-20	2D	Apr/85
5-20	3	Apr/85
5-20	4	Oct/83
5-20	5	Oct/83
5-20	6	Feb/76
5-20	7	Oct/83
5-20	8	Feb/76
5-20	9	Nov/75
5-20	10	Oct/82
5-20	10A/B	Oct/82
5-20	11	Aug/97
5-20	12	Nov/79
5-20	13	Nov/78
5-20	14	Nov/78
5-20	15	Nov/78
5-20	16	Mar/81
5-20	17	Mar/81
5-20	18	Nov/81
5-20	19	Nov/81
5-20	20	Nov/81
5-20	21	Oct/82
5-20	22	Oct/82
5-21	1	Nov/80
5-21	2	Nov/80
5-21	3/4	Nov/80
5-22	1	Oct/83
5-22	2	Mar/84
5-22	3	Apr/85
5-22	4	Apr/85
5-30	1	Aug/97
5-30	2	Aug/97
5-30	3	Oct/83
5-30	4	Apr/85
5-30	5	Apr/85
5-30	6	Apr/85
5-30	6A	Apr/85
5-30	6B	Apr/85
5-30	7	Nov/81
5-30	8	Apr/85
5-30	8A/B	Apr/85
5-30	9	Nov/75
5-30	10	Oct/76
5-30	11	Nov/75
5-30	12	Mar/80
5-30	13	Oct/76
5-30	14	Oct/76
5-30	15	Nov/78
5-30	16	Apr/85
5-30	17	Mar/80
5-30	18	Apr/85
5-30	18A	Apr/85
5-30	18B	Apr/85
5-30	18C	Apr/85
5-30	18D	Apr/85
5-30	18E	Apr/85
5-30	18F	Apr/85
5-30	18G	Apr/85
5-30	18H	Apr/85
5-30	19	Apr/85
5-30	20	Jun/81
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5-30	22	Jun/81
5-30	23	Jun/81
5-30	24	Mar/80
5-30	25/26	Jun/81
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5-40	3	Mar/81
5-40	4	Apr/85
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5-40	7	Nov/75
5-40	8	Mar/81
5-40	8A	Nov/80
5-40	8B	Mar/81
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5-40	10	Nov/75
5-40	11	Nov/75
5-40	12	Nov/75
5-40	13	Nov/80
5-40	14	Nov/79
5-40	15	Nov/75
5-40	16	Nov/75
5-40	17	Nov/79
5-40	18	Nov/75
5-40	19	Nov/75
5-40	20	Nov/75
5-50	1	Apr/85
5-50	2	Apr/85
5-50	3/4	Apr/85
Chapter-6		
Contents-6	1	Nov/84
Contents-6	2	Nov/84
Contents-6	3/4	Nov/84
Components Location-6	1/2	Mar/79
6-00	1/2	May/78
6-10	1	Oct/82
6-10	2	Nov/75
6-10	3	Oct/82
6-10	4	Nov/84
6-10	5	Oct/82
6-10	6	Oct/82
6-10	6A	Nov/80
6-10	6B	Nov/80
6-10	7	Oct/82
6-10	8	Aug/97
6-10	9	Aug/97
6-10	10	Nov/80
6-10	10A	Oct/83
6-10	10B	Oct/83
6-10	10C	Oct/83
6-10	10D	Mar/81
6-10	10E	Mar/2000
6-10	10F	Mar/2000
6-10	11	Nov/80
6-10	12	Nov/75
6-10	13	Oct/83
6-10	14	Oct/83
6-10	14A/B	Oct/83

CHAPTER/ SECTION	PAGE	DATE
6-10	15	Nov/80
6-10	16	Nov/78
6-11	1	Oct/76
6-11	2	Nov/81
6-20	1/2	Nov/75
6-21	1	Oct/83
6-21	2	Oct/76
6-21	3/4	Oct/76
6-21	5	Oct/76
6-21	6	Oct/76
6-21	7	Mar/80
6-21	8	Oct/76
6-21	9/10	Oct/76
6-22	1	Nov/75
6-22	2	Nov/79
6-23	1	Nov/75
6-23	2	Nov/80
6-23	3	Nov/80
6-23	4	Nov/80
6-23	5/6	Nov/80
6-30	1	Nov/75
6-30	2	Oct/82
6-30	3	Nov/80
6-30	4	Nov/80
6-30	5	Nov/80
6-30	6	Nov/80
6-31	1	Oct/76
6-31	2	Oct/76
6-31	3	Oct/76
6-31	4	Nov/84
6-31	4A	Nov/84
6-31	4B	Nov/84
6-31	5	Nov/84
6-31	6	Nov/84
6-31	7	Mar/79
6-31	8	Oct/76
6-31	9	Nov/84
6-31	10	Mar/81
6-31	11/12	Nov/84
6-32	1	Nov/77
6-32	2	Nov/81
6-32	2A/B	Nov/77
6-32	3	Oct/82
6-32	4	Oct/82
6-32	5	Nov/81
6-32	6	Nov/77
6-32	7	Nov/77
6-32	8	Mar/80
6-32	9/10	Feb/76
6-33	1	Feb/76
6-33	2	Nov/75
6-40	1	Nov/75
6-40	2	Nov/75
6-40	3	Nov/75
6-40	4	Feb/76
6-40	5	Nov/80
6-40	6	Nov/75
6-40	7	Nov/75

CHAPTER/ SECTION	PAGE	DATE
6-40	8	Nov/81
6-40	9/10	Nov/81
6-41	1	Nov/75
6-41	2	Nov/75
6-41	3	Nov/75
6-41	4	Nov/75
6-41	5	Feb/77
6-41	6	Nov/75
6-42	1	Nov/75
6-42	2	Nov/75
6-42	3	Nov/75
6-42	4	Nov/75
Chapter-7		
Contents-7	1	Nov/84
Contents-7	2	Nov/84
Contents-7	3	Nov/84
Contents-7	4	Nov/84
Components		
Location-7	1/2	Nov/84
7-00	1	Nov/80
7-00	2	Nov/79
7-00	3/4	Feb/76
7-00	5/6	Feb/76
7-00	7	Nov/84
7-00	8	Nov/84
7-00	9	Nov/84
7-00	10	Feb/76
7-00	11	Oct/76
7-00	12	Nov/84
7-00	13	Nov/81
7-00	14	Nov/81
7-00	15	Nov/81
7-00	16	Nov/81
7-01	1	Feb/76
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7-02	1	Nov/75
7-02	2	Nov/75
7-10	1	Oct/83
7-10	2	Oct/83
7-10	3	Nov/80
7-10	4	Nov/80
7-10	5	Nov/80
7-10	6	Nov/80
7-10	7	Nov/80
7-10	8	Mar/81
7-10	9	Nov/80
7-10	10	Nov/80
7-10	10A	Nov/80
7-10	10B	Nov/80
7-10	11	Aug/97
7-10	12	Aug/97
7-10	13	Oct/83
7-10	14	Oct/83
7-11	1	Nov/80
7-11	2	Nov/80
7-11	3	Nov/80
7-12	1	Nov/81
7-12	2	Oct/83

CHAPTER/ SECTION	PAGE	DATE
7-12	3/4	Oct/83
7-13	1	Oct/76
7-13	2	Nov/84
7-14	1	Nov/84
7-14	2	Nov/84
7-14	3	Aug/97
7-14	4	Aug/97
7-14	5	Aug/97
7-14	6	Aug/97
7-14	7/8	Aug/97
7-20	1	Feb/76
7-20	2	Nov/75
7-20	3	Nov/75
7-20	4	Feb/76
7-20	5/6	Mar/81
7-21	1	Nov/77
7-21	2	Mar/81
7-21	3/4	Jun/81
7-22	1	Nov/80
7-22	2	Nov/75
7-23	1/2	Oct/76
7-30	1	Nov/84
7-30	2	Nov/75
7-30	3/4	Nov/84
7-31	1	Oct/82
7-31	2	Nov/75
7-32	1	Nov/75
7-32	2	Nov/79
7-32	3/4	Nov/75
7-40	1	Nov/84
7-40	2	Nov/84
7-40	3/4	Nov/84
7-40	5	Nov/75
7-40	6	Nov/84
7-40	7	Nov/84
7-40	8	Nov/80
7-40	9	Nov/75
7-40	10	Nov/84
7-41	1	Oct/82
7-41	2	Nov/75
7-41	3	Nov/84
7-41	4	Feb/76
7-42	1	Nov/84
7-42	2	Nov/84
7-42	3	Nov/84
7-42	4	Nov/84
7-42	5/6	Nov/84
7-43	1/2	Nov/84
7-44	1	Nov/75
7-44	2	Nov/75
7-50	1	Apr/85
7-50	2	Feb/76
7-50	3	May/78
7-50	4	May/78
7-50	5/6	May/78
7-51	1	Nov/81
7-51	2	Nov/81
7-51	3	Nov/81

CHAPTER/ SECTION	PAGE	DATE	CHAPTER/ SECTION	PAGE	DATE	CHAPTER/ SECTION	PAGE	DATE
7-51	4	Nov/81	8-20	1	Feb/77	9-31	1	Nov/75
7-60	1	Nov/84	8-20	2	Nov/75	9-31	2	Nov/75
7-60	2	Nov/84	8-20	3	Nov/75	9-40	1	Mar/80
7-60	3/4	Nov/84	8-20	4	Mar/81	9-40	2	Oct/76
7-61	1	Oct/82	8-20	5	Mar/84	9-40	3	Mar/79
7-61	2	Oct/82	8-20	6	Oct/98	9-40	4	Oct/76
7-61	3/4	Oct/82	8-20	7	Mar/81	9-50	1	Mar/81
7-70	1	Oct/76	8-20	8	Nov/80	9-50	2	Oct/83
7-70	2	Oct/76	8-20	9/10	Nov/80	Chapter-10		
7-70	3/4	Nov/75	Chapter-9			Contents-10	1/2	Nov/84
7-80	1	Oct/83	Contents-9	1	Apr/85	10-00	1	Nov/75
7-80	2	Nov/75	Contents-9	2	Nov/84	10-00	2	Nov/81
7-80	3/4	Nov/81	Components			10-00	3/4	Nov/75
7-90	1	Oct/98	Location-9	1/2	Nov/79	10-10	1	Mar/81
7-90	2	Feb/77	9-00	1	Jun/81	10-10	2	Jun/81
7-90	3	Feb/77	9-00	2	Nov/80	10-10	3	Nov/77
7-90	4	Oct/82	9-00	2A	Mar/81	10-10	4	Nov/77
7-90	5	Feb/77	9-00	2B	Oct/83	10-10	5	Mar/81
7-90	6	Feb/77	9-00	3	Nov/75	10-10	6	Mar/81
7-90	7	Feb/77	9-00	4	Mar/81	10-20	1	Oct/82
7-90	8	Feb/77	9-00	5	Oct/83	10-20	2	Oct/82
7-90	9/10	Feb/77	9-00	6	Jun/81	10-20	3	Oct/82
Chapter-8			9-00	7	Jun/81	10-20	4	Oct/82
Contents-8	1/2	Apr/85	9-00	8	Nov/80	10-20	5	Oct/82
Components			9-00	9	Oct/83	10-20	6	Nov/75
Location-8	1/2	Nov/78	9-00	10	Aug/97	10-20	7	Oct/82
8-00	1	Feb/76	9-00	11	Aug/97	10-20	8	Oct/82
8-00	2	Nov/75	9-00	12	Aug/97	10-20	9	Oct/82
8-00	3	Nov/75	9-00	12A/B	Aug/97	10-20	10	Oct/82
8-00	4	Nov/75	9-00	13	Aug/97	10-20	11	Oct/82
8-00	5	Aug/97	9-00	14	Oct/83	10-20	12	Oct/82
8-00	6	Aug/97	9-00	15	Oct/83	10-30	1	Feb/76
8-00	7	Nov/75	9-00	16	Oct/83	10-30	2	Nov/75
8-00	8	Aug/97	9-10	1	Oct/76	10-30	3	Nov/75
8-10	1	Nov/75	9-10	2	Nov/78	10-30	4	Nov/75
8-10	2	Aug/97	9-10	2A/B	Mar/80	10-30	5	Nov/75
8-10	3/4	Mar/80	9-10	3	Jun/81	10-30	6	Nov/75
8-11	1	Nov/75	9-10	4	Nov/81	10-30	7	Nov/75
8-11	2	Nov/75	9-10	5	Oct/82	10-30	8	Nov/75
8-11	3/4	Nov/75	9-10	6	Nov/84	10-30	9	Nov/75
8-12	1	Oct/76	9-10	7	Nov/84	10-30	10	Nov/75
8-12	2	Nov/75	9-10	8	Nov/84	10-30	11/12	Nov/75
8-12	3	Nov/75	9-10	9	Nov/84	10-40	1	Nov/75
8-12	4	Nov/75	9-10	10	Nov/84	10-40	2	Nov/75
8-13	1	Nov/79	9-10	11	Nov/84	10-40	3	Nov/75
8-13	2	Nov/79	9-10	12	Nov/84	10-40	4	Nov/75
8-13	3	Apr/85	9-10	13/14	Nov/84	Chapter-11		
8-13	4	Apr/85	9-20	1	Nov/79	Contents-11	1/2	Nov/84
8-13	5	Apr/85	9-20	2	Nov/80	Components		
8-13	6	Apr/85	9-20	3	Oct/76	Location-11	1/2	Nov/78
8-13	6A/B	Apr/85	9-20	4	Oct/76	11-00	1	Nov/80
8-13	7	Apr/85	9-20	5	Oct/76	11-00	2	Nov/78
8-13	8	Apr/85	9-20	6	Mar/80	11-00	2A/B	Nov/84
8-13	9	Apr/85	9-30	1	Apr/85	11-00	3	Nov/80
8-13	10	Apr/85	9-30	2	Nov/75	11-00	4	Oct/76
8-13	11	Apr/85	9-30	3	Apr/85	11-00	5	Nov/77
8-13	12	Apr/85	9-30	4	Apr/85	11-00	6	May/78
8-13	13/14	Apr/85	9-30	5/6	Apr/85	11-00	7	Nov/81

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11-00	8	Mar/84
11-00	9	Nov/84
11-00	10	Oct/76
11-00	11	Nov/84
11-00	12	Nov/84
11-00	13	Mar/84
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INTRODUCTION

1. **Foreword.**

A. This Service Manual contains factory recommended procedures for ground handling, servicing, and maintaining the Cessna 421 Series Airplane. Where there are specific differences, reference will be made to the individual airplane. This Service Manual also describes the Cessna 421 II which is the same as the Cessna 421 with some optional equipment installed as standard. Besides serving as a reference for the experienced mechanic, this Service Manual also covers step-by-step procedures for the less experienced mechanic. Read the procedures in the manual completely prior to attempting the job, then read it again as you accomplish the job. This Service Manual should be kept in a handy place for ready reference.

WARNING: **ALL INSPECTION INTERVALS, REPLACEMENT TIME LIMITS, OVERHAUL TIME LIMITS, THE METHOD OF INSPECTION, LIFE LIMITS, CYCLE LIMITS, ETC., RECOMMENDED BY CESSNA ARE SOLELY BASED ON THE USE OF NEW, REMANUFACTURED, OR OVERHAULED CESSNA APPROVED PARTS. IF PARTS ARE DESIGNED, MANUFACTURED, REMANUFACTURED, OVERHAULED, AND/OR APPROVED BY ENTITIES OTHER THAN CESSNA, THEN THE DATA IN CESSNA'S MAINTENANCE/SERVICE MANUALS AND PARTS CATALOGS ARE NO LONGER APPLICABLE AND THE PURCHASER IS WARNED NOT TO RELY ON SUCH DATA FOR NON-CESSNA PARTS. ALL INSPECTION INTERVALS REPLACEMENT TIME LIMITS, OVERHAUL TIME LIMITS, THE METHOD OF INSPECTION, LIFE LIMITS, CYCLE LIMITS, ETC., FOR SUCH NON-CESSNA PARTS MUST BE OBTAINED FROM THE MANUFACTURER AND/OR SELLER OF SUCH NON-CESSNA PARTS.**

B. The information in this Service Manual is based on data available at the time of publication and is supplemented, and kept current by service letters and service news letters published by Cessna Airplane Company. These are sent to all Cessna Service Stations so that they have the latest authoritative recommendations for servicing Cessna airplanes. Therefore, it is recommended that Cessna owners utilize the knowledge and experience of the factory trained Service Station Organization.

C. Inspection, maintenance and parts required for supplement type certificate (STC) installations are not included in this manual. When an STC installation is incorporated on the airplane, those portions of the airplane affected by the installation must be inspected in accordance with the inspection program published by the owner of the STC since STC installations may change systems interface, operating characteristics and component loads or stresses on adjacent structures. Cessna provided inspection criteria may not be valid for airplanes with STC installations.

D. In addition to the information in this Service Manual, a group of supplier publications are available from the Cessna Customer Service Department. These manuals describe complete disassembly, overhaul and parts breakdown of some of the various supplier equipment items. A listing of the available publications is issued periodically in Service Letters.

E. This Service Manual covers the following airplanes:

MODEL	YEAR	SERIAL NUMBER BEGINNING		ENDING
421C	1976	C0001	Thru	C0200
421C	1977	C0201	Thru	C0400
421C	1978	C0401	Thru	C0600
421C	1979	C0601	Thru	C0800
421C	1980	C0801	Thru	C1000
421C	1981	C1001	Thru	C1200
421C	1982	C1201	Thru	C1400
421C	1984	C1401	Thru	C1800
421C	1985	C1801		

2. **List of Effective Pages.**

A. A list of effective pages is provided in the front of the manual. All pages in the manual are listed in sequence on the effectivity pages with the most recent revision date for each page. A revised list of effectivity pages is provided for each regular service manual revision.

3. **Aerofiche (Microfiche).**

A. This Service Manual is designed for aerofiche presentation. To facilitate the use of the aerofiche index, aerofiche fiche/frame number have been added to the Table of Contents and at the bottom center of each page. Refer to the header of the applicable fiche/frame for location of various indexing information.

4. **Change Symbols.**

A. Additions, or revisions to text in an existing section will be identified by a revision bar on the page adjacent to the change.
B. When technical changes cause unchanged text to appear on a different page/pages, a revision bar will be placed in the margin opposite the page number of all affected pages providing no other revision bar appears on the page.
C. When extensive technical changes are made to text in an existing section that requires a complete retype of copy, revision bars will appear the full length of the page.
D. From Revision 22 and ON, art in an existing illustration that is revised will have a revision bar appear adjacent to the figure title and figure number on the illustration and will indicate the area of the art revised.
E. New art added to an existing section will be identified by a revision bar and will appear the full length of the illustration and adjacent to the figure title and figure number.
F. Revision bars are not shown for:
1. Introductory material, indexes and tabular data.
2. Blank spaces which are the result of text, illustration or table deletion.
3. Correction of minor inaccuracies, such as punctuation, etc., unless such a correction changes the meaning of instructive information and procedures.

Further, this publication is also kept current in the following two ways:

1. **Revisions/Changes** - These are issued for this publication as required, and include only pages that require updating.

2. **Reissue** - Manual is reissued to dealers as required, and is a complete manual incorporating all the latest information and outstanding revisions/changes. It supersedes and replaces previous issue (s).

Revisions/Changes and Reissues - These can be purchased from your Cessna Service Station or directly from the Cessna Parts Distribution, Department 701, CPD 2, Cessna Aircraft Company, 5800 East Pawnee Road, Wichita, Kansas 67218-5590.

All supplemental service information concerning this manual is supplied too all appropriate Cessna Service Stations so that they have the latest authoritative recommendations for servicing these Cessna airplanes. Therefore, it is recommended that Cessna owners utilize the knowledge and experience of the factory trained Service Station Organization.

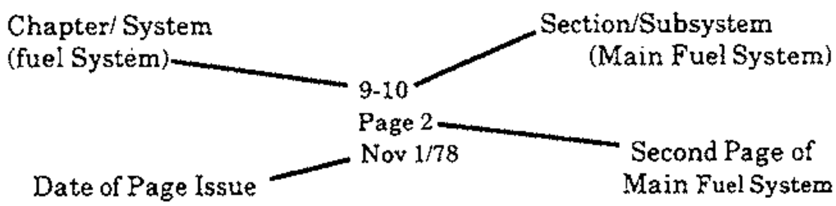
CUSTOMER CARE SUPPLIES AND PUBLICATIONS CATALOG

A Customer Care Supplies and Publications Catalog is available from your Cessna Service Station or directly from the Cessna Parts Distribution, Department 701, CPD 2, Cessna Aircraft Company, 5800 East Pawnee Road, Wichita, Kansas 67218-5590. This catalog lists all publications and Customer Care Supplies available from Cessna for prior year models as well as new products.

CUSTOMER COMMENTS ON MANUAL

Cessna Aircraft Company has endeavored to furnish you with an accurate, useful, up to date manual. This manual can be improved with your help. Please use the Customer Comment Card, provided with your manual, to report any errors, discrepancies, and omissions in this manual as well as any general comments you wish to make.

5. **A Typical Page Number.**



SERVICE LETTERS

REFERENCE DATA	ISSUE DATE	TITLE	INCORPORATION DATE
ME77-34	13 Mar 78	Trim Control System	May 78
ME78-25	24 July 78	Hydraulic Flow Switch (V9F-37) Leakage	Nov 78
ME78-24	24 July 78	Improved Tail Drainage 400 Series Airplane	Nov 78
ME78-28	7 Aug 78	Main Landing Gear Trunnion Inspection	Nov 79
ME79-11	19 Mar 79	Main Landing Gear Trunnion Replacement Program	Nov 79

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REFERENCE DATA	ISSUE DATE	TITLE	INCORPORATION DATE
AV79-17	5 Apr 79	NAV 1/NAV 2 Indicator Clamps	Nov 79
SP79-3M	6 Apr 79	8001 FCS Flight Director Indicator Connector Diode Installation	Nov 79
ME79-12	19 Mar 79	Hydraulic Powered Air Conditioner Pressures	Nov 79
ME79-40	4 Dec 79	Troubleshooting for Vibration	Mar 80
ME79-42	4 Dec 79	Oxygen Hose Assembly Inspection	Mar 80
ME80-10	24 Mar 80	100 Amp Teledyne Crittenden Alternator Inspection	Nov 80
ME80-15	18 Apr 80	Heated Windshield Static Discharge	Nov 80
ME80-19	9 May 80	Improved 421 Wastegates	Nov 80
ME80-41	5 Sep 80	Main Gear Actuator Orifice Replacement	Nov 80
ME80-45	26 Sep 80	Improved Routing of Engine Control Cable	Jun 81
ME80-50	26 Nov 80	New Engine Priming System	Mar 81

SERVICE KITS

REFERENCE DATA	ISSUE DATE	TITLE	INCORPORATION DATE
SK310-32B	26 Sep 78	Oxygen Refill Kit (Less Bottles)	Mar 79
SK421-76B	6 July 78	Locator Beacon Replacement Modification Kit	Nov 78
SK421-81	3 May 78	Electric Windshield	Nov 78
SK421-83	28 July 78	Nose Gear Actuator Anchor Lug Replacement	Aug 78
SK421-84	13 Nov 78	RT485A Receiver/Transmitter Cooling Fan Installation	Mar 79
SK421-91	7 May 78	Electric Windshield	Nov 79
SK421-92	19 Mar 81	Alternator Installation (100 AMP Teledyne Crittenden)	Oct 82
SK421-93A	20 Feb 79	Main Landing Gear Trunnion and Upper Barrel Assembly Replacement	Nov 79
SK421-96	4 Jun 79	Upper Cabin Door Extender Modification	Nov 79
SK421-97	10 Sep 79	Engine Breather Line Rerouting	Nov 79
SK421-102	13 Mar 80	Aileron Yoke Mount Modification	Nov 80
SK421-104	30 Jan 81	Propeller Deice Cable Improvements	Jun 81
SK421-105	2 July 82	Main Landing Gear Wheel Well Lower Skin Gusset Installation (Not Applicable)	Oct 82
SK421-106	11 Jun 82	Lower Cabin Door Extender Modification	Oct 82
SK421-107	30 Oct 81	Landing Gear Emergency Blowdown Clamp Installation	Oct 82

LIST OF PUBLICATIONS

Manual Nomenclature	Suppliers Part No./ Type No.	Manual Number	Manufacturer
DEICE SYSTEM			
B.F. Goodrich Deice Components Maintenance and Overhaul Instructions	3D2363	BF80/81-36-13AF	B.F. Goodrich

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Manual Nomenclature	Suppliers Part No./ Type No.	Manual Number	Manufacturer
ELECTRICAL			
Battery Service Manual	R2425	PRB8-13	Prestolite
D.C. Generation		D5230-1-13	Cessna
Landing Light Overhaul/Parts Manual	45-0515-1	33-40-84	Grimes
Landing Light Overhaul/Parts Manual	45-0148-9 45-0148-10	45-0148-1-13	Grimes
Strobe Light/Power Supply Overhaul/Parts Manual	60-2798-1	60-2798-1-13	Grimes
ENGINE			
Airplane Turbochargers, Valves and Controllers, Illustrated Parts Catalog		TP30-4001	Garrett AiResearch
Airplane Turbochargers, Valves and Controllers, Overhaul Manual		TP20-0120	Garrett AiResearch
Alternator Service Instructions	7CA7601	X30531-1-13	Teledyne Continental
Magneto Overhaul Instructions	S-200 Searies	L645-1-13	Bendix
Maintenance and Overhaul	GTSI0-520	X30045-13	Teledyne Continental
Parts Catalog	GTSI0-520	X30046A-13	Teledyne Continental
Spark Plug Service		AV6-13	Champion
ENVIRONMENTAL SYSTEMS			
Air Conditioning System Service Parts Manual		D5213-13	Cessna
Air Conditioning Blower Motor		6305	General Design, Inc.
Heater and Components Service Parts Manual		15E31-1-13	Janitrol
Heater and Components Service Parts Manual	81D94-3	D5428-13	Cessna
DC Motor Maintenance Manual with Illustrated Parts List	9910155-1	6305-13AF	General Design, Inc.
Gear Pump Components Maintenance Manual with Illustrated Parts List	24343RAB	24343-RAB-13	Cessna
Piston Motor Components Maintenance Manual with Illustrated Parts List	74118LAA	74118-LAA-13	Cessna
Piston Motor Components Maintenance Manual with Illustrated Parts List	74118LAB	74118-LAB-13	Cessna

LIST OF PUBLICATIONS

Manual Nomenclature	Suppliers Part No./ Type No.	Manual Number	Manufacturer
ENVIRONMENTAL SYSTEMS (Continued)			
Cabin Pressure Control System	140400	4258-13	Garrett AiResearch
Cabin Pressure Control System		4259-13 4.2 PSI	Garrett AiResearch
Cabin Pressure Control		4265-13	Garrett AiResearch
Cabin Pressure Control System	140463	4266-13	Garrett AiResearch
FUEL SYSTEM			
Auxiliary Fuel Pump Overhaul Manual	9910202-1	M10030-13	Weldon
Auxiliary Fuel Pump Overhaul Manual	9910202-2	M10032-13	Weldon
Auxiliary Fuel Pump Service and Repair	9910202-3	A2104-13	Airborne
Valve Assembly Overhaul Manual	74D8/81A	74D8/81A-13	Auto-Valve Inc.
GENERAL			
Accessory Kit Catalog		D5255-13	Cessna
Parts Catalog		P544-12	Cessna
Service Manual		D2515-13	Cessna
Special Tools and Support Equipment		D5435-13	Cessna
HYDRAULIC SYSTEMS			
Hydraulic Manifold Assy Overhaul Manual with Parts List	9910188	52020	Sterer
Hydraulic Manifold Assy Overhaul Manual with Parts List	9910188-3	52020-2-13	Sterer
24100 Series Pump Service Instruction	9910137-1	24194-RAA-13	Cessna
Overhaul Instruction for Master Brake Cylinders	A049-6		Gerdes Products Co.

Manual Nomenclature	Suppliers Part No./ Type No.	Manual Number	Manufacturer
LANDING GEAR AND FLAPS			
NoseGear Actuator Overhaul Manual	9910139-3	3798TM01-13	Western Hydraulic
NoseGear Actuator Overhaul Manual	9910139-3	32-31-01-13	Teijin-Seiki
	9910139-3	57142-EAA-13	Cessna
Main Gear Actuator Overhaul Manual	9910136-3	3990TM01-13	Western Hydraulic
Main Gear Actuator Overhaul Manual	9910136-3	32-32-01-13	Teijin-Seiki
	9910136-3	57213-LAA-13	Cessna
	9910136-4	32-30-01-13	Teijin-Seiki
	9910136-5	32-30-01-13	Teijin-Seiki
	9910136-6	57213-LAB-13	Cessna
	9910136-7	57213-LAC-13	Cessna
Maintenance Manual for Emergency Blow Down Bottle	9910154-2	900297-4-13	Futurecraft
System Components Manual		D5266-13	Cessna
PROPELLER			
Full Feathering Constant Speed Propeller Governing System (Basic Principals)		MPC4-13	McCauley
Governor and Accumulators Overhaul Parts Manual		750320-13	McCauley
Propeller Parts Manual	3AF32C Series	710930-1-13	McCauley
Propeller Service Manual	C500 Series	810915-13	McCauley
Synchrophaser Control Box	B28000	791005	McCauley
Synchrophaser Governors	DCF-S290D9/T Series	780401	McCauley
WATER AND WASTE DISPOSAL SYSTEM			
Airplane Toilet Illustrated Parts List	15500-001	PL No. 135	Monogram Industrial

SUPPLEMENTAL INSPECTION DOCUMENT (SID)

MODEL 421C

GOLDEN EAGLE

1976 THRU 1985

THE MODEL 421C SUPPLEMENTAL INSPECTION DOCUMENT
IS VALID FOR MODEL 421C AIRPLANES
WITH LESS THAN 40,000 FLIGHT HOURS

06 January 2003

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LIST OF EFFECTIVE PAGES

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	57-10-19	1 Thru 4	Jan 6/2003
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	57-10-22	1 Thru 5	Jan 6/2003

RECORD OF REVISIONS

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(Continued)

SECTION III SUPPLEMENTAL DOCUMENT INSPECTIONS
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SECTION IV INSPECTION METHODS AND REQUIREMENTS
(Continued) .... PAGE

SECTION IV INSPECTION METHODS AND REQUIREMENTS
(Continued) .... **PAGE**

1. APPLICABILITY

MODEL	YEAR	SERIAL
421C	1976 Thru 1985	421C0001Thru 421C1807

THE MODEL 421C SUPPLEMENTAL INSPECTION DOCUMENT IS VALID FOR MODEL 421C AIRPLANES WITH LESS THAN 40,000 FLIGHT HOURS

INTRODUCTION

1. DISCUSSION

A. Introduction

(1) The Supplemental Structural Inspection Program for the Cessna Model 421C airplane is based on Model 421C series current airplane usage and state-of-the-art analysis, testing and inspection methods. Analysis methods include durability, fatigue and damage tolerance assessments. A practical state-of-the-art inspection program is established for each Principal Structural Element (PSE), where:

A PSE is that structure whose failure, if it remained undetected, could lead to the loss of the airplane. Selection of a PSE is influenced by the susceptibility of a structural area, part or element to fatigue, corrosion, stress corrosion, or accidental damage.

(2) The inspection program consists of the current structural maintenance inspection, plus supplemental inspections, as required for continued airworthiness of the airplane as years of service are accumulated. The current inspection program is considered to be adequate in detecting corrosion and accidental damage. The emphasis of the Supplemental Structural Inspection Program is to detect fatigue damage whose probability increases with time.

(3) The Supplemental Structural Inspection Program was developed through the combined efforts of Cessna Aircraft Company, Model 400 series operators, and the FAA. This program is valid for Model 421C airplanes with less than 40,000 flight hours. Contact Cessna Aircraft Company, Propeller Aircraft Product Support for additional inspection information regarding airplanes exceeding 40,000 flight hours.

B. History

(1) The first Cessna Model 421 was produced in 1967. The basic version of the Model 421 was produced through 1975 as the M421, M421A and M421B. In 1976, the Cessna Model 421C was introduced. The Model 421C has a new wing design and new engines and operates at a higher gross weight. Over 2000 Model 421 through 421C airplanes were produced.

C. Objective

(1) The objective of the Supplemental Structural Inspection Program is the detection of damage due to fatigue, overload or corrosion through the practical use of Nondestructive Inspection (NDI), as well as visual inspections. This Supplemental Inspection Document (SID) addresses primary and secondary airframe components only. Engine, electrical items and primary and secondary systems are not included in this document. The following assumptions have been made to establish the basis for these items.

- The airplane has been maintained in accordance with Cessna recommendations or equivalent.
- Where the SID is directed to a specific part or component, it is implied that the inspection will include observation and evaluation of the surrounding area of parts and equipment. Any discrepancies found during this inspection outside the scope of the SID should be reported to Cessna Aircraft Company through the existing condition reporting system, so that changes can be made to the SID where necessary.
- The inspections presented in the SID apply to all Cessna Model 421C airplanes. The inspection intervals presented are for unmodified airplanes, and represent the maximum allowable inspection times. Airplanes that have been modified to alter the airplane design, gross weight or airplane performance may need to be inspected more frequently. Examples of common STCs, which will require modified inspection intervals include non-Cessna wing spar straps, vortex generators, winglets and non standard engines. The owner and/or maintenance organization should contact the STC holder(s) or modification originator for obtaining new FAA approved inspection criteria.

2. PRINCIPAL STRUCTURAL ELEMENTS

A. Rationale Used to Select Principal Structural Elements

(1) An airplane component is classified as a Principal Structural Element (PSE) if the component contributes significantly to carrying flight and ground loads, and if failure of the component could result in catastrophic failure of the airframe. The monitoring of these PSE's is the main focus of this Supplemental Structural Inspection Program. Typical examples of PSEs, taken from FAA Advisory Circular 25.571 are the following:

Table 1.
Typical Examples Of Principal Structural Elements (PSE's)

WING AND EMPENNAGE

- Control surfaces, flaps, associated mechanical systems and attachments (hinges, tracks, and fittings).
- Primary fittings
- Principal splices
- Skin or reinforcement around cutouts or discontinuities
- Skin-stringer combinations
- Spar caps
- Spar webs

FUSELAGE

- Circumferential frames and adjacent skin
- Door Frames
- Pilot window posts
- Bulkheads
- Skin and skin frame or stiffener element around cutout
- Skin and or skin splices, under circumferential loads
- Skin or skin splices, under fore and aft loads
- Skin around a cutout
- Skin and stiffener combinations under fore-and-aft loads
- Door skins, frames and latches
- Window frames

LANDING GEAR AND LANDING GEAR ATTACHMENTS

ENGINE SUPPORT STRUCTURE AND ENGINE MOUNTS

B. **Selection Criteria**

(1) The factors used in determining the PSE's in this document include:

(a) SERVICE EXPERIENCE

1 Three sources of information were used to determine service discrepancies.

a Service experience data was collected from Model 400 series operators. Surveys were conducted which asked the operators to describe any major structural repairs made to their airplanes.

b Cessna Service Bulletins and Service Information Letters issued to repair common service discrepancies were reviewed.

c FAA Service Difficulty Records covering a time period from the mid 1970's to December 1995 were reviewed.

2 The data collected was also used to determine a component's susceptibility to corrosion or accidental damage as well as its inspectability.

(b) STRESS ANALYSIS

1 Mathematical models were developed for the airframe and airframe components. Models were developed for the wing and carry-thru, flap, aileron, engine beam, fuselage, horizontal stabilizer, elevator, vertical stabilizer, rudder, and both nose and main landing gears. These models were reviewed to identify components that exhibit the potential for additional inspection requirements.

(c) FATIGUE AND DAMAGE TOLERANCE ANALYSIS

1 Fatigue and damage tolerance analyses were conducted for the critical areas of the PSE's. Details of these analyses are presented in Section 3, Durability - Fatigue And Damage Tolerance.

(d) TESTING

1 New static tests for similar Model 400 series airframe components were conducted to verify the mathematical models which were developed. Test results from previously conducted static tests and fatigue cyclic tests were also reviewed to identify the critical areas of the PSE's. These test results were considered applicable to the Model 421C.

(e) INSPECTION OF AIRCRAFT

1 A high-time Model 400 series airplane was purchased from a customer for disassembly and inspection in 1988. The airplane had over 20,000 flight hours and 60,000 landings. Locations where cracking was discovered during disassembly are included as inspection locations.

3. DURABILITY - FATIGUE AND DAMAGE TOLERANCE

A. **Airplane Usage**

(1) Airplane usage data for the SID program is based on the evaluation of the in-service utilization of the airplane and published data. This information was used to develop the representative fatigue loads spectra.

(2) Usage for spectra determination is defined in terms of flights representing typical average in-service utilization of the airplane. This usage, in terms of flights, reflects the typical in-service flight variation of flight length, takeoff gross weight, payload and fuel.

(3) Each flight is defined in detail in terms of a flight profile. The profile identifies the gross weight, payload, fuel, altitude, speed, distance, etc., required to define the pertinent flight and ground parameters needed to develop the fatigue loads. The flight is then divided into operational segments, where each segment represents the average values of the parameters (speed, payload, fuel, etc.) that are used to calculate the loads spectrum.

B. **Stress Spectrum**

(1) A fatigue loads spectrum, in terms of gross area stress, was developed for each PSE to be analyzed based on the usage-flight profile. The spectrum represents the following loading environments: flight loads (gust and maneuver), landing impact, balancing tail loads, thrust loads, ground loads (taxi, turning, landing, braking, pivoting, etc.), and ground-air-ground cycles. The resulting spectrum is a representative flight-by-flight, cycle-by-cycle random loading sequence that reflects the appropriate and significant airplane response characteristics. After reviewing the aircraft usage data and the way in which the surveyed aircraft were flown, stress spectra was developed for the flight profile, as described in Section 3.C. Description of the Flight Profiles.

C. **Description of the Flight Profiles**

(1) A typical usage profile consisting of six individual flights was created. The flight length distribution was derived from Cessna fleet utilization data which represents actual aircraft usage as obtained from pilot logs and general aviation survey data published by the Federal Aviation Administration. The six flight profiles are used with flight times varying from 9.6 minutes to 205.2 minutes and cruising altitudes of 3000 through 25,000 feet. The mean flight length for the six flights was adjusted to 66 minutes based on FAA recommendations in FAA publication AFS-120-73-2.

D. **Damage Tolerance and Fatigue Assessments**

(1) The damage tolerance and fatigue assessments provide the basis for establishing inspection frequency requirements for each PSE. The evaluation includes a determination of the probable location and modes of damage and is based on analytical results, available test data and service experience. The evaluation includes classical fatigue analyses, the determination of the crack growth time history and residual strength. Linear elastic fracture mechanics are used to perform the damage tolerance analysis, while fatigue analyses were based on the 'Palmgren-Miner' linear cumulative damage theory.

(2) In the analysis, particular attention is given to potential structural condition areas associated with aging airplanes. Examples include:

(a) Large areas of structure working at the same stress level, which could develop widespread fatigue damage.

(b) A number of small (less than detectable size) adjacent cracks suddenly joining into a long crack (e.g., as in a line of rivet holes).

(c) Redistribution of load from adjacent failing or failed parts causing accelerated damage of nearby parts (i.e., the "domino" effect).

(d) Concurrent failure of multiple load path structure (e.g., crack arrest structure).

(3) Initial inspections of a particular area of structure are based on both crack growth and fatigue analytical results. For structures which were proven to be fail-safe, the initial inspections were based on fatigue life. For locations with long fatigue lives, the maximum initial inspection was limited to 15,000 flight hours. Structure which was proven to be fail-safe included the Model 421C wing, fuselage and empennage.

(4) The Model 421C engine beams were not fail-safe tested. For these locations, initial inspections of a particular area of structure were based on crack growth. The crack growth for each PSE is calculated from the initial crack size c_o to crack length at instability/failure, c_{crit}, due to limit load. The crack growth history is represented in terms of crack length versus time in flight hours. Refer to Figure 1.

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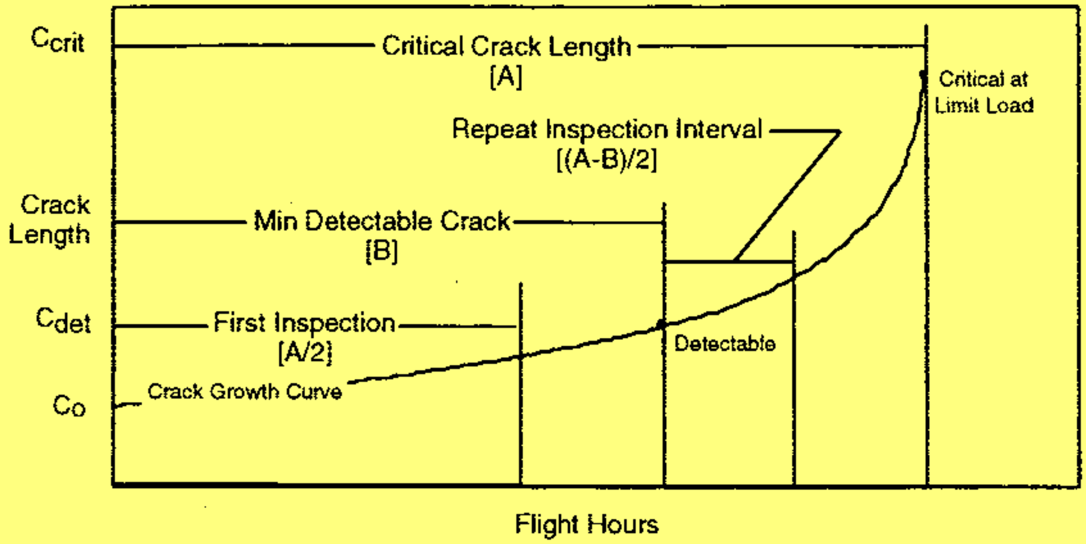


Typical Crack Growth Curve
Figure 1

4. REPORTING - COMMUNICATIONS

For the SID to be successful on a continuing basis, it is essential that a free flow of information exist between the operator, FAA and Cessna. The significant details of inspection results, repairs and modifications accomplished must be communicated to Cessna in order to assess the effectiveness of the recommended inspection procedures and inspection intervals.

Additionally, items not previously considered for inclusion in the SID may be uncovered through operator inspections and reporting. These items will be evaluated by Cessna and, if applicable generally to the airplane configurations concerned, will be added to the SID for the benefit of all operators.

A reporting system has been established with the Propeller Aircraft Product Support of Cessna Aircraft Company and the appropriate forms have been incorporated into this document. Copies of these forms are available from a Cessna Service Station or Cessna Field Service Engineer.

A. **Discrepancy Reporting**

(1) Discrepancy reporting is essential to provide for adjusting the inspection thresholds and the repeat times as well as adding or deleting PSE's. It may be possible to improve the inspection methods, repairs, and modifications involving the PSE's based on the data reported.

(2) All cracks, multiple sheared fasteners, and corrosion found during the inspection shall be reported to Cessna Aircraft Company within ten days. The PSE inspection results are to be reported on a form as shown on the following pages.

B. **Discrepancy Form Disposition**

(1) Send all available data including forms, repairs, photographs, sketches, etc., to:

Cessna Aircraft Company
Attn. SID Program
Technical Support Services
Dept. 751
Wichita, Kansas USA 67277
Fax: 316-942-9006

NOTE: This system does not supersede the normal channels of communication for items not covered by the SID.

C. **Cessna Follow-up Action**

(1) All SID reports will be reviewed to determine if any of the following actions should be taken.

(a) Check the effect on structural or operational integrity.
(b) Check other high-time airplanes to see if a service bulletin should be issued.
(c) See if a reinforcement is required.
(d) Revise the SID if required.

5. INSPECTION METHODS

A very important part of the SID program is selecting and evaluating state-of-the-art nondestructive inspection (NDI) methods applicable to each PSE, and determining a minimum detectable crack length, c_{det}, for each NDI method. The minimum detectable crack length is used in conjunction with the critical crack length, c_{crit}, to define the life interval for the crack to grow from c_{det} to c_{crit} as: (Life @ c_{crit} - Life @ c_{det})/2. This interval is used to define the repeat inspection frequency for the SID program's required inspections. The initial inspection occurs at Life @ c_{crit}/2. For a given NDI method and PSE, c_{det} corresponds to a crack size with a 90% probability of detection. An example of initial and repeat inspection interval determination is shown in Figure 1. For fail-safe structure, the initial inspection requirements were based on fatigue analyses.

Potential NDI methods were selected and evaluated on the basis of crack orientation, location, c_{crit}, part thickness and accessibility. Inspection reliability depends on size of the inspection task, human factors (such as qualifications of the inspector), equipment reliability and physical access. Visual, radiographic, liquid penetrant, eddy current and magnetic particle methods are used. A complete description of each of these methods is presented in SECTION IV - INSPECTION METHODS AND REQUIREMENTS.

6. RELATED DOCUMENTS

A. **Existing Inspections, Modifications, and Repair Documents**

(1) Cessna has a number of documents that are useful to maintaining continued airworthiness of airplanes.

(a) Cessna 400 Series Service/Maintenance Manuals
(b) Cessna 400 Series Illustrated Parts Catalogs
(c) Cessna Multi-engine Service Information Letters and Service Bulletin Summaries
(d) Cessna Service Newsletter and Newsletter Summaries

(2) For information regarding these documents, contact:

Cessna Aircraft Company
Attn. Dept. 751
P.O. Box 7706
Wichita, Kansas USA 67277
Phone: 316-517-5800
Fax: 316-942-9006

(3) Modifications accomplished under STC's by other organizations are not addressed in this SID. Refer to Section 7, Applicability/Limitations.

B. **Service Information Letters/Bulletins Affected by SID**

(1) As an aid to the operator, a listing of the Service Information Letters/Bulletins pertaining to the SID are listed in SECTION I - TECHNICAL DOCUMENT REFERENCE. For information concerning the technical data included in these Service Information Letters/Bulletins that apply to a specific airplane, contact Cessna Technical Information Services, Department 753. A Service Bulletin Listing Program which provides a list of all Cessna Service Information Letters, Service Bulletins and Service Newsletters applicable to a particular airplane model and serial number is also available from Cessna. This service is obtained by calling 316-517-5800/FAX 316-942-9006.

7. APPLICABILITY/LIMITATIONS

This SID is applicable to the Cessna Model 421C0001 through 421C1807.

There are modifications available for Cessna Model 421C airplanes that were accomplished under STC's by other organizations without Cessna Engineering involvement. The inspection intervals presented in this SID are for unmodified airplanes, and represent the maximum allowable inspection times. Airplanes that have been modified to alter the airplane design, gross weight or airplane performance may need to be inspected more frequently. Examples of common STCs not covered by this SID document include non-Cessna wing spar straps, vortex generators, winglets, and non-standard engines. The owner and/or maintenance organization should contact the STC holder(s) or modification originator for obtaining new FAA-approved inspection criteria.

The SID inspection times are based on total airframe hours/landings or calendar time in service. If a specific airframe component has been replaced, the component is to be inspected based on total component hours/landings or calendar time requirements. However, any attachment structure that was not replaced when the component was replaced must be inspected based on the total airframe hour/landings or calendar time requirements.

8. PSE DETAILS

This section contains the significant details selected by the rationale process described in Section 2, Principal Structural Elements. These items are considered significant to maintain continued airworthiness of the Cessna 421C series models. Service Information Letters and Service Bulletins pertaining to the PSE's are listed in SECTION I - TECHNICAL DOCUMENT REFERENCE.

A summary of the PSE's is presented in the SECTION II - LISTING OF SUPPLEMENTAL INSPECTIONS. This can be used as a checklist by the operators. A summary of inspections by flight hours and calendar time is also given.

A. PSE Data Sheets

(1) A data sheet for each PSE is provided in SECTION III - SUPPLEMENTAL INSPECTION DOCUMENTS. Each data sheet contains the following:
- (a) Supplemental Inspection Number
- (b) Title
- (c) Effectivity
- (d) Inspection Compliance
- (e) Initial Inspection Interval(s)
- (f) Repeat Inspection Interval(s)
- (g) Purpose
- (h) Inspection Instructions
- (i) Access/Location
- (j) Detectable Crack Size
- (k) Inspection Method
- (l) Repair/Modification
- (m) Comments

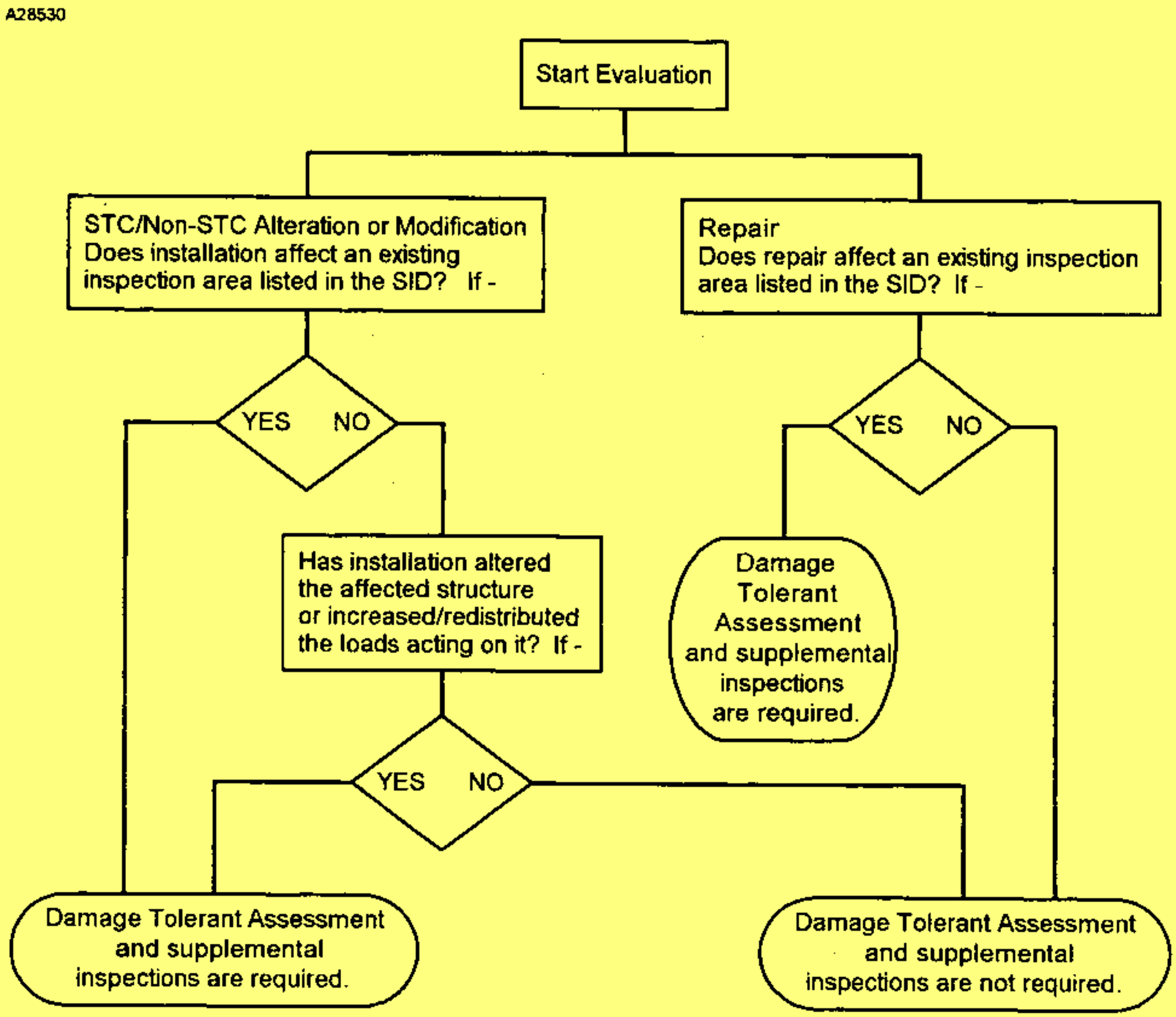
NOTE: The entry N/A under item (j) (Detectable Crack Size) means that no cracks are allowed in the PSE. Where both hour and calendar time are listed in items (e) and (f), inspection shall occur at whichever comes first.

NOTE: Accomplishment of SID inspections does not in any way replace preflight inspections, good maintenance practices or maintenance and inspections specified in the appropriate service manual.

B. Repairs, Alterations and Modifications (RAM)

(1) Repairs, alterations and modifications (RAM) made to PSEs may affect the inspection times and methods presented in the SID. The flowchart in Figure 2 can be used to determine if a new damage tolerance assessment and FAA approved supplemental inspection criteria are required.

(2) Repairs not covered by the recommendations in this SID document may be coordinated with Cessna Propeller Aircraft Product Support at telephone 316-517-5800/FAX 316-942-9006. Since January 2003, repairs provided by Cessna Aircraft Company meet the damage tolerant assessment requirements.



Damage Tolerance Assessment Flowchart
Figure 2 (Sheet 1)

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DISCREPANCY REPORT

SID NO: ______ AIRPLANE LOCATION: ______________________ S/N OF AIRPLANE: __________

INSPECTION CONDUCTED: Date ________ Airplane Total Hours __________ Cycles ____________

Component Total Hours ________ Cycles ____________

OWNER NAME ____________________________ OWNER PHONE NUMBER ______________

OWNER ADDRESS ____

SERVICE HISTORY:

____

____

____

INSPECTION METHOD/LIMITS:

____

____

____

ACCESS REQUIRED:

____

____

____

REPAIR DESCRIPTION:

____

____

____

COMMENTS:

____

____

____

Enclose all available data including photos, sketches, etc., to:

Cessna Aircraft Company
Attn: SID Program
Technical Support Services
Dept. 751
P.O. Box 7706
Wichita, Kansas USA 67277
FAX 316-942-9006

SECTION I TECHNICAL DOCUMENT REFERENCE

1. SERVICE/MAINTENANCE MANUALS

Aircraft	Number	Title
Model 421C	D2515-23-13	Service Manual

To obtain a Service Manual, Service Information Letter or Service Bulletin, contact:
Cessna Aircraft Company
Dept. 751C
P.O. Box 7706
Wichita, Kansas USA 67277
Telephone: 316-517-5800
Fax 316-942-9006

2. SERVICE INFORMATION LETTERS/SERVICE BULLETINS

Number	Title	Date	Reference SID Number
MEB88-5R2	Nose Gear Trunnion Inspection And Replacement	10/02/00	32-30-07 32-30-08
MEB89-2R1	Main Gear Torque Link Collar Inspection And Repair	11/02/90	32-30-04
MEB91-11	Nose Landing Gear Drag Brace Inspection/Replacement	12-13-91	32-20-00
MEB95-11R1	Bonded Wing Inspection and Sealing	06/21/96	57-10-21
MEB00-7	Lower Wing Spars and Skin Inspection	12/26/00	57-10-23

Section III assumes that the following Service Bulletins/Service Kits have been accomplished.

Number	Title
ME76-24	Lower Wing Skin Doubler Installation (Effectivity 421C0001 Thru 421C0210)
ME77-5	Windshield Inspection (Effectivity 421C0001 Thru 421C0272)
ME79-11	Main Landing Gear Trunnion Replacement Program (Effectivity 421C0001 Thru 421C0638)
ME80-38	Aft Auxiliary Wing Spar Attachment (Effectivity 421C0801 Thru 421C0886)
ME81-22	Lower Cabin Door Hinge Support Improvement (Effectivity 421C0801 Thru 421C1023)
ME83-33R2	Pilot and Co-Pilot Windshield Attach Hole Inspection (Effectivity 421C0273 Thru 421C1257)

Number	Title
ME84-10R1	Nose Gear Actuator Rod End Replacement (Effectivity 421C0001 Thru 421C1401)
ME84-12R1	Front Carry Thru Spar Web Inspection (Effectivity 421C0001 Thru 421C1412)
MEB85-11R4	Main Gear Forward Trunnion Support Inspection (Effectivity 421C0001 Thru 421C0715)
MEB87-4	Escape Hatch and Cabin Window Retainer Installation (Effectivity 421C0001 Thru 421C1807)
MEB91-7R1	Wing Front Spar Upper Cap Inspection (Effectivity 421C0801 Thru 421C1807)
MEB98-11	Lower Cabin Door Hinge Replacement (Effectivity 421C0001 Thru 421C1807)
MEB00-4	Rudder Hinge Bearing Inspection/Replacement (Effectivity 421C0001 Thru 421C1807)
SK421-121A	Actuator Rod End Replacement - Nose Landing Gear (Effectivity 421C0001 Thru 421C1401)

SECTION II - LISTING OF SUPPLEMENTAL INSPECTIONS

1. SUPPLEMENTAL INSPECTIONS

Supplemental Inspection Number	Inspection Compliance Title	Effectivity	Initial	Repeat
27-10-05	Aileron Hinges and Fittings	421C0001 Thru 421C1807	15,000 Hours or 20 Years	2500 Hours or 5 Years
27-20-03	Rudder Structure	421C0001 Thru 421C1807	7500 Hours or 15 Years	2500 Hours or 5 Years
27-20-04	Rudder Torque Tube	421C0001 Thru 421C1807	7500 Hours or 15 Years	2500 Hours or 5 Years
27-30-01	Elevator Torque Tube Assembly	421C0001 Thru 421C1807	5000 Hours or 10 Years	1000 Hours or 3 Years
32-10-04	Main Gear Actuator Collar	421C0001 Thru 421C0800	12,500 Landings or 20 Years	2500 Landings or 5 Years
32-20-00	Nose Gear Drag Brace	421C0001 Thru 421C1807	5000 Landings or 10 Years	500 Landings or 3 Years
32-20-01	Nose Gear Attachment and Wheel Well Structure	421C0001 Thru 421C1807	7500 Landings or 15 Years	1000 Landings or 3 Years
32-20-02	Nose Gear Fork	421C0001 Thru 421C1807	15,000 Landings or 20 Years	5000 Landings or 10 Years
32-30-04	Upper Barrel Main Gear	421C0001 Thru 421C0800	1000 Landings or 3 Years	500 Landings or 3 Years
32-30-06	Main/Nose Gear Retraction Systems Teardown and Inspection	421C0001 Thru 421C1807	7500 Landings or 15 Years	5000 Landings or 10 Years
32-30-07	Nose Gear Trunnion Inspection (1.19 inch lugs)	421C0001 Thru 421C1807	Per MEB88-5R2	Per MEB88-5R2
32-30-08	Nose Gear Trunnion Inspection (1.31 inch lugs)	421C0001 Thru 421C1807	Per MEB88-5R2	Per MEB88-5R2
32-50-00	Nose Gear Steering Bell Crank	421C0001 Thru 421C1807	7500 Landings or 15 Years	2500 Landings or 5 Years
52-10-01	Cabin Door Retention	421C0001 Thru 421C1807	10,000 Hours or 20 Years	2500 Hours or 5 Years
53-10-01	Pressurized Cabin Structure Inspection	421C0001 Thru 421C1807	6000 Hours or 12 Years	3600 Hours or 7 Years
53-10-02	Fuselage Left and Right Hand Channel Assemblies	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
53-10-03	Horizontal Stabilizer Rear Spar Angle Attachment	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
54-10-04	Engine Support Beams	421C0001 Thru 421C1807	6500 Hours or 13 Years	1600 Hours or 3 Years

Supplemental Inspection Number	Inspection Compliance Title	Effectivity	Initial	Repeat
55-10-03	Horizontal Stabilizer Spars and Attachments	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-10-04	Horizontal Stabilizer Forward Spar Upper Cap	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-10-05	Horizontal Stabilizer Forward Spar Lower Cap	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-10-06	Horizontal Stabilizer Forward Spar Attach BL 7.69	421C0001 Thru 421C1807	10,000 Hours or 20 Years	5000 Hours or 10 Years
55-10-07	Horizontal Stabilizer Rear Spar Lower Cap Attach	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-10-08	Horizontal Stabilizer Rear Spar Upper Cap, BL 0.0	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-10-09	Horizontal Stabilizer Rear Spar Lower Cap, BL 0.0	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-20-01	Outboard Elevator Hinge Bracket and Attachment	421C0001 Thru 421C1807	5000 Hours or 10 Years	1000 Hours or 3 Years
55-20-02	Elevator Hinges and Fittings	421C0001 Thru 421C1807	15,000 Hours or 20 Years	2500 Hours or 5 Years
55-30-01	Vertical Stabilizer Spars and Attachments	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
55-30-02	Rudder Hinges and Fittings	421C0001 Thru 421C1807	15,000 Hours or 20 Years	2500 Hours or 5 Years
55-30-04	Vertical Stabilizer Rear Spar Cap Attach, WL 108.38	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
56-10-01	Pilot and Copilot Windshield Attach Hole Inspection - Acrylic Windshield	421C0001 Thru 421C1807	200 Hours or 1 Year	200 Hours or 1 Year
56-10-02	Windshield	421C0001 Thru 421C1807	13,200 Hours	13,200 Hours
57-10-14	Wing Lower Carry-Thru Front Spar Cap	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
57-10-15	Wing Lower Front Spar Cap at Root Fitting Attach	421C0001 Thru 421C1807	Note 1	Note 1
57-10-16	Lower Main Wing Spar Cap Inspection and Modification	421C0001 Thru 421C1807	Note 1	Note 1
57-10-17	Wing Lower Forward Auxiliary Spar Cap	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
57-10-18	Wing Lower Aft Auxiliary Spar Cap	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
57-10-19	Wing Rear Spar Lower Cap at Spar Splice	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years

Supplemental Inspection Number	Inspection Compliance Title	Effectivity	Initial	Repeat
57-10-20	Wing Lower Carry-Thru Rear Spar Cap, BL49.50	421C0001 Thru 421C1807	15,000 Hours or 20 Years	5000 Hours or 10 Years
57-10-21	Bonded Wing Inspection and Sealing	421C0001 Thru 421C1807	Per MEB95-11	Per MEB95-11
57-10-22	Wing Front Spar Lug Inspection	421C0001 Thru 421C1807	15,000 Hours or 20 Years	2500 Hours or 5 Years
57-10-23	Lower Wing Spars and Skin Inspection	421C0001 Thru 421C1807	10,000 Hours	100 Hours
57-10-25	Wheel Well Close-Out Rib Inspection	421C0001 Thru 421C1807	5000 Hours or 10 Years	1000 Hours or 3 Years
57-10-26	Upper Wing to Carry-Thru Attachment fittings	421C0001 Thru 421C1807	1000 Hours or 3 Years	1000 Hours or 3 Years

NOTE: **(1)** Refer to SID details for initial and repeat inspections times.

NOTE: **(2)** Except 57-10-16, corresponding calendar inspection times are per Figure 1. Inspections should be accomplished at hours or calendar time, whichever occurs first.

NOTE: **(3)** If the number of landings is unknown, assume two landings are made for each flight hour.

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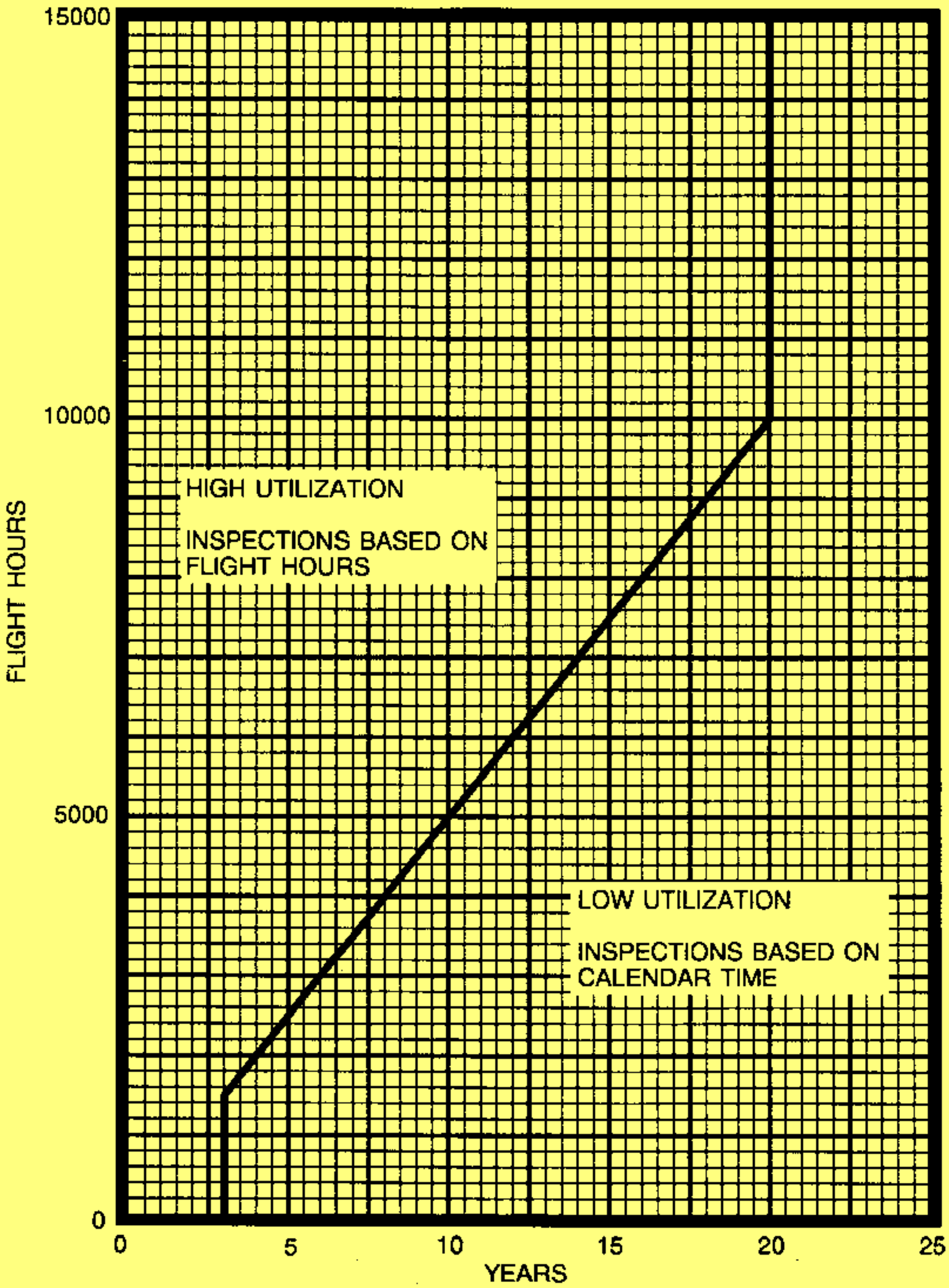

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Inspection Requirements - Hours to Years Equivalance
Figure 1

2. Typical Spectrum - Summary of Inspections by Flight Hours
Model 421C0001 Thru Model 421C1807
Initial Inspection Intervals

INITIAL INSPECTION	EFFECTIVITY	SID INSPECTION NUMBERS
200 Hours or 1 Year	421C0001 Thru 421C1807	56-10-01
1000 Hours or 3 Years	421C0001 Thru 421C1807	57-10-26
1000 Landings or 3 Years	421C0001 Thru 421C0800	32-30-04
5000 Hours	421C0001 Thru 421C0800	57-10-15, 57-10-16
5000 Hours or 10 Years	421C0001 Thru 421C1807	27-30-01, 55-20-01, 57-10-25
5000 Landings or 10 Years	421C0001 Thru 421C1807	32-20-00
6000 Hours or 12 Years	421C0001 Thru 421C1807	53-10-01
6500 Hours or 13 Years	421C0001 Thru 421C1807	54-10-04
7500 Hours or 15 Years	421C0001 Thru 421C1807	27-20-03, 27-20-04
7500 Landings or 15 Years	421C0001 Thru 421C1807	32-20-01, 32-30-06, 32-50-00
10,000 Hours or 20 Years	421C0001 Thru 421C1807	52-10-01, 55-10-06
10,000 Hours	421C0001 Thru 421C1807	57-10-23
12,500 Landings or 20 Years	421C0001 Thru 421C0800	32-10-04
13,200 Hours	421C0001 Thru 421C1807	56-10-02
15,000 Hours	421C0801 Thru 421C1807	57-10-15, 57-10-16
15,000 Hours or 20 Years	421C0001 Thru 421C1807	27-10-05, 53-10-02, 53-10-03, 55-10-03, 55-10-04, 55-10-05, 55-10-07, 55-10-08, 55-10-09, 55-20-02, 55-30-01, 55-30-02, 55-30-04, 57-10-14, 57-10-17, 57-10-18, 57-10-19, 57-10-20, 57-10-22
15,000 Landings or 20 Years	421C0001 Thru 421C1807	32-20-02
Per MEB95-11	421C0001 Thru 421C1807	57-10-21
Per MEB88-5R2	421C0001 Thru 421C1807	32-30-07, 32-30-08
Initial Inspection After Spar Modification		
INITIAL INSPECTION	**EFFECTIVITY**	**SID INSPECTION NUMBERS**
2000 Hours or 4 Years	421C0001 Thru 421C0800	57-10-15
6000 Hours or 12 Years	421C0801 Thru 421C1807	57-10-15
12,500 Hours or 13 Years	421C0001 Thru 421C0800	57-10-16
20,000 Hours or 20 Years	421C0801 Thru 421C1807	57-10-16

3. Typical Spectrum - Summary of Inspections by Flight Hours
Model 421C0001 Thru Model 421C1807
Repeat Inspection Intervals

REPEAT INSPECTION	EFFECTIVITY	SID INSPECTION NUMBERS
100 Hours	421C0001 Thru 421C1807	57-10-23
200 Hours or 1 Year	421C0001 Thru 421C1807	56-10-01
500 Landings or 3 Years	421C0001 Thru 421C1807	32-20-00
500 Landings or 3 Years	421C0001 Thru 421C0800	32-30-04
1000 Hours or 3 Years	421C0001 Thru 421C1807	27-30-01, 55-20-01, 57-10-25, 57-10-26
1000 Landings or 3 Years	421C0001 Thru 421C1807	32-20-01
2500 Hours or 5 Years	421C0001 Thru 421C1807	27-10-05, 27-20-03, 27-20-04, 52-10-01, 55-20-02, 55-30-02, 57-10-22
2500 Landings or 5 Years	421C0001 Thru 421C1807	32-10-04, 32-50-00
1600 Hours or 3 Years	421C0001 Thru 421C1807	54-10-04
3600 Hours or 7 Years	421C0001 Thru 421C1807	53-10-01
5000 Hours or 10 Years	421C0001 Thru 421C1807	53-10-02, 53-10-03, 55-10-03, 55-10-04, 55-10-05, 55-10-06, 55-10-07, 55-10-08, 55-10-09, 55-30-01, 55-30-04, 57-10-14, 57-10-17, 57-10-18, 57-10-19, 57-10-20
5000 Landings or 10 Years	421C0001 Thru 421C1807	32-20-02, 32-30-06
13,200 Hours	421C0001 Thru 421C1807	56-10-02
Per MEB95-11	421C0001 Thru 421C1807	57-10-21
Per MEB88-5R2	421C0001 Thru 421C1807	32-30-07, 32-30-08
Repeat Inspection After Spar Modification		
REPEAT INSPECTION	**EFFECTIVITY**	**SID INSPECTION NUMBERS**
1200 Hours or 3 Years	421C0001 Thru 421C0800	57-10-15
4000 Hours or 8 Years	421C0001 Thru 421C0800	57-10-16
4000 Hours or 8 Years	421C0801 Thru 421C1807	57-10-15
5000 Hours or 10 Years	421C0801 Thru 421C1807	57-10-16

SUPPLEMENTAL INSPECTION NUMBER: 27-10-05

1. **TITLE**
   Aileron Hinges and Fittings

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   To inspect aileron hinges, fittings and associated hardware and components for condition.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the ailerons in accordance with the Service Manual.
   B. Visually inspect:
      (1) Aileron hinges for condition, cracks, and security.
      (2) Hinge bolts and hinge bearings for condition and security.
      (3) Bearings for freedom of rotation.
      (4) Attach fittings for evidence of damage, wear, failed fasteners and security.
   C. Fluorescent liquid penetrant inspect aileron hinge assemblies for cracks. Refer to Section IV (NDI inspection), Supplemental Inspection Number 27-10-05, for specific instructions.
   D. Reinstall aileron in accordance with the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	Visual: 0.25 Inch
	Penetrant: 0.10 Inch

6. **INSPECTION METHOD**
   Visual Inspection and Fluorescent Liquid Penetrant Inspection

7. **REPAIR/MODIFICATION**
   Replace worn/damaged components with the latest superseding part numbers.

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 27-20-03

1. **TITLE**
   Rudder Structure

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	7,500 Hours Or 15 Years
		REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   To ensure structural integrity of the rudder assembly.

4. **INSPECTION INSTRUCTIONS**
   A. Inspect rudder for deterioration resulting from fatigue, wear, overload, wind damage, and corrosion.
   B. Inspect skins, spars, ribs and hinge brackets for cracks, corrosion, and working fasteners. Refer to Figure 1.
   C. Remove bolts and inspect the hinge bolt holes for elongation. Refer to the Service Manual as required.
   D. Install hinge bolts in accordance with the Service Manual.

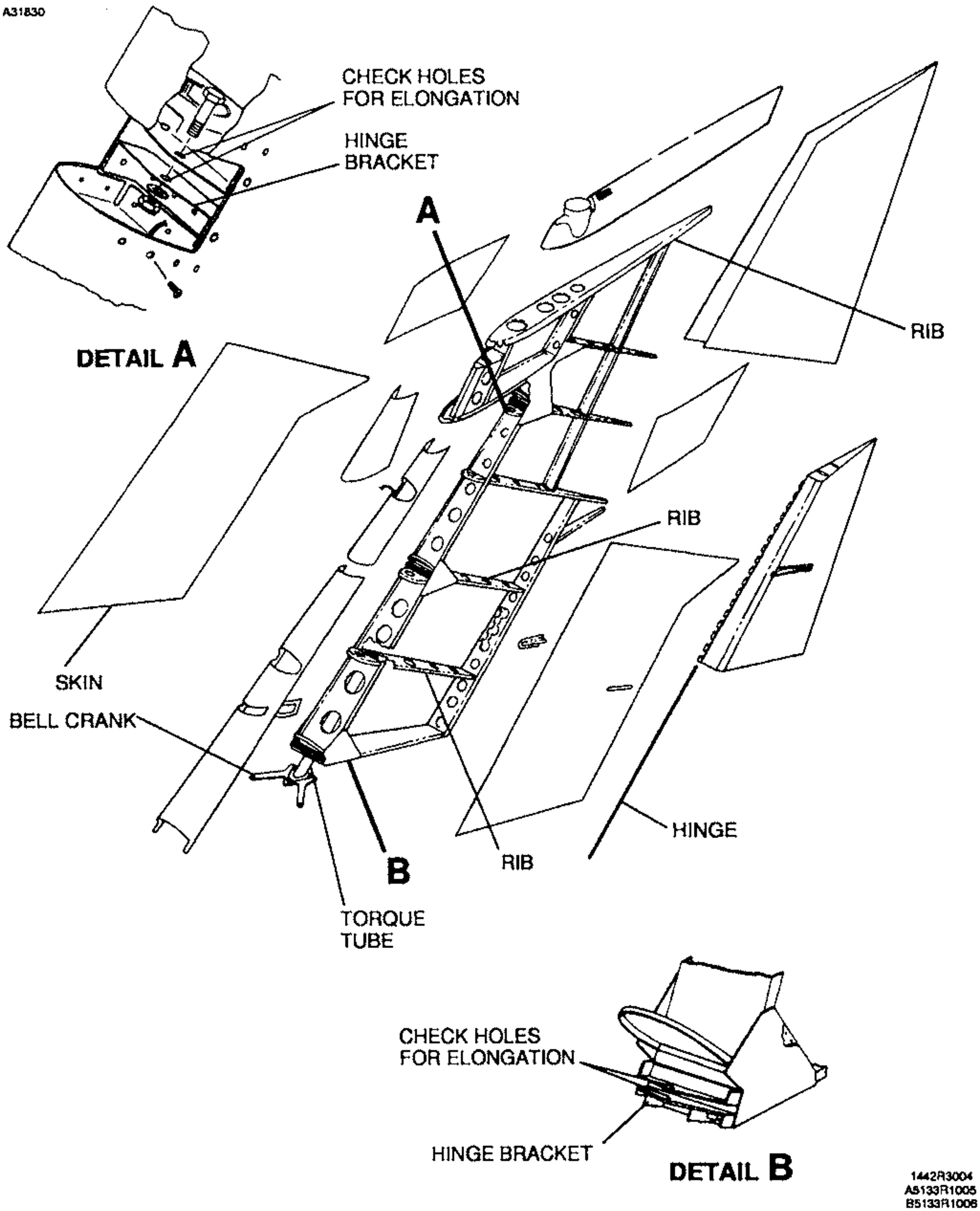
5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Rudder	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   Repairs may be made in accordance with the airplane service manual. Any repair not covered by recommendations in the above documents should be coordinated with Cessna Aircraft Company, Propeller Aircraft Product Support prior to beginning the repair.

8. **COMMENTS**
   None



Rudder Structure
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 27-20-04

1. **TITLE**
   Rudder Torque Tube

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	7,500 Hours Or 15 Years
		REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   To ensure structural integrity of the rudder torque tube assembly.

4. **INSPECTION INSTRUCTIONS**
   A. Remove rudder torque tube access plates in accordance with the airplane Service Manual.
   B. Inspect weld on the torque tube for cracks.
   C. Inspect the torque tube for internal rusting.
   D. Install rudder torque tube access plates in accordance with the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Rudder	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   Repairs may be made in accordance with the airplane service manual which is considered to be acceptable repair data. Any repair not covered by recommendations in the above documents should be coordinated with Cessna Aircraft Company, Propeller Aircraft Product Support prior to beginning the repair.

8. **COMMENTS**
   None

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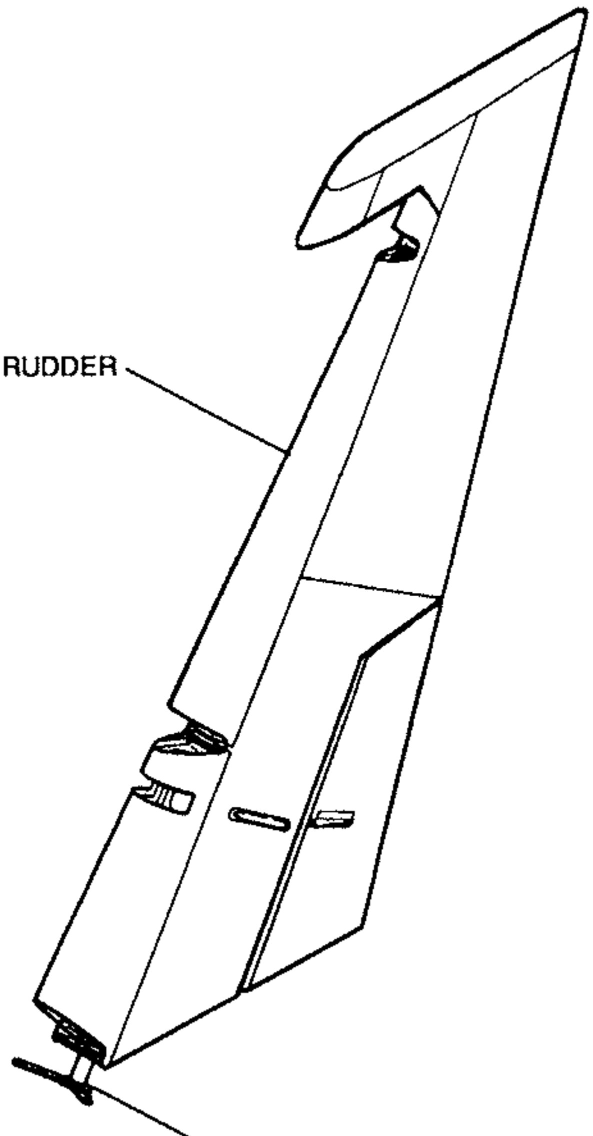

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Rudder Torque Tube
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 27-30-01

1. **TITLE**
   Elevator Torque Tube Assembly

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	5,000 Hours Or 10 Years
		REPEAT	1,000 Hours Or 3 Years

3. **PURPOSE**
   To verify the integrity of the elevator torque tube to elevator bell crank attachment.

4. **INSPECTION INSTRUCTIONS**
   A. Inspect the torque tube and torque tube fitting for signs of corrosion, stress cracks, and lack of surface finish in the area of the torque tube fitting attachment. Refer to Figure 1.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone Stinger Area	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   Refer to Service Information Letters ME70-25 and ME71-8.

8. **COMMENTS**
   Loss or reduction in pitch control could result in the loss of the airplane.

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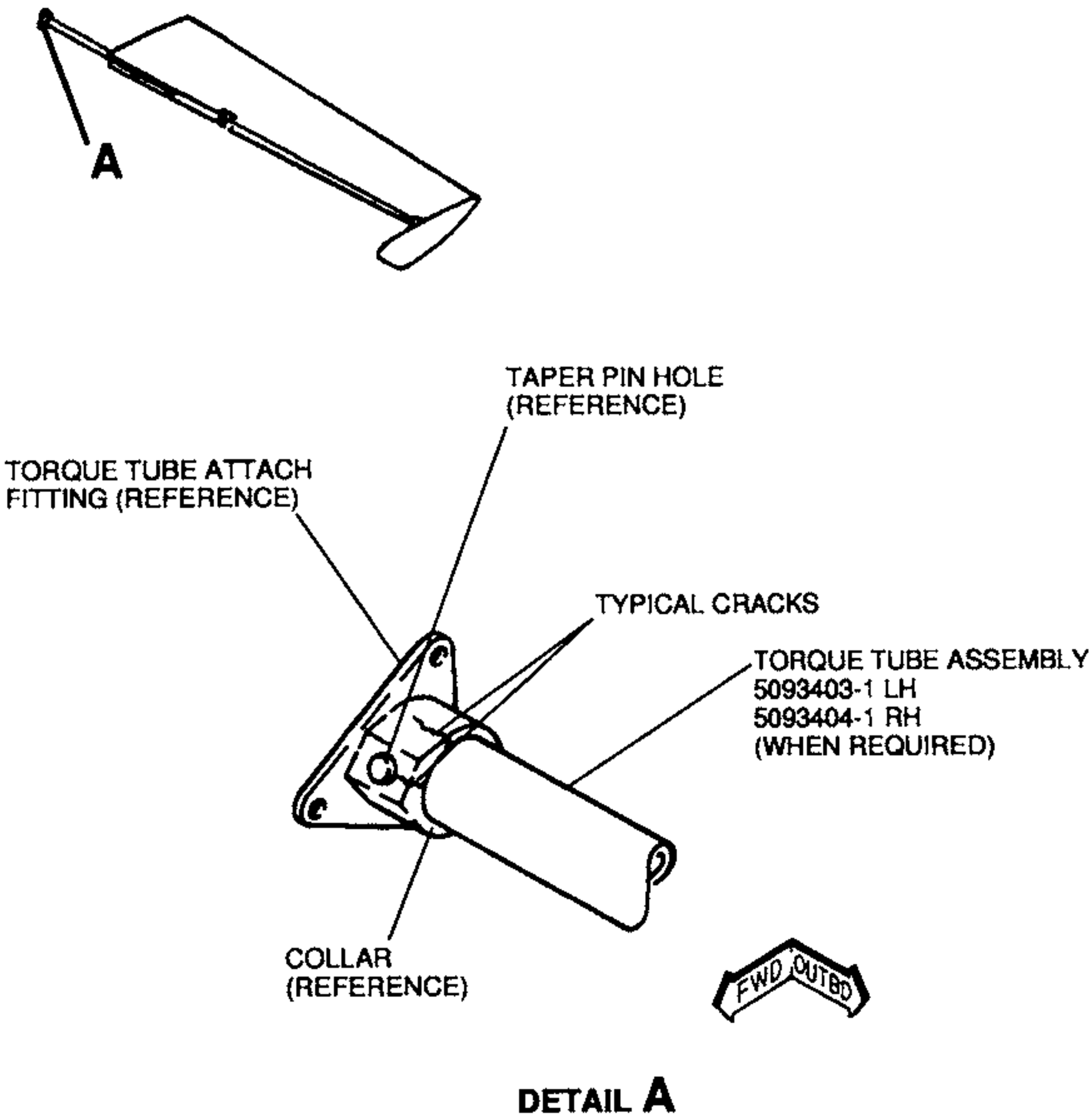

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Elevator Torque Tube Assembly
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 32-10-04

1. **TITLE**
   Main Gear Actuator Collar

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C0800			
	TYPICAL:	**INITIAL**	12,500 Landings Or 20 Years
		REPEAT	2,500 Landings Or 5 Years

3. **PURPOSE**
   Detailed inspection of the main gear actuator collar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Jack the airplane off the ground surface. Refer to the Service Manual.
   B. Remove necessary assemblies to gain access to entire area of main gear actuator collar. Refer to the service manual.
   C. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 32-10-04, for specific instructions.
   D. Replace any removed assemblies and return airplane to ground surface. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Main Gear Actuator Collar	0.10 Inch

6. **INSPECTION METHOD**
   Magnetic Particle

7. **REPAIR/MODIFICATION**
   Replace the main gear actuator collar if a crack is found. Refer to the Service Manual.

8. **COMMENTS**
   None.

SUPPLEMENTAL INSPECTION NUMBER: 32-20-00

1. **TITLE**
   Nose Gear Drag Brace

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	**INITIAL**	5,000 Landings Or 10 Years
		REPEAT	500 Landings Or 3 Years

3. **PURPOSE**
   To verify the integrity of the drag brace link.

4. **INSPECTION INSTRUCTIONS**
   A. Inspect the drag brace for cracks in areas shown in Figure 1. Refer to Section IV (NDI Inspection), Page 4, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Nose Landing Gear	0.10 Inch

6. **INSPECTION METHOD**
   Visual and Fluorescent Liquid Penetrant Inspection

7. **REPAIR/MODIFICATION**
   Replace the drag brace in accordance with the Service Manual.

8. **COMMENTS**
   Cracking of the drag brace can be caused by improper rigging. Refer to MEB91-11.

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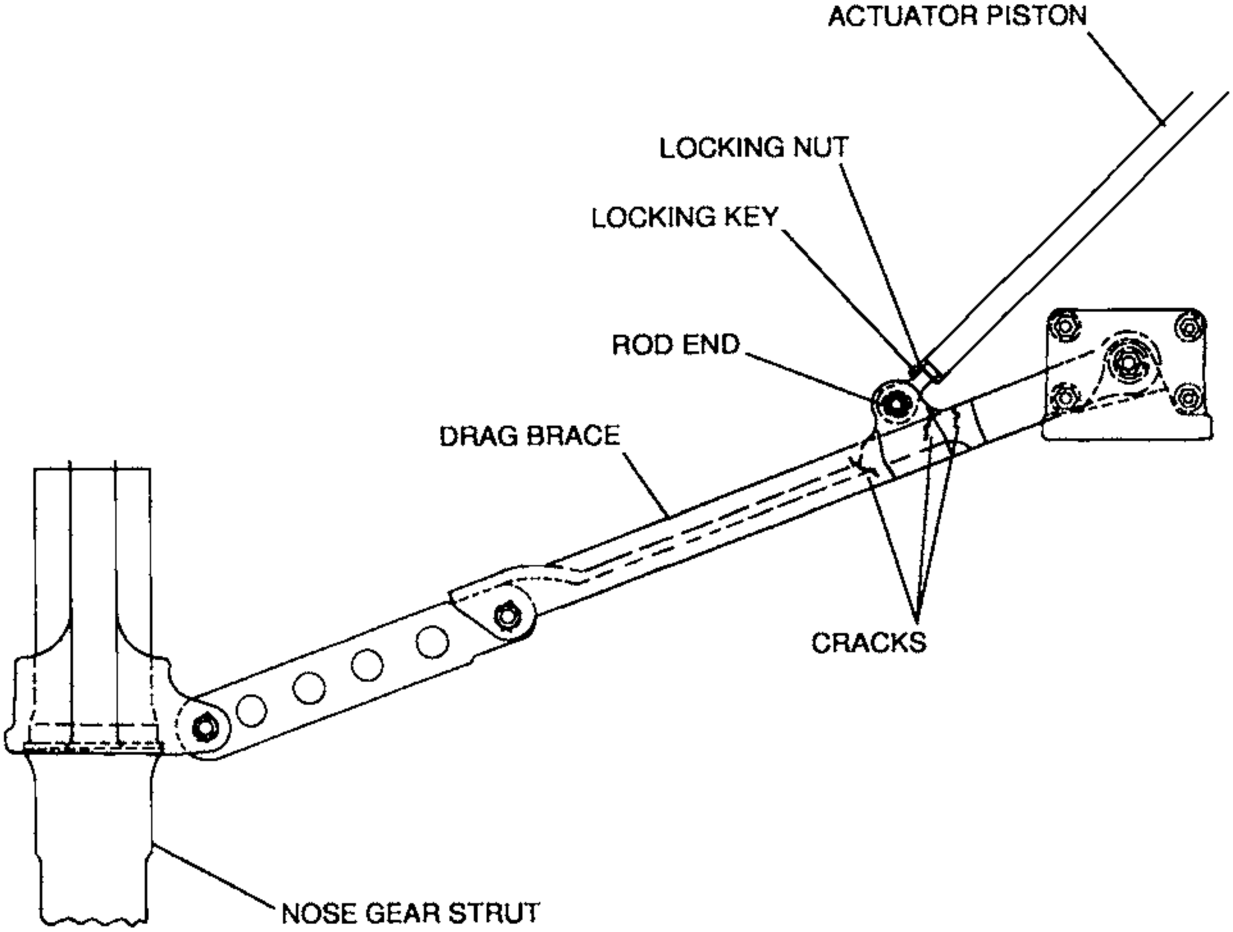

Nose Gear Actuator Drag Brace
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 32-20-01

1. **TITLE**
   Nose Gear Attachment and Wheel Well Structure

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	7,500 Landings Or 15 Years
		REPEAT	1,000 Landings Or 3 Years

3. **PURPOSE**
   Inspect wheel well structure, including nose gear attachment and drag brace attachment areas, for cracks, loose rivets and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove avionic equipment, oxygen bottles and other equipment per the service manual to gain full access to wheel well structure.
   B. Visually inspect wheel well structure including webs, stiffeners, braces, brackets and support channels for cracks, loose rivets, corrosion and deterioration. Refer to Figure 1, Sheet 1.
   C. Inspect local areas surrounding the nose gear attach points and drag brace attach points for cracks, loose rivets, corrosion and deterioration. Refer to Figure 1, Sheet 2.
   D. Reinstall all equipment removed from nose area for access.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Refer to the above inspection instructions.	0.25 Inch

6. **INSPECTION METHOD**
   Refer to the above inspection instructions.

7. **REPAIR/MODIFICATION**
   Repair using standard repair procedures in accordance with the Cessna Service Manual and approved data if major in scope, or replace weakened parts. However, care must be taken not to over-stiffen the web areas. Some flexibility is required to ensure that the gear can travel to over-center position during extension and retraction without overloading the structure.

8. **COMMENTS**
   The nose wheel well structure carries all landing and gear retraction loads into the nose structure. If the structure has deteriorated, gear failure upon landing could occur.

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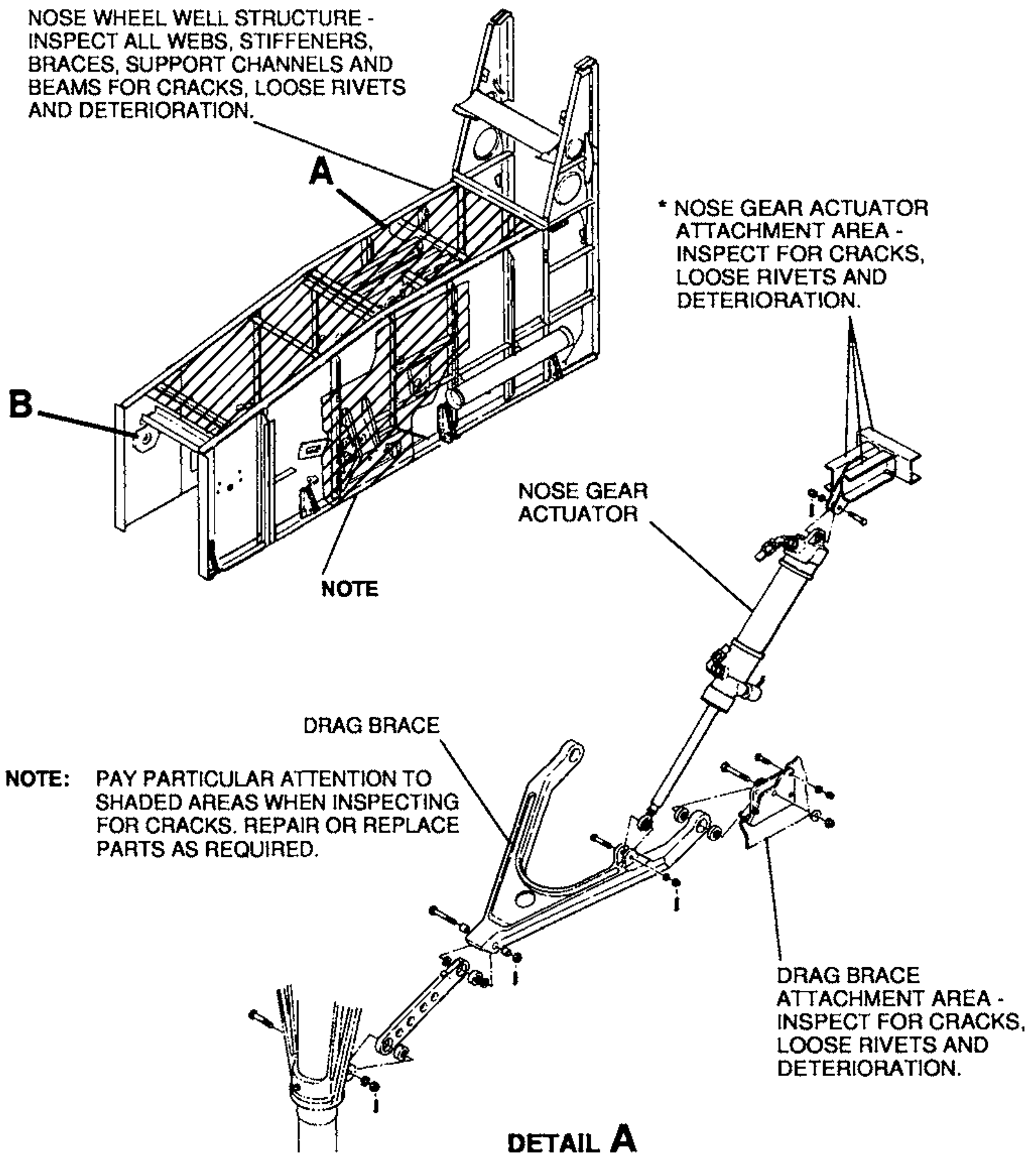

NOTE: PAY PARTICULAR ATTENTION TO SHADED AREAS WHEN INSPECTING FOR CRACKS. REPAIR OR REPLACE PARTS AS REQUIRED.

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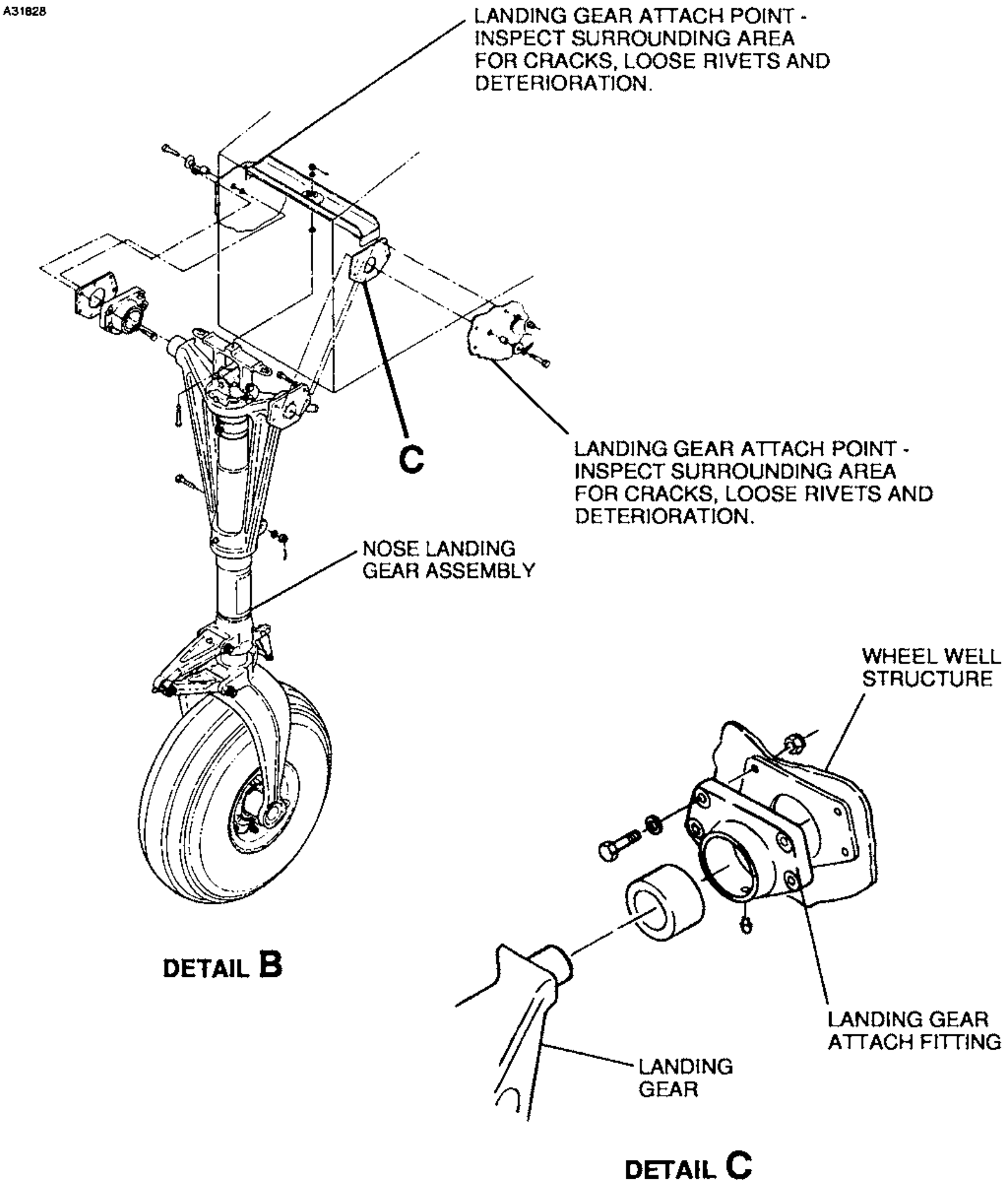
Nose Wheel Well Structure
Figure 1 (Sheet 1)



Nose Wheel Well Structure
Figure 1 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 32-20-02

1. TITLE

Nose Gear Fork

2. EFFECTIVITY

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Landings Or 20 Years
		REPEAT	5,000 Landings Or 10 Years

3. PURPOSE

Detailed inspection of the nose gear fork for cracks due to fatigue, overload, and corrosion.

4. INSPECTION INSTRUCTIONS

A. Jack the airplane off the ground surface. Refer to the Service Manual.

B. Remove necessary assemblies to gain access to entire area of the nose gear fork in accordance with the service manual.

C. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 32-20-02, for specific instructions.

D. Replace any removed assemblies and return aircraft to ground surface. Refer to the Service Manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Nose Gear	0.10 Inch

6. INSPECTION METHOD

Surface Eddy Current

7. REPAIR/MODIFICATION

8. COMMENTS

If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 32-30-04

1. **TITLE**
   Upper Barrel Main Gear

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C0800			
	TYPICAL:	INITIAL	1,000 Landings Or 3 years
		REPEAT	500 Landings Or 3 Years

3. **PURPOSE**
   To determine if cracks exist at the lobes inside radius top and bottom of the attach point of the upper torque link on the upper barrel and trunnion assembly of the hydraulic main gear.

4. **INSPECTION INSTRUCTIONS**

   A. Inspect applicable barrel and trunnion assemblies using fluorescent magnetic particle inspection as defined in MEB89-2, Revision 1.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Main Landing Gear	0.10 Inch

6. **INSPECTION METHOD**
   Magnetic Particle

7. **REPAIR/MODIFICATION**
   If cracks exceed limits in MEB89-2, Revision 1, replace barrel and trunnion assemblies.

8. **COMMENTS**
   Cracks may be reworked to limits provided by MEB89-2, Revision 1.

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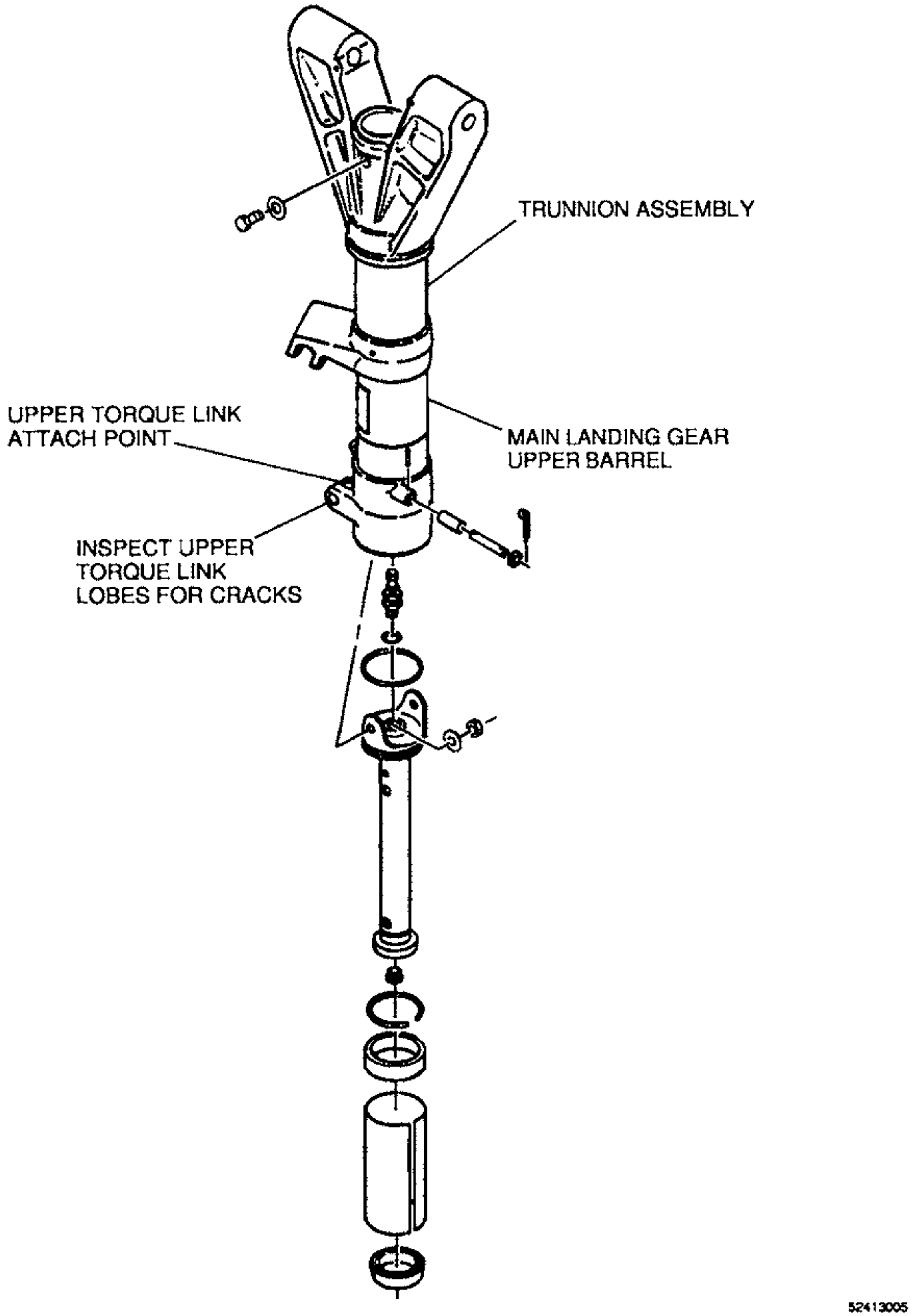

Main Landing Gear Assembly Upper Torque Link Attach Point Inspection
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 32-30-06

1. TITLE

Main/Nose Gear Retraction Systems Tear Down and Inspection

2. EFFECTIVITY

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	7,500 Landings Or 15 Years
		REPEAT	5,000 Landings Or 10 Years

3. PURPOSE

To inspect for fatigue cracks and excessive wear in mechanisms, bushings, bearings, attachment holes in structure and attaching hardware which could hinder proper rigging and cause gear down position failures or structural failures.

4. INSPECTION INSTRUCTIONS

A. Remove all gear assemblies and retraction mechanism parts and hardware from the airplane. Refer to the Service Manual.

B. Inspect the wing, nose wheel well and supporting structures for cracks, corrosion and elongated attachment holes. Repair or replace, as required.

C. Inspect all components of the gear and retraction mechanism for cracks and corrosion. Replace with new parts/components where required. Refer to Figures 1 and 2.

D. Reinstall all components and rig the system in accordance with the Service Manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing and Nose Section	0.25 Inch

6. INSPECTION METHOD

Visual

7. REPAIR/MODIFICATION

Refer to the above inspection instructions.

8. COMMENTS

Refer to MEB88-5, Revision 2, for information on trunnion lug inspection.

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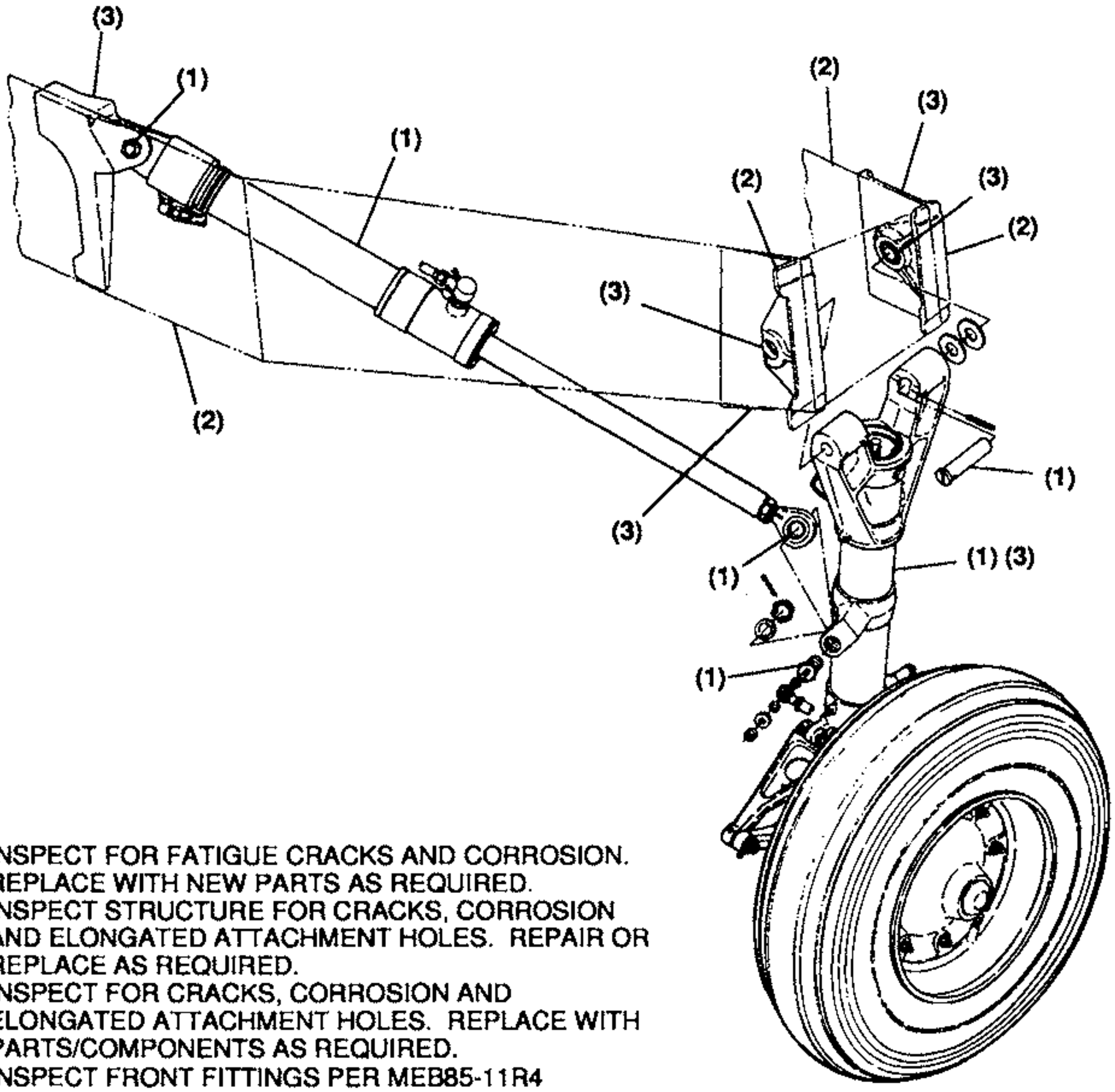


(1) INSPECT FOR FATIGUE CRACKS AND CORROSION. REPLACE WITH NEW PARTS AS REQUIRED.
(2) INSPECT STRUCTURE FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPAIR OR REPLACE AS REQUIRED.
(3) INSPECT FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPLACE WITH PARTS/COMPONENTS AS REQUIRED.
(4) INSPECT FRONT FITTINGS PER MEB85-11R4 AND REPLACE CRACKED FITTINGS PER SK421-132 OR SK421-133, AS APPLICABLE.

NOTE: REPLACE ALL HARDWARE REMOVED DURING INSPECTION PROCEDURE WITH NEW ATTACHING HARDWARE AT REASSEMBLY/ REINSTALLATION.

STRAIGHT OLEO STRUT
MAIN LANDING GEAR

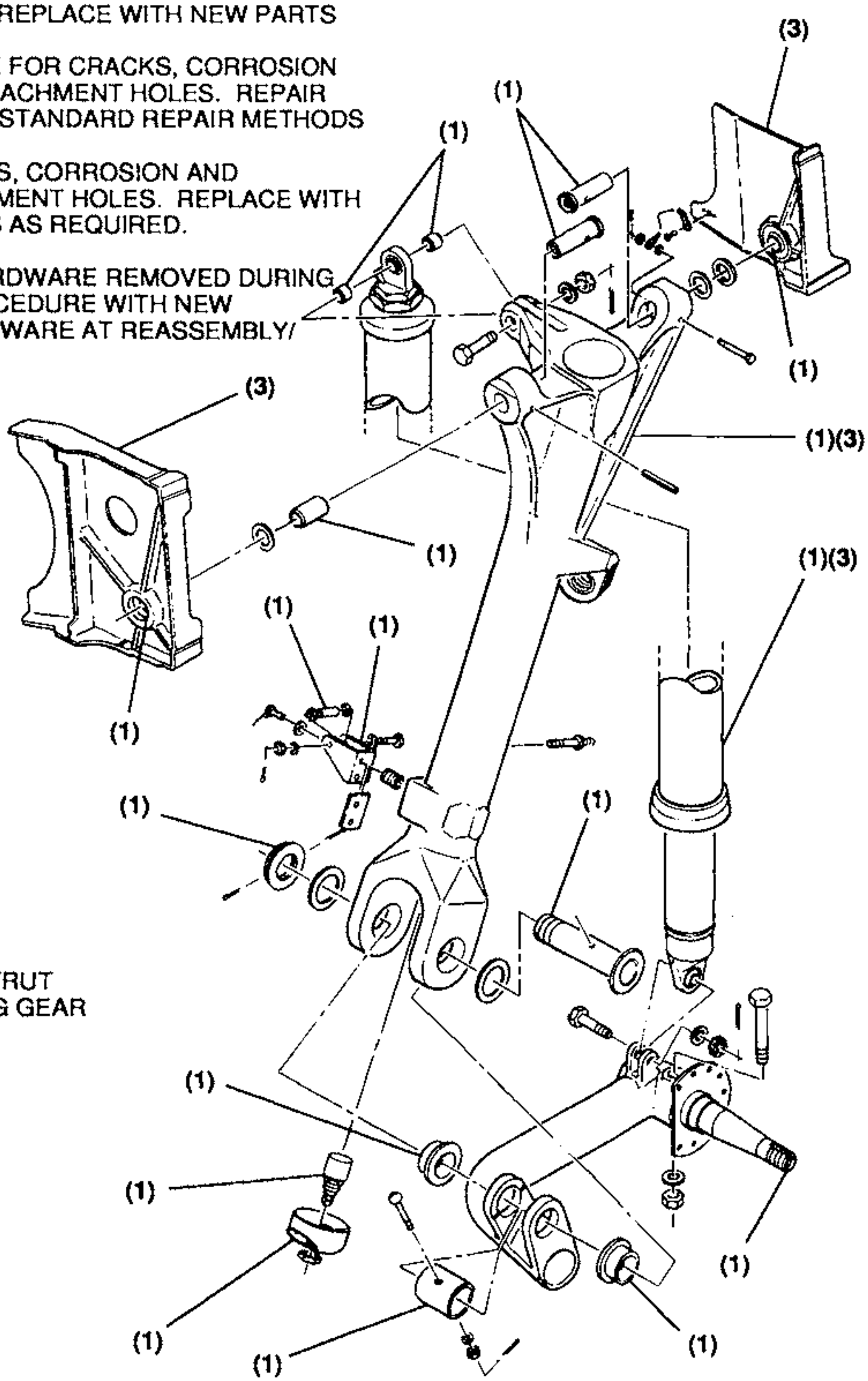
51414004

Main Landing Gear Installation (Typical)
Figure 1 (Sheet 1)

A26069

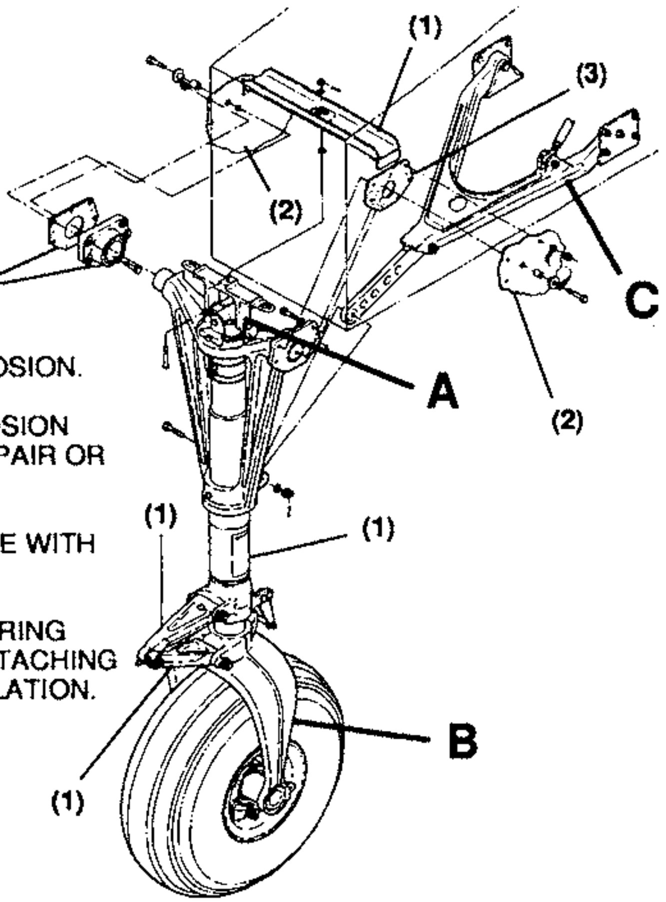
(1) INSPECT FOR FATIGUE CRACKS, CORROSION AND EXCESS WEAR. REPLACE WITH NEW PARTS AS REQUIRED.
(2) INSPECT STRUCTURE FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPAIR AS REQUIRED USING STANDARD REPAIR METHODS OR APPROVED DATA.
(3) INSPECT FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPLACE WITH PARTS/COMPONENTS AS REQUIRED.

NOTE: REPLACE ALL HARDWARE REMOVED DURING INSPECTION PROCEDURE WITH NEW ATTACHING HARDWARE AT REASSEMBLY/ REINSTALLATION.



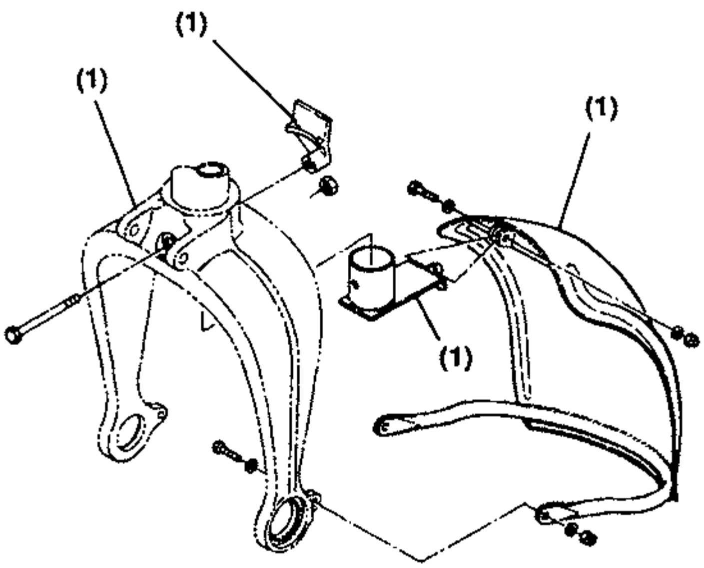
Main Landing Gear Installation (Typical)
Figure 1 (Sheet 2)

A31665

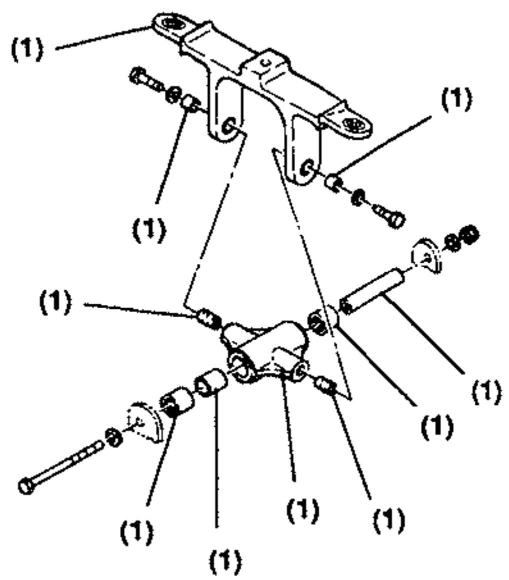


(1) INSPECT FOR FATIGUE CRACKS AND CORROSION. REPLACE WITH NEW PARTS AS REQUIRED.
(2) INSPECT STRUCTURE FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPAIR OR REPLACE AS REQUIRED.
(3) INSPECT FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPLACE WITH PARTS/COMPONENTS AS REQUIRED.

NOTE: REPLACE ALL HARDWARE REMOVED DURING INSPECTION PROCEDURE WITH NEW ATTACHING HARDWARE AT REASSEMBLY/REINSTALLATION.



DETAIL B

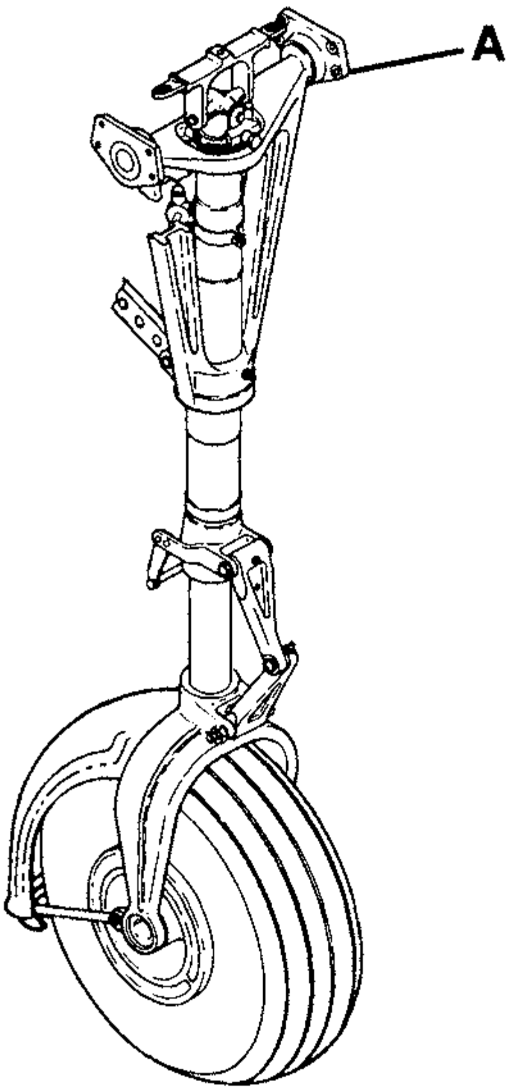


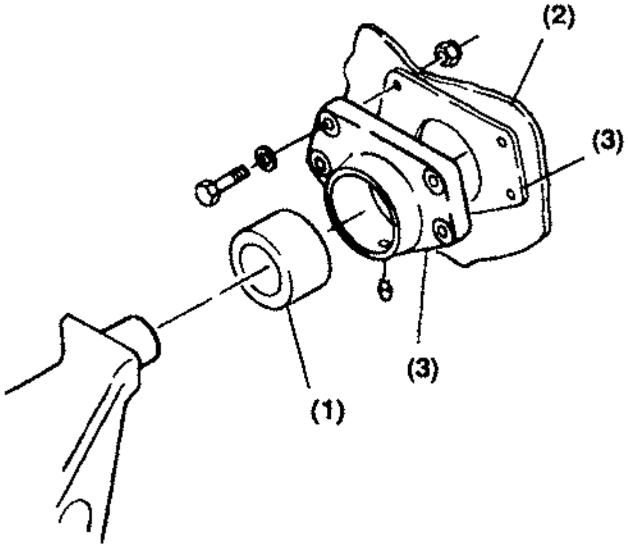
DETAIL A

A5742R4004
B5142R1003
C5142R2002

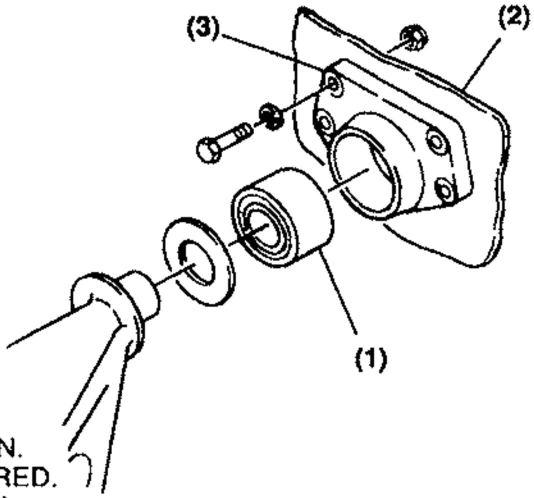
Nose Landing Gear Installation (Typical)
Figure 2 (Sheet 1)

A31829





DETAIL A
LARGE LUG (1.31 DIAMETER) TRUNNION



DETAIL A
SMALL LUG (1.19 DIAMETER) TRUNNION

(1) INSPECT TRUNNION PER MEB88-5R2.
(2) INSPECT FOR FATIGUE CRACKS AND CORROSION. REPLACE WITH NEW PARTS REPLACE AS REQUIRED.
(3) INSPECT STRUCTURE FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPAIR REPLACE AS REQUIRED.
(4) INSPECT FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPLACE WITH PARTS/COMPONENTS AS REQUIRED.

NOTE: REPLACE ALL HARDWARE REMOVED DURING INSPECTION PROCEDURE WITH NEW ATTACHING HARDWARE AT REASSEMBLY/REINSTALLATION.

1442R004
A1042R1005
A1042R1005

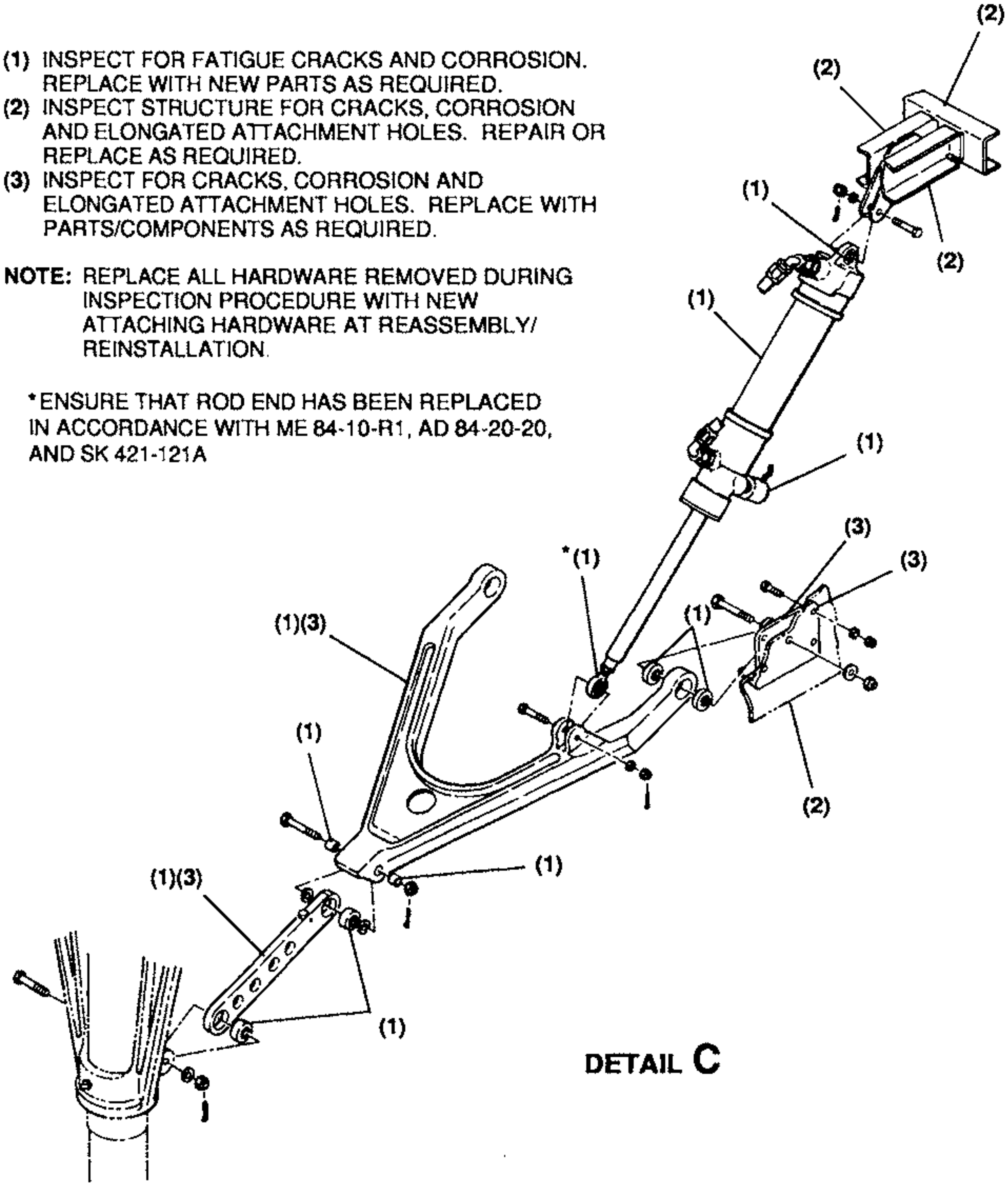
Nose Landing Gear Installation (Typical)
Figure 2 (Sheet 2)

A31834

(1) INSPECT FOR FATIGUE CRACKS AND CORROSION. REPLACE WITH NEW PARTS AS REQUIRED.
(2) INSPECT STRUCTURE FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPAIR OR REPLACE AS REQUIRED.
(3) INSPECT FOR CRACKS, CORROSION AND ELONGATED ATTACHMENT HOLES. REPLACE WITH PARTS/COMPONENTS AS REQUIRED.

NOTE: REPLACE ALL HARDWARE REMOVED DURING INSPECTION PROCEDURE WITH NEW ATTACHING HARDWARE AT REASSEMBLY/ REINSTALLATION.

*ENSURE THAT ROD END HAS BEEN REPLACED IN ACCORDANCE WITH ME 84-10-R1, AD 84-20-20, AND SK 421-121A



5142R4005

Nose Landing Gear Installation (Typical)
Figure 2 (Sheet 3)

SUPPLEMENTAL INSPECTION NUMBER: 32-30-07

1. **TITLE**
   Nose Gear Trunnion Inspection (1.19 inch lugs)

2. **EFFECTIVITY**

	INSPECTION COMPLIANCE
421C0001 Thru 421C1807	Per MEB88-5R2

3. **PURPOSE**
   Detailed inspection of the nose gear trunnion pivot lugs (1.19 inch only). Airplanes which have replaced the trunnion with a 5942000-213 Trunnion, inspect to Supplemental Inspection Number 32-30-08.

4. **INSPECTION INSTRUCTIONS**
   A. Refer to Service Bulletin MEB88-5R2 for accomplishment instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Nose Section	N/A

6. **INSPECTION METHOD**
   Fluorescent Penetrant

7. **REPAIR/MODIFICATION**

8. **COMMENTS**
   If a crack is detected, replace the trunnion using Service Bulletin MEB88-5R2 instructions.

SUPPLEMENTAL INSPECTION NUMBER: 32-30-08

1. **TITLE**
   Nose Gear Trunnion Inspection (1.31 inch lugs)

2. **EFFECTIVITY**

	INSPECTION COMPLIANCE
421C0001 Thru 421C1807	Per MEB88-5R2

3. **PURPOSE**
   Detailed inspection of the nose gear trunnion pivot lugs (1.31 inch only).

4. **INSPECTION INSTRUCTIONS**
   A. Refer to Service Bulletin MEB88-5R2 for accomplishment instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Nose Section	N/A

6. **INSPECTION METHOD**
   Fluorescent Penetrant

7. **REPAIR/MODIFICATION**

8. **COMMENTS**
   If a crack is detected, replace the trunnion using Service Bulletin MEB88-5R2 instructions.

SUPPLEMENTAL INSPECTION NUMBER: 32-50-00

1. **TITLE**
   Nose Gear Steering Bell Crank

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	7,500 Landings Or 15 Years
		REPEAT	2,500 Landings Or 5 Years

3. **PURPOSE**
   To verify the integrity of the steering bell crank assembly.

4. **INSPECTION INSTRUCTIONS**
   A. Remove bell crank from nose gear. Refer to the Service Manual.
   B. Inspect the entire bell crank for cracks. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 32-50-00, for specific instructions.
   C. Install bell crank gear. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

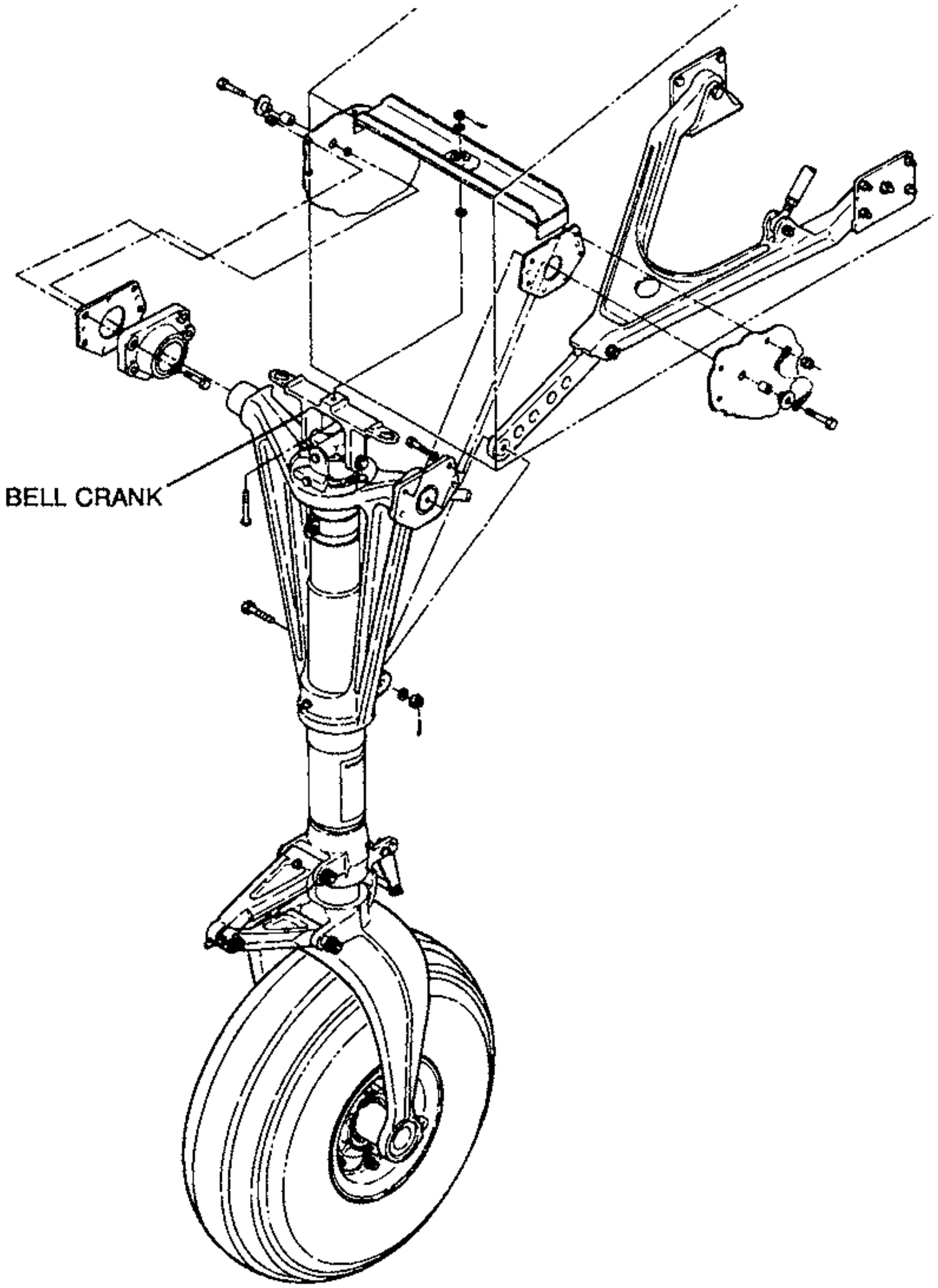
ACCESS/LOCATION	DETECTABLE CRACK SIZE
Nose Gear	0.10 Inch

6. **INSPECTION METHOD**
   Visual Inspection and Fluorescent Dye Penetrant

7. **REPAIR/MODIFICATION**
   Replace bell crank

8. **COMMENTS**
   None

A31853



Nose Landing Gear Bell Crank
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 52-10-01

1. **TITLE**
   Cabin Door Retention

2. **EFFECTIVITY**

		INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807				
		TYPICAL:	INITIAL	10,000 Hours Or 20 Years
			REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   To verify the integrity of the door retention system.

4. **INSPECTION INSTRUCTIONS**
   A. Remove all the pin retention linkages from the upper and lower cabin door. Refer to the Service Manual.
   B. Inspect all the bell cranks, push rods, handle, and pins for cracks, corrosion, worn holes and signs of fatigue. Refer to Figure 1.
   C. Dye penetrant inspect the latch pin receptacles for corner cracks. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 52-10-01, for specific instructions.
   D. Install all the pin retention linkages from the upper and lower cabin door. Refer to the Service Manual.

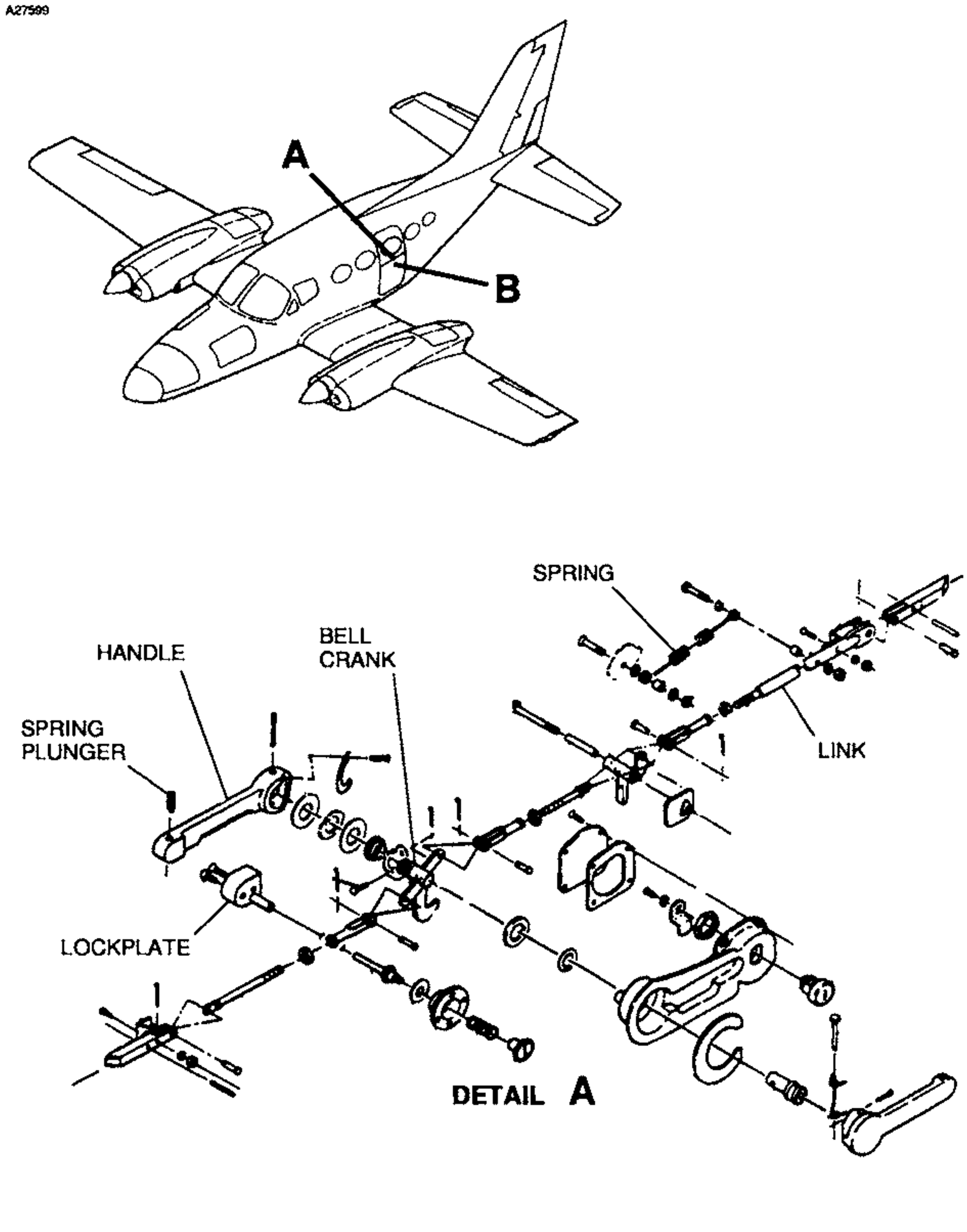
5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Cabin Door	0.05 Inches

6. **INSPECTION METHOD**
   Visual and Dye Penetrant Inspection

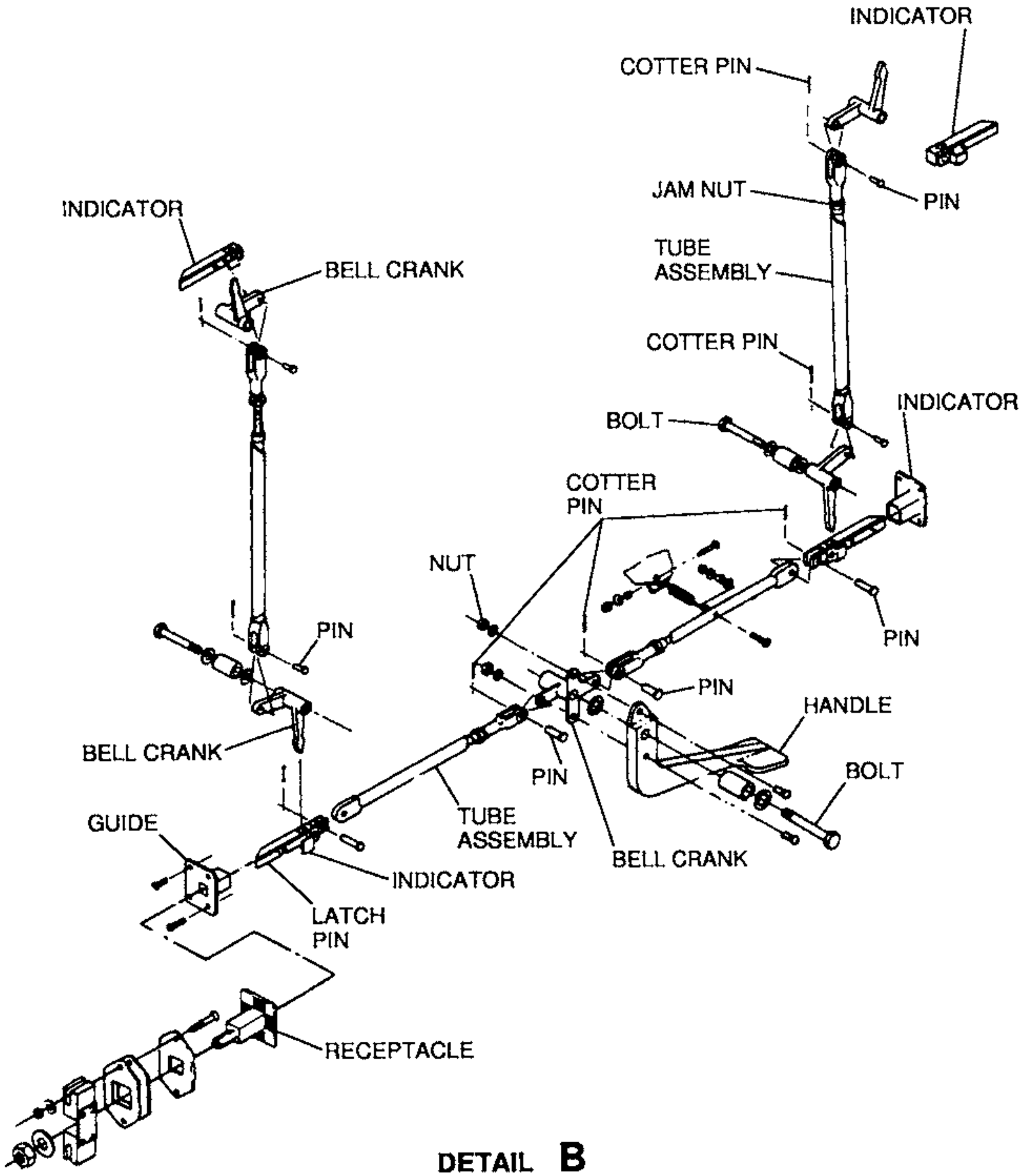
7. **REPAIR/MODIFICATION**
   Repairs may be made in accordance with the applicable Cessna Service Manual. Any repair not covered by recommendations in the above, documents should be coordinated with Cessna Aircraft Company, Propeller Aircraft Product Support prior to beginning the repair.

8. **COMMENTS**
   None



Cabin Door Linkage Installation
Figure 1 (Sheet 1)

A25376



DETAIL B

51144036

Cabin Door Linkage Installation
Figure 1 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 53-10-01

1. **TITLE**
   Pressurized Cabin Structure Inspection

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	6,000 Hours Or 12 Years
		REPEAT	3,600 Hours Or 7 Years

3. **PURPOSE**
   To inspect specified areas of the pressurized cabin structure for indications of deterioration.

4. **INSPECTION INSTRUCTIONS**
   A. Visually inspect all cabin entry door and emergency exit door frame structure for corrosion, cracks, loose or missing fasteners, and signs of deterioration. Refer to Figures 1 and 2 for the critical areas to be inspected.
   B. Visually inspect all window frames and surrounding structure for corrosion, cracks, loose or missing fasteners, and signs of deterioration.
   C. Visually inspect the entire forward and aft pressure bulkheads and surrounding structure for corrosion, cracks, loose or missing fasteners, and signs of deterioration. Refer to Figures 3, 4 and 5. Eddy current inspect the forward and aft pressure bulkhead structures. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 53-10-01, for specific instructions.
   D. Visually inspect all cabin frame structure for corrosion, cracks, loose or missing fasteners, and signs of deterioration. Refer to Figures 6, 8, 10, 11 and 12 for the critical areas.
   E. Visually inspect the entire forward and rear spar bulkheads for corrosion, cracks, loose or missing fasteners and signs of deterioration. Refer to Figures 7 and 9 for the critical areas.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Fuselage	0.25 Inches (Eddy Current)

6. **INSPECTION METHOD**
   Visual and Surface Eddy Current

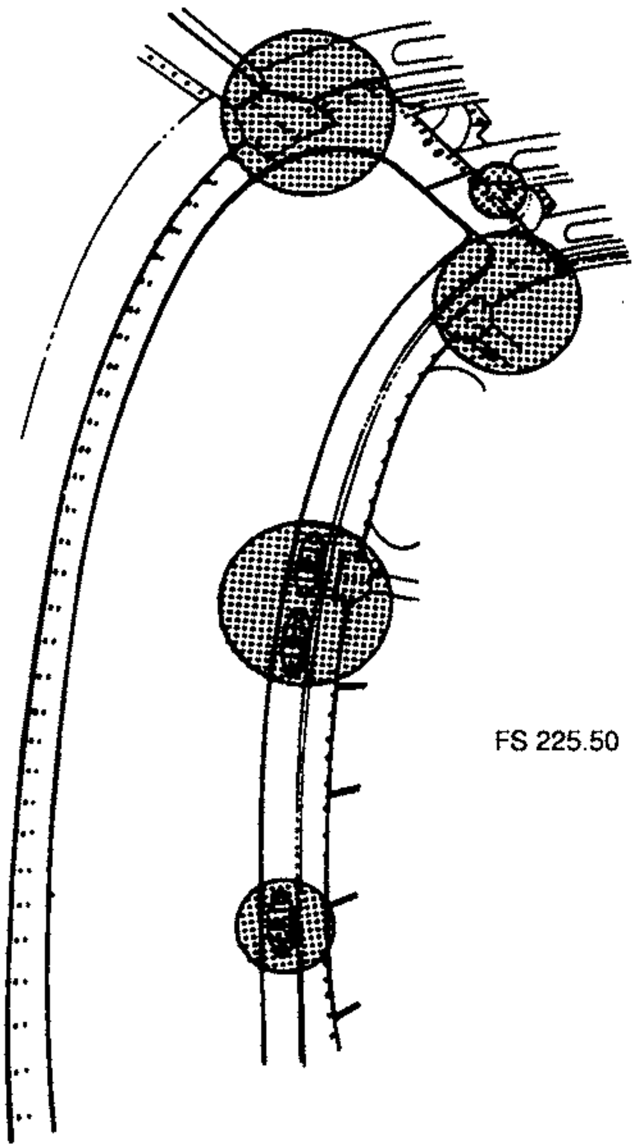
7. **REPAIR/MODIFICATION**
   Repair or replace any worn, cracked, damaged or deteriorated components found during inspection in accordance with the applicable Service Manual or approved data.

8. **COMMENTS**
   None

A27602

NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

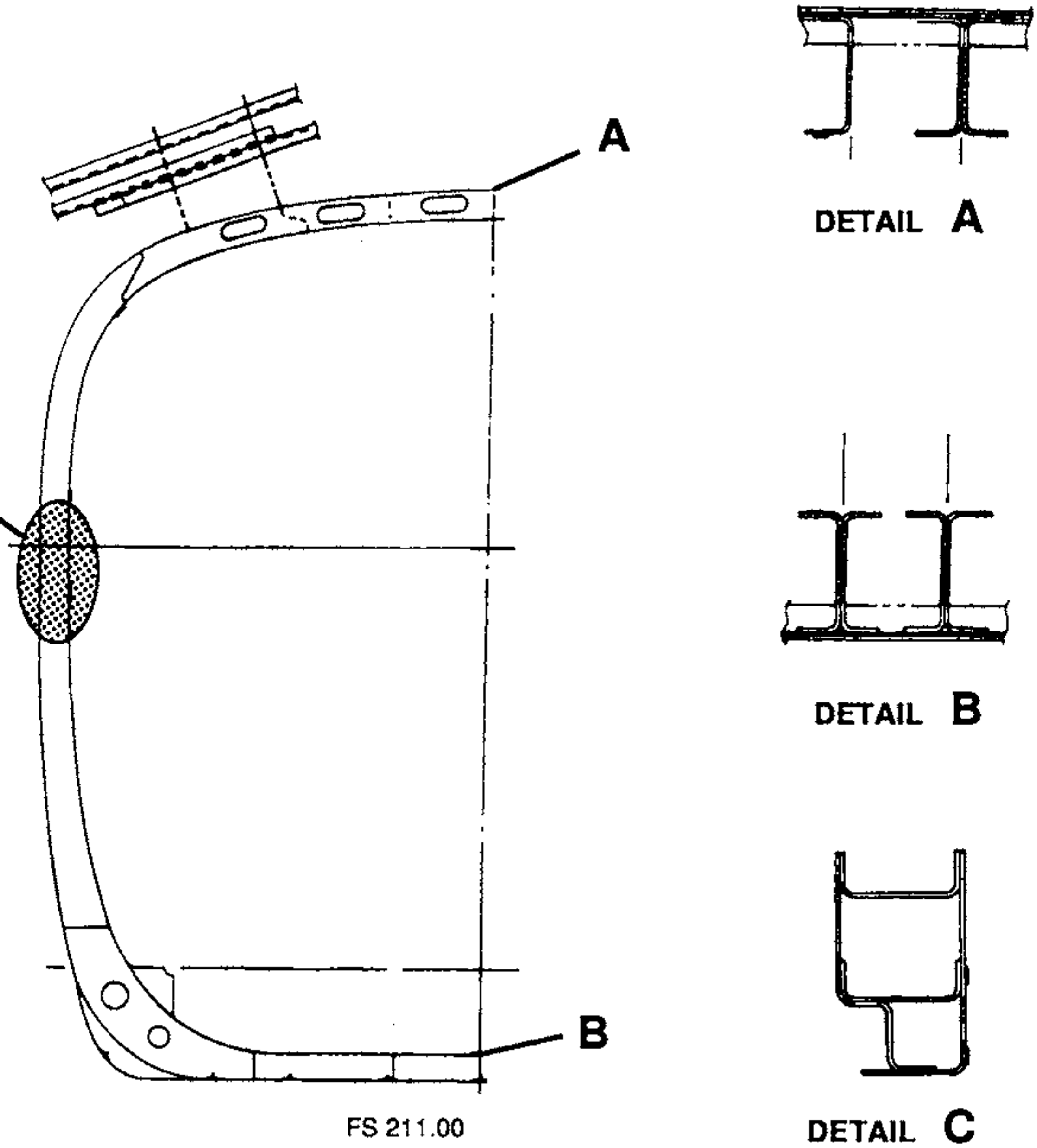
NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.



5110R3008

Pressurized Cabin Structure Inspection
Figure 1 (Sheet 1)

A27503

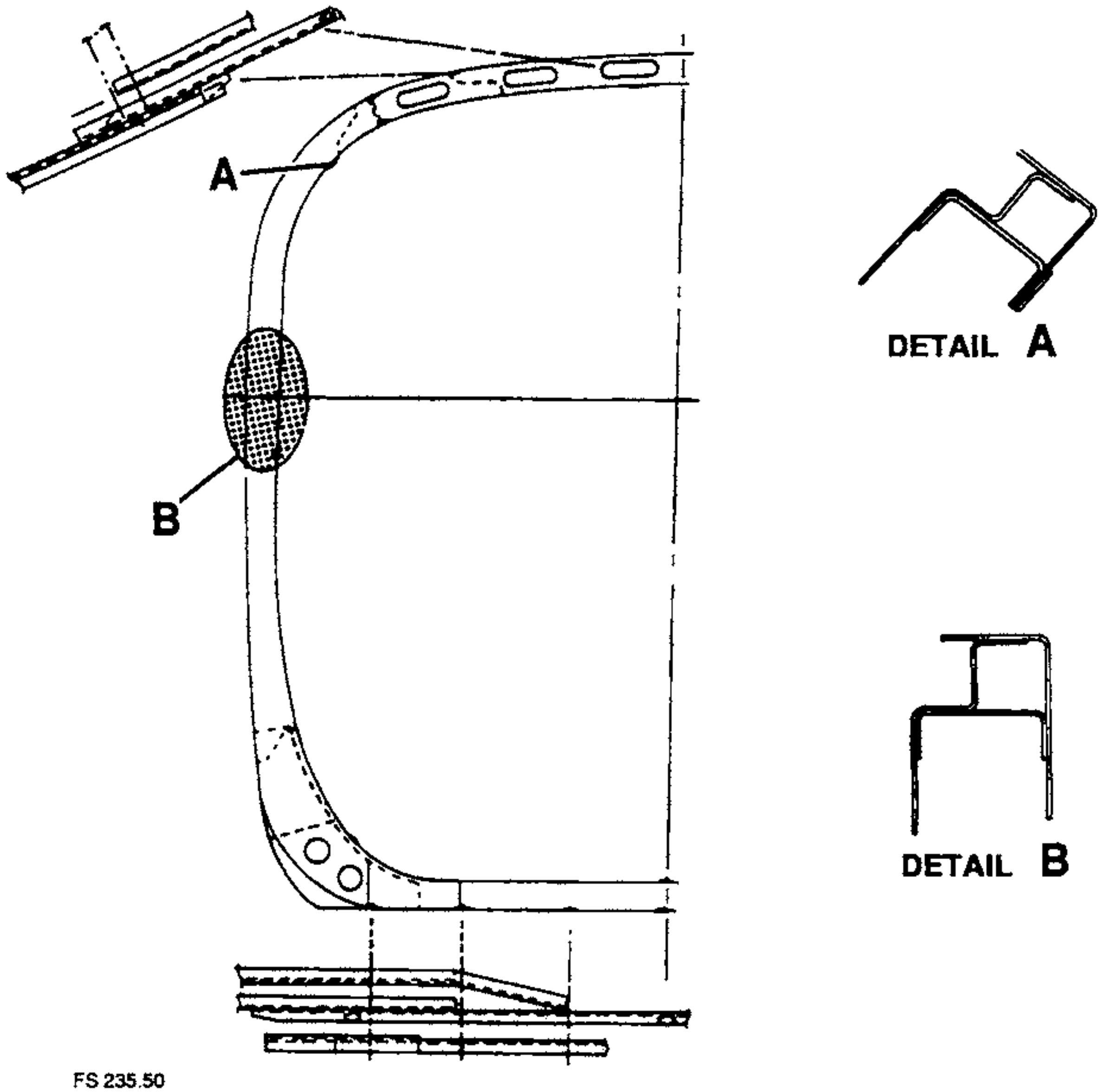


NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

Pressurized Cabin Structure Inspection
Figure 2 (Sheet 1)

A27604

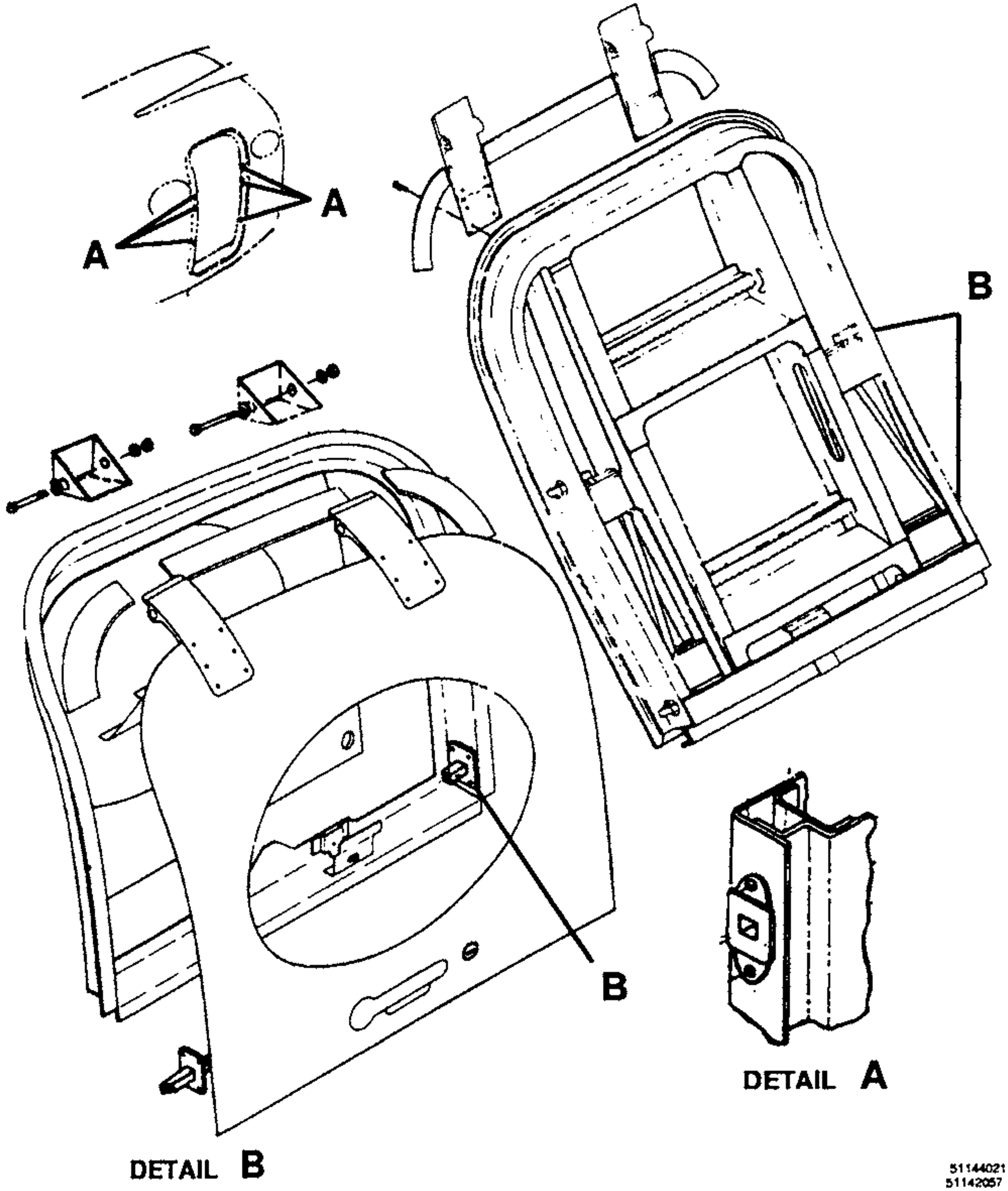


NOTE: 1 VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE: 2 SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

Pressurized Cabin Structure Inspection
Figure 2 (Sheet 2)

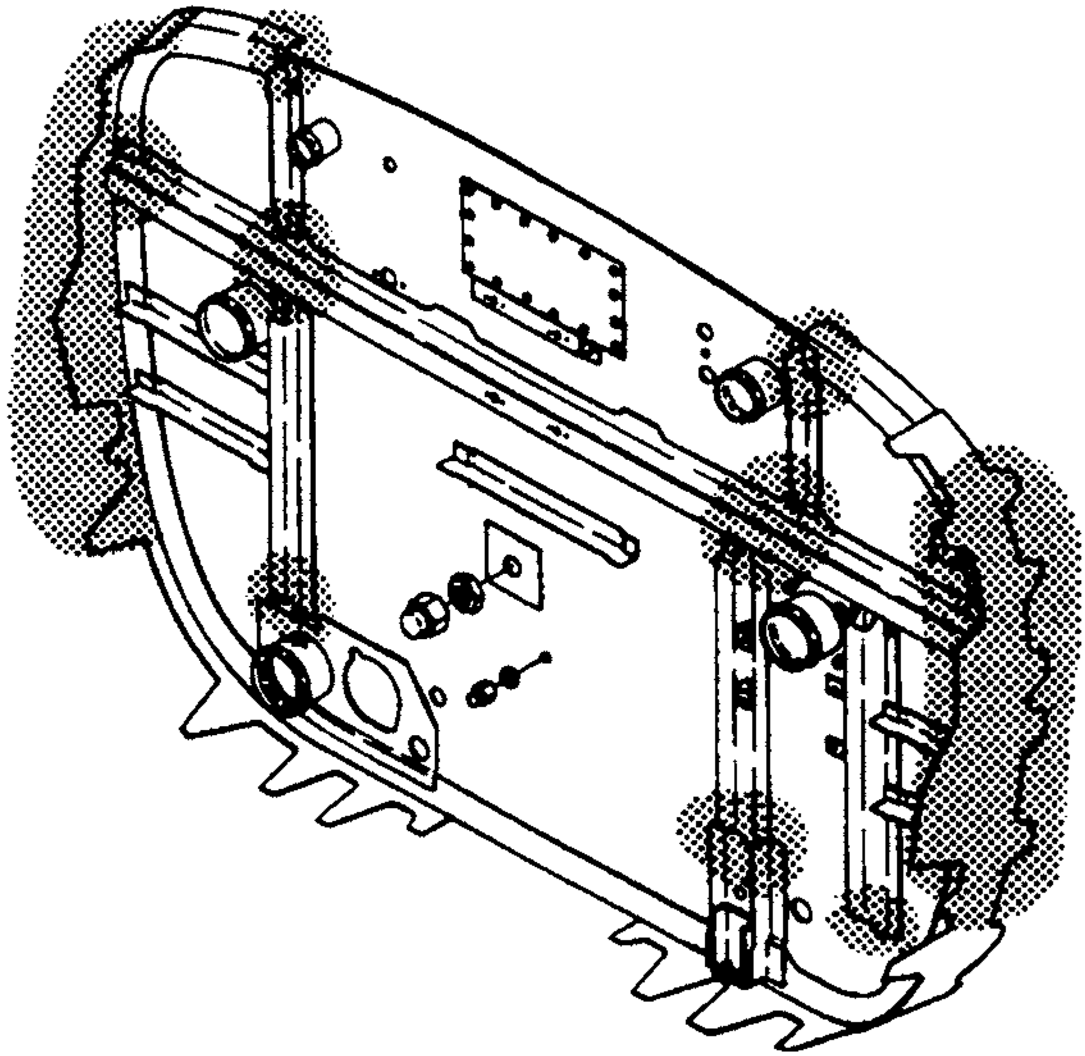
A931



51144021
51142057

Pressurized Cabin Structure Inspection
Figure 2 (Sheet 3)

A27605



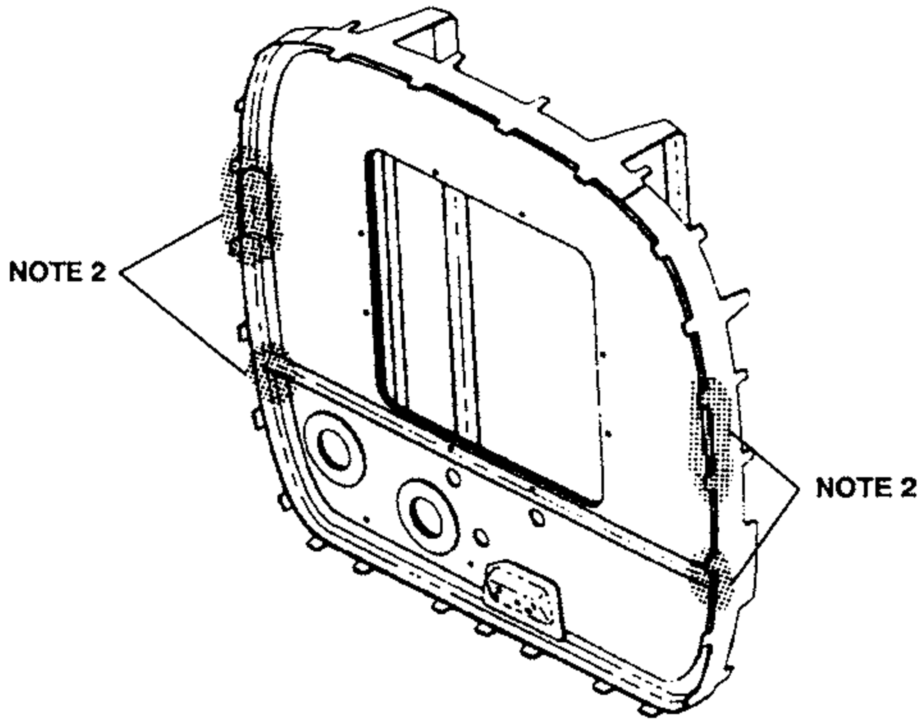
NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

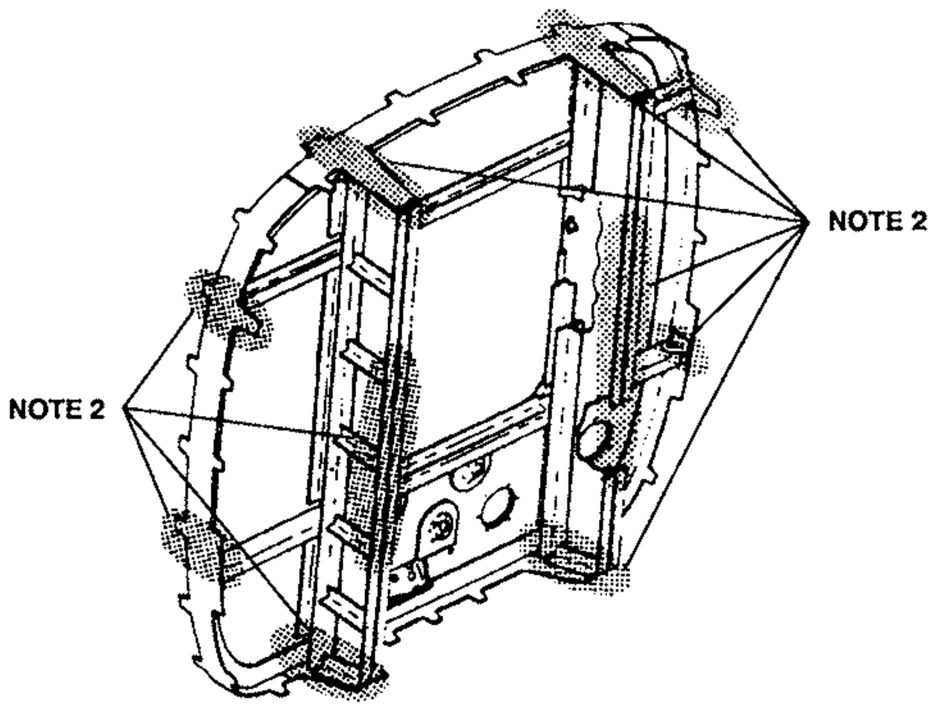
511120101

Pressurized Cabin Structure Inspection
Figure 3 (Sheet 1)

A27644



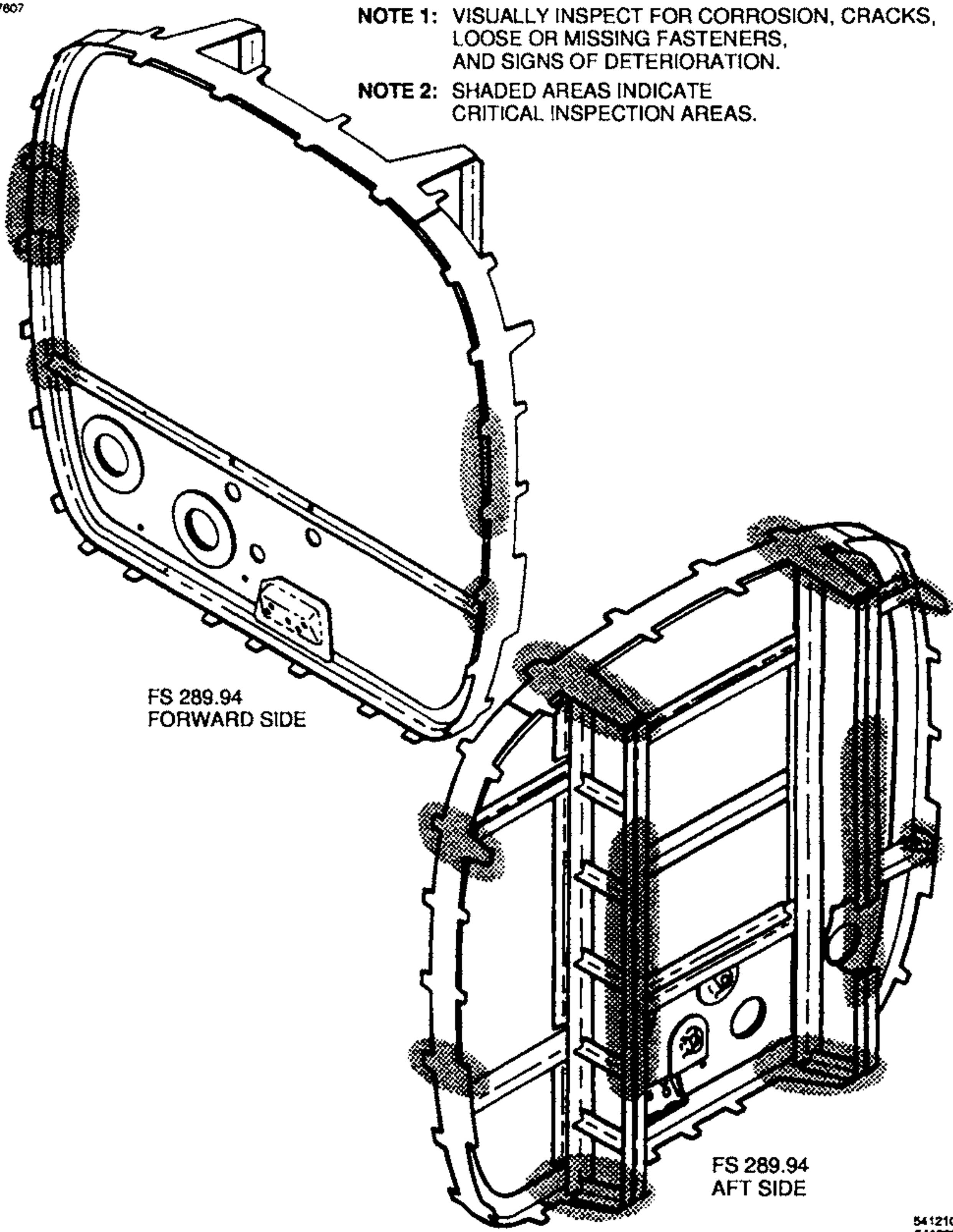
LOOKING AFT AT FS 289.94



LOOKING FORWARD AT FS 289.94

Pressurized Cabin Structure Inspection (421C0001 Thru 421C0400)
Figure 4 (Sheet 1)

A27607

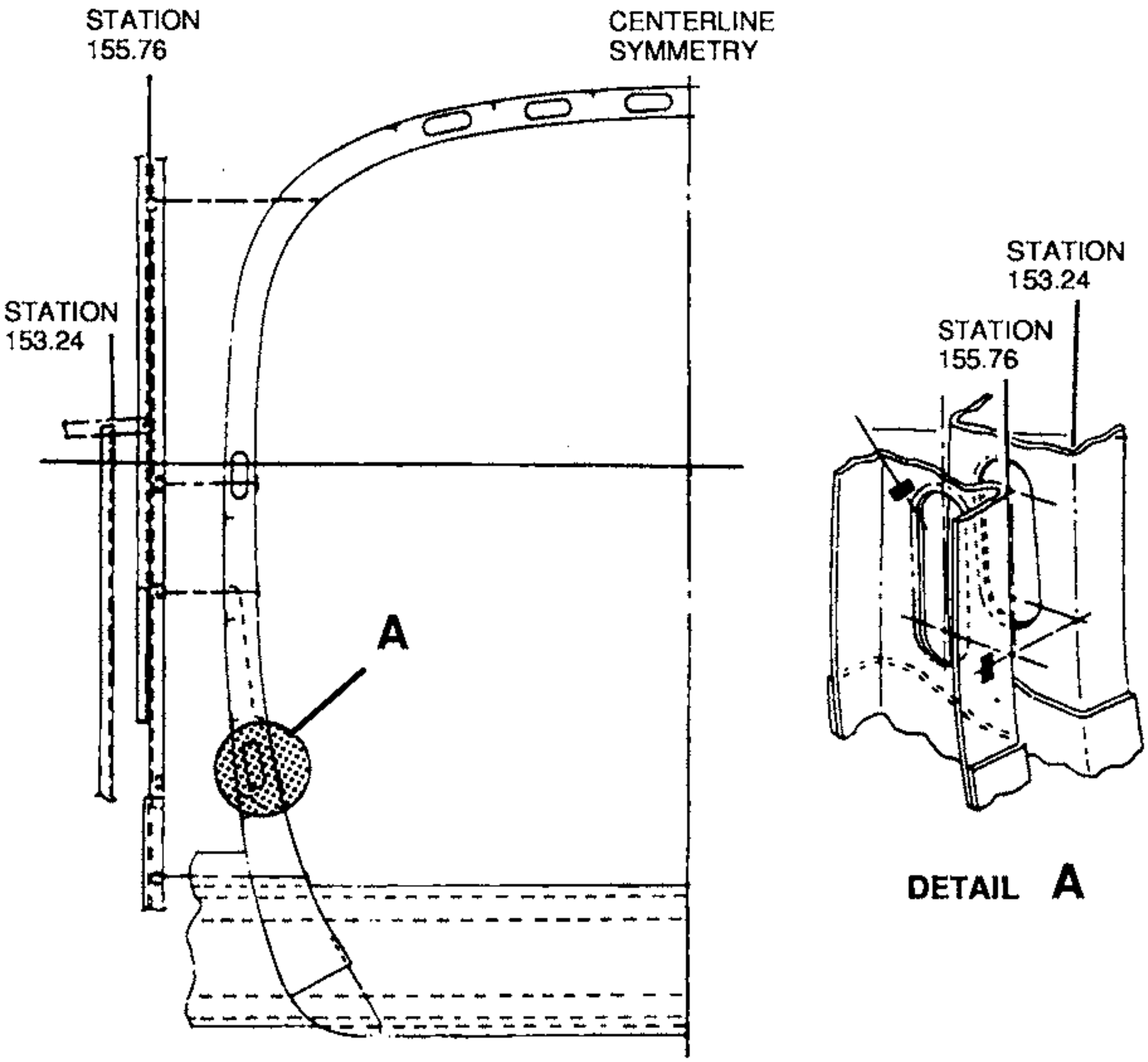


Pressurized Cabin Structure Inspection (421C0401 Thru 421C1807)
Figure 5 (Sheet 1)

A27608

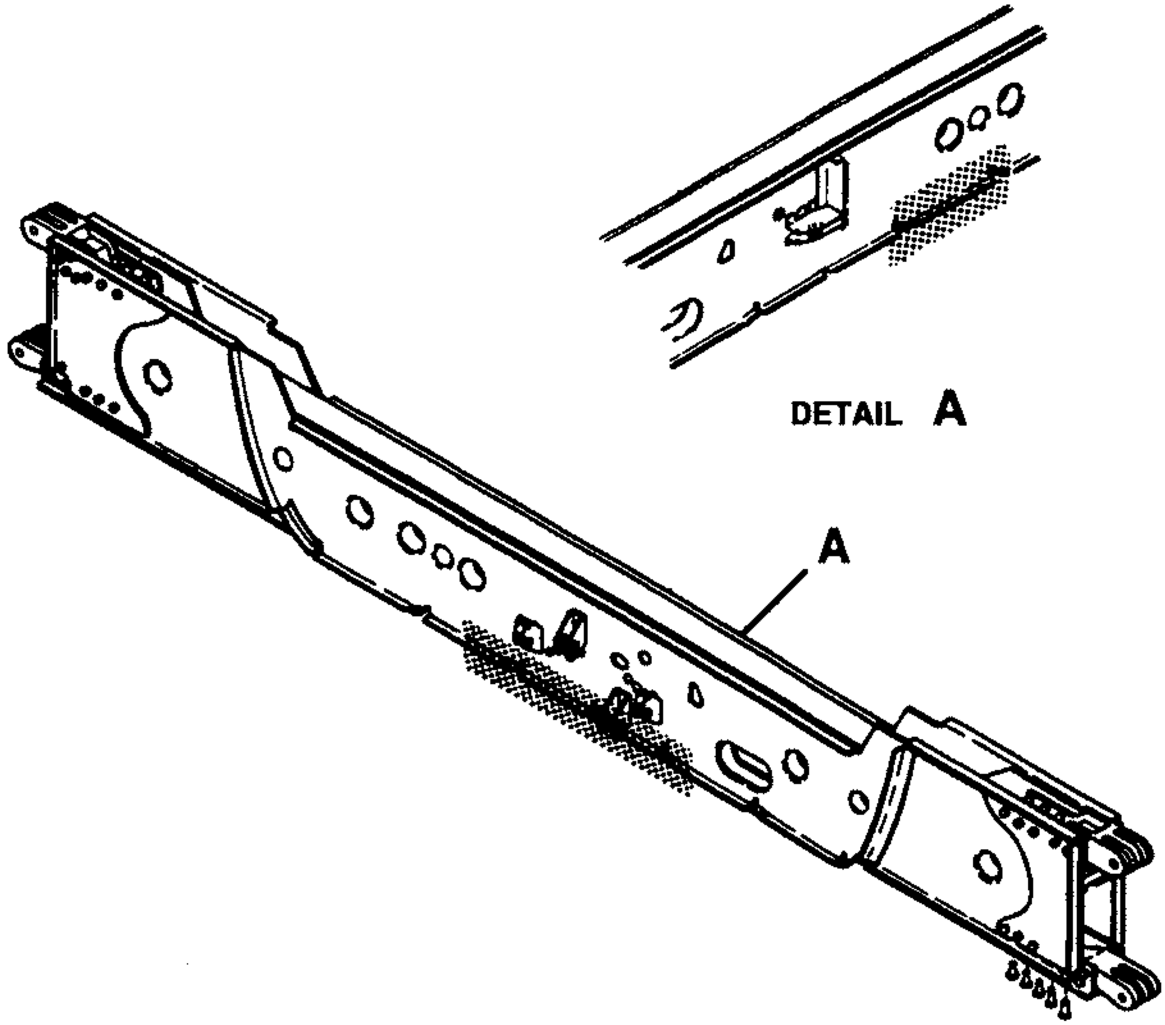
NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.



Pressurized Cabin Structure Inspection
Figure 6 (Sheet 1)

A27609

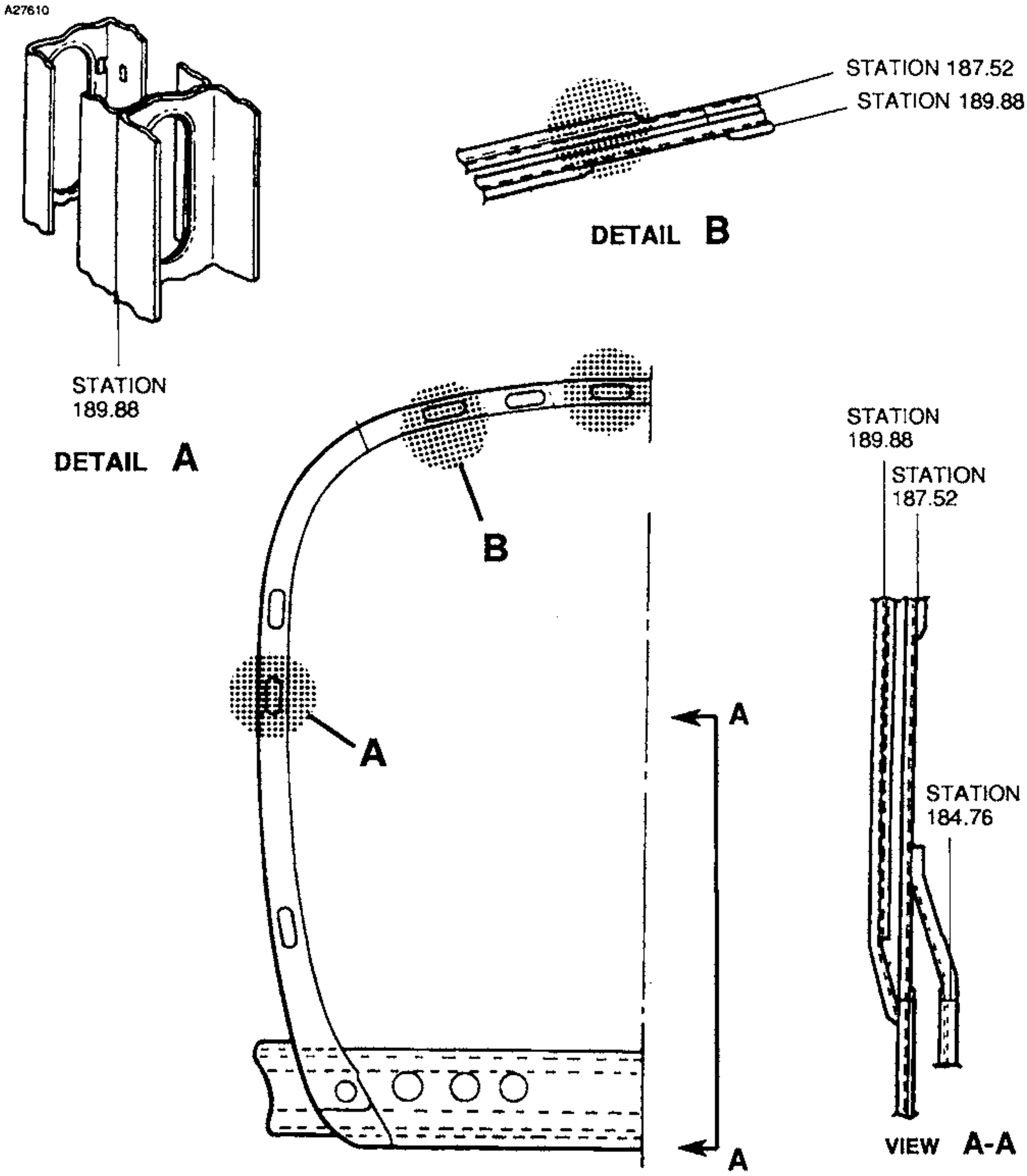


NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

1419R2020
A5119R2001

Pressurized Cabin Structure Inspection
Figure 7 (Sheet 1)



NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS AND SIGNS OF DETERIORATION.

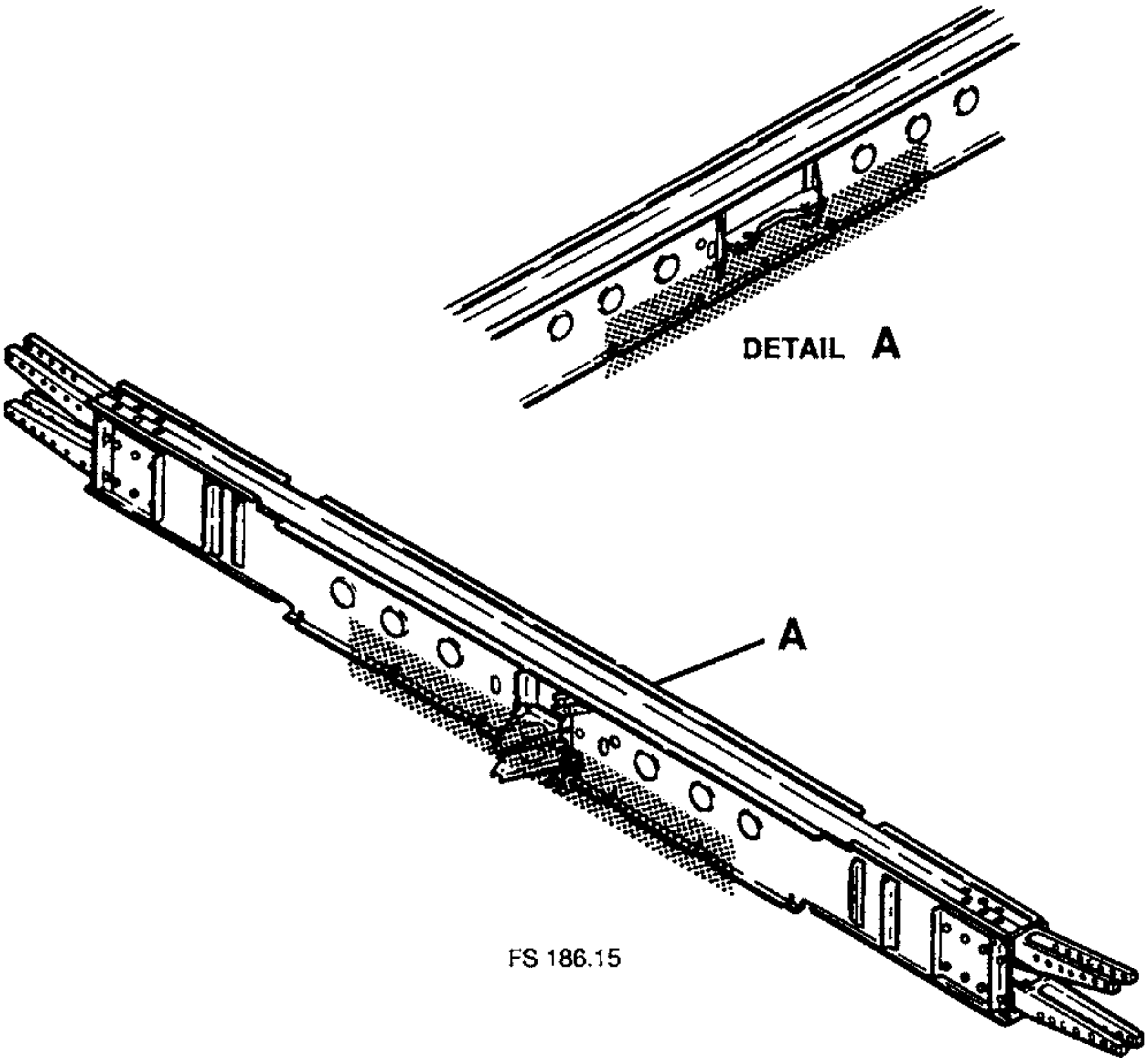
NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

Pressurized Cabin Structure Inspection
Figure 8 (Sheet 1)

A27611

NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

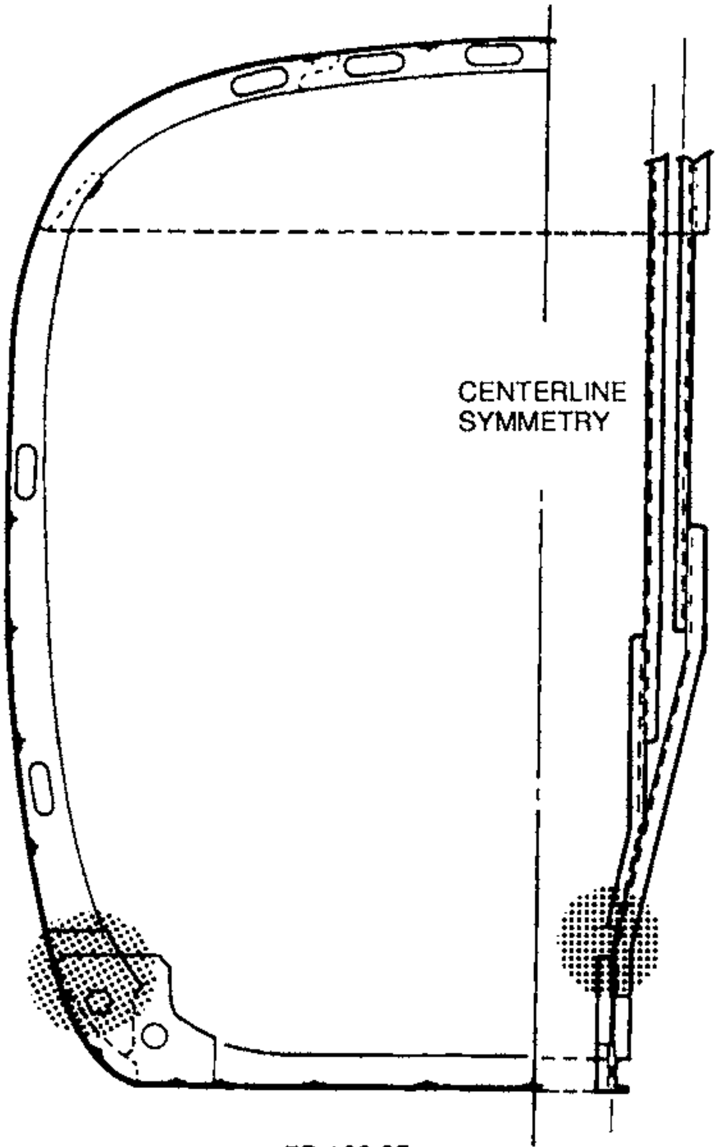


Pressurized Cabin Structure Inspection
Figure 9 (Sheet 1)

A27612

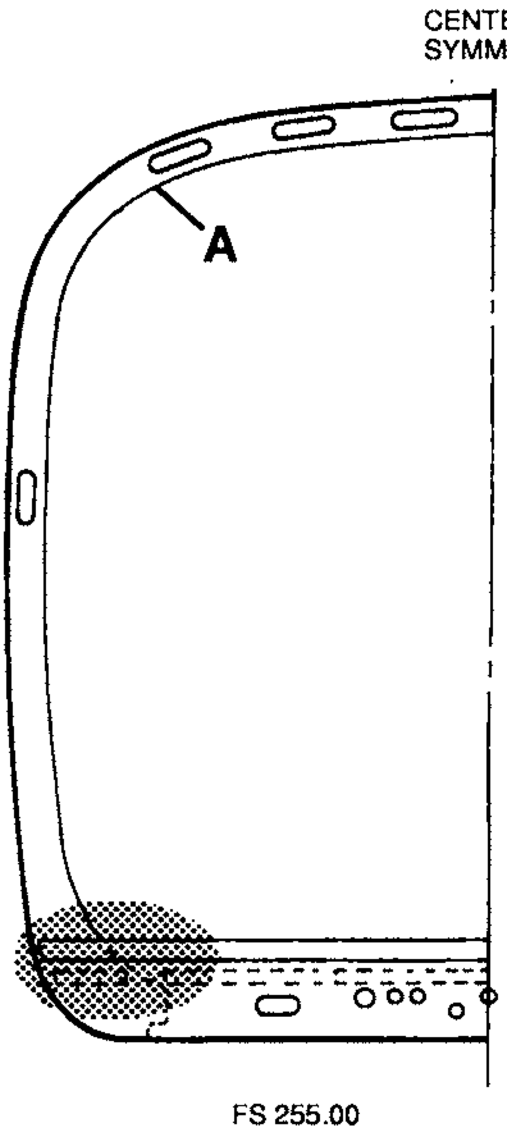
NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.



Pressurized Cabin Structure Inspection
Figure 10 (Sheet 1)

A27613



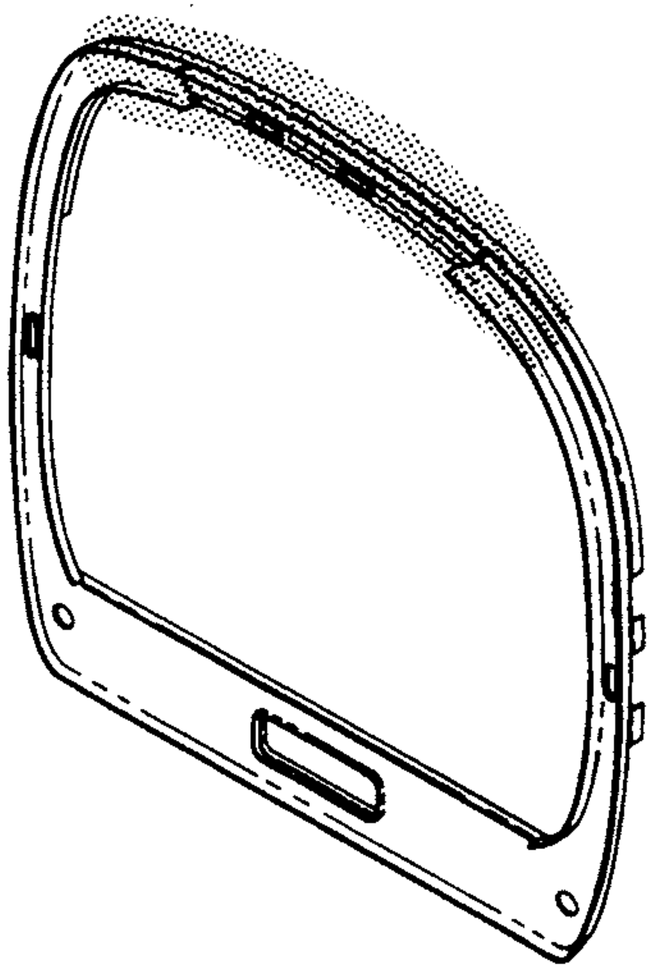
DETAIL A

NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS, LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

Pressurized Cabin Structure Inspection
Figure 11 (Sheet 1)

A27614



NOTE 1: VISUALLY INSPECT FOR CORROSION, CRACKS LOOSE OR MISSING FASTENERS, AND SIGNS OF DETERIORATION.

NOTE 2: SHADED AREAS INDICATE CRITICAL INSPECTION AREAS.

Pressurized Cabin Structure Inspection
Figure 12 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 53-10-02

1. **TITLE**
   Fuselage Left and Right Hand Window Frame Stringers

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   A detailed inspection around the fastener holes common to the window frame stringers and fuselage skin for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the upholstery panels forward of the cabin door and aft of the side crew window to expose the window channel assembly. Refer to the Service Manual for removal instructions.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 53-10-02, for specific instructions.
   C. Reinstall the upholstery panels. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Fuselage Cabin	0.15 Inch

6. **INSPECTION METHOD**
   Surface Eddy Current

7. **REPAIR/MODIFICATION**

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 53-10-03

1. **TITLE**
   Horizontal Stabilizer Rear Spar Angle Attachment

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   A detailed inspection of the tailcone angle attachment to the horizontal stabilizer rear spar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to the service manual.
   B. Inspect the tailcone angle attachment and the horizontal stabilizer rear spar for corrosion.
   C. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 53-10-03, for specific instructions.
   D. Reinstall the horizontal stabilizer. Refer to the service manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   It is permissible to remove/blend out up to ten percent of the spar cap or attachment angle thickness to remove corrosion. Refer to the service manual for approved corrosion removal procedures.

8. **COMMENTS**
   If a crack is detected, or corrosion requiring removal of more than ten percent of the spar cap or attachment angle thickness is discovered, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 54-10-04

1. TITLE
Engine Support Beams

2. EFFECTIVITY

	INSPECTION	**COMPLIANCE**	
421C0001 Thru 421C1807			
	TYPICAL:	**INITIAL**	6,500 Hours Or 13 Years
		REPEAT	1,600 Hours Or 3 Years*

* Repeat inspection interval corresponds with every engine overhaul.

3. PURPOSE
Detailed inspection of the engine beams for cracks due to fatigue, overload, and corrosion.

4. INSPECTION INSTRUCTIONS

A. Gain access to inspect the engine beams.
  (1) Remove engines from the airplane. Refer to the Service Manual.
  (2) Remove four bolts attaching the unfeathering accumulator (if installed) and remove to allow access to the engine mount bolts.
  (3) Do not disconnect hose.
  (4) Mark all engine mount components for proper orientation.
  (5) Disconnect the forward and aft mounts from the engine and engine beam and remove mounts. Retain bolts and washers.

B. Visually inspect the engine support structure for cracks, overload deformations, corrosion, loose fasteners and exhaust leak heat damage.

C. Inspect the engine beams (Refer to Section IV, (NDI Inspection), Supplemental Inspection Number 54-10-04).
  (1) Eddy current inspect the area around and between the fasteners common to the engine beams.
  (2) Inspect the forward and aft engine mount areas including fastener holes in the unfeathering accumulator attach area.

D. Visually inspect engine support beams for loose or working fasteners.

E. If no cracks/damage is found, reinstall equipment removed for access. Refer to the Service Manual.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Engine	0.16 Inch

6. INSPECTION METHOD
Visual/Eddy Current

7. REPAIR/MODIFICATION
None

8. COMMENTS
If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-03

1. **TITLE**
   Horizontal Stabilizer Spars and Attachments

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   To inspect the forward and aft horizontal stabilizer spars, auxiliary spars, and attachments for signs of damage, fatigue, corrosion and deterioration.

4. **INSPECTION INSTRUCTIONS**
   A. Remove elevator from the airplane and open all horizontal stabilizer access panels. Refer to the service manual.
   B. Inspect the forward and aft spars, auxiliary spars, and attach fittings for cracks, corrosion, loose fasteners, elongated fastener attach holes and signs of fatigue and deterioration.
   C. Close all horizontal stabilizer access panels and reinstall the elevator. Refer to the service manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   Blend out of up to ten percent of the spar cap thickness is permissible to remove corrosion. Refer to the Service Manual for approved corrosion removal procedures. Repairs may be made in accordance with the Service Manual, which is considered to be acceptable repair data. Repair of corrosion greater than ten percent of the spar cap thickness or any repair not covered by recommendations in the Service Manual should be coordinated with Cessna Aircraft Company, Propeller Aircraft Product Support prior to beginning the repair.

8. **COMMENTS**
   If a crack is detected, or corrosion greater than ten percent of the spar thickness is discovered, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-04

1. **TITLE**
   Horizontal Stabilizer Forward Spar Upper Cap

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the front spar upper cap horizontal flange fastener holes for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to the service manual.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-10-04, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-05

1. **TITLE**
   Horizontal Stabilizer Forward Spar Lower Cap

2. **EFFECTIVITY**

		INSPECTION	COMPLIANCE
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the front spar lower cap horizontal flange fastener holes for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to Service Manual.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-10-05, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-06

1. **TITLE**
   Horizontal Stabilizer Forward Spar Attach, BL 7.69

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	10,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the front spar attachment at BL 7.69 for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to the Service Manual.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-10-06, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-07

1. **TITLE**
   Horizontal Stabilizer Rear Spar Lower Cap Attach

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the rear spar lower cap horizontal flange attach points for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to the Service Manual.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-10-07, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-08

1. **TITLE**
   Horizontal Stabilizer Rear Spar Upper Cap, BL 0.00

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	**INITIAL**	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the rear spar upper cap horizontal flange fastener holes around BL 0.00 for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to the Service Manual.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-10-08, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-10-09

1. **TITLE**
   Horizontal Stabilizer Rear Spar Lower Cap, BL 0.00

2. **EFFECTIVITY**

		INSPECTION	COMPLIANCE
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the rear spar lower cap horizontal flange fastener holes around BL 0.00 for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the horizontal stabilizer. Refer to the Service Manual.
   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-10-09, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-20-01

1. **TITLE**
   Outboard Elevator Hinge Bracket and Attachment

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	**INITIAL**	5,000 Hours Or 10 Years
		REPEAT	1,000 Hours Or 3 Years

3. **PURPOSE**
   To inspect, repair or replace the outboard elevator hinge bracket and stabilizer bracket.

4. **INSPECTION INSTRUCTIONS**
   A. Remove elevator from the airplane. Refer to the Service Manual.
   B. Inspect the elevator and stabilizer hinge brackets for looseness, cracks and deterioration. Refer to Figure 1, SNL88-10 and SK421-130 for replacement of elevator hinge brackets.
   C. Reinstall the elevator. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Horizontal Stabilizer	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   Replace with the latest superseding bracket assemblies and attaching hardware.

8. **COMMENTS**
   Failure can be critical to airplane pitch control.

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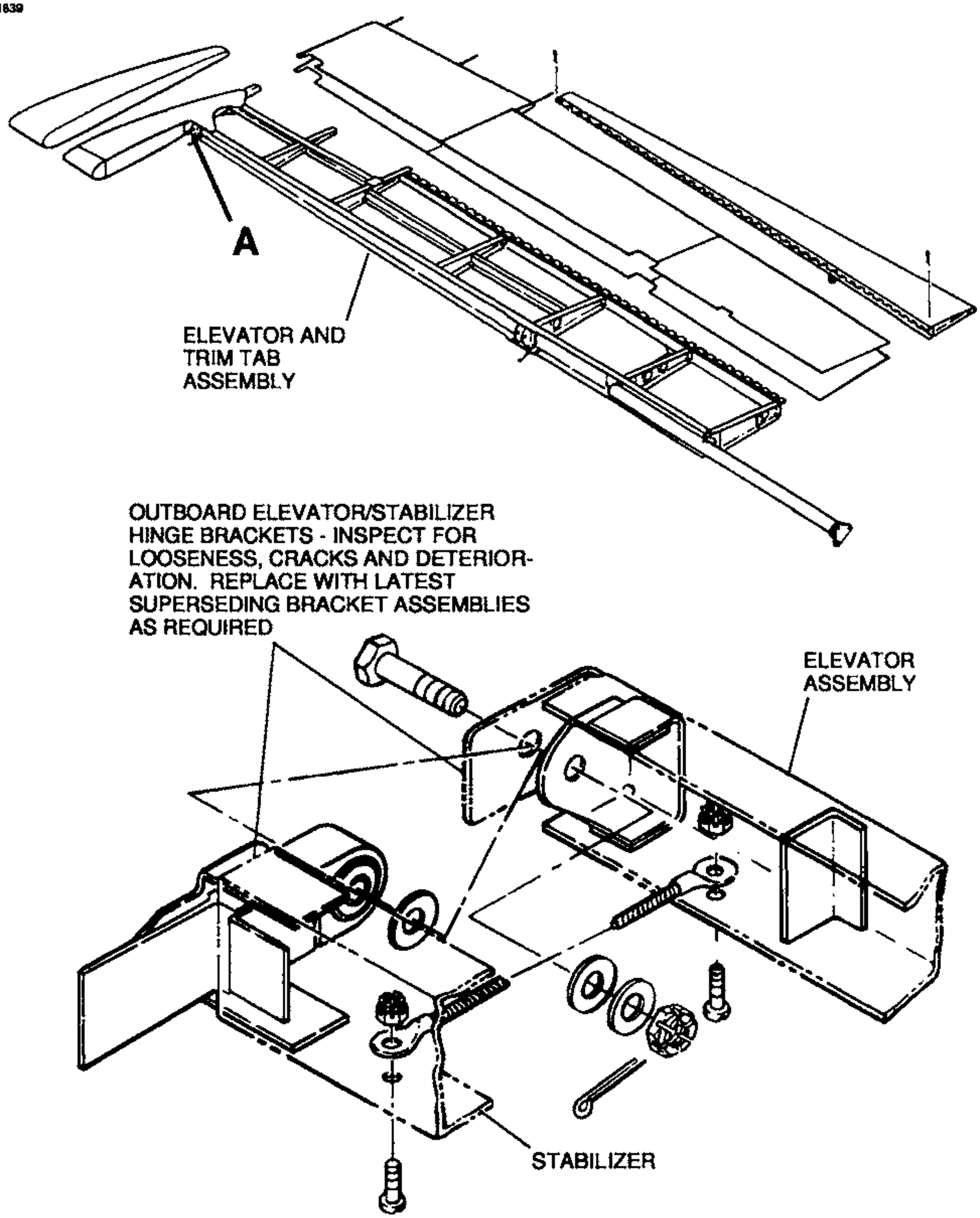

DETAIL A

5134001
A51341004

Elevator and Trim Tab Assembly
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 55-20-02

1. **TITLE**
   Elevator Hinges and Fittings

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	2,500 Hours Or 5 Years

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   To inspect the elevator hinges, fittings and associated hardware and components for signs of damage, fatigue and deterioration.

4. **INSPECTION INSTRUCTIONS**
   A. Remove elevator from the airplane. Refer to the Service Manual.
   B. Visually inspect:
      (1) Elevator hinges for condition, cracks and security.
      (2) Hinge bolts and hinge bearings for condition and security.
      (3) Bearings for freedom of rotation.
      (4) Attach fittings for evidence of damage, wear, failed fasteners and security.
   C. Dye penetrant inspect the elevator hinge attach fittings for cracks. Refer to Section IV (NDI Inspection), Page 4, for specific instructions.
   D. Reinstall the elevator. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Horizontal Stabilizer	Visual: 0.25 Inch Dye Penetrant: 0.10 Inch

6. **INSPECTION METHOD**
   Visual/Dye Penetrant

7. **REPAIR/MODIFICATION**
   Replace defective/damaged components with the latest superseding part numbers.

8. **COMMENTS**
   None

SUPPLEMENTAL INSPECTION NUMBER: 55-30-01

1. **TITLE**
   Vertical Stabilizer Spars and Attachments

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   To inspect the vertical stabilizer spars and attachments for signs of damage, fatigue and deterioration.

4. **INSPECTION INSTRUCTIONS**
   A. Remove rudder from the airplane and open all vertical stabilizer access panels. Refer to the Service Manual.
   B. Inspect the forward and aft spars and attach fittings for cracks, corrosion, loose fasteners, elongated fastener attach holes and signs of fatigue and deterioration. Attention to the aft spar structure for corrosion is recommended.
   C. Close all vertical stabilizer access panels and reinstall the rudder. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   Blend out of up to ten percent of the spar cap thickness is permissible to remove corrosion. Refer to the Service Manual for approved corrosion removal procedures. Repairs may be made in accordance with the Service Manual, which is considered to be acceptable repair data. Repair of corrosion greater than ten percent of the spar cap thickness or any repair not covered by recommendations in the Service Manual should be coordinated with Cessna Aircraft Company, Propeller Aircraft Product Support prior to beginning the repair.

8. **COMMENTS**
   If a crack is detected, or repair for corrosion is required, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 55-30-02

1. **TITLE**
   Rudder Hinges and Fittings

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   To inspect the rudder hinges, fittings and associated hardware and components for signs of damage, fatigue and deterioration.

4. **INSPECTION INSTRUCTIONS**
   A. Remove rudder from the airplane. Refer to the Service Manual.
   B. Visually inspect:
      (1) Rudder hinges for condition, cracks and security.
      (2) Hinge bolts, hinge bearings for condition and security.
      (3) Bearings for freedom of rotation.
      (4) Attach fittings for evidence of damage, wear, failed fasteners and security.
   C. Dye penetrant inspect the rudder hinge attach fittings for cracks. Refer to Section IV (NDI Inspection), Page 4, for specific instructions.
   D. Reinstall the rudder. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Vertical Stabilizer	Visual: 0.25 Inch Dye Penetrant: 0.10 Inch

6. **INSPECTION METHOD**
   Visual/Dye Penetrant

7. **REPAIR/MODIFICATION**
   Replace defective/damaged components with the latest superseding part numbers.

8. **COMMENTS**
   Verify that MEB00-4, Rudder Hinge Bearing Inspection Replacement, has been incorporated.

SUPPLEMENTAL INSPECTION NUMBER: 55-30-04

1. **TITLE**
   Vertical Stabilizer Rear Spar Cap Attach, WL 108.38

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of the rear spar attachment at WL 108.38 for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 55-30-04, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Tailcone	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 56-10-01

1. **TITLE**
   Pilot and Copilot Windshield Attach Hole Inspection - Acrylic Windshield

2. **EFFECTIVITY**

	INSPECTION	**COMPLIANCE**	
421C0001 Thru 421C1807			
	TYPICAL:	**INITIAL**	200 Hours Or 1 Year
		REPEAT	200 Hours Or 1 Year

3. **PURPOSE**
   To inspect acrylic windshield for cracks and ensure rubber grommets are properly installed and in good condition for the protection of the windshield from direct contact with attaching fasteners.

4. **INSPECTION INSTRUCTIONS**
   A. Visually inspect the windshield for cracks around attaching fasteners and make sure grommets are properly installed and are in good condition.
   B. Perform an optical prism inspection. Refer to Section IV (NDI Inspection), Supplemental Inspection 56-10-01, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Fuselage	N/A

6. **INSPECTION METHOD**
   Visual, Optical Prism Inspection

7. **REPAIR/MODIFICATION**
   The acrylic windshield is to be replaced every 13,200 hours. Refer to the Service Manual for removal instructions.

8. **COMMENTS**
   Improperly installed or deteriorated grommets allowing fasteners direct contact with the windshield can create cracks, which could ultimately cause windshield failure in flight while the airplane is pressurized.

SUPPLEMENTAL INSPECTION NUMBER: 56-10-02

1. **TITLE**
   Acrylic Windshield

2. **EFFECTIVITY**

INSPECTION COMPLIANCE

421C0001 Thru 421C1807

TYPICAL:	**INITIAL**	13,200 Hours
	REPEAT	13,200 Hours

3. **PURPOSE**
   To make sure that the life-limited acrylic windshield is replaced per the time schedule.

4. **INSPECTION INSTRUCTIONS**
   A. Verify windshield replacement.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Forward Fuselage	N/A

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   The acrylic windshield is to be replaced every 13,200 hours. Refer to the 421C Service Manual for windshield removal and installation instructions.

8. **COMMENTS**
   None

SUPPLEMENTAL INSPECTION NUMBER: 57-10-14

1. TITLE

Wing Lower Carry-Thru Front Spar Cap

2. EFFECTIVITY

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. PURPOSE

Detailed inspection of the front carry-thru spar for cracks due to fatigue, overload, and corrosion.

4. INSPECTION INSTRUCTIONS

A. Obtain SK421-152 Service Kit from Cessna Aircraft Company.

B. Install access panels as described in SK421-152.

C. Remove the fitting and inspect the spar and fitting for corrosion. If corrosion is found on the fitting, install a new fitting.

D. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-14, for specific instructions.

5. ACCESS AND DETECTABLE CRACK SIZE

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. INSPECTION METHOD

Bolt Hole Eddy Current

7. REPAIR/MODIFICATION

Install Service Kit SK421-152 from Cessna Aircraft Company. Replace corroded or cracked fittings. Blend out of up to ten percent of the spar cap thickness is permissible to remove corrosion. Refer to the Service Manual for approved corrosion removal procedures. Repair of corrosion greater than ten percent of the spar cap thickness should be coordinated with Propeller Aircraft Product Support prior to beginning the repair

8. COMMENTS

If a crack is detected or corrosion greater than ten percent of the spar thickness is discovered, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-15

1. **TITLE**
   Wing Lower Front Spar Cap at Root Fitting Attach

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C0800			
	TYPICAL:	INITIAL	5,000 Hours
		INITIAL AFTER MODIFICATION	2,000 Hours Or 4 Years
		REPEAT	1,200 Hours Or 3 Years
421C0801 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours
		INITIAL AFTER MODIFICATION	6,000 Hours Or 12 Years
		REPEAT	4,000 Hours Or 8 Years

3. **PURPOSE**
   Detailed inspection of the front spar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**

   NOTE: Service Bulletin is currently in work. Inspection compliance is not applicable until Service Bulletin is issued.

   A. Remove access panels to gain access to the root fitting attach location.

   B. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-15, for specific instructions.

   C. Install access panels.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-16

1. **TITLE**
   Lower Main Wing Spar Cap Inspection and Modification

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C0800			
	TYPICAL:	INITIAL	5,000 Hours
		INITIAL AFTER MODIFICATION	12,500 Hours Or 13 Years
		REPEAT	4,000 Hours Or 8 Years
421C0801 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours
		INITIAL AFTER MODIFICATION	20,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Inspect all fastener holes through the lower main wing spar cap and skin from the wing root fitting to fifteen inches outboard of the outboard engine beam. Install spar cap reinforcing strap.

4. **INSPECTION INSTRUCTIONS**

   NOTE: Service Bulletin is currently in work. Inspection compliance is not applicable until Service Bulletin is issued.

   A. Obtain applicable Service Bulletins, Service Information Letters and/or Service Kits from Cessna Aircraft Company.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing/Nacelle	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-17

1. **TITLE**
   Wing Lower Forward Auxiliary Spar Cap

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of forward auxiliary spar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-17, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-18

1. **TITLE**
   Wing Lower Aft Auxiliary Spar Cap

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of aft auxiliary spar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Through the wheel well area, open the access panels in the rear auxiliary spar web. Refer to Figure 1.
   B. Visually inspect aft auxiliary spar structure for cracks, overload deformations, corrosion and loose fasteners.
   C. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-18, for specific instructions.
   D. Install access panels in the rear auxiliary spar web.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. **INSPECTION METHOD**
   Visual/Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

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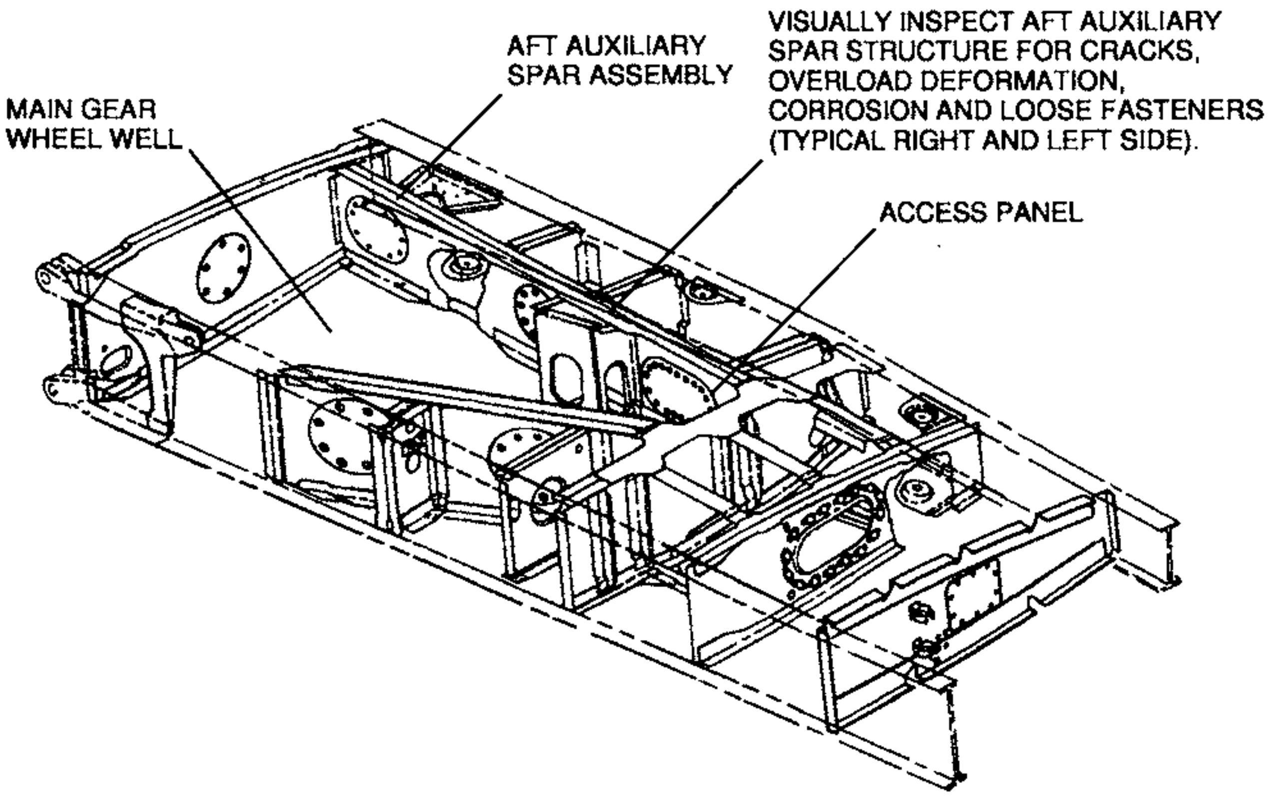

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Aft Auxiliary Spar Assembly
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-19

1. **TITLE**
   Wing Rear Spar Lower Cap at Spar Splice

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of rear spar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Lower the flap at the rear spar splice location, outboard of WS 103.29.
   B. Remove the access panels in the lower wing skin. Refer to Figure 1.
   C. Visually inspect the rear spar structure for cracks, overload deformation, corrosion, and loose fasteners.
   D. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-19, for specific instructions.
   E. Install access panels in the lower wing skin.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. **INSPECTION METHOD**
   Visual/Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

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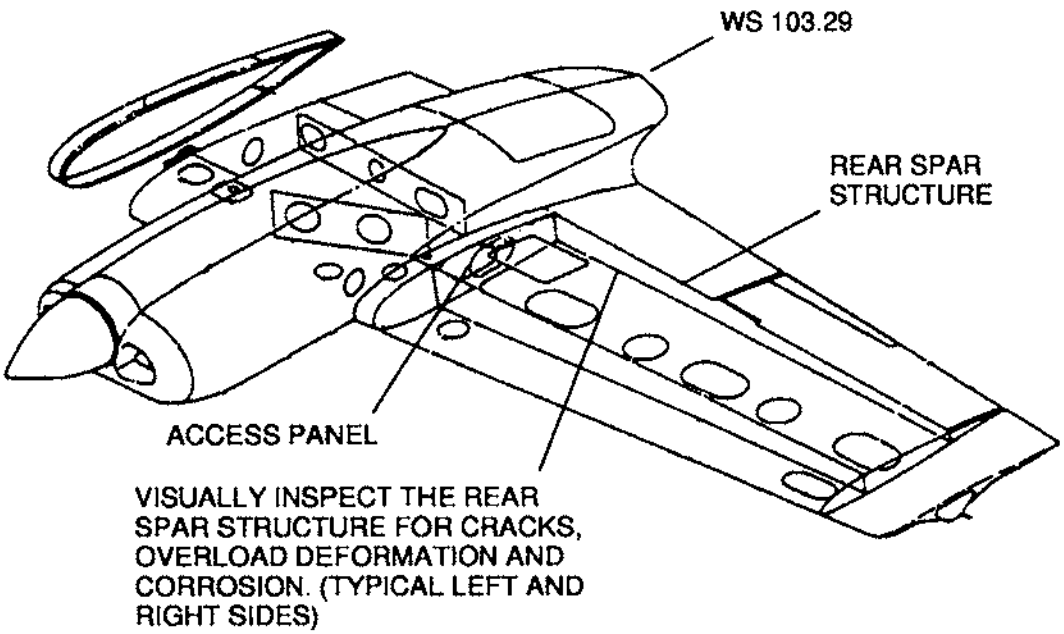

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Wing Rear Spar Structure
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-20

1. **TITLE**
   Wing Lower Carry-Thru Rear Spar Cap at Fitting

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	5,000 Hours Or 10 Years

3. **PURPOSE**
   Detailed inspection of carry-thru rear spar for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Obtain Service Kit SK421-152 from Cessna Aircraft Company.
   B. Install access panels as describe in Service Kit SK421-152.
   C. Remove fitting from airplane. Inspect spar and fitting for corrosion. If corrosion is found on the fitting, replace with new fitting.
   D. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-20, for specific instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-21

1. **TITLE**
   Bonded Wing Inspection and Sealing

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	Per MEB95-11R1
		REPEAT	Per MEB95-11R1

3. **PURPOSE**
   Detailed inspection of bonded wing assemblies for evidence of corrosion and/or debonding.

4. **INSPECTION INSTRUCTIONS**
   A. Refer to Service Bulletin MEB95-11R1 for accomplishment instructions.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	N/A

6. **INSPECTION METHOD**
   Visual, Ultrasonic

7. **REPAIR/MODIFICATION**
   Repairs may be made in accordance with Cessna Service Bulletin MEB95-11R1.

8. **COMMENTS**
   Contact a Cessna Multi-engine Service Station for detailed information concerning this inspection.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-22

1. **TITLE**
   Wing Front Spar Lug Inspection

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	15,000 Hours Or 20 Years
		REPEAT	2,500 Hours Or 5 Years

3. **PURPOSE**
   Detailed inspection of the wing front spar lugs for cracks due to fatigue, overload, and corrosion.

4. **INSPECTION INSTRUCTIONS**
   A. Remove the wing gap cover to gain access to the front spar lower lugs. Refer to the Service Manual.
   B. Visually inspect the lugs for cracks, overload deformations, and corrosion.
   C. Refer to Section IV (NDI Inspection), Supplemental Inspection Number 57-10-22, for specific instructions.
   D. Reinstall the wing gap cover. Refer to the Service Manual.

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.080 Inch

6. **INSPECTION METHOD**
   Bolt Hole Eddy Current

7. **REPAIR/MODIFICATION**
   Comply with applicable service bulletins, service information letters and/or service kits from Cessna Aircraft Company.

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-23

1. **TITLE**
   Lower Wing Spar and Skin Inspection

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	10,000 Hours
		REPEAT	100 Hours

3. **PURPOSE**
   To inspect the forward and aft lower wing spars for cracks. The lower wing skins shall also be inspected for cracks and the associated attachment fasteners for deteriorated condition.

4. **INSPECTION INSTRUCTIONS**

   A. Refer to Service Bulletin MEB00-7 for accomplishment instructions

5. **ACCESS AND DETECTABLE CRACK SIZE**

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing Wheel Well	0.25 Inch

6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   None

8. **COMMENTS**
   This inspection is not required if the wing modification in Supplemental Inspection Number 57-10-16 has been accomplished. If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 57-10-25

1. **TITLE**
   Wheel Well Close-Out Rib Inspection

2. **EFFECTIVITY**

	INSPECTION	COMPLIANCE	
421C0001 Thru 421C1807			
	TYPICAL:	INITIAL	5,000 Hours Or 10 Years
		REPEAT	1,000 Hours Or 3 Years

3. **PURPOSE**
   To inspect the wheel well close-out ribs for cracks.

4. **INSPECTION INSTRUCTIONS**
   A. Visually inspect the W.S. 106.79 wing rib for cracks as shown in Figure 1.

5. **ACCESS AND DETECTABLE CRACK SIZE**

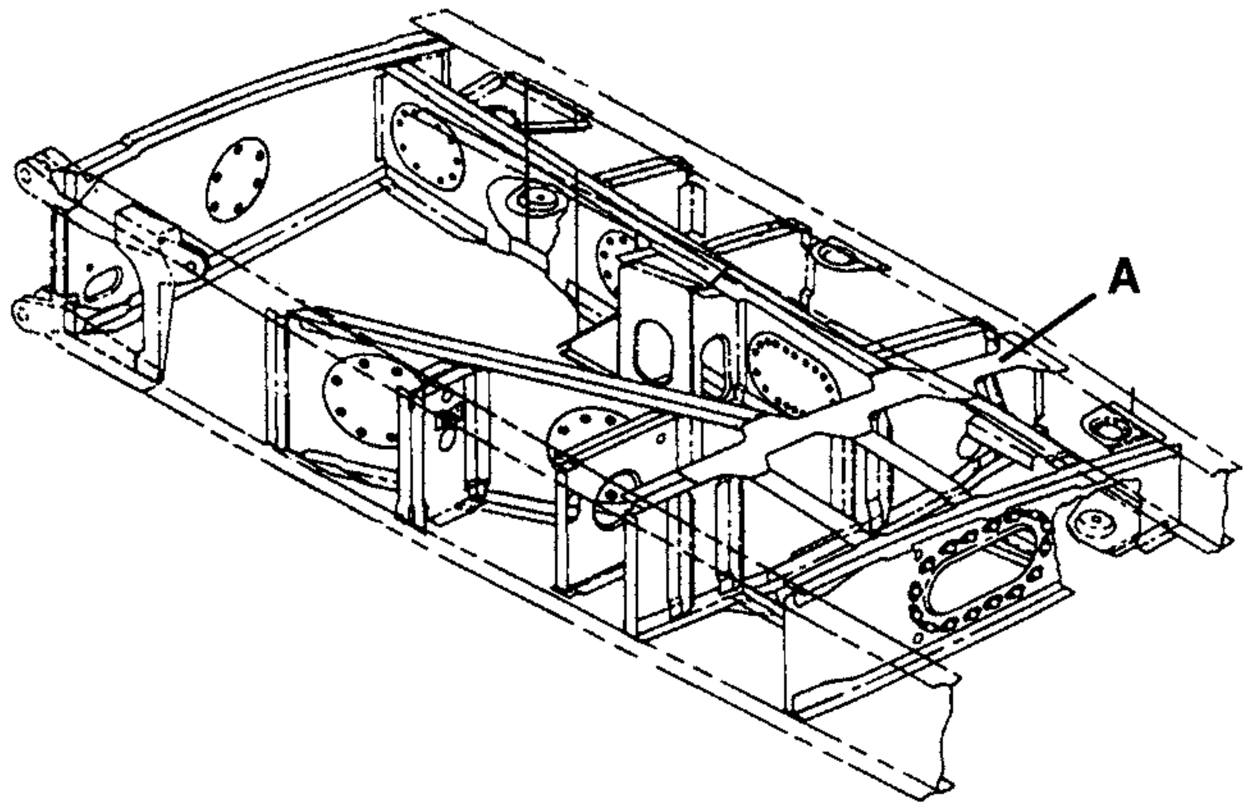
ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing Wheel Well	0.25 Inch

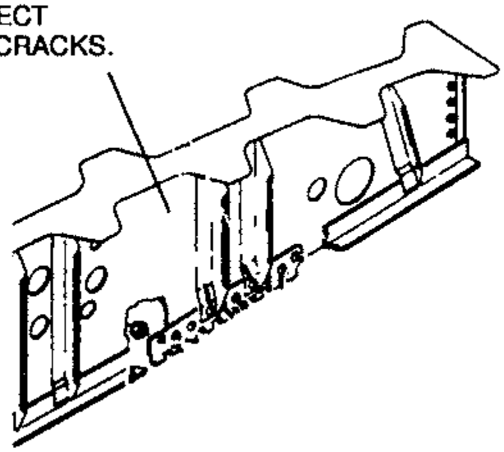
6. **INSPECTION METHOD**
   Visual

7. **REPAIR/MODIFICATION**
   If a crack is detected, replace cracked parts.

8. **COMMENTS**
   If a crack is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.

A27800





DETAIL A

5122R3006
A5122R2009

Wheel Well Close-Out Rib Inspection
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-26

1. **TITLE**
   Upper Wing to Carry-Thru Attachment Fittings

2. **EFFECTIVITY**

INSPECTION COMPLIANCE

421C0001 Thru 421C1807

TYPICAL:	**INITIAL**	1,000 Hours	Or	3 Years
	REPEAT	1,000 Hours	Or	3 Years

3. **PURPOSE**
   To inspect the upper forward and aft wing to carry-thru spar attachment fittings for cracks and corrosion.

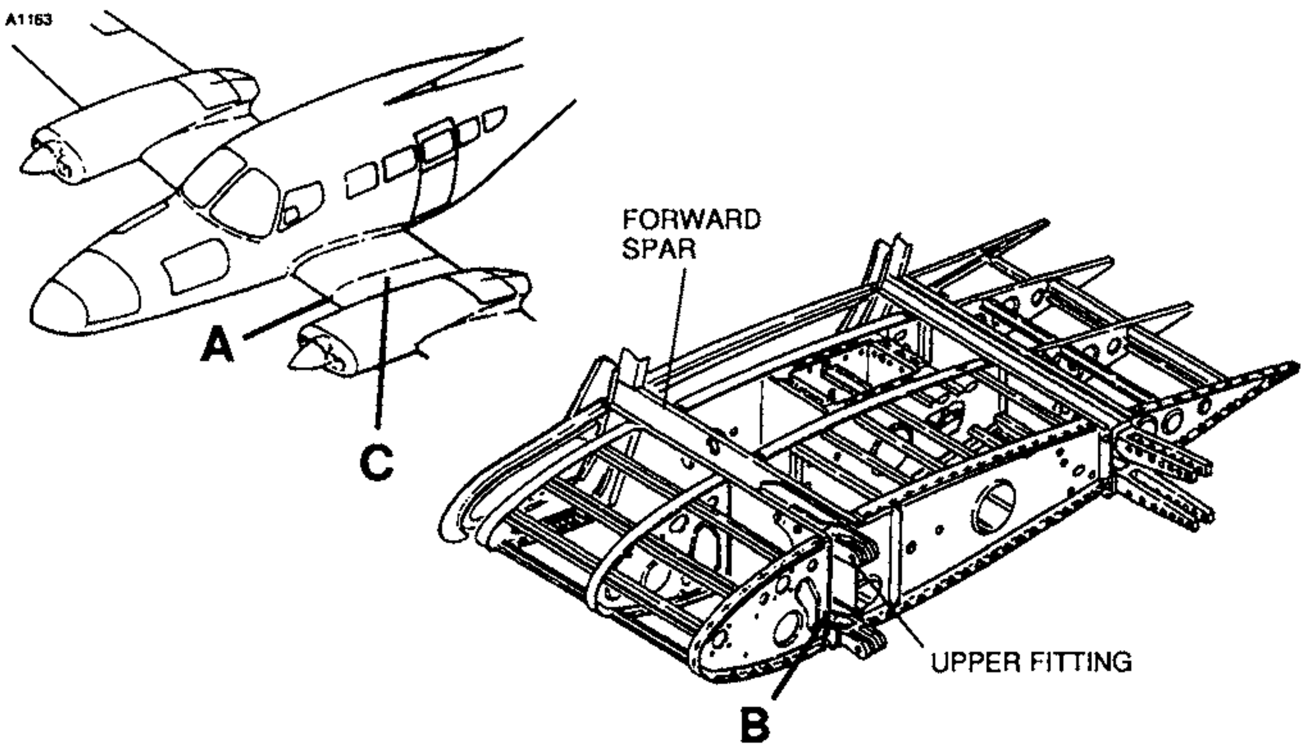
4. **INSPECTION INSTRUCTIONS**
   A. Remove wing gap cover and wing inspection panels to gain access to the wing to carry-thru spar fittings. Refer to service manual.
   B. Visually inspect the upper forward spar attachment fittings for cracks and corrosion as shown in Figure 1.
   C. Visually inspect the upper aft spar attachment fittings for cracks and corrosion as shown in Figure 2.
   D. If no cracks or corrosion are detected, replace the wing gap cover and wing inspection panels. Refer to the service manual.

ACCESS/LOCATION	DETECTABLE CRACK SIZE
Wing	0.25 Inch

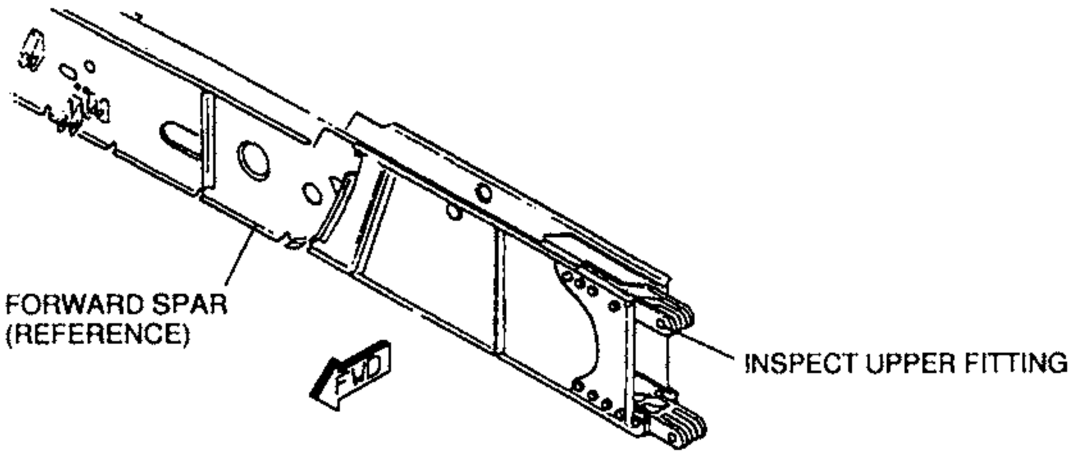
5. **INSPECTION METHOD**
   Visual

6. **REPAIR/MODIFICATION**
   If cracks or corrosion are detected, replace wing fittings.

7. **COMMENTS**
   If a crack or corrosion is detected, contact Cessna Aircraft Company, Propeller Aircraft Product Support.



DETAIL A
LOOKING INBOARD AT
LEFT WING
(RIGHT WING OPPOSITE)

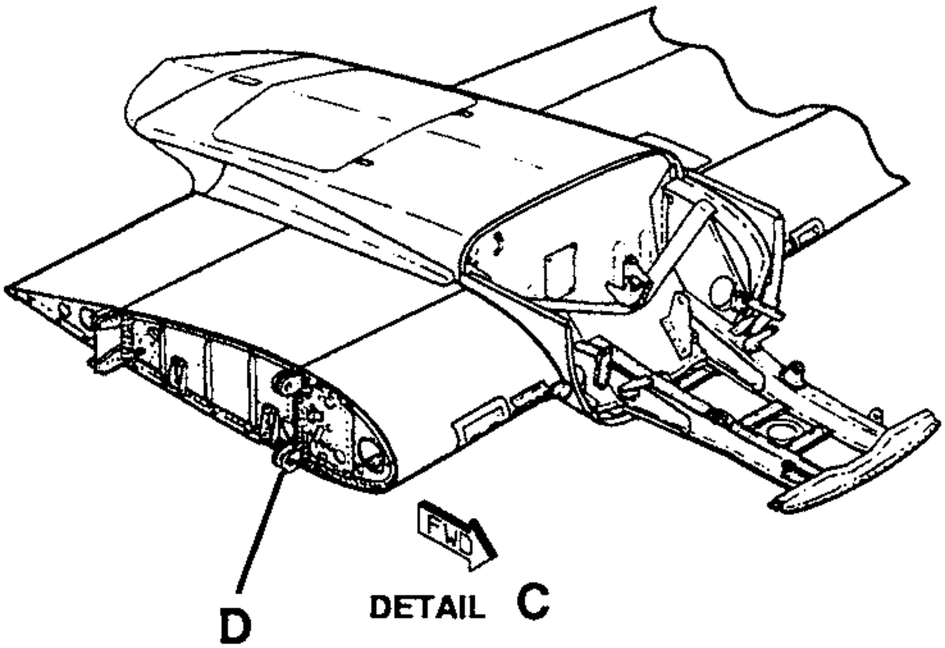


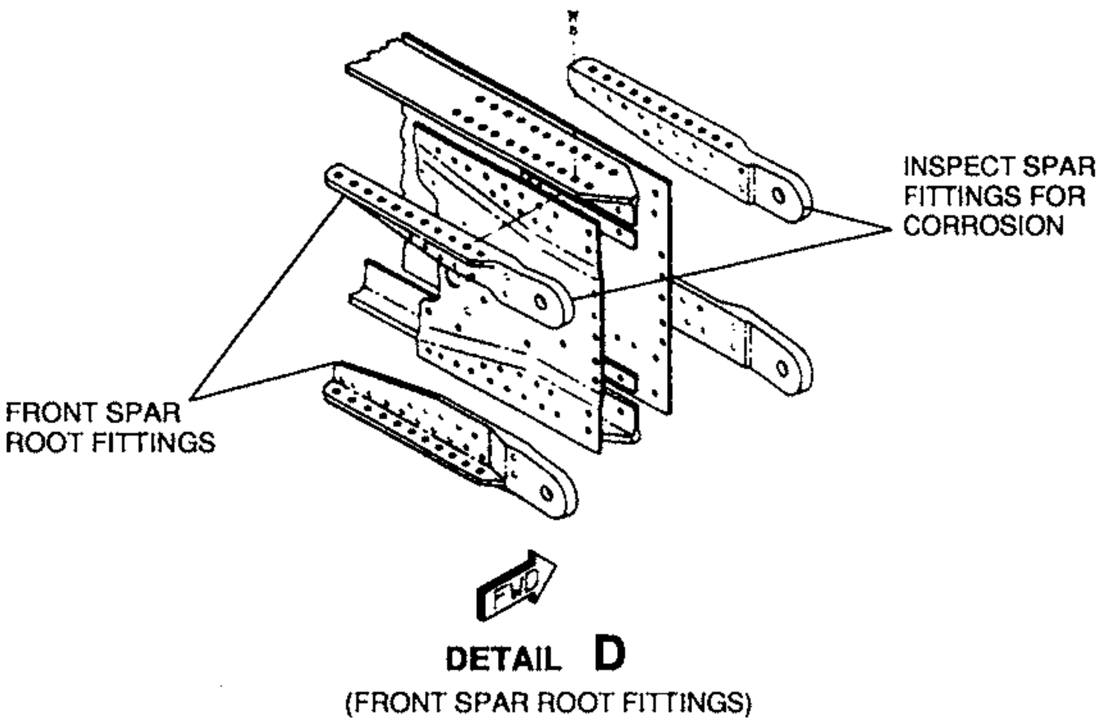
DETAIL B
LOOKING AT LEFT WING
FORWARD SPAR
(RIGHT SIDE OPPOSITE)

52103004
A52203003
B52221012

Wing Upper Carry-Thru Front Spar Cap Inspection
Figure 1 (Sheet 1)

A1164

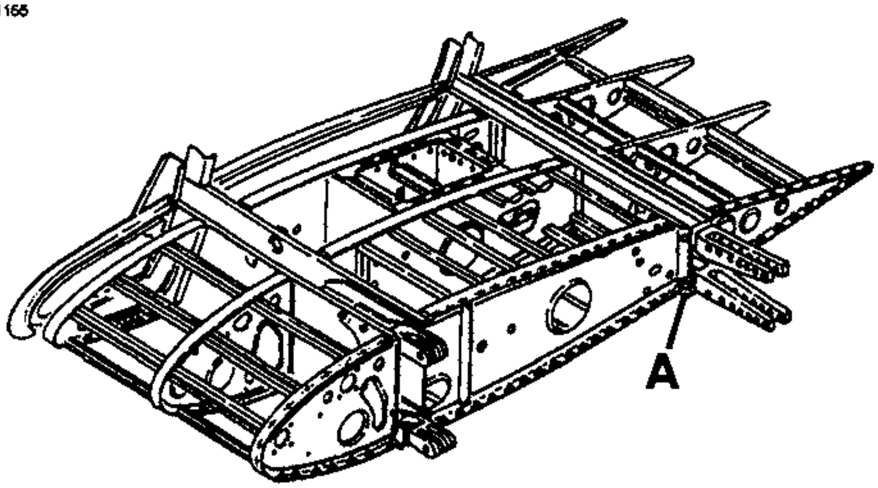


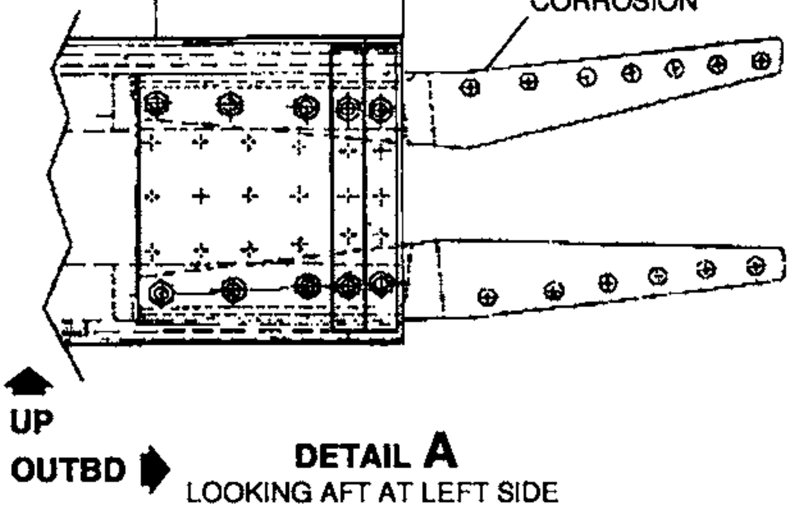


C52203001

Wing Upper Carry-Thru Front Spar Cap Inspection
Figure 1 (Sheet 2)

A1165





5220R3003
A5220R1015

Wing Upper Carry-Thru Rear Spar Cap Inspection
Figure 2 (Sheet 1)

SECTION IV - INSPECTION METHODS AND REQUIREMENTS

1. GENERAL REQUIREMENTS

A. General

(1) Facilities performing nondestructive inspection as defined in this Supplemental Inspection Document must hold a valid FAA Repair Station Certificate with a Specialized Service Rating in the applicable method of nondestructive inspection.

(2) Personnel performing nondestructive inspections defined in this Supplemental Inspection Document shall be certified to a minimum of a Level II in the appropriate inspection method as defined in a written practice that meets the minimum intent of The American Society for Nondestructive Testing Recommended Practice Number SNT-TC-1A or National Aerospace Standard NAS 410, NAS Certification and Qualification of Nondestructive Test Personnel.

(3) Organizations and personnel engaged in the application of nondestructive inspection and operating under the jurisdiction of a foreign government shall use the appropriate documents issued by the applicable regulatory agency in complying with the above requirements.

(4) Facilities performing nondestructive inspection as defined in this Supplemental Inspection Document, must own or have access to the appropriate test equipment capable of performing the inspection and reporting the test results as defined in this manual.

2. GENERAL EDDY CURRENT INSPECTION

A. General

(1) Eddy current inspection is effective for the detection of surface and near surface cracks in nonferrous metals. The inspection is accomplished by inducing eddy currents into the material and observing electrical variations of the induced field. The character of the observed field change is displayed and interpreted to determine the nature of the indication. This method can be applied to airframe parts or assemblies where the inspection area is accessible to contact by the eddy current probe. An important use of eddy current inspection is for the detection of cracking caused by corrosion or stress in and around fastener holes. Bolt hole eddy current probes are effective in detecting fatigue cracks emanating from the wall of the fastener hole. Surface probes can detect cracks around fastener holes with the fastener installed.

B. Equipment

(1) The eddy current equipment listed in each procedure was what was used in the development of the inspection technique. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity. When substitute equipment is used, it may be necessary to make appropriate adjustments to the established techniques.

(2) Instrument Requirements

(a) Certain inspection techniques require the use of instruments that provide both phase and amplitude information on a storage cathode ray tube for impedance plane analysis. Impedance plane instruments may be used as a substitute for metered instruments. Metered instruments shall not be substituted for impedance plane instruments where the ability to distinguish phase information is required.

(b) The instrument shall demonstrate a repeatable signal response that has a signal-to-noise ratio of greater than 3 to 1 for the test in which it is to be used. Impedance plane instruments shall be able to resolve the signal within the guidelines shown in Figure 1 and Figure 2.

(c) Functional performance of the eddy current instrumentation shall be verified at an interval of no more than one year.

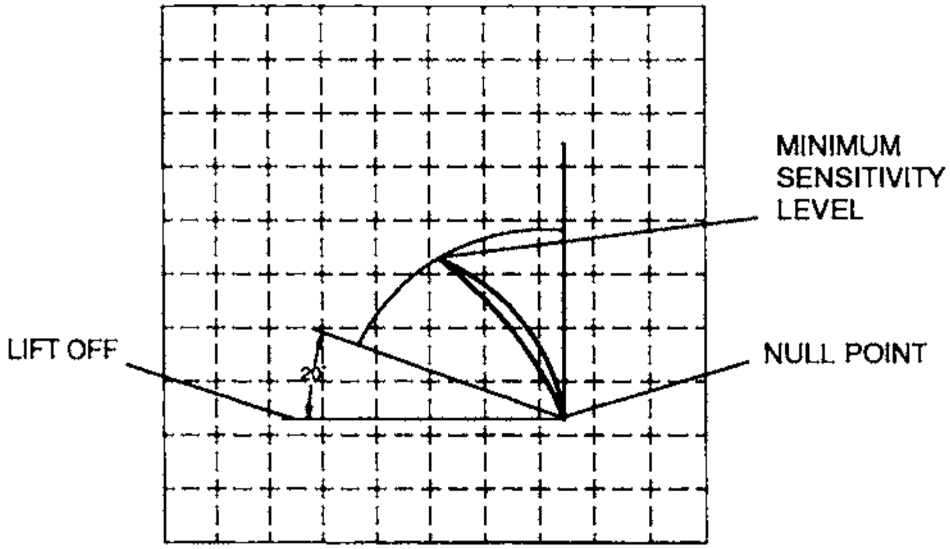
(3) Probe Requirements

(a) The probe may have an absolute or differential coil arrangement. The probe may be shielded or unshielded. A shielded probe is normally recommended.

(b) The probe shall have an operating frequency that produces the required test sensitivity and depth of penetration as indicated in the technique.

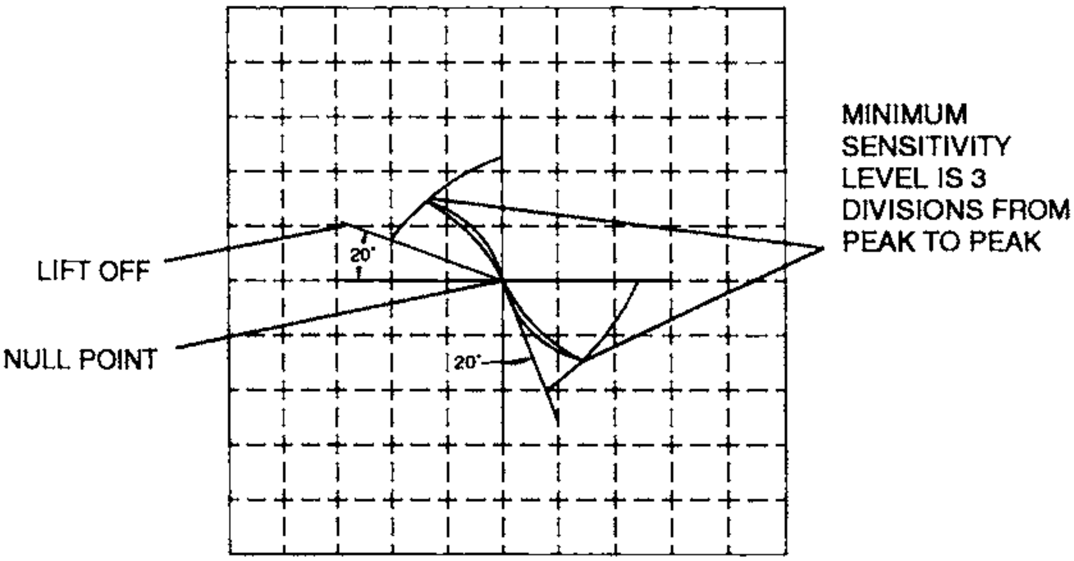
(c) Smaller coil diameters are more effective in detecting cracks. A coil diameter of 1/8 inch is normally used for surface crack detection. The coil will usually contain a ferrite core.

A10766



Absolute Probe Calibration Range
Figure 1 (Sheet 1)

A16316



Differential Probe Calibration Range
Figure 2 (Sheet 1)

(d) The probe shall not give interfering responses from handling pressures, scanning or normal operating pressure variations on the sensing coil that cause the signal-to-noise ratio to be less than 3 to 1.

(e) Teflon tape may be used to decrease the wear on the eddy current probe coil. When Teflon tape is used, the instrument calibration must be verified.

(4) Calibration Standard Requirements

(a) In some cases, specially fabricated reference standards will be necessary to simulate a part's geometry, configuration, and/or a specific discontinuity location. If a technique specifies a reference standard manufactured by Cessna Aircraft Company, substitution of another standard is not permitted. If a general-purpose surface or bolt hole reference standard is indicated, substitution is permitted.

(b) Reference standards should be of an alloy having the same major base material, basic temper and the approximate electrical conductivity of the material to be inspected.

(c) Reference standards shall have a minimum surface finish of 150 RHR or RMS 165.

(d) An EDM (Electrical Discharge Machined) surface notch no deeper than 0.020 inch shall be used for surface eddy current inspection calibration. An EDM corner notch of no larger than 0.050 inch surface lengths shall be used for bolt hole eddy current inspection calibration. The dimensional accuracy of the notch shall be documented and traceable to the National Institute of Standards and Technology (NIST).

C. Inspection

(1) General Considerations

(a) Inspections shall not be performed until the temperature of the probe, the standard and the material have been allowed to equalize.

(b) Eddy current inspection requires that good contact be made between the probe and the part unless a specific procedure requires a certain amount of lift-off. The inspection area shall be free of dirt, grease, oil or other contaminants that may interfere with the inspection. Mildly corroded parts must be cleaned lightly with emery cloth. Heavily corroded parts must be lightly abraded and cleaned locally in the inspection area. If paint thickness is such that it will interfere with the inspection, the paint must be removed to maintain inspection sensitivity.

NOTE: All cleaning materials and methods shall be approved for use by the appropriate Cessna Aircraft Service Manual, Structural Repair Manual, or Component Maintenance Manual.

(2) Instrument Calibration

(a) The instrument shall be calibrated and operated in accordance with the manufacturer's instructions. Calibration shall be done using the reference standard indicated in the inspection technique.

(b) Instrument calibration shall be performed prior to inspection. Calibration shall be checked at intervals necessary to maintain calibration during continuous use and at the end of the inspection. The instrument shall be recalibrated if any part of the system is replaced or if any calibrated control settings are changed.

(c) Normally, the instrument will be adjusted to achieve a minimum separation of three major screen divisions between the null/balance point and the appropriate reference notch. For a differential probe, the signal amplitude should be considered as peak to peak. Filters may be used to improve signal to noise ratio as necessary.

(3) Inspection Performance

(a) Whenever possible, the inspection area shall be scanned in two different directions which are at scan paths 90 degrees to each other.

(b) Scan the inspection area at index increments that do not exceed the width of the eddy current test coil. The part edge shall be scanned as long as the response from edge effect does not mask the calibration notch response. Areas where edge effect is greater than the calibration notch signal shall not be inspected using eddy current.

(c) Whenever possible, fillets and radii should be scanned both transverse and parallel to the axis of the radius. The edge of the fillet or radius shall be scanned transverse to the axis of the radius.

(d) If performing bolt hole eddy current inspection, the entire depth of a hole shall be inspected unless otherwise stated. Be aware that the hole may have more than a single layer of material.

(4) Inspection Interpretation

(a) If an indication is detected, carefully repeat the inspection in the opposite direction of probe movement to verify the indication. If the indication persists, carefully monitor the amount of probe movement or rotation required to cause the instrument to move off maximum indication response.

(b) If performing bolt hole eddy current inspection with the probe centered on a crack, the signal will be at maximum and movement of the probe will cause the signal to begin returning to the original reading. Corrosion pits, foreign material, and out of round holes can cause an instrument response for 20 to 30 degrees of bolt hole probe rotation before the indication begins to return to the original reading.

(c) Unless otherwise specified, cracks shall be considered unacceptable.

(d) The end of a crack is determined using the 50 percent method. Scan the probe slowly across the end of the crack until a point is reached where the crack signal amplitude has been reduced by 50 percent. The center of the probe coil is considered the end of the crack.

3. GENERAL FLUORESCENT LIQUID PENETRANT INSPECTION

A. General

(1) Fluorescent penetrant inspection is effective in detecting small cracks or discontinuities open to the surface that may not be evident by normal visual inspection. Penetrant inspection can be used on most airframe parts and assemblies accessible for its application. The inspection is performed by applying a liquid that penetrates into surface discontinuities. The penetrant on the surface is removed and a suitable developer is applied to draw the remaining penetrant from the surface discontinuities. Visual indications are obtained by the fluorescence of the penetrant when exposed to ultraviolet light.

B. Materials and Equipment

(1) General

(a) Fluorescent penetrant is the required inspection method when penetrant inspection is specified in the Supplemental Inspection Document. Fluorescent penetrant inspection has a high sensitivity and the ability to detect small fatigue cracks open to the surface.

(b) The equipment and materials listed in each procedure were those utilized in the development of the inspection technique. Equivalent equipment and materials may be used if they provide equal or better sensitivity.

(2) Materials

(a) Only materials approved for listing on the latest revision to QPL-SAE-AMS-2644; Qualified Products List of Products Qualified Under SAE Aerospace Material Specification AMS 2644 Inspection Materials, Penetrant; or an equivalent shall be used for penetrant inspection. All materials shall be from the same family group. Interchanging or mixing penetrant cleaners, penetrant materials, or developers from different manufacturers is prohibited.

CAUTION: CERTAIN COMPONENTS INTENDED FOR USE IN LIQUID OXYGEN SYSTEMS MUST BE TESTED WITH SPECIAL PENETRANTS DESIGNED AS LOX USAGE PENETRANT WHICH ARE COMPATIBLE WITH A LIQUID OXYGEN ENVIRONMENT. REACTION BETWEEN SUCH ENVIRONMENTS AND NON-LIQUID OXYGEN USAGE PENETRANT CAN CAUSE EXTREMELY VIOLENT EXPLOSION OR FIRE.

(b) Penetrant materials are defined by specific classifications per SAE AMS 2644; Inspection Materials, Penetrant; or an equivalent and must meet or exceed the classifications listed below. This list assumes a portable inspection system for use at the airplane.

Type 1	(Fluorescent)
Level 3	(High Sensitivity)
Method C	(Solvent Removable)
Form d	(Nonaqueous Type 1 Fluorescent, Solvent Based)
Class 2	(Non-halogenated Solvent Removers)

(c) Visible dye penetrants (Type 2) shall not be used for inspections on this airplane or its components. This penetrant type has poor sensitivity compared to fluorescent type penetrant. It is extremely difficult to completely clean visible penetrant dyes from surface discontinuities under field conditions. Dye build-up can prevent subsequent penetrant inspections from entering or indicating surface discontintuities.

CAUTION: TYPE 2 (VISIBLE) PENETRANTS SHALL NOT BE USED FOR THE INSPECTION OF AIRCRAFT OR AIRCRAFT COMPONENTS.

NOTE: If Type 2 (visible) penetrant was used for an inspection, penetrant is no longer a valid inspection method for that inspection. Another inspection method must be used.

(3) Lighting Requirements
   (a) Penetrant inspection shall be performed in a darkened environment where the ambient white light intensity does not exceed two foot candles.
   (b) Ultraviolet lights used for penetrant inspection shall operate at a wavelength in the range of 320 – 380 nanometers. Light intensity shall be at least 1200 microwatts per square centimeter at the part surface or 1000 microwatts per square centimeter at a distance of 15 inches. Ultraviolet lights shall be energized for at least 10 minutes before use.
   (c) The ultraviolet light and the ambient light intensities shall be measured with a calibrated light meter prior to each inspection.

C. Inspection
(1) General
   (a) Fluorescent penetrant shall be accomplished in accordance with the procedures contained or referenced in the Supplemental Inspection Document. ASTM E1417, Standard Practice for Liquid Penetrant Examination, or an equivalent shall be consulted for the general requirements for penetrant inspection. In the event of a conflict between the text of the Supplemental Inspection Document and ASTM E1417, the text of the Supplemental Inspection Document shall take precedence.
   (b) Paint removal from the inspection area is required to allow penetration into surface discontinuities. In addition, the inspection area must be clean, dry, and free of dirt, grease, oil, paint or any contaminates which would interfere with the liquid penetrant inspection. Cleaning and paint removal methods selected for a particular component shall be consistent with the contaminants to be removed and shall not be detrimental to the component or its intended function.

NOTE: All cleaning materials must be approved for use by the appropriate Cessna Aircraft Service Manual, Structural Repair Manual, Component Maintenance Manual, or Nondestructive Testing Manual.

NOTE: Mechanical methods of cleaning and paint removal should be avoided where practical. Take care when using mechanical methods of cleaning and paint removal to avoid filling in or sealing the entrance to a surface discontinuity. Penetrant inspection can not show discontinuities that are not open at the surface.

CAUTION: HALOGENATED SOLVENTS SHALL NOT BE USED ON TITANIUM OR HIGH NICKEL ALLOY MATERIALS.

   (c) Throughout the penetrant inspection process, the materials, equipment, and area to be inspected shall maintain a temperature within the range of 40 – 120 degrees Fahrenheit.
(2) Penetrant Application
   (a) Completely cover the inspection area with the penetrant. Allow penetrant to remain on the area (dwell) for a minimum of 15 minutes for temperatures above 50 degrees Fahrenheit or 25 minutes for temperatures under 50 degrees Fahrenheit. Maximum dwell times should not exceed one hour except under special circumstances.

NOTE: If penetrant is allowed to dry on the inspection surface, it shall be completely removed and the cleaning and inspection reacomplished.

(3) Penetrant Removal
   (a) Initially, remove the penetrant by wiping with a clean dry lint free cloth. Then remove the remaining penetrant using a clean lint free cloth dampened with the penetrant cleaner. Examine the inspection area with the ultraviolet light to ensure removal of the surface penetrant. This process is complete when all the excess surface penetrant has been removed from the area.

   NOTE: Do not flush the surface or saturate the cloth with the penetrant cleaner. This may remove penetrant from smaller discontinuities, preventing their detection.

(4) Developer Application
   (a) Inspection shall occur after a minimum dwell time of 10 minutes, but not after a maximum dwell time of four hours.
   (b) The best result is obtained by applying the developer to achieve the minimum coating thickness possible. The coating should be slightly translucent with the color of the inspection area visible through the developer.

(5) Interpretation
   (a) Personnel shall not wear light-sensitive (photochromatic) lenses during the evaluation process.
   (b) Personnel shall allow a minimum of three minutes for dark adaptation of the eyes prior to evaluating inspections.

4. GENERAL MAGNETIC PARTICLE INSPECTION

A. General
   (1) Magnetic particle inspection is a nondestructive inspection method for revealing surface and near surface discontinuities in parts made of magnetic materials. Alloys that contain a high percentage of iron and can be magnetized make up the ferromagnetic class of metals. The magnetic particle inspection method consists of three basic operations:
      (a) Establishment of a suitable magnetic field.
      (b) Application of magnetic particles.
      (c) Examination and evaluation of the particle accumulations.
   (2) Electrical current is used to create or induce magnetic fields into the material. The direction of the magnetic field can be altered and is controlled by the direction of the magnetizing current. When a magnetic field within a part is interrupted by a discontinuity, some of the field is forced out into the air above the discontinuity. The presence of a discontinuity is detected by the application of finely divided fluorescent ferromagnetic particles to the surface of the part. Some of the particles will be gathered and held by the leakage field. The magnetically held collection of particles forms an outline of the discontinuity and indicates its location, size and shape.

B. Materials and Equipment
   (1) Fluorescent magnetic particle inspection has a high sensitivity and the ability to detect small fatigue cracks. Visible dry magnetic particles do not have the required sensitivity.

   CAUTION: VISIBLE DRY MAGNETIC PARTICLES SHALL NOT BE USED FOR INSPECTION OF AIRCRAFT OR COMPONENTS.

   (2) The equipment and materials listed in each procedure were those utilized in the development of the inspection technique. Equivalent equipment and materials may be used if they provide equal or better sensitivity.
   (3) Magnetic particle inspection shall be accomplished in accordance with the procedures contained or referenced in the Supplemental Inspection Document. ASTM E1444, Standard Practice for Magnetic Particle Examination, and ASTM E709, Standard Guide for Magnetic Particle Examination, or equivalents shall be consulted for general requirements of magnetic particle inspection. In the event of a conflict between the text of the Supplemental Inspection Document and ASTM E1444 or ASTM E709, the text of the Supplemental Inspection Document shall take precedence.
   (4) Permanent magnets shall not be used, as the intensity of the magnetic field can not be altered to suit inspection conditions.

CAUTION: PERMANENT MAGNETS SHALL NOT BE USED FOR INSPECTION OF AIRCRAFT OR COMPONENTS.

(5) Contact prods shall not be used due to concerns with localized heating of the surface and arcing of the electrical current.

CAUTION: CONTACT PRODS SHALL NOT BE USED FOR INSPECTION OF AIRCRAFT OR COMPONENTS.

C. Quality Control

(1) Quality control of magnetic particle materials and equipment shall be accomplished per ASTM E1444, ASTM E709, or equivalent document. This section assumes the use of a portable magnetic particle system for use on an aircraft (electromagnetic yoke, spray can type magnetic particles, and portable ultraviolet light).

(2) Dead Weight Check

(a) The electromagnetic yoke shall demonstrate the ability to lift 10 pounds with a leg spacing of two to four inches while operating on AC current. It shall demonstrate the ability to lift either 30 pounds with a leg spacing of two to four inches or 50 pounds with a leg spacing of four to six inches while operating on DC current.

(3) Lighting Requirements

(a) Magnetic particle inspection shall be performed in a darkened environment where the ambient white light intensity does not exceed two foot candles.

(b) Ultraviolet lights used for magnetic particle inspection shall operate at a wavelength in the range of 320 – 380 nanometers. Light intensity shall be at least 1000 microwatts per square centimeter. Ultraviolet lights shall be energized for at least 10 minutes before use.

(c) The ultraviolet light and ambient light intensities shall be measured with a calibrated light meter prior to each inspection.

D. Inspection

(1) Magnetic particle inspection shall be accomplished per ASTM E1444, ASTM E709, or equivalent document. This section assumes the use of a portable magnetic particle system for use on an airplane (electromagnetic yoke, spray can type magnetic particles, and portable ultraviolet light).

(2) Magnetic particle inspection can be accomplished through thin layers of paint. If the paint is thick enough that it will interfere with the inspection, it shall be removed. Cleaning and paint removal methods selected for a particular component shall be consistent with the contaminants to be removed and shall not be detrimental to the component or its intended function.

NOTE: All cleaning materials must be approved for use by the appropriate Cessna Aircraft Service Manual, Structural Repair Manual, Component Maintenance Manual, or Nondestructive Testing Manual.

(3) An adequate magnetic field for inspection shall be tested using a Hall Effect meter, field indicator or equivalent detector. Quality indicators approved in ASTM E1444, ASTM E709 or equivalent documents may be used to determine the presence of an adequate magnetic field.

(4) When possible, the preferred method of particle application is the continuous method.

(5) A minimum three-minute dark adaptation time is required before evaluating an inspection.

(6) Personnel shall not wear light sensitive (photochromatic) lenses during the evaluation process.

5. GENERAL RADIOGRAPHY INSPECTION

A. General

(1) Radiographic inspection is a nondestructive inspection method used for the inspection of airframe structure inaccessible or unsatisfactory for the application of other nondestructive test methods. Radiographic inspection will show internal and external structural details of all types of parts and materials. The inspection is accomplished by passing radiation through the part or assembly to expose radiographic film. The processed film shows the structural details of the part or assembly by variations in film density.

B. Safety

(1) The use of radiation in nondestructive inspection presents a potential health hazard to operating and adjacent personnel, unless all safety precautions and protective requirements are observed. Information on radiation protection can be found in the Code of Federal Regulations Title 10 Parts 19, 20, and 34.6.1.2.

C. Requirements

(1) Radiographic inspection shall be accomplished in accordance with the procedures contained or referenced in the Supplemental Inspection Document. ASTM E1742, Standard Practice for Radiographic Examination, or equivalent shall be consulted for the general requirements for radiographic inspection. In the event of a conflict between the text of the Supplemental Inspection Document and ASTM E1742, the text of the Supplemental Inspection Document shall take precedence.

(2) The use of radioactive isotopes is not permitted due to the inability to alter the characteristics of the radiation produced.

CAUTION: THE USE OF RADIOACTIVE ISOTOPES FOR RADIOGRAPHIC INSPECTION IS PROHIBITED.

(3) Abbreviations

KV = Kilovoltage

MAM = Milliampere minutes

SFD = Source to Film Distance

MAS = Milliampere seconds

(4) The film used for the radiographic inspection of this airplane shall be at least as sensitive to the discontinuity as the film listed in the Supplemental Inspection Document. Equivalence shall be established by either film manufacturer's documentation or a recognized industry standard.

(5) A densitometer shall be used to determine the density of the radiographic film. It shall be capable of reading film transmission density up to a maximum of 4.0 and have a density unit resolution of at least 0.02. The calibration shall be checked within the last 90 days per ASTM E1079, Standard Practice for Calibration of Transmission Densitometers, or equivalent.

D. Inspection Requirements

(1) Optimum densities are given for each inspection technique contained in this manual; however, densities in the area of interest below 1.5 and above 3.7 are unacceptable for the radiographic examination of this airplane.

NOTE: Settings specified in individual radiograph procedures in this manual were established to provide quality radiographs. It may be necessary to vary the MA, time and KV settings due to differences in equipment, film and method of processing in order to achieve the contrast, sensitivity, and density specified. X-ray equipment is considered acceptable provided it produces the quality radiographs specified for the procedures contained in this manual.

(2) When intensifying screens are used, front screens are not permitted. The back screen shall be at least 0.005 inch thick. The preferred screen material is lead. The back screen is not needed if backscatter radiation will not interfere with the inspection. All screens shall be free of cracks, creases, scratches, or foreign material that may interfere with the inspection.

NOTE: Fluorescent type screens shall not be used unless specifically stated in the inspection technique.

(3) When Image Quality Indicators (IQI) are specified, they shall be placed toward the edge of the film in a location where they do not interfere with the inspection.

(4) Each film shall be tagged using lead letters or an equivalent for identification. The tag shall be placed toward the edge of the film in a location that does not interfere with the inspection. At a minimum, the tag shall have the following information:
   (a) Inspection company identification
   (b) Airplane type and serial number
   (c) The inspection being accomplished
   (d) Date inspected
   (e) Specific film location if inspection requires multiple radiographs

(5) After development, film shall be handled in such a way as to avoid damage to the image.

SUPPLEMENTAL INSPECTION NUMBER: 27-10-05

1. **TITLE**
   Aileron Hinges and Fittings

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the aileron attach fittings.

4. **PREPARATION**
   A. Clean the inspection area with solvent to remove dirt, grease, oil, and other substances that may interfere with the inspection.
   B. Remove paint from the aileron hinge assembly using an approved chemical paint stripper.

5. **INSPECTION METHOD**
   Fluorescent Liquid Penetrant

6. **CRACK SIZE**
   Minimum detectable crack size: 0.10 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent fluorescent liquid penetrant materials may be used providing the material is a minimum of a Type 1, Level 3 sensitivity capable of achieving the requirements listed in the General Section, Fluorescent Liquid Penetrant of the Supplemental Inspection Document.

PART NUMBER	QUANTITY	DESCRIPTION
SKC-HF	1	SOLVENT CLEANER Magnaflux 3624 West Lake Avenue Glenview, IL 60025
ZL-27A	1	FLUORESCENT PENETRANT Magnaflux
ZP-9F	1	DEVELOPER Magnaflux
DSE-100X	1	DIGITAL RADIOMETER Spectronics Corporation Westbury, New York
ZB-32A	1	PORTABLE BLACK LIGHT Magnaflux

8. **INSPECTION INSTRUCTIONS**
   A. Surface Preparation
      (1) The aileron hinge attach fittings must be clean, dry, free of dirt, grease, oil, paint or any contaminants which would fill, mask, or close a defect open to the surface.
         (a) Remove the paint in the area to be inspected using an approved chemical stripper. The bearing areas around the inspection zone should be masked or protected.
         (b) Rinse the area thoroughly with water and dry prior to applying cleaner.
         (c) Prepare the inspection area by scrubbing the part surface with a cloth that is damp with penetrant cleaner to remove any contaminates.

(d) Thoroughly dry the area before penetrant application.

B. Penetrant Application
(1) Penetrant shall be applied by spraying, dipping, or brushing to provide complete coverage of the aileron attach fitting.
(2) The penetrant shall completely cover the area of interest for a minimum dwell time of 20 to 30 minutes.
(3) The penetrant shall not be allowed to dry on the part surface.

CAUTION: TYPE II (VISIBLE DYE) PENETRANT SHALL NOT BE USED FOR INSPECTION OF AIRCRAFT COMPONENTS.

C. Penetrant Removal
(1) Remove the excess penetrant by first wiping the part surface with a dry, clean, lint free cloth.
(2) Remove the remainder of the excess penetrant with a solvent dampened cloth.
(3) Do not flush the surface of the component with solvent.
(4) Examine the inspection area under a black light to make sure all of the surface penetrant is removed.
(5) Over-removal of the surface penetrant shall require that the component be cleaned and reprocessed.
(6) The part surface shall be dried by blotting with a clean, dry towel or cloth, or by evaporation.

D. Application of Developer
(1) The aileron attach fittings shall be dry before the application of developer.
(2) Nonaqueous developer shall be applied by spraying and allowed to dry at ambient temperature.
(3) Apply the developer as a uniform thin coating over the entire surface to be inspected.
(4) The minimum dwell time for nonaqueous developers is 10 minutes.
(5) The dwell time starts after the developer is dry on the component when using form d nonaqueous developers.

NOTE: The aerosol nonaqueous developer shall be frequently agitated before and during application.

E. Interpretation
(1) The inspection area shall consist of a darkened booth or an area where the ambient white light does not exceed 2 foot candles when measured by a radiometer. Viewing areas for portable fluorescent penetrant inspection shall utilize a dark canvas, photographer's black cloth, or other methods to reduce the white light background to the lowest level possible during inspection.
(2) The inspection area shall be viewed using a black light that provides a minimum of 1000 micro watts per square centimeter at the component surface. Do not position black lights closer than 6 inches from the inspection surface.
(3) All areas of fluorescence shall be interpreted. Components with excessive background or irrelevant indications which interfere with the detection of relevant indications shall be cleaned and reprocessed. Indications may be evaluated by wiping no more than twice. Magnifiers of 3X to 10X may be used to interpret or evaluate indications.

F. Post-Cleaning
(1) Remove all developer and penetrant material from the part surface using the appropriate penetrant cleaner. Verification of adequate post cleaning shall be conducted using a black light.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support.

SUPPLEMENTAL INSPECTION NUMBER: 32-10-04

1. **TITLE**
   Main Gear Actuator Collar

2. **EFFECTIVITY**
   421C0001 Thru 421C0800

3. **DESCRIPTION**
   Inspect for cracks in the main gear actuator collar.

4. **PREPARATION**

   A. Remove paint from the inspection area using an approved chemical paint stripper. Refer to Figure 1.

5. **INSPECTION METHOD**
   Magnetic Particle

6. **CRACK SIZE**
   Minimum detectable crack size: 0.10 Inch

7. **EQUIPMENT**
   The following types of magnetic particle inspection yokes may be used to accomplish this inspection. Equivalent substitutes may be used for the listed equipment.

   A. Direct current electromagnetic yokes with a dead weight lifting capacity of at least 50 pounds with a four to six inch yoke leg spacing.

   B. Alternating current electromagnetic yokes with a dead weight capacity of at least ten pounds with yoke leg spacing of two to four inches.

PART NUMBER	QUANTITY	DESCRIPTION
Magnaglo 14AM	1	FLUORESCENT MAGNETIC PARTICLE BATH Magnaflux Corporation 7400 W. Lawrence Avenue Chicago, IL 50656
ZB-23A	1	PORTABLE BLACK LIGHT Magnaflux Corporation
105645	1	DEVELOPER Magnaflux Corporation

8. **INSPECTION INSTRUCTIONS**

   A. Remove all dirt, oil, grease and paint from the inspection area. Refer to Figure 1.

   B. Position one of the electromagnetic yoke legs on the base of the main landing gear side brace actuator collar and the other leg at the end of the side brace attach point.

   C. Apply the fluorescent magnetic particle bath to the inspection area. Stop bath application and immediately energize the yoke for approximately one second. This inspection applies to the inner radius of the main gear side brace actuator attach fitting.

   D. Inspect the main gear collar radius for cracks using a black light that has a minimum intensity of 1200 micro watts per square centimeter. The ambient light in the inspection area shall not exceed two foot candles.

   E. After completing the inspection, demagnetize the main landing gear side brace actuator collar using the maximum alternating current. The residual magnetic field shall not exceed three Gauss.

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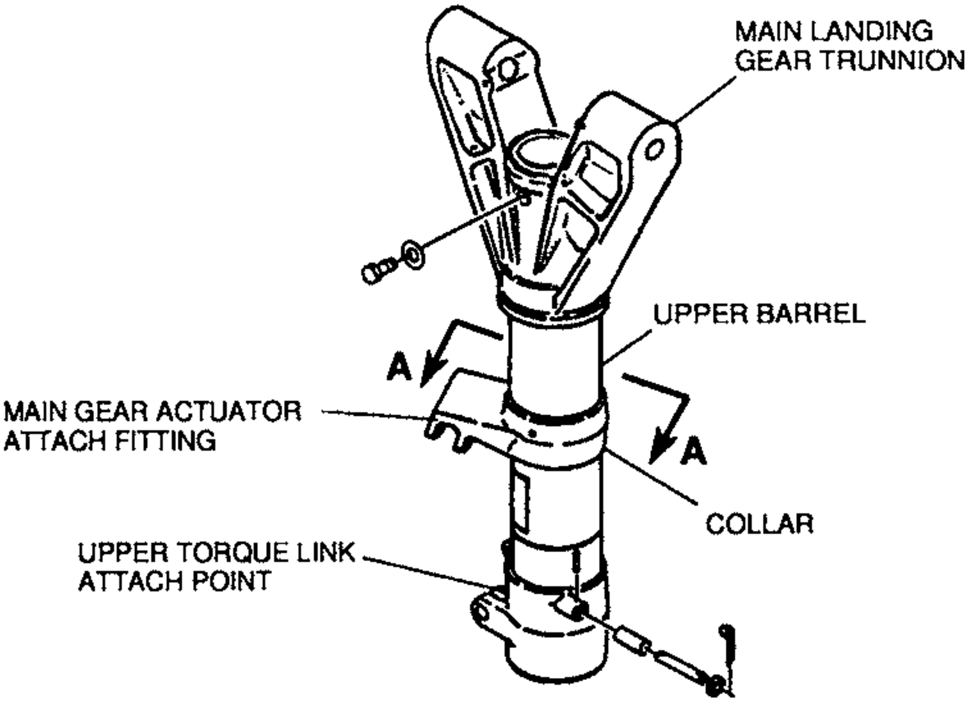

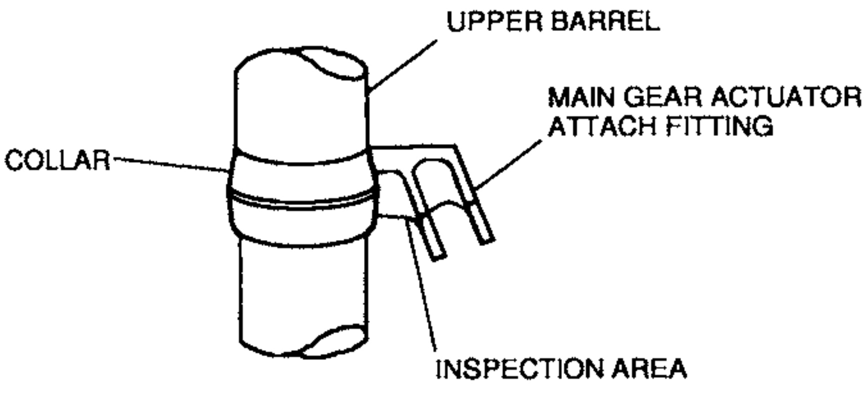

VIEW **A-A**

52413006
A-A52411014

Main Landing Gear Side Brace Actuator Attach Fitting
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 32-20-02

1. **TITLE**
   Model 421C Nose Gear Fork

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for cracks in the nose gear fork.

4. **PREPARATION**
   A. Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Surface Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.10 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e"	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM202AF-6 shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Surface Pencil Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Depths Surface Eddy Current: 0.008 inch, 0.020 inch and 0.040 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the surface probe to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe on the reference standard away from the calibration notches.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.
   D. Adjust the instrument gain controls to obtain a signal amplitude response from the 0.02 inch depth calibration notch that is a minimum of 2 major screen divisions.

E. Refer to Figure 1. Inspect the upper outboard radii of the nose gear fork. Inspect the area around the inboard and outboard area of the axle lug of the nose gear fork. Observe the phase and amplitude changes on the eddy current instrument.

F. If an indication is noted, carefully repeat the inspection in the opposite direction to verify the indication.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. These reports will include location, length, and direction of the crack.

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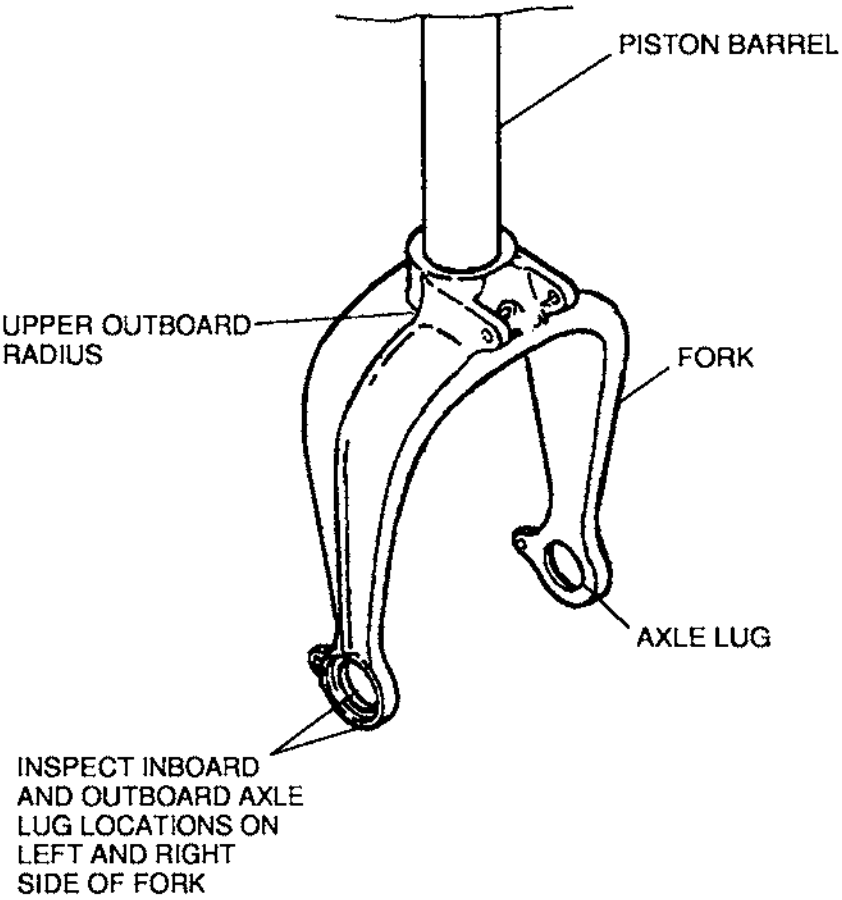


Nose Gear Fork
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 32-50-00

1. **TITLE**
   Nose Gear Steering Bell Crank

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for cracks in the nose gear steering bell crank.

4. **PREPARATION**
   A. Clean the inspection area with solvent to remove dirt, grease, oil, and other substances that may interfere with the inspection. Refer to Figure 1.
   B. Remove paint from the nose gear steering bell crank assembly using an approved chemical paint stripper.

5. **INSPECTION METHOD**
   Fluorescent Liquid Penetrant

6. **CRACK SIZE**
   Minimum detectable crack size: 0.10 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent fluorescent liquid penetrant materials may be used providing the material is a minimum of a Type 1, Level 3 sensitivity capable of achieving the requirements listed in this supplemental inspection document, in the Inspection Methods And Requirements section for fluorescent liquid penetrant.

PART NUMBER	QUANTITY	DESCRIPTION
SKC-HF	1	SOLVENT CLEANER Magnaflux 3624 West Lake Avenue Glenview, IL 60025
ZL-27A	1	FLUORESCENT PENETRANT Magnaflux
ZP-9F	1	DEVELOPER Magnaflux
ZB-32A	1	PORTABLE BLACK LIGHT Magnaflux
DSE-100X	1	DIGITAL RADIOMETER Spectronics Corporation Westbury, New York

8. **INSPECTION INSTRUCTIONS**
   A. Surface Preparation

   NOTE: The nose gear steering bell crank must be clean, dry, free of dirt, grease, oil, paint or any contaminants which would fill, mask, or close a defect open to the surface.

   (1) Remove the paint in the area to be inspected using an approved chemical stripper. The bearing areas around the inspection zone should be masked or protected.

(2) Thoroughly water rinse and dry the area prior to applying cleaner.
(3) Prepare the inspection area by scrubbing the part surface with a cloth that is damp with penetrant cleaner to remove any contaminants.
(4) Thoroughly dry the area before penetrant application.

B. Penetrant Application
(1) Penetrant shall be applied by spraying, dipping, or brushing to provide complete coverage of the nose gear steering bell crank.
(2) The penetrant shall completely cover the area of interest for a minimum dwell time of 20 to 30 minutes.
(3) The penetrant shall not be allowed to dry on the part surface.

CAUTION: TYPE II (VISIBLE DYE) PENETRANT SHALL NOT BE USED FOR INSPECTION OF AIRCRAFT COMPONENTS.

C. Penetrant Removal
(1) Remove the excess penetrant by first wiping the part surface with a dry, clean, lint free cloth.
(2) Remove the remainder of the excess penetrant with a solvent dampened cloth.
(3) Do not flush the surface of the component with solvent.
(4) Examine the inspection area under a black light to ensure the removal of all surface penetrant.
(5) Over-removal of the surface penetrant shall require that the component be cleaned and reprocessed.
(6) Dry the part surface by blotting with a clean, dry towel or cloth, or allow evaporation to dry the part surface.

D. Application of Developer
(1) Make sure the nose gear steering bell crank is dry before the application of developer.
(2) Nonaqueous developer shall be applied by spraying and allowed to dry at ambient temperature.
(3) Apply the developer as a uniform thin coating over the entire surface to be inspected.
(4) The minimum dwell time for nonaqueous developers is 10 minutes.
(5) The dwell time starts after the developer is dry on the component when using form d nonaqueous developers.

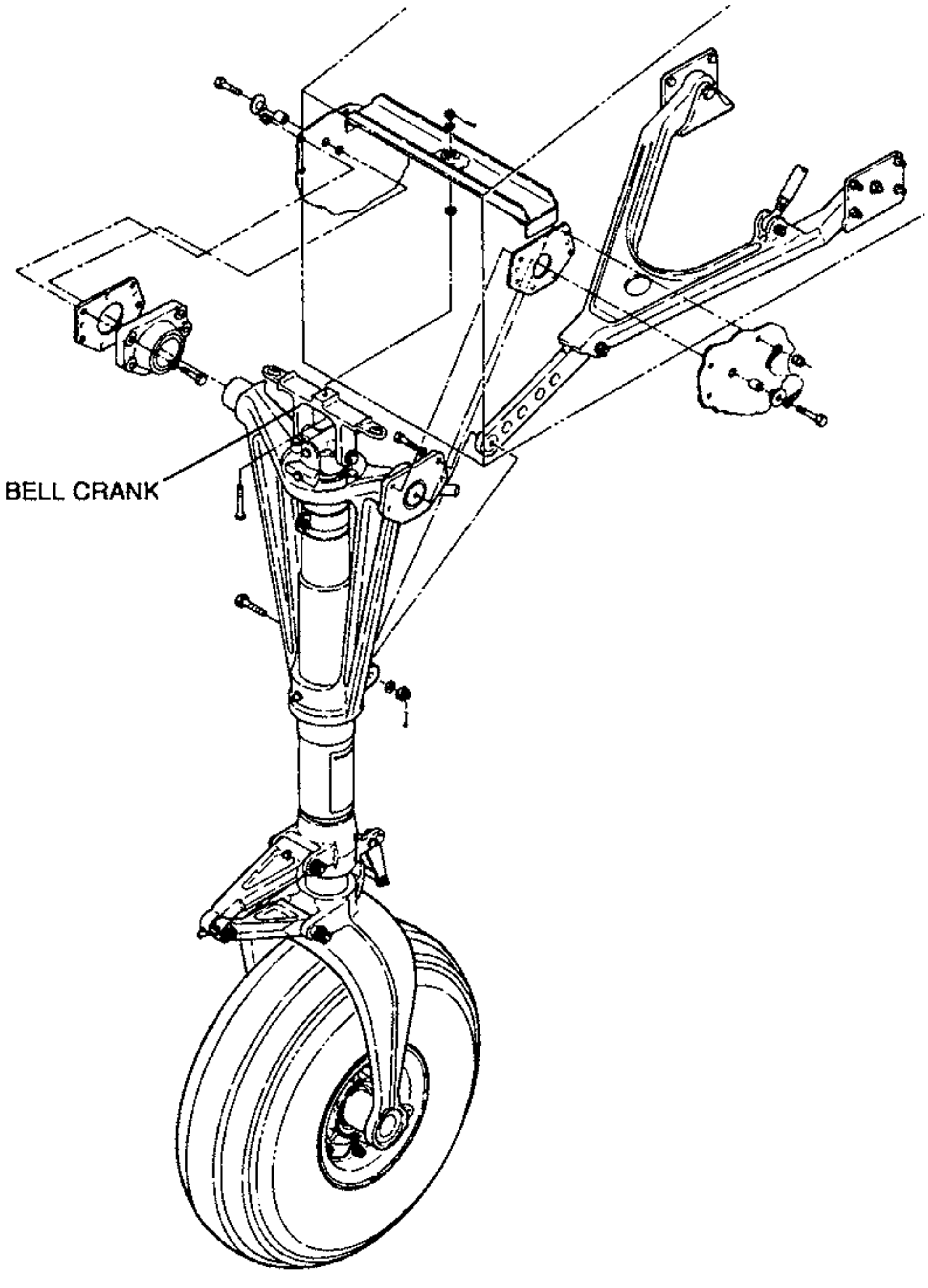
NOTE: Frequently agitate the aerosol nonaqueous developer before and during application.

E. Interpretation
(1) The inspection area shall consist of a darkened booth or an area where the ambient white light does not exceed 2 foot candles when measured by a radiometer. Viewing areas for portable fluorescent penetrant inspection shall utilize a dark canvas, photographer's black cloth, or other methods to reduce the white light background to the lowest level possible during inspection.
(2) The inspection area shall be viewed using a black light that provides a minimum of 1000 micro watts per square centimeter at the component surface. Do not position black lights closer than 6 inches from the inspection surface.
(3) All areas of fluorescence shall be interpreted. Components with excessive background or irrelevant indications which interfere with the detection of relevant indications shall be cleaned and reprocessed. Indications may be evaluated by wiping no more than twice. Magnifiers of 3X to 10X may be used to interpret or evaluate indications.

F. Post-Cleaning
(1) Remove all developer and penetrant material from the part surface using the appropriate penetrant cleaner. Verification of adequate post cleaning shall be conducted using a black light.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support.

A31853



Nose Landing Gear Bell Crank
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 52-10-01

1. **TITLE**
   Cabin Door Retention

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks emanating from the corners of the latch pin hole and around the fastener holes of the latch mechanism receptacles, lock plates, and guides. Refer to Figure 1, View B-B.

4. **PREPARATION**

   A. Remove the latch mechanism Receptacle Assembly (P/N 5111532), latch mechanism Guide Assembly (P/N 5111531or 5711503), and latch mechanism Lock Plate (P/N 5111533) in accordance with the service manual. Refer to Figure 1, Detail A.

   B. Remove all grease and contaminants from the inspection area using an approved solvent.

   C. Paint in the inspection area must be removed with approved paint strippers or mechanical stripping as defined in step 4.D.

   D. Excessive surface roughness or conditions which may interfere with the inspection may be removed with 600 grit aluminum oxide or silicone carbide coated paper.

5. **INSPECTION METHOD**
   Fluorescent Liquid Penetrant

6. **CRACK SIZE**
   Minimum detectable crack size: 0.050 Inch

7. **MATERIALS AND EQUIPMENT**
   The penetrant materials used for this inspection shall be of the same family group and listed in QPL-AMS-2644 (Qualified Products List).

   A. This inspection shall be performed with the following penetrant process.
      (1) Type I (Fluorescent)
      (2) Method C (Solvent Removable)
      (3) Level 3 (High Sensitivity)
      (4) Form D (Non-Aqueous)

   B. The black light used during this inspection shall have a minimum light intensity of 1000 μw/cm² at the part surface. This measurement shall be taken after a warm up period of at least ten minutes.

   C. A calibrated light meter shall be used to verify the ultraviolet and ambient white light intensities during the inspection.

8. **INSPECTION INSTRUCTIONS**

   NOTE: In order to perform this inspection the specimen, penetrant, and atmosphere temperature must be in the range of 40° to 120°F (4° to 49°C).

   A. Clean the parts as necessary per the preparation section of this document. Allow all solvents to flash from the surface before proceeding to step 8.B.

   B. Apply the penetrant to the area of interest by brushing (recommended) or spraying. For the parts with teeth, apply the penetrant to the opposite side of the part. Refer to Figure 1, View A-A.

      NOTE: The dwell time for the penetrant shall be a minimum of ten minutes.

C. Remove the excess penetrant by first wiping with a clean, dry, lint-free cloth. Remove the remaining penetrant with a clean, lint-free cloth dampened with solvent cleaner.

NOTE: Excess penetrant removal shall be performed under a black light to ensure adequate removal.

CAUTION: DO NOT SPRAY THE SOLVENT CLEANER DIRECTLY ON THE PART OR SATURATE THE CLOTH. THIS COULD REMOVE PENETRANT FROM SHALLOW CRACKS.

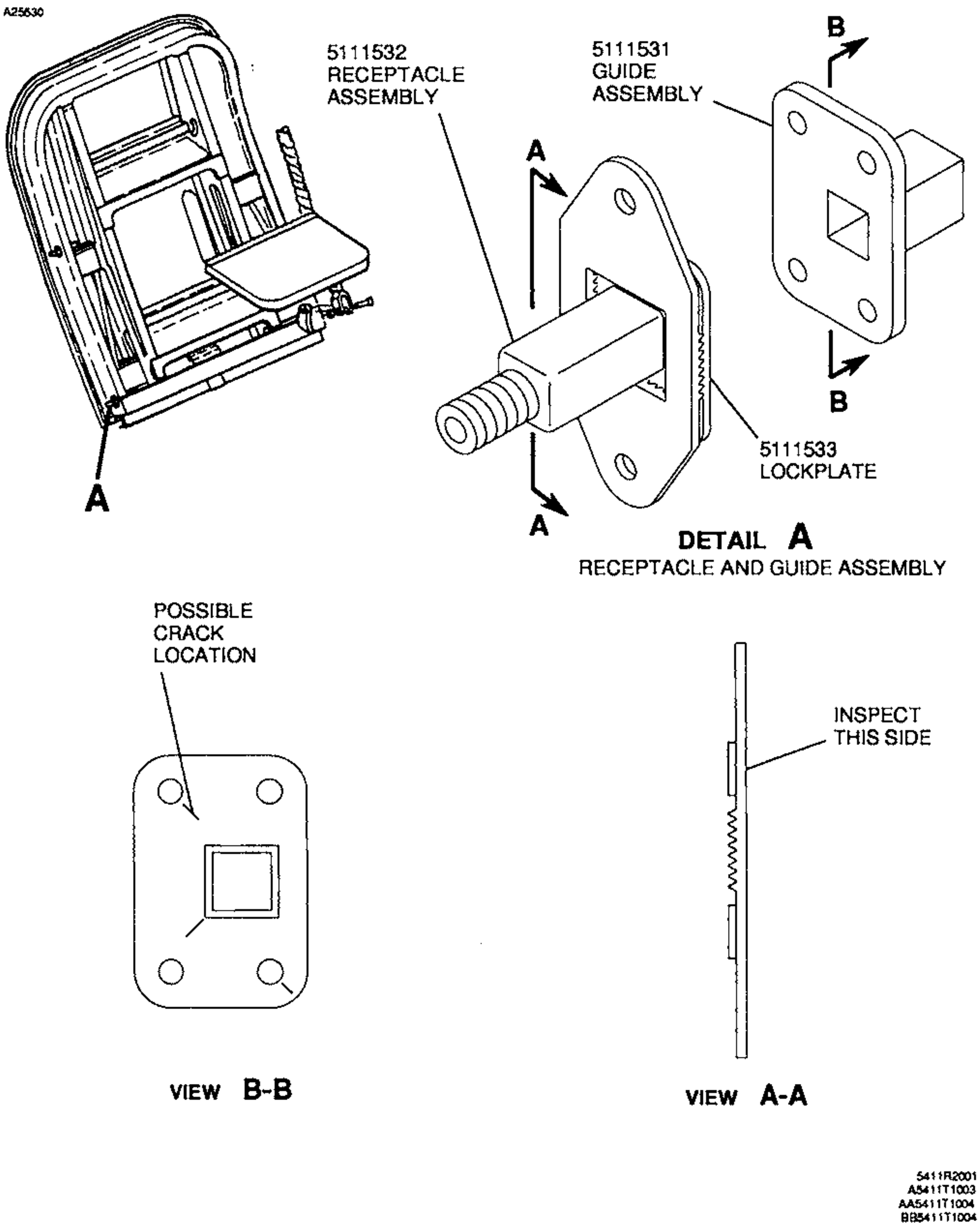
D. Agitate the nonaqueous wet developer thoroughly prior to application. Apply a thin uniform coating of developer on each part. The surface of the parts should still be visible through the developer.

NOTE: The dwell time for the developer shall be a minimum of ten minutes and will begin after the developer has dried on the surface of the part.

E. Examine the part after the developer dwell time and while exposed to ultraviolet light.
(1) The examination shall take place in a darkened environment with a maximum ambient white light intensity of two foot candles (fc), and a minimum ultraviolet light intensity of 1000 $\mu w/cm^2$ at the part surface. Verify both light intensities with a calibrated light meter.
(2) Magnification may be used to enhance the examination.

NOTE: A minimum of three minutes is recommended for eye adaptation prior to examinations in darkened areas.

F. Evaluation
(1) All linear indications with a length three times greater than the width shall be considered relevant.
(2) If necessary, relevant indications may be verified by wiping the indication with a solvent dampened cloth and reapplying developer. Refer to Step 8.D.
(3) The reappearance of the indication indicates the presence of a crack and will require part replacement.



Cabin Door Latch Mechanism
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 53-10-01

1. **TITLE**
   Pressurized Cabin Structure Inspection

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks originating in the radii of the forward and aft pressure bulkheads (pressure side) using an eddy current surface probe technique.

4. **PREPARATION**
   A. Remove seats, carpet, panels, or other objects necessary to gain access to the inspection area.
   B. Clean the inspection area to remove dirt, grease, oil, excess sealer, and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Surface Eddy Current

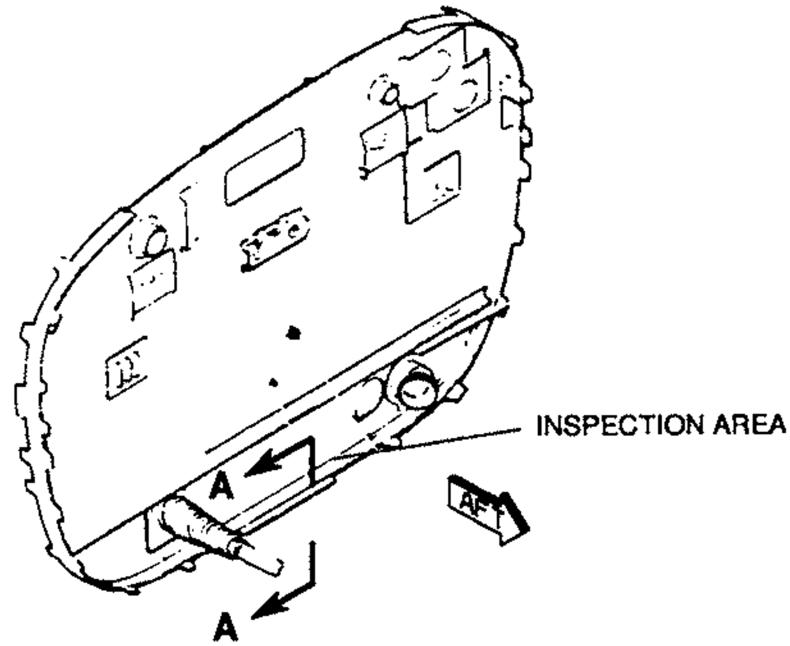
6. **CRACK SIZE**
   Minimum detectable crack size: 0.25 Inch

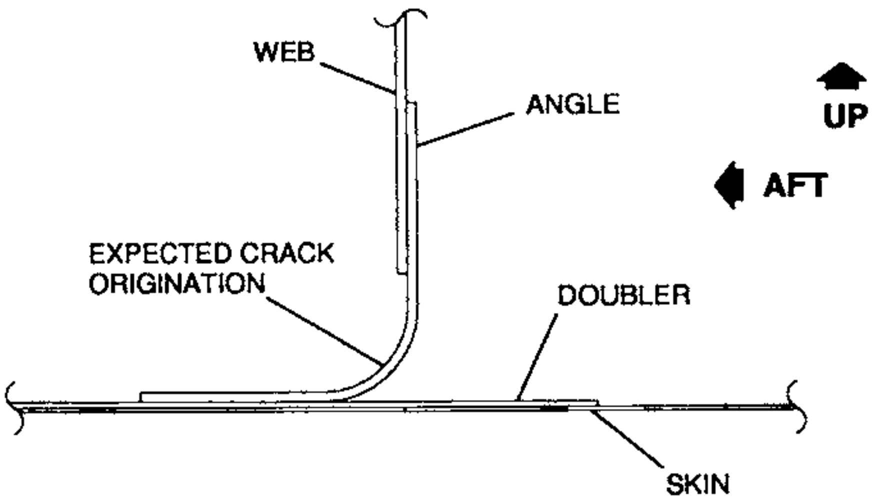
7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used provided the equipment is capable of achieving the required frequency range and sensitivity.

Item	Model/Part Number	Manufacturer	Use
Eddy Current Instrument	Nortec 2000	Staveley Instruments 421 N. Quay Kennewick, Wa 99336	Detection of Cracks
Right Angle Surface Probe	NEC-4112-2	NDT Engineering Corp. 19620 Russell Rd. Kent, WA 98032	Detection of Cracks
Reference Standard	5683101-2	Cessna Aircraft Co. To obtain a Reference Standard, contact a Cessna Multi-engine Service Station.	Calibration of Surface Probe

8. **INSPECTION INSTRUCTIONS**
   A. Connect the probe to the instrument and adjust the frequency to 15 kHz.
   B. Null the probe on the reference standard away from the calibration notches.
   C. Adjust lift-off so it deflects horizontally and to the left.
   D. Adjust the instrument to obtain a signal of three major divisions of separation between lift-off and the calibration notch signal.
   E. Inspect the radii around the circumference of the forward and aft pressure bulkheads (pressure side).
   F. If an indication is noted, carefully remove the sealer and repeat the inspection to verify the indication.
   G. Report all cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support.

A25531



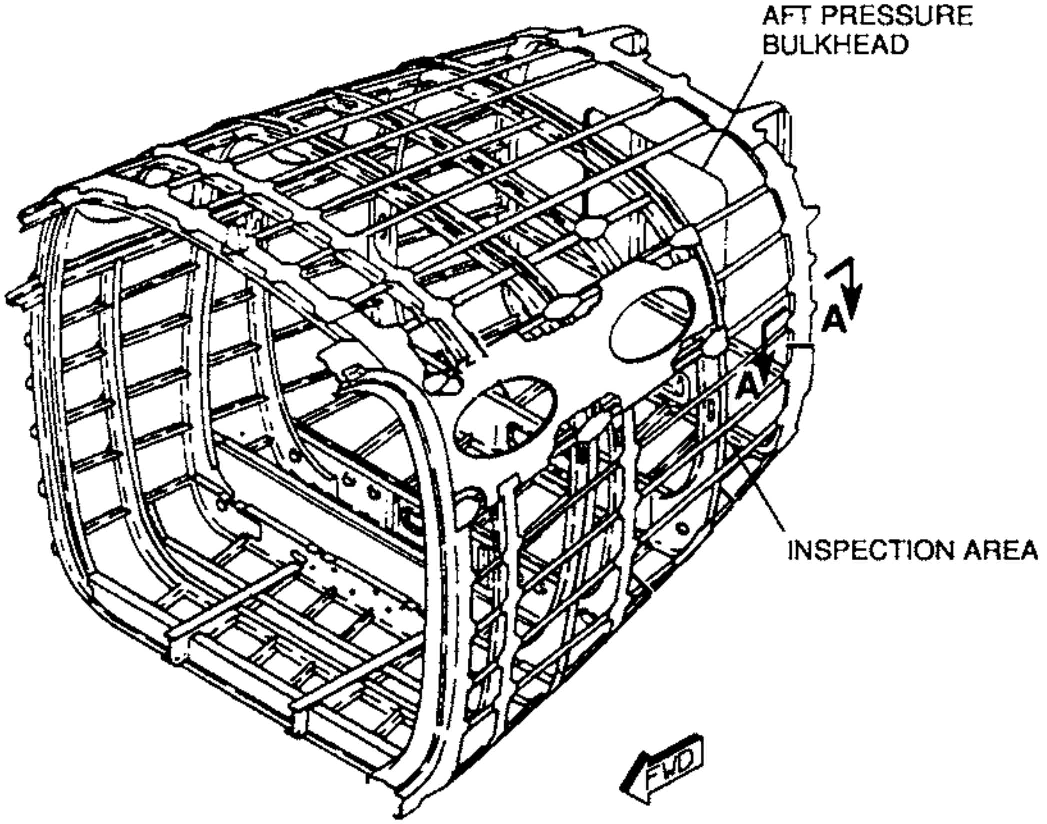


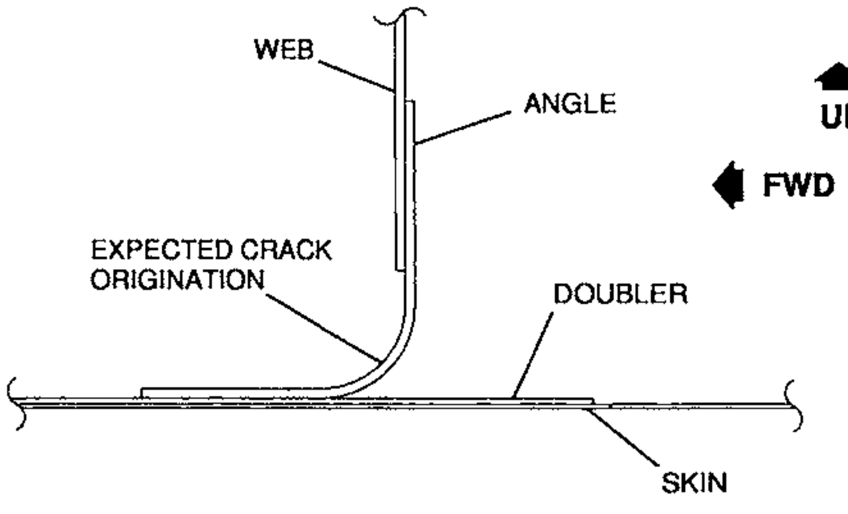
VIEW **A-A**
CROSS SECTION OF INSPECTION AREA

5119R3007
AA5413T1002

Forward Pressure Bulkhead Inspection Location
Figure 1 (Sheet 1)

A25532





VIEW **A-A**
CROSS SECTION OF INSPECTION AREA

5119R2008
AA5413T1002

Aft Pressure Bulkhead Inspection Location
Figure 2 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 53-10-02

1. **TITLE**
   Fuselage Left and Right Hand Window Frame Stringers

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks around the fasteners common to the window frame stringers and the fuselage skin.

4. **PREPARATION**
   A. Clean the inspection area to remove dirt, grease, oil, excess sealer, and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Surface Eddy Current

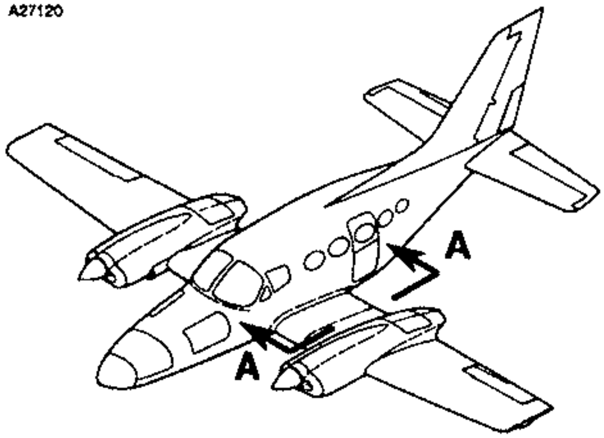
6. **CRACK SIZE**
   Minimum detectable crack size: 0.15 Inch

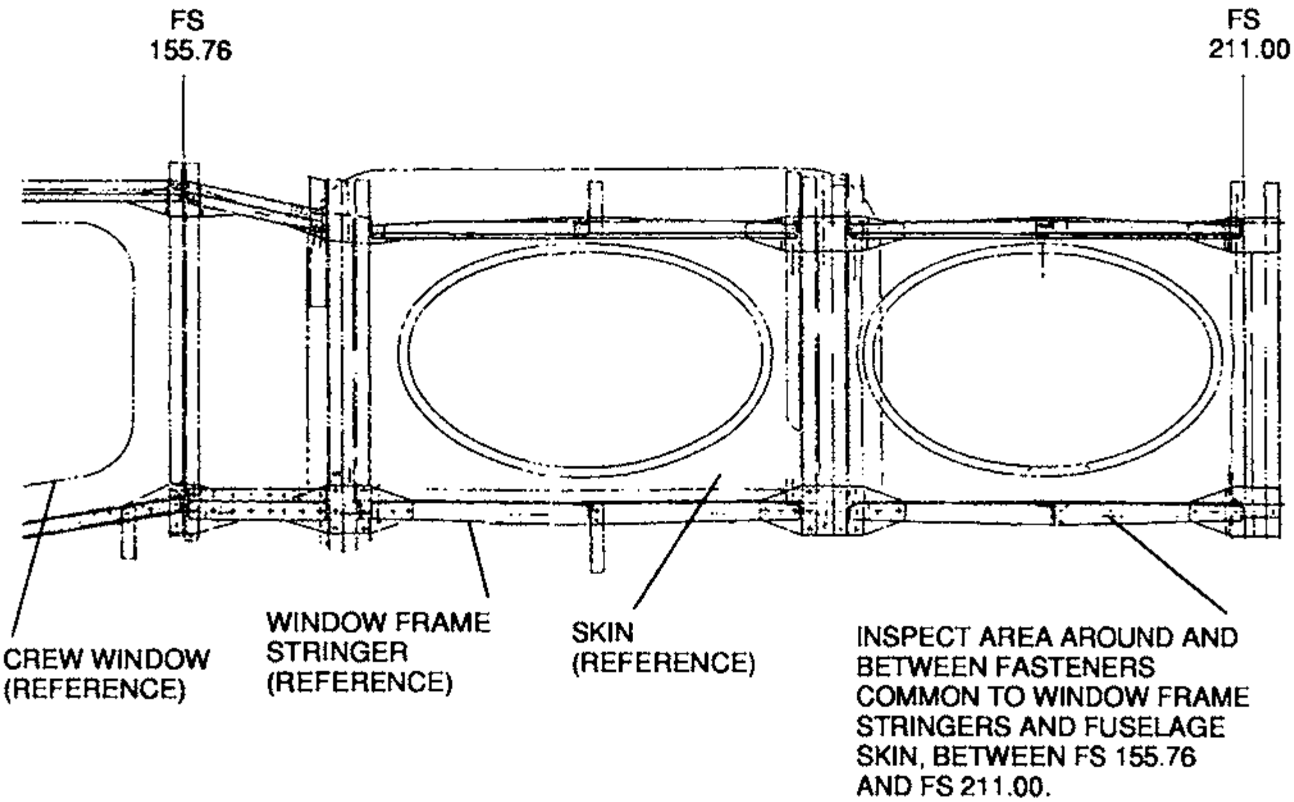
7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used provided the equipment is capable of achieving the required frequency range and sensitivity.

Item	Model/Part Number	Manufacturer	Use
Eddy Current Instrument	Staveley 19e"	Staveley Instruments 421 N. Quay Kennewick, Wa 99336	Detection of Cracks
200 kHz, 0.125", Right Angle Surface Probe	MP905-60	NDT Engineering Corp. 19620 Russell Rd. Kent, WA 98032	Detection of Cracks
Reference Standard	VM89A	VM Products, Inc. 11208 62nd Ave. Puyallup , WA 98373	Calibration of Surface Probe

8. **INSPECTION INSTRUCTIONS**
   A. Connect the probe to the instrument and adjust the frequency to 200 kHz.
   B. Null the probe on the reference standard away from the calibration notches.
   C. Adjust lift-off so it deflects horizontally and to the left.
   D. Adjust the instrument to obtain a signal of three major divisions of separation between lift-off and the 0.020 inch calibration notch signal.
   E. Inspect the area around and between the fasteners common to the window frame stringers and the fuselage skin from FS 155.76 to FS 211.00. Observe the phase and amplitude changes on the eddy current instrument.
   F. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support.

A27120





VIEW **A-A**
LOOKING INBOARD AT WINDOW FRAME STRINGERS
AND FUSELAGE SKIN INSPECTION AREA
(LEFT SIDE SHOWN)

5110R3006
AA5414R1044

Fuselage Left and Right Hand Window Stringer Assemblies
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 53-10-03

1. **TITLE**
   Horizontal Stabilizer Rear Spar Angle Attachment

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the tailcone angle attachment to the horizontal stabilizer rear spar.

4. **PREPARATION**
   A. Refer to Figure 1 and Figure 2.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e"	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/16 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.3125 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.
   D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

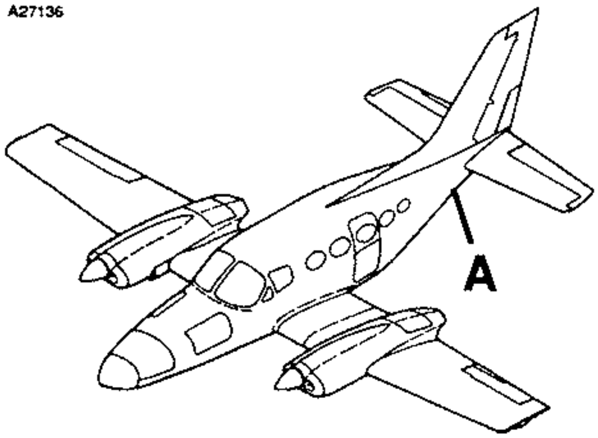
E. Inspect the inner circumference of the four holes common to the tailcone angle attachment to the horizontal stabilizer lower rear spar. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2, Sheet 1 and Sheet 2.

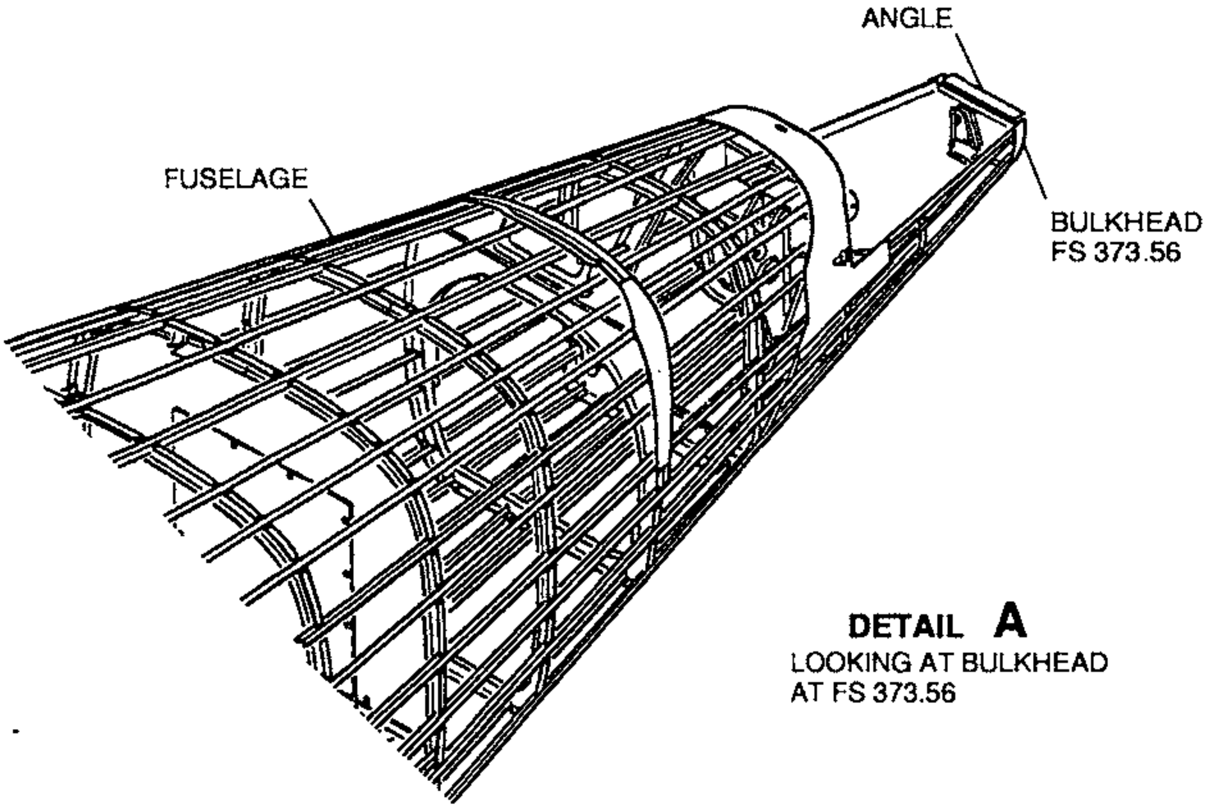
F. If an indication is noted, carefully repeat the inspection in the opposite direction to verify the indication.

G. If no cracks are detected during this inspection, reinstall the horizontal stabilizer. Refer to the Service Manual.

H. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Reports will include hole diameter; location of hole; hole edge distance; length and direction of crack.

A27136

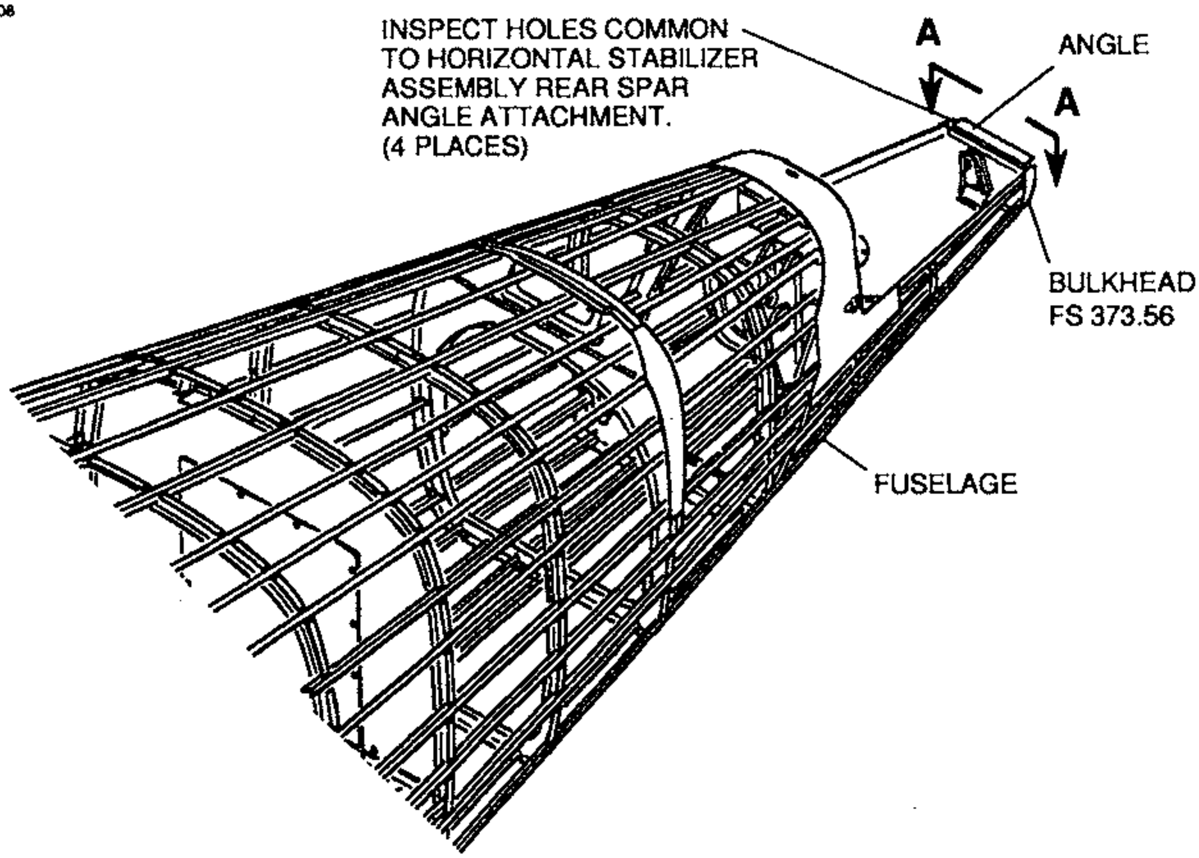


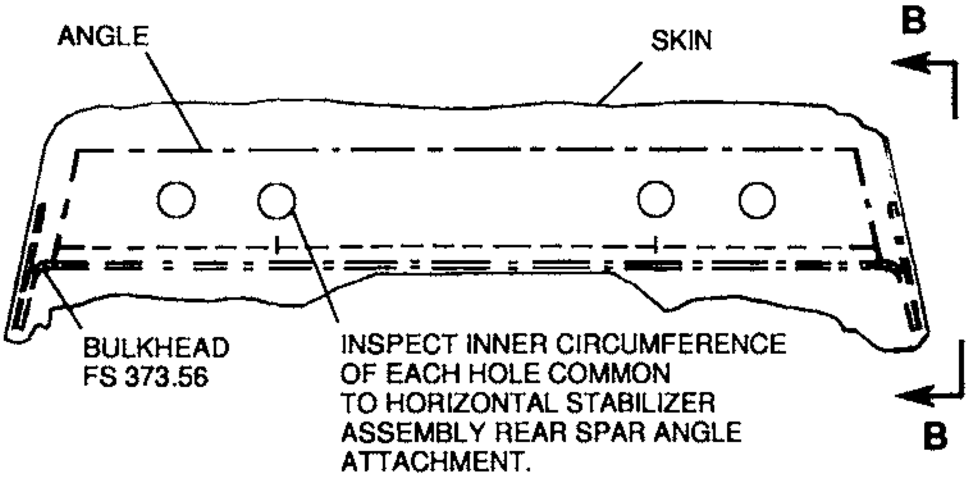


5110R3008
A5212R3002

Horizontal Stabilizer Assembly Rear Spar Angle Attachment
Figure 1 (Sheet 1)

A25808



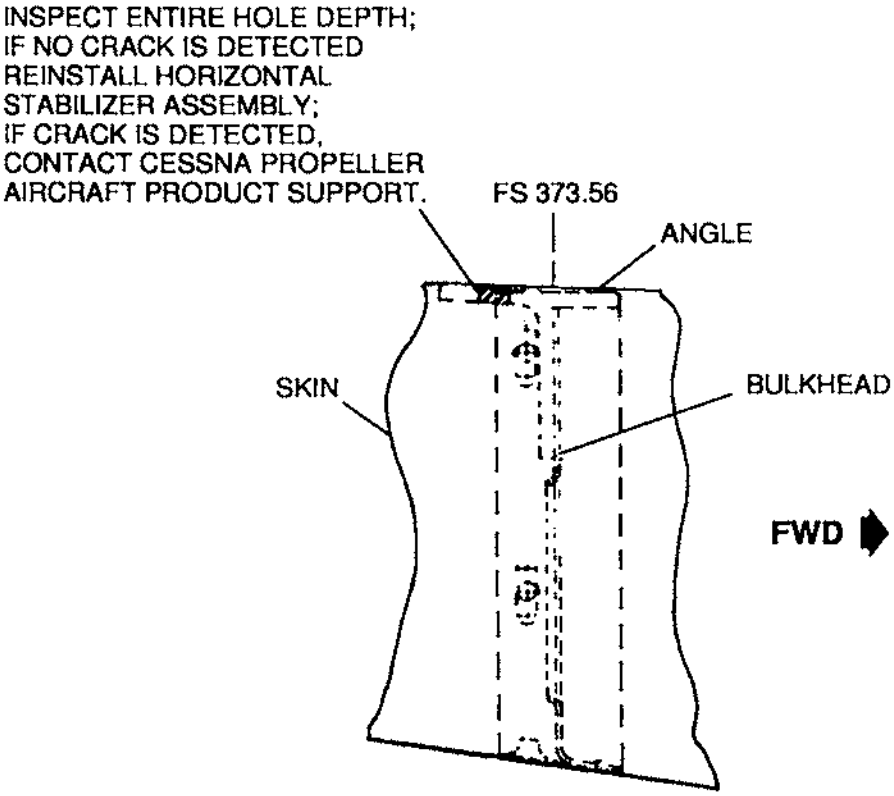


VIEW A-A
LOOKING DOWN AT ANGLE ATTACHMENT

5212R3002
AA5212R1005

Horizontal Stabilizer Assembly Rear Spar Angle Attachment Inspection
Figure 2 (Sheet 1)

A25609



VIEW **B-B**
LOOKING INBOARD AT ANGLE ATTACHMENT

BB5212R1006

Horizontal Stabilizer Assembly Rear Spar Angle Attachment Inspection
Figure 2 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 54-10-04

1. **TITLE**
   Engine Support Beams

2. **EFFECTIVITY**
   421C0001 Thru 421C1870

3. **DESCRIPTION**
   Inspect for cracks in the engine beam support structure.

4. **PREPARATION**
   A. Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Surface Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e"	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
MP905-60 absolute shielded coil, 0.125 inch coil diameter	1	EDDY CURRENT PROBE Surface Probe NDT Engineering Corporation 19620 Russell Road Kent, WA 98032
SRS-123A Aluminum (Must be NIST traceable)	1	REFERENCE STANDARD NDT Engineering Corporation

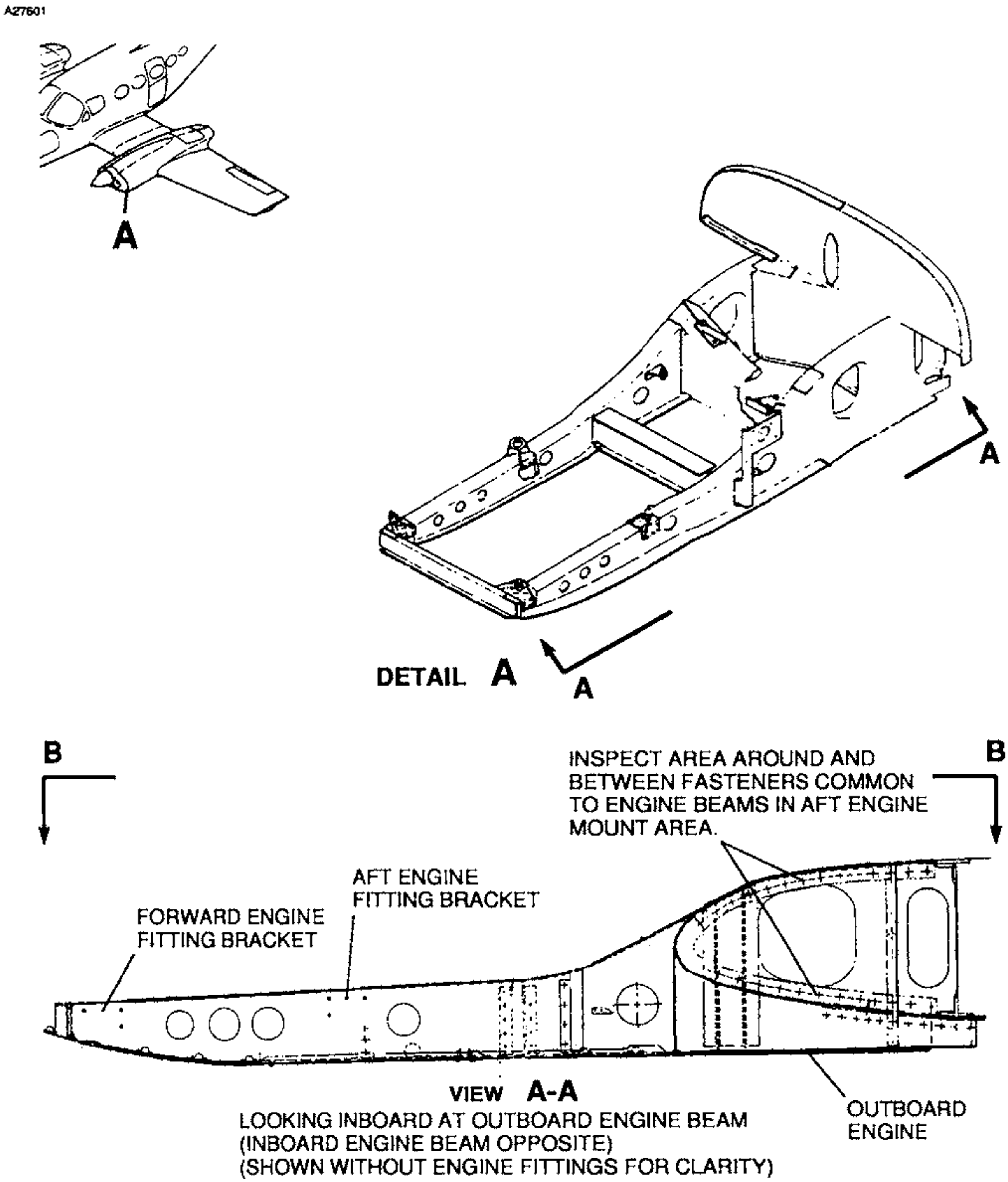
   Reference Standard Notch Depths Surface Eddy Current: 0.008 inch, 0.020 inch and 0.040 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the surface probe to the eddy current instrument and adjust the instrument frequency to 200 kHz.
   B. Null the probe on the reference standard away from the calibration notches.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.
   D. Adjust the instrument gain controls to obtain a signal amplitude response from the 0.020 inch calibration notch that is a minimum of three major screen divisions.

E. Inspect around the circumference of each fastener common to the engine beams at the forward and aft engine mount attach area, and the fasteners indicated in Figure 1. Observe the phase and amplitude changes on the eddy current instrument.

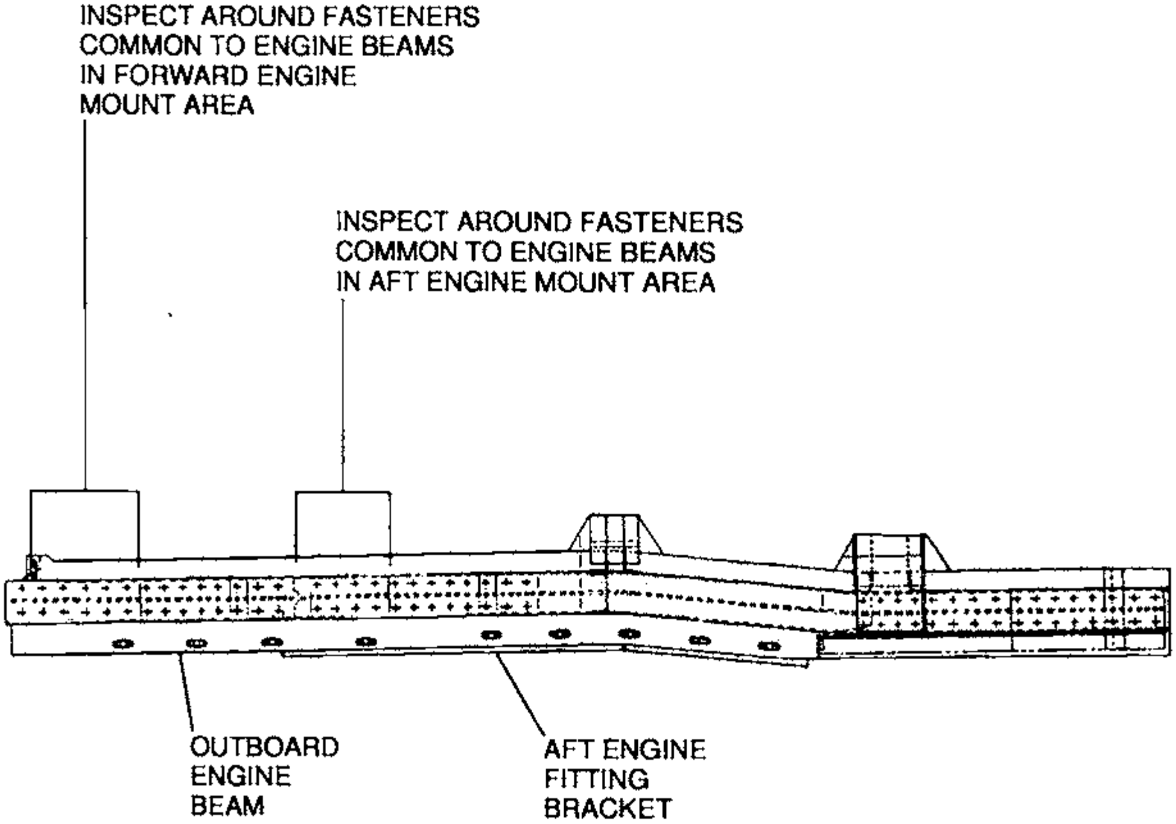
F. If an indication is noted, carefully repeat the inspection in the opposite direction to verify the indication.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Reports will include hole diameter, location of hole, hole edge distance, length, and direction of crack.



Engine Mount Inspection - Model 421C
Figure 1 (Sheet 1)

A24459



VIEW B-B
LOOKING DOWN AT OUTBOARD ENGINE BEAM
(INBOARD ENGINE BEAM OPPOSITE)

BB5251R1003

Engine Mount Inspection - Model 421C
Figure 1 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 55-10-04

1. **TITLE**
   Horizontal Stabilizer Forward Spar Upper Cap

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the horizontal stabilizer forward spar upper cap.

4. **PREPARATION**
   A. Remove 13 fasteners from the horizontal stabilizer assembly forward spar upper cap, one at BL 0.00, and six adjacent fasteners on each side of BL 0.00. Refer to Figure 1, View B-B.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e^{II}	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/32 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz.	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.156 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

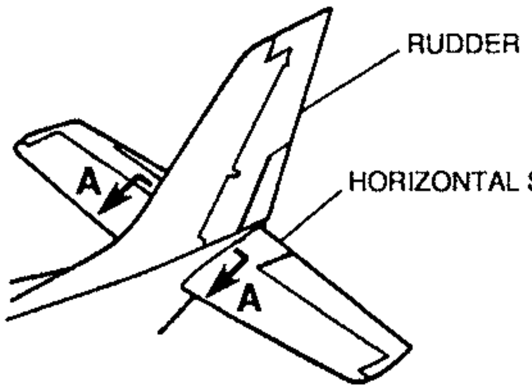
E. Inspect the inner circumference of each hole common to the horizontal stabilizer assembly forward spar upper cap fastener at BL 0.0 and the six fasteners on each side of BL 0.0. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 1 View C-C and View D-D.

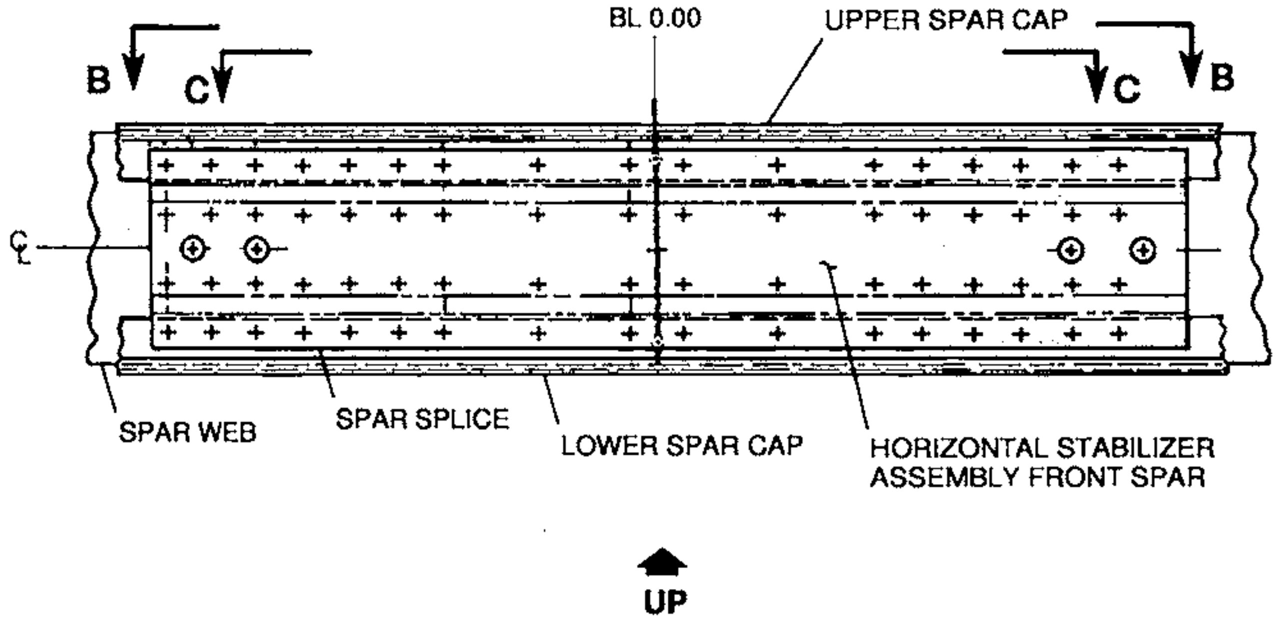
F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, install MS20426AD5 Rivets and reinstall the horizontal stabilizer. Refer to the Service Manual.

H. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack on all reports.

A31867





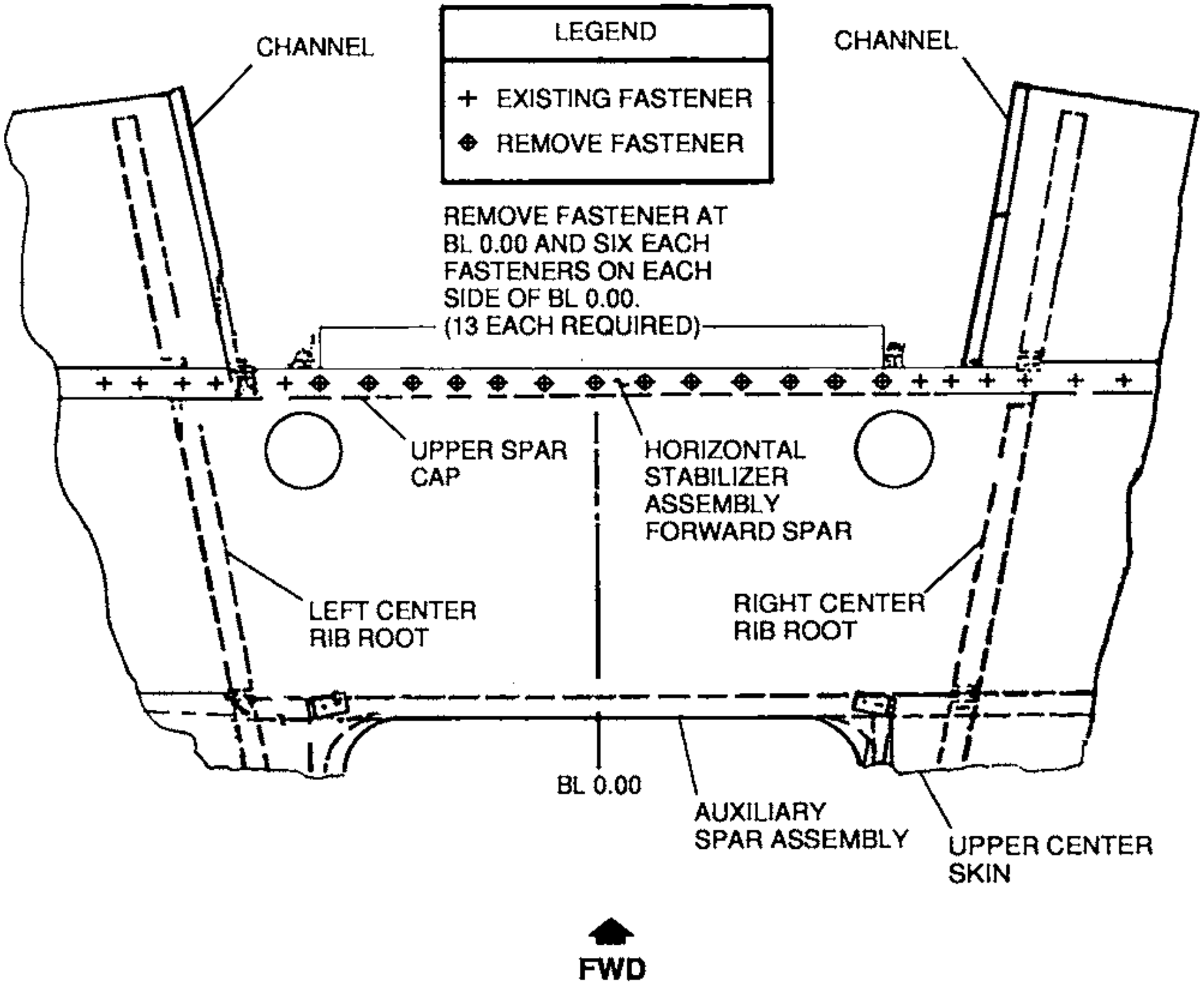
VIEW **A-A**

LOOKING FORWARD AT HORIZONTAL
STABILIZER FRONT SPAR

5232R1006
AA5232R1001

Horizontal Stabilizer Assembly Forward Spar Upper Cap Inspection
Figure 1 (Sheet 1)

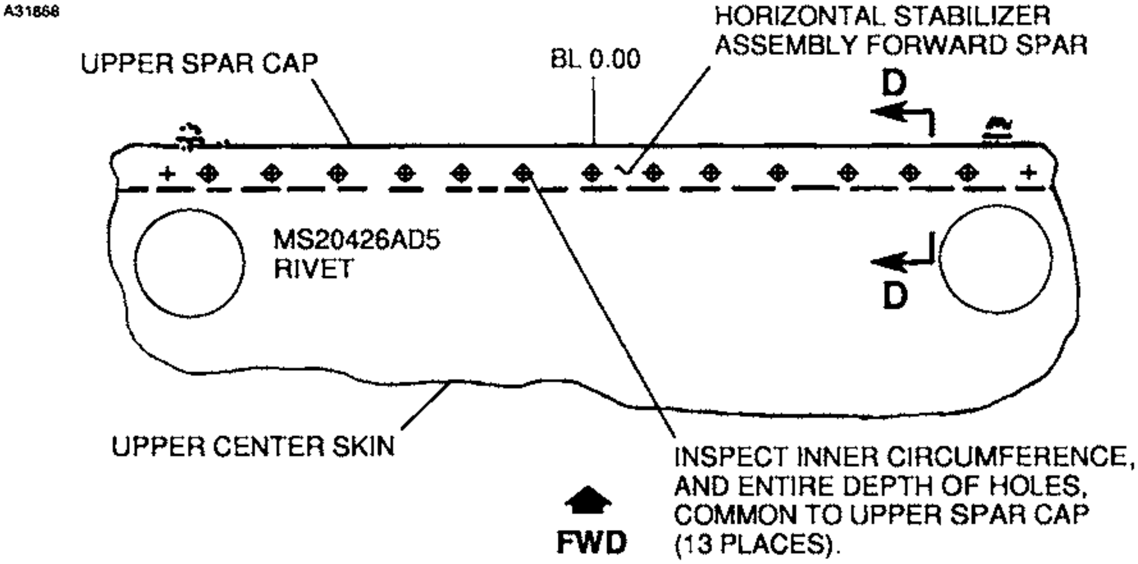
A31863



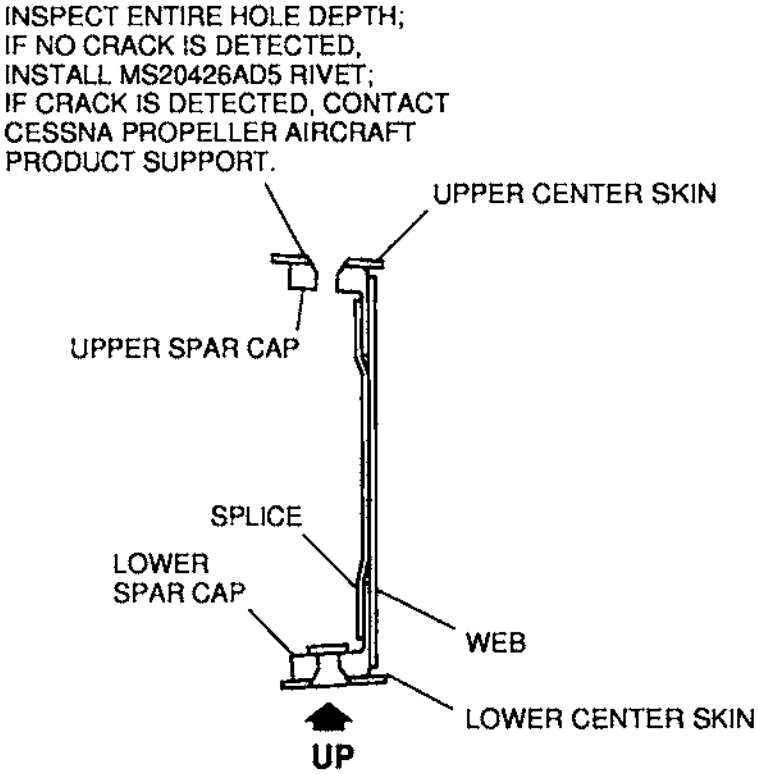
VIEW **B-B**
LOOKING DOWN AT HORIZONTAL STABILIZER FORWARD SPAR

BB52321002

Horizontal Stabilizer Assembly Forward Spar Upper Cap Inspection
Figure 1 (Sheet 2)



VIEW C-C
LOOKING DOWN AT HORIZONTAL
STABILIZER FORWARD SPAR ASSEMBLY



VIEW D-D
LOOKING INBOARD AT TYPICAL
UPPER SPAR CAP HOLE INSPECTION

CC5232R003
DD5232R005

Horizontal Stabilizer Assembly Forward Spar Upper Cap Inspection
Figure 1 (Sheet 3)

SUPPLEMENTAL INSPECTION NUMBER: 55-10-05

1. **TITLE**
   Horizontal Stabilizer Forward Spar Lower Cap

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the horizontal stabilizer forward spar lower cap.

4. **PREPARATION**
   A. Remove 13 fasteners from the horizontal stabilizer assembly forward spar lower cap, one at BL 0.00, and six adjacent fasteners on each side of BL 0.00. Refer to Figure 1, View B-B.

   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e"	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/32 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

   Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.156 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.

   B. Null the probe in the appropriate reference standard hole away from the calibration notch.

   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

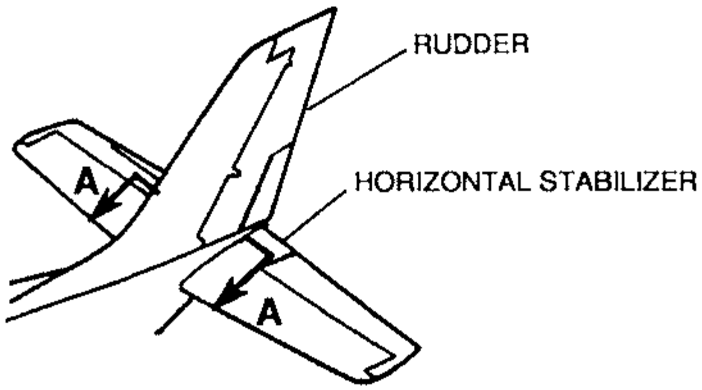
E. Inspect the inner circumference of each hole common to the horizontal stabilizer forward spar lower cap fastener at BL 0.0 and the six fasteners on each side of BL 0.0. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 1, View C-C and View D-D.

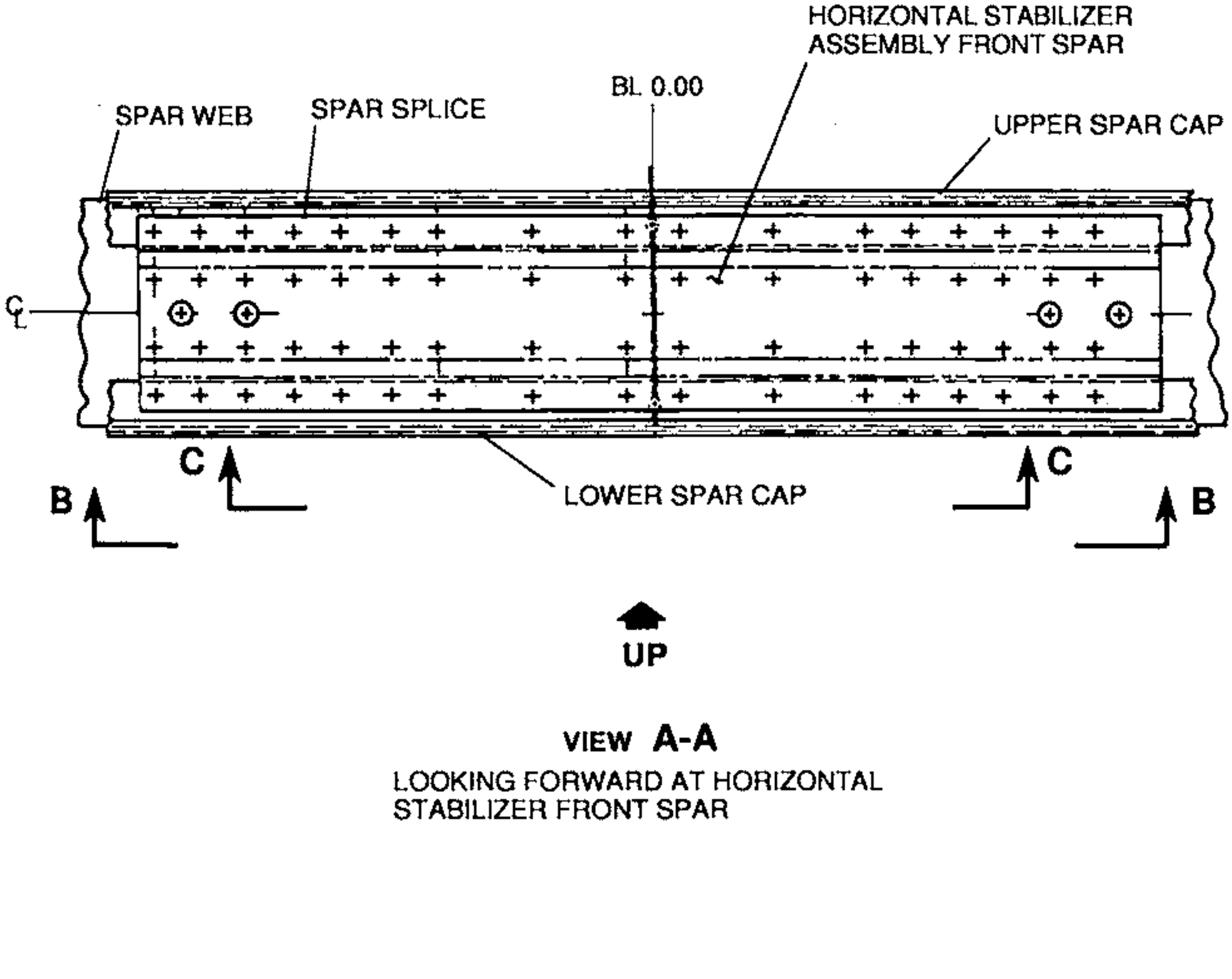
F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, install MS20426AD5 Rivets and reinstall the horizontal stabilizer. Refer to the Service Manual.

H. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack on all reports.

A31869





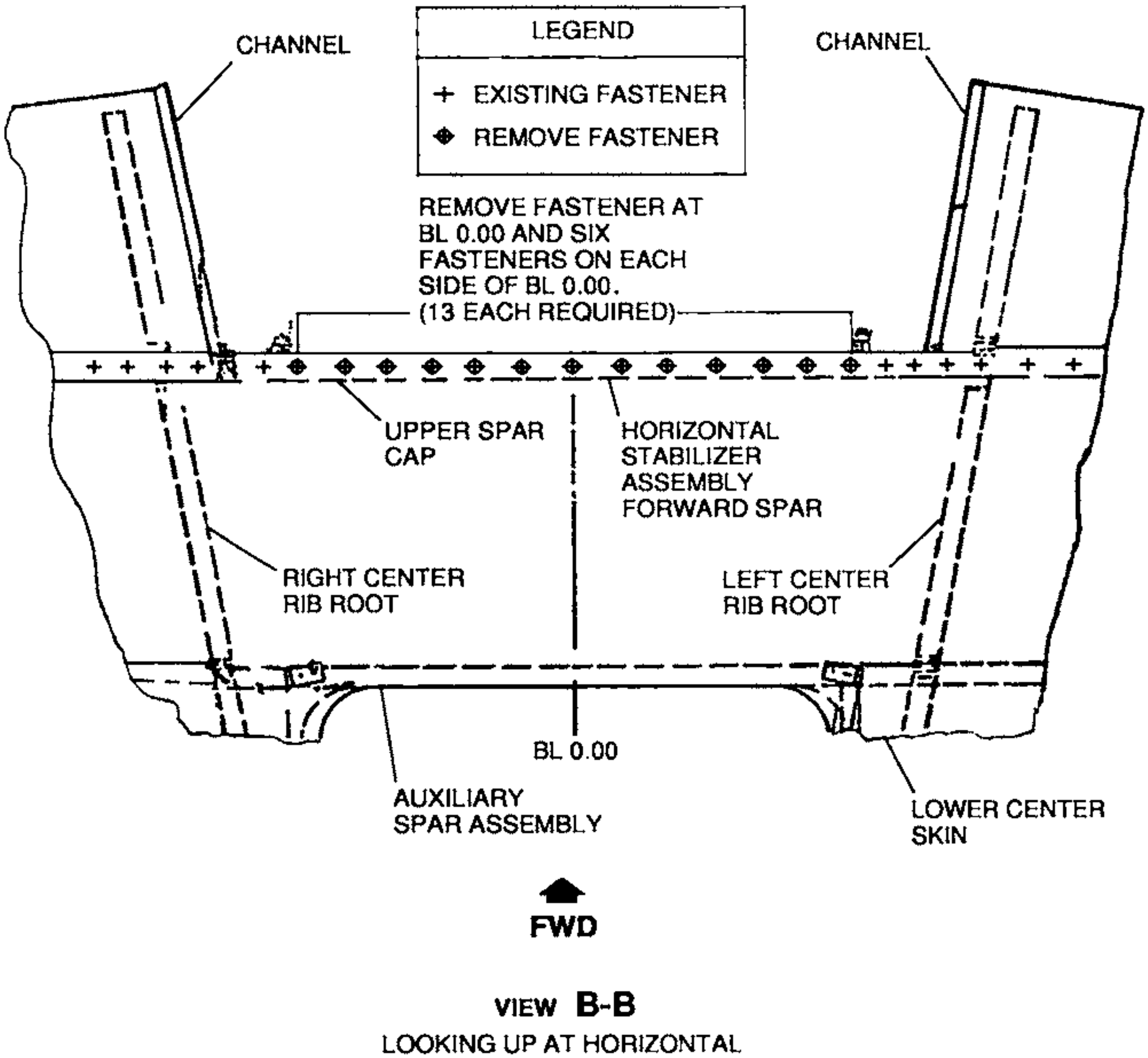
VIEW **A-A**

LOOKING FORWARD AT HORIZONTAL
STABILIZER FRONT SPAR

5232R1006
A-A5232R1001

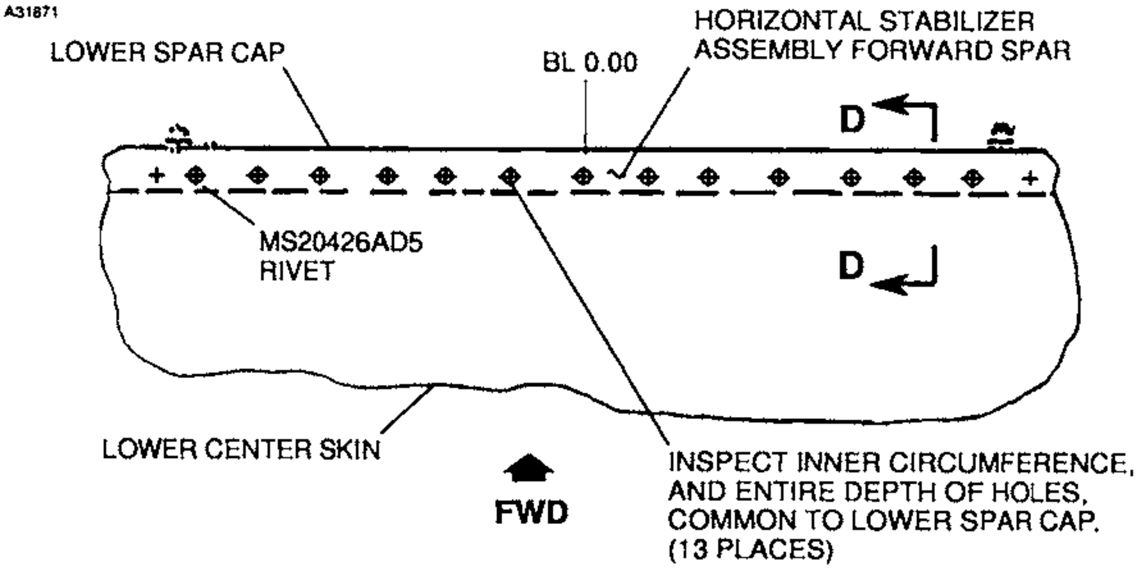
Horizontal Stabilizer Assembly Forward Spar Lower Cap Inspection
Figure 1 (Sheet 1)

A31870

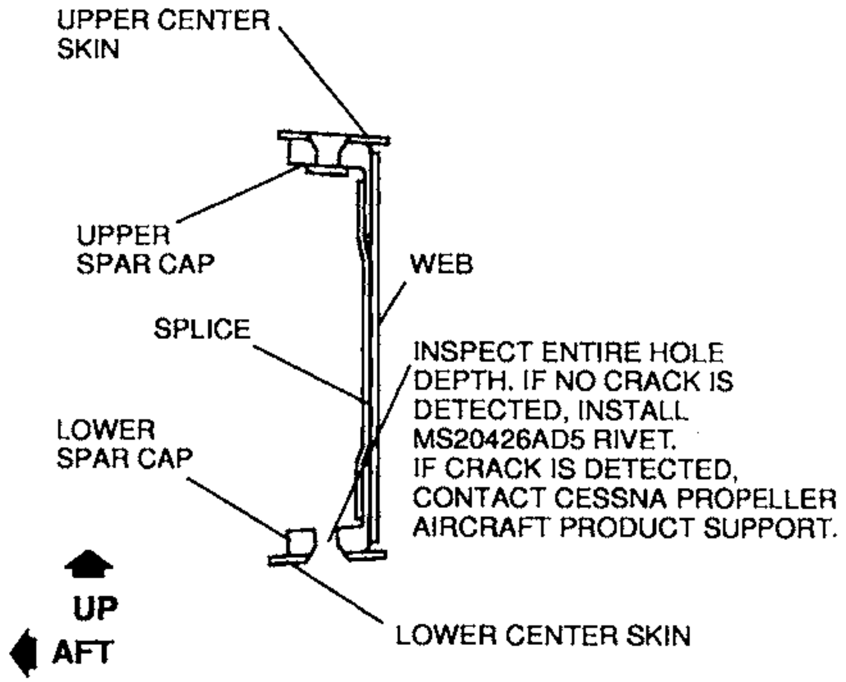


B-B5232R1002

Horizontal Stabilizer Assembly Forward Spar Lower Cap Inspection
Figure 1 (Sheet 2)



VIEW **C-C**
LOOKING UP AT HORIZONTAL STABILIZER FORWARD SPAR ASSEMBLY



VIEW **D-D**
LOOKING OUTBOARD AT TYPICAL UPPER SPAR CAP HOLE INSPECTION

C-C5232R1003
D-D5232R1005

Horizontal Stabilizer Assembly Forward Spar Lower Cap Inspection
Figure 1 (Sheet 3)

SUPPLEMENTAL INSPECTION NUMBER: 55-10-06

1. **TITLE**
   Horizontal Stabilizer Forward Spar Attach, BL 7.69

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the horizontal stabilizer forward spar attach points.

4. **PREPARATION**
   A. Remove the horizontal stabilizer forward spar attach bolts. Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e"	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/8 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.375 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.
   D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

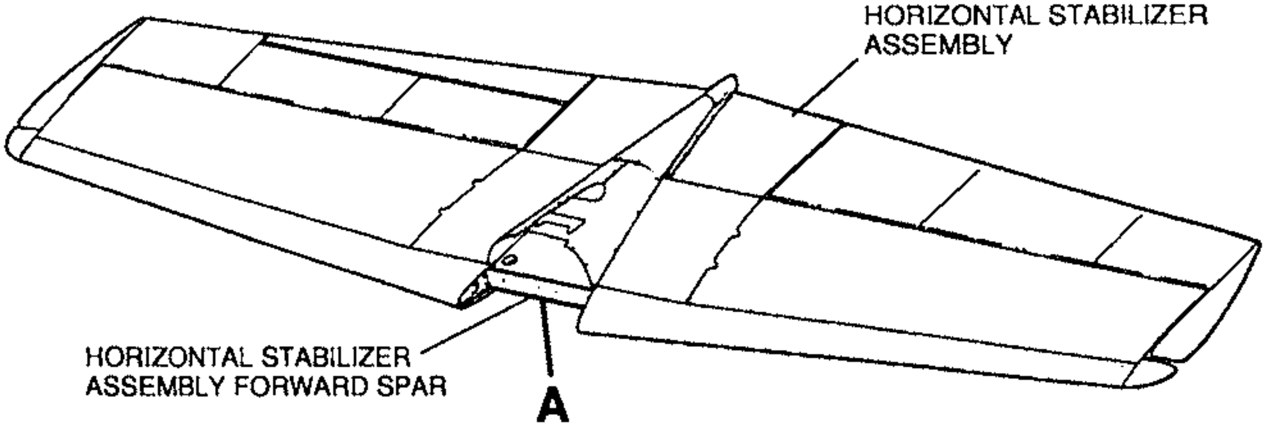
E. Inspect the inner circumference of each horizontal stabilizer forward spar attach bolt hole. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2.

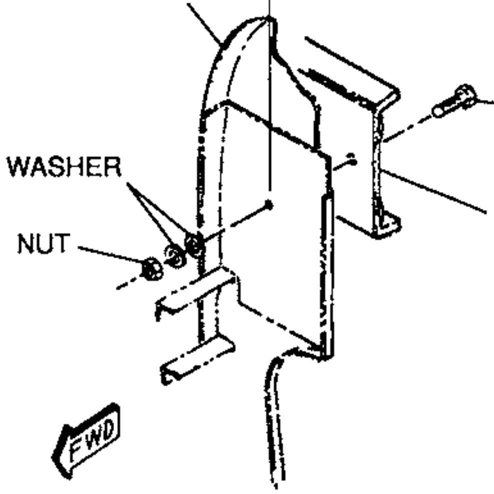
F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, reinstall the horizontal stabilizer. Refer to the Service Manual.

H. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack on all reports.

A31872



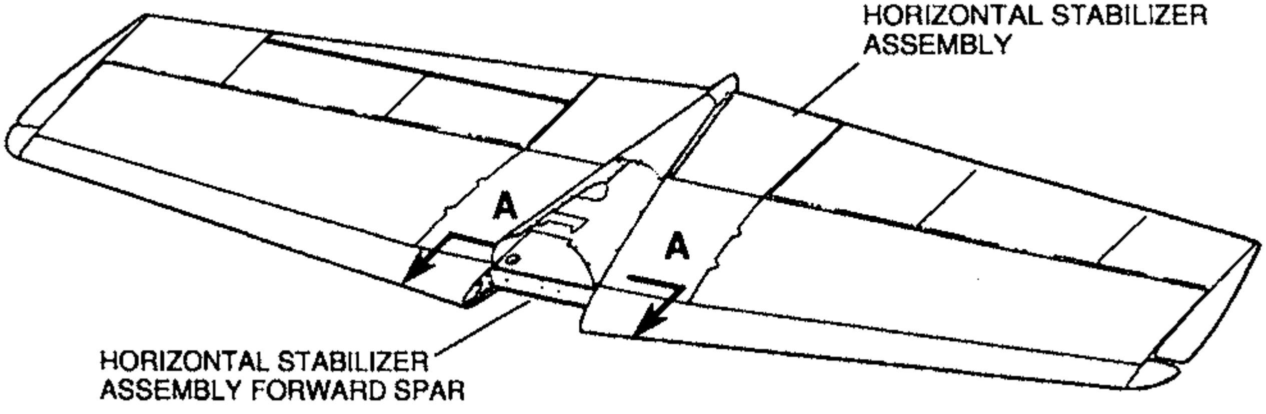


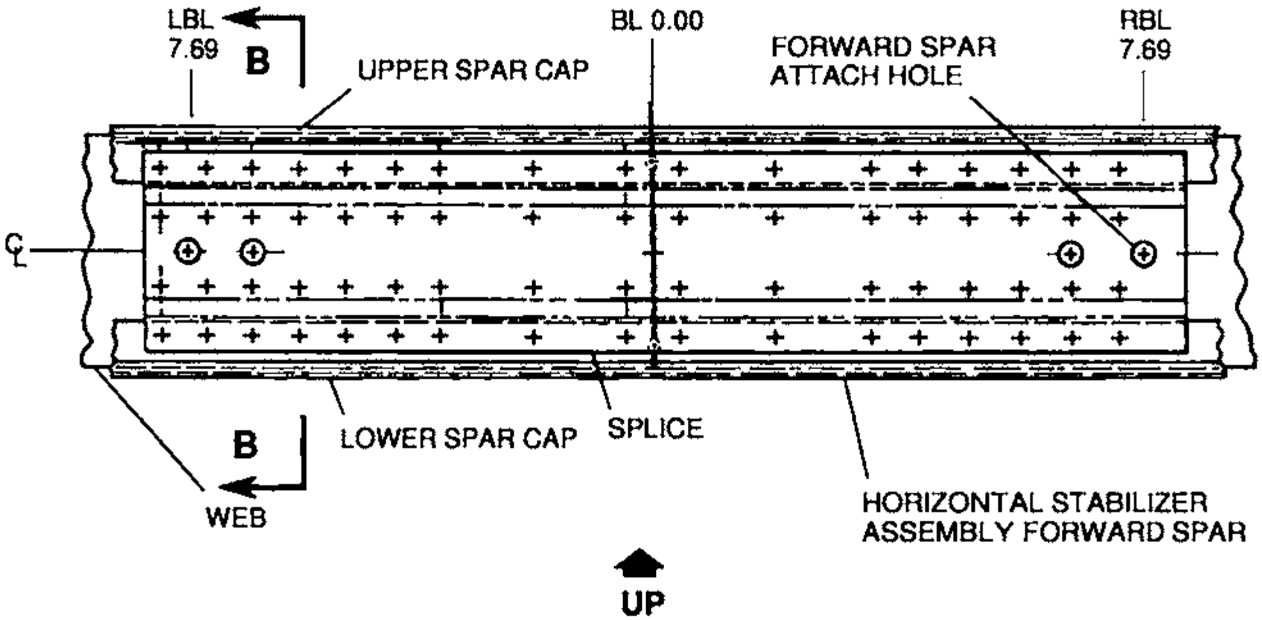
DETAIL A
LOOKING AFT AT HORIZONTAL STABILIZER ASSEMBLY FORWARD SPAR

51324001
A51322001

Horizontal Stabilizer Assembly Forward Spar Attach, BL 7.69
Figure 1 (Sheet 1)

A31873



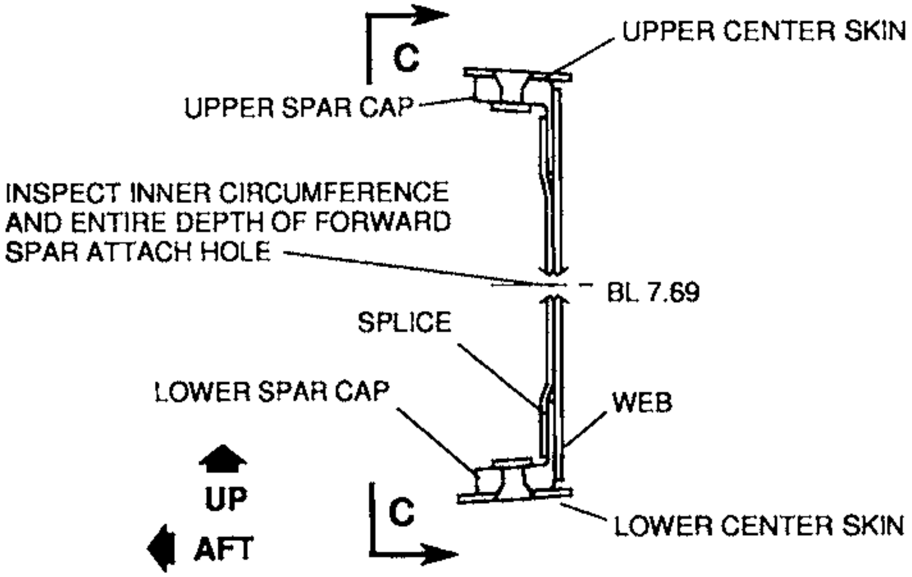


VIEW **A-A**
LOOKING FORWARD AT HORIZONTAL
STABILIZER ASSEMBLY FORWARD SPAR

51324001
A-A52321001

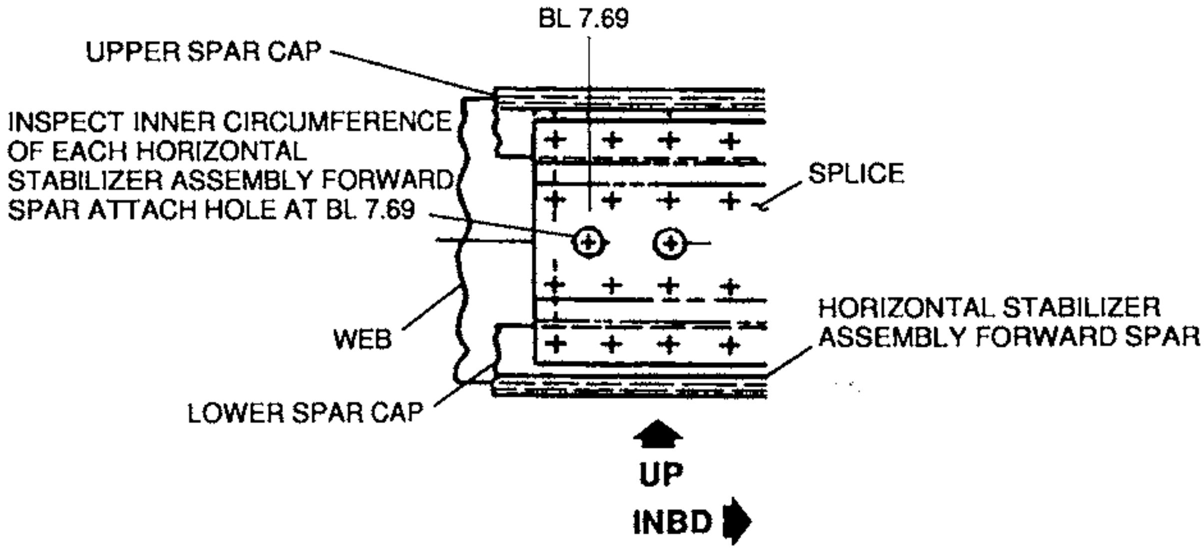
Horizontal Stabilizer Assembly Forward Spar Attach Hole Inspection
Figure 2 (Sheet 1)

A31874



VIEW B-B

LOOKING OUTBOARD AT TYPICAL
FORWARD SPAR ATTACH HOLE



VIEW C-C

LOOKING FORWARD AT
HORIZONTAL STABILIZER ASSEMBLY
FORWARD SPAR ATTACH HOLE
(LEFT SIDE SHOWN, RIGHT SIDE OPPOSITE)

B-B52321005
C-C52321001

Horizontal Stabilizer Assembly Forward Spar Attach Hole Inspection
Figure 2 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 55-10-07

1. **TITLE**
   Horizontal Stabilizer Rear Spar Lower Cap Attach

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the horizontal stabilizer rear spar lower cap attach points.

4. **PREPARATION**
   A. Remove the attach bolts on the horizontal stabilizer rear spar lower cap. Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/16 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.3125 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.
   D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

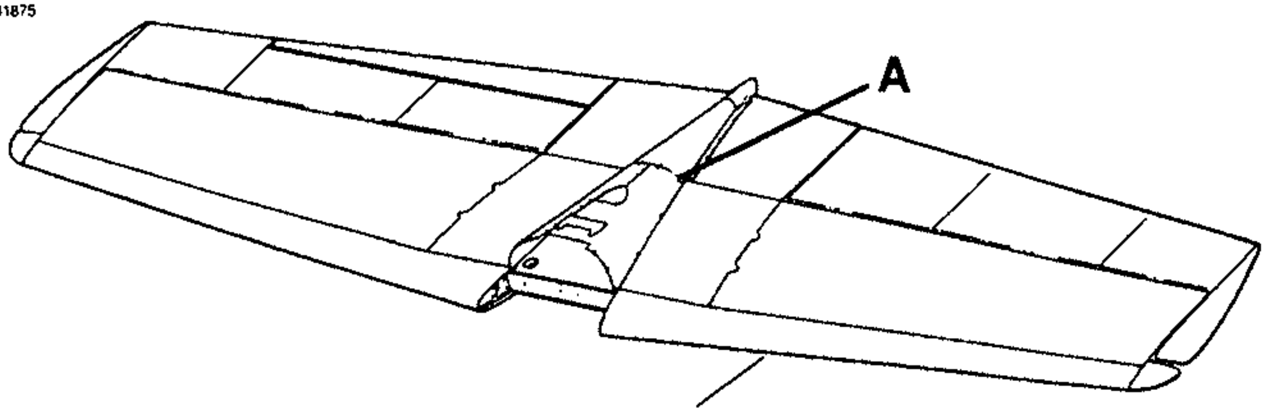
E. Inspect the inner circumference of each of the horizontal stabilizer rear spar lower cap attach bolt holes. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2.

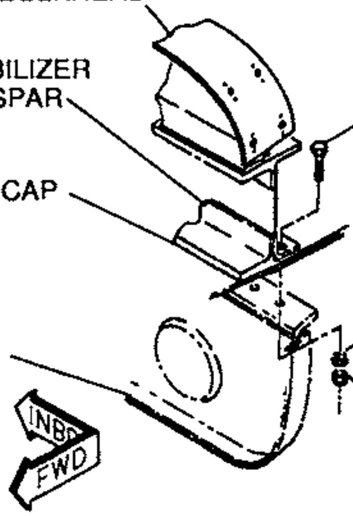
F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, reinstall the horizontal stabilizer. Refer to the service manual.

H. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of crack on all reports.

A31875



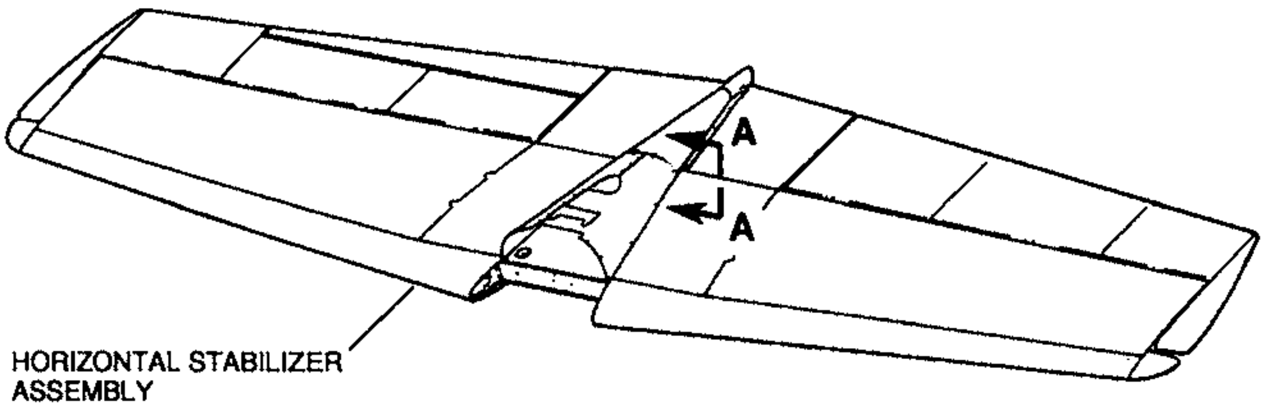


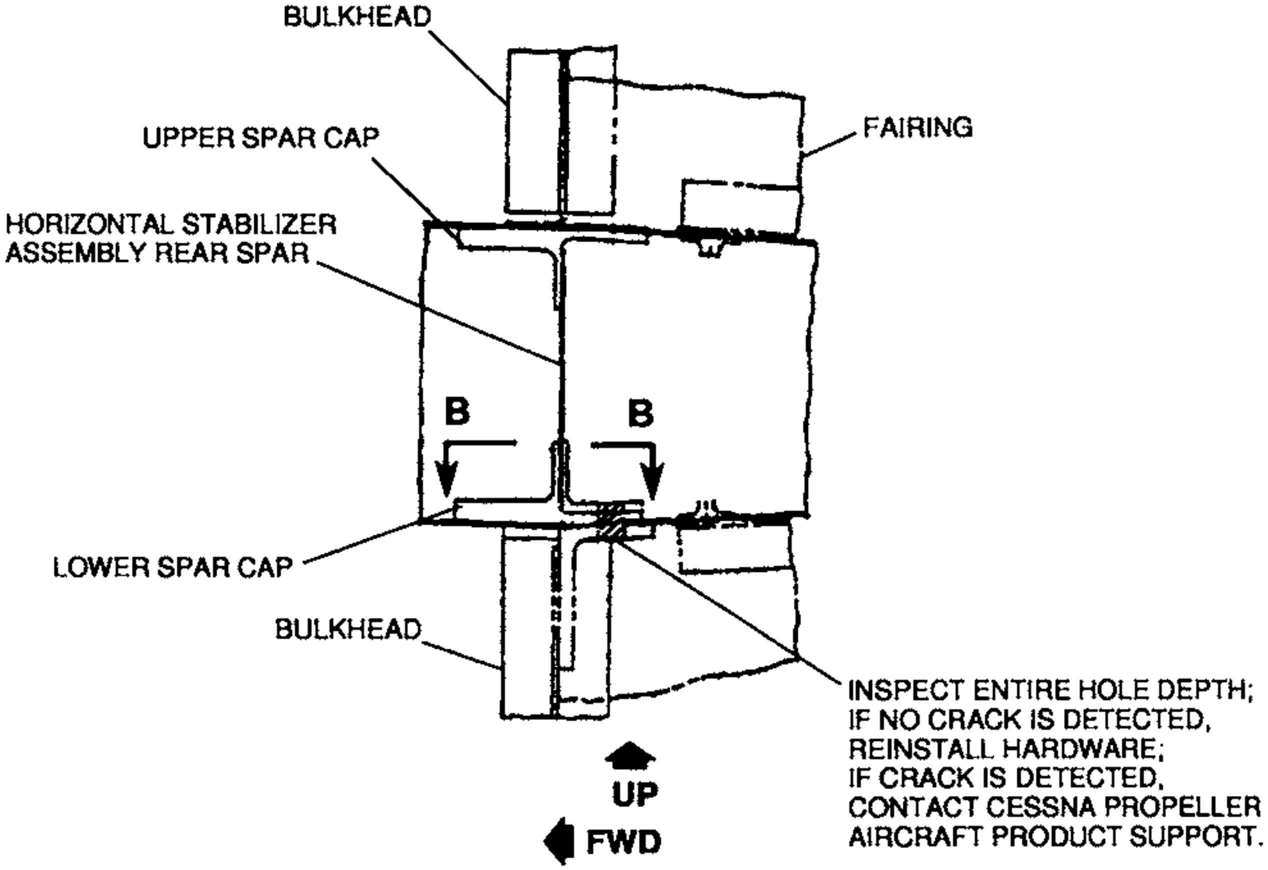
DETAIL A
LOOKING AFT AT TYPICAL HORIZONTAL
STABILIZER ASSEMBLY REAR SPAR LOWER
CAP ATTACH

51324001
A52321013

Horizontal Stabilizer Assembly Rear Spar Lower Cap Attach
Figure 1 (Sheet 1)

A31876





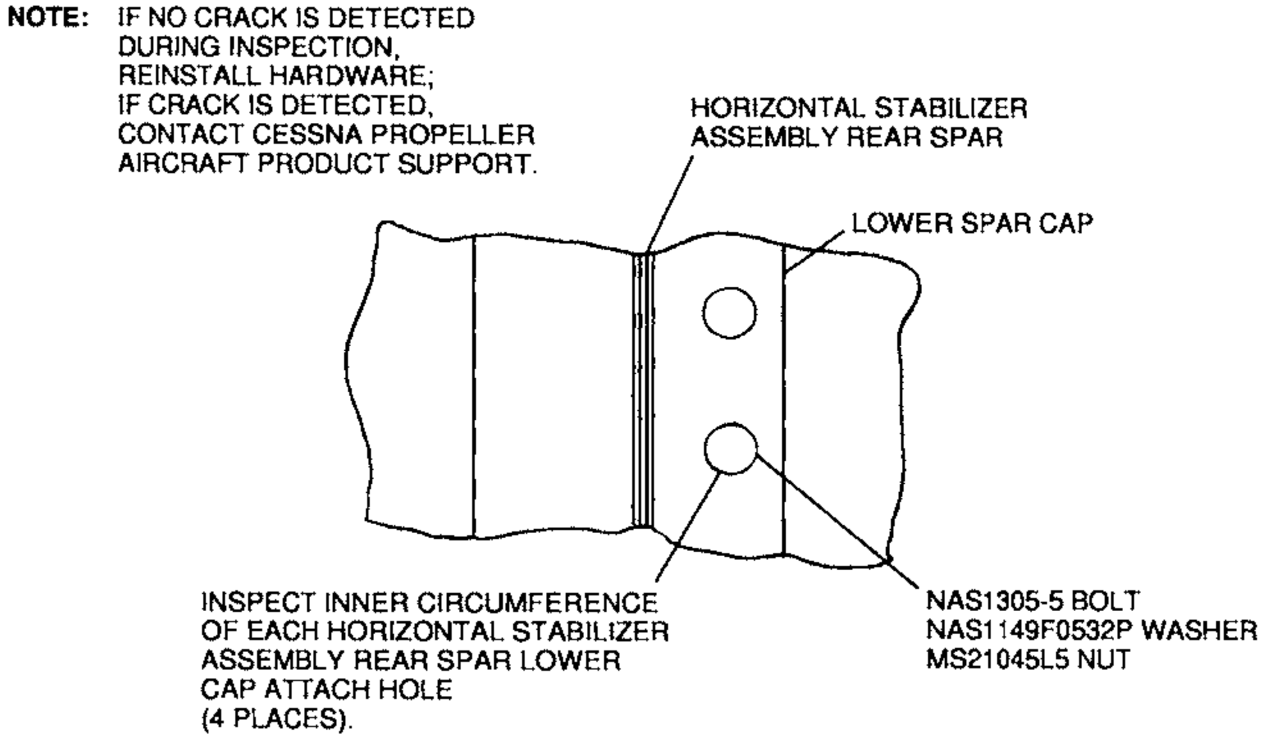
VIEW **A-A**

LOOKING INBOARD AT TYPICAL HORIZONTAL
STABILIZER ASSEMBLY REAR SPAR LOWER CAP ATTACH

61324001
A-A52321014

Horizontal Stabilizer Assembly Rear Spar Lower Cap Attach Inspection
Figure 2 (Sheet 1)

A31877



VIEW B-B

LOOKING DOWN AT TYPICAL HORIZONTAL STABILIZER ASSEMBLY REAR SPAR LOWER CAP ATTACH

B-B52321015

Horizontal Stabilizer Assembly Rear Spar Lower Cap Attach Inspection
Figure 2 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 55-10-08

1. **TITLE**
   Horizontal Stabilizer Rear Spar Upper Cap, BL 0.00

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the horizontal stabilizer rear spar upper cap.

4. **PREPARATION**
   A. Remove the two fasteners left and two fasteners right of BL 0.00, on the horizontal stabilizer rear spar upper cap (four fasteners total). Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/32 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.156 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

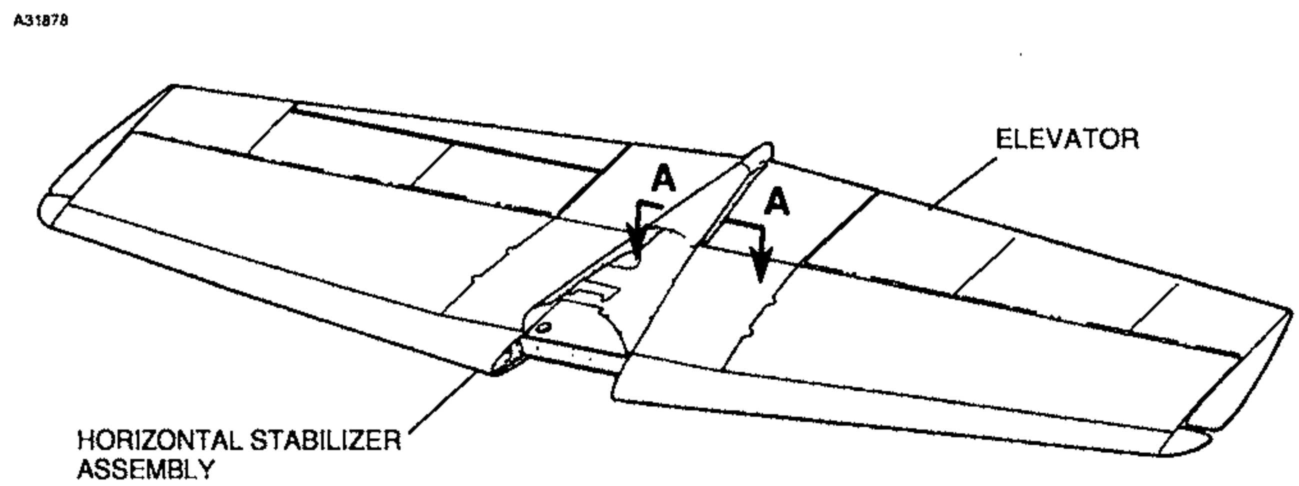
D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

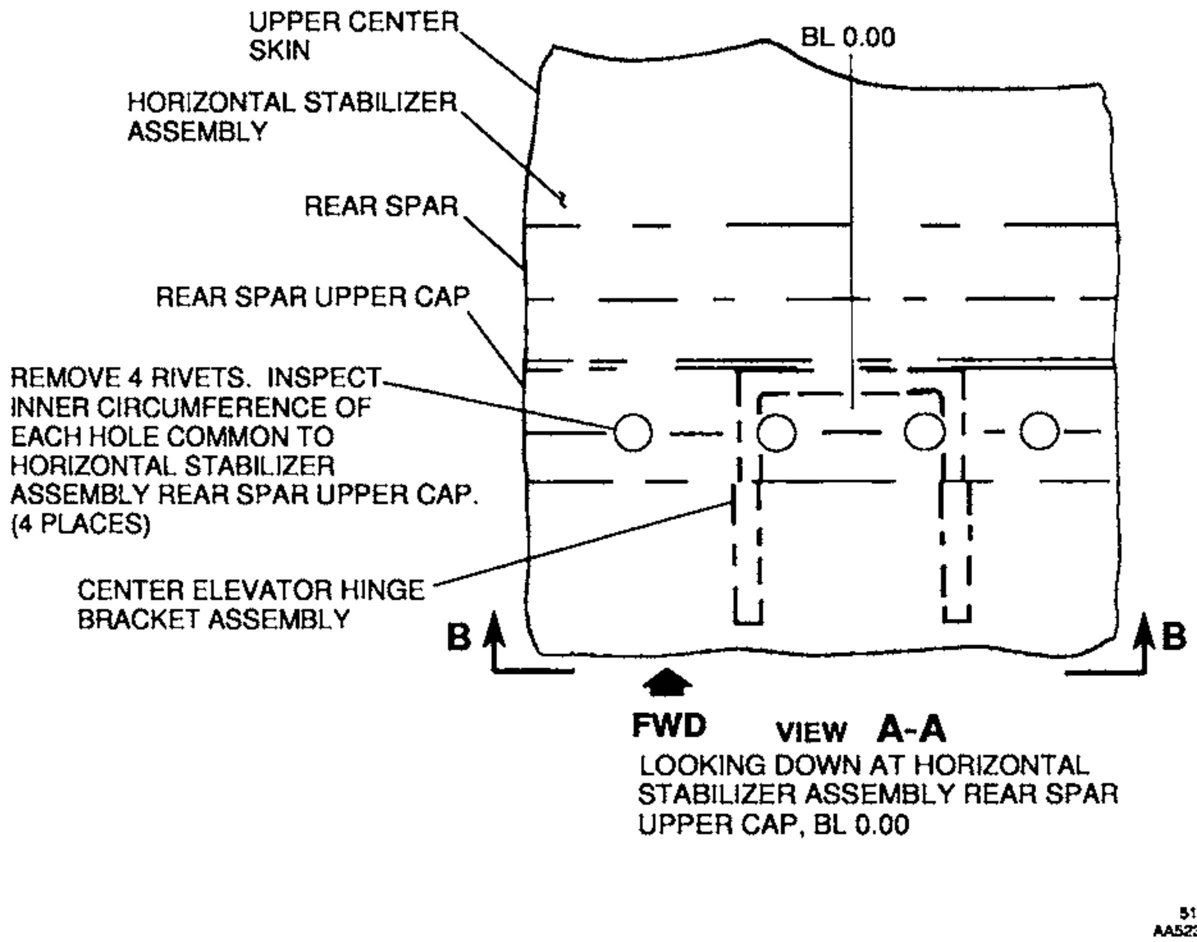
E. Inspect the inner circumference of the four fastener holes common to the horizontal stabilizer rear spar upper cap around BL 0.00. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2.

F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of crack on all reports.

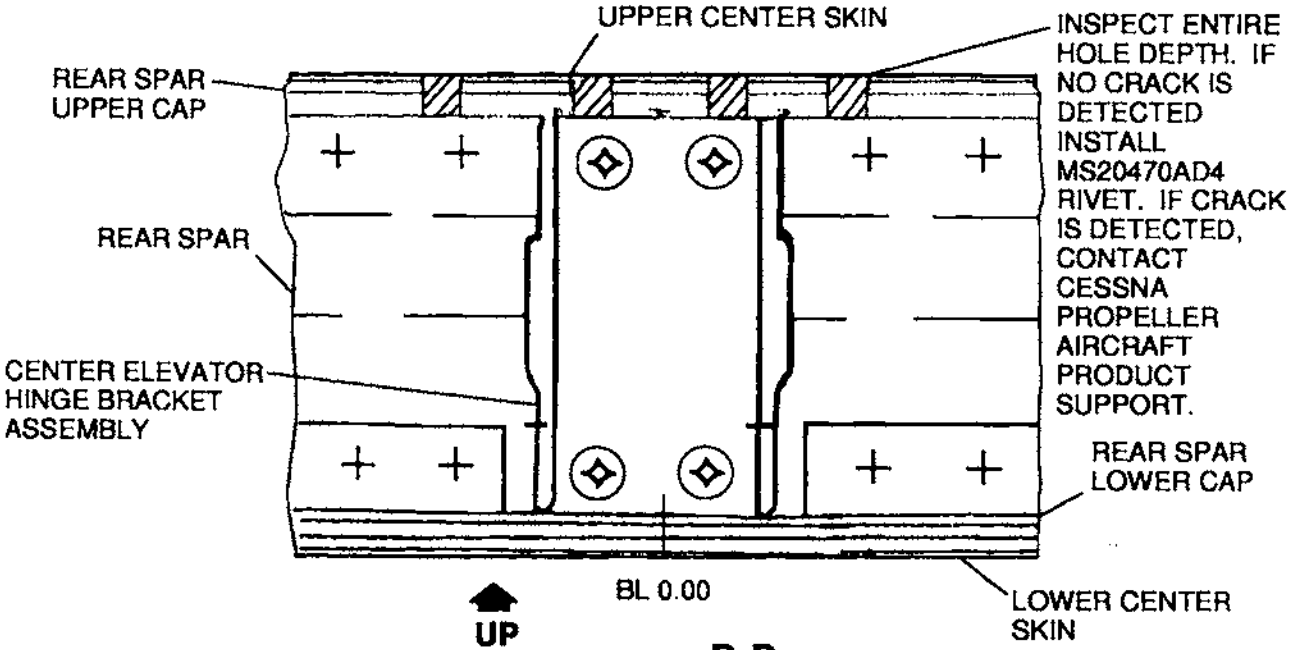
H. If no cracks are detected during this inspection:
   (1) Install four each MS20470AD4 Rivets in the horizontal stabilizer rear spar upper cap.
   (2) Reinstall the horizontal stabilizer. Refer to the Service Manual.





Horizontal Stabilizer Assembly Rear Spar Upper Cap, BL 0.00
Figure 1 (Sheet 1)

A31879



VIEW B-B

LOOKING FORWARD AT HORIZONTAL STABILIZER ASSEMBLY REAR SPAR UPPER CAP, BL 0.00

B8852321009

Horizontal Stabilizer Assembly Rear Spar Upper Cap, BL 0.00, Inspection
Figure 2 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 55-10-09

1. **TITLE**
   Horizontal Stabilizer Rear Spar Lower Cap, BL 0.00

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the horizontal stabilizer rear spar lower cap.

4. **PREPARATION**
   A. Remove one fastener left and one fastener right of BL 0.00, from the horizontal stabilizer rear spar lower cap (two fasteners total). Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/32 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.156 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

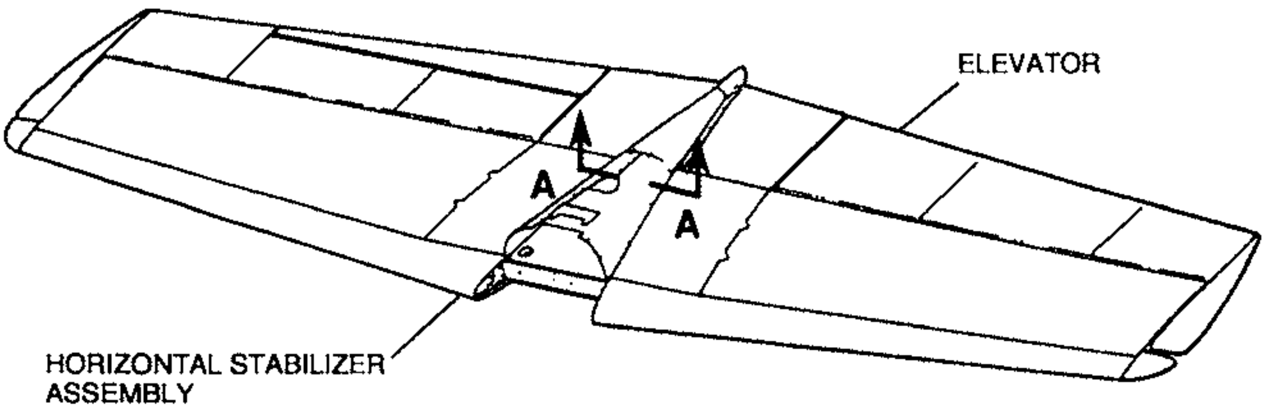
E. Inspect the inner circumference of the two holes common to the horizontal stabilizer rear spar lower cap around BL 0.00. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2.

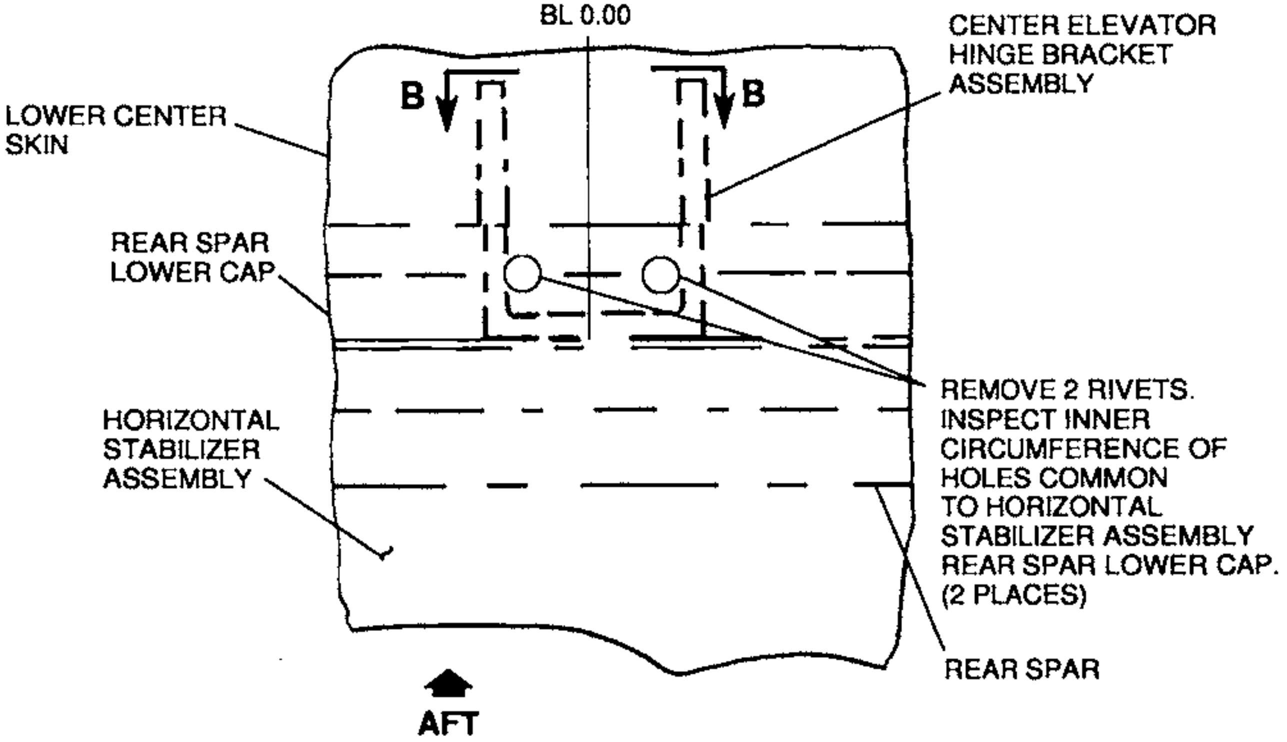
F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of crack on all reports.

H. If no cracks are detected during this inspection:
   (1) Install two MS20426AD4 Rivets in the horizontal stabilizer rear spar lower cap.
   (2) Reinstall the horizontal stabilizer. Refer to the Service Manual.

A31680



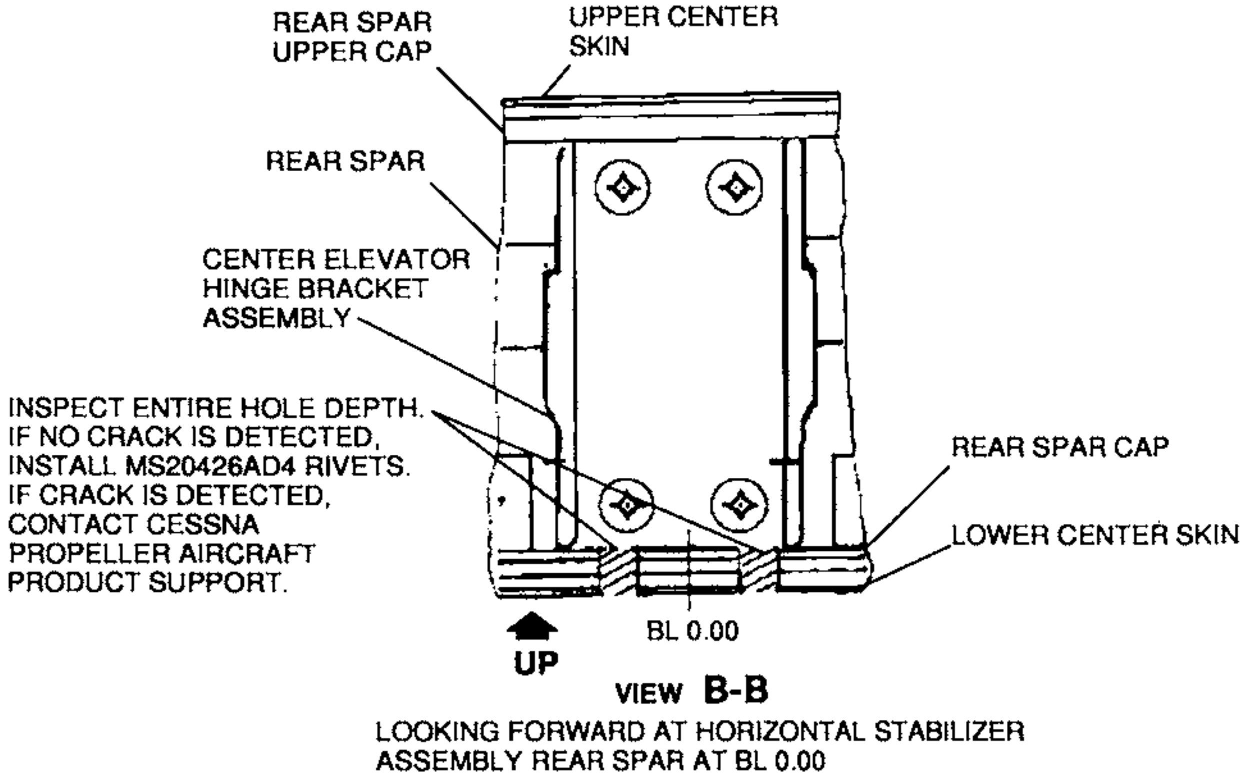


VIEW **A-A**
LOOKING UP AT HORIZONTAL
STABILIZER ASSEMBLY REAR SPAR
LOWER CAP, BL 0.00

51324001
AA52321012

Horizontal Stabilizer Assembly Rear Spar Lower Cap, BL 0.00
Figure 1 (Sheet 1)

A31881



BB52321012

Horizontal Stabilizer Assembly Rear Spar Upper Cap, BL 0.00, Inspection
Figure 2 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 55-30-04

1. **TITLE**
   Vertical Stabilizer Rear Spar Cap Attach, WL 108.38

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the vertical stabilizer rear spar cap attach points.

4. **PREPARATION**

   A. Remove the vertical stabilizer rear spar cap attach bolts. Refer to Figure 1.

   CAUTION: DO NOT REMOVE MORE THAN ONE BOLT AT A TIME WHILE PERFORMING THIS INSPECTION.

   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 3/8 inch shielded absolute coil, 0.10 inch coil diameter, 100-500 KHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**

   A. Connect the bolt hole probe (0.375 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 KHz.

   B. Null the probe in the appropriate reference standard hole away from the calibration notch.

C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

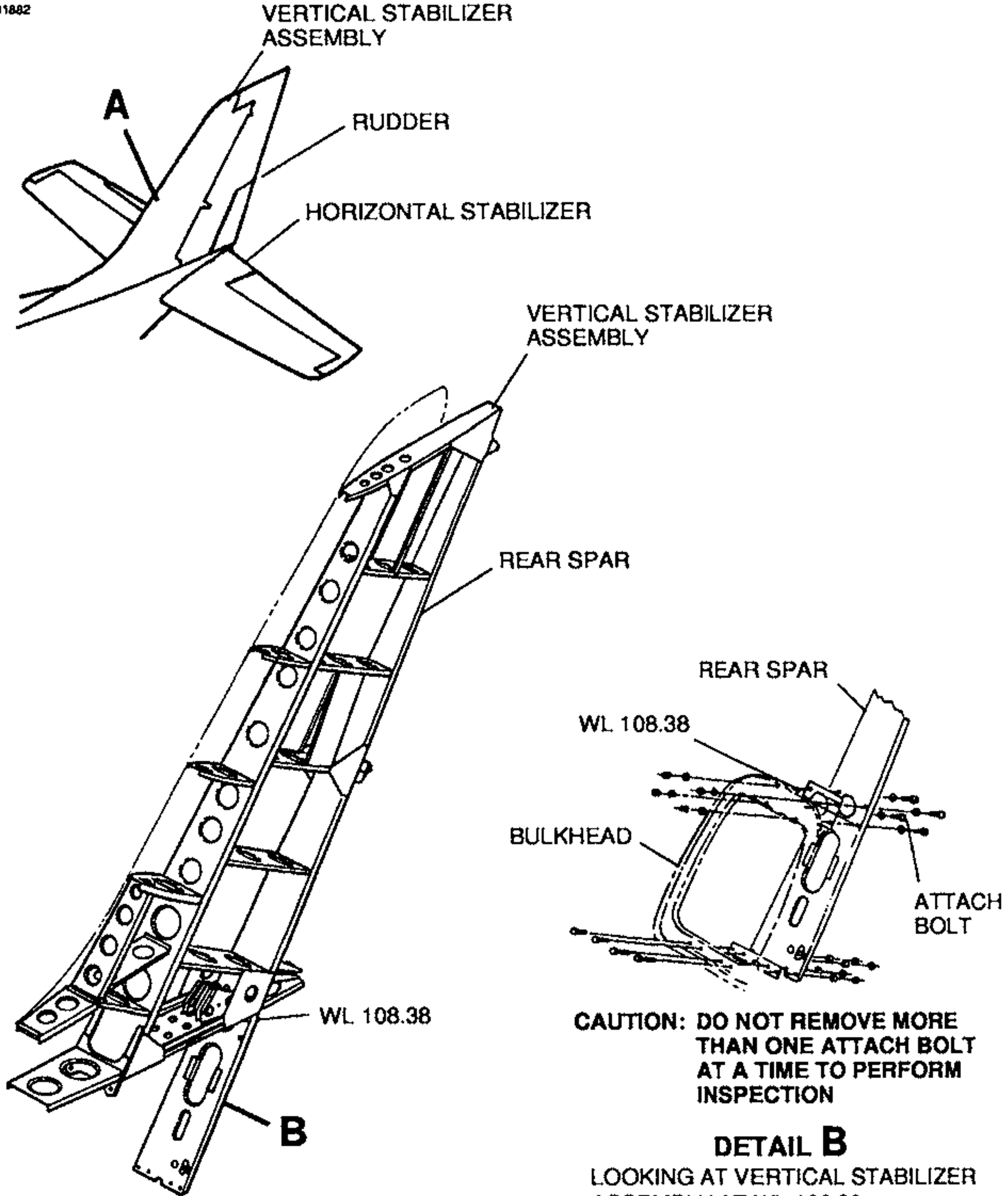
E. Inspect the inner circumference of each vertical stabilizer rear spar cap attach bolt hole. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2.

F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. Cracks detected during this inspection shall be reported to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack on reports.

H. If no cracks are detected during this inspection, reinstall the vertical stabilizer rear spar cap attach bolts. Refer to the Service Manual.

A31882



CAUTION: DO NOT REMOVE MORE THAN ONE ATTACH BOLT AT A TIME TO PERFORM INSPECTION

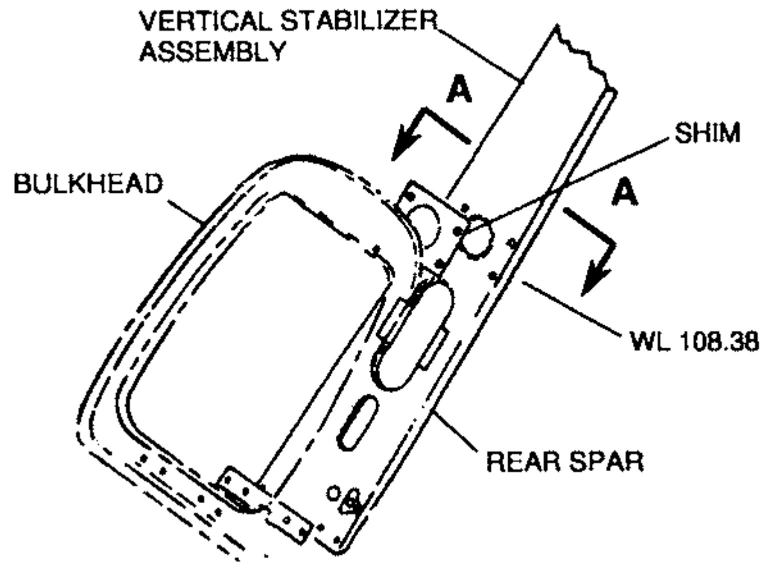
DETAIL B
LOOKING AT VERTICAL STABILIZER ASSEMBLY AT WL 108.38

DETAIL A
LOOKING AT VERTICAL STABILIZER ASSEMBLY

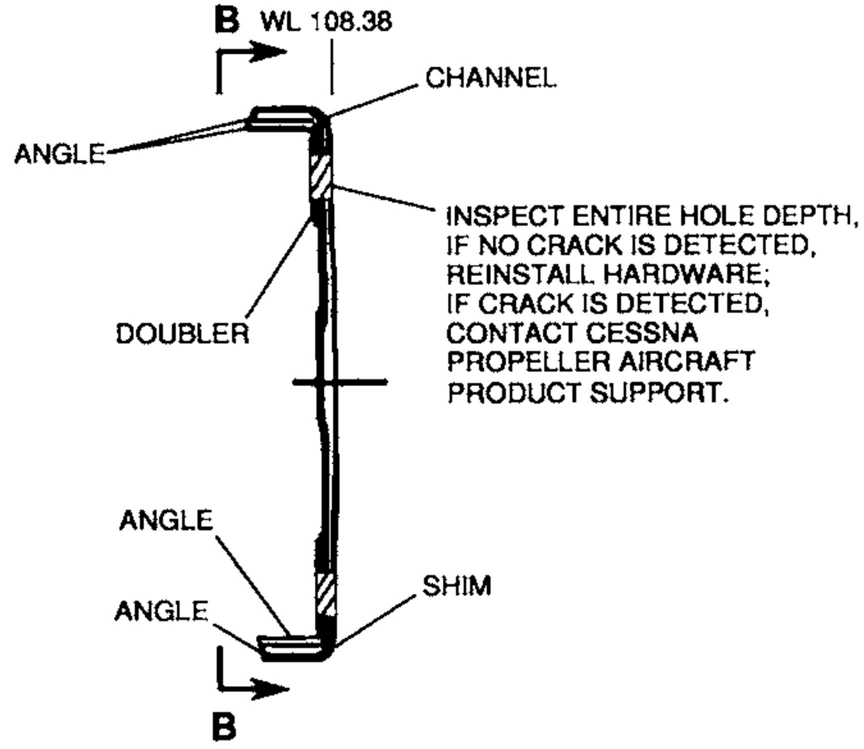
52321006
A51314004
BB1312004

Vertical Stabilizer Assembly Rear Spar Cap Attach, WL 108.38
Figure 1 (Sheet 1)

A31863



CAUTION: DO NOT REMOVE MORE THAN ONE BOLT AT A TIME WHILE PERFORMING INSPECTION

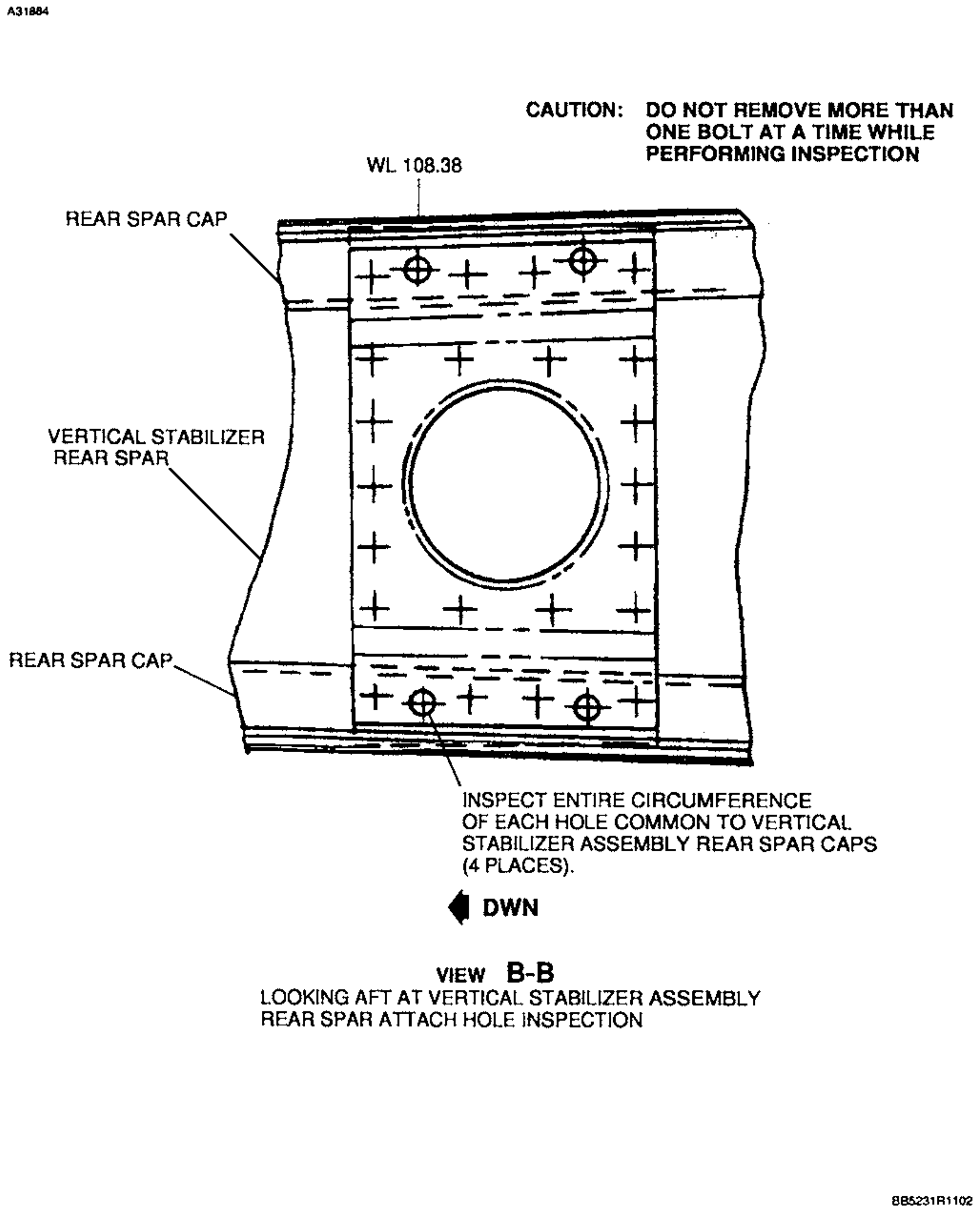


VIEW A-A

LOOKING DOWN AT VERTICAL STABILIZER
REAR SPAR ATTACH HOLE, WL 108.38

5131R2004
AA5231R1003

Vertical Stabilizer Assembly Rear Spar Lower Cap Attach, WL 108.38, Inspection
Figure 2 (Sheet 1)



Vertical Stabilizer Assembly Rear Spar Lower Cap Attach, WL 108.38, Inspection
Figure 2 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 56-10-01

1. **TITLE**
   Pilot and Copilot Windshield Attach Hole Inspection - Acrylic Windshield

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for voids and cracks near fastener holes of the acrylic windshields.

4. **PREPARATION**
   A. Clean the windshield according to the applicable section of the Service Manual.

5. **INSPECTION METHOD**
   Optical Prism Inspection

6. **CRACK SIZE**
   N/A

7. **EQUIPMENT**

NOTE: The following materials or equivalents are required.

Item	Model/Part Number	Manufacturer	Use
Optical Prism (Note 1)		Fabricate Locally (Refer to Figure 1)	Optical Inspection of Windshield
Optical Prism (Note 1)	6580000-1 NOTE: The 6580000-1 Optical Prism will not look exactly like the prism illustrated in Figure 1.	Cessna Aircraft Company Cessna Parts Distribution 5800 E. Pawnee P.O. Box 1521 Wichita, KS 67218	Optical Inspection of Windshield
Couplant	Ultragel II	SONOTECH, INC. 774 Marine Drive Bellingham, WA 98225	Coupling of Prism to Windshield
White Light Source		Commercially Available	Illumination of Inspection Area

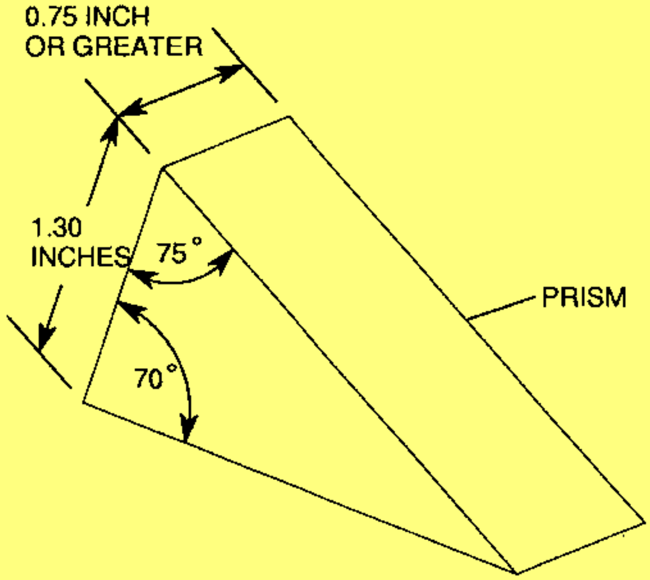
NOTE 1: Either prism may be used for the inspection.

8. **INSPECTION INSTRUCTIONS**
   A. Clean the windshield.
   B. Apply couplant to windshield near inspection area.
   C. Couple the prism to the windshield. Refer to Figure 2.
   D. Illuminate prism with light source at an angle of 30 to 60 degrees. Refer to Figure 4.
   E. Inspect fastener holes, moving the prism toward and away from the fastener holes to get a clear view of the entire hole.
   F. The image of an undamaged hole will appear as a frosty cylinder.
   G. The image of a fastener hole with a crack will appear as a frosty cylinder with a frosty or reflective ear extending from the hole. Refer to Figure 3.

H. The image of a crack from one fastener hole to another will appear as a frosty irregular surface. Refer to Figure 3.

I. Clean the windshield.

A2002

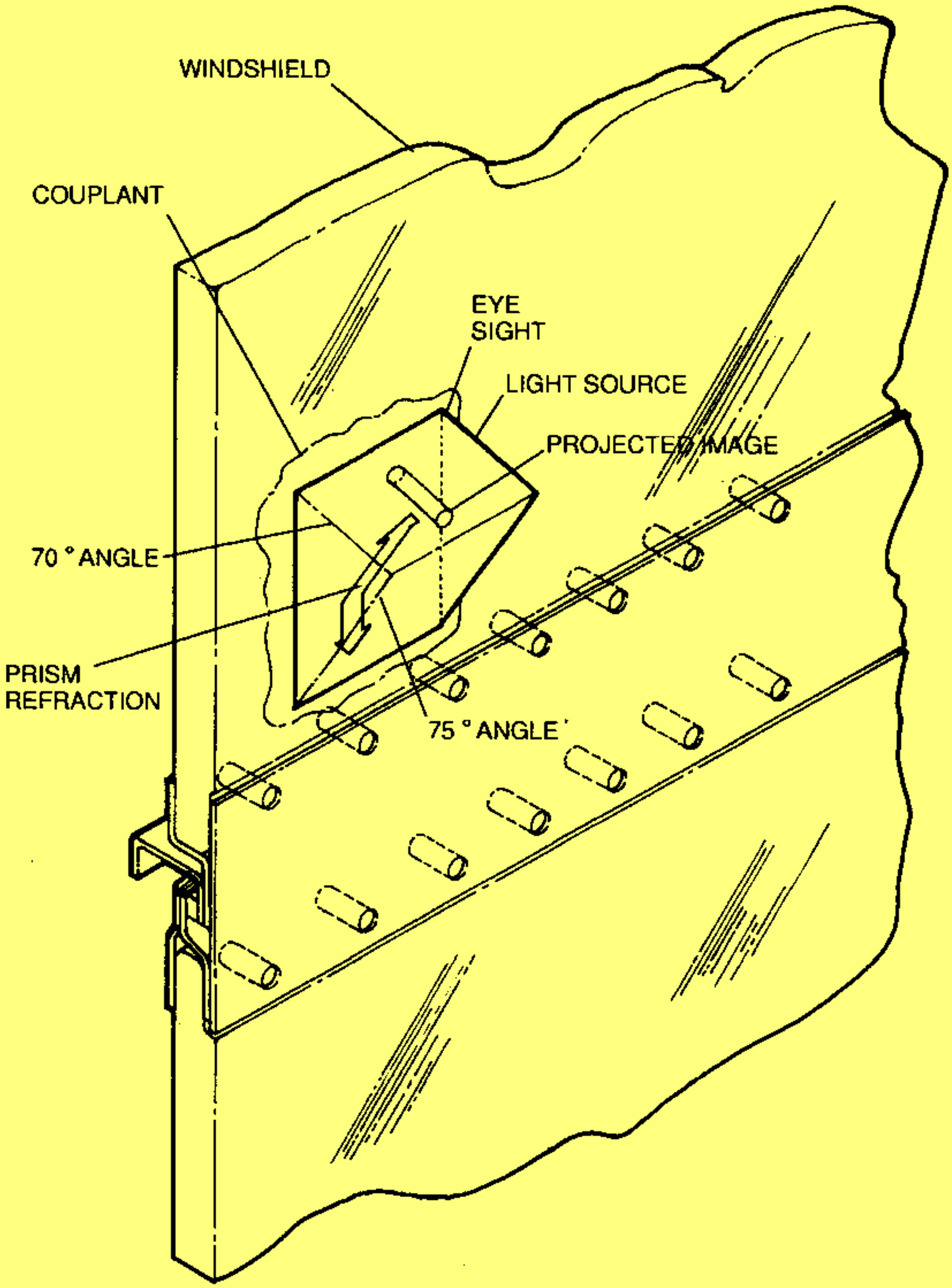


FABRICATE PRISM FROM TYPE II UVA ACRYLIC,
MIL-P-5425D, 0.75 INCH MINIMUM THICKNESS

5583T1011

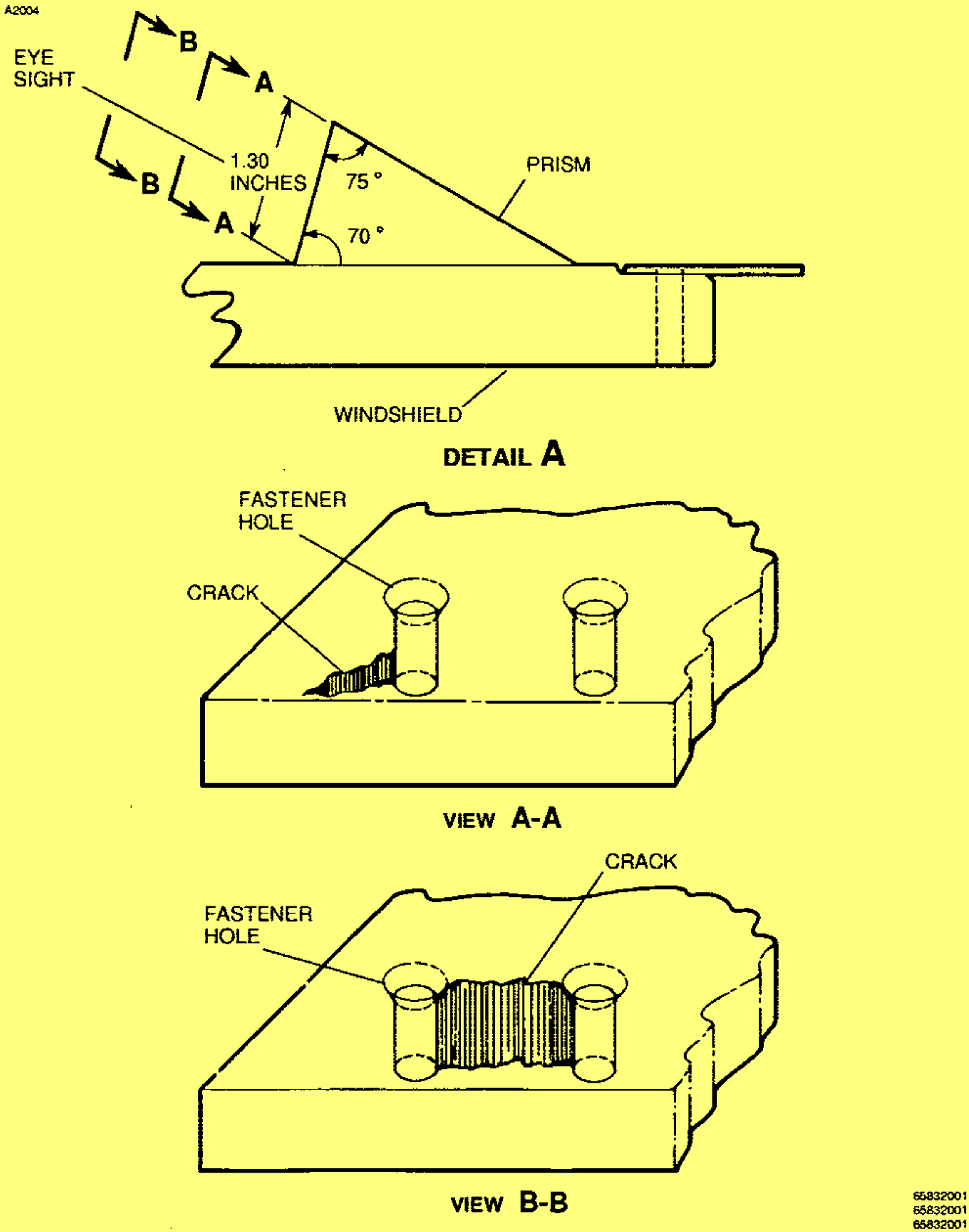
Optical Prism
Figure 1 (Sheet 1)

A2003



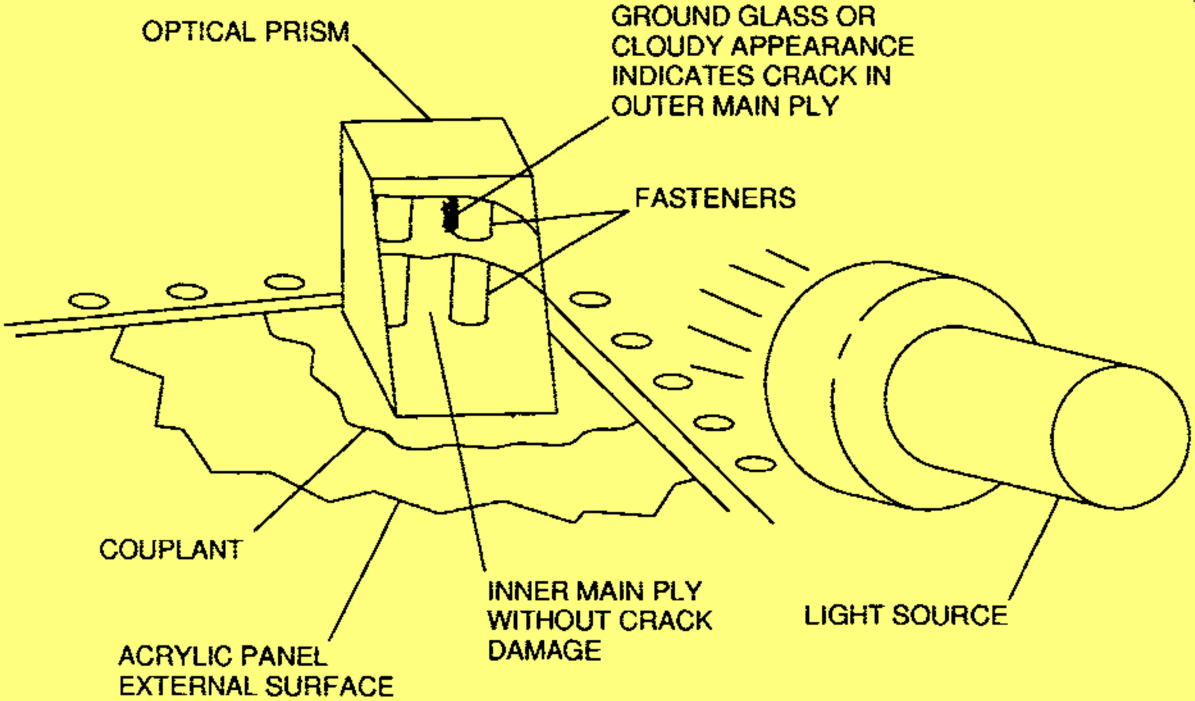
65832001

Prism Refraction
Figure 2 (Sheet 1)



Crack Images In Prism
Figure 3 (Sheet 1)

A16123



A5583T1013

Prism Light Source
Figure 4 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-14

1. **TITLE**
   Wing Lower Carry-Thru Front Spar Cap

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the fastener holes common to the lower front carry-thru fitting and lower front carry-thru spar cap.

4. **PREPARATION**
   A. Remove lower attach fitting from airplane.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole and Surface Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model-19e[II], Eddy Current Unit with x-y storage oscilloscope	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 3/16, Bolt Hole Eddy Current Probe with shielded absolute coil, 0.125 inch coil diameter. 100-500 kHz	1	EDDY CURRENT BOLT HOLE PROBE VM Products 11208 62 Avenue Puyallup, WA 98373
VM101BS 1/4, Bolt Hole Eddy Current Probe with shielded absolute coil, 0.125 inch coil diameter. 100-500 kHz	1	EDDY CURRENT BOLT HOLE PROBE VM Products 11208 62 Avenue Puyallup, WA 98373
MP905-60/500K, Surface Eddy Current Probe with shielded absolute coil, 0.125 inch coil diameter. 100-500 kHz	1	EDDY CURRENT SURFACE PROBE NDT Engineering Corp. 19620 Russell Rd. Kent, WA 98032

Aluminum Bolt Hole Reference Standard, EDM corner notch (NIST traceable) size: 0.050 x 0.050 inch	1	REFERENCE STANDARD A commercially available bolt hole standard for calibration of unit.
Aluminum Surface Reference Standard, EDM surface notch (NIST traceable) depth: 0.020 inch	1	REFERENCE STANDARD A commercially available surface standard for calibration of unit.

8. INSPECTION INSTRUCTIONS

NOTE: Inspect the holes in the spar caps opened by the removal of the attach fitting and inspect the attach fitting. It is not important to this technique whether the surface or bolt hole inspection occurs first.

A. Bolt Hole Inspection

(1) Standardize the eddy current instrument in accordance with the manufacturer's instructions using an operating frequency of 200 kHz.
(2) Adjust the instrument parameters so that liftoff is placed horizontal and to the left of the null point on the impedance plane.
(3) Using the bolt hole standard, adjust the instrument parameters to achieve a minimum vertical separation of three major divisions between the null point and the reference standard corner notch indication.

NOTE: Be sure to recalibrate the instrument (Steps 8.A.(1) through 8.A.(3)) when replacing one probe with another.

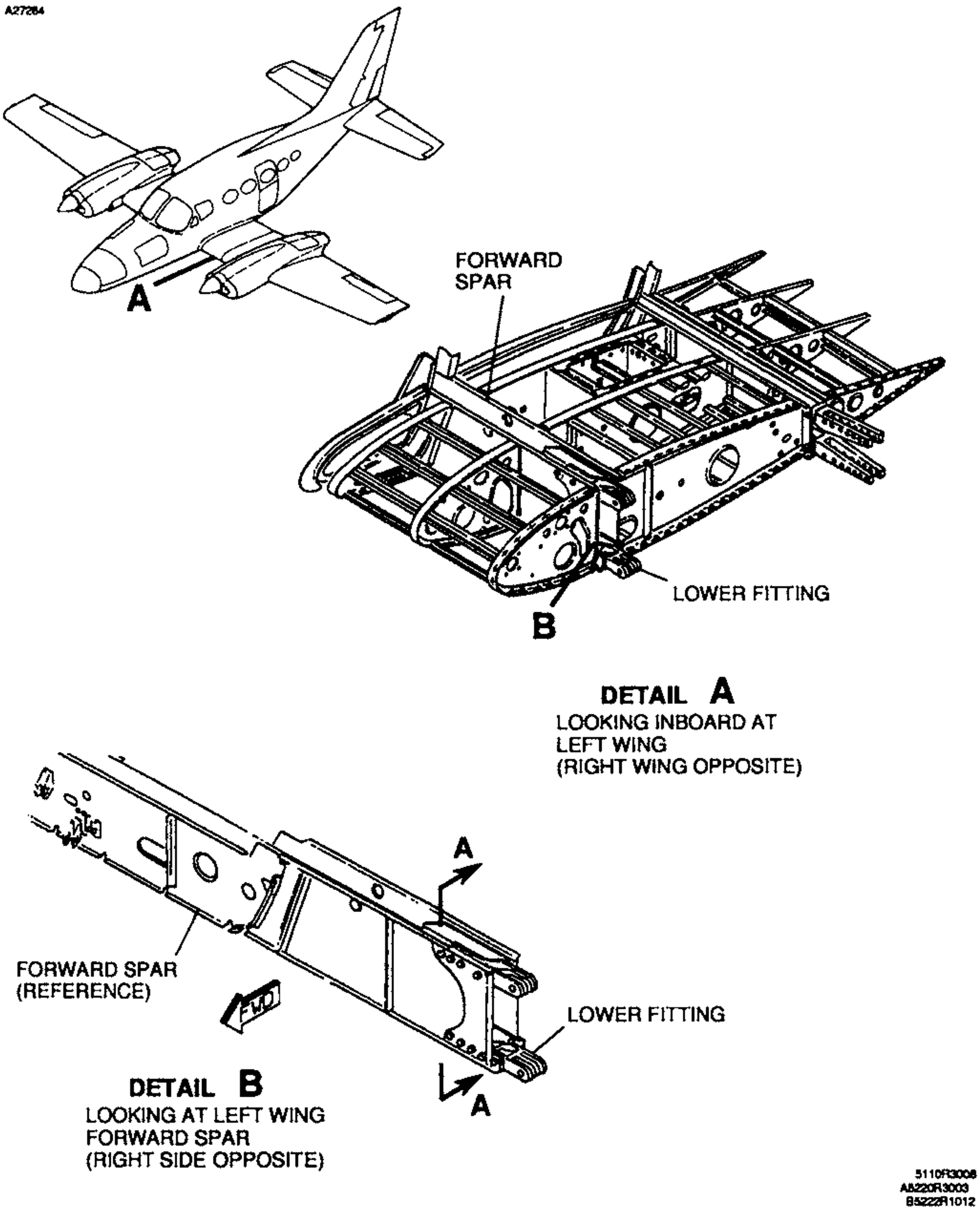
(4) Perform bolt hole inspections on all holes common to the left and right spars which were opened for the removal of the attach fitting. Inspect the entire depth and circumference of each hole.
(5) Perform bolt hole inspections on all holes in the left and right attach fittings. Inspect the entire depth and circumference of each hole.
(6) If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

B. Surface Inspection

(1) Standardize the eddy current instrument in accordance with the manufacturer's instructions using an operating frequency of 200 kHz.
(2) Adjust the instrument parameters so that liftoff is placed horizontal and to the left of the null point on the impedance plane.
(3) Using the surface crack standard, adjust the instrument parameters to achieve a minimum vertical separation of three major divisions between the null point and the 0.020 inch deep surface notch indication.
(4) Perform a surface inspection of the left and right spar caps. Refer to Figure 1.
  (a) Perform a surface inspection immediately adjacent to all holes common to the spar cap which were opened for the removal of the attach fitting.
  (b) Inspect both sides of each hole.
  (c) Inspect both forward and aft radii of the spar cap for a distance of 8 inches.
  (d) Inspect both forward and aft sides along the vertical and horizontal edge of the spar cap for a distance of eight inches.
(5) Perform a surface inspection of the left and right attach fittings.
  (a) Perform a surface inspection immediately adjacent to the holes in the attach fitting.
  (b) Inspect both forward and aft side of each hole.
  (c) Perform a surface inspection in each radius and along the free edges of the attach fitting.
(6) If an indication is noted, carefully repeat the inspection in the opposite direction of probe movement to verify the indication.

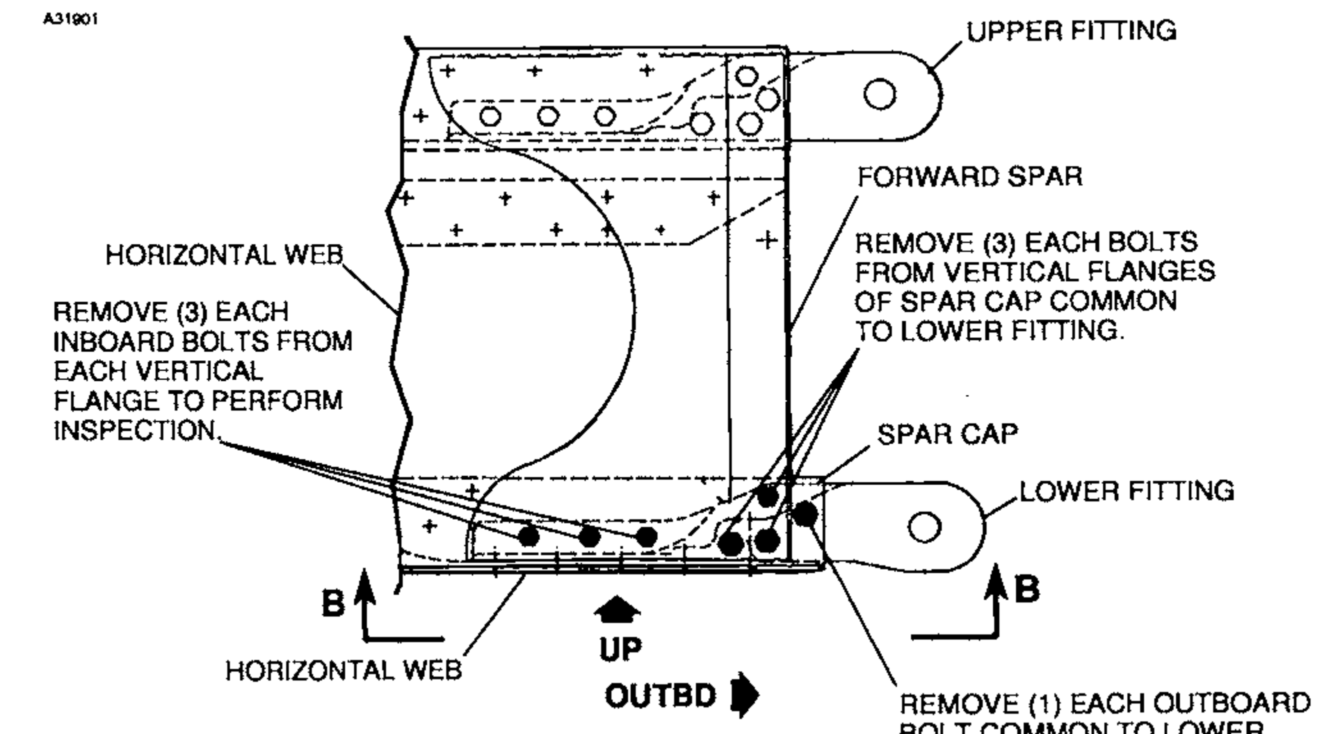
C. Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and length and depth of the crack with report.

D. If no cracks or damage is found, install NAS6203, NAS6204 and HL18PB8 fasteners in the wing lower carry-thru front spar cap and fitting. Refer to Cessna Service Kit SK421-152 for replacement fastener criteria. If access to install the Hi-Lok fasteners is an issue, some acceptable alternatives include: (1) installing the Hi-Lok fasteners upside down, (2) using KR nuts instead of collars and (3) using MS90354 fasteners instead of Hi-Loks.



Wing Lower Carry-Thru Front Spar Cap Inspection
Figure 1 (Sheet 1)

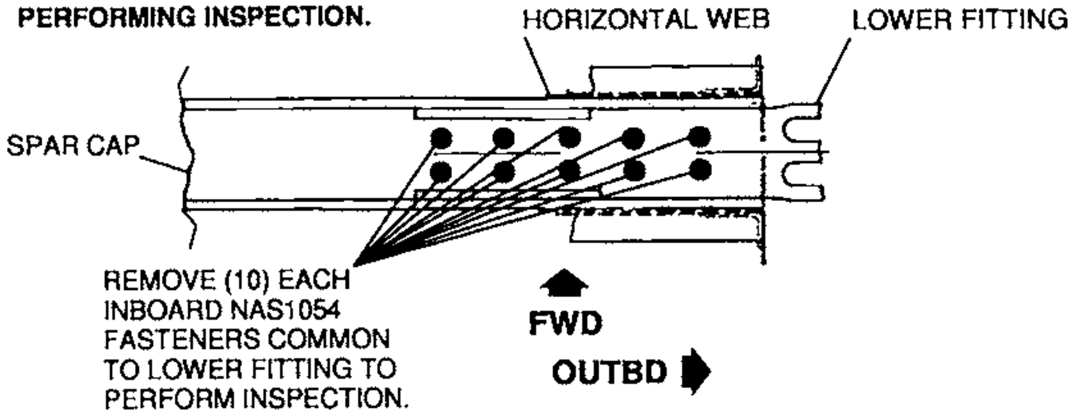
A31901



VIEW **A-A**

LOOKING AFT AT LEFT WING
CARRY-THRU SPAR
(RIGHT SIDE OPPOSITE)

CAUTION: DO NOT REMOVE MORE THAN ONE BOLT AT A TIME WHILE PERFORMING INSPECTION.



VIEW **B-B**

LOOKING UP AT LEFT WING
CARRY-THRU SPAR LOWER ATTACH FITTING
(RIGHT SIDE OPPOSITE)

AA5222R1017
BB5222R1018

Wing Lower Carry-Thru Front Spar Cap Inspection
Figure 1 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-15

1. **TITLE**
   Wing Lower Front Spar Cap at Root Fitting Attach

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the lower front spar root fitting and in the fitting radius.

4. **PREPARATION**
   A. Remove the inboard two fasteners and the outboard pair of fasteners from each of the vertical flanges of the lower wing front spar root fitting attachments. Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole and Surface Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

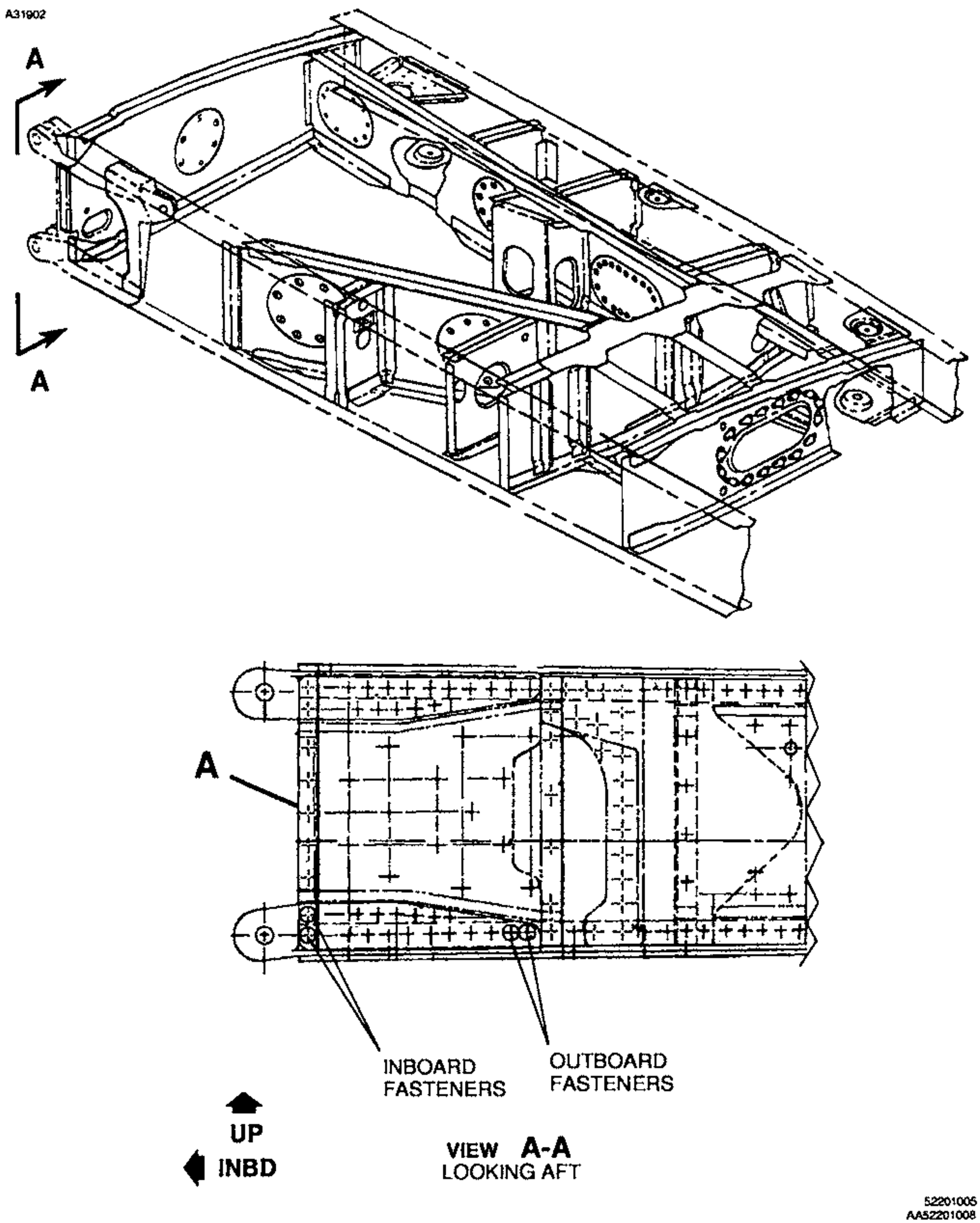
7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model-19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 3/16 inch shielded absolute coil, 0.125 inch coil diameter. 100-500 kHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
MP905-60/500K: Surface eddy current probe with shielded absolute coil, 0.125 inch coil diameter. 100-500 kHz.	1	EDDY CURRENT SURFACE PROBE NDT Engineering Corp. 19620 Russell Rd. Kent, WA 98032
Aluminum Bolthole Reference Standard: EDM corner notch (NIST traceable) size: 0.050 X 0.050 inch.	1	REFERENCE STANDARD A commercially available bolthole standard for calibration of unit.
Aluminum Surface Reference Standard: EDM surface notch (NIST traceable) depth: 0.020 inch.	1	REFERENCE STANDARD A commercially available bolthole standard for calibration of unit.

8. INSPECTION INSTRUCTIONS

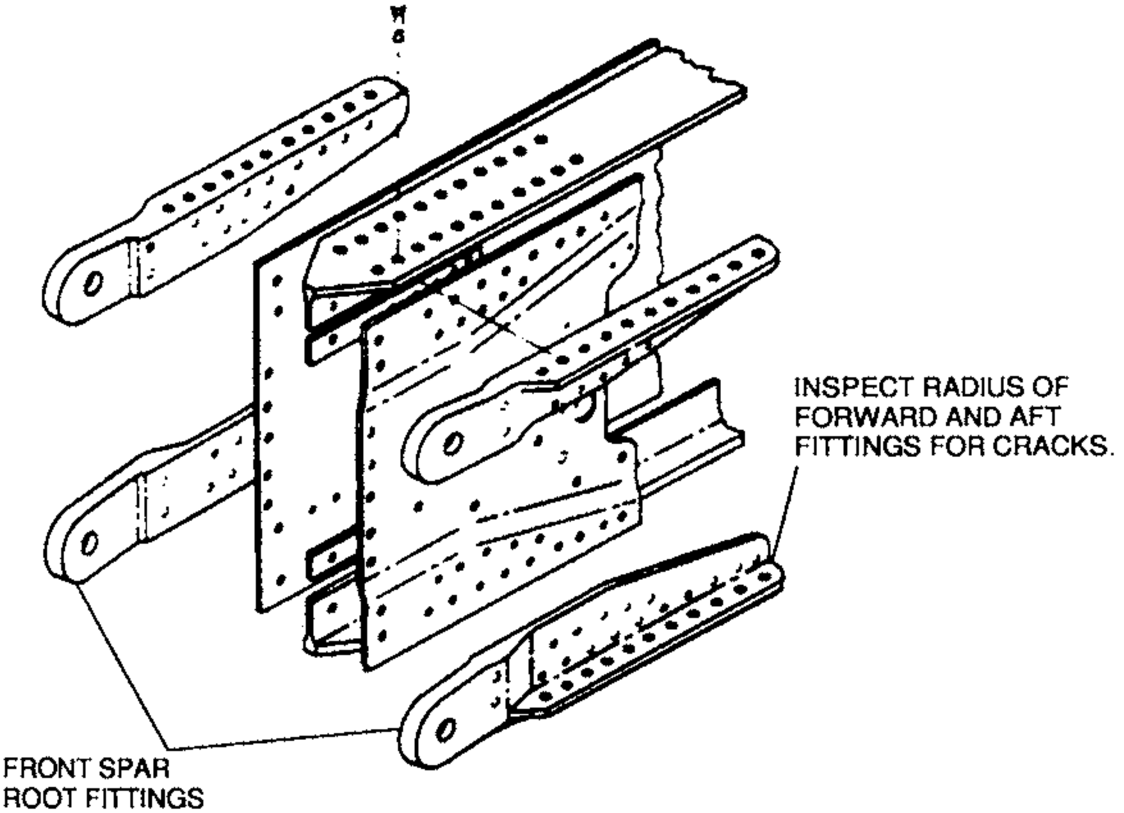
A. Bolthole inspection
   (1) Standardize the eddy current instrument in accordance with the manufacturer's instructions using an operating frequency of 200 kHz.
   (2) Adjust the instrument parameters so that lift-off is placed horizontal and to the left of the null point on the impedance plane.
   (3) Using the bolt hole standard, adjust the instrument parameters to achieve a minimum vertical separation of three major divisions between the null point and the reference standard corner notch indication.
   (4) Perform bolthole inspections on the two outboard holes common to the vertical flange of the wing front spar root fitting. Inspect the entire depth and circumference of each hole. Refer to Figure 1.
   (5) If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.
   (6) Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack with report.

B. Surface inspection
   (1) Standardize the eddy current instrument in accordance with the manufacturer's instructions using an operating frequency of 200 kHz.
   (2) Adjust the instrument parameters so that lift-off is placed horizontal and to the left of the null point on the impedance plane.
   (3) Using the surface crack standard, adjust the instrument parameters to achieve a minimum vertical separation of three major divisions between the null point and the 0.020 inch deep surface notch indication
   (4) Perform surface inspection in the radius of both the forward and aft attach fitting. Refer to Figure 1.
   (5) If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.
   (6) Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support along with the following information: distance from inboard end of radius, location in radius (upper, middle or lower side), and length of crack with report.
   (7) If no cracks are found, install MS20470AD Rivets of appropriate size and grip length.



Wing Lower Front Spar Cap at Root Fitting Attach Inspection
Figure 1 (Sheet 1)

A25580



DETAIL A
VIEW LOOKING AFT

A1022R2002

Wing Lower Front Spar Cap at Root Fitting Attach Inspection
Figure 1 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-17

1. **TITLE**
   Wing Lower Forward Auxiliary Spar Cap

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the wing lower forward auxiliary spar cap.

4. **PREPARATION**
   A. Remove three rivets from the wing lower forward auxiliary spar cap forward flange, and two rivets from the aft flange, immediately aft of the forward spar lower cap. Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 1/8 inch Shielded Absolute Coil, 0.10 inch coil diameter. 100-500 kHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.125 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 kHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

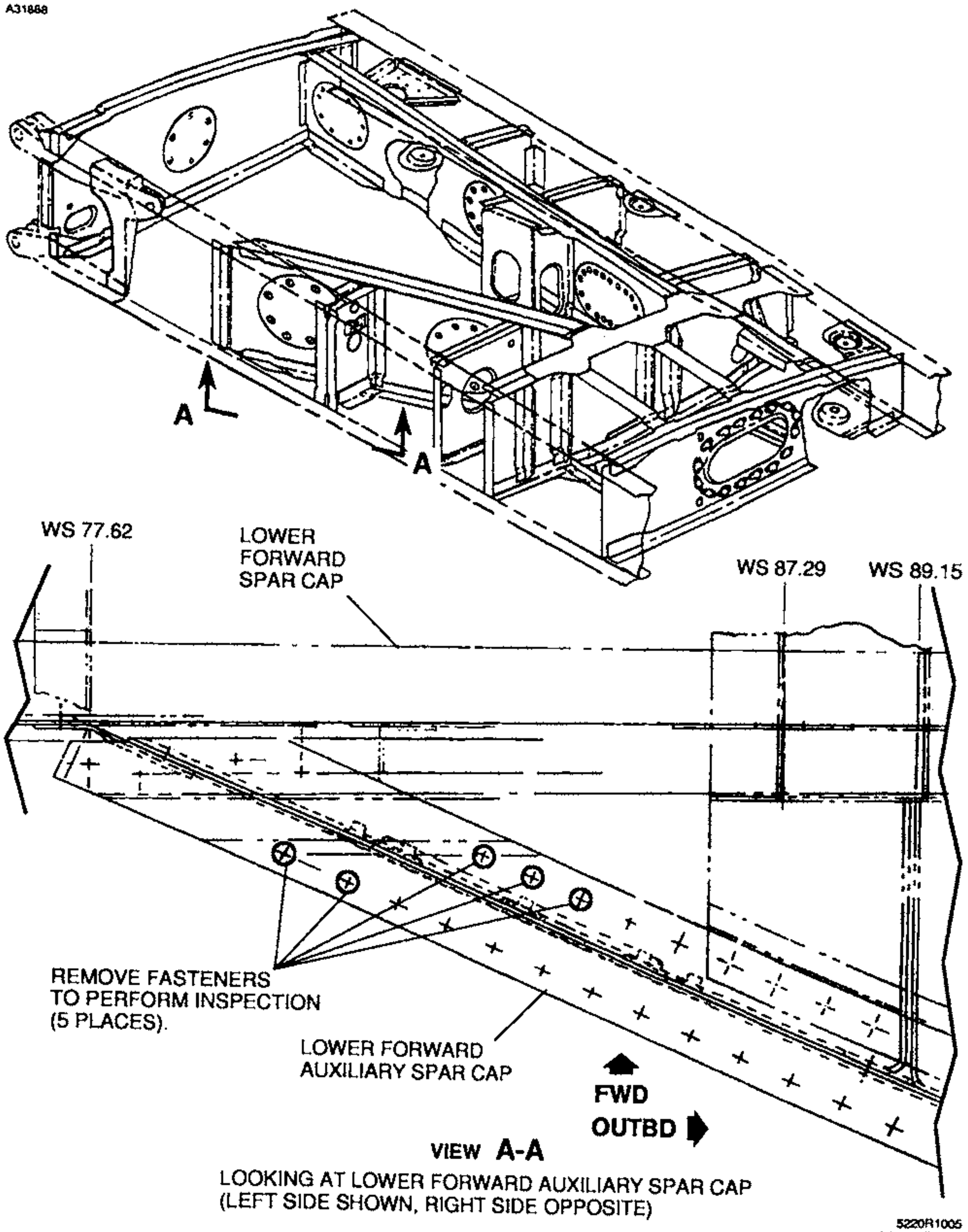
D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

E. Inspect the inner circumference of each hole common to the wing lower forward auxiliary spar cap. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 1.

F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, install the CM3827AD4 fasteners in the aft flange of the forward auxiliary spar cap. Cherrymax CR3213 and CR3214 blind rivets may be installed in the forward flange in place of CM3827AD and MS20470AD Rivets as a result of limited accessibility.

H. Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack with report.



Wing Lower Forward Auxiliary Spar Cap Inspection
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-18

1. **TITLE**
   Wing Lower Aft Auxiliary Spar Cap

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the wing lower aft auxiliary spar cap.

4. **PREPARATION**
   A. Remove all the fasteners on the lower aft auxiliary spar cap bottom flanges from the second fastener outboard of WS 91.19 to the third fastener inboard of WS 102.01 (Ten fasteners from each of the forward and aft flanges). Refer to Figure 1.
   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e"	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/32 inch Shielded Absolute Coil, 0.10 inch coil diameter. 100-500 kHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**
   A. Connect the bolt hole probe (0.156 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 kHz.
   B. Null the probe in the appropriate reference standard hole away from the calibration notch.
   C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

E. Inspect the inner circumference of each hole common to the wing lower forward auxiliary spar cap. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 1.

F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, install the CM3827AD5 Rivets.

H. Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack with report.

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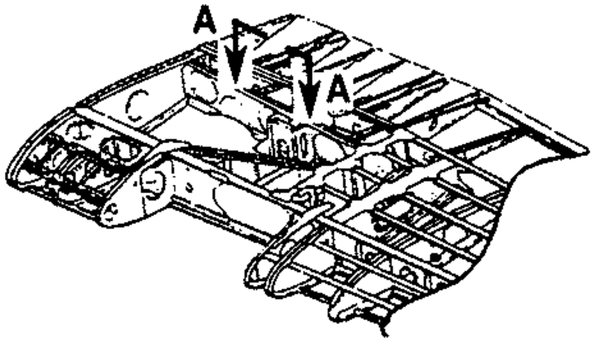
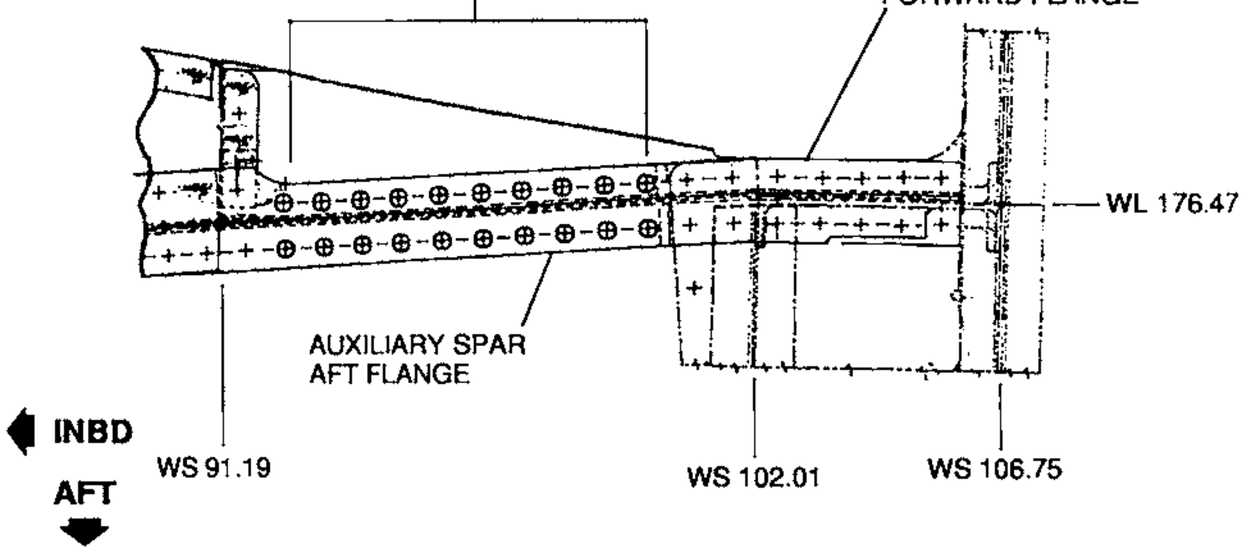


NOTE: REMOVE (10) EACH FASTENERS FROM FORWARD AND AFT FLANGES OF LOWER AFT AUXILIARY SPAR CAP, FROM SECOND FASTENER OUTBOARD OF WS 91.19, TO THIRD FASTENER INBOARD OF WS 102.01 (20 PLACES).



VIEW A-A

LOOKING DOWN AT LOWER AUXILIARY SPAR CAP ASSEMBLY

5220R4001
AA5222R1015

Wing Lower Aft Auxiliary Spar Cap Inspection
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-19

1. **TITLE**
   Wing Rear Spar Lower Cap at Spar Splice

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the wing lower rear spar cap flanges and the lower rear spar splice angles.

4. **PREPARATION**
   A. Remove the four fasteners at the outboard end of the lower splice angles from the horizontal flanges of the wing rear spar lower cap. Refer to Figure 1. If a repair has been added to the wing rear spar lower cap near the spar splice, contact Propeller Aircraft Product Support for revised inspection procedures.

   B. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole and Surface Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e^{II}	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/32 inch Shielded Absolute Coil, 0.10 inch coil diameter. 100-500 kHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
Aluminum Bolthole Reference Standard: EDM corner notch (NIST traceable) size: 0.050 inch X 0.050 inch.	1	REFERENCE STANDARD A commercially available bolthole standard for calibration of unit.
Aluminum Surface Reference Standard: EDM surface notch (NIST traceable) depth: 0.020 inch.	1	REFERENCE STANDARD A commercially available bolthole standard for calibration of unit.

8. **INSPECTION INSTRUCTIONS**
   A. Bolthole inspection
      (1) Connect the bolt hole probe (0.156 inch dia.) to the eddy current instrument and adjust the instrument frequency to 200 KHz.

(2) Null the probe in the appropriate reference standard hole away from the calibration notch.
(3) Adjust liftoff on impedance plane instrumentation so the deflection of the liftoff trace is horizontal and deflects from right to left as the probe is lifted from the part surface.
(4) Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of 2 major screen divisions
(5) Inspect the inner circumference of each hole common to the wing lower rear spar cap flanges and the lower rear spar cap splice angles at WS 110.24. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 1.
(6) If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.
(7) If no crack is found reinstall MS20470AD fasteners of appropriate size and grip length.
(8) Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack with report.

B. Surface inspection
(1) Standardize the eddy current instrument in accordance with the manufacturer's instructions using an operating frequency of 200 kHz.
(2) Adjust the instrument parameters such that lift off is placed horizontal and to the left of the null point on the impedance plane.
(3) Using the surface crack standard, adjust the instrument parameters to achieve a minimum vertical separation of three major divisions between the null point and the 0.020 inch depth surface notch indication.
(4) Perform surface inspection immediately adjacent the holes in the spar reinforcement as shown in Figure 2. Inspect both forward and aft side of each hole. Perform surface inspection in each radius and along the free edges of the spar reinforcement.
(5) Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack with report.

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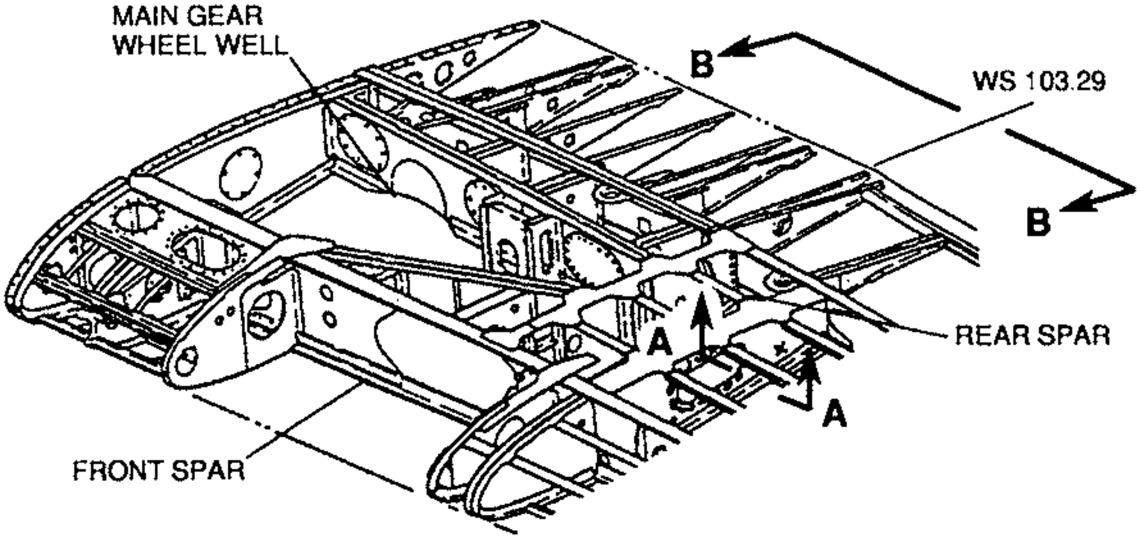
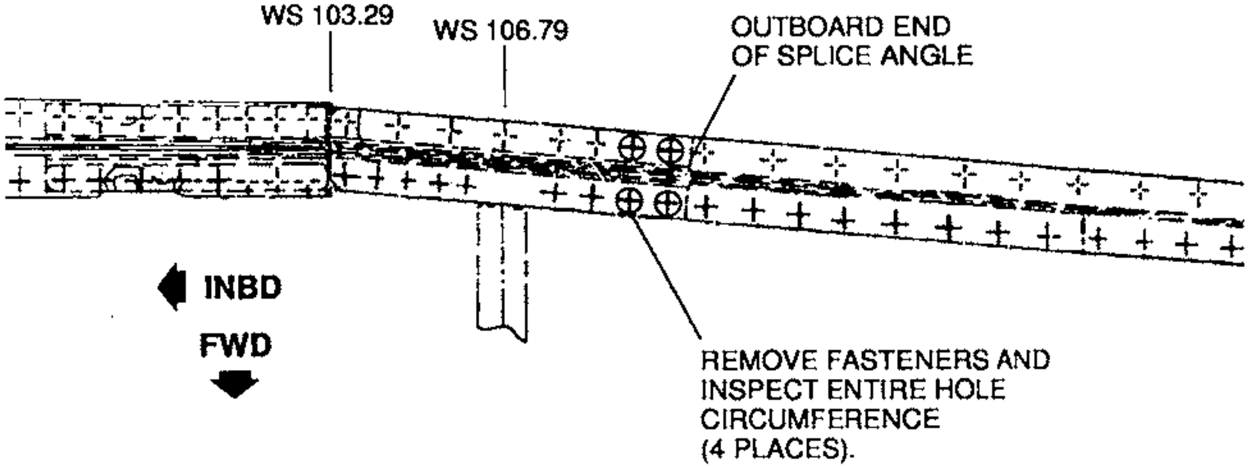
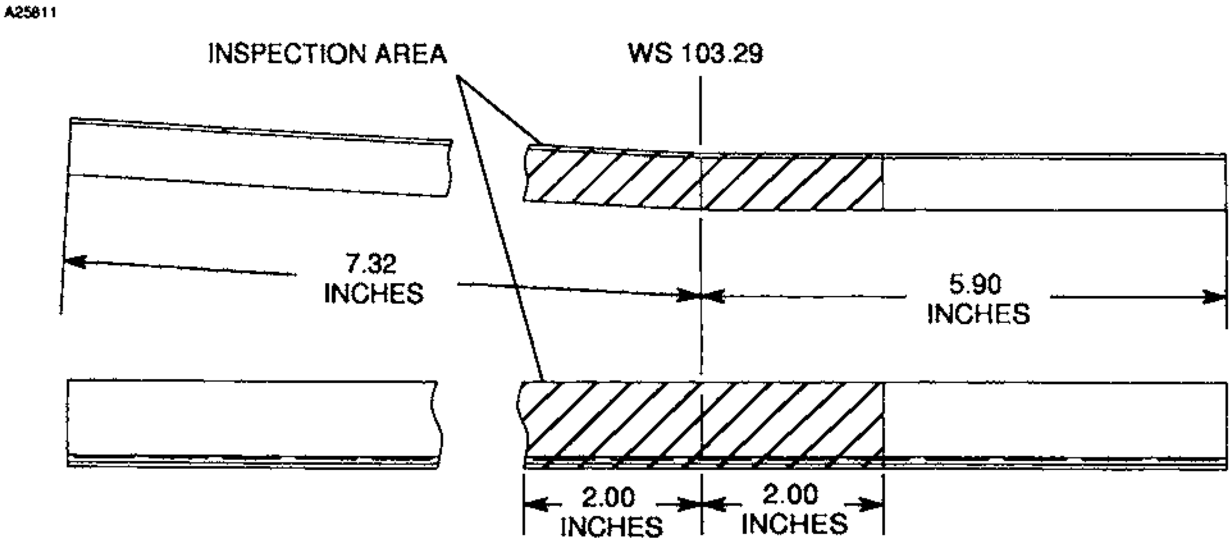




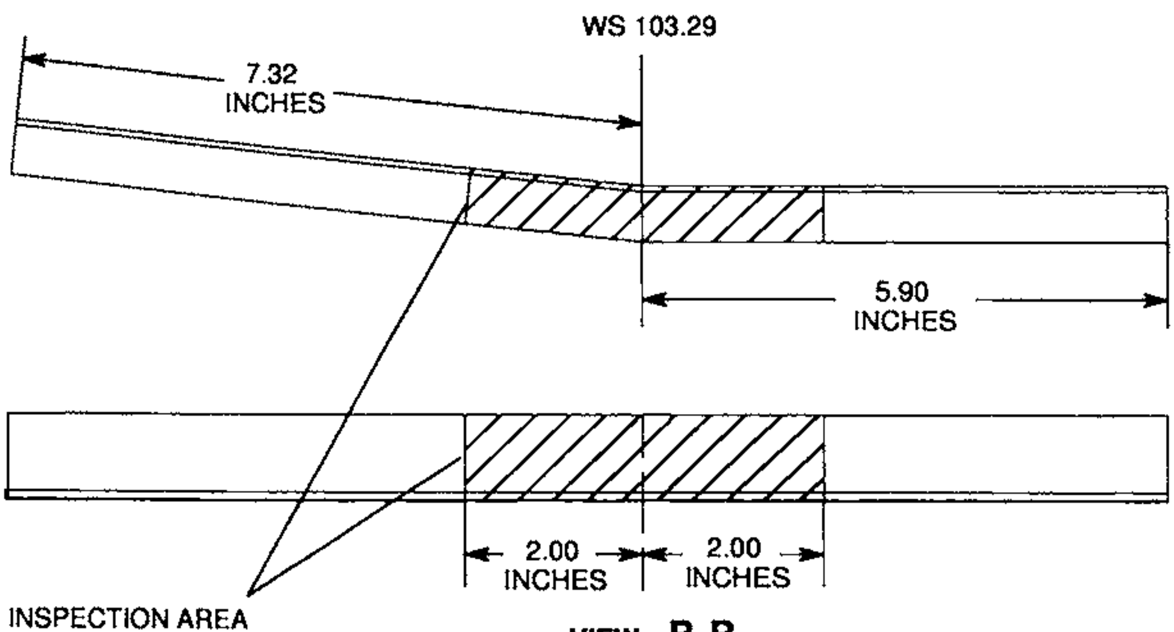
VIEW **A-A**
LOOKING UP AT
REAR LOWER SPAR CAP

52204001
A-A52201007

Wing Rear Spar Lower Cap at Spar Splice
Figure 1 (Sheet 1)



VIEW B-B
VIEW LOOKING FORWARD AT
LOWER AFT SPAR



VIEW B-B
VIEW LOOKING FORWARD AT
LOWER FORWARD SPAR

B5022T1002
B5422T1002

Wing Rear Spar Lower Cap at Spar Splice
Figure 1 (Sheet 2)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-20

1. **TITLE**
   Wing Lower Carry-Thru Rear Spar Cap at Fitting

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks in the rear spar cap of the lower wing carry-thru at the rear spar wing attach fitting.

4. **PREPARATION**

   A. Remove the two screws from the bottom horizontal web of the wing lower carry-thru rear spar cap, common to the attach fitting, at the inboard end of the fitting. Refer to Figure 1.

   CAUTION: DO NOT REMOVE ALL OF THE CARRY-THRU FASTENERS AT ONE TIME.

   B. Remove the bolts one pair at a time from the vertical flanges of the wing lower carry-thru rear spar cap, common to the attach fitting, at the inboard end of the fitting. Refer to Figure 1.

   C. Clean the inspection area with solvent to remove dirt, grease, oil and other substances that may interfere with the inspection.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Model 19e[II]	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
VM101BS 5/16 inch Shielded Absolute Coil, 0.10 inch coil diameter. 100-500 kHz	1	EDDY CURRENT PROBE Bolt Hole Probe VM Products 11208 62 Avenue Puyallup, WA 98373
VM89A	1	REFERENCE STANDARD VM Products 11208 62 Avenue Puyallup, WA 98373

   Reference Standard Notch Size Bolt Hole Inspection: 45 Degree Corner Notch 0.050 inch x 0.050 inch, width 0.005 inch.

8. **INSPECTION INSTRUCTIONS**

   A. Connect the bolt hole probe (0.312 inch diameter) to the eddy current instrument and adjust the instrument frequency to 200 kHz.

B. Null the probe in the appropriate reference standard hole away from the calibration notch.

C. Adjust lift-off on impedance plane instrumentation so the deflection of the lift-off trace is horizontal and deflects from right to left as the probe is lifted from the part surface.

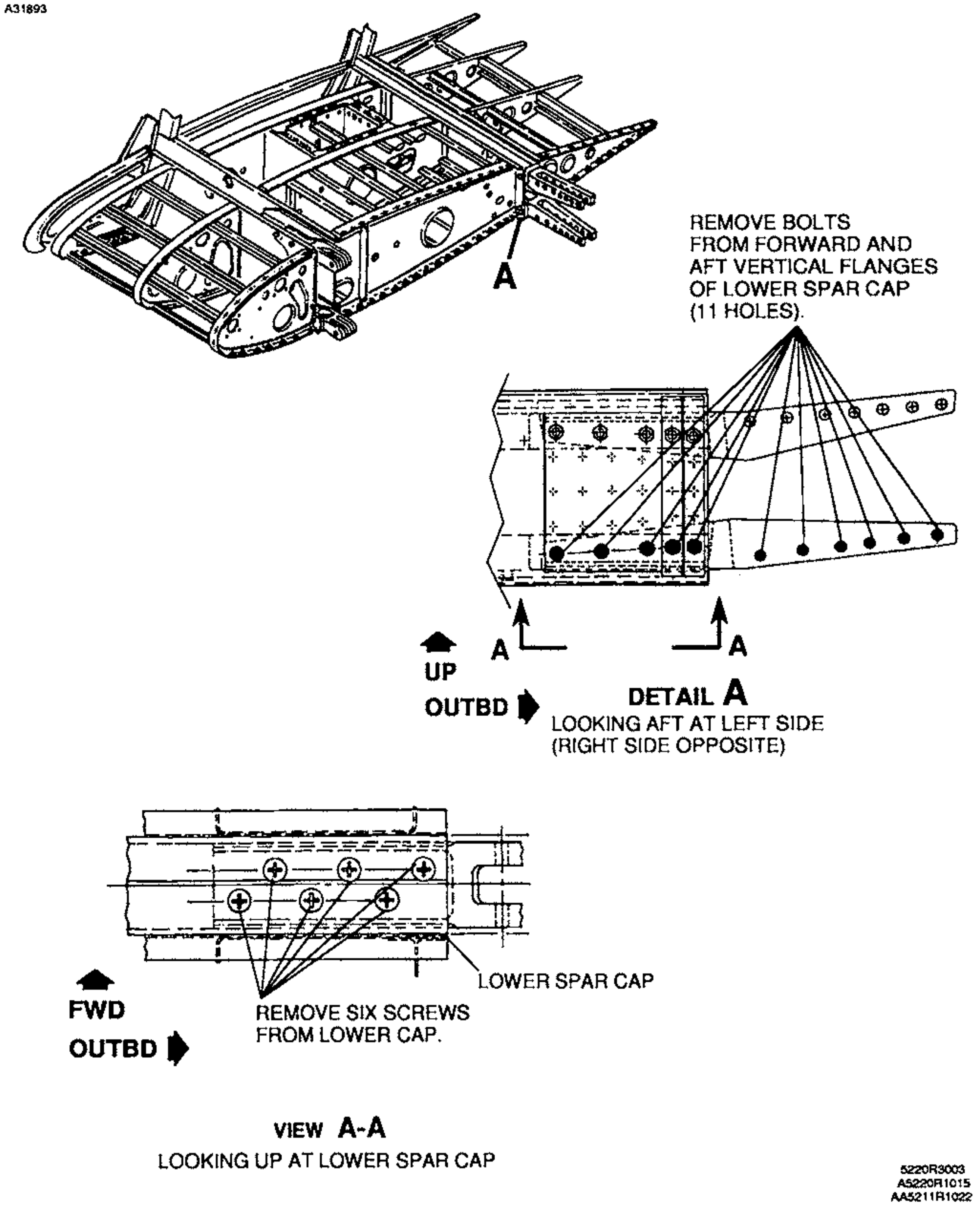
D. Adjust the instrument gain controls to obtain a signal amplitude response from the calibration notch that is a minimum of two major screen divisions.

E. Inspect the inner circumference of each hole common to the wing lower carry-thru rear spar cap and wing attach fitting. Inspect the entire depth of each hole. Observe the phase and amplitude changes on the eddy current instrument. Refer to Figure 2.

F. If an indication is noted, carefully repeat the inspection in the opposite direction of probe rotation to verify the indication.

G. If no cracks are detected during this inspection, reinstall AN5-7A Bolts and MS24694 Screws in the wing lower carry-thru rear spar cap.

H. Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and approximate length and depth of the crack with report.



Wing Lower Carry-Thru Rear Spar Cap Inspection
Figure 1 (Sheet 1)

SUPPLEMENTAL INSPECTION NUMBER: 57-10-22

1. **TITLE**
   Wing Front Spar Lug Inspection

2. **EFFECTIVITY**
   421C0001 Thru 421C1807

3. **DESCRIPTION**
   Inspect for fatigue cracks originating in the bolt holes of the lower forward carry-thru and wing spar fitting lugs. The assembly consists of two spar fitting lugs nested inside of three carry-thru fitting lugs.

4. **PREPARATION**
   A. Remove the wing gap cover. Refer to the service manual.
   B. Remove the wing attach bolt. Support the outboard wing as described in the wing removal section of the service manual.
   C. Remove any surface contaminants that may interfere with the inspection using an approved solvent.

5. **INSPECTION METHOD**
   Bolt Hole Eddy Current

6. **CRACK SIZE**
   Minimum detectable crack size: 0.080 Inch

7. **EQUIPMENT**
   The following equipment was used to develop this procedure. Equivalent eddy current test equipment may be used providing the equipment is capable of achieving the required frequency range and test sensitivity.

PART NUMBER	QUANTITY	DESCRIPTION
Nortec 2000 (Note 1)	1	EDDY CURRENT INSTRUMENT Staveley Instruments Incorporated 421 North Quay Kennewick, WA 99336
5/8 inch diameter Bolt Hole Probe (200 kHz) (Note 2)	1	Commercially Available
Aluminum EDM Bolt Hole Standard (Note 3)	1	Commercially Available
Dial Calipers (Note 4)	1	Commercially Available

NOTE 1: Metered eddy current instruments shall be considered equivalent for the purpose of this procedure.

NOTE 2: The probe shall have a maximum coil dimension of 1/8 inch and operate at 200 kHz. The attach fittings have a nominal hole diameter of 5/8 inch although this dimension may increase due to over sizing of the hole.

NOTE 3: Any NIST (National Institute of Standards and Technology) (or equivalent) traceable bolt hole standard may be used provided it is an aluminum alloy and has 0.050 inch X 0.050 inch corner EDM (Electro Discharge Machined) notches.

NOTE 4: The dial calipers shall be used to set the index points on the eddy current probe.

8. CALIBRATION

A. The instrument shall be calibrated and operated in accordance with this procedure and the manufacturer's instructions.

B. Instrument calibration shall be performed prior to inspection. Calibration shall be checked at intervals necessary to maintain calibration during continuous use and at the conclusion of the inspection. The instrument shall be recalibrated if any part of the system is replaced or if any calibrated control settings are changed.

C. The test system sensitivity shall be established by setting the instrument frequency to 200 kHz and adjusting the instrument controls to achieve a minimum signal deflection of three major divisions when the coil is centered over the EDM notch (Refer to Figure 1).

9. INSPECTION INSTRUCTIONS

A. Both the left and right fitting assemblies shall be inspected for 100% of their thickness (all 5 lugs) by indexing the bolt hole probe and scanning a total of 16 times per assembly as indicated in Figure 2 and Table 1.

B. Calibrate the instrument to establish sensitivity in accordance with Step 8.

C. Establish each index point by measuring the distance from the center of the probe coil to the edge of the probe collar.

D. After setting each index point, position the probe in the hole and balance the instrument if necessary. Rotate the probe through more than 360 degrees.

NOTE: This procedure assumes the eddy current probe has a working length of 2.0 inches or greater. If necessary, the procedure may be accomplished by indexing the probe through points 1 to 10 from both the forward and aft sides of the fitting assembly.

E. Indications found during the inspection may be confirmed with a right angle surface probe that has a 1/8 inch or less diameter coil.

F. If no cracks are found, reinstall the wing attach bolt.

G. Report cracks detected during this inspection to Cessna Aircraft Company, Propeller Aircraft Product Support. Include hole diameter, location of hole, hole edge distance, and length and depth of the crack with report.

Table 1. Index Depths (Refer to Figure 2.)

Index Point	Depth (Inches)
1	0.065
2	0.17
3	0.30
4	0.43
5	0.56
6	0.68
7	0.81
8	0.94
9	1.06
10	1.19
11	1.32

Table 1. Index Depths (Refer to Figure 2.)	
Index Point	**Depth (Inches)**
12	1.45
13	1.57
14	1.70
15	1.83
16	1.94

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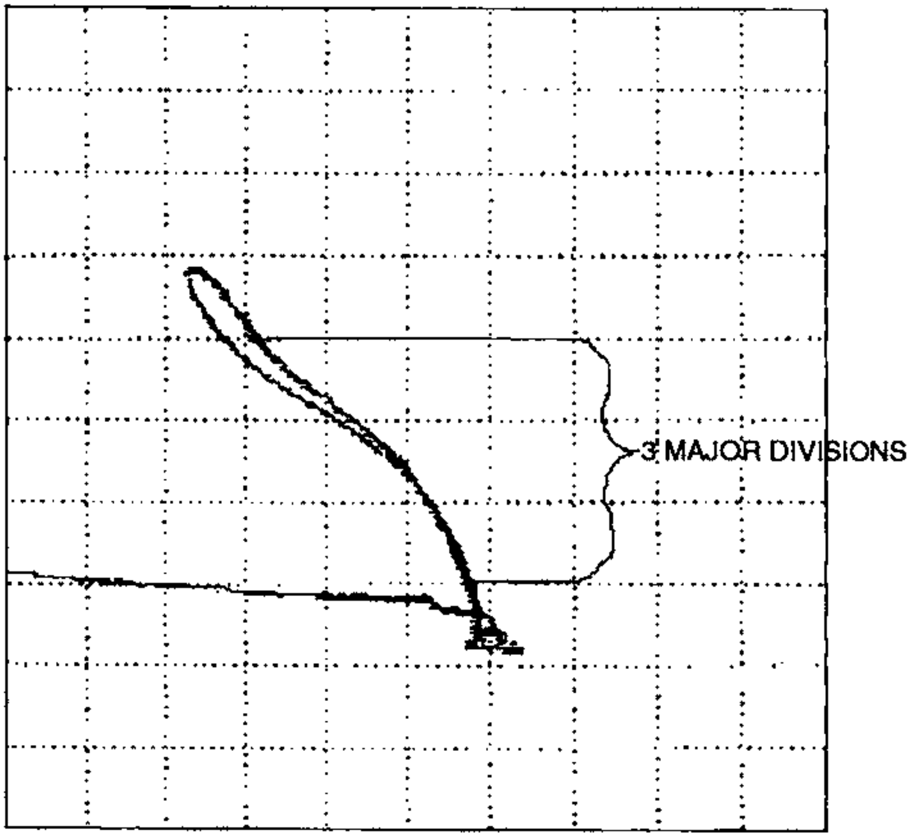

Calibration Display
Figure 1 (Sheet 1)

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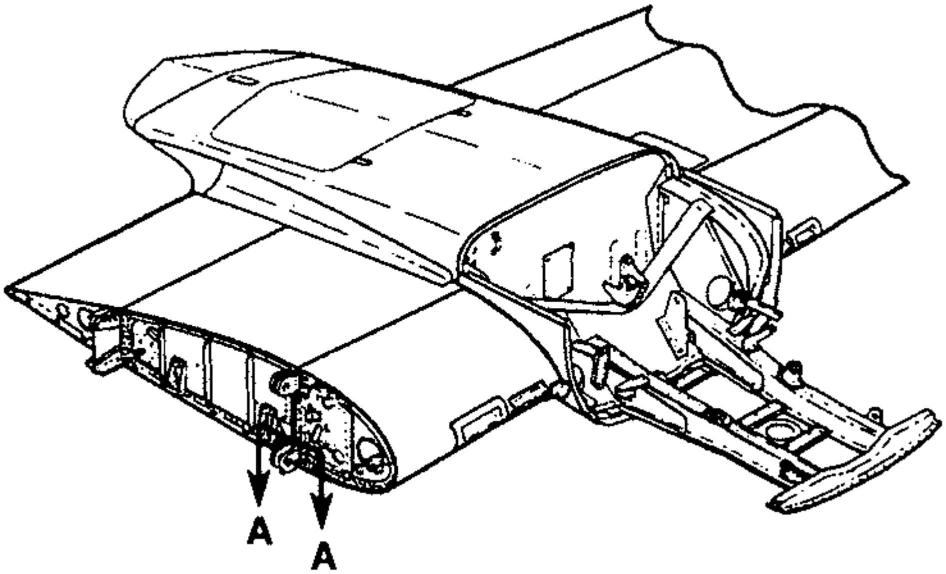
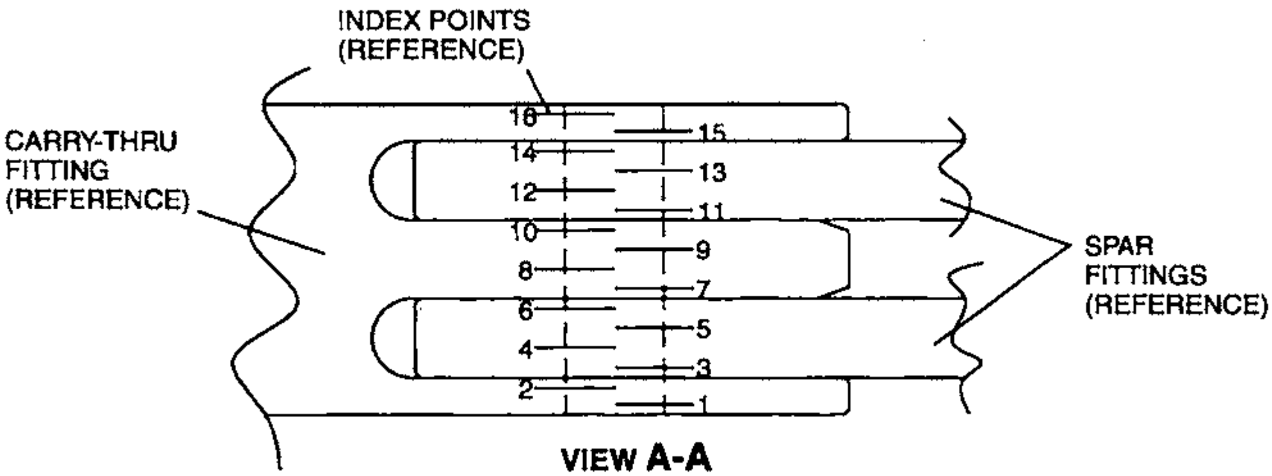




VIEW A-A

Lower Carry-Thru and Spar Fitting Attach Bolt Hole Inspection
Figure 2 (Sheet 1)

CHAPTER

1

GENERAL INFORMATION

TABLE OF CONTENTS

GENERAL INFORMATION

1. General Description

The Model 421C is an all-metal, low-wing, pressurized executive, twin-engine airplane, powered by two Continental GTSIO-520 engines, driving a constant speed, full feathering propeller. The airframe consists of a fully retractable landing gear, split-type flaps, manually adjustable trim tabs for all three axes and a pressurized cabin permitting flights to 26,500 feet without the use of oxygen.

2. Specifications and Adjustments

Chapter 1 - General Information

A. Airplane Weight
- (1) Ramp Weight (Airplanes C0401 and On) . . . . . 7500 Pounds
- (2) Gross Weight - Takeoff . . . . . 7450 Pounds
- (3) Landing Weight - Maximum . . . . . 7200 Pounds
- (4) Zero Fuel Weight (Airplanes C0001 Thru C1400) . . . . . 6733 Pounds
- (5) Zero Fuel Weight (Airplanes C1401 and On) . . . . . 7000 Pounds

B. Airplane Dimensions
- (1) Fuselage Length . . . . . Approximately 436.36 Inches
- (2) Fuselage Height - Maximum . . . . . 50.9 Inches
- (3) Fuselage Width - Maximum . . . . . 50.0 Inches
- (4) Wing Span - Overall (Airplanes C0001 Thru C1400) . . . . . Approximately 493.53 Inches
- (5) Wing Span - Overall (Airplanes C1401 and On) . . . . . Approximately 497.52 Inches

Chapter 2 - Inspection and Servicing

A. Main Strut Pressure (Airplane On Jacks) . . . . . 275 PSIG
B. Main Strut Extension (Airplane On Ground) . . . . . Approximately 2.70 Inches
(Empty Except For Fuel and Oil)
C. Nose Strut Pressure (Airplane On Jacks) Airplanes C0001 Thru C0800 . . 65 PSIG
D. Nose Strut Extension (Airplane On Ground) Airplanes C0001 Thru C0800 . . . . . 1.37 Inches
(Empty Weight Full Fuel and Oil)
E. Nose Strut Pressure (Airplane on Jacks) Airplanes C0801 and On . . . 75 PSIG
Nose Strut Extension (Airplane On Ground) Airplanes C0801 and On . 1.37 Inches
F. Main Gear Tire Pressure Airplanes C0001 Thru C0800 . . . . . 70 PSIG
Airplanes C0801 and On . . . . . 80 PSIG
G. Nose Gear Tire Pressure Airplanes C0001 Thru C0800 . . . . . 35 PSIG
Airplanes C0801 and On . . . . . 50 PSIG
H. Air Bottle Landing Gear Emergency Blow Down . . . . . 1750 To 2200 PSIG
I. Oil Sump Capacity (With Filter) . . . . . 13 Quarts
J. Fuel Capacity (Each Wing)
- (1) Main Tank (Each Wing) (Usable) . . . . . 103 Gallons
- (2) Wing Locker (Each Wing) . . . . . 28 Gallons

K. Windshield Anti-Ice System (Alcohol) . . . . . 3.0 Gallons
L. Oxygen Cylinder (11.0 Cubic Feet) (At 70°F) . . . . . 1800 PSI
M. Oxygen Cylinder (114.9 Cubic Feet) (At 70°F) . . . . . 1800 PSI
N. Hydraulic System Reservoir Capacity . . . . . Approximately 1.2 Quarts
(With Gear Down & Locked)

Chapter 5 - Flight Controls

A. Aileron
- (1) Aileron Up Travel . . . . . 20, +1, -1 Degrees
- (2) Aileron Down Travel . . . . . 20, +1, -1 Degrees
- (3) Aileron Cable Tension . . . . . 25, +5, -5 Pounds

B. Aileron Trim Tab
- (1) Aileron Trim Tab Up Travel . . . . . 20, +1, -0 Degrees
- (2) Aileron Trim Tab Down Travel . . . . . 20, +1, -0 Degrees
- (3) Aileron Trim Tab Cable Tension . . . . . 10, +3, -3 Pounds

C. Rudder (Measured Perpendicular to Hinge Line)
(1) Rudder Travel Left . . . . 32, +1, -1 Degrees
(2) Rudder Travel Right . . . . 32, +1, -1 Degrees
(3) Rudder Cable Tension . . . . 25, +5, -5 Pounds
(4) Nose Wheel Steering Cable Tension . . . . 25, +5, -5 Pounds

D. Rudder Trim Tab (Measured Perpendicular to Hinge Line)
(1) Rudder Trim Tab Travel Left . . . . 16, +1, -1 Degrees
(2) Rudder Trim Tab Travel Right . . . . 11, +1, -1 Degrees
(3) Rudder Trim Tab Cable Tension . . . . 10, +3, -3 Pounds
(4) Rudder Trim Tab (Take OFF Position) Airplanes C0210 AND ON . 1 Degree Left

E. Yaw Damper
(1) Yaw Damper Cable Tension (At 65°F to 95°F) . . . . . . 16, +2, -2 Pounds

F. Elevator
(1) Elevator Up Travel . . . . 25, +1, -1 Degrees
(2) Elevator Down Travel . . . . 15, +1, -1 Degrees
(3) Elevator Cable Tension . . . . 32, +5, -5 Pounds

G. Elevator Trim Tab
(1) Elevator Trim Tab Up Travel . . . . 12, +1, -0 Degrees
(2) Elevator Trim Tab Down Travel . . . . 20, +1, -0 Degrees
(3) Elevator Trim Tab Cable Tension . . . . 10, +5, -5 Pounds

H. Electric Elevator Trim Tab Control
(1) Elevator Trim Tab Cable Tension . . . . 22, +2, -2 Pounds

I. Flaps
(1) Flaps Down Travel . . . . 45, +1, -1 Degrees
(2) Flaps Extend Cable Tension (At 65°F to 95°F) . . . . 85, +10, -10 Degrees
(3) Flaps Return Cable Tension (At 65°F to 95°F) . . . . 225, +25, -25 Pounds

Chapter 7 - Engines

A. Engine
(1) Airplanes C0001 Thru C1000 . . . . GTSIO-520-L.
(2) Airplanes C1001 and On . . . . GTSIO-520-N.
(3) Spark Plug Type
(a) Champion RHB-32E
(b) A.C. AC-273
(4) Timing Spark Occurs Both Mags . . . . 24° B.T.C.
(5) Spark Plug Gap . . . . 0.017 - 0.018
(6) Magneto Breaker Point Gap . . . . 0.016, +0.003, -0.003 Inches
(7) Magnetos
(a) Bendix LH S6LN-1201
(b) Bendix RH S6LN-1205
(8) Engine Firing Order 1-4-5-2-3-6

B. Unmetered Low Fuel Pressure
(1) 450 Propeller RPM . . . . 5.5 to 6.5 PSI

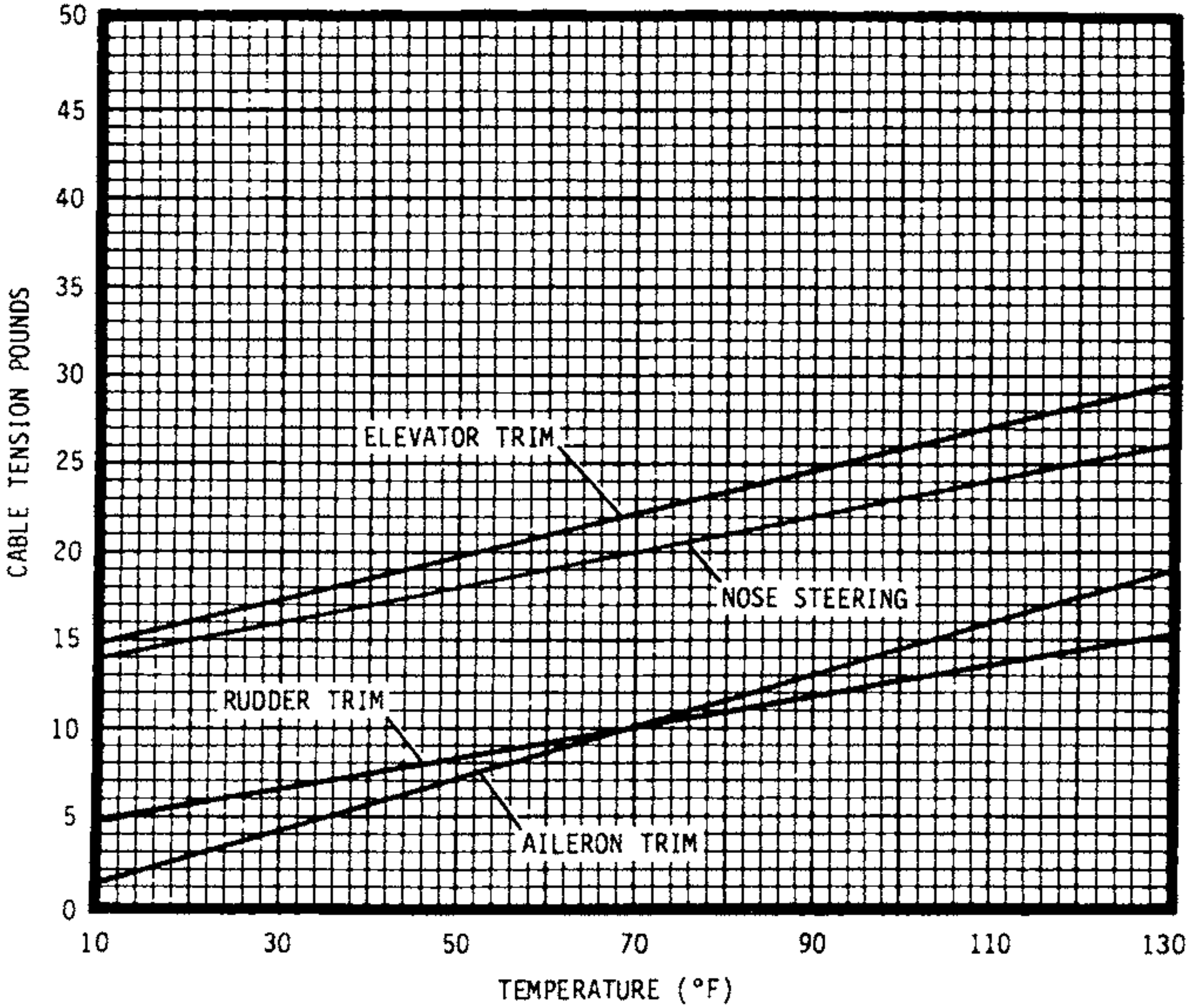
C. Maximum Fuel Flow Pressure
(1) Full Throttle . . . . 255 to 265 Pounds Per Hour

Chapter 13 - Electrical System

A. Battery (Lead Acid) 25 Ampere Hour . . . . 24 Volts
B. Voltage Regulator . . . . 27.5 Volts
C. Alternator (Standard) . . . . 50 Amp
D. Alternator (Optional) . . . . 100 Amp

Chapter 14 - Avionics

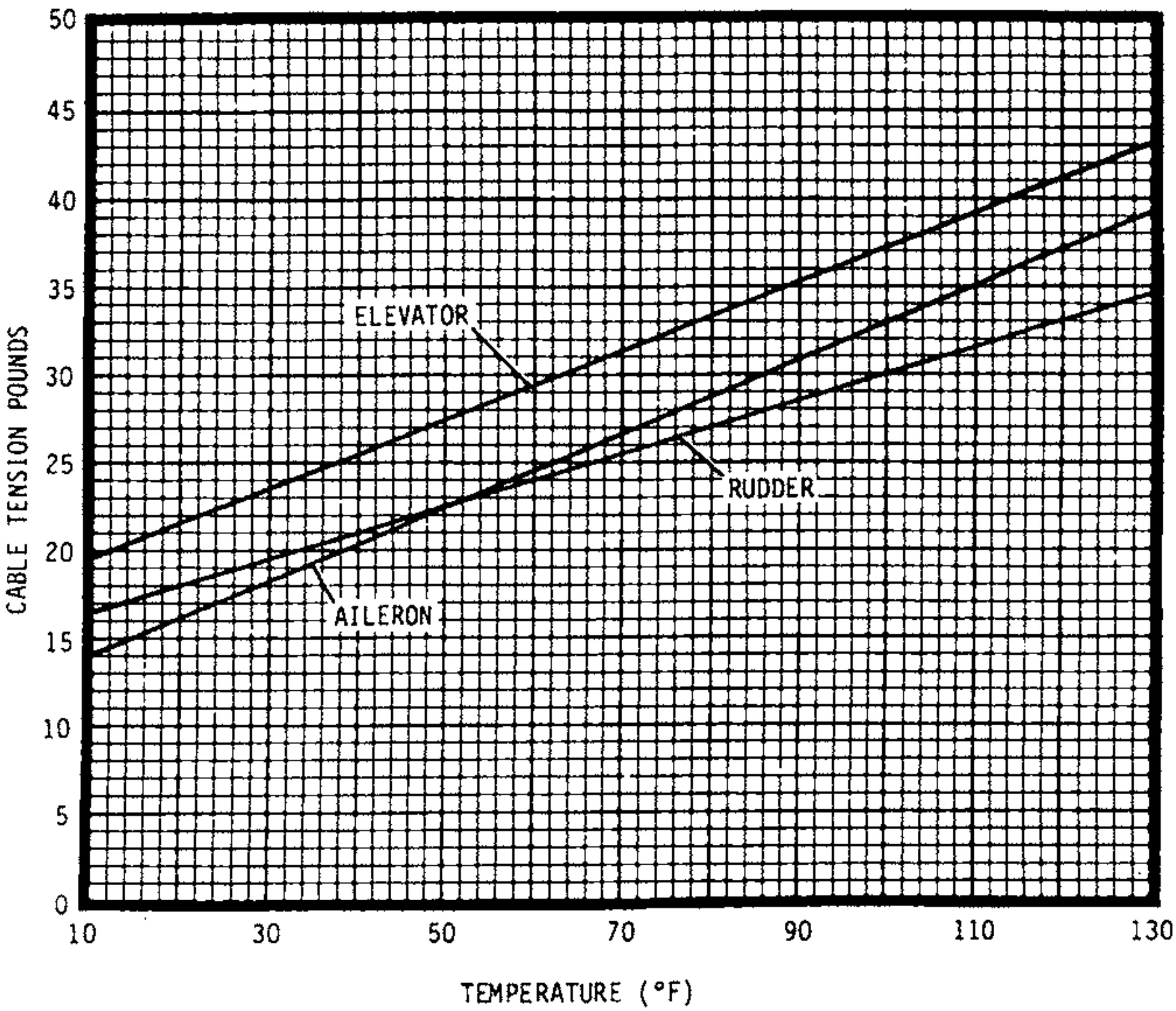
A. 400B Nav-O-Matic Autopilot or IFCS System
(1) Aileron Control Cable Tension (At 65° to 95°F) . . . . 12, +3, -3 Degrees
(2) Elevator Control Cable Tension (At 65°F to 95°F) . . . 22, +2, -2 Pounds
(3) Elevator Trim Control Cable Tension (At 65°F to 95°F)
(a) With Electric Trim . . . . 19, +3, -3 Pounds



NOTE 1: ALLOW AIRPLANE TEMPERATURE TO STABILIZE FOR A PERIOD OF FOUR (4) HOURS.

54606001

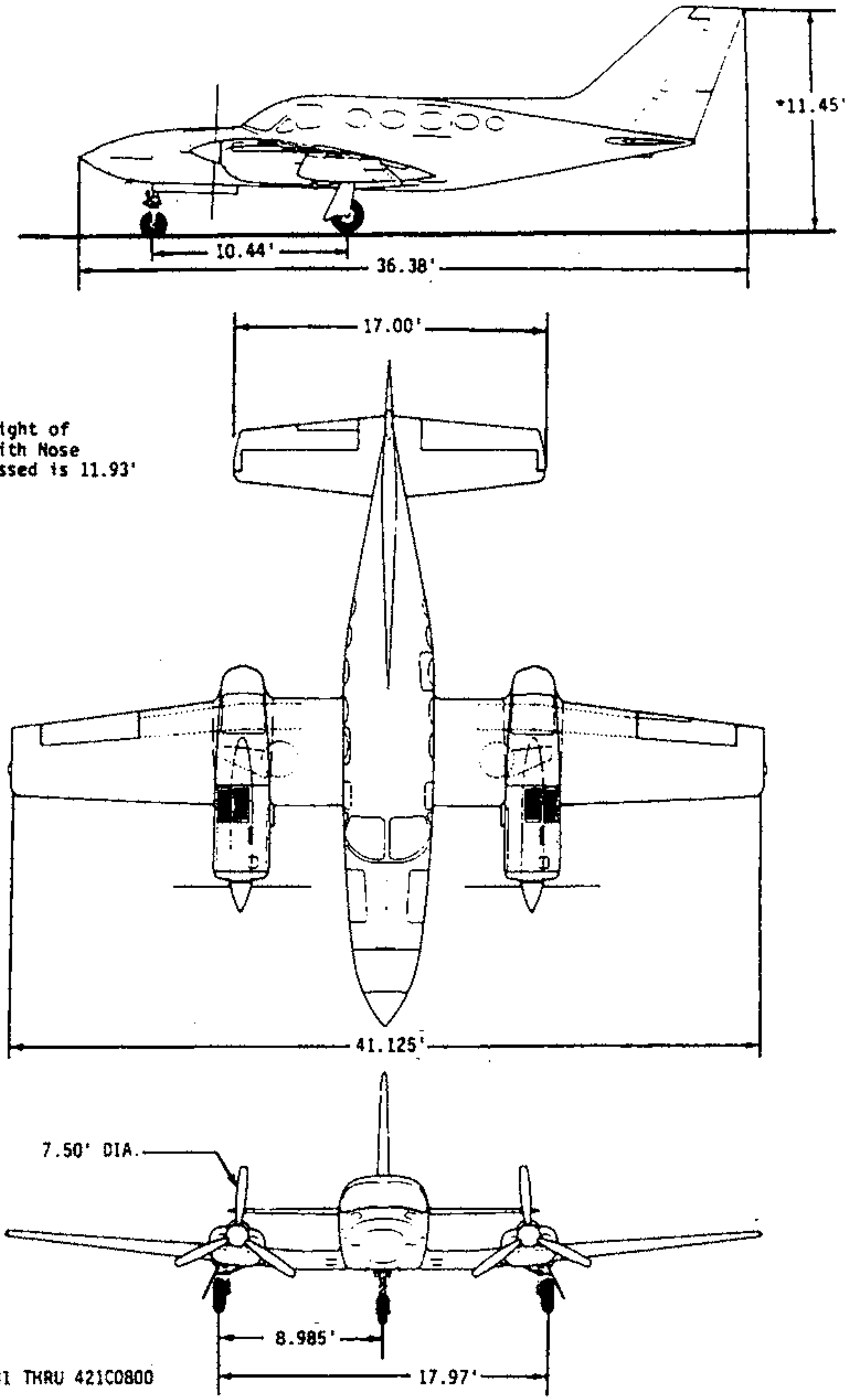
Cable Tension Versus Ambient Temperature Chart
(Sheet 1)



NOTE 1: ALLOW AIRPLANE TEMPERATURE TO STABILIZE FOR A PERIOD OF FOUR (4) HOURS.

54606002

Cable Tension Versus Ambient Temperature Chart
(Sheet 2)

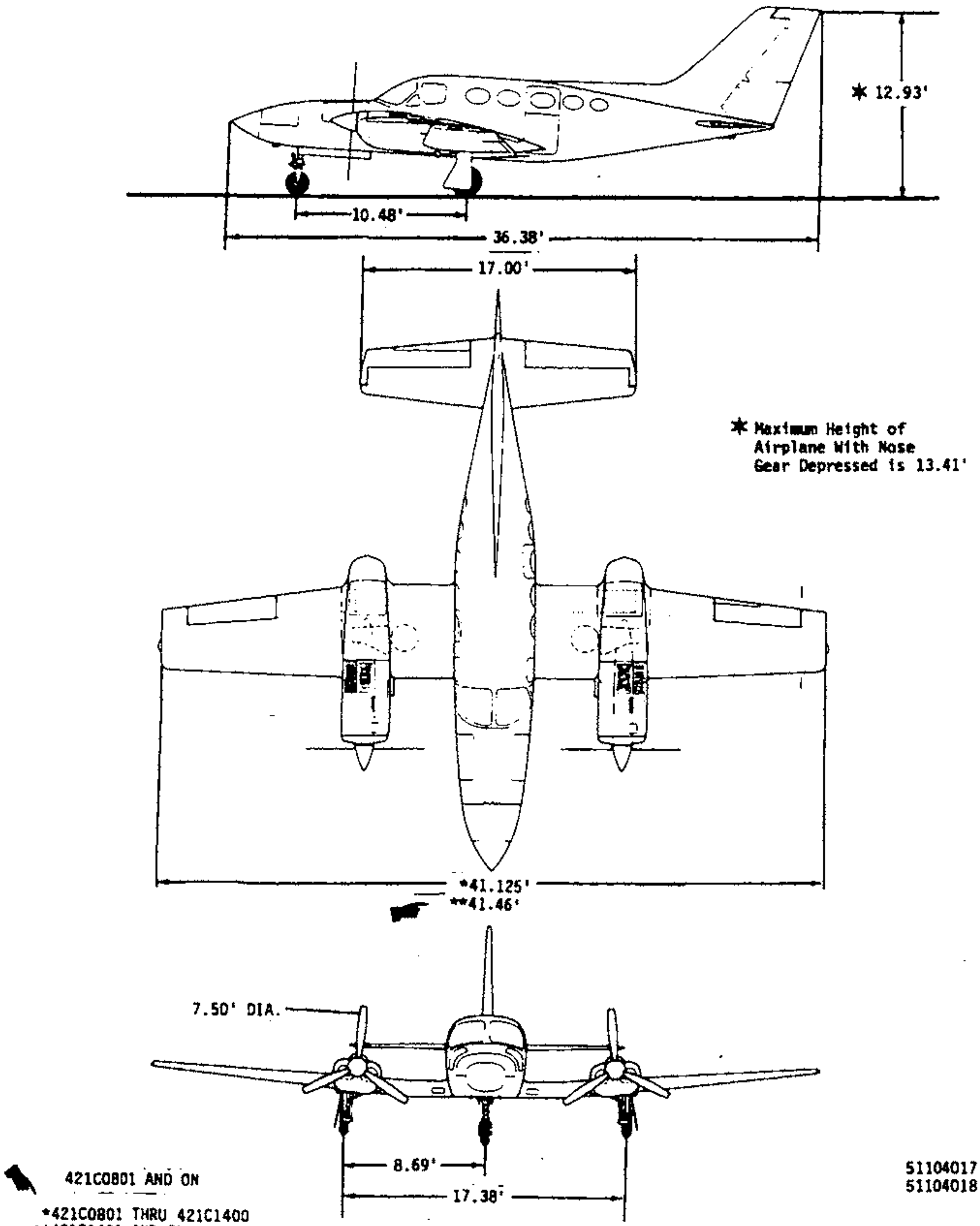


* Maximum Height of Airplane With Nose Gear Depressed is 11.93'

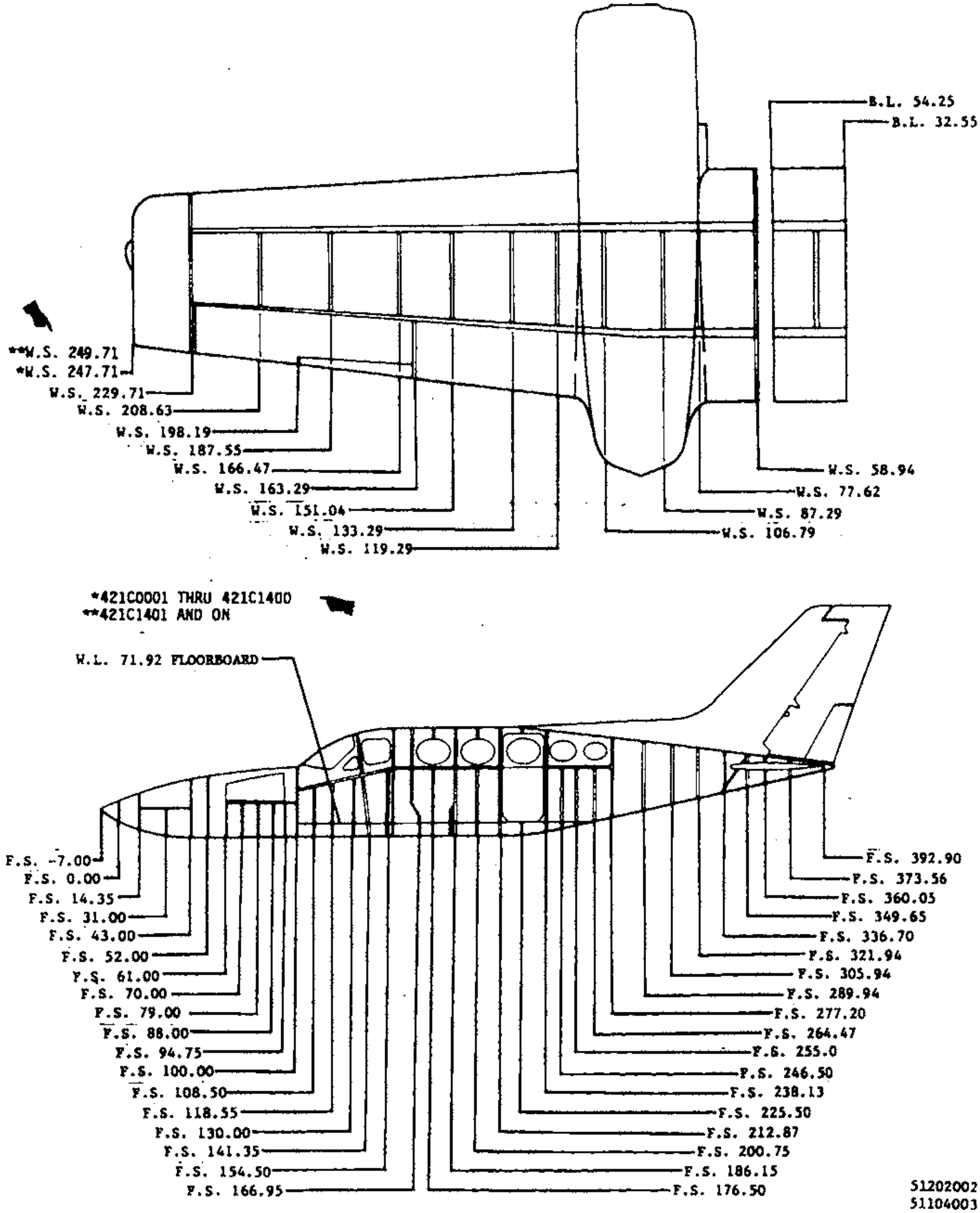
421C0001 THRU 421C0800

51104008
51104009

Airplane Dimensions
Figure 1 (Sheet 1 of 2)



Airplane Dimensions
Figure 1 (Sheet 2)



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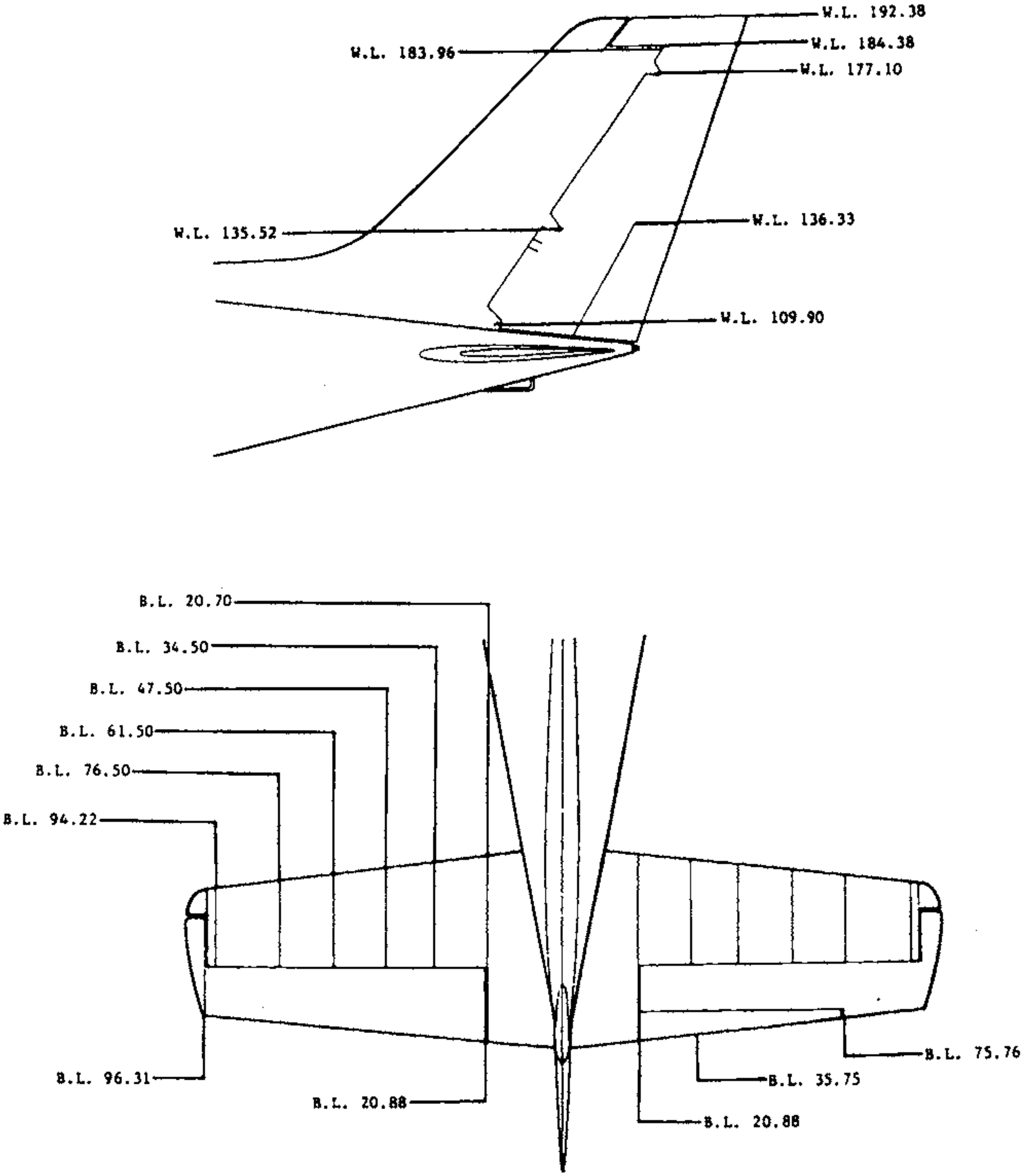
Station Diagrams
Figure 2 (Sheet 1 of 2)



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Station Diagrams
Figure 2 (Sheet 2)

LIFTING AND SHORING

Description

1. The entire airplane may be lifted at wing and nose jack points to perform landing gear tests, removal and installation of main and nose gear and major repairs. All three jacks must be used when jacking the airplane.
2. When possible, the airplane should be on a level surface when jacking. The jacking site should be protected from the wind preferably inside a hangar.
3. The airplane can be jacked with full fuel.

Lifting

1. Tools and Equipment

NOTE: Equivalent substitutes may be used for the following items:

Name	Number	Manufacturer	Use
Jack Pad	5520151-2	Cessna Aircraft Company	Raise airplane

2. Jacking Instructions (See Figure 1)

A. Jacking Three Wheels

WARNING: TO PREVENT INJURY TO PERSONNEL, DO NOT ALLOW PERSONNEL UNDER ANY PART OF THE AIRPLANE DURING JACKING OPERATIONS.

CAUTION: ENSURE THAT PARKING BRAKES ARE RELEASED BEFORE JACKING TO PREVENT AIRPLANE FORWARD OR AFT MOVEMENT AS IT IS RAISED OR LOWERED.

(1) Ensure static ground wire is connected to airplane.

NOTE: On airplanes 421C0001 thru 421C0200 incorporating flight hour recorder, remove the flight hour recorder fuse located in the side console to deactivate the flight hour recorder, when maintenance requires the battery switch to be ON. Airplanes 421C0201 thru 421C1246, disconnect the electrical connectors (bayonet fittings) from the back of the flight hour recorder to deactivate recorder. Airplanes 421C1247 and On, turn the alternator field switches OFF to deactivate the flight hour recorder.

(2) Insert jack pads at each jack point.
(3) Position jack beneath each jack pad.
(4) Insure that jack cylinders are vertical at start of jacking operation to prevent side loads and possible gear strut binding.
(5) Simultaneously raise wing and fuselage jacks. Keep airplane level until tires are clear of ground. Maintain follower nut of each jack against jack shoulder.

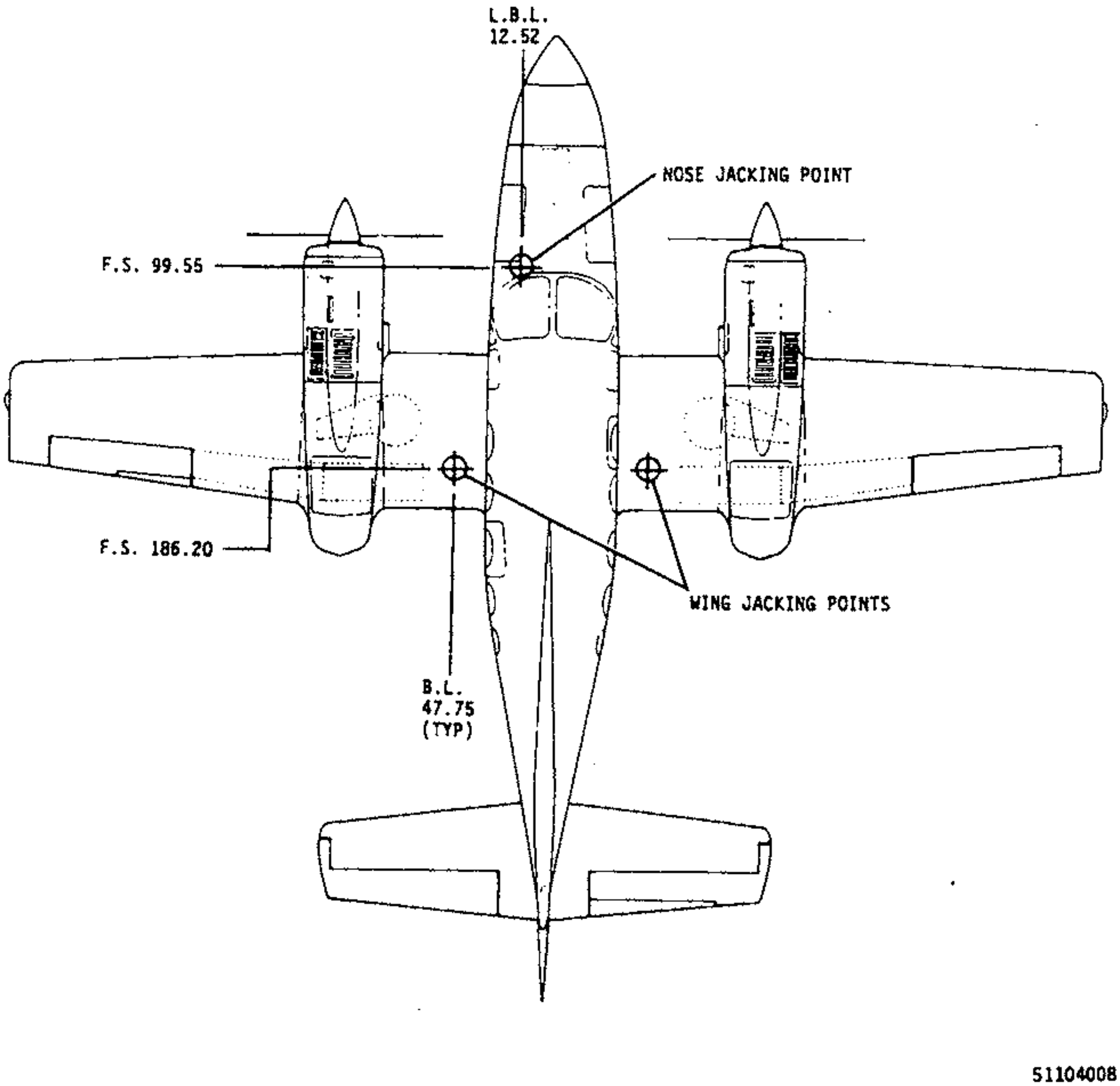
CAUTION: POSITION PADDED STAND UNDER TAILCONE FOR ADDED SAFETY PRECAUTION.

NOTE: Raise tires no more than required for the maintenance being performed.

(6) Remove padded tail stand from under tailcone.
(7) Loosen jack follower nuts; lower fuselage and wing jacks simultaneously.
(8) Remove jacks and jack pads.
(9) If flight hour recorder is incorporated, install fuse or reset circuit breaker as applicable.

JACK REQUIREMENTS

HEIGHT CLOSED		HEIGHT EXPANDED (INCHES)	CAPACITY
421C0001 THRU 421C0800			
NOSE	28.5	40.50	2 TONS
MAIN	20.37	36.50	2 TONS
421C0801 AND ON			
NOSE	29.00	42.62	2 TONS
MAIN	27.62	43.50	2 TONS



Jacking Points
Figure 1

3. Shoring Instructions

A. Shoring the airplane is accomplished by using contour boards. The boards can be fabricated locally from 1" thick plywood by placing two pieces side by side and contouring to fit the lower surface of the wing and fuselage. The contour boards should be padded with 1/2 inch felt and covered with canvas duck.

B. Fuselage and wing jacks should be used in conjunction with wing and fuselage shoring.

C. Contour shoring may be used at the following locations.

Wing Stations	Fuselage Stations
W.S. 119.29	F.S. 254.96

D. In some instances, it may be necessary to use a sling to raise the aircraft. When using a sling, proceed as follows:

(1) Fabricate sling from any suitable material capable of sustaining a 7500 pound load. Attach a hoisting lug to the sling. The lug attaches to the upper bolt which secures the front wing spar to the fuselage spar.
(2) Access to the wing spar bolts is gained by removing the wing gap cover.
(3) Each lug may be temporarily attached to the upper bolt on each wing for hoisting purposes only.
(4) The forward spar bolts are located directly in line with the airplane center of gravity, so the sling should be positioned accordingly.
(5) Position a man at both the nose and tail section of the airplane to assure it stays in a level position while hoisting.

NOTE: After removing lugs, torque front spar nuts to 60 ±5 foot-pounds, and rear spar nuts to 175 ±15 inch-pounds.

AIRPLANE RECOVERY - DESCRIPTION AND OPERATION

General

1. An airplane that has belly-landed or an airplane with collapsed landing gear can be lifted using a fuselage sling, jacks, or pneumatic bags. When the airplane is resting on a runway or equivalent hard ground surface in a nose-down condition, there is sufficient clearance for placement of a fuselage sling. If the airplane is resting with one main gear retracted or collapsed, there is sufficient clearance for placement of a jack under the wing. When the airplane has plowed into soft ground (belly landing), it may be necessary to undermine the forward fuselage for placement of a pneumatic bag. In some instances, it may be necessary to use a sling to raise the airplane.

   CAUTION: TO REDUCE STRUCTURAL LOADS DURING LIFTING, IT IS RECOMMENDED THAT THE WEIGHT OF THE AIRPLANE BE REDUCED AS MUCH AS POSSIBLE BY REMOVING BAGGAGE, CARGO AND FUEL BEFORE PROCEEDING WITH LIFTING OPERATIONS. REFER TO CHAPTER 2 DEFUELING FOR DEFUELING PROCEDURES.

Tools and Equipment

NOTE: Equivalent substitutes may be used for the following listed items.

Name	Number	Manufacturer	Use
Hydraulic Jacks		Cessna Aircraft Company Wichita, KS 67277	Raise airplane
Pneumatic Bag		Firestone Tire and Rubber Company Maginolia, AR 71753	Raise airplane
		Goodyear Tire and Rubber Company Akron, OH 44316	
		General Tire and Rubber Company Akron, OH 44329	
		U.S. Rubber Company Turker, GA 30084	

Lifting Airplane in Nose-Down Condition (Refer to Figure 1)

1. Sling Method.

   A. Position contour boards previously described, beneath the wing and clear of flaps.

   B. Attach hoisting lugs to ends of contour boards.

   C. Fabricate sling from suitable material capable of sustaining a 8500-pound load. Attach slings to hoisting lugs.

   D. Position a man at both fuselage and wing of airplane to assure it stays in a level position while hoisting.

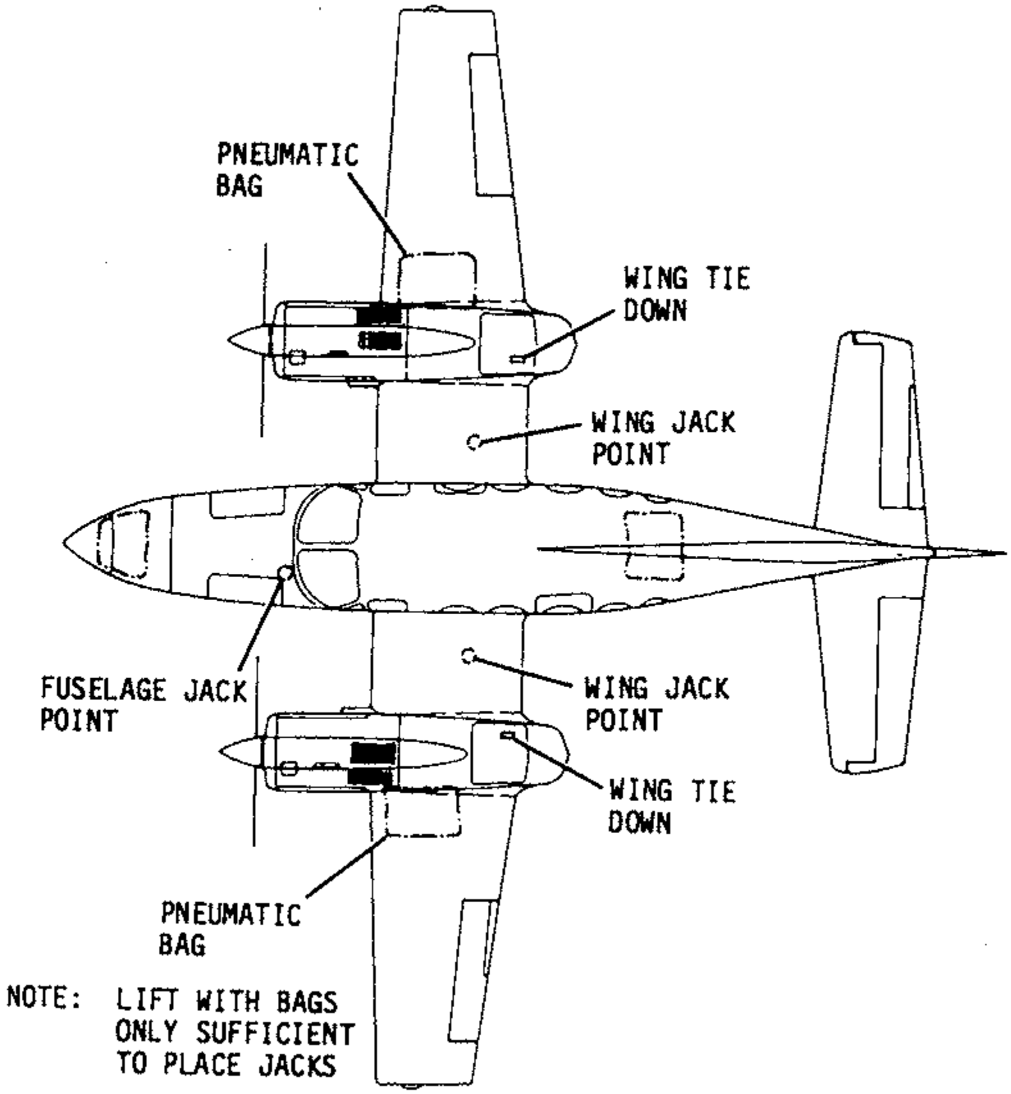
   E. Raise nose enough to level airplane longitudinally.

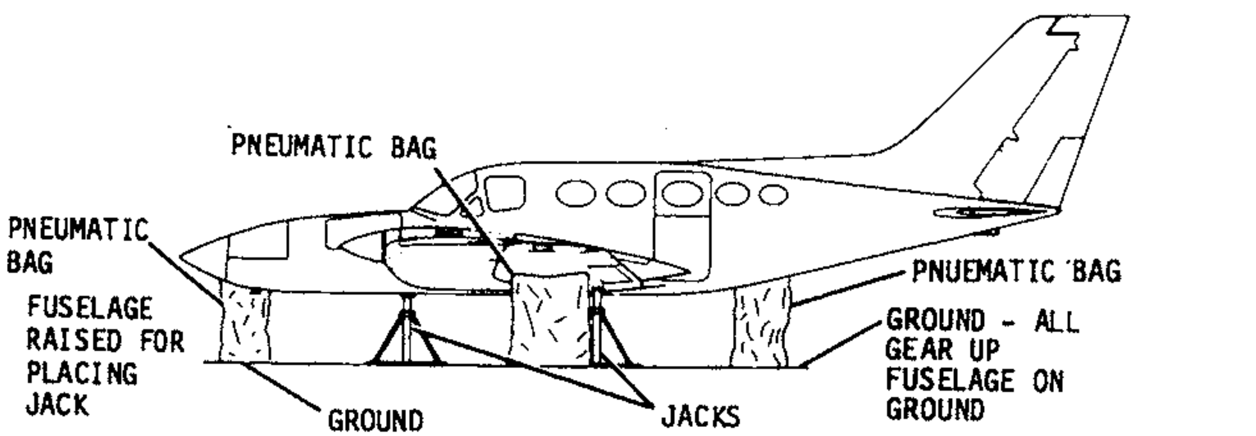
   CAUTION: MAINTAIN LOCK RING AGAINST JACK SHOULDERS.

   F. Place jack under fuselage jack pad and extend jack until nose gear has free-fall clearance.

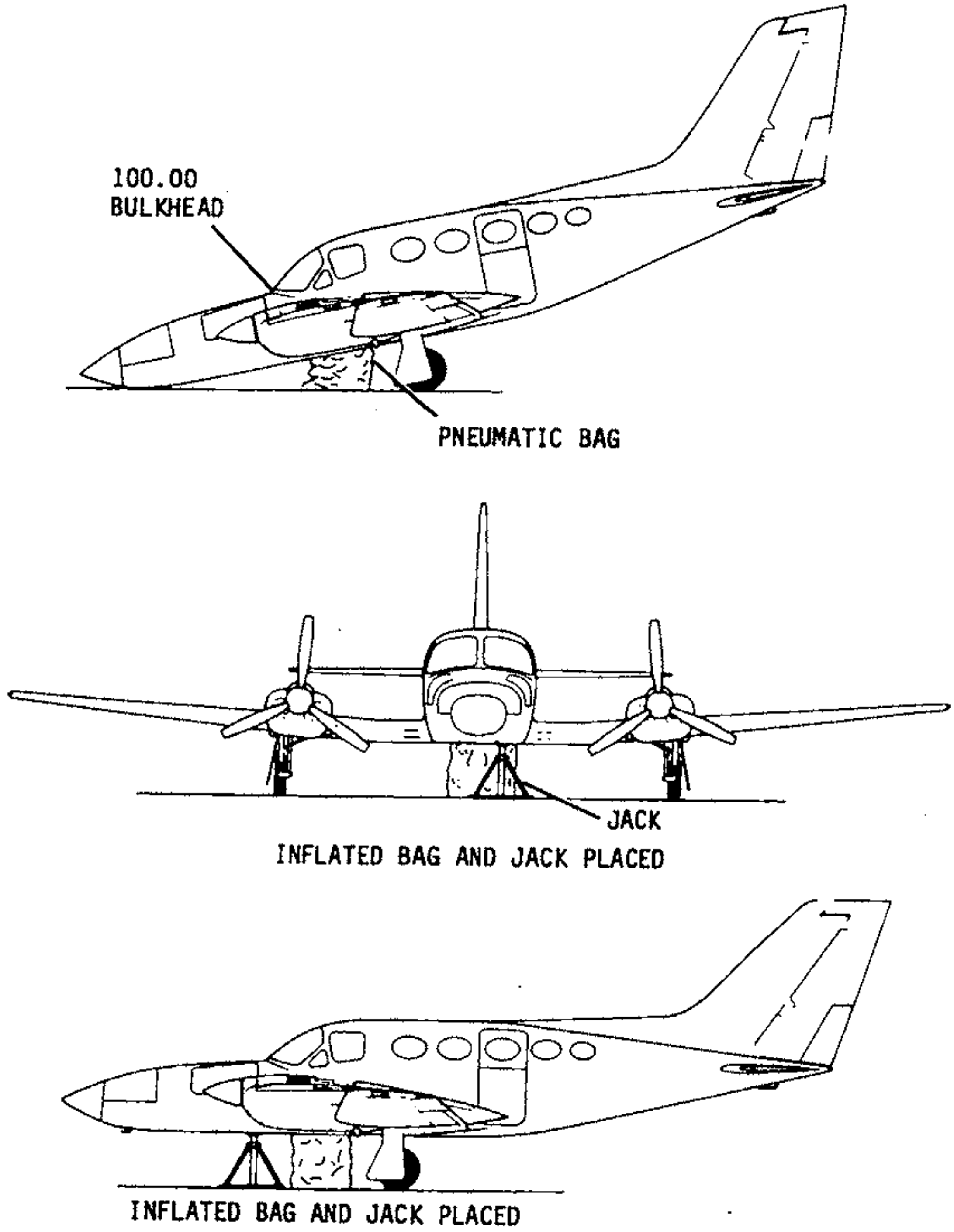
   G. Remove sling from airplane.

   H. On completion of maintenance, lower and remove jack.





Lifting Airplane
Figure 1 (Sheet 1)



NOTE: LIFT WITH
BAGS ONLY
SUFFICIENT
TO PLACE
JACKS.

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Lifting Airplane
Figure 1 (Sheet 2)

2. Pneumatic Bag Method.

   A. Place pneumatic bag lengthwise under forward fuselage at Station 100.00 and just aft of nosewheel well doors.

   B. Inflate bag to raise nose enough to level airplane longitudinally.

   CAUTION: MAINTAIN LOCK RING AGAINST JACK SHOULDERS.

   C. Place jack under fuselage jack point. Extend jack until nose gear has free-fall clearance.

   D. Deflate and remove bag.

   E. On completion of maintenance, lower and remove jack.

Lifting with One Main Gear Retracted or Collapsed (Refer to Figure 1)

1. When conditions allow, an airplane resting in a wing-down position with one main gear retracted or collapsed should be lifted at wing jack point. If the jack point is too close to the ground, a floor jack may be used to lift the wing to permit inserting a jack. Careful jacking and shoring procedures should be followed to avoid further damage to airplane. Refer to 1-10, Lifting and Shoring.

   CAUTION: PLACE PROTECTIVE COVER AT AREA TO BE JACKED TO PREVENT FURTHER DAMAGE TO WING STRUCTURE.

   RAISE WING ONLY ENOUGH TO ALLOW PLACEMENT OF JACK AT JACK POINT AND SUITABLE SHORING; OTHERWISE, STRUCTURE DAMAGE MAY RESULT.

   A. If necessary to raise wing sufficiently to insert jack, place floor jack on main or rear spar.

   B. Position jack under affected wing at jack point.

   C. Raise jack until desired height is attained.

Lifting Belly-Landed Airplane (Refer to Figure 1)

1. Lifting the entire airplane that is resting on the lower fuselage is accomplished by using pneumatic bags under the wing and fore and aft fuselage. The pneumatic bags are inflated only enough to allow the placement of standard airplane jacks at the jacking points.

   A. Place a pneumatic bag under each wing main spar, outboard of main gear door.

   B. Place one pneumatic bag under airplane's nose aft of radome, and one bag under aft fuselage.

   C. Inflate bags simultaneously to maintain airplane at a level attitude.

   D. Continue inflation of bags; inflate fore and aft bags only as required to maintain a level attitude longitudinally.

   E. Raise airplane until airplane jacks can be placed under wing and fuselage jack points (Refer to Figure 1).

   F. Deflate and remove pneumatic bags.

   G. Jack airplane until landing gear has free-fall clearance. Refer to 1-10, Lifting and Shoring.

LEVELING AND WEIGHING

Description

1. Leveling lugs are provided for longitudinally leveling on the right side of the fuselage at F.S. 214.00 and 238.00, and approximate W.L. 90.00. Lateral leveling is accomplished by placing a spirit level on the outside skin centered between the black marks at F.S. 154.00 aft of the front spar on the underside of the fuselage.

2. Weighing is accomplished by placing airplane on electronic-type scales positioned at each jacking point or using platform scales under each main and nose wheel tires.

Leveling

1. Tools and Equipment

   NOTE: Equivalent substitutes may be used for the following items:

Name	Number	Manufacturer	Use
Spirit Level	Commercially Available	Purchase Locally 18 Inches Length Minimum	Level airplane.
Jacks	Refer to Lifting and Shoring		

2. Leveling Longitudinally (See Figure 1)

   A. Back the leveling screws on the right side of the fuselage out a sufficient length to place spirit level on.
   B. Adjust fuselage jacks as required to level airplane.

Weighing

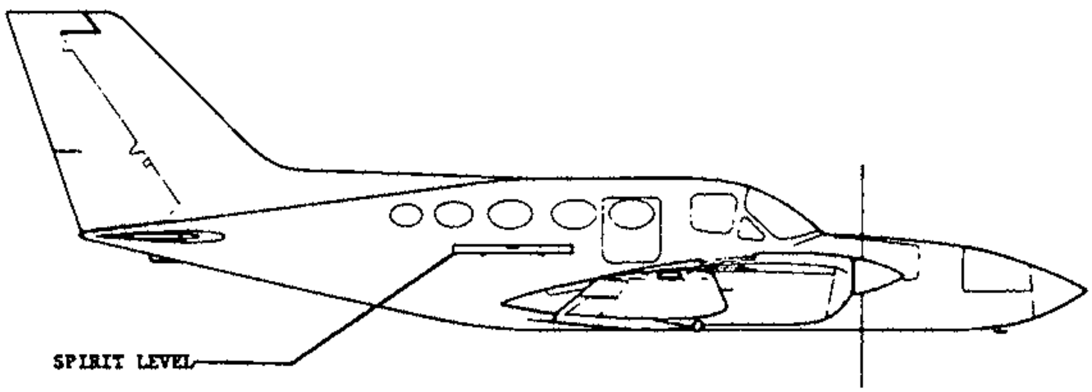
1. Tools and Equipment

   NOTE: Equivalent substitutes may be used for the following items:

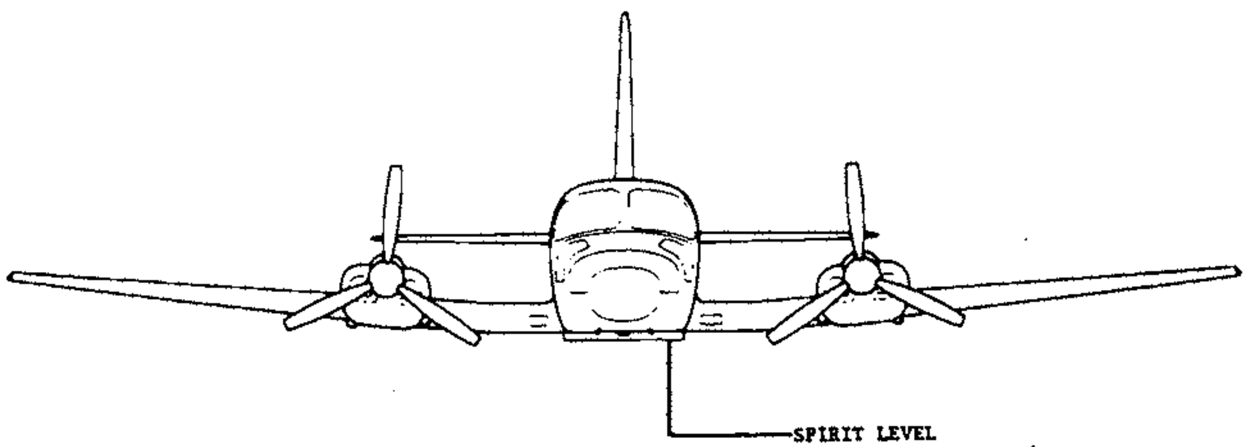
Name	Number	Manufacturer	Use
Scales	Commercially Available		Weigh airplane.
Chocks	Commercially Available		
Jacks	Refer to Lifting & Shoring.		

2. Airplane Weighing Procedures.

   A. Refer to Section 6 of the Pilot's Operating Handbook and FAA Approved Flight Manual for weighing procedures.



LONGITUDINALLY LEVELING POINT



LATERAL LEVELING POINT

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Leveling Aircraft
Figure 1

TOWING AND TAXIING

Description

1. Towing and Taxiing Procedures are basically the same as those used on other airplanes equipped with tricycle gear.

2. The airplane can be towed forward or pushed aft, on hard surfaces, using a yoke-type tow bar attached to the nose wheel.

3. The airplane can be towed at the main gear when the airplane is in soft sand, earth, mud, or at anytime damage could result to the nose gear.

   CAUTION: STRUCTURAL DAMAGE CAN OCCUR IF TURN LIMITS ARE EXCEEDED AND AN INSPECTION MUST BE PERFORMED IN THIS EVENT.

Towing

1. Tools and Equipment

   NOTE: Equivalent substitutes may be used for the following items:

Name	Number	Manufacturer	Use
Tow Bar	C173001-0104	Cessna Aircraft Company	For nose gear towing.
	C9001-1	Cessna Aircraft Company	For nose gear towing.
Cable	Commercially Available		For main gear towing.

2. Nose Gear Towing

   CAUTION: THE PARKING BRAKE MUST BE RELEASED AND THE EXTERNAL AND INTERNAL RUDDER GUST LOCKS REMOVED BEFORE TOWING. FAILURE TO REMOVE LOCKS COULD RESULT IN STRUCTURAL DAMAGE TO THE AIRPLANE NEVER PUSH, PULL OR LIFT AIRPLANE BY THE PROPELLER, AILERONS, ELEVATORS, FLAPS, NACELLES OR UNSUPPORTED SKINS BETWEEN THE RIBS.

   A. Place the tow bar at nosewheel, insert tow bar into nose wheel axle and secure tow bar locking handle.
   B. Connect tow bar to towing vehicle.
   C. Station person in pilot's seat.
   D. Disengage parking brake.
   E. Remove interior rudder gust lock.
   F. Ensure that wheel chocks, static ground cables, external gust locks and mooring cables are removed.
   G. If area is congested, station wing walkers to check clearance between airplane and adjacent equipment or structure.
   H. Tow airplane making smooth starts and stops with towing vehicle. Do not exceed turning limitations. Refer to placard on nose gear strut.
   I. When towing operation is complete, turn nosewheel to center, engage parking brake, chock wheels, connect static ground cable, install external and internal gust locks.

3. Main Gear Towing

   A. Attach cables to each main gear and towing vehicle. Insure cables are of sufficient length to clear airplane and the towing vehicle is on a firm surface.
   B. Remove wheel chocks, mooring cables, static ground cables and external gust locks.
   C. Station person in pilot's seat.
   D. Release parking brake and remove internal gust locks.
   E. During towing steer the airplane by the rudder pedals. Brake airplane evenly and smoothly using airplane brakes.

F. When towing is complete, center nosewheel, chock airplane wheels, connect static ground cable, install external and internal gust locks and set parking brake if desired.
G. Disconnect tow cables.

Taxiing

1. Preliminary Procedures

   A. Clear the area around the airplane.
   B. Check main gear wheels and remove static ground cable, external and internal gust locks, and wheel chocks.
   C. Assure parking brake is engaged.

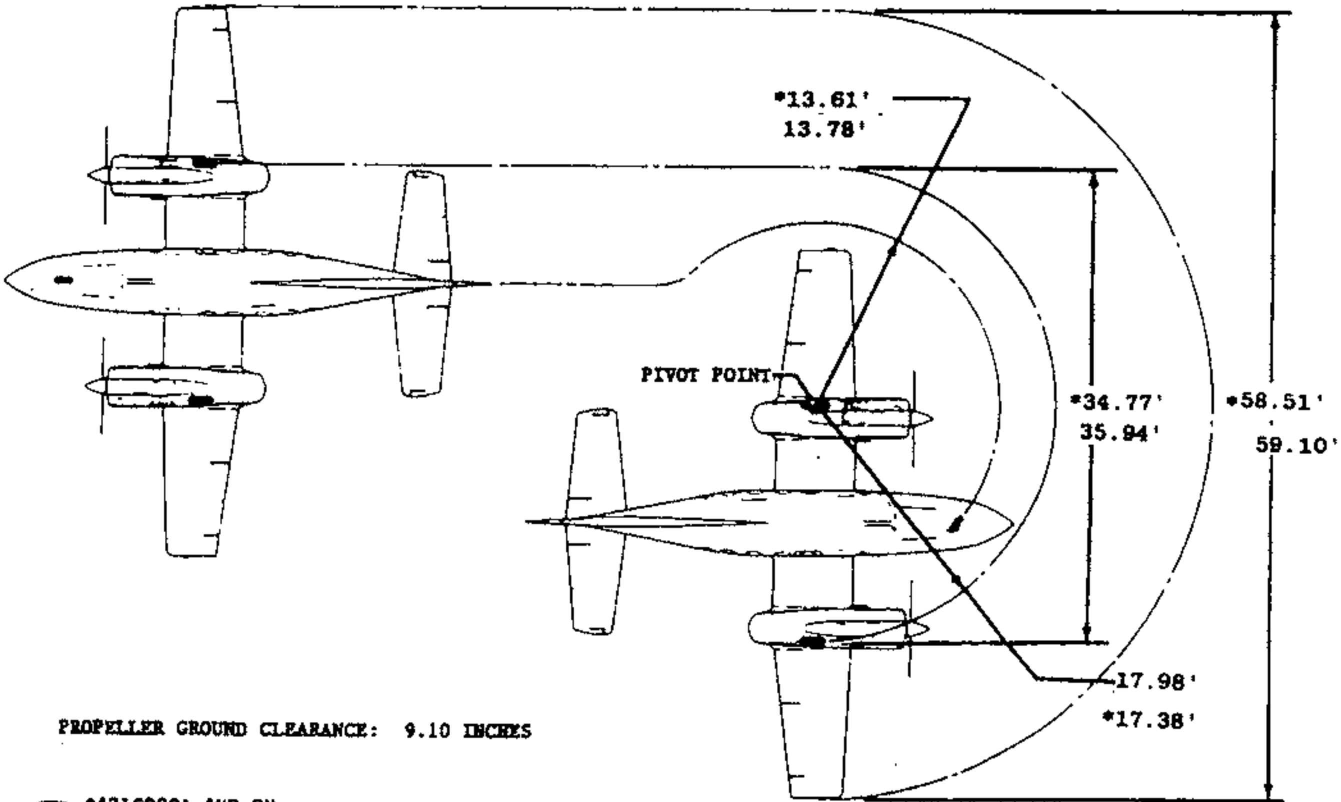
2. Taxiing Procedures

   WARNING: INSURE PERSONNEL AND EQUIPMENT ARE CLEAR OF PROPELLER AND AIRPLANE.

   A. Start engines, refer to Pilot's Operating Handbook.
   B. Release parking brake.
   C. Apply sufficient power to start taxi roll.

      NOTE: It may become necessary to apply brakes to slow taxi speed. Intermittent braking provides a cooling period between brake applications.

   D. Steer the airplane using the rudder pedals. Nose gear steering is operated by the rudder pedals. While taxiing, make slight turns to determine effectiveness of nose gear steering.
   E. In congested areas, wing walkers should be used as an aid.
   F. Observe minimum turning radius during taxiing (See Figure 1). Avoid high engine RPM while taxiing over ground containing loose stones or gravel to prevent damage to propeller blades.
   G. Taxi airplane to desired area.
   H. Apply parking brake, shut down engines, chock main gear wheels, connect static ground and install internal gust locks. If the airplane is to be moored outside, install external gust locks and refer to mooring procedures.



PROPELLER GROUND CLEARANCE: 9.10 INCHES

*421C0801 AND ON

51108001

Minimum Turning Radius
Figure 1

PARKING AND MOORING

Description

1. The aircraft is normally parked or moored on a hard surface apron where necessary mooring accommodations are available.

2. The aircraft may be parked during normal weather conditions by heading the aircraft into the wind, installing wheel chocks, and engaging parking brake and control locks. Refer to mooring procedures if anticipation of high winds, or any time the aircraft is to remain outside for a length of time, such as overnight.

Parking

1. Tools and Equipment

   NOTE: Equivalent substitutes may be used for the following listed items:

Name	Number	Manufacturer	Use
Wheel Chocks	Commercially Available		Chock landing gear wheels.
Pitot Tube Cover	Commercially Available		Prevent water entry.
Static Grounding Cables	Commercially Available		Static ground aircraft.

2. Parking Instructions

   A. Position aircraft on level surface.
   B. Set parking brake and install internal control locks and external gust locks.

   NOTE: If main gear wheels are chocked, the parking brake may remain released.

   C. Chock main gear wheels.
   D. Connect static ground cable to aircraft.
   E. Install protective covers.
   F. Close windows and doors as necessary.

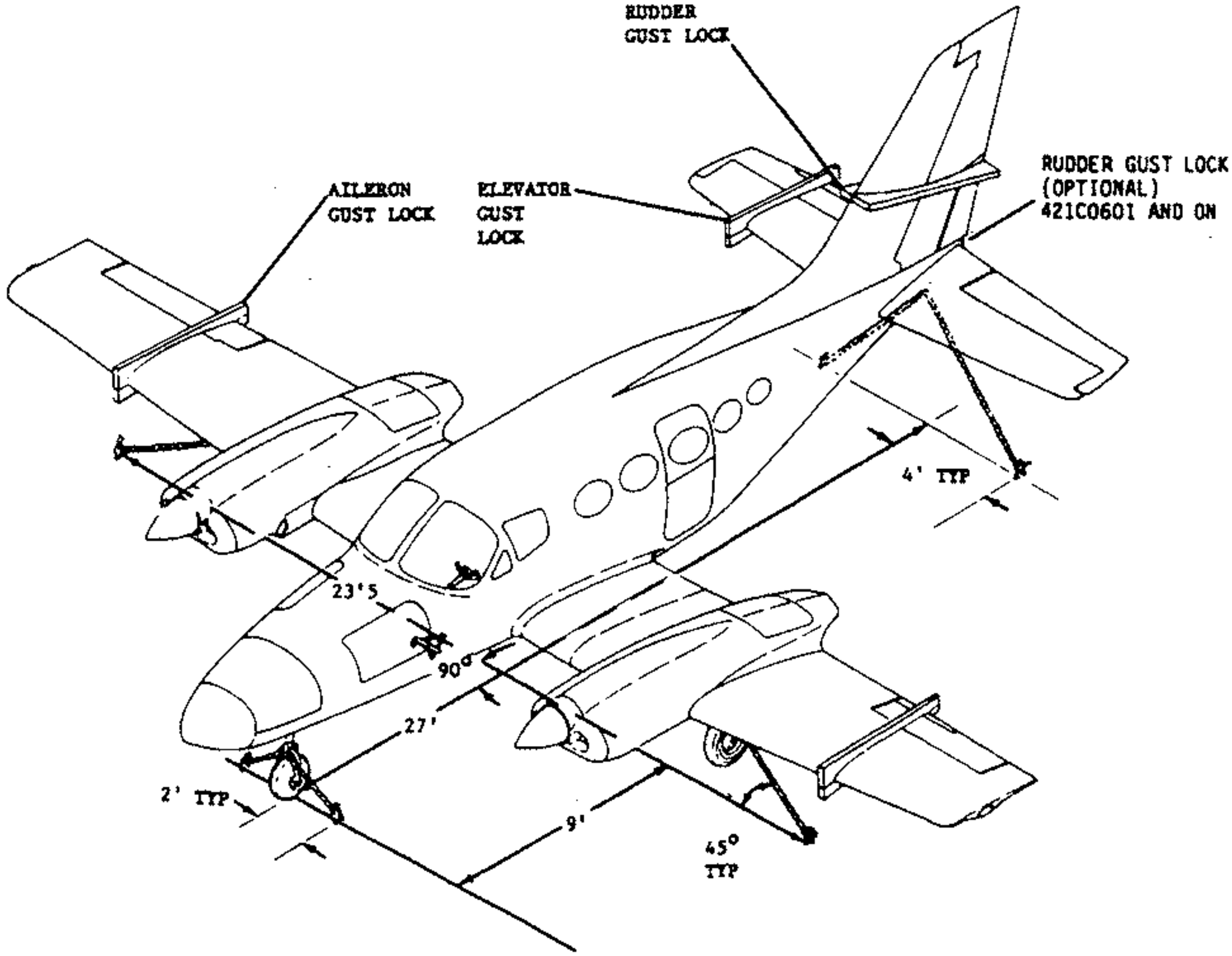
   CAUTION: AFTER PARKING AND PRIOR TO FLIGHT, CHECK RUDDER FOR DAMAGE. IF DAMAGE IS EVIDENT, CHECK RUDDER TAB PUSH ROD FOR DAMAGE.

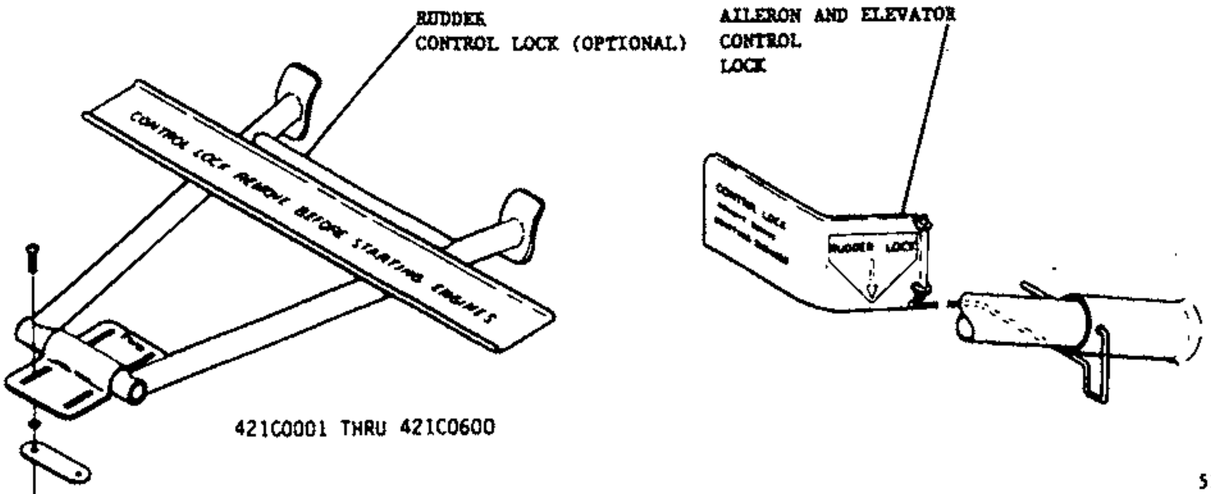
Mooring

1. Tools and Equipment

   NOTE: Equivalent substitutes may be used in place of the following items:

Name	Number	Manufacturer	Use
Wheel Chocks	Commercially Available		Chock landing gear wheels.
Pitot Tube Cover	Commercially Available		Prevent water entry.





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Mooring Points
Figure 1

2. Mooring Instructions (See Figure 1)

A. Park aircraft on level surface.
B. Set parking brake and install control lock.
C. Chock main landing gear wheels.
D. Connect static ground cable.
E. Install external gust locks on rudder, elevator and aileron (one lock on each control).

NOTE: If external rudder gust lock is not available, turn nosewheel to extreme right or left position.

F. If aircraft is to be moored on sod surface, proceed as follows:

(1) Drive anchor stakes as shown in Figure 1, to provide a rope angle of 45° to the ground. Secure chains or manila rope of 700 pounds or more tensile strength to the mooring fittings under the wings and secure opposite end to the ground stakes.

G. Install protective covers.
H. Close doors and windows as necessary.

STORAGE OF AIRPLANE

Description

1. There are three recommended categories of storage of the airplane.
2. Flyable Storage - Airplanes which will not be flown for an indefinite period of time but which are to be kept ready to fly with the least possible preparation.
3. Temporary Storage - Airplanes which will be stored for a period of time up to 90 days.
4. Indefinite Storage - Airplanes which will be stored for an indefinite period of time.

   CAUTION: FUEL ON TIRES FOR AN EXTENDED LENGTH OF TIME WILL CAUSE RUBBER TO DETERIORATE.

Storage

CAUTION: BATTERIES ARE SUSCEPTIBLE TO SLOW DISCHARGE FROM KEEP ALIVE ELECTRICAL CIRCUITS, SUCH AS FUEL FLOW TOTALIZER AND AVIONICS MEMORY CIRCUITS. TO MINIMIZE BATTERY DISCHARGE DURING AIRPLANE STORAGE OR PERIODS OF LOW AIRPLANE UTILIZATION (INACTIVE FOR LONGER THAN TWO DAYS), THE BATTERY SHOULD BE DISCONNECTED AND/OR THE CIRCUIT BREAKERS DISENGAGED FOR ALL CIRCUITS ON THE HOT BATTERY BUS BAR. THIS INCLUDES THE KEEP ALIVE CIRCUITS, CABIN, BAGGAGE AND COURTESY LIGHTS; AND THE ELECTRICAL CLOCK IF THE AIRPLANE IS TO BE INACTIVE LONGER THAN FIVE DAYS.

1. Flyable Storage Procedures

   A. Fill fuel tanks full to minimize condensation in the fuel tanks. Keep battery fully charged to prevent the electrolyte from freezing in cold weather. If the airplane is stored outside, tie-down should be accomplished in anticipation of high winds.
   B. Tie ropes or chains to the wing tie-down fittings located on the underside of each wing. Secure the opposite ends of the ropes or chains to ground anchors.
   C. Secure a rope (no chains or cables) to the upper trunnion of the nose gear and secure opposite end of rope to a ground anchor.
   D. Secure the middle of a rope to tail tie-down ring. Pull each end of rope away at 45-degree angle and secure to ground anchors at each side of tail.
   E. Install surface control locks on ailerons, rudder and elevators if available.
   F. Install control lock on pilot control column if available; if control lock is not available, tie pilot control wheel back with front seat belt.
   G. Airplanes which are not in daily flight should have the engine preserved in accordance with latest issue of Continental Aircraft Engine Service Bulletin M84-10.

2. Temporary Storage Procedures

   A. Preserve engine in accordance with the latest issue of Continental Aircraft Engine Service Bulletin M84-10.
   B. Install pitot tube cover, seal static source, install ground locks on retractable gear airplane and attach red streamers at each location. Close all vents and plug cowl openings to prevent bird nests in the engine compartment.
   C. Engines, with propellers installed, that are preserved for storage in accordance with this section should have a tag affixed to the propeller in a conspicuous place with the following notation on the tag: "DO NOT TURN PROPELLER - ENGINE PRESERVED."
   D. Disconnect or remove the battery from the airplane. If the battery is disconnected and left in the airplane, regular servicing will be required to prevent freezing or discharge. Batteries which are removed from the airplane and stored should be checked regularly for state of charge. To assure accurate warranty records, battery should be reinstalled in the same airplane from which removed.
   E. If the airplane is stored outdoors, place control locks on all movable control surfaces and tie the airplane down snugly, not tight, with enough clearance so wind gusts will not shift airplane into another airplane. Leave no long chains dangling. To prevent brake seizing, release the parking brake and chock the wheels.

3. Indefinite Storage Procedures

   A. Preserve engine in accordance with the latest issue of Continental Aircraft Engine Service Bulletin M84-10.

B. Engines, with propellers installed, that are preserved for storage in accordance with this section should have each propeller tagged in a conspicuous place with the following notation of the tag: "DO NOT TURN PROPELLER - ENGINE PRESERVED."

C. After the engine has been prepared for storage, remove the battery from the airplane, store in a cool dry place and check regularly for state of charge. Note serial number on battery and reinstall in the same airplane.

D. If the airplane is stored outdoors, place control locks on all movable control surfaces and tie the airplane down snugly, not tightly, with enough clearance so wind gusts will not shift airplane into another airplane. Leave no long chains dangling. To prevent brake seizing, release parking brake and chock wheels.

E. Cover the airplane with moisture-resistant paper and tape as necessary.

NOTE: The necessity of this requirement can be determined by the condition at the storage area.

F. Install pitot tube cover and seal static source. Close all vents and plug cowl openings to prevent bird nests in the engine compartment.

G. When the airplane is being stored in an area of high moisture condensation it is recommended that Paraformaldehyde be used to protect the upholstery and carpet against fungus and mildew.

NOTE: Paraformaldehyde can be purchased from Wilchem D/B/A Vapor, Orlando, Florida in 1.5 ounce bags.

H. When using Paraformaldehyde use the following safety precaution.

WARNING: MAY BE FATAL IF SWALLOWED. IF SWALLOWED, CALL PHYSICIAN IMMEDIATELY. DO NOT BREATHE VAPORS.

DO NOT GET INTO EYES, ON SKIN OR ON CLOTHING. IN CASE OF CONTACT WITH EYES, FLUSH WITH CLEAN WATER. IN CASE OF CONTACT WITH SKIN, WASH IMMEDIATELY WITH SOAP AND WATER.

DO NOT EXPOSE TO UNCOATED METAL SURFACES. DO NOT EXPOSE TO HEATED SURFACE OR OPEN FLAME. FLAMMABLE AND TOXIC WHEN HEATED.

I. Place 1.5 ounce bag of Paraformaldehyde on a sheet of plastic in each wing baggage locker. This will protect baggage area for approximately 6 weeks.

J. Hang 1.5 ounce bag of Paraformaldehyde in the forward and aft cabin area of the fuselage. This will protect the cabin area for approximately 6 weeks.

Restoring Airplane to Service

1. If the proper procedures were followed for indefinite storage, the airplane should require the following service.

A. Airframe

(1) Remove Paraformaldehyde from wing locker baggage and fuselage area if applicable. Ventilate the cabin for one hour prior to use.
(2) Remove all covers from vents and air inlets.
(3) Clean airplane if required.
(4) Lubricate the airplane.
(5) Check the brake cylinders, struts and shimmy damper.
(6) Drain a small amount of fuel from all fuel lines and check for water sediment.
(7) Check fuel selector valve for evidence of leakage.

B. Battery

(1) Check battery, charge if necessary.
(2) Install battery.

C. Engines

(1) To restore engine to service, refer to the latest issue of Continental Aircraft Engine Service Bulletin.
(2) Check propellers for freedom of operation.
(3) Perform complete ground run-up check on engines.

AIRPLANE ZONING AND ACCESS PLATES/PANELS IDENTIFICATION - DESCRIPTION

1. Zoning

A. The airplane is divided into numbered zones to provide a method for locating components. The zones are identified by a three-digit number. Each digit designates a zone category: major, submajor or subdivision.

```
EXAMPLE                    311
     major zone-------------┘│└----------------subdivision zone
                             │
                       submajor zone
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B. Major Zones
100 - Radome and area below nose baggage shelves and below cabin floorboards to rear pressure bulkhead.
200 - Area above nose baggage shelves and cabin floorboards to rear pressure bulkhead.
300 - Empennage
400 - Nacelle area forward of firewall.
500 - Left Wing
600 - Right Wing
700 - Landing gear and landing gear doors.
800 - Cabin and Emergency Doors.

C. Submajor Zones

(1) Submajor zoning is accomplished by adding the second digit to the zone number. The second digit makes reference to a smaller area within the major zone.

D. Subdivision zoning is accomplished by adding the third digit to the zone number. The third digit makes reference to a smaller area within the subzone (right side or left side of the fuselage).

2. Access Plates and Panels Identification

A. Access plates and panels are provided for inspection and maintenance purposes. Locations of the various plates and panels are shown in Figure 1. Access panels indicated by an asterisk are considered to be structural support items, or integral parts of the airplane, and must be installed for all functional testing and taxiing of the airplane.

B. All access plates, panels and doors are identified by using the airplane zoning number plus one ot two suffix letters. The first suffix letter is the primary identifier. The primary identifier identifies the plate panel or door in a logical sequence, i.e., inboard, outboard, forward or aft, starting with the letter "A" within each zone.

C. The second suffix letter identifies the plate, panel or door in relation to the airplane such as top, bottom, left, right or internal.

```
EXAMPLE

                                  521 AT
   AIRPLANE ZONE-------------------┘ │└--------LOCATOR
  PRIMARY IDENTIFIER-----------------┘           T = TOP
                                                 B = BOTTOM
                                                 L = LEFT
                                                 R = RIGHT
                                                 Z = INTERNAL
```

3. Wing Fuel Access Plates

A. Access Plates Removal/Installation.

(1) Remove Access Plate(s).

NOTE: Verify fuel has been removed from wing. Refer to Chapter 2, Defueling.

(a) Remove screws securing access plate(s) to the lower skin panel.

NOTE: Prior to removing access plate(s), index-mark the plate to the lower skin panel and identify the plate to its location to ensure that the plate is not rotated and is installed in the position that it was removed.

(b) Remove access plate(s) carefully to avoid damaging seal.

(2) Install Access Plate(s).

(a) Select and verify the correct access plate for the applicable access opening.

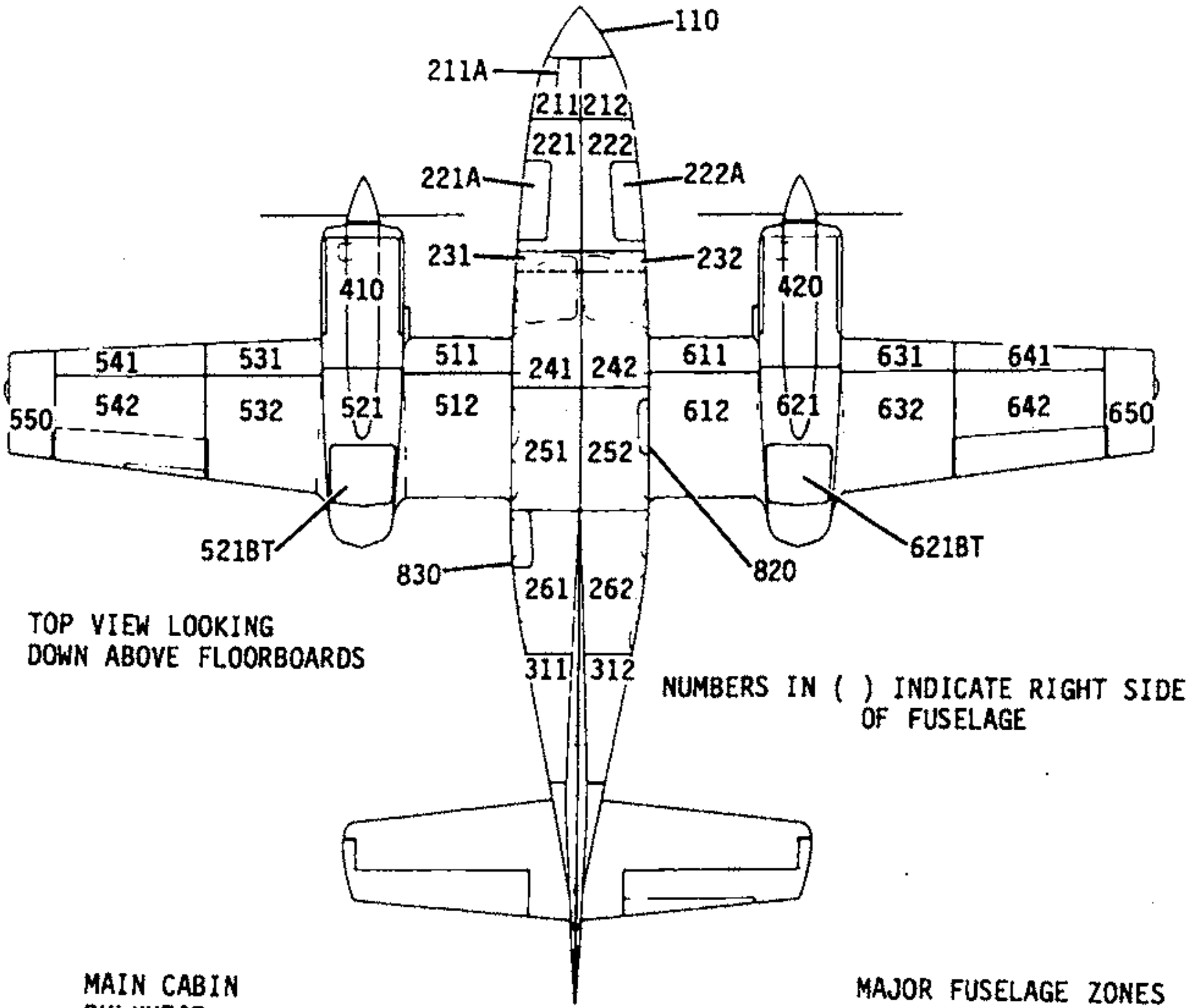
(b) Check plate seal for serviceability. Replace damaged or deteriorated seal.

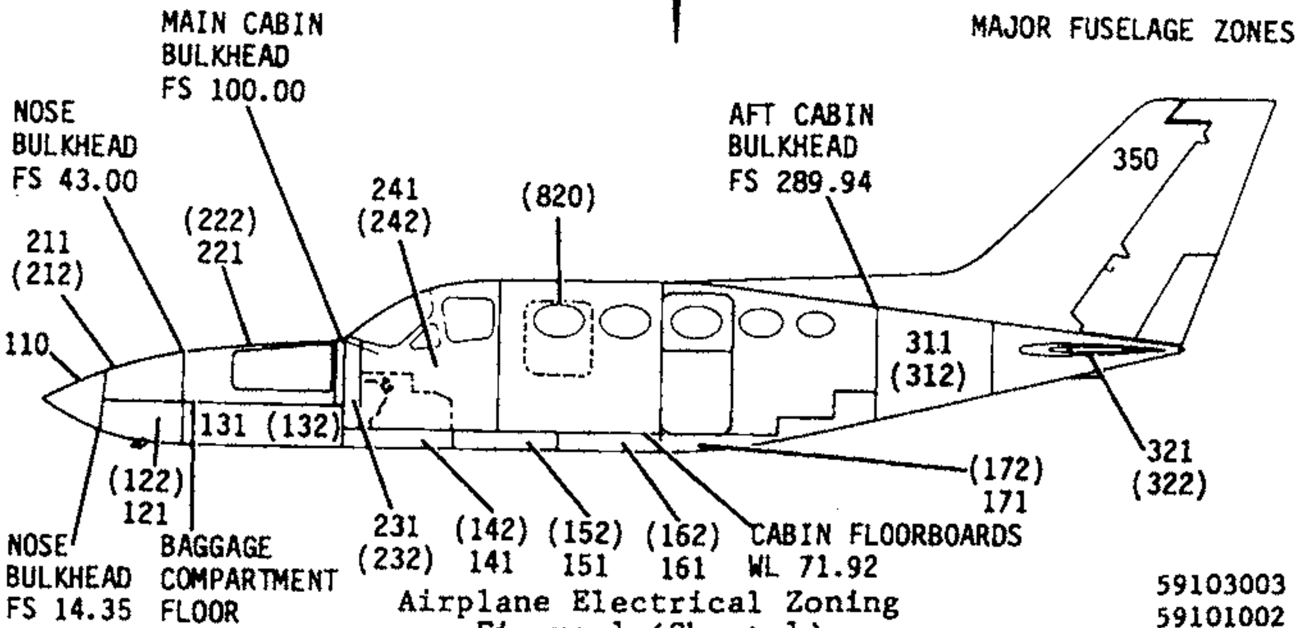
(c) Position access plate and install screws (MS24694S49). Screws to be snug but not tight.

CAUTION: USE ONLY MS24694S49 SCREWS TO SECURE THE FUEL ACCESS PLATES. LONGER SCREWS WILL DAMAGE THE NUTPLATE DOME SEALS AND RESULT IN FUEL LEAKAGE.

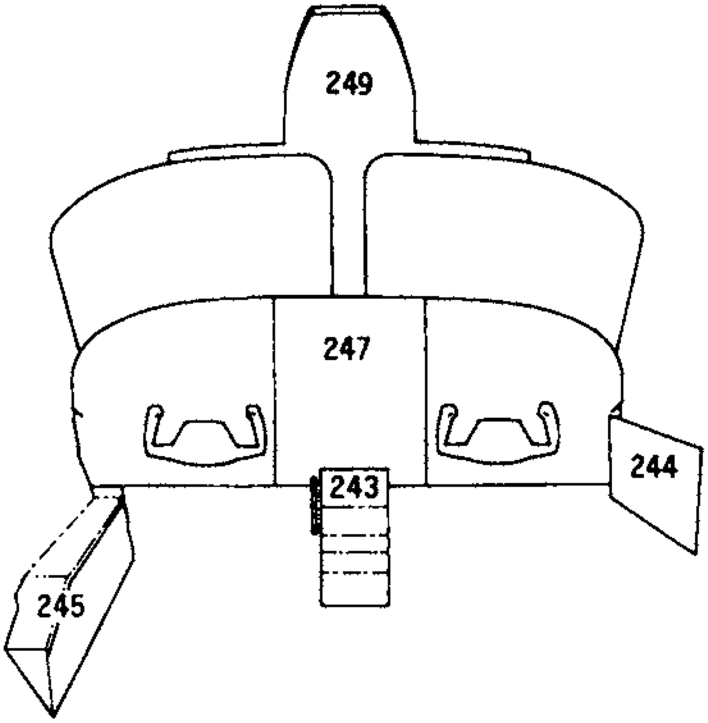
(d) Torque all screws at 20-25 inch-pounds in numerical sequence as illustrated for the particular plate(s) being installed (refer to Figure 1).

(e) After servicing wing with fuel, check access plate(s) for leaks.

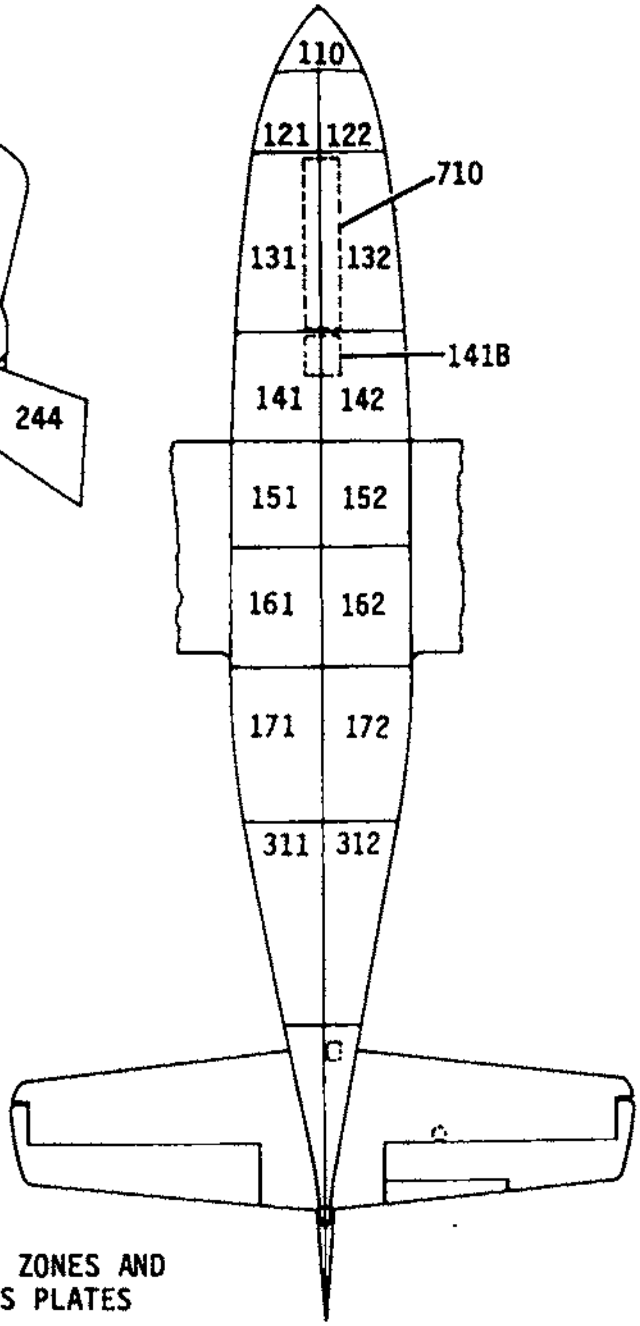




Airplane Electrical Zoning
Figure 1 (Sheet 1)



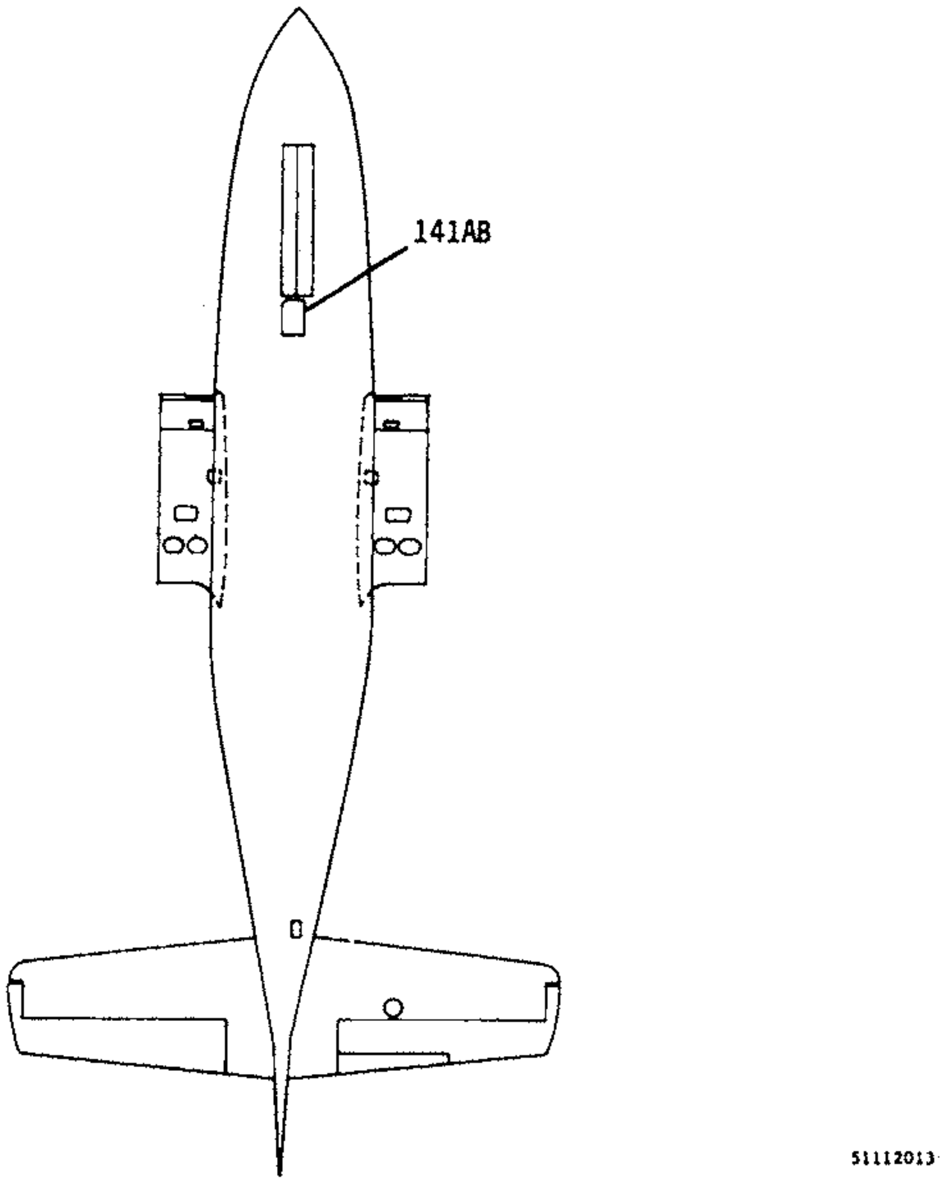
CREW COMPARTMENT ZONES



MAJOR FUSELAGE ZONES AND
FUSELAGE ACCESS PLATES

51101005
51102010

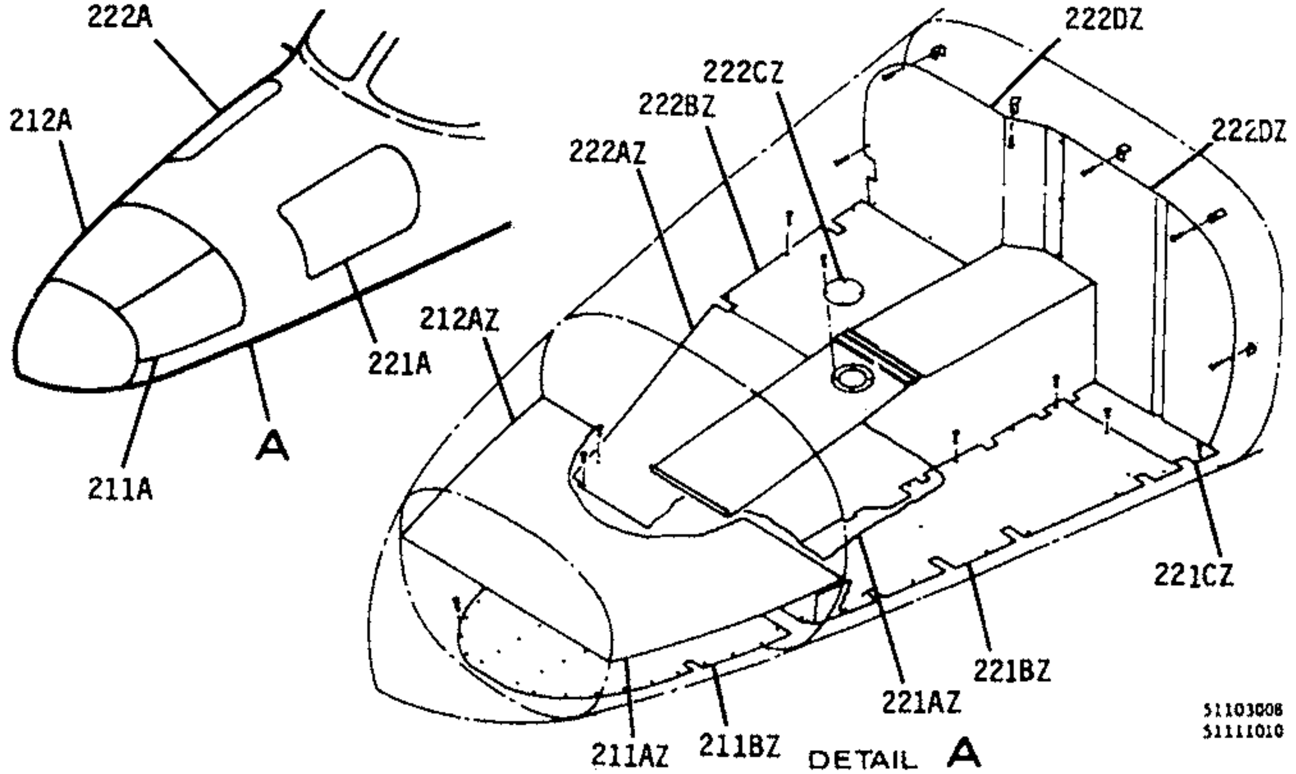
Airplane Electrical Zoning
Figure 1 (Sheet 2)



VIEW LOOKING UP

(141AB) Aileron Cable Pulleys
Aileron Trim Tab Cable Pulleys
Brake Cylinder (Inboard)
Elevator Cable Pulleys
Elevator Trim Tab Cable Pulleys
Engine Control Cable
Rudder Interconnect Cable Turnbuckle
Rudder Interconnect Spring

Access Plates/Panels Identification
Figure 2 (Sheet 1)



(211A) Avionics Equipment
Baggage Area
Communication Equipment

(211AZ) Avionics Cooling Fan
Avionics Equipment
Avionics Fuses
Avionics J Box
Communication Equipment
Wire Bundle

(211BZ) Oxygen Control Cable
Oxygen Cylinder
Oxygen Filler Valve
Oxygen Regulator

(212A) Avionics Equipment
Baggage Area
Communication Equipment

(212AZ) Avionics Cooling Fan
Avionics Equipment

(221A) Baggage Area
Pressure Gage, Emergency Gear Blow Down Bottle
Sight Tube, Hydraulic Reservoir

(221AZ) Avionics Equipment

(221BZ) Nose Gear Steering Cable
Nose Gear Steering Cable Pulley
Nose Gear Steering Spring

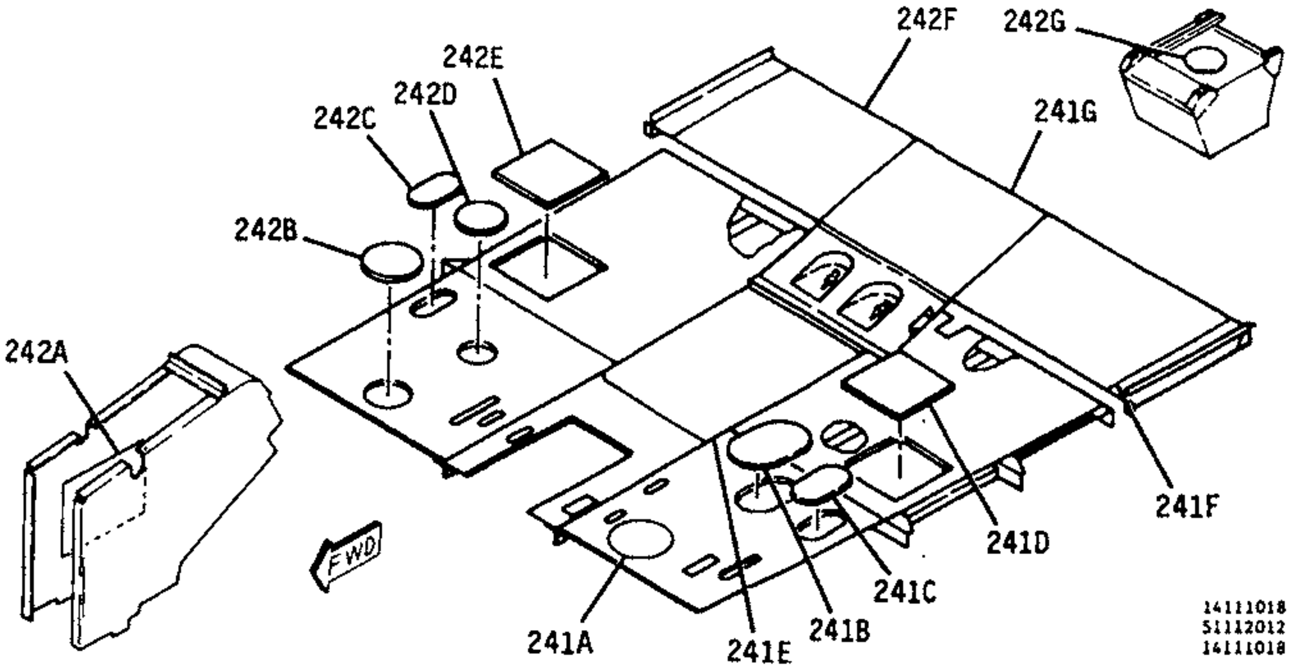
(221CZ) Hydraulic Lines
Wire Bundle

(221DZ) Emergency Gear Blow Down Bottle
Hydraulic System
Check Valve
Control Valve
Manifold
Pressure Switch
Reservoir
Vacuum Filter
Wire Bundle

(222A) Baggage Area
Heater Hour Meter

(222AZ) Heater
Ram Air Control Cable
Ram Air Control Valve

Access Plates/Panels Identification
Figure 2 (Sheet 2)



(241A) Brake Cylinder (Inboard)
Bulkhead Fitting (Hydraulic)

(241B) Brake Cylinder (Outboard)
Parking Brake Valve

(241C) Wire Bundle (Side Console)

(241D) Cooling Fan
Wire Bundle (Side Console)

(241E) Aileron Trim Cable Pulleys
Aileron Trim Cable Turnbuckles
Elevator Trim Cable Turnbuckles
Fuel Selector Valve Gear Box
Rudder Cable Interconnect Pulley
Rudder Cable Interconnect Spring
Rudder Trim Tab Cable Turnbuckles

(241F) Engine Control Cables
Fuel Lines
Heater Duct
Hydraulic Lines
Wire Bundle

(241G) Aileron Cable Pulley
Elevator Cable Pulley
Engine Control Cable
Fuel Lines
Hydraulic Lines
Rudder Cable Pulleys
Wire Bundle

(242A) Avionics Cooling Fan

(242B) Heater Duct

(242C) Heater Duct

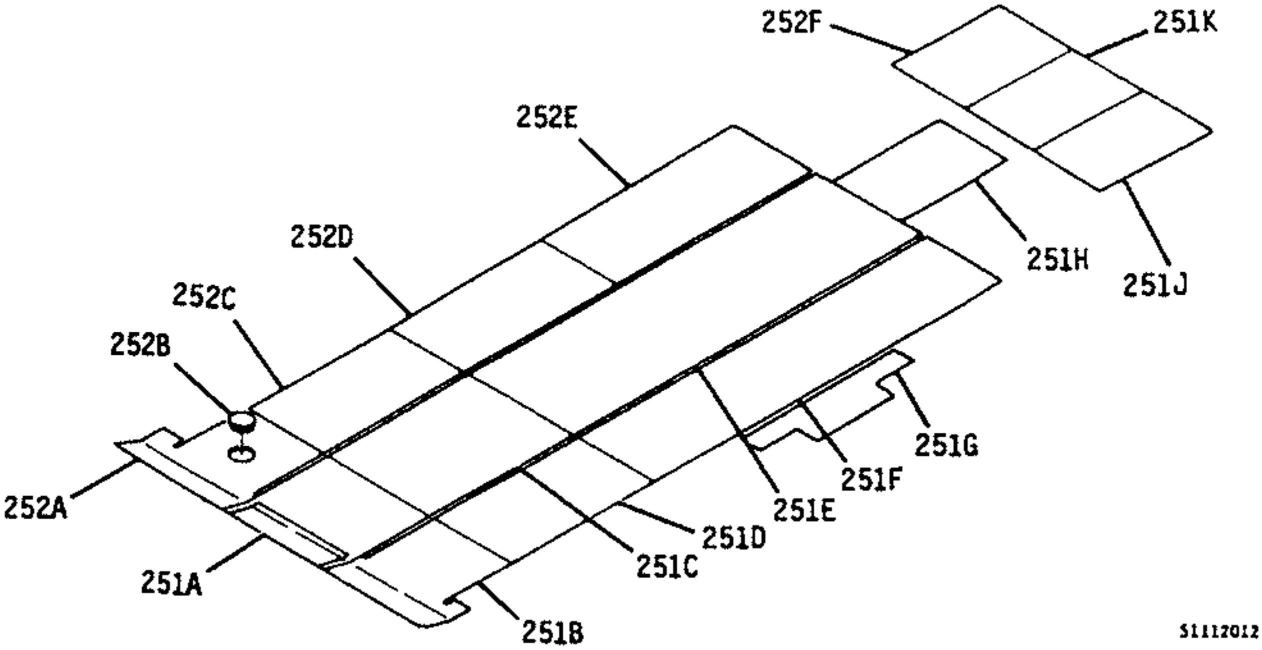
(242D) Heater Duct

(242E) Heater Duct

(242F) Engine Control Cables
Fuel Lines
Heater Duct
Hydraulic Lines
Wire Bundle

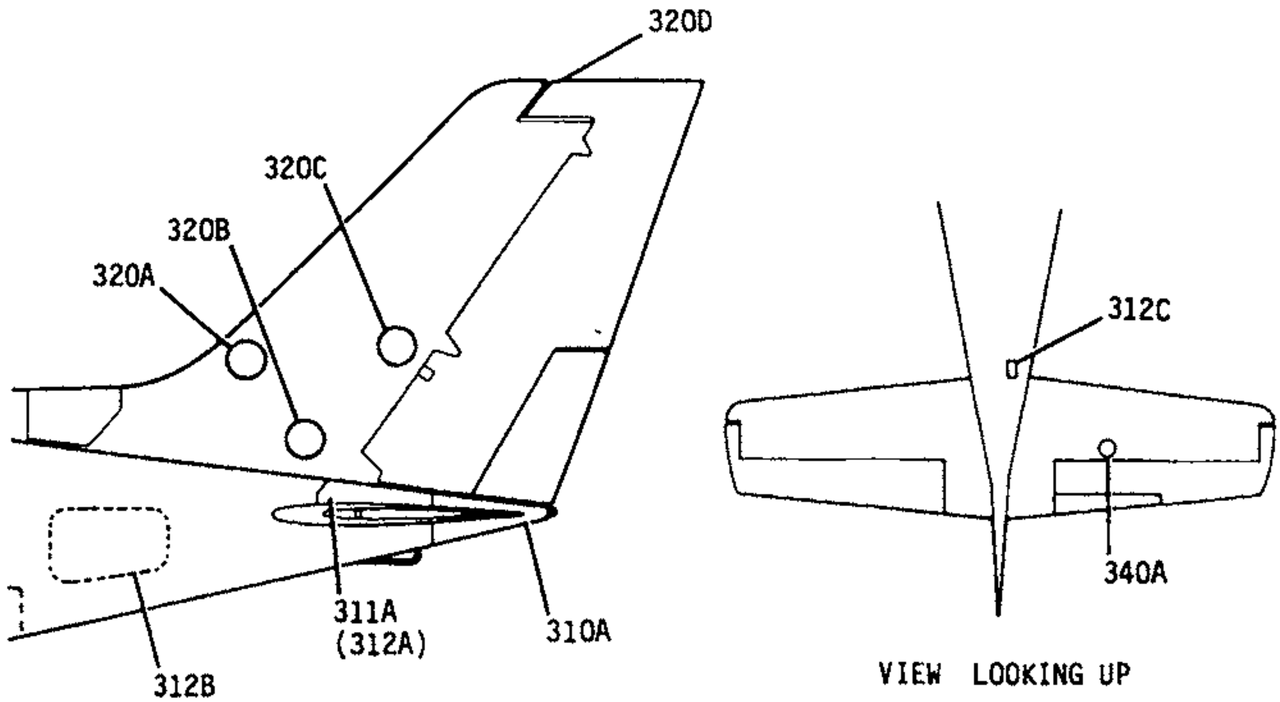
(242G) Prop Deice Timer

Access Plates/Panels Identification
Figure 2 (Sheet 3)



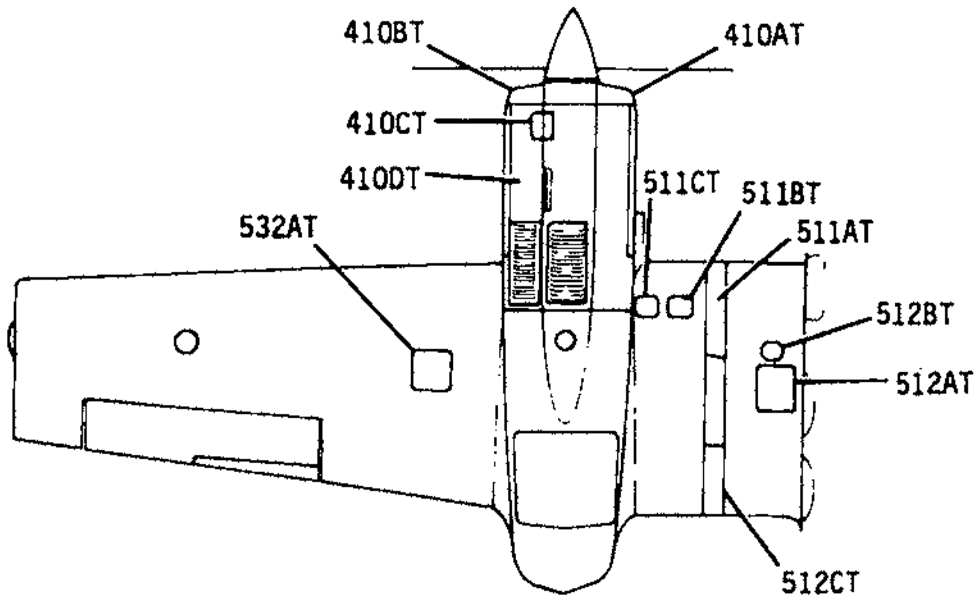
(251A) Flap Actuator
Flap Actuator Motor
Flap Actuator Limit Switches
Hydraulic Lines
(251B) Wire Bundle
(251C) Deice Line
Flap Cable Pulleys
Flap Cable Turnbuckles
(251D) Deice Line
Flap Cable Pulleys
Wire Bundle
(251E) Aileron Bellcrank
Aileron Cable Pulley
Aileron Cable Turnbuckles
Elevator Cable Pulleys
Deice Line
Wire Bundle
(251F) Aileron Cable Turnbuckles
Aileron Servo
Aileron Trim Cable Turnbuckles
Cabin Door Seal Pressure Line
Check Valve, Door Seal
Vacuum Breaker Valve, Door Seal
(251G) Cabin Door Seal Pressure Line
(251H) Elevator Cable Pulleys
Rudder Cable Pulleys
Wire Bundle
(251J) Wire Bundle
(251K) Bulkhead Cable Seals
Outflow Valve
(252A) Automatic Direction Finder
Heater Duct
Hydraulic Line
(252B) Automatic Direction Finder
(252C) Deice Line
Flap Cable Turnbuckles
(252D) Aileron Cable Turnbuckles
Heater Duct
(252E) Altitude Sensor
Computer Amplifier
Deice Line
Relief Tube
(252F) Pressurization Safety Wire
Pressurization Solenoid Dump Valve

Access Plates/Panels Identification
Figure 2 (Sheet 4)



(310A)	Elevator Torque Tube Rudder Gust Lock	(312C)	Elevator Bellcrank
(311A)	Rudder Torque Tube	(320A)	Flux Detector
(312A)	Rudder Torque Tube	(320B)	Rudder Cable Pulleys
(312B)	Deice Flow Valve Deice Lines Deice Pressure Switch Elevator Bellcrank Elevator Down Spring Elevator Trim Tab Pulleys Elevator Trim Tab Stop Blocks Emergency Locator Beacon Rudder Cable Turnbuckles Rudder Trim Tab Cable Stop Blocks Static Sump (Autopilot) Yaw Damper Cable Pulleys Yaw Damper Cable Turnbuckles	(320C)	Rudder Trim Tab Actuator
		(320D)	Rudder Balance Weight
		(340A)	Elevator Trim Tab Actuator

Access Plates/Panels Identification
Figure 2 (Sheet 5)

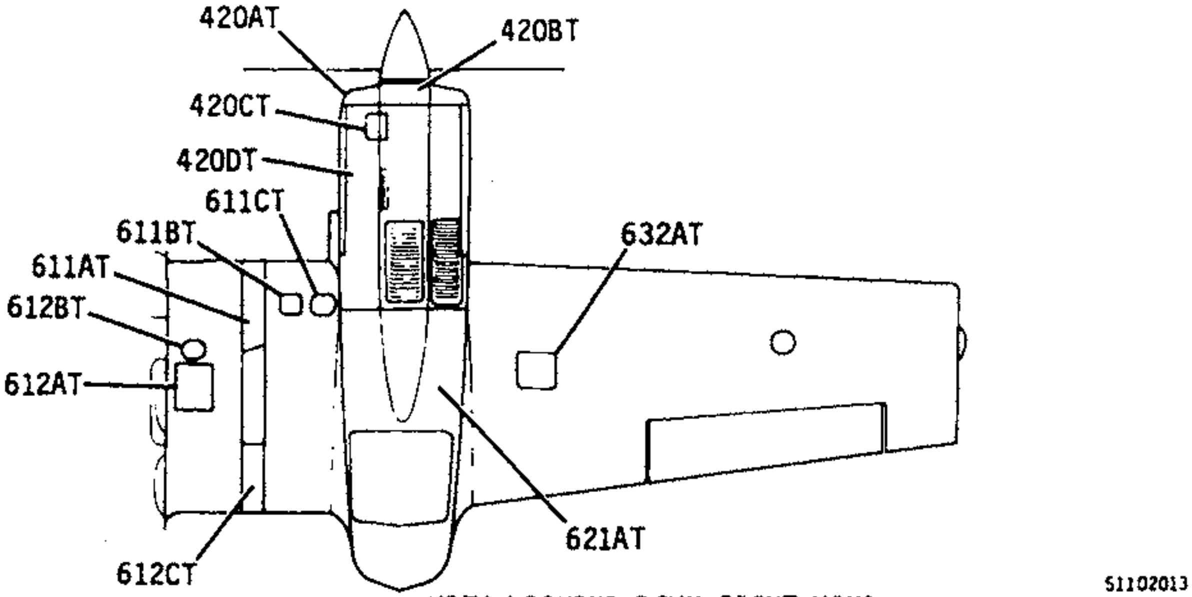


VIEW LOOKING DOWN LEFT WING

51102013

(410AT) Propeller Deice Brush Block
(410BT) Propeller Deice Brush Block
(410CT) Oil Fill Tube
(410DT) Air Induction Filter
Deice Flow Valve
Deice Light
Fuel Flow Transducer
Fuel Pressure Switch
Oil Cooler
Tachometer Generator
(511AT) Deice Lines
Deice Pressure Regulating Valve
Engine Control Cables
Fuel Lines
Instrumentation Lines
Wing Spar Bolts (Forward)
(511BT) Deice Lines
Engine Control Cables
Fuel Lines
Hydraulic Lines
Instrumentation Lines
Wire Bundle
(511CT) Deice Lines
Deice Flow Valve
Engine Control Cable
Fuel Lines
Fire Extinguisher Bottle
(511CT) Hydraulic Flow Check Valve
Hydraulic Lines
Instrumentation Lines
Wire Bundle
(512AT) Avionics Power Buss Circuit Breaker
Fuse Panel
(512BT) Battery
Battery Box
(512DT) Wing Spar Bolts (AFT)
(532AT) Fuel Bay

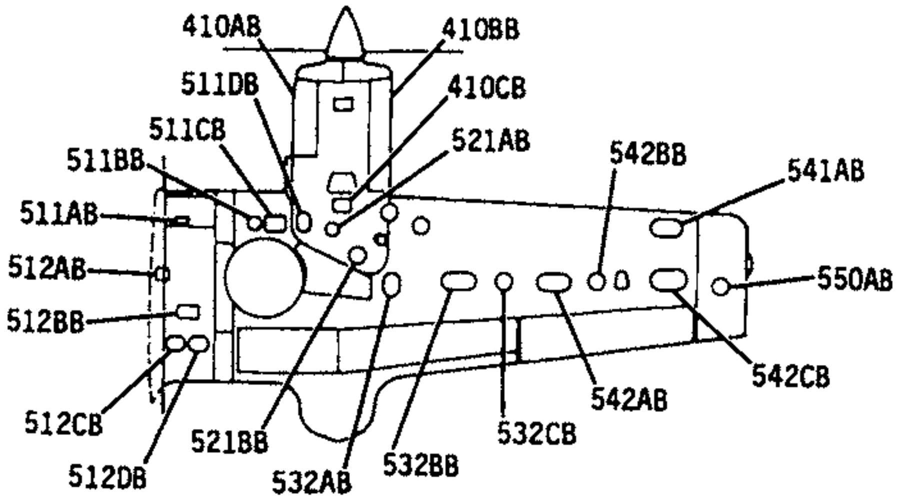
Access Plates/Panels Identification
Figure 2 (Sheet 6)



VIEW LOOKING DOWN RIGHT WING

(420AT) Propeller Deice Brush Block
(420BT) Propeller Deice Brush Block
(420CT) Oil Fill Door
(420DT) Air Induction Filter
Deice Filter
Deice Flow Valve
Deice Light
Fuel Flow Transducer
Fuel Pressure Switch
Oil Cooler
Tachometer Generator
(611AT) Deice Lines
Deice Pressure Regulating Valve
Engine Control Cable
Fuel Lines
Hydraulic Lines
Instrumentation Lines
Wing Spar Bolts (Forward)
(611BT) Deice Lines
Engine Control Cable
Fuel Lines
Hydraulic Lines
Instrumentation Lines
Wire Bundle
(611CT) Deice Lines
Deice Flow Valve
Engine Control Cables
Fuel Lines
Fire Extinguisher Bottle
Hydraulic Flow Check Valve
Hydraulic Lines
Instrumentation Lines
Wire Bundle
(612AT) Static Inverter
(612BT) Static Inverter
(612CT) Wing Spar Bolts (AFT)
(621AT) Airconditioning Compressor
Airconditioning Condensor
Airconditioning High Temperature Switch
Airconditioning Low Temperature Switch
Airconditioning Receiver Dryer
Airconditioning Sight Gage
Hydraulic Manifold (Airconditioning)
Hydraulic Reservoir (Airconditioning)
(632AT) Fuel Bay

Access Plates/Panels Identification
Figure 2 (Sheet 7)

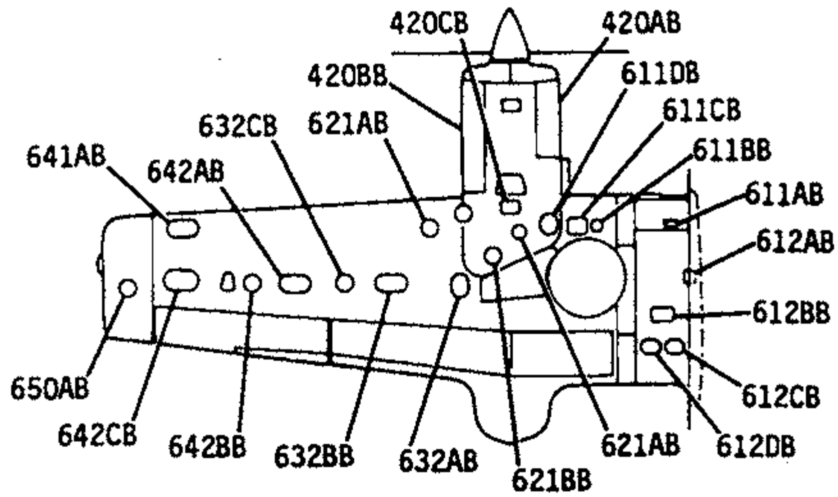


VIEW LOOKING DOWN LEFT WING

51112013

(410AB) Engine Mounts
Manifold Drain Valve
(410BB) Engine Mounts
Exhaust Gas Temperature Probe
Propeller Unfeathering Accumulator
(410CB) Oil Separator
(511AB) Deice Lines
Engine Control Cable
Fuel Drain Valve
Fuel Lines
Heat Exchanger
Hydraulic Lines
Instrumentation Lines
Wire Bundle
(511BB) Deice Lines
Engine Control Cables
Fuel Lines
Hydraulic Lines
Instrumentation Lines
(511CB) Deice Lines
Deice Flow Valve
Engine Control Cable
Fuel Lines
Fire Extinguisher Bottle
(511CB) Hydraulic Lines
Instrumentation Lines
Wire Bundle
(512AB) Bulkhead Feed-Thru
(512BB) Flap Cable Pulleys
(512CB) Aileron Cable Pulleys
Aileron Trim Cable Pulleys
(512DB) Aileron Trim Cable Pulleys
(521AB) Bulkhead Feed-Thru
(521BB) Fuel Filter
(531AB) Fuel Inlet Valve
(532AB) Fuel Filter
Fuel Pump
Fuel Selector Valve
Fuel Signal Conditioner
(532BB) Fuel Sensing Unit
(532CB) Fuel Sensing Unit
(541AB) Fuel Bay
(542BB) Fuel Sensing Unit
(542CB) Fuel Bay
(550AB) Landing Light Power Supply

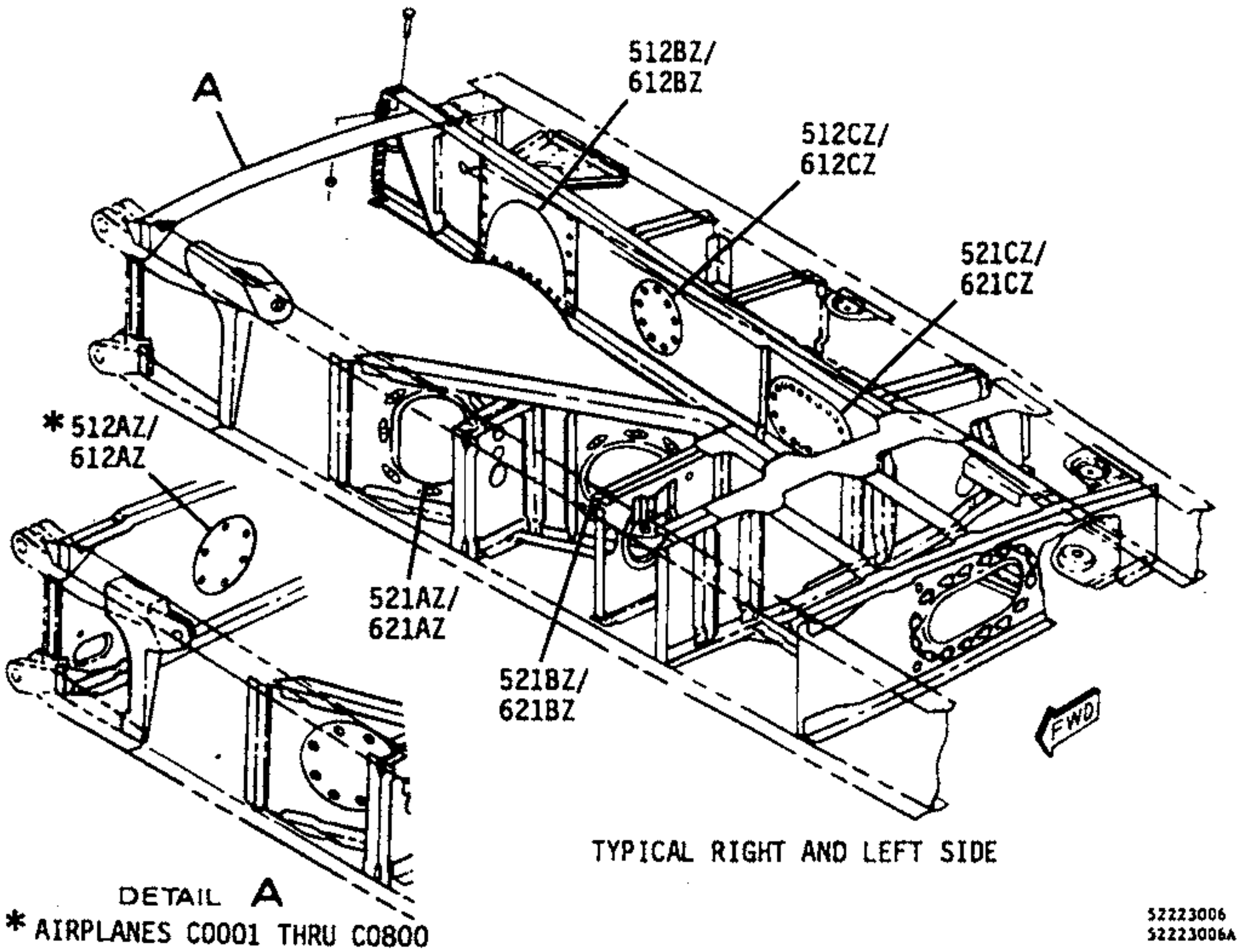
Access Plates/Panels Identification
Figure 2 (Sheet 8)



VIEW LOOKING DOWN RIGHT WING

(420AB) Engine Mounts
Manifold Drain Valve
(420BB) Engine Mounts
Exhaust Gas Temperature Probe
Propeller Unfeathering Accumulator
(420CB) Oil Separator
(611AB) Deice Lines
Engine Control Cables
Fuel Drain Valve
Fuel Lines
Heat Exhanger
Heater Fuel Filter
Heater Fuel Shut-Off Valve
Hydraulic Lines
Instrument Lines
(611BB) Deice Lines
Engine Control Cables
Fuel Lines
Instrumentation Lines
(611CB) Deice Lines
Deice Flow Valve
Engine Control Cable
Fuel Lines
Fire Extinguisher Bottle
(611CB) Hydraulic Lines
Instrumentation Lines
Wire Bundle
(612AB) Bulkhead Feed-Thru
(612BB) Flap Cable Pulleys
(612CB) Aileron Trim Cable Pulleys
(612DB) Aileron Trim Cable Pulleys
(621AB) Bulkhead Feed-Thru
(621BB) Fuel Filter
(631AB) Fuel Inlet Valve
(632AB) Fuel Filter
Fuel Pump
Fuel Selector Valve
Fuel Signal Conditioner
(632BB) Fuel Sensing Unit
(632CB) Fuel Sensing Unit
(641AB) Fuel Bay
(642BB) Fuel Bay
(642BB) Fuel Sensing Unit
(642CB) Fuel Bay
(650AB) Landing Light Power Supply

Access Plates/Panels Identification
Figure 2 (Sheet 9)



(512AZ)	Wing Cap Access	(612AZ)	Refer to 512AZ
(512BZ)	Flap Bellcrank Rear Spar Bolts	(612BZ)	Refer to 512BZ
(512CZ)	Flap Cable Pulleys Fuel Drain Valve Fuel Line	(612CZ)	Refer to 512CZ
(521AZ)	Engine Control Cable Fuel Line Fuel Selector Control Cable Hydraulic Line	(621AZ)	Refer to 521AZ
(521CZ)	Flap Bellcrank	(621BZ)	Refer to 521BZ
		(621CZ)	Refer to 521CZ

Access Plates/Panels Identification
Figure 2 (Sheet 10)

SIDE OF FUSELAGE
AIRPLANES C0001 THRU C0200

SIDE OF FUSELAGE
AIRPLANES C0201 THRU C0400

cessna

SIDE OF FUSELAGE
AIRPLANES C0001 THRU C0200

cessna

SIDE OF FUSELAGE
AIRPLANES C0201 THRU C0400

wide oval cabin

SIDE OF FUSELAGE
AIRPLANES C0201 THRU C0400

Golden Eagle

SIDE OF FUSELAGE
AIRPLANES C0001 THRU C0200

GoldenEagle

SIDE OF FUSELAGE
AIRPLANES C0001 THRU C0400

Golden Eagle II

SIDE OF FUSELAGE
AIRPLANES C0001 THRU C0200

421

CONTROL WHEEL PAD
AIRPLANES C0001 THRU C0401

GoldenEagleII

SIDE OF FUSELAGE
AIRPLANES C0201 THRU C0400

Cessna

SIDE OF FUSELAGE

Golden Eagle

CONTROL WHEEL PAD
AIRPLANES C0801 THRU C1800

SIDE OF FUSELAGE

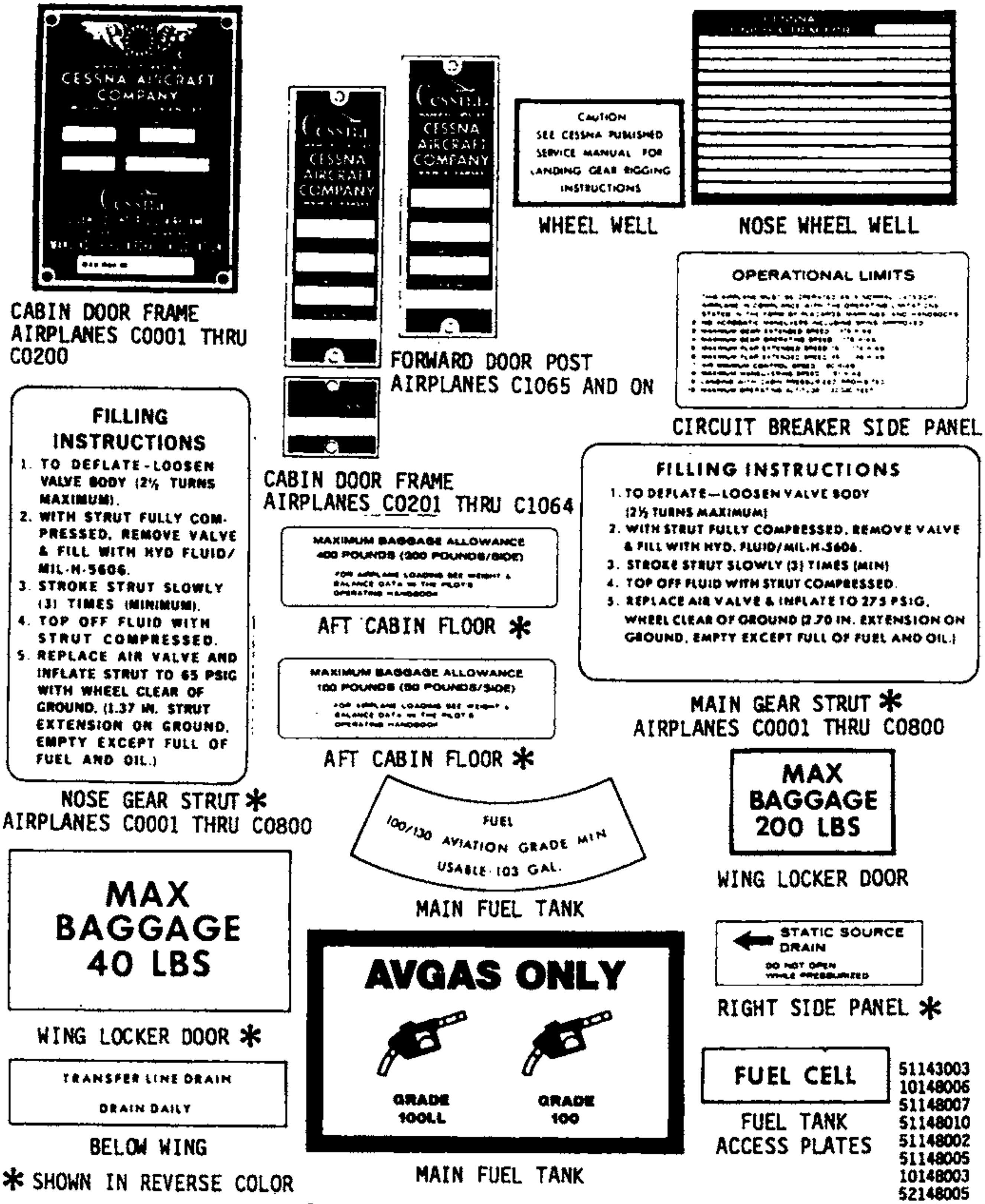
421 Golden Eagle

AIRPLANE C1801 AND ON

SIDE OF FUSELAGE

SIDE OF FUSELAGE

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 1 of 11)



Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 2)

FUEL TRANSFER
100/130 AVIATION GRADE MIN
USABLE 28 GAL

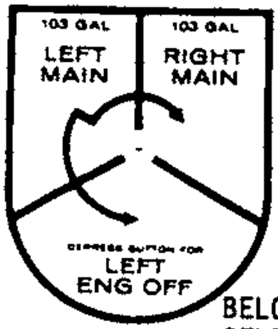
AUXILIARY FUEL TANK

TANK & SUMP
DRAINS

BOTTOM OF WING

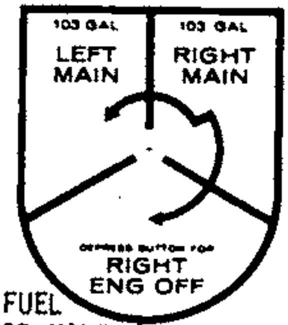
FUEL STRAINER DRAIN DAILY
NOTE
IF WATER IS OBSERVED AT THE FUEL STRAINER FUEL TANK SUMPS MUST BE DRAINED

BOTTOM OF WING



421C0001
THRU 421C0600

BELOW FUEL
SELECTOR HANDLE



421C0001
THRU 421C0600

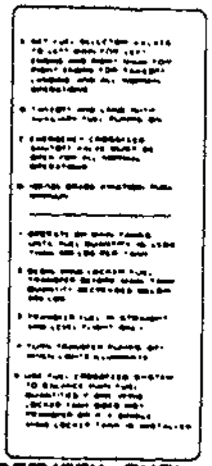
A SET FUEL SELECTOR VALVES TO LEFT MAIN FOR LEFT ENGINE AND RIGHT MAIN FOR RIGHT ENGINE FOR TAKEOFF LANDING AND ALL NORMAL OPERATIONS

B TAKEOFF AND LAND WITH AUXILIARY FUEL PUMPS ON

C EMERGENCY CROSSFEED SHUTOFF VALVE MUST BE OPEN FOR ALL NORMAL OPERATIONS

D 100/130 GRADE AVIATION FUEL MINIMUM

BETWEEN FUEL
SELECTOR HANDLES*
421C0001 THRU 421C0600



BETWEEN FUEL
SELECTOR HANDLES*
421C0001 THRU 421C0600

LEVER UP
CROSSFEED
OFF

BELOW CROSSFEED LEVER*

CROSSFEED LINE
DRAINS
DRAIN DAILY

BELOW WING

ALCOHOL ANTI-ICE
FILL WITH
ISOPROPYL ALCOHOL
MIL-F-5566
TANK CAP. 3.0 GAL.

DOOR TO ALCOHOL FILLER
RIGHT WING

EMERGENCY CROSSFEED
SHUTOFF VALVE
PULL
TO SHUTOFF

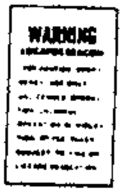
ON CROSS- *
FEED LEVER

TURN LIMITS
DISENGAGE RUDDER & CONTROL
LOCKS BEFORE GROUND HANDLING

NOSE GEAR

INSTALL
JACK PAD
HERE

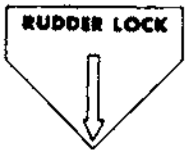
BELOW WING AND
NOSE SECTION



INSTRUMENT
PANEL*

AFT FACING SEAT BACK MUST BE
ERECT FOR TAKEOFF & LANDING

ON WALL
OPPOSITE EMERGENCY
EXIT WINDOW



ON CONTROL
LOCK*

PROP UNFEATHERING ACCUMULATORS
ARE INSTALLED ON THIS AIRPLANE

INSTRUMENT PANEL

*SHOWN IN REVERSE COLOR

52148005
10148002
51148010
51148007
51148006
51148008
10148003
53148002
51148005
10148001

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 3)

PLACE LEVEL BETWEEN
MARKS FOR LATERAL LEVELING

BOTTOM OF FUSELAGE

LEVEL
POINT

SIDE OF FUSELAGE

EXTERNAL POWER
24 VOLTS D. C.

APU RECEPTACLE DOOR

MOORING & GROUND
PUSH AFT

LOWER WING

OXYGEN HIGH
PRESSURE RELIEF
DO NOT COVER

SIDE OF NOSE

OXYGEN FILLER
AVIATORS BREATHING OXYGEN
PER MIL-0-27210
SEE SERVICE MANUAL FOR
SERVICING INSTRUCTIONS

ADJACENT TO
OXYGEN FILLPORT *

CAUTION
PRIOR TO INITIAL USE
THE OXYGEN SYSTEM
SHALL BE PURGED
WITH OXYGEN FOR A
PERIOD OF TEN (10)
MINUTES BY INSERTING
MASK FITTINGS AT EACH
OF THE OUTLETS AND
ALLOWING THE OXYGEN
TO FLOW THROUGH
SLOWLY

ADJACENT TO
OXYGEN BOTTLE *

G/S
NAV 1

INSTRUMENT
PANEL

-CAUTION-
WHEN REMOVING
OXYGEN BOTTLE,
CAP LINE FITTING
WITH PLASTIC CAP

ADJACENT TO
OXYGEN BOTTLE *

EXTERNAL HYD.
RESERVOIR FILL
MIL-H-5606

INSIDE LEFT NOSE
BAGGAGE DOOR

CLOSE
OPEN

CABIN DOOR
421C0001 THRU 421C0600

N4XXX

* INSTRUMENT PANEL

LOCATOR
BEACON

INSTRUMENT PANEL *

HEATER
OVERHEAT SWITCH

NOSE WHEEL WELL

RNAV ONLY FOR VFR

INSTRUMENT PANEL
GERMAN AIRPLANES ONLY

MAXIMUM BAGGAGE XX.X
MAX CAPACITY 350 LBS LESS
XX.X OPTIONAL EQUIP

NOSE BAGGAGE DOOR
421C0001 THRU 421C0600

* SHOWN IN REVERSE COLOR

10148003
51148002
51148004
52148011
52148005

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 4)

0°
176 KIAS
15°
146 KIAS
30°
FLAPS
45°

FLAP SELECTOR HANDLE*

EMERGENCY EXIT HANDLE

BELOW EMERGENCY EXIT WINDOW

EMERGENCY EXIT
1. TURN HANDLE OPEN
2. PULL DOOR INBD & DOWN

BELOW EMERGENCY EXIT WINDOW

LOCATOR BEACON
TEST & EMER
NORM — ON & TEST

INSTRUMENT PANEL

LOCATOR BEACON
DISARM SWITCH
OFF — NORM
DEACTIVATE AFTER RESCUE

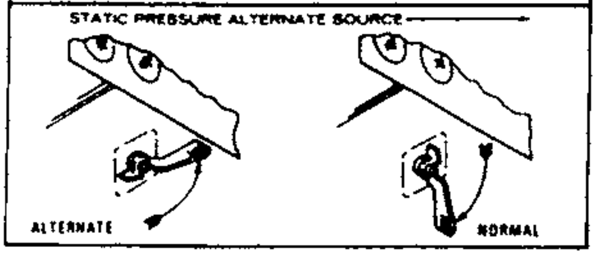
88

ACCEPTABLE INDICATED CONTAINER PRESSURES

TEMP °F	MINIMUM	MAXIMUM
-60	110	134
-40	127	155
-20	148	180
0	174	212
+20	207	251
+40	249	299
+60	304	354
+70	335	385
+80	387	417
+100	442	492
+120	532	582

FIRE EXTINGUISHER BOTTLE
421C0801 AND ON

PARKING BRAKE
TO APPLY BRAKES, DEPRESS RUDDER PEDALS, THEN PULL KNOB.
TO RELEASE PUSH IN KNOB. DO NOT DEPRESS RUDDER PEDALS.



SIDE OF CIRCUIT BREAKER CONSOLE

EMERGENCY LOCATOR TRANSMITTER INSTALLED AFT OF THIS PARTITION MUST BE SERVICED IN ACCORDANCE WITH FAR PART 91.52

AFT CABIN BULKHEAD*
C0079 AND ON

MAPLIGHT
MAXIMUM SPEED FOR AUTOPILOT OPERATION IS 230 KIAS - DO NOT LEAVE CONTROLS UNATTENDED WHILE AUTOPILOT IS ENGAGED.
OFF

PILOTS CONTROL WHEEL

DOOR OPERATION
OPEN
1. CLOSE DOOR
2. INSERT SAFETY PIN FROM BOTTOM SIDE OF HANDLE
3. CHECK SAFETY PIN FOR POSITIVE ENGAGEMENT
CLOSE

CABIN DOOR

APPLY EXTRA FORCE IN EMERGENCY TO OVERCOME INTERNAL HANDLE NORMAL RESTRAINT

CABIN DOOR*

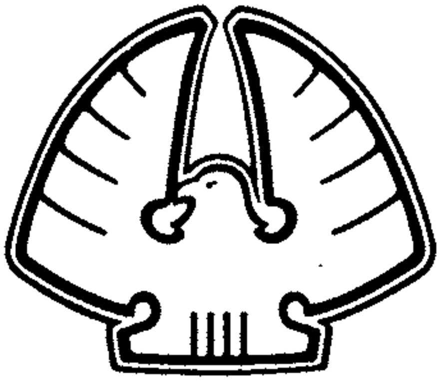
FLT HR
&
LOC BCN

INSTRUMENT PANEL*
C0201 AND ON

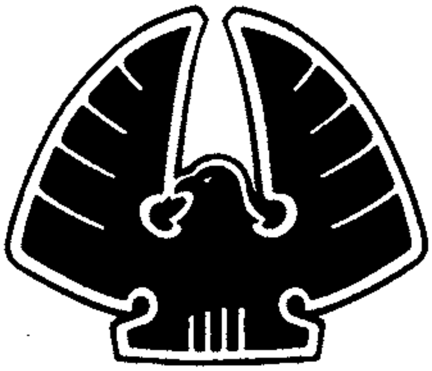
*SHOWN IN REVERSE COLOR

51148010
51148004
58148010
51148008

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 5)



SIDE OF FUSELAGE
C0401 TO C0800



SIDE OF FUSELAGE
C0800 THRU C1000

GOLDEN EAGLE

SIDE OF FUSELAGE
C0401 TO C0600

GOLDEN EAGLE II

SIDE OF FUSELAGE
C0401 TO C0600

GOLDEN EAGLE III

SIDE OF FUSELAGE
C0401 TO C0600

CESSNA421

SIDE OF FUSELAGE
C0401 TO C0600

51148009
58148008
58148011

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 6)

421 GOLDEN EAGLE III

ENGINE NACELLE
C0601 TO C0800

421 GOLDEN EAGLE II

ENGINE NACELLE
C0601 TO C0800

421 GOLDEN EAGLE

ENGINE NACELLE
C0601 TO C0800

CESSNA 421 GOLDEN EAGLE III

ENGINE NACELLE
C0601 TO C0800

CESSNA 421 GOLDEN EAGLE II

ENGINE NACELLE
C0801 AND ON

CESSNA 421 GOLDEN EAGLE

ENGINE NACELLE
C0801 AND ON

51148009
58148008
58148011

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 7)

CESSNA comfort capsule

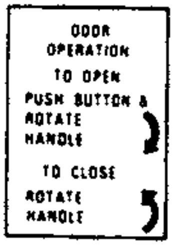
SIDE OF FUSELAGE
C0401 AND ON

EMERGENCY LOCATOR TRANSMITTER
INSTALLED AFT OF THIS PARTITION
MUST BE SERVICED IN ACCORDANCE
WITH FAR PART 91.52

AFT CABIN BULKHEAD *
C0001 THRU C0453

THE EMERGENCY LOCATOR TRANSMITTER
INSTALLED INSIDE THIS COMPARTMENT
MUST BE SERVICED IN ACCORDANCE
WITH PART 91.52

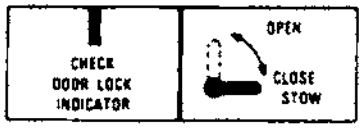
TAILCONE DOOR
C0454 THRU C1400



CABIN DOOR
421C0601 AND ON

TAIL SECTION
C0601 AND ON

CABIN DOOR *
C0601 AND ON



CABIN DOOR *
C0601 AND ON

SET FUEL SELECTOR VALVES TO LEFT MAIN FOR LEFT ENGINE AND RIGHT MAIN FOR RIGHT ENGINE FOR TAKEOFF, DESCENT, LANDING, AND ALL NORMAL OPERATIONS

TAKEOFF AND LAND WITH AUXILIARY FUEL PUMPS ON

EMERGENCY CROSSFEED SHUTOFF VALVE MUST BE OPEN FOR ALL NORMAL OPERATIONS

100 GRADE AVIATION FUEL MINIMUM

BETWEEN FUEL SELECTOR HANDLES *
C0601 AND ON

SET FUEL SELECTOR VALVES TO LEFT MAIN FOR LEFT ENGINE AND RIGHT MAIN FOR RIGHT ENGINE FOR TAKEOFF, LANDING, AND ALL NORMAL OPERATIONS

TAKEOFF AND LAND WITH AUXILIARY FUEL PUMPS ON

EMERGENCY CROSSFEED SHUTOFF VALVE MUST BE OPEN FOR ALL NORMAL OPERATIONS

100 GRADE AVIATION FUEL MINIMUM

1 OPERATE ON MAIN TANKS UNTIL FUEL QUANTITY IS LESS THAN 400 LBS PER TANK.

2 BEGIN WING LOCKER FUEL TRANSFER BEFORE MAIN TANK QUANTITY DECREASES BELOW 200 LBS

3 TRANSFER FUEL IN STRAIGHT AND LEVEL FLIGHT ONLY

4 TURN TRANSFER PUMPS OFF WHEN LIGHTS ILLUMINATE

5 USE FUEL CROSSFEED SYSTEM TO BALANCE MAIN FUEL QUANTITIES IF ONE WING LOCKER TANK DOES NOT TRANSFER OR IF A SINGLE WING LOCKER TANK IS INSTALLED

BETWEEN FUEL SELECTOR HANDLES *
C0601 AND ON

51148009
51148010
52148010

* SHOWN IN REVERSE COLOR

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 8)

100 GRADE AVIATION FUEL MINIMUM
USABLE - 28 GAL

AUXILIARY FUEL TANK
C0601 AND ON

100 GRADE AVIATION FUEL MINIMUM
USABLE 103 GAL

MAIN FUEL TANK
C0601 AND ON

CAUTION
USE DETERGENT
OIL ONLY PER
CONTINENTAL SPEC
MHS-24
CAPACITY 12 QUARTS
(13 QUARTS WHEN
CHANGING OIL AND
FILTER)

OIL FILLER DOOR *
C0601 AND ON

Cessna ENGINE OIL
ALL TEMP. USE SAE 20W 50 OR
ABOVE 4°C (40°F) USE SAE 50
BELOW 4°C (40°F) USE SAE 30
TACH HOURS DATE
OIL CHANGED:
OIL USED:
USE ONLY DETERGENT OIL THAT COMPLIES WITH TCM SPEC.
MHS-24B CESSNA DEALERS HAVE LIST OF APPROVED OILS

INSIDE ENGINE COWL DOOR
C0708 THRU C1242

Cessna ENGINE OIL
TACH HOURS DATE
OIL CHANGED:
OIL USED:

C1243 AND ON

OPERATIONAL LIMITS ON REVERSE SIDE

PILOTS SUN VISOR
C0801 AND ON

M.G. FILLING INSTRUCTIONS
NOTE AIR VALVE MUST ALWAYS FACE AFT ON AIRCRAFT
1 ROTATE OUTER HEX CCW (2½ TURNS MAXIMUM) ON VALVE ASSY TO LIFT INTERNAL VALVE POPPET COLLAPSE STRUT SLOWLY
2 WITH STRUT FULLY COLLAPSED REMOVE PLUG AT TOP OF STRUT ATTACH HAND PUMP OR EQUIVALENT AND FILL WITH HYDRAULIC FLUID/MIL-H-5606 UNTIL STRUT IS FULLY EXTENDED
3 APPLY 750 ± 50 PSIG HYDRAULIC PRESSURE RELIEVE PRESSURE AND COLLAPSE STRUT ALLOWING AIR TO ESCAPE
4 REPEAT STEPS TWO AND THREE UNTIL ALL AIR IS EXPELLED FROM UPPER STRUT (THREE CYCLES MINIMUM)
5 TOP OFF FLUID WITH STRUT FULLY COLLAPSED AND REPLACE PLUG AT TOP OF STRUT
6 CHARGE STRUT TO 250 PSIG ALLOWING STRUT TO FULLY EXTEND ROTATE OUTER HEX CW ON VALVE ASSY TO CLOSE INTERNAL POPPET
7 WITH STRUT FULLY EXTENDED BLEED PRESSURE TO 170 PSIG (NO HYDRAULIC FLUID PERMITTED IN LOWER CHAMBER IF FLUID EXISTS, REPLACE THE ISOLATION PISTON SEAL)
8 SECURE VALVE POPPET & CAP SYSTEM

TIRE PRESSURE 80 PSIG

MAIN LANDING GEAR *
C0801 AND ON

OPERATIONAL LIMITS
THE MARKINGS AND PLACARDS INSTALLED IN THIS AIRPLANE CONTAIN OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS AIRPLANE IN THE NORMAL CATEGORY OTHER OPERATING LIMITATIONS WHICH MUST BE COMPLIED WITH WHEN OPERATING THIS AIRPLANE IN THE NORMAL CATEGORY ARE CONTAINED IN THE "PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL"
NO ACROBATIC MANEUVERS, INCLUDING SPINS, APPROVED
AIR MINIMUM CONTROL SPEED — 80 KIAS
MAXIMUM GEAR OPERATING SPEED — 176 KIAS
MAXIMUM GEAR EXTENDED SPEED — 176 KIAS
MAXIMUM FLAP EXTENDED SPEED, 15° FLAP — 176 KIAS
MAXIMUM FLAP EXTENDED SPEED, 45° FLAP — 146 KIAS
MAXIMUM MANEUVERING SPEED — 151 KIAS
LANDING WITH CABIN PRESSURIZED PROHIBITED
THIS AIRPLANE IS APPROVED FOR DAY-NIGHT VFR CONDITIONS IT IS APPROVED FOR DAY-NIGHT IFR CONDITIONS AND FLIGHTS INTO ICING CONDITIONS IF THE PROPER EQUIPMENT IS INSTALLED AND OPERATIONAL

PILOTS SUN VISOR *
C0601 AND ON

DURING TAKEOFF & LAND
DRAWER MUST BE IN STOWED
POSITION

STORAGE DRAWER *
C0802 AND ON

N.G. FILLING INSTRUCTIONS
1 ROTATE OUTER HEX CCW (2½ TURNS MAXIMUM) ON VALVE ASSY TO LIFT INTERNAL VALVE POPPET COLLAPSE STRUT SLOWLY
2. WITH STRUT FULLY COMPRESSED, REMOVE VALVE AND FILL WITH HYDRAULIC FLUID/MIL-H-5606
3 STROKE STRUT SLOWLY (THREE TIMES MINIMUM)
4 TOP OFF FLUID WITH STRUT COMPRESSED
5 REPLACE VALVE AND INFLATE STRUT TO 75 PSIG WITH TIRE CLEAR OF GROUND (1.37 INCH STRUT EXTENSION ON GROUND EMPTY EXCEPT FULL OF FUEL AND OIL, REF ONLY)
6 SECURE VALVE POPPET AND CAP SYSTEM

TIRE PRESSURE 50 PSIG

NOSE LANDING GEAR *
C0801 AND ON

* SHOWN IN REVERSE COLOR

51148001
51148010
51148011
54148001

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 9)

UP
GEAR + GEAR
DOWN

INSTRUMENT PANEL

EMER. GEAR CONTROL
1. GEAR SELECT—DOWN
2. GEAR HYD C/B—PULL
3. "T"—HANDLE—PULL

INSTRUMENT PANEL
C0001 THRU C1600

MAX OPER & EXTD SPEED 176 KIAS
GEAR
UP + ON
GEAR

INSTRUMENT PANEL
C1001 AND ON

MUST BE OFF FOR TAKEOFF LDG. AND ONE ENG. OPER.

INSTRUMENT PANEL
C0001 THRU C0800

EMER GEAR CONTROL
1. AIRSPEED-130 KIAS OR LESS
2. GEAR SELECT-DOWN
3. GEAR HYD C/B-PULL
4. "T"-HANDLE-PULL

INSTRUMENT PANEL
C1601 AND ON

PHASING

INSTRUMENT PANEL
C0801 AND ON

MAGNETIC COMPASS DEVIATIONS GREATER THAN 10° CAN BE EXPECTED WHEN D.C. HEATED WINDSHIELD IS IN OPERATION.

INSTRUMENT PANEL
C0801 AND ON

DOOR MUST BE OPEN AND SECURED FOR TAKEOFF, LANDING AND SMOKE REMOVAL
NO SMOKING WITH DIVIDER CLOSED

ON CABIN DIVIDER DOOR

-HOURS-
HEATER OPERATION

INSTRUMENT PANEL

MANUAL INSIDE

GLOVE BOX DOOR

WARNING FOR DISPOSAL
REFER TO SERVICE MAINTENANCE MANUAL FOR DISPOSAL PROCEDURES
UNIT IS UNDER PRESSURE 7105034-1

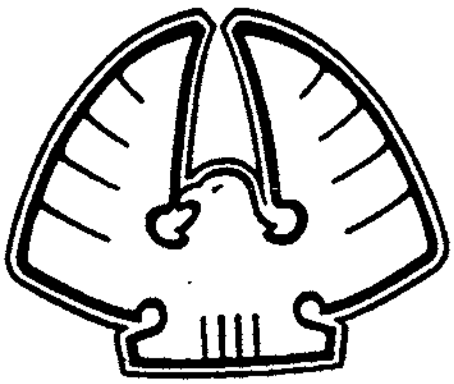
ON DOOR EXTENDER

WARNING
ASSURE THAT SEAT IS LOCKED IN POSITION PRIOR TO TAXI, TAKEOFF, AND LANDING. FAILURE TO PROPERLY LATCH SEAT AND HEED ALL SAFETY INSTRUCTIONS CAN RESULT IN BODILY INJURY OR DEATH. 0705097-1

ON THE RIGHT-HAND LOWER PORTION OF THE INSTRUMENT PANEL.

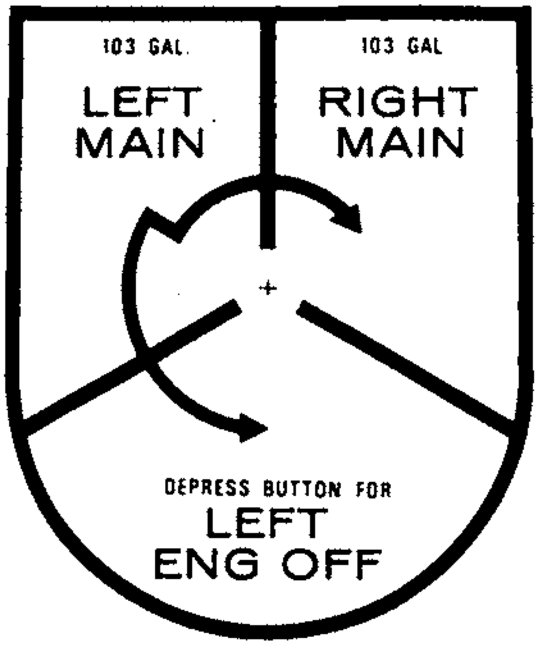
WARNING
ASSURE THAT ALL CONTAMINATES, INCLUDING WATER, ARE REMOVED FROM FUEL AND FUEL SYSTEM BEFORE FLIGHT. FAILURE TO ASSURE CONTAMINATE FREE FUEL AND HEED ALL SAFETY INSTRUCTIONS AND OWNER ADVISORIES PRIOR TO FLIGHT CAN RESULT IN BODILY INJURY OR DEATH. 0705098-1

ON THE RIGHT-HAND LOWER PORTION OF THE INSTRUMENT PANEL.

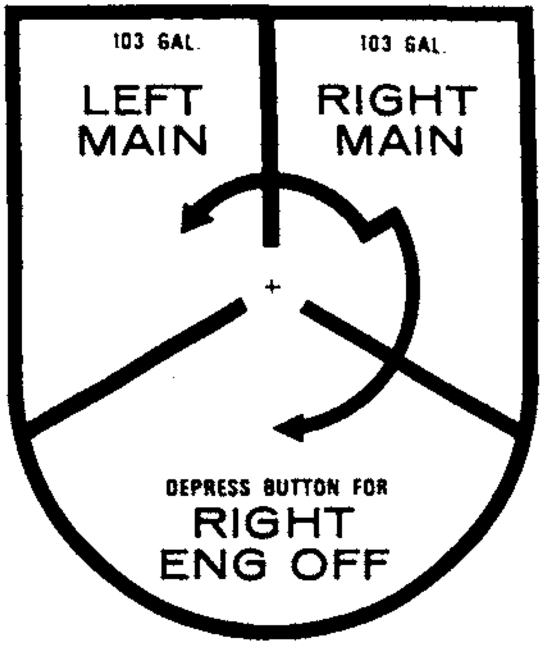


SIDE OF FUSELAGE
C1001 AND ON

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 10)



BELOW FUEL SELECTOR HANDLE



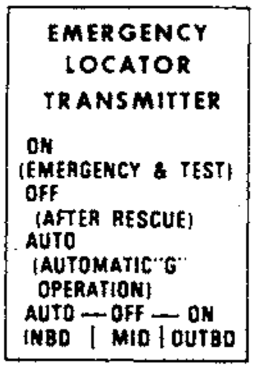
BELOW FUEL SELECTOR HANDLE

INSIDE WING LOCKER DOOR

INSIDE NOSE BAGGAGE DOOR
C0601 AND ON

& GND START

CONTROL QUADRANT COVER
C1001 AND ON



RIGHT SIDE OF TAILCONE
C1407 AND ON

TAILCONE ACCESS DOOR
C1407 AND ON

Nameplates, Placards and Exterior Markings
Figure 1 (Sheet 11)

The General Aviation Manufacturers Association (Gama) Fuel Information Decal

1. The GAMA Fuel Information Decal has been designed to prevent misfueling (use of improper fuel) of general aviation airplanes. The color-coded fuel information decal (matches color-coded fuel filler nozzle) may be applied to any certificated airplane (location to be adjacent to each fuel filler on airplane) as long as FAA required fuel filler markings approved for that airplane are retained and the information on the color-coded decal does not conflict with information on the required fuel filler markings.

2. Application of Fuel Information Decal.

   NOTE: The color-coded fuel information decal must be applied adjacent to each fuel filler on the airplane.

3. Application of decal.

   NOTE: Minimum Application temperature is 35°F.

   A. Clean surface adjacent to each fuel filler with a mild solvent and dry.
   B. Remove protective liner from decal.
   C. Locate decal and apply with a plastic squeegee.
   D. Remove premask by pulling it back over itself.

4. Removal of decal.

   A. Cover the decal with a hot, wet towel for approximately two minutes.
   B. Lift one corner of decal and slowly remove.

CLEANING, PAINTING AND SEALING

Description

1. To improve the appearance of the airplane and retard the formation of corrosion, the airplane exterior should be cleaned at frequent intervals to remove dirt, exhaust deposits and other contaminants.

2. Materials for maintaining the exterior and interior of the airplane are listed in this chapter. It is recommended that chemical supplier's bulletins and instructions be closely followed for proper mixing of solutions, application methods and safety precautions.

   WARNING: USE NORMAL SAFETY PRECAUTIONS WHEN USING FLAMMABLE MATERIALS DURING CLEANING AND PAINTING PROCEDURES.

3. Corrosion treatment is applied to surfaces impractical to remove from the airplane for immersion treatment. Exercise caution to prevent additional damage to airplane assemblies and finish.

4. Paint stripper solution is harmful to the eyes and skin. Wear goggles, rubber gloves, apron and boots when working with paint stripper.

5. Deicing fluid is used to clear ice and frost from exterior surfaces. Deicing fluid is not intended for snow removal.

Protective Treatment of Metal

1. Any repair process which breaks the surface of original structure requires a protective treatment. The treatment acts as a paint base and corrosion protection when applied prior to the installation of repair parts.

2. Structural components whose surfaces have not been damaged beyond the limits of allowable damage or whose surfaces have been damaged by corrosion must be protective treated.

Finish Specification and Code Number

1. Finish Specification

	Aluminum	Non-Corrosion Resistant Steel	Corrosion Resistant Steel	Fiberglass	Plastics	Magnesium
Fuselage	5 3			4	1	
Interior		F8				F7-3
Exterior		--	--			F7-3
Empennage	5			4	1	
Interior		F8				F7-3
Exterior		--	--			F7-3
Wings Integral Fuel Tank	6					
Interior	F25-23	F8-23	--			
Exterior	F25-23	--				
Wings-Non-Integral Fuel Tank	5 3					
Interior		F35				F7-3
Exterior		--	--			
Nacelle	5					
Interior		F38				
Exterior						
Landing						
Internal	F27-23	F35-23				F7-23
External	F27-23-29	F35-23-29				F7-23
Control Wheels						F1-25
Plumbing - All except Oxygen	2					
Interior						
Exterior						
Oxygen Tubing	2					
Interior						
Exterior						

NOTES :

1 (1) All ABS thermoplastic surfaces, that are to receive a finish, shall be wiped clean with isopropyl alcohol and then softened by spray coating with thinner. Vinyl enamel or lacquer topcoats may be applied directly to the surface while it is still tacky.

(2) Polycarbonate surfaces that are to receive a finish shall be cleaned with isopropyl alcohol and primed per CES-2607. Care should be taken so parts are properly annealed per CES-2909 if annealing is required.

2 Interior surfaces of tubing shall receive no finish and shall be cleaned in accordance tith CES-2605. The external surfaces of tubing shall receive F27 chemical film only if it is to be subsequently primed. The primer shall be the primer used for the area of the airplane in which the tubing is installed.

3 Areas subject to battery electrolyte, hydraulic oil, fuel or synthetic turbine oils shall receive F27-23 finish.

4 Surfaces shall be finished to match the interior color scheme, if desired.

5 Non-clad aluminum alloys 2024, 7075, 7178 and other high strength, non-clad alloys require F27-15 and F48-15 or F27-23 finish.

6 This finish is for aluminum surfaces that have been coated with adhesive epoxy primer (bonding primer) per CES-2694 or CES-2138. For uncoated aluminum surfaces, the finish shall be F27-23.

2. The code number may be composed of one, two or three dash numbers as required to finish a part.
   A. The order of dash numbers specifies the sequence of application.
   B. The finish code numbers are listed in table form.
   C. The application of the finish is referenced in the description column.

3. Finish Code Number.

Code Number			Description
1st	2nd	3rd	
F1			(A) Vapor Degrease (B) Chemically Clean*
F7			(A) F1 (B) Chemical Protective Treatment Magnesium
F9			(A) F11 (B) Cadmium Plate .0002 to .0003 inch
F27			(A) F1 (B) Chemical Film (Colored)
F35			Phosphate Coating
F38			Clean and Pretreat
	-1		Apply coats as required of primer as recommended by the manufacturer of the paint system being used
	-3		Apply two coats or two additional coats of low moisture-sensitive primer (Color T)
	-23		Apply 1 coat Fuel and Corrosion Resistant Epoxy Primer
		-25	Apply Heat Resistant Black Enamel
		-29	Apply one coat of Epoxy Enamel

*Several methods for chemically cleaning metals prior to painting, plating, joining, etc. The specific method to be used will depend on the type of metal and will be noted in applicable specifications.

Vapor Degreasing

1. General.
   A. Reference MIL-S-5002 for vapor degreasing and surface treatment for metal and metal parts.

2. Material.
   A. Trichloroethylene stabilized degreasing
      Perm-A-Clor and Triad; Detrex Corporation
      Blakosolv; G.S. Blakeslee and Co.

3. Procedure.
   A. Parts shall not be introduced into degreaser unless the vapor level is up to the condensing coils. Parts shall be left in vapors until clean or until there is no longer any condensation on the surfaces.
   B. Parts may be subjected to some scrubbing action or sprayed with cold solvent to aid in dislodging heavy films. Parts which are not clean shall be recycled. If parts are not clean after two cycles, chemically clean.
   C. Handling parts, which receive no further cleaning prior to painting, with the bare hands shall be minimized.

Corrosion Protection for Dissimilar Metals Contact

A. Grouping of Metals.

Group I	Group II	Group III	Group IV
Magnesium alloys	Cadmium	Martensitic stainless steels (400 series alloys)	Tin
	Zinc	Lead	Chrome plate
	All aluminum alloys (includes 6061, 6063, 2000 and 700 series alloys)	Tin	Nickel plate
		Diffused nickel-cadmium	Gold
		Chrome plate	Platinum
			silver NOTE (c)
			Titanium and its alloys
	Vacuum-deposited, pure aluminum	Tungsten and its alloys	Cobalt and rhodium and their alloys
	Beryllium * (pure)	Nickel	Austenitic Stainless steels (300 series alloys)
			Inconel
			Monel
			Tungsten and its alloys
			Copper and its alloys (includes brass and bronze)
			Lead
			Graphite
			Precipitation hardened steels (15-5 PH, 17-7 PH, 17-4 PH)

*Beryllium alloys should be classified on the basis of the major alloying element which, in most cases, is not beryllium itself.

NOTES:
(a) Metals listed in the same group should be considered compatible or similar when in contact.
(b) Low alloy (4130 and 4340) and carbon (1010 and 1005) steels are only compatible with or similar to nickel and cobalt.
(c) Cadmium and silver plated fasteners should not be used in or around titanium or its alloys due to accelerated embrittlement of titanium caused by these metals.
(d) Unless otherwise specified, any metal listed refers to both parts and/or fasteners made completely from that material and parts that are made of a different base metal but which are plated with the metal listed in the table.

EXAMPLE: Zinc includes both zinc plated fasteners and zinc castings.

(e) A metal listed under two or more group headings is compatible with all of the other metals listed in each of those groups and with itself; however, metals listed in the same group with a material which is under two different group headings should not be considered compatible with all of the other metals listed in the second group.

EXAMPLE: Chrome plate is compatible with all of the metals listed in Groups III and IV (a total of 19 other metals) but other metals in Group III, such as a Martensitic stainless steel, are not compatible with any other metals besides chrome plate listed in Group IV.

B. Requirements.

(1) Fasteners involving dissimilar metal contact should be assembled in wet paint or sealant of the type described in the applicable dissimilar metal insulation procedure.
(2) Tape must overlap parts to ensure no metal to metal contact. The minimum overlap should be 0.06 inch and the maximum overlap should be 0.19 inch.
(3) Tape to separate fluid fittings, electrical connectors, etc., from dissimilar metal parts such as bulkheads and firewalls, may be fabricated to the individual configuration.
(4) Torn, scuffed, or displaced tape should be replaced. Tape installed between parts which have been predrilled or punched, should be punctured with a sharp instrument before insertion of rivets or bolts.

C. Protective Treatment for Fastener Installation.

Fastener Material in Contact with Dissimilar Metal	Low Temperature Environment Below 250°F	High Temperature Environment 250 to 500°F
Aluminum	2 coats corrosion inhibiting primer △1	2 coats silicone enamel △2
Monel	Sealant - Type I, Class B △3	Silicone sealant Type V △4
Stainless steel	Sealant - Type I, Class B △3	Silicone sealant Type V △4
Cadmium	2 coats epoxy primer △5 or sealant - Type I, Class B △3	Silicone enamel △2 or silicone sealant △4

△1 Type 1-E Wash Primer

△2 Sherwin Williams 85955

△3 Pro Seal 890, 3M EC-1675, Products Research PR-1422

△4 General Electric RTV-106

△5 Bostik-Finch 454-4-1

(1) Shank and underside of head must be completely coated with primer or sealant and internal surfaces of hole through which fastener is driven must be completely coated.
(2) Fasteners must be driven or tightened while primer or sealant is wet.

WARNING: IN LOW TEMPERATURE ENVIRONMENTS, SPECIAL CARE MUST BE EXERCISED IN PROTECTING CADMIUM FROM TITANIUM. ABSOLUTELY NO CONTACT OF UNPROTECTED METAL IS ALLOWED. CADMIUM PLATED FASTENERS SHOULD NEVER BE COUPLED WITH TITANIUM EVEN WITH AN INSULATING BARRIER AT ELEVATED TEMPERATURES (ABOVE 250°F).

D. Assembly Procedure for Dissimilar Metals Contact.

Group Temperature Range Interior/Exterior	Not Exposed to Fuel	Exposed to Fuel
Group I below 250°F Interior	1. Anodize or chemical film 2. 4 coats wash primer 3. Tape 3M Company No. 473	
Group I below 350°F Exterior	Chemically clean 2 coats epoxy primer Tape 3M Company No. 473	Chemically clean 2 coats epoxy primer Polyurethane enamel
Group II below 250°F Interior	Aluminum Anodize or chemical film 3 coats primer Fed Std 595	Anodize or chemical film 2 coats epoxy primer
	Other Group II Chemically clean 2 coats epoxy primer	
Group II 250 to 350°F Interior	Aluminum Anodize or chemical film 2 coats epoxy primer or silicone sealant (Type V)	
	Other Group II Chemically clean 2 coats epoxy primer	
Group II Below 350°F Exterior	Anodize or chemical film (aluminum) Chemically clean (other Group II) Tape 3M Company No. 473 or polyurethane enamel	Anodize or chemical film (aluminum Chemically clean (other Group II) 2 coats epoxy primer
Group III Below 350°F		<u>Nickel, nickel cadmium</u> Chemically clean 2 coats epoxy primer
	<u>Lead</u> Tape 3M Company No. 473	
	<u>Stainless steel, tungsten</u> Tape 3M Company No. 473	<u>Stainless steel, tungsten</u> pickle, passivate 2 coats wash primer 2 coats epoxy primer
Group III 350 to 500	<u>Stainless steel, tungsten</u> difused nickel-cadmium Chemically clean General Electric RTV 105 or 2 coats silicone enamel	
Group IV Below 350°F	<u>All, except graphite</u> Vapor degrease chemically clean 2 coats wash primer epoxy primer	<u>All, except graphite</u> Vapor degrease chemically clean Pro Seal 890 Class B or polyurethane enamel
Group IV 350 to 500°F	<u>All, except graphite</u> Vapor degrease chemically clean General Electric RTV 106 or 2 coats silicone enamel	
Group IV	<u>Graphite composites</u> Layer of 181 fiberglass bonded or tape - 3M Company No. 473	

Cleaning

1. General Precautions

   A. Use chemical supplier's recommendations for mixing and applying cleaning agents and for equipment and personnel safety.
   B. Use of cleaners while the airplane is hot from being in the sun may cause streaking.
   C. Start washing operation at the top and work down to prevent streaking previously cleaned areas.
   D. Lubricate airplane components, whenever necessary, after washing.

2. Tools and Equipment

   NOTE: Equivalent substitutes may be used for the following listed items:

Name	Number	Manufacturer	Use
		GENERAL CLEANING	
Aerowash A		Wyandotte Chemical Corp. 8921 Dick Road Los Nietos, CA 90605	For general exterior cleaning
Air Tee	No. 2	Turco Products Inc. Box 1055 Wilmington, CA 90744	
Delchem Jet Wash	2271	Pennwalt Chemical Corp. 2700 South Eastern Ave. Los Angeles, CA 90040	
		HEAVY-DUTY CLEANING	
Navee	427	The Penetone Company 74 Hudson Ave. Tenafly, NJ 07670	For removing exhaust stains and other heavy duty applications
Naphtha	PS661 Solvent) Alternate TT-N-94	Commercially Available	For diluting Navee 427
		ACRYLIC PLASTIC CLEANING	
Mild Soaps and Detergents		Commercially Available	General cleaning
Wilco Anti-Static Cleaner		Wilco Co. Los Angeles, CA 90040	
		PAINT REMOVER (IMMERSION)	
Paint Remover	Delchem 773	Pennwalt Chemical Corp. 2700 South Eastern Ave. Los Angeles, CA 90040	Lacquers and primers
Paint Remover	Delchem 2236A Thin	Pennwalt Chemical Corp.	Epoxy
Paint Remover	Delchem 691	Pennwalt Chemical Corp.	General
Paint Remover	Turco 5351 Thin	Turco Products, Inc. Box 1055 Wilmington, CA 90744	Epoxy, nylon and polyurethane.
Paint Remover	Turco 5555B	Turco Products, Inc.	General, enamels and primers

Name	Number	Manufacturer	Use
		PAINT REMOVER (IMMERSION) (Cont.)	
Paint Remover	Oakite EPA	Oakite Products 50 Valley Road Berkeley Hights, NJ 07922	Difficult epoxies and polyurethane
		PAINT REMOVER (SPRAY AND BRUSH-ON)	
Paint Remover	Delchem E-Z Strip 19B	Pennwalt Chemical Corp. 2700 South Eastern Ave. Los Angeles, CA 90040	Polyurethane, general
Paint Remover	Paint Off ID	Turco Products Inc. Box 1055 Wilmington, CA 90744	General
Paint Remover	Pennwalt 739A	Pennwalt Chemical Corp.	Polyurethane only
Paint Remover	Turco 5556A	Turco Products Inc.	General, polyurethane applied over wash primer
Paint Remover	Turco 5556AF	Turco Products Inc.	General, polyurethane
		CORROSION REMOVAL	
Delchem	810	Pennwalt Chemicals Corp. 2700 South Eastern Ave. Los Angeles, CA 90040	To remove light corrosion or discoloration
Pennwalt	715	Pennwalt Chemicals Corp.	To remove moderate corrosion

WARNING: CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE.

Name	Number	Manufacturer	Use
Step A Cleaner	225S	DuPont 1007 Market St. Wilmington, DE	To remove battery acid corrosion
Step B Conversion Coating	226S	DuPont 1007 Market St. Wilmington, DE	To neutralize area cleaned by 225S
		DEICING EXTERIOR SURFACES	
Deicing Fluid	WD-20	Jefferson Chemical Co. Houston, Texas	To remove ice and frost from control surfaces
		PRETREATMENT	
Iridite	14-2	Allied Research Inc.	To protect aluminum against corrosion
Alodine	1200S	Amchem Products In.	To protect aluminum against corrosion
		INTERIOR CLEANING	
Yosemite or Aliphatic Naphtha	Y-999	Yosemite Chemical Co. 1248 Wholesale St. Los Angeles, CA Commercially Available	For cleaning vinyl coated fabrics, Mylar, Scotchcal murals, Polyplastex, leathers, vinyl flooring, Formica, linoleum, finished Flexwood, or painted surfaces
Host Dry Cleaning Compound		Host of California 2935 Coleridge Ave. Pasadena, CA	For cleaning drapes, curtains, upholstery, fabrics and carpet
Wet Rug Shampoo		Commercially Available	Carpeting
Perchloro-ethylene		Commercially Available	Spot clean carpet
Stoddard Solvent	Fed. Spec.		Cleaning nylon safety belts
Mild Soap Detergent		Commercially Available	Cleaning nylon safety belts. Cleaning Noryl plastic
Step A Cleaner	225S	DuPont 1007 Market Street Wilmington, DE	To remove battery and corrosion.
Step B Conversion Coating	226S	DuPont 1007 Market Street Wilmington, DE	To neutralize area cleaned by 225S.

WARNING: CLEANING OPERATIONS USING SOLVENTS SHOULD BE PERFORMED IN A WELL-VENTILATED ATMOSPHERE. EXERCISE NORMAL SAFETY PRECAUTIONS DURING USE.

3. Exterior Cleaning

   A. Connect static ground cables to airplane.
   B. Install protective covers on engine intake, and engine exhaust, pitot tubes, static ports and tailcone air inlets.

C. If there are leaks around cabin door, baggage door or foul weather window, seal with tape.

NOTE: Use chemical suppliers (manufacturers) recommendations for mixing and applying cleaning agents and for equipment and personnel safety.

D. For general exterior cleaning, dilute one part of the following cleaners with the indicated quantities of water by volume:

Cleaner	Moderate Soils	Heavy Soils
Wyandotte Aerowash A	3-7	3
Turco Air-Tee No. 2	3-7	3

CAUTION: THE UNDILUTED CONCENTRATE SHOULD NOT BE ALLOWED TO CONTACT WINDOWS AND/OR COVERS. PLASTIC IS CRAZED BY THE UNDILUTED CONCENTRATE.

E. For removing exhaust stains and for other heavy-duty applications listed below, dilute Navee 427 with the indicated quantities of water or naphtha by volume.

Soils	Dilute One Part by Volume Navee 427 to the Following Parts Water or Naphtha
Carbon Stains	Full Strength
Ordinary Exhaust Stains	3 to 4 Parts Naphtha to 1 to 5 Parts Water
Grease and Oil	3 to 7 Parts
Wheel Wells	5 Parts Water
General Heavy-Duty Cleaning	5 to 10 Parts Water

F. The following cleaners may be used to polish airplane exterior painted area:

(1) K-2 Eadpol High-Speed Gloss Aircraft Polish.
(2) DuPont "7" Car Polish.
(3) Method of application.
  (a) Use nonatomizing spray equipment.
  (b) Use soft bristle fiber brushes. Presoften brushes by soaking in the cleaning solution.

CAUTION: DO NOT BRUSH WINDOWS. WINDOWS ARE CONSTRUCTED OF STRETCHED ACRYLIC AND BRUSHING MAY SCRATCH THE WINDOWS.

  (c) Application of cleaner.
    1) Apply the cleaner using one of the methods mentioned previously.

CAUTION: DO NOT USE HIGH-PRESSURE WATER ON BEARINGS, ELECTRICAL OR ELECTRONIC EQUIPMENT.

NOTE: Do not apply cleaner to excessively large areas which cannot be adequately brushed and thoroughly rinsed before the cleaner dries on the surface.

    2) Allow cleaner to soak for 5-10 minutes.

NOTE: Do not allow cleaner to dry on the surface brfore rinsing, as staining can result.

    3) Reapply the solution with a brush and scrub where necessary.
    4) Pressure wash all surfaces contacted by the cleaner thoroughly with fresh water, preferably warm (120°F-140°F).

d. Clean stained areas (exhaust, carbon, etc.).
   1) Apply cleaner with a mop or nonatomizing spray.
   2) Allow cleaner to soak for 5-20 minutes.
   3) Flush thoroughly with a pressure water rinse.
e. Clean acrylic windows.
   1) Remove loosely adhering dirt and grit from the windows by flushing with water filtered free of dirt and abrasive materials.
   2) Wash with nonabrasive soap and water. A soft, thoroughly clean cloth, sponge or chamois may be used in washing, but only as a means of carrying the soapy water to the plastic. Go over the surface only with the bare hand so that any abrasive can be quickly detected and removed before it scratches the plastic surface.

      NOTE: All rubbing operations on acrylic plastics shall be done with as light a pressure as possible.

   3) Dry the window with a clean, damp chamois. A clean, soft cloth or tissue may be used if care is taken not to rub the plastic after it is dry.

      CAUTION: RUBBING THE PLASTIC SURFACE WITH A DRY CLOTH WILL CAUSE SCRATCHES AND BUILD UP AN ELECTROSTATIC CHARGE WHICH ATTRACTS DUST PARTICLES.

   4) Remove oil and grease by rubbing lightly with a cloth dampened with aliphatic naphtha.

      CAUTION: DO NOT USE THE FOLLOWING MATERIALS ON ACRYLIC PLASTICS: GASOLINE, ALCOHOL, BENZENE, HEXANE, XYLENE, ACETONE, CARBON TETRACHLORIDE, FIRE EXTINGUISHER OR DEICING FLUIDS, LACQUER THINNERS OR WINDOW CLEANING SPRAYS AS THEY SOFTEN THE PLASTIC AND/OR CAUSE CRAZING.

G. Rinse covers and tape.
H. Clean windows.
I. If airplane is new or has just been painted, do not use polish or wax which would exclude air from the surface during (first 90 days) curing period.

4. Interior Cleaning

A. Clean Interior Decorative Materials

(1) Clean with Yosemite Y-999 (or equivalent) as follows:
   (a) Spray or wipe on over the soiled surface.
   (b) Wipe off with a clean cloth dampened in water.
(2) Clean with Aliphatic Naphtha as follows:
   (a) Wipe with a clean cloth dampened with naphtha and wipe dry with a clean cloth.
   (b) When removing tar, asphalt, or chewing gum, remove as much as possible with a knife. Apply naphtha to the residue and then wipe dry with a clean cloth; this has a buffing effect that eliminates the possibility of stain from the solution.

B. Cleaning Rugs, Drapes, Curtains and Upholstery Fabrics

(1) Dry-clean commercially.
(2) Host dry cleaning compound.
   (a) Sprinkle the compound liberally on the soiled area.
   (b) Rub the compound into the soiled area.
   (c) Remove the compound with a vacuum cleaner.

   NOTE: This compound is nonflammable and may be used on fueled airplane.

(3) Wet shampoo.
   (a) Remove carpet or upholstery from the airplane. If at all possible, use the spot cleaning method.
   (b) Vacuum the carpet and upholstery, removing as much dirt and dust as possible.
   (c) Place a tablespoon of shampoo in a pail and direct a jet of water into the shampoo to produce abundant foam.
   (d) Apply the foam uniformly over the surface to be cleaned.
   (e) Remove the suds by wiping with a brush or clean cotton cloth. Since there is very little moisture in the foam, wetting of the fabric or retention of moisture will not occur.

   CAUTION: USE OF A MECHANICAL SHAMPOOER MAY DISTORT THE CARPET.

   (f) If tar, asphalt, or chewing gum is present, remove as much as possible by mechanical means; then perform steps (a) through (d).
(4) Spot cleaning.
   (a) Spot clean tufted carpet in the airplane, if at all possible, rather than completely removing the carpet for shampooing.
   (b) Saturate a clean white or colorless cloth with Perchloroethylene solution.

   CAUTION: DO NOT POUR PERCHLOROETHYLENE SOLUTION DIRECTLY ON THE CARPET.

   (c) Hand rub the Perchloroethylene saturated cloth in a circular motion on the soiled spot.

   CAUTION: DO NOT USE A MECHANICAL SHAMPOOER; IT WILL DISTORT THE CARPET.

   (d) An upholstery hand shampooer may be utilized on difficult to clean areas.

C. Clean Royalite.
   (1) Clean royalite with isoproply alcohol only. Do not use solvents to remove paint. Paint may be removed by sanding.

Corrosion Treatment

1. Description

A. Cleaning the airplane at regular intervals is helpful in the prevention of corrosion. Where corrosion occurs, complete removal of corrosion deposits is required to prevent recurrence. Partial removal and covering with paint will not halt continued attack, since a small amount of moisture penetrates the surface of all paints and allows corrosion to continue.

B. When an area of corrosion is determined to exist, the area must be cleaned and the paint stripped as required. If the area is confined and the use of paint stripper is impractical because of rinsing difficulties, the paint may be removed with solvent material per Federal Specification TT-E-751 or TT-T-266. Apply solvent with soft bristle brush, allow solvent to remain until paint film is loosened, then wipe clean with a clean damp cloth.

C. Heavy aluminum parts are susceptible to intergranular corrosion attack. Mechanical corrosion removal may be used on areas of heavy corrosion, pitted areas or in conjunction with chemical corrosion removal. For lightly corroded areas, number 400 aluminum grit abrasive paper or abrasive mat may be used. For heavily corroded or pitted areas, a carbide tipped scraper, fine fluted rotary file or grinding stone may be used. To avoid the possibility of stress concentrations, the cleaned area should be blended into the surrounding area to form a saucer-shaped depression. The cleaned area should have a width of ten times the depth and a length of twenty times the depth when possible. Mechanical corrosion removal must be followed by chemical corrosion removal in order to thoroughly clean the surface for corrosion proofing treatment.

D. Chemical corrosion removal is used on clad aluminum parts; such as skin, and in other areas of light corrosion. The surrounding parts and materials shall be protected from corrosion remover damage by masking or other appropriate methods. Specific caution should be exercised in areas where the corrosion remover could become entrapped or attack an uncorroded area. Care should be taken to ensure when possible that clad surface is not penetrated or removed.

Manual Cleaning and Deoxidizing of Aluminum Alloys

1. Alkaline Cleaners

WARNING: WHEN MIXING AND USING ALKALINE CLEANERS, ALWAYS USE RUBBER GLOVES.

A. Oakite 164 - Oakite Products
Mix: 5-8 ounces Oakite 164 to 1 gallon of water at 160° to 190°F.
B. Pensalt A-28A - Penwalt Chemicals Corporation.
Mix: 5-8 ounces Pensalt A-28A to 1 gallon of water at 160° to 190°F.
C. Pensalt 85 - Penwalt Chemicals Corporation.
Mix: 3-6 ounces Pensalt 85 to 1 gallon of water at 130° to 160°F.
D. Turco 4215S - Turco Products, Inc.
Mix: 4-6 ounces Turco 4215S to 1 gallon of water at 140° to 170°F.

2. Deoxidizers

WARNING: WHEN MIXING DEOXIDIZERS, ALWAYS ADD CHEMICAL AND ACID TO THE WATER SEPARATELY. ALWAYS USE RUBBER GLOVES AND GLASSES.

A. Turco Smut Go #4 - Turco Products, Inc.
Mix: 2-4 ounces Turco Smut Go #4 to 1 gallon of water; 5-8 ounces nitric acid to 1 gallon of water.
B. Aldox A - Penwalt Chemicals Corporation.
Mix: 6-8 ounces Aldox A to 1 gallon of water; 12-20 ounces sulfuric acid to 1 gallon of water.
C. Aldox W - Penwalt Chemicals Corporation.
Mix: 12-16 ounces Aldox W to 1 gallon of water.

Abrasive Cleaning of Metals

1. General Requirements

A. Grit blasting is not recommended for general use on aluminum sheet, springs, close tolerance dimensioned parts and threads.

B. Where a significant loss of metal cannot be tolerated and/or a smooth finish is required, a size 180 grit or finer abrasive shall be used. When heavy layers of scale or oxides are to be removed and the surface finished by subsequent operations or processes, a metallic brush or size 150 grit or coarser grit may be used for cleaning.

C. Parts fabricated from different material types shall not be grit blasted with the same grit, wire brushed with the same brush or cleaned with the same abrasive cloth or paper.

D. To avoid the possibility of stress concentrations, the cleaned area should be blended into the surrounding area to form a saucer-shaped depression. The cleaned area should have a width of 10 times the depth and a length of 20 times the depth when possible. If the corrosion was mechanically cleaned, it must then be chemically cleaned in order to thoroughly clean the surface for corrosion proofing treatment.

E. Parts and assemblies shall be cleaned after abrasive cleaning to assure removal of all abrasive media. Corrosion resistant steels shall be passivated after abrasive cleaning.

2. Blast Cleaning

A. When parts are oily, they shall be vapor degreased prior to blast cleaning.

B. Parts must be within the original permissible tolerances after blast cleaning and must display no significant evidence of warpage or distortion. Extreme care must be exercised to avoid excessive local blasting and warpage of thin sections. Blast cleaning of section thickness less than 0.050 inch is not recommended.

C. All loose particles shall be removed from blast cleaned surfaces with a jet of air immediately after blasting. Subsequent surface treatments shall be applied as soon as possible after blast cleaning. Blasted parts which will be held over night shall be dipped in a light oil. When ready to continue the processing of the parts, they shall be vapor degreased to remove the oil.

3. Corrosion Removal

A. Removal of Light Corrosion and Discoloration

(1) Apply Delchem 810 with brush or cloth.
(2) Agitate with short fiber brush or abrasive mat until all corrosion products are removed. Do not leave conditioner in contact with the surface for more than 20 minutes.
(3) Rinse off the corrosion remover with a damp cloth, rinsing frequently in water.
(4) Repeat cycle as required.
(5) After all corrosion is removed, thoroughly rinse treated area with clean water.
(6) Apply pretreatment (Iridite 14-2 or Alodine 1200S) to aluminum where corrosion was removed. Follow the manufacturers instructions.

B. Removal of Moderate Corrosion

(1) Dilute Pennwalt 715 with an equal volume of water in a plastic lined container.
(2) Apply diluted Pennwalt 715 with a brush or cloth wetting the entire corroded surface thoroughly.
(3) Allow the solution to stand as long as necessary to remove the corrosion products but never longer than 20 minutes.
(4) Scrub with a short fiber brush just before rinsing with water or a damp cloth.
(5) Repeat cycle as necessary.
(6) After all corrosion is removed, thoroughly rinse treated area with clean water and dry.
(7) Apply pretreatment (Iridite 14-2 or Alodine 1200S) to aluminum where corrosion was removed. Follow manufacturers instructions.

C. Removal of Battery Acid Corrosion

(1) Small Areas of Corrosion.
   (a) Wash with mild detergent.
   (b) Rinse thoroughly and dry.
   (c) Remove corrosion with Scotch Brite.
   (d) Clean with Methyl n-Propyl Ketone, acetone or similar solvent.
(2) Large Areas of Corrosion.
   (a) Dilute one part 225S Step A cleaner (DuPont product) with two parts water in a plastic or glass container before using.
   (b) Protect adjacent areas by using masking tape and polyurethane sheeting.
   (c) Freely apply the diluted 225S solution to the affected area. While the surface is still wet, rinse thoroughly with clear water or wipe with a clean damp cloth.
   (d) Allow surface to air dry or wipe dry with a clean cloth.
   (e) From a clean plastic container, apply 226S Step B conversion coating without dilution to the affected area. Allow to remain 2-5 minutes.
   (f) 226S should be applied to as much surface as can be coated and rinsed before the solution dries.
   (g) Flush 226S from surface with cold water or mop with a damp synthetic sponge, rinsed occasionally in cold water.

NOTE

Both 225S and 226S are DuPont products and can be obtained from any DuPont outlet. Manufacturers safety precautions should be followed.

D. Removal of Exhaust Corrosion (Wing Spar)

(1) Strip the affected area with a stripper such as Turco Paint Gon (Turco Products, Inc.) or Strypeeze (Sarogran Company). Follow the manufacturers instructions.
(2) Remove the corrosion with a NON-METTALIC abrasive pad such as Scotch Brite (3M Company) or chemical brighteners such as Quickbrite (Pennwalt Chemical Corporation) or Metal Glo #3 or #4 (Turco Products, Inc.). Follow the manufacturers instructions. Do not use steel wool, emery cloth or wire brush to remove corrosion.

WARNING: DO NOT APPLY CHEMICAL BRIGHTENERS TO INACCESSIBLE AREAS WHERE THE BRIGHTENER CANNOT BE COMPLETELY FLUSHED OR REMOVED.

CAUTION: CARE SHOULD BE TAKEN NOT TO REMOVE OR OTHERWISE DAMAGE THE ALCLAD COATING IN ADJACENT AREAS WHEN USING ABRASIVE TO REMOVE CORROSION.

(3) Treatment of fayed surfaces or very detailed structures will normally require disassembly.
(4) Fluorescent inspect the areas to assure removal of all corroded material and to determine if any cracks are present. Should cracks be indicated, continue removal of material and penetrant inspection until cracks are no longer indicated.
(5) Determine the depth of material removed at each of the affected areas.
   (a) If the maximum depth of removed material is equal to or less than the allowables shown in Figure 1, proceed to step (6). For material removal greater than allowables shown in Figure 1, a structural beefup is required. Typical spar cap beefups are defined in Chapter 15.
(6) Apply a brushon conversion coating to the cleaned area such as a solution of Alodine 1200S (Amchem Products, Inc.) or Iridite 14-2 (Allied-Kelite). Follow manufacturer's instructions.
(7) Apply appropriate primer and paint for finish.

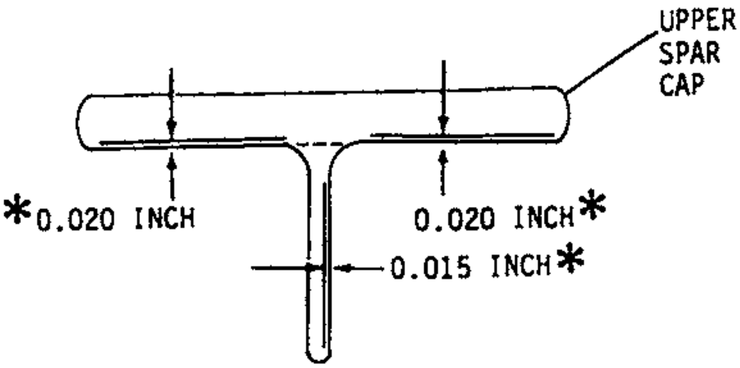
E. Removal of Filiform Corrosion

(1) Remove paint from the corroded area.
(2) Remove corrosion by sanding area to metal surface using either a Scotchbrite pad or 320 grit sandpaper (aluminum oxide grit).
(3) Clean and refinish surface.

Paint Stripping

1. Description

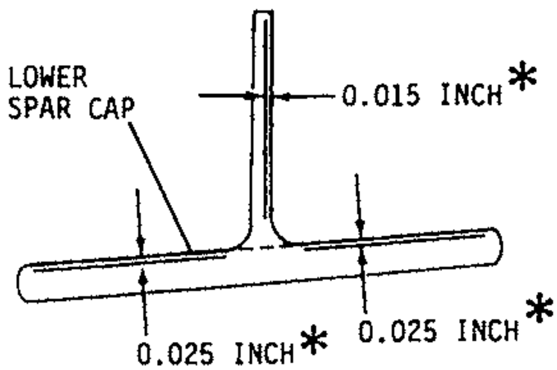
A. Stripping of paint is required to reach paint covered corrosion, when new paint is incompatible with existing paint and before repainting an area that has been repaired.



W.S. 67.95 TO 104.79

*MAXIMUM THICKNESS ALLOWED TO
BE REMOVED WITHOUT BEEF UP

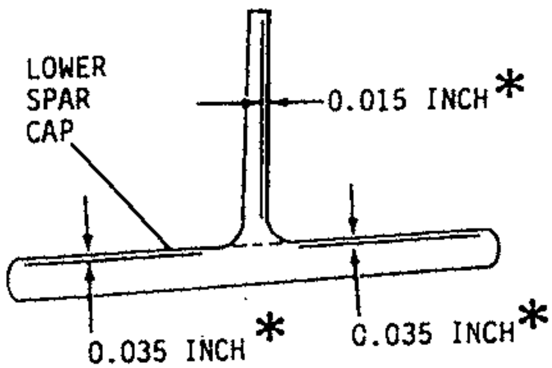
Front Spar Upper Spar Cap



W.S. 67.95 TO 100.60

*MAXIMUM THICKNESS ALLOWED TO BE
REMOVED WITHOUT BEEF UP

421C0001 THRU 421C0800



W.S. 67.27 TO 104.79

*MAXIMUM THICKNESS ALLOWED TO
BE REMOVED WITHOUT BEEF UP

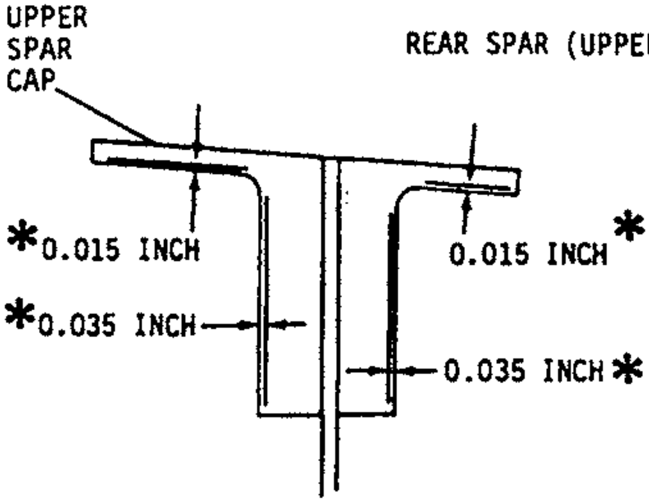
421C0801 AND ON

14142040

Front Spar Lower Spar Cap

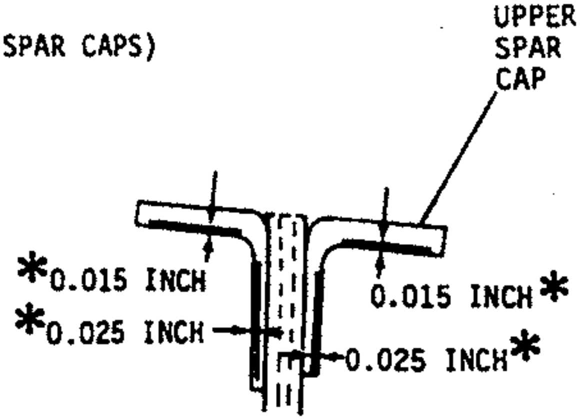
Wing Spar Dimensions
Figure 1 (Sheet 1 of 3)

REAR SPAR (UPPER SPAR CAPS)



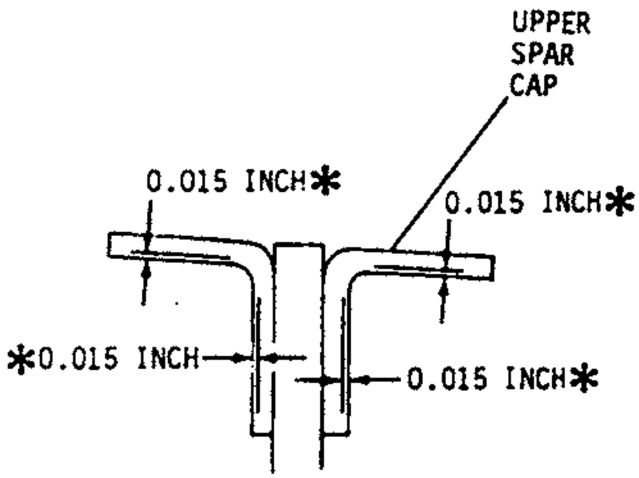
W.S. 56.29 AND 77.62

*MAXIMUM THICKNESS ALLOWED TO BE REMOVED WITHOUT BEEF UP



W.S. 77.62 TO 89.31

*MAXIMUM THICKNESS ALLOWED TO BE REMOVED WITHOUT BEEF UP



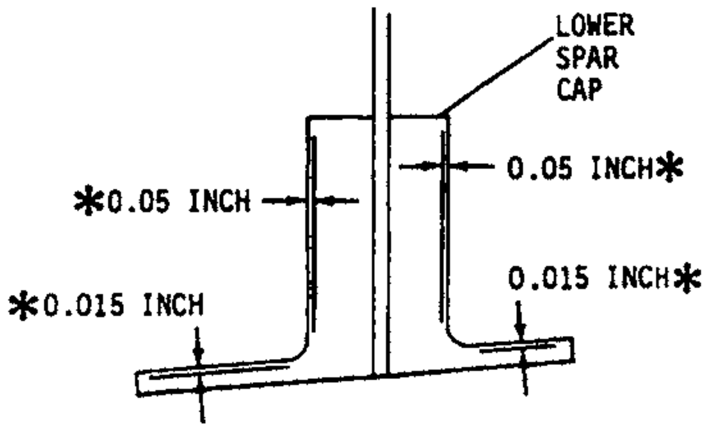
W.S. 89.31 TO 97.39

*MAXIMUM THICKNESS ALLOWED TO BE REMOVED WITHOUT BEEF UP

Rear Spar (Upper Spar Caps)

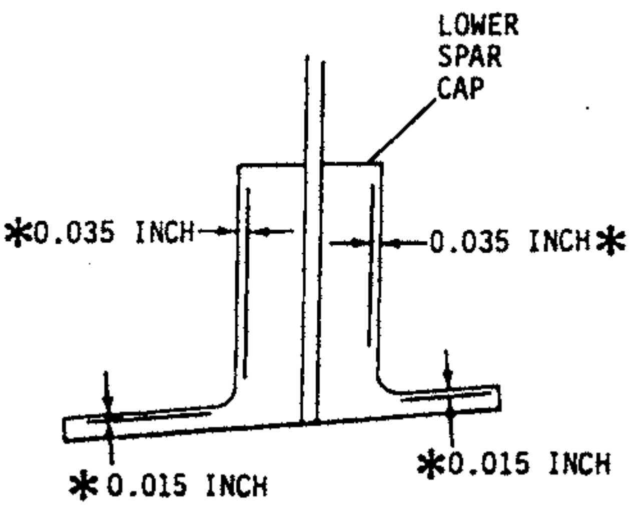
14142060

Wing Spar Dimensions
Figure 1 (Sheet 2)



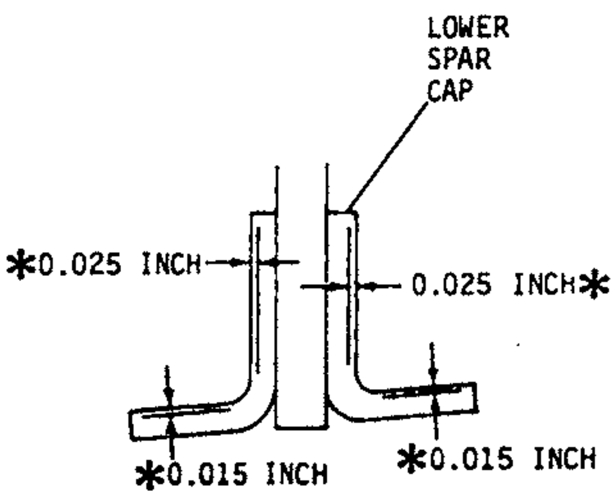
W.S. 56,29 TO 77.62

MAXIMUM THICKNESS ALLOWED TO
BE REMOVED WITHOUT BEEF UP



W.S. 77.62 TO 89.31

*MAXIMUM THICKNESS ALLOWED TO
BE REMOVED WITHOUT BEEF UP



W.S. 89.31 TO 97.39

*MAXIMUM THICKNESS ALLOWED TO
BE REMOVED WITHOUT BEEF UP

14142040

Rear Spar (Lower Spar Caps)

Wing Spar Dimensions
Figure 1 (Sheet 3)

B. All paint strippers are harmful to the eyes and skin. Operators shall wear goggle-type eye glasses, rubber gloves, aprons and boots. In case of contact with skin, flush with water. In case of contact with eyes, flush eyes thoroughly with water and consult physician immediately. Paint stripping shall be done in a well-ventilated area.

C. All strippers should be stored in an area within the temperature range of 35° to 90°F. Stocks should be rotated so that the remover will be used within six months from the date of manufacture except as noted.

D. Seams, joints, skin laps, repairs, inspection holes or any other place on honeycomb or bonded assemblies where the stripping solution would contact adhesives shall be masked.

E. When stripping the exterior of an entire airplane, all assembly openings, Plexiglas, rubber and other non-metals shall be protected from the stripper by masking or other suitable means. Special care must be exercised to avoid exposing Plexiglas and other plastics to the strippers. If however, contact is made, the stripper should be water-flushed from the Plexiglas or other plastics material immediately. Strippers must be kept out of interior areas of assemblies.

2. Paint Stripping Procedures

A. Brush or spray paint stripper on painted surface starting at the top and working down.

B. Allow paint stripper to set until paint is completely loosened. Add fresh stripper as necessary to keep stripper moist. It may take several minutes for the paint to loosen. Scrubbing with a stiff bristle brush may help loosen dirt.

C. Remove paint and paint stripper in accordance with paint stripper manufacturer's instructions.

D. Repeat process on areas where paint was not completely removed.

E. Rinse area with water starting at the top and working down.

Masking

1. Tools and Equipment

NOTE: Equivalent substitutes may be used for the following listed items:

Name	Number	Manufacturer	Use
Kraft Paper	UU-P-268	Commercially Available	Masking off paint area.
Water and Grease-Proof Barrier Material	MIL-B-121D Grade A, Type 2 Class 1	Commercially Available	Paint mask for window.
Tape	P-703	Permacel	Masking.
Tape	6223 Mistic	Commercially Available	Masking.
Polyethylene Vapor Barrier	HG1032CL	Tackmer Co.	Protective Coating
Polyethylene Vapor Barrier	5XN Poly-Spot Stick	St. Regis Newton, MA.	Protective Coating

2. Window Masking

A. General

(1) Acrylic windows may be softened or otherwise damaged by paint stripper, solvent or paint. Use water and grease-proof barrier material and polyethylene coated tape to protect windows.

B. Cover the entire inside and outside of DC electric windshield with Polyethylene vapor barrier coating.

3. Alternator Masking and painting.

   A. Mask the following areas:
      (1) Alternator shaft and end of alternator.
      (2) Alternator terminal ends.
      (3) Name plate and interior of alternator cooling air inlet.
      (4) Air outlet slots on back side alternator.

   B. Painting Alternator.
      (1) Paint alternator with nongloss black paint.

   C. Stripping Paint
      (1) Place barrier material over window and seal around periphery with polyethylene backed masking tape.
      (2) Cut second sheet of barrier material an inch or more larger than window.
      (3) Place second sheet of barrier material over the window and seal with polyethylene tape.
      (4) After stripping paint from panel, remove outer layer of barrier material and hand strip the border around window.
      (5) Place barrier material over window and seal around periphery with polyethylene backed masking tape.
      (6) Refer to exterior finish.

Finish and Trim

1. Description

   A. When ordering replacement trim items and paint to ensure matching colors, supply Cessna Dealers Organization with the proper information from the Illustrated Parts Catalog.

2. Paint Touch up Kits (Airplanes C1401 and On).

   A. Paint touch up kits are supplied with new delivered airplanes for touching up the exterior paint of the airplane. The contents of the touch up kit include one quart each of base color and catalyst and one pint each of paint and catalyst for each additional color. Color kits are in accordance with CES-2800 colors and match paint schemes specified on the airplane order. Special exterior colors to be in accordance with the vendor part number as specified on the engineering order.

Exterior Finish

1. Description

   A. On airplanes prior to 1977 Models, the standard airplane exterior finish is vinyl enamel. This paint system is comprised of a chemical film treatment and vinyl enamel topcoat. An optional polyurethane paint system (U. S. Paint) was also offered. The landing gear was finished with the epoxy paint system.

   B. On 1977 Model airplanes, the airplane exterior finish is polyurethane paint. The polyurethane paint which is applied over the exterior surface is comprised of chemical film treatment, intermediate coat and a top coat. The landing gear is finished with the epoxy paint system.

   C. Surfaces to be painted must be solvent cleaned. Scuff sand and solvent clean with Methyl n-Propyl Ketone unremoved polyurethane finish. Methyl n-Propyl Ketone is used on surfaces where pretreatment and/or corrosion proofing is undisturbed. Pennwalt is used when paint stripping was required in the rework as Pennwalt will impart a light etch to the aluminum surface and will provide a good paint base. Apply wash primer as soon as possible after solvent cleaning. Area should be masked carefully and all taped edges firmly adhered to metal to prevent a ragged edge. Class A wrapping paper and thinner proof masking tape should be used to cover plexiglas.

CAUTION

METALLIC PAPER, METAL FOIL OR METAL OF ANY KIND SHOULD NEVER BE USED AS A PAINT SPRAY MASK ON WINDOWS AND WINDSHIELDS.

D. Methyl n-Propyl Ketone is used on surfaces where pretreatment and/or corrosion proofing is undisturbed. Pennwalt 2331 acid activated solvent is used when paint stripping was required as part of the rework. Pennwalt 2331 will provide a good paint base. Apply wash primer as soon as possible after solvent cleaning. To assure paint matching when repainting sections or touching up, obtain the code number from the finish and trim plate located in the left forward nosewheel well.

CAUTION

REBALANCE FLIGHT CONTROLS AFTER REPAIR OR PAINTING.

E. The following listed items do not receive polyurethane paint finish and shall be masked off during painting.
   (1) Static ports - a one inch diameter circle around the static port shall receive a mechanical finish. The paint edge shall be feathered to provide smooth airflow across the ports.
   (2) Fastener heads on the nose access - the fastener heads are unpainted to prevent chipping paint during removal / installation.
   (3) Fastener heads on the nacelle cowling - the fastener heads are unpainted to prevent chipping paint during removal / installation.

2. Tools and Equipment

NOTE

Equivalent substitutes may be used for the following items.

Name	Number	Manufacture	Use
Methyl n-Propyl Ketone	CAS NO. 107-87-9	Eastman Chemical Products Inc. P.O. Box 431 Kingsport, TN 37662	Clean aluminum surfaces.
Pennwalt	2331	Pennwalt Chemicals Corp. 2700 S. Eastern Ave. Los Angeles, CA 90040	To clean aluminum surfaces after paint has been stripped.
Air Tech Metal - Glo	Number 12 Number 6 (MIL-C-38334)	Purex Corp. Turco Product Division 24600 S. Main St. P.O. Box 6200 Carson, CA 90749	Cleaning. Cleaning.
Scotch Brite Clean N' Finish Material	Type A (Fine)	Minnesota Mining and Mfg. Co. 24600 S. Main St. P.O. Box 6200 St. Paul, MN 55144	Cleaning.
RUBBING COMPOUND			
Rubbing Compound	Turco	Purex Corp. Turco Products Division 24600 S. Main St. P.O. Box 6200 Carson, CA 90749	To smooth finish.
NONCHROMATED PRIMER			
Primer (Green)	34151	Sterling Lacquer Company 3150 Brannon Ave. St Louis, Mo 63139	Primer coat over pretreated aluminum, magnesium and Steel.
	403-525	Pratt and Lambert	
POLYCARBONATE PRIMER			
Base	Lacco 600	Red Spot Paint and Varnish Co. 110 Main St. Evansville, IN 47708	Primer used on polycarbonate surfaces.
Thinner	SL-8381	Red Spot Paint and Varnish Co.	Thinner for base.

Name	Number	Manufacturer	Use
		PRIMER SURFACER (Sterling Lacquer Company)	
Base	65-U-1761	Sterling Lacquer Company 3150 Brannon Ave. St. Louis, MO 63139	Primarily used on fiber-glass surfaces to fill pin holes and flows in the surface.
Catalyst	65-U-1762	Sterling Lacquer Company	Catalyst for base.
Catalyst	65-U-1762	Sterling Lacquer Company	Catalyst for base.
		EPOXY PRIMER	
Base	54P Series	Pratt and Lambert Wichita Division P. O. Box 2153 Wichita, KS 67201	Base for epoxy finish on landing gears.
Catalyst Thinner	T-6487	Pratt and Lambert	Catalyst for base.
Base	454-4-1	Bostik Chemical Group U.S.M. Corp. Middleton, MA 01949	Base for epoxy finish.
Base	454-4-2	Bostik Chemical Group	Base for epoxy finish.
Catalyst	CA-109	Bostik Chemical Group	Catalyst for base.
		CHEMICAL FILM TREATMENT	
Accelagold	MIL-C-81706	Purex Corp. Turco Product Division 24600 S. Main St. P. O. Box 6200 Carson, CA 90749	Prepare surface for immediate coat.
		INTERMEDIATE COAT	
Base	U-1482	Sterling Lacquer Co. 3150 Brannon Ave. St. Louis, MO 63139	Intermediate coat for polyurethane finish.
Catalyst	U-1483	Sterling Lacquer Co.	
Reducer	U-1385	Sterling Lacquer Co.	
Base	AA-92-Y-43	U. S. Paint 2115 Singleton St. St. Louis, MO 63103	
Catalyst	AA-92-Y-43	U. S. Paint	
Reducer	T888	U. S. Paint	
Base	560-564	Pratt and Lambert Wichita Division P. O. Box 2153 Wichita, KS 67201	Intermediate coat for polyurethane finish.
Activator Thinner	120-888 110-615 or 110-655	Pratt and Lambert Pratt and Lambert	

Name	Number	Manufacturer	Use
		POLYURETHANE ENAMEL	
Base	78-U-1003	Sterling Lacquer Co. 3150 Brannon Ave. St. Louis, MO 63139	Black around deice boots. Top coat polyurethane finish.
Base	76-U-1601	Sterling Lacquer Co.	
Catalyst	U-1001	Sterling Lacquer Co.	
Thinner	U-1275	Sterling Lacquer Co.	
Base	AA-92	U. S. Paint 2115 Singleton St. St. Louis, MO 63103	
Catalyst	AA-92-C-39	U. S. Paint	
Thinner	T732A	U. S. Paint	
Base	570 Series	Pratt and Lambert Wichita Division P. O. Box 2153 Wichita, KS 67201	Top coat polyurethane finish and paint trim (stripes).
Activator	578-520	Pratt and Lambert	
Thinner	110-655	Pratt and Lambert	
Base	65-U	Sterling Lacquer Co. 3150 Brannon Ave. St. Louis, MO 63139	Top coat for stripes.
Catalyst	65-U-1685	Sterling Lacquer Co.	
		VINYL ENAMEL TOPCOAT	
Base	82A Series	Pratt and Lambert Wichita Division P. O. Box 2153 Wichita, KS 67201	Vinyl enamel topcoat.
Lift Control	T-5321		
Thinner	T-1866B		Enamel thinner.
		EPOXY ENAMEL	
	54E Series	Pratt and Lambert Wichita Division P. O. Box 2153 Wichita, KS 67201	Epoxy finish coat.
Catalyst	T-6221A		
Thinner	5400		
		METALLIC GOLD POLYURETHANE COATING	
Clear Base	C-21C	U. S. Paint 2115 Singleton St. St. Louis, MO 63103	Clear polyurethane topcoat.
Catalyst	C-22B	U. S. Paint	Catalyst for base.
Metallic Gold Powder		U.S. Paint	Added to clear base to produce metallic paint.

Name	Number	Manufacturer	Use
		METALLIC GOLD POLYURETHANE COATING	
Clear Base	65-U-1005	Sterling Lacquer Co. 3150 Brannon Ave. St. Louis, MO 63139	Clear topcoat for metallic paint.
Catalyst	65-U-1685	Sterling Lacquer Company	Catalyst for base.
Metallic Gold Base	65-U-1712	Sterling Lacquer Company	Metallic paint.
Catalyst	65-U-1685	Sterling Lacquer Company	Catalyst for base.
		PREPARE KEVLAR SURFACE FOR PAINTING	
Surfacer (White)	464-3-1 Base CA-142 Catalyst	Bostik Chemical Group U.S.M. Corp. Middleton, MA 01949	Prepare kevlar surface for painting.
Thinner	TL-52	Bostik Chemical Group	To thin surfacer.
Skyspar Surfacer	P-900	Koppers Co., Inc. 801 E. Lee Irving, TX 75060	Prepare Kevlar surface for painting.
Catalyst (Thinner)	C-916	Koppers Co., Inc.	To thin catalyst.
Catalyst (Concentrate)	C-918	Koppers Co., Inc.	Catalyst for base.
Thinner	T262	Koppers Co., Inc.	

2A. Nonchromated Primer.

A. Exterior Aluminum.

(1) All aluminum parts shall receive one of the following surface treatments before priming: anodizing, chemical film treatment or wash primer.

B. Interior Aluminum.

(1) All aluminum parts that require corrosion protection shall be chemically filmed or wash primed before priming.

C. Magnesium.

(1) Magnesium parts shall receive dichromate treatment before priming (magnesium protective treatment).

D. Corrosion Resistant Steel.

(1) All corrosion resistant steel parts shall be pretreated by abrasive cleaning or chemically cleaned.
(2) In general, no finish coats are necessary unless specific environmental problems exist.

E. Noncorrosion Resistant Steel.

(1) All ferrous alloys to be finished shall be pretreated by abrasive cleaning or chemically cleaned.
(2) Ferrous alloys may be phosphated, cadmium plated, chromium plated or primed with zinc chromate.

F. Nonchromated primer should be thinned for spray application to a viscosity of 14 to 18 seconds when measured with a number two Zahn cup (approximately one volume of primer to one volume of Toluene).
G. Primer shall be applied by spraying to a dry film thickness of 0.0003 to 0.0004 inch.
H. Parts shall be allowed to air dry for at least 5 minutes before handling. Parts that require a second coat of primer shall be air dried at a temperature of at least 65°F for at least 1.5 hours before the second coat of primer is applied. To accelerate the cure, the parts may be air dried for at least 10 minutes and then force dried for 30 to 35 minutes at 200 to 220°F.

3. Polycarbonate Primer

A. Surfaces to receive polycarbonate primer shall be solvent wiped with Isopropyl Alcohol.
B. Lacco 600 base shall be reduced 1 to 1 by volume with SL-8381 thinner.
C. The first coat of reduced primer shall be dry sprayed. The second coat shall be sprayed and applied to all surfaces that receive organic finishes to yield a cured film thickness of 0.0003 to 0.0004 inch. A minimum of 30 minutes should be allowed before applying overcoating.

4. Primer Surfacer (Sterling Lacquer Company).

A. Mix 1 part by volume of U-1761 base with 1 part by volume of U-1762 catalyst and mix thoroughly. The material should be thinned for spray application with Methyl n-Propyl Ketone to a spray viscosity of approximately 25 seconds when measured with a #2 Zahn cup.
B. No induction time is required and pot life under normal temperature conditions (70°F) is 2-1/2 hours. Avoid mixing more material than can be used during this period.
C. Coating may be applied in relatively heavy droplets as compared to a fine spray. Allow 30 to 45 minutes to air dry depending on temperature and film thickness before sanding.

5. Epoxy primer (Pratt and Lambert).

A. Surfaces to receive epoxy primer shall be wash primed prior to receiving epoxy primer.
B. Epoxy primer is catalyzed by addition of one volume of catalyst to an equal volume of primer base. The catalyst is always added to the base: not vice-versa. Primer may be thinned if necessary with T-6487 thinner to a number 2 Zahn cup viscosity of between 18 and 20 seconds.

NOTE

The catalyzed primer will have an induction time of 1 hour after mixing before use and a pot life of six hours.

C. Epoxy primer is applied by spraying to a dry film thickness of 0.5 to 0.7 mils and must be air dried for 2 to 4 hours prior to topcoating.
D. Epoxy primer must not be used as finishes by itself. Topcoating is a requirement and must be accomplished within 24 hours.
E. Primed surfaces should be allowed to air dry for 30 minutes before force drying at 135°F for a period of 4 hours.

NOTE

Clean spraying equipment immediately with Methyl n-Propyl Ketone or Toluene.

6. Epoxy Primer (Bostik-Finch).

A. Mix one part by volume CA-109 catalyst to three parts by volume 454-4-1 base. Always add catalyst to base with adequate agitation. Viscosity of the catalyzed mixture shall be in the range of 17-19 seconds with a No. 2 Zahn cup. No thinner shall be used.
B. Material shall be applied in a single wet coat to a dry film thickness of between 0.4 mils and 0.8 mils.
C. Parts shall be allowed to air dry at a temperature of 65°F for at least 15 minutes prior to handling. Parts shall then be cured in a heated oven at a temperature of 150°F for one hour to achieve full cure.

NOTE

Parts to be primed shall be cleaned with a 50/50 mixture of Toluene and Methyl n-Propyl Ketone.

NOTE

Where state laws on air pollution are in conflict with its use, 454-4-1 primer base may be replaced with 454-4-2 primer base.

7. Vinyl Wash Primer.
   A. Wash primer shall be mixed with diluent in a 2 to 2 volume ratio. Always add catalyst to base with adequate agitation.

NOTE

No induction time is required and pot life is six hours.

   B. Wash primer shall be applied by spray coating, to insure a cured film thickness of 0.0003 to 0.0004 inch. A minimum of 30 minutes should be allowed to dry before applying overcoating.
   C. Wash primer surface irregularities should be scuff sanded and tack-ragged. Wash primer should be reapplied to sanded areas to prevent a break in the primer film.

NOTE

Clean spraying equipment immediately with Methyl n-Propyl Ketone or Toluene.

8. Polyurethane Wash Primer (U. S. Paint).
   A. Mix 1 part by volume of 66C-7225 catalyst to 1 part by volume of C-22-Y-7247 base; always add catalyst to base with adequate agitation.
   B. Material should be applied in 1 wet even coat to yield a dry film thickness of 0.0005 to 0.0007 inch. A minimum of 30 minutes should be allowed before overcoating.
   C. Pot life of the material is 6-8 hours.
9. Polyurethane Wash Primer (Sterling Lacquer Company).
   A. Mix 1 part of M-3225 vinyl wash primer to 1 part of M-3226 wash primer reducer. This may be used at once.
   B. Spray as is and apply approximately 0.0003 to 0.0005 inch dry film thickness.
   C. Conventional air or airless spray equipment may be used. Make sure equipment is thoroughly cleaned before use.
   D. Sterling U-1014 reducer may be used to thin in conditions of high humidity. At least 30 minutes should be allowed before recoating. There is no critical period with respect to length of time in which the material must be recoated.
10. Polyurethane Enamel Intermediate (U. S. Paint).
   A. Mix 1 part AA-92-C-33 catalyst to two parts AA-92-Y-43 base. Thin with T-888 thinner to a spray viscosity of 17.5 seconds in a Number 2 Zahn cup. Always add catalyst to base with adequate agitation.
   B. Induction time is 30 minutes and the pot life is 6 to 8 hours.
   C. Material should be applied in a wet coat application to yield a dry film thickness of 0.0005 to 0.0007 inch.
   D. Allow to dry at room temperature for 1 hour before overcoating.

NOTE

Clean spraying equipment immediately with T-888 thinner, Methyl n-Propyl Ketone or Toluene.

11. Polyurethane Intermediate Primer (Sterling Lacquer Company).
   A. Mix 2 parts by volume of U-1482 base with one part by volume of U-1483 catalyst. If thinning is required, thin with U-1385 to a viscosity of 17or 18 seconds in a #2 Zahn cup.
   B. No induction time is required and material should be used within 8 hours after catalyzation.
   C. Material should be applied in one (1) wet and uneven coat to yield a dry film thickness of 0.0003 to 0.0007 inch. Allow 30-45 minutes air dry prior to top coating.

12. Polyurethane Enamel Top Coat (U. S. Paint).
   A. Mix 1 volume AA-92-C-39 catalyst to 1 volume AA-92 base. Thin with T-732A or T-316 thinner to allow a spray viscosity of 17 to 20 seconds in a Number 2 Zahn cup. Always add catalyst to base with adequate agitation.

NOTE

Anti-cratering solution #92C24 may be used at the rate of no more than 2 ounces per catalyzed gallon.

B. Induction time is 30 minutes and the pot life is 6 to 8 hours.
C. Material shall be applied in one wet coat or 1 mist coat followed by one wet coat to provide a dry film thickness of 0.0013 to 0.0025 inch.
D. Coating may be force dried at 140°F for 4 hours or air dried 12 to 14 hours before masking. Stripes should be applied within 24 hours after application of topcoat. If this requirement cannot be met, area under stripe should be scuff sanded and wiped down with Methyl n-Propyl Ketone.

13. Polyurethane Enamel Topcoat (Sterling Lacquer Company)

A. Mix one (1) part by volume of 76-U (Color) base with one (1) part by volume of 76-U-1001 Catalyst. This with U-1275 Thinner to a viscosity of 17-19 seconds in a #2 Zahn cup.
B. Mixture must sit for 15 minutes before application and the catalyzed material pot life is 6-8 hours.
C. Apply 1 mist coat followed by 1 wet coat to yield a dry film thickness of 0.0013 to 0.0025 inch. Air dry for 6-8 hours or force air dry at approximately 135°F for 3 hours prior to taping.

14. Top Coat - Stripes (Sterling Lacquer Company).

A. Mix 2 parts by volume of 78-U (Color) base with 1 part by volume 78-U-1001 Catalyst. This with U-1275 or U-1385 Thinner to a spray viscosity of 17-19 seconds in a #2 Zahn cup.
B. Mixture must sit for 15 minutes before application. The pot life of the material is 6-8 hours.
C. Apply one (1) mist coat followed by one (1) wet coat to yield a dry film thickness of 0.0013 to 0.0025 inch. Air dry for 3-4 hours or force air dry at approximately 135°F for 1 1/2 hours prior to taping.

15. Vinyl Enamel

A. Vinyl enamel shall be prepared for spraying by adding 1 part T-5321 lift control to 20 parts paint with T-1866B thinner added to bring viscosity to a range of 19 to 20 seconds in a #2 Zahn cup.
B. The vinyl enamel should be applied in full cross coats to ensure a total cured film thickness of 0.002 to 0.003 inch.
C. Vinyl enamel should be force dried for a minimum of 6 hours at 130-140°F prior to handling or masking.

NOTE

Clean spraying equipment immediately with Methyl n-Propyl Ketone or Toluene.

16. Epoxy Enamel

A. Epoxy enamel 54E series epoxy shall be catalyzed with T-6221A in a ratio of 4 parts base to 1 part adduct. This mixture may be thinned with Methyl n-Propyl Ketone to a spray viscosity of 19 to 20 seconds in a # 2 Zahn cup.
B. Induction time for mixture is 10 to 15 minutes and the pot life is 16 hours.
C. Material shall be applied in a spray coat to yield a dry film thickness of 0.0008 to 0.0012 inch.
D. Epoxy enamel finish should be allowed to cure 8 hours at room temperature or force dried by air for 30 minutes followed by 30 minutes at 250°F or 2 hours at 130° Fahrenheit.

NOTE

Clean spraying equipment immediately with Methyl n-Propyl Ketone or toluene.

17. Heat Resistant Enamel (Refer to Figure 1A).

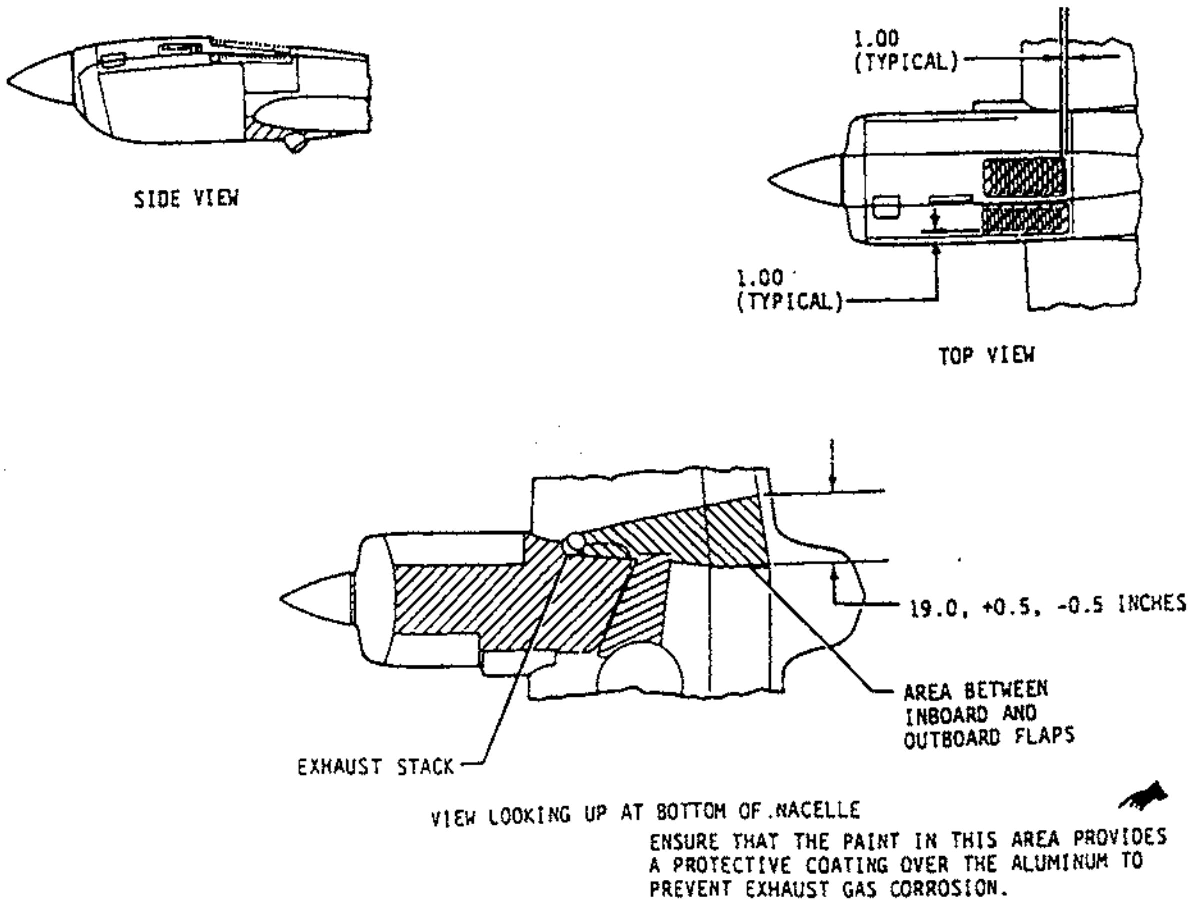
A. Surfaces to receive heat resistant enamel shall be chemically filmed treated with Iridite 14-2 in accordance with manufacturers instructions.
B. Fiberglass surface should be lightly sanded and solvent cleaned.
C. Heat resistant enamel may be reduced by adding 1 to 2 volumes of Xylene or Toluene to 1 volume base.
D. Heat resistant enamel should be spray coated to yield a film thickness of 0.001 to 0.0015 inch.
E. Heat resistant enamel may be force dried by 250°F to 300°F for 45 minutes. Allow 30 minutes to air dry at room temperature prior to force drying.

NOTE

Clean spraying equipment immediately with Methyl n-Propyl Ketone or toluene.

NOTE

Heat resistant enamel is not required on the polyurethane finish.



Heat-Resistant Paint Surfaces
Figure 1A

18. Metallic Gold Urethane Coating (U. S. Paint)

NOTE

Touch up of Metallic Gold Urethane paint is not recommended. The entire area must be stripped and a new application of Metallic Gold Urethane applied.

A. The area to be painted shall be thoroughly cleaned and washed before priming.
B. Apply a wash primer (EX-2016G Enmar, or 818-012 Dupont) mixed with diluent (T-670 Enmar, or Dupont, respectively) in a 1 to 1 volume ratio.

NOTE

The mixed wash primer must be used within a six hour period or be discarded.

C. Apply wash primer by spray coating to ensure a film thickness of 0.0002 to 0.0003 inch.
D. Allow primer to air dry for 30 minutes before overcoating.
E. Wash primer surface irregularities should be sanded and tack-ragged. New primer should be applied to sanded areas to prevent a break in primer film.
F. Wash primer may be overcoated after air drying a minimum of 30 minutes or a maximum of 4 hours.
G. Mix a small amount of Methyl n-Propyl Ketone with the metallic powder until a paste is formed. Continue adding thinner, a little at a time, until gold powder is evenly dispersed with no lumps and volume of Methyl n-Propyl Ketone added reaches one pint.
H. Mix the clean urethane C-21C in a 1 to 1 ratio with C-22B catalyst.
I. Slowly add the thinner powder mixture. The viscosity will be 15 to 17 seconds in a #2 Zahn cup. This mixture should be sprayed immediately.
J. Spray one overlap spray coat and then let flash off. Add light dry coat to ensure uniformity of color.
K. Allow to air dry for one hour.

CAUTION

METALLIC GOLD IS NOT A FINISH COAT IN ITSELF, AND MUST BE OVERCOATED. CARE SHOULD BE TAKEN THAT THE SURFACE NOT BE TOUCHED OR WIPED, THIS WILL CAUSE A DISCOLORATION. MUST BE APPLIED AS SOON AS POSSIBLE.

19. Metallic Gold Urethane Coating (Sterling)

NOTE

Touch up of Metallic Gold Urethane paint is not recommended. The entire area must be stripped and a new application of Metallic Gold Urethane applied.

A. The area to be painted shall be thoroughly cleaned and washed before priming.
B. Mix 1 part of M-3225 (Serling) wash primer to 1 part of M-3226 (Sterling) wash primer catalyst. Apply wash primer by spray coating to ensure a dry film thickness of approximately 0.3 to 0.5 mils.
C. Allow the wash primer to dry for 30 minutes before overcoating.
D. Mix two volumes of U-1482 (Sterling) intermediate primer with 1 volume of U-1483 (Sterling) catalyst. Primer may be thinned with U-1385 (Sterling) thinner to a spray viscosity of 18 to 20 seconds in a #2 Zahn cup.
E. Apply the intermediate primer over wash primed surfaces by spray coating to ensure a dry film thickness of 0.0008 to 0.0012.
F. Allow the primer to dry at room temperature for 1 hour before overcoating.
G. Mix 1 volume of 65-U-1712 (Sterling) metallic gold polyurethane with 1 volume of U-1685 (Sterling) polyurethane catalyst. The polyurethane enamel may be thinned with U-1275 (Sterling) thinner to a spray viscosity of 18 to 22 seconds in a #2 Zahn cup.
H. Spray one overlap spray coat and let flash off. Add one light dry coat to ensure uniformity of color.
I. Allow to air dry for one hour.

CAUTION

METALLIC GOLD IS NOT A FINISH COAT IN ITSELF AND MUST BE OVERCOATED. CARE SHOULD BE TAKEN THAT THE SURFACE SHALL NOT BE TOUCHED OR WIPED, AS THIS WILL CAUSE DISCOLORATION. TOP COAT MUST BE APPLIED AS SOON AS POSSIBLE.

20. Clear Urethane Top Coat (U. S. Paint).

A. Mix the clear urethane C-21C in a 1 to 1 ratio with catalyst C-22B. Mixture may be sprayed at this viscosity or thinned with Methyl n-Propyl Ketone to a viscosity of no less than 18 to 20 seconds in a #2 Zahn cup.
B. Apply the clear coating in three uniform 50% overlap spray coats to an approximate thickness of 2-1/2 to 3 mils dry film thickness.

C. Allow to air dry 4 to 6 hours or force dry at approximately 135°F for 1 hour.

NOTE

If area is to be recoated, lettered or stenciled in any way, this will have to be applied within a 36 hour period. Longer times will necessitate a light sanding (remove gloss) before recoating or lettering.

NOTE

All equipment should be cleaned immediately after use. T-732A, or Cellosolve Acetate should be used for cleaning equipment.

21. Clean urethane top coat for metallic gold (Sterling).
    A. Mix 1 volume of clear polyurethane enamel 65-U-100S (Sterling) with 1 volume of 65-U-1685 (Sterling) polyurethane catalyst. The polyurethane enamel may be thinned with U-1275 (Sterling) thinner to a spray viscosity of 18 to 22 seconds in a #2 Zahn cup.
    B. Apply the clear polyurethane enamel over the metallic gold by spraying the coating in uniform coats to yield an approximate dry film thickness of 2 mils.
    C. Allow to air dry 6 to 8 hours.

22. Touch Up Polyurethane.
    A. When it is necessary to touch up or refinish a small area, the edge of the finish adjacent to the defect shall be feathered by sanding with #320 grit sandpaper followed by #400 grit sandpaper. Avoid, if possible, sanding through the primer. If the primer is penetrated over an area of 1 inch square or larger, the surface must be reprimed.

NOTE

Avoid spraying metal primer on the adjacent paint as much as possible.

    B. After sanding check area for damage; repair as required.
    C. Clean area to be refinished with solvent. Methyl n-Propyl Ketone is used on surfaces where pretreatment and/or corrosion proofing is undisturbed. Pennwalt is used when paint stripping was required in the rework as Pennwalt will impart a light etch to the aluminum surface and will provide a good paint base.
    D. Apply wash primer as soon as possible after solvent cleaning. Avoid spraying primer on adjacent paint as much as possible.
    E. Fill the feathered areas by spraying sanding surfacer. Coating may be applied in relatively heavy droplets as compared to a fine spray. Air dry for 30 to 45 minutes depending on temperature and film thickness.

NOTE

Remove dry overspray from adjacent painted surfaces as soon as possible with Methyl n-Propyl Ketone.

    F. Sand area with #320 grit paper to blend with surrounding area followed by #400 grit paper. Final surface to be finished shall be smooth and free from imperfections, irregularities and pin holes. Ensure area is clean with Methyl n-Propyl Ketone.
    G. Apply intermediate coat and topcoat per manufacturers instructions.
    H. Buff area with vert fine rubbing compound Turco T-1495X or equivalent.

23. Touch Up Vinyl.
    A. When it is necessary to touch up or refinish an area, the edge of the finish adjacent to the defect shall be feathered by sanding with #320 grit followed by #400 grit sandpaper. Avid, if possible, sanding through the primer. If the primer is penetrated over an area of 1/2 inch square or larger, the surface must be reprimed.

NOTE

Avoid spraying metal primer on the adjacent paint as much as possible.

    B. When touching up vinyl, use EX-2016G primer mixed one part primer to one part EX-2016A activator. Stir and allow 30 minutes before spraying.
    C. When priming with EX-2016G, use a light coat of nonzinc chromate primer thinned 4 parts toluol to 1 part primer applied over the EX-2016G.
    d. Fill the feathered areas by spraying on several coats of Sterling 65-U-1761 and U-1762 primer surface and allow 1 hour drying time for each coat.
    E. Sand the entire area with #400 grit sandpaper and apply the top coat.

23A. Silicone Grease Removal.

A. To eliminate primer flaking off due to silicone grease on skin surface, remove primer in affected area using 1,1,1 Trichlorethane and a Scotchbrite pad. Scrub the affected area thoroughly until water will not bead on the surface. Retreat to restore chemfilm and reapply wash primer and intermediate coat per steps 9 and 11.

23B. Liquid Solvent Cleaning.

A. Liquid solvent cleaning should be used to clean the unpainted surface or paint stripped surface. Never spray or pour solvents on the structure to be cleaned; use a damp cloth. It is essential that clean solvents are used during the final cleaning operation. Iridescent surfaces are evidence of improper cleaning. Solvent cleaning procedures are as follows:

WARNING

TO PREVENT INJURY TO PERSONNEL, ALL SOLVENTS SHOULD BE CONSIDERED FLAMMABLE AND SHOULD NOT BE EXPOSED TO FLAME OR SPARK. FRESH AIR MASKS AND/OR ADEQUATE VENTILATION SHOULD BE USED.

(1) Wipe off excess oil, grease or dirt from surface to be cleaned.
(2) Apply solvent to a clean cloth, preferably by pouring solvent onto cloth from a safety can or other approved, labeled container. The cloth should be well saturated, but not to the point where dripping.
(3) Wipe surface with moistened cloth as required to dissolve or loosen soil. Confine to a small enough area so the surface being cleaned remains wet.
(4) With a clean, dry cloth, immediately wipe the surface while solvent is still wet. Do not allow the surface to evaporate dry.
(5) Repeat steps (b) through (d) until there is no discoloration on the drying cloth.

23C. Chemical Film Treatment.

A. Chemical film treatment establishes the procedures and requirements for cleaning and applying a chromate conversion coating to exterior surfaces of the airplane after paint has been stripped from the entire airplane or sections of the airplane exterior. The following is a list of requirements that apply to chemical film treatment:
(1) Painted surfaces must not be cleaned in accordance with this information.
(2) Mask all transparent plastic surfaces, such as windows. Plastics mat craze, frost or lose transparency if solutions come in contact with them.
(3) Deoxidizing solutions will attack magnesium anodized aluminum and cadmium plated surfaces. To prevent damage, mask or avoid prolonged exposure to solution.
(4) High strength steels are embrittled by deoxidizing solutions. Thoroughly mask all high strength steel parts, such as landing gear and flap brackets.
(5) Exterior surfaces, after cleaning, shall be visually examined as evidenced by a smooth break free water film upon removal from the final rinse.
(6) The final protective paint system or primer shall be applied only on a completely dry surface after application of the chromate conversion coating.
(7) Each time the painting sequence on an airplane is broken over night or longer, a hand solvent wipedown should be performed immediately before further coats are applied.

B. Procedure.
(1) When certain soils, such as corrosion preventive compounds, lubricants, sealer, primer or other hard to remove contaminants are present on surfaces, remove by solvent cleaning. Refer to Liquid Solvent Cleaning above.
(2) Fill any indentations and low spots with body putty and sand.
(3) Solvent clean to remove any contamination from the application of body putty or sanding.

24. Touch Up Landing Gear Finish.

A. When it is necessary to touch up or refinish landing gear area, the edge of the finish adjacent to the defect shall be feathered by sanding with #320 grit sandpaper followed by #400 grit sandpaper. Avoid, if possible, sanding through the primer. If the primer is penetrated over an area of 1 inch square or larger, the surface must be cleaned with Methyl n-Propyl Ketone and reprimed with 54P epoxy primer.

B. Apply epoxy white 54E series enamel in accordance with epoxy finish.

25. Touch Up Around Rivets.

A. Paint peeling around rivets may be caused from flexing of surrounding metal. To prevent further paint peeling after paint touch up, repair as follows:
(1) Scuff sand area using #320 grit sandpaper.
(2) Clean area with isopropyl alcohol.
(3) Apply EC-2216 sealant, Minnesota Mining and Manufacturing Co., mixed in accordance with manufactures instructions.
(4) Wipe off excess material and allow to cure (approximately 24 hours).
(5) Sand lightly as required for appearance.
(6) Apply original finish.

26. Touch Up Propeller Tips.

A. Refer to McCauley Specification MC-2607.

27. Preparing Kevlar and fiberglass Surface for Painting.

A. Surfacer is applied to Kevlar to provide a surface the polyurethane paint will adhere to on the exterior of the airplane. Reapplication of surfacer may be administered to the entire surface or confined to local areas. Sand all loose paint from the Kevlar surface.

B. The surfacer is a two part epoxy material consisting of a base material and a catalyst.
(1) Cleaning.

(a) Check surface for loose paint and peel all loose paint from the surface. Check areas having missing and loose paint for damage.
(b) Scuff sand area to be refinished with #320 grit paper and clean surface with Methyl n-Propyl Ketone. Follow the manufacturers instructions for the final cleaning procedure.

(2) Mixing Instructions (Bostik-Finch Paint Co.).

(a) Place three parts by volume 464-3-1 base in a container and add one part by volume CA-142 catalyst. Mix thoroughly.
(b) Useable pot life under standard day temperature, 70°F condition is eight hours. Avoid mixing more material than can be used during this period.

(3) Application (Bostik-Finch Paint Co.).

(a) Surfacer shall be thinned for spray application with TL-52 thinner to a spray viscosity of approximately 25 seconds when measured with a #2 Zahn cup. Coating may be applied at heavy film thicknesses up to 10-15 mils without running or sagging.
(b) The coating will air dry to sand in three hours, depending on temperature and film thickness. Parts may be force dried for 30-40 minutes at 180-200° Fahrenheit.

(4) Mixing instructions (Andrew Brown Paint Co.).

(a) If, after mixing surfacer and catalyst, a putty consistency is desired:
Mix 12 parts of Skyspar surfacer with one part of catalyst concentrate. Mix thoroughly, then cover the container and let stand for one hour. The mixture should be thick, smooth putty and may be applied with a spatula or a heavy bristled brush. Once applied the putty may be overcoated immediately by a brushing or spraying application. The material will be dry for sanding when it does not gum up in the sandpaper and sands off in a dry powder. This will occur after air dried for two hours, or is force dried at 170°F for 1/2 hour.
(b) If, after mixing surfacer and catalyst, a brushing consistency is desired: take a portion of the putty material that has been allowed to set for one hour and thin it down to a suitable brushing viscosity with catalyst thinner. This material is ready for use immediately after thinning. Brush the mixture on the part, making sure to work the material well into the surface and filling all holes. Parts may be force dried at 170°F for approximately 15-20 minutes. Drying time will be dependent on the coating thickness and will be ready for sanding when the material does not gum up on the sandpaper.

(c) If after mixing surfacer, catalyst and catalyst thinner, a spraying consistency is desired: Take a portion of the brushing mixture and thin it to a suitable spray viscosity with thinner (T-262). This material may be used immediately after thinning. Spray the mixture with the necessary number of coats to completely cover any brush marks or imperfections in the surface of the part. The part may be force dried at 170°F for 20 to 30 minutes.

NOTE

When applying heavy spray coats, solvent entrapment may occur causing pin holes. To eliminate this, let the part stand for 5 to 10 minutes after it has been sprayed to allow solvent flash off. After 10 minutes, spray one final finish coat and dry.

(5) Application of Sanding Surfacer (Andrew Brown Paint Co.).

NOTE

Apply only enough sanding surfacer to obtain a smooth surface, maximum thickness of applied sanding surfacer shall not exceed 0.015 inch.

(a) Clean the part to receive the sanding surfacer with isopropyl alcohol.
(b) Fill all large holes and crevices with putty.
(c) Thin the putty mixture to a brushing consistency and apply with a brush, working the material well into the surface. Do not work back over the surface once it has been completed because the material begins to dry quickly and the brush strokes that are made and are difficult to sand out.
(d) Place the part in the oven at 170°F for approximately 1/2 hour or until dry enough to be sanded. Sand out all brush strokes as smoothly as possible, being careful not to break through the outer layer of fiberglass.
(e) For a final finish, mix the material to a spray viscosity and apply enough spray coats to completely cover any imperfections in the surface to give a smooth even appearance. Force dry at 170°F for 1/2 hour, or until dry enough to sand. If necessary, repeat the procedure as often as needed to achieve the desired results.

(6) Rework procedure.

(a) This procedure shall be used when repairing non-metallic painted parts having cracked or chipped paint.
(b) If paint is cracked, there is a good possibility that the sanding surfacer has been applied too thick and this surfacer needs to be reduced in thickness. If paint and surfacer failed as a small sheet of material, this indicates poor adhesion and the surface will need rework. In any case, the part should be reworked as follows:
1) Sand entire surface. Sand surfacer down to glass or Kevlar fabric, but do not sand into fabric. If surfacer of paint was cracked, surfacer must be removed down to fabric or crack will redevelop.
2) Fill pin holes or surface defects with sanding surfacer of paint primer. On radomes, surfacer or primer must not contain metallic filler. Apply surfacer or primer with a squeegee filling in pin holes and depressions.
3) Allow to dry, sand smooth. reapply, dry and sand if necessary.
4) When surface is smooth and free of defects, apply a thin coat of primer by spray. Sand and apply paint.

(7) Primer for fiberglass surfaces.

(a) Data.
1) U-1201 primer is a two component epoxy polyamide material formulated to meet the performance requirements of MIL-P-23377C.
2) When the primer is applied properly, it has excellent fluid resistance and offers excellent corrosion protection on aluminum surfaces.
(b) Cleaning
1) Clean loose paint from area to be repainted.
2) Check area for damage; repair as required.
3) Scuff sand area to be refinished with # 320 grit sandpaper and clean surface with Methyl n-Propyl Ketone. Follow the manufacturers instructions for the final cleaning procedures.
(c) Mixing instructions.
(d) The U-1202 catalyst should be added on a 1:1 by volume basis to the U-1201 base component. Add one part catalyst to one part base component and mix thoroughly.

(b) If additional thinning is desired, add thinner conforming to MIL-T-19588
(d) Application.
1) Protective clothing, adequate ventilation and a mask shall be utilized while applying (spray or brush).
2) The primer may be overcoated after one hour.

27. Cadmium Plate, Steel and Copper Alloys.

A. Surface Preparation.

(1) Steel parts not to be machined all over shall be descaled to preclude excessive chemical cleaning. This mechanical cleaning should be done prior to any finish machining to avoid changes in dimension or finish of machined surfaces by descaling operations.
(2) Parts shall be vapor degreased as required.
(3) Parts shall be alkaline cleaned. Steel parts must be thoroughly cleaned and derusted, preferably by anodic cleaning, so that only brief pickling will be required. Do not use cathodic (direct) electro-cleaning on steel parts heat treated over 180,000 psi.
(4) Parts shall be pickled for the minimum time necessary, do not pick steel parts heat treated over 180,000 psi for more than 10 seconds.
(5) If plating is delayed after removal of parts from the pickle, they shall be held in a one to two percent sodium cyanide solution.

B. Plating.

(1) Plating shall be accomplished under conditions within the following limits:

Voltage	1 to 10 volts
Solution Concentrations	
Cadmium Oxide	3.0 to 4.0 ounces per gallon
Sodium Cyanide	11.0 to 18.0 ounces per gallon
Sodium hydroxide	2.1 to 3.0 ounces per gallon

(2) Immediately after plating, parts shall be rinsed thoroughly in cold water and then in hot water.
(3) Bake.
(a) All cadmium plated parts heat treated to a tensile strength between 180,000 psi and 220,000 psi shall be baked in an air atmosphere maintained at 375° ±25°F for three hours. The bake period shall be initiated within four hours after the completion of the plating operation.

C. Type II Conversion Coating, Supplementary Treatment.

(1) Cadmium plated surfaces over which organic finishes are to be applied shall be given supplementary chromate treatment.
(2) The chromate treatment shall produce a continuous, smooth distinct protective film, distinctly colored iridescent bronze to brown.
(3) Supplementary chromate treatment shall consist of immersion for 5 to 10 seconds, without agitation, in the following described solution. Drain for 3 to 4 seconds, then rinse in water at a temperature not over 160°F.
(a) 24 to 30 ounces sodium dichromate, 38 milliliters of sulfuric acid (66° baume) and 0.1 ounce Nacconol NR per gallon of solution.

NOTE: Maintain the PH between 0.65 and 1.0 by additions of sulfuric acid.

D. Stripping.

(1) Parts to be stripped for replating shall be stripped by chemically cleaning method, except that steel parts heat treated over 180,000 psi shall be stripped only in ammonium nitrate solution.

28. Color Chemical Film Treatment of Aluminum.

A. Materials.

(1) Iridite 14-2 Powder - Allied Research Products Inc. The treating solution shall contain 1.25 to 2.25 ounces of Iridite 14-2 powder per gallon of water (7.8 to 14.0 pounds per 100 gallons water). The PH shall be in the range of 1.1 to 1.6. When the PH cannot be maintained in the specified range with the addition of the required Iridite 14-2 powder, adjustments of the solution PH shall be made by nitric acid or sodium hydroxide. Thirteen fluid ounces of nitric acid (40 degree Baume') per 100 gallons of solution will lower the PH by about 0.10 unit. One-half pound of sodium hydroxide per 100 gallons of solution will raise the PH about 0.10 unit.

B. Requirements.

(1) Parts covered with significant quantities of oil or grease shall be vapor degreased using trichloroethylene.
(2) Clean using alkaline cleaner Oakite 164 or Pennwalt A-28A. Assemblies with lap joints or crevices which will entrap solution shall be cleaned with solvent Pennwalt 2331. If the solvent was used wipe dry with a clean cloth.

C. Treatment.

(1) Parts shall be immersed in the Iridite 14-2 solution from two to eight minutes. The solution shall be maintained in the temperature range of 65 to 100°F.
(2) Parts shall be rinsed in clean water at a temperature of 70° to 160°F and dried in the temperature range of 60° to 180°F in still or circulating air. The parts should not be wiped until they have dried 24 hours.

<u>NOTE</u>: Color chemical film vary from iridescent to dull brown. The coating shall adhere when rubbed with a white cloth or glove after parts are dry.

(3) Iridite 14-2 may be applied by brushing on small areas which cannot be dipped. Swabbing or brushing small quantities of the treating solution over the stripped area until a satisfactory chemical film has been produced. Rinse the treated area with water. The water may be applied with sponge or brush. The treated area shall be dried in the same manner as a dipped part.
(4) Parts should be primed within 48 hours after removed from the iridite solution.

29. Magnesium Protective Treatment.

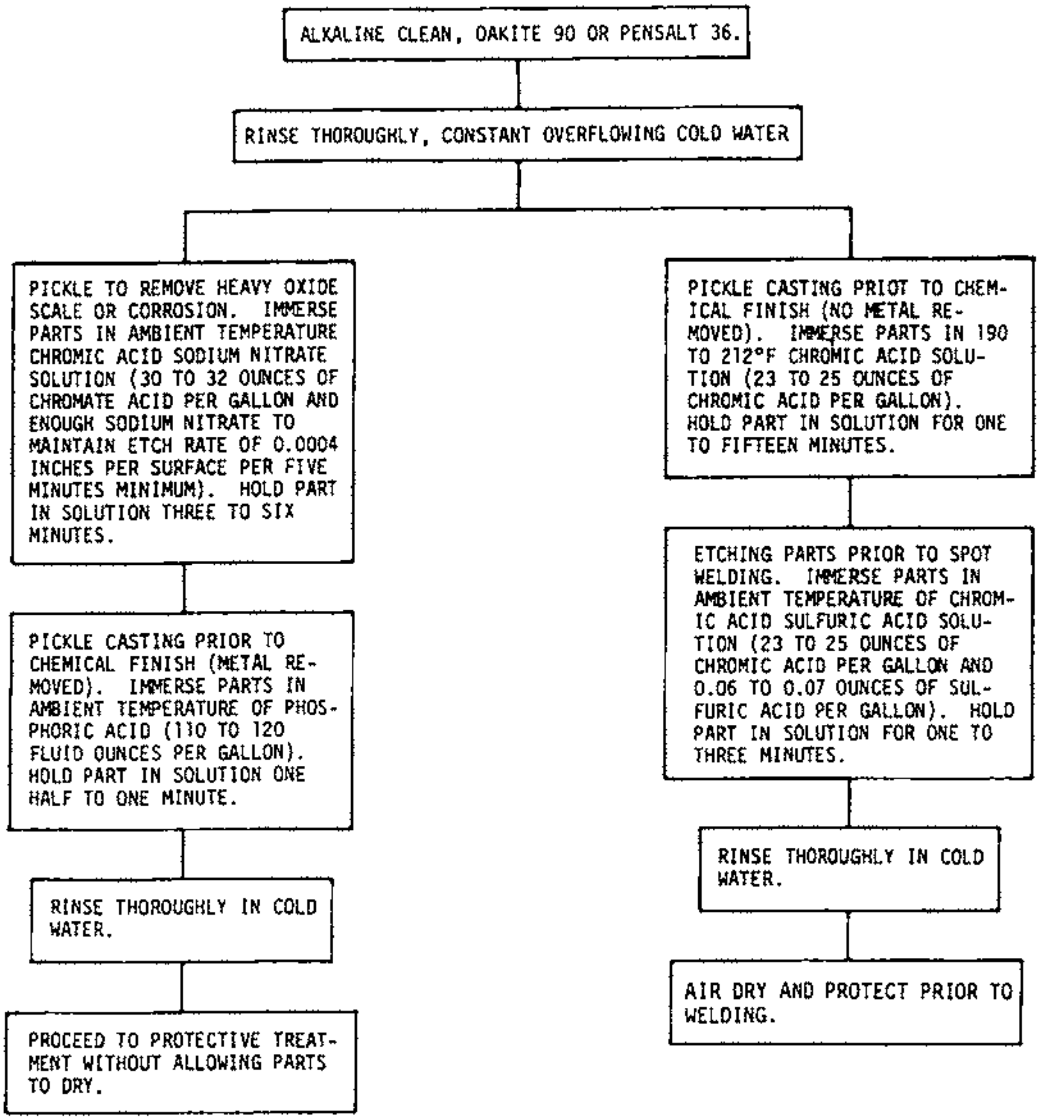
A. Materials

(1) Dow No. 7 Dichromate solution - 16 to 24 ounces sodium dichromate and 1/3 ounce calcium fluoride per gallon of solution. The PH must be between 4.2 and 5.5. Boil new solution for one hour before using and whenever the solution temperature drops below 200°F. Maintain the solution at boiling temperature while treating parts.
(2) Iridite No. 15 Dichromate solution - 4.5 to 5.5 ounces of iridite No. 15 (Allied Research Products) per gallon, 7 to 8 ounces hydrochloric acid (20° BE') 31 percent by weight per gallon, and one ml of A.R.P. number two (Allied Research Products detergent) per gallon. The PH must be between 0.2 and 0.6. The temperature of the solution must be between 75 and 100°F.

B. Requirements.

(1) Oxides, scale, and water insoluble substances shall be mechanically removed with aluminum oxide paper or cloth or a monel brush.
(2) The parts shall be alkaline cleaned with Oakite 90 Oakite Products Inc.) or with Pennwalt 36 (Pennwalt Chemical Corporation).
    (a) Use five to seven ounces of Oakite 90 per gallon and maintain the solution at a temperature of 180° to 200°F.
    (b) Use five to ten ounces of Pennwalt 36 per gallon and maintain the solution at a temperature of 180° to 212°F.

(3) Cleaning and Pickling of Magnesium Alloys



C. Treatment.

(1) Dow Number 7 Process.
- (a) The parts shall be cleaned and pickled prior to treatment.
- (b) Wrought alloys and forgings shall be immersed for a one to five minute period in a solution comprised of 5.5 to 7 ounces of ammonium biflouride per gallon of water. Castings shall be immersed from one half to five minutes in an aqueous solution containing 10 to 20 percent hydrofluoric acid by weight. The temperature of these solutions shall be 65 to 100°F.
- (c) The parts shall be rinsed in cold water.
- (d) Immerse the parts in the Dow Number 7 solution for 35 to 60 minutes.
- (e) Rinse parts in cold water and then in hot water.
- (f) Dry the parts in still air at room temperature or in a low velocity stream of warm air.
- (g) Finish should be applied within 12 hours after protective treatment, refer to 11-10-03 for exterior finish.

(2) Iridite Number 15 Process.

NOTE

The Iridite Number 15 process can be used to produce a protective film on detail parts by immersion where there is no possibility of solution entrapment.

(a) The parts shall be cleaned and pickled prior to treatment.
(b) Immerse the parts in the Iridite Number 15 solution for 10 to 30 seconds.
(c) Rinse the parts in cold water.
(d) Dry the parts in still air at room temperature or in a low velocity stream of warm air. No moisture shall be entrapped between parts.
(e) Finish should be applied within 12 hours after protective treatment.

(3) Touchup.
(a) When small areas of the Dow Number 7 or the Iridite Number 15 protective film on parts have been scratched or otherwise impaired, these areas shall be touched up by a brush or swab application of Iridite Number 15 solution. The areas to be treated shall be smoothed with # 400 grit or finer aluminum oxide abrasive paper prior to the application of the touchup solution. Brush or swab on the Iridite Number 15 solution. The surface of the magnesium shall be kept wet with the solution for a sufficient time to produce a film. This time will usually be one to three minutes. The solution shall be used at room temperature.
(b) Where drilling or punching operations have been preformed on surfaces already chemically treated, it will not be necessary to touchup the exposed surfaces. It should be noted, however, drilling or punching operations should be performed before chemical treatment whenever practical.

D. Stripping.

(1) Parts treated with the Dow Number 7 process may be stripped by immersing in chromic acid. Stripped parts shall be given protective treatment.
(2) Parts treated with the Iridite Number 15 process may be stripped by immersing in hot caustic (16 ounces per gallon of N_aOH at 180 to 200°F until the surface turns gray). Rinse in cold water. Stripped parts shall be given protective treatment.

30. Mechanical Finish.

A. Unpainted aluminum surfaces have a mechanical finish. The mechanical finish is achieved by polishing the bare metal with an abrasive compound with binder which serves as a lubricant.

B. Mirror Finish.

(1) A mirror finish is applied to aluminum by applying T-41 tripol compound on a revolving muslin buffing wheel.
(2) The part shall be buffed using slight contact pressure between the muslin buffing wheel and part.
(a) Parts shall be free of knicks, gouges, scratches and similar defects prior to polishing and buffing. Minor defects which do not penetrate the cladding and which will be removed during polishing are not objectionable.
(b) The circumference of the polishing wheel should revolve at approximately 6500 feet per minute; higher speeds can produce hot spots and damage paint.
(c) Polishing wheel must be kept clean by raking to prevent caking of compounds which might cause scratching.
(d) Care must be exercised during polishing to avoid penetration and removal of the clad.

31. Touch Up Identification Number.

A. Determine Paint Used on Identification Number.

(1) Rub a small area of the number with a damp cloth of Methyl n-Propyl Ketone. Lacquer paint is easily removed with Methyl n-Propyl Ketone and polyurethane is not.

B. Lacquer Identification Number is Damaged.

(1) Mask around number and remove paint from affected area using Methyl n-Propyl Ketone.
(2) Prepare area to be retouched using touch up polyurethane procedures.
(3) Remove masking tape and clean area under tape with Methyl n-Propyl Ketone.
(4) Remask around number and paint area using touchup polyurethane procedures.

C. Polyurethane Identification Number is Damaged.

(1) Mask around number and remove paint and prepare area to be retouched using polyurethane procedures.
(2) Remove masking tape and clean area under tape with Methyl n-Propyl Ketone.
(3) Remask around number and paint area using touchup polyurethane procedures.

Sealing

1. Description.

A. Sealing is intended to prevent the leakage of liquids, vapors or air pressure through airframe compartment structure. It may be accomplished with sealing compounds alone or the compounds may require structural assistance. Sealing is required for the protection of personnel and equipment.
B. The extent or level of sealing and type of sealant material required varies depending upon location, environment and intent.

2. Levels of Sealing.

A. The necessary "tightness" establishes the complexity or level of sealing. There are three such sealing levels:
(1) Absolute - All openings of any nature through the seal plane are positively sealed; i.e., no leakage allowed.
(2) Intermediate - All holes, slots, joggles and enclosure joints are sealed.
(3) Special - All holes, slots and joggles are sealed.

3. Functions of Sealing (Types).

A. There are six functions that sealing must accomplish. These functions are based upon the intent or requirements for the areas to be sealed. These functions are listed and briefly described as follows:

(1) Fuel Areas - To contain fuels, to control fuel, to control fuel spillage and to prevent leaks of fuel or fumes into dangerous areas.
(2) Pressure Areas - To contain air pressure so that cabin operating air pressures can be maintained.
(3) Firewall Areas - To prevent the spreading of fire or flames from an engine to the airplane.
(4) Weather Areas - To exclude weather elements which can cause damage to equipment and/or might cause corrosion.
(5) Acid Areas - To protect structure in the battery area from battery acid or alkaline attack and to protect structure in relief areas from uric acid attack.
(6) Electrical Wire Bundles - To prevent pressure and/or moisture leaks about electrical wire bundles.

4. Materials.

A. Sealants

(1) Type of Sealants - Sealants are categorized by type of usage.
(a) Type I - Fuel, pressure, weather and acid sealing.
(b) Type II - Hole filling compound. This material is for holes, slots, etc. that cannot be filled with one application of Type I, Class B sealant. Type II sealant shall not be used for the sealing of an integral fuel tank.
(c) Type III - High - temperature sealant. This material is for use where exposure to fuel is moderate and for intermittent intermittent exposures up to 450°F, but is not suitable for pressure sealing.

(d) Type IV - Firewall sealant. This material is for use when exposure to fuel is minimal and for intermittent temperature exposures up to 500°F, but is not suitable for pressure sealing.
(e) Type V - Extreme high-temperature sealant. This material is for use where exposure to fuel is minimal and for intermittent exposures up to 600°F and is also suitable for pressure sealing.
(f) Type VI - High-temperature sealant. This material is for use where exposure to fuel is minimal and for intermittent exposures up to 500°F and is also suitable for pressure sealing.

(2) Class of Sealants - The Type I sealants are separated into three classes to differentiate the material to use for the three methods of application.
(a) Class A sealant which is suitable for brush application.
(b) Class B sealant which is suitable for application by extrusion gun, spatula, etc.
(c) Class C sealant which is suitable in the faying surface application.

(3) The dash numbers following the class designation indicate the minimum application time (in hours) for Classes A and B and minimum work life (in hours) for Class C.

(4) The time periods given in Table 1 are based on a temperature of 77°F and 50 percent relative humidity. Any increase in either temperature or relative humidity may shorten these time periods and accelerate the sealant cure.

Class	Application Time (Hours, Minimum)	Work Life (Hours, Minimum)	Tack-Free Time (Hours, Maximum)	Curing Rate (Hours, Maximum)
A-1/2	1/2		10	40
A-2	2		40	72
B-1/2	1/2		10	30
B-2	2		40	72
B-4	4		48	90
C-20	8	20	96	168 (7 days)

Table 1. Curing Properties of Type I Sealant

5. Tools and Equipment.

NOTE: Specified sealants, cleaning solvents, parting agents, adhesion inhibitors and equipment are listed for use. Suitable substitutes may be used for sealing equipment only.

Name	Federal/Military Specification	Manufacturer	Manufacturer's Number
Sealant	MILS8802, Type I, Class A-1/2	Products Research and Chemical Corp. Glendale, CA 91203	PR-1422 Class A-1/2
Sealant	MILS8802, Type I, Class A-2	Products Research and Chemical Corp.	PR-1422 Class A-2
			Pro-Seal 890 Class A-2

Name	Federal/Military Specification	Manufacturer	Manufacturer's Number
Sealant	MIL-S-8802, Type I, Class B-1/2	Products Research and Chemical Corp. Glendale, CA 91203	PR-1422 Class B-1/2
			Pro-Seal 890 Class B-1/2
Sealant	MIL-S-8802, Type I, Class B-2	Products Research and Chemical Corp.	PR-1422 Class B-2
			Pro-Seal 890 Class B-2
Sealant	MIL-S-8802, Type I, Class B-4	Products Research and Chemical Corp.	Pro-Seal 890 Class B-4
Sealant	MIL-S-8802, Type I, Class C-20	Products Research and Chemical Corp.	Pro-Seal 890 Class C-20
Sealant	Type II	Products Research and Chemical Corp.	PR-205
			Pro-Seal 567
Sealant	Type III	Products Research and Chemical Corp.	PR-810
Sealant	Type IV	Products Research and Chemical Corp.	Pro-Seal 700
Sealant	Type V	General Electric Co. Silicone Products Dept. Waterford, NY 12188	RTV-106
Sealant	Type VI	Dow Corning Midland, MI 48640	RTV-732 (White)
Sealant	Class A	General Electric Co.	RTV-102
Sealant	Class B	Dow Corning	RTV-738
Sealant	Class B	General Electric Co.	RTV-162

Name	Federal Specification	Manufacturer	Number
CLEANING SOLVENTS			
Methyl n-Propyl Ketone	TT-M-251		
Toluene, Technical	TT-T-548		
Cleaning Compound	MIL-C-38736		
Isopropyl Alcohol	TT-I-735		
PARTING AGENTS			
Silicone Compound	MIL-S-8660		
Petrolatum, Technical	VV-P-236		
EQUIPMENT			
Pneumatic Sealing Gun		Semco, A Div. of Products Research and Chemical Corp. Glendale, CA.	Semco No. 250 with accessories (or equivalent)
Hand-Operated Sealing Gun		Semco, A Div. of Products Research and Chemical Corp. Glendale, CA.	Semco No. 850
Nozzles, Round 1/16 Orifice Round 1/8 Orifice Duckbill Duckbill Comb		Semco, A Div. of Products Research and Chemical Corp. Glendale, CA.	Semco No. 420 Semco No. 440 Semco No. 8615 Semco No. 8648 Semco No. 8646
Metal Spatulas, with either stainless steel or glass plates for hand mixing of sealants.			
Polyethylene Cartridges, with plungers and caps for sealant gun.			
Balance having an accuracy of 0.1 gram or better (not spring actuated).			
Sealant fairing tools.			
Cheesecloth, lint-free.			
Plastic Scraper, 45-degree cutting edge.			
Cold Storage Equipment, capable of -40°F.			

Name	Federal Specification	Manufacturer	Number
Durometer		Rex Gauge Co., Inc.	Rex Model 1500 (or equivalent)
Gloves, lightweight, lint-free white cotton			
Nylon Bristle Brushes			
Plastic Lined Cups, Wax-free with caps			
Pipe cleaners			
Funnel brushes			

6. Definition of Sealing Terms.

   A. Absolute Sealing - There can be no leakage allowed. All openings of any nature through the seal plane are positively sealed. This is the first level of sealing. (All holes, slots, joggles, fasteners and seams must be sealed.)

   B. Accelerator (Activator) - Curing agent for sealants.

   C. Application Time - The length of time sealant remains workable or suitable for application to structure by brush, extrusion gun, spatula or roller.

   D. Base Compound - The major component of a two-part sealing compound which is mixed with the accelerator prior to application to produce a fuel, temperature, pressure, weather and/or firewall sealing material.

   E. Brush Coat - Apply an overcoating or continuous film of appropriate sealing compound by use of a brush.

   F. Electrical Seal Fitting - A device used for sealing electrical wires which pass through bulkheads, etc.. Not to be used through the integral fuel tank wall.

   G. Fay Seal or Faying Surface Seal - A seal barrier created by the sandwiching of sealant between mating surfaces of structure. Special attention must be taken to avoid metal chips or dirt at the faying surface. This seal is not recommended as a primary seal due to the difficulty of inspection and/or repairing it, but is used extensively as an emergency seal.

   H. Fillet Seal - Sealant material applied at the internal corner or juncture formed by two (2) adjacent parts and shall conform to the dimensions shown in applicable figure. This is a post-assembly seal.

   I. Hole - An opening that has no appreciable depth, such as a tool hole. Holes that penetrate the seal plane must be metal filled with a fastener, gusset or patch.

   J. Injection Seal - Filling of channels by forcing sealant into a void or cavity after assembly.

   K. Integral Tank - Composition of structure and sealant material which forms a tank that is capable of containing fuel without a bladder.

   L. Intermediate Seal - The second level of sealing. All holes, slots, joggles and seams in the seal plane must be sealed. A minor amount of leakage is tolerable and permanent fasteners are not required to be sealed.

   M. Post-Assembly Seal - A seal that is applied after the structure is assembled. (Fillet and injection seals.)

N. Preassembly Seal - Sealant material that must be applied during or prior to the assembly of the structure. (Faying surface and pre-pack seals.)

O. Pre-Pack Seal - A preassembly seal used to fill voids and cavities; can be a primary seal used to provide seal continuity when used in conjunction with a fillet seal. It can be used as a backup seal to support a fillet across a void. Fill the entire cavity to be pre-packed. Usage as a primary seal should be kept to a minimum.

P. Primary Seal - Sealant material that prevents leakage and forms a continuous seal plane. This seal is in direct contact with the fuel, vapor, air, acid, etc. With few exceptions, it is in the form of a fillet seal.

Q. Sealant - A compound applied to form a seal barrier.

R. Seal Plane - A surface composed of structure, sealant and fasteners on which the continuity of seal is established.

S. Shank Sealing - Sealant compound shall be applied to the hole or to both the shank and the underhead area of the fastener in sufficient quantity that the entire shank is coated and a small continuous bead of sealant is extruded out around the complete periphery of each end of the fastener when installed. The fastener shall be installed within the application time of the sealing compound used.

T. Squeeze-Out Life - Length of time sealant remains suitable for structure assembly in faying surface seal application.

U. Tack-Free Time - Tack-free time is a stage, during the cure of the sealant compound, after which the sealant compound is no longer tacky. When the sealant compound is pressed firmly with the knuckles, but no longer adheres to the knuckles, the sealant compound is tack-free.

7. General Requirements.

A. Unmixed sealants shall not be more than two months old when received. These sealants shall not be more than six months old when used.

B. Unmixed sealants stored at temperatures exceeding 80 degrees Fahrenheit shall be used within five weeks.

C. Sealants which have been premixed, degassed and flash frozen shall be maintained at -40 degrees Fahrenheit or lower and shall not be received more than two weeks beyond the date of mixing. These sealants shall not be used more than six weeks after the date of mixing.

D. Frozen sealant shall be thawed before being used. If sealant were applied at a temperature below 60 degrees Fahrenheit, it would not be sufficiently pliable for proper application and adhesion could be critically reduced by condensation of moisture. On the other hand, although sealant must extrude freely for proper application, it would be subject to excessive slumping if applied at a temperature above 80 degrees Fahrenheit. Frozen sealant may be thawed by any suitable means which does not cause contamination or overheating of the sealant and does not shorten the application time of the sealant to an impractical period. Examples: Thawing by exposure to ambient air temperature, accelerated thawing by exposure in a constant temperature bath (using clean, hot water), accelerated thawing in a microwave oven. In any case, thawing temperature and time shall be adjusted to give a thawed sealant temperature between 60 degrees Fahrenheit and 80 degrees Fahrenheit at the time the sealant is applied.

E. Mixed, frozen sealants which have thawed shall not be refrozen.

F. Preassembly operations such as fitting, filing, drilling, countersinking, dimpling and deburring shall be completed prior to cleaning and sealant application.

G. Surfaces must be clean and dry, free from dust, lint, grease, chips, oil condensation or other moisture and all other contaminating substances prior to the application of sealant.

H. Naphtha Type II or Isopropyl Alcohol (TT-I-735) are the only cleaners which may be used on plastic transparencies.

I. Sealant materials may be applied to unprimed or primed surfaces. Zinc chromate or epoxy primers shall have good adhesion to the substrate material and shall have aged at least 48 hours prior to sealant application.

J. Sealants shall not be applied when the temperature of either the sealant or the structure is below 60 degrees Fahrenheit.

K. The sealants Pro-Seal 890 B-1/2, B-2 or B-4 are the only sealants which may be used on plastic transparencies.

L. Sealant applied by the fillet or brush coat methods shall always be applied to the pressure side of a joint if possible.

M. After application, sealants shall be free of entrapped air bubbles and shall not exhibit poor adhesion. All fillets shall be smoothed down and pressed into the seam or joint with a filleting tool before the sealant application time has expired.

N. Where fasteners have been sunk or underhead sealed, extruded sealant shall be evident around the complete periphery of the fastener to indicate adequate sealing. Sealant extruded through a hole by a rivet shall be wiped from the end of the rivet before bucking. Threaded fasteners which have been shank or underhead sealed shall not be retorqued after the expiration of the application time of the sealant. In torquing, turn the nut rather than the bolt if possible.

O. Pressure testing shall not be accomplished until the sealant is cured.

P. Sealant shall not be applied over ink, pencil or wax pencil marks. If these materials extend into the sealing area, they must be removed.

Q. If sealing is to be accomplished over primer and the primer is removed during the cleaning process, it is permissible to seal directly over the cleaned area and then touch up the exposed areas after the sealant has been applied and is tack free.

R. Sealed structure shall not be handled or moved until sealant is tack free (sealant may be dislodged or have the adhesion damaged). Excessive vibration of structure, such as riveting, engine run up, etc. is not permitted.

S. Blind fasteners shall not be installed through the integral fuel tank walls.

8. Sealant Curing.

A. Room Temperature.

(1) Room temperature curing properties are based on a temperature of 77 degrees Fahrenheit and a relative humidity of 50 percent. Curing times of two-part sealants are retarded by reduced temperature and/or relative humidities.
(2) Room temperature curing properties of Type I sealants are given in Table 1.
(3) Room temperature curing properties of Type II sealant are:

Application Time	2 Hours (Minimum)
Tack-Free Time	20 Hours (Maximum)
Curing Rate	40 Hours (Maximum)

(4) Room temperature curing properties of Type III sealant are dependent upon solvent release. Type III sealant should cure for a minimum of 17 days at a room temperature before being subjected to temperatures as high as 400 degrees Fahrenheit.
(5) Room temperature curing properties of Type IV sealant are:

Application Time	1-1/2 Hours (Minimum)
Tack-Free Time	24 Hours (Maximum)
Curing Rate	48 Hours (Maximum)

Type IV sealant should cure for a minimum of 72 hours at room temperature before being subjected to temperatures as high as 400 degrees Fahrenheit.

(6) Room temperature curing properties of Type V sealant are:

Tack-Free Time	1/2 Hour (Maximum)
Curing Rate	24 Hours (Maximum)

Type V sealant should cure for a minimum of 48 hours at room temperature before being subjected to temperatures as high as 400 degrees Fahrenheit.

(7) Room temperature curing properties of Type VI sealant are:

Class A:	
Tack-Free Time	1/2 Hours (Maximum)
Curing Rate	24 Hours (Maximum)
Class B:	
Tack-Free Time	2 Hours (Maximum)
Curing Rate	48 Hours (Maximum)

Type VI sealant should cure for a minimum of 48 hours at room temperature for Class A and 96 hours at room temperature for Class B before being subjected to temperatures as high as 400 degrees Fahrenheit.

(8) Room temperature curing properties of Type VII sealant are:

Class B-1/2:	
Tack-Free Time	10 Hours (Maximum)
Curing Rate	24-35 Hours (Maximum)
Class B-2:	
Tack-Free Time	24 Hours (Maximum)
Curing Rate	35-48 Hours (Maximum)

B. Accelerated Curing.

(1) Accelerated curing of sealant can be accomplished in several ways. The procedure to be used is dependent on the type of sealant and other factors.

(2) The cure of Type I or Type II sealants can be accelerated by an increase in temperature and/or relative humidity. Warm circulating air at a temperature not to exceed 120 degrees Fahrenheit may be used to accelerate cure. Heat lamps may be used if the surface temperature of the sealant does not exceed 120 degrees Fahrenheit. At temperatures above 120 degrees Fahrenheit, the relative humidity will normally be so low (below 40 percent) that sealant curing will be retarded. If necessary, the relative humidity may be increased by the use of water containing less than 100 parts per million total solids and less than 10 parts per million chlorides.

(3) The cure of Type III sealants can be accelerated after first curing for a minimum of 72 hours at room temperature by heating for 8 hours with warm circulating air or heat lamps in such a manner that the surface temperature of the sealant does not exceed 120 degrees Fahrenheit. (Lowered relative humidity is helpful.) Curing should be completed before the sealant is subjected to temperatures as high as 400 degrees Fahrenheit.

(4) The cure of Type IV sealants can be accelerated by reducing the relative humidity. However, the sealants should be cured for a minimum of 72 hours at room temperature before being subjected to temperatures as high as 400 degrees Fahrenheit.

(5) The cure of Type V and Type VI sealants can be accelerated by the same procedures as given for Type I or Type II sealants.

9. Mixing of Sealants.

A. Requirements.

(1) Sealants shall be mixed or thinned in accordance with the manufacturer's recommendations and thoroughly blended prior to application. All mixed sealant shall be as void free as possible.

(2) All sealants covered by these procedures may be either machine mixed or hand mixed. The Type I, Class A-2, B-2, B-4 and C-20 are the only sealant materials that may be machine mixed and frozen.

(3) Prior to either hand or machine mixing, the sealing compound base and its curing agent, both in their respective original unopened containers, shall be brought to a temperature between 75 degrees Fahrenheit and 90 degrees Fahrenheit along with all required mixing equipment.

(4) The base compound batch shall be matched with the appropriate curing agent batch prior to mixing and the containers for the mixed sealant shall be marked with the following information:
(a) Manufacturer's product designation.
(b) Manufacturer's batch number.
(c) The specification type, class and dash number as applicable.
(d) Expiration date for mixed material.
(e) Mix number.
(f) Mixer's initials.

B. Hand Mixing of Sealant.

(1) Weigh into clean, wax-free containers the correct amount of base and accelerator, per manufacturer's instructions, immediately prior to mixing. An alternate method is to mix the sealant on a flat plate with a spatula. The scales and weighing process must be controlled with ±2% of the accelerator to insure good quality.
(2) Do not allow the accelerator to come into contact with the sides of the container.
(3) Materials shall be accurately weighed on scales that are calibrated and maintained for required accuracy.
(4) Mix the components until the color is uniform taking care not to trap air in the sealant.
(5) Transfer the sealant to another clean container and complete the mix.

C. Sem-Kit Mixing.

(1) Push dasher into cartridge all the way.
(2) Insert ramrod (1/4" dowl or equivalent) into hole in top of dasher rod. Push ramrod in gradually at the same time gradually withdrawing the dasher so the catalyst is evenly distributed throughout the entire length of the cartridge. Remove bottom cap.
(3) To mix, push dasher rod to bottom of cartridge and being stroking slowly in a spiral clockwise motion from top to bottom of cartridge. On last stroke, dasher rod should be fully extended.
(4) Unscrew dasher rod (approximately 3 turns) while gripping the cartridge in the area of the dasher. Remove dasher rod and discard.
(5) Screw nozzle into cartridge.
(6) Place cartridge in sealant gun for application.

10. Cleaning

A. All surfaces to which sealant is to be applied shall be clean and dry.

B. Remove all dust, lint, chips, shavings, etc. with a vacuum cleaner where necessary.

C. Cleaning shall be accomplished by scrubbing the surface with clean cheesecloth moistened with solvent. The cloth shall not be saturated to the point where dripping will occur. For channels and joggles, pipe cleaners and/or funnel brushes may be used instead of cheesecloth.

(1) The solvents to be used on all surfaces to be sealed, except the integral fuel tank and on plastic transparencies, shall be MIL-C-38736, cleaning compound, O-T-620, 1, 1, 1 - Trichloroethane, Technical, Inhibited or TT-M-261, Methyl Ethyl Ketone in this order of preference.
(2) The solvents to be used for the cleaning in the integral fuel tank are MIL-C-38736 or TT-M-261 for the first or preliminary cleaning and the O-T-620 only shall be used for the final cleaning.
(3) The only solvents to be used on plastic transparencies shall be TT-I-735, isopropyl alcohol.

D. The cleaning solvent should never be poured or sprayed on the structure.

E. The cleaning solvent shall be wiped from the surfaces before evaporation using a piece of clean, dry cheesecloth in order that oils, grease, wax etc. will not be redeposited.

F. It is essential that only clean cheesecloth and clean solvent be used in the cleaning operations. Solvents shall be kept in safety containers and shall be poured onto the cheesecloth. The cheesecloth shall not be dipped into the solvent containers and contaminated solvents shall not be returned to the clean solvent containers.

G. Final cleaning shall be accomplished immediately prior to sealant application by the person who is going to apply the sealant.

(1) The area which is to be sealed shall be thoroughly cleaned. A small clean paint brush may be needed to clean corners, gaps, etc. Always clean an area larger than the area where the sealant is to be applied. Never clean an area larger than 30 inches in length when practical. When the area is being scrubbed with a moistened cloth in one hand, another clean dry cloth shall be held in the other hand and shall be used to dry the structure. The solvent must be wiped from the surfaces before it evaporates.
(2) The above procedure shall be repeated until there is no discoloration on the clean drying cloth. Marks resulting from wax or grease pencils must be removed from parts prior to sealing.

H. Allow all cleaned surfaces to dry a minimum of 5 minutes before the application of sealant materials.

I. Sealant shall be applied as soon as possible after cleaning and drying the surfaces to be sealed. Do not handle the parts between the cleaning and sealing operations. Sealant application personnel handling cleaned surfaces shall wear clean white gloves to prevent surface contamination. In the event contamination does occur, the surfaces shall be recleaned.

J. Safety precautions should be observed during the cleaning and sealing operation. Cleaning solvents are toxic and flammable in most cases. Fresh air masks and/or adequate ventilation are required for all closed areas. The structure shall be electrically grounded before starting any cleaning or sealing operation.

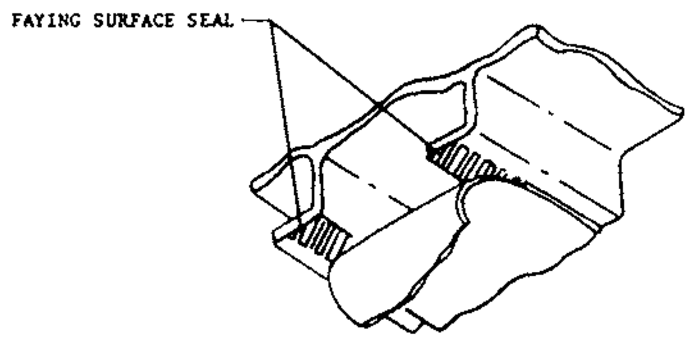
11. Sealing Application.

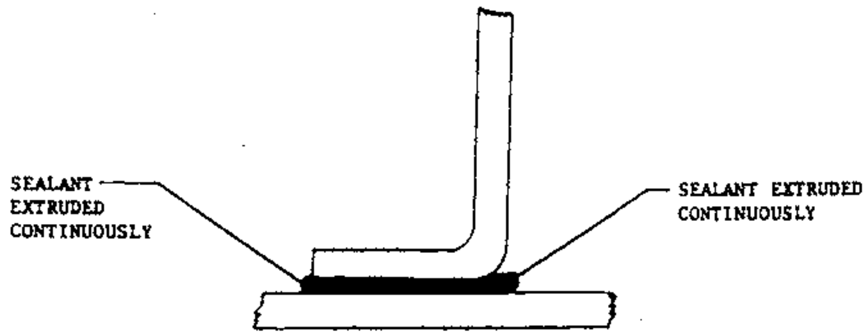
A. General.

(1) All new sealing shall be accomplished using the type of sealing material required for the area being sealed. All sealant repairs shall be accomplished using the same type of sealing material as that which is being repaired.
(2) Application time of the sealing compound shall be strictly observed. Material which becomes too stiff and difficult to work or which does not wet the surface properly shall be discarded even though the application time has not expired.
(3) Prior to sealant application, all surfaces to be sealed shall be cleaned per Section 10.

B. Faying Surface Sealing - The application of a faying surface seal shall be made only when new structure is being added to the airplane and requires a faying surface seal or when the structure and/or parts have been disassembled for reasons other than a faulty seal.

(1) Immediately prior to final closure of the joint, sealant shall be applied to one mating surface of the joint with a sealant gun, spatula, roller or other suitable tool. Sufficient sealant shall be applied so that the space between the assembled faying surfaces is completely filled with sealant and a small excess is squeezed out in a continuous bead around the periphery of the joint when the joint is secured (see Figure 2).
(2) Place parts in assembly position and install the fasteners within the application time of the faying surface sealant. When assembly with permanent type fasteners is not feasible, temporary fasteners (clecos or bolts) may be used, but when the temporary fasteners are used, they must be replaced by permanent type fasteners prior to the expiration of the work life of the faying surface sealant. Removal of each individual temporary fastener shall be followed immediately by the installation of the permanent fastener.





Fay Sealing
Figure 2

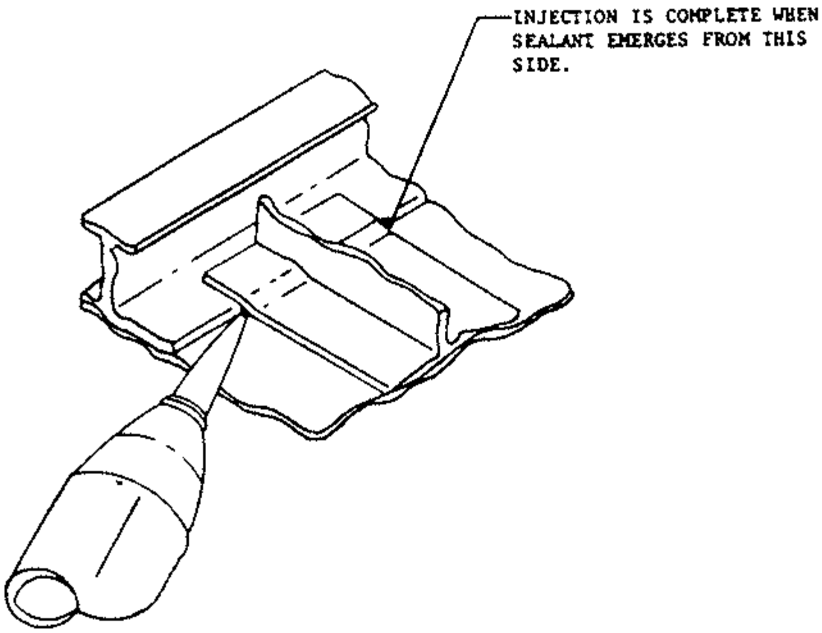
(3) When a fillet seal is required around the periphery of a fay sealed joint, it is not necessary to remove the sealant squeeze-out where the fillet is to be applied, provided that the material which was squeezed out has been shaped into a small fillet configuration prior to the expiration of the application time. When the squeeze-out has been shaped, a final or full bodied seal can be applied over the shaped squeeze-out without waiting for the squeeze-out to cure. If the squeezed out material was not shaped before the expiration of its application time, it shall be cured to a tack-free condition and then removed, by use of a plastic tool, from locations where a fillet is to be applied.

(4) Immediately after the assembly is completed and all permanent type fasteners have been installed, remove uncured sealant which extrudes onto the exterior of the aircraft using clean rags moistened with TT-T-548, Toluene or TT-M-261, Ketone.

C. Injection Sealing

(1) Sealant shall be injected into the channel, joggle, void or cavity from one point only, using a sealant gun, in such a manner that no air is entrapped and the channel, joggle, void or cavity is completely filled and sealant is observed emerging from the prescribed opening (see Figure 3). If multiple exits or channels exist, block each channel exit after it is filled, without stopping the injection, so that sealant extrudes into all necessary channels.

(2) Remove excess sealant before the expiration of its application time and smooth flush with the surface using a suitable tool.



Injection Sealing
Figure 3

D. Fillet Sealing.

(1) Fastener considerations:
   (a) Do not fillet seal any parts until they are held completely together by permanent fasteners.
   (b) Prior to filleting the periphery of bolted structure and fittings, it is necessary that all bolts, accomplishing the attachment, be properly torqued.

(2) The sealant shall be applied using a sealant gun or spatula.

(3) When using a sealant gun for fillet sealing, the nozzle tip shall be pointed into the seam or joint and shall be maintained nearly perpendicular to the line of travel. A continuous bead of sealant shall precede the tip and the tip size, shape and rate of travel shall be such that sufficient sealant shall be applied to produce the required fillet.

(4) Fillets shall be shaped or formed to meet the size and shape requirements as shown in applicable figures using the nozzle tip and/or fairing tools to press against the sealant while moving parallel to the bead. Exercise caution to prevent folds and entrapment of air during application and shaping of the fillet and work out any visible air bubbles. The fillet shall be formed so that the highest portion of the fillet is centered over the edge of the structure or fitting. Lubrication in any form shall not be used for smoothing purposes. In all cases, fillet size shall be kept as near minimum as practical.

(5) Where it is more convenient or fillet slumping is encountered, the fillet may be applied in two stages. A small first fillet should be applied which is allowed to cure to a tack-free state, followed by a second application of sealant sufficient to form the final fillet conforming to the specified dimensions for a fillet seal. If the first fillet has cured, it must be cleaned before the second application of sealant is made. If the fillet has only cured to a tack-free state, it shall be wiped lightly with a gauze pad or cheesecloth pad dampened with cleaning solvent.

(6) Allow the sealant to cure to a tack-free condition prior to the airplane being moved, handled and/or worked on.

(7) In cases where a fillet seal connects to an injection seal, the full bodied fillet shall extend past the end of the injection and then taper out.

(8) Lap joint and seam fillets shall be as shown in Figure 4.

(9) Butt joint fillets shall be as shown in Figure 5.

(10) Bolts shall be fillet sealed as shown in Figure 6. The area for sealing shall consist of the area of the structure surrounding the base of the fastener end plus the entire exposed area of the fastener. An optional method of sealing threaded fasteners is to apply a brush coat of Type I, Class A sealant. Where brush coating is used as the method of sealing threaded fasteners, the sealant must be worked around each fastener with a stiff brush and considerable care to be effective. A simple pass of the brush with the sealant is not sufficient to produce an effective seal.

(11) Dome-type nutplates shall be fillet sealed as shown in Figure 7. The area for sealing shall consist of the area of the structure surrounding the base of the fastener and from there up over the rivets to the dome.

(12) Hole filling and slot fillets shall be as shown in Figure 8.

NOTE: A hole or slot through the wall of an integral fuel tank shall not be sealed by this method.

(a) Holes and slots that are too large to be filled with one application of Type I, Class B sealant shall be filled with Type II sealant. Large holes or slots may be backed with masking tape to prevent excessive extrusion of sealant through the holes or slots, but the masking tape shall be removed after the sealant has cured to a tack-free condition.

(b) In all locations where Type II sealant has been applied, after the Type II sealant has cured to a tack-free condition it shall be brush coated with Type I, Class A sealant. The brush coat shall overlap the edge of the Type II sealant sufficiently to insure complete coverage.

(c) Tooling holes shall be plugged with a shank sealed soft rivet and then brush coated with Type I, Class A sealant.

E. Firewall Sealing - The engine firewall shall be sealed to an intermediate level of sealing using Type IV sealant.

(1) Clean the areas to be sealed per paragraph 10.

(2) Mix, by weight, 1 part of curing agent with 100 parts of Type IV (Coast Pro-Seal #700) sealant.

NOTE: Sealant should be mixed by weight. It is important that accelerator be completely and uniformly dispersed throughout the base compound.

(3) Using a spatula and fairing tool, apply a fillet of sealer along all cracks, seams, joints and also over all fasteners in the firewall.

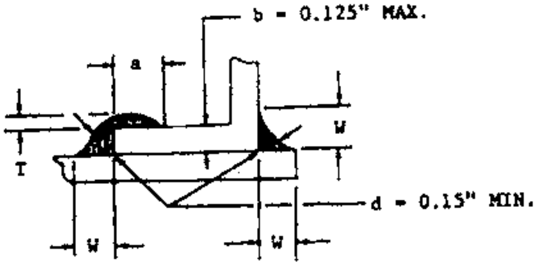
(4) Type IV sealant should cure for a minimum of 72 hours at room temperature before being subjected to temperatures as high as 400 degrees Fahrenheit.

F. Wire Bundle Sealing - These procedures are for the sealing of continuous wire bundles that pass through a sealed bulkhead, inlet, etc. using seal assembly.

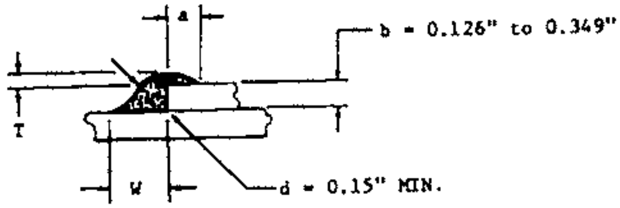
(1) Pre-Pack Method.

(a) Pass the wires or wire bundle through the bulkhead cutout provided. Secure the wire bundle on each side of the bulkhead in such a manner as to provide at least two inches of slack at the cutout to facilitate sealing. Bundle ties shall not be placed within six inches of the location to be sealed in order to allow better penetration of sealant around individual wires in the bundle.

(b) Separate the wires and coat each wire individually with sealant over the length which passes through the bulkhead plus 1/4 to 1/2 inch added length on each side of the bulkhead.



(a)



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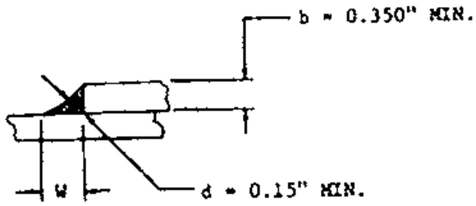
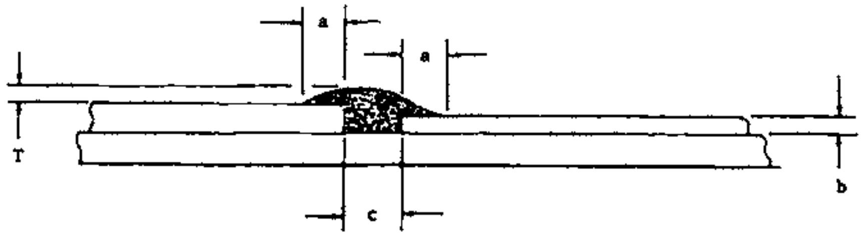


(c)

FOR FIGURE (a); W = 0.25" TO 0.50"
FOR FIGURES (b) AND (c); W = 0.35" TO 0.50"
a + b = W, EXCEPT a = 0 WHEN b = 0.35" OR MORE
T = 0.02" to 0.10"

Lap Joint and Seam Fillets
Figure 4



a = 0.15" MIN., EXCEPT a = 0 WHEN b AND c = 0.35" OR MORE
T = 0.02" to 0.10"

NOTE: GAP MUST BE FILLED NOT BRIDGED.

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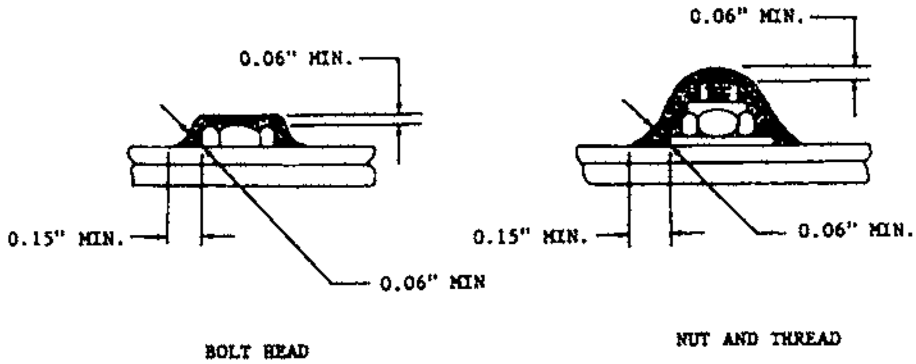
Butt Joint Fillets
Figure 5



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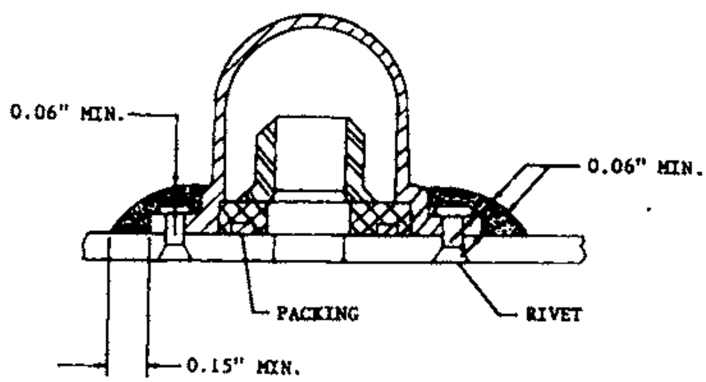
Bolthead, Nut and Thread Sealing
Figure 6



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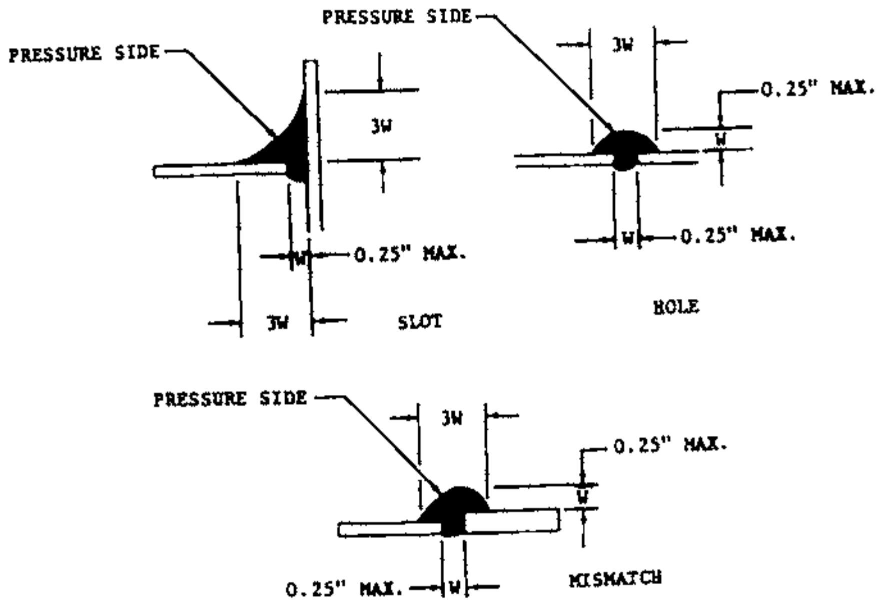
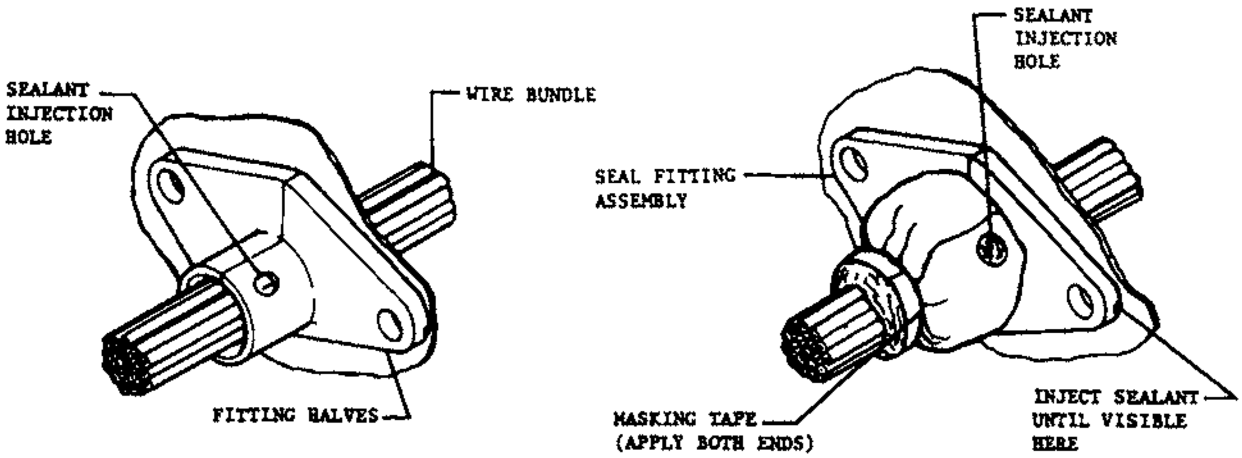
Dome Type Nutplate
Figure 7



Slot, Hole and Mismatch Sealing
Figure 8

(c) Place the seal fitting halves around the wire bundle on the pressure side of the bulkhead, if at all possible.
(d) Wrap several turns of masking tape around the wire bundle and over the cylindrical end of the assembled fitting to center the bundle and retain the sealant when applied.
(e) Hold the seal assembly as nearly vertical as possible with the open base end up and inject or pack the sealant in the fitting around the wires. Inject or pack at several locations within and around the wire bundle to fill all voids between the wires and around the wires and the seal assembly. The wires may be spread and moved around to allow sealant to flow and fill all voids.
(f) Lay a heavy bead of sealant within the flange of the seal fitting so that when placed against the bulkhead some of the sealant will extrude between the fitting base and the bulkhead.
(g) Position the seal assembly in the cutout of the bulkhead and secure it with the required fasteners.
(h) Remove any excessive sealant which may extrude from around the base of the seal assembly.
(i) After the sealant has cured, remove the masking tape.

(2) Injection Method.
(a) Proceed as prescribed in paragraphs F.(1)(a), (b) and (c).
(b) Position the seal assembly in the bulkhead cutout and secure it with the required fasteners.
(c) Wrap several turns of masking tape around the wire bundle and over the cylindrical end of the assembled fitting at each end of the fitting in such a manner as to center the wire bundle and retain the sealant when the injection is made (see Figure 9).



Electrical Sealing
Figure 9

(d) Puncture the tape over the most convenient injection hole in the seal assembly. Using pressure suitable for the sealant being used, inject the sealant until it emerges, without visible evidence of entrapped air, from both notches in the outer periphery of the seal assembly base.
(e) Continue procedure as prescribed in paragraphs F.(1)(h) and (i).

12. Sealant Repair.

A. Materials - Repairs, in general, shall be accomplished with the same type of material as that being repaired.

NOTE: Type I, Class B-1/2 is recommended for use during cold weather to obtain an accelerated cure.

B. Temperature Requirements.

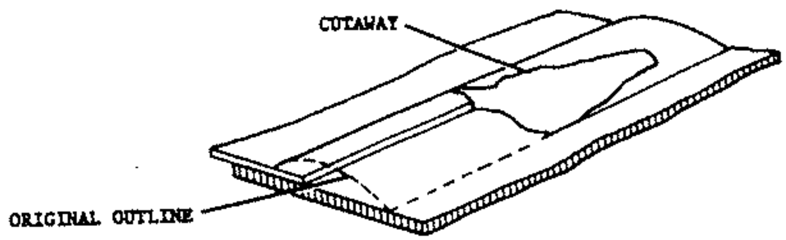
(1) The structure shall be above 60 degrees Fahrenheit before the sealant is applied and shall remain above 60 degrees Fahrenheit until the sealant is tack-free.

NOTE: For outside operations only, the temperature of the structure may be allowed to drop below 60 degrees Fahrenheit but not below 58 degrees Fahrenheit, after application for a period of time not to exceed 48 hours; however, the structure must be subsequently heated to above 60 degrees Fahrenheit and the sealant allowed to become tack-free before the tanks are refueled.

(2) The maximum air temperature allowed to come in contact with the curing sealant is 120 degrees Fahrenheit.

C. Fillet and Fastener Sealing Repairs.

(1) Repair of damaged or faulty sealant applications shall be accomplished as follows:
(a) Remove all damaged or faulty sealant to insure solid residual material.
(b) Sealant shall be cut so as to produce a smooth continuous scarfed face (see Figure 10). The sealant shall be completely removed in the affected areas. The cutting tools shall only be made from nonmetallic materials that are softer than aluminum.



Cutaway View of Sealing Bead
Figure 10

(c) Inspect repair areas for clean and smooth cuts. Loose chunks or flaps of sealant on the cut areas shall be removed.
(d) Clean the area to be sealed, including the scarfed face of the old seal, per paragraph 10.
(e) Apply new fillet seals per paragraph 11.D. Slight overlapping of the fresh material over the existing fillet is permissible. A large buildup of sealant shall not be allowed. Type VI sealant may be used over Type I, II and III sealant except in the integral fuel tank sealing. Type VI will cure more rapidly for weather and pressurization repairs.
(f) Rework of a fillet which has been oversprayed or brushed with primer shall be accomplished by a scarfed joint and removal of the fillet having primer on it, in the area of the repair. The primer shall not be sandwiched in between the old and new sealants.
(g) If the primer is removed during the cleaning operation, it is permissible to apply the new fillet seal directly over the clean bare metal and then touch up with the proper primer all exposed areas of bare metal after the sealant has been applied.

D. Faying Surface Sealing Repair - After determining the area which contains the faulty and/or leaking faying surface seal, the repair shall be accomplished by applying a fillet seal along the edge of the part adjacent to the faying surface seal and of a length to fully cover the area of the faulty and/or leaking seal.

E. Brush Coat Sealing Repair - Repair of damaged or leaking brush coat seals shall be accomplished by removing the discrepant brush coat. Clean the area of sealant removal and also clean the surrounding structure and sealant per paragraph 10. Apply a new brush coat of sealant.

F. Electrical Wire Bundle Seal Repair (Fitting Only) - When wires need to be added to previously installed and sealed wire bundles, or there is a need to repair a leaking seal through an S45A fitting, one of the following procedures shall be followed.

(1) Where the wire bundle does not contain filler rods and new wires need to be added, or there is a leak through the fitting, the repair shall be as follows:
(a) Remove the seal assembly attach screws.
(b) Remove the seal assembly from the structure by prying loose at the seal assembly mounting flanges.
(c) Force the assembly into original halves. The failure of the assembly will be largely adhesive sealant failure around the periphery of the wire bundle.

(d) Discard the old seal assembly and remove all original sealing material from the wires and adjacent structure. Sealant shall be removed from the wires with hands and/or pliers. Sealant may be removed from the structure with a scraper (no harder than 2024-T3 aluminum) followed by cleaning.

NOTE: Care shall be taken to avoid damage to the wire insulation.

(e) Add any new wires required to the wire bundle.

NOTE: The hole through the seal fitting assembly shall not be filled so that the cross sections of the wires in the wire bundle totals more than 75 percent of the cross section of the seal assembly hole.

(f) Install new seal assembly and seal per paragraph 11.

13. Integral Fuel Tank Sealing.

NOTE: Integral fuel tank sealing or leak repair shall be accomplished with Type I sealant only.

A. Integral wing fuel tank sealing is a refinement of fuel sealing process. With an integral fuel tank, the fuel is confined in a sealed cavity in the wing structure rather than in the conventional rubber cell inside the wing.
(1) All damaged or leak areas must be completely and carefully repaired.
(2) Cleaning shall be performed with a clean cheesecloth dampened with solvent. Brush or pipe cleaners may be used to clean corners, gaps, joggles and channels.
(3) After application, the sealant must be free of entrapped air bubbles.
(4) All fillets are to be smoothed down and pressed into the seam or joint with a filleting tool.
(5) The sealant shall be tack-free and additional 50% of normal cure time shall be allowed prior to refueling.
(6) Before pressure testing, the sealant must be cured.
(7) See Figure 11 for integral fuel tank sealing repair when the structure has been disassembled for reasons other than the repair of a leaking seal. The repair shall be accomplished per paragraph 12.

14. Wing Fuel Access Panel Seal.

A. Access Panel Seal Removal/Installation.

(1) Remove seal.
(a) Peel existing seal from access panel.

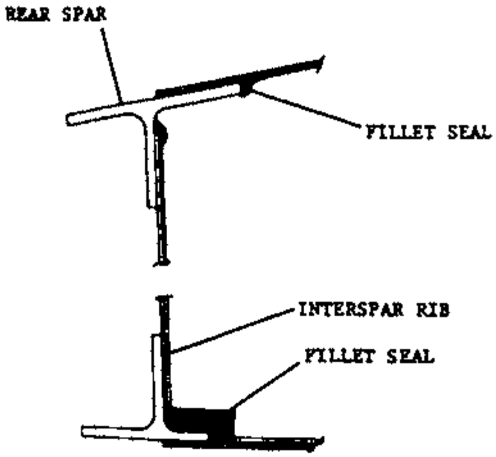
NOTE: It may be necessary to soften seal with cleaning solvent to aid in removal.

(2) Install seal.

NOTE: All surfaces to which sealant is to be applied shall be free of old sealant, clean and dry.

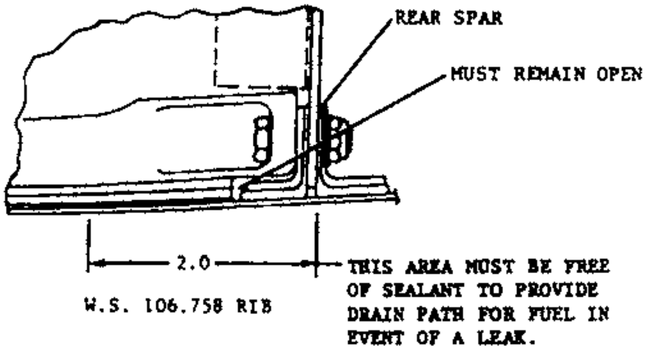
(a) Thoroughly clean seal area. Refer to cleaning procedures in this chapter.
(b) Bond new seal to access panel with Type I, Class B or C sealant. Refer to Classification of Sealant, Requirements and Application in this chapter.

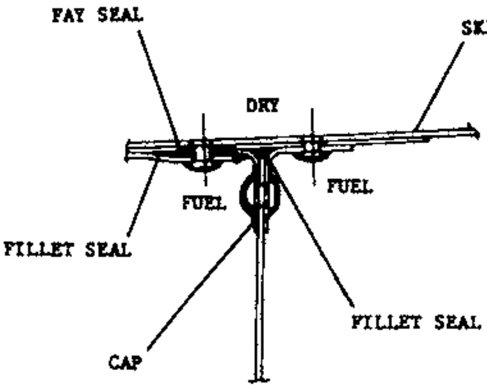
NOTE: Refer to manufacturers recommendations for application time, tack-free time, curing rate and adhesion properties.



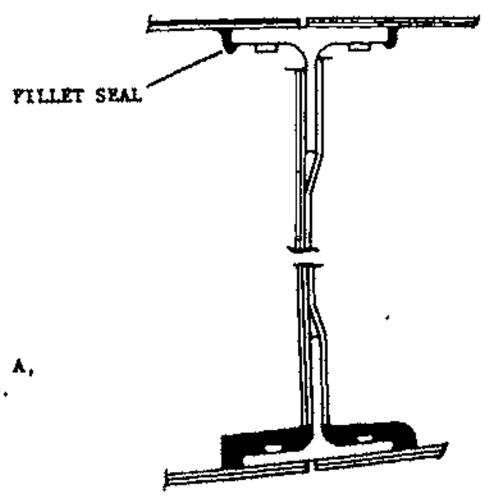
TYPICAL SEALING OUTBOARD FROM NACELLE
REAR SPAR

TYPICAL STRINGER AND DOUBLER SEALING





TYPICAL RIB CAP AND SKIN SEALING
EXCEPT TANK END RIBS



NOTE BRUSH COAT ALL RIVETS IN FUEL AREA WITH TYPE I, CLASS A, SEALANT; SEALANTS: PRO-SEAL 890 COAST PRO-SEAL MFG CO. OR PR1422 PRODUCTS RESEARCH AND CHEMICAL CO.

51822001
55821038
51821001

Integral Wing Tank Repair Sealing
Figure 11

GENERAL DATA

Standard Torque Values

1. Description.

   A. To ensure security of installation and prevent overstressing of components during installation, the torque values outlined in Figure 1 and other applicable chapters of this manual should be used during installation and repair of components.

Alignment and Symmetry Check

1. Description.

   A. Before making an alignment and symmetry check the airplane should be defueled and leveled in accordance with Leveling. Figure 2 provides the measurements and shows the relative elevation points to be measured during the alignment symmetry check. Measurements are made with a steel tape projected between alignment points.

Checking Wing Twist and Location of Thrust Line (See Figure 3)

A. Remove wing, refer to Chapter 3. Place wing on suitable supports beneath the root and tip ribs.

B. Locate wing datum plane as follows:

   (1) Locate a line at the root rib (wing station 58.16) which is 4.515 inches up from the lower surface of the front spar, and 3.99 inches up from the lower surface of the rear spar.
   (2) Locate a line at the tip rib (wing station 229.7) which is 1.44 inches up from the lower surface of the front spar, and 0.81 inches up from the lower surface of the rear spar.
   (3) These two lines locate the wing datum plane, and the three degrees of twist will be present if the lines are parallel.
   (4) Figure 3, Detail A, B and C, locate engine thrust line.

Loctite and Permabond Application

A. All surfaces to be bonded and/or sealed shall be free of paints and corrosion preventive organic coatings, e.g. zinc chromate primer.

B. Surfaces must be clean and dry, i.e. free from dust, lint, grease, chips, oil, condensation or other moisture and all other contaminating substances prior to the application of adhesive. This includes all fasteners and their associated nuts, collars, spacers, washers, etc.

C. Primers and/or adhesives shall not be applied when the temperature of the primer, adhesive must squeeze out of the joint when it is secured.

NOTE: The torque values stated are pound-inches, related only to steel nuts on oil-free cadmium plated threads.

RECOMMENDED NUT TORQUES

FINE THREAD SERIES

THREAD SIZE	TENSION NUTS TORQUE STD (NOTE 1)	TENSION NUTS TORQUE ALT (NOTE 2)	SHEAR NUTS TORQUE STD (NOTE 3)	SHEAR NUTS TORQUE ALT (NOTE 2)
8-32	12-15		7-9	
10-32	20-25	20-28	12-15	12-19
1/4-28	50-70	50-75	30-40	30-48
5/16-24	100-140	100-150	60-85	60-106
3/8-24	160-190	160-260	95-110	95-170
7/16-20	450-500	450-560	270-300	270-390
1/2-20	480-690	480-730	290-410	290-500
9/16-18	800-1000	800-1070	480-600	480-750
5/8-18	1100-1300	1100-1600	660-780	660-1060
3/4-16	2300-2500	2300-3350	1330-1500	1300-2200
7/8-14	2500-3000	2500-4650	1500-1800	1500-2900
1-14	3700-4500	3700-6650	2200-3300	2200-4400
1-1/8-12	5000-7000	5000-10000	3000-4200	3000-6300
1-1/4-12	9000-11000	9000-16700	5400-6600	5400-10000

COARSE THREAD SERIES

THREAD SIZE	(NOTE 4)	(NOTE 5)
8-32	12-15	7-9
10-24	20-25	12-15
1/4-20	40-50	25-30
5/16-18	80-90	48-55
3/8-16	160-185	95-100
7/16-14	235-255	140-155
1/2-13	400-480	240-290
9/16-12	500-700	300-420
5/8-11	700-900	420-540
3/4-10	1150-1600	700-950
7/8-9	2200-3000	1300-1800
1-8	3700-5000	2200-3000
1-1/8-8	5500-6500	3300-4000
1-1/4-8	6500-8000	4000-5000

NOTE:
1. Covers AN310, AN315, AN345, AN362, AN363, AN366, MS17825, MS20365, MS21042, MS21044, MS21045, MS21046, MS21047, MS21048, MS21078, and other fine thread tension nuts except NAS679.
2. When using AN310, AN320, MS17825 or MS17826 castellated nuts where alignment between the bolt and cotter pin slots is not reached using normal torque values, use alternate torque values or replace the nut.
3. Covers AN316, AN320, AN7502, MS17826, MS20364, MS21043, MS21083, MS21245 and other fine thread shear nuts except NAS679.
4. Covers AN340, MS20341, MS20365 and other course thread tension nuts.
5. Covers MS20364 and other course thread shear nuts.
6. Covers NAS nuts except NAS-679A.

Torque Values
Figure 1 (Sheet 1 of 2)

NOTE: 1. Castellated Nuts.
(a) Self-locking castellated nuts MS17825 and MS17826 require cotter pins and shall be tightened to the high torque valuse shown in Figure 1.
(b) Nonself-locking castellated nuts requiring cotter pins shall be tightened to the low torque value shown in Figure 1. The torque may be increased to install the cotter pin, but this increase shall not exceed the alternate torque value.
2. Straight threaded fittings, such as flared tube and hose end fittings, shall be torqued per Figure 1 (Sheet 2).
3. Straight threaded using O-rings or gaskets for seal, such as AN924 nut or AN6298 nut, and fittings conforming to MS33656, Style E, need not be tightened to a specific torque value, but shall be installed per AND10064.
4. Joints containing wood, plastics, rubber or rubber-like materials shall be torqued to values approximately 80 percent of the torque at which crushing is observed, or to the requirements of Table I, whichever is lower, or as specified.

Torque Values
Figure 1 (Sheet 2)

TUBING AND HOSE

1. General

   A. Tubing and hose assemblies which carry fluids or gases are subject to damage during normal service life; when maintenance is performed on the assemblies or when maintenance is performed in the immediate area. This section contains information pertaining to installation procedures for all fluid or gas lines.

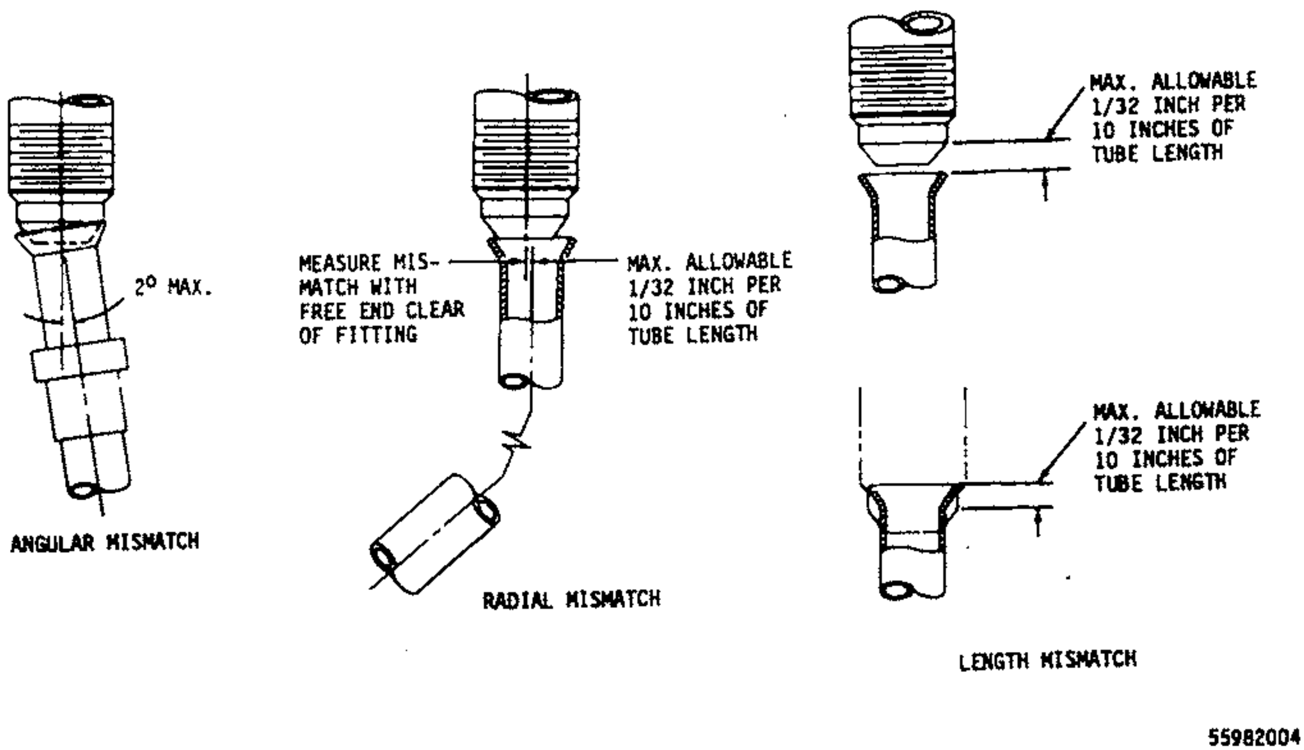
2. Removal/Installation Tubing or Hose

   A. Remove Tubing or Hose.

      (1) Cap all tubing, hoses and fittings immediately upon disconnecting from system to prevent contamination.
      (2) When several lines are disconnected in the same working area, tag lines or hoses for identification on reinstallation.
      (3) After removal, handle and store hose to prevent excessive bending, twisting and kinking.

   B. Install Hose.

      (1) Visually check hose for cleanliness before installation. Hose with protective caps missing should be thoroughly cleaned before installation.
      (2) Check hose for chafing, cuts, or evidence of kinking before installation.
      (3) Make certain that fittings are properly aligned and secured before installation of hose.
      (4) Apply antiseize lubricant to fittings only as specified.
      (5) Install hose on fitting and tighten connectors to torque values specified in Figure 1B.
      (6) Hose assemblies installed on nonmoving connections should have no twist after B-nut has been tightened. Hoses should not be under tension, or cause any deflection of rigid tubing when subjected to full system pressure.



Tube Installation Mismatch
Figure 1A

(7) When installing hoses, connect the most inaccessible end first and tighten finger tight so hose is free to turn when connecting the other end. Torque fitting to torque values specified in Figure 1B and ensure that hoses do not twist during torquing.
(8) Route hoses in the same position as they were when removed.
(9) When installing clamps allow a slight bow or slack to permit both growth and contraction in the line because of pressure variation as well as relative motion between the components.
(10) Check that hose assemblies installed on moving connections are free of torsion or tension stresses through entire range of travel when subjected to full system pressure.
(11) Check that hose is free to expand, contract, and is clear of all structure. Where inadequate clearance exists between hose and structure, protection must be provided for hose to prevent damage from chafing.

C. Install Tubing.

(1) Visually check tubing for cleanliness before installation. Tubing with protective caps missing should be thoroughly cleaned before installation.
(2) Check tubing for damage, particularly at flared tubing ends, fittings, and at bends. Tubing which is damaged beyond limits specified in paragraph 4 should be replaced.
(3) Make certain that fittings are properly aligned and secured before installation of tubing.
(4) Check alignment and fit of tube before installation as follows:
   (a) Place tubing in proper installation position and tighten the coupling nut at one end of the tube assembly.
   (b) The free tube end must be parallel with the fitting within 2 degrees (see Figure 1A).
   (c) The free tube end must be in line with fitting within 1/32-inch per 10 inches of tube length (see Figure 1A).
   (d) The free tube end must match the fitting cone lengthwise within 1/32-inch per 10 inches of tube length (see Figure 1A).
(5) Apply antiseize compound to fittings as specified.
(6) Install tubing on fittings; tighten B-nuts to torque values specified in Figure 1B.

TORQUE LIMITS (INCH-POUNDS)									
Hose Size	Tubing O.D.	Aluminum Tubing Flare		Steel Tubing Flare		Aluminum Fittings Oxygen Lines Only		Hose End Fittings	
		Min	Max	Min	Max	Min	Max	Min	Max
-3	3/16	---	---	90	100	---	---	70	100
-4	1/4	40	65	135	150			70	120
-5	5/16	60	80	180	200	100	125	85	180
-6	3/8	75	125	270	300	---	---	100	250
-8	1/2	150	250	450	500	---	---	210	420
-10	5/8	200	350	700	800	---	---	300	480
-12	3/4	300	500	1100	1150	---	---	500	850
-16	1	500	700	1200	1400	---	---	700	1150
-20	1-1/4	600	900	1300	1450	---	---	---	---
-24	1-1/2	600	900	1350	1500	---	---	---	---

Torque Values for Hoses and Tubes
Figure 1B

D. Tubing Installation.

(1) Make certain that tubing assemblies are not closer than 1/8 inch to surrounding structure, adjacent tubing and fittings except where specifically authorized.
(2) Oxygen system tubing should be no closer than 2 inches to control cables and other moving parts of the airplane.
(3) Oxygen system tubing should be separated from all electrical wiring and conduits by at least 6 inches. When this minimum separation cannot be maintained, a separation of between 2 to 6 inches is acceptable provided the electrical wires and conduits are rigidly clipped.

(4) Where electrical wires cross oxygen line or parallel oxygen lines within two inches, cover oxygen line with .375 outside diameter Polyamide Resin (Nylon Tubing); Spencer No. 603 Cadillac Plastic and Chemical Co., Detroit, Michigan or MIL-I-23053/5 Class 1 Sleeving. Split the Polyamide Resin Tubing to allow installation over oxygen line. Secure the polyamide Resin Tubing to the oxygen line with Class IA adhesive. Cover all unprotected terminations which are within two inches of any oxygen line with MIL-I-23053/5 Class 1 sleeving.

4. Inspection of Tubing

A. Refer to Chapter 2 for tubing inspection procedures.

5. Bearings Removal/Installation

A. Remove the bearing with its supporting bracket or housing from the airframe. Refer to Structural Repair for removal of rivets.

B. Press the worn bearing from its housing or supporting bracket (refer to Figure 1C).

C. After removal, inspect the housing or bracket for structural damage (cracks, warpage or bends). Inspect hole in housing for damage, cracks or other abnormal conditions of material and hole diameter. The gap between bearing outside diameter and hole inside diameter must be 0.0010- to 0.0035-inch.

D. Clean outer surfaces of bearing and hole in housing with a clean cloth to remove all traces of oil or grease. The cloth may be dampened with MEK (Federal Specification TT-M-261). Wipe bearing and hole dry.

CAUTION: DO NOT ALLOW CLEANER TO PENETRATE INTO BEARING, REMOVING LUBRICATION.

E. Coat the outer surfaces of the bearing and mating surface of hole in housing with Loctite (refer to application of fastener retaining compounds) and press the bearing into position (refer to Figure 1C).

CAUTION: EXERCISE CARE TO PREVENT ENTRANCE OF LOCTITE INTO BEARINGS.

F. Stake the bearing in place using a staking tool similar to the tool shown in Figure 1F. Stake between the previous stake marks around the hole (refer to Figure 1D). If a new housing or bracket is required, stake pattern shall be like the original installation.

NOTE: If bearing is not retained on opposite side of stake like the bearing shown in Figure 1D, a support must be utilized to back up staking operation and the bearing housing shall be staked on both sides (refer to Figure 1E).

G. Reinstall the bearing housing or bracket assembly on the airplane component. For riveted-on installations, refer to Structural Repair.

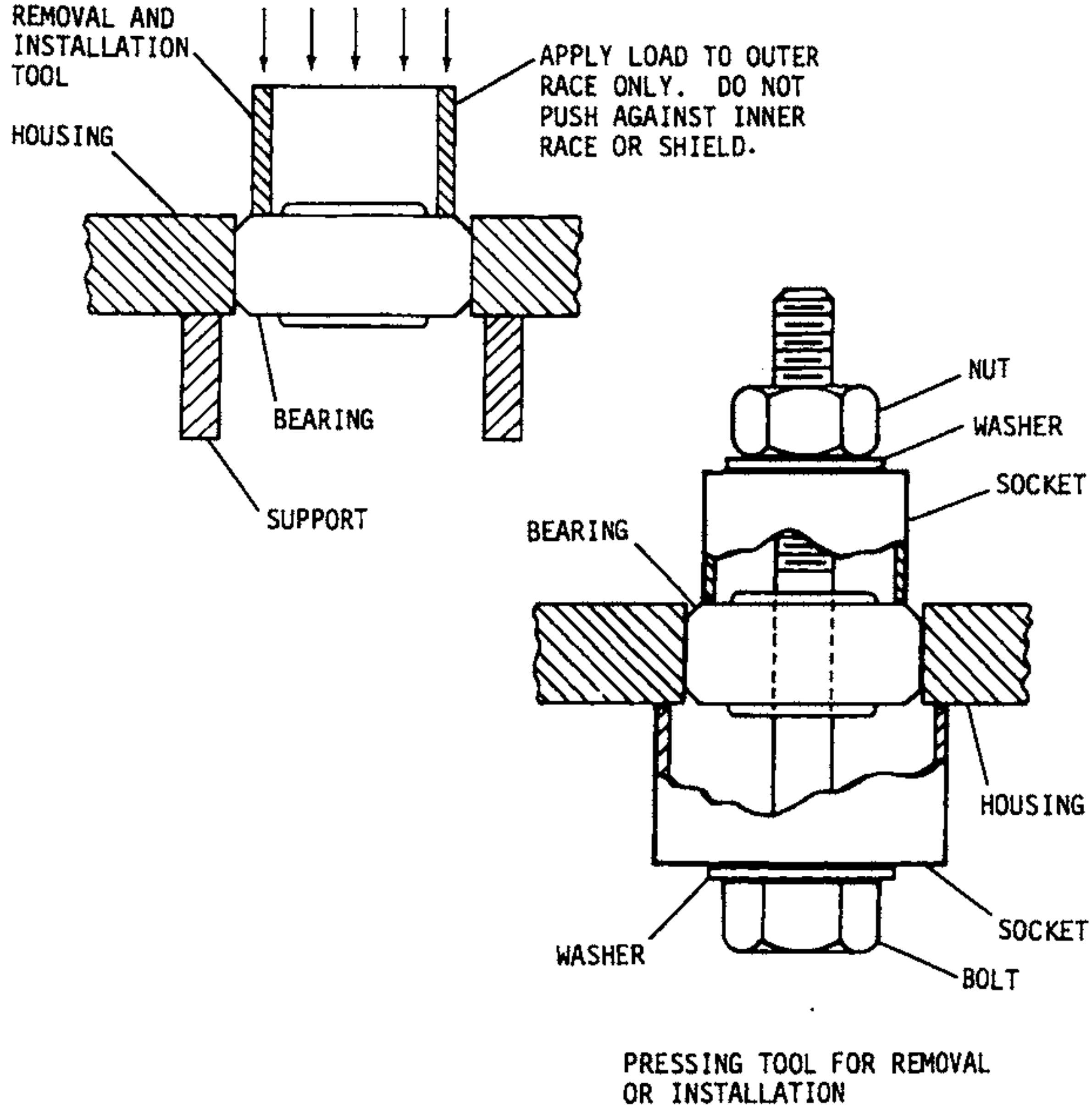
H. Replacement of riveted-on bearing brackets or housings:

(1) Replacement bearing brackets, housings or bearing and bracket assemblies may be supplied blank. Locating and drilling for riveted installation is required.

NOTE: In instances where hinge centerline alignment or interfaces must be maintained, procedures must be established to retain the original interface.

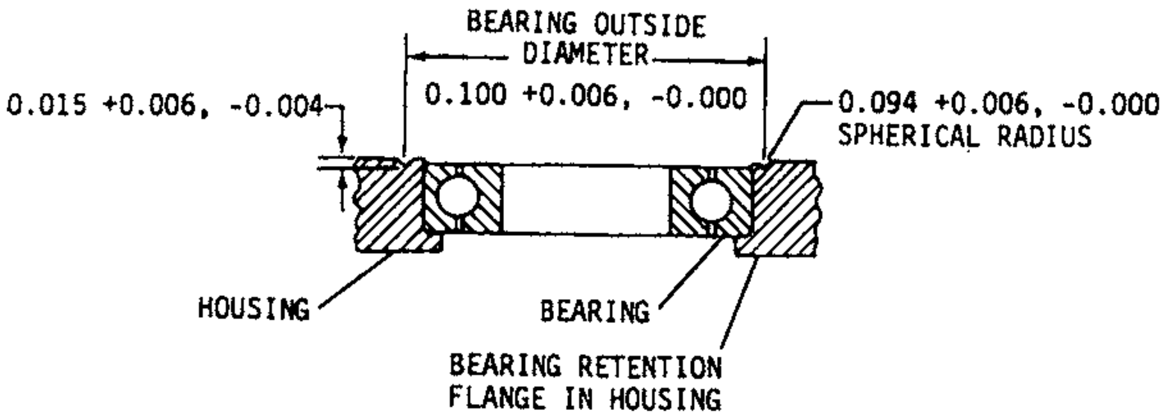
CENTER THE BEARING CAREFULLY IN THE HOUSING. THE BEARING SHALL NOT BE CANTED IN THE HOLE, AND IT SHALL NOT BE BOUND.

APPLY THE INSTALLING LOAD TO THE OUTER RACE OF THE BEARING.



Bearing Pressing
Figure 1C

THE DEPRESSIONS SHALL BE CONCENTRIC WITH THE BORE OF THE BEARING, WITHIN 0.020 TOTAL INDICATOR READING.



Staking Dimension
Figure 1D

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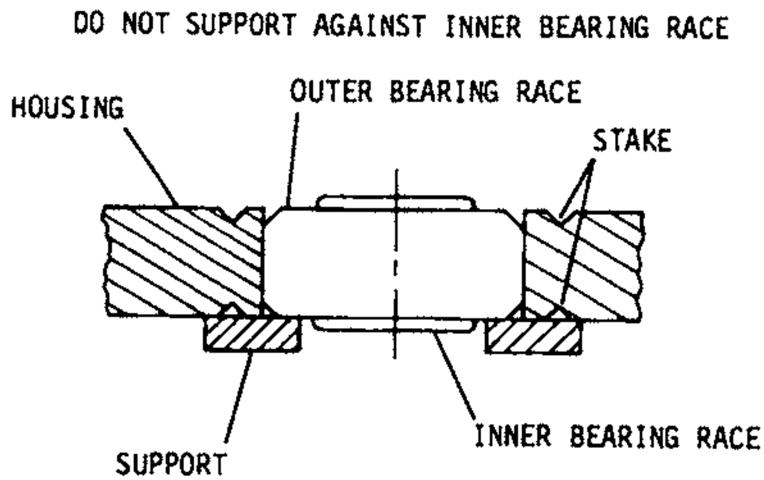
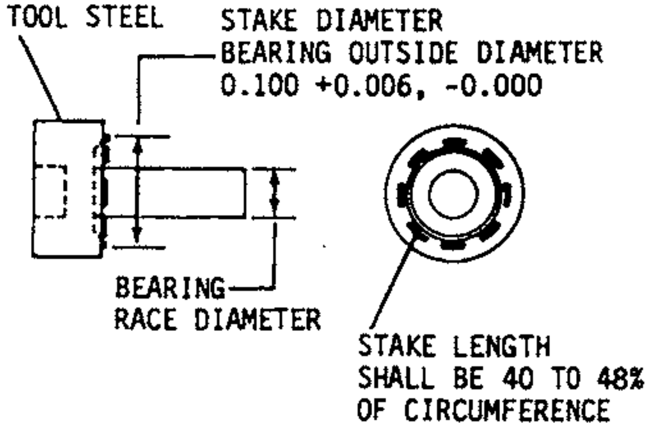
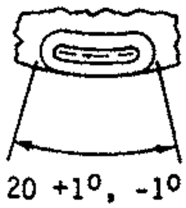


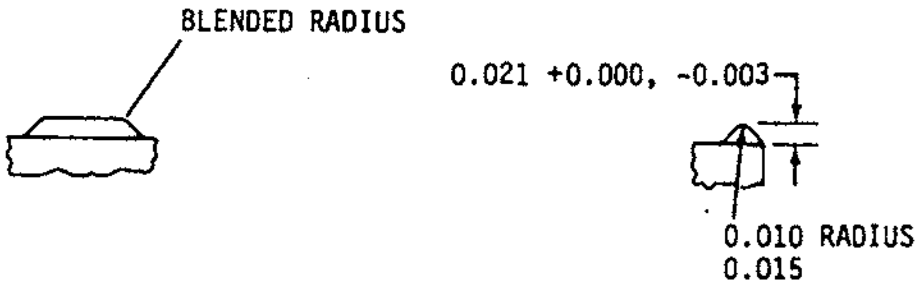
Support During Staking
Figure 1E

57801010





BEARING OUTSIDE DIAMETER	NUMBER OF STAKES
UP TO 0.734	4
0.735 TO 0.984	6
0.985 TO 1.234	8
1.235 TO 1.690	10
1.601 TO 1.984	12



STAKE DETAIL

Staking Tool - Typical
Figure 1F

57801008

6. Application of Fastener Retaining Compounds

A. This procedure establishes general methods for application of materials suitable for sealing, locking and retaining metal parts. The retaining compounds described herein will harden only when placed between properly prepared mating surfaces where air is excluded. Refer to Table 1 for the retaining compounds and surface primers covered by this procedure.

CAUTION: PREVENT CONTACT OF PRIMER AND RETAINING COMPOUNDS WITH SYNTHETIC RUBBER.

CAUTION: PREVENT ENTRANCE OF PRIMER AND RETAINING COMPOUNDS INTO BUSHINGS (BEARINGS).

NOTE: For a high strength application, bonding surfaces must not be cadmium or zinc plated, and such surfaces must be stripped before proceeding.

NOTE: Cadmium or zinc plated parts may be bonded when properly primed, but lower strength bonds will result.

NOTE: Anodized surfaces and corrosion resistant steel surfaces must be primed.

NOTE: Surfaces other than cadmium, zinc, anodized or corrosion resistant steel do not require priming.

NOTE: For optimum strength properties, the gap between bushing (bearing) outside diameter and housing hole inside diameter must be 0.0010- to 0.0035-inch.

NOTE: Primer and retaining compounds must be stored in an enclosed building that will protect containers from direct sunlight, wind and rain.

Table 1. Sealing, Locking and Retaining Compounds

LOCQUIC SURFACE PRIMER - MIL-S-22473

GRADE	FORM	COMPOUND	COLOR
N	R	PRIMER, NORMAL	GREEN
T	R	(READY TO USE)	YELLOW

LOCTITE RETAINING COMPOUND - MIL-R-46082

TYPE	MATERIAL
I	RC-75 (LOW VISCOSITY)
II	RC-40 (MEDIUM VISCOSITY)
III	RC-35 (HIGH VISCOSITY)

7. Bearing/Bushing Retention

A. Prepare parts to be retained as follows:

(1) Clean all surfaces to which retaining compound is to be applied by flushing with clean MEK, Federal Specification TT-M-261 and wiping with a clean cloth to remove all traces of grease or oil. Cleaned surfaces must be protected against recontamination, particularly if they will not be assembled immediately after cleaning. Clean parts must not be handled by bare hands. Use clean cloth or clean white cotton gloves when mating parts.

CAUTION: DO NOT PLACE PRIMER ON THERMOPLASTICS AND PARTICULARLY TITANIUM WHICH ARE AFFECTED BY THESE CHEMICALS. MATERIALS AFFECTED BY SOFTENING OR CRAZING INCLUDE VINYL, CELLULOSIC, STYRENE AND METHACRYLATE PLASTICS. THERMOSETTING PLASTICS ARE NOT AFFECTED.

NOTE: Cadmium, zinc, anodized, corrosion resistant steel and plastic surfaces require priming with Locquic primer, Grade N, Form R (green) or Grade T, Form R (yellow).

B. Apply Locquic primer, Grade N, Form R (green) or Grade T, Form R (yellow), Military Specification MIL-S-22473, to all surfaces to which the compound is to adhere. The primer must not be applied to oil grooves or ports of bearings. Allow to air dry for 30 minutes minimum at room temperature.

C. Bearings/Bushings may be installed dry and compound applied as in the following step, or given a thin coat of Loctite retaining compound specified for repair to primed surfaces to be joined and assembled wet.

D. After installation (wet or dry), apply specified Loctite retaining compound, Military Specification MIL-R-46082, by touching the application nozzle of compound container to the mating joint between the bearing outside diameter and the housing. The compound will be drawn into the joint by capillary action. Complete capillary penetration is ensured when a ring of compound remains just outside the joint.

8. Curing Sealing, Locking or Retaining Compounds

A. Two methods for curing sealing, locking or retaining compounds are:

(1) Method 1 - Parts must remain undisturbed for 24 hours at room temperature to attain full strength.
(2) Method 2 - Cure at 275° +10, -10°F for 15 minutes after part reaches temperature.

NOTE: Relubricate bearing/bushing after retaining compound has cured.

NOTE: If the bearing/bushing slips out of position or falls out before full cure of the compound is complete, the parts must be recleaned, primed and assembled.

NOTE: Examine the bearing for damage before reinserting. Resurface damaged area before use.

1. General

A. Lockwire.

(1) Inconel (Uncoated), Monel (Uncoated).
(a) Used for general lock wiring purposes. Lock wiring is the application of wire to prevent relative movement of struc-ural or other critical components subjected to vibration, tension, torque, etc. Monel to be used at temperatures up to 700°F and inconel to be used at temperatures up to 1500°F. Identified by the color of the finish, monel and inconel color is natural wire color.

(2) Copper, Cadmium Plated and Dyed Yellow in Accordance with FED-STD 595.
(a) This will be used for shear and seal wiring applications. Shear applications are those where it is necessary to purposely break or shear the wire to permit operation or actuation of emergency devices. Seal applications are those where the wire is used with a lead seal to prevent tampering or use of a device without indication. Identified by the color of the finish, copper is dyed yellow.

(3) Aluminum-Alloy (Alclad 5056), Anodized and Dyed Blue in Accordance with FED-STD 595.
(a) This wire will be used exclusively for safety wiring magnesium parts.

NOTE: Surface treatment which obscure visual identification of safety wire is prohibited.

(4) Ni-Cu, monel, wire can be substituted for same diameter and length of carbon steel or corrosion resistant wire.

(5) Wires are visually identifiable by their colors: natural for inconel and monel, yellow for copper, and blue for aluminum.

B. Cotter Pin.

(1) The selection of material shall be in accordance with temperature, atmosphere and service limitations.

C. Locking Clips.

(1) Used to safety turnbuckles.

2. Safety Wire

A. Wire Size.

(1) The size of the wire shall be in accordance with the following requirements of Table 1.

Table 1. Safety Wire

Material	Number (MS20995-XXX)							
Ni-CU Alloy (Monel)	NC20	NC32	NC40			NC51	NC91	
Ni-CR-FE Alloy (Inconel)	N20	N32	N40			N51	N91	
Carbon Steel Zinc-Coated	F20	F32		F41	F47		F91	
Corrosion Resistant Steel	C15	C20	C32		C41	C47		C91
Alluminum Alloy (Blue)		AB20	AB32		AB41	AB47		AB91
Copper (Yellow)	CY15	CY20						

Example of Parts Numbers
MS20995 CY20 = Copper, Cadmium Plated, Yellow, Shear or Seal Wire, 0.020 Diameter
MS20905 AB32 = Aluminum Alloy, Anodized, Blue, 0.032 Diameter

NOTE: The dash numbers indicate wire material and diameter in thousands of an inch.

(a) 0.032 inch minimum diameter for general purpose lockwiring except that 0.020 inch diameter wire may be used on parts having a nominal hole diameter of less than 0.045 inch; on parts having a nominal hole diameter between 0.045 and 0.062 with spacing between parts of less than two inches; or on closely spaced screws and bolts of 0.25 inch diameter and smaller.
(b) 0.020 inch diameter copper wire shall be used for shear and seal wire applications.
(c) When employing the single wire method of locking the largest nominal size wire for the applicable material or part which the hole will accommodate shall be used.

3. Lockwire Installation

A. Method. (Refer to Figure 1G.)

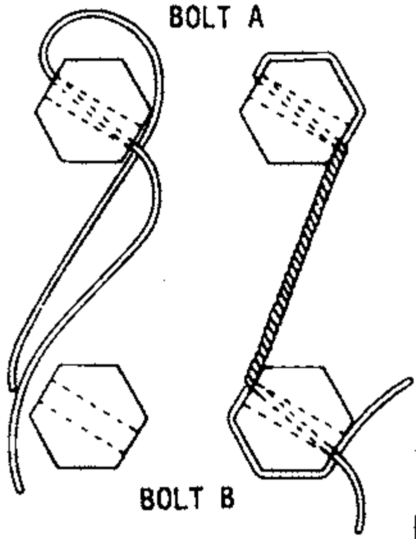
CAUTION: SCREWS IN CLOSELY SPACED GEOMETRIC PATTERNS WHICH SECURE HYDRAULIC OR AIR SEALS, HOLD HYDRAULIC PRESSURE, OR USED IN CRITICAL AREAS SHOULD USE THE DOUBLE-TWIST METHOD OF LOCKWIRING.

(1) Single wire method of locking shall use the largest nominal size wire in Table 1 which will fit the hole.
(2) The double-twist method of lockwiring shall be used as the common method of lockwiring. It is really one wire twisted on itself several times. The single wire method of lockwiring may be used in a closely spaced, closed geometrical pattern (triangle, square and circle), on parts in electrical systems, and in places that would make the single wire method more advisable. Closely spaced shall be considered a maximum of two inches between centers.
(3) Use single wire method for shear and seal wiring application. Make sure that the wire is so installed that it can easily be broken when required in an emergency situation. For securing emergency devices where it is necessary to break the wire quickly, use copper only.

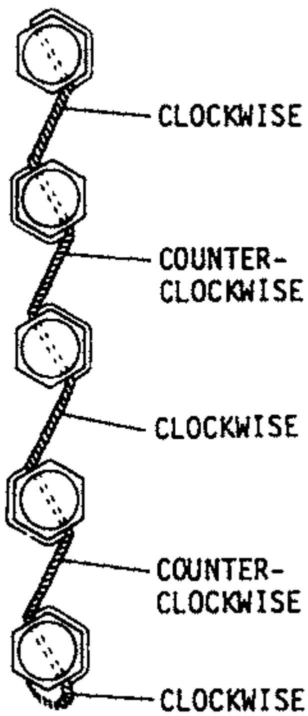
STEP 1. INSERT WIRE THROUGH BOLT A AND BEND AROUND BOLT (IF NECESSARY, BEND WIRE ACROSS BOLT HEAD). TWIST WIRES CLOCKWISE UNTIL THEY REACH BOLT B.

STEP 2. INSERT ONE END OF WIRE THROUGH BOLT B. BEND OTHER END AROUND BOLT (IF NECESSARY, BEND WIRE ACROSS HEAD OF BOLT). TWIST WIRES COUNTERCLOCKWISE 1/2 INCH OR 6 TWISTS. CLIP ENDS. BEND PIGTAIL BACK AGAINST PART.

NOTE: RIGHT-HAND THREADED PARTS SHOWN: REVERSE DIRECTIONS FOR LEFT-HAND PARTS.

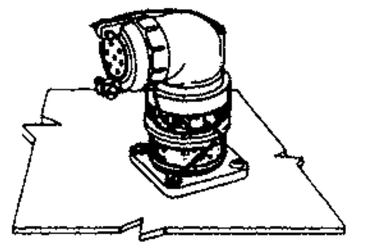


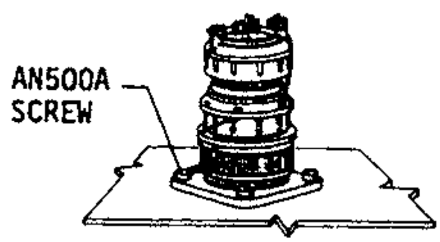
DOUBLE-WIRE SAFETYING



DOUBLE-WIRE SAFETYING
MULTIPLE GROUPS

MULTIPLE FASTENER APPLICATION
DOUBLE-TWIST METHOD





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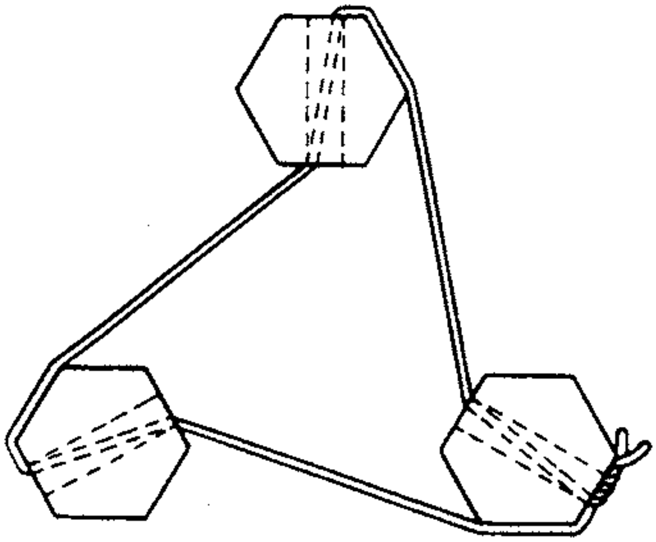
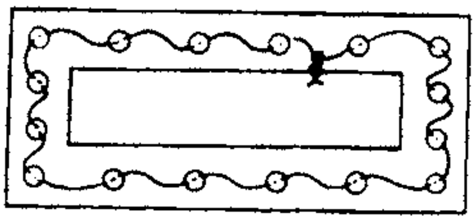
Lockwire Safetying
Figure 1G (Sheet 1)

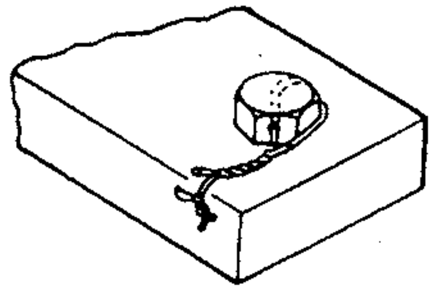


BOLTS IN CLOSELY SPACED, CLOSED GEOMETRICAL PATTERN. SINGLE WIRE METHOD

EXTERNAL SNAP RING SINGLE-WIRE METHOD



SMALL SCREWS IN CLOSELY SPACED, CLOSED GEOMETRICAL PATTERN, SINGLE WIRE METHOD



SINGLE FASTENER APPLICATION DOUBLE-TWIST METHOD

NOTE: RIGHT-HAND THREADED PARTS SHOWN. REVERSE DIRECTION FOR LEFT-HAND THREADS

CASTELLATED NUTS ON DRILLED STUDS

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Lockwire Safetying
Figure 1G (Sheet 2)

(4) Lockwiring by the double twist method shall be done as follows:

(a) One end of the safety wire shall be inserted through one set of lockwire holes in the bolt head. The other end of the safety wire shall preferably be looped firmly around the head to the next set of lockwire holes in the same unit and inserted through this set of lockwire holes. The "other-end" may go over the head when the clearances around the head are obstructed by adjacent parts.

(b) The strands, while taut, shall be twisted until the twisted part is just short of the nearest lockwire hole in the next unit. The twisted portion shall be within 1/8 inch of the holes in each unit as shown in the Figures of this specification. The actual number of twists will depend upon the wire diameter, with smaller diameters being able to have more twists than larger diameters. The twisting shall keep the wire taut without over-stressing or allowing it to become nicked, kinked or mutilated. Abrasions from commercially available twist pliers shall be acceptable.

(c) The wire shall be twisted to form a pigtail of 3 to 5 twists after wiring the last unit. The excess wire shall be cut off. The pigtail shall be bent towards the part to prevent it from becoming a snag.

Lock wiring multiple groups by the double twist double hole method shall be the same as the previous double twist single hole method except the twist direction between subsequent fasteners may be clock wise or counter clockwise.

B. Spacing.

(1) When lockwiring widely spaced multiple groups by the double-twist method, three units shall be the maximum number in a series.
(2) When lockwiring closely spaced multiple groups, the number of units that can be lockwired by a twenty-four inch length of wire shall be the maximum number in a series.
(3) Widely spaced multiple groups shall mean those in which the fastenings are from 4 to 6 inches apart. Lockwiring shall not be used to secure fasteners or fittings which are spaced more than 6 inches apart, unless tie points are provided on adjacent parts to shorten the span of the lockwire to less than six inches.

C. Tension.

(1) Parts shall be lockwired in such a manner that the lockwire shall be put in tension when the part tends to loosen. The lockwire should always be installed and twisted so that the loop around the head stays down and does not tend to come up over the bolt head and leave a slack loop.

NOTE: This does not necessarily apply to castellated nuts when the slot is close to the top of the nut, the wire will be more secure if it is made to pas: along the side of the stud.

(2) Care shall be exercised when installing lockwire to ensure that it is tight but not overstressed.

D. Usage.

(1) A pigtail of 0.25 to 0.50 inch (3 to 6 twists) shall be made at the end of the wiring. This pigtail shall be bent back or under to prevent it from becoming a snag.
(2) Safety wire (lockwire) shall be new upon each application.
(3) When castellated nuts are to be secured with lockwire, tighten the nut to the low side of the selected torque range, unless otherwise specified, and if necessary, continue tightening until a slot aligns with the hole.
(4) In blind tapped hole applications of bolts or castellated nuts on studs, the lockwiring shall be as described in these instructions.
(5) Hollow head bolts are safetied in the manner prescribed for regular bolts.
(6) Drain plugs and cocks may be safetied to a bolt, nut or other part having a free lock hole in accordance with the instructions described in this text.
(7) External snap rings may be locked if necessary in accordance with the general locking principles as described and illustrated. Internal snap rings shall not be lockwired.

(8) When locking is required on electrical connectors which use threaded coupling rings, or on plugs which employ screws or rings to fasten the individual parts of the plug together, they shall be lockwired with 0.020 inch diameter wire in accordance with the locking principles as described and illustrated. It is preferable to lockwire all electrical connectors individually. Do not lockwire one connector to another unless it is necessary to do so.

(9) Drilled head bolts and screws need not be lockwired if installed into self-locking nuts or installed with lockwashers. Castellated nuts with cotter pins or lockwire are preferred on bolts or studs with drilled shanks but self-locking nuts are permissible within the limitations of MS33588.

(10) Larger assemblies such as hydraulic cylinder heads for which locking wiring is required, but not specified, shall be lock-wired as described in these instructions.

(11) For new design, lockwire shall not be used to secure nor shall lockwire be dependent upon fracture as the basis for operation of emergency devices such as handles, switches, guards covering handles, etc., that operate emergency mechanisms such as emergency exits, fire extinguishers, emergency cabin pressure release, emergency landing gear release and the like. However, where existing structural equipment or safety of flight emergency devices require shear wire to secure equipment while not in use, but which are dependent upon shearing or breaking of the lockwire for successful emergency operation of equipment, particular care shall be exercised to assure that wiring under these circumstances shall not prevent emergency operations of these devices.

4. Cotter Pin Installation. (Refer to Figure 1H.)

A. General instruction for the selection and application of cotter pins.

(1) Select cotter pin material in accordance with temperature, atmosphere and service limitations.

(2) Cotter pins shall be new upon each application.

(3) When nuts are to be secured to the fastener with cotter pins, tighten the nut to the low side (minimum) of the applicable specified or selected torque range, unless otherwise specified, and if necessary, continue tightening until the slot aligns with the hole. In no case shall you exceed the high side (maximum) torque range.

(4) Castellated nuts mounted on bolts may be safetied with cotter pins or lockwire. The preferred method is with the cotter pin. An alternate method where the cotter pin is mounted normal to the axis of the bolt may be used where the cotter pin in the preferred method is apt to become a snag.

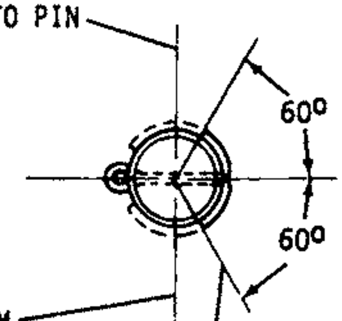
(5) In the event of more than 50 percent of the cotter pin diameter is above the nut castellation, a washer should be used under the nut or a shorter fastener should be used. A maximum of two washers may be permitted under a nut.

(6) The largest nominal diameter cotter pin listed in MS24665 which the hole and slots will accommodate shall be used; but in no application to a nut, bolt or screw shall the pin size be less than the sizes described in Figure 1H.

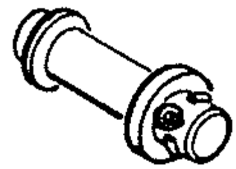
(7) Install the cotter pin with the head firmly in the slot of the nut with the axis of the eye at right angles to the bolt shank bend prongs so that the head and upper prong are firmly seated against the bolt.

(8) In the pin applications, install the cotter pin with the axis of the eye parallel to the shank of the clevis pin or rod end. Bend the prongs around the shank of the pin or rod end.

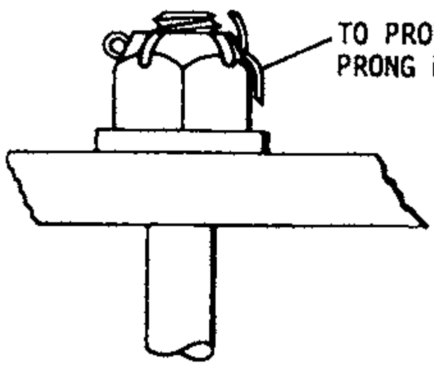
(9) Cadmium plated cotter pins shall not be used in applications bringing them in contact with fuel, hydraulic fluid or synthetic lubricants.



CASTELLATED NUT ON BOLT
ALTERNATE METHOD



PIN APPLICATION



CASTELLATED NUT ON BOLT
PREFERRED METHOD

THREAD SIZE	MINIMUM PIN SIZE
6	0.028
8	0.044
10	0.044
1/4	0.044
5/16	0.044
3/8	0.072
7/16	0.072
1/2	0.072
9/16	0.086
5/8	0.086
3/4	0.086
7/8	0.086
1	0.086
1 1/8	0.116
1 1/4	0.116
1 3/8	0.116
1 1/2	0.116

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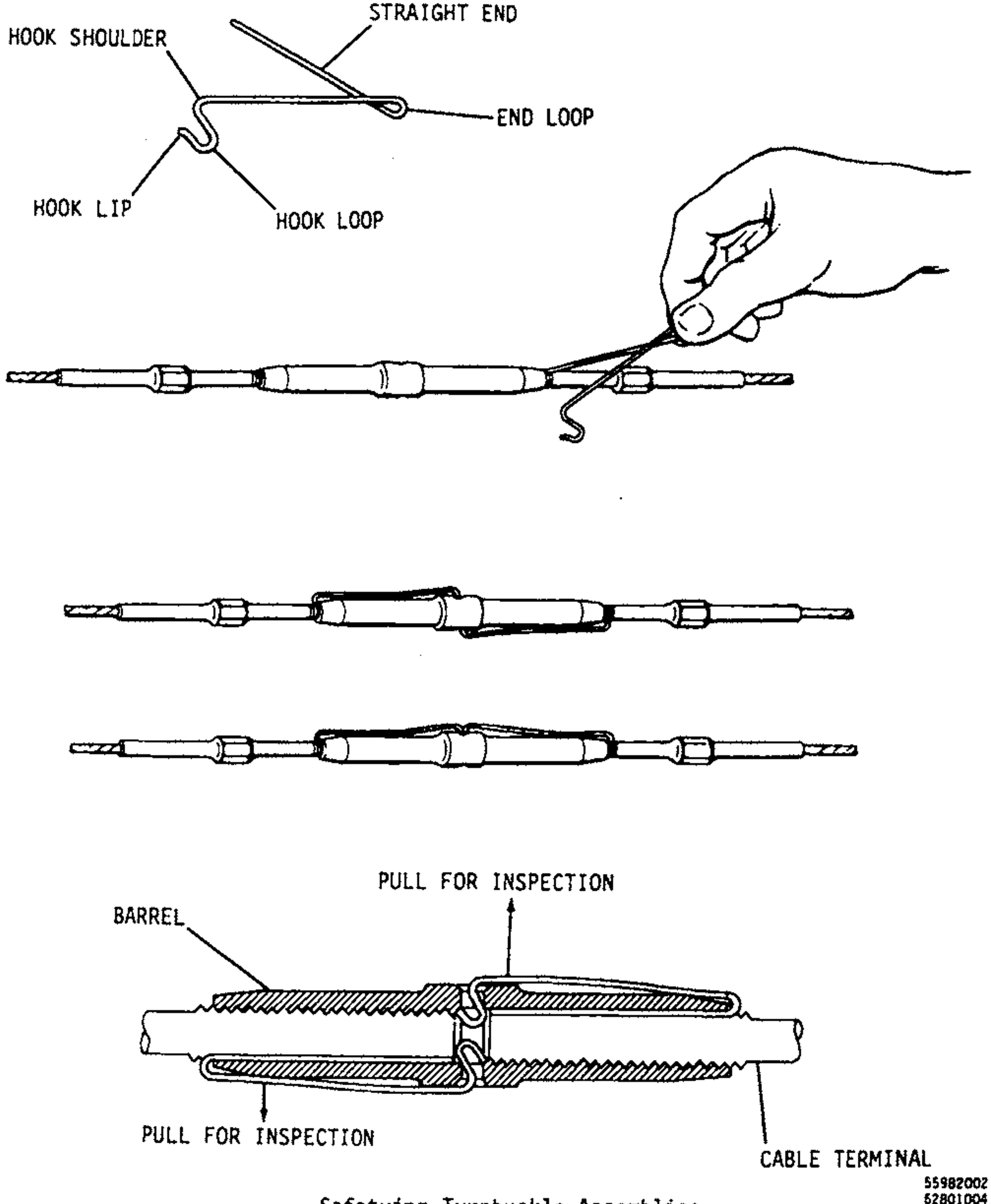
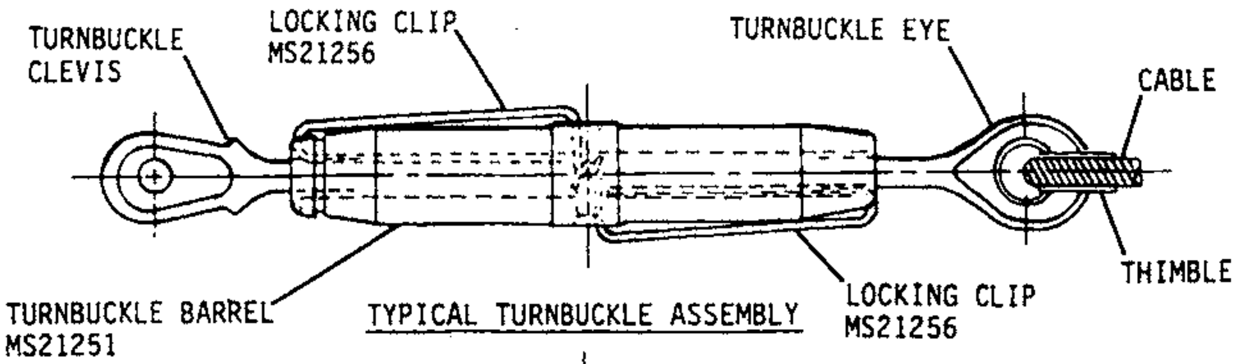
	TEMPERATURE	SERVICE
MS24665 Cotter Pins Carbon Steel	Ambient Temperatures Up to 450°F.	Normal Atmospheres Cotter Pins Contacting Cadmium Plated Bolts or Nuts.
MS24665 Cotter Pins Corrosion Resistant	Ambient Temperatures Up to 800°F.	Non-Magnetic Requirements Cotter Pin Contacting Corrosion Resistant Steel Bolts or Nuts Corrosive Atmospheres.

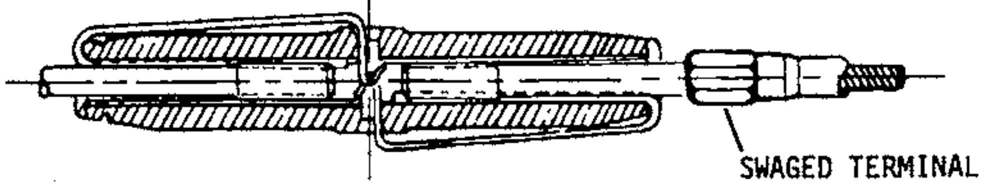
Cotter Pin Safetying
Figure 1H



Safetying Turnbuckle Assemblies
Figure 1J (Sheet 1)



TYPICAL TURNBUCKLE ASSEMBLY



METHOD OF ASSEMBLING LOCKING CLIPS, TURNBUCKLE BARREL AND TERMINALS

NOMINAL CABLE DIAMETER	THREAD UNF-3	LOCKING CLIP MS21256 (NOTE 1)	TURNBUCKLE BODY MS21251
1/16	6-40	-1	-2S
3/32	10-32		-3S
		-2	-3L
		-1	-4S
1/8	1/4-28	-2	-4L
5/32		-1	-5S
		-2	-5L
3/16	5/16-24	-1	-6S
			-6L
7/32		-2	-7L
1/4	3/8-24		-8L
9/32	7/16-20	-3	-9L
5/16	1/2-20		-10L

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Safetying Turnbuckle Assembly
Figure 1J (Sheet 2)

5. Locking Clip Installation

A. Safetying Turnbuckles. (Refer to Figure 1J)

(1) Prior to safetying, both threaded terminals shall be screwed an equal distance into the turnbuckle body and shall be screwed in at least so far that not more than three threads of any terminal are exposed outside the body.

(2) After the turnbuckle has been adjusted to its locking position, with the slot indicator groove on terminals and slot indicator notch on body aligned, insert the end of the locking clip into the terminal and body, refer to Figure 203, until the "U" curved end of the locking clip is over the hole in the center of the body.

(a) Press the locking clip into the hold to its full extent.

(b) The curved end of the locking clip will expand and latch in the body slot.

(c) To check proper seating of locking clip, attempt to remove pressed "U" end from body hole with fingers only.

<u>NOTE</u>: Do not use tool as locking clip could be distorted.

(3) Locking clips are for one time use only and shall not be reused.

(4) Both locking clips may be inserted in the same hole of the turnbuckle body or in opposite holes of the turnbuckle body.

6. Lock Washers

A. Lock washers may be used within the following conditions:

(1) When self-locking feature cannot be provided in externally or internally threaded part.

(2) When a cotter pin cannot be used to prevent rotation of internal threads with respect to external threads.

(3) When lock wire cannot be used to prevent loosening of threaded parts.

(4) When fastening is not used for fabrication of primary structure.

(5) When loosening of threaded parts would not endanger the safety of the airplane or people.

(6) When corrosion encouraged by gouging aluminum or magnesium alloys by edges of teeth on tooth locked washers, would not cause malfunctioning of parts being fastened together.

7. Self-Locking Nuts

A. Self-Locking nuts shall not be used in the following ways:

(1) Threaded parts, at joints in control systems at single attachments or where loss of the bolt would affect safety of flight. These are to be held by a positive locking device that requires shearing or rupture of materials before torsional loads would relieve the initial stresses of the assembly.

(2) On an externally threaded part that serves as an axis of rotation for another part unless there are no possible torsional loads which in such a manner as to relieve the initial stresses of the assembly, that requires shearing or rupture of material before torsional loads would relieve the initial stresses of the assembly.

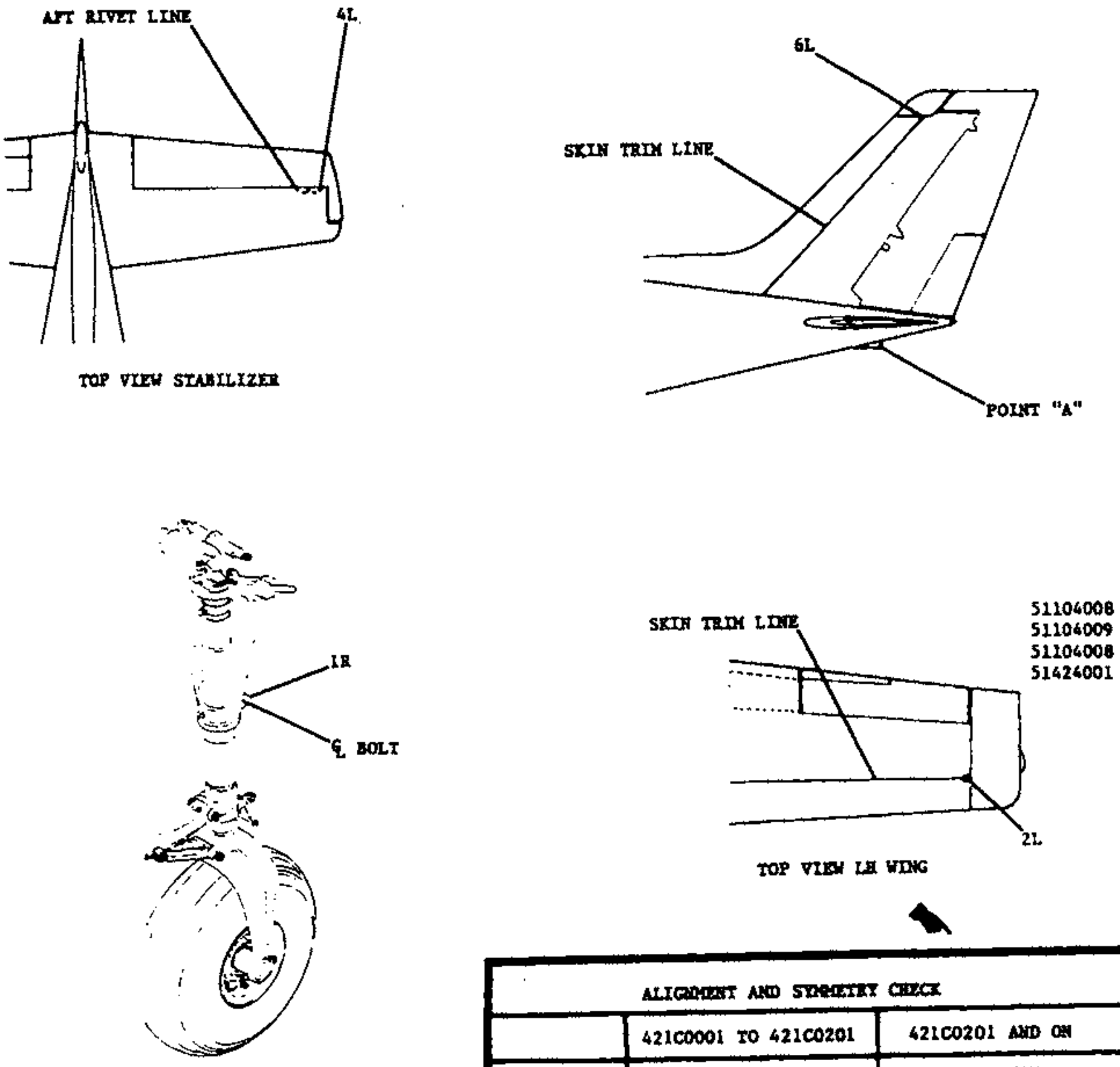
Example: Pulleys, cranks levers, linkages, hinge pins, and cam followers.

(3) With bolts, screws, or studs to attach access panels, doors or to assemble any parts that are routinely disassembled prior to or after each flight.

(a) Bolts, studs or screws, excluding Hi-Locks, must extend through the self-locking nut for a length equivalent of two threaded pitches. This length includes the chamfer.

(b) Self-locking nuts which are attached to the structure shall be attached in a positive manner to eliminate the possibility of their rotation or misalignment when tightening is to be accomplished by rotating the bolts to the structure and permit replacement of the nuts. When projection maintained in order that removal by drilling out the welds permit replacement with drilled plate nuts.

(c) Self-locking nuts that have been reworked or reprocessed shall not be used.

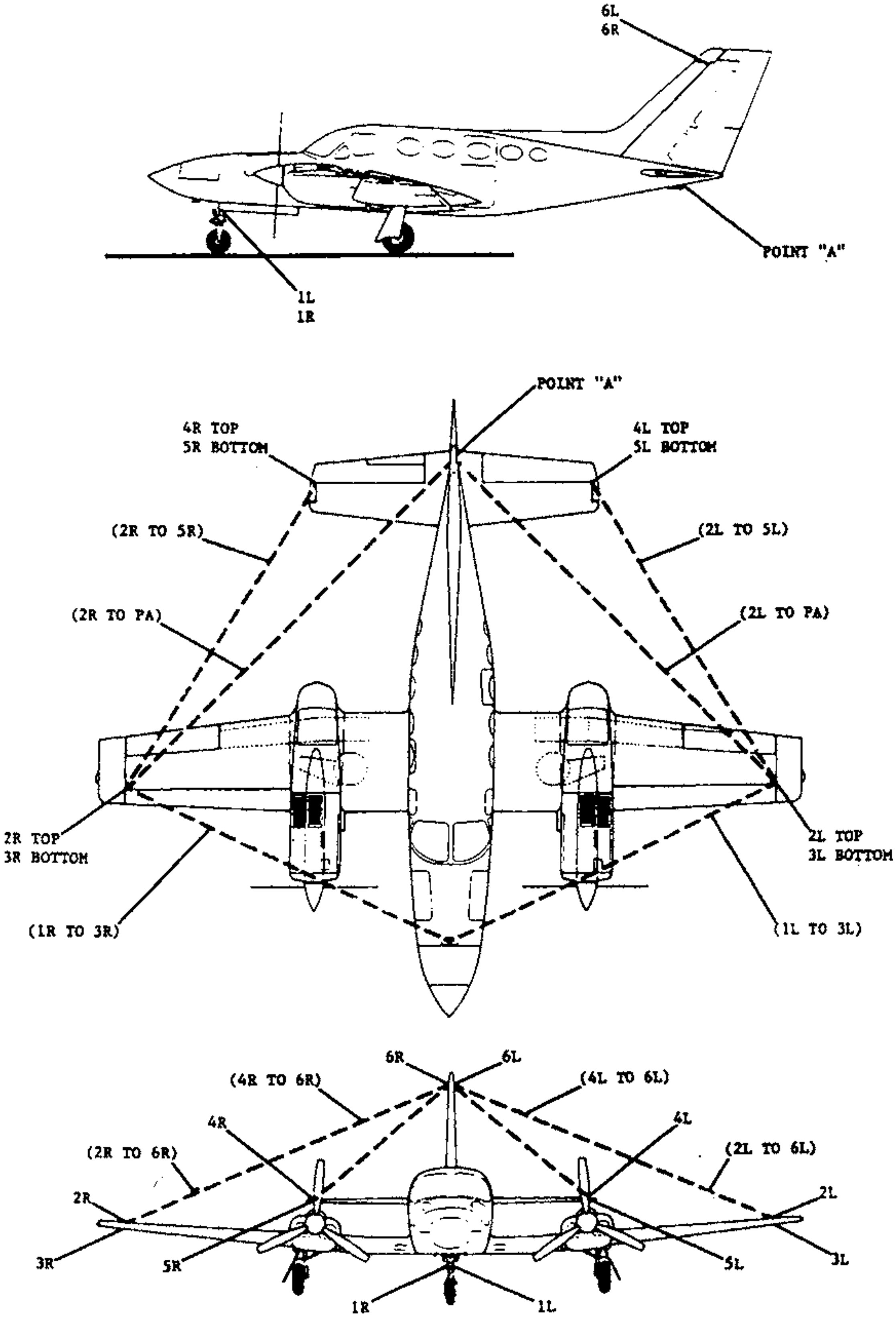


DETAILS OF CHECK POINTS:

A. CENTER LINE AFT TAIL SKID BOLT.
1. CENTER LINE OF BOLT AT GEAR STRUT AND DRAG BRACE ATTACHMENT. CENTER LINE HEAD OF BOLT RH SIDE AND SHANK OF BOLT LH SIDE.
2. SKIN TRIM LINE AND INBOARD EDGE OF WING TIP AT FRONT SPAR.
3. SAME AS 2 EXCEPT BOTTOM OF WING.
4. CENTER LINE AFT RIVET LINE OF REAR STABILIZER AT OUTBOARD EDGE OF STABILIZER.
5. SAME AS 4 EXCEPT BOTTOM OF STABILIZER.
6. SKIN TRIM LINE AT FORWARD FIN SPAR AND LOWER EDGE OF TIP CAP.

ALIGNMENT AND SYMMETRY CHECK		
	421C0001 TO 421C0201	421C0201 AND ON
POINTS	DISTANCE	DISTANCE
1L TO 3L 1R TO 3R	21' 1.00" ± 1.25	21' 1.00" ± 1.25
2L TO 5L 2R TO 5R	21' 4.74" ± 2.00	21' 4.74" ± 2.00
2L TO PA 2R TO PA	26' 4.49" ± 1.50	26' 4.49" ± 1.50
4L TO 6L 4R TO 6R	10' 4.89" ± 1.00	10' 4.6" ± 1.00 10' 5.0" ± 1.00
2L TO 6L 2R TO 6R	28' 2.67" ± 2.00	28' 2.51" ± 2.00 28' 2.85" ± 2.00

Alignment and Symmetry
Figure 2 (Sheet 1 of 2)



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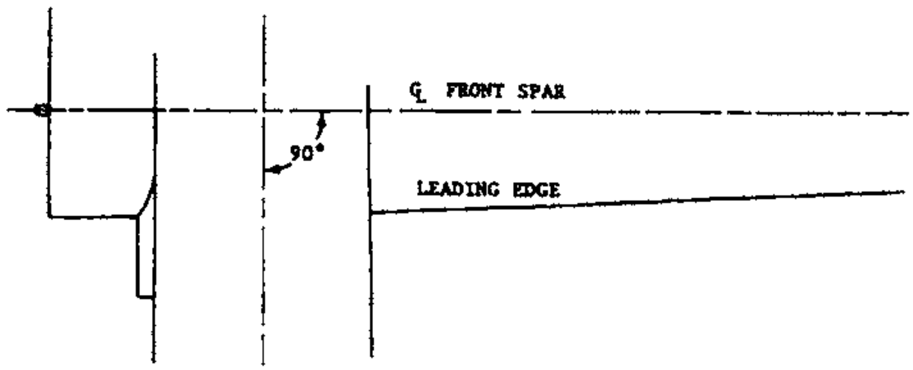
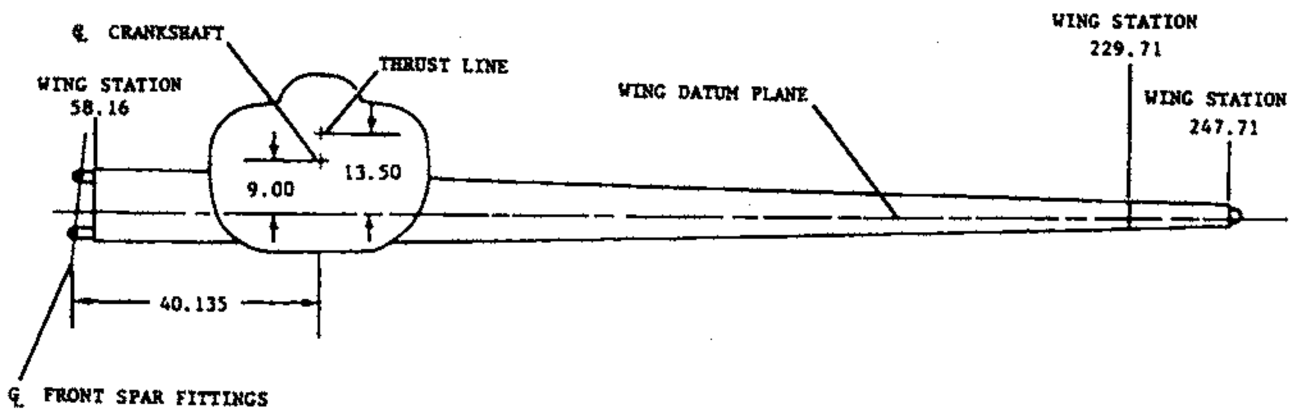
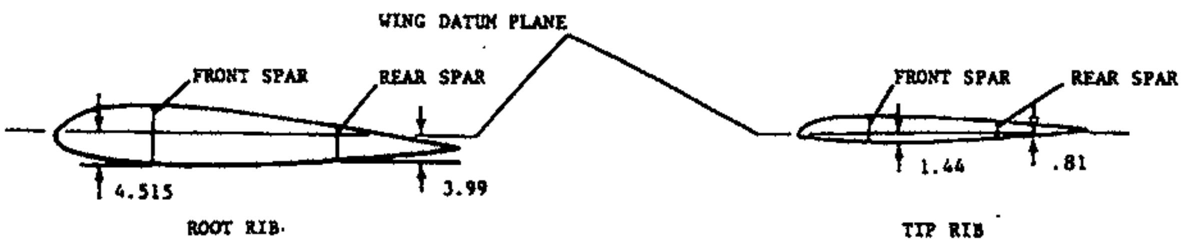
Alignment and Symmetry
Figure 2 (Sheet 2)



DETAIL A



DETAIL B



DETAIL C

WING ANGLE OF INCIDENCE

ROOT	TIP
+2°30'	-50'

WING TWIST (WASHOUT)
3°

A51201001
B51201002
C51201003

Wing Twist and Thrust Line Data
Figure 3

Static Balancing of Flight Control Surfaces

1. General

   A. Flight control surfaces must be balanced after repair or painting.

2. Tools and Equipment.

Name	Number	Manufacturer	Use
Control surface balance fixture kit	5180002-1	Cessna Aircraft Co. Wichita, KS 67277	Balance flight control surfaces.

3. Control Surface Balancing.

   A. General Information.

      (1) It is recommended that control surface balancing be accomplished in a draft-free room or area.

      NOTE: Be certain when control surface weights are installed, surfaces are clean, all foreign material inside control surfaces is removed, and control surfaces are painted with hinge bolts installed. Surfaces which have trim tabs incorporated must have the tab secured in a streamlined position. Push-pull rods, with attaching hardware on the trim tab and rudder bellcrank, must be installed before starting balancing procedures. Use only Cessna specified part numbers for add-on weights. Install weights using only the existing attachment provisions. Do not alter the airplane structure except as noted for adding weights. If balancing cannot be accomplished within limitations specified by balancing procedures, it may be possible to reduce weight by stripping excessive paint and repainting. If weight cannot be corrected to allow balancing, the control surface should be replaced.

   B. Control Surface Balancing Fixture Procedure.

      (1) (See Figure 4.) Adjust beam to fit onto control surface as follows:
         (a) Beam can be located anywhere on control surface as practical. On control surfaces with hinge bolts, the best location is directly over a hinge bolt to allow easier beam alignment.

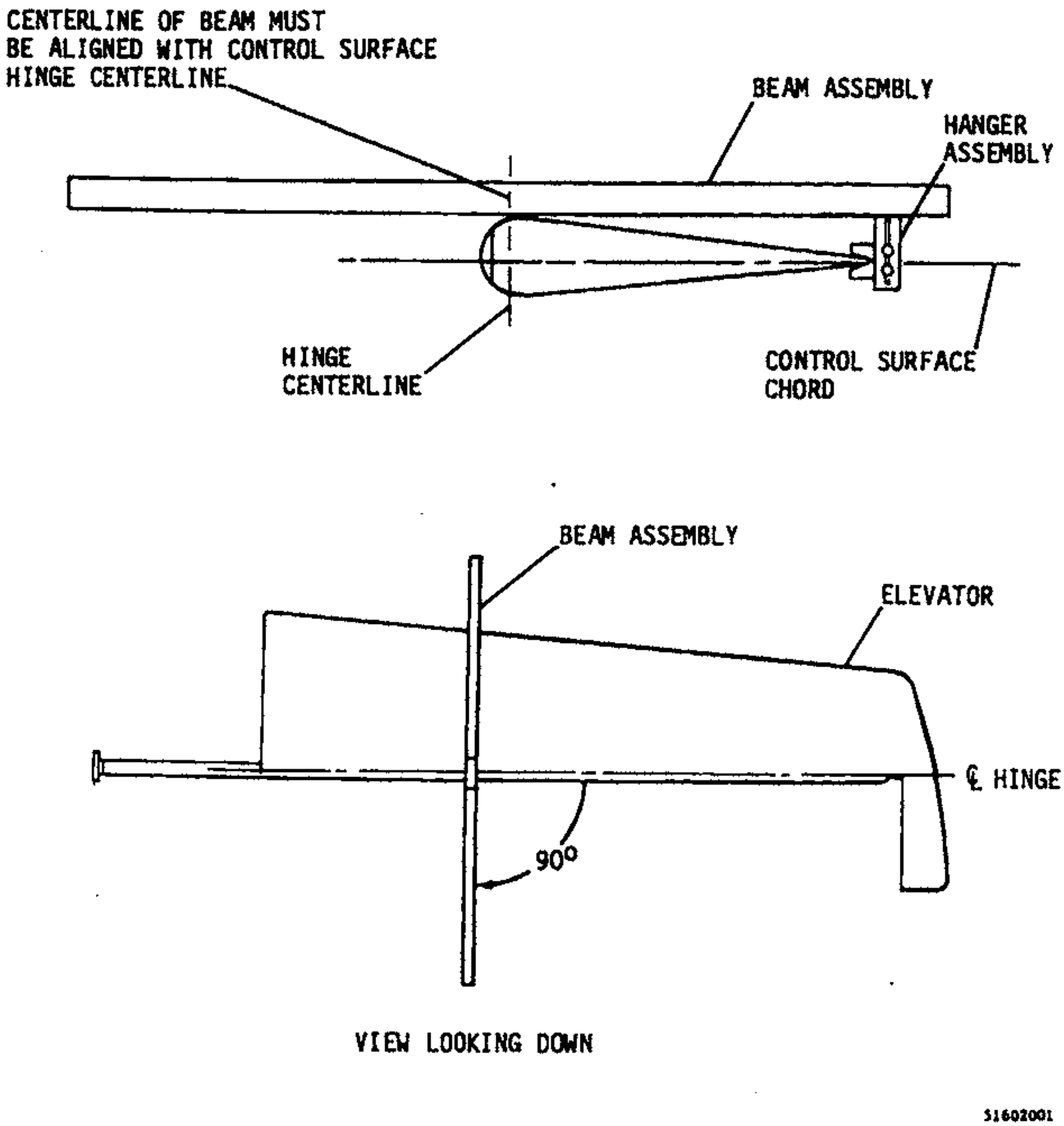
         NOTE: Do not allow the beam or hanger assembly to rest on any rivet heads.

         (b) Align the beam so that it is positioned 90 degrees to the hinge line and the centerline mark on beam (0 position) is directly over the hinge line.
         (c) Adjust the hanger assembly to fit against the trailing edge of the control surface so that the beam is parallel to the chord of the control surface. Check position of the beam centerline mark to ensure that it is still directly over the hinge line.
         (d) Mark the location of the beam on the control surface and remove the beam assembly from the control surface.

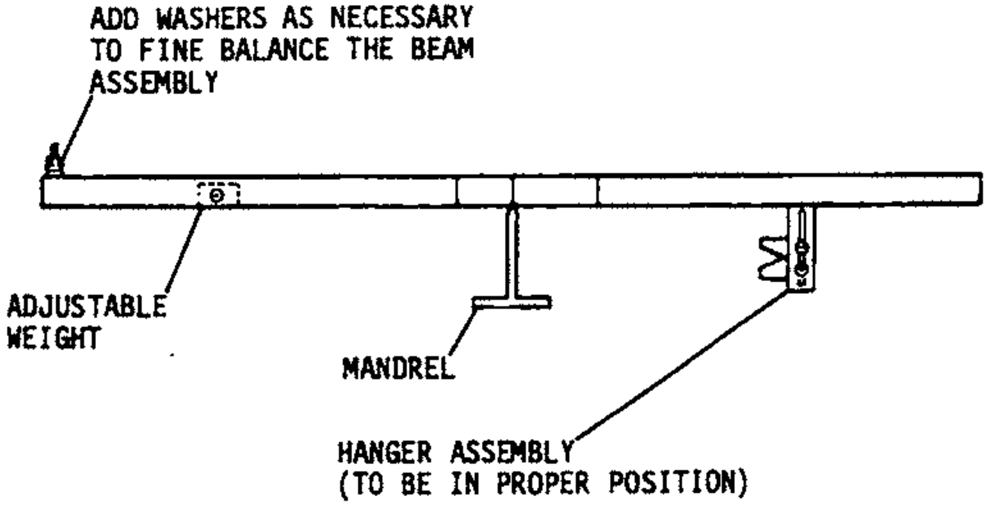
      (2) (See Figure 5.) Balance the beam assembly as follows:

      NOTE: The beam must be rebalanced for each individual control surface that is to be balanced.

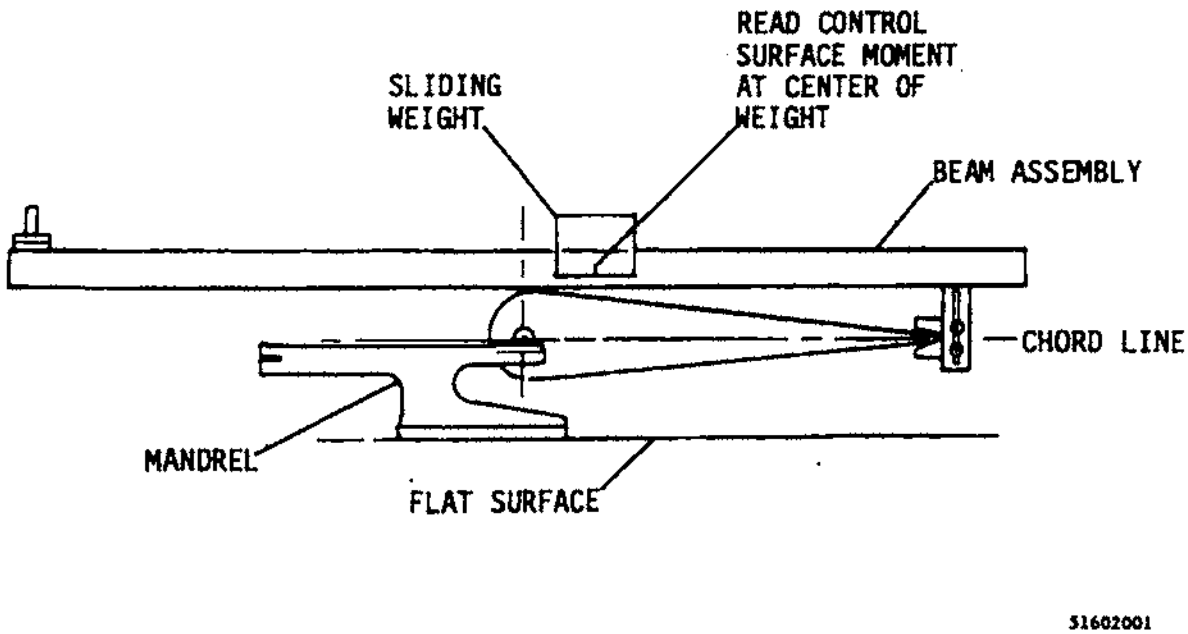
         (a) Place the beam assembly on the knife edge of one mandrel at the centerline of the beam assembly (in notch).
         (b) Position the weight (fastened by a screw) along the beam assembly as required to allow the beam assembly to be balanced. Secure the weight in position by tightening the screw. Washers may be added to the long screw (at the other end of the beam) to provide for fine balancing of the beam assembly.



Adjustment of Beam to Fit Control Surface
Figure 4



Balancing of Beam Assembly
Figure 5

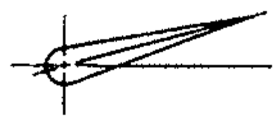


Balancing of Control Surface
Figure 6

(3) (See Figure 6.) Place the mandrels on a horizontal, flat surface in position to accept the control surface to be balanced and place the control surface onto the mandrels as follows:
   (a) Control surfaces with hinge bolts are to be placed on the mandrels such that the hinge bolt shank rests on the knife edge portion of the mandrel. Use either end of the mandrel as required.
   (b) Control surfaces with a hinge pin are to be placed on mandrels to utilize the slot in the long end of the mandrels.

      NOTE: The control surface is to be positioned on the mandrels such that no portion of the control surface contacts in mandrels except the hinge bolt or hinge pin.

(4) (See Figure 6.) Balance the control surface as follows:
   (a) Place the beam assembly onto the control surface (as previously marked) and place the sliding weight onto the beam assembly.
   (b) Position the sliding weight to allow the control surface to be balanced (control surface chord to be parallel to horizontal, flat surface). Read the number on the scale directly below the center mark on the sliding weight. The number read is the moment of the control surface in inch-pounds. The moment must be assigned a + or - as follows:
      1) Overbalance is defined as the condition that exists when surface is leading edge heavy and is defined by symbol (-). If the balance beam sliding weight must be on the trailing edge side of the hinge line (to balance the control surface) the control surface is considered to be overbalanced.



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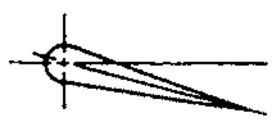
Overbalance of Control Surface
Figure 7

      2) Underbalance is defined as the condition that exists when surface is trailing edge heavy and is defined by symbol (+). If the balance beam sliding weight must be on the leading edge side of the hinge line (to balance the control surface) the control surface is considered to be underbalanced.



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Underbalance of Control Surface
Figure 8

C. Control Surface Allowable Balance Tolerances are as Follows:

Control Surface	Allowable Balance Tolerance
Aileron	-3.35 to -4.10 Inch-Pounds
Elevator	+0.75 to -2.00 Inch-Pounds
Rudder	+0.75 to -3.75 Inch-Pounds

D. Rudder Balancing.

NOTE: Make sure rudder control surface has freedom of movement, does not drag on mandrels and bonding straps are free.

(1) Secure the rudder trim tab in a streamlined position with masking tape using a minimum amount, and install associated hardware.
(2) If the rudder assumes a position parallel with the base of the mandrel and the balance weight is within the allowable balance tolerance, the rudder is statically balanced.
(3) If rudder assumes a position of trailing edge up when balance weight is on the aft end of the range, rudder is overbalanced and needs weight removed.

NOTE: Correct overbalance by drilling weight as necessary. Do not remove material within 0.25 inch of attach bolts.

(4) If rudder control surface assumes a position of trailing edge down when balance weight is on forward end of the range, rudder surface is underbalanced and needs more balance weight added.
(5) The approximate amount of weight needed for underbalance can be determined by placing small amounts of loose weight in the balance weight area.

CAUTION: TOTAL RUDDER BALANCE WEIGHT EXCLUDING ATTACHING FASTENERS SHOULD NOT EXCEED 10.67 POUNDS.

(6) Additional balance weight may be added by tamping lead wool into existing holes of the balance weight. If holes are not available to insert added weight, add two nutplates on each side of the lightening hole and attach a lead bar weight secured with two bolts.

NOTE: The rudder tip and mounting screws must be installed each time the rudder is checked for balance.

E. Aileron Balancing.

NOTE: Make sure aileron control surface has freedom of movement, does not drag on mandrel and the bonding straps are free.

(1) Secure the trim tab on the left aileron in a streamlined position with masking tape using a minimum amount and install associated hardware.
(2) If the aileron assumes a position parallel with the base of mandrel and the balance weight is within the allowable balance tolerance, the aileron is statically balanced.
(3) If aileron assumes a position of trailing edge up when balance weight is on the aft end of the range, the aileron is overbalanced and needs weight removed.

NOTE: Correct overbalance by drilling weight as necessary. Do not remove material within 0.25 inch of the attach bolts. The aileron balance weight must be removed from the aileron in order to remove excess weight.

(4) If the aileron assumes position of trailing edge down, when balance weight is on forward end of range, aileron is underbalanced and needs more balance weight added.

CAUTION: BALANCE WEIGHT FOR AILERONS EXCLUDING ATTACHING HARDWARE SHOULD NOT EXCEED 2.58 POUNDS FOR THE RIGHT AND 5.45 POUNDS FOR THE LEFT. INTERNAL BALANCE WEIGHTS SHOULD NOT BE ALTERED TO ACCOMPLISHED BALANCING.

(5) The approximate amount of weight needed for underbalance can be determined by placing small amounts of loose weight in the balance weight area.
(6) Addition of balance weight may be added by tamping lead wool into existing holes of the weight. If holes are not available, additional weight may be added by removing existing screws and installing longer screws to attach added weight.

CAUTION: MAKE CERTAIN BOLTS SECURING WEIGHT IN PLACE ARE TIGHT BEFORE INSTALLING AILERON ON AIRPLANE.

(7) If weight has been removed or installed, ensure screws on cover are properly installed and safetyed.

F. Elevator Balancing.

NOTE: Make sure elevator control surface has freedom of movement, does not drag on mandrels and bonding straps are free.

(1) Secure the elevator trim tab on elevator in a streamlined position using a minimum amount of masking tape and install associated hardware.
(2) If the elevator assumes a position parallel with base of the mandrel and the balance weight is within the allowable balance tolerance, the elevator is statically balanced.

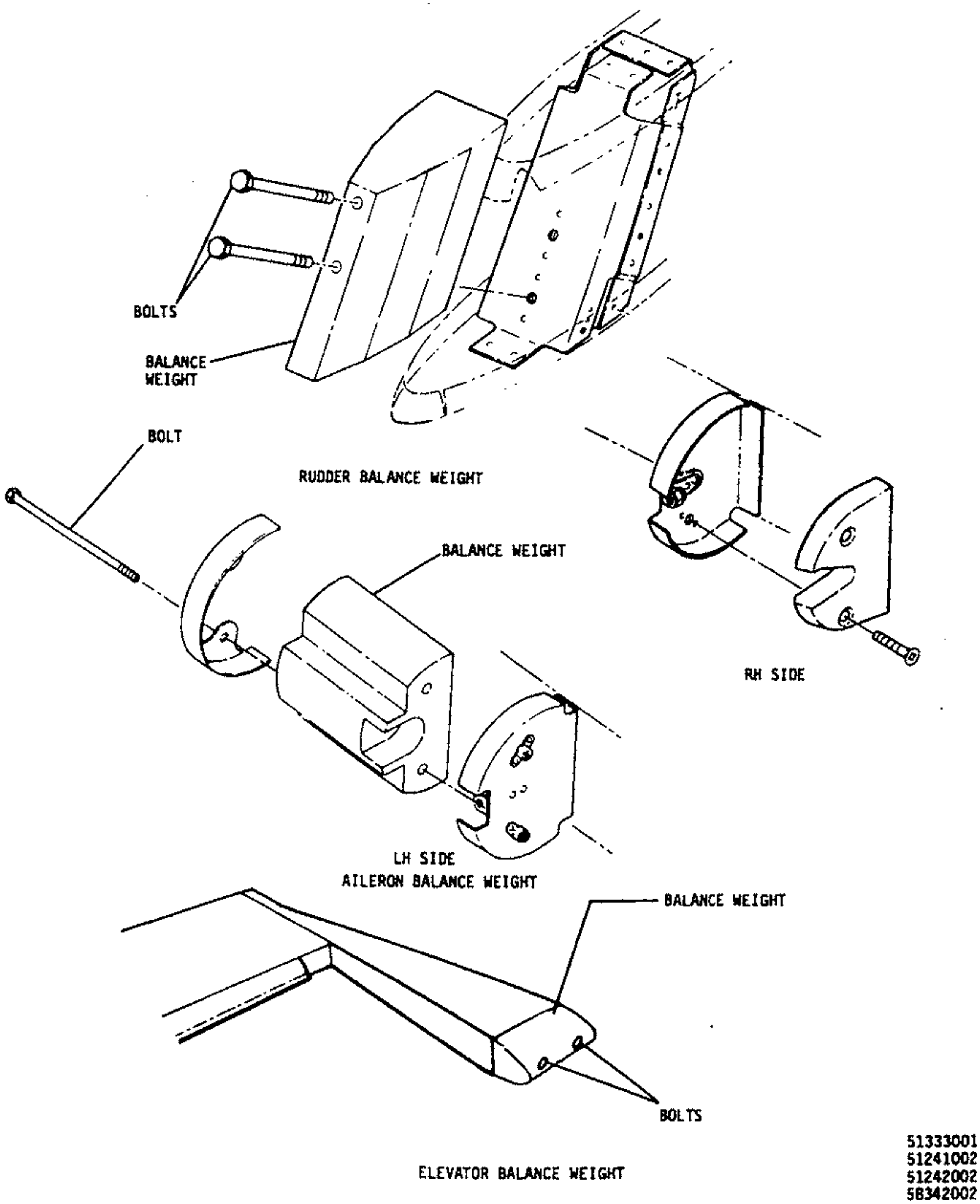
CAUTION: TOTAL BALANCE WEIGHT EXCLUDING ATTACHING FASTENERS SHOULD NOT EXCEED 4.25 POUNDS FOR EITHER ELEVATOR.

(3) If the elevator assumes a position of trailing edge up when balance weight is on the aft end of the range, elevator is overbalanced and needs weight removed.

NOTE: Correct overbalance by drilling weight as necessary. Do not remove material within 0.25 inch of attach bolts.

(4) If the elevator assumes position of trailing edge down when balance weight is on the forward end of the range, elevator is underbalanced and needs more balance weight added.
(5) The approximate amount of weight needed for underbalance can be determined by placing small amounts of loose weight in the balance weight area.
(6) Additional balance weight may be added by tamping lead wool in existing holes of the weight. If holes are not available, it will be necessary to add new weights.

NOTE: Each time the elevator is checked for weight and balance, the elevator tip must be installed and elevator tip screws must be in the proper location (short screws toward aft end of elevator).



Aileron, Rudder and Elevator Balance Weights
Figure 9

CHAPTER 2

INSPECTION AND SERVICING

TABLE OF CONTENTS

SCHEDULED MAINTENANCE CHECKS

1. **Inspection Requirements**
   a. Two basic types of inspections are available as defined below:
      (1) As required by Federal Aviation Regulation Part 91.409 (a), all civil airplanes of U.S. registry must undergo a complete inspection (ANNUAL) each twelve calendar months. In addition to the required ANNUAL inspection, airplane operated commercially (for hire) must also have a complete inspection every 100 hours of operation as required by Federal Aviation Regulation Part 91.409 (b).

      (2) In lieu of the above requirements, an airplane may be inspected in accordance with a progressive inspection program in, accordance with Federal Aviation Regulation Part 91.409 (d), which allows the work load to be divided into smaller operations that can be accomplished in shorter time period. CESSNA PROGRESSIVE CARE PROGRAM has been developed to provide a modern progressive inspection schedule that satisfies the COMPLETE AIRPLANE INSPECTION requirements of both the 100 HOUR and ANNUAL inspection as applicable to Cessna Airplanes.

2. **Inspection Program Selection**
   a. As a guide for selecting the inspection program that best suits the operation of the airplane, the following is provided.
      (1) If the airplane is flown less than 200 hours annually, the following conditions apply:
         (a) If flown for hire
            1) An airplane operating in this category must have a COMPLETE AIRPLANE INSPECTION each 100 hours of operation and each 12 calendar months of operation (ANNUAL). A COMPLETE AIRPLANE INSPECTION consists of all , 100 Hour, and 200 Hour Special and Yearly Inspection Items shown in the Inspection Time Limits Charts and Component Time Limits Charts.
         (b) If not flown for hire
            1) An airplane operating in this category must have a COMPLETE AIRPLANE INSPECTION each 12 calendar months of operation (ANNUAL). A COMPLETE AIRPLANE INSPECTION consists of all 100 Hour, and 200 Hour Special and Yearly Inspection Items shown in the Inspection Time Limits Charts and Component Time Limits Charts. In addition, it is recommended that between annual inspections, all items be inspected at the intervals specified in the Inspection Time Limits Charts and Component Time Limits Charts.
      (2) If the airplane is flown more than 200 hours annually, the following condition applies:
         (a) Weather flown for hire or not, it is recommended that airplanes operating in this category be placed on the CESSNA PROGRESSIVE CARE PROGRAM. However, if not placed on the Progressive Care Program, the inspection requirements for airplanes in this category are the same as those defined under Paragraph 2., a., (1), (a) or (b). CESSNA PROGRESSIVE CARE PROGRAM may be utilized as a total concept program which ensures that the inspection intervals in the inspection charts are not exceeded. Manuals and forms which are required for conducting the Progressive Care Program inspections are available from the Cessna Service stations

3. **Inspection Charts**

   NOTE: CESSNA HAS PREPARED THESE INSPECTION CHARTS TO ASSIST THE OWNER OR OPERATOR IN MEETING THE FORGOING RESPONSIBILITIES AND TO MEET THE INTENT OF FEDERAL AVIATION REGULATION PART 91.409 (a), (b) AND (d). THE INSPECTION CHARTS ARE NOT INTENDED TO BE ALL-INCLUSIVE, FOR NO SUCH CHARTS CAN REPLACE THE GOOD JUDGMENT OF A CERTIFIED AIRFRAME AND POWERPLANT MECHANIC IN PERFORMANCE OF HIS DUTIES. AS THE ONE PRIMARILY RESPONSIBLE FOR THE AIRWORTHINESS OF THE AIRPLANE, THE OWNER OR OPERATOR SHOULD SELECT ONLY QUALIFIED PERSONNEL TO MAINTAIN THE AIRPLANE.

   a. The following Inspection Charts (Inspection Time Limits, Component Time Limits, Progressive Care Inspection and Expanded Inspection) show the recommended intervals at which items are to be inspected based on normal usage under average environmental conditions. Airplanes operated in extremely humid tropics, or in exceptionally cold, damp climates, etc., may need more frequent inspections for wear, corrosion and lubrication. Under these adverse conditions, perform periodic inspections in compliance with this chart at more frequent intervals until the operator can set his own inspection periods based on field experience. The operators inspection intervals shall not deviate from the inspection time limits shown in this manual except as provided below:

(1) Each inspection interval can be exceeded by a maximum of 10 hours but the next interval due point must retain the original due point. Inspections can be accomplished early as provided below:

(a) In the event of early accomplishment of an inspection interval, that occurs 10 hours or less earlier than due, the next inspection interval due point can remain where originally set.

(b) In the event of early accomplishment of an inspection interval, that is more than 10 hours early, the next inspection interval due point must be moved up to establish a new due point from the time of early accomplishment.

b. As shown in the charts, there are items to be checked at the first 100 hours, each 100 hours, each 200 hours, or at Special or Yearly Inspections. Special or Yearly inspection items require servicing or inspection at intervals other than 100 or 200 hours. If two inspection time requirements are listed for one inspection item, one hourly and the other yearly, both apply and whichever requirement occurs first determines the time limit.

NOTE

The only 50 hour requirement in the inspection program is the changing of engine oil and replacement of the oil and filter each 50 hours on airplanes equipped with a short oil filter (approximately 4.8 inches long). This item is listed as a special inspection item in the Inspection Charts.

(1) When conducting an inspection at the first 100 hours, all items marked under FIRST 100 HOURS in addition to all items marked under EACH 100 HOURS would be inspected, serviced or otherwise accomplished as necessary to ensure compliance with the inspection requirements.

(2) When conducting an inspection at each 100 hours, all items marked under EACH 100 HOURS would be inspected, serviced or otherwise accomplished as necessary to ensure compliance with the inspection requirements.

(3) When conducting an inspection at EACH 200 HOURS, all items marked under EACH 200 HOURS in addition to all items marked under EACH 100 HOURS would be inspected or otherwise accomplished as necessary to ensure compliance with the inspection requirements.

(4) A COMPLETE AIRPLANE INSPECTION includes all 100 and 200 hour items plus those Special and Yearly Inspection Items which are due at the specified time.

(5) Component Time Limits Charts should be checked at each inspection interval to ensure proper overhaul and replacement requirements are accomplished at the specified times.

4. Inspection Guidelines.

a. The Inspection Charts are to be used as a recommended inspection outline. Detailed information of systems and components in the airplane will be found in various sections of this Service Manual and the pertinent vendor publications. It is recommended that reference be made to the applicable portion of this manual for service instructions, installation instructions and to the vendor's data or publications specifications for torque values, clearances, settings, tolerances and other requirements.

b. For the purpose of this inspection, the term "on condition" is defined as follows:

The necessary inspections and or checks to determine that a malfunction or failure will not occur prior to the next scheduled inspection.

c. MOVABLE PARTS: Inspect for lubrication, servicing, security of attachment, binding, excessive wear, safetying, proper operation, proper adjustment, correct travel, cracked fittings, security of hinges, defective bearings, cleanliness, corrosion, deformation, sealing and tension.

d. FLUID LINES AND HOSES: Inspect for leaks, cracks, bulging, collapsed, twisted, dents, kinks, chafing, proper radius, security, discoloration, bleaching, deterioration, proper routing and rubber hoses for stiffness and metal lines for corrosion.

e. METAL PARTS: Inspect for security of attachment, cracks, metal distortion, broken spotwelds, condition of paint especially chips at seams and around fasteners for onset of corrosion and any other apparent damage.

f. WIRING: Inspect for security, chafing, burning, arcing, defective insulation, loose or broken terminals, heat deterioration and corroded terminals.

g. STRUCTURAL FASTENERS: Inspect for correct torque in accordance with applicable torque values. Refer to Bolt Torque Data, during installation or when visual inspection indicates the need for a torque check.

NOTE

Torque values listed are not to be used for checking tightness of installed parts during service.

h. FILTERS, SCREENS AND FLUIDS: Inspect for cleanliness, and the need for replacement at specified intervals.

i. System check (operation or function) requiring electrical power must be performed using 27.5, +0.25, -0.25 bus voltage. This will ensure all components are operating at their designed requirements.

j. Airplane file

(1) Miscellaneous data, information and licenses are a part of the airplane file. Check that the following documents are up-to-date and in accordance with current Federal Aviation Regulations. Most of the items listed are required by the Federal Aviation Regulations. Since the regulations of other nations may require other documents and data, owners of exported airplanes should check with their own aviation officials to determine their individual requirements.

(a) To be displayed in the airplane at all times:

1) Standard Airworthiness Certificate (FAA Form 8100-2).

2) Aircraft Registration Certificate (FAA Form 8050-3).

3) Aircraft Radio Station License, (Federal Communication Commission Form 556, if transmitter is installed.)

4) Radio Telephone Station License (Federal Communication Commission Form 409, if Flitefone Radio Telephone is installed).

(b) To be carried in the airplane at all times:

1) Weight and Balance Data Sheets and associated papers (all copies of the Repair and Alteration Form, FAA Form 337, is applicable.)

2) Equipment List.

3) Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

(c) To be made available upon request:

1) Airplane Log Book and Engine Log Books.

PREINSPECTION CHECKS

1. Preinspection Operational Checks

a. Before beginning the step-by-step inspection, start and run-up the engines and upon completion, shut down the engines in accordance with instructions in the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual. During the run-up, observe the following, making note of any discrepancies or abnormalities:

(1) Engine temperatures and pressures.

(2) Static RPM.

(3) Magneto drop

(4) Engine response to changes in power.

(5) Any unusual engine noises.

(6) Fuel selector and shutoff valve operation; operate each engine on each tank to determine that selector valve does not shut off fuel; operate each shutoff valve to determine that fuel flow does shut off to each engine.

(7) Idling speed and mixture; proper idle cut-off.

(8) Alternator (voltage and amperage).

(9) Suction pressure.

(10) Fuel flow.

(11) Heater operation.

(12) Air Conditioner operation (as season permits).

INSPECTION TIME LIMITS

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
A.	**Placards (Section 1).**					
1.	Placards and Decals - Inspect presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for required placards.			•		
B.	**Air Conditioning (Section 6).**					
	Heating, Air Distribution System.					
	NOTE: All heater inspection times are based on airplane heater hour meter and not airplane flight hour meter. If heater hour meter is not installed, use actual airplane flight hours divided by two.					
1.	Heater Components and Heater Fuel Lines - Inspect all components for condition and security. Inspect for leaks. Inspect drain lines for proper slope and obstructions.		•			
2.	Heater Fuel Lines in Wing - Inspect for condition and leaks		•			
3.	Heater Inlets and Outlets - Inspect all lines, connections, ducts, clamps, seals and gaskets for condition, restriction and security.			•		
4.	Ventilating Blower - Inspect blower fan/wheel for blade damage.			•		
5.	Combustion Air Blower - Inspect wheel for damage.			•		
6.	Heater Sealant - Inspect all sealant around heater for deterioration.			•		
7.	Heater Electrical System - Inspect block and components for loose connections, possible chaffing of insulation, indications of arcing and security of attachment points. Inspect high voltage cable for security at spark plug. Inspect high voltage cable for burning or discoloration of sheath, which would indicate arcing. Inspect spark plug for signs of fouling or erosion.			•		
8.	Heater Assembly (Janitrol) - Perform pressure decay test.				Every 500	
9.	Nose Ram Air - Inspect clamps, hoses, valve, heater and ventilation system for condition and security.			•		
10.	Heater Control Cables and Valves - Inspect for proper operation.			•		
11.	Air Distribution Lines and Ducts - Inspect for condition and security.			•		
12.	(421C0001 Thru 421C0200) Heater Fuel Screen and/ or Filter (Stewart-Warner) - Clean or service.					Every 1
	Air Conditioning System.					
1.	Air Conditioning Lines - Inspect air injection and discharge lines for cracks, sharp bends, condition and security.			•		
2.	Air Conditioner Compressor and Motor - Inspect for condition and security.			•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
3.	Air Conditioner Condenser - Inspect inlets and outlets for obstructions; inspect coils for debris, condition and security.			•		
4.	Air Conditioner Condenser Fan - Inspect blades for condition and security.				Every 400	
5.	Air Conditioner Condenser Fan Motor Check brushes for proper length. Inspect fan motor condition and security.				Every 400	
6.	Air Conditioner Evaporator Fan - Inspect blower wheel for condition and security.				Every 400	
7.	Air Conditioning Electrical Components - Inspect the electrical components in accordance with electrical power inspection.			•		
8.	Air Conditioner Hydraulic Lines, Pumps and Components (Hydraulic Driven Systems) - Inspect for leaks, condition and security.		•			
9.	Air Conditioner Hydraulic Fluid and Filter (Hydraulic Driven Systems) - Change fluid, element and packing.	•			Every 400	
	Pressurization System					
1.	Pressurization Outflow Valves, Safety Valves and Filters - Inspect for condition and security. Clean and replace filters, if applicable.			•		
2.	Pressurization Electrical Components - Inspect electrical components in accordance with electrical power inspection.			•		
3.	Pressurization Plumbing Components - Inspect plumbing for condition, security and loose connections.			•		
4.	Pressurization Bleed Air Dump Valves - Inspect for condition, security and smooth operation.			•		
5.	Pressurization Controllers, Filters and Control Units - Inspect for condition and security. Clean or replace filters and clean parts. Inspect controls for smooth rotation.			•		
6.	Heat Exchanger - Inspect for condition, security and air passage obstruction.				Every 400	
7.	Pressurization Differential Limiting Check - perform check.	•			Every 500	
8.	Barometric Pressure Switch - Perform Functional/ Operational Test				Every 600	
C.	**Autoflight (Section 14) (If Installed).**					
1.	Autopilot Actuators - Inspect for condition, security and evidence of overheating. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points and chains for proper alignment with actuator sprockets. Inspect pulleys drive sprocket, drive chain and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.			•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
2.	Autopilot Computer Amplifier, Mount, Mounting Knob and Electrical Components - Inspect for condition and security.	•		•		
3.	Autopilot Controller - Inspect for condition and security. Check switches for proper operation.	•		•		
4.	Autopilot Cables - Check Cable Tension	•			Every 600	Every 1
D.	**Communications (Section 15) (Inspect Following Items If Applicable).**					
1.	COM 1, COM 2, HF Transceiver and Audio Control Panels - Inspect for condition, security and proper operation of controls.			•		
2.	COM 1 and COM 2 Receiver/Transmitters, HF Transceiver/Exciter - Inspect for condition and security. Inspect electrical components in accordance with electrical power inspection.			•		
3.	HF Power Amplifier/Power Supply - Inspect for condition and security. Inspect electrical components in accordance with electrical power inspection.			•		
4.	COM 1, COM 2, HF and Flight Phone Antennas and Couplers - Inspect for condition and security.			•		
5.	Flight Phone Component Station - Inspect for security, cleanliness, evidence of damage and operation of the drawer assembly				Every 600	
6.	Flight Phone Transceiver - Inspect for security and evidence of damage.				Every 600	
7.	Stereo Player, Stereo Speakers, Stereo Transducers and Headsets - Inspect for condition, security, cleanliness, and operation.				Every 600	
8.	Stereo Tape Head and Pinch Roller - Inspect for condition, security. Clean			•		
9.	Microphone and Headset Jacks - Inspect for cleanliness, security and evidence of damage.			•		
10.	Static Wicks - Inspect for condition and security.			•		
11.	Static Wicks - Check resistance.	•		•		
E.	**Electrical Power (Section 13)**					
1.	General Airplane and System Wiring - Inspect for chafing, broken or loose terminals, general condition, broken or inadequate clamps and sharp bends in wiring.	•		•		
2.	Side Consoles, Circuit Breaker Panel, Fuses, Terminal Blocks and Junction Boxes - Inspect wiring and terminals for condition and security.	•		•		
3.	Circuit Breaker, Fuses, Terminal Blocks and Junction Boxes - Inspect wiring and terminals for condition and security.	•		•		
4.	Switches - Check operation, terminals, wiring and mounting for condition, security and interference.	•		•		
5.	Voltage Regulators - Inspect wiring, mounting, condition and wire routing.	•		•		
6.	Flap Switches and Motor - Inspect wiring and terminals for condition and security.	•		•		

INSPECTION TIME LIMITS

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
7.	Landing Gear Switches and Safety Switches - Inspect wiring and terminals for condition and security.	•		•		
8.	Wing Battery - Check electrolyte and general condition and security.		•			
9.	Wing Battery Cables - Inspect for corrosion and security.		•			
10.	Wing Battery Box - Inspect for corrosion, condition and security. Clean vent tube.		•			
11.	Instrument Panel and Control Pedestal - Inspect wiring, mounting and terminals for condition and security. Check resistance between stationary panel and instrument panel for proper ground.			•		
12.	Starter Relay - Inspect contact area.	•		•		
13.	Alternators - Inspect brushes, leads, bearings and slip rings for condition and security.				Every 600	
14.	Alternators - Inspect for condition and security. 100-amp Prestolite Alternators - Check water shield if installed.			•		
15.	External Power Receptacle and Power Cables - Inspect for condition and security.			•		
16.	External Power Relay - Inspect for condition and security.			•		
F.	**Equipment And Furnishings (Section 12) Inspect The Following Items It Applicable).**					
1.	Pilot's and Copilot's Inertia Reels, Seat Belts and Shoulder Harness - Inspect for security of installation, frayed edge and evidence of damage and proper operation.			•		
2.	Pilot's and Copilot's Seats - Inspect seat brackets, guides and stops for condition and security; controls for condition, security and proper operation; seat structure and seat cushions for condition and security.			•		
3.	Mechanical and Electrical Adjusting Seats - Service seat adjusting screws and bearings.	•			Every 600	
4.	Scuff Plates - Inspect for condition, security and clean.			•		
5.	Seat Tracks - Inspect seat tracks and stops for condition and security of installation. Inspect seat track stops for proper location and installation.			•		
6.	Passenger Seat Belts - Inspect for security of installation, frayed edge and evidence of damage and proper operation.			•		
7.	Passenger Seats - Inspect seat brackets, guides and stops for condition and security; controls for condition, security and proper operation: seat structure and seat cushions for condition and security. Inspect seats for proper forward and aft installation per seat guides.			•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
8.	Interior Furnishings - Inspect for condition and security. Inspect electrical components in accordance with electrical power inspection.			•		
G.	**Fire Protection (Section 12).**					
1.	Detection Sensor - Inspect for security, cleanliness, nicks and abrasions.		•			
2.	Fire Detection Control Unit and Warning Indicating Lights - Inspect for condition, security and for proper operation.			•		
3.	Engine Compartment Fire Extinguisher - Inspect for proper operating pressure, condition, security of electrical connections, dents and scratches on container.		•			
4.	Engine Compartment Fire Extinguisher Container - Weigh to determine charge.					Every 3
5.	Engine Compartment Fire Extinguisher Container Manufactured by HTL - If container is past due date for hydrostatic test, is holding a charge and is in good working condition, perform hydrostatic test.					Every 4
6.	Engine Compartment Fire Extinguisher Container Manufactured by HTL - Perform hydrostatic test if required. (Refer to Expanded Inspection)					Every 5
7.	Engine Compartment Fire Extinguisher Container Manufactured by Kiddie Company - Perform condition inspection. Do a Hydrostatic test if required. (Refer to Expanded Inspection)					Every 5
8.	Discharge Tubes for Fire Extinguisher - Inspect for condition, security and obstruction.			•		
9.	Engine Compartment Fire Extinguisher Container Cartridge - Inspect service life date.					Every 1
10.	Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition and security.		•			
H.	**Flight Controls (Section 5).**					
	Aileron Control System.					
1.	Aileron - Inspect the aileron skins for cracks and loose rivets; aileron hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fit-tings and bonding jumpers for evidence of damage or wear, failed fasteners and security. Inspect the aileron hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weights for looseness and their supporting structure for damage.		•			
2.	Aileron Actuator Yoke - Inspect the aileron actuator yoke, yoke attach bracket, yoke attach bolts and yoke mount bracket attach nutplates for evidence of damage or wear, condition and security. Inspect yoke attach bolts for proper safetying of nuts with cotter pins	•		•		

INSPECTION TIME LIMITS

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	YEARS
3.	Aileron Quadrant - Inspect aileron quadrant for condition, security, corrosion, evidence of damage to quadrant arm, stop bolts and support bracket. Inspect aileron quadrant bolt and stop bolts for proper safetying.	•		•		
4.	Aileron Wing Cables - Inspect wing cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security. Inspect cable seals for deterioration and lubrication.	•		•		
5.	Aileron Bell Crank - Inspect bell crank for security, cleanliness, corrosion, evidence of damage to guard pins, guides and cable attach points.	•		•		
6.	Fuselage and Control Column Aileron Cables Including the Wing Cables from the Bell Crank to Fuselage Seals - Inspect cables for fraying, chafing, cleanliness, trunbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.	•		•		
7.	Control Wheel - Inspect control wheel for condition and security. Operate control wheel and check for freedom of movement.	•		•		
8.	Control Wheel Column Bearings - Service.				Every 600	Every 1
9.	Aileron - Check aileron travel and cable tension.				Every 600	Every 1
	Aileron Trim Tab System.					
1.	Aileron Trim Tab - Inspect the trim tab skins for cracks, loose rivets and security; trim tab binge for cracks, security and evidence of damage. Inspect hinge pin for proper installation at hinge pin retainer. Inspect horn and push rod for evidence of damage and security. Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.	•		•		
2.	Aileron Trim Tab Actuator - Inspect actuator for security and evidence of damage. Inspect mounting clamp(s) (if applicable) and structure for evidence of damage, cracks and security. Inspect actuator mounting bolts for security. If torque putty is broken, retorque mounting bolts. Inspect snap rings for complete and proper engagement in snap ring grooves of actuator (if applicable). Inspect actuator rod for evidence of bending. Inspect push rod bolt at actuator for proper safetying of nut with cotter pin. Inspect push rod ends for bearing looseness and excessive wear.	•		•		
3.	Aileron Trim Tab Actuator Push Rod - Inspect for free play in actuator.	•		•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
4.	Aileron Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.	•		•		
5.	Aileron Trim Tab Cable Stop Blocks - Inspect for condition and security.	•		•		
6.	Aileron Trim Tab Control and - Indicator - Inspect control and indicator for condition and security. Operate trim tab control and check aileron trim tab for freedom of movement. Inspect guide block for condition and security.	•		•		
7.	Aileron Trim Tab - Check aileron trim tab travel and cable tension.	•			Every 600	Every 1
8.	Aileron Trim Tab Control Bearing and Gears - Service.				Every 600	Every 1
9.	Aileron Trim Control Wheel Bearings - Service.				Every 600	Every 1
	Rudder Control System.					
1.	Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumper for evidence of damage or wear, failed fasteners and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.		•			
2.	Rudder Bell Crank - Inspect bell crank stop bolts for corrosion, evidence of damage and security. Inspect cables attached to bell crank for proper cotter pin safetying	•		•		
3.	Rudder Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.	•		•		
4.	Rudder Pedals and Rudder Pedal Linkage - Inspect for condition and security. Operate rudder controls and check for freedom of movement.	•		•		
5.	Rudder Pedal Linkage - Service.				Every 600	Every 1
6.	Rudder and Rudder Pedal - Check travel and cable tension.	•			Every 600	Every 1
	Rudder Trim Tab System.					

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
1.	Rudder Trim Tab - Inspect trim tab skins for cracks, loose rivets and security; trim tab hinge for security, cracks, evidence of damage. Inspect hinge pin for proper installation and proper cotter pin safetying at both ends. Inspect horn and push rod for evidence of damage and security. Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.	•		•		
2.	Rudder Trim Tab Actuator - Inspect actuator for security and evidence of damage. Inspect guide block and clamp for evidence of damage and security. Inspect actuator mounting bolts for security. If torque putty is broken, retorque mounting bolts. Inspect actuator rod for evidence of bending. Inspect push rod bolts for proper safetying of nuts with cotter pins. Inspect push rod ends for bearing looseness and excessive wear.	•		•		
3.	Rudder Trim Tab Actuator Push Rod - Inspect for free play in actuator.	•		•		
4.	Rudder Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect travel stop blocks for security. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.	•		•		
5.	Rudder Trim Tab Cable Stop Blocks - Inspect for condition and security.	•		•		
6.	Rudder Trim Tab Control and Indicator - Inspect control and indicator for condition and security. Operate trim tab control and check rudder trim tab for freedom of movement.	•		•		
7.	Rudder Trim Tab Wheel Bearing and Track - Service.				Every 600	Every 1
8.	Rudder Trim Tab - Check Rudder trim tab travel and cable tension.	•			Every 600	Every 1
	Rudder Gust Lock (If Installed).					
1.	Rudder Gust Lock - Inspect for condition and security.	•		•		
2.	Rudder Gust Lock - Perform operational test of automatic disengagement with side load applied Check clearance between tailcone skin and rudder skin.	•		•		
3.	Rudder Gust Lock - Service	•			Every 600	Every 1
	Yaw Damper System.					

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
1.	Yaw Damper Actuator and Cables - Inspect actuators for condition, security and evidence of overheating. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points and chains for proper alignment on actuator sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.	•		•		
2.	Yaw Damper - Check cable tension.	•			Every 600	Every 1
	Elevator Control System.					
1.	Elevator - Inspect the elevator skins for cracks and loose rivets; elevator hinges for condition, cracks and security; hinge bolts, hinge bearings, torque tube, horn, attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security. Inspect the elevator hinge bolts for proper safetying of nuts with cotter pins. Inspect elevator torque tube end assembly for looseness. Inspect balance weights for looseness and supporting structure for damage. Inspect out board tips for cracks in rib flange and web. Inspect taper pins for looseness (if applicable).		•			
2.	Elevator Bell Crank - Inspect bell crank, bearings, push rods, stop bolts and brackets for corrosion, evidence of damage, failed fasteners and security, proper safety of bell crank and push rod bolts for proper safety of nuts with cotter pins.	•		•		
3.	Elevator Cables - Inspect cable seals for deterioration. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.	•		•		
4.	Control Column - Inspect bobweights, control column for evidence of damage, failed fasteners and security. Operate control column and check for freedom of movement.	•		•		
5.	Elevator Cable Guard - Inspect for condition and security of spacers at elevator bell crank in quadrant.	•		•		
6.	Elevator - Check elevator travel and cable tension	•			Every 600	Every 1
	Elevator Trim Tab System.					
1.	Elevator Trim Tab - Inspect the trim tab skins for cracks, loose rivets and security; trim tab hinge for security, cracks and evidence of damage. Inspect hinge pin for proper installation at hinge pin retainer. Inspect horn(s) and push rod(s) for evidence of damage and security. Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.	•		•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	YEARS
2.	Elevator Trim Tab Actuator - Inspect actuator for security and evidence of damage; mounting clamp(s) (if applicable) and mounting structure for evidence of damage, cracks and security at the rear spar of the horizontal stabilizer. Check that the bolts are secure (torque putty not broken). Looking through the actuator access holes in the horizontal stabilizer, inspect the chain guard for security. Check that the guard attach screws are secure. Inspect snap rings (if applicable) for complete and proper engagement in snap ring groove of actuator. Check that snap ring is properly seated in positioning slot on mounting bracket. Inspect the actuator rod and bearing for condition and security. Inspect push rod bolt for proper safetying of nuts and cotter pin installed for security. Inspect the actuator chain for condition. Inspect chain to cable attach link for security.	•		•		
3.	Elevator Trim Tab Actuators Push Rod - Inspect for free play in actuator.	•		•		
4.	Elevator Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for p roper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.	•		•		
5.	Elevator Trim Tab Cable Stop Blocks - Inspect for condition and security.	•		•		
6.	Elevator Trim Tab Control and Indicator - Inspect control and indicator for condition and security. Operate trim tab control and check for freedom of movement.	•		•		
7.	Elevator Trim Tab Wheel Bearing and Track - Service.				Every 600	Every 1
8.	Elevator Trim Tab - Check elevator trim tab travel and cable tension.	•			Every 600	Every 1
	Electric Elevator Trim System.					
1.	Electric Elevator Trim Actuator - Inspect actuator for condition, security and evidence of overheating. Inspect cables for fraying chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points and chains for proper alignment of actuator sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.	•		•		
2.	Electric Elevator Trim - Operate electric trim, check trim tab travel time and cable tension.	•			Every 600	Every 1
	Stall Warning System.					
1.	Stall Warning System - Inspect for condition and security of installation. Perform operational check.	•		•		

INSPECTION TIME LIMITS

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
	Flap System.					
1.	Flaps - Inspect flaps for condition and security.	•		•		
2.	Flaps - Inspect linkage, bell cranks, torque tube, pulleys and cables for condition and security; inspect hinges for condition security and cracks.	•		•		
3.	Flap Motor, Position Indicator and Flap Actuator Assembly - Check for condition and security.	•		•		
4.	Flap Preselect System - Inspect control and position indicator for security of installation, adequate slack in wiring through full range of travel and evidence of damage. Inspect cable for deterioration and security of installation.	•		•		
5.	Inboard and Outboard Flap Bell Cranks and Pushrods - Inspect bell cranks and push rods for evidence of damage and security of installation. Inspect push rods for bent rods, seized or worn bearings, loose locknuts and use push rod inspection holes to verify that there is sufficient thread engagement of the rod end to reach at least to the inspection hole. Inspect cable seals for deterioration and lubrication. Inspect chains for excessive wear and rubbing on chain guards.	•		•		
6.	Flaps - Check flap travel, cable tension and travel time.	•			Every 600	Every 1
I.	**Fuel (Section 11).**					
1.	Fuel Selector Gear Box - Perform operational check (feel for dents), inspect linkage, bearings for condition and security. Service	•		•		
2.	Fuel Selector Valve and Crossfeed Control - Inspect linkage and components for condition and security.	•		•		
3.	Fuel Filter - Service.	•		•		
4.	Fuel System Plumbing and all Fuel Components - Inspect for condition, security, fuel leaks and fuel stains.		•			
5.	Fuel System Filters - Service.	•		•		
6.	Fuel Cross-Over Line Drains- Drain.		•			
7.	Fuel Inlet Float Valve - Perform functional/ installations test.				Refer to MEB93-10	
8.	Fuel Electrical Components - Inspect in accordance with electrical power inspection.		•			
J.	**Hydraulic System (Section 11).**					
1.	Hydraulic Pump - Inspect for leaks, condition and security.		•			
2.	Hydraulic Fluid Filter - Change element.	•			Every 400	
3.	Hydraulic Hoses - Inspect for hardness, deterioration, looseness and bulging.		•			
4.	Hydraulic System - Inspect plumbing and components for leaks, condition and security.		•			
5.	Hydraulic System Pressure Switch - Check for leaks.		•			
6.	Hydraulic System Flow Switches - Check for leaks.		•			

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
7.	Reservoir Vent Line - Inspect vent line for obstructions.			•		
8.	Hydraulic Pressure Lines - Perform a hydraulic pressure lines leak test.				1500 and Every 500 There-after	
K.	**Ice And Rain Protection (Section 12).**					
1.	Surface Deice System (Pneumatic) - Inspect for condition and leaks. Inspect lines and clamps for security. Perform operational check.			•		
2.	Surface Deice Regulator, Pressure Control Valve and Deice Control Valves - Inspect for condition and security.			•		
3.	Surface Deice System - Inspect electrical components in accordance with electrical power inspection.			•		
4.	Deice Boots - Inspect for abrasions, cuts, nicks and security of mounting and clearance.			•		
5.	(421C0001 Thru 421C0115) Deice Filter - Clean or replace.			•		
6.	Alcohol Anti-Ice Nozzles - Inspect for security and obstructions.			•		
7.	Alcohol Anti-Ice Pump - Inspect for leaks, condition and security.			•		
8.	Alcohol Anti-Ice System - Inspect for leaks, condition and security.			•		
9.	Alcohol Anti-Ice System - Perform Operational Check.			•		
10.	Windshield Static Discharge Strips (If Installed) - Inspect for deterioration, security, and resistance from ground terminal to primary structure.			•		
11.	Propeller Deice Slip Rings, Brushes and Boots - Inspect for condition, and security. Perform operational check.			•		
12.	Propeller Deice Electrical Leads - Inspect for condition and security.			•		
13.	Static Ports Heater Elements - Perform operational check			•		
14.	Pitot Tube(s) Heater Element(s) - Perform operational check.			•		
15.	Stall Warning Vane Heater Element - Perform operational check.			•		
16.	Heated Nacelle Drain Tube - Perform operational check of heating element.			•		
L.	**Landing Gear (Section 4).**					
1.	Landing Gear System - Inspect for condition and security.	•		•		
2.	Landing Gear System - Perform landing gear rigging and operational check.	•			Every 600	Every 2
3.	Landing Gear Retracting Linkage - Inspect for condition and security.	•		•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
4.	Landing Gear Shock Strut - Inspect for evidence of leakage and proper extension. Inspect strut barrel for corrosion, pitting and cleanliness.	•		•		
5.	Nose Gear Torque Links - Inspect for condition and security. Service.	•		•		
6.	(421C0001 Thru 421C0800) Main Gear Torque Links - Inspect for condition and security. Service.	•		•		
7.	(421C0801 and On) Main Gear Trailing Link - Inspect for condition and security.	•		•		
8.	(421C0001 Thru 421C0800) Nose Gear Trunnion Pivot Bearing - Inspect for condition and service.				Every 1000	Every 3
9.	(421C0801 and On) Nose Gear Trunnion Pivot Bearing - Service.	•		•		
10.	Main Gear Trunnion Pivot Bearing - Inspect for condition.				Every 1000	Every 3
11.	(421C0001 Thru 421C0628) not incorporating 5K421-93 Main Gear Trunnion - Dye Penetrant Inspect for cracks.				300 and Every 50 There-after	
12.	Landing Gear Uplock Roller Mounted on Gear - Inspect for condition and security.	•		•		
13.	(421C0001 Thru 421C0473) not modified by SK421-83 Nose Gear Actuator Anchor Lugs - Inspect for cracks and hole elongation.	•	•			
14.	Landing Gear Wheel Bearings - Inspect for condition and repack.	•			Every 400	
15.	Nose Gear Shimmy Damper - Inspect for condition and security.	•		•		
16.	Nose Gear Shimmy Damper - Service.	•		•		
17.	Nose Wheel Steering Cable - Check cable tension and travel.	•		•		
18.	Nose Wheel Steering Gimbal Bolts - Inspect for condition and security.	•		•		
19.	Nose Gear Steering Stop Block - Inspect for condition and security.	•		•		
20.	Nose Gear Steering Bell Crank - Inspect for condition and security.	•		•		
21.	Nose Gear Fork - Inspect for condition and security	•		•		
22.	Landing Gear Wheel and Tire - Check wear, pressure and condition.	•		•		
23.	Landing Gear Doors - Inspect for condition and security.	•		•		
24.	Brake System Plumbing - Inspect for leaks, hoses for bulges and deterioration, parking brake for operation.	•		•		
25.	Brake Assemblies - Inspect for wear of lining and disc warpage.	•		•		
26.	Brake Master Cylinders - Service.	•		•		
27.	Parking Brake Handle Shaft and Pivot Points - Service.				Every 600	

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
28.	Nose Landing Gear Drag Brace Inspection - For drag braces that have been in service for a total of 4,000 hours. Refer to Expanded Inspection for procedure.				Every 400	
29.	Nose Landing Gear Drag Brace Inspection - For drag braces that have been in service for a total of 4,000 hours and have required crack removal. Refer to Expanded Inspection for procedure.				Every 200	
	Hydraulic Landing Gear.					
1.	Nose Gear Actuator Piston Rod End - Inspect for condition and security.		•			
2.	Main Gear Actuator Piston Rod End - Inspect for condition and security.		•			
3.	Emergency Blowdown System - Perform blowdown test.					Every 1
4.	Emergency Gear Blowdown Bottle - Check pressure and hydrostatic test date.					Every 1
5.	Emergency Gear Blowdown Bottle - Perform hydrostatic test.					Every 5
6.	Emergency Gear Blowdown Control Cable - Inspect for condition, security and proper rigging.	•		•		
7.	Landing Gear Actuator and Control/Indicating System Functional Test - Perform test every one year or anytime the landing gear emergency blowdown bottle has been discharged or a landing gear actuator is replaced. (Refer to Expanded Inspection).					Every 1
M.	**Lights (Section 13)**					
	1. Flight Compartment Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			•		
2.	Passenger Compartment Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			•		
3.	Nose Baggage Light - Perform operational check and inspect electrical components in accordance with electrical power inspection.			•		
4.	Wing Locker Baggage Light - Perform operational check and inspect electrical components in accordance with electrical power inspection.			•		
5.	Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.		•			
6.	Landing Light Hinge Point and Gears - Service.	•		•	Every 800	
N.	**Navigation (Section 14).**					
1.	Navigation Indicators, Controls and Components - Inspect for condition and security.			•		
2.	Magnetic Compass - Check if within 10 degrees of compass rose heading.					Every 2

INSPECTION TIME LIMITS

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS	
					HOURS	YEARS
3.	Altimeter and Static System - Inspect in accordance with 14 CFR 91.411.					Every 2
4.	Static System - Inspect for security of installation, cleanliness and evidence of damage.	•		•		
5.	Static System Sumps - Inspect for cracks, leaks and presence of water and drain sumps.	•		•		
6.	Emergency Locator System - Inspect for security of installation, position of function switch and condition of electrical components. Inspect structure for corrosion.		•			
7.	Emergency Locator System - Perform operational test. Check cumulative time and useful life of battery in accordance with 14 CFR 91.207.		•			
8.	Transponder System - Inspect for security of installation, evidence of damage and damaged electrical components.			•		
9.	Transponder Control - Operate individual controls and perform operational test transponder in accordance with 14 CFR 91.413.					Every 2
O.	**Oxygen (Section 6).**					
1.	Oxygen System - Inspect installation and component mounting for condition and security.			•		
2.	Oxygen Mask and Hose Assemblies - Inspect for condition and clean. Inspect hose connection for security. Inspect flow control indicator for freedom of movement.			•		
3.	Oxygen Cylinder - ICC-3HT/DOT-3HT (Light-weight) - Inspect for condition, check hydrostatic test date and perform hydrostatic test if due.					Every 3
4.	Oxygen Cylinder - ICC-3AA/DOT-3AA (Standard Weight) - Inspect for condition, check hydrostatic test date and perform hydrostatic test if due.					Every 5
P.	**Vacuum System (Section 10).**					
1.	Vacuum Pump and System (Wet) - Inspect for leaks, condition and security.		•			
2.	Vacuum Dry Air Pump and System - Inspect for condition and security.		•			
3.	Vacuum Pump Pad Seal - Inspect for oil leaks. Replace seal if there is evidence of any leakage.		•			
4.	Vacuum Dry Air Pump - Inspect coupling and fittings for condition and security. If loose, tighten.		•			
5.	Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.		•			
6.	Vacuum System Air Filter - Inspect for deterioration and contamination. Clean or replace.		•			
7.	Vacuum System Relief Valve - Inspect for condition and security. Clean or replace filter.		•			

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
Q.	**Water and Waste (Section 12).**					
1.	Waste Container, Pump, Bowl Assembly, Seat, Relief Tube and Stowage Drawer - Inspect for condition, security and operation.			•		
R.	**Door (Section 3).**					
1.	Cabin Door - Inspect for condition, security and operation; and inspect door cables for proper rigging.			•		
2.	Cabin Door Seal - Inspect for proper installation, cuts, abrasions and excessive wear. Clean.			•		
3.	Cabin Door Latch Pins (Upper and Lower) - Inspect for damage, cracks, wear and rigging.			•		
4.	Cabin Door Latch Pin Guides - Inspect for damage, cracks and wear.			•		
5.	Cabin Door Latch Pin Receptacles - Inspect for damage, cracks and wear.			•		
6.	Cabin Door Hinges, Latch Pins, Step Hinges and Stop Assembly - Service.	•			Every 400	
7.	Cabin Door Hinges - Perform a surface eddy current inspection of the hinges after hinge replacement.				After 6000 Every 3600 there-after	
8.	Nose Baggage and Avionics Door Seals - Inspect for proper installation, cuts, abrasions and excessive wear. Clean and service.			•		
9.	Nose Baggage and Avionics Door - Inspect for condition, security and operation. Inspect Hinges, Latches, Latch Pins and Stops for damage, cracks, wear, alignment and adjustment.			•		
10.	Wing Locker Door Seals - Inspect for proper installation, cuts, abrasions and excessive wear. Clean and service.			•		
11.	Wing Locker Door - Inspect for condition, security and operation. Inspect Hinges, Latches, Latch Pins and Stops for damage, cracks, wear, alignment and adjustment.			•		
12.	Nose Baggage Door and Wing Locker Door Hinges and Latch Pins and Stops - Service.	•			Every 400	
13.	Emergency Exit Door and Handle - Inspect for condition and security.			•		
13.	Emergency Exit Door Seal - Inspect for proper installation, cuts, abrasions and excessive wear. Clean and service. Perform operation check.					Every 1
S.	**Fuselage (Section 3).**					
1.	Nose Structure - Inspect structure and fasteners for condition and. security.			•		
2.	Fuselage Structure - Inspect structure and fasteners for condition and security.			•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
3.	Tail Structure - Inspect structure and fasteners for condition and security.			•		
4.	Control Pedestal - Inspect for condition and security.			•		
5.	Control Quadrant - Inspect for condition and security.			•		
6.	Pressure Cabin (Type A Inspection).				Every 1200	
7.	Pressure Cabin (Type B Inspection).				6000 and Every 3600 There-after	
8.	Pressure Cabin (Type C Inspection).				13,200 and Every 3600 There-after	
9.	Tailcone Drain Tubes - Inspect for obstruction and remove any foreign material from tailcone to prevent blockage.			•		
10.	Tailcone Wire Bundles - Inspect for proper position of drip loop to prevent moisture from entering connector.			•		
T.	**Nacelles (Section 3).**					
1.	Nacelle Firewall Structure - Inspect for condition and security.			•		
2.	Nacelle Structure and Cowling - Inspect structure and fasteners for condition and security.			•		
3.	Engine Beam and Nacelle Structure - Inspect for condition and security.	•		•		
4.	Engine Shock Mounts and Ground Straps - Inspect for condition and security.	•		•		
5.	Wing Locker Baggage Compartment (If Applicable) - Inspect for condition and open latch drain.			•		
6	Oil Filler Door and Access Panels - Inspect for condition and security.			•		
U.	**Stabilizers (Section 3).**					
1.	Vertical and Horizontal Stabilizers - Inspect structure and attach points for condition and security.			•		
V.	**Windows (Section 3)**					
1.	Flight Compartment Windows and Non-Heated Windshield - Inspect for scratches, cracks, discoloration, deformities and security. Check (If applicable) latches, hinges, and seals for condition and operation. Inspect for cracks propagating between fasteners using the optical prism inspection.			•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
2.	Electrically Heated Windshields - Inspect for scratches, cracks, discoloration, deformities and security. For Acrylic windshields, inspect for cracks propagating between fasteners using the optical prism inspection.			•		
3.	Cabin Side Windows - Inspect for scratches, cracks, discoloration, deformities and security. Inspect for cracks propagating between fasteners using the optical prism inspection.			•		
W.	**Wings (Section 3).**					
1.	Wings - Inspect structure and attach points for condition and security.			•		
2.	Wing and Stub Wing Structure - (Type A Inspection).			•		
3.	Wing and Stub Wing Structure - (Type B Inspection).				Every 1200	
4.	Forward Wing Spar Web - Inspect area above upper spar cap immediately outboard of fuselage for cracks (unless web has been modified to remove area). Airplanes C0001 Thru C1413 only.				Every 1000	
5.	Wing Spar Fittings - Inspect bolts for condition and security. (Check torque first 100 hours, do not retorque thereafter).	•		•		
6.	Drain Openings and Vent Holes in Bottom of Engine Nacelle - Inspect for obstructions.			•		
7.	Drain Openings and Vent Holes in Bottom of Wing - Inspect for obstructions.			•		
8.	Outboard Leading Edge Drain Tube Located in bottom of Nacelle - Inspect for obstructions.			•		
9.	Skin Assembly Corrosion Inspection. Refer to expanded inspection 23.c. and MEB95-11 Revision1 (or latest revision).				•	•
X.	**Propeller (Section 8).**					
1.	Propeller Spinners - Inspect for condition and security.	•		•		
2.	Propeller Blades - Inspect for nicks, cracks and scratches.		•			
3.	Propeller Blades - Check track	•			Every 800	
4.	Propeller Hub - Inspect for condition and security.	•		•		
5.	Spinner Bulkhead - Inspect for condition and security.	•		•		
6.	Propeller - Inspect for oil leaks.	•		•		
7.	Propeller Mounting - Inspect nuts for condition and retorque.	•		•		
8.	Propeller Cylinder - Inspect for leaks and bolt security.	•		•		
9.	Propeller Governor - Inspect for oil leaks condition and security.	•		•		

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
10.	Propeller Unfeathering Accumulator - Inspect for leaks, condition, security and proper charge.	•		•		
11.	Propeller Synchrophaser or Synchronizer Components - Inspect for condition and security.			•		
12.	Propeller Electrical Harness - Inspect for condition and security.	•		•		
Y.	**Power Plant (Section 7).**					
	WARNING: Ground magneto primary circuit before working on the engine.					
	NOTE Wash Engine before Inspecting.					
1.	Electrical Harness - Inspect connector, terminals and wire for condition and security.	•		•		
2.	Engine Drains - Inspect for security of installation, line routing, deterioration of hoses and evidence of damage.	•		•		
3.	Cylinder - Perform compression check.			•		
4.	Engine Cylinder, Rocker Box Covers and Push Rod Housings - Inspect for fin damage, cracks, oil leakage, security of attachment and general condition.		•			
5.	Crankcase, Oil Sump and Accessory Section - Inspect for cracks and evidence of oil leakage. Inspect bolts and nuts for looseness and retorque as necessary.		•			
6.	Engine Baffles and Seals - Inspect for condition and security.		•			
7.	Engine Compartment Hoses - Inspect for condition; inspect fuel (Inspect Fuel Lines Under Pressure), Oil, Vacuum and Hydraulic for leaks, chafing, deterioration, discoloration, bleaching and rubber hoses for stiffness.		•			
8.	Engine Compartment and Lower Wing Surface - Inspect for condition.					Every 1
Z.	**Engine Fuel And Control (Section 7).**					
1.	Engine Fuel Pumps - Inspect for leaks, condition and security.		•			
2.	Fuel Flow Indicator System - Inspect for condition and security.		•			
3.	Fuel Metering Unit Filter - Clean.		•			
4.	Fuel Injection System, Fuel Air Control Unit, Drain Valves and Manifold - Inspect for condition and for proper operation.		•			
5.	Fuel Injection Nozzles - Inspect orifices and clean. At the first 100-hour inspection on new, rebuilt or overhauled engines, remove and clean the fuel injection nozzles. Thereafter, the fuel injection nozzles must be cleaned at 300-hour intervals or more frequently if fuel stains are found.	•			300	
6.	Fuel Pressure Switch - Inspect (Refer to MEB88-3).		•			

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
7.	Fuel Primer Start Nozzle - Inspect orifices for condition and clean.	•		•		
AA.	**Ignition (Section 7).**					
1.	Engine Spark Plugs - Clean and rotate (top right to bottom left, top left to bottom right.		•			
2.	Engine Ignition Cables - Inspect for condition and security.		•			
3.	Magnetos - Check Timing, breaker gap and security.			•		
AB.	**Engine Controls (Section 7).**					
1.	Engine Controls - Check controls for freedom of operation. Inspect for security of installation, routing and evidence of damage. Inspect for deterioration of rubber seals on ends of control cables.			•		
AC.	**Engine Indicating (Section 7).**					
1.	Manifold Pressure Gages, Tachometers, Economy Mixture Indicator and Cylinder Head Temperature Gages - Inspect for condition and security.			•		
AD.	**Exhaust (Section 7).**					
1.	Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) Prior to 500 Hour Complete Disassembly Inspection - Perform a visual inspection. Refer to Expanded Inspection (2-50), Exhaust.				Every 50	
2.	Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) after Complete 500 Hour Disassembly Inspection - Perform a visual inspection. Refer to Expanded Inspection (2-50), Exhaust.				Every 100	
3.	Engine Exhaust System (Inconel Only) - Perform a visual inspection. Refer to Expanded Inspection (2-50), Exhaust.					
4.	Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired). Perform disassembly inspection of the exhaust slip joints and turbocharger tailpipe. Refer to Expanded Inspection (2-50), Exhaust.					
5.	Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) - Perform a complete disassembly inspection. Refer to Expanded Inspection (2-50), Exhaust.					
6.	Engine Exhaust System (Inconel Only) - Perform a complete disassembly inspection. Refer to Expanded Inspection (2-50), Exhaust.					
7.	Engine Exhaust System (Inconel Systems only, Slip Joints and Aft) - Perform a disassembly inspection of the exhaust slip joints and the turbocharger tailpipe. Refer to Expanded Inspection (2-50), Exhaust.					
AE.	**Oil (Section 7)**					

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	SPECIAL INSTRUCTIONS YEARS
2.	Engine Oil Temperatures and Pressure Indicators - Inspect for condition and security.			•		
2.	Engine Oil Pressure system - Inspect components for condition and security.		•			
3.	Engine Oil and Short Oil Filter (Approximately 4.8 inches) - Replace oil and filter element; inspect adapters for condition and security.				Every 50	
4.	Engine Oil and Long Oil Filter (Approximately 5.8 inches) - Replace oil and filter elements; inspect adapters for condition and security		•			
5.	Engine Oil Breather Separator - Inspect, clean or replace.		•			
AF.	**Starting (Section 7)**					
1.	Engine Starter - Inspect for condition and security.		•			
2.	Engine Starter Brushes, Commutator and Electrical Connections - Inspect for cleanliness, evidence of heat or arcing and condition.				Every 400	
3.	Starter Switch and Electrical Connections - Inspect for condition and security.	•		•		
AG.	**Turbines (Section 7)**					
1.	Turbocharger - Inspect housing for condition and security. Inspect oil lines, fittings and inside turbocharger air inlet for oil leaks, Inspect impellers for coking, cracks, nicks or obstructions. Remove the clamp attaching the exhaust stack and inspect for cracks. Inspect the turbine housing for coking nicks or obstructions.		•			
2.	Wastegate and Wastegate Actuator, Variable Absolute Pressure Controller - Inspect for condition and security. Inspect springs and linkage for condition and security.		•			
3.	Turbocharger Alternate Air Inlet Door - Inspect for condition, security and proper operation.		•			
4.	Induction Air Filter - Clean and inspect for deterioration and security (more frequently when local dust conditions exist).		•			
5.	Induction Air Filter - Replace				Every 400	
6.	Manifold Pressure Relief Valve - Inspect for obstructions, condition and security.		•			
7.	Induction System, Manifold and Induction Elbow Clamp - Inspect connections, flexible elbow and drain valve for condition and security. Check drain valve for proper operation.		•			

		FIRST 100 HOURS	EACH 100 HOURS OR EVERY YEAR	EACH 200 HOURS OR EVERY YEAR	SPECIAL INSTRUCTIONS HOURS	YEARS
8.	Replace all fairings, doors and access hole covers. Ground check engine, check ignition drop, alternator charging rate, oil pressure, manifold pressure gages, tachometers, economy mixture indicator, cylinder head temperature gages, oil temperature and pressure gages and general operation of components.					
AI.	**Perform the Following Operational Checks:**					
1.	Heater System - Proper operation.					
2.	Air Conditioning System - Proper Operation. Check proper charge in freon sight glass with engines operating and air conditioner on. Check condenser inlet air door operation (hydraulic driven systems).		•			
3.	Main and Parking Brake - Proper Operation		•			
4.	Cabin Pressurization System - Proper Operation		•			
5.	Surface Deice System (Pneumatic) - Proper Operation		•			
AJ.	**Service Letters/Service Bulletins/Airworthiness Directives/SID**		•			
1.	Check that all applicable Cessna Service Information Letters, Cessna Service Bulletins and Supplier Service Bulletins are complied with.		•			
2.	Check that all applicable Airworthiness Directives and Federal Aviation Regulations are complied with.		•			
3.	Make sure all Logbook Entries required by Federal Aviation Regulations are completed before returning the airplane to service.		•			
4.	Check that all SID inspections have been complied with.		•			

COMPONENT TIME LIMITS

1. Component Time Limits

A. Do an inspection for all components not listed, as detailed elsewhere in this Chapter. Repair, overhaul, or replace the components, as necessary. Items shown here must be overhauled or replaced during the regular maintenance periods that are nearest to the specified limit.

2. Schedule

Item	Replace	Overhaul
a. AIR CONDITIONING (Section 6)		
1) Heater - Stewart Warner		Refer to the latest issue of the manufacturer's manual (NOTE 1)
2) Heater - Janitrol		Refer to the latest issue of the manufacturer's manual (NOTE 1)
b. FIRE PROTECTION (Section 12)		
1) Engine Fire Extinguisher Cartridge	3 Years (NOTE 2)	
c. FLIGHT CONTROLS (Section 5)		
1) Trim Tab Actuators		Every 1000 hours or 3 years, whichever occurs first.
2) Flap Actuator Gearbox		Every 2000 hours or 4000 landings, whichever occurs first. (NOTE 11)
d. NAVIGATION (Section 14)		
1) Locator Beacon Battery Pack	(NOTE 3)	
e. OXYGEN (Section 6)		
1) Oxygen Bottle (ICC-3HT, DOT-3HT)	Every 24 years or 4380 cycles, whichever occurs first.	
f. WINDOWS (Section 3)		
1) Windshield (Acrylic)	Every 13,200 hours.	
g. PROPELLER (Section 10)		
1) Propeller (Refer to McCauley Maintenance and Overhaul Manual)		Refer to the latest issue of the manufacturer's Service Bulletin
2) Accumulator, Unfeathering		Refer to the latest issue of the manufacturer's Service Bulletin

Item	Replace	Overhaul
3) Governor (Refer to Manufacturer's Publications) McCauley		Refer to the latest issue of the manufacturer's Service Bulletin
4) Woodward		Refer to the latest issue of the manufacturer's Service Bulletin
h. POWERPLANT (Section 71)		
1) Engine (See Teledyne Continental Motors Engine Overhaul Manual)		Refer to the latest issue of the manufacturer's Service Bulletin (NOTE 4)
2) Magnetos		Engine overhaul or every four years (NOTE 5)
3) Engine Compartment Flexible Fluid Carrying Rubber Hoses (Cessna-Installed) Except Drain Hoses	(NOTE 6)	
4) Engine Compartment Drain Hoses	On condition	
5) Engine Flexible Hoses (Continental Motors-Installed) (See Continental Engine Maintenance Manual)	(NOTE 7)	
6) Engine Mounts	To coincide with engine TBO	
i. EXHAUST (Section 78)		
1) Engine Exhaust Multi-Segment V-Band	Every 400 hours (NOTE 9)	
j. FUEL (SECTION 9)		
1) Fuel Inlet Float Valve	Refer to MEB-93-10	
k. VACUUM (SECTION 10)		
1) Vacuum System (Parker Hannifin Airborne) Manifold Check Valves	Every 10 years (NOTE 12)	
2) Vacuum Hoses	Every 10 years (NOTE 10)	

NOTE 1: If the heater does not have an hourmeter, use the airplane flight hours divided by 2.

NOTE 2: Cartridge life is a combination of shelf life and service life. Shelf life for a cartridge wrapped very carefully in aluminum foil and kept in a well-sealed container is three years; if the cartridge is stored in a box, the shelf life is two years. The combination of shelf life and service life cannot be more than six years. The maximum service life is four years.

NOTE 3: If the battery has been in use for more than one collective hour and/or at 50% of the useful life of the battery, then the date on the battery shows 50% of the useful life.

NOTE 4: It is recommended the items listed below be inspected at engine overhaul to establish condition for their replacement or overhaul. Although no overhaul or replacement interval has been established for these items, the inspection of these items at engine overhaul could eliminate overhaul or replacement of the items at a later time.

a. Engine components, such as turbocharger, controller, manifold pressure relief valve and wastegate, magneto, vacuum pump, etc., should be inspected for condition, at the time of engine overhaul, as it may be cost effective to overhaul or replace marginal components at that time. A determination is to be made during engine overhaul such that if the components have less hours in service than the engine, or have not accumulated hours sufficiently close to the engine overhaul time to warrant overhaul judged by inspection or the economic aspect, the components may not require overhaul or replacement concurrent with engine overhaul. It is recommended that the overhaul or replacement interval for these components not exceed the engine overhaul interval.
b. Inspect the engine nacelle compartment for structural damage when engine is removed for overhaul, and make the necessary repairs.
c. Inspect the engine exhaust as it may be cost effective to replace components at engine overhaul.
d Inspect electrical harnesses for damage which would be cost effective to replace at engine overhaul.

NOTE 5: Overhaul Magneto(s) at engine overhaul or when engine is partially overhauled for severe environmental affects, engine overspeed, engine sudden stoppage or other unusual circumstances.

NOTE 6: Replace engine compartment flexible fluid carrying hoses (Cessna installed only) manufactured of rubber material every five years or at engine overhaul whichever occurs first. This does not include drain hoses. Hoses which are beyond these limits and are in a serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving the new hose from Cessna.

NOTE 7: Refer to latest Continental Motors Engine Service Bulletin.

NOTE 8: The terms overhaul and replacement as used within this section dictate action as defined below:

a. Overhaul - Item may be overhauled as defined in Federal Aviation Regulation 43.2 or can be replaced as defined below:
b. Replacement - Item must be replaced with a new item or one that has been rebuilt as defined in Federal Aviation Regulation 43.2.

NOTE 9: Multi-segmented V-band clamps shall be replaced every 400 hours total time in service (TTIS) until the Initial 500 Hour Complete Disassembly Inspection or 500 Hour Partial Disassembly Inspection is accomplished. After completing the Disassembly Inspection and Installation of new clamps, the clamps shall be replaced every 500 hours of operation.

NOTE 10: Vacuum hoses which are beyond these limits and in serviceable condition, must be placed on order immediately and then be replaced within 120 days after receiving new hose(s) from Cessna.

NOTE 11: For gearboxes on which the overhaul limits have been exceeded, accomplish the overhaul by no later than the next 300 hours, 400 landings, or May 30, 2006, whichever occurs first.

NOTE 12: Refer to Airborne Air and Fuel Products Service Letter 39A, or latest revision, for replacement time limits.

PROGRESSIVE CARE PROGRAM

1. **Inspection Requirements**
   a. Purpose and Use.
      (1) As required in Federal Aviation Regulation Part 91.409, paragraph (d), airplane that desire to use a Progressive Inspection Program must be inspected in accordance with an authorized progressive inspection program. This chapter presents the current progressive inspection program for the Cessna Model 421C, recommended by the Cessna Aircraft Company

2. **Introduction**

   a. Following is the recommended Progressive Care Program for Model 421C airplane.

   b. This program is divided into four separate operations which are to be accomplished initially after 100 hours of operation and each 200 hours of operation thereafter. Items which require more frequent inspections are duplicated on applicable operations. Additional special inspection requirements indicated as Special Inspection, which are required at other intervals are specified separately.

   c. Recommended continuous airworthiness inspection may be accomplished by one of the following methods after the 100-hour inspection point.
      (1) Operations 1 through 4 are based on 200-hour cycles with an operation being performed every 50 hours.
         (a) When performing each operation, refer to special inspections which may be required.
      (2) Operations 1 through 2 can be combined and performed simultaneously at 100-hour points with Operations 3 and 4 being performed at alternate 100-hour points.
         (a) When combining operations, the 50-hour requirement for changing engine oil and replacement of the short oil filter (approximately 4.8 inches long) must continue to be performed at a 50-hour interval.
         (b) When performing these operations, refer to special inspections which may be required.

   d. Performance of the inspections as listed herein at the specified points will assure compliance with the Inspection Time Limits detailed in Section 2. Expanded Inspection Section 2 may be utilized as detailed information for Section 2. Special inspections shall be complied with at prescribed intervals and/or intervals coinciding with operations 1 through 4 as outlined in Section 2.

   e. An operator may elect to perform the recommended inspections on a schedule other than that specified. any inspection schedule requiring the various inspection items detailed in this section to be performed at a frequency equal to that specified herein or more frequently is acceptable. Any inspection item performed at a time period in excess of that specified herein must be approved at the appropriate regulating agency.

   f. As defined in Federal Aviation Regulations Part 91.409(d), (4), the frequency and detail of the Progressive Inspection Program shall provide for the complete inspection of the airplane within each 12-calendar months. If the airplane is approaching the end of a 12-calendar month period, but the complete cycle of 4 operations has not been accomplished, it will be necessary to complete the remaining operations, regardless of airplane hours, before the end of the 12-calendar month period. If the Progressive Inspection Program is to be discontinued, an annual inspection becomes due at the time when any item reaches a maximum of 12 calendar months from the last time it was inspected under the Progressive Inspection Program. Refer to Federal Aviation Regulation Part 91.409 (d), (4) for detailed information.

3. **Inspection Time Limitations**

   a. Each inspection intervals can be exceeded by a maximum of 10 hours but the next interval due point must retain the original due point. Inspections can be accomplished early as provided below:
      (1) In the event of early accomplishment of an inspection interval, that occurs 10 hours or less earlier than due, the next inspection interval due point can remain where originally set.
      (2) In the event of early accomplishment of an inspection interval, that is more than 10 hours early, the next inspection interval due point must be moved up to establish a new due point from the time of early accomplishment.

PROGRESSIVE CARE PROGRAM

4. **Procedures**

a. The following instructions are provided to air in implementation of the Model 421C Progressive Care Program Schedule.

(1) Use the Progressive Care Program Inspection Chart, provided herein, for each airplane. The chart is to be placed in the airplane flight log book for use as a quick reference for pilots and maintenance personnel in determining when inspections are due and that they are performed within prescribed flight time intervals.

(2) Use the Progressive Care Program Component Overhaul and replacement log, provided herein, for each airplane. This log is to be kept with the airplane maintenance records and serves as a periodic reminder to maintenance personnel when various components are due for overhaul or replacement.

(3) To start the Progressive Care Program, begin conducting the inspections defined herein and refer to Federal Aviation Regulations Part 91.409 (d) for procedures to notify the Federal Aviation Administration of the intent to begin a progressive inspection program.

(4) Accomplish each inspection and maintenance item per the checklists on the operation sheets of the Progressive Care and Maintenance Schedule. Spaces have been provided for the mechanics and inspectors signatures as required, as well as any remarks. These are to become part of the maintenance records for each airplane. Each inspection is to be logged in the airplane and/or engine log books. Refer to Federal Aviation Regulations Part 43.9 (a) for the recommended entry statement.

PROGRESSIVE CARE PROGRAM

COMPONENT OVERHAUL AND REPLACEMENT LOG

COMPONENT	DATE	REASON FOR REPLACEMENT	REPLACEMENT PART NUMBER SERIAL NUMBER	NEXT OVERHAUL AIRPLANE HOURS DATE
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			
	X			

PROGRESSIVE CARE PROGRAM
INSPECTION CHART

AIRPLANE MODEL: REGISTRATION NUMBER:

INSPECTION POINTS	TIME INSPECTION DUE	 INSPECTION ACCOMPLISHED	TIME INSPECTION DUE	 INSPECTION ACCOMPLISHED
OPERATION 1				
OPERATION 2				
OPERATION 3				
OPERATION 4				

EXAMPLE:

The airplane in this example was placed on the Progressive Care Program after flying a total of 110 hours. At that point, a complete initial inspection of the airplane was performed. The following steps indicate what will have taken place up through an hourmeter reading of 261 hours.

1. After the initial inspection at 110 hours, the first "Inspection Due" column was filled out to show the total flying time at which each of the four (4) operation inspections would be due.
2. As each inspection was performed, the total flying time was recorded in the "Inspection Accomplished" column. The next "Inspection Due" space for that particular operation is also filled in at this time. These times will always be 200 hours from the last due point providing the operation was actually accomplished within the ten (10) hours limit.
3. The sample airplane now as a total flying time of 261 hours and the inspection chart shows that a Phase 4 will be due at 310 hours.

INSPECTION POINTS	TIME INSPECTION DUE	 INSPECTION ACCOMPLISHED	TIME INSPECTION DUE	 INSPECTION ACCOMPLISHED
OPERATION 1	160	162	360	
OPERATION 2	210	209	409	
OPERATION 3	260	261	460	
OPERATION 4	310			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

DEALER INFORMATION		CUSTOMER AND AIRPLANE INFORMATION	
ZONE ______	NAME ______		
SERVICING DEALER NAME ______	ADDRESS ______		
SERVICING DEALER CODE ______	CITY AND STATE ______		
	AIRPLANE MODEL AND SERIAL NUMBER ______	REGISTRATION NUMBER ______	
DATE ______	LEFT HAND ENGINE SERIAL NUMBER ______	RIGHT HAND ENGINE SERIAL NUMBER ______	
	ZONE CODE ______		
	SELLING DEALER CODE ______	WARRANTY START DATE ______	

	MECHANIC	INSPECTOR	REMARKS

NOSE

1. Heater Components and Heater Fuel Lines - Inspect all components for condition and security. Inspect for leaks. Inspect drain lines for proper slope and obstructions.
2. Hydraulic Hoses - Inspect for hardness, deterioration, looseness and bulging.
3. Hydraulic System - Inspect plumbing and components for leaks, condition and security.
4. Hydraulic System Pressure Switch - Check for leaks.
5. Nose Gear Actuator Piston Rod End - Inspect for condition and security.
6. (421C0001 Thru 421C0473) Not Modified by SK421-83 Nose Gear Actuator Anchor Lugs - Inspect for cracks and hole elongation.
7. Vacuum System Air Filter - Inspect for deterioration and contamination. Clean or replace.

TAIL

1. Placards and Decals - Inspect presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for required placards.

CESSNA PROGRESSIVE CARE MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
2. Autopilot Actuators - Inspect for condition, security and evidence of overheating. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points and chains for proper alignment with actuator sprockets. Inspect pulleys drive sprocket, drive chain and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.			
3. Autopilot Computer Amplifier, Mount, Mounting Knob and Electrical Components - Inspect for condition and security.			
4. Static Wicks - Inspect for condition and security.			
5. Static Wick - Check resistance.			
6. General Airplane and System Wiring - Inspect for chafing, broken or loose terminals, general condition, broken or inadequate clamps and sharp bends in wiring.			
7. Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumper for evidence of damage or wear, failed fasteners and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.			
8. Rudder Bellcrank - Inspect bellcrank stop bolts for corrosion, evidence of damage and security. Inspect cables attached to bellcrank for proper cotter pin safetying.			
9. Rudder Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
10. Rudder Trim Tab - Inspect trim tab skins for cracks, loose rivets and security; trim tab hinge for security, cracks, evidence of damage. Inspect hinge pin for proper installation and proper cotter pin safetying at both ends. Inspect horn and push rod for evidence of damage and security. Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
11. Rudder Trim Tab Actuator - Inspect actuator for security and evidence of damage. Inspect guide block and clamp for evidence of damage and security. Inspect actuator mounting bolts for security. If torque putty is broken, retorque mounting bolts. Inspect actuator rod for evidence of bending. Inspect push rod bolts for proper safetying of nuts with cotter pins. Inspect push rod ends for bearing looseness and excessive wear.			
12. Rudder Trim Tab Actuator Push Rod - Inspect for free play in actuator.			
13. Rudder Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect travel stop blocks for security. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
14. Rudder Gust Lock - Inspect for condition and security.			
15. Yaw Damper Actuator and Cables - Inspect actuators for condition, security and evidence of overheating. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points and chains for proper alignment on actuator sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.			
16. Elevator - Inspect the elevator skins for cracks and loose rivets; elevator hinges for condition, cracks and security; hinge bolts, hinge bearings, torque tube, horn, attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security. Inspect the elevator hinge bolts for proper safetying of nuts with cotter pins. Inspect elevator torque tube end assembly for looseness. Inspect balance weights for looseness and supporting structure for damage. Inspect outboard tips for cracks in rib flange and web. Inspect taper pins for looseness (if applicable).			
17. Elevator Bellcrank - Inspect bellcrank, bearings, push rods, stop bolts and brackets for corrosion, evidence of damage, failed fasteners and security, proper safetying of bellcrank and push rod bolts for proper safety of nuts with cotter pins.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
18. Elevator Cables - Inspect cable seals for deterioration. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
19. Elevator Cable Guard - Inspect for condition and security of spacers at elevator bellcrank in quadrant.			
20. Elevator Trim Tab - Inspect the trim tab skins for cracks, loose rivets and security; trim tab hinge for security, cracks and evidence of damage. Inspect hinge pin for proper installation at hinge pin retainer. Inspect horn(s) and push rod(s) for evidence of damage and security. Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.			
21. Elevator Trim Tab Actuator - Inspect actuator for security and evidence of damage; mounting clamp(s) (if applicable) and mounting structure for evidence of damage, cracks and security at the rear spar of the horizontal stabilizer. Check that the bolts are secure (torque putty not broken). Looking through the actuator access holes in the horizontal stabilizer, inspect the chain guard for security. Check that the guard attach screws are secure. Inspect snap rings (if applicable) for complete and proper engagement in snap ring groove of actuator. Check that snap ring is properly seated in positioning slot on mounting bracket. Inspect the actuator rod and bearing for condition and security. Inspect push rod bolt for proper safetying of nuts and cotter pin installed for security. Inspect the actuator chain for condition. Inspect chain to cable attach link for security.			
22. Elevator Trim Tab Actuators Push Rod - Inspect for free play in actuator.			
23. Elevator Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
24. Elevator Trim Tab Cable Stop Blocks - Inspect for condition and security.			

CESSNA PROGRESSIVE CARE MODEL 421C

OPREATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
25. Electric Elevator Trim Actuator - Inspect actuator for condition, security and evidence of overheating. Inspect cables for fraying chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points and chains for proper alignment of actuator sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.			
26. Surface Deice System (Pneumatic) - Inspect for condition and leaks. Inspect lines and clamps for security. Perform operational check.			
27. Surface Deice Regulator, Pressure Control Valve and Deice Control Valves - Inspect for condition and security.			
28. Surface Deice System - Inspect electrical components in accordance with electrical power inspection.			
29. Deice Boots - Inspect for abrasions, cuts, nicks and security of mounting and clearance.			
30. Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
31. Static System - Inspect for security of installation, cleanliness and evidence of damage.			
32. Static System Sumps - Inspect for cracks, leaks and presence of water and drain sumps.			
33. Emergency Locator System - Inspect for security of installation, position of function switch and condition of electrical components. Inspect structure for corrosion.			
34. Emergency Locator System - Perform operational test. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207.			
35. Vacuum System Hose - Inspect for hardness, deterioration, looseness or collapsed hoses.			
36. Tail Structure - Inspect structure and fasteners for condition and security.			
37. Tailcone Drain Tubes - Inspect for obstruction and remove any foreign material from tailcone to prevent blockage			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPREATION NO. 1

MECHANIC INSPECTOR REMARKS

38. Tailcone Wire Bundles - Inspect for proper position of drip loop to prevent moisture from entering connector.

39. Vertical and Horizontal Stabilizers - Inspect structure and attach points for condition and security.

ENGINE

1. Placards and Decals - Inspect presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Flight Manual for required placard.

2. Air Conditioner Hydraulic Lines, Pumps and Components (Hydraulic Driven Systems) - Inspect for leaks, condition and security.

3. General Airplane and System Wiring - Inspect for chafing, broken or loose terminals, general condition, broken inadequate clamps and sharp bends in wiring.

4. Alternators-Inspect for condition and security. 100-amp Prestolite Alternator - Check water shield if installed.

5. Detection Sensor - Inspect for security, cleanliness, nicks and abrasions.

6. Engine Compartment Fire Extinguisher - Inspect for proper operating pressure, condition, security of electrical connections, dents and scratches on container.

7. Discharge Tubes for Fire Extinguisher - inspect for condition, security and obstruction.

8. Fuel Electrical Components - Inspect in accordance with electrical power inspection.

9. Hydraulic Pump - Inspect for leaks, condition and security.

10. Hydraulic Hoses - Inspect for hardness, deterioration, looseness and bulging.

11. Hydraulic System - Inspect plumbing and components for leaks, condition and security.

12. Hydraulic System Flow Switches - Check for leaks.

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
13. (421C0001 Thru 421C0115) Deice Filter - Clean or replace.			
14. Propeller Deice Slip Rings, Brushes and Boots - Inspect for condition, and security. Perform operational check.			
15. Propeller Deice Electrical Leads - Inspect for condition and security.			
16. Heated Nacelle Drain Tube - Perform operational check of heating element.			
17. Vacuum Pump and System (Wet) - Inspect for leaks, condition and security.			
18. Vacuum Dry Air Pump and System - Inspect for condition and security.			
19. Vaccum Pump Pad Seal - Inspect for oil leaks. Replace seal if there is evidence of any leakage.			
20. Vacuum Dry Air Pump - Inspect coupling and fittings for condition and security. If loose, tighten.			
21. Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.			
22. Nacelle Firewall Structure - Inspect for condition and security.			
23. Nacelle Structure and Cowling - Inspect structure and fasteners for condition and security.			
24. Engine Beam and Nacelle Structure - Inspect for condition and security.			
25. Engine Shock Mounts and Ground Straps - Inspect for condition and security.			
26. Wing Lockers Baggage Compartment (If Applicable) - Inspect for condition and open latch drain.			
27. Oil Filler Door and Access Panels - Inspect for condition and security.			
28. Drain Openings and Vent Holes in Bottom of Engine Nacelle - Inspect for obstructions.			
29. Outboard Leading Edge Drain Tube Located in Bottom of Nacelle - Inspect for obstructions.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
30. Propeller Spinners - Inspect for condition and security.			
31. Propeller Blades - Inspect for nicks, cracks and scratches.			
32. Propeller Hub - Inspect for condition and security.			
33. Spinner Bulkhead - Inspect for condition and security.			
34. Propeller - Inspect for oil leaks.			
35. Propeller Mounting - Inspect nuts for condition and retorque.			
36. Propeller Cylinder - Inspect for leaks and bolt for security.			
37. Propeller Governor - Inspect for oil leaks, condition and security.			
38. Propeller Unfeathering Accumulator - Inspect for leaks, condition, security and proper charge.			
39. Propeller Synchrophaser or Synchronizer Components - Inspect for condition and security.			
40. Propeller Electrical Harness - Inspect for condition and security.			
41. Electrical Harness - Inspect connector, terminals and wire for condition and security.			
42. Engine Drains - Inspect for security of installation, line routing, deterioration of hoses and evidence of damage.			
43. Cylinder - Perform compression check.			
44. Engine Cylinder, Rocker Box Covers and Push Rod Housings - Inspect for fin damage, cracks, oil leakage, security of attachment and general condition.			
45. Crankcase, Oil Sump and Accessory Section - Inspect for cracks and evidence of oil leakage. Inspect bolts and nuts for looseness and retorque as necessary.			
46. Engine Baffles and Seals - Inspect for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
47. Engine Compartment - Inspect for condition; inspect fuel (Inspect Fuel Lines Under Pressure), Oil, Vacuum and Hydraulic for leaks, chafing, deterioration, discoloration, bleaching and rubber hoses for stiffness.			
48. Engine Compartment and Lower Wing Surface - Inspect for condition.			
49. Engine Fuel Pumps - Inspect for leaks, condition and security.			
50. Fuel Flow Indicator System - Inspect for condition and security.			
51. Fuel Metering Unit Filter - Clean.			
52. Fuel Injection System, Fuel Air Control Unit, Drain Valves and Manifold - Inspect for condition and for proper operation.			
53. Fuel Discharge Nozzle - Inspect orifices and clean.			
54. Fuel Pressure Switch - Inspect (Refer to MEB88-3).			
55. Fuel Primer Start Nozzle - Inspect orifices for condition and clean.			
56. Engine Spark Plugs - Clean and rotate (top right to bottom left, top left to bottom right).			
57. Engine Ignition Cables - Inspect for condition and security.			
58. Magnetos - Check timing, breaker gap and security.			
59. Engine Controls - Check controls for freedom of operation. Inspect for security of installation, routing and evidence of damage. Inspect for deterioration of rubber seals on ends of control cables.			
60. Engine Exhaust System - (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) after complete 500 Hour Disassembly Inspection - Perform a visual inspection. Refer to Expanded Inspection (2-50). Exhaust.			
61. Engine Exhaust System (Inconel Only) - Perform a visual inspection. Refer to Expanded Inspection (2-50) Exhaust.			
62. Engine Oil Pressure System - Inspect components for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 1

	MECHANIC	INSPECTOR	REMARKS
63. Engine Oil and Long Oil Filter (Approximately 5.8 Inches) - Replace oil and filter element. Inspect adapters for condition and security. Refer to Special Inspection in Progressive Care Section for short oil filter (Approximately 4.8 inches).			
64. Engine Oil Breather Separator - Inspect, clean or replace.			
65. Engine Starter - Inspect for condition and security. Inspect terminal block and electrical connections for cleanliness, evidence of heat or arcing.			
66. Turbocharger - Inspect housing for condition and security. Inspect oil lines, fittings and inside turbocharger air inlet for oil leaks. Inspect impellers for coking, cracks, necks or obstructions. Remove the clamp attaching the exhaust stack and inspect for cracks. Inspect the turbine for coking, cracks, nicks or obstructions.			
67. Wastegate and Wastegate Actuator, Variable Absolute Pressure Controller - Inspect for condition and security. Inspect springs and linkage for condition and security.			
68. Turbocharger Alternate Air Inlet Door - Inspect for condition, security and proper operation.			
69. Induction Air Filter - Clean and inspect for deterioration and security (more frequently when local dust conditions exist).			
70. Manifold Pressure Relief Valve - Inspect for obstructions, condition and security.			
71. Induction System, Manifold and Induction Elbow Clamp - Inspect connections, flexible elbow and drain valve for condition and security. Check drain valve for proper operation.			

FUSELAGE

	MECHANIC	INSPECTOR	REMARKS
1. Rudder Gust Lock - Perform operational test of automatic disengagement with side load applied. Check clearance between tailcone skin and rudder skin.			

CESSNA PROGRESSIVE CARE
MODEL 421C

SPECIAL INSPECTION ITEMS

1. Check and accomplish all Special Inspection Items due. ______________________

POST INSPECTION

1. Replace all fairings, doors and access hole covers. Ground check engine, check ignition drop, alternator charging rate, oil pressure, manifold pressure gages, tachometers, economy mixture indicator, cylinder head temperature gages, oil temperature and pressure gages and general operation of components. ______________________

OPERATION NO. 1 COMPLETED

AIRPLANE MODEL/SERIAL ______________ REGISTRATION NO. ______________

AIRPLANE HOURS ______________ DATE ______________

I certify that this operation was performed on the above airplane and that this airplane is approved for return to service.

SUPERVISOR MECHANIC ______________ AIRPLANE INSPECTOR ______________

CERTIFICATE NO. ______________ CERTIFICATE NO. ______________

COMPANY NAME ______________________________

ADDRESS ______________ CITY ______________ STATE ________

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

DEALER INFORMATION	CUSTOMER AND AIRPLANE INFORMATION	
ZONE ______	NAME ______	
SERVICING DEALER NAME ______	ADDRESS ______	
SERVICING DEALER CODE ______	CITY AND STATE ______	
	AIRPLANE MODEL AND SERIAL NUMBER ______	REGISTRATION NUMBER ______
DATE ______	LEFT HAND ENGINE SERIAL NUMBER ______	RIGHT HAND ENGINE SERIAL NUMBER ______
	ZONE CODE ______	
	SELLING DEALER CODE ______	WARRANTY START DATE ______

	MECHANIC	INSPECTOR	REMARKS
WING			
1. Heater Fuel Lines in wing - Inspect for condition and leaks.			
2. Air Conditioner Hydraulic Lines, Pumps and Components (Hydraulic Driven Systems) - Inspect for leaks, condition and security.			
3. Wing Battery - Check electrolyte and general condition and security.			
4. Wing Battery Cables - Inspect for corrosion and security.			
5. Wing Battery Box - Inspect for corrosion, condition and security. Clean vent tube.			
6. Aileron - Inspect the aileron skins for cracks and loose rivets; aileron hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security. Inspect the aileron hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weights for looseness and their supporting structure for damage.			
7. Fuel System Plumbing and All Fuel Components - Inspect for condition, security, fuel leaks and fuel stains.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
8. Fuel Electrical Components - Inspect in accordance with electrical power inspection.			
9. Hydraulic Hoses - Inspect for hardness, deterioration, looseness and bulging.			
10. Hydraulic System - Inspect plumbing and components for leaks, condition and security.			
11. Main Gear Actuator Piston Rod End - Inspect for condition and security.			
12. Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
13. Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.			
14. Vacuum System Relief Valve - Inspect for condition and security. Clean or replace filter.			
15. Engine Oil Pressure System - Inspect components for condition and security.			
FUSELAGE			
1. Placards and Decals - Inspect presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for required placards.			
2. Air Distribution Lines and Ducts - Inspect for condition and security.			
3. Air Conditioning Lines - Inspect air injection and discharge lines for cracks, sharp bends, condition and security.			
4. Air Conditioning Electrical Components - Inspect the electrical components in accordance with electrical power inspection.			
5. Pressurization Outflow Valves, Safety Valves and Filters - Inspect for condition and security. Clean and replace filters, if applicable.			
6. Pressurization Electrical Components - Inspect electrical components in accordance with electrical power inspection.			

CESSNA PROGRESSIVE CARE MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
7. Pressurization Plumbing Components - Inspect plumbing for condition, security and loose connections.			
8. Pressurization Controllers, Filters and Control Units - Inspect for condition and security. Clean or replace filters and clean parts. Inspect controls for smooth rotation.			
9. Autopilot Actuators - Inspect for condition, security and Evidence of overheating. Inspect cables for fraying, chafting, cleanliness, turnbuckle safetying and proper routing. Inspect chain for proper safetying at all points, and chains for proper alignment with actuator sprockets. Inspect pulleys drive sprocket, drive chain and guard pins for condition, wear, corrosion and security. Inspect electrical components in accordance with electrical power inspection.			
10. Autopilot Controller - Inspect for condition and security. Check switches for proper operation.			
11. COM 1, COM 2, HF Transceiver and Audio Control Panels - Inspect for condition, security and proper operation of controls.			
12. COM 1 and COM 2 Receivers/Transmitters, HF Transceiver Receiver/Exciter - Inspect for condition and security. Inspect electrical components in accordance with electrical power inspection.			
13. COM 1, COM 2, HF and Flight Phone Antennas and Couplers - Inspect for condition and security.			
14. Stereo Tape Head and Pinch Roller - Inspect for condition, security. Clean.			
15. Microphone and Headset Jacks - Inspect for cleanliness, security and evidence of damage.			
16. General Airplane and System Wiring - Inspect for chafing, broken or loose terminals, general condition, broken or inadequate clamps and sharp bends in wiring.			
17. Side Consoles, Circuit Breaker Panels, Fuses, Terminal Blocks and Junction Boxes - Inspect wiring and terminals for condition and security.			
18. Switches - Check operation, terminals, wiring and mounting for condition, security and interference.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
19. Voltage Regulators - Inspect wiring, mounting, condition and wire routing.			
20. Flap Switches and Motor - Inspect wiring and terminals for condition and security.			
21. Landing Gear Switches and Safety Switches - Inspect wiring and terminals for condition and security.			
22. Instrument Panel and Control Pedestal - Inspect wiring, mounting and terminals for condition and security. Check resistance between stationary panel and instrument panel for proper ground.			
23. Pilot's and Copilot's Inertia Reels, Seat Belts and Shoulder Harness - Inspect for security of installation, frayed edge and evidence of damage and proper operation.			
24. Pilot's and Copilot's Seats - Inspect seat brackets, guides and stops for condition and security; controls for condition, security and proper operation; seat structure and seat cushions for condition and security.			
25. Scuff Plates - Inspect for condition, security and clean.			
26. Seat Tracks - Inspect seat tracks and stops for condition and security of installation. Inspect seat track stops for proper location and installation.			
27. Passenger Seat Belts - Inspect for security of installation, frayed edge and evidence of damage and proper operation.			
28. Passenger Seats - Inspect seat brackets, guides and stops for condition and security; controls for condition, security and proper operation; seat structure and seat cushions for condition and security. Inspect seats for proper forward and aft installation per seat guides.			
29. Interior Furnishings - Inspect for condition and security. Inspect electrical components in accordance with electrical power inspection.			
30. Fire Detection Control Unit and Warning Indicating Lights - Inspect for condition, security and for proper operation.			
31. Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition and security.			

CESSNA PROGRESSIVE CARE MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
32. Aileron Bellcrank - Inspect bellcrank for security, cleanliness, corrosion, evidence of damage to guard pins, guides and cable attach points.			
33. Fuselage and Control Column Aileron Cables Including the Wing Cables from the Bellcrank to Fuselage Seals - Inspect cables for fraying, chafing, cleanliness, trunbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
34. Control Wheel - Inspect control wheel for condition and security. Operate control wheel and check for freedom of movement.			
35. Aileron Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
36. Aileron Trim Tab Control and - Indicator - Inspect control and indicator for condition and security. Operate trim tab control and check aileron trim tab for freedom of movement. Inspect guide block for condition and security.			
37. Rudder Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
38. Rudder Pedals and Rudder Pedal Linkage - Inspect for condition and security. Operate rudder controls and check for freedom of movement.			
39. Rudder Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect travel stop blocks for security. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
40. Rudder Trim Tab Cable Stop Blocks - Inspect for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
41. Rudder Trim Tab Control and Indicator - Inspect control and indicator for condition and security. Operate trim tab control and check rudder trim tab for freedom of movement.			
42. Elevator Cables - Inspect cable seals for deterioration. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
43. Control Column - Inspect bobweights, control column for evidence of damage, failed fasteners and security. Operate control column and check for freedom of movement.			
44. Elevator Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
45. Elevator Trim Tab Control and Indicator - Inspect control and indicator for condition and security. Operate trim tab control and check for freedom of movement.			
46. Stall Warning System - Inspect for condition and security of installation. Perform operational check.			
47. Flaps - Inspect linkage, bellcranks, torque tube, pulleys and cables for condition and security ;inspect hinges for condition security and cracks.			
48. Flap Motor, Position Indicator and Flap Actuator Assembly - Check for condition and security.			
49. Flap Preselect System - Inspect control and position indicator for security of installation, adequate slack in wiring through full range of travel and evidence of damage. Inspect cable for deterioration and security in installation.			
50. Fuel Selector Gear Box - Perform operational check (feel for detents), inspect linkage, bearings for condition and security. Service.			
51. Fuel System Plumbing and All Fuel Components - Inspect for condition, security, fuel leaks and fuel stains.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
52. Fuel Cross-Over Line Drains - Drain.			
53. Fuel Electrical Components - Inspect in accordance with electrical power inspection.			
54. Hydraulic System - Inspect plumbing and components for leaks, condition and security.			
55. Surface Deice System (Pneumatic) - Inspect for condition and leaks. Inspect lines and clamps for security. Perform operational check.			
56. Surface Deice System - Inspect electrical components in accordance with electrical power inspection.			
57. Alcohol Anti-Ice Nozzles - Inspect for security and obstructions.			
58. Alcohol Anti-Ice System - Inspect for leaks, condition and security.			
59. Alcohol Anti-Ice System - Perform Operational Check.			
60. Windshield Static Discharge Strips (If Installed) - Inspect for deterioration, security, and resistance from ground terminal to primary structure.			
61. Static Ports Heater Elements - Perform operational check.			
62. Landing Gear System - Inspect for condition and security.			
63. Landing Gear Retracting Linkage - Inspect for condition and security.			
64. Landing Gear Shock Strut - Inspect for evidence of leakage and proper extension. Inspect strut barrel for corrosion, pitting and cleanliness.			
65. Emergency Gear Blowdown Control Cable - Inspect for condition, security and proper rigging.			
66. Flight Compartment Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
67. Passenger Compartment Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
68. Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
69. Navigation Indicators, Controls and Components - Inspect for condition and security.			
70. Static System - Inspect for security of installation, cleanliness and evidence of damage.			
71. Transponder System - Inspect for security of installation, evidence of damage and damaged electrical components.			
72. Oxygen System - Inspect installation and component mounting for condition and security.			
73. Oxygen Masks and Hose Assemblies - Inspect for condition and clean. Inpsect hose connection for security. Inspect flow indicator for freedom of movement.			
74. Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.			
75. Waste Container, Pump, Bowl Assembly, Seat, Relief Tube and Stowage Drawer - Inspect for condition, security and operation.			
76. Cabin Door - Inspect for condition, security and operation; and inspect door cables for proper rigging.			
77. Cabin Door Seal - Inspect for proper installation, cuts, abrasions and excessive wear. Clean.			
78. Cabin Door Latch Pins (Upper and Lower - Inspect for damage, cracks, wear and rigging.			
79. Cabin Door Latch Pin Guides - Inspect for damage, cracks and wear.			
80. Cabin Door Latch Pin Receptalces - Inspect for damage, cracks and wear.			
81. Emergency Exit Door and Handle - Inspect for condition and security.			
82. Fuselage Structure - Inspect structure and fasteners for condition and security.			
83. Control Pedestal - Inspect for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 2

	MECHANIC	INSPECTOR	REMARKS
84. Control Quadrant - Inspect for condition and security.			
85. Windows and Non-Heated Windshield - Inspect for condition, security. Check (if applicable) latches, hinges, seals for condition and operation.			
86. Propeller Unfeathering Accumulator - Inspect for leaks, condition, security and proper charge.			
87. Propeller Synchrophaser or Synchronizer Components - Inspect for condition and security.			
88. Fuel Flow Indicator System - Inspect for condition and security.			
89. Engine Controls - Check controls for freedom of operation. Inspect for security of installation, routing and evidence of damage. Inspect for deterioration of rubber seals on ends of control cables.			
90. Manifold Pressure Gages, Tachometers, Economy Mixture Indicator and Cylinder Head Temperature Gages - Inspect for condition and security.			
91. Engine Oil Temperature and Pressure Indicators - Inspect for condition and security.			
92. Engine Oil Pressure System - Inspect components for condition and security.			
93. Starter Switch and Electrical Connections - Inspect for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

SPECIAL INSPECTION ITEMS

1. Check and accomplish all Special Inspection Items due. ______

POST INSPECTION

1. Replace all fairings, doors and access hole covers. Ground check engine, check ignition drop, alternator charging rate, oil pressure, manifold pressure gages, tachometers, economy mixture indicator, cylinder head temperature gages, oil temperature and pressure gages and general operation of components. ______

OPERATION NO. 2 COMPLETED

AIRPLANE MODEL/SERIAL ______ REGISTRATION NO. ______

AIRPLANE HOURS ______ DATE ______

I certify that this operation was performed on the above airplane and that this airplane is approved for return to service.

SUPERVISOR MECHANIC ______ AIRPLANE INSPECTOR ______

CERTIFICATE NO. ______ CERTIFICATE NO. ______

COMPANY NAME ______

ADDRESS ______ CITY ______ STATE ______

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 3

DEALER INFORMATION	CUSTOMER AND AIRPLANE INFORMATION	
ZONE ______	NAME ______	
SERVICING DEALER NAME ______	ADDRESS ______	
SERVICING DEALER CODE ______	CITY AND STATE ______	
	AIRPLANE MODEL AND SERIAL NUMBER ______	REGISTRATION NUMBER ______
DATE ______	LEFT HAND ENGINE SERIAL NUMBER ______	RIGHT HAND ENGINE SERIAL NUMBER ______
	ZONE CODE ______	
	SELLING DEALER CODE ______	WARRANTY START DATE ______

	MECHANIC	INSPECTOR	REMARKS

NOSE

1. Placards and Decals - Inspect presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for required placards.
2. Heater Components and Heater Fuel Lines - Inspect all components for condition and security. Inspect for leaks. Inspect drain lines for proper slope and obstructions.
3. Heater Inlets and Outlets - Inspect all lines, connections, ducts, clamps, seals and gaskets for condition, restriction and security.
4. Ventilating Blower - Inspect blower fan/wheel for blade damage.
5. Combustion Air Blower - Inspect wheel for damage.
6. Heater Sealant - Inspect all sealant around heater for deterioration.
7. Heater Electrical System - Inspect block and components for loose connections, possible chaffing of insulation, indications of arcing and security of attachment points. Inspect high voltage cable for security at spark plug. Inspect high voltage cable for burning or discoloration of sheath, which would indicate arcing. Inspect spark plug for signs of fouling or erosion.

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 3

	MECHANIC	INSPECTOR	REMARKS
8. Nose Ram Air - Inspect clamps, hoses, valve, heater and ventilation system for condition and security.			
9. Heater Control Cables and Valves - Inspect for proper operation.			
10. HF Power Amplifier/Power Supply - Inspect for condition and security. Inspect electrical components in accordance with electrical power inspection.			
11. General Airplane and System Wiring - Inspect for chafing, broken or loose terminals, general condition, broken or inadequate clamps and sharp bends in wiring.			
12. Circuit Breaker, Fuses, Terminal Blocks and Junction Boxes - Inspect wiring and terminals for condition and security.			
13. Hydraulic Hoses - Inspect for hardness, deterioration, looseness and bulging.			
14. Hydraulic System - Inspect plumbing and components for leaks, condition and security.			
15. Hydraulic System Pressure Switch - Check for leaks.			
16. Reservoir Vent Line - Inspect vent line for obstructions.			
17. Pitot Tube(s) Heater Element(s) - Perform operational check.			
18. Landing Gear System - Inspect for condition and security.			
19. Landing Gear Retracting Linkage - Inspect for condition and security.			
20. Landing Gear Shock Strut - Inspect for evidence of leakage and proper extension. Inspect strut barrel for corrosion, pitting and cleanliness.			
21. Nose Gear Torque Links - Inspect for condition and security. Service.			
22. (421C0801 and On) Nose Gear Trunnion Pivot Bearing - Service.			
23. Landing Gear Uplock Roller Mounted on Gear - Inspect for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 3

	MECHANIC	INSPECTOR	REMARKS
24. (421C0001 Thru 421C0473 not modified by SK421-83) Nose Gear Actuator Anchor Lugs - Inspect for cracks and hole elongation.			
25. Nose Gear Shimmy Damper - Inspect for condition and security.			
26. Nose Gear Shimmy Damper - Service.			
27. Nosewheel Steering Cable - Check cable tension and travel.			
28. Nosewheel Steering Gimbal Bolts - Inspect for condition and security.			
29. Nose Gear Steering Stop Block - Inspect for condition and security.			
30. Nose Gear Steering Bellcrank - Inspect for condition and security.			
31. Nose Gear Fork - Inspect for condition and security.			
32. Landing Gear Wheel and Tire - Check wear, pressure and condition.			
33. Landing Gear Door - Inspect for condition and security.			
34. Brake System Plumbing - Inspect for leaks, hoses for bulges and deterioration, parking brake for operation.			
35. Nose Gear Actuator Piston Rod End - Inspect for condition and security.			
36. Nose Baggage Light - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
37. Static System - Inspect for security of installation, cleanliness and evidence of damage.			
38. Oxygen System - Inspect installation and component mounting for condition and security.			
39. Vacuum System Air Filter - Inspect for deterioration and contamination. Clean or replace.			

CESSNA PROGRESSIVE CARE MODEL 421C

OPERATION NO. 3

	MECHANIC	INSPECTOR	REMARKS
40. Nose Baggage and Avionics Door Seals - Inspect for proper installation, cuts, abrasions and excessive wear. Clean and service.			
41. Nose Baggage and Avionics Door - Inspect for condition, security and operation. Inspect Hinges, Latches, Latch Pins and Stops for damage, cracks, wear, alignment and adjustment.			
42. Nose Structure - Inspect structure and fasteners for condition and security.			
TAIL			
1. Rudder - Inspect the rudder skins for cracks and loose rivets, rudder hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumper for evidence of damage or wear, failed fasteners and security. Inspect the rudder hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weight for looseness and the supporting structure for damage.			
2. Elevator - Inspect the elevator skins for cracks and loose rivets; elevator hinges for condition, cracks and security; hinge bolts, hinge bearings, torque tube, horn, attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security. Inspect the elevator hinge bolts for proper safetying of nuts with cotter pins. Inspect elevator torque tube end assembly for looseness. Inspect balance weights for looseness and supporting structure for damage. Inspect outboard tips for cracks in rib flange and web. Inspect taper pins for looseness (if applicable).			
3. Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 3

	MECHANIC	INSPECTOR	REMARKS
4. Emergency Locator System - Inspect for security of installation, position of function switch and condition of electrical components. Inspect structure for corrosion			
5. Emergency Locator System - Perform operational test. Check cumulative time and useful life of batteries in accordance with FAR Part 91.207.			
6. Vacuum System Hose - Inspect for hardness, deterioration, looseness or collapsed hoses.			
ENGINE			
1. Air Conditioner Hydraulic Lines, Pumps and Components (Hydraulic Driven Systems) - Inspect for leaks, condition and security.			
2. Detection Sensor - Inspect for security, cleanliness, nicks and abrasions.			
3. Engine Compartment Fire Extinguisher - Inspect for proper operating pressure, condition, security of electrical connections,dents and scratches on container.			
4. Discharge Tubes for fire Extinguisher - Inspect for condition, security and obstruction.			
5. Fuel Electrical Components - Inspect in accordance with electrical power inspection.			
6. Hydraulic Pump - Inspect for leaks, condition and security.			
7. Hydraulic Hose - Inspect for hardness, deterioration looseness and bulging.			
8. Hydraulic Systems - Inspect plumbing and components for leaks, condition and security.			
9. Hydraulic Systems Flow Switches - Check for leaks.			
10. Vacuum Pump and System (Wet) - Inspect for leaks, condition and security.			
11. Vacuum Dry Air Pump and System - Inspect for condition and security.			
12. Vacuum Pump Pad Seal - Inspect for oil leaks. Replace seal if there is evidence of any leakage.			
13. Vacuum Dry Air Pump - Inspect coupling and fittings for condition and security. If loose, tighten.			
14. Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.			
15. Propeller Blades - Inspect for nicks, cracks and scratches			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 3

	MECHANIC	INSPECTOR	REMARKS
16. Engine Cylinder, Rocker Box Covers and Push Rod Housings - Inspect for fin damage,cracks, oil leakage, security of attachment and general condition.			
17. Crankcase, Oil Sump and Accessory Section - Inspect for cracks and evidence of oil leakage. Inspect bolts and nuts for looseness and retorque as necessary.			
18. Engine Baffles and Seals - Inspect for condition and security.			
19. Engine Compartment - Inspect for condition; inspect fuel (Inspect Fuel Lines Under Pressure), Oil, Vacuum and Hydraulic for leaks, chafing, deterioration, discoloration, bleaching and rubber hoses for stiffness.			
20. Engine Compartment and Lower Wing Surface - Inspect for condition.			
21. Engine fuel Pumps - Inspect for leaks, condition and security.			
22. Fuel flow Indicator System - Inspect for condition and security.			
23. Fuel Metering Unit Filter - Clean.			
24. Fuel Injection System, Fuel Air Control Unit, Drain Valves and Manifold - Inspect for condition and for proper operation.			
25. Fuel Pressure Switch - Inspect (Refer to MEB88-3)			
26. Engine Spark Plugs - Clean and rotate (top right to bottom left, top left to bottom right).			
27. Engine Ignition Cables - Inspect for condition and security.			
28. Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) after complete 500 hour disassembly Inspection - Perform a visual Inspection. Refer to Expanded Inspection (2-50), Exhaust			
29. Engine Exhaust System (Inconel Only) - Perform a visual inspection. Refer to Expanded Inspection (2-50) Exhaust.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 3

	MECHANIC	INSPECTOR	REMARKS
30. Engine Oil Pressure System - Inspect components for condition and security.			
31. Engine Oil and Long Oil Filter (Approximately 5.8 Inches) - Replace oil and filter element. Inspect adapters for condition and security. Refer to Special Inspection in Progressive Care Section for short oil filter (Approximately 4.8 inches).			
32. Engine Oil Breather Separator - Inspect, clean or replace.			
33. Engine Starter - Inspect for condition and security. Inspect terminal block and electrical connections for cleanliness, evidence of heat or arcing.			
34. Turbocharger - Inspect housing for condition and security. Inspect oil lines, fittings and inside turbocharger air inlet for oil leaks. Inspect impellers for coking, cracks, necks or obstructions. Remove the clamp attaching the exhaust stack and inspect for cracks. Inspect the turbine for coking, cracks, nicks or obstructions.			
35. Wastegate and Wastegate Actuator, Variable Absolute Pressure Controller - Inspect for condition and security. Inspect springs and linkage for condition and security.			
36. Turbocharger Alternate Air Inlet Door - Inspect for condition, security and proper operation.			
37. Induction Air Filter - Clean and inspect for deterioration and security (more frequently when local dust conditions exist).			
38. Manifold Pressure Relief Valve - Inspect for obstructions, condition and security.			
39. Induction System, Manifold and Induction Elbow Clamp - Inspect connections, flexible elbow and drain valve for condition and security. Check drain valve for proper operation.			

SPECIAL INSPECTION ITEMS

1. Check and accomplish all Special Inspection Items due. ______________________

POST INSPECTION

1. Replace all fairings, doors and access hole covers. Ground check engine, check ignition drop, alternator charging rate, oil pressure, manifold pressure gages, tachometers, economy mixture indicator, cylinder head temperature gages, oil temperature and pressure gages and general operation of components. ______________________

OPERATION NO. 3 COMPLETED

AIRPLANE MODEL/SERIAL ______________ REGISTRATION NO. ______________

AIRPLANE HOURS ______________ DATE ______________

I certify that this operation was performed on the above airplane and that this airplane is approved for return to service.

SUPERVISOR MECHANIC ______________ AIRPLANE INSPECTOR ______________

CERTIFICATE NO. ______________ CERTIFICATE NO. ______________

COMPANY NAME ______________________________

ADDRESS ______________ CITY ______________ STATE __________

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 4

DEALER INFORMATION	CUSTOMER AND AIRPLANE INFORMATION	
ZONE ______	NAME ______	
SERVICING DEALER NAME ______	ADDRESS ______	
SERVICING DEALER CODE ______	CITY AND STATE ______	
	AIRPLANE MODEL AND SERIAL NUMBER ______	REGISTRATION NUMBER ______
	LEFT HAND ENGINE SERIAL NUMBER ______	RIGHT HAND ENGINE SERIAL NUMBER ______
DATE ______	ZONE CODE ______	
	SELLING DEALER CODE ______	WARRANTY START DATE ______

	MECHANIC	INSPECTOR	REMARKS

WING

1. Placards and Decals - Inspect presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for required placards. ______
2. Heater Fuel Lines in wing - Inspect for condition and leaks. ______
3. Air Conditioning Lines - Inspect air injection and discharge lines for cracks, sharp bends, condition and security. ______
4. Air Conditioner Compressor and Motor Inspect for condition and security. ______
5. Air Conditioner Condenser - Inspect inlets and outlets for obstructions; inspect coils for debris, condition and security. ______
6. Air Conditioning Electrical Components - Inspect the electrical components in accordance with electrical power inspection. ______
7. Air Conditioner Hydraulic Lines, Pumps and Components (Hydraulic Driven Systems) - Inspect for leaks, condition and security. ______
8. Pressurization Electrical Components - Inspect electrical components in accordance with electrical power inspection. ______

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
9. Pressurization Plumbing Components - Inspect plumbing for condition, security and loose connections.			
10. Pressurization Bleed Air Dump Valves - Inspect for condition, security and smooth operation.			
11. Static Wicks - Inspect for condition and security.			
12. Static Wick - Check resistance.			
13. General Airplane and System Wiring - Inspect for chafing, broken or loose terminals, general condition, broken or inadequate clamps and sharp bends in wiring.			
14. Landing Gear Switches and Safety Switches - Inspect wiring and terminals for condition and security.			
15. Wing Battery - Check electrolyte and general condition and security.			
16. Wing Battery Cables - Inspect for corrosion and security.			
17. Wing Battery Box - Inspect for corrosion, condition and security. Clean vent tube.			
18. Starter Relay - Inspect contact area.			
19. External Power Receptacle and Power Cables - Inspect for condition and security.			
20. External Power Relay - Inspect for condition and security.			
21. Aileron - Inspect the aileron skins for cracks and loose rivets; aileron hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security. Inspect the aileron hinge bolts for proper safetying of nuts with cotter pins. Inspect balance weights for looseness and their supporting structure for damage.			
22. Aileron Actuator Yoke - Inspect the aileron actuator yoke, yoke attach bracket, yoke attach bolts and yoke mount bracket attach nutplates for evidence of damage or wear, condition and security. Inspect yoke attach bolts for proper safetying of nuts with cotter pins.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
23. Aileron Quadrant - Inspect aileron quadrant for condition, security, corrosion, evidence of damage to quadrant arm, stop bolts and support bracket. Inspect aileron quadrant bolt and stop bolts for proper safetying.			
24. Aileron Wing Cables - Inspect wing cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect pulleys and guard pins for condition, wear, corrosion and security. Inspect cable seals for deterioration and lubrication.			
25. Aileron Trim Tab - Inspect the trim tab skins for cracks, loose rivets and security; trim tab hinge for cracks, security and evidence of damage. Inspect hinge pin for proper installation at hinge pin retainer. Inspect horn and push rod for evidence of damage and security. Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.			
26. Aileron Trim Tab Actuator - Inspect actuator for security and evidence of damage. Inspect mounting clamp(s) (if applicable) and structure for evidence of damage, cracks and security. Inspect actuator mounting bolts for security. If torque putty is broken, retorque mounting bolts. Inspect snap rings for complete and proper engagement in snap ring grooves of actuator (if applicable). Inspect actuator rod for evidence of bending. Inspect push rod bolt at actuator for proper safetying of nut with cotter pin. Inspect push rod ends for bearing looseness and excessive wear.			
27. Aileron Trim Tab Actuator Push Rod - Inspect for free play in actuator.			
28. Aileron Trim Tab Cables - Inspect cable seals for deterioration and lubrication. Inspect cables for fraying, chafing, cleanliness, turnbuckle safetying and proper routing. Inspect chains for proper safetying at all points and chains for proper alignment on sprockets. Inspect pulleys and guard pins for condition, wear, corrosion and security.			
29. Aileron Trim Tab Cable Stop Blocks - Inspect for condition and security.			
30. Stall Warning System - Inspect for condition and security of installation. Perform operational check.			
31. Flaps - Inspect flaps for condition and security.			

CESSNA PROGRESSIVE CARE MODEL 421C

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
32. Flaps - Inspect linkage, bellcranks, torque tube, pulleys and cables for condition and security ;inspect hinges for condition security and cracks.			
33. Inboard and Outboard Flap bellcranks and Pushrods - Inspect bellcranks and push rods for evidence of damage and security of installation. Inspect push rods for bent rods, seized or worn bearings, loose locknuts and use push rod inspection holes to verify that there is sufficient thread engagement of the rod end to reach at least to the inspection hole. Inspect cable seals for deterioration and lubrication. Inspect chains for excessive wear and rubbing on chain guards.			
34. Fuel Selector Valve and Crossfeed Control - Inspect linkage and components for condition and security.			
35. Fuel Filter - Service.			
36. Fuel System Plumbing and All Fuel Components - Inspect for condition, security, fuel leaks and fuel stains.			
37. Fuel System Filters - Service.			
38. Fuel Electrical Components - Inspect in accordance with electrical power inspection.			
39. Hydraulic Hoses - Inspect for hardness, deterioration, looseness and bulging.			
40. Hydraulic System - Inspect plumbing and components for leaks, condition and security.			
41. Surface Deice System (Pneumatic) - Inspect for condition and leaks. Inspect lines and clamps for security. Perform operational check.			
42. Surface Deice Regulator, Pressure Control Valve and Deice Control Valves - Inspect for condition and security.			
43. Surface Deice System - Inspect electrical components in accordance with electrical power inspection.			
44. Deice Boots - Inspect for abrasions, cuts, nicks and security of mounting and clearance.			
45. Alcohol Anti-Ice Pump - Inspect for leaks, condition and security.			

CESSNA PROGRESSIVE CARE MODEL 421C

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
46. Alcohol Anti-Ice System - Inspect for leaks, condition and security.			
47. Stall Warning Vane Heater Element - Perform operational check.			
48. Landing Gear System - Inspect for condition and security.			
49. Landing Gear Retracting Linkage - Inspect for condition and security.			
50. Landing Gear Shock Strut - Inspect for evidence of leakage and proper extension. Inspect strut barrel for corrosion, pitting and cleanliness.			
51. (421C0001 Thru 421C0800) Main Gear Torque Links - Inspect for condition and security. Service.			
52. (421C0801 and On) Main Gear Trailing Link - Inspect for condition and security.			
53. Landing Gear Uplock Roller Mounted on Gear - Inspect for condition and security.			
54. Landing Gear Wheel and Tire - Check wear, pressure and condition.			
55. Landing Gear Door - Inspect for condition and security.			
56. Brake System Plumbing - Inspect for leaks, hoses for bulges and deterioration, parking brake for operation.			
57. Brake Assemblies - Inspect for wear of lining and disc warpage.			
58. Brake Master Cylinders - Service.			
59. Main Gear Actuator Piston Rod End - Inspect for condition and security.			
60. Wing Locker Baggage Light - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
61. Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.			
62. Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS
63. Vacuum System Relief Valve - Inspect for condition and security. Clean or replace filter.			
64. Wing Locker Door Seals - Inspect for proper installation, cuts, abrasions and excessive wear. Clean and service.			
65. Wing Locker Door - Inspect for condition, security and operation. Inspect Hinges, Latches, Latch Pins and Stops for damage, cracks, wear, alignment and adjustment.			
66. Wings - Inspect structure and attach points for condition and security.			
67. Wing and Stub Wing Structure - (Type A Inspection).			
68. Wing Spar Fittings - Inspect bolts for condition and security. (Check torque first 100 hours, do not retorque thereafter).			
69. Drain Openings and Vent Holes in Bottom of Wing - Inspect for obstructions.			
70. Propeller Unfeathering Accumulator - Inspect for leaks, condition, security and proper charge.			
71. Propeller Synchrophaser or Synchronizer Components - Inspect for condition and security.			
72. Engine Controls - Check controls for freedom of operation. Inspect for security of installation, routing and evidence of damage. Inspect for deterioration of rubber seals on ends of control cables.			
73. Engine Oil Pressure System - Inspect components for condition and security.			

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 4

	MECHANIC	INSPECTOR	REMARKS

FUSELAGE

1. Portable Hand Fire Extinguisher - Inspect for proper operating pressure, condition and security.
2. Fuel System Plumbing and All Fuel Components - Inspect for condition, security, fuel leaks and fuel stains.
3. Fuel Cross-Over Line Drains - Drain.
4. Fuel Electrical Components - Inspect in accordance with electrical power inspection.
5. Hydraulic System - Inspect plumbing and components for leaks, condition and security.
6. Exterior Lights - Perform operational check and inspect electrical components in accordance with electrical power inspection.
7. Vacuum System Hoses - Inspect for hardness, deterioration, looseness or collapsed hoses.
8. Fuel Flow Indicator System - Inspect for condition and security.
9. Engine Oil Pressure System - Inspect components for condition and security.

SPECIAL INSPECTION ITEMS

1. Check and accomplish all Special Inspection Items due.

POST INSPECTION

1. Replace all fairings, doors and access hole covers. Ground check engine, check ignition drop, alternator charging rate, oil pressure, manifold pressure gages, tachometers, economy mixture indicator, cylinder head temperature gages, oil temperature and pressure gages and general operation of components.

CESSNA PROGRESSIVE CARE
MODEL 421C

OPERATION NO. 4 COMPLETED

AIRPLANE MODEL/SERIAL ____________________ REGISTRATION NO. ____________________

AIRPLANE HOURS ____________________ DATE ____________________

I certify that this operation was performed on the above airplane and that this airplane is approved for return to service.

SUPERVISOR MECHANIC ____________________ AIRPLANE INSPECTOR ____________________

CERTIFICATE NO. ____________________ CERTIFICATE NO. ____________________

COMPANY NAME ____

ADDRESS ____________________ CITY ____________________ STATE ____________

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 50 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Engine Oil and Short Oil Filter (Approximately 4.8 inches) - Replace oil and filter element; inspect adapters for condition and security.			
2. (421C001 Thru 421C0628) Not incorporating SK 421-93. Dye Penetrant Inspect Main Gear Trunion for cracks (Refer to expanded Inspection.			

NOTE : This inspection to be first accomplished at 300 hours and every 50 hours thereafter.

	MECHANIC	INSPECTOR	REMARKS
3. Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) Prior to 500 hour complete disassembly inspection - Perform a visual inspection. Refer to Expanded Inspection (2-50) Exhaust.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 200 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Nose Landing Gear Drag Brace Inspection - For drag braces that have been in service for a total of 4,000 hours and have required crack removal. Refer to Expanded Inspection for procedure.			
2. Fuel Inlet Float Valve - Perform functional/ installation test. (Refer to MEB93-10).			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 400 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Air Conditioner Condenser Fan - Inspect blades for condition and security.			
2. Air Conditioner Condenser Fan Motor - Check brushes for proper length. Inspect fan motor condition and security.			
3. Air Conditioner Evaporator Fan - Inspect blower wheel for condition and security.			
4. Air Conditioner Hydraulic Fluid and Filter (Hydraulic Drive Systems) - Change fluid, element and packing.			
5. Heat Exchanger - Inspect for condition, security and air passage obstruction.			
6. Hydraulic Fluid Filter - Change element.			
7. Landing Gear Wheel Bearings - Inspect for condition and repack.			
8. Cabin Door Hinges, Latch Pins, Step Hinges and Stop Assembly - Service.			
9. Nose Baggage Door and Wing Locker Door Hinges and Latch Pins and Stops - Service.			
10. Engine Starter Brushes, Commutator and Electrical Connections - Inspect for cleanliness, evidence of heat or arcing and condition.			
11. Induction Air Filter - Replace.			
12. Nose Landing Gear Drag Brace Inspection - For drag braces that have been in service for a total of 4,000 hours. Refer to Expanded Inspection for procedure.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 500 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Heater Assembly (Janitrol) - Perform pressure decay test.			
2. Pressurization Differential Limiting Check - perform check.			
3. Engine Exhaust. System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only) Perform a complete disassembly inspection. Refer to Expanded Inspection (2-50), Exhaust.			
4. Engine Exhaust System (Inconel Systems only, Slip Joints and Aft) - Perform a disassembly inspection of the exhaust slip joints and the turbocharger tailpipe. Refer to Expanded Inspection (2-50), Exhaust.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 600 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Flight Phone Component Station - Inspect for security, cleanliness, evidence of damage and operation of the drawer assembly.			
2. Flight Phone Transceiver - Inspect for security and evidence of damage.			
3. Stereo Player, Stereo Speakers, Stereo Transducers and Headsets - Inspect for condition, security, cleanliness and operation.			
4. Alternators - Inspect brushes, leads, bearings and slip rings for condition and security.			
5. Mechanical and Electrical Adjusting Seats - Service seat adjusting screws and bearings.			
6. Fuel Inlet Float Valve - Perform functional/ operational test. (Refer to MEB93-10)			
7. Parking Brake Handle Shaft and Pivot Points - Service.			
8. Barometric Pressure Switch - Perform Functional/ Operational Test.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 800 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Landing Light Hinge Point and Gears - Service.			
2. Propeller Blades - Check track.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 1000 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Forward Wing Spar Web - Inspect Area above upper spar cap immediately outboard of fuselage for cracks (Unless web has been modified to remove area). Airplanes C0001 Thru C1413 only.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 1200 HOURS

	MECHANIC	INSPECTOR	REMARKS
1. Pressure Cabin (Type A Inspection).			
2. Wing and Stub Wing Structure - (Type B Inspection).			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 1 YEAR

	MECHANIC	INSPECTOR	REMARKS
1. (421C0001 Thru 421C0200) Heater Fuel Screen and/or Filter (Stewart-Warner) - Clean or service			
2. Radiotelephone Frequency Accuracy Test - Perform frequency accuracy test in accordance with FCC rules and regulating, Section 21.207.			
3. Engine Compartment Five Extinguisher Container Cartridge - Inspect service life date.			
4. Emergency Blowdown System - Perform blowdown test.			
5. Emergency Gear Blowdown Bottle - Check pressure and hydrostatic test date.			
6. Emergency Exit Door Seal - Inspect for proper installation, cuts, abrasions and excessive wear. Clean and service. Perform operation check.			
7. Landing Gear Actuators and Control/Indicating System Functional Test - Perform test every one year or anytime the landing gear emergency blowdown bottle has been discharged or a landing gear actuator is replaced, (Refer to Expanded Inspection).			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 2 YEARS

	MECHANIC	INSPECTOR	REMARKS
1. Magnetic Compass - Check if within 10 degrees of compass rose headings.			
2. Altimeter and Static System - Inspect in accordance with FAR Part 91.411.			
3. Transponder Control - Operate individual controls and perform operational test transponder system in accordance with FAR Part 91.413.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 3 YEARS

	MECHANIC	INSPECTOR	REMARKS
1. Engine Compartment Fire Extinguisher Container - Weigh to determine charge.			
2. Oxygen Cylinder - ICC-3HT/DOT-3HT (Light-weight) - Inspect for condition, check hydrostatic test date and perform hydrostatic test if due.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 5 YEARS

		MECHANIC	INSPECTOR	REMARKS
1.	Engine Compartment Fire Extinguisher Container Manufactured by HTL - Perform hydrostatic test if required.			
2.	Engine Compartment Fire Extinguisher Container Manufactured by Kiddle Company - Perfrom condition inspection. Hydrostatic test if required.			
3.	Emergency gear Blowdown Bottle - Perform hydrostatic test.			
4.	Oxygen Cylinder-ICC-3AA/DOT-3AA (Standard Weight) - Inspect for condition, check hydrostatic test date and perform hydrostatic test if due.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 14 YEARS

MECHANIC INSPECTOR REMARKS

NOT USED

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 400 HOURS OR 1 YEAR, WHICHEVER OCCURS FIRST

	MECHANIC	INSPECTOR	REMARKS
1. Landing Gear System - Perform landing gear rigging and operational check.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 600 HOURS OR 1 YEAR, WHICHEVER OCCURS FIRST

	MECHANIC	INSPECTOR	REMARKS
1. Autopilot Cables - Check cable tension.			
2. Control Wheel Column Bearings - Service.			
3. Aileron - Check aileron travel and cable tension.			
4. Aileron Trim Tab - Check aileron trim tab travel and cable tension.			
5. Aileron Trim Tab Control Bearing and Gears - Service.			
6. Aileron Trim Control Wheel Bearings - Service.			
7. Rudder Pedal Linkage - Service.			
8. Rudder and Rudder Pedal - Check travel and cable tension.			
9. Rudder Trim Tab Wheel Bearing and Track - Service.			
10. Rudder Trim Tab - Check Rudder trim tab travel and cable tension.			
11. Rudder Gust Lock - Service.			
12. Yaw Damper - Check cable tension.			
13. Elevator - Check elevator travel and cable tension.			
14. Elevator Trim Tab Wheel Bearing and Track - Service.			
15. Elevator Trim Tab - Check elevator trim tab travel and cable tension.			
16. Electric Elevator Trim - Operate electric trim, check trim tab travel time and cable tension.			
17. Flaps - Check flap travel, cable tension and travel time.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED EVERY 1000 HOURS OR 3 YEARS, WHICHEVER OCCURS FIRST

	MECHANIC	INSPECTOR	REMARKS
1. (421C0001 Thru 421C0800) Nose Gear Trunnion Pivot Bearing - Inspect for condition and service.			
2. Main Gear Trunnion Pivot Bearing - Inspect for condition and service.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED THE FIRST 6000 HOURS AND EVERY 3600 HOURS THEREAFTER

	MECHANIC	INSPECTOR	REMARKS
1. Pressure Cabin (Type B Inspection).			
2. Cabin Door Hinged - For airplanes performing an surface eddy current inspection of the hinge. See expanded inspection section.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED THE FIRST 13,200 HOURS AND EVERY 3600 HOURS THEREAFTER

	MECHANIC	INSPECTOR	REMARKS
1. Pressure Cabin (Type C Inspection).			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THE INSPECTION TO BE PERFORMED AT 1500 HOURS AND EVERY 500 HOURS THEREAFTER

	MECHANIC	INSPECTOR	REMARKS
1. Hydrualic Pressure Lines - Perform a hydraulic pressure leak test.			

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED WITHIN 100 HOURS AFTER RECEIVING TEMPORARY REVISION 9

	MECHANIC	INSPECTOR	REMARKS
1. Engine Exhaust System (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired) Perform disassembly inspection of the exhaust slip joints and turbocharger tailpipe. Refer to Expanded Inspection (2-50), Exhaust.			

NOTE : TR 9 was issued 16 July 1999 and incorporated in Revision 22 dated 31 March 2000.

PROGRESSIVE CARE PROGRAM
SPECIAL INSPECTION

THIS INSPECTION TO BE PERFORMED AT EVERY ENGINE OVERHAUL

	MECHANIC	INSPECTOR	REMARKS
1. Engine Exhaust System (Inconel Only) - Perform a complete disassembly inspection. Refer to Expanded Inspection (2-50), Exhaust.			

EXPANDED INSPECTION

1. Placards (Refer to Section 1).

a. Inspect placards for presence, legibility and security. Consult Pilot's Operating Handbook and FAA Approved Airplane Flight Manual for required placards.

2. Air Conditioning System (Refer to Section 6).

a. Heating, air distribution system.

NOTE

For cleaning, repair and maintenance of individual heaters, use the Heater Overhaul Manual.

(1) Heater components and heater fuel lines.

(a) Inspect all components on heater for condition and security. Inspect heater and adjacent area for abnormal stains, discoloration and excessive carbon formation that would indicate poor heater operation.

(b) Perform inspections as required to ensure the mechanical and electrical integrity of the heater accessories.

(c) Inspect the full length of all fuel lines to ensure all joints and shrouds are secure and that there is no evidence of leaks. Ensure the fuel lines are secure at the points of attachment to the airplane.

(d) Inspect drain lines for proper slope and obstructions. If obstructions are found, it may be necessary to clear the tube with wire.

(2) Heater inlets and outlets.

(a) Inspect ventilating air and combustion air inlets and exhaust outlets for restrictions, damage of any kind and security at the airplane skin.

(3) Ventilating blower.

(a) Inspect ventilating blower fan/wheel for blade damage and security.

(4) Combustion air blower.

(a) Inspect combustion air blower wheel for blade damage and security.

(5) Heater sealant.

(a) Inspect all sealant around heater and heater compartment for deterioration.

(6) Heater electrical system.

(a) Inspect heater terminal block and electrical components for loose connections and indications of arcing.

(b) Inspect the electrical components in accordance with Electrical Power Inspection.

(c) Remove and inspect spark plug for signs of fouling or erosion.

(d) Inspect high voltage cable for burning or discoloration of the sheath which would indicate arcing.

(7) Heater sensing tube (Janitrol).

(a) Inspect tube from combustion air pressure switch to heater exhaust at pressure switch for obstructions.

(8) Nose ram air.

(a) Inspect heater and ventilation system, clamps, hoses and valves for connection and security.

(b) Inspect all control cables and valves for proper operation.

(9) (421C0001 thru 421C0200) Heater fuel screen filter (Stewart-Warner).

(a) Clean or change fuel screen filter in fuel pump inlet line to prevent the collection of water and formation of ice.

(10) (421C0201 and On) Heater Assembly (Janitrol) - Perform pressure delay test per manufacturer's maintenance manual.

b. Air conditioning system.

NOTE

Before inspection of air conditioning components, all components should be wiped clean with a cloth and a stream of low-pressure dry air. Remove lint, grease or other debris from evaporator module coils. Clean and flush condensate (drain) valve with water. For repair of major components, refer to Air Conditioning System Service/Parts Manual.

CAUTION

IF EVIDENCE OF OIL SEEPAGE IS NOTED AROUND THE COMPRESSOR SHAFT OR AT THE SYSTEM FITTINGS, THE COMPRESSOR SEAL SHOULD BE REPLACED, FITTINGS TIGHTENED, OIL LEVEL CHECKED FOR PROPER LEVEL AND REFRIGERANT SYSTEM CHECKED FOR PROPER CHARGE.

(1) Air conditioning lines.
   (a) Inspect air injection and discharge lines for cracks, chafing, sharp bends, condition and security.
(2) Compressor and motor.
   (a) Inspect for condition, security and leaks.
(3) Condenser.
   (a) Inspect inlets and outlets for obstructions. Inspect coils for debris, condition and security.
(4) Condenser fan.
   (a) Inspect condenser fan blade for excessive nicks, cracks and hub security.
(5) Condenser fan motor and brushes.
   (a) Check brushes of condenser fan motor for proper length. If brush length is 0.375 inch or less, new brushes are required.
   (b) Inspect fan motor for condition and security. (For repair and troubleshooting, refer to Component Maintenance Manual listed in Customer Care Supplies and Publications catalog.)
(6) Evaporator fan.
   (a) Inspect blower wheel for condition and security. Inspect evaporator blower motor shaft and evaporator modules for looseness and security of mounting.
(7) Air Conditioning Electrical Components.
   (a) Inspect the electrical components in accordance with Electrical Power Inspection.
(8) Hydraulic lines and components (hydraulic driven systems).
   (a) Inspect hydraulic pump, motor, manifold and valve assembly, reservoir, lines and fittings for evidence of hydraulic fluid seepage. Inspect drain valve for safetying. If evidence of hydraulic fluid leakage is noted, tighten the fittings and check the hydraulic fluid reservoir for proper level.
(9) Hydraulic fluid and filter
   (a) Change fluid, element and packing per schedule requirements.

c. Pressurization system
   (1) Outflow valve and safety valve.
      (a) Inspect for tobacco tar, grease or other foreign deposits. Clean valve if required. (Refer to cleaning of pressurization components.)
      (b) Inspect the outflow valve and safety valve diaphragm retention ring as follows (see Figure 1):

CAUTION

USE EXTREME CARE WHEN LIFTING THE POPPET TO PREVENT BREAKING THE DIAPHRAGM MOUNTING STEM.

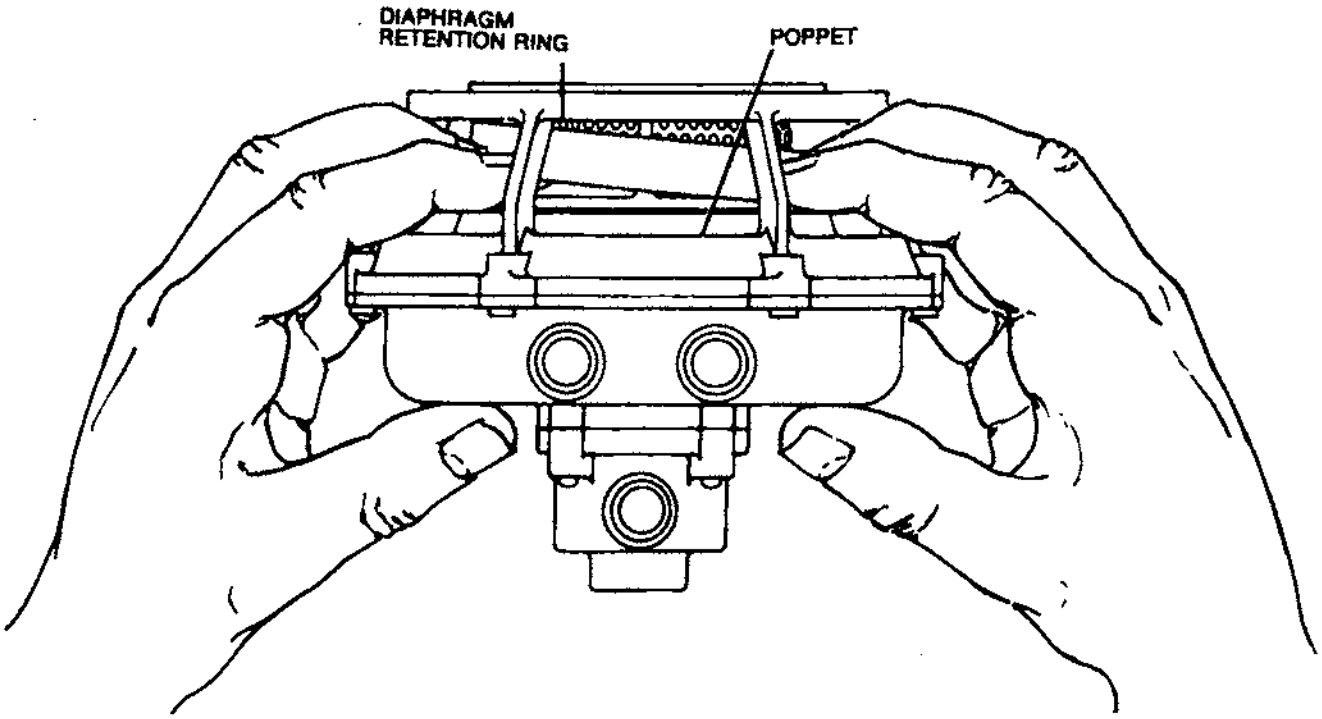
1) Carefully raise poppet evenly by grasp with hands as near to 180 degrees apart as possible.
2) See Figure 1 if diaphragm retention ring is found in the poppet seating or the retention ring is broken.
3) Gently attempt to rotate the diaphragm retention ring with finger tips. If the ring rotates, the ring is broken.

4) If the retention ring does not rotate, use an inspection mirror and check the entire periphery of the ring for cracks or breaks.

(2) (421C0001 and On) Safety outflow valve filter, rate-of-change and cabin altitude control unit filter.

(a) Inspect filters. If filter is contaminated, clean.

(3) Barometric Pressure Switch - Perform Functional/Operational Test.



Outflow and safety valves
Figure 1

3. Autoflight (Refer to Section 14, If Installed).

a. Aileron servo actuator.
   (1) Inspect for condition, security and evidence of overheating.
   (2) Inspect terminal connections, pulleys, turnbuckles and cables for fraying, corrosion, routing and condition.
   (3) Check cable tension, if required.
   (4) Inspect electrical components for condition and security.

b. Elevator servo actuator.
   (1) Inspect for condition, security and evidence of overheating.
   (2) Inspect terminal connections, pulleys, turnbuckles and cables for fraying, corrosion, routing and condition.
   (3) Check cable tension, if required.
   (4) Inspect electrical components for condition and security.

c. Autopilot computer and air data computer.
   (1) Inspect computers, mount, mounting knob and electrical components for condition and security.

d. Pitot and static plumbing.
   (1) Inspect for proper routing, cracks, chafing, abrasions and security.

e. Autopilot controller.
   (1) Inspect for condition and security.
   (2) Inspect electrical components for condition and security.
   (3) Check switches for proper operation.

f. Yaw damper actuator.
   (1) Inspect for condition, security and evidence of overheating.
   (2) Inspect terminal connections, pulleys, turnbuckles and cables for fraying, corrosion, routing and condition.
   (3) Check cable tension, if required.
   (4) Inspect electrical components for condition and security.

g. PA-495A-2 Pitch Actuator.
   (1) Check torque limiting and overcurrent limiting per manufacturer's manual.

4. Communications (Refer to Section 15). Inspect the Following Items if Applicable.

a. Control panels COM 1 and COM 2.
   (1) Inspect the control panel(s) installed in the instrument panel for condition and security.
   (2) Operational test requires external power and the operation of communication and navigation system.

b. Receiver/transmitter COM 1 and COM 2.
   (1) Inspect the receiver-transmitter installed in the avionics compartment. The unit is installed in a mount.
   (2) Check the mount for security in installation. When checking the receiver-transmitter for damage, inspect the dust cover for unusual dents and the electrical components in accordance with the Electrical Power inspection described in this section.
   (3) Check the control knobs for security in installation and operation (rotation).
   (4) Operational test may be performed during functional test of the antenna systems.

c. Fin tip antenna.
   (1) Inspect the fin tip antenna (COM 2) installed on the tip of the vertical stabilizer leading edge. The area where corrosion may first appear is the surface that mates with the stabilizer.
   (2) To functional test the antenna, external power and a thruline wattmeter with coax cables are required.
   (3) The VHF communications system that utilizes this antenna may be operational tested at this time.

d. Blade antenna.
   (1) Inspect the blade antenna (COM 1) installed on the bottom left side of the fuselage. Check the blade for cracks and other damage. To functional test the antenna, external power and a thruline wattmeter

with coax cables are required. The VHF communications system that utilizes this antenna may be operational tested at this time.

e. Receiver/exciter (HF transceiver).
   (1) Inspect shock mounts, mount and receiver/exciter for proper electrical bond and security.
   (2) Inspect for dents, evidence of overheating and damage.
f. Power amplifier/power supply (HF transceiver).
   (1) Inspect shock mounts, mount and power amplifier/power supply for proper electrical bond and security.
   (2) Inspect for dents, evidence of overheating and damage.
g. Antenna coupler (HF transceiver).
   (1) Inspect for security and evidence of damage.
h. Control panel (HF transceiver).
   (1) Inspect for security, evidence of damage and operation of individual selectors.
i. Antenna (HF system).
   (1) Inspect the insulator, anchor, feedthru, transport tension unit and mechanical connections.
j. HF system.
   (1) Inspect electrical components for damage.
   (2) Functional test of the high frequency system requires external power and thruline wattmeter.
k. Flight phone component station, transceiver and antenna (UH frequency).
   (1) Inspect the flight phone handset, handset cord, cradle and control.
   (2) Inspect the transceiver installed below the aft baggage compartment floor and the blade antenna.
   (3) Inspect the electrical components in accordance with the Electrical Power inspection.
   (4) Operational test of the radiotelephone requires external power and within range of a station.
   (5) Test equipment may be substituted for a station to perform the operational test.
l. Radiotelephone frequency accuracy test.
   (1) Perform frequency accuracy test to ensure frequency is within tolerance of 0.0005 percent. Frequency accuracy tests shall be made by or under the immediate supervision of a person holding a first- or second-class commercial radio operator license who shall authenticate the accuracy of such entries by signing his name in the airplane log, together with the class, serial number and expiration date of his license, provided, however, that the licensee of the station may optionally have the required determinations made by any qualified engineering measurement service, in which case, the required record entries shall also show the name and address of the engineering measurement service.
m. Stereo system.
   (1) Inspect the stereo components; the 8-track stereo tape cartridge player, relay, regulator and selector switch installed in the refreshment center for security in screw and nut mountings of the components, cleanliness (lint and dust).
   (2) Inspect the electrical components in accordance with the Electrical Power inspection.
   (3) Check the stereo speakers for cleanliness and evidence of objects piercing the grille and speaker cone.
   (4) Check the transducer and escutcheon installation for security.
   (5) Check the stereo headsets for cleanliness and evidence of deterioration.
   (6) Operational check the stereo system; check volume, tone, balance, program selector, speaker/headset selector switch, rheostats on escutcheon and also include quality of audio for possible cleaning of tape head and capstan shaft.
n. Audio control panel, microphone and headset jacks.
   (1) Inspect the audio control panel(s) installed in the instrument panel, the handheld microphone, the headset, oxygen mask microphone, microphone jacks at left and right side consoles and the speakers in the overhead console.
   (2) Inspect the electrical components in accordance with the Electrical Power inspection.
   (3) Operational test requires external power and the operation of communication and navigation system.
o. Static wicks.
   (1) Inspect the static wicks installed on the wing tips, ailerons, elevators, rudder and rudder trim tab. Check for loose screws and damage. Conduct a resistance check on each static wick. Resistance shall

not be greater than 0.0005-ohm. If resistance is greater than 0.0005-ohm, remove wick and clean attachment areas with bonding brush. Reinstall wick and recheck resistance.

NOTE

To check resistance, use a DIGITAL LOW RESISTANCE OHMETER WITH CHARGER, part number 24700 of James G. Biddle Company, Plymouth Meeting, PA 19642, per manufacturer's instructions.

5. Electrical Power (Refer to Section 13).

CAUTION

TO AVOID THE POSSIBILITY OF FIRE OR DAMAGE BY AN ARC, IT IS MANDATORY THAT ALL ELECTRICAL POWER BE OFF PRIOR TO PERFORMING ELECTRICAL INSPECTIONS. DISCONNECT BATTERY AND EXTERNAL POWER.

a. General.

(1) The purpose of this section is to provide instructions for conducting inspection of airplane electrical system wiring and integral interconnecting components and to point out the conditions that are to be checked. Compliance with these instructions will be effective in reducing the possibility of a system(s) and/or electrical malfunctions. The inspections described will be accomplished at intervals outlined under Inspection Time Limits.

b. Wiring installation requirements.

CAUTION

WHEN MODIFICATION REPAIRS OR REPLACEMENT IS PERFORMED, ALL MATERIALS USED SHALL BE CAPABLE OF WITHSTANDING THE ENVIRONMENT AFTER INSTALLATION.

(1) Wires and cables shall be inspected for adequacy of support, protection and general condition throughout.

(a) Wires and cables supported by clamps, grommets or other devices must be of a suitable size and type and the wires and cables must be held securely in place without damage to the insulation.

(b) Adequate stand-off support is provided in order to prevent chafing of wires when routed over structural members.

(c) Phenolic blocks, plastic liners or rubber grommets are installed in holes in bulkheads, floors or structural members through which wiring must pass.

(d) Wires and cables in junction boxes, panels and bundles are properly supported and laced to provide proper grouping and routing.

(e) Clamp retaining screws are properly secured so that movement of wires and cables is restricted to the span between points of support and not at soldered or mechanical connections to terminal posts or connectors.

(f) Wires and cables are supported and bound so interference with other wires, cables and equipment does not exist.

(g) Wires and cables are adequately supported to prevent excessive movement in areas of high vibration.

(h) Insulating tubing and tape is secured in place by tying or with clamps.

(i) Tapes (such as friction tape) which will dry out in service, produce chemical reactions with wire or cable insulation, or absorb moisture are not used.

(j) Moisture-absorbent type material is not used as "fill" for clamp or adapters. Proper size of clamp shall be used.

(k) Cable supports do not restrict the wires or cables in such a manner as to interfere with operation of equipment shock mounts.

(l) Wires and cables are routed in such a manner that chafing will not occur.

(m) Wires and cables are adequately protected in wheel wells where they are exposed to rocks, ice, mud, etc.

(n) Wires and cables are kept separate from high temperature equipment such as resistors and engine bleed air ducts.

(o) The minimum radius of bend for wire or cable is ten times the outside diameter of the wire or cable, except that at the terminal strips where the wire is suitably supported, the radius may be three times the diameter of the wire or cable. Where it is impractical to install wiring or cables within the radius requirements, the bend shall be enclosed in insulating tubing.

(p) Coaxial cables are not bent at a radius of less than six times the outside diameter of the cable.

(q) Wires and cables attached to assemblies where relative movement occurs (such as at hinges, control column and control wheels) are installed or protected in such a manner as to prevent deterioration of the wires and cables caused by the relative movement of the assembly parts.

(r) Wires and cables are provided with enough slack to meet the following requirements:

1) Permit ease of maintenance.

2) Prevent mechanical strain on the wires, cables, junctions and supports.

3) Permit free movement of shock and vibration mounted equipment.

4) Allow shifting of equipment as necessary to perform alignment and servicing while installed in airplane.

(s) Unused wires are individually dead-ended and secured into the bundle.

c. Wiring replacement or repair.

(1) Wiring shall be replaced when found to have the following defect:

(a) Wiring that shows evidence of overheating.

(2) Wiring can be repaired when found to have any of the following defects:

(a) Wiring that bears evidence of having been crushed or severely kinked.

(b) Shielded wiring on which the metallic shield is frayed and/or corroded.

(c) Wiring that has been damaged to the extent that the primary insulation has been broken.

d. Terminals and terminal blocks.

(1) Inspect to ensure that the following installation requirements are complete:

(a) Insulating tubing is placed over terminals (except preinsulated types) to provide electrical protection and mechanical support; and is secured to prevent slippage of the tubing from the terminal.

(b) Terminal blocks are securely mounted.

(c) Evidence of overheating is not present on connections to terminal block.

(d) Physical damage to studs or terminal block is not evident. Replace damaged terminal block.

(e) Terminal connections to terminal block studs are free of corrosion and evidence of arcing.

1) Terminal junctions with snap-in pin contacts, check pin contacts for being pulled from the terminal junction, pin contacts for being loose and pin contacts that pull free of the terminal junction easily.

2) A junction box with snap-in pin contacts may be removed from its installation position and visually inspected for loose contacts, corrosion and arcing. Replace terminal junction if contact pins do not lock in securely.

e. Fuses and fuse holders.

(1) Inspect to ensure the following requirements are complete:

(a) For security of connections to fuse holders.

(b) For the presence of corrosion and evidence of overheating on fuses and fuse holders. Replace corroded fuses and clean fuse holders. If evidence of overheating is found, check for correct rating of fuse and cause of overheating condition.

(c) For security of mounting of fuse holder.

(d) Check for proper quantity of spare fuses.

(e) For replenishment of spare fuses with fuses of appropriate current rating.

(f) For exposed fuses susceptible to shorting.

f. Connectors.

(1) Ensure reliability of connectors by checking that the following conditions are met or that repairs are effected as required.

(a) Inspect connectors for pushed back pins, bent pins, moisture corrosion, carbon arc and damaged shell.

(b) Inspect wires leading to the connectors for deterioration due to heat, proper wrapping where required to prevent chafing and proper clamping to provide strain relief.

(c) Inspect coax connectors for pushed back or bent center conductor.

1) Check continuity of the coax cable.

2) Check resistance between conductor and shield.

(d) Inspect for loose contact pins by a slight pull on the wires. All wires that are loose or pull free of the locked position, use proper insertion and retraction tool and reinstall contact pin. If contact pin does not lock in, replace contact pin or connector.

(e) Inspect solder contact for good solder joint.

(f) Connector safetied as required.

g. Splices.

(1) Ensure reliability of crimp and disconnect splices.

(a) Check the spacing of splices at staggered intervals to prevent excessive enlargement of the bundle.

(b) Check wire in the immediate area of the disconnect splice for broken wire and damaged insulation.

h. Junction Boxes.

(1) These assemblies shall be examined to ascertain the following:

(a) Securely mounted.

(b) Clean internally and free of foreign objects.

(c) All lid fasteners on junction boxes are securely fastened by safety wire method, self-locking fasteners or appropriate self-locking device.

(d) Terminal junctions, diodes, relays, resistors, fuses, wiring and etc., shall comply the described electrical inspection.

i. Bonds.

(1) A bond is defined as any fixed union existing between two metallic objects that results in electrical conductivity between them. Such union results from either physical contact between conductive surfaces of the objects or from the addition of a firm electrical connection between them. Other desirable features which must be present for a good bond to exist are as follows:

(a) Intermittent electrical contact between conducting surfaces, which may become part of a ground plane or a current path, shall be prevented either by bonding or by insulation, as appropriate.

(b) Metallic conduit shall be bonded to the airplane structure at each terminating and break point. The bonding path may be through the equipment at which the conduit terminates.

(c) Bond connections shall be secure and free from corrosion.

(d) Bonding jumpers shall be installed in such a manner as not to interfere in any way with the operation of movable components of the airplane.

(e) Self-tapping screws shall not be used for bonding purposes. Only standard threaded screws or bolts of appropriate size shall be used.

(f) Bonding jumpers shall be kept as short and direct as possible.

(g) Bonds shall be attached directly to the basic airplane structure rather than through other bonded parts insofar as practical.

j. Switches.

(1) In the event the following inspections reveal that the switch is unserviceable, replace defective switch with switch of the same type and current rating.

(a) Conduct visual examination for physical damage and check to see that switch is securely attached to the mounting panel.

(b) Check for loose or deformed electrical connections or evidence of corrosion of the terminals, terminal lugs or screws. Check for foreign material (metal chips, wire pieces, etc.) between connections.

(c) Check for manual operation by actuating several times. This also serves to remove any superficial contamination or foreign deposits on the internal electrical contacts.

(d) Test for electrical continuity as measured across the external terminals by means of an ohmmeter. Intermittent or excessive resistance normally indicates that the internal contacts are corroded. Electrically isolate switch from other circuitry during continuity check.

k. Circuit breakers.

(1) In the event the following inspections reveal that the circuit breaker is unserviceable, replace defective circuit breaker with circuit breaker of the same type and current rating.

(a) Determine that the breaker case and mounting means are secure to the mounting panel and there is no evidence of physical damage.

(b) Inspect for loose electrical termination or evidence of corrosion of the terminals, terminal lugs or screws.

(c) Assure positive manual operation by actuating several times. This operation also serves to remove any superficial contaminates or foreign deposits present on the surface of the internal electrical contacts.

(d) Check for evidence that breaker had been subjected to burning or overheating. The burned area is usually caused by electrical arcing as a result of a combination of the presence of excessive moisture and poor dielectric characteristics of the breaker.

(e) Tripped circuit breakers indicate that an abnormal electical overload occurred. Test and physically inspect associated wiring for short circuit.

l. Diodes and transistors.

(1) The semiconductor material is either germanium or silicon. Semiconductor is having electrical conductivity greater than insulators but less than good conductors. In the event the following inspections reveal that the semiconductor malfunctions, replace defective semiconductor with a semiconductor of the same type.

(a) Stud mounted semiconductor must be secure in its mount.

(b) Soldered connections must be inspected for broken leads and cold solder joints.

(c) Transistors are highly shock resistant, but can be damaged by a sharp blow or by being dropped.

(d) Power transistor usually is mounted on a heat sink or on a radiator. The heat sink or radiator normally is not part of the transistor, but power transistor installation is not complete, as far as power operation is concerned, until the power transistor is properly mounted. Inspect the mounting heat sink or radiator installation.

(e) Voltage checks and continuity checks may be used to determine serviceable condition of semiconductors.

m. Resistors.

(1) Inspect to ensure that the following installation requirements are complete.

(a) Power resistors shall be mounted in free air to dissipate heat (free air is free from contacting wires, wire ties, closed spaces and other components).

(b) Check wires in the immediate area for damaged insulation or broken wires and proper routing.

(c) Soldered connections are secure and not a cold solder joint.

(d) The resistor is not broken, charred or indicates signs of overheating.

n. Relays.

(1) Inspect to ensure that the following installation requirements are complete.

(a) Check for secure installation.

(b) Check terminal contacts for cleanliness. The screw contact connection shall be tight and wire routed to prevent the connection from working loose.

(c) Seal terminals where required.

(d) Soldered connections shall be checked for a good joint, single strands of wire that have separated from the wire and cleanliness.

(e) Check wires in the immediate area for damaged insulation or broken wires and proper routing.

NOTE

The side console cover, pedestal covers and all applicable access covers must be removed prior to inspecting wiring, circuit breakers or other electrical components.

o. Electrical.

(1) Inspect wiring for chafing, terminals for security and general condition; circuit breakers for mounting and condition; regulators for mounting, terminals for loose wires; switches for loose wiring proper mounting; relays for wiring and mounting; motors for proper mounting and wires for clamp.

(2) Inspect instruments and interior lights for operation and broken glass; instrument panel and control pedestal for loose wiring, clamps and terminals for security.

(3) Inspect wing and fuselage wiring for proper wire routing, proper clamping and loose terminals.

(4) Inspect engine compartment wire bundles for proper clamping, evidence of burning, heat hardness, security and chafing.

p. Voltage regulators.

(1) Inspect wiring, mounting, condition and wire routing.

q. Flap switches and motor

(1) Inspect wiring and terminals for condition and security.

r. Landing gear switches

(1) Inspect wiring and terminals for condition and security.

s. Battery, battery box, battery vent tubes, battery cables and battery box electrical connections.

(1) Inspect for corrosion, cleanliness, deterioration and damage.

(2) Remove the battery cable ground connection and check for corrosion, cleanliness, condition of the grounding stud and check the structure in the vicinity of the ground for evidence of arcing, cracks in the structure and check the electrical upon installation of the cable.

(3) Inspect the ammeter and voltmeter installed in the instrument panel and battery switch installed on the left side console. When inspecting the battery, some slight deposits of potassium carbonates (white in color) may be encountered; if it is excessive, the battery shall be removed and cleaned. When cleaning is required, use tap water, shop air and stiff bristle brush. Do not use wire brush. If battery is found to have evidence of heat damage (discoloration or deterioration), remove and replace damaged components.

(4) Inspect the electrical components in accordance with the Electrical Power inspection.

(5) Operation of the voltmeter and ammeter is accomplished during operational test of the generator system.

t. Instrument panel and control pedestal.

(1) Inspect wiring, mounting and terminal for condition and security.

(2) Check bonding between stationary panel and instrument panel for proper ground. Resistance must be 0.010-ohms or less.

u. Starter relay.

(1) Inspect contact area for burned and pitted area. If 25 percent of area is burned and pitted, replace relay. (See Figure 2.)

v. Alternators.

(1) Clean the alternator by washing down at the time the engine is cleaned using the same cleaning procedure.

(2) Inspect alternator for condition and security. Inspect retension bolt for condition and security.

(3) Inspect all electrical connections for cleanliness and security.

(4) For electrical output and operational check, refer to electrical section.

(5) Refer to Component Time Limits for overhaul and replacement.

(6) Inspect 100-amp alternator slip ring end bearing by removing bearing end cover.

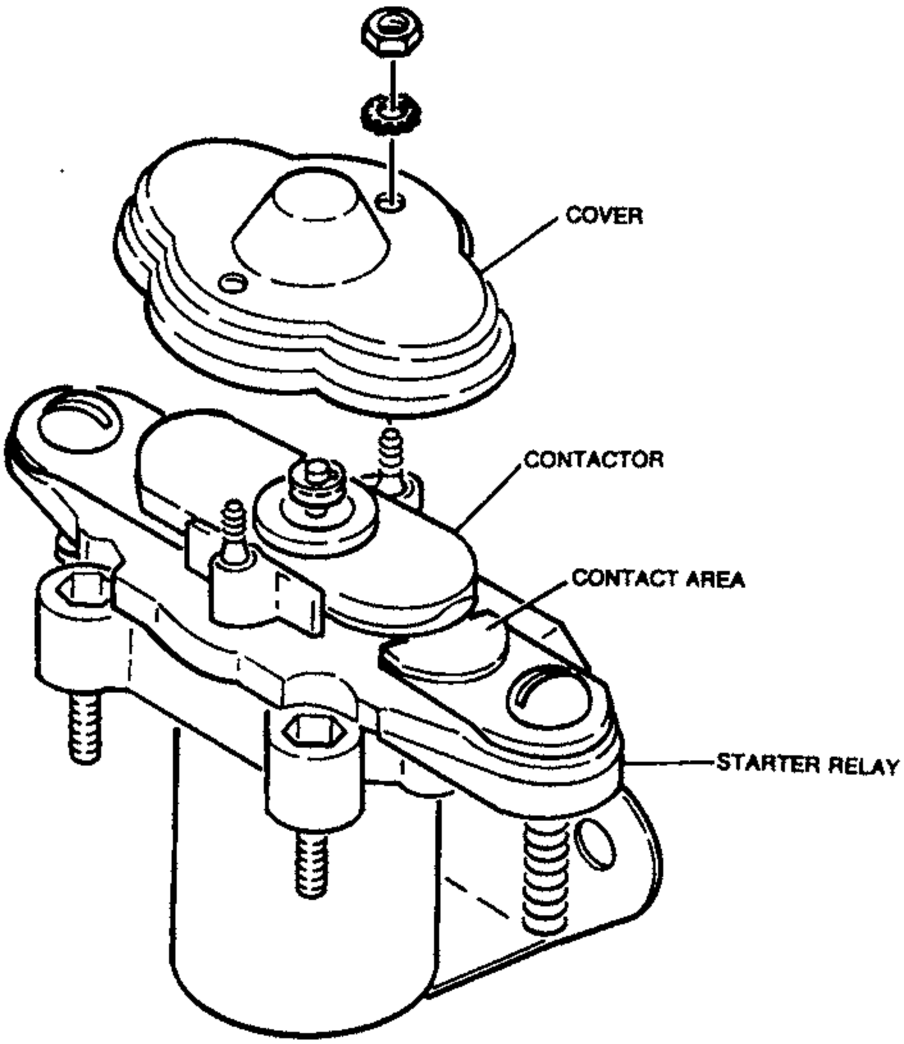
(7) Inspect bearing for signs of overheating or indication that the rotor shaft has been turning in the inner race or the outer race has been turning in the end head. If any of these conditions exist, replace or repair alternator. Refer to manufacturer's overhaul/parts manual.

(8) Check bearing grease for signs of overheating, discoloration or contamination. If any of these conditions exist, replace bearing; if not, lubricate bearings. Refer to servicing.

w. Alternators (100-amp Prestolite only).

(1) Service.

(2) Check alternator water shield for condition and security (if installed).



Starter Relay Inspection
Figure 2

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x. External power.

(1) Inspect the external power receptacle and cable assembly for security, doors for closing, terminals for looseness and corrosion.

6. Equipment and Furnishings (Refer to Section 12). (Inspect the following items if applicable.):

a. Pilot's and copilot's inertia reels, shoulder harness and seat belts.

(1) Inspect for security of installation, frayed edge and evidence of damage and proper operation.

b. Pilot's and copilot's seats.

(1) Inspect seat brackets, guides and stops for condition and security.

(2) Inspect controls for security of installation and proper operation.

(3) Inspect seat structure and cushions for condition and security.

c. Seat tracks.

(1) Inspect seat tracks for condition and security of installation.

(2) Inspect seat track stops for condition, proper location and installation.

d. Passenger seat belts.

(1) Inspect for security of installation, frayed edge and evidence of damage and proper operation.

e. Passenger seats.

(1) Inspect seat brackets, guides and stops for condition and security.

(2) Inspect controls for security and proper operation.

(3) Inspect seat structure and cushions for evidence of damage.

(4) Inspect seats for proper forward and aft installation per seat guides.

f. Mechanical and electrical adjusting seats.

(1) Service seat adjusting screws and bearings.

g. Passenger compartment.

(1) Inspect the forward and aft divider and curtains, headliner, upholstery panels, trim carpet, refreshment center, executive table, 110-volt converter, aft folding door, baggage tie downs, stowage items. Check the divider curtain operation (slide curtain in the track from open to closed position).

(2) Refreshment center, check all doors and/or drawer operations including door latch, drain (if the refreshment center is so equipped), hot cup and hot cup outlet.

(3) Inspect the altimeter and airspeed indicator in the forward divider (if installed) for security and inspect the electrical components in accordance with the Electrical Power inspection.

7. Fire Protection (Refer to Section 12).

a. Detection sensor.

(1) Inspect the fire warning sensor cable installed on each engine as follows:

(a) Inspect the center pins and contacts of each cable to see that the pins are centered properly in the cable terminations, and that no foreign material or contamination exists in the recesses surrounding the pins or contacts.

(b) The continuity check requires an ohmmeter to check the continuity of the center pin conductor and a megohmmeter to check insulation resistance. Inspect for continuity between the sensor cable connector and ground. Refer to Detection Adjustment/Test in fire protection section.

(c) Inspect sensor cable for proper mounting. Adjust mounting clamps to prevent cable assembly from striking or chafing adjacent structure.

(d) Inspect for evidence of engine bleed air leaking into the sensor cable.

(e) Inspect sensor cable for cleanliness, nicks and abrasions.

b. Detection control unit.

(1) The fire detection control units are installed in the left side console and the indicating lights are installed on the instrument panel. Inspect the control units for security.

(2) Check control units connector for damage pins and foreign material.

c. Fire warning indicating lights.

(1) The functional test of the indicating system requires external power and selecting the fire detect position on the test switch (installed on the instrument panel).

(2) Push the press-to-test switch; fire warning indicators illuminate.
   (a) Sensor cable continuity is checked.
   (b) Fire warning wheatstone bridge is checked.
   (c) Fire warning relay is checked.
   (d) Fire warning indicators are checked.

NOTE

A system verification test cannot be accomplished when a short is present.

d. Engine compartment fire extinguisher container.
   (1) Inspection.
      (a) Inspect the fire extinguisher containers. Dents deeper than 0.0625-inch per inch of dent diameter, or scratches deeper than 0.004-inch are cause for removal and rejection of the container.
      (b) Inspect the deployment tube, the conversion placard on the container and the actuator cartridge.
      (c) Inspect the electrical components in accordance with Electrical Power Inspection. Repair of components is limited to replacement of parts.
   (2) Check container pressure.
      (a) If low (see Pressure-Temperature Correction Table) and the container is still within the five-year inspection time, the container can be refilled and returned for service.
   (3) Hydrostatic test.
      (a) Check the date (identified on the extinguisher) of the last test.
      (b) Check the condition of the installation; proper service, corrosion, deformation (dents and gouges) and evidence of damage to determine a hydrostatic test. Refer to Abbreviated Inspection for the recommendation of hydrostatic test.
   (4) Weigh container.
      (a) Weigh container on a scale with a scale that is a 5 to 10 pound scale with an accuracy of plus or minus 0.1 percent full scale. Weight of 0.10 below marked weight indicates a leaky container. Check and recharge container.
   (5) Cartridge.

NOTE

A cartridge in the fire extinguisher container that has been thermally discharged through the container safety valve should be replaced. The maximum temperature has been exceeded.

      (a) Discharge cartridge.
         1) Check the replacement schedule and date of the explosive cartridge. Coordinate replacement with Component Time Limits.
      (b) Cartridge Service Life.
         1) The life of a cartridge shall be determined as starting from the (month/year) that is stamped or marked on the plastic bag containing the cartridge or on the container body.

PRESSURE-TEMPERATURE CORRECTION TABLE

F° TEMPERATURE	-60	-40	-20	0	+20	+40	+60	+80	+100	+120
OPERATING PRESSURE (PSIG)	110 to 134	127 to 155	148 to 180	174 to 212	207 to 251	249 to 299	304 to 354	367 to 417	442 to 492	532 to 582

(6) Expanded Five - year Inspection.
(a) Engine fire extinguishing container.
1) Hydrostatic Test: The maximum time allowed between hydrostatic test of the engine fire extinguisher container is five years. Perform a hydrostatic test on the engine fire extinguisher container. The pressure for the test shall be in accordance with Department of Transportation Specifications, 178.53 Specification 4D and 178.47 Specification 4DS. The vessel shall be returned to service if requirements of the hydrostatic test are acceptable. The container shall be identified by date when the hydrostatic test was performed.

WARNING: DO NOT HAMMER TEST CONTAINER UNDER ANY CIRCUMSTANCES.

(7) Temperature limits.
(a) A container in storage must not exceed 130 Degrees Fahrenheit.
(b) A container in service has a normal temperature of 200 Degrees Fahrenheit.

c. Portable Hand Fire Extinguisher.
(1) Inspect the portable fire extinguisher installed near the right crew seat in the flight compartment for condition and security and proper pressure.

8. Flight Controls (Refer to Sections 5)

a. Inspection of cable system.

(1) Routing.

(a) Examine cable runs for incorrect routing, fraying, twisting, wear at fairleads, wear at rub blocks, wear on guard pins and wear at pulleys. Look for interference with adjacent structure, equipment, wiring, plumbing and other controls.

(b) Check cable movement for binding and full travel. Observe cables for slack when moving the corresponding controls.

(2) Cable fittings.

(a) Check swaged fitting reference marks for an indication of cable slippage within the fitting. Inspect the fitting for distortion, cracks and broken wires at the fitting.

(b) Check turnbuckles for proper thread exposure. Also, check turnbuckle locking clip is properly installed. Refer to the section on safetying.

b. Inspection of control cables.

(1) The control cable assemblies are subjected to a variety of environmental conditions and forms of deterioration that ultimately may be easy to recognize as wire/strand breakage or the not-so-readily visible types of wear, corrosion and/or distortion. The following data will aid in detecting the deficient cable condition.

(2) Broken wire (see Figure 4).

(a) Critical areas for wire breakage are those sections of the cable which pass through fairleads, across rub blocks and around pulleys. Examine cables for broken wires by passing a cloth along the length of the cable. This will detect broken wires if the cloth snags on the cable. When snags are found, closely examine the cable to determine the extent of the damage.

(b) The absence of snags is not positive evidence that broken wires do not exist. An example is illustrated in Figure 4 on detecting broken wires. The damage became readily apparent when the cable was removed and bent in a loop as depicted in the illustration.

(c) Wire breakage criteria for the cables are as follows:

1) Individual broken wires are acceptable in primary and secondary control cables at random locations when no more than one broken wire occurs per inch, and no more than five broken wires in 10 inches. Additionally, in any area of broken wires, e.g. one inch each side of a broken strand, wear on adjacent wires in the strand may not exceed 40 percent.

(3) External cable wear patterns.

(a) Wear will normally extend along the cable equal to the distance the cable moves at that location and may occur on one side of the cable only or on its entire circumference. Replace cables when the individual wires in each strand appear to blend together as illustrated in Figure 3. Additional external cable wear patterns are illustrated in Figure 3. External cable wear less than having the wires blend together, is considered serviceable; however, monitoring the condition of that cable shall be at a frequency more often than a cable experiencing no external wear.

(4) Internal cable wear pattern (see Figure 3).

(a) As wear is taking place on the exterior surface of a cable, the same condition is taking place internally, particularly in the sections of the cable which pass over pulleys, quadrants and sectors. This condition is not easily detected unless the strands of the cable are separated. Wear of this type is a result of the relative motion between inner wire surfaces. Under certain conditions, internal cable wear can be greater than external cable wear. See Figure 3 for internal cable wear pattern. Replace cable if internal wear can be identified.

(5) Corrosion.

(a) Carefully examine any cable for corrosion that has a broken wire in a section not in contact with wear producing airframe components such as pulleys, fairleads, rub blocks, etc. It may be necessary to remove and bend the cable to properly inspect it for internal strand corrosion as this condition is usually not evident on the outer surface of the cable. Replace cable if internal corrosion is found.

(b) Areas conducive to cable corrosion are below refreshment center, in the wheel well and in the tailcone. Also, if a cable has been wiped clean of its corrosion preventive lubricant and metal-brightened, the cable shall be monitored closely for corrosion.

c. Inspecting pulleys (see Figure 5).

(1) Inspect pulleys for roughness, sharp edges and presence of foreign material embedded in the grooves. Examine pulley bushings or bearings to assure smooth rotation, freedom from flat spots and foreign material.

(2) Periodically rotate pulleys, which turn through a small arc, to provide a new bearing surface for the cable.

(3) Check pulley alignment. Check pulley brackets and guards for damage, alignment and security. Various cable system malfunctions may be detected by analyzing pulley conditions. Refer to the figure 5 for pulley wear patterns; these include such discrepancies as too much tension, misalignment, pulley bearing problems and size mismatch between cable and pulley.

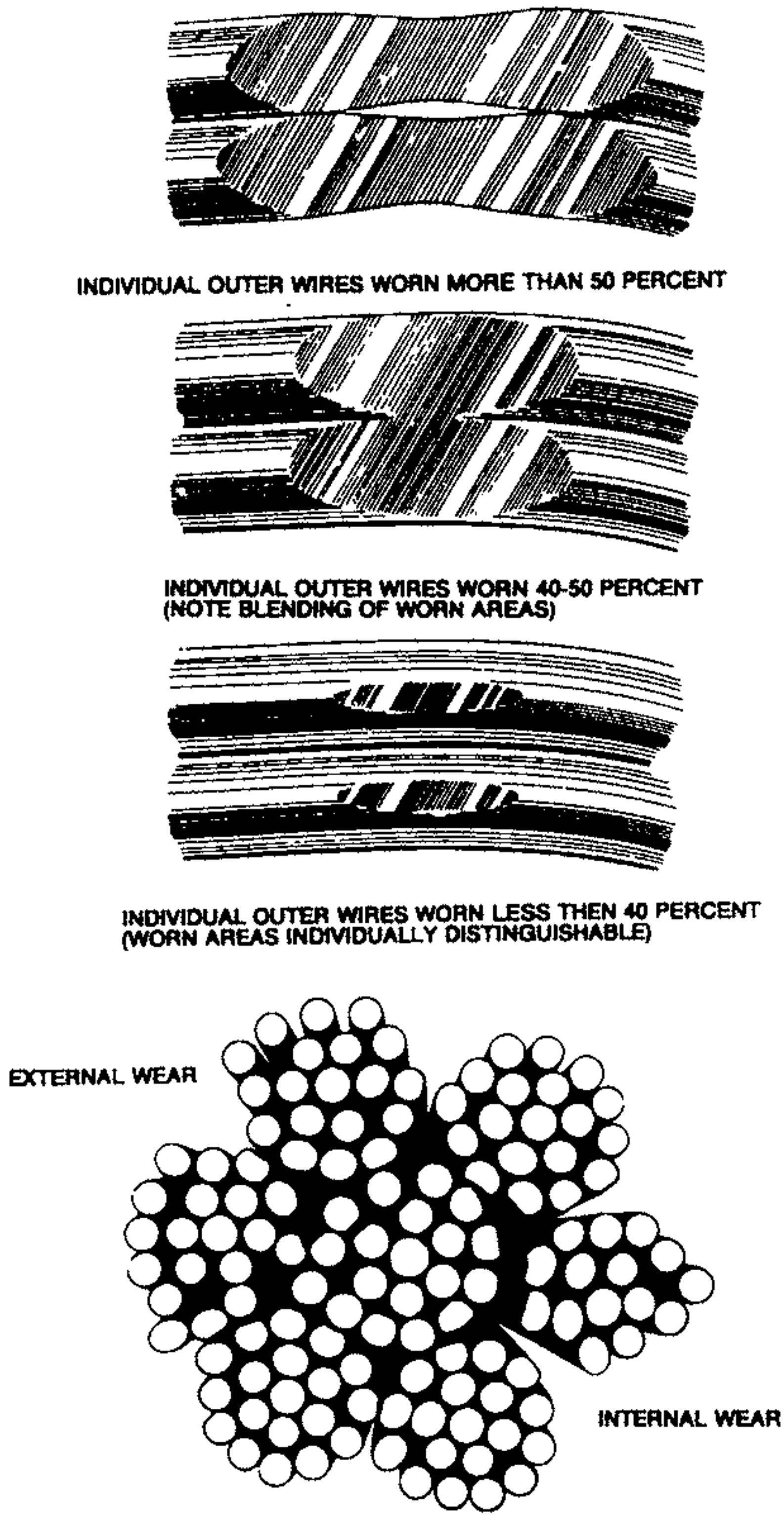
d. Inspection of pressure seals

(1) Check the seal for deterioration.

(2) Check the seal to see if it retains grease. If all the lubricant is out of the seal, replace the pressure seal.

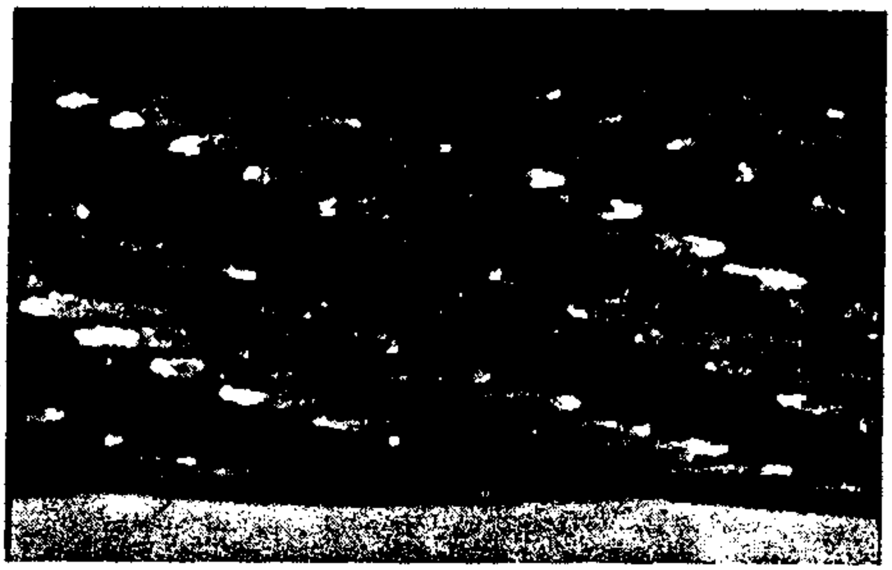
e. Inspection of chain and sprockets.

(1) Inspect chain for proper safety at all points and chains for proper alignment on sprockets. Inspect chain, chain guard and sprockets for wear, damage and security. Inspect chain to cable attach link for security.



Cable Wear
Figure 3 (Sheet 1 of 2)

WORN CABLE (REPLACEMENT NECESSARY)



WORN CABLE (REPLACEMENT RECOMMENDED)

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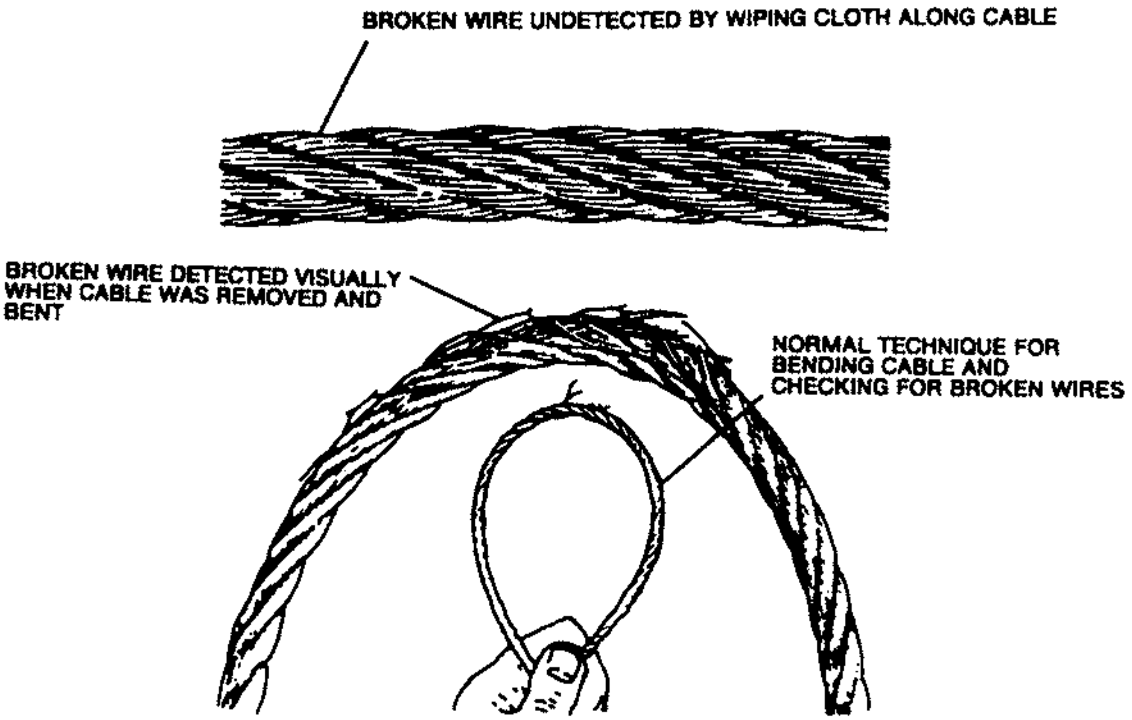
Cable Wear
Figure 3 (Sheet 2)



Cable Broken Wire
Figure 4

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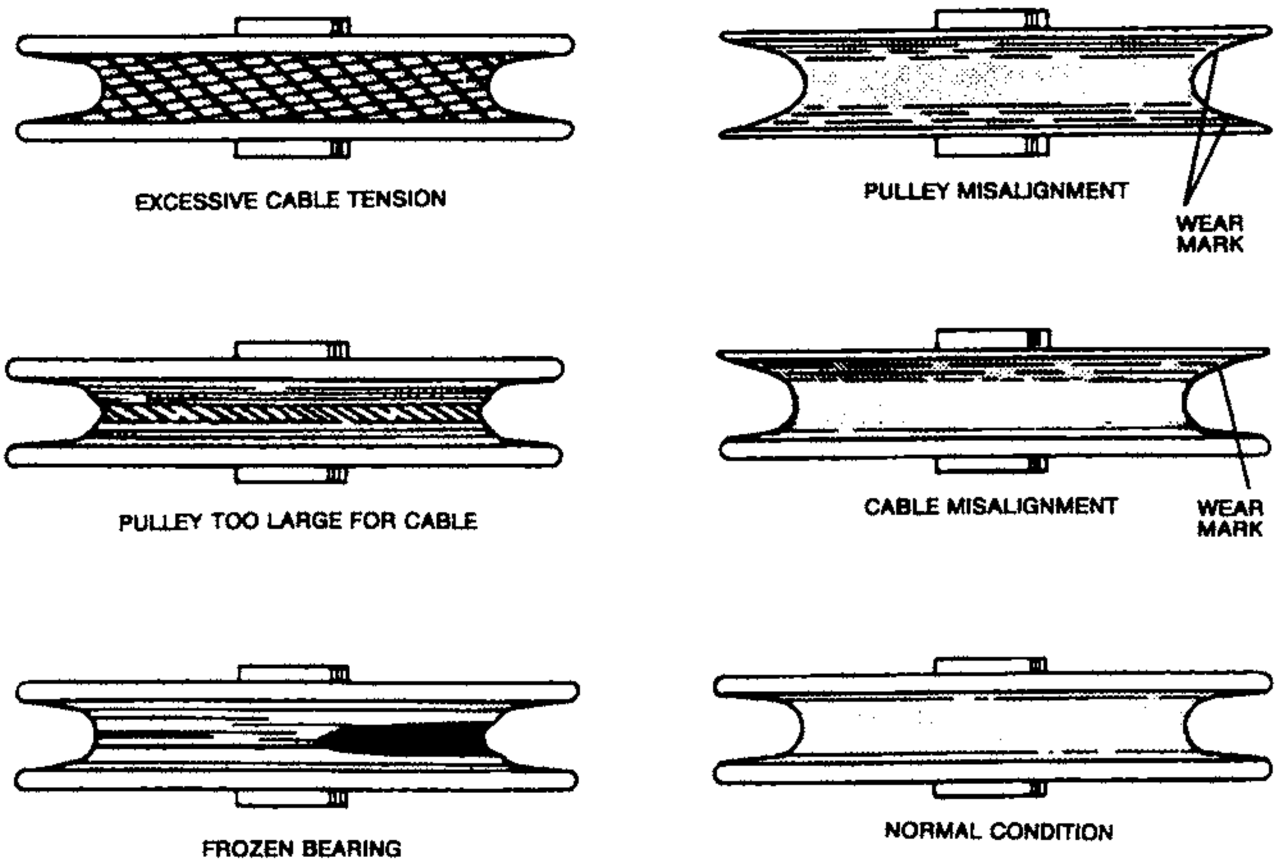


Pulley Wear Patterns
Figure 5

f. Inspection of aileron and aileron trim control system.

(1) Aileron and trim control cables.

(a) Wipe cables clean with a clean cloth and inspect control cables for freedom of movement (no binding) and proper routing.

(b) Inspect cables, pulleys and pressure seals, in accordance with their inspection procedures.

(c) Inspect turnbuckle for proper safetying.

(d) Check cables for proper rigging and cable tension (if required).

(2) Aileron control system.

(a) Inspect the aileron skins for cracks and loose rivets; aileron hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security.

(b) Inspect the aileron hinge bolts for proper safetying of nuts with cotter pins.

(c) Inspect balance weights for looseness and their supporting structure for damage.

(d) Inspect the aileron actuator yoke, yoke attach bracket, yoke attach bolts and yoke mount bracket attach nutplates for evidence of damage or wear, condition and security.

(e) Inspect yoke attach bolts for proper safetying of nuts with cotter pins.

(f) Inspect the aileron quadrant for condition, security, corrosion, evidence of damage to quadrant arm, stop bolts and support bracket.

(g) Inspect aileron quadrant bolt and stop bolts for proper safety wire installation.

(h) Inspect the aileron bellcrank for condition, security, corrosion, evidence of damage to guard pins, guides and cable attach points.

(i) Inspect control wheel for evidence of damage and security. Operate control wheel and check for freedom of movement and proper rigging.

(3) Aileron trim tab system.

NOTE

Maintain a minimum of 0.40-inch thread engagement on all trim tab actuators. Minimum engagement is to be measured from the fully extended actuator position.

(a) Inspect the trim tab skins for cracks, loose rivets and security. Inspect trim tab hinge for cracks, security and evidence of damage.

(b) Inspect hinge pin for proper installation at hinge pin retainer.

(c) Inspect horn and push rod for evidence of damage and security.

(d) Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.

(e) Inspect the trim tab actuator for security and evidence of damage, mounting clamp(s) (if applicable) and structure for evidence of damage, cracks and security (clamps must be firmly seated on actuator).

(f) Inspect mounting clamp bolts or screws for security. If the torque putty is broken or cracked, remove the putty, torque bolts 20 to 25 inch-pounds and apply white lacquer torque putty to bolts for future inspections.

(g) Inspect snap rings for complete and proper engagement in snap ring grooves of actuator. Check that snap rings are properly seated in positioning slots on the mounting bracket(s).

(h) Inspect actuator rod for evidence of bending.

(i) Inspect push rod bolt at actuator for proper safety of nut with cotter pin.

(j) Inspect push rod ends for bearing looseness and excessive wear.

(k) When servicing actuator, remove shaft from actuator and inspect threads for condition, rust, excessive wear and foreign particles that may impair smooth operation. (Refer to fight control chapter for removal and installation.) Replace the internal plunger and the shaft if any evidence of damage is detected. Lubricate threads (see servicing instructions) and install shaft.

(l) Inspect aileron trim tab control and indicator for security, evidence of damage.

(m) Operate control and check aileron trim tab for freedom of movement.

(n) Inspect guide block for evidence of damage and security.

(4) Aileron and trim tab deflection check. Refer to specification page for deflection valves.

(a) Rotate control wheel counterclockwise until stops contact. Hold aileron in this position and make the following checks:

1) Check right aileron deflection degrees below neutral position and check left aileron deflection degrees above neutral position.

(b) Rotate control wheel clockwise until stops contact. Hold aileron in this position and make the following checks:

1) Check left aileron deflection degrees below neutral position and check right aileron deflection degrees above neutral position.

(c) Return ailerons to neutral position.

(d) Rotate aileron trim control knob clockwise until stop contacts. Check trim tab deflection degrees above neutral position.

(e) Rotate aileron trim control wheel counterclockwise until stop contacts. Check trim tab deflection degrees below neutral position.

(f) Return trim tab to neutral position.

(g) Check aileron trim tab deflection (free play) as follows (see Figure 6):

1) With aileron and aileron trim tab in neutral position, restrain the aileron control surface and manually deflect the tab at the trailing edge at the point where the actuator push-pull rod is located. Using one pound of force, deflect the tab one direction and measure the deflection from neutral using the control surface as a reference, then measure the deflection from neutral in the opposite direction. The sum of the two deflections must not exceed 0.050-inch at the outboard trailing edge. If the sum of the two deflections exceeds 0.050- inch, replace the bolts in the push rod and recheck; if unacceptable, replace bearing in rod end and recheck; if unacceptable, replace the trim tab horn bearing and recheck; if still unacceptable, overhaul or replace the trim tab actuator and ensure areas are properly safetied.

NOTE

If new pins are installed when replacing bearings, safety wire them in place.

g. Inspection of rudder and rudder trim control system.

(1) Rudder and trim control cables.

(a) Wipe cables clean with a clean cloth and inspect control cables for freedom of movement (no binding) and proper routing.

(b) Inspect cables, pulleys, pressure seals, chains, sprockets and guides in accordance with their inspection procedures.

(c) Inspect turnbuckle for proper safetying.

(d) Check cables for proper rigging and cable tension.

(2) Rudder control system.

(a) Inspect the rudder skins for cracks and loose rivets; rudder hinges for conditon, cracks and security; hinge bolts, hinge bearings, hinge attach fitting and bonding jumper for evidence of damage or wear, failed fasteners and security.

(b) Inspect the rudder hinge bolts for proper safety of nuts with cotter pins.

(c) Inspect balance weight for looseness and the supporting structure for damage.

(d) Inspect rudder bellcrank stop bolts for corrosion, evidence of damage and security.

(e) Inspect cables attached to bellcrank for proper cotter pin safety.

(f) Inspect rudder pedals for evidence of damage and security. Operate rudder pedals and check for freedom of movement and proper rigging.

(3) Rudder trim tab system.

NOTE

Maintain a minimum of 0.40-inch thread engagement on all trim tab actuators. Minimum engagement is to be measured from the fully extended actuator position.

(a) Inspect the trim tab skins for cracks, loose rivets and security; trim tab hinge for security, cracks and evidence of damage.
(b) Inspect hinge pin for proper installation and proper cotter pin safetying at both ends.
(c) Inspect horn and push rod for evidence of damage and security
(d) Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.
(e) Inspect the trim tab actuator for security and evidence of damage.
(f) Inspect guide block and clamp for evidence of damage and security.
(g) Inspect actuator mounting bolts for security. If torque putty is broken or cracked, remove putty, retorque mounting bolts.
(h) Inspect actuator rod for evidence of bending.
(i) Inspect push rod bolts for proper safetying of nuts with cotter pins.
(j) Inspect push rod ends for bearing looseness and excessive wear.
(k) While servicing, remove screw assembly from trim tab actuator and inspect threads for damage, corrosion or dirt particles that may impair smooth operation. (Refer to flight control section for removal and installation.)
(l) Overhaul actuator assembly if any damage is detected.
(m) Lubricate threads (see servicing instructions) and install screw assembly.
(n) Inspect rudder trim tab control and indicator for security, evidence of damage. Operate trim tab control and check rudder trim tab for freedom of movement.

(4) Rudder and trim tab deflection check. Refer to specification page for deflection valves.

NOTE

Deflection is measured perpendicular to hinge line.

(a) Place the rudder and rudder trim tab in trail position.
(b) Depress the rudder pedal to full left rudder. Check rudder deflection degrees to the left.
(c) Depress the rudder pedal to full right rudder. Check rudder deflection degrees to the right.
(d) Rotate the rudder trim control wheel to full nose left. Check rudder trim tab deflection degrees to the right.
(e) Rotate the rudder trim control wheel to full nose right. Check rudder trim tab deflection degrees to the left.

(5) Check rudder trim tab deflection (free play) as follows (see Figure 6):

(a) With rudder and rudder trim tab in neutral position, restrain the rudder control surface and manually deflect the tab at the trailing edge at a point where the actuator push-pull rod is located. Using one pound of force, deflect the tab in one direction and measure the deflection from neutral using the control surface as a reference, then measure the deflection from neutral in the opposite direction. The sum of the two deflections must not exceed 0.200 at the upper end of tab. If the sum of the two deflections exceeds are 0.200 replace the bolts in the push rod and recheck. If unacceptable, replace bearing in rod end and recheck; if unacceptable, replace the trim tab actuator and ensure areas are properly safetied.

NOTE

If a new pin is installed when bearing is replaced, safety wire pin to actuator.

h. Gust lock inspection (if installed).

(1) Check for smooth operation and release. The cam and locking mechanisms must be capable of uniform movement throughout stroke cycle. Check to ensure cam is located to release trigger properly. Perform sideload test procedure, refer to Section 5, Rudder Gust Lock - Sideload Check. (Gust lock is released no less than 3 degrees trailing edge down on elevator with rudder side load applied.)
(2) Check clearance between tailcone skin and rudder skin. This distance shall not be less than 0.56 inch.
(3) Check that the locking pin is completely retracted when it is in the UNLOCKED position.
(4) Check rudder travel with locking pin retracted. Travel should be free and smooth.

i. Inspection of elevator and elevator trim control systems.

NOTE

Maintain a minimum of 0.40-inch thread engagement on all trim tab actuators. Minimum engagement is to be measured from the fully extended actuator position.

(1) Elevator and trim control cables.
   (a) Wipe cables clean with a clean cloth and inspect control cables for freedom of movement (no binding) and proper routing.
   (b) Inspect cables, pulleys, pressure seals, chains, sprockets and guides in accordance with their inspection procedures.
   (c) Inspect turnbuckle for proper safetying.
   (d) Check cables for proper rigging and cable tension.
(2) Elevator control system.
   (a) Inspect elevator skins for cracks and loose rivets; elevator hinges for condition, cracks and security; hinge bolts, hinge bearings, hinge attach fittings and bonding jumpers for evidence of damage or wear, failed fasteners and security.
   (b) Inspect the elevator hinge bolts for proper safetying of nuts with cotter pins.
   (c) Inspect elevator torque tube end assembly for looseness.
   (d) Inspect balance weights for looseness and supporting structure for damage, and inspect outboard tips for cracks in rib flange and web.
   (e) Inspect taper pins for looseness (some airplanes).
   (f) Remove access panels on bottom of tailcone and horizontal stabilizer fairing and stinger. Inspect bellcrank, push rods, stop bolts and brackets for corrosion, evidence of damage, failed fasteners and security, proper safetying of bellcrank and push rod bolts for proper safetying of nuts with cotter pins.
   (g) Inspect control column and bob weights for evidence of damage, failed fasteners and security.
   (h) Inspect installation and security of spacers at elevator bellcrank in quadrant.
(3) Elevator trim tab system.
   (a) Inspect the trim tab skins for cracks, loose rivets and security; trim tab hinge for security, cracks and evidence of damage; Hinge pin for proper security.
   (b) Inspect horn(s) and push rod(s) for evidence of damage and security.
   (c) Inspect push rod bolts for condition and proper safetying of nuts with cotter pins.
   (d) Inspect the trim tab actuator for security and evidence of damage; mounting clamp(s) (if applicable) and mounting structure for evidence of damage, cracks and security at the rear spar of the horizontal stabilizer.
   (e) Inspect mounting clamp bolts or screws for security. If the torque putty is broken or cracked, remove putty; torque bolts 20 to 25 inch-pounds and apply white lacquer torque putty to bolts for future inspections.
   (f) Inspect snap rings (if applicable) for complete and proper engagement in snap ring groove of actuator. Check that snap ring is properly seated in positioning slot on the mounting bracket.
   (g) Inspect actuator rod for evidence of bending.
   (h) Inspect push rod bolt and actuator for proper safetying of nut with cotter pin.
   (i) Inspect push rod ends for bearing looseness and excessive wear.
   (j) While servicing, remove screw assembly from trim tab actuator and inspect threads for damage, corrosion or dirt particles that may impair smooth operation. (Refer to flight control section for removal and installation.)
   (k) Overhaul actuator assembly if any damage is detected.
   (l) Lubricate threads (see servicing instructions) and install screw assembly.
   (m) Inspect elevator trim tab control and indicator for security and evidence of damage. Operate trim tab control and check for freedom of movement.
(4) Elevator and trim tab deflection check. Refer to specification page for deflection valves.
   (a) Place the elevator and elevator trim tab in neutral position.

(b) Place the inclinometer to the elevator and pull the control wheel aft. Check elevator deflection degrees up.

(c) Push the control wheel forward. Check elevator deflection degrees down.

(d) Rotate the elevator trim control wheel to full nose up position. Check elevator trim tab deflection degrees down.

(e) Rotate the elevator trim control wheel to full nose down position. Check elevator trim tab deflection degrees up.

(5) If electric elevator trim (optional) is installed:

(a) Apply electrical power to operate the electric trim.

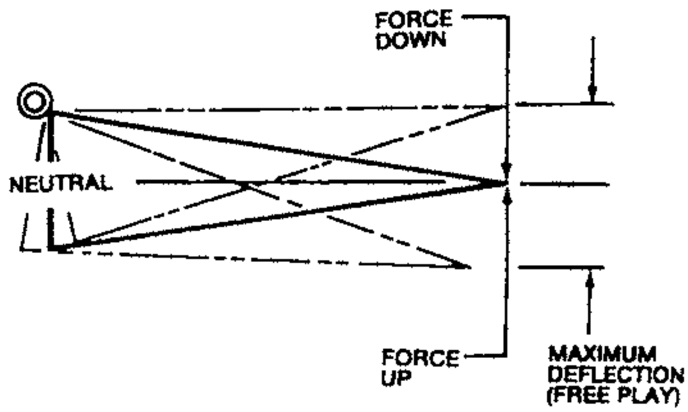
(b) Operate the elevator trim control switch on the left control wheel left grip.

(6) Check elevator trim tab deflection (free play) as follows (see Figure 6).

(a) With elevator and elevator trim tab in neutral position, restrain the elevator control surface and manually deflect the tab at the trailing edge at the point where the actuator push-pull rods are located. Using one pound of force, deflect tab in one direction and measure the deflection from neutral using the control surface as a reference; then measure the deflection from neutral in the opposite direction. The sum of the two deflections must not exceed 0.070 at the outboard trailing edge. If the sum of the two deflections exceeds 0.070, replace the bolts in the push rod with NAS464 bolts of equivalent diameter and grip length, and recheck; if unacceptable, replace bearing in rod end and recheck; if unacceptable, replace the trim tab horn bearing and recheck; if still unacceptable, adjust actuator bearing to remove end play from actuator body, tighten the bearing and then drill new holes through the bearing and reinstall the groov-pins and safety wire pins to actuator. If still unacceptable, replace the trim tab actuator and ensure areas are properly safetied.

NOTE

If new pins are installed when replacing bearings, safety wire them in place.



Trim Tab Deflection
Figure 6

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j. Inspection of stall warning system.

(1) Inspect the stall warning transmitter for condition and security of installation, cleanliness, vane operates free and warning horn operational.

k. Inspection of yaw damper system.

(1) Inspect yaw damper actuator for security; mount for cracks and structure for evidence of damage.

(2) Wipe cables clean with a clean cloth and inspect control cables for freedom of movement (no binding) and proper routing.

(3) Inspect cables, pulleys, chains, sprockets and guides in accordance with their inspection procedures.

(4) Inspect turnbuckle for proper safetying.

(5) Check cables for proper cable tension.

(6) Inspect bellcranks, links, arm assembly, bolts and mounting brackets for condition and security.

l. Inspection of flap system.

(1) Angular dimensions for checking flaps are measured by placing inclinometer on flap surface. Flap is in zero degree position when the trailing edge is streamlined with wing to fuselage fairing. Refer to flight control section.

(2) Move flaps to the full down position.

CAUTION

OPEN FLAP CIRCUIT BREAKER OR DISCONNECT BATTERY TO PREVENT OPERATION OF FLAPS.

(3) Open flap circuit breaker.

(4) Remove floor panels as required to provide access to flap control cables. Remove access covers from wing.

(5) Inspect bellcranks, push rods, pulleys and brackets for corrosion, cracks, nicks, wear, bends or warping.

(6) Inspect bearings for seizure or excessive wear.

(7) Inspect push rods for loose locknuts and use push rod inspection holes to verify that there is sufficient thread engagement of rod end to reach at least to the inspection hole.

(8) Check for proper safetying and broken putty. If the torque putty is broken or cracked, remove putty, retorque and apply white lacquer torque putty for future inspections.

(9) Inspect cable seals for deterioration and lubrication.

(10) Wipe cables clean with a clean cloth and inspect control cables for freedom of movement (no binding) and proper routing.

(11) Inspect cables, pulleys, pressure seals, chains, sprockets and guides in accordance with their inspection procedures.

(12) Inspect turnbuckle for proper safetying.

(13) Check cables for proper cable tension.

(14) Inspect flap motors for security of installation, evidence of overheating and damaged electrical components.

(15) Inspect gear box, shafts and chains for cracks, cleanliness and excessive wear.

(16) Check actuator for worn bearings, worn sprockets, loose mounting and misalignment.

(17) Inspect flap preselect, pulleys and brackets for cracks, bends, corrosion and security of installation.

(18) Check limit switches for loose connections, evidence of burning or arcing and security of installation.

(19) Inspect flaps for dents, tears, ribs, corrosion, loose rivets and loose screws in access panels and proper flush fit.

(20) Check bearings for excessive wear, loose bolts and worn tracks.

(21) Use Stoddard solvent to remove dirt and grease in the flap scissor area. Refer to flight control section. Inspect the flap scissors and attaching bolts for wear and security.

(22) Check for proper cable tensions and flap rigging. Refer to specifications page.

(23) Check flap operation for proper flight operation. Refer to flight control section.

(24) Inspect flap hinges for cracked hinge sections. Acceptable limits are a maximum of two consecutive cracked sections provided a minimum of three noncracked hinge sections must exist between the cracked sections unless the discrepant hinge sections are within ten hinge sections from either end of flap. In which case, ten hinge sections must exist between two cracked hinge sections. Inspection interval must be reduced to 50 hours while operating airplane under the acceptable limits. Replace hinge when cracks are beyond acceptable limits.

(25) Perform flap operation check.

(a) Close flap circuit breaker.

(b) Operate flaps through one complete cycle; check limit switches and operation of approach switch to sound gear warning horn.

(c) Check flap travel.

1) Move flaps preselect to zero degree position; measure angle of flap. Refer to flight control section.

9. Fuel (Refer to Section 9).

a. Fuel selector gear box, fuel selector valve and crossfeed control.

(1) Perform an operational check (feel for detents).

(2) Inspect linkage and bearings for condition and security.

(3) Service.

(1) Clean or replace.

b. Fuel filter

(1) Clean or replace.

c. Fuel system main.

(1) Inspect plumbing vent scoops, fuel filler assembly, drain valves and component mounting for condition, security, fuel leaks and fuel stains. If fuel leakage is evident, defuel and repair. Refer to fuel section.

(2) Inspect the electrical components in accordance with Electrical Power Inspection.

d. Auxiliary fuel pumps

(1) Inspect for leaks at seals, operation, vent and overboard drain for obstruction.

e. Wing leading edge vent hole

(1) Clean obstructions.

f. Fuel inlet float valve.

(1) Perform operational check.

g. Wing locker transfer pump (if installed).

(1) Inspect for leaks, condition and security.

(2) Clean screen.

h. Heater fuel filter.

(1) Clean and inspect for deterioration

i. Heater fuel pump.

(1) Inspect for condition and security.

10. Hydraulic Power (Refer to Section 11)

a. Hydraulic pump.

(1) Inspect for leaks, condition and security.

b. Hydraulic fluid filter.

(1) Change element if required.

c. Hydraulic hoses.

(1) Inspect for hardness, deterioration, looseness and bulging.

d. Hydraulic system.

(1) Inspect plumbing and components for leaks, condition and security. For servicing reservoir, refer to servicing section.

(2) Inspect hydraulic system electrical components in accordance with the Electrical Power Inspection.

e. Hydraulic system pressure switch and flow switches.

(1) Inspect switches for leaks.

f. Reservoir vent line.

(1) Inspect vent line for obstruction.

g. Hydraulic lines.

(1) Perform hydraulic pressure lines leak test. Refer to Section 11, Inspection/Check.

11. Ice and Rain Protection (Refer to Section 12).

a. Surface deice system (pneumatic).

(1) Inspect the flow valves, pressure switches and deice time for condition and operation. To perform an operational test of the deice boots, flow valves and deice timer, operate the airplane engines.

(2) Inspect lines and clamps for leaks, conditon and security.

(3) Inspect the electrical components in accordance with Electrical Power Inspection.

b. Regulator and deice control valve.

(1) Inspect for condition and security.

(2) Inspect electrical components in accordance with Electrical Power Inspection.

c. Deice boots.

(1) Inspect the rubber boots installed on the airfoil leading edge for abrasions, cuts, nicks and security of mounting.

d. Deice filter.

(1) Inspect for condition. To clean filter, remove filter and clean with naphtha and dry with a jet of dry compressed air.

e. Windshield anti-ice system (alcohol), (if installed).

(1) Nozzles.

(a) Inspect for security and obstructions.

(2) Pump.

(a) Inspect for leaks, condition and security.

(3) Anti-ice system.

(a) Inspect for leaks, condition and security.

(b) Inspect lines for cracks, chafing and abrasions.

(c) Perform operational check of controls.

f. Propeller deice slip rings, brushes and boots.

(1) Inspect propeller deice brushes for condition. The brushes are deemed replaceable when 0.25 inch of brush material remains. It is considered good practice, however, to replace the brushes when 0.375 inch of the brush material still remains. The brush block should be dismantled and the brush length measured periodically in order to determine usable remaining brush lengths.

(2) Inspect brush holder and mounting bracket for condition and security.

(3) Inspect slip rings and boots for condition and security.

(4) Perform operational check.

g. Propeller deice electrical leads.

(1) Inspect for condition and security in accordance with Electrical Power Inspection.

h. Heater elements on static ports, pitot tube(s), angle-of-attack (optional) and stall warning vane.

(1) Inspect for condition and security.

(2) Perform operational check.

i. Wing locker (421)

(1) Perform operational check of nacelle drain heating element.

12. Landing Gear (Refer to Section 4).

a. Nose and main landing gear assemblies.

(1) Clean exterior surface with clean cloth. Inspect visible parts of the trunnion, cylinder, piston, axle,drag brace and torque links for nicks, gouges, chipped paint and evidence of damage. Visually check washers and torque links in area of washer contact for wear and damage. Visually inspect attaching fasteners that assemble components for failed or damaged fasteners.

b. Nose and main landing gear retracting linkage.
   (1) Inspect the main and nose gear actuator for hydraulic oil leaks, failed or damaged fasteners, damaged down and lock switches. Inspect the piston rod end for condition and security.
   (2) Inspect the main and nose gear uplock assemblies for hydraulic oil leaks, failed or damaged fasteners. Inspect uplock hook for wear and evidence of damage.
   (3) Inspect the landing gear control handle assembly for loose components.

c. Landing gear system operational check.
   (1) With airplane on jacks, perform operational check. Check for excessive noise and for proper operation.

d. Landing system rigging inspection.
   (1) Perform landing gear rigging inspection. See Figure 7.

e. Nose and main landing gear shock struts.
   (1) Check the shock strut for proper inflation; inspect for evidence of hydraulic oil leaks and proper extension; check air pressure. Service shock strut if evidence of oil leak and / or air pressure is not in accordance with service placard.
   (2) Inspect barrel for corrosion, pitting and cleanliness.

f. Wheels, Tires and Brakes.
   (1) Clean surface. Inspect visible areas of the nose and main gear wheels for nicks, corrosion, scratches,scuffed finish, cracks, loose or missing wheel bolts.
   (2) Inspect disc drive keys for damage, looseness and excessive wear.
   (3) Inspect bearing cups for damage and wear. Do not remove bearing cups unless replacement is required.
   (4) Inspect retainers and snap rings for damage and distortion. Straighten or replace as necessary.
   (5) When repacking wheel bearings, clean and inspect bearings and seals for damage; refer to servicing section. Corroded areas on wheel can be repaired. Refer to landing gear section.
   (6) With airplane on jacks, check for looseness in main gear assembly attach points by relieving hydraulic lock (if applicable) in actuator and manually moving gear assembly. Also, check freedom of movement in main gear attach bearings.
   (7) Check main gear wheel camber adjustment. Refer to landing gear section.

   CAUTION : **BRAKES, FLAT SPOTS, EXPOSED CORDS AND CUTS THAT DAMAGE CORDS ARE CAUSE FOR IMMEDIATE REJECTION OF TIRE. SHOULD THERE BE ANY DOUBT ABOUT A TIRE'S RELIABILITY, DON'T HESITATE TO REJECT IT.**

   (8) Inspect tires for wear, cuts, brakes, foreign objects embedded in tread and flat spots and / or exposed cords.
   (9) Check tire inflation and service tire.

g. Shimmy damper.
   (1) Inspect shimmy damper for mounting security, failed attaching fasteners, hydraulic oil leaks and proper service.
   (2) Check for a properly serviced shimmy damper. Refer to servicing section.

h. Nose gear steering.
   (1) Inspect the steering bellcrank and spring assembly for failed fasteners and evidence of damage.
   (2) Inspect control cables for proper routing, chafing, fraying and corrosion.
   (3) Check cable rigging for proper cable rigging for proper cable tension. A tensiometer is utilized to check cable tension.
   (4) Check nose wheel and rubber pedal alignment.

i. Position and warning.
   (1) Inspect the landing gear position and warning switches, uplock switches, down and lock switches, and safety switches for security in installation.

(2) Inspect the electrical components in accordance with the electrical Power Inspection.
(3) Operation of the switches, indicators, warning horn and horn disable switches, is performed during
landing gear functional test.

j. Main landing gear support bearing-inspect retainer ring, bearing race and bearing for condition, wear, damage and security.

k. Nose and main landing gear door.
(1) Inspect doors and linkage for condition and security.

l. Emergency gear extension.
(1) Inspect the landing gear emergency blowdown system components.
(2) Check the handle assembly and cable for condition and security.
(3) Inspect the air storage bottle for proper service. Refer to servicing section. Refer to Parts Catalog for overhaul kit to repair valve assembly if required.
(4) Inspect blowdown bottle.
(a) Internal.
1) Illuminate inside the blowdown bottle and inspect surface with a boroscope.
a) Check for corrosion and deformity. No corrosion or deformation is acceptable.
(b) External.
1) Inspect threaded ports for defects.
2) Inspect blowdown bottle for nicks, corrosion and dents. Nicks greater than 0.002, corrosion
or dents are not acceptable.
3) Inspect gage, relief valve, changing valve for damage and security.
4) Inspect blowdown bottle for security of mounting and lines for chafing and damage.
5) Check that blowdown bottle is changed within the green range indicated on gage.

m. Brakes.
(1) Brake system plumbing.
(a) Clean as required. Refer to landing gear section.
(b) Inspect fittings for damaged threads and deformed flares on ends of tubing; lines for cracks, dent, deep scratches, flattened bends and signs of chafing; hoses for swelling, cracking, abrasions through protective plies and leaks. Repairs to brake system plumbing should be made in accordance with best shop practice using standard parts and procedures and conducted in compliance with applicable regulations. For repairs, refer to landing gear section.
(2) Brake assemblies.
(a) Clean as required. Refer to landing gear section.
(b) Inspect metal parts for wear and thread damage.
(c) Inspect brake disc. Refer to landing gear section.
(d) Inspect cylinder walls for corrosion, pitting and scoring. Refer to landing gear section.
(3) Brake master cylinder.
(a) Clean all metal parts. Refer to landing gear section.
(b) Inspect metal parts for wear and thread damage.
(c) Inspect cylinder walls for corrosion, pitting and scores.
(d) Inspect O-ring seal and O-ring portion of lock-o-seal for swelling, chipping or other evidence of damage. For approved repairs, refer to landing gear section.

n. Main landing gear trunnion crack inspection.

NOTE : This inspection is applicable to airplanes 421C0001 thru 421C0638 not incorporating SK421-93.

(1) Perform a fluorescent dye penetrant inspection of trunnion area. Refer to Figure 6A.
(2) Utilize fluorescent dye penetrant inspection procedures as outlined by the penetrant test kit manufacture and/or service Letter ME79-11.

NOTE : To check drag brace over center adjustment refer to Chapter 32.

NOTE: THERE ARE SEVERAL MANUFACTURES OF FLUORESCENT PENETRANT MATERIALS, WHICH ARE SATISFACTORY PROVIDED THE MATERIALS ARE USED AS A FAMILY GROUP.

(3) If no cracks are found - Clean the area and paint with two coats of zinc chromate primer.
(4) If cracks are found - Scribe a pencil line across top of trunnion, refer to Figure 6A. Determine if the crack can be removed. Any crack found outboard of scribed line cannot be reworked and the upper barrel and trunnion assembly must be replaced prior to the next flight. If crack is inboard of scribed line rework as follows:
   (a) Remove material using a rotary file, such as a Nicholson A7U Fine. Remove no more material then shown in Figure 6A.
   (b) After rotary filing, sand the ares with 320 grit sandpaper and finish up with 400 to 600 grit sandpaper.
   (c) Perform another fluorescent dye penetrant inspection to ensure removal of the crack.
   (d) If crack was not removed, the upper barrel and trunnion assembly must be replaced prior to the next flight.

o. Landing Gear Actuator and Control/Indication Systems Functional Test.
(1) Landing gear actuator functional test.
   (a) Jack airplane until the tires clear the ground. Assure each actuator is down and locked.
   (b) Connect hydraulic service cart to the airplane and auxiliary electrical power.

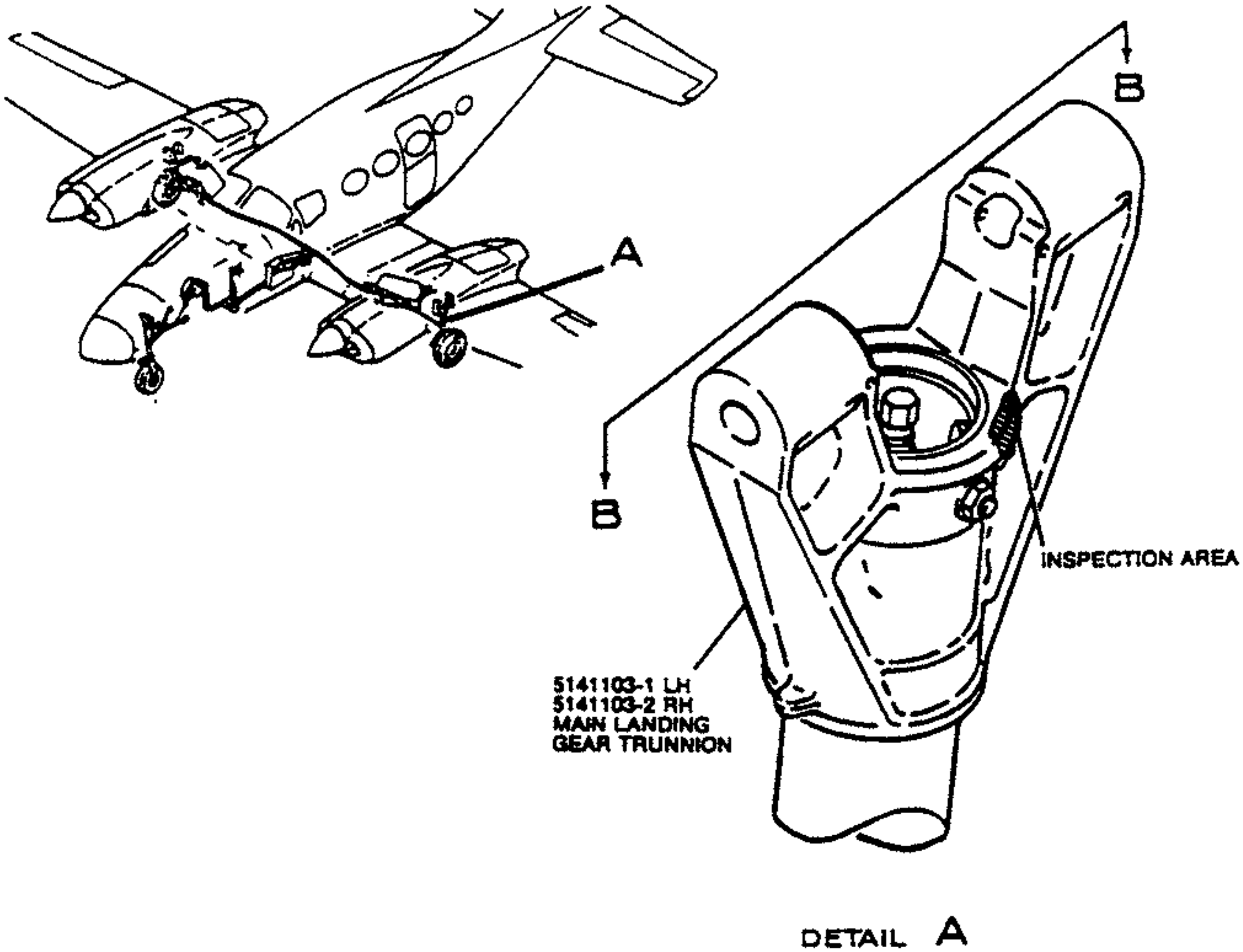
   NOTE: HAVE AN OBSERVER IN THE COCKPIT TO OBSERVE GEAR DOWNLOCK AND IN TRANSIT LIGHTS AND ONE AT EACH GEAR TO WITNESS GEAR MOVEMENT.

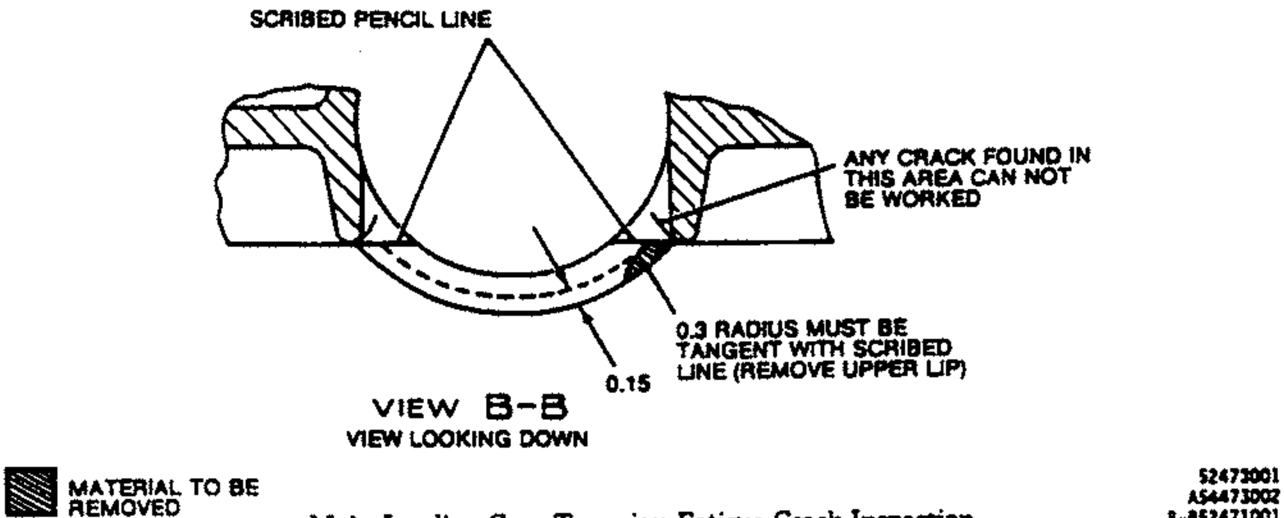
   (c) Very slowly increase hydraulic pressure to the gear system, monitoring hydraulic pressure at the cart. Observe and record the pressure at which each landing gear actuator unlocks. The landing gear internal lock is designed to release between 250 and 400 PSIG (with the exception of the 9910139-3 nose gear actuator, which is between 250 and 610 PSIG).

   NOTE: THE PISTON WILL MOVE MORE IMMEDIATELY UPON RELEASE OF THE INTERNAL LOCK AND HYDRAULIC PRESSURE MAY FALL TO NEAR ZERO. ALSO, THE ELECTRICAL SWITCH WILL ACTUATE SIMULTANEOUSLY WITH THE RELEASE OF THE INTERNAL LOCK.

   (d) Replace actuator if it does not meet the uplock pressure requirement, refer to the Model 421C Illustrated Parts Catalog for part number of actuator and to Chapter 4 for removal and installation procedures, then repeat step o. (1) (c).

(2) Landing gear control/indication system functional test.
   (a) Check the landing gear control and indication circuit as follows :
   (b) Retract the gear to the up and locked position.
   (c) Shut off hydraulic pressure to the airplane.
   (d) Position the gear handle in the down position. Re-apply hydraulic pressure until the uplocks release. Shut off hydraulic pressure to the airplane. Move two of the gear to the down and locked position while manually restraining one of the gears from going into the down and locked position. Check that the two gears indicate locked on the panel.
   (e) Slowly apply hydraulic pressure to the airplane. The gear that is not down and locked should move to the locked position. Failure of the gear to go to the locked position indicates a faulty control circuit. Check and repair the control circuit as required.
   (f) After gear indicates downlock, manually attempt to retract (unlock) the gear. Gear shall remain locked. If gear does not remain locked, troubleshoot and accomplish required repairs.
   (g) Repeat steps o. (2) (a) thru (f) until all three landing gear have been tested.
   (h) Following satisfactory completion of the above test, disconnect hydraulic cart, remove auxiliary electrical power and remove airplane from jacks per Chapter 1.





Main Landing Gear Trunnion Fatigue Crack Inspection
Figure 6A

o. Nose Landing Gear Drag Brace Inspection/Replacement.

(1) Tools and Equipment.

NAME	NUMBER	MANUFACTURER	USE
Penetrant	ZL-22	Magnaflux Corporation 7300 W. Lawrence Avenue Chicago, Il 60656	To detect crack.
Developer	ZP-9	Magnaflux Corporation 7300 W. Lawrence Avenue Chicago, Il 60656	To develop penetrant.
Cleaner	ZC-7	Magnaflux Corporation 7300 W. Lawrence Avenue Chicago, Il 60656	To clean off penetrant
Portable Black Light	ZB-23A	Magnaflux Corporation 7300 W. Lawrence Avenue Chicago, Il 60656	To detect crack.
Magnifying Glass	8x to 10x	Available Locally	To detect crack.

(2) Inspection.

(a) Jack airplane in accordance with Chapter 1.

(b) Attach hydraulic service unit to appropriate lines.

(c) Momentarily power system with gear handle in up position until over center tension on drag brace is relieved.

(d) Disconnect nose gear doors by removing cotter pins, nuts, washers, and bolts from door link tube and tape doors open for access to drag brace. Retain bolts, nuts, and washers. Discard cotter pins.

(e) Disconnect the nose gear actuator from drag brace. Retain bolt and washers. Discard nut and cotter pin (Refer to Figure 6B.)

(f) Remove cotter pin, nut, washers and bolt securing drag brace to drag link. Retain bolt and washers. Discard nut and cotter pin.

(g) Open nose baggage compartment doors and remove carpet and floor panels.

(h) Remove nuts washers and bolts securing drag brace and remove drag brace. discard nuts.

(i) Chemically remove paint from inspection area (See Figure 6B, View B-B.)

(j) Clean area with AC-7 cleaner using a lint free cloth.

(k) Apply ZL-22 penetrant to area and allow to remain on surface for 20 minutes.

(l) Clean penetrant from area using a clean lint free cloth dampened with ZC-7 cleaner. The inspection area is considered clean when no background florescence is visible when examined under ZB-23A black light.

(m) Apply a thin coat of ZP-9 developer per manufacturers instructions to the inspection area and allow a 15 minute development time before final inspection.

(n) Examine the inspection area under black light. If no cracks are detected, clean area to remove all inspection material.

(o) If a crack is detected, then enough material shall be removed by blending to a 5:1 ratio of length-to-depth. A crack or reworked area deeper than 0.20 inch is not acceptable and the drag brace must be replaced. Proceed to Step (v).

(p) After rework, prime and paint inspection area.

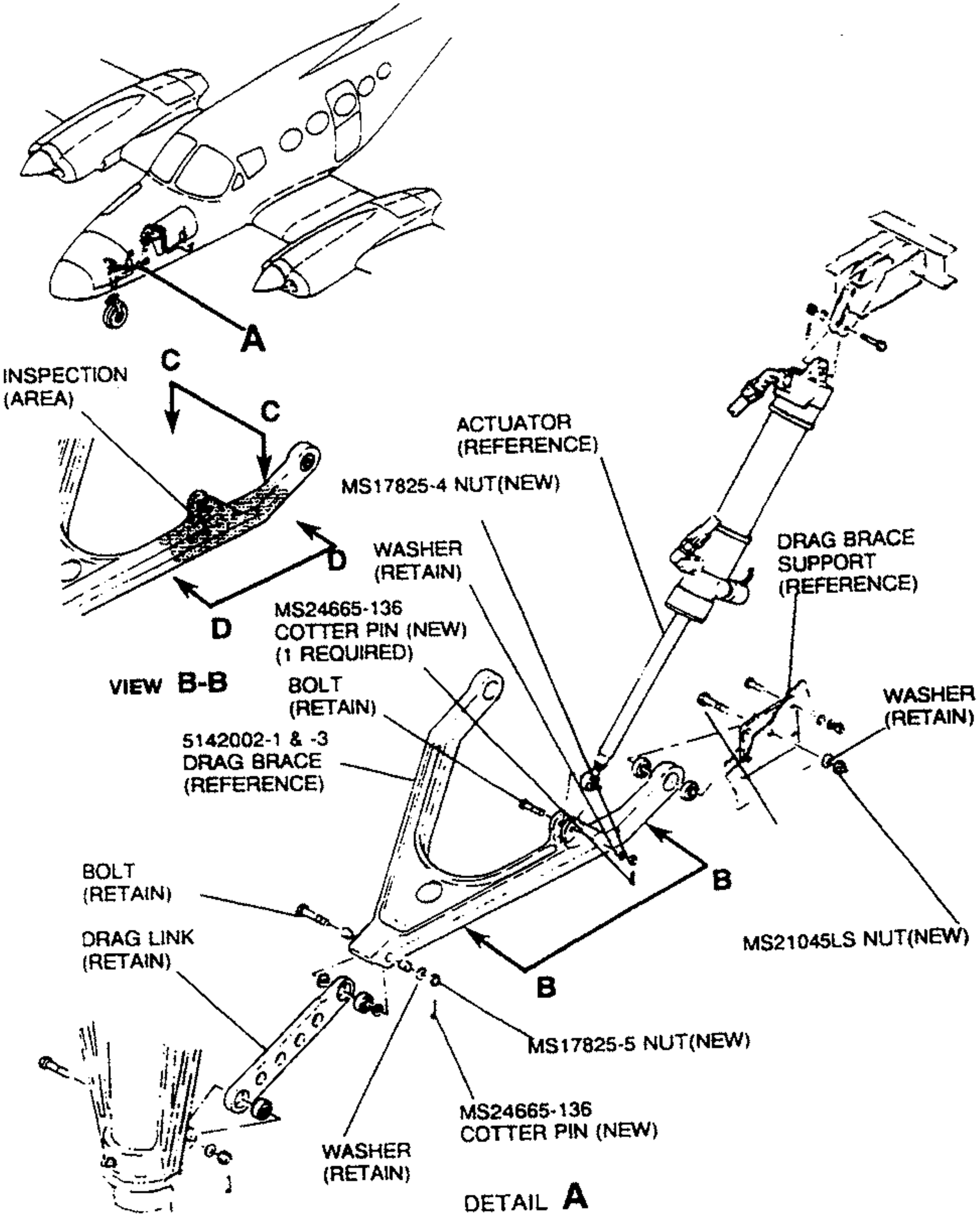
(q) Reinstall drag brace supports using bolts and washers retained in Step (f), and new MS21045L5 nuts. Refer to Chapter 20 for nut torque values.

(r) Connect drag link to drag brace using hardware retained in Step (f). Install new MS17825-5 nut and new MS24665-136 cotter pin.

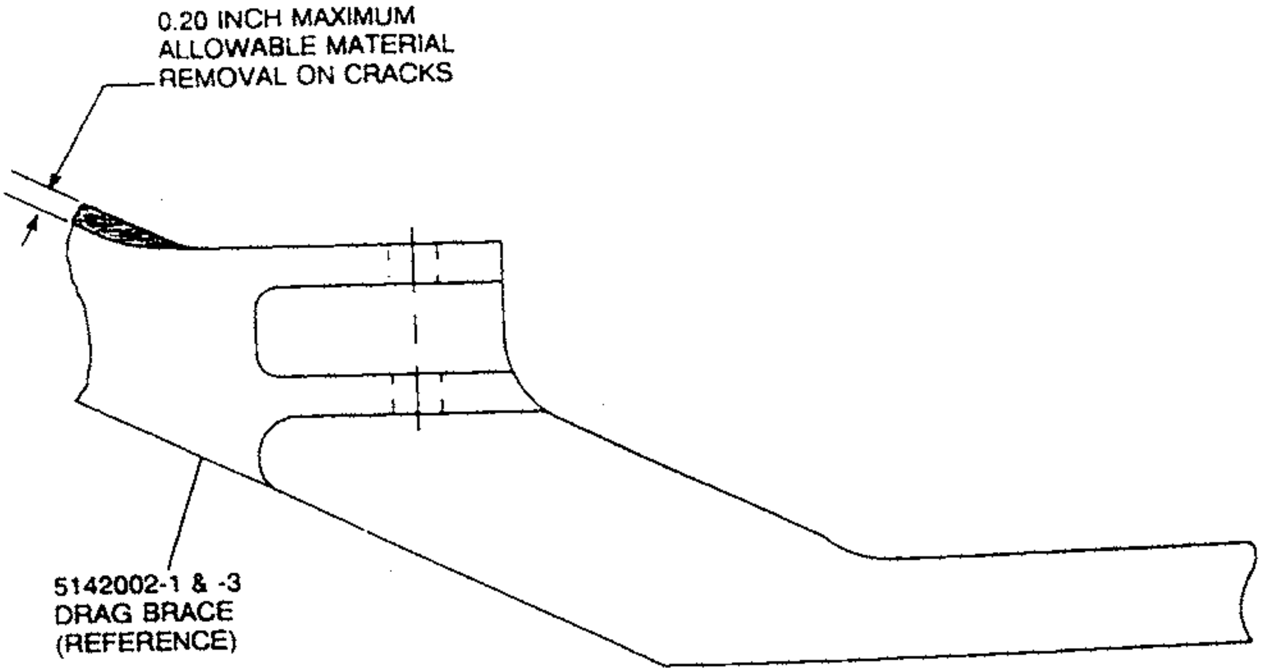
(s) Connect actuator to drag brace using hardware retained in Step (e). Install new MS17825-4 nut and MS24665-136 cotter pin.

NOTE: To check drag brace over center adjustment refer to Chapter 32.

(t) Remove tape and reconnect gear doors using hardware retained in Step (d). Install new cotter pins.
(u) Perform a landing gear functional check, refer to Chapter 32.
(v) If drag brace is to be replaced, position new drag brace on drag brace supports using bolts and washers retained in Step (h), and new MS21045L5 nuts. Complete Steps (r) thru (u).



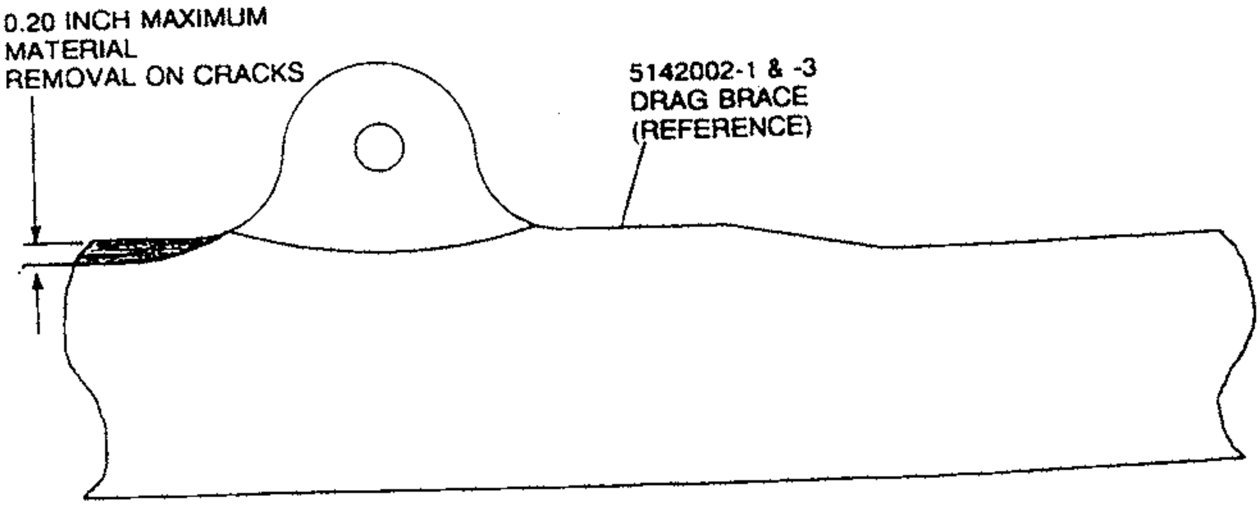
Nose Gear Drag Brace Inspection and Rework
Figure 6B (Sheet 1)



FWD

VIEW **C-C**

VIEW LOOKING DOWN AT 5142002-1 OR -3 DRAG BRACE AT ACTUATOR ATTACH POINT



FWD

VIEW **D-D**

VIEW LOOKING INBOARD AT 5142002-1 OR -3 DRAG BRACE ACTUATOR ATTACH POINT

Nose Gear Drag Brace Inspection and Rework
Figure 6B (Sheet 2)

--READ THIS--BEFORE STARTING INSPECTION

NOSE AND MAIN LANDING GEAR RIGGING INSPECTION.

NOTE

The following procedures provide detailed inspection instructions for the landing gear system to assure that the system is properly rigged.

The nose and main landing gear rigging inspection should be performed indoors with the airplane on jacks. A hydraulic power ground test unit and a 28 VDC power source are required to perform this inspection. When making adjustments required by this rigging inspection, refer to landing gear chapter for procedures.

Prior to jacking the airplane, the necessary access plates, seats, carpet, and floorboards must be removed and hydraulic lines checked for evidence of leakage.

The areas should be cleaned with a suitable solvent and allowed to dry before performing the inspection. Step-by-step procedures are presented and each step must be completed before performing the next step.

CAUTION

WHEN OPERATING THE LANDING GEAR ALWAYS BE PREPARED TO STOP TO PREVENT DAMAGE TO THE SYSTEM.

AFTER REMOVAL OF COMPONENTS FOR CHECKING OR ADJUSTING, THE COMPONENT MUST BE REINSTALLED BEFORE PROCEEDING THE NEXT STEP. REFER TO LANDING GEAR CHAPTER FOR ASSEMBLY INSTRUCTIONS.

WHEN OPERATING GEAR TO CHECK ADJUSTMENTS, ENSURE THAT ALL DISCONNECTED PARTS ARE CLEAR OF MOVING MECHANISM.

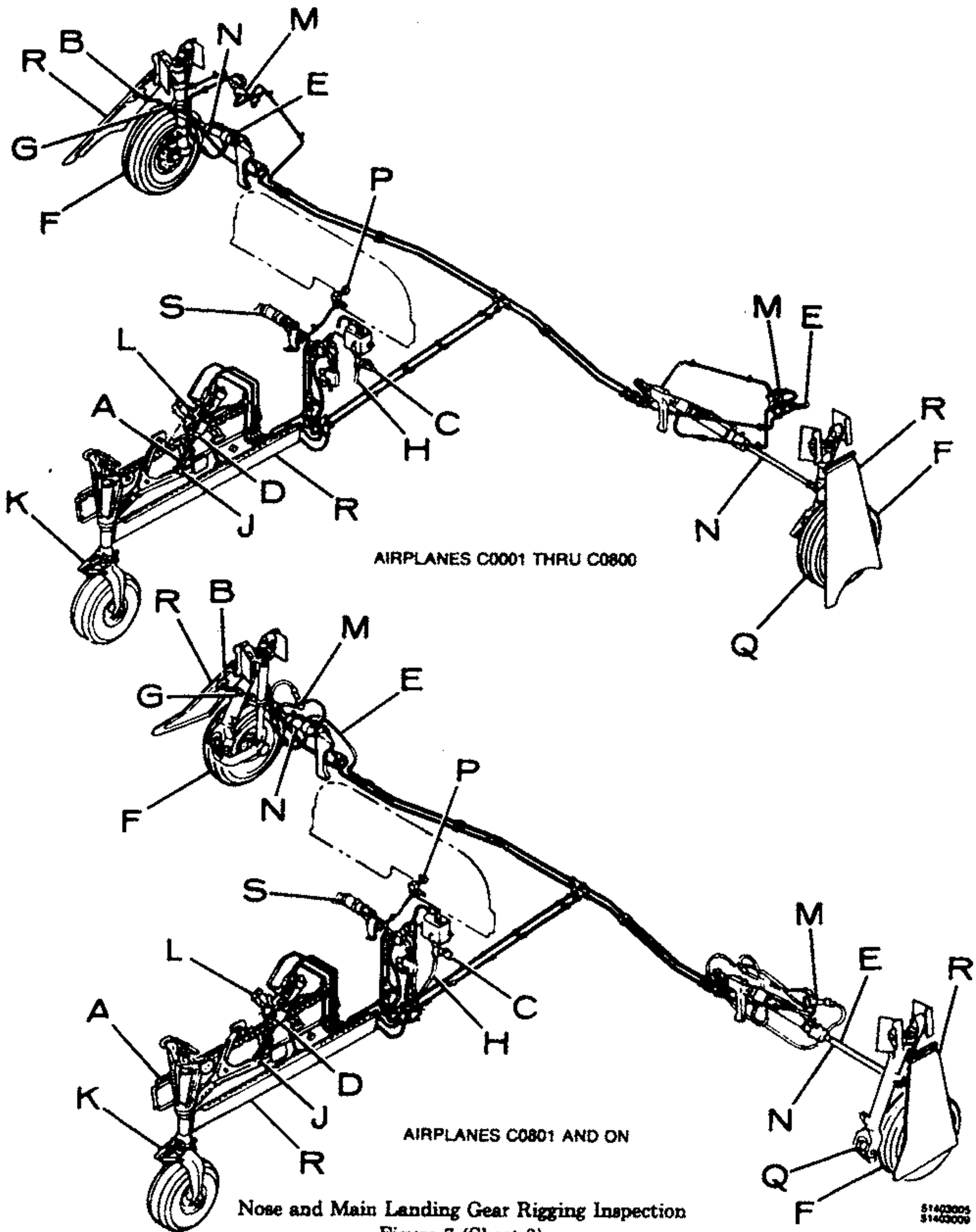
The Landing Gear Rigging Inspection is given in alphabetical and/or alphanumerical sequence. The alphabetical details are the items to be checked. The alphanumerical detail is the related adjustment performed only when adjustment is necessary. The following table lists the details and the related adjustment to be checked. Refer to landing gear chapter for required disassembly/assembly procedures and required rigging procedures.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 1 of 20)

TABLE I

Check	Adjustment If Required
Detail A	—
Detail B	—
Detail C	—
Detail D	—
Detail E	—
Detail F	F-1
Detail G	—
Detail H	—
Detail J	J-1
Detail K	—
Detail L	L-1
Detail M	M-1
Detail N	—
Detail P	—
Detail Q	Q-1
Detail R	—
Detail S	—

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 2)

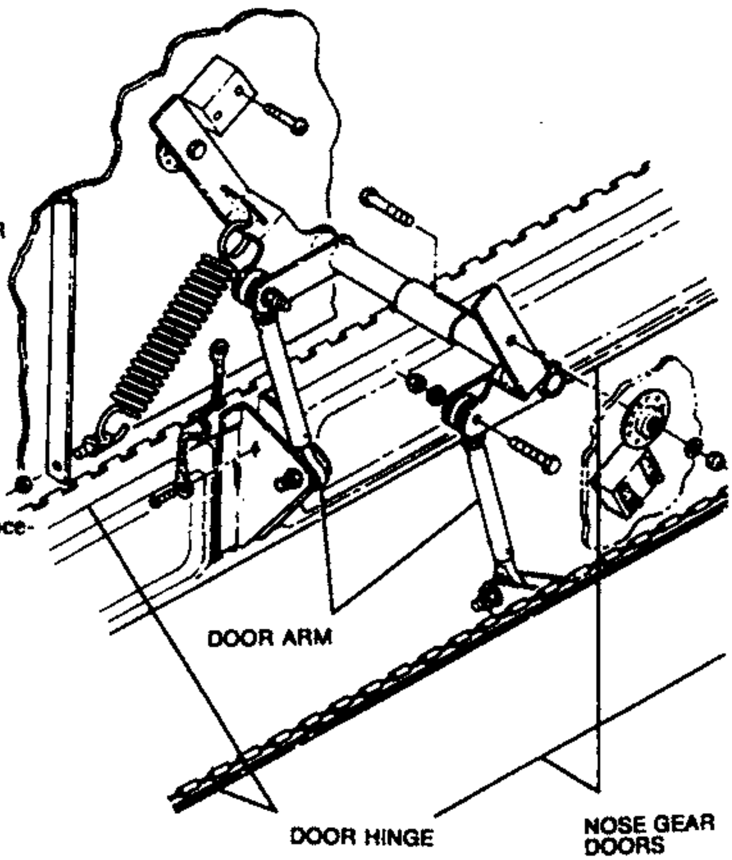


Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 3)

start here

DETAIL A

DISCONNECTING NOSE GEAR DOOR



1. Jack airplane in accordance with jacking procedures, Chapter 1.
2. Disconnect nose landing gear doors.

CAUTION

WHEN DISCONNECTING NOSE GEAR DOOR, ALWAYS DISCONNECT THE NOSE GEAR DOOR LINK AT THE TORQUE TUBE FITTING, NEVER AT THE DOOR HINGE.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 4)

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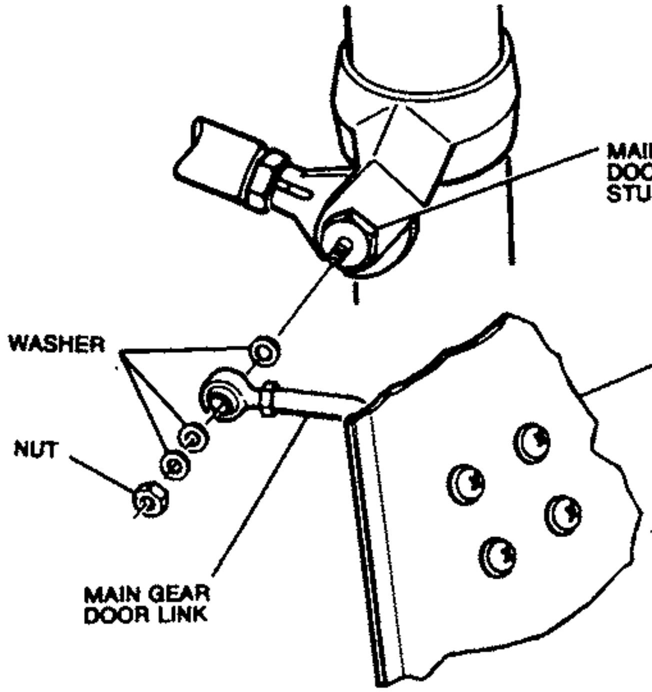
DETAIL B AIRPLANES C0001 THRU C0800

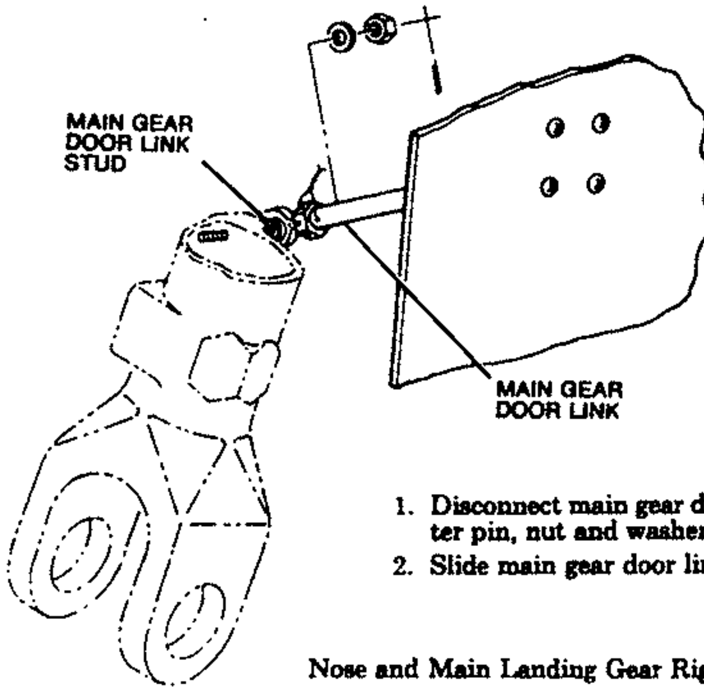
DISCONNECTING MAIN GEAR DOOR



1. Disconnect main gear door link by removing nut and washer.
2. Slide main gear door link off stud.

DETAIL B AIRPLANES C0801 AND ON

DISCONNECTING MAIN GEAR DOOR



1. Disconnect main gear door link by removing cotter pin, nut and washer.
2. Slide main gear door link off stud.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 5)

DETAIL C

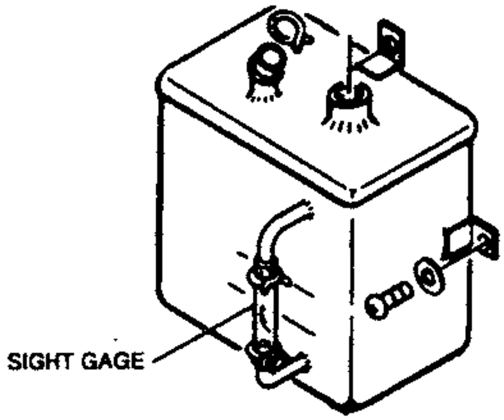
CHECKING HYDRAULIC FLUID LEVEL

1. Check hydraulic fluid reservoir for proper fluid level.

CAUTION

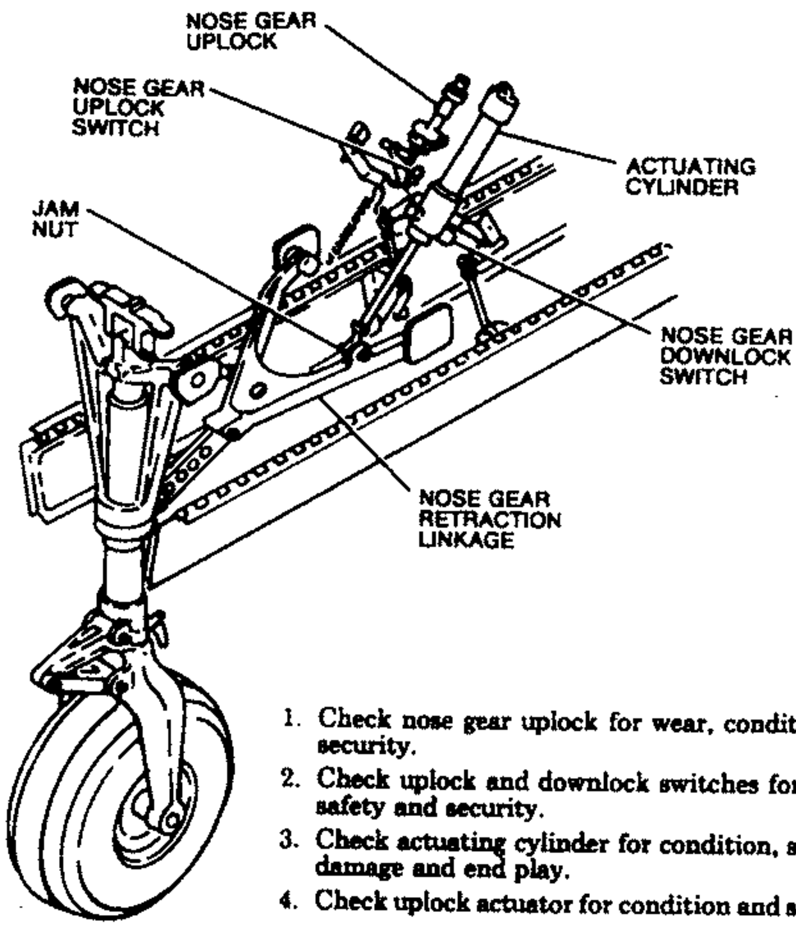
DO NOT OPERATE LANDING GEAR IF SIGHT GLASS INDICATION IS BELOW THE ADD MARK.

2. Remove floorboard access plates and check for evidence of leaks, chafing of lines, condition and security.



DETAIL D

CHECKING NOSE GEAR WHEEL WELL AREA



1. Check nose gear uplock for wear, condition and security.
2. Check uplock and downlock switches for proper safety and security.
3. Check actuating cylinder for condition, security, damage and end play.
4. Check uplock actuator for condition and security.

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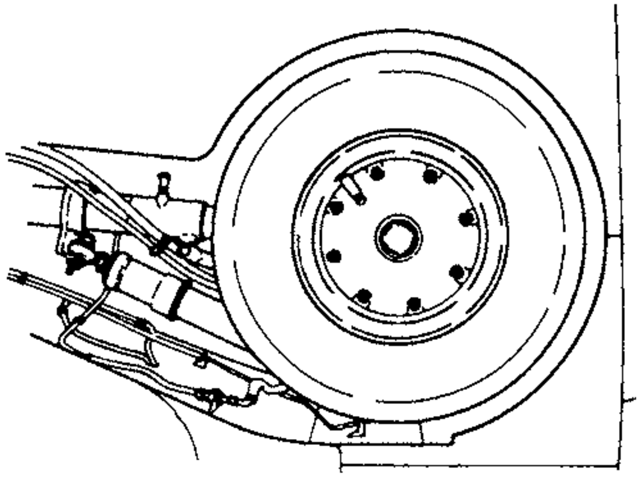
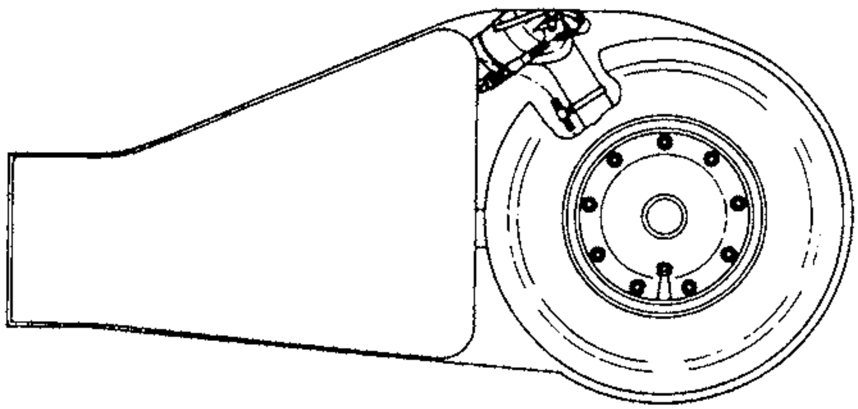
Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 6)

DETAIL E

CHECKING MAIN GEAR WHEEL WELL AREA



AIRPLANES C0001 THRU C0800



AIRPLANES C0801 AND ON

1. Check wheel well area for condition.
2. Check wires for condition and security.
3. Check hydraulic lines for leaks, condition and security.

Nose and Main Landing Gear Rigging
Figure 7 (Sheet 7)

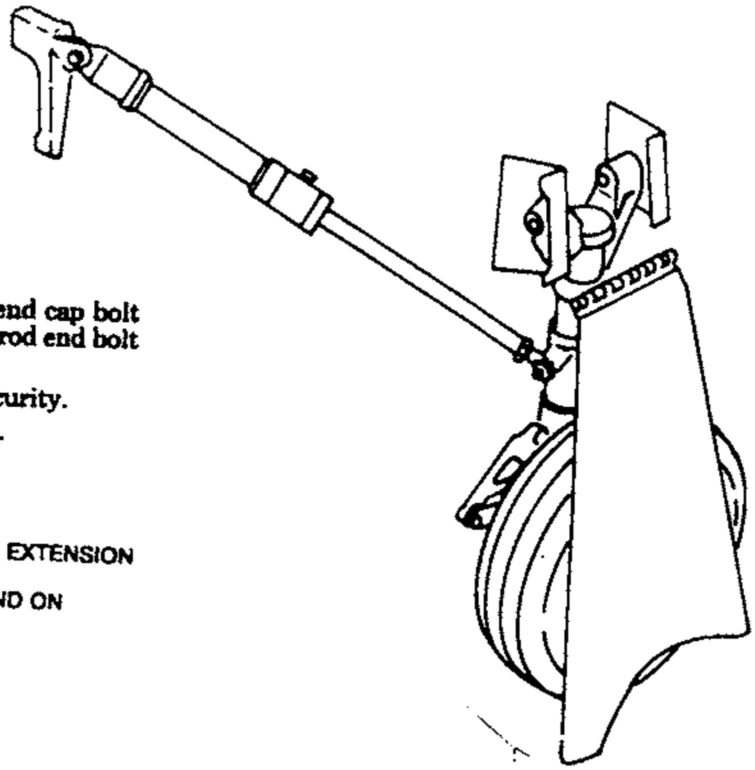
DETAIL F

CHECKING

MAIN GEAR FOR PROPER EXTENSION

AIRPLANES C0001 THRU C0800

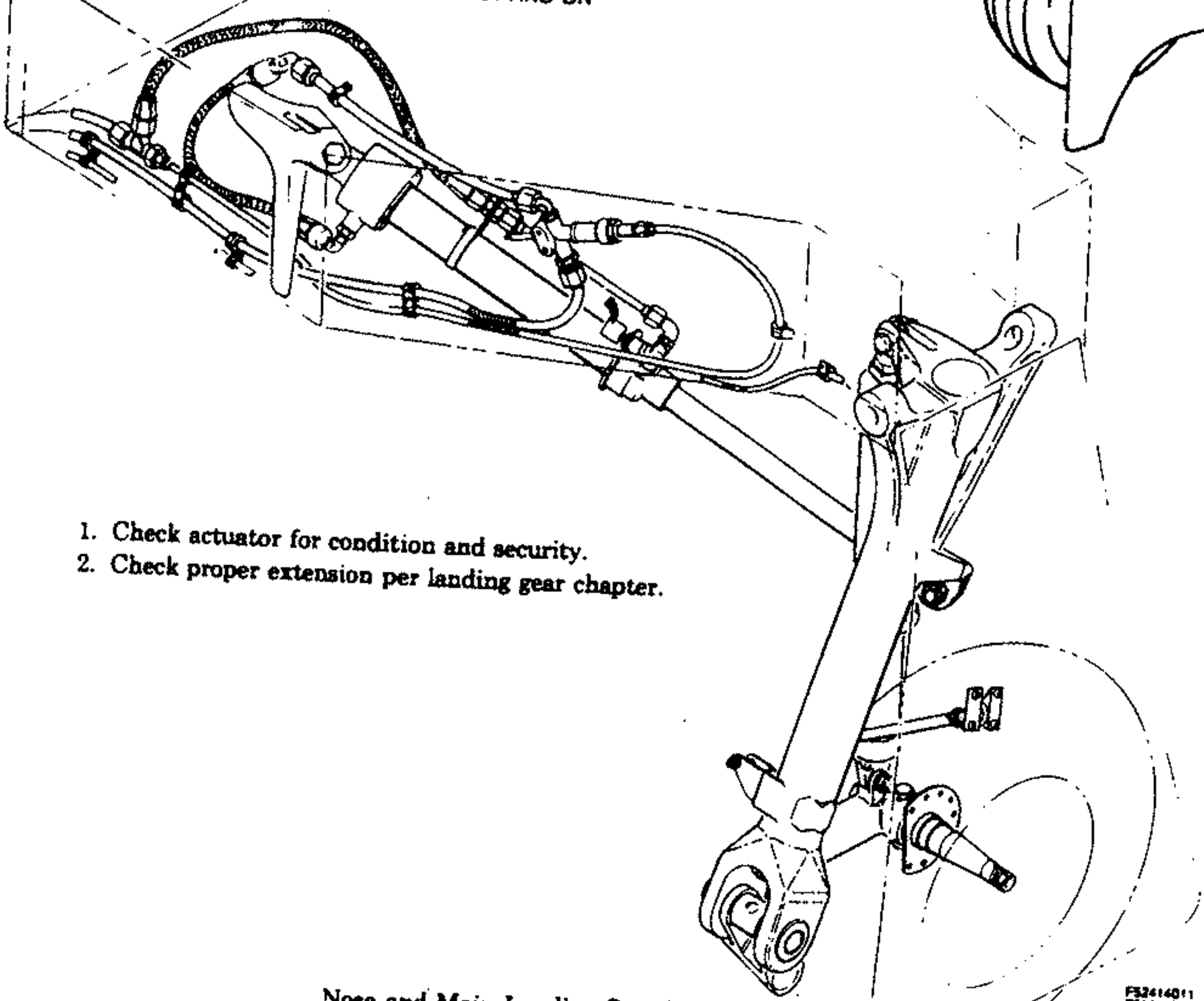
1. Measure distance between actuator end cap bolt centerline and centerline of actuator rod end bolt as shown.
2. Check actuator for condition and security.
3. Check for proper thread engagement.



DETAIL F

CHECKING MAIN GEAR FOR PROPER EXTENSION

AIRPLANES C0801 AND ON



1. Check actuator for condition and security.
2. Check proper extension per landing gear chapter.

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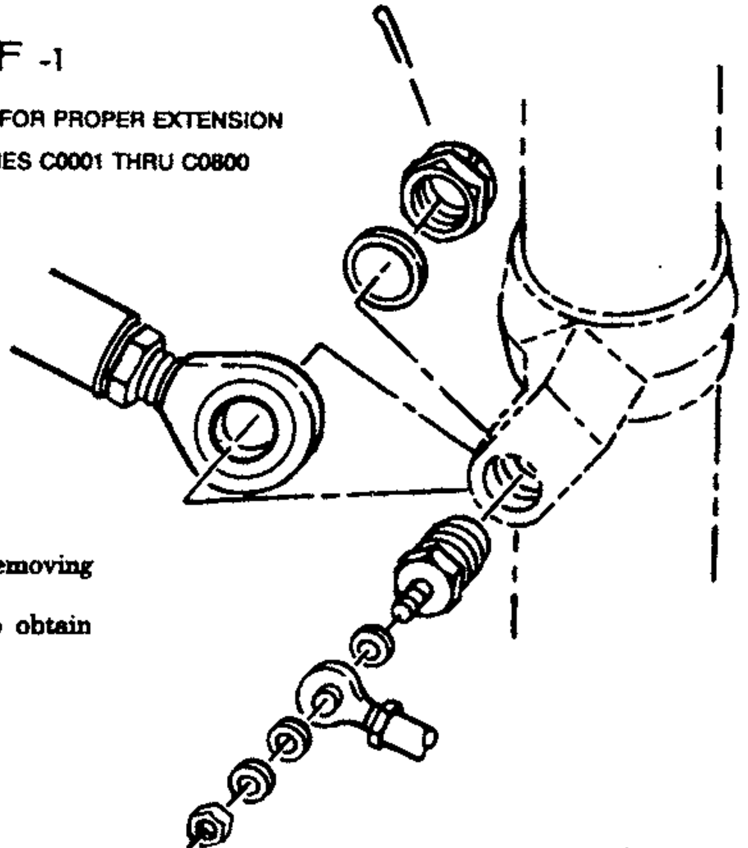
Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 8)

DETAIL F -1

ADJUSTING MAIN GEAR FOR PROPER EXTENSION

AIRPLANES C0001 THRU C0800

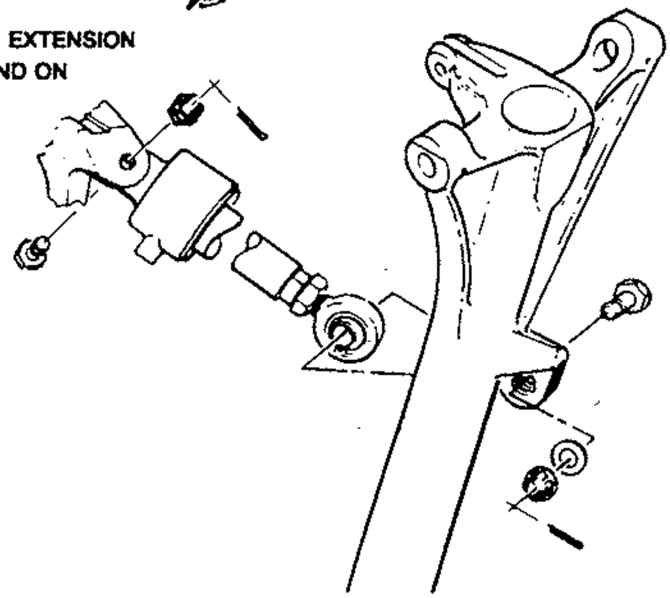


1. Cut safety wire and loosen jamnut.
2. Disconnect piston rod end fitting by removing cotter pin, nut and bolt.
3. Lengthen or shorten piston rod end to obtain proper camber.

DETAIL F -1

ADJUSTING MAIN GEAR FOR PROPER EXTENSION

AIRPLANES C0801 AND ON

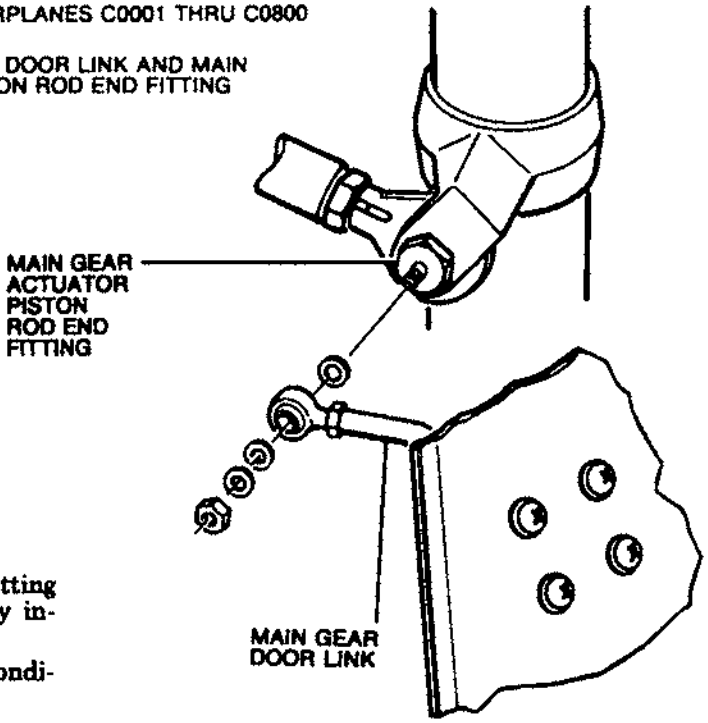


1. Cut safety wire and loosen jamnut.
2. Disconnect piston rod end fitting by removing cotter pin, nut and bolt.
3. Adjust in accordance with lainding gear chapter.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 9)

DETAIL G AIRPLANES C0001 THRU C0800

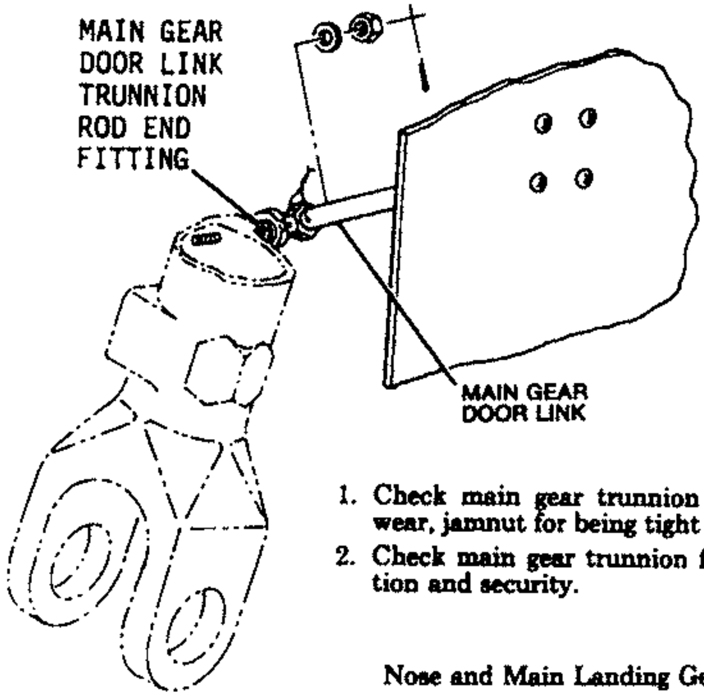
CHECKING MAIN GEAR TRUNNION DOOR LINK AND MAIN GEAR ACTUATOR PISTON ROD END FITTING



1. Check main gear actuator piston rod end fitting for wear, jamnut for being tight and safety installed.
2. Check main gear trunnion for looseness, condition and security.

DETAIL G AIRPLANES C0801 AND ON

CHECKING MAIN GEAR TRUNNION DOOR LINK END FITTING



1. Check main gear trunnion rod end fitting for wear, jamnut for being tight and safety installed.
2. Check main gear trunnion for looseness, condition and security.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 10)

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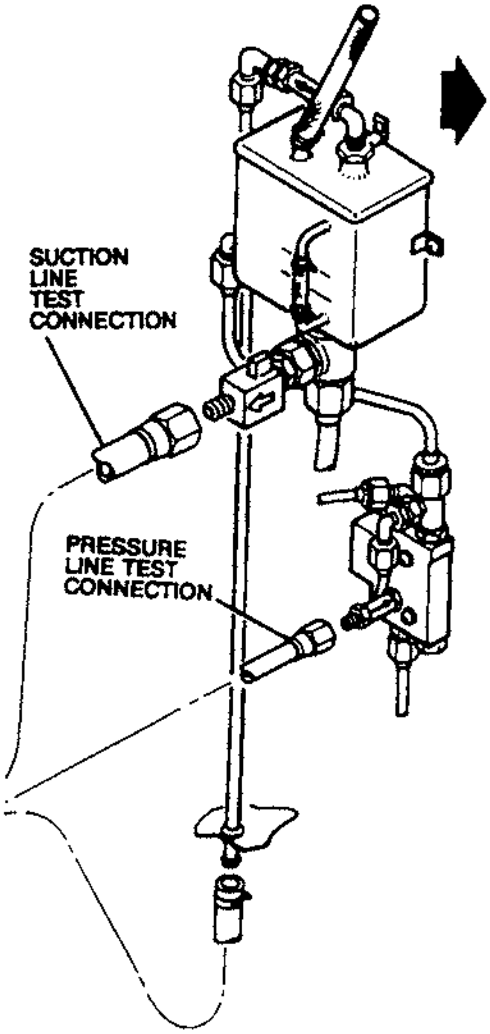


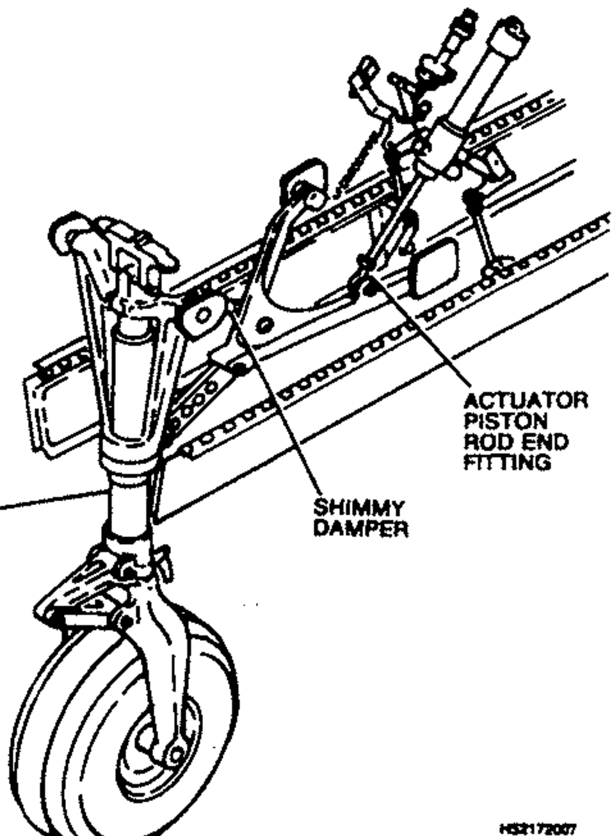
DETAIL H

CONNECTING HYDRAULIC GROUND TEST UNIT

1. Connect hydraulic ground test unit as shown.
2. Operate hydraulic ground test unit to provide a 3 GPM flow.
3. Retract landing gear.
4. Observe landing gear travel for clearance of lines and hoses and assure landing gear rests on uplock hooks when full up travel is reached.

DETAIL J

CHECKING NOSE GEAR TRUNNION AND ACTUATOR PISTON ROD END FITTING



1. Check nose gear trunnion for wear, condition and security.
2. Check shimmy damper for leaks, condition and security.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 11)

DETAIL J-1

ADJUSTING

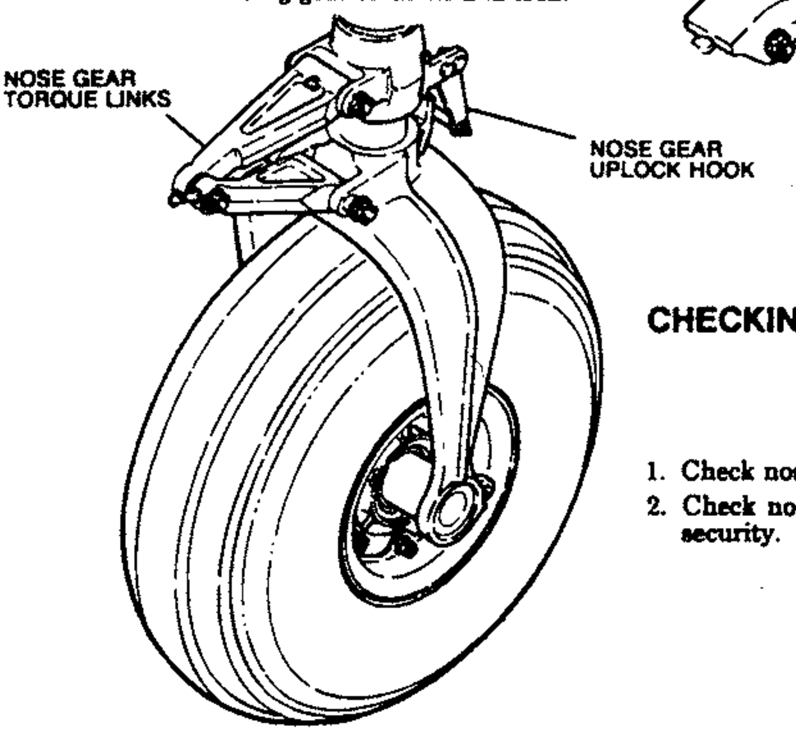
NOSE GEAR UPLOCK AND NOSE GEAR TORQUE LINKS

1. Retract landing gear approximately one inch travel on the piston rod.
2. Remove safety and loosen jamnut.
3. Disconnect piston rod end fitting by removing cotter pin, nut, washer and bolt.
4. Extend nose landing gear full down.
5. Check that nose landing gear retraction linkage is locked firmly overcenter.
6. Check alignment of hole in piston rod end and hole in drag brace are aligned.
7. Lengthen piston rod end one turn.

NOTE

This will apply a preload to linkage.

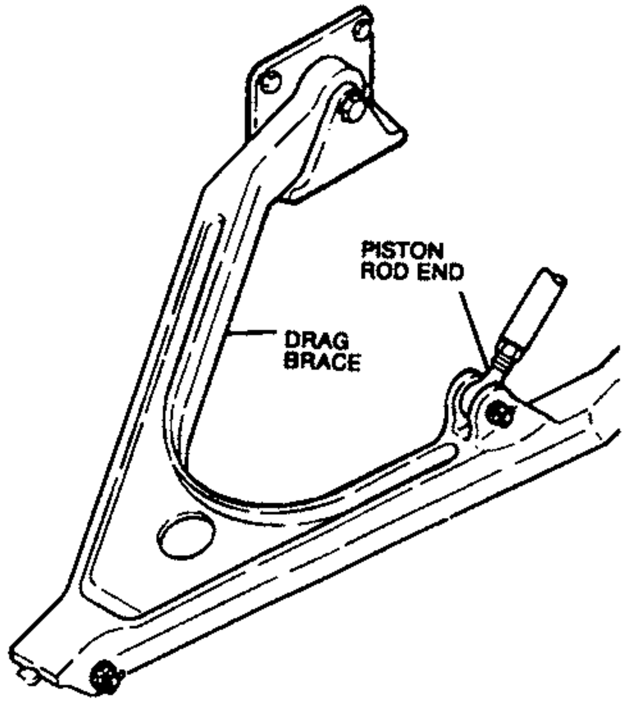
8. Reconnect piston rod end with bolt, washer, nut and cotter pin by retracting landing gear approximately one inch on piston rod.
9. Extend nose landing gear to down and lock.



DETAIL K

CHECKING

NOSE GEAR ACTUATOR PISTON ROD END FITTING

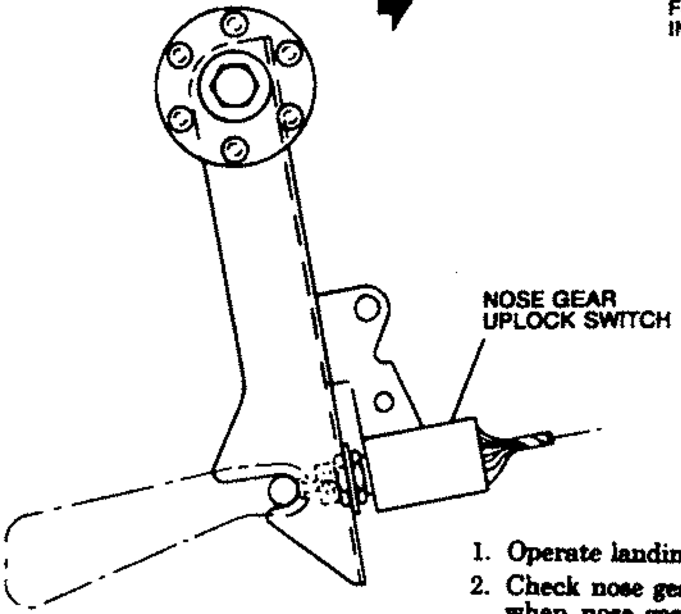


1. Check nose gear uplock for looseness and wear.
2. Check nose gear torque links for condition and security.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 12)

DETAIL L

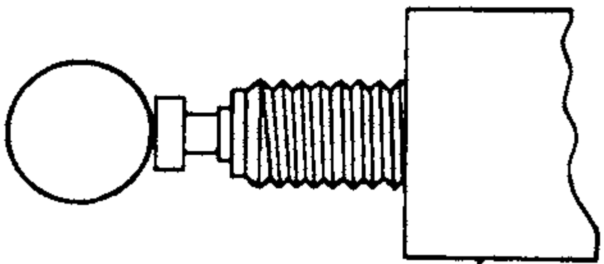
CHECKING NOSE GEAR UPLOCK AND UPLOCK SWITCH FOR PROPER ENGAGEMENT AND ACTUATION IN RETRACTED POSITION



1. Operate landing gear to up and locked position.
2. Check nose gear uplocks for proper engagement when nose gear is retracted. If uplocks are not fully engaged, replace uplocks prior to continuing.
3. Check function of nose gear uplock actuator.
4. Check nose gear for clearance of wires, door rods, etc.
5. Check nose gear uplock actuator switch for proper dimension.

DETAIL L-1

ADJUSTING NOSE GEAR UPLOCK SWITCH



1. Operate landing gear to the up and locked position.
2. Adjust uplock switch in accordance with landing gear chapter.
3. Safety wire backup nuts to each other.
4. Operate gear down and up and recheck dimension.
5. If dimension cannot be obtained, replace uplock switch prior to continuing.

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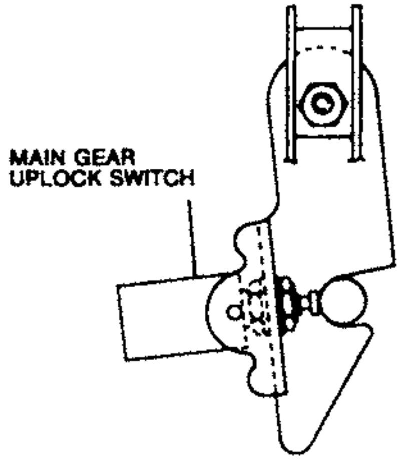
Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 13)

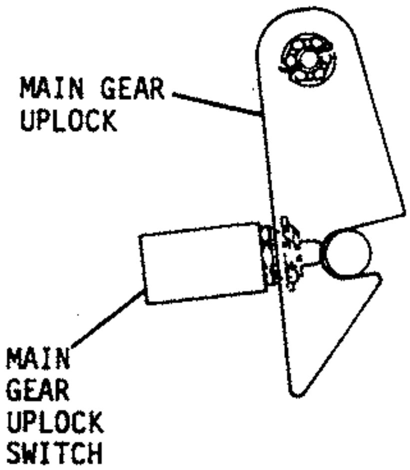
DETAIL M

CHECKING MAIN GEAR UPLOCKS AND UPLOCK SWITCH FOR PROPER ENGAGEMENT AND ACTUATION IN RETRACTED POSITION



AIRPLANES C0001 THRU C0800

1. Operate landing gear to retract position.
2. Check main gear uplock for proper engagement when main gear is retracted. If uplocks are not fully engaged, replace uplocks prior to continuing.
3. Check function of main gear uplock actuator.
4. Check main gear for clearance of wires, door rods, etc.

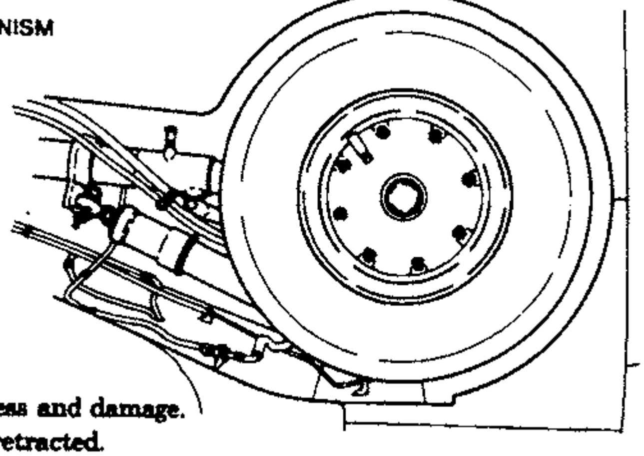


AIRPLANES C0801 AND ON

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 14)

DETAIL N AIRPLANES C0001 THRU C0800

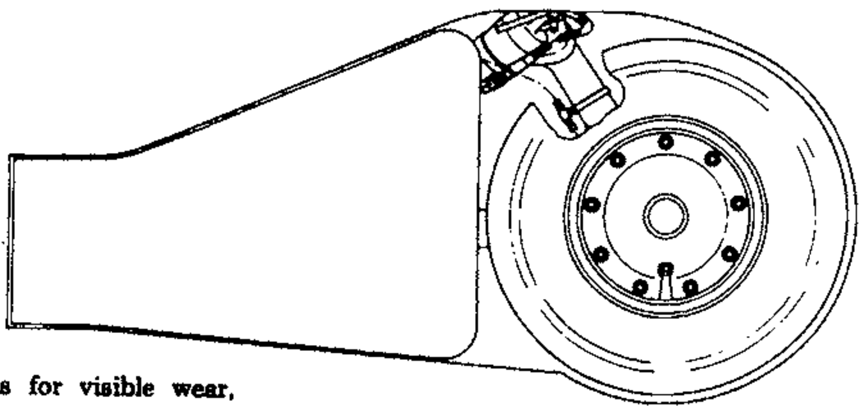
CHECKING MAIN GEAR RETRACTING MECHANISM AND WHEEL WELL AREA



1. Check main gear trunnions for visible wear, looseness and damage.
2. Check main gear for clearance in wheel well when retracted.
3. Check tire for clearance when retracted in wheel well.

DETAIL N AIRPLANES C0801 AND ON

CHECKING MAIN GEAR RETRACTING MECHANISM AND WHEEL WELL AREA



1. Check main gear trunnions for visible wear, looseness and damage.
2. Check main gear for clearance in wheel well when retracted.
3. Check tire for clearance when retracted in wheel well.

NOTE

Minimum clearance between highest point of tire (center of tread) and lower wheel well structure shall be 0.35 inches minimum.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 15)

N52481001
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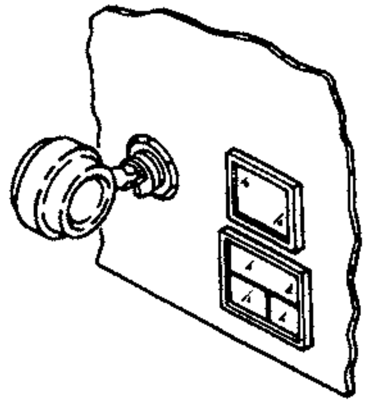
DETAIL **P**

CHECKING GEAR DOWN INDICATOR LIGHT SWITCHES FOR PROPER ADJUSTMENT

1. Retract landing gear approximately half way up.
2. Check that gear uplock light is illuminated.
3. Extend landing gear checking indicator light switches for proper actuation.
4. If gear down indicator lights do not operate properly, refer to landing gear chapter and adjust switches.



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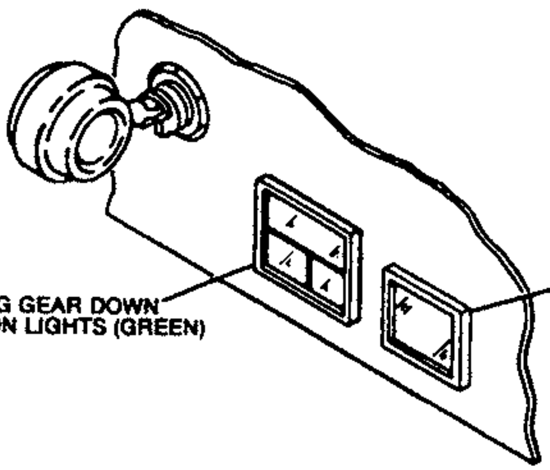

AIRPLANES C0801 AND ON

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 16)

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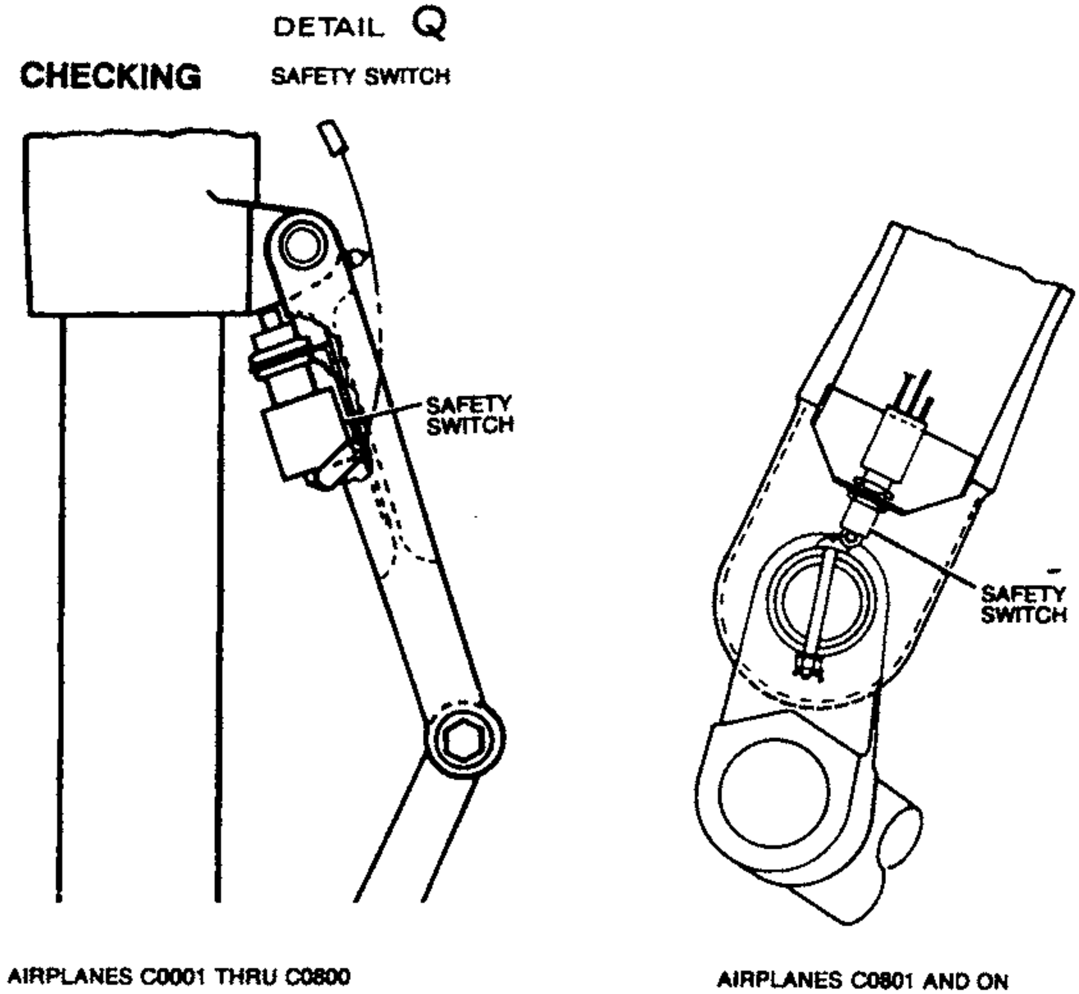

1. Check safety switch for condition and security, wires for condition.
2. Check safety switch for proper actuation.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 17)

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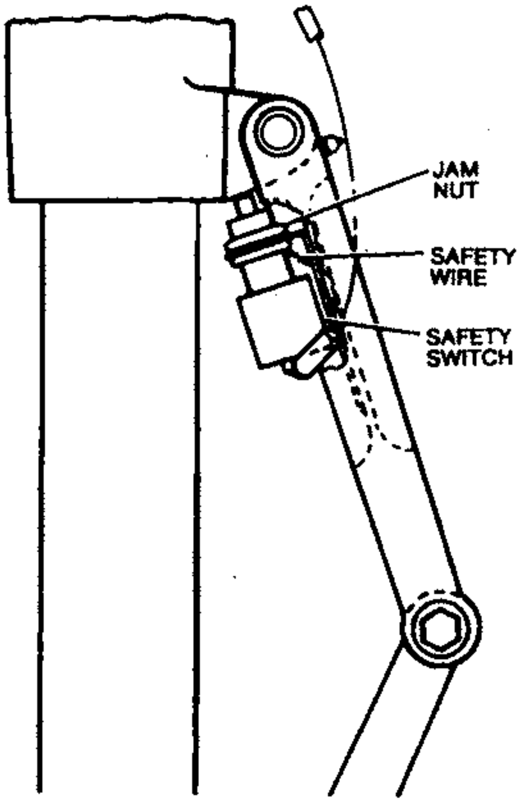
DETAIL Q -1

ADJUSTING SAFETY SWITCH



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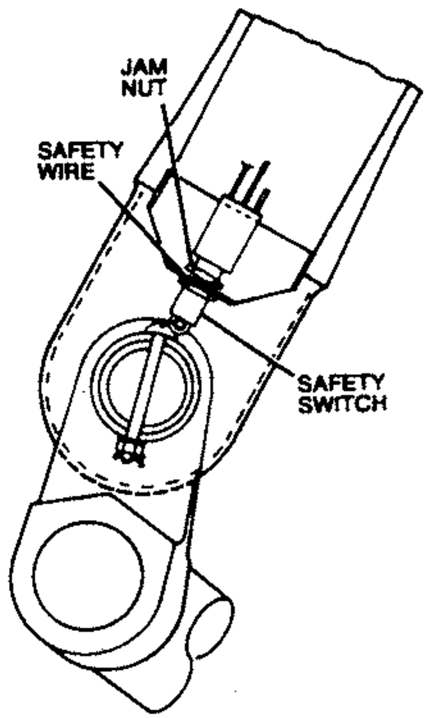

AIRPLANES C0801 AND ON

1. Adjust safety switch in accordance with Chapter 4.
2. Tighten jamnut and install safety wire.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 18)

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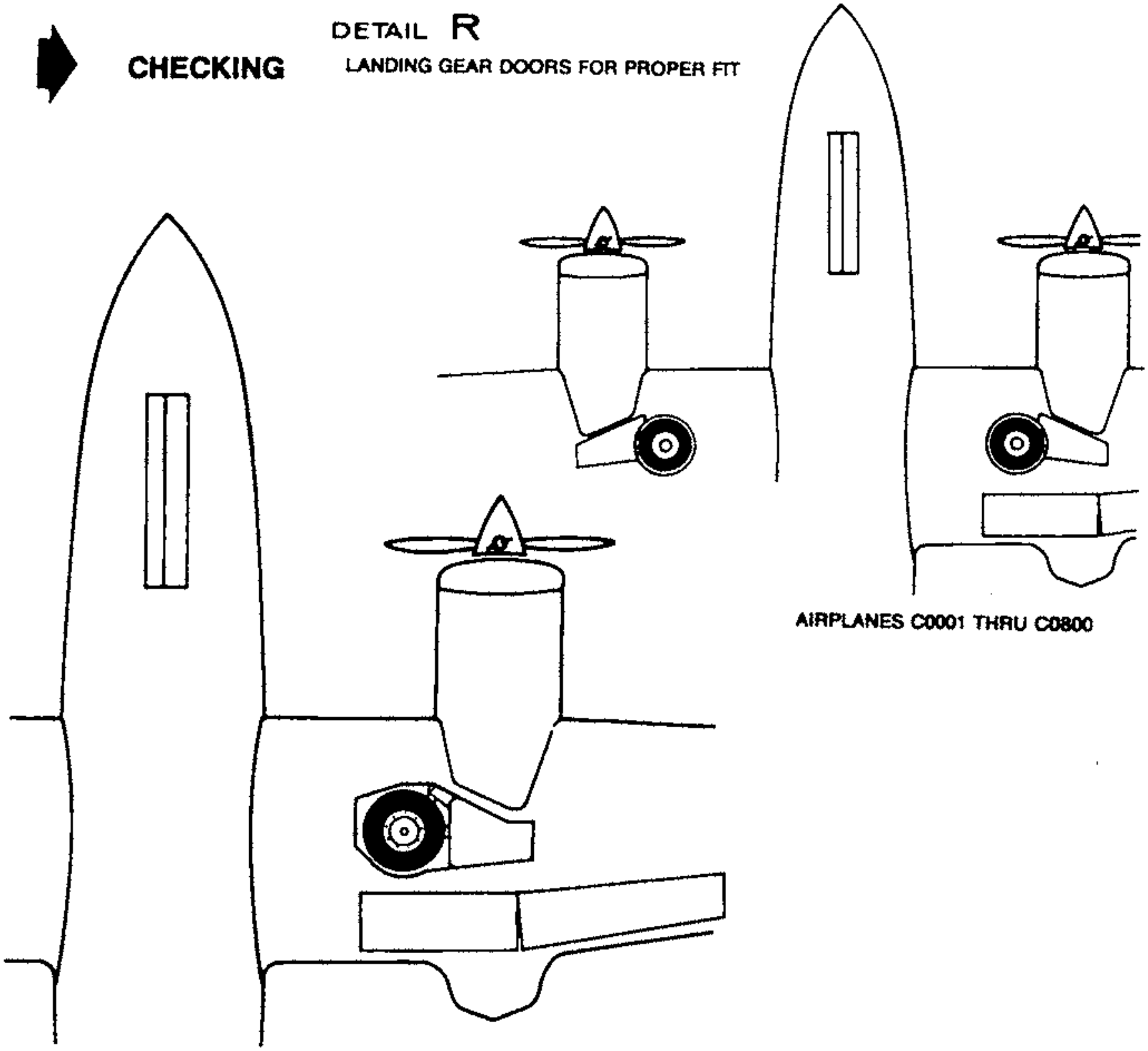
DETAIL R

CHECKING LANDING GEAR DOORS FOR PROPER FIT

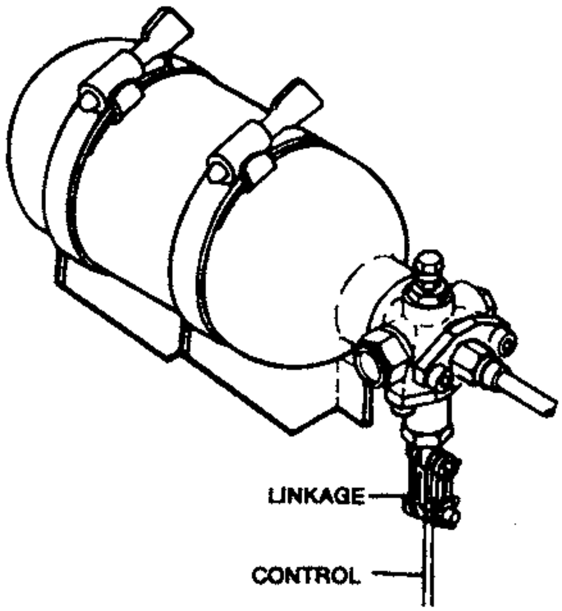


1. Operate landing gear through one complete cycle.
2. Operate landing gear to full up.
3. Check doors for proper fit.
4. Operate landing gear and check indicator lights and warning horn for proper operation, retracted and extended.

Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 19)

DETAIL S

CHECKING EMERGENCY GEAR BLOW DOWN BOTTLE



1. Check linkage for proper rig, refer to Chapter 4.
2. Check blow down bottle pressure.
3. Check lines and hoses for nicks, cuts, and security.

NOTE

Refer to inspection chart for time interval applicable to steps 4 and 5.

4. With gear in the up position turn off hydraulic ground test unit.
5. Refer to Chapter 4 and perform emergency gear extension.

After completing the inspection, make sure the gear is down and locked, hydraulic reservoir is filled, 28 VDC power source is disconnected and the gear is lubricated.

NOTE

If adjustments were made, make sure all bolts have been torqued, cotter pins installed and doors connected before installing access plates, floorboards, seats and seat stops, carpet and removing the airplane from jacks.

complete

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Nose and Main Landing Gear Rigging Inspection
Figure 7 (Sheet 20)

13. Lights (Refer to Section 13).

a. Flight compartment lights.

(1) Apply external power and operational test the cockpit floodlight, map light, instrument panel lighting and the annunciator panels. The floodlight, map light, instrument panel lights, circuit breaker panels and compass have a variable control to vary the light intensity. Inspect electrical components in accordance with Electrical Power Inspection.

b. Passenger compartment lights.

(1) Apply external power and operational test the passenger light by each seat, the OXYGEN and SEAT BELT lights installed on the forward cabin divider and the cabin door entrance light. Inspect electrical components in accordance with Electrical Power Inspection.

c. Cargo and service compartment lights.

(1) Apply external power and operational test the nose compartment baggage light; check light operation with the left and right baggage doors. Inspect electrical components in accordance with Electrical Power Inspection.

d. Exterior lights.

(1) Apply external power and operational test the wing ice detection light(s), navigation lights and anticollision strobe lights, landing lights and taxi light. Each strobe light has its own power supply inverter installed in the immediate vicinity. Inspect the electrical components in accordance with the Electrical Power Inspection.

14. Navigation (Refer to Section 14).

a. Flight environment data.

(1) The flight environment data includes systems which sense environmental conditions and use the data to influence navigation.

(a) Airspeed indicator, barometric pressure altimeter, vertical speed indicator.

1) Inspect for condition and security of installation, cleanliness.

(b) Pitot tube(s), static ports, alternate static source, sumps and lines.

1) Inspect for security of installation, cleanliness, evidence of damage and obstructions.

2) Inspect sumps for cracks, leaks and presence of water.

3) Drain sumps.

(c) A pitot-static tester is required to functional test the flight environment data instruments.

(2) Angle-of-attack.

(a) Indicator.

1) Inspect for security and cleanliness of installation.

2) Inspect electrical components in accordance with Electrical Power Inspection.

(b) Transducer.

1) Inspect for evidence of damage, security and cleanliness of installation.

2) Inspect vane for free operation.

3) Inspect for proper operation of transmitter case heat.

4) Inspect electrical components in accordance with Electrical Power Inspection.

(c) An operational test (ground) of the angle-of-attack system and transducer case heat requires external electrical power.

(3) Altimeter.

(a) Radio altimeter.

1) Inspect indicator, transceiver and antennas for condition and security.

2) Inspect the electrical components in accordance with the Electrical Power Inspection.

3) An operation test is performed by operating the press- to-test button on the indicator.

(b) Encoding altimeter.

1) Inspect indicator for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

3) An operational test is performed in conjunction with the pitot-static functional test.

(c) Altitude alerting and reporting.

1) Inspect altimeter-encoder and altitude alerter for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

3) An operational test is performed in conjunction with the encoding altimeter and pitot-static functional test.

b. Attitude and direction.

(1) The attitude and direction includes systems which use magnetic gyroscopic and inertia forces.

(a) Magnetic compass.

1) Inspect for condition and security.

(b) Turn and bank indicator.

1) Inspect for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

3) Operate the electrically driven gyro and check power OFF warning flag.

(c) Horizon gyro.

1) Inspect for condition and security.

2) For system inspection, refer to vacuum section.

(d) Flight director, IFCS control unit, horizontal situation indicator and mode selector.

1) Inspect for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

3) Functional test of the flight director is performed during the autoflight system test. Refer to autoflight section.

(e) Directional gyro.

1) Inspect for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

3) For system inspection, refer to vacuum section.

c. Landing and taxiing aids.

(1) The landing and taxiing aids provide guidance during approach, landing and taxiing.

(a) Glideslope antenna and antenna coupler.

1) Inspect for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

3) A test set and external power are required to functional test the glideslope system. The glideslope system is checked during the autopilot/flight director system test. Refer to autof-light section.

(b) Marker beacon.

1) Inspect for condition and security.

2) Inspect the electrical components in accordance with Electrical Power Inspection.

d. Independent position determining.

(1) The independent position determining provides information to determine position and is mainly independent of ground installation.

(a) Emergency locator system.

1) Inspect for condition and security.

2) Inspect locator battery pack; verify the replacement date on the battery has sufficient time to surpass the next regular scheduled inspection. Verify the function switch is positioned to the auto position upon completion of the inspection.

3) Operational test.

a) Connect an auxiliary power unit (APU) with the output voltage adjusted to the airplanes specified voltages to supply power to airplane radios.

NOTE

The emergency locator transmitter receives electrical power from self-contained battery pack.

b) Place the airplane battery switch, master avionics switch and the VHF COM 1 or VHF COM 2 and audio control circuit breakers to ON.

c) Place the COM 1 or COM 2 power switch to ON.

d) Set the COM frequency selector switch to 121.50 MHz and audio control as required.

CAUTION

THE FOLLOWING TEST SHALL BE MADE ONLY DURING THE FIRST FIVE (5) MINUTES OF EACH HOUR. IT IS ILLEGAL TO TRANSMIT ON 121.50 AND 243.00 MHz AT ANY OTHER TIME EXCEPT IN AN EMERGENCY.

e) Place the ELT-6 AUTO-OFF-ON function switch in the ON position. A TONE modulation sweeping downward between 1300 to 600 Hz shall be heard in cockpit speakers or headsets, whichever is applicable. Let the ELT cycle at least six (6) times.

f) Place the ELT-6 AUTO-OFF-ON switch in the AUTO position. The TONE shall not be heard.

NOTE

Ensure that the ELT-6 TONE-OFF-ON switch is in the AUTO position before ending test.

g) Record in the airplane log the length of time the battery pack supplied power to operate the locator beacon. Coordinate total time with replacement schedule.

(b) Weather radar.

1) Radar wave guide, receiver-transmitter and radar indicator.

a) Inspect for condition and security.

b) Inspect the electrical components in accordance with Electrical Power Inspection.

c) External power is required to operational test the radar system.

NOTE

Do not operate the radar system within 15 feet of ground personnel or containers holding flammable or explosive material. Do not operate the radar system during fueling operations. When preflighting the radar system, ensure that the airplane is facing away from buildings or large metal structures that are likely to reflect significant amounts of radar energy back into the system.

e. Dependent position determining.

(1) The dependent position determining provides information to determine position and is mainly dependent on ground installation.

(a) ADF system.

1) Inspect ADF receiver, control unit, power supply, loop antenna and sense antenna for condition and security. When an airplane is equipped with dual ADF systems, perform the inspection on each ADF system.

2) Inspect electrical components in accordance with Electrical Power Inspection.

3) Apply external power and operational check the ADF system including the RMI indication.

(b) DME (Distance Measuring Equipment).

1) Inspect the receiver-transmitter, antenna and indicator for condition and security. The DME system is operated by the frequency selection of the navigation receivers. When an airplane is equipped with dual DME, perform the inspection on each DME system.

2) Inspect electrical components in accordance with Electrical Components Inspection.

3) Apply external power and perform an operational test on the DME system.

(c) Radio magnetic indicator.

1) Inspect for condition and security.

2) Apply external power and check operation of the indicator. The operation is performed in conjunction with the navigation receivers and ADF receiver.

(d) Navigation system.
   1) Navigation receivers, antennas, control units and course indicators.
      a) Inspect for condition and security.
      b) Inspect electrical components in accordance with Electrical Components Inspection.
      c) Apply external power and operational check the navigation system.

(e) Area navigation system.
   1) Inspect all components for condition and security. When an airplane is equipped with dual area navigation systems, perform the inspection on each system.
   2) Inspect electrical components in accordance with Electrical Components Inspection.
   3) Functional test requires external power and a test set.

(f) Transponder system.
   1) Inspect for condition and security.
   2) Inspect the electrical components in accordance with Electrical Power Inspection.
   3) Apply external power, operate individual controls and perform operational test of transponder system. A ramp test set is required to functional test the transponder system.

(g) Vertical speed indicators.
   1) Inspect for condition and security.
   2) Perform operational test.

15. Oxygen (Refer to Section 6).

a. Oxygen system and regulator.
   (1) Inspect the oxygen cylinder, supply pressure regulator, filler valve and pressure gage for condition and security.
   (2) Check pressure and rate-of-flow indicator. The operational test requires a test run.

b. Oxygen masks and hoses.
   (1) Inspect mask and hoses for leaks, cracks and deterioration. Check mask stowage compartment for cleanliness and general condition. Check flow indicator for freedom of movement; couplings and adapters for proper insertion.
   (2) Inspect hoses on both sides of flow indicator. If there is any indication that the hoses have slipped off flow regulator, trim off approximately one-half inch and reinstall hose.
   (3) Perform the operational test of crew and passenger masks during functional test of the oxygen system.

c. Oxygen cylinder.
   (1) Inspect for condition and security.
   (2) Check hydrostatic test date and perform hydrostatic test if due. Refer to Oxygen section.

16. Vacuum System (Refer to Section 10).

a. Vacuum pump and system.
   (1) Inspect for leaks, condition and security.
   (2) For functional test and adjustment, refer to vacuum system section.

b. Pump pad seal.
   (1) Inspect for oil leakage. If found, replace seal.

c. Dry vacuum dry air pump.
   (1) Inspect coupling fittings, for condition and security.

d. Vacuum system hoses.
   (1) Inspect all hoses for harness, deterioration and looseness. Replace if defective.
   (2) With vacuum applied to system, inspect for collapsed lines.

e. Regulator and deice control valves.
   (1) Inspect for condition and security.
   (2) Inspect the electrical components in accordance with electrical power inspection.

f. Vacuum system air filter.

(1) Clean per vacuum system section.
(2) Inspect for deterioration and contamination.

g. Vacuum system relief valve.
(1) Clean relief valve and filter screen and inspect per vacuum system section.
(2) Replace or clean filter if required.

17. Water and Waste (Refer to Section 12).

a. Flush toilet.
(1) Inspect the waste container, pump, bowl assembly, seat, relief tube and stowage drawer for condition and security.
(2) Inspect electrical components in accordance with electrical power inspection.
(3) Functional test by applying external power and check the flush cycle of the toilet. For toilet servicing information, refer to servicing section.

18. Door (Refer to Section 3).

a. Cabin Door.
(1) Door.
(a) Inspect door for condition and security.
(b) Operate door and observe for proper function of component parts. Replace components which show evidence of excessive wear.
(c) For lubricant, refer to servicing section.
(d) Inspect door cables for proper rigging and ensure that the door extender is not supporting any weight while the door is carrying a load of approximately 150 lbs.
(2) Seals.
(a) Inspect for cracks, breaks, tears, abrasions and excessive wear.
(b) For lubricant refer to servicing section.
(c) For repair or replacement, refer to door section.
(3) Door latch pins, guides and receptacles.
(a) Operate upper and lower latching mechanisms and inspect for excessive wear, cracks, improper threads and proper operation.
(b) Check for proper rigging. Refer to door section.
(4) Door hinges, latch pins, step hinges and stop assembly.
(a) Service. Refer to servicing section.
(5) Door Hinges.
(a) On airplanes with lower cabin door extenders which were modified, an eddy current inspection is required on the replacement hinges at the given interval after installation. The surface around the three rivets must be inspected for cracks. If any crack is found in the hinge during this inspection, it must be replaced.
(6) Perform an Eddy Current Inspection of Lower Cabin Door Hinge.

NOTE

Facilities performing nondestructive inspection must hold a valid FAA Repair Station Certificate with a Specialized Service Rating for the applicable method of nondestructive inspection. Facilities must own or have access to appropriate test equipment capable of performing the inspection and reporting test results, as defined in the procedure.

NOTE

Personnel performing inspection shall be certified to a minimum of Level II in eddy current test method, as defined by the American Society of Nondestructive Testing Recommended Practice Number SNT-TC-1A.

(a) Following equipment, or equivalent, shall be used providing equipment is capable of achieving required frequency range and test senitivity. A frequency of 200 KHz shall be used for impedance plane instrumentation.

NAME	MODEL No.	MANUFACTURER	USE
Eddy Current Instrument	ED-520	Centurion NDT 707 Remington Rd. Schaumburg, IL 60173	To perform eddy current inspection.
Right angle surface probe, absolute coil, ferrite shielded, 100-500 KHz, 0.125 inch diameter	VM202AF	VM Products 11208 62nd Ave Puyallup, WA 98373	To perform eddy current inspection.
Reference Standard 7075-T6, Notch depths 0.008 inch, 0.020 inch and 0.040 inch	VM-89A	VM Products	To perform eddy current inspection.

(b) Inspection area shall be visibly free of grease, oil, scale, loose paint, or other substances which may interfere with inspection.
(c) Standardize eddy current instrument for balance and lift-off in accordance with the manufacturer's instructions.
(d) Adjust sensitivity of instrument to ensure a rapid needle deflection from 0.020 inch notch in calibration standard.
(e) If probe passes over a crack, needle will deflect repidly and return to the approximate original reading.

NOTE

Needle deflection can be as little as three to four divisions.

(f) Working from exterior of airplane, inspect area around three rivets in each of the lower cabin door hinges.
1) If an indication is noted, verify indication by repeating inspection in opposite direction.

NOTE

Gradual needle movements up or down scale may occur due to liftoff or minor changes in material conductivity. These indications shall be disregarded.

2) If a crack is detected, replace lower cabin door hinge.

b. Nose baggage door, avionics and wing lock doors.
(1) Door.
(a) Inspect door for condition and security.
(b) Operate door and observe for proper function of component parts. Replace components which show evidence of excessive wear.
(c) For lubricant, refer to servicing section.
(2) Seals.
(a) Inspect for cracks, breaks, tears, abrasions and excessive wear.
(b) For lubricant, refer to servicing section.
(c) For repair or replacement, refer to door section.
(3) Hinges, latches, latch pins and stops.
(a) Operate latching mechanism and inspect for excessive wear, cracks, improper threads and proper operation.
(b) Check for proper rigging. Refer to door section.
(4) Hinges, latches and stops.
(a) Service. Refer to servicing section.

c. Emergency exit door.
  (1) Door and Handle.
    (a) Inspect door and handle for condition and security.
    (b) Perform operational check. Refer to door section.
  (2) Seal.
    (a) Inspect for proper installation, cuts, abrasions and excessive wear.
d. Main and nose landing gear door.
  (1) Inspect for condition and security.

19. Fuselage (Refer to Section 3).

a. Fuselage skin.
  (1) Inspect the fuselage skin for cracks, loose failed fasteners and evidence of damage. The areas of interest for skin cracks and failed fasteners are around fuselage openings (doors, windows, etc.). The skin damage will appear in forms of dents, scrapes and nicks which are caused by flying objects projected by the wheels during takeoffs and landings, maintenance stands, hanger racks, etc. Refer to standard practices section for repair of loose rivets and cracks.
b. Control pedestal and quadrant.
  (1) Inspect for condition and security.
c. Control pedestal bearings and trim control gears and track.
  (1) Service. Refer to servicing section.
d. Inspection pressurized cabin (this does not include type A, B or C inspection).
  (1) Any leak at windows or doors should be corrected. If pressurization air dump valve malfunctions were detected, the unit should be repaired or replaced.
  (2) Inspect cabin pressurization ducting fittings in the engine compartment for security, cracks, leaks, loose clamps and deterioration.
  (3) Check ram air valve in the nose for operation and possible leakage or blockage due to foreign material.
  (4) Inspect access doors to the cabin for possible seal leaks. Inspect test fittings in forward pressure bulkhead in nose wheel well area.
  (5) Inspect the sealing of any repairs or field electronics installation affecting the cabin pressurized area and the control cable seals for cracks, deterioration, excessive wear and proper installation. Leaks in the cabin structure may be sealed in accordance with sealing instructions.
  (6) Inspect heater ducting, mounting and sealing forward of forward pressure bulkhead.
  (7) On completion of repairs to the cabin pressurization area, preform operational check. Refer to air conditioning section.
  (8) To assure a successful fail safe structure for the pressure cabin, pressure cabin, periodic inspections are required. Three types of inspections are outlined for the pressure cabin structure cabin structure, Types A, B and C. The airplane hour intervals and type of inspection to be performed are listed in Inspection Time Limits.
e. Pressure cabin Type A Inspection.
  (1) Type A inspection consists of a limited inspection of the cabin structure requiring a vary minimum of equipment and upholstery removal for access. The shaded areas to each figure are the critical areas to be inspected. Use the following procedures:

NOTE

In case of any skin cracks or rivet damage, upholstery should be removed in the local damage area to inspect internal structure for damage.

    (a) Inspect all external pressure cabin structure for cracks and damage.
    (b) Inspect pressure cabin structure for loose or failed fasteners.
    (c) Inspect pressure cabin skin and skin splices for cracks, loose rivets or failed fasteners.
    (d) Inspect windshield cockpit side windows and cabin windows for looseness, cracks, nicks, deep gouges and scratches.
    (e) Inspect the cabin door and cabin doorframe for cracks, loose rivets or fasteners.
    (f) (See Figure 8). Inspect forward cabin pressure bulkhead.
    (g) (See Figure 9). Inspect aft cabin pressure bulkhead.

f. Pressure cabin Type B Inspection.
   (1) Type B Inspection is a visual inspection of the most critical areas of the cabin structure. To conduct this inspection, only partial upholstery and floorboards necessary for these areas must be removed. Inspect all cabin structure for fatigue cracks and damaged areas for loose and failed rivets or structural fasteners. Shaded areas in each figure are the critical areas to be inspected. Use the following procedures:
      (a) (See Figure 10). Inspect entire front spar bulkhead at F.S. 154.5 both left and right especially around the lightening holes.
      (b) (See Figure 11). Inspect front spar carry thru noting especially the critical points.
      (c) (See Figure 12). Inspect entire rear spar bulkhead at F.S. 186.15
      (d) (See Figure 13). Inspect rear spar carry thru at F.S. 186.15
      (e) (See Figure 9). Inspect aft pressure bulkhead at F.S. 289.74
g. Pressure cabin Type C Inspection.
   (1) Type C Inspection is a complete visual inspection of the cabin structure. Should a crack be detected, the structure must be repaired using the standard structural repair as defined in Standard Practices section with the following exceptions: the windshield, cockpit side windows, cabin windows, door latch pin receptacles, door latch pin guides and lower cabin door pins. Any cracks found in any of these components require replacement of the components. To conduct this inspection, the floorboards and upholstery must be removed. Shaded areas in each figure are the critical areas to be inspected. Use the following procedures:
      (a) (See Figure 8). Inspect forward pressure bulkhead at especially noted areas at F.S. 100.00
      (b) Inspect windshield, cockpit side windows and cabin windows, especially in attaching areas, for cracks, nicks, dents, deep gouges, loose rivets or structural fasteners.

CAUTION
WHEN INSPECTING THE CRITICAL (SHADED) AREAS, IT MAY BE NECESSARY TO REMOVE PRIMER AND DYE CHECK. REMOVAL OF SEALING IS NOT RECOMMENDED UNLESS REPAIR IS BEING MADE.

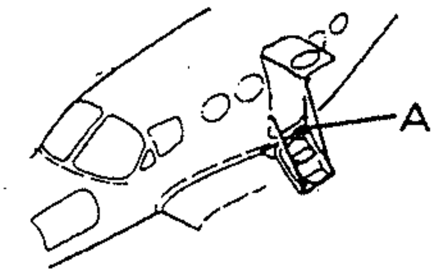
      (c) (See Figure 14). Inspect bulkhead for structural mounting left and right at F.S. 166.95
      (d) Open escape hatch and inspect frame, seal and operating mechanism..
      (e) (See Figure 15). Inspect cabin doorframe at F.S. 225.50
      (f) (See Figure 16). Inspect cabin doorframe supporting bulkheads. Note critical areas.
      (g) (See Figure 17). Inspect cabin doorframes, hinges, hinge pins, hinge support castings and support casting attachments.
      (h) (See Figure 17). Remove cabin door latch pin receptacles and guides from cabin door and cabin doorframe and inspect for wear, cracks, dents, bends and reinstall.

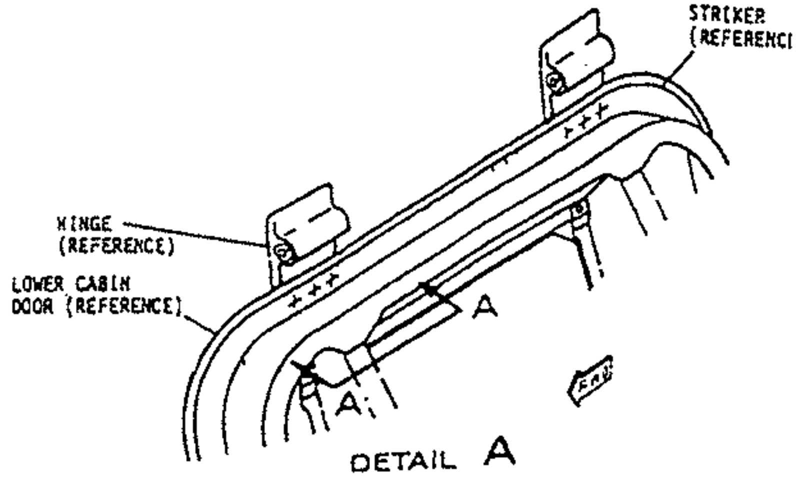
NOTE
If latch pin receptacles or cabin door latch pins are damaged or worn, don't hesitate to reject and install new parts.

      (i) (See Figure 18). Inspect entire bulkhead at F.S. 225.500 especially at the left and right mountings as shown.
      (j) (See Figure 19). Inspect entire bulkhead at F.S. 277.20, especially at the critical points.
      (k) Inspect skins, skin attaching rivets and skin splices in pressure cabin area.
      (l) Inspect all stringers behind upholstery and under the floorboards.

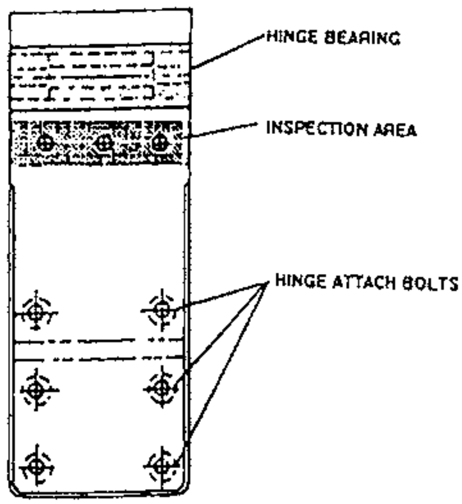
NOTE
It will be necessary to drill out rivets to remove overhead air plenum cover to inspect stringer splices at F.S. 160.50. Refer to structural repair for riveting procedures and refer to general information for sealing procedures when reinstalling air plenum cover.

h. Fuselage drains.
   (1) Inspect drains for obstruction and remove any foreign material from tailcone prevent blockage.
i. Tailcone wire bundles.
   (1) Inspect wire bundles for proper position of drip loop to prevent moisture from entering connector.

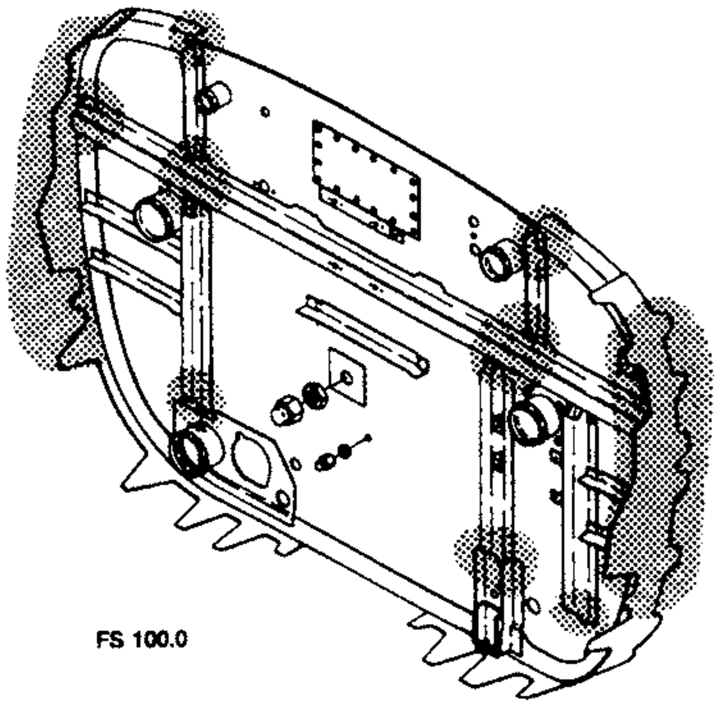




LOWER CABIN DOOR HINGE



Lower Cabin Door Hinge Eddy Current Inspection
Figure 7A (Sheet 1)



Forward Pressure Bulkhead
Figure 8

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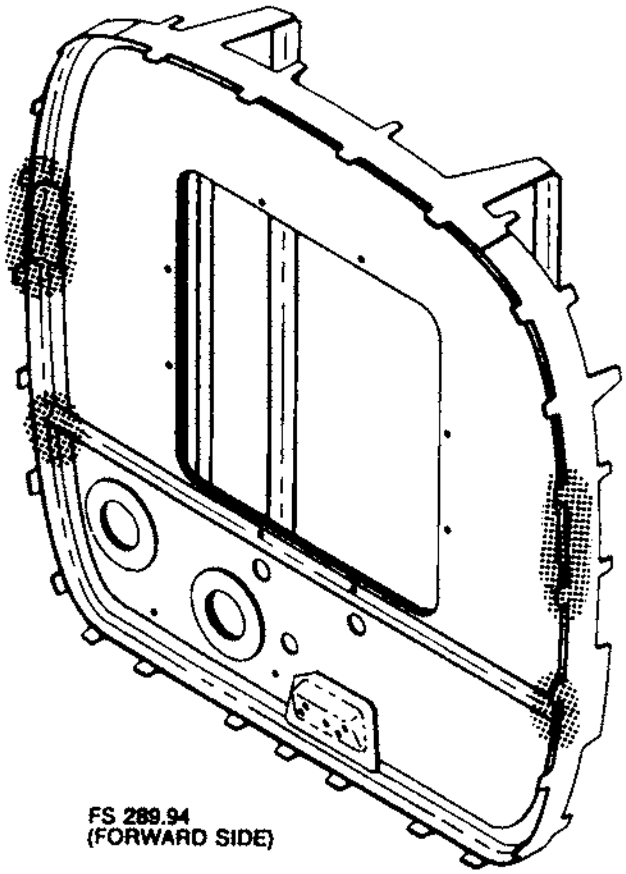
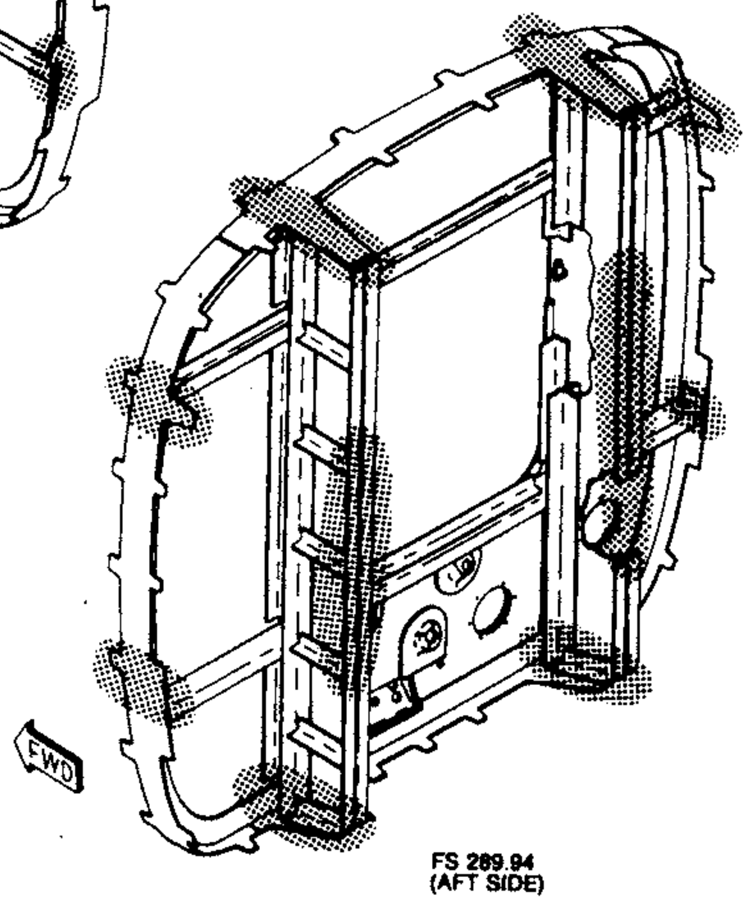


FS 289.94
(FORWARD SIDE)

AIRPLANES C0001 THRU C0400



FS 289.94
(AFT SIDE)

AIRPLANES C0001 THRU C0400

Aft Pressure Bulkhead
Figure 9 (Sheet 1 of 2)

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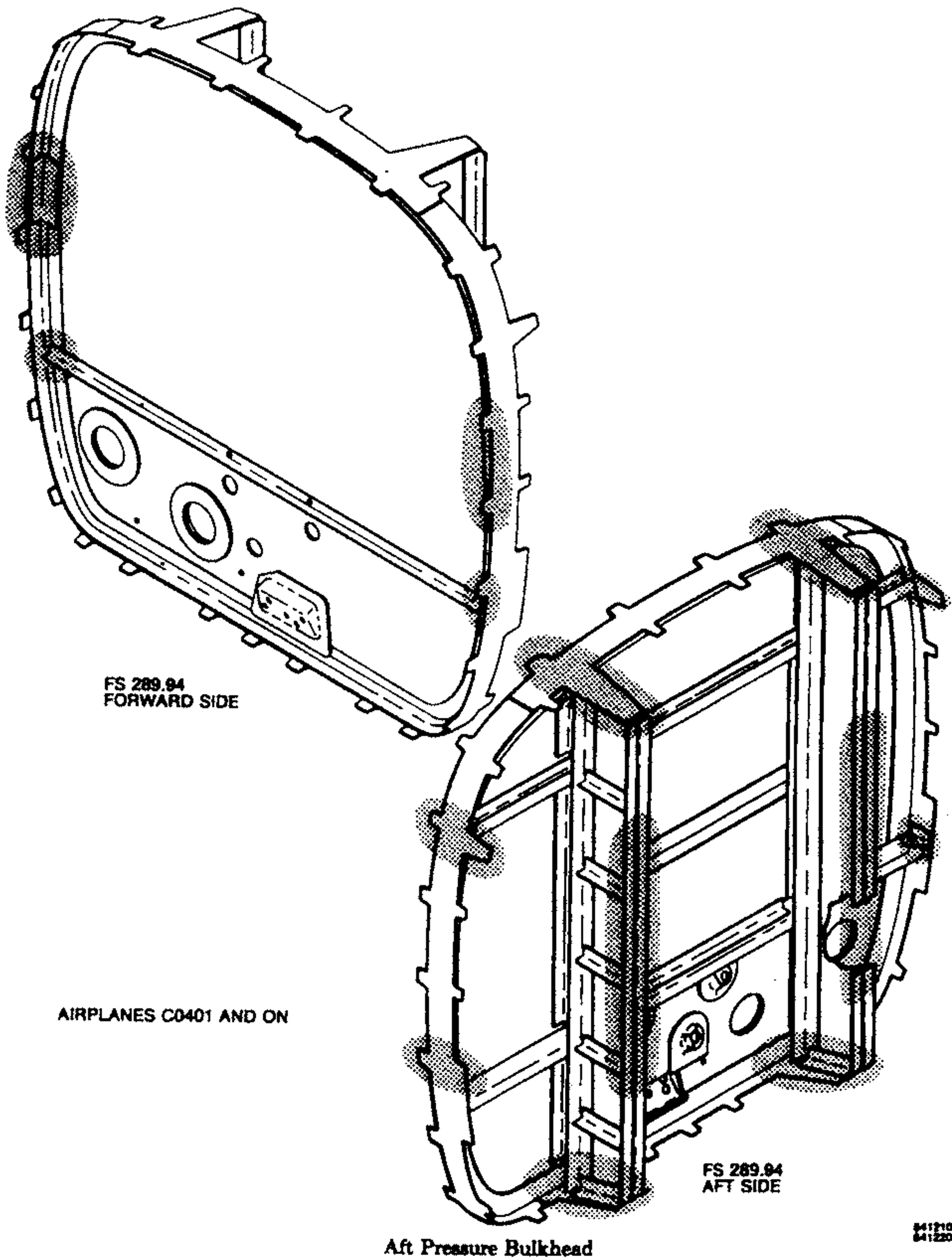
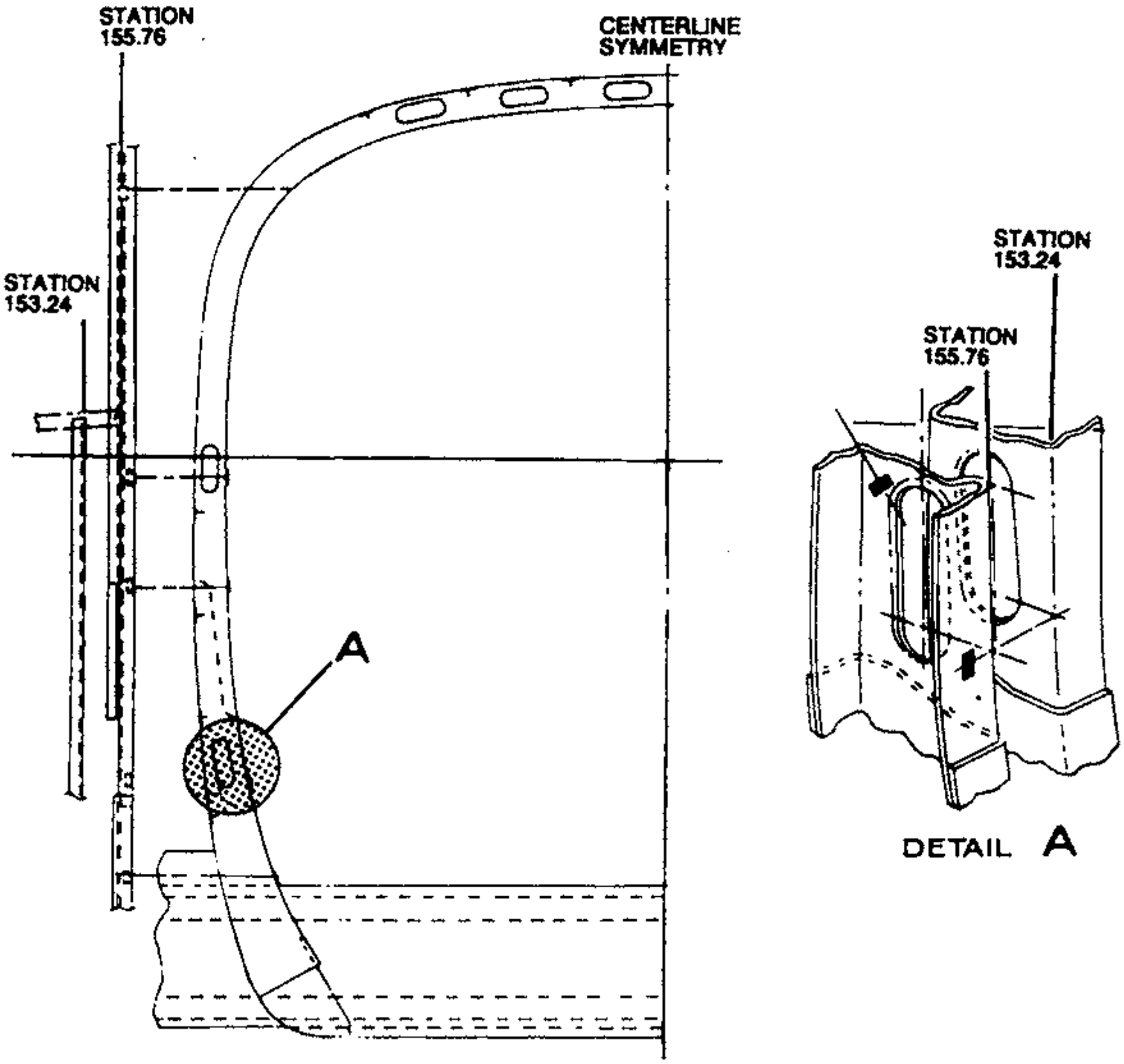
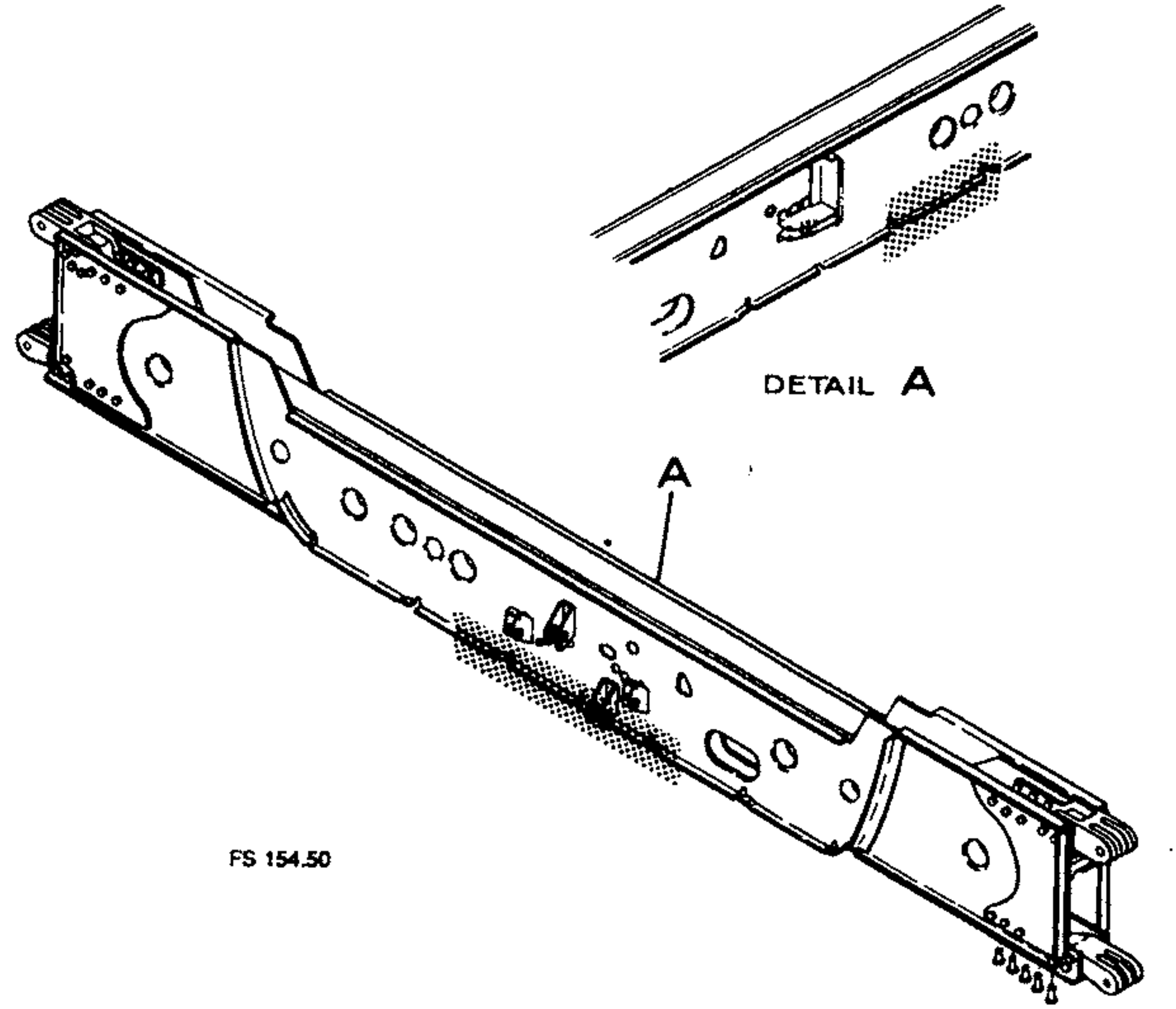


Aft Pressure Bulkhead
Figure 9 (Sheet 2)



Front Spar Bulkhead
Figure 10



Fuselage Front Spar
Figure 11

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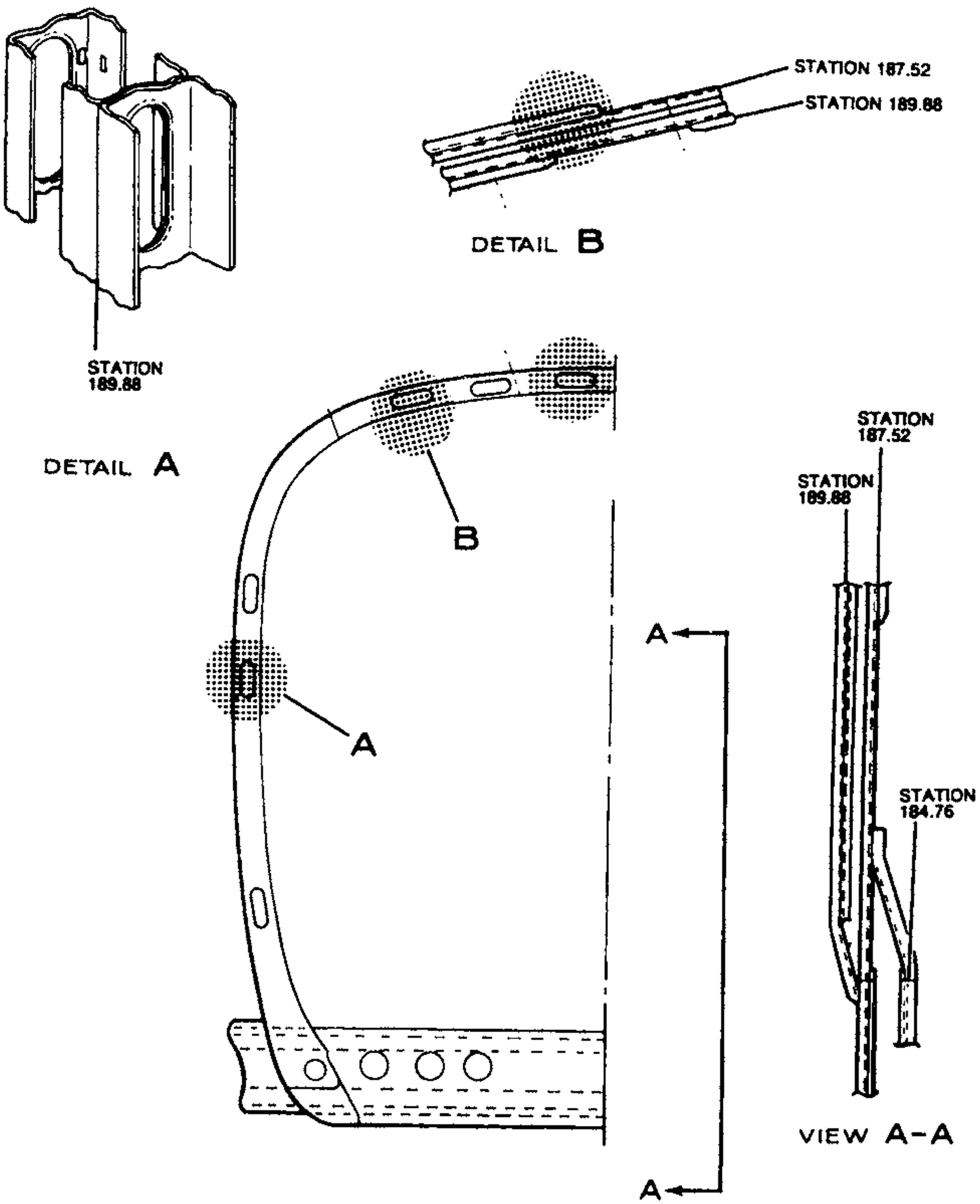
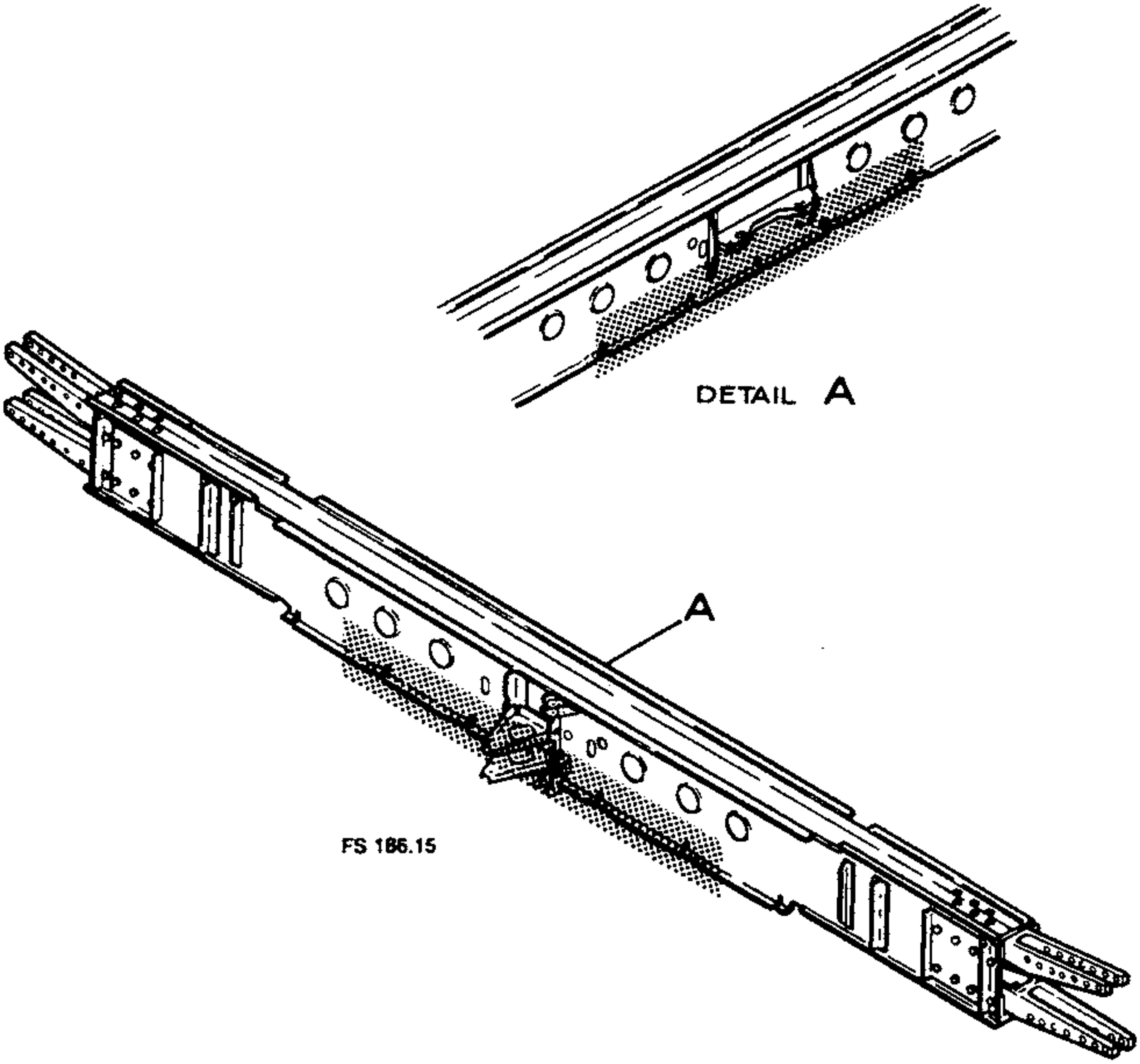


Rear Spar Bulkhead (Left)
Figure 12



Rear Spar Carry-Thru
Figure 13

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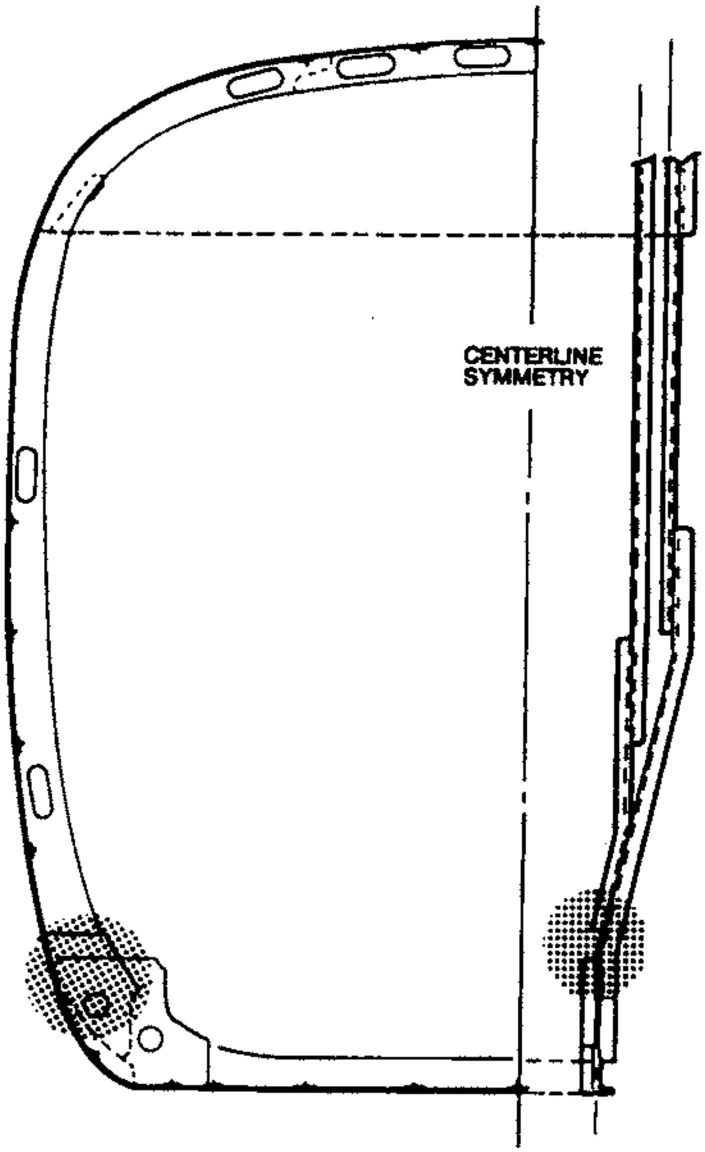
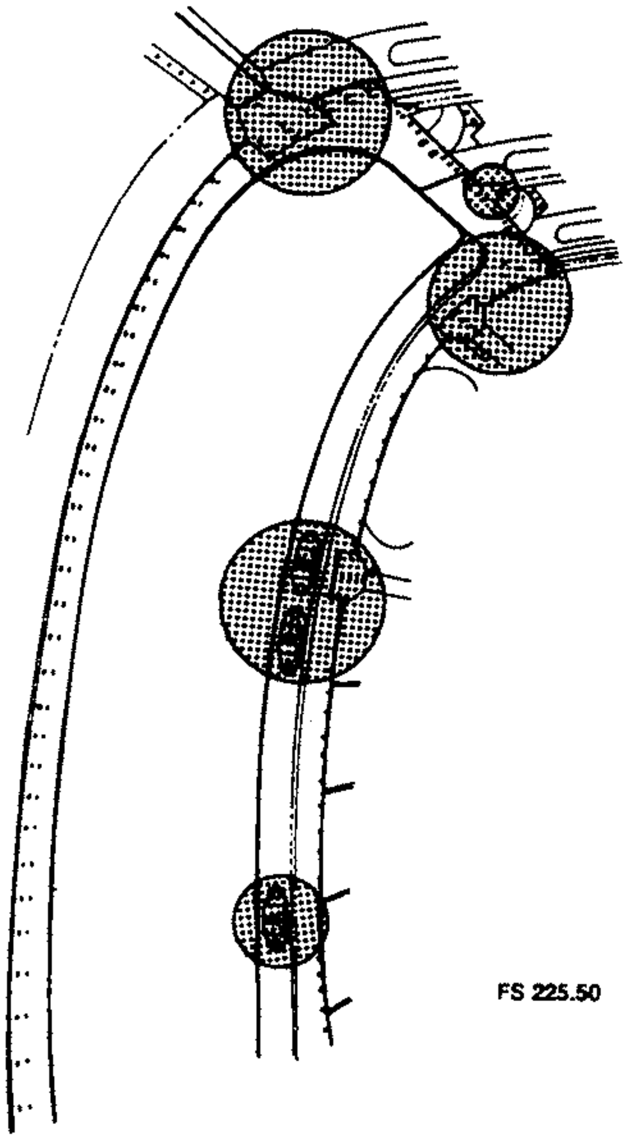
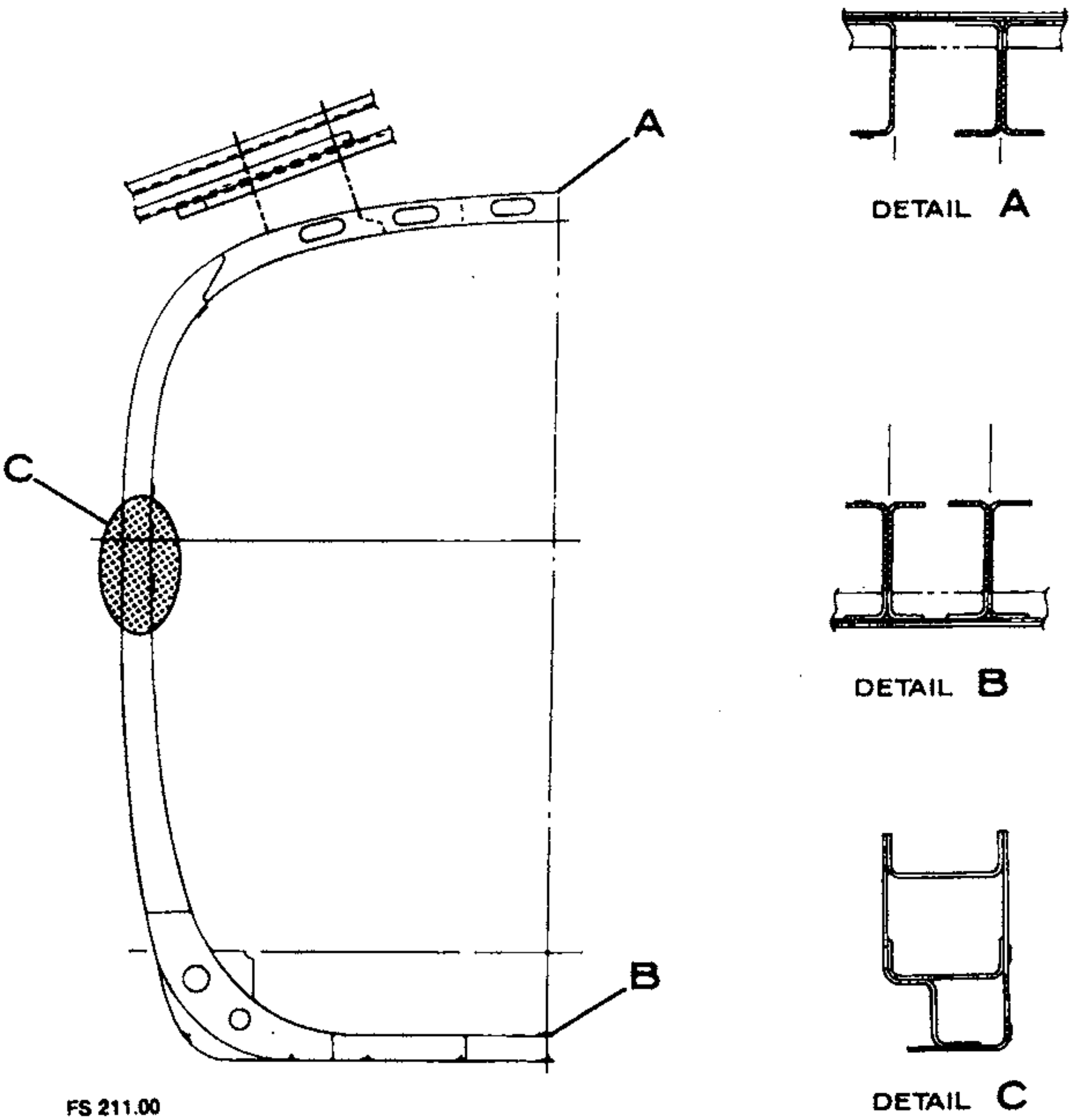


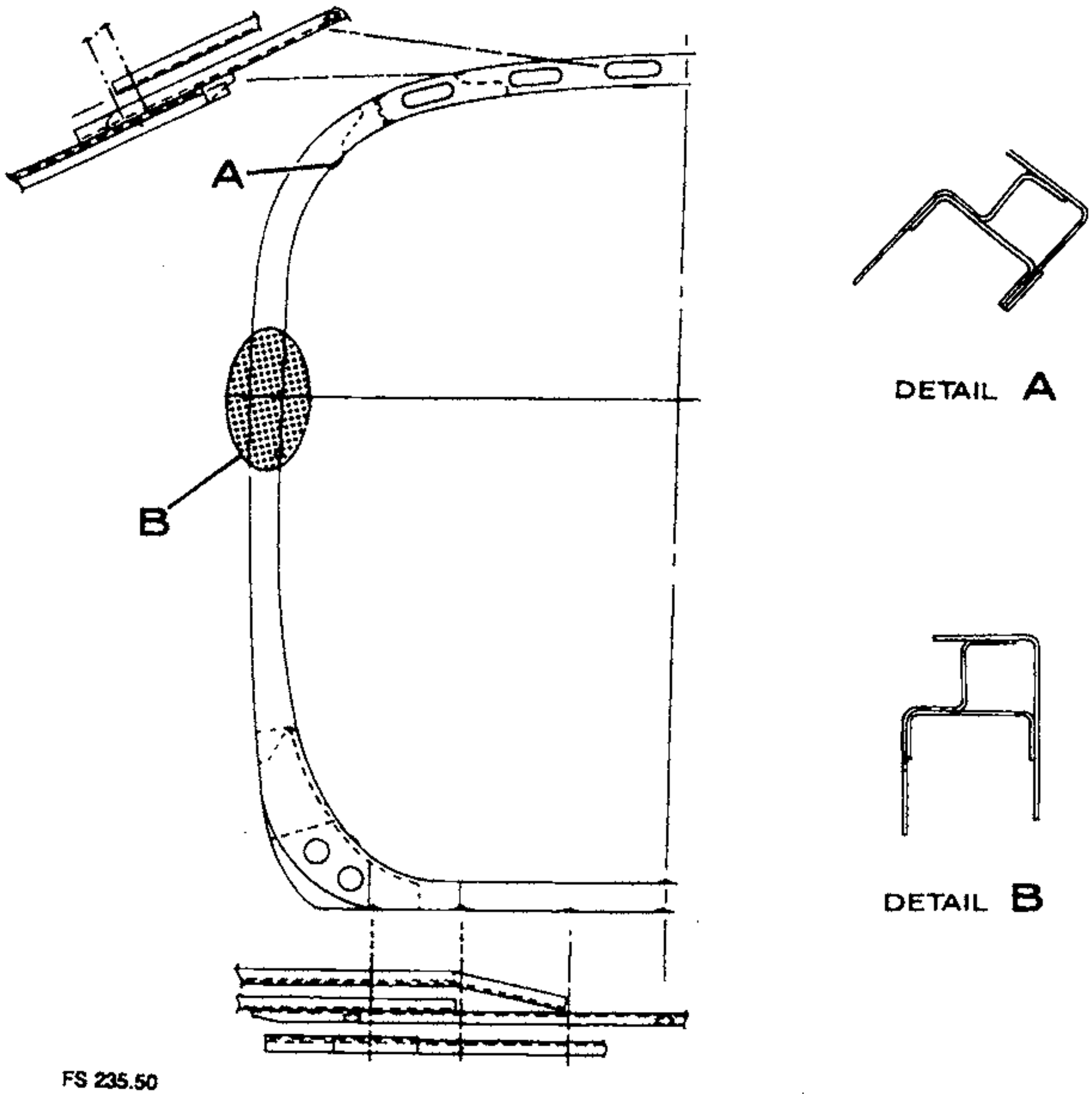
Left Bulkhead
Figure 14



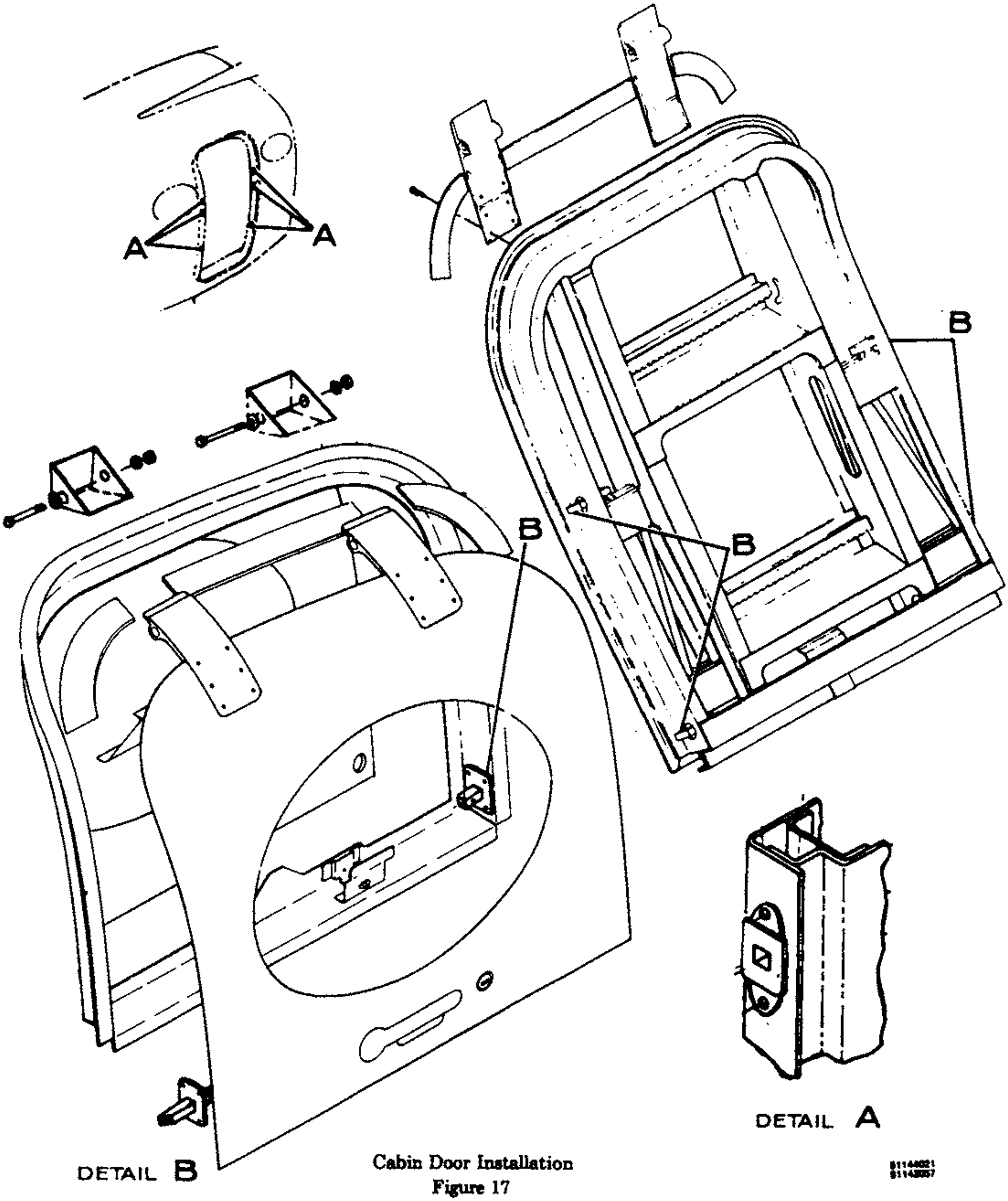
Cabin Doorframe
Figure 15



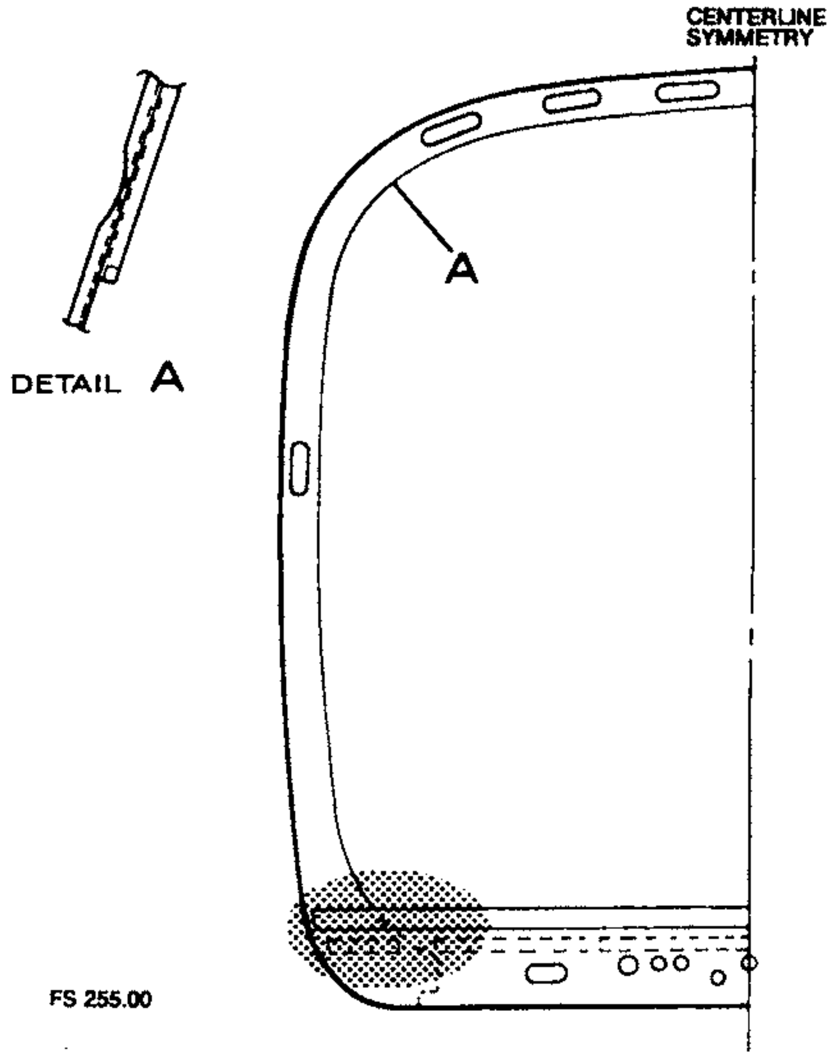
Forward and Aft Door Bulkhead
Figure 16 (Sheet 1 of 2)



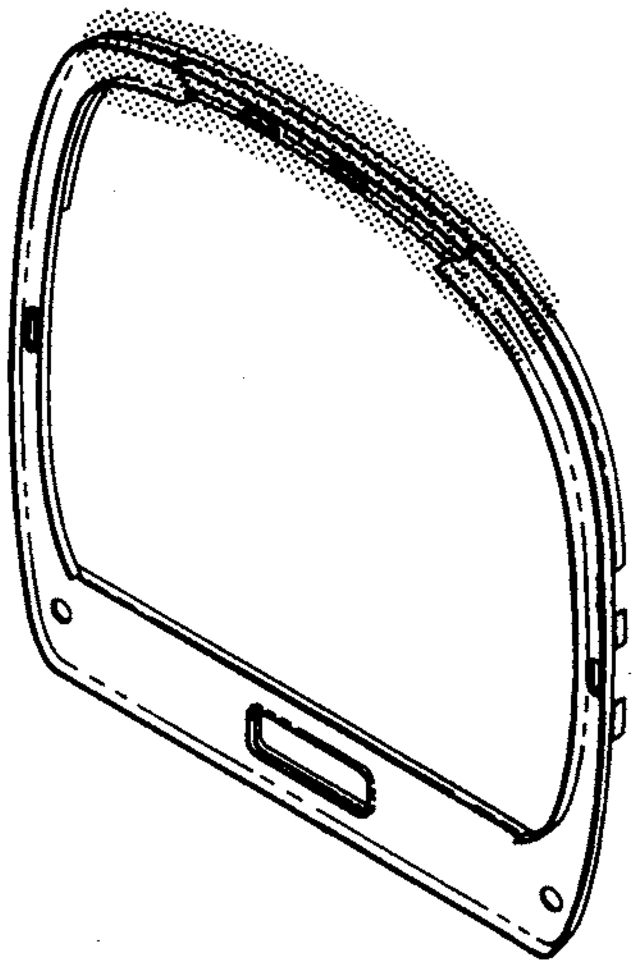
Forward and Aft Door Bulkhead
Figure 16 (Sheet 2)



Cabin Door Installation
Figure 17



Left Bulkhead
Figure 18



Bulkhead Fuselage Station 277.20
Figure 19

20. Nacelles (Refer to Section 3).

a. Nacelle firewall structure.
   (1) Inspect for cracks, condition and security.
   (2) Inspect sealant for deterioration.
   (3) Inspect feed-thru ducts and lines for chafing.
b. Nacelle structure and cowling.
   (1) Inspect paint for damage.
   (2) Inspect for cracks, wrinkles, corrosion, loose or failed fasteners and evidence of structural damage.
c. Wing locker baggage compartment (if applicable).
   (1) Inspect for damage, condition and security.
   (2) Visually check cup below latch for blockage at drain hole. If blocked blow shop air into drain line from bottom side of nacelle to remove any blockage.
d. Oil filler door and access panels.
   (1) Inspect for security of installation and evidence of damage.

21. Stabilizer (refer to Section 3).

a. Horizontal stabilizer.
   (1) Inspect entire skin surface for cracks, loose or failed fasteners, corrosion and any indication of sturctural damage.
   (2) Inspect bolts for security.
   (3) Inspect attach bulkheads for cracks, failed fasteners and structural damage.
   (4) Inspect right and left outboard tip rib for cracks.
   (5) Inspect right and left upper and lower spar caps for cracks extending from tip inboard through fitting attach holes.
   (6) Inspect hinge bracketry for cracks and loose and/or working fasteners.
   (7) Inspect outboard hinge bearing for looseness.
b. Vertical stabilizer.
   (1) Inspect entire skin surface for cracks, loose or failed fasteners, corrosion and any indication of structural damage.
   (2) Inspect bolts for security.
   (3) Inspect front and rear spar attach points for cracks, failed fasteners and structural damage.
   (4) Inspect upper tip ribs for cracks.
   (5) Inspect hinge bracketry for cracks and loose and/or working fasteners.
   (6) Inspect hinge bearings for looseness.
c. Elevator and rudder.
   (1) Inspect per flight control inspection procedures.

22. Windows (refer to Section 3).

a. Windows and nonheated windshield.
   (1) Inspect all windows and nonheated windshield for pits, scratches, crazing and deterioration. Pay particular attention to the critical vision areas in the windshield, pilot's side window and copilot's side window.

23. Wings (refer to Section 3).

a. Wings.
   (1) Inspect wing skins, wing attach fittings, flap and aileron attach fittings for cracks, loose or failed fasteners, corrosion and indication of structural damage.
b. Wing and stub wing structure.
   (1) Inspect area above upper wing spar cap immediately outboard of fuselage for cracks (unless web has been modified to remove area).
   (2) Two types of wing inspections are required for the wing structure. These inspections (Types A and B) are outlined in the following paragraphs. The airplane hour intervals and type of inspection to be performed are outlined in Inspection Time Limits.

(a) Type A Inspection - Type A Inspection is a limited visual inspection of the center and outboard wing structure. Use the following procedures :
   1) Inspect all external wing surfaces for cracks and damaged areas.
   2) Inspect for loose and failed fasteners.
   3) Inspect wing skin and splices for cracks, wrinkles, dents, etc.
   4) Inspect rivets, especially those common to the main, and front and rear spar skins in the center wing for loose or working rivets, and cracks around rivets.
   5) Inspect gear attach fittings and supporting structure for loose bolts, elongated bolt holes and structural members for damage which can result in secondary damage such as sheared or stretched rivets.

(b) Type B Inspection - Type B Inspection is a complete visual inspection of the wing structure using all available access holes, lightening holes and etc. To conduct this inspection, the engine cowling and access panels and doors must be removed. In addition to the access requirements, the flaps must be fully extended. Shaded areas in each figure are critical areas to be inspected. Should a crack be detected, the structure must be repaired using the standard structural repair defined in the structural repair section.. Cracks in the following items are not repairable : outer wing spar fittings, landing gear and attachment fittings, push-pull tubes, bellcranks, hinges, bolts, rivets, pins, bushings, bearings and wing/fuselage attach fittings. Any cracks in or failure of these items require that the discrepant item be replaced.

CAUTION : WHEN INSPECTING CRITICAL (SHADED) AREAS, IT MAY BE NECESSARY TO REMOVE PRIMER AND DYE CHECK.

   1) Inspect all wing structure for cracks and damaged areas.
   2) Inspect for loose and failed structural fasteners.
   3) Inspect front spar structure at the wing attach fittings. (Refer to Figure 20).
   4) Inspect rear spar structure at the wing attach fittings. (Refer to Figure 21).
   5) Inspect wing skin splices in outer wing. (Refer to Figure 22).
   6) Inspect internal and external surface wing panels for wrinkles and bulges or evident of damage (Refer to Figure 22).
   7) Inspect wheel well, especially gear fittings, ribs and spars.
   8) Inspect rivets, especially those common to spars and skin in outer wing.
   9) Inspect front and rear outer wing carry-thru structure (For carry-thru structure inside fuselage, refer to fuselage inspection) (Refer to Figure 23).
   10) Inspect engine nacelle, engine mount structure, propeller unfeathering accumulator mounting holes and shaded areas (Refer to Figure 24).
   11) Inspect stub wing (Refer to Figure 25).
   12) Inspect outboard wing and leading edge. Refer to defueling procedures and defuel fuel tanks. Remove access panels to gain entry into fuel cavity. Inspect bonded structure at stringer and doubler intersections of wing and leading edge using a mirror and a vapor-proof flashlight to check for cracks and delaminations. Refer to structural repair for repair if cracks or delamination are found.
   13) Inspect periphery of access panel doublers for cracks from the panel attach holes.
   14) Inspect exterior and interior structure for deterioration and corrosion. If corrosion is detected, refer to structures chapter for removal and treatment.
   15) Wing skins (Refer to Figure 22).
      a) Visually inspect the wing skins for cracks and evidence of damage.
   16) Wing tips (Refer to Figure 23).
      a) Inspect the tip tanks for cracks and evidence of damage. The light assembly inspections are performed under lights.
   17) Aileron and aileron trim tab (Refer to Figure 26).
      a) Inspect in accordance with Flight Controls Inspection.
   18) Flaps.
      a) Inspect entire surface and installation for condition and security

c. Skin Assembly Corrosion Inspection.

NOTE : TO ASSIST IN THE EARLY DETECTION AND/OR PREVENTION OF CORROSION BETWEEN THE WING SKIN AND THE SPAR CAP AND/OR THE RIB OF BONDED WING ASSEMBLIES, PERFORM THE SPECIAL INSPECTIONS REQUIRED BY THE REVISION OF MULTI-ENGINE SERVICE BULLETIN, MEB95-11, REVISION 1 (OR LATEST REVISION). IF NO EVIDENCE OF CORROSION OR DEBONDING IS DETECTED, THE EXPOSED BOND LINE EDGES SHALL BE SEALED. IF EVIDENCE OF CORROSION OR DEBONDING IS DETECTED, A MORE EXTENSIVE NONDESTRUCTIVE INSPECTION (NDI) MUST BE PERFORMED, AS DEFINED BY MEB95-11, REVISION 1 (OR LATEST REVISION).

(1) Repetitive Inspections:
  a) For airplanes on which only a visual inspection is accomplished and no evidence of debonding or corrosion detected during the initial or subsequent inspections; repeat the visual inspection every 12 months.
  b) For airplanes on which the NDI type inspection is accomplished and no evidence of debonding or corrosion detected during the initial or subsequent inspections; repeat a NDI type inspection every 24 months.
  c) For airplanes on which the NDI type inspection is accomplished and evidence of debonding or corrosion is detected during the initial or subsequent inspections, repair and repeat a NDI type inspection every 12 months.
(2) For airplanes on which affected wing skin panel or panels have been replaced or repaired:
  a) For airplanes on which a complete wing skin panel assembly has been replaced in accordance with the instructions provided in MEB95-11, Revision 1 (or latest revision). A repetitive inspection will no longer be required for the replaced wing skin panel only. Perform repetitive inspections as applicable for all nonreplaced wing skin panels visually or using NDI procedures as listed in (1) above or (2) b) below as applicable.
  b) For airplanes on which affected wing skin panel(s) have been repaired in accordance with MEB95-11(or latest revision), the repaired wing skin panel(s) shall be inspected visually or using NDI procedures as listed above in (1) above or (2) b) below as applicable.

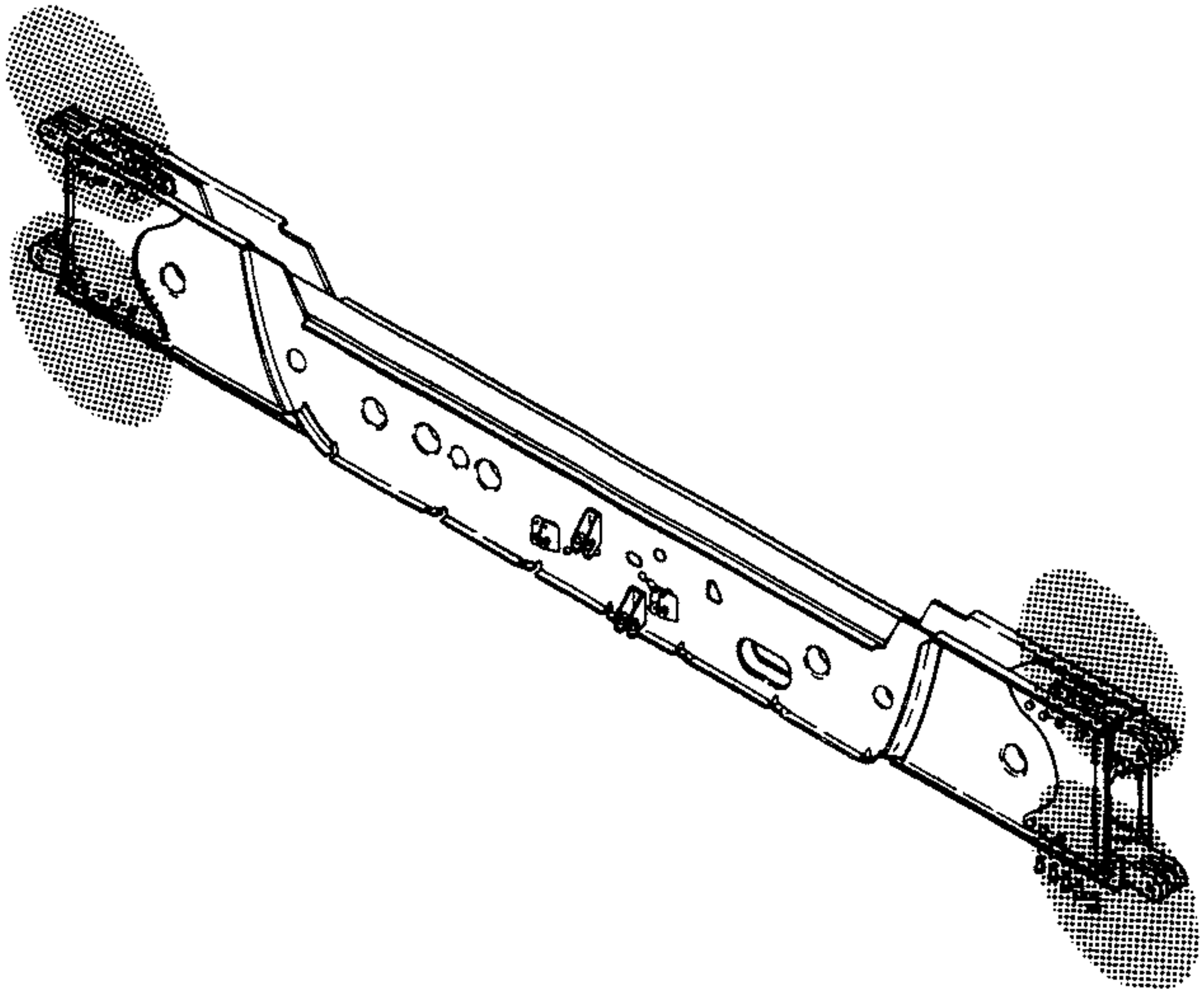
d. Wing wheel well.
  (1) Inspect wheel well, fluid lines and hoses for leaks, cracks, dents, kinks, chafing, bleaching or discoloration, proper radius, security, corrosion, deterioration and foreign matter.

e. Wing spar fittings.
  (1) Inspect spar fittings for condition and security and fuel leaks.
  (2) Inspect wing spar bolts for security. Ensure they are not working loose and check torque. (Check torque first 100-hours. Do not retorque thereafter.) Refer to wing section for proper torque values.

NOTE : WHEN CHECKING TORQUE ON SPAR BOLTS, ALWAYS LOOSEN NUT FIRST THEN CHECK TORQUE WHILE TIGHTENING NUT. SPAR BOLTS ARE INSTALLED IN SHEAR POSITION. DO NOT OVERTORQUE. IT IS POSSIBLE WING SPAR BOLTS WILL TURN IF A SLIGHT TORQUE IS APPLIED TO BOLT HEAD.

f. Wing leading edge.
  (1) Inspect bonded structures for condition.
  (2) Inspect for evidence of fluid leaks.

g. Wing Access Plates.
  (1) Inspect plates for security of installation and evidence of damage. It is not necessary to remove wing access panels for inspection purpose, except for wing structure inspection (Type B) and to inspect system components.



Front Spar Carry-Thru Structure
Figure 20

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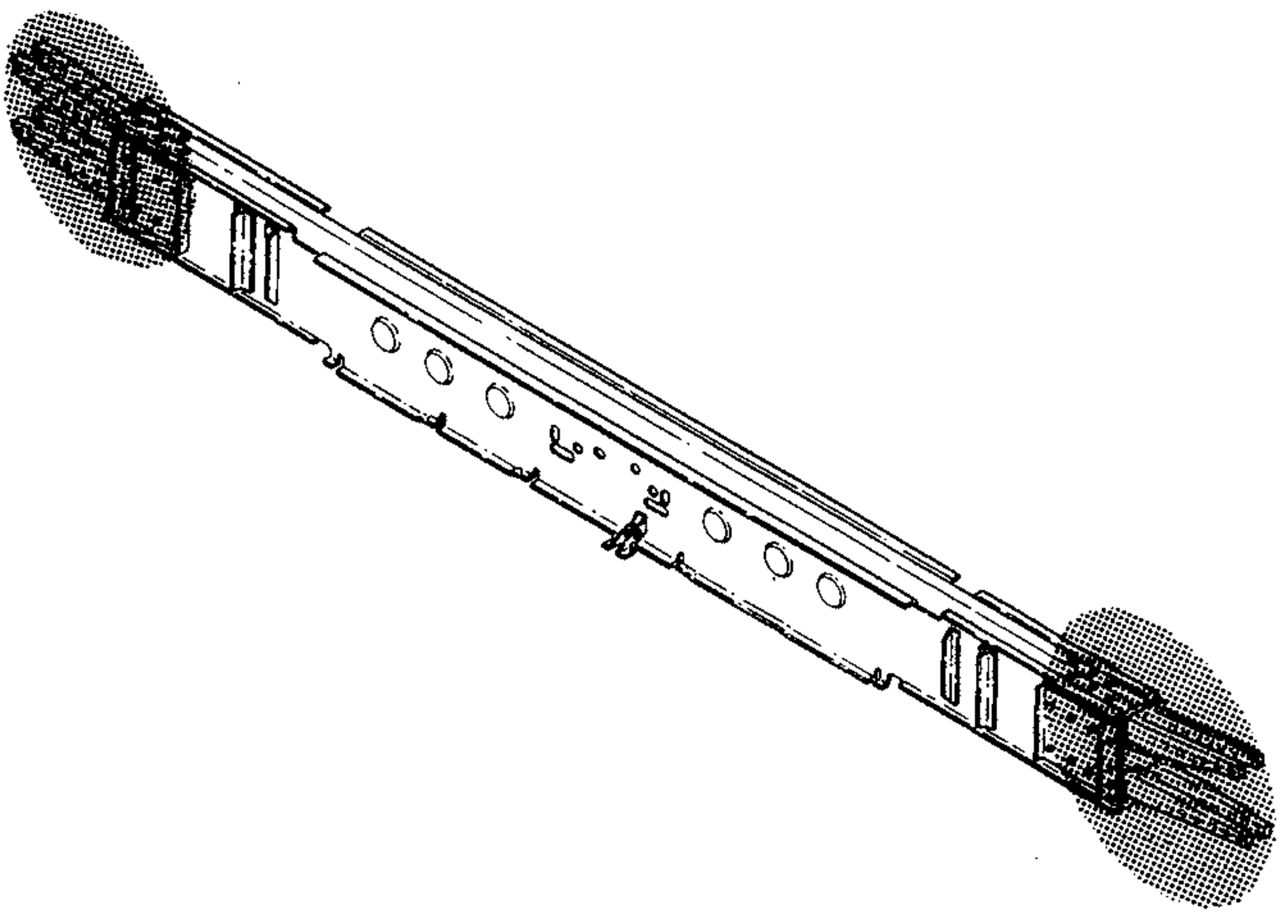

Rear Spar Carry-Thru Structure
Figure 21

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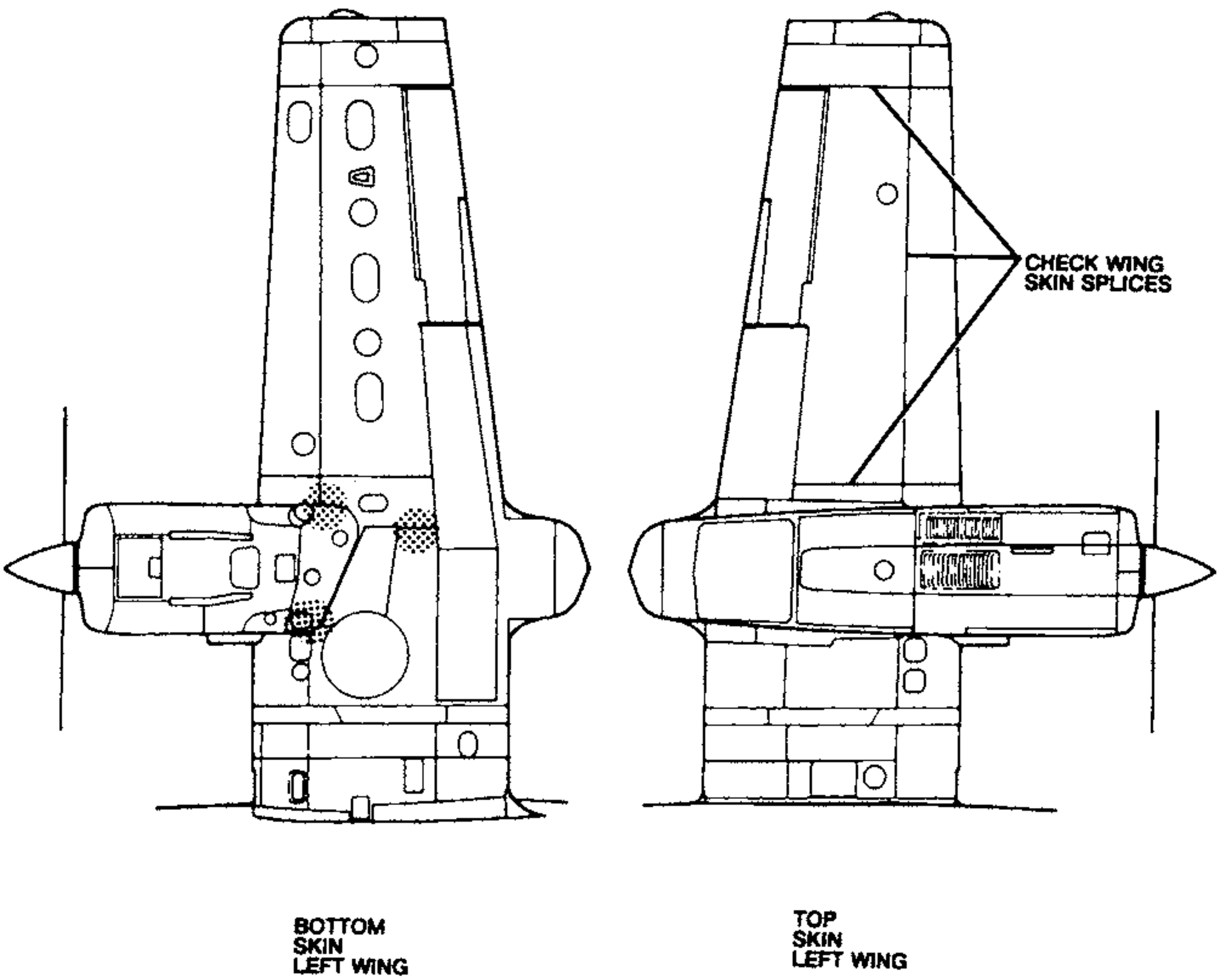
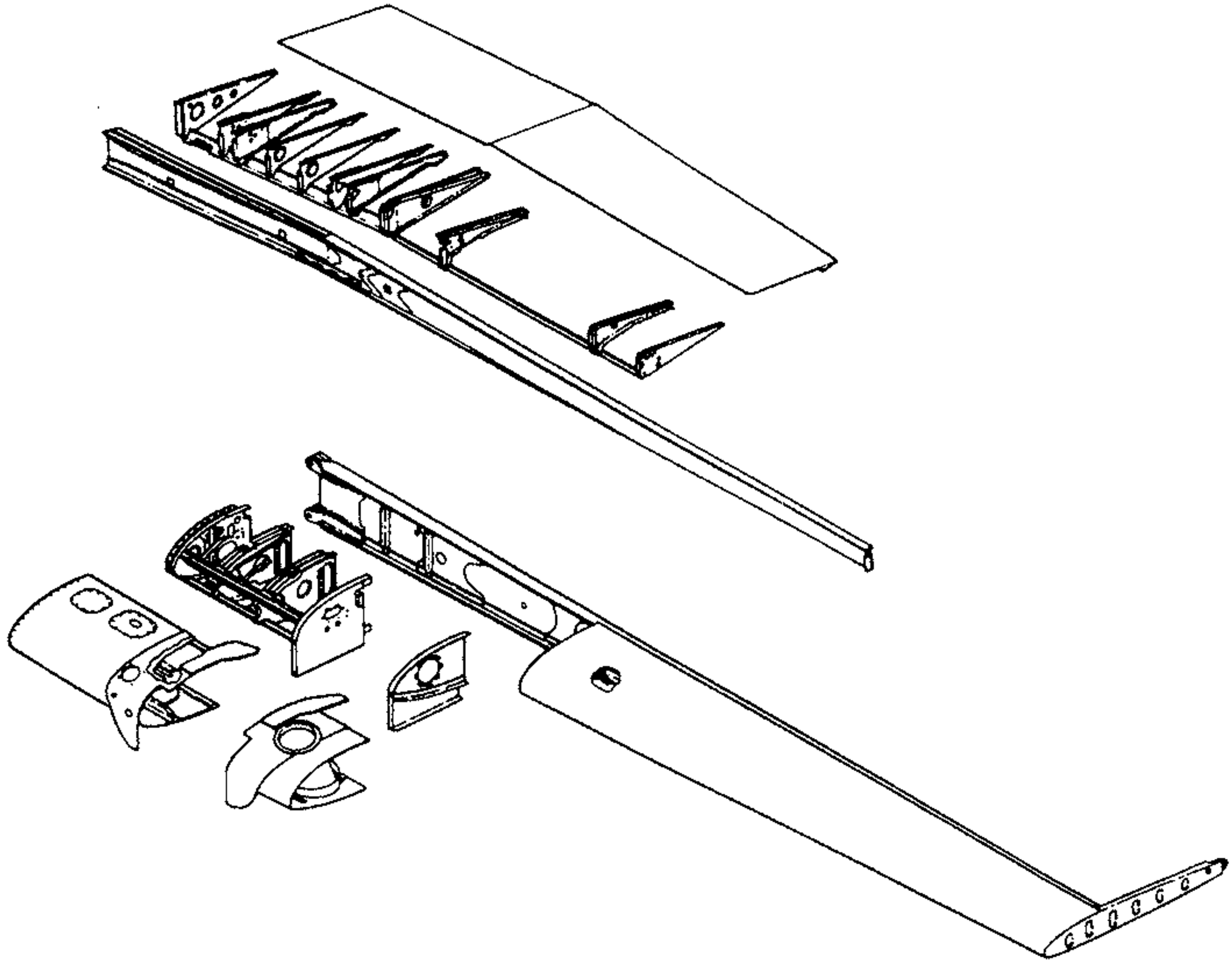


Wing Skin and Splices
Figure 22



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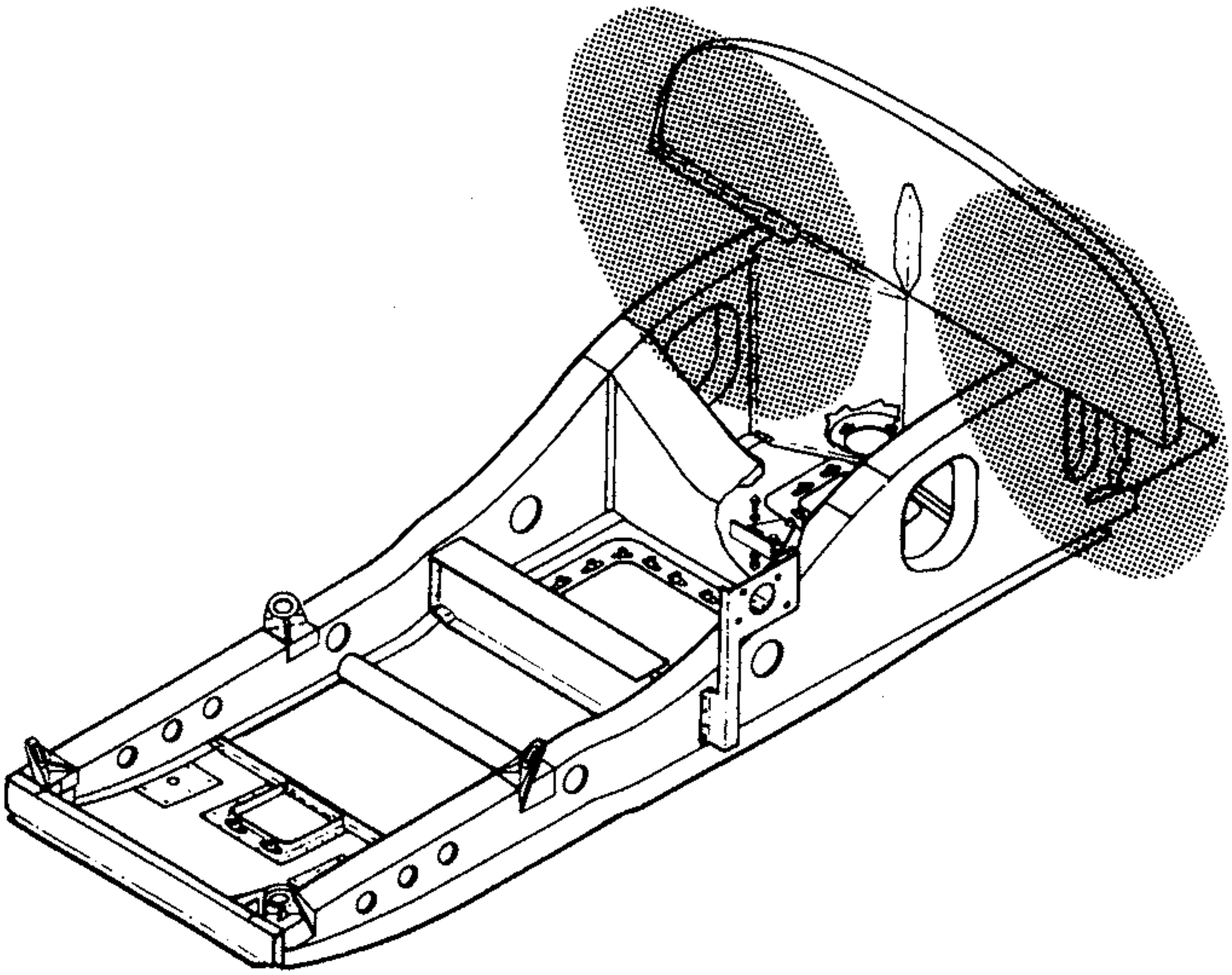
Wing Spars and Leading Edge Assembly
Figure 23



Engine Nacelle
Figure 24

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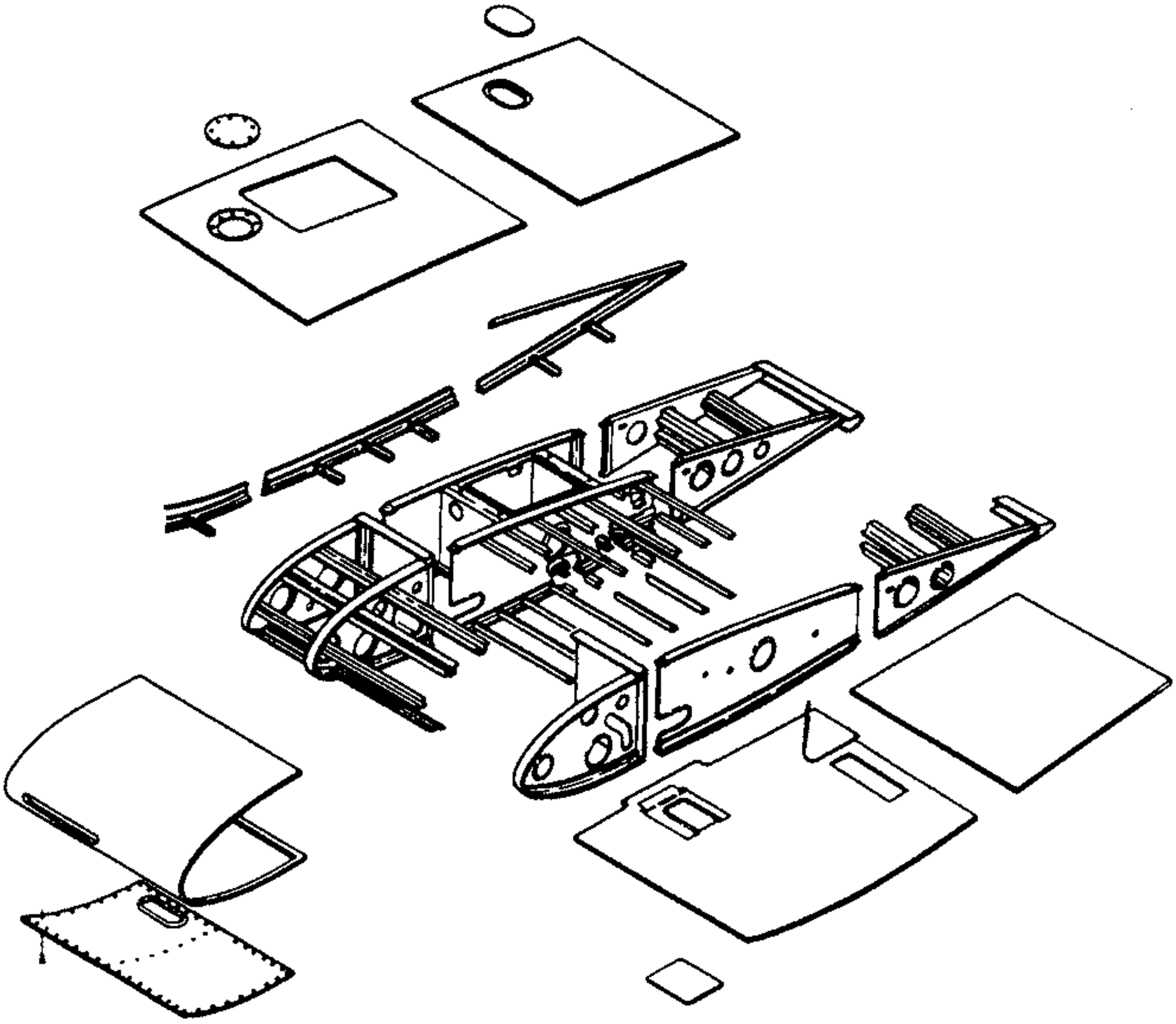

Stub Wing
Figure 25

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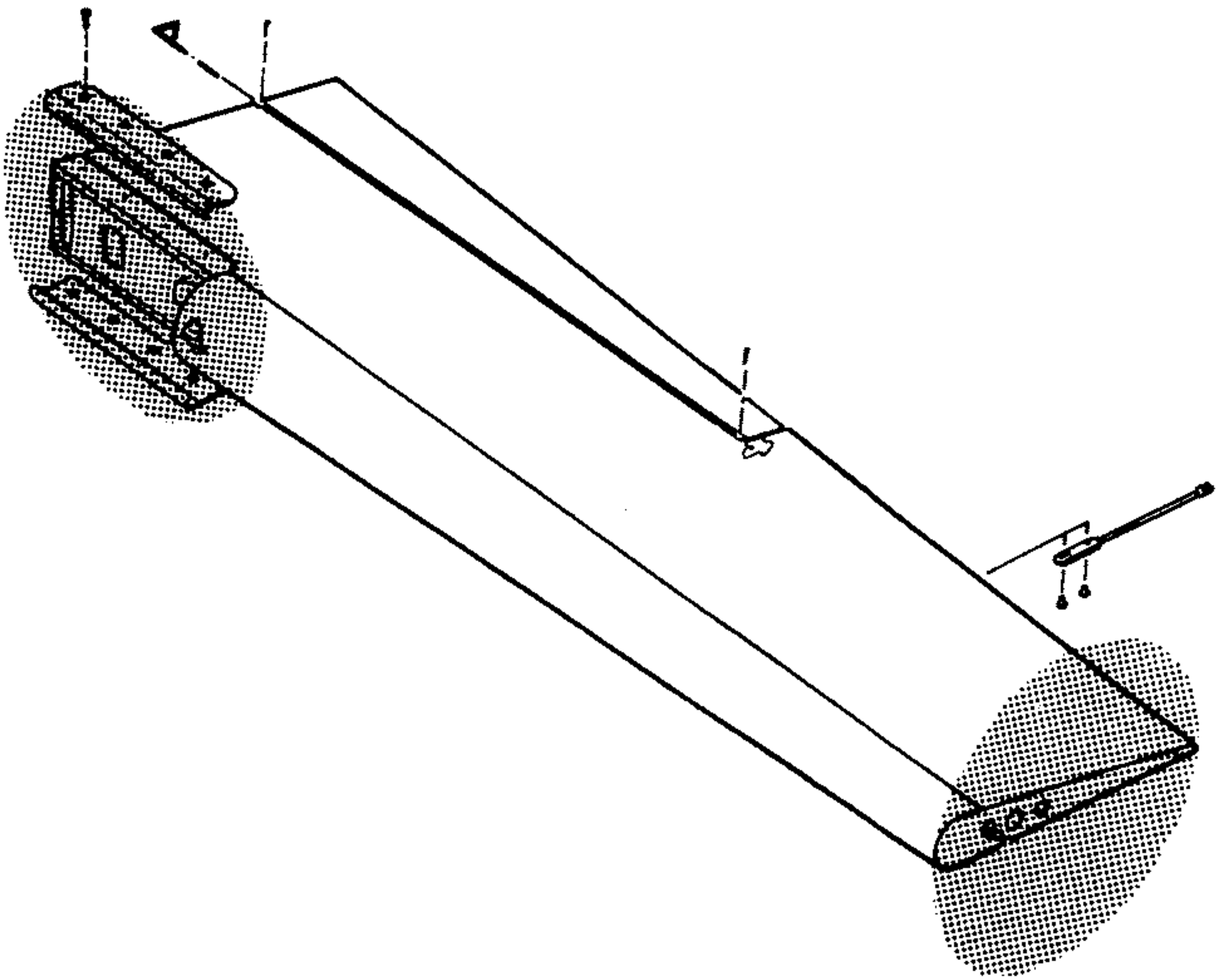

Ailerons
Figure 26

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g. Drain openings and vent holes.

(1) Inspect the engine and wing drain openings and vent holes for obstructions.

h. Outboard leading edge drain tube located in bottom of nacelle.

(1) Inspect for obstructions by inserting a wire thru tube.

i. Flaps.

(1) Inspect entire surface for condition and security.

24. Propeller (Refer to Section 8).

a. Cleaning propellers. Refer to propeller section. Refer to McCauley Industrial Corporation's Service Manual for inspection. Any time the propeller attachment has been subjected to excessive engine roughness, the propeller should be removed and dowel pins inspected for looseness, cracks and visual damage. Refer to McCauley Industrial Corporation's Service Manual and lubricate only on reassembly. Any repairs should be made as outlined in McCauley Industrial Corporation's Service Manual and FAA regulations.

(1) Propeller spinner.

(a) Inspect for cracks, fractures and security of installation.

(2) Blades.

(a) Inspect for nicks, cracks and scratches.

WARNING

GROUND MAGNETO'S BEFORE STARTING BLADE TRACK PROCEDURE.

(b) Check propeller track.

1) Set up a reference point to the tip of one propeller blade. Rotate propeller and observe blade tip positions relative to the reference point. Blade track should not be off more than 0.0625 inch. If track is off more than 0.0625 inch, refer to McCauley Industrial Corporation's Service Manual.

(3) Propeller hub.

(a) Inspect for cracks, wear, condition and security.

(4) Spinner bulkhead.

(a) Inspect for cracks and security on crankshaft.

(5) Propeller.

(a) Inspect for oil leaks.

(6) Propeller mounting.

(a) Check propeller attachment nuts for 120 to 125 foot-pounds, torque. If torque is less than 120 foot-pounds replace nuts with new elastic element locking nuts.

(7) Propeller cylinder.

(a) Inspect for leaks and bolt for security.

(8) Propeller governor.

(a) Inspect for oil leaks, condition and security.

(9) Propeller unfeathering system.

(a) Clean accumulator with suitable solvent and wipe hoses and accumulator with a clean cloth.

(b) Inspect hose assemblies for chafing and fittings for tightness.

(c) Inspect accumulator for security in mounting brackets.

(d) Inspect filler valve after charging for leaks.

(e) For charging accumulator, refer to propeller section.

(f) Repair to propeller unfeathering system is limited to replacement of components.

PROPELLER CONTROL IN UNFEATHERING POSITION AND RELEASING ACCUMULATOR PRESSURE THROUGH FILLER VALVE BEFORE DISCONNECTING HOSE BETWEEN ACCUMULATOR AND GOVENOR OR REMOVING ACCUMULATOR.

10) Propeller synchrophaser (if applicable).
    a) Inspect the electrical components in accordance with the Electrical Components Inspection.
11) Propeller synchrophaser (if applicable).
    a) Inspect rod ends, actuator housing, flexible shaft for condition and security.
    b) Inspect the electrical components in accordance with Electrical Components Inspection.
12) Propeller electrical harness.
    a) Inspect for condition and security.

25. Power Plant (Refer to Section 7).

WARNING: GROUND MAGNETO PRIMARY CIRCUIT BEFORE WORKING ON THE ENGINE.

NOTE: Wash engine before inspecting.

a. Engine shock mounts, engine mount structure and ground straps.
   1) Clean engine mounts and inspect engine mounts for security, safetying, looseness, deterioration, cracked fittings, localized burning, blistering, sagging and end separation.
   2) Check engine sag.
      a) If the area between the exhaust riser of number six cylinder and the lower cowl panel does not have a minimum of 0.40 inch clearance, install engine mount shims. See Figure 27 for inspection requirements.
   3) Inspect engine mount structure and ground straps for condition and security.
   4) Inspect engine mounting bolts for condition and security.

b. Electrical Harness.
   1) Inspect connector, terminals and wire in accordance with the electrical power inspection.

c. Engine drains.
   1) Inspect for security of installation, line routing, deterioration of hoses and evidence of damage.

d. Cylinder compression check.
   1) Perform compression check.

e. Engine cylinder, rocker box covers and push rod housings.
   1) Inspect for fin damage, cracks, oil leakage, security of attachment and general condition.

f. Crankcase, oil sump and accessory section.
   1) Inspect for cracks and evidence of oil leakage.
   2) Inspect bolts and nuts for looseness and retorque as necessary.

g. Engine compartment hoses.
   1) Clean engine compartment hoses by washing engine compartment down with mineral spirits or a suitable solvent (nonflammable or noncombustible). Inspect all engine compartment hoses for excessive wear, cracks, nicks, bulges, deterioration, discoloration, bleaching and rubber hoses for hardening. Teflon hose assemblies exhibit considerable stiffness throughout their useful life. Reasonable stiffness is normal and does not indicate that the line should be replaced. Inspect engine compartment fuel hoses under pressure for deformation and leaks as follows: make sure throttles are in idle position and mixture controls are in idle cutoff; turn prime switch on and assure boost pumps are operating

in HI position; check hoses for leaks, bulges, deterioration and deformation. Inspect hoses in the high heat areas such as close proximity of exhaust stacks or turbocharger area for heat deterioration and hardening or cracking due to age. For replacement intervals of engine compartment hoses, refer to Component Time Limits.

h. Engine baffles and seals.
   (1) Inspect for condition and security.
i. Engine compartment.
   (1) Inspect for oil , fuel, and hydraulic leaks.
j. Engine compartment and lower wing surface.
   (1) Inspect for corrosion residue aft of engine overboard stack.
k. Engine (Refer to Engine Maintenance Manual).
   (1) To complete the engine inspection, refer to the appropriate section of Engine Maintenance Manual. This airplane inspection guide may repeat an inspection item listed in the engine maintenance manual. Should a conflict arise between the engine manual and the airplane manual, the engine manual will take priority.

26. Engine Fuel and Control (Refer to Section 7).

a. Fuel pumps.
   (1) Inspect for leaks, condition and security.
b. Fuel flow indicating system.
   (1) Perform operational check in accordance with fuel flow write up in engine fuel and control section.
c. Fuel flow indicator and transducer (both standard and optional).
   (1) Inspect for condition, security and leaks.
   (2) Inspect electrical components in accordance with Electrical Components Inspection.
d. Fuel meter unit filter.
   (1) For cleaning filter screen, refer to engine fuel and control section.
e. Fuel injection system, fuel-air control unit, and manifold drain valves.
   (1) Inspect for leakage and manifold drain valves for proper operation.
   (2) Inspect control connections, levers and linkage for security of attaching parts, for safetying and lost motion due to wear.
f. Fuel discharge nozzle.
   (1) For cleaning fuel discharge nozzles, refer to engine fuel and control section.
   (2) Inspect the fuel nozzle for damaged orifice, dirt and foreign objects.
g. Fuel Pressure Switch.
   (1) Inspect for leaks and proper operation.
h. Fuel primer start nozzle and system.
   (1) For cleaning primer start nozzle, refer to engine fuel and control section.
   (2) Inspect orifices for condition and security.
   (3) Inspect electrical components in accordance with Electrical Components Inspection.
i. Refer to Engine Maintenance Manual for inspection of the fuel control, fuel filter and other engine fuel components.

27. Ignitor (Refer to Section 7).

a. Spark plugs.
   (1) For cleaning and proper gap of spark plugs, refer to ignition section.
   (2) Inspect porcelain for cracks and evidence of arcing.
   (3) Rotate Spark plugs top right to bottom left and top left to bottom right.
b. Ignition cables.
   (1) For cleaning cables, refer to Ignition chapter.
   (2) inspect cable for damaged insulation and end fitting for evidence of cracks and damage.
c. Magnetos.
   (1) Clean and inspect magnetos.
   (2) for timing and breaker gap, refer to ignition section.
   (3) Inspect for condition and security.

28. **Engine Controls (Refer to Section 7).**
   a. Engine Controls.
      (1) Clean when engine compartment is cleaned.
      (2) Inspect for security of mounting, sharp bends, kinks and damage.
      (3) Inspect for deterioration and wear of rubber seals on ends of cables.
      (4) Inspect control cables for proper routing.
      (5) Move controls throughout range of travel and check for smoothness.

29. **Engine Indicating (Refer to Section 7).**
   a. Manifold pressure gages.
      (1) Inspect for condition and security.
      (2) Perform operation check per engine indicating section.
   b. Tachometers.
      (1) Inspect t for condition and security.
      (2) Inspect the electrical components in accordance with the Electrical Components Inspection.
   c. Economy mixture indicator and security.
      (1) Inspect for condition and security.
      (2) Inspect the electrical components in accordance with the Electrical Components Inspection.
   d. Cylinder head temperature gages and probes.
      (1) Inspect for condition and security.

30. **Exhaust (Refer to Section 7).**
   a. Tools and Equipment.

      NOTE: Equivalent substitutes may be used for the following listed items.

NAME	NUMBER	MANUFACTURER	USE
Eddy Current Instrument	MIZ 40	Zetec, Inc. 1370 NW Mail St. P.O. Box 140 Issaquah, WA 98027-0140	To determine exhaust components material type.
Surface Probe	Z-5-125	Zetec, Inc.	To perform material type inspection.
Ultrasonic Digital Thickness Gage	25DL	Panametrics Inc. 221 Cresent St. Watham, Mass 02154-3497	Inspect for material thickness.
Ultrasonic Transducer	V208-RM	Panametrics, Inc.	Inspect for material thinning.
Calibration Standard	0880000-2 601 Inconel (0.050 inch thick)	Cessna Aircraft Company Cessna Parts Distribution 5800 East Pawnee P. O. Box 1521 Wichita, KS 67218 USA	To calibrate ultrasonic instrument for material thickness.

NAME	NUMBER	MANUFACTURER	USE
Calibration Standard	0880000-3 301 Stainless Steel (0.050 inch thick)	Cessna Aircraft Company	To calibrate ultrasonic instrument for material thickness.
Calibration Standard	0880000-4 321 Stainless Steel (0.018 inch thick)	Cessna Aircraft Company	To calibrate ultrasonic instrument for material thickness.
Calibration Standard	0880000-5 321 Stainless Steel (0.063 inch thick)	Cessna Aircraft Company	To calibrate ultrasonic instrument for material thickness.
Solvent	Naptha PD-680, Type III	Commercially Available	To clean the engine support structure prior to inspection.
Crocus cloth		Commercially Available	To clean exhaust system components prior to inspection.

b. Accomplishment Instructions.

WARNING: ALL REPAIRED COMPONENTS MUST BE REPLACED WITH A NEW COMPONENT.

WARNING: A THOROUGH INSPECTION OF THE ENGINE EXHAUST SYSTEM IS REQUIRED TO DETECT ANY BREAKS OR CRACKS CAUSING LEAKS WHICH MIGHT RESULT IN THE LOSS OF OPTIMUM TURBOCHARGER EFFICIENCY AND ENGINE POWER. A LEAKING EXHAUST SYSTEM MAY ALSO PROMOTE DETERIORATION OF ENGINE COMPARTMENT STRUCTURE AND COMPONENTS OR COULD RESULT IN A FIRE.

WARNING: NEVER USE LEAD PENCILS OR HIGHLY FLAMMABLE SOLVENTS ON ENGINE EXHAUST SYSTEMS.

WARNING: NEVER USE A WIRE BRUSH OR ABRASIVES TO CLEAN ENGINE EXHAUST SYSTEMS.

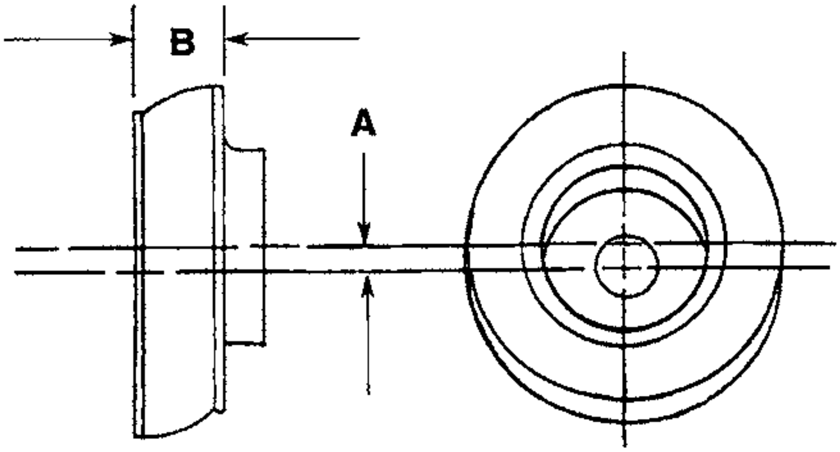
NOTE: Facilities performing the nondestructive ultrasonic and eddy current inspections must hold a valid FAA repair station certificate, or international equivalent, with a specialized service rating for the applicable method of nondestructive inspection. Appropriate test equipment capable of performing the inspection(s) must be available. The minimum requirements for certification shall meet the minimum recommended requirements from the American Society for Nondestructive Testing Recommended Practice Number SNT-TC-1A (1992).

NOTE: Do not use dye penetrant inspection procedures, since noncritical metal forming folds yield misleading failure indications.

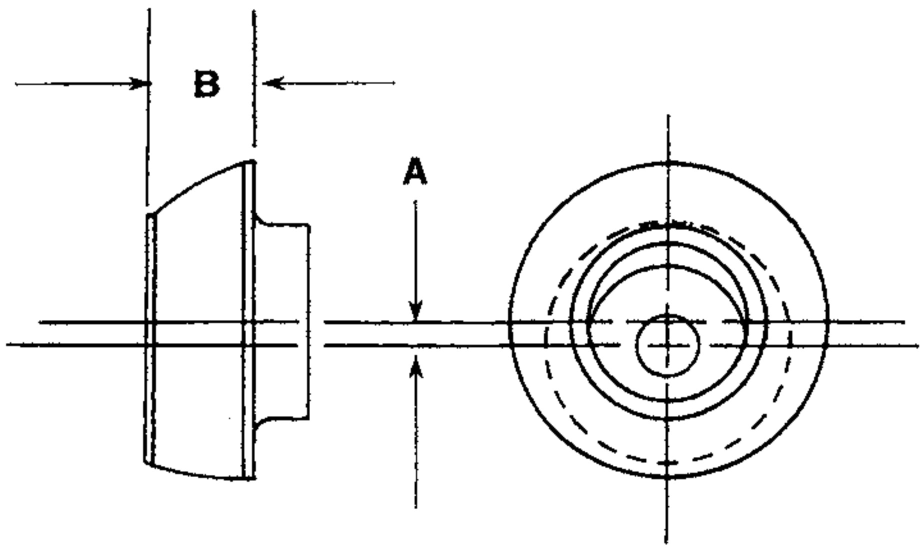
NOTE: Inspection procedures for both left and right engine exhaust systems are typical.

NOTE: This inspection supersedes previously released service information concerning engine exhaust system inspections.

NOTE: Component material type, (stainless steel, a mixture, unknown or inconel) referenced in this section applies to exhaust systems components located aft of the risers.



FLAT (UPPER PAD)



CONICAL (LOWER PAD)

Model	Mount Engine	Mount Assembly	Max. A Component	Min. B Eccentricity	Thickness
421C*	GTSI0-520-L	J-96-13-54	J9612-32	0.12 Inch	1.20 Inch
421C**	GTSI0-520-N	J-96-13-58	J9612-33	0.12 Inch	1.20 Inch

* 421C0001-1000

** 421C1001-1807

1051X1001
1051X1002

Engine Mount Inspection Limits
Figure 27

NOTE : Accomplish the following inspections when required as specified in the Inspection Time Limits, Section 2-20.

c. General Requirements for All inspections.
   (1) (Refer to Figure 28). Open lower engine cowling doors or remove upper and lower engine cowlings, as required, to gain access to the engine exhaust system. Refer to Chapter 7 Engine Baffles - Removal/Installation.
   (2) (Refer to Figure 28). Remove the heat shields as required which obscure visual inspection of the engine exhaust system. Remove heat shields from around the exhaust system, slip joints, multi-segment "V" band clamps, and any other items which might hinder inspection of the entire exhaust system. (Refer to the applicable sections of the Maintenance Manual).

      NOTE : Ensure exhaust system has all required heat shields installed. (Refer to the Illustrated Parts Catalog).

   (3) Install all hardware, any removed component(s) and connect any disturbed controls and adjust, as required, which may have been disturbed during any one of the inspections.

      WARNING : FOLLOW ALL SAFETY PRECAUTIONS PERTAINING TO RUNNING AIRPLANE ENGINES, HOT EXHAUST SYSTEMS AND HOT EXHAUST GASES.

   (4) Install engine cowlings, as required. Refer to Chapter 7 Engine Baffles - Removal/Installation.
   (5) Perform a run and leak check of the engines and exhaust system when appropriate to ensure the integrity of the exhaust system and/or operation of related components. (Refer to applicable sections of the Service/Maintenance Manual and/or Owners Manual or the Pilots Operating Handbook and/or the Flight Manual).
   (6) Refer to Inspection Time Limits, Chapter 2 for required repetitive inspection requirements for the exhaust system.
   (7) Identify and record in the appropriate logbook the material types for each exhaust system component and Total Time In Service (TTIS).

d. 50 and 100 Hour Visual Inspection.
   (1) (Refer to Figure 28). Perform a 50 Hour Visual Inspection or 100 Hour Visual Inspection of the engine exhaust system.

      NOTE : Aid of artificial light and a mirror will be required.

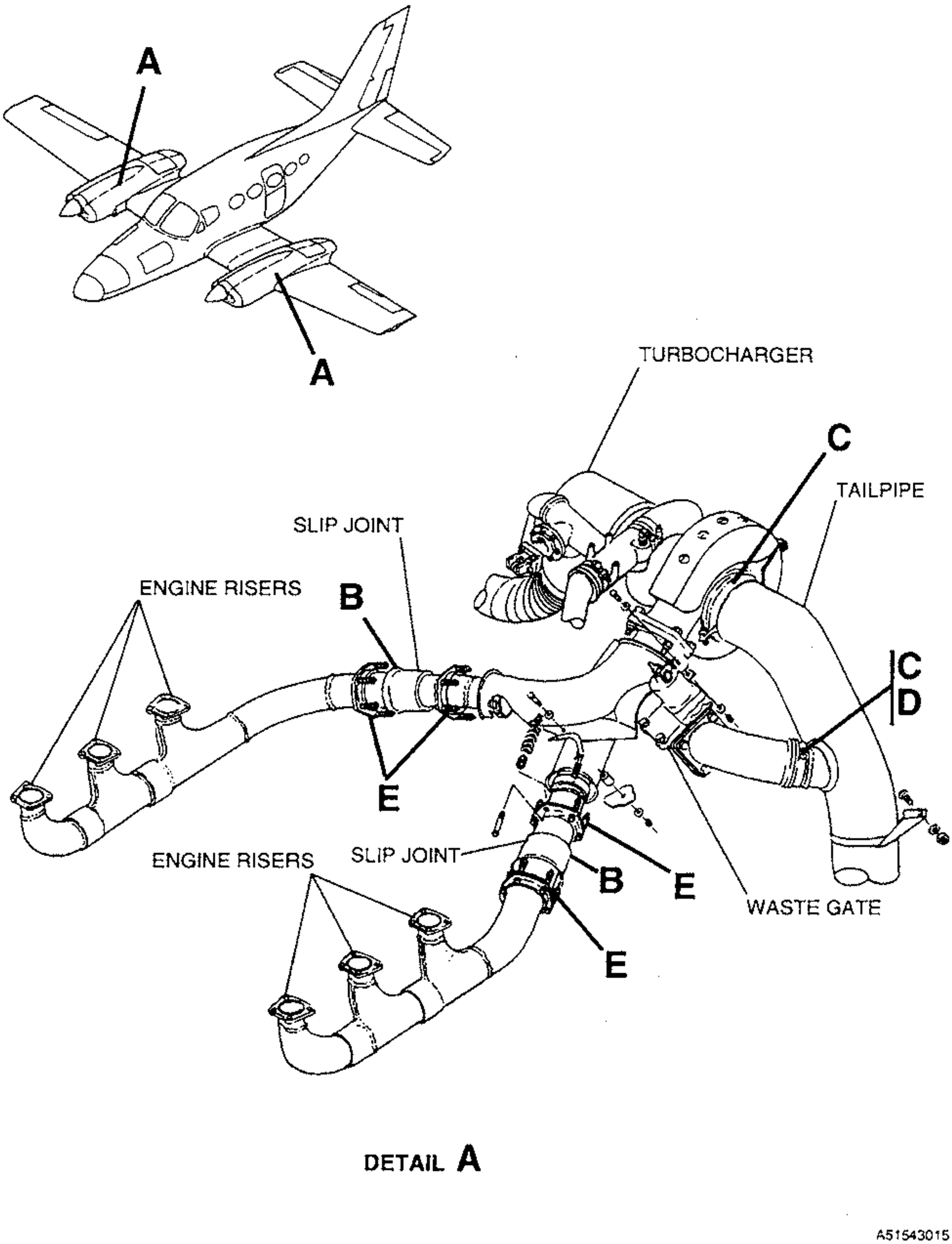
   (2) Inspect the engine exhaust system for erosion, burned areas, thinning of material, bulging, looseness, cracks, and integrity of welds. If any repaired components are found, they must be replaced with a new component.

      WARNING : ALL REPAIRED COMPONENTS MUST BE REPLACED WITH A NEW COMPONENT.

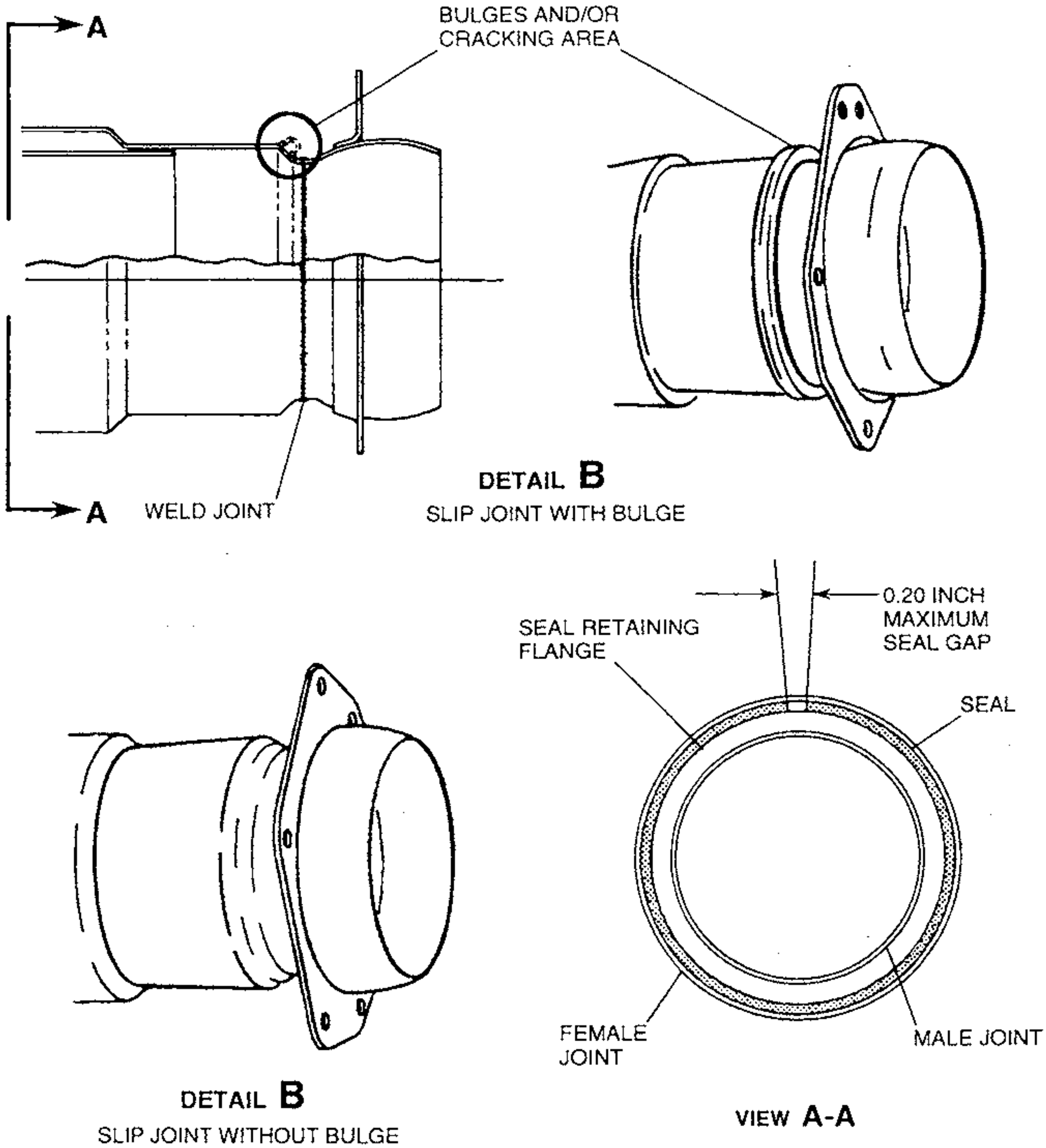
   (3) Inspect exhaust system clamps for cracks and looseness.

      NOTE : Particular attention should be given to condition of the multi-segment and one-piece V-band clamp flanges, multi-segment clamps outer band spot welds, and exhaust system coupling flanges.

   (4) Inspect slip joints for erosion, burned areas, thinning of material, bulging, looseness, cracks, and integrity of welds.
   (5) (Refer to Figure 28, Detail E). Inspect exhaust slip joint springs for correct compression.
      (a) Measure exhaust slip joint springs installed length. Length must be 0.51 inch, +0.00 or -0.03 inch.
         1 Springs compressed to less than 0.45 inch must be replaced.



Exhaust System Inspection
Figure 28 (Sheet 1)



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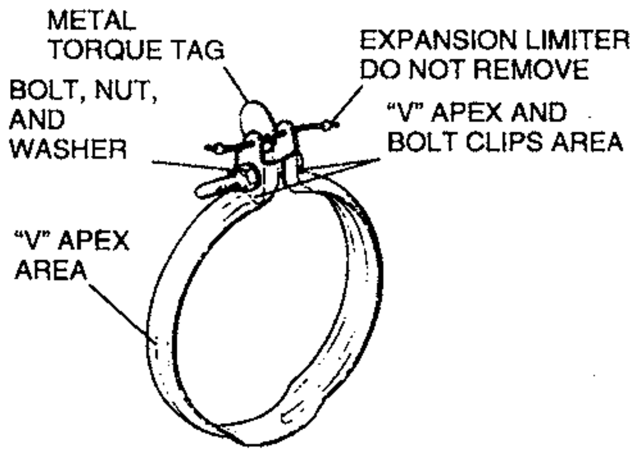
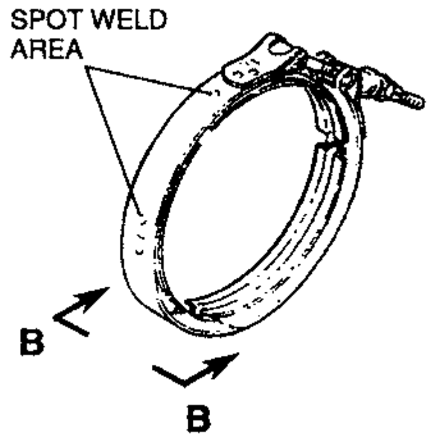
2655X1040
AA2655X1042
2655X1041

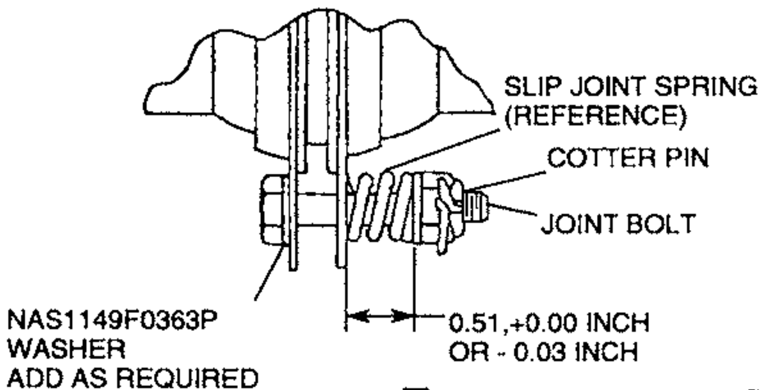
Exhaust System Inspection
Figure 28 (Sheet 2)



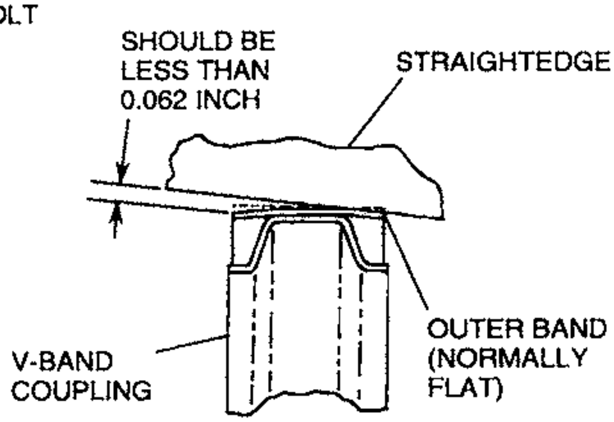
DETAIL C
ONE PIECE "V" BAND CLAMP



DETAIL D
MULTI-SEGMENT "V" BAND CLAMP



DETAIL E
TYPICAL EXHAUST JOINT
SPRING INSTALLATION



VIEW B-B
MULTI-SEGMENT "V" BAND
CLAMP OUTER BAND
DEFORMATION CHECK

C2655X1032
D2655X1031
E2655X1030

Exhaust System Inspection
Figure 28 (Sheet 3)

(6) Inspection of slip joint seal.
   (a) Inspect each slip joint seal per Inspection schedule using a mirror and flashlight. Inspect around the entire slip joint. If an open gap or missing portion of the seal in excess of 0.20 inch (Refer to Figure 28) is detected between the seal retaining flange and the female joint section, the seal must be replaced.

   NOTE : Minor exhaust stains on airframe and/or surrounding accessories must be considered normal since these joints will exhibit a perceptible leakage during their entire service life.

e. 100 Hour Disassembly Inspection.

NOTE : This inspection applies to Exhaust Systems (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired only).

(1) (Refer to Figure 28). Perform 100 Hour Disassembly Inspection of the exhaust slip joints and the turbocharger tailpipe.
(2) (Refer to Figure 28, Detail E). Inspect exhaust slip joint springs for correct compression.
   (a) Measure exhaust slip joint springs installed length. Length must be 0.51 inch, +0.00 or -0.03 inch.
   (b) After removal, springs having a free length of less than 0.57 inch must be replaced.
(3) Remove bolts, washers, nuts, cotter pins, and springs securing the slip joints to the engine exhaust. Discard the cotter pins and retain the remaining serviceable hardware for installation.
(4) Remove slip joints for inspection.
   (a) Installed springs compressed to less than 0.45 inch must be replaced.
(5) Remove clamp securing the tailpipe to the turbocharger.

   NOTE : Retain serviceable attaching hardware for installation.

   CAUTION : DO NOT REMOVE THE EXPANSION LIMITER.

   1 Remove nut, washer and bolt from clamp, unseat coupling and slide clamp down tailpipe.
   2 Retain one-piece "V" band clamp for inspection, if installed.
   3 If installed, replace segmented "V" band clamp at tailpipe to turbocharger junction with one-piece "V" band clamp.

   WARNING : ALL REPAIRED COMPONENTS MUST BE REPLACED WITH A NEW COMPONENT.

(6) Inspect the removed slip joints and the turbocharger tailpipe.
   (a) Using artificial light and inspection mirrors, visually inspect the inside and outside surfaces of removed components for repairs, erosion, burned areas, thinning of material, looseness, pitting on the interior of the tubes, cracks, and integrity of weld joints.
      1 (Refer to Figure 28, Detail B). Inspect removed slip joints for cracks and bulges.
      2 If any of these conditions exist, the component must be replaced.
(7) Install slip joints.
   (a) Install retained serviceable and/or new springs, bolts, washers, nuts.
      1 (Refer to Figure 28, Detail E). Tighten nut until length of installed spring measures 0.51 inch, +0.00 or -0.03 inch).

NOTE : Add NAS1149F0363P washers under head of bolts, as required, to obtain correct dimensions.

NOTE : During installation, slip joint bolts should be tightened evenly and gradually and spring length checked frequently to prevent over compression of springs.

(b) Install one (1) MS24665-153 cotter pin per nut.

(8) Install turbocharger tailpipe.

(a) Install clamp, bolt, washer and nut and torque nut in accordance with torque requirement stamped on clamp tag (40 inch-pounds). As the clamp is tightened, lightly tap the outer band in a radial direction with a rawhide or soft rubber mallet.

f. 500 Hour Complete Disassembly Inspection (Stainless Steel or Partial Stainless Steel Systems, Unknown or Repaired Only).

(1) (Refer to Figure 28 and 29). Perform 500 Hour Complete Disassembly Inspection of the engine exhaust system.

NOTE : Record position of all controls that will be disturbed by exhaust system removal.

(2) (Refer to Figure 28). Disassembly Inspection of the exhaust slip joints and the turbocharger tailpipe.

(3) (Refer to Figure 28, Detail E). Inspect exhaust slip joint springs for correct compression.

(a) Measure exhaust slip joint springs installed length. Length must be 0.51 inch, +0.00 or -0.03 inch.

1 Springs compressed to less than 0.45 inch must be replaced.

(4) Remove bolts, washers, nuts, cotter pins, and springs securing the slip joints to the engine exhaust. Discard the cotter pins and retain the remaining serviceable hardware for installation.

(a) After removal, springs having a free length of less than 0.57 inch must be replaced.

(5) Remove the engine risers.

(6) Remove the turbocharger tailpipe from the turbocharger.

NOTE : Retain serviceable attaching hardware for installation.

CAUTION : DO NOT REMOVE THE EXPANSION LIMITER.

1 Remove nut, washer and bolt from clamp, unseat coupling and slide clamp down tailpipe.

2 Retain one-piece "V" band clamp for inspection, if installed.

3 If installed, replace segmented "V" band clamp at tailpipe to turbocharger junction with one-piece "V" band clamp.

(7) Remove the manifold header.

(a) Using artificial light and inspection mirrors, visually inspect the multi-segment "V" band clamp(s) prior to removing.

1 Ensure the "V" clamps are torqued to 35 inch-pounds.

2 Using crocus cloth, or equivalent, clean the outer band of the multi-segment "V" band clamp(s), particular attention should be given to the spot weld areas on the clamp(s).

3 (Refer to Figure 28, Detail D and View B-B). Using artificial light and inspection mirrors, inspect the multi-segment "V" band clamp(s) surface(s) for signs of cracks or fractures. If cracks or fractures are visible, replace the clamp(s).

4 Inspect flatness of the outer band, especially within 2 inches of the spot welded tabs which retain the T-bolt fastener.

5 (Refer to Figure 28, View B-B). Placing a straight edge across the flat part of the outer band, check the gap between the straight edge and the outer band. This gap should be less than 0.062 inch. If deformation exceeds 0.062 inch, replace the clamp(s).

(b) (Refer to Figure 28 Detail D). Remove the Multi-segment "V" band clamp(s) securing the inboard and outboard exhaust tubes to the manifold header. Retain components for inspection, retain serviceable attaching hardware for installation.

NOTE: Multi-segmented "V" band clamps are life limited to 400 hours prior to this inspection. Replacing the clamps during this inspection will allow the replacement interval to increase to 500 hours.

(c) Remove the manifold header from the airplane.

WARNING: ALL REPAIRED COMPONENTS MUST BE REPLACED WITH A NEW COMPONENT.

(8) Perform a visual inspection of the removed engine exhaust system components.

(9) Using artificial light and inspection mirrors, visually inspect the inside and outside surfaces of removed components for repairs, bulging, cracking, material deformation, warped mating surfaces, eroded flange surfaces, and integrity of welds.

(10) Inspect "V" band clamp(s).

NOTE: Multi-segment "V" band clamp(s) are life-limited to 400 hour. After completing this Disassembly inspection and installation of new clamps, the clamps must be replaced on every 500 hours of operation.

(a) (Refer to Figure 28, Detail D and View B-B). Using artificial light and inspection mirrors, inspect the multi-segment "V" band clamp(s) surface(s) for signs of cracks or fractures. If cracks or fractures are visible, replace the clamp(s).

(b) (Refer to Figure 28, Detail C). Using artificial light and inspection mirrors, inspect the one-piece "V" band clamp(s) surface(s) adjacent to the intersection of the "V" apex and bolt clips, and the entire length of the "V" apex of the clamp for signs of cracks or fractures. If cracks or fractures are visible, replace the clamp(s).

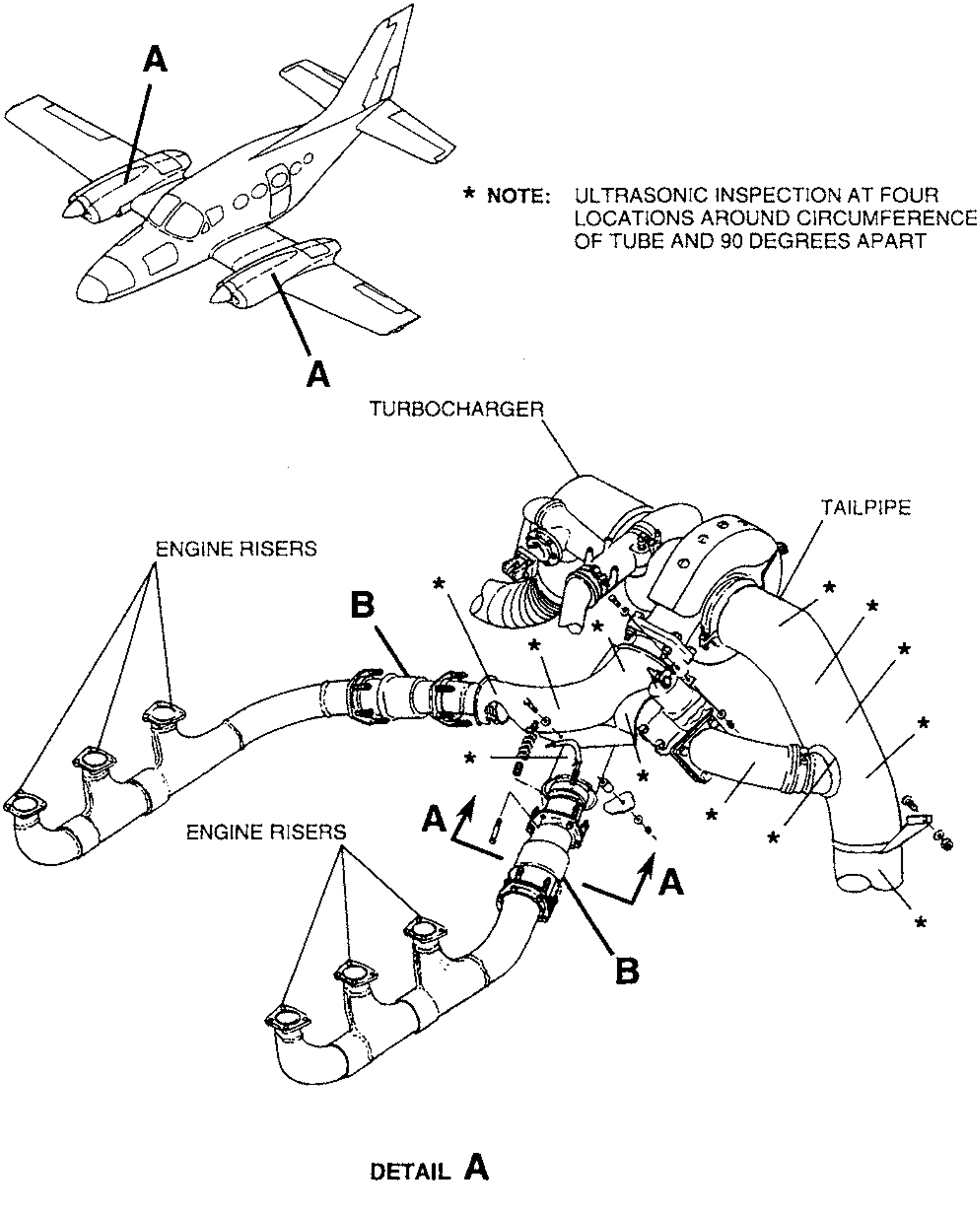
(11) (Refer to Figure 29). Perform a Digital Ultrasonic Thickness inspection of the engine exhaust system components except risers for wall thickness.

NOTE: The ultrasonic test system shall meet the minimum requirements as stated; the test equipment shall be a digital ultrasonic thickness gage capable of operating in a frequency range of 10-20 MHz. The minimum resolution of the instrument shall be 0.015 inch in steel. The transducer shall be a delay line type with a frequency between 10-20 MHz. The stand-off shall possess a maximum diameter of 0.19 inch.

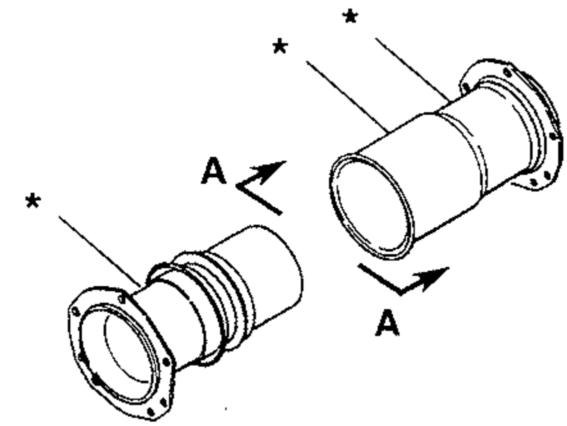
WARNING: COMPONENTS WHICH DO NOT MEET THE REQUIREMENTS SHALL BE REPLACED. WALL THICKNESS OF EXHAUST TUBES SHALL BE NO LESS THAN 0.020 INCH. (FIGURE 29, DETAIL A) WALL THICKNESS OF SLIP JOINTS SHALL BE NO LESS THAN 0.025 INCH. (FIGURE 29, DETAIL B).

(a) Ultrasonic thickness gage calibration.

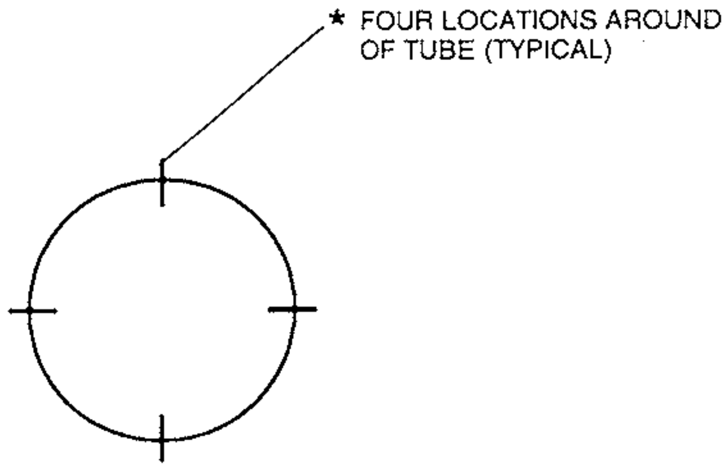
NOTE: Instrument calibration shall be accomplished in accordance with the manufacturers recommendations.



Exhaust System Ultrasonic Inspection Locations
Figure 29 (Sheet 1)



DETAIL B
SLIP JOINT INSPECTION LOCATIONS



VIEW A-A
EXHAUST TUBE CROSS SECTION

* **NOTE:** ULTRASONIC INSPECTION AT FOUR LOCATIONS AROUND CIRCUMFERENCE OF TUBE AND 90 DEGREES APART

C2655X1036
AA26X1037

Exhaust System Ultrasonic Inspection Locations
Figure 29 (Sheet 2)

1 The instrument shall be calibrated using the 0880000-5 and 0880000-4 calibration standards.
2 The instrument shall be calibrated for a thickness range of 0.020 inch to 0.063 inch for 321 stainless steel.
3 The instrument shall be recalibrated at 30 minute intervals.

NOTE : Any change in accessories, or interruption of power supply also require recalibration.

(b) (Refer to Figure 29, Detail A). Inspect the exhaust system components for wall thickness.
1 The exhaust components shall be inspected at the identified locations in Figure 29.
2 (Refer to Figure 29, View A-A). Four measurements shall be taken at each location, and separated by 90°.
3 Components which do not meet the requirements shall be replaced. Wall thickness of exhaust tubes shall be no less than 0.020 inch. (Figure 29, Detail A) Wall thickness of slip joints shall be no less than 0.025 inch. (Figure 29, Detail B).

(12) (Refer to Figure 29). Using the MIZ 40 eddy current instrument, inspect the engine exhaust system aft of the risers (slip joints and aft) to determine the material type.
(a) (Refer to Figure 30). Eddy current calibration.
1 The operating frequency of the eddy current test system shall be 2.0 MHz.
2 Balance the instrument with the probe in air and adjust the "air point" on the instrument display to 10% horizontal and 80% vertical.
3 Place the probe on the 0880000-3 calibration standard (301 stainless steel) reference standard. Adjust the resultant material point as depicted in Figure 30.
4 Place the probe on the 0880000-5 calibration standard (321 stainless steel) reference standard. Adjust the resultant material point as depicted in Figure 30.
5 Place the probe on the 0880000-2 calibration standard (601 inconel) reference standard. Adjust the resultant material point as depicted in Figure 30.
6 The instrument parameters shall be adjusted to achieve a minimum vertical separation of two major divisions on the instruments display between the 601 inconel and 321 stainless steel material points.
(b) Inspect the exhaust system components aft of the risers (slip joints and aft) to determine the material type.

NOTE : Identify and record in the logbooks the material type for each exhaust system component. Determine when the next inspection is due based on material type).

(c) Corresponding material points from the exhaust system components and the reference standards will indicate exhaust system material type. A minimum of two (2) readings shall be taken on each tube.

(13) Install exhaust system components.

WARNING: ALL PREVIOUSLY REPAIRED COMPONENTS MUST BE REPLACED WITH A NEW COMPONENT.

(a) Install the manifold header using retained serviceable and new hardware, as applicable. (Refer to Chapter 7, Exhaust - Maintenance Practices and the Model 421C Illustrated Parts Catalog).

(b) Install engine system exhaust tubes. (Refer to Chapter 7, Exhaust - Maintenance Practices and the Model 421C Illustrated Parts Catalog).

1 Position inboard and outboard exhaust tube on the manifold header.

a. Install clamp, bolt, washer and nut and torque nut (torque Multi-segment "V" band clamp(s) to 35 inch-pounds, torque one-piece "V" band clamp(s) to 40 inch-pounds). As the clamp is tightened, lightly tap the outer band in a radial direction with a rawhide or soft rubber mallet.

2 Install exhaust system slip joints. (Refer to Chapter 7, Exhaust - Maintenance Practices).

3 Install serviceable and/or new springs, bolts, washers, nuts. Refer to Illustrated Parts Catalog.

4 (Refer to Figure 28, Detail E). Tighten nut until length of installed spring measures 0.51 inch, +0.00 or -0.03 inch.

NOTE: Add NAS1149F0363P washers under head of bolts, as required, to obtain correct dimensions.

NOTE: During installation, bolts should be tightened equally and gradually and spring length checked frequently to prevent over compression of springs.

5 Install one (1) MS24665-153 cotter pin per nut.

(c) Install turbocharger using retained serviceable and new hardware, as applicable. (Refer to the Model 421C Illustrated Parts Catalog).

(d) Install all exhaust system heat shields. (Refer to Chapter 7, Exhaust - Maintenance Practices).

NOTE: Ensure exhaust system has all required heat shields installed.

(e) Install turbocharger tailpipe and secure with serviceable and/or new one-piece V-band clamp. (Refer to Chapter 7, Exhaust - Maintenance Practices and the Model 421C Illustrated Parts Catalog).

1 Install clamp, bolt, washer and nut and torque nut in accordance with torque requirement stamped on clamp tag (40 inch-pounds). As the clamp is tightened, lightly tap the outer band in a radial direction with a rawhide or soft rubber mallet.

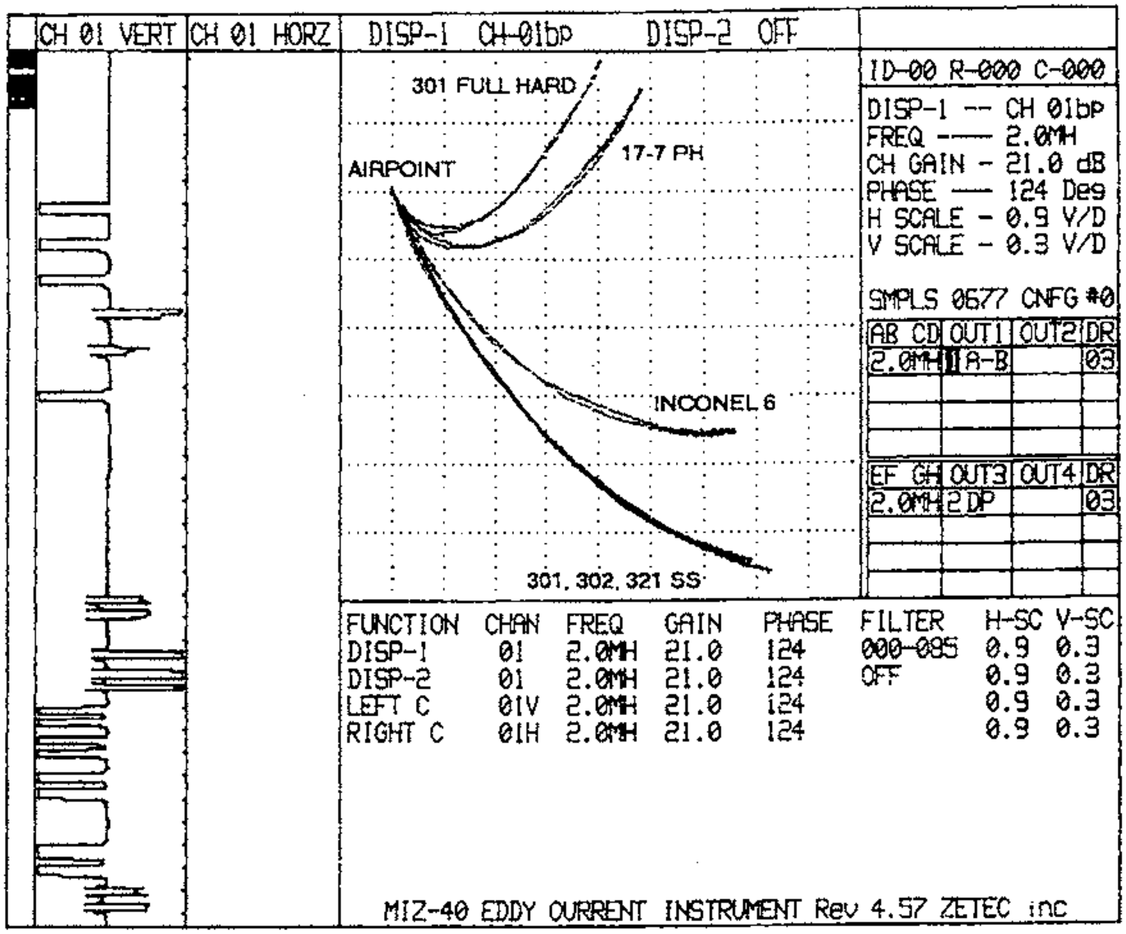
G. 500 Hour Partial Disassembly inspection (Inconel Systems Only Slip Joints and Aft).

(1) (Refer to Figure 28). Perform 500 Hour Disassembly Inspection of the exhaust slip joints and the turbocharger tailpipe.

(2) (Refer to Figure 28, Detail E). Inspect exhaust slip joint springs for correct compression.

(a) Measure exhaust slip joint springs installed length. Length must be 0.51 inch, +0.00 or -0.03 inch.

1 Installed springs compressed to less than 0.45 inch must be replaced.



Eddy Current Inspection Calibration Image
Figure 30 (Sheet 1)

(3) Remove bolts, washers, nuts, cotter pins, and springs securing the slip joints to the engine exhaust. Discard the cotter pins and retain the remaining serviceable hardware for installation.
   (a) After removal, springs having a free length of less than 0.57 inch must be replaced.
(4) Remove slip joints for inspection.
(5) Remove clamp securing the turbocharger tailpipe to the turbocharger.

CAUTION: DO NOT REMOVE THE EXPANSION LIMITER.

   (a) Remove nut, washer and bolt from clamp, unseat coupling and slide clamp down tailpipe.
   (b) Retain one-piece "V" band clamp for inspection, if installed.
   (c) If installed, replace segmented "V" band clamp at tailpipe to turbocharger junction with one-piece "V" band clamp.

WARNING: ALL REPAIRED COMPONENTS MUST BE REPLACED WITH A NEW COMPONENT.

(6) Inspect the removed slip joints and the turbocharger tailpipe.
   (a) Using artificial light and inspection mirrors, visually inspect the inside and outside surfaces of removed components for repairs, erosion, burned areas, thinning of material, looseness, pitting on the interior of the tubes, cracks, and integrity of weld joints.
      1 Refer to Figure 28, Detail B). Inspect removed slip joints for cracks and bulges.
      2 If any of these conditions exist, the component must be replaced.

(7) Install slip joints.
   (a) Install retained serviceable and/or new springs, bolts, washers, nuts.
      1 (Refer to Figure 28, Detail E). Tighten nut until length of installed spring measures 0.51 inch, +0.00 or -0.03 inch).

      NOTE: Add NAS1149F0363P washers under head of bolts, as required, to obtain correct dimensions.

      NOTE: During installation, slip joint bolts should be tightened evenly and gradually and spring length checked frequently to prevent over compression of springs.

      2 Install one (1) MS24665-153 cotter pin per nut.

(8) Install turbocharger tailpipe.
   (a) Install one-piece V-band clamp, bolt, washer and nut and torque nut in accordance with torque requirement stamped on clamp tag (40 inch-pounds). As the clamp is tightened, lightly tap the outer band in a radial direction with a rawhide or soft rubber mallet.

H. Engine Overhaul Disassembly Inspection (Inconel Systems Only).

NOTE: Engine Overhaul is based on the engine manufacturers current recommended time between overhaul requirement.

(1) Refer to Step 30. f., 500 Hour Complete Disassembly Inspection and perform all steps in the procedure with the exception of step (12).

31. Oil (Refer to Section 7).

a. Oil Indicating
   (1) Inspect the oil pressure and oil temperature indicator, oil pressure sensor, oil temperature sensor and oil pressure switch for condition and security.
   (2) Inspect electrical components in accordance with Electrical Components Inspection.
   (3) Start and run engine for a few moments observing oil pressure gage for fluctuations. Shut down engine and inspect oil pressure lines and fittings for leaks. Any time the oil pressure indicating system has been removed or repairs have been accomplished, the oil pressure system should be bled. Refer to engine oil section.

b. Engine oil filter
   (1) For changing filter element, refer to engine oil section.
   (2) Inspect bottom surface of filter case by placing a straight edge on the washer seat surface. If any distortion or out of flat condition greater than 0.010 inch is observed, replace filter case.
   (3) Inspect the adapter gasket seat for possible gouges, excessive scratches, wrench marks or other types of mutilation. If defects are found, replace the adapter.
   (4) Inspect threaded hole in the center of the adapter gasket seat. If the hole is off center more than 0.030 inch, replace adapter.

c. Oil breather separator.
   (1) Wash metal parts and element in suitable solvent.
   (2) Inspect metal parts for cracks in body and around the weld tubes.
   (3) Inspect for clogging.

32. Starting (Refer to Section 7).

a. Starter
   (1) Inspect for condition and security, inspect terminal block and electrical connections for cleanliness., evidence of heat or arcing.
   (2) Inspect starter brushes, commutator and electrical connections for cleanliness, evidence of heat or arcing and condition.
   (3) To complete the starter inspection, refer to the appropriate section of the engine maintenance manual.
   (4) Operational check by cranking engine.

b. Starter switch, starter relay and electrical components and cables.
   (1) Inspect in accordance with the Electrical Power Inspection.

33. Turbines (Refer to Section 7).

a. Turbocharger.
   (1) Clean outer surface of turbocharger with a suitable solvent and inspect turbine housing for cracks or bulges.
   (2) Remove the tailpipe from the turbine and inspect impellers and visible portions of turbine for coking, carbonization, oil deposits, nicks or dents. If cracks or bulges do appear on the turbine housing, replace housing in accordance with the Turbocharger and Control Overhaul / Parts Manual. For removing coke and carbonized oil deposits, refer to Turbo charger and Controls Overhaul / Parts Manual.

b. Turbocharger system plumbing.
   (1) Inspect for leaks, damage, loose lines and fittings, cracks and kinks.

c. Wastegate and wastegate actuator, variable absolute pressure controller.
   (1) Inspect for condition and security.
   (2) Inspect springs and linkage for condition and security.

d. Induction air filter.
   (1) For cleaning filter, refer to turbines section.
   (2) Inspect filter for holes, cracks, deterioration and pleats for proper bonding. Filter element should not be used after 15 cleaning operations. Inspect alternate air inlet door assembly for condition, security and proper operation.

e. Manifold pressure relief valve.

(1) Clean dirt and debris from valve with a clean cloth. Inspect relief valve vents for obstructions or foreign material.

(2) Check for proper operation as follows: after adequate engine warmup with oil temperature at the lower third of green arc, accelerate the engine rapidly from idle to maximum RPM (discontinue acceleration if manifold pressure exceeds 41.0-inches Hg.); if maximum manifold pressure exceeds 41.0-inches Hg., immediately reduce power and shut down engine. Manifold pressure relief valve is faulty and must be replaced.

f. Induction system, manifold and elbow clamp.

(1) Clean the air induction manifold when washing down engine using the same procedures. Inspect the induction manifold for security, loose connections, air leaks and condition. Repair of induction manifold is limited to replacement of components.

(2) Inspect manifold drain as follows:

(a) Attach a 0.25-inch I.D. hose to each manifold drain valve located under each engine nacelle.

(b) Blow softly into hose (less than 0.6 CFM). Valve will remain open. Increase velocity (over 0.6 CFM) and valve will close.

(c) Apply suction to hose (less than 0.8 CFM). Valve will remain open. Increase suction (over 0.8 CFM) and valve will close.

(d) If valve does not meet the above requirements, replace valve.

UNSCHEDULED MAINTENANCE CHECKS.

1. General.

a. During operation, the airplane may be subjected to:
   (1) Hard/Overweight landings.
   (2) Overspeed.
   (3) Severe air turbulence or severe maneuvers.
   (4) Foreign object damage.
   (5) Towing with a large fuel unbalance or high drag/side loads due to ground handling.

b. When any of these conditions are reported by the flight crew, a visual inspection of the airframe and specific inspections of components and areas involved must be accomplished.

c. The inspections are performed to determine and evaluate the extent of damage in local areas of visible damage and to the structure and components adjacent to the area of damage.

d. When a lightning strike is encountered, a comprehensive inspection of the airplane exterior is performed to locate possible damage.

e. If foreign object damage is encountered (suspected or actual), a visual inspection of the airplane must be accomplished before airplane is returned to service.

2. Unscheduled Maintenance Checks Defined and Areas to be Inspected.

a. Hard/Overweight landings.
   (1) Any landing made by an airplane at what is believed to be an excessive sink rate. Closely related to hard landings, is overweight landing, which is defined as landing the airplane at any gross weight which exceeds maximum gross landing weight outlined in Pilot's Operating Handbook and FAA Approved Airplane Flight Manual.

NOTE

If the hard/overweight landing is combined with high drag/side loads, additional checks are required.

   (2) Hard or overweight landing check.
      (a) Landing gear.
         1) Main gear shock struts - Inspect for security of attachment and leakage.
         2) Main gear actuator attachments and supporting structure - Inspect for security, loose or failed fasteners and evidence of structural damage.
         3) Nose gear trunnion at crossarms, supports and attaching structure - Inspect for security, loose or failed fasteners and any evidence of structural damage.
         4) Nose gear actuator attachments and supporting structure - Inspect for security, loose or failed fasteners and any evidence of structural damage.
      (b) Wings.
         1) Wing surface in landing gear area - Inspect for skin buckles, loose or failed fasteners, security of landing gear trunnion fittings and fuel leaks.
         2) Trailing edge - Inspect for any deformation affecting normal flap operation.

b. Overspeed.
   (1) Any time an airplane has exceeded one or both of the following:
      (a) Airplane overspeed exceeding placard speed limits of flaps.
      (b) Airplane overspeed exceeding design speeds.
   (2) Overspeed check.
      (a) Landing gear.
         1) Trunnion and supports - Inspect for cracks, security and evidence of structural damage.
         2) Doors and attachments - Inspect for loose or failed fasteners, cracks, buckling and evidence of structural damage.

3) Check for freedom of movement and perform an operational check.

(b) Fuselage.

1) Radome - Inspect for buckling, dents, loose or failed fasteners and any evidence of structural damage.

2) All hinged access doors - Inspect hinges, hinge attach points, latches and attachments and skins for deformation and evidence of structural damage.

(c) Nacelles.

1) Skins - Inspect for buckling, cracks, loose or failed fasteners and indications of structural damage.

2) Fillets and fairings - Inspect for buckling, dents, cracks and loose or failed fasteners.

(d) Stabilizers.

1) Stabilizers - Inspect skins, hinges and attachments, movable surfaces, mass balance weights and attaching structure for cracks, dents, buckling, loose or failed fasteners and evidence of structural damge.

(e) Wings.

1) Flaps - Inspect for skin buckling, cracks, loose or failed fasteners, attachments and structure for damage.

2) Check for freedom of movement operation.

c. Severe air turbulence or severe maneuvers.

(1) May be defined as atmospheric conditions producing violent buffeting of airplane. Severe maneuvers can be defined as any maneuvers exceeding Pilot's Operating Handbook and FAA Approved Airplane Flight Manual limits.

(2) Severe turbulence and/or maneuvers checks.

(a) Stabilizers.

1) Horizontal stabilizer hinge fittings, actuator fittings and stabilizer center section - Inspect for security, loose or failed fasteners and any evidence of structural damage.

2) Vertical stabilizer - Inspect for evidence of structural damage, skin buckles and security at primary attachments in tailcone, loose or failed fasteners, damage to hinges and actuator fittings.

3) Elevator and rudder balance weight supporting structure - Inspect for security, loose or failed fasteners and evidence of structural damage.

(b) Wing.

1) Wing to body fittings and supporting structure - Inspect for security, loose or failed fasteners and evidence of structural damage.

2) Trailing Edge - Inspect for any deformation affecting normal operation of flap and aileron.

d. Lightning strike.

(1) If flown through an electrically stressed region of the atmosphere where electrical discharges are transferred from cloud to cloud and from cloud to earth, the airplane may become a part of this discharge path. During a lightning strike, the current enters the airplane at one point and exits at another, usually at opposite extremities. It is in these areas, wing tips, nose and tail sections where damage is most likely to occur. Burning and/or eroding of small surface areas of the skin and structure may be detected during inspection. In most cases, the damage is obvious. In some cases, however, hidden damage may result. The purpose of the lightning strike inspection is to locate any damage that may have occurred to the airplane before returning it to service.

(2) Lightning strike check.

(a) Communications.

1) Antennas - Inspect all antennas for evidence of burning or eroding. If damage is noted, perform functional check of affected system.

(b) Navigation.

1) Radar reflector, feed horn, motor box assembly and mounting structure - Inspect for damage. If damage is noted, perform a bench check of system. If superficial pitting or burning of mount structure only is noted, perform a functional check of radar system.

2) Glideslope antenna - Inspect for burning and pitting. If damage is noted, perform a functional check of glideslope system.

3) Compass - Compass should be considered serviceable if the corrected heading is within plus or minus 10 degrees of heading indicated by the remote compass system. If remote compass is not within tolerance, remove, repair or replace.

(c) Fuselage.

1) Radome - Inspect for evidence of burning or eroding.

2) Skin - Inspect surface of fuselage skin for evidence of damage.

3) Tailcone - Inspect tailcone and static dischargers for damage.

(d) Stabilizers.

1) Inspect surfaces of stabilizers for evidence of damage.

(e) Wings.

1) Skins - Inspect for evidence of burning and eroding.

2) Wing tips - Inspect for evidence of burning and pitting.

3) Flight surfaces and hinging mechanisms Inspect for burning and pitting.

(f) Propellers.

1) Propeller - Return to manufacturer for inspection.

(g) Powerplant.

1) Engine - Refer to engine manufacturer's overhaul manual for inspection procedures.

e. Foreign object damage.

(1) Damage to the airplane engine may be caused by the ingestion of slush, by a bird strike or by any other foreign object while operating the airplane on the ground or in normal flight. Damage may also be caused by tools, bolts, nuts, washers, rivets, rags or pieces of safety wire left in the engine nacelle inlet duct during maintenance operations. The purpose of the foreign object damage inspection is to locate any damage prior to repairing or returning the airplane to service.

(2) Safety precautions should be taken to prevent foreign objects from coming in contact with the airplane during towing and at all times when airplane is not in service. To prevent dirt and foreign objects damage, the engines should be provided with suitable covers. When there is wind and dust conditions, the covers should be installed as soon as practicable following engine shutdown.

(3) The aerodynamic cleanliness level (degree of surface smoothness), contributes to performance capabilities of the airplane. It is important that the high cleanliness level be maintained.

(4) Contour and waviness distortion of the aerodynamic surface may be developed in the course of normal operation or by improper handling during maintenance operations. Doors and access panels are susceptible to waviness through rough handling. Care should be exercised in the handling of these items.

(5) Foreign object damage check.

(a) Landing gear.

1) Doors - Inspect for dents, cracks, misalignment and indication of structural damage.

(b) Fuselage.

1) Radome - Inspect for dents, cracks, punctures, scratches, etc.

2) Skin - Inspect forward and belly areas for dents, punctures, cracks and any evidence of damage.

(c) Nacelles/Pylons.

1) Skins - Inspect for dents, punctures, loose or failed fasteners, cracks and indications of structural damage.

(d) Stabilizers.

1) Leading edge skins - Inspect for dents, cracks, scratches and any evidence of structural damage.

2) Surface deice boots - Inspect for cuts, punctures or tears.

(e) Windows.

1) Windshield - Inspect for chipping, scratches and cracks.

(f) Wings.

1) Leading edge skins - Inspect for dents, cracks, punctures and evidence of possible structural damage.

2) Surface deice boots - Inspect for cuts, punctures or tears.

(g) Powerplant.

1) Cowling - Inspect for dents, cuts, tears, scratches, blood and feathers.

(h) Engine.

1) Air inlet section - Inspect for dents, cracks, scratches, punctures, blood and feathers.

2) Propeller - Inspect for nicked, bent, broken, cracked or rubbing blades.

f. High drag/side loads due to ground handling.

(1) High drag/side load condition shall be defined to exist whenever the airplane skids or overruns from the prepared surface onto an unprepared surface, or landings short of prepared surface, or makes a landing which involves the blowing of tires or skids on a runway to the extent that the safety of the airplane was in question. This covers takeoff and landings or unusual taxi conditions.

(2) High drag/side loads due to ground handling check.

(a) Landing gear.

1) Main gear and doors - Inspect for loose or failed fasteners, buckling, security, cracks and evidence of structural damage.

2) Nose gear and doors - Inspect for loose or failed fasteners, cracks, steering cables tension, security, buckling and evidence of structural damage.

(b) Wings.

1) Wing to fuselage attach fittings and attaching structure - Inspect for security, loose or failed fasteners and evidence of structural failure.

g. Cabin vibration check.

NOTE

Vibration can be transmitted from the engine to the airplane structure from points of contact between engine components and the cowl, firewall or engine mount. The following is a list of areas to be checked to ensure the engine is isolated from the airplane structure or to minimize the effect from components which must bridge between engine and structure.

(1) Baffle to cowl clearance.

(a) Check inside of cowl for chafing; trim metal baffle as required. Repaint affected area and reinspect next flight.

(2) Exhaust to cowl.

(a) Check exhaust stack for clearance where it extends through cowl. Check stack and cowl for signs of interference. Enlarge cutout in cowl as required.

(3) Induction hose clamps.

(a) Check induction hose clamp for clearance with the engine mount structure. Look for marks on engine mount. Rotate clamps as required.

(4) Exhaust couplings.

(a) Check exhaust couplings for clearance with the engine mount and/or nacelle structure and heat shields. Rotate couplings as required.

(5) Breather and overboard dump lines.

(a) Check all overboard dump lines from the engine for clearance with the firewall, cowl and/or cowl flap openings (if applicable). Check cowl flap (if applicable) in both the open and closed positions. Reposition and reclamp to clear.

(6) Engine isolators.

(a) Check engine isolator bolt lengths. Bolts which are too long will shank out and will not apply the correct pressure to the isolator. Bolts must be removed to be properly checked. Replace with next size shorter bolt if barrel nut has shanked out.

(b) Check isolators for aging and deterioration. Replace if rubber is separated from metal pad, there is cracking of the rubber and/or pronounced set of the rubber pad.

(c) Check that the large snubbing washers on the lower mounts (if installed) have proper clearance with the engine mount structure.

(7) Propeller.

(a) Check propeller track. Refer to scheduled maintenance check.
(b) Check propeller for loose or binding blades, loose or missing attach bolts.
(c) Check propeller spinner for loose, damaged or deformed parts and visual wobble.
(d) Check the propeller to ensure proper indexing with the engine crankshaft in compliance with service manuals (when applicable).
(e) Balance suspected propeller if roughness continues.

(8) Engine controls.
(a) Engine controls should be routed to provide a gentle curve between engine and firewall. They should not be stretched tight. Pull control through firewall, as required, and reclamp.
(b) Check engine controls behind engine for contact with engine. Reroute and reclamp controls, as required, to clear.

(9) Starter cable.
(a) Check starter cable for clearance with cowl and that a loop is provided for flexing.

(10) Engine condition.
(a) Check spark plugs for proper type and for fouling or improper gap.
(b) Check condition of ignition wiring.
(c) Check condition of points.
(d) Check magneto timing.
(e) Check engine compression.
(f) On fuel injection engines; check fuel injector nozzles for restriction and correct size. Check fuel pump setting and fuel distributor valve calibration and proper flow.
(g) On turbocharged engines:
1) Check nozzle shrouds for leakage, check air induction for leaks and/or rubber couplings for proper seal.
2) Check turbocharger for foreign object damage, binding or worn bearing.
3) Check exhaust slip joints for proper axial loads. Axial loads must not exceed 200 pounds.
4) Check security of exhaust ducting.

(11) Antenna vibration.
(a) Check antenna if vibration tends to be related to airspeed rather than power setting.

(12) Wheel balance and brake disc trueness.
(a) Wheel balance and brake disc trueness can be sources of vibration during the ground run on some airplanes. These should be checked as a part of the vibration diagnostic process if conditions indicate that they may be a problem.

(13) Airframe items. For low frequency vibration or "rumble" condition check the following:
(a) Check proper rigging of wing flaps, gear doors and landing lights.
(b) Check external skins for excess oil canning.

(14) Interior items. The following interior items can amplify normal vibration levels resulting in discomfort reports:
(a) Check instrument panel for loose panels and interference among components attached to the instrument panel.
(b) Check for excessive play on control mechanisms.
(c) Check the cabin divider and attaching components for proper security.

h. Rough engine opertion.
(1) Propeller mounting - Inspect nuts for condition and retorque.
(2) Cylinder - Perform compression check.
(3) Fuel discharge nozzle - Inspect orifices and clean.
(4) Magnetos - Check timing, breaker gap and security.

SERVICING

Description

1. This text consists of descriptions, illustrations and servicing procedures necessary to locate system or component service points, and to replenish or service equipment as required.

2. Adherence to instructions, cautions, and warnings will avoid injury to personnel and damage to the airplane and associated equipment.

3. The operational integrity of the airplane systems can be seriously impaired if unapproved or contaminated fuels, oils, fluids, lubricants and materials are used. Mixture of various brands, kinds and qualities of material should be avoided.

4. The replenishment chart provides capacities and pressures. Additional information concerning servicing of the various airplane systems and components is provided in the applicable chapter.

5. Items to be serviced and/or lubricated are shown in the various procedures and illustrations. The illustration identifies the item, lube type and type of application. Refer to Inspection Time Limits for servicing frequencies.

6. Specified lubricants will meet requirements for extreme hot or extreme cold temperature operations. Use of substitutes or other lubricants may cause malfunction when operating in extreme temperature conditions, or may cause excessive wear due to improper lubrication.

2. Service Nose and Main Gear Struts.

A. Service Nose Gear Strut.

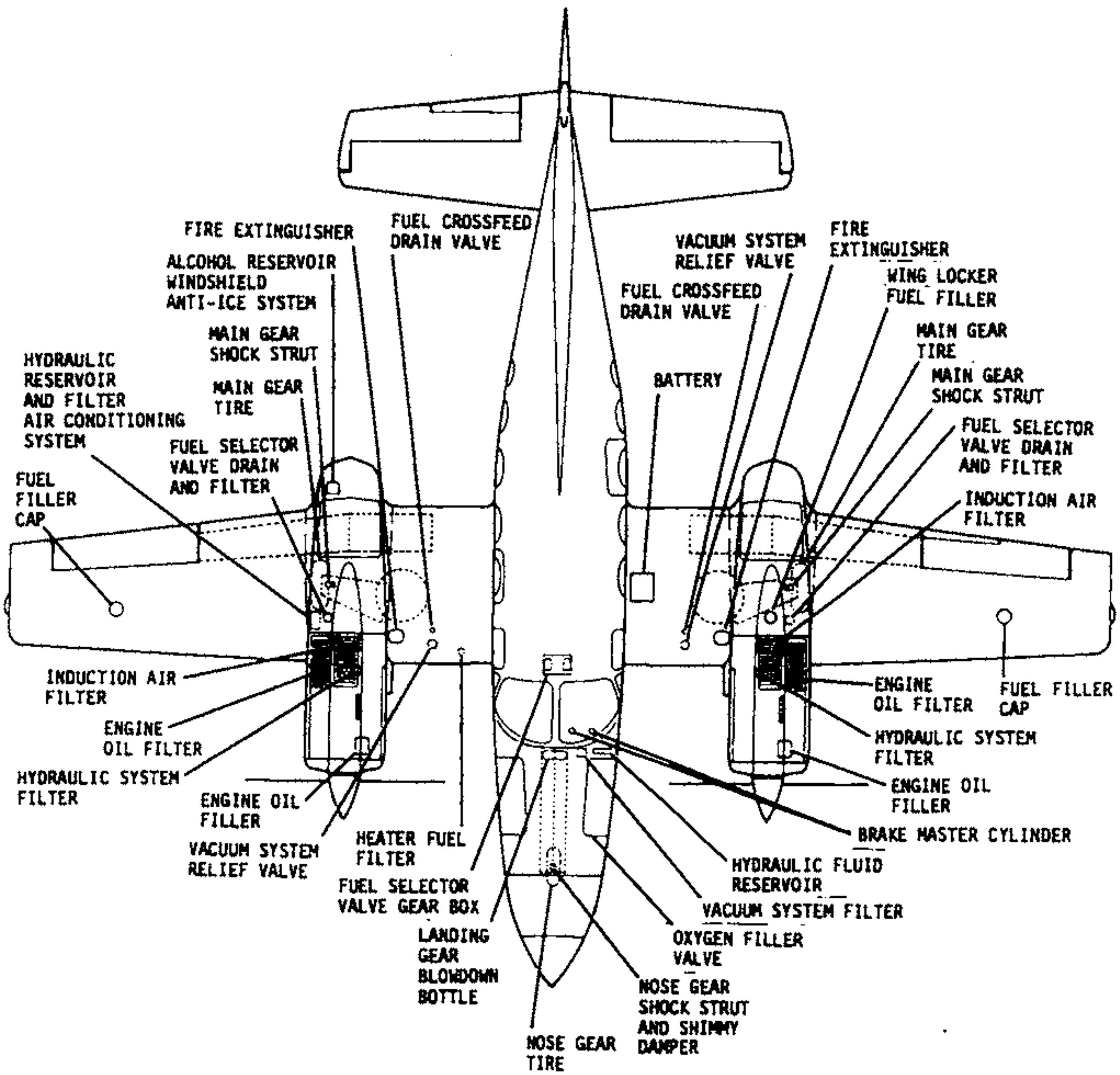
NOTE: Gear must be in an upright position for servicing. If gear is on the airplane, it must be extended and clear of the ground.

(1) Jack airplane. Refer to Chapter 1, Lifting and Shoring.
(2) Deflate strut by loosening valve body 2-1/2 turns (minimum).
(3) With strut fully compressed, remove valve assembly and replace with an AN919-3 and MS28778-8 packing, then attach a hand pump containing MIL-H-5606 hydraulic fluid. Operate hand pump until strut is fully extended.
(4) Open check valve on pump and force strut to a collapsed position slowly. Repeat until no air is expelled from strut.
(5) With strut in fully collapsed position, remove hand pump, hose and fitting, then replace MS28889-2 valve assembly and tighten against packing and safety wire.
(6) Open valve and charge strut to 100 psig with a regulated source of dry air or nitrogen; then bleed down to 75 psig.
(7) Remove airplane from jacks.

B. Service Main Gear Strut. (Airplanes C0001 Thru C0800)

NOTE: Gear must be in an upright position for servicing. If gear is on the airplane, it must be extended and clear of the ground.

(1) Jack airplane Refer to Chapter 1, Lifting and Shoring.
(2) Deflate strut by loosening valve body 2-1/2 turns (minimum).
(3) With strut fully compressed, remove valve assembly and replace with an AN919-3 reducer and MS28778-8 packing, then attach a hand pump containing MIL-H-5606 hydraulic fluid. Operate hand pump until strut is fully extended.
(4) Open check valve on pump and force strut to a collapsed position slowly. Repeat until no air is expelled from the strut.
(5) With the strut in a fully collapsed position, remove hand pump, hose and fitting, then replace MS28889-2 valve assembly and tighten against packing and safety wire.
(6) Open valve and charge strut to 400 psig with a regulated source of dry air or nitrogen; then bleed down to 275 psig.



Airplane Service Points
Figure 1

C. Servicing Main Gear Strut with Air Only (Airplanes C0801 and On).

WARNING: THE SWIVEL NUT AND AIR SERVICE VALVE BODY ARE 3/4 INCH HEX. TURNING THE BODY NUT WILL REMOVE VALVE FROM SERVICE PORT, ALLOWING VALVE TO BE BLOWN OUT.

DO NOT COVER VALVE WITH HANDS OR ALLOW PRESSURE TO BE BLOWN INTO FACE.

(1) Remove cover from air service valve.

NOTE: No hydraulic fluid is permitted in lower chamber of piston barrel. If fluid exists, the strut assembly must be overhauled.

(2) Release torque on swivel nut while holding the service valve body and slowly turn to allow any existing air pressure to escape.

CAUTION: WHEN CHARGING WITH DRY AIR OR NITROGEN, STRUT MAY EXTEND RAPIDLY. TAKE CARE TO PREVENT INJURY.

(3) Connect regulated air supply, relief valve and pressure gage to service valve body. Slowly charge strut to 250 psig with regulated source of dry air or nitrogen.
(4) Close relief valve and disconnect air source.
(5) Slowly open relief valve and bleed pressure down to 170 psig with strut fully extended. If hydraulic fluid is expelled from lower air chamber, strut must be overhauled. No hydraulic fluid is permitted in lower chamber.
(6) Rotate outer hex swivel nut clockwise on air service valve body to close internal poppet and remove pressure gage and relief valve.
(7) Secure service valve, swivel nut and install cover.
(8) Safety wire filler plug.

D. Servicing Main Gear Strut with Air and Oil (Airplanes C0801 and On).

(1) Jack airplane until strut is fully extended and clear of ground.
(2) Remove cover from air service valve.

WARNING: THE SWIVEL NUT AND AIR SERVICE VALVE BODY ARE 3/4 INCH HEX. TURNING THE BODY NUT WILL REMOVE VALVE FROM SERVICE PORT, ALLOWING VALVE TO BE BLOWN OUT.

DO NOT COVER VALVE WITH HANDS OR ALLOW PRESSURE TO BE BLOWN INTO FACE.

CAUTION: DO NOT OPEN VALVE MORE THAN 1/2 TURN. TOO RAPID PRESSURE RELEASE WILL CAUSE FROSTING AND POSSIBLE BLOCKAGE OF VALVE STEM.

(3) Release torque on swivel nut while holding the service valve body and slowly turn to allow air pressure to escape.

NOTE: No hydraulic fluid is permitted in lower chamber of piston barrel. If fluid exists, the strut assembly must be overhauled.

(4) Remove filler plug and packing from top of strut and replace with AN919-1D reducer and MS28778-2 packing.
(5) Connect the reducer to a hydraulic hand pump filled with MIL-H-5606 hydraulic fluid.
(6) Pump hydraulic fluid into strut until fully extended. Increase pressure to 750, +50, -50 psig to assure isolation piston is properly bottomed out when strut is fully extended.

CAUTION: IF STRUT IS CYCLED WHILE MOUNTED ON THE TRUNNION/DRAG LINK, USE OF A HYDRAULIC JACK TO LIFT THE WHEEL SHOULD BE DONE WITH EXTREME CAUTION. THE STRUT MUST BE STROKED COMPLETELY WHILE AVOIDING ANY POSSIBILITY THAT THE WING WEIGHT IS REMOVED FROM THE PRIMARY WING JACK. WING WEIGHT ON THE WHEEL JACK COULD RESULT IN DAMAGE SHOULD THE WING JACK COME OFF THE JACK PAD.

(7) Open pump vent valve on hydraulic pump and slowly force strut to the collapsed position. Crack the reducer and continue to collapse strut until it bottoms out allowing air to expel from strut.
(8) Repeat cycling of strut (three cycles minimum) as required with hand pump until no air is being discharged from oil chamber.
(9) Keeping strut fully collapsed, carefully remove hydraulic pump, AN919-1D reducer and packing. Top off strut with fluid and reinstall filler plug and new MS28778-2 packing and tighten.

CAUTION: WHEN CHARGING WITH DRY AIR OR NITROGEN, STRUT MAY EXTEND RAPIDLY. TAKE CARE TO PREVENT INJURY.

(10) Connect regulated air supply, relief valve and pressure gage to service valve body. Slowly charge strut to 250 psig with regulated source of dry air or nitrogen.
(11) Close relief valve and disconnect air source.
(12) Slowly open relief valve and bleed pressure down to 170 psig with strut fully extended. If hydraulic fluid is expelled from lower air chamber, strut must be overhauled. No hydraulic fluid is permitted in lower chamber.
(13) Rotate outer hex swivel nut clockwise on air service valve body to close internal poppet and remove pressure gage and relief valve.
(14) Secure service valve, swivel nut and install cover.
(15) Safety wire filler plug.

Servicing - Shimmy Damper

1. Service Shimmy Damper.

A. Using the tow bar, turn the nosewheel strut to the extreme left position against the 55-degree stop. This will place the shimmy damper piston to the rear of the cylinder and eliminate the possibility of entrapped air in the cylinder.
B. Remove the filler plug and fill with hydraulic fluid (MIL-H-5606).
C. Replace filler plug and turn nosewheel strut through its entire travel several times.
D. Return strut to the extreme left position against the 55-degree stop.
E. Remove filler plug and add whatever fluid is needed to fill the cylinder.
F. Replace and safety filler plug.

Servicing - Main and Nose Gear Tires

1. General.

   A. Tire air pressure will decrease somewhat as the temperature drops, but excessive deflation could indicate trouble at the air valve. Avoid unnecessary pressure checks. If it is necessary to check tire inflation in cold climates, always apply heat to air valve when checking and adding air.

   B. Follow all local safety and technical directives while servicing tires.

   WARNING: INTRODUCING RELATIVELY COOLER NITROGEN INTO A TIRE THAT IS HOT MAY CAUSE THE TIRE TO BURST. ALLOW THE TIRE TO COOL BEFORE ATTEMPTING TO SERVICE.

   WARNING: THE TENDENCY OF A BURSTING TIRE IS TO RUPTURE ALONG THE BEAD. STANDING IN ANY POSITION IN FRONT OF EITHER BEAD AREA COULD CAUSE INJURY SHOULD THE TIRE BURST.

   CAUTION: APPLYING A TIRE SEALANT TO THE TIRE MAY CAUSE WHEEL CORROSION.

   CAUTION: REFER TO CHAPTER 4, TIRE OPERATION PRESSURE MAINTENANCE CRITERIA, WHEN TIRE PRESSURE FALLS BELOW THE RECOMMENDED LIMIT TO DETERMINE PROPER CORRECTIVE ACTION.

2. Service Main Gear Tire (Size 6.50 x 10, 8-Ply Rating).

   A. Tire pressure should be maintained at 70 PSIG.

3. Service Nose Gear (Size 6.00 x 6, 6-Ply Rating).

   A. Tire pressure should be maintained at 50 PSIG.

Servicing - Brake Master Cylinder

1. General.

   A. The hydraulic brake reservoir is incorporated in the master cylinder. The filler cap and air vent is located on the head of each master cylinder.

2. Service Brake Master Cylinder.

   A. Remove filler cap and fill reservoir to within one-quarter inch below the filler opening with hydraulic fluid MIL-H-5606 (RED).

   CAUTION: ALWAYS RELEASE PARKING BRAKE BEFORE SERVICING MASTER CYLINDER.

Servicing - Landing Gear Emergency Blowdown Bottle

1. General.

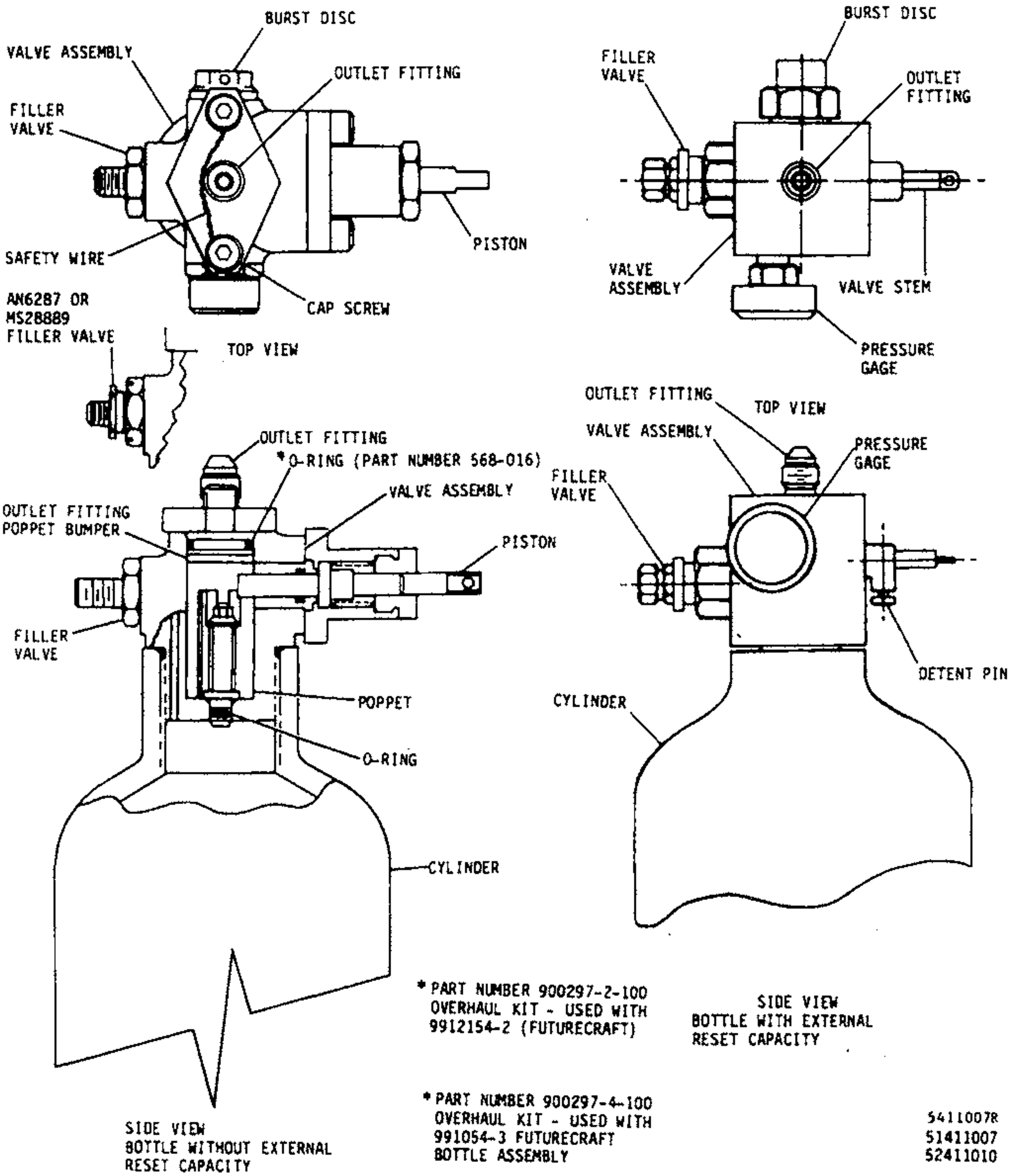
   A. The blowdown bottle and valve is located behind the baggage retainer in the nose compartment. A window is provided in the baggage retainer for visual sight of the pressure gage, incorporated in the valve of the bottle. Access to the bottle is gained by removing the baggage retainer.

   B. The bottle is charged with nitrogen, and bottle pressure must be maintained within the pressure gage green arc - 1750 to 2200 PSIG.

2. Servicing Blowdown Bottle (Refer to Figure 2).

   A. Routine Servicing of Blowdown Bottle System (Refer to Figure 2).

      (1) Check the emergency gear extension T-handle to insure that it is full IN.
      (2) Check pressure gage through the window in the baggage retainer for correct pressure indication.
      (3) If bottle pressure is low, remove baggage retainer for access to bottle.
      (4) Remove cap from bottle filler valve. Refer to Figure 2.



*PART NUMBER 900297-2-100 OVERHAUL KIT - USED WITH 9912154-2 (FUTURECRAFT)

*PART NUMBER 900297-4-100 OVERHAUL KIT - USED WITH 991054-3 FUTURECRAFT BOTTLE ASSEMBLY

5411007R
51411007
52411010

Blow Down Bottle Servicing
Figure 2

(5) Connect dry air or nitrogen supply regulated to 2000 PSIG to filler valve. Insure pressure regulator valve is turned out full.

<u>WARNING</u>: DO NOT CHARGE BLOWDOWN BOTTLE WITH OXYGEN. USE DRY AIR OR NITROGEN ONLY.

DO NOT LOOSEN FILLER VALVE WHILE BOTTLE IS PRESSURIZED.

<u>NOTE</u>: Filler valves other than those called out below in step (6) do not require opening prior to filling. An internal check valve performs this function.

(6) Open bottle filler valve approximately 1/2 turn (bottles equipped with AN6287 or MS28889 valves). Refer to Figure 2.
(7) Fill bottle to 2000 +200, -250 PSIG, regulated at supply source.
(8) Close bottle filler valve and close regulator valve on supply source.
(9) Disconnect supply line and cap bottle filler valve.
(10) Check for leakage at the discharge outlet fitting.

<u>NOTE</u>: If leakage exists, discharge bottle to atmosphere and refill bottle. If bottle valve stil leaks, replace.

(11) Reinstall baggage retainer.

B. Servicing Blowdown Bottle System After Emergency Gear Extension.

(1) Check the emergency gear extension T-handle to insure that it pulled all the way to the full OUT (extend) position.
(2) Remove baggage retainer for access to bottle.
(3) Loosen discharge line at bottle outlet fitting and at "extend" port of all landing gear system actuators very slowly and allow residual pressure to bleed off completely.

<u>WARNING</u>: LOOSEN LINE WITH CARE FOR PROTECTION FROM BLAST OF BLEED PRESSURE. BOTTLE MUST BE COMPLETELY DISCHARGED WITH THE RED RING SHOWING ON THE BOTTLE VALVE PISTON AND THE "B" NOT LOOSENED OR REMOVED FROM THE VALVE OUTLET FITTING BEFORE RESETTING PISTON.

<u>CAUTION</u>: DO NOT OPERATE LANDING GEAR SYSTEM BEFORE BLEEDING OFF EMERGENCY BLOWDOWN PRESSURE AT BOTTLE OUTLET FITTING AND "EXTEND" PORT OF ALL LANDING GEAR SYSTEM ACTUATORS. DAMAGE TO HYDRAULIC RESERVOIR MAY RESULT.

(4) Reset bottle discharge valve piston as follows:

(a) Bottles with External Reset Capability.

1) Bottle manufactured by Carlton: Pull out the detent pin located on the valve body, push the piston back into the reset portion and release detent pin.
2) Bottle manufactured by H.T.L.: Push detent pin in and push piston back into the reset position and release detent pin.
3) Check emergency gear extension T-handle to insure that handle is in the full IN position.

(b) Bottles Without External Reset Capability.

1) Check emergency gear extension T-handle to ensure that handle is in the full IN position.
2) Remove bottle from bracket assembly.
3) Cut safety wire and remove the two cap screws at the outlet fitting.

<u>WARNING</u>: DO NOT REMOVE OUTLET FITTING WITH BOTTLE PRESSURIZED.

4) With a straight pull, remove the outlet fitting from the valve assembly.

WARNING: IF A BOTTLE TO BE RECHARGED IS FOUND TO BE CONTAMINATED WITH HYDRAULIC FLUID, IT MUST BE COMPLETELY DISASSEMBLED AND CLEANED BEFORE FILLING CAN BE ACCOMPLISHED. FAILURE TO DO SO CAN RESULT IN HYDRAULIC DIESEL EXPLOSION CAUSING INJURY OR DEATH TO OPERATING PERSONNEL.

5) With bottle inverted, check for entrapped hydraulic fluid. If hydraulic fluid is found in the bottle, the bottle should be cleaned in accordance with vendor's maintenance manual. Refer to List of Publications.
6) Pull the piston out and hold; remove the poppet assembly and inspect O-ring for damage (replace if required). Insert the poppet assembly (hold piston out) in body by pushing poppet inward into cylinder. Ensure piston groove on poppet is parallel to piston; then, push piston in.

NOTE: Lubricate O-ring with Dow Corning, DC 33 Silicone Grease.

7) Inspect the outlet fitting poppet bumper and replace O-ring, if required.
8) Reinstall the outlet fitting and secure with cap screws. Torque cap screws 80 to 100 inch-pounds and safety wire cap screws.
9) Reinstall bottle in bracket assembly. Refer to Chapter 4, Landing Gear Blowdown System.

WARNING: DO NOT CHARGE BOTTLE WITH OXYGEN; USE DRY AIR OR NITROGEN ONLY.

(5) Remove cap from filler valve. Connect dry air or nitrogen supply regulated to 2000 PSIG to charging valve. Ensure pressure regulator valve is turned out full.

WARNING: DO NOT LOOSEN VALVE WHILE BOTTLE IS PRESSURIZED.

WARNING: EMPLOY ALL SAFETY PRECAUTIONS USED IN THE PRESENCE OF HIGH PRESSURE HAZZARDS TO PREVENT INJURY.

(6) Open bottle charging valve one-half turn (bottles equipped with AN6287 or MS28889 valves).
(7) Slowly fill bottle to 2000 PSIG +200, -250 PSIG, regulated at supply source. Make sure the charging rate is moderate enough to keep the gas at a stable temperature. The duration for pressurizing the bottle should be 15 minutes (minimum).
(8) Close bottle charging valve first, then turn off the pressure supply source.

WARNING: BLEED OFF THE PRESSURE CAPTURED IN THE FILLER HOSE BEFORE ATTEMPTING TO DISCONNECT IT FROM THE CHARGING VALVE TO PREVENT INJURY.

(9) Disconnect supply line and cap bottle filler valve.
(10) Check for leakage at the discharge outlet fitting.

NOTE: If leakage exists, discharge bottle to atmosphere and refill bottle. If bottle valve still leaks, replace.

(11) Torque and safety wire cap screws at outlet fitting in accordance with 8, Step (4), 8).
(12) Connect system pneumatic line to outlet fitting. Refer to Chapter 4, Landing Gear Blowdown System.

NOTE: Landing gear shuttle valve must be reshuttled. Refer to Chapter 4, Landing Gear Blowdown System.

(13) Reinstall baggage retainer. Refer to Chapter 3, Nose Section.

Servicing - (Optional) Air Conditioning Hydraulic System

1. General

   A. The air conditioning hydraulic fluid reservoir is located in the right nacelle aft of the engine. Access to the reservoir is gained by opening the access door.

   B. The hydraulic fluid level of the reservoir should be checked and filled as required on preflight.

   C. The reservoir capacity is 2.75 quarts. Service with hydraulic fluid MIL-H-5606 (Red) per placard on inside of access door.

Servicing - Oxygen System

1. General

   A. The oxygen filler valve is located inside the nose baggage compartment, left or right side depending on the cubic inch capacity of the cylinder. A pressure gage for the system is provided on the instrument panel.

   B. The oxygen system gage should be checked for anticipated requirements before first flight each day.

   C. Whenever pressure drops below 300 PSIG, refill with aviator's breathing oxygen Military Specification MIL-0-27210. Service Kit SK310-328 (available through Cessna Dealer's Organization) provides fittings, lines, hoses and pressure gage for equipping two oxygen cylinders to service the oxygen system.

2. Charging Oxygen System.

   A. Open nose baggage door, remove oxygen filler valve cap and connect charging unit.
   B. Slowly charge the oxygen cylinder to proper PSI as indicated on cylinder placard and in accordance with Oxygen Cylinder Filling Pressure Table (corrected pressure using a regulated oxygen supply).

Initial Temp °F	Filling Pressure PSIG	Initial Temp °F	Filling Pressure PSIG	Initial Temp °F	Filling Pressure PSIG
0	1600	40	1775	90	2000
10	1650	50	1825	100	2050
20	1675	60	1875	110	2100
30	1725	70	1925	120	2150
		80	1950	130	2200

NOTE: 1. Table filling pressure is based on oxygen cylinder filled to 1800 PSIG at 70°F. Add 50 PSIG when filling 1850 PSIG cylinders.

2. Initial temperature refers to ambient temperature in filling room. A rise of approximately 25°F may be expected as a result of compression. The cylinder should be filled as quickly as possible and allowed to cool by ambient air only.

Oxygen Cylinder Filling Pressure Table

   C. Shut off oxygen supply, disconnect charging unit, install filler cap and close nose baggage door.

Servicing - Engine Oil

1. General

   A. The oil system servicing is identical on each engine. The oil sump is an integral part of the crankcase. Oil serves the lubrication requirements of the internal engine components and accessory drive gear box. Oil pressure is supplied to main bearings, journal bearings and propeller governor by the oil pump and is returned to the oil sump by the scavenge pump.

2. Servicing.

CAUTION: DO NOT OPERATE ON LESS THAN 9 QUARTS.

A. Drain Oil.

WARNING: PERSONS WHO HANDLE ENGINE OIL ARE ADVISED TO MINIMIZE SKIN CONTACT WITH USED OIL ON THEIR SKIN. A LABORATORY STUDY, WHILE NOT CONCLUSIVE, FOUND SUBSTANCES WHICH MAY CAUSE CANCER IN HUMANS. THOROUGHLY WASH USED OIL OFF SKIN AS SOON AS POSSIBLE WITH SOAP AND WATER. DO NOT USE KEROSENE, THINNERS OR SOLVENTS TO REMOVE USED ENGINE OIL. IF WATERLESS HAND CLEANER IS USED, ALWAYS APPLY SKIN CREAM AFTER USING.

DO's: DO follow work practices that minimize the amount of skin exposed and the length of time used oil stays on skin.

DO thoroughly wash used oil off skin as soon as possible with soap and water. A waterless hand cleaner can be used when soap and water are not available. Always apply skin cream after using waterless hand cleaner.

DO wash oil-soaked clothing before wearing it again. Discard oil-soaked shoes.

DO use gloves made of nitrile, Neoprene, Viton or other material that oil cannot penetrate, if this is practical for your kind of work.

DONT's: DON'T use kerosene, thinners or solvents to remove used engine oil. The remove the skin's natural protective oils, and cause dryness, irritation, and possibly more serious toxic effects.

DON'T over use waterless hand cleaners, soaps or detergents. They can remove the skin's protective barrier oils.

DON'T put oily rags in pockets or tuck them under a belt: this can cause continuous skin contact.

DON'T pour used engine oil on the ground or down drains and sewers; it is a violation of Federal Law (Chapter 40, Code of Federal Regulations, Section 110). EPA encourages collection of used motor oil at collection points in compliance with appropriate state and local ordinaces.

B. Fill to 10-quart level for normal flights of less than 3 hours. For extended flights fill to capacity which is 13 quarts for each engine (includes 1 quart for oil filter).

C. Oil level in the sump is checked by the dipstick in the filler neck. The dipstick access door is located on top of the engine nacelle.

D. Draining the oil is accomplished by removing the lower nacelle access panel and removing the sump drain plug.

NOTE: Oil should be drained when the engine is warm and the oil is in the normal operating temperature range on the indicator.

Inspect and clean oil screen, if applicable, at each oil change. The fine mesh screen filters out carbon and other particles from the lubricating system. Oil filter should be opened and inspected for contaminants at each filter change by using a standard oil filter cutting tool which may be obtained locally. New engines frequently show widely dispersed metal flakes and lint on the first few oil changes. This should disappear after a few changes, but if large amounts of metal are apparent on any oil change, it is an indication of possible malfunction and should be investigated thoroughly.

E. Use aviation grade engine oil; SAE 50 above 4.4°C (40°F), SAE 30 below 4.4°C (40°F) or multiviscosity unrestricted temperature range. Multiviscosity oil is recommended for use after the first 100 hours of engine operation for improved starting and turbocharger controller operation in temperatures below 4.4°C (40°F). When operating temperatures overlap indicated ranges, use the lighter grade of oil. Ashless dispersant oil, conforming to the latest issue of Continental Motors Specification MHS-24, must be used. No oil additives are approved for use. Replace filters and change oil every 100 hours or 6 months, whichever occurs first. Reduce intervals for prolonged operation in dusty areas, cold climates or when short flights and long idle periods result in sludging conditions.

NOTE: For faster ring seating and improved oil control, your Cessna was delivered from the factory with corrosion preventive oil conforming to MIL-C-6529, Type II. This break-in oil must be used only for the first 25 hours of operation; at that time it must be replaced with ashless dispersant oil. If oil must be added during this first 25 hours of operation, use straight mineral oil conforming to MIL-L-6082.

SYSTEM	QUANTITY EACH ENGINE U.S. GALLONS	IMPERIAL GALLONS	METRIC LITERS	NAME, NUMBER OR TYPE
Engine Oil (Including Filter)	3.50	2.91	13.3	Aviation Grade SAE 30 below 40°F, SAE 50 above 40°F, refer to Engine Oil Servicing for break-in oil. Multiviscosity, after 100 hours, may be used for Turbocharger Controller Operation in cold weather if oil conforms to Continental Motor Specification MHS-24.

Engine Oil System Replenishment Chart

Servicing - Fuel Loading

1. General

   A. The main fuel tanks are filled through a filler assembly, located on each wing. Wing locker (optional) tank(s) are filled through the filler assembly above the tank. The fuel filler nozzle hole diameter has been reduced from 3.00 inch to 2.36 inch on airplanes C1401 and On. This was done to prevent the airplane from being inadvertently serviced with jet fuels. The fuel tank capacities and acceptable fuel specifications are shown on the Fuel Replenishment Chart.

2. Fuel Servicing

   WARNING: DURING ALL FUELING PROCEDURES, FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE. TWO GROUND WIRES FROM DIFFERENT POINTS ON THE AIRPLANE TO SEPARATE APPROVED GROUND STAKES SHALL BE USED TO PREVENT ACCIDENTAL DISCONNECTION OF ONE GROUND WIRE. GROUND NOZZLE OF HOSE TO AIRPLANE.

   CAUTION: ENSURE THAT AIRPLANE HAS BEEN SERVICED WITH THE PROPER GRADE AND TYPE OF FUEL. (PRIMARY - 100 GRADE AVIATION FUEL (GREEN), ALTERNATE 100 LL GRADE AVIATION FUEL (BLUE).

   A. Fuel servicing rates on some ground servicing equipment may tend to exceed the airplane's fuel system intake rate, thus creating several false "FULL" indications. A slower fueling rate is recommended.

      WARNING: DO NOT OPERATE RADIO, RADAR, ELECTRICAL OR ELECTRONIC EQUIPMENT ON THE AIRPLANE DURING FUELING.

   B. Connect ground wire from fueling nozzle to airplane structure.
   C. Remove filler cap, insert nozzle and fill tank.
   D. Remove fuel nozzle and nozzle ground wire.

      CAUTION: ENSURE FILLER CAP IS LOCKED DOWN.

   E. Install filler cap.

SYSTEM	TOTAL FUEL CAPACITY (U.S. GALLONS)	TOTAL FUEL CAPACITY (IMPERIAL GALLONS)	TOTAL FUEL CAPACITY (METRIC LITERS)
Standard System	213.4	177.7	807.7
Standard System With One Optional Wing Locker Tank	241.8	201.4	915.2
Standard System With Two Optional Wing Locker Tanks	270.2	224.1	1022.7

FUEL (APPROVED FUEL GRADES AND COLORS)

100LL Grade Aviation Fuel (Blue).
100 (Formerly 100/130) Grade Aviation Fuel (Green).

NOTE

Isopropyl alcohol may be added to the fuel supply in quantities not to exceed 1% of the total. Refer to fuel additive procedures for additional information.

Fuel System Replenishment Chart

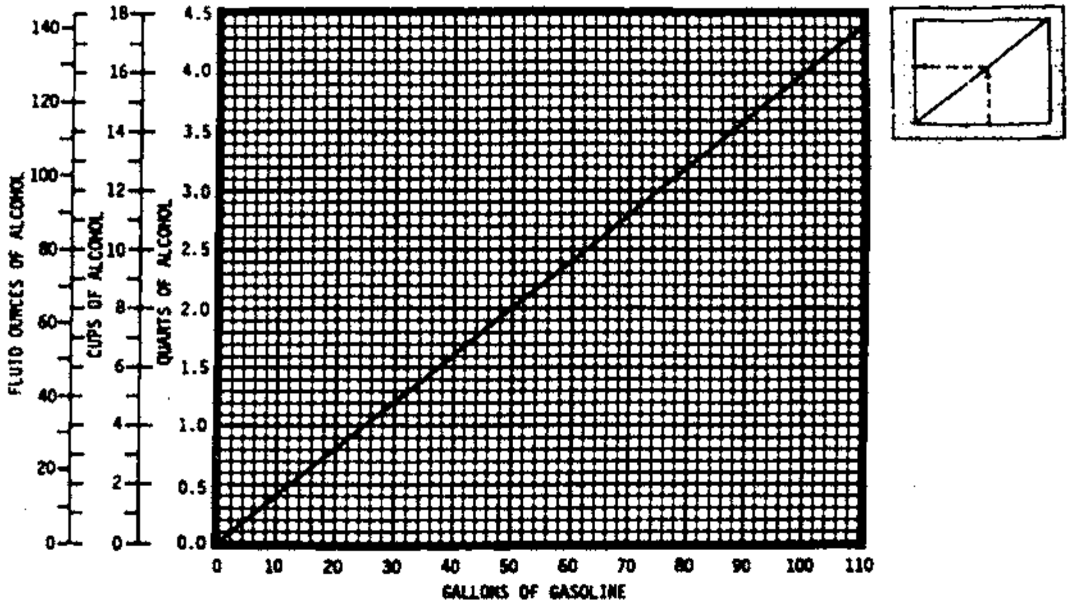
Fuel Additive

1. General

   A. Strict adherence to recommended preflight draining instructions as called for in Pilot's Operating Handbook will eliminate any free water accumulations from the tank sumps. While small amounts of water may still remain in solution in the gasoline, it will normally be consumed and go unnoticed in the operation of the engine.
   B. One exception to this can be encountered when operating under the combined effect of: 1) use of certain fuels, with 2) high humidity conditions on the ground 3) followed by flight at high altitude and low temperature (flight levels of 20,000 feet or above and temperatures of -28.9°C (-20°F) or below). Under these unusual conditions small amounts of water in solution can precipitate from the fuel stream and freeze in sufficient quantities to induce partial icing of the engine fuel injection system.
   C. While these conditions are quite rare and will not normally pose a problem to owners and operators, they do exist in certain areas of the world and consequently must be dealt with, when encountered.
   D. Therefore, to alleviate the possibility of fuel icing occurring under these unusual conditions, it is permissible to add isopropyl alcohol or ethylene glycol monomethyl ether (EGME) compound to the fuel supply.
   E. The introduction of alcohol or EGME compound into the fuel provides two distinct effects: 1) it absorbs the dissolved water from the gasoline and 2) it has a freezing temperature depressant effect.
   F. Alcohol, if used, is to be blended with the fuel in a concentration of 1% by volume. Concentrations greater than 1% are not recommended since they can be detrimental to fuel tank materials.
   G. The manner in which the alcohol is added to the fuel is significant because alcohol is most effective when it is completely dissolved in the fuel. To insure proper mixing the following is recommended.

      (1) For best results the alcohol should be added during the fueling operation by pouring the alcohol directly on the fuel stream issuing from the fueling nozzle.
      (2) An alternate method that may be used is to premix the complete alcohol dosage with some fuel in a separate clean container (approximately 2-3 gallon capacity) and then transferring this mixture to the tank prior to the fuel operation.

H. Isopropyl alcohol with a maximum water content not to exceed 0.4 pervent by volume must be used, such as: Anti-icing fluid (isopropyl alcohol) (MIL-F-5566) or isopropyl alcohol (Federal Specification TT-I-735a).



Alcohol - Fuel Mixing Ratio Chart

WARNING: ANTI-ICE ADDITIVE (ETHYLENE GLYCOL MONOMETHYL ETHER) IS TOXIC. IT IS DANGEROUS TO HEALTH WHEN BREATHED AND/OR ABSORBED INTO THE SKIN. WHEN SERVICING FUEL WITH ANTI-ICE ADDITIVE, THE USE OF APPROPRIATE PERSONAL PROTECTIVE EQUIPMENT SHOULD BE UTILIZED; SUCH AS EYE GOGGLES/SHIELD, RESPIRATOR WITH ORGANIC VAPOR CARTRIDGES, NON-ABSORBING GLOVES AND ADDITIONAL SKIN PROTECTION FROM SPRAYING OR SPLASHING ANTI-ICE ADDITIVE. IF ANTI-ICE ADDITIVE ENTERS THE EYES, FLUSH WITH WATER AND CONTACT A PHYSICIAN IMMEDIATELY.

I. Ethylene glycol monomethyl ether (EGME) compound in compliance with MIL-I-27686E, if used, must be carefully mixed with the fuel in concentrations not to exceed 0.15 percent by volume.

CAUTION: MIXING OF THE EGME COMPOUND WITH THE FUEL IS EXTREMELY IMPORTANT BECAUSE CONCENTRATION IN EXCESS OF THAT RECOMMENDED (0.15 PERCENT BY VOLUME MAXIMUM) CAN HAVE A DELETERIOUS EFFECT ON ENGINE COMPONENTS. USE ONLY BLENDING EQUIPMENT THAT IS RECOMMENDED BY THE MANUFACTURER TO OBTAIN PROPER PROPORTIONING.

CAUTION: DO NOT ALLOW THE CONCENTRATED EGME COMPOUND TO COME IN CONTACT WITH THE AIRPLANE FINISH OR FUEL CELL AS DAMAGE CAN RESULT.

J. Prolonged storage of the airplane will result in a water buildup in the fuel which "leeches out" the additive. An indication of this is when an excessive amount of water accumulates in the fuel tank sumps. The concentration can be checked using a differential refractometer, manufactured by the Seiscor Corporation, Tulsa, Oklahoma. It is imperative that the technical manual for the differential refractometer be followed explicitly when checking the additive concentration.

Fuel Contamination

1. Fuel contamination is usually the result of foreign material present in the fuel system, and may consist of water, rust, sand, dirt, microbes or bacterial growth.
2. Before the first flight of the day and after each refueling, use the fuel sampler and drain fuel from the fuel tank sump drains, the fuel strainer drains and the crossfeed line drains to determine if contaminants are present, and that the airplane has been fueled with the proper grade of fuel.

3. If contamination is detected, continue draining from all fuel drain points until all contamination has been removed. If the airplane has been serviced with the improper fuel grade, defuel completely and refuel with the correct grade. Do not fly the airplane with contaminated or unapproved fuel.
4. In addition, owners/operators who are not acquainted with a particular fixed base operator should be assured that the fuel supply has been checked for contamination and is properly filtered before allowing the airplane to be serviced. Also, fuel tanks should be kept full between flights, provided weight and balance considerations will permit, to reduce the possibility of water condensing on the walls of partially filled tanks.
5. To further reduce the possibility of contaminated fuel, only the proper fuel, as defined in Fuel System Replenishment Chart and the Pilot's Operating Handbook and FAA Approved Airplane Flight Manual, should be used. Fuel additives should not be used unless approved by Cessna and the Federal Aviation Administration.

Defueling Servicing

1. General

   A. The fuel tanks can be defueled by using the defueling pump on the service truck. Procedures are the same for either left or right wing.

2. Defueling

   CAUTION: DURING ALL DEFUELING PROCEDURES, FIRE FIGHTING EQUIPMENT MUST BE AVAILABLE. TWO GROUND WIRES FROM DIFFERENT POINTS ON THE AIRPLANE TO SEPARATE APPROVED GROUND STAKES SHALL BE USED TO PREVENT ACCIDENTAL DISCONNECTION OF ONE GROUND WIRE. GROUND NOZZLE OF HOSE TO AIRPLANE.

   A. Turn off all electrical power.
   B. Turn fuel selector valve handles OFF.
   C. Remove engine cowling.
   D. Disconnect inlet fuel supply hose (13). Refer to Chapter 7-10, Figure 3.
   E. Connect defueling hose to inlet fuel supply hose.

      NOTE: Adapt defueling hose to connect to the 5/8 inch hose fitting.

   F. Turn fuel selector valve handle to ON and defuel wing until all possible fuel is removed.
   G. Remove drain valves from bottom side of wing fuel sump and drain remaining fuel in a clean, open container. Use defuel pump to remove fuel from container. Drain fuel selector valves and fuel crossfeed lines.

      WARNING: RESIDUAL FUEL ACCUMULATION IN THE WING IS A FIRE HAZARD. USE CARE TO PREVENT THE ACCUMULATION OF SUCH FUEL.

Flushing Fuel System

1. General

   A. After removal and installation of fuel system components or repairs to the main tank, the system should be purged prior to servicing main tank.

2. Flush Fuel System

   A. Ensure all electrical power is OFF.
   B. Mixture levers CLOSED.
   C. Remove engine cowling on applicable side of airplane where repairs were made or maintenance was performed.
   D. Disconnect fuel supply line at engine-driven fuel pump.
   E. Attach a clean flexible hose with an (8) eight micron filter in line to the disconnected fuel supply hose and return this line to main tank filler opening.
   F. Add a minimum of (40) forty gallons of fuel to main tank.

G. Connect an external power source.
H. Purge main fuel line from left main tank to left-hand engine by setting the left fuel selector to "LEFT MAIN" and right fuel selector to "OFF," and operating left auxiliary fuel pump approximately (5) five minutes.

NOTE: Observe fuel return to main tank. A solid stream of fuel should be observed.

I. Purge main fuel line from left main to right-hand engine by setting left-hand fuel selector to "OFF" and right-hand fuel selector to "LEFT MAIN." Operate left auxiliary pump (5) five minutes.
J. Repeat steps H and I for opposite engine.

Servicing - Hydraulic System Reservoir

1. General

A. The hydraulic system reservoir is located in the nose baggage compartment aft left side, behind the baggage retainer. A filler assembly is provided to fill the reservoir. The filler assembly is located on the exterior surface of the nose just aft of the left nose baggage door.
B. The reservoir incorporates a sight gage for visual display of fluid level. The hydraulic fluid level should be checked and filled as required on preflight.
C. Fill the reservoir with hydraulic fluid MIL-H-5606 (Red).
D. After servicing the hydraulic reservoir, loosen the hose connection at the hydraulic pump to ensure fluid has reached the pump and it does not run dry.

Servicing - Windshield Anti-Ice System (Alcohol)

1. General

A. The windshield anti-icing system reservoir is located in the aft portion of the right wing locker. The reservoir filler cap is located inside the access door.
B. The fluid level should be checked and filled as required on preflight.

SYSTEM	U.S. GALLONS	IMPERIAL GALLONS	METRIC LITERS	NAME, NUMBER, OR TYPE
ISOPROPYL ALCOHOL				Military Specification MIL-F-5566
TANK CAPACITY	3.0	2.50	11.4	

Windshield Anti-Ice (Alcohol) Replenishment Chart

Servicing - Battery

1. General

A. The battery is located in the left stub wing. The electrolyte level must be maintained such that the tops of the plates are covered with electrolyte. Refer to Vendor Maintenance Manual for servicing.

B. The battery must be removed from the airplane for checking state of charge and charging the battery.

C. The battery box incorporates a sump in the bottom of the box. Access to the sump is gained by removing the battery and removing the cover. The battery box sump is serviced with 50 grams of Sodium nitride perferred or 50 grams of sodium bicarbonate.

Servicing - Deice Boots

1. General

A. The optional deice boots have a special, electrically conductive coating to bleed-off static charges which cause radio interference and may perforate the boots. Fueling and other servicing operations should be done carefully, to avoid damaging this conductive coating or tearing the boots.

B. To prolong the life of surface and propeller deice boots, they should be washed and serviced on a regular basis. Keep the boots clean and free from oil, grease and other solvents which cause rubber to swell and deteriorate. Outlined below are recommended cleaning and servicing procedures.

CAUTION: USE ONLY THE FOLLOWING INSTRUCTIONS WHEN CLEANING BOOTS. DISREGARD INSTRUCTIONS WHICH RECOMMEND PETROLEUM BASE LIQUIDS (METHYL-ETHYL-KETONE (MEK), NON-LEADED GASOLINE, ETC.) WHICH CAN HARM THE BOOT MATERIAL.

(1) Clean the boots with mild soap and water, then rinse thoroughly with clean water.

NOTE: Isopropyl alcohol can be used to remove grime which cannot be removed using soap. If isopropyl alcohol is used for cleaning, wash area with mild soap and water, then rinse thoroughly with clean water.

(2) To possibly improve the service life of deice boots and to reduce the adhesion of ice, it is recommended that the deice boots be treated with AGE MASTER NUMBER 1 and ICEX.

(3) AGE MASTER NUMBER 1, used to protect the rubber against deterioration from ozone, sunlight, weathering, oxidation and pollution, and ICEX, used to help retard ice adhesion and for keeping deice boots looking new longer, are both products of and recommended by B. F. Goodrich.

CAUTION: PROTECT ADJACENT AREAS, CLOTHING AND USE PLASTIC OR RUBBER GLOVES DURING APPLICATIONS, AS AGE MASTER NUMBER 1 STAINS AND ICEX CONTAINS SILICONE WHICH MAKES PAINT TOUCH UP ALMOST IMPOSSIBLE.

ENSURE THAT THE MANUFACTURER'S WARNINGS AND CAUTIONS ARE ADHERED TO WHEN USING AGE MASTER NUMBER 1 AND ICEX.

(4) The application of both AGE MASTER NUMBER 1 and ICEX should be in accordance with the manufacturer's recommended directions as outlined on the containers.

(5) If a high gloss finish is desired on the deice boots, ACROSEAL coating (available from Huber Janitorial Supplies, 114 North St. Francis Street, Wichita, KS 67202) may be used in lieu of AGE MASTER Number 1 and/or ICEX. Preparation for application of ACROSEAL is the same as required for AGE MASTER Number 1 and ICEX. Apply a thin layer of ACROSEAL on the clean and dry surface of the deice boot with a cloth swab. Let dry thoroughly and hand buff with a soft cloth.

(6) Small tears and abrasions in surface deice boots can be repaired temporarily without removing the boots, and the conductive coating can be renewed. Your Cessna Dealer has the proper materials and know-how to do this correctly.

Servicing - Toilet

1. General

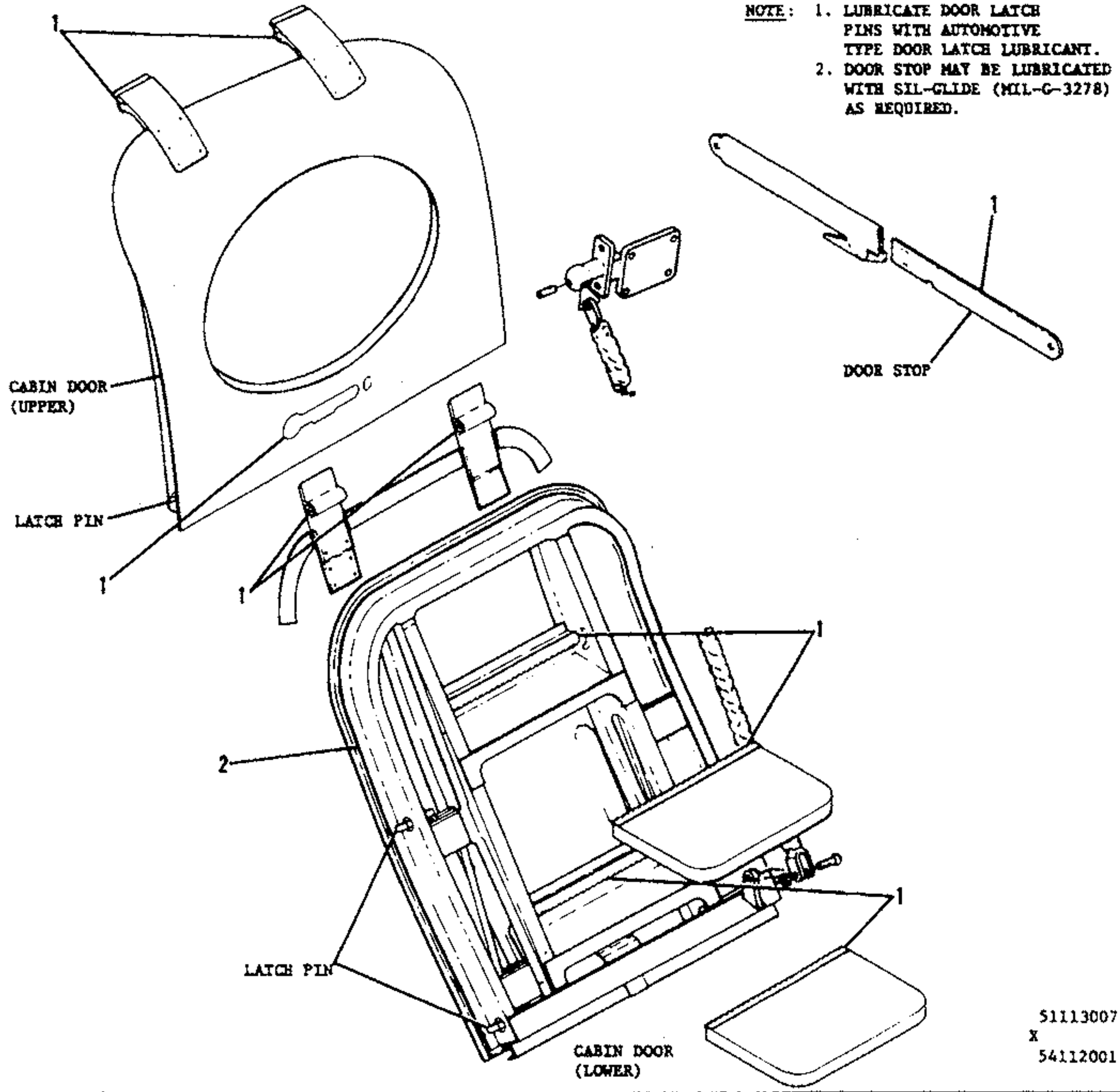
A. Two types of toilets are used. The nonflush type utilizes a waste container, disposable bag, and a relief tube. The flush type utilizes a reservoir tank, containing water and chemicals, which both flushes the bowl and stores the waste material until disposal.

B. The flush toilet reservoir requires servicing after 35 to 40 cycles of the system.

2. Tools and Equipment.

NOTE: Equivalent substitutes may be used for the following items.

NOTE: 1. LUBRICATE DOOR LATCH PINS WITH AUTOMOTIVE TYPE DOOR LATCH LUBRICANT.
2. DOOR STOP MAY BE LUBRICATED WITH SIL-GLIDE (MIL-G-3278) AS REQUIRED.

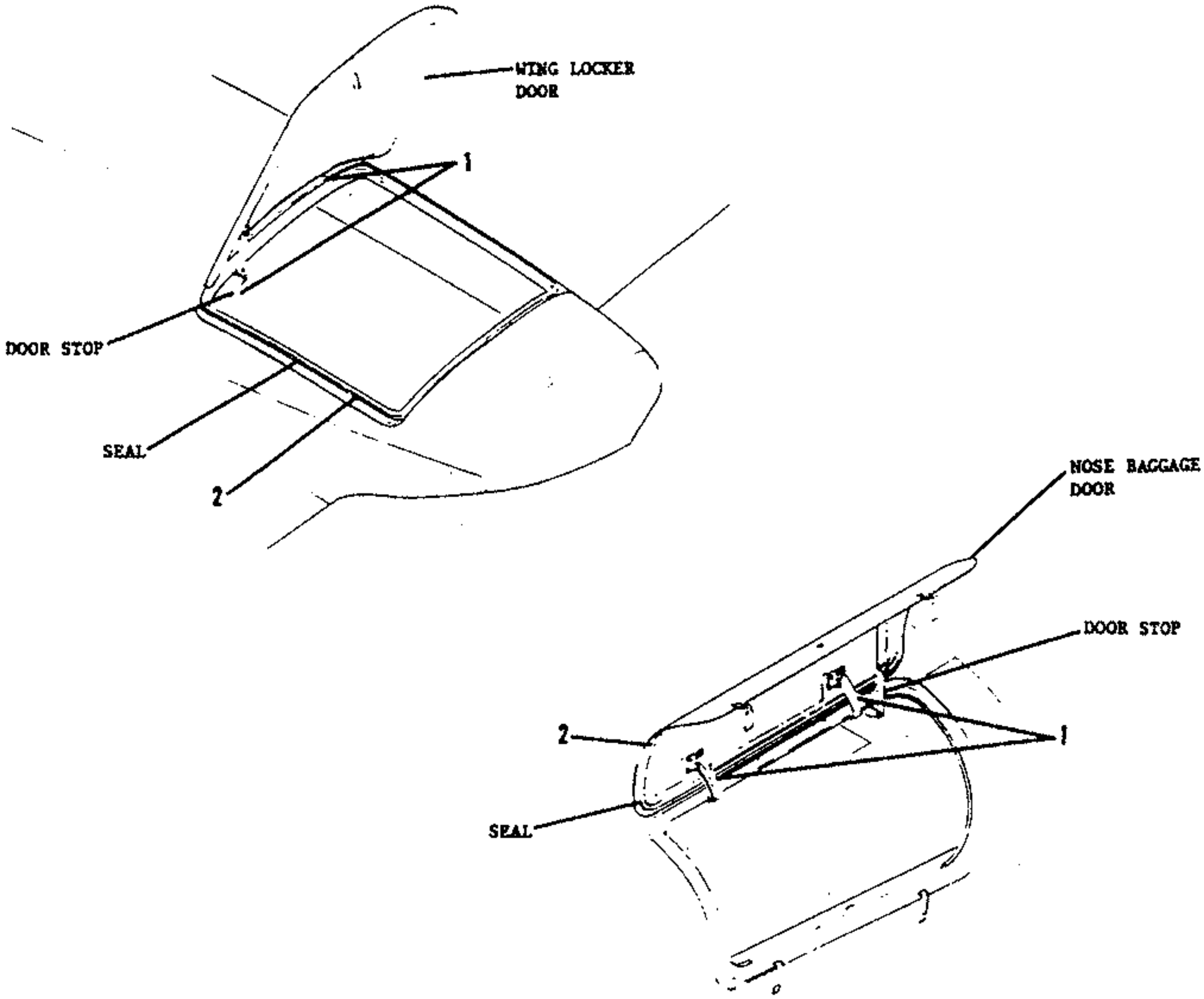


ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Door Hinges and Latch Mechanism	OG	Oil Can	---
2.	Door Seal	GS	Hand	---

OG - Oil, General Purpose (MIL-L-7870)
GS - Grease, Medium Consistency
Silicone Dow Corning DC4

Cabin Door
Figure 3

NOTE: 1. DOOR STOP MAY BE LUBRICATED WITH SIL-GLIDE (MIL-G-3278) AS REQUIRED.



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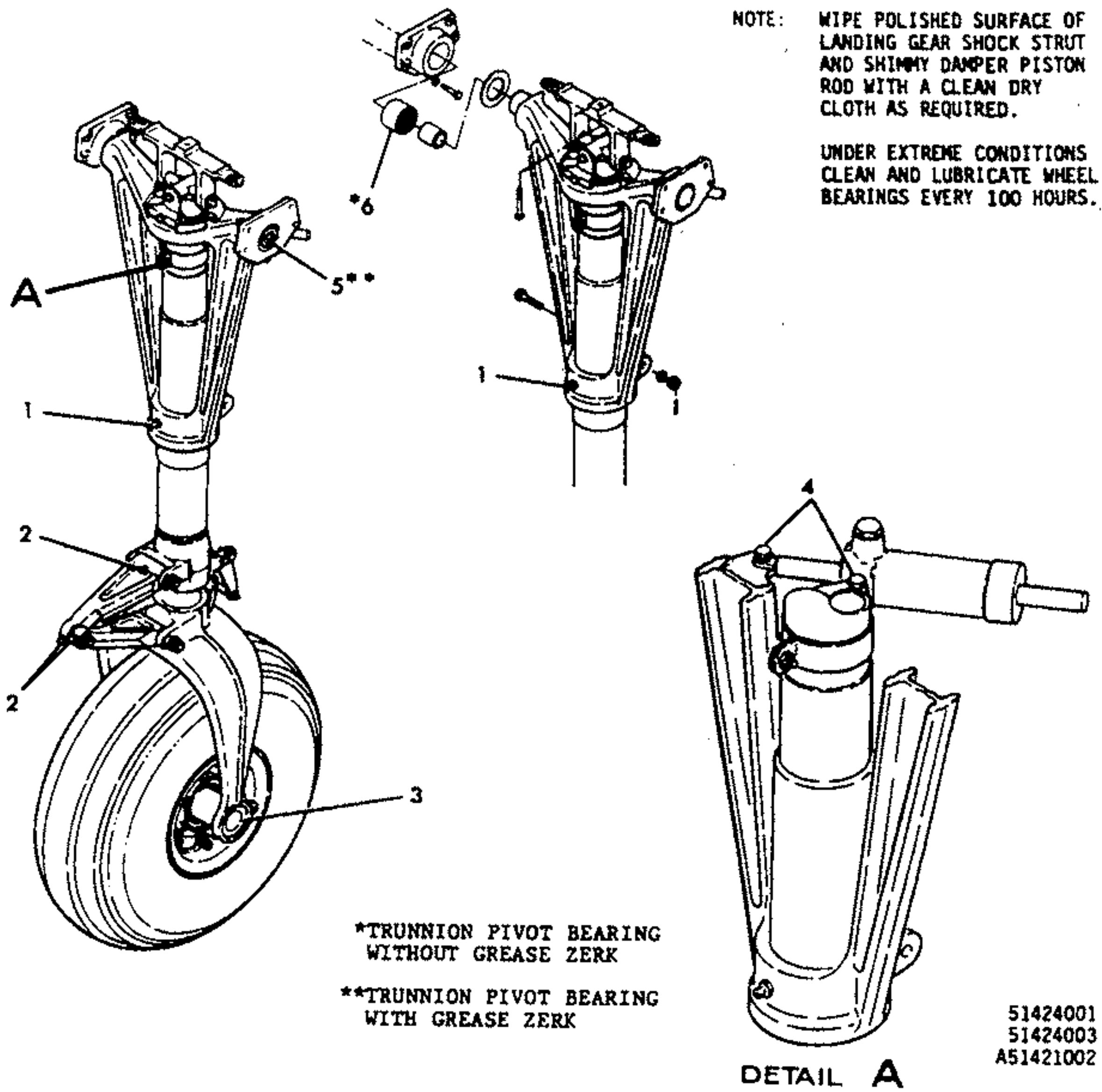
ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTING IN AREA
1.	Hinge and Door Stop	OG	Oil Can	--
2.	Door Seal	GS	Hand	--

OG - Oil, General Purpose (MIL-L-7870)
GS - Grease, Medium Consistency Silicone Dow Corning DC4

Nose, Wing Locker Baggage Doors
Figure 4

NOTE: WIPE POLISHED SURFACE OF LANDING GEAR SHOCK STRUT AND SHIMMY DAMPER PISTON ROD WITH A CLEAN DRY CLOTH AS REQUIRED.

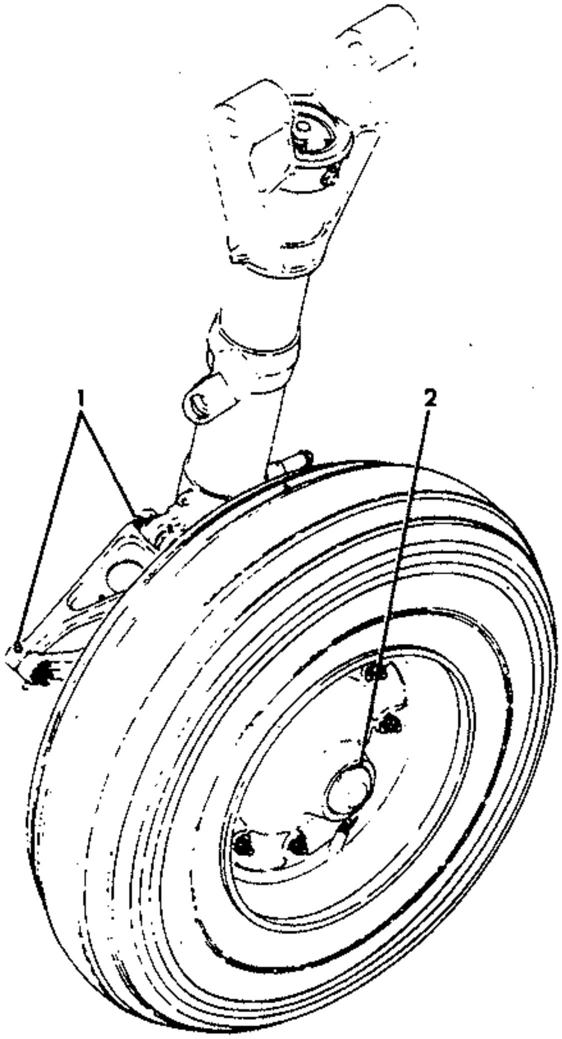
UNDER EXTREME CONDITIONS CLEAN AND LUBRICATE WHEEL BEARINGS EVERY 100 HOURS.

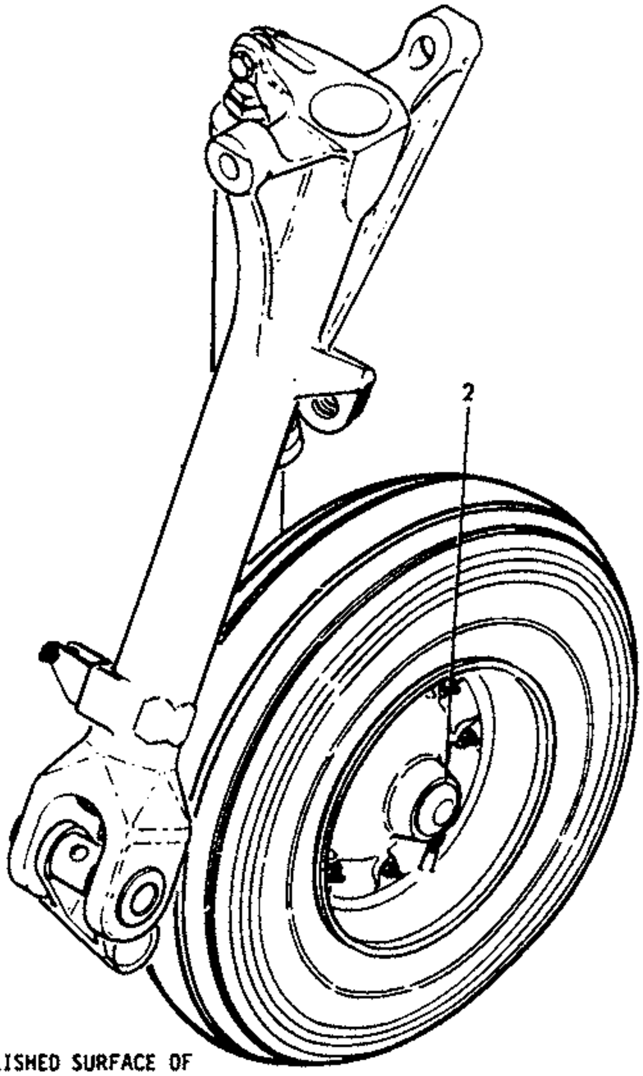


ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Trunnion Fitting	GL	Gun	1
2.	Torque Link	GL	Gun	4
3.	Wheel Bearing	GW	Hand	-
4.	Pivot Bushings	OG	Oil Can	-
**5.	Trunnion Pivot Bearing	GL	Gun	2
*6.	Trunnion Pivot Bearing	GL	Hand	-

OG - Oil, General Purpose (MIL-L-7870)
GW - Grease, Wide Temperature Range (MIL-G-81322C)
GL - Grease, Low Temperature (MIL-G-21164)

Nose Gear - Lubrication
Figure 5





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NOTE: 1. WIPE POLISHED SURFACE OF LANDING GEAR SHOCK STRUT WITH A CLEAN DRY CLOTH AS REQUIRED.
2. UNDER EXTREME CONDITIONS CLEAN AND LUBRICATE WHEEL BEARINGS EVERY 100 HOURS.

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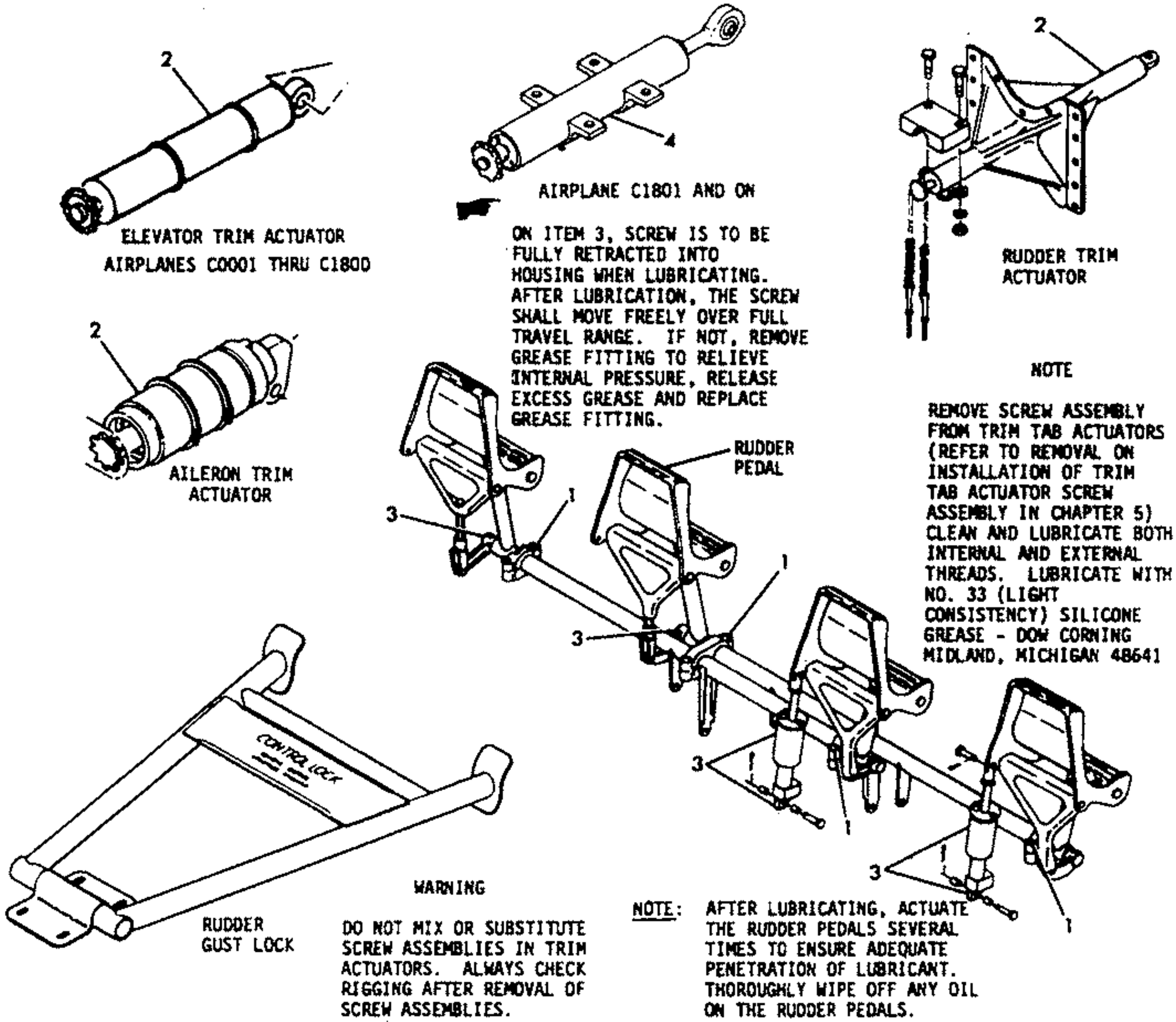
ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Torque Link Fittings	GL	Gun	6
2.	Wheel Bearings and Axle Threads	GW	Hand	---

GL - Grease, Low Temperature (MIL-G-81322C)

Main Gear - Lubrication
Figure 6



ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Rudder Gust Lock and Bearing Halves	GW	Hand	-
2.	Internal Threads	GSL	Hand Pack	-
3.	Pedal Linkage Bearings and Pivot Bearings	OG	Oil Can	-
4.	Elevator Trim Tab Actuator	*	Gun	1

GW - Grease, Wide Temperature Range (MIL-G-81322)
OG - Oil, General Purpose (MIL-L-7870)
GSL - Grease, Light Consistency #33, Dow Corning, Midland, Mich.
* - Silicone Grease (MIL-G-83261)

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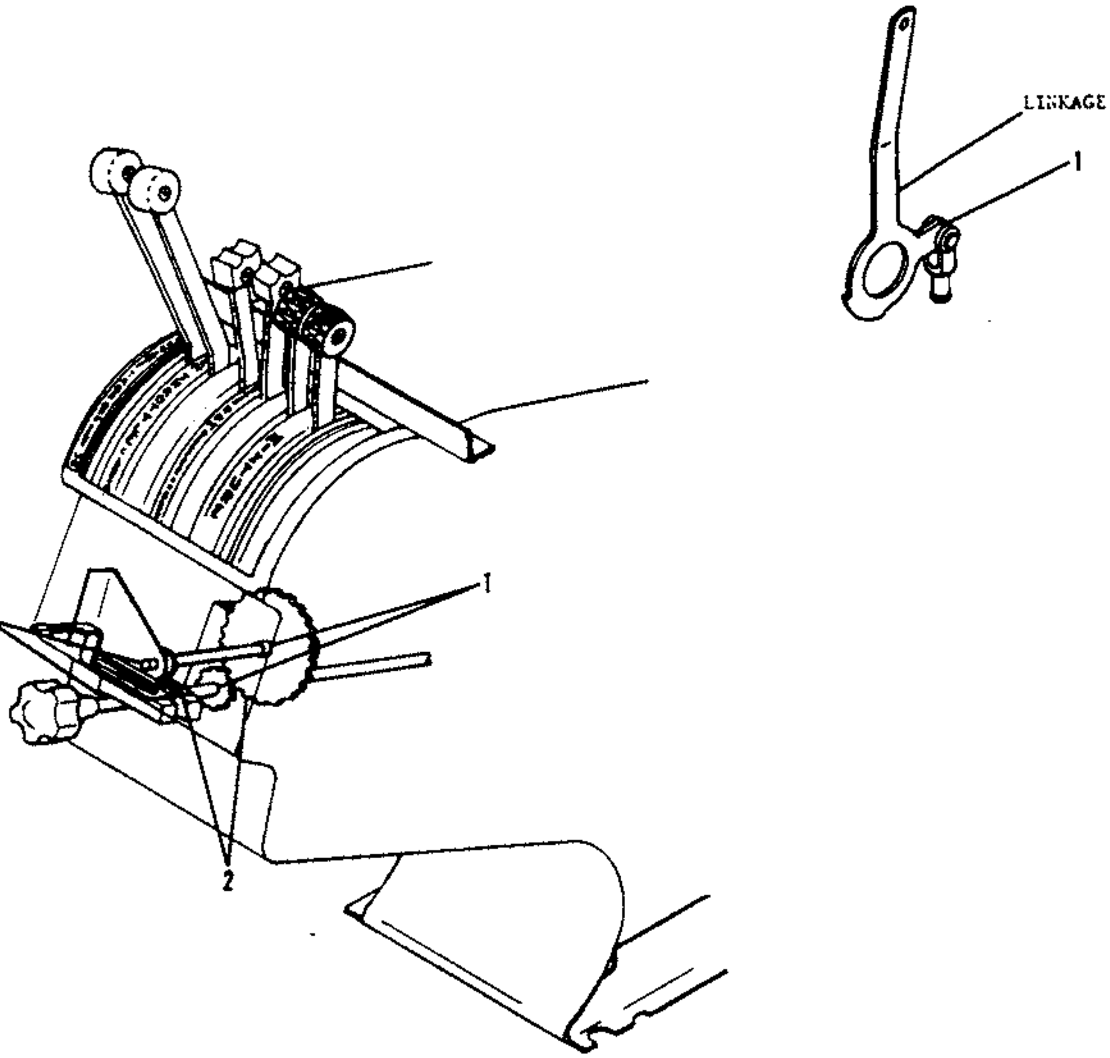

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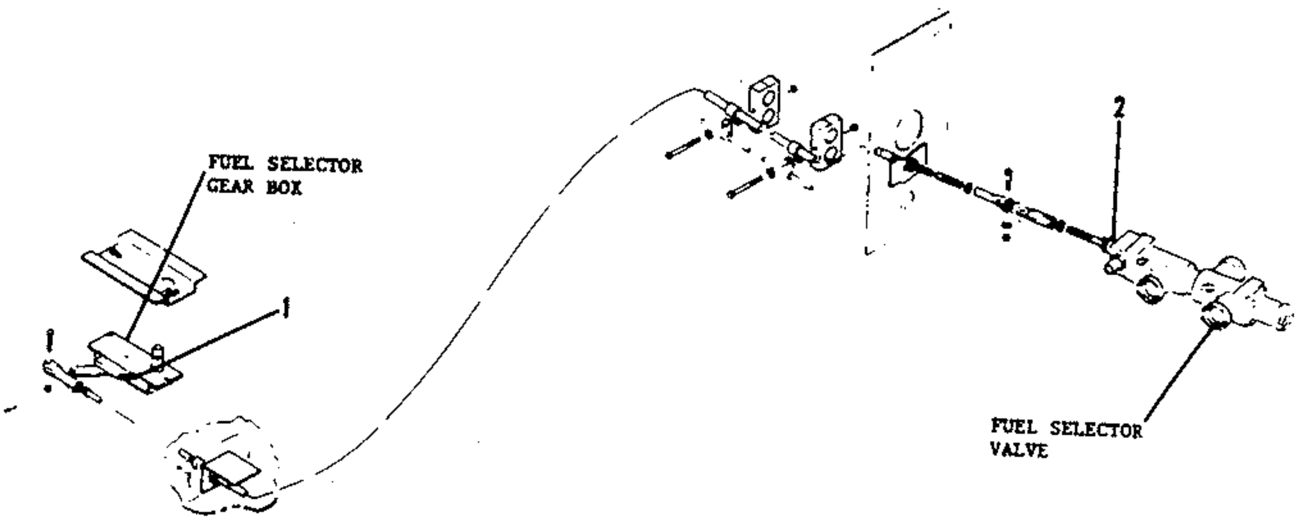
ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Bearing and Linkage	OG	Oil Can	--
2.	Gears and Track	GL	Hand	--

OG - Oil General Purpose (MIL-L-7870)
GL - Grease, Low Temperature (MIL-G-21164)

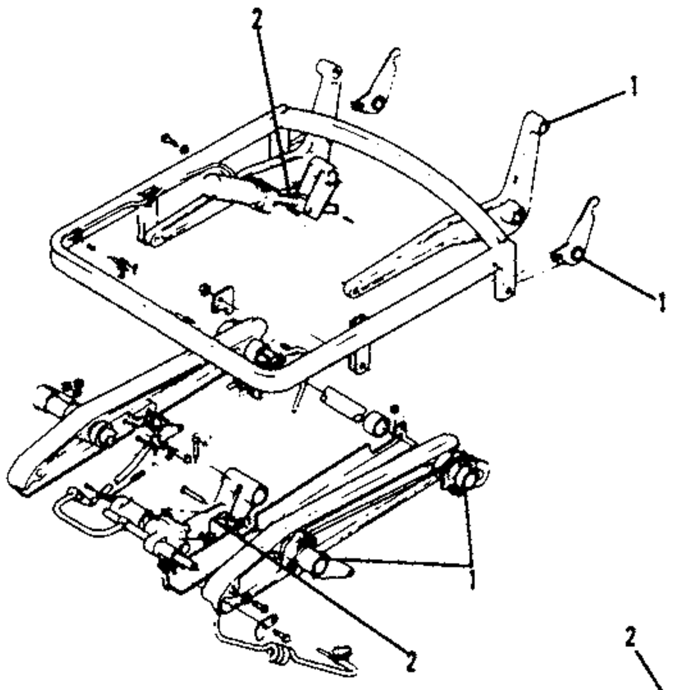
Control Pedestal - Lubrication
Figure 8



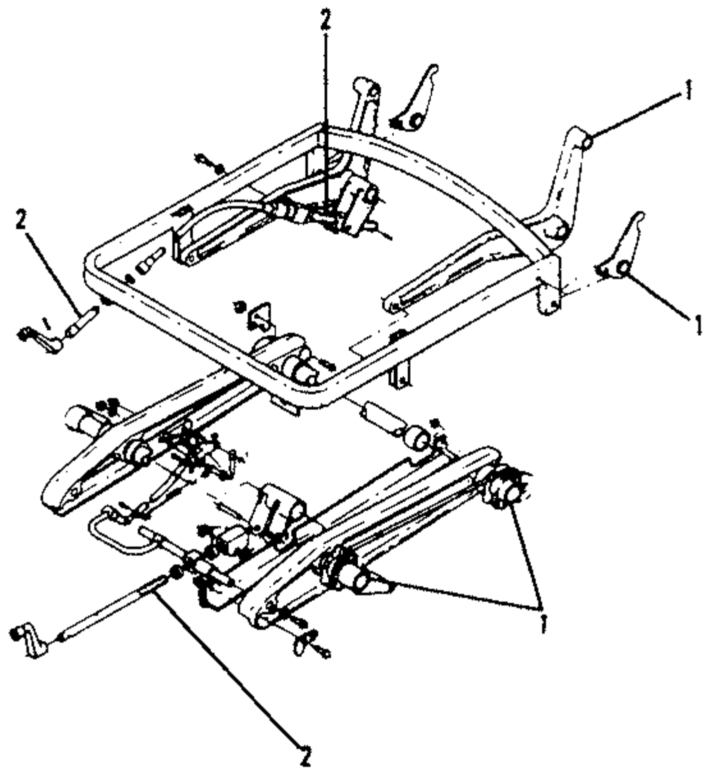
ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Gear	GL	Hand	--
2.	Detents	GL	Hand	--

GL - Grease, Low Temperature (MIL-G-21164)

Fuel Selector Valve and Gear Box
Figure 9



ELECTRICAL SEAT



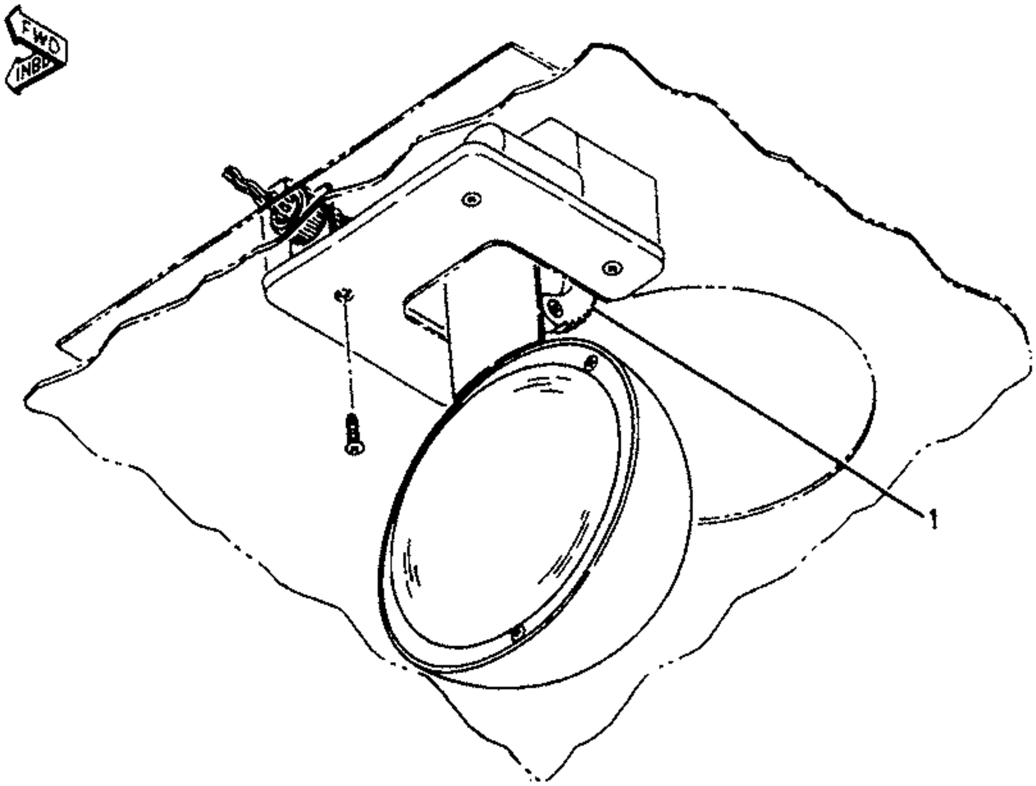
MECHANICAL SEAT

14144006
14144007

ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	Bearing	OG	Oil Can	--
2.	Adjusting Screw	GL	Hand	--

OG - Oil, General Purpose (MIL-L-7870)
GL - Grease, Low Temperature (MIL-G-21164)

Mechanical and Electrical Adjusting Seats
Figure 10



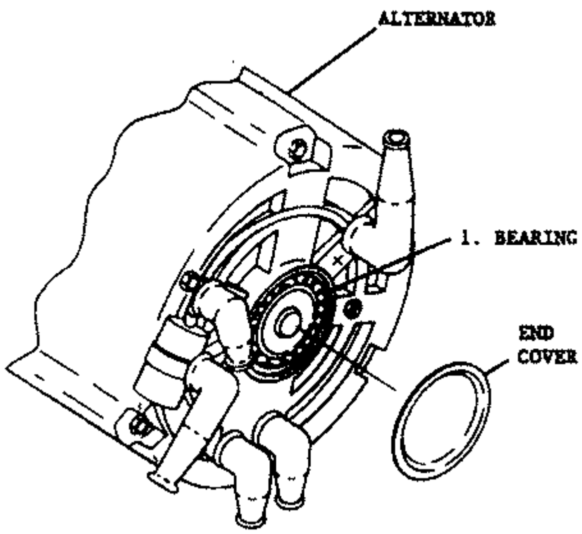
NOTE: 1. THE LIGHT MUST BE EXTENDED TO LUBRICATE THE GEAR. WIPE OFF EXCESS GREASE FROM GEAR BEFORE RETRACTING THE LIGHT.
2. THE OPTIONAL RIGHT WING LANDING LIGHT, IF INSTALLED, MAY BE LUBRICATED IN THE SAME MANNER.

51281004

ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER FITTINGS IN AREA
1.	Exposed Gear	GL	Hand	--

GL - Grease, Low Temperature (MIL-G-21164)

Landing Light
Figure 11



NOTE: REMOVE END COVER BY PRYING OUT WITH SMALL SCREWDRIVER. HAND LUBRICATE BEARING.

58581001

ITEM NO.	ITEM DESCRIPTION	LUBE TYPE	APPLICATION	NUMBER OF FITTINGS IN AREA
1.	ALTERNATOR SLIP RING END BEARING	SRI #2	HAND	2

SRI #2 Chevron Grease

Alternator Slip Ring End Bearing
Figure 12

Name	Number	Manufacturer	Use
Chemical Deodorant, Toilet	Aerofresh	Commercially Available	Servicing nonflush toilet.
Disinfectant, Spray	Lysol	Commercially Available	Cleaning toilet.
Flush Solution	DG-19	Monogram Industries, Inc. Venice Division 3226 Thatcher Ave. Venice, Ca. 90291	Servicing flush toilet.
Anti-Freeze	Ethylene Glycol Base	Commercially Available	Prevent flush solution from freezing.

3. Servicing Nonflush Toilet.

A. Servicing.

(1) Lift toilet lid and remove toilet ring assembly.
(2) Lift waste container from toilet assembly and remove from airplane. Remove waste bag from waste container and dispose.
(3) Install a new disposable bag in the waste container and position waste container in center of toilet assembly resting on the pan.
(4) Install toilet ring assembly in position with apron of the toilet ring nesting in the waste container.
(5) Close toilet lid.
(6) Check amount of tissue in the tissue holder. Add tissue as required.

4. Servicing Flush Toilet.

A. Reservoir.

(1) Lift cover and ring assembly and disconnect the electrical connector plug.
(2) Unlock reservoir by turning wing-head fasteners one half turn counter-clockwise.
(3) Remove reservoir to service area. Remove cap from waste discharge spout on tank and pour contents into commode.
(4) Rinse reservoir thoroughly. Replace cap on waste spout. Recharge tank with mixture of 2 quarts of clear water and one 3 oz. package of Monogram DG-19 Chemical.
(5) Replace reservoir in aircraft and lock in place with wing-head fasteners. Connect the electrical connector plug and check for proper operation.

CAUTION: IF TEMPERATURES ARE BELOW FREEZING AND AIRPLANE IS TO BE STORED IN AN UNHEATED HANGAR, ETHYLENE GLYCOL BASE ANTI-FREEZE MAY BE ADDED TO THE FLUSH SOLUTION TO PREVENT FREEZING.

B. Napkin Dispenser.

(1) Pull out storage drawer.
(2) Insert napkin box in receptacle shelf.
(3) Close storage drawer.

5. Consumable Materials

A. Information - Chart I

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Grease-Low and High Temp.	MIL-G-3278	Aeroshell Grease II	Shell Oil Co. 50 West 50th Street New York 20, NY
		L324	Sinclair Refining Co. 600 Fifth Ave. New York, NY
		Supermil Grease No. 8723	Standard Oil Co. 910 South Michigan Ave. Chicago, Il
		Texaco Uni-Temp Grease	The Texas Co. 135 E. 42nd Street New York 17, NY
Grease, Molybdenum Disulfide-Low and High Temp	MIL-G-21164	Castrolease MSA (c)	Burmah-Castrol Inc. Continental Plaza 401 Hackensack Ave. Hackensack NJ 07601
		Ever Lube 211-G Moly Grease	E/M Lubricants Inc. P.O. Box 2200 West Lafayette, IN 47906
		Royco 64C	Royal Lubricants Co. River Road East Hanover, NJ 07939
		Aeroshell Grease 17	Shell Oil Co. P.O. Box 2463 One Shell Plaza Houston, TX 77001
Grease, Airplane and Instrument Gear and Actuator Screw	MIL-G-23827	Braycote 627S	Bray Oil Co. 1925 North Mariana Ave. Los Angeles, CA 90032
		Mobilgrease 27	Mobile Oil Corp. 150 E. 42nd Street New York, NY 10017
		Aeroshell Grease 7	Shell Oil Co. P.O. Box 2463 One Shell Plaza Houston, Texas 77001
		Low Temp. Grease E.P.	Texaco Inc. 2000 Westchester Ave. White Plains, NY
Grease, General Purpose, Wide Temp. Range	MIL-G-81322	Mobilgrease 28	Mobile Oil Corp. 150 E. 42nd Street New York, NY 10017
		Aeroshell Grease 22	Shell Oil Co. One Shell Plaza P.O. Box 2463 Houston, TX 77001

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
		Royco No. 22C	Royal Lubricants Co. Inc. River Road East Hanover, NJ 07936
		Aeroshell Grease 22C	Shell International Petroleum Co. Ltd. Shell Centre London SE17NA United Kingdom
Silicone Grease, with Teflon	MIL-G-83261	Q5-0120	Dow Corning S. Saginaw Road Midland, Michigan 48641
		Tribo-2	Aero Space Lubricates 249 Foruoff Road Columbus, Ohio 43207
Hydraulic Fluid Petroleum Base	MIL-H-5606	PQ 2863 PQ 2890	American Oil and Supply Company 238 Wilson Ave. Newark, NJ 07105
		BRACO 757B	Bray Oil Co. 1925 North Marianna Ave. Los Angeles, CA 90032
		Mobil Aero HFB	Mobil Oil Corp. 150 East 42nd Street New York, NY 10017
		Aeroshell Fluid 41	Shell International Petroleum Co. Ltd. Shell Centre London SE 17 NA United Kingdom
Lubricating Oil, General Purpose Low Temp	MIL-L-7870	'PQ' Rust Preventive #107	American Oil and Supply Company 238 Wilson Ave. Newark, NJ
		Brayco 363	Bray Oil Co. 3344 Medford St. Los Angeles 63, CA
		Gulfite Oil Code No. 6	Gulf Oil Corp. P.O. Box 7409 Philadelphia, PA
		1692 Low Temp. Oil	The Texas Co. 135 E. 42nd Street New York 17, NY 10017
Grease, Light Consistency		DC #33	Dow Corning S. Saginaw Rd. Midland, Michigan 48641
Silicone Grease With Teflon		G-5-0120	Dow Corning S. Saginaw, Rd. Midland, Michigan 48641

MATERIAL	SPECIFICATION	PRODUCT	VENDOR
Cable Seal		DC #55M	Dow Corning
Isopropal Alcohol	TT-1-735A		
Aviators Breathing Oxygen	MIL-0-27210		
Anti-Ice Fluid	MIL-F-5566		
Etylene Glycol Monomethyl Ether	MIL-1-27686		
Oil, A/Cond Compressor		SUNISO #5	
Oil, A/Cond Compressor		Texaco "Capella E" Grade 500	
Dry Spray		Camie #1000	
Dry Spray		Dupont Slip Spray Dry Film	

CHAPTER

3

AIRFRAME

TABLE OF CONTENTS

AIRFRAME

Description

1. The aircraft structure features all metal construction, conventional design, incorporating aluminum alloys, steel and other materials as appropriate.

2. The fuselage is of semimonocoque construction, pressurized to the skin between forward pressure bulkhead and aft pressure bulkhead. The fuselage consists of the nose section, center section and aft section. Two carry-thru spars (one forward and one aft) pass through the fuselage and incorporate attach fittings at the outboard stub wing for attaching the wings.

3. Doors are provided for the cabin, emergency exit, nose baggage and wing locker baggage compartments, nose landing gear and main landing gear strut.

4. Windows are provided in the fuselage. The windows consists of the windshield, pilot and copilot side windows, foul weather windows and cabin windows.

5. The empennage structure consists of the horizontal and vertical stabilizers. The stabilizers consist of spars, ribs, skin panels and access panels to respective stabilizer components.

6. The wings are attached to the forward and rear spar carry-thru of each stub wing. Wing structure consists of the spars, ribs and skins. The wing structure provides attach fittings for the main landing gear, aileron, flap, and engine nacelle. The wing is constructed to incorporate a wet wing for the fuel capacity outboard of the engine nacelle.

7. The airframe primary structure consists of frames, bulkheads, formers, longerons, stringers, carry-thru spars, wing spars and bonded skins, fuselage and wing skin, and frames around openings.

   A. Transverse frames throughout the fuselage made of aluminum alloy make up the backbone of the fuselage. Aluminum alloy bands and doublers installed between the frames and skin and are fastened together with skin fasteners.

   B. Longerons and bulkheads located throughout the fuselage and wing are connected to the wing spars and fuselage bulkheads by metal fasteners to provide a framework for skin attachment.

   C. The wing spars, carry-thru spars provide support and attachment of the wings engine nacelle structure and main landing gear attach fittings.

   D. The nose wheel well structure constructed of web, angles and doublers, provide nose gear trunnion support and attachment, nose gear door and uplock support and attachment.

8. The airframe secondary structure consists of nose baggage compartment shelves, avionics shelves, cabin dividers, fore and aft bulkheads, center pedestal, flight and passenger compartment floor panels and the refreshment bar and structure.

   A. The nose baggage compartment shelves and dividers are located in the nose compartment. The shelves and dividers are attached to supporting structure with screws and nuts. The avionics shelves are fastened to supporting structure and bulkheads with screws and clip nuts.

   B. The cabin dividers (optional) are located at each end of the passenger compartment and attach to supporting structure with screws.

   C. The fore and aft cabin bulkheads are located at the ends of passenger and crew compartments and are made up of angles, channels, formers and webs.

   D. The center pedestal is located at the forward end of the flight compartment between the crew seats. The pedestal contains the engine controls, autopilot flight controller, instrument panel diming control, audio system terminal blocks, and the trim tab control wheels for all three flight axes.

E. The floor panels consist of various lengths and widths throughout the passenger and flight crew compartment. The refreshment bar is located in the fuselage baggage area and is secured by screws to the supporting structure mounted on floorboards.

DOORS

Description

1. Doors are provided on the aircraft for cabin entry, emergency exit, avionics equipment access, nose baggage compartment, nose landing gear and main gear strut. All doors are flush fitting and open outward, except the emergency exit door which opens inward.

2. A cabin door warning system is incorporated into the upper cabin door jamb. The system is electrically controlled and illuminates a light on the annunciator panel when the cabin door is open.

CABIN DOOR

Description

1. The cabin door is located on the left side of the fuselage just aft of the wing. The cabin door is constructed of two doors: the upper and lower door.

2. The upper cabin door is secured to the fuselage by two hinges and swings upward when opened. The door incorporates an individual latching mechanism with indicators installed at the door latch pin locations. When the door is closed each indicator is visible through a window in the door's upholstery trim. A door stop is utilized to hold the door in the upward position when opened. Also, the upper door interlocks with the lower door. This is accomplished by the upper door bellcrank interlocking with the lower door catch.

3. The lower cabin door is secured to the bottom of fuselage by two hinges and swings downward when opened to provide a convenient stairway for boarding the airplane. Two cable assemblies, one forward and one aft, connect to the door to support the door in the open position. The door incorporates an individual latching mechanism with indicators installed at the door latch pin locations. When the door is closed, each indicator is visible through a window in the door's upholstery trim.

Maintenance Practices

1. Removal/Installation Upper Cabin Door (See Figure 1)

   A. Remove Upper Cabin Door

      (1) Open cabin doors and carefully pull headliner out of retainer above door to gain access to door hinge bolts (1).
      (2) Remove screw (7), washer (8) and spacer (9) securing door stop (6) to upper cabin door on airplanes 421C0001 Thru 421C0200. Airplanes 421C0201 and On, refer to Removal/Installation of Upper Cabin Door Extender.
      (3) With upper cabin door open and supported, remove nuts (3), stat-o-seals (2) and bolts (1).
      (4) Remove upper cabin door from airplane.

   B. Install Upper Cabin Door

      (1) Secure upper cabin door to hinges, using bolts (1), new stat-o-seals (2) and nuts (3).
      (2) Secure door stop (6) to upper cabin door, using screw (7), washer (8) and spacer (9) on airplanes 421C0001 Thru 421C0200. Airplanes 421C0201 and On, refer to Removal/Installation of Upper Cabin Door Extender.
      (3) Install headliner in retainer above the upper cabin door.

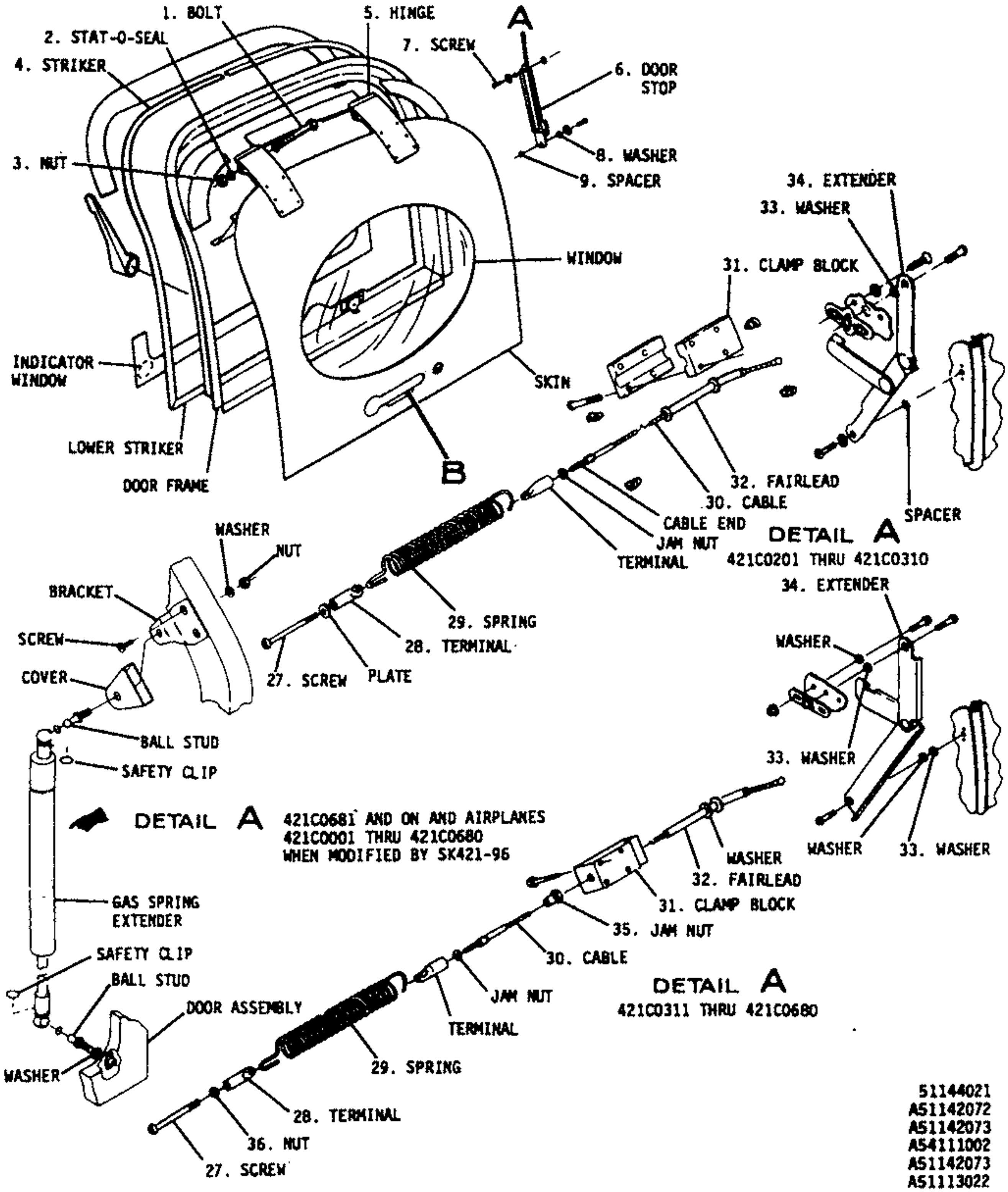
2. Removal/Installation Upper Cabin Door Latch Assembly (See Figure 1)

   A. Remove Door Latch Assembly

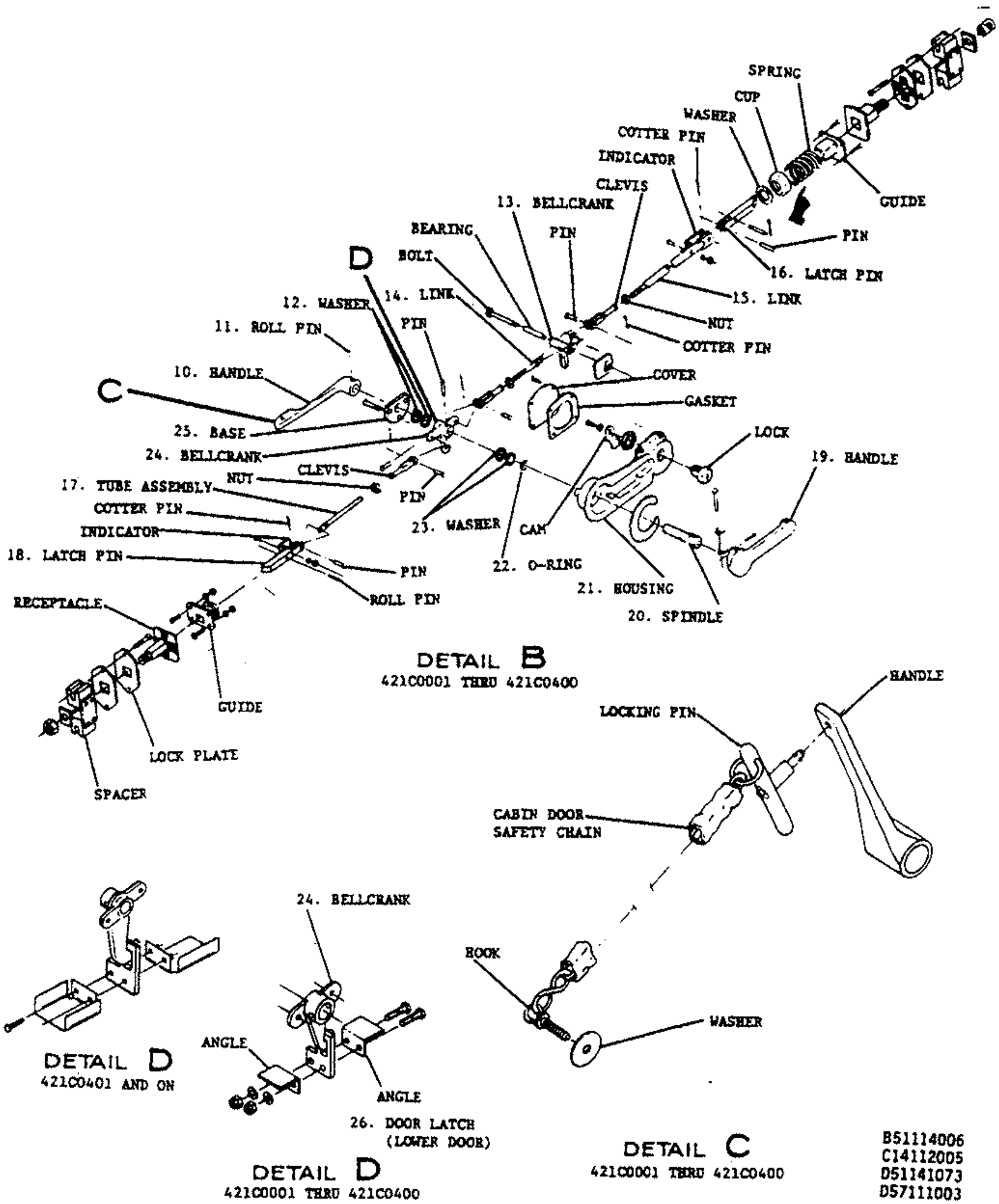
      (1) Remove roll pin (11) from handle (10) and remove handle.
      (2) Remove base (25) by removing bolts.
      (3) Refer to Chapter 12. Remove window trim from upper cabin door.
      (4) Remove door latch assembly as follows:
         (a) Disconnect links from bellcrank (24) by removing cotter pins and pins.
         (b) Remove cotter pin and pin securing bellcrank (24) to spindle (20).
         (c) Remove washers (12) and bellcrank (24) from spindle (20).
         (d) Remove washers (23) and O-ring (22) from spindle (20).
         (e) Remove handle (19) with spindle (20) attached from housing (21).
      (5) If further disassembly is desired, refer to Figure 1.

   B. Install Door Latch Assembly

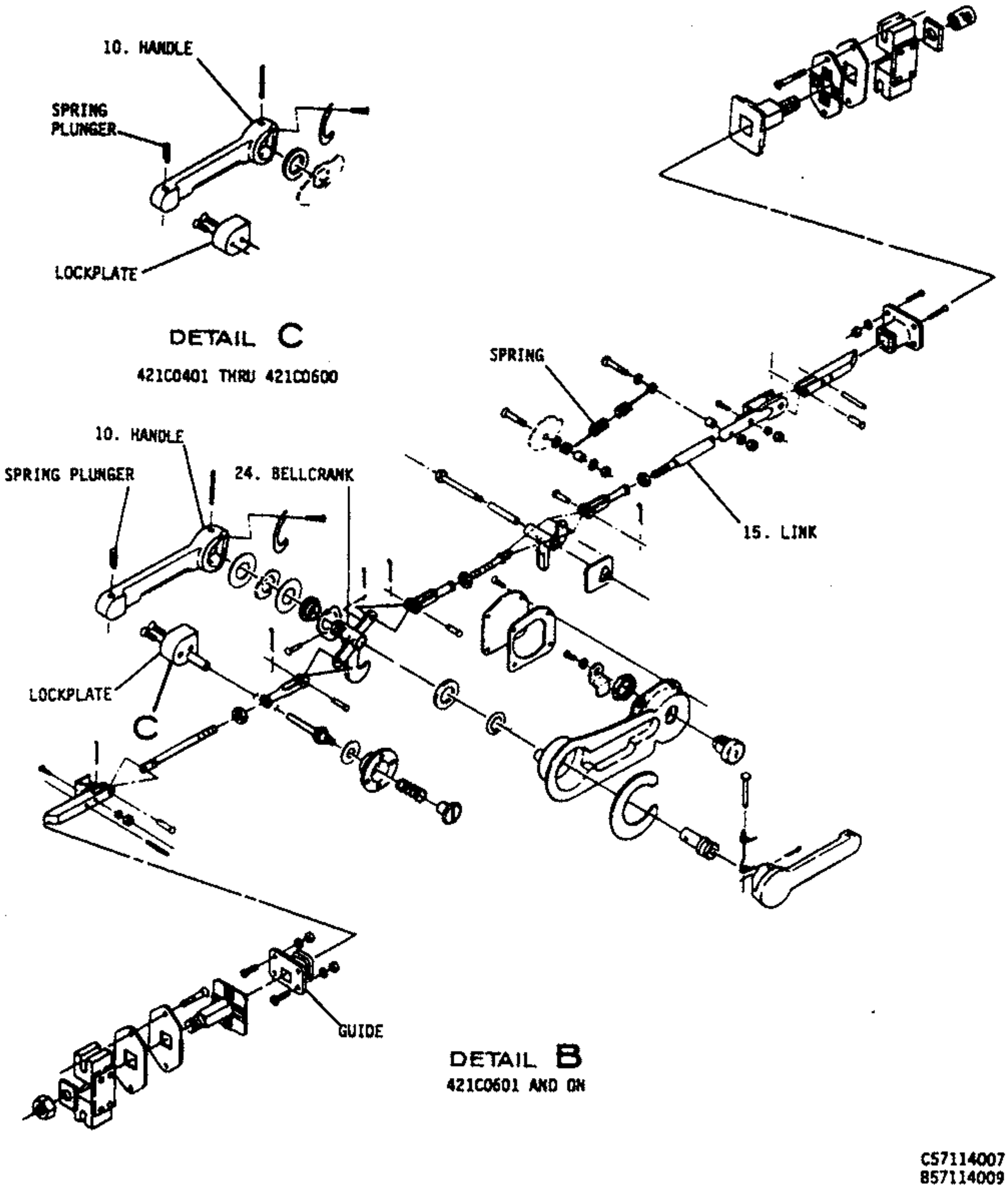
      (1) Install door latch assembly as follows:
         (a) Slide handle (19) with spindle (20) attached into housing (21).
         (b) Install O-ring (22) and washers (23) on spindle (20).
         (c) Slide bellcrank (24) on spindle (20) and secure with pin and cotter pin.
         (d) Slide washers (12) on spindle (20).



Upper Cabin Door Installation
Figure 1 (Sheet 1 of 3)



Upper Cabin Door Installation
Figure 1 (Sheet 2)



Upper Cabin Door Installation
Figure 1 (Sheet 3)

(2) Temporarily install handle (10) on spindle (20).
(3) Check upper cabin door latch adjustment. Refer to Adjustment/Test.
(4) After the door latch adjustment has been accomplished proceed as follows:
(a) Remove handle (10) from spindle (20).
(b) Install door window trim. Refer to Chapter 12.
(c) Secure base (25) to door with bolts.
(d) Install handle (10) on spindle (20) and secure with roll pin (11).

3. Removal/Installation Upper Cabin Door Extender (See Figure 1)

A. Remove Upper Cabin Door Extender (421C0001 Thru 421C0310).

(1) Open upper cabin door and remove upholstery panel to gain access to extender components.
(2) Remove screw (27) and plate from terminal (28).
(3) Remove terminals (28) and spring (29) from cable (30).
(4) Remove screws as required to remove fairleads (32), cable assembly (30) and clamp blocks (31). Remove cable assembly from door.
(5) Restrain upper door and remove extender (34) from door and doorframe by removing screws, washers and washer (33).

B. Install Upper Cabin Door Extender.

(1) Install and secure extender (34) to door and doorframe with screws, washers and washers (33).
(2) Route cable assembly (30) into door and secure to clamp block (31) with fairleads (32).
(3) Install spring (29) and terminals (28) to cable and secure terminal (28) to door with screw (27) and plate.
(4) Adjust tension on spring with screw (27) as required to hold upper door in the fully extended position.
(5) Assure that jamb nut is tight. Install upholstery.

C. Remove Upper Cabin Door Extender (421C0311 Thru 421C0680).

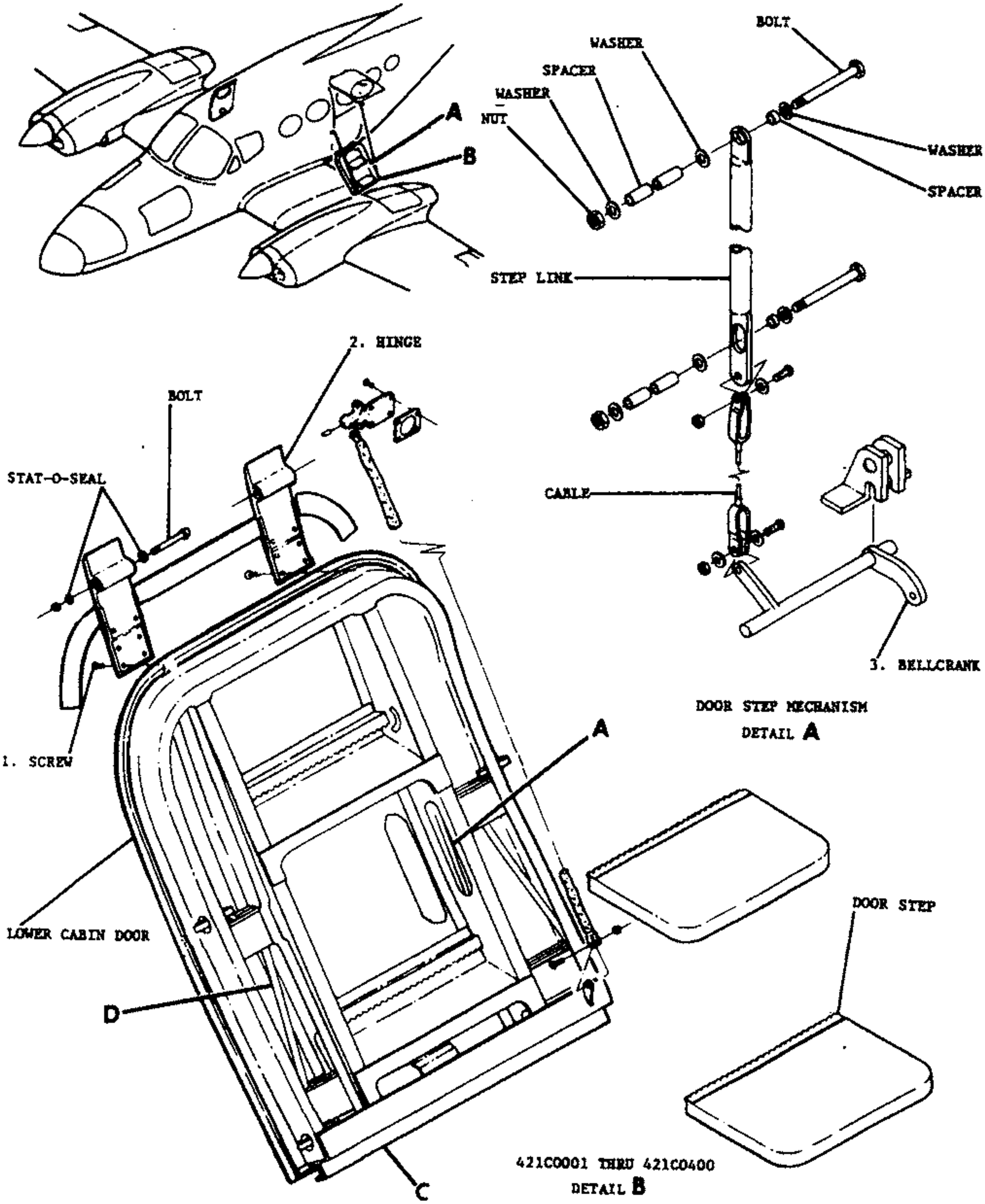
(1) Open upper cabin door and remove upholstery panel to gain access to extender components.
(2) Loosen nut (36) and remove screw (27) from terminal (28).
(3) Remove terminal (28) and spring (29) from cable (30) by loosening jamb nut and unthreading terminal.
(4) Loosen nut (35) from cable (30) and clamp block (31).
(5) Remove clamp block (31) by removing screws and sliding off cable (30).
(6) Restrain upper door and remove extender (34) from door and doorframe by removing screws and spacers (33).

D. Install Upper Cabin Door Extender (421C0311 Thru 421C0680).

(1) Install and secure extender (34) to door and doorframe with screws and spacers (33).
(2) Install washer on fairlead (32), route cable (30) through clamp block (31) and install nut (35).
(3) Install clamp block (31) with screws.
(4) Install jamb nut and terminal to cable end.
(5) Connect spring (29) to cable end terminal.
(6) Connect terminal (28) to opposite end of spring (29). Install screw (27) and nut (36) to terminal (28).
(7) Adjust tension on spring (29) with screw (27) as required to hold upper door in the fully extended position.
(8) Assure jamb nuts are tight. Install upholstery.

E. Remove Upper Cabin Door Extender (421C0681 and On).

(1) Open and support upper cabin door.
(2) Remove safety clips securing door extender to ball studs.
(3) Disconnect and remove door extender.



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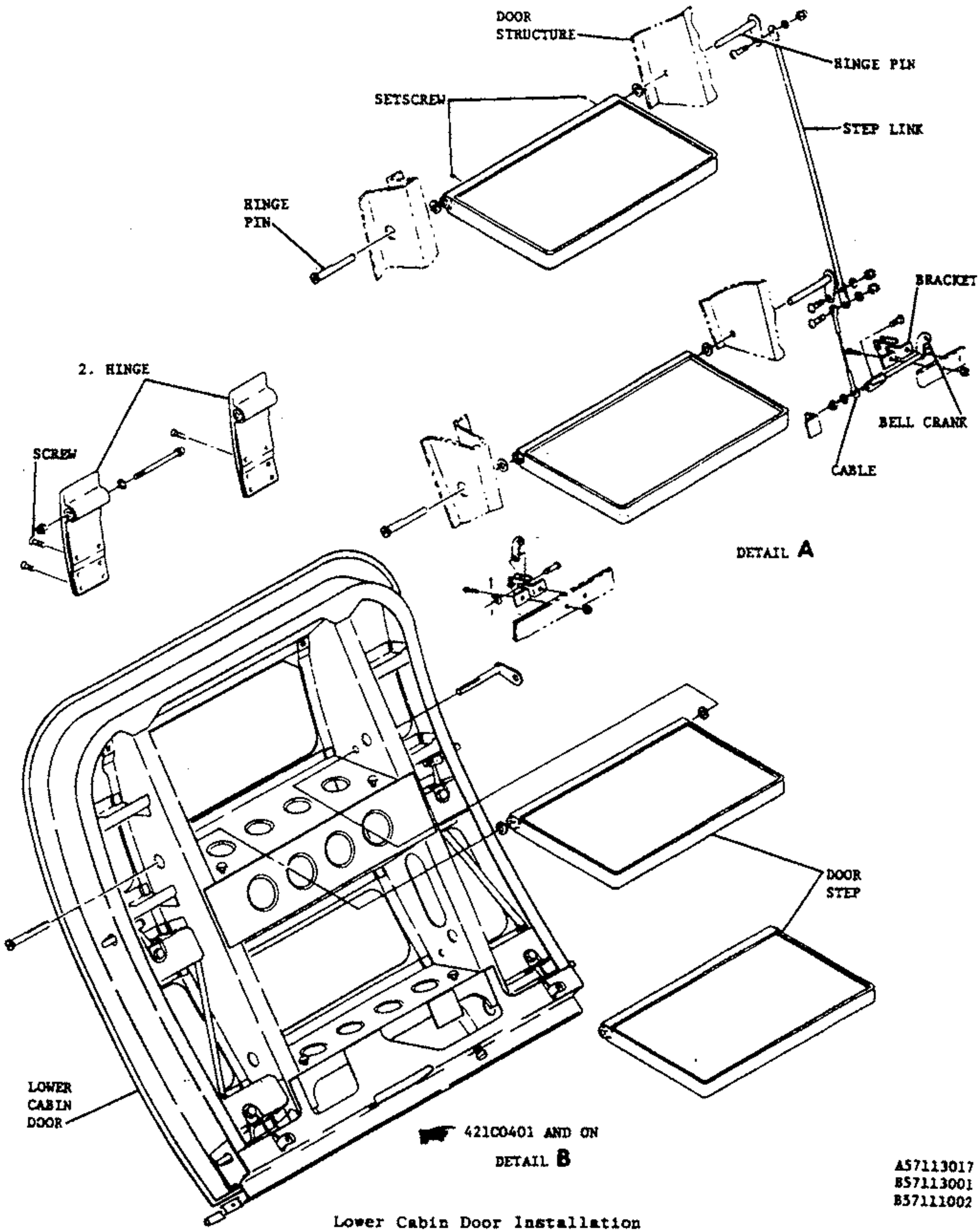
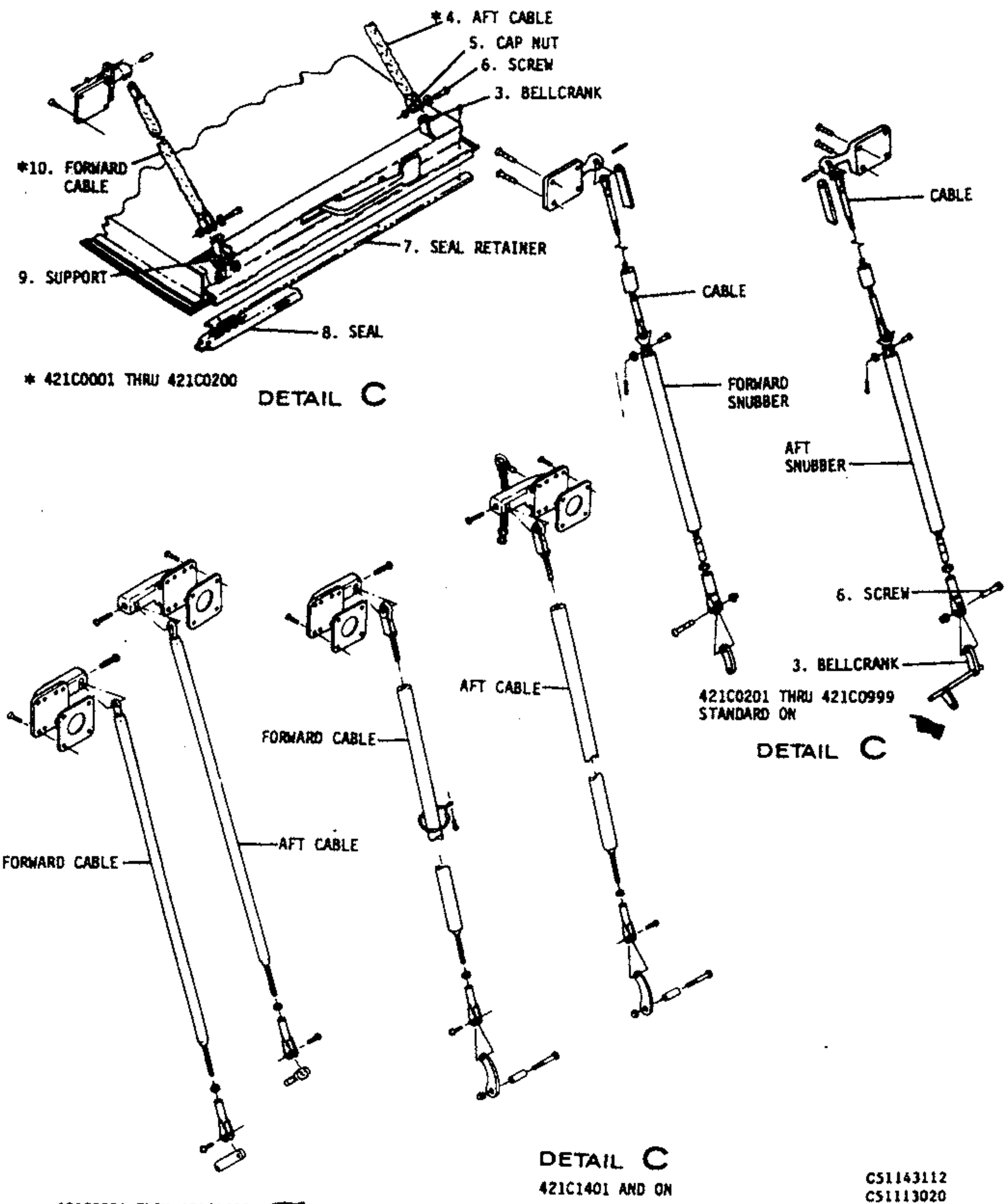
Lower Cabin Door Installation
Figure 2 (Sheet 1 of 5)



Lower Cabin Door Installation
Figure 2 (Sheet 2)



Lower Cabin Door Installation
Figure 2 (Sheet 3)

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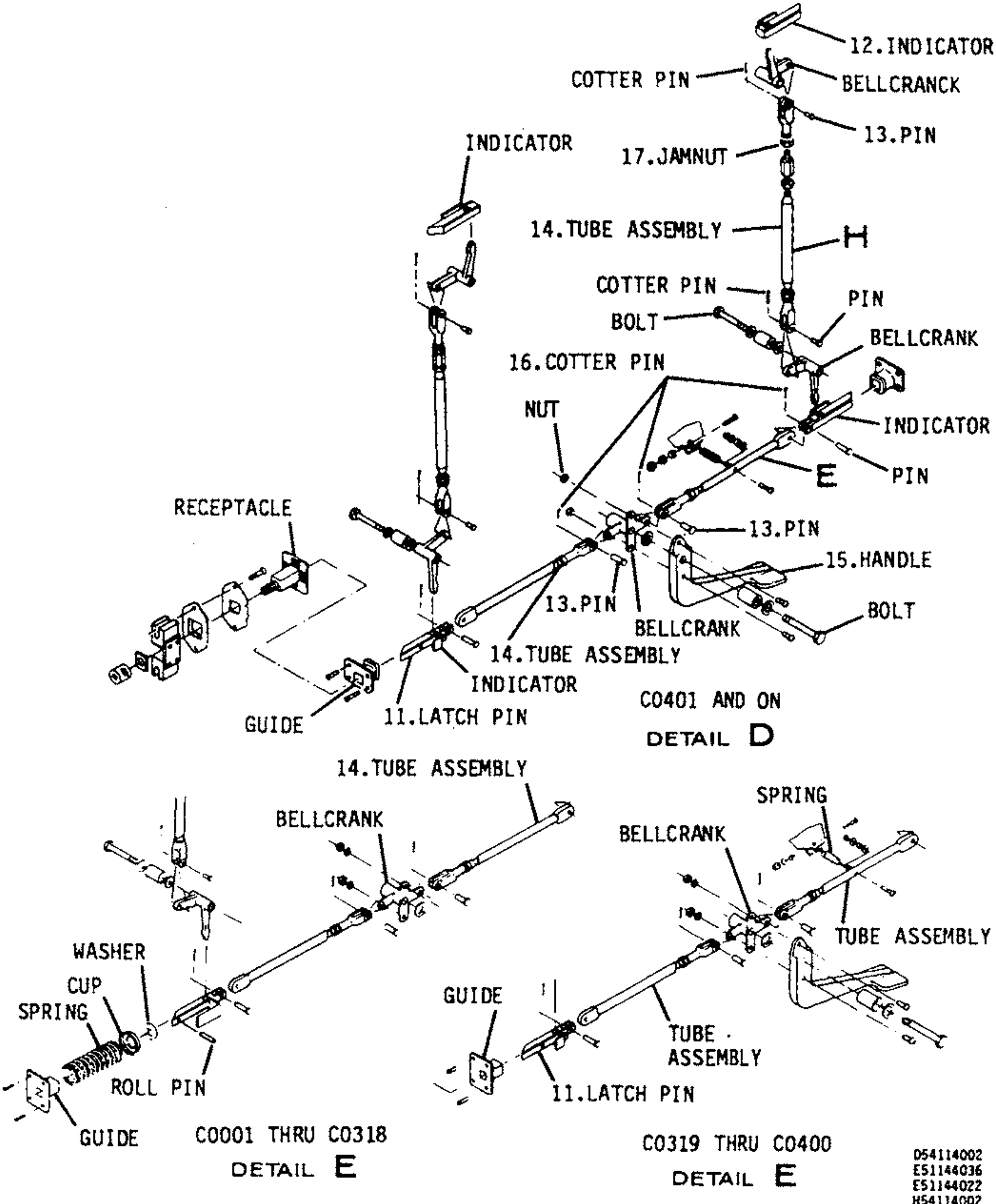
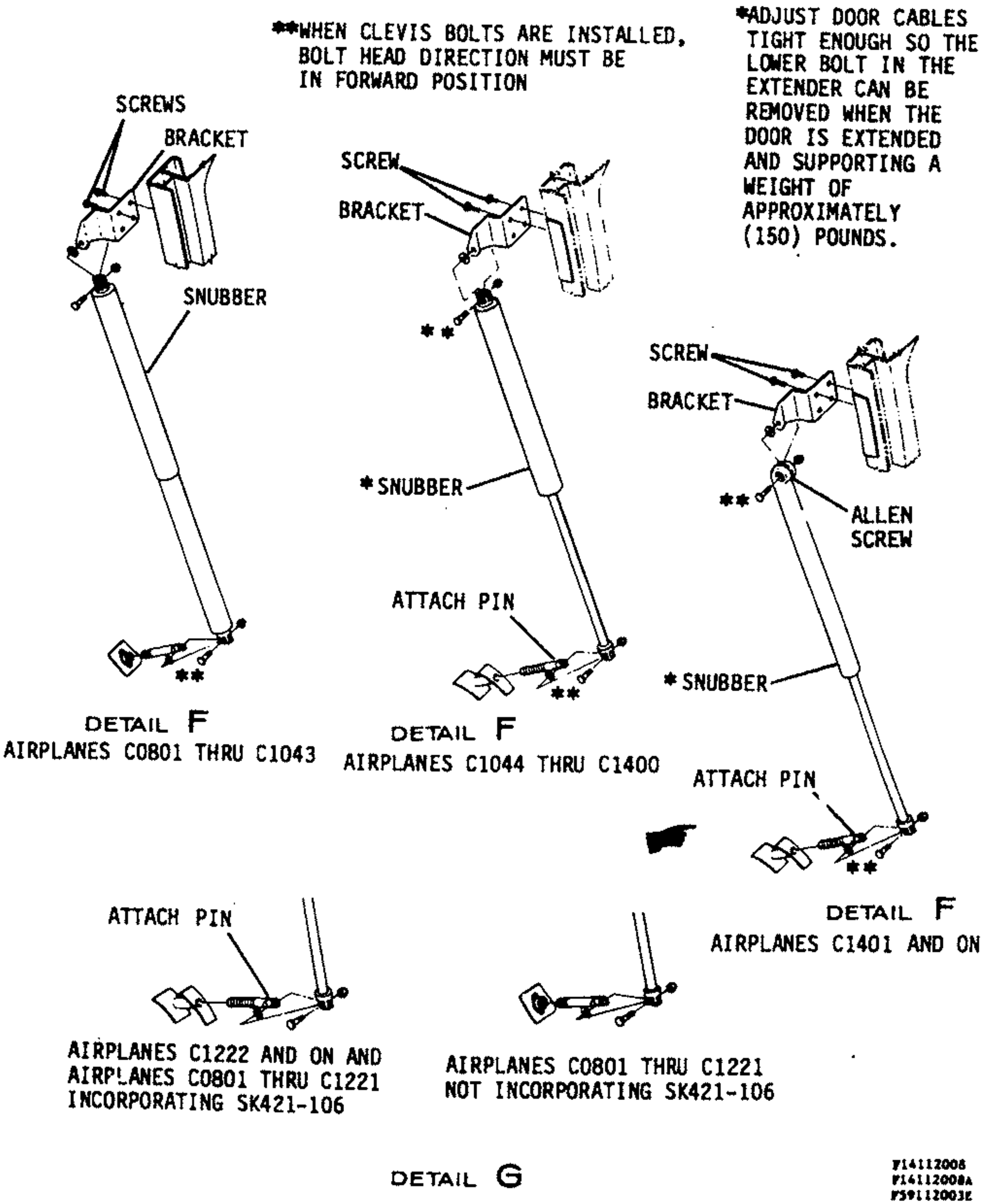


Lower Cabin Door Installation
Figure 2 (Sheet 4)



Lower Cabin Door Installation
Figure 2 (Sheet 5)

F. Install Upper Cabin Door Extender (Airplanes C0681 and On).

NOTE: When door extender is installed, ensure that push rod of extender extends up when door is open.

(1) Position door extender on ball studs and secure with safety clips.
(2) Check operation of door extender.

4. Removal/Installation Lower Cabin Door (Refer to Figure 2)

A. Remove Lower Cabin Door

(1) With cabin door open, support lower door.
(2) Remove cap nuts (5) and screws (6) attaching forward and aft cables (10 and 4) to support (9) and bellcrank (3).
(3) Remove screws (1) attaching hinges (2) to lower cabin door.
(4) Remove door from airplane.

B. Install Lower Cabin Door

(1) Align lower cabin door to hinges (2) and install screws (1).
(2) Connect forward and aft cables (10 and 4) to support and bellcrank (3), using screws (6) and cap nuts (5).

5. Removal/Installation Lower Cabin Door Latch Assembly (Refer to Figure 2)

A. Remove Door Latch Assembly.

(1) With cabin door open and lower door supported, remove cap nuts (5) and screws (6) attaching forward and aft cables (10 and 4) to support (9) and bellcrank (3).
(2) Remove door upholstery panel. Refer to Chapter 12, Maintenance Practices.
(3) Using Figure 2, disassemble latch assembly as necessary to repair.

B. Install Door Latch Assembly

(1) Using Figure 2, assemble door latch assembly.
(2) Adjust the lower cabin door latch assembly. Refer to Adjustment/Test.
(3) Install upholstery panel on door. Refer to Chapter 12, Maintenance Practices.
(4) Connect forward and aft cables (10 and 4) to support and bellcrank (3), using screws (6) and cap nuts (5).

6. Removal and Installation of Lower Cabin Door Snubber (Airplanes C0801 and On). (Refer to Figure 2, Sheet 3)

A. Remove Extender.

(1) Removal of extender consists of removing the nut and bolt at each end of the extender.

B. Install Extender.

(1) Install door extender by reversing the removal procedure.
(2) Adjust door cables tight enough if necessary so that the lower bolt in the extender is free and can be removed when door is extended and supporting a weight (approximately 150 pounds).

7. Removal/Installation Lower Cabin Door Step Mechanism (Refer to Figure 2)

A. Remove Step Mechanism

(1) With cabin door open support lower door. Remove cap nuts (5) and screws (6) attaching forward and aft cables (10 and 4) to support (9) and bellcrank (3).
(2) Remove door upholstery panel. Refer to Chapter 12, Maintenance Practices.
(3) Using Figure 2, disassemble and repair as necessary.

B. Install Step Mechanism

(1) Using Figure 2, reassemble door step mechanism as necessary.
(2) Install upholstery panel. Refer to Chapter 12, Maintenance Practices.
(3) Connect forward and aft cable (10 and 4) to support (9) and bellcrank (3), using screws (6) and cap nuts (5).

8. Removal/Installation Cabin Door Seal (Refer to Figure 1 or 2)

A. Remove Cabin Door Seal

(1) Remove door seal from seal retainer being careful not to tear or damage seal. Use a phenolic wedge or plastic tool to help remove door seal.

B. Install Cabin Door Seal

(1) Install seals by gently edging seal into retainer, using a plastic tool. It is permissible to use talcum powder, soapstone or water to facilitate installation of seals.

<u>NOTE</u>: Install upper door seal (4, Figure 1) with the holes toward the door opening, and the lower door seal (8, Figure 2) with the holes toward the top of the door. Pressurized air from inside the cabin door enters the holes, inflating the seal to form a pressurized seal.

9. Removal/Installation Door Latch Receptacle (Without Light Switch)

A. Remove Door Receptacle.

(1) Insert allen wrench into receptacle and loosen nut to snug condition.

<u>NOTE</u>: When nut clears the fiber stop insert, there is approximately one turn remaining before it drops off.

(2) Insert special tool into nut snugly so the nut will remain on the tool when it is free of the receptacle.
(3) Remove nut and slide receptacle off over handle.

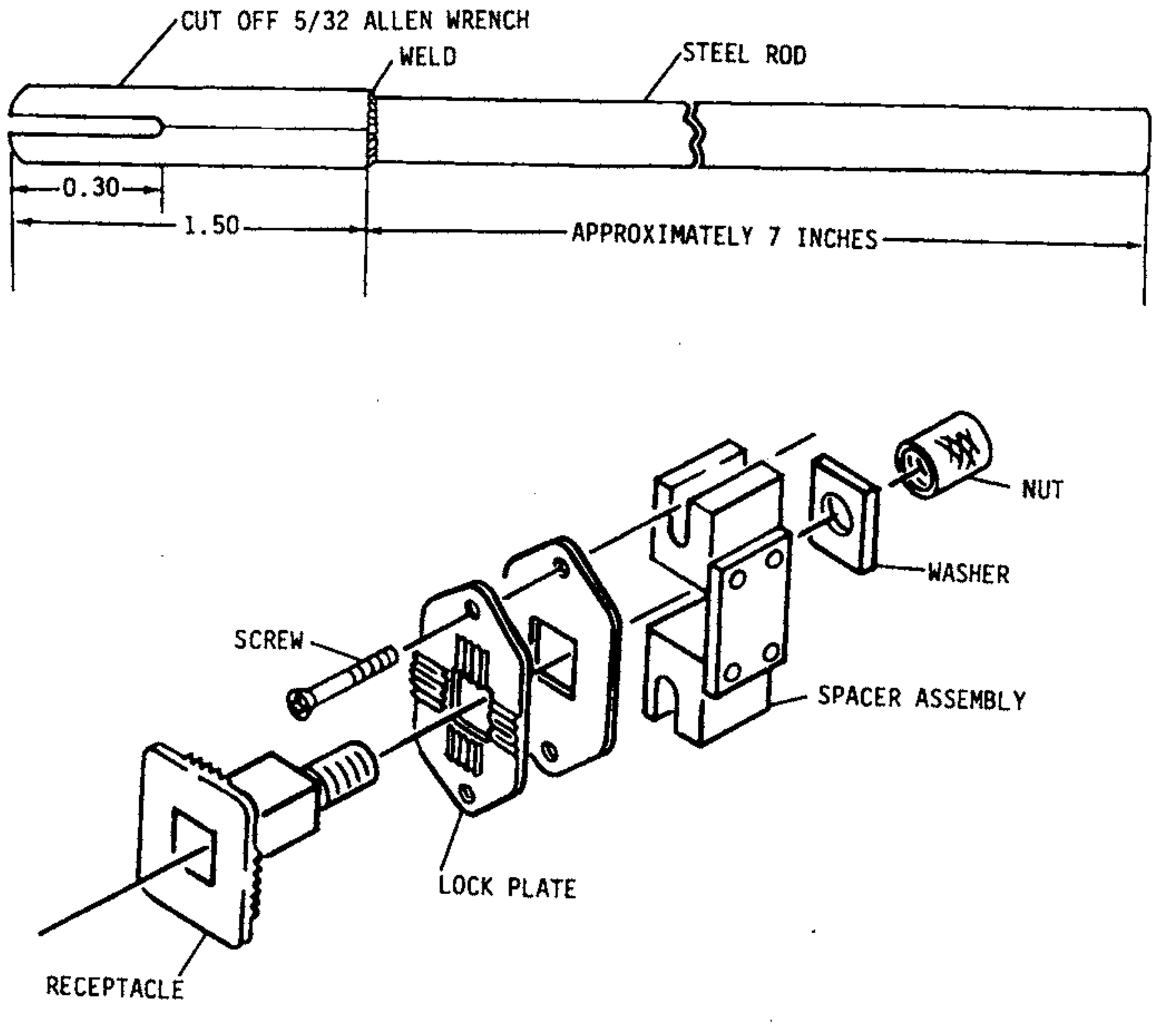
B. Install Door Latch Receptacle.

(1) Slide receptacle over handle of tool into door frame.
(2) Gently shake washer onto receptacle and start nut.
(3) Remove special tool, hold receptacle in position and tighten with allen wrench.

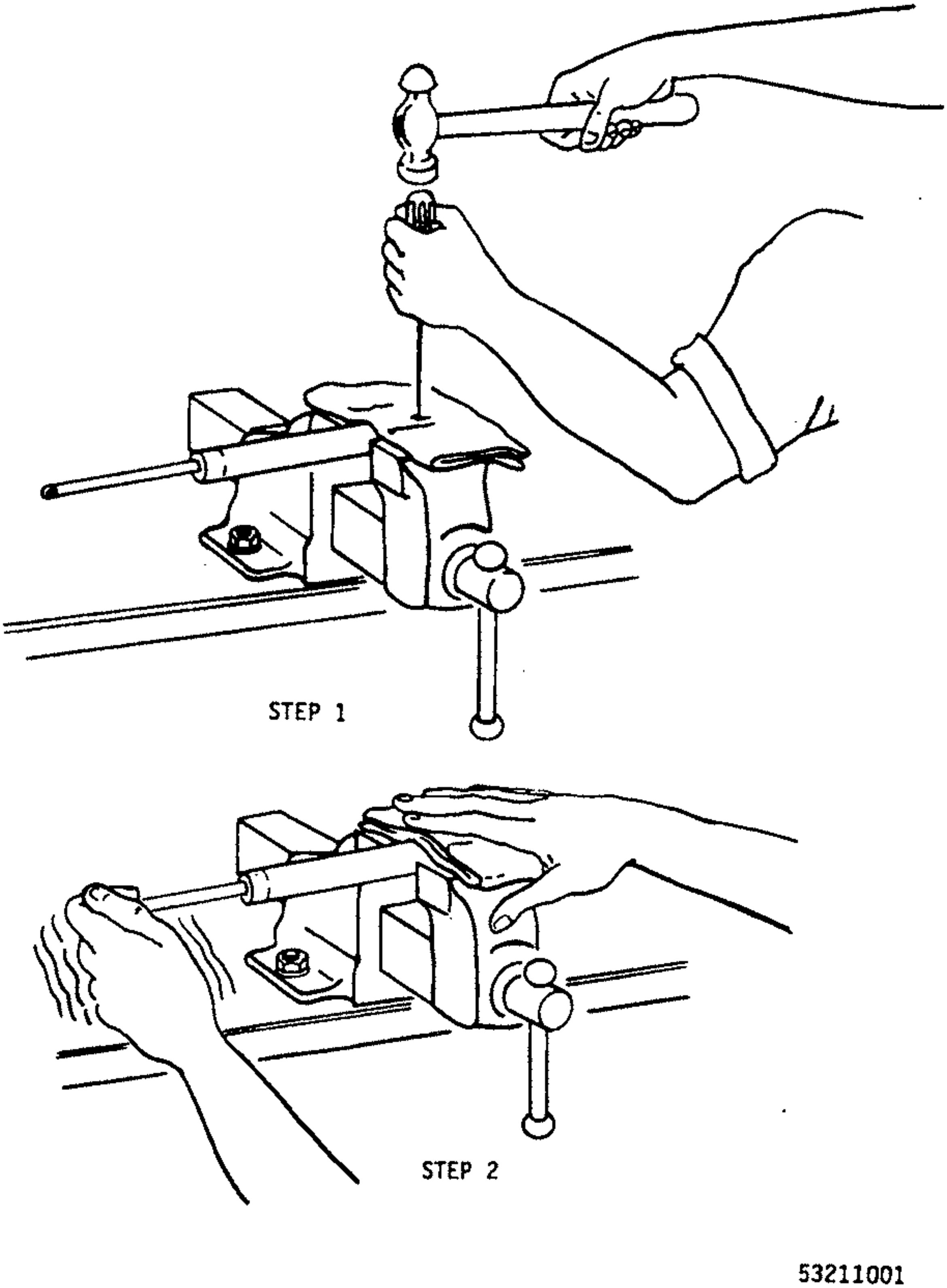
10. Install Latch Receptacle Removal Tool

A. Tool Fabrication Instructions. (Refer to Figure 3.)

(1) Heat end of allen wrench to remove some temper and cut notch .30 inch deep. (Use metal cutoff wheel or other suitable tool.)
(2) Slightly spread and round off notched end so it will fit tightly into nut.
(3) Cut allen wrench off to 1.50 inches and weld to rod approximately same size diameter and approximately 7 inches long for handle.



Removal Tool - Door Latch Receptacle
Figure 3



Disposal of Gas Operated Extender
Figure 4

11. Disposal of Gas Operated Extender.

A. Disposal.

WARNING: WHEN REMOVED, DEPRESSURIZE THE GAS SPRING EXTENDER AS DESCRIBED BEFORE DISCARDING.

PROTECTIVE EYE COVERING MUST BE WORN WHILE PERFORMING THE FOLLOWING STEPS.

(1) Place extender horizontally in bench vise and tighten vise.
(2) Place several layers (4 layers minimum) of shop towels or rags over end of cylinder in vise (refer to Figure 4, Step 1).
(3) Measure (1-1/2 inches) in from fixed end of cylinder and, using a scratch awl or pointed center punch and hammer, drive awl or punch through the towel into the cylinder until the gas begins to escape (refer to Figure 4, Step 1).
(4) Hold the towel and scratch awl in place until all gas has escaped (a few seconds). Then slowly remove scratch awl. Escaping oil will be absorbed by the towel.
(5) While still holding towel over hole, push shaft completely into cylinder to purge remaining oil (refer to Figure 4, Step 2).
(6) Remove extender from vise and discard.

Adjustment/Test

1. Adjustment Upper Cabin Door Latch Assembly (Refer to Figure 1)

A. Adjust Upper Cabin Door Latch Assembly

NOTE: Adjustment is accomplished with window trim removed and inner handle installed.

(1) With the handle (10) turned as far as handle will go in a clockwise rotation, adjust link (14) to give a positive locking of the bellcrank (13).
(2) Adjust link (15) and tube assembly (17) until the pin can be installed with no binding.
(3) Install cotter pins, except on pins holding latch pins (16 and 18) to link (15) and tube assembly (17).
(4) Secure jamnut on link (14) holding to bellcrank (13).
(5) Position handle (10) so that bellcrank (24) is against the housing stop in open position.
(6) Loosen jamnuts on tube assembly (17) and link (15) holding latch pins (16 and 18) and remove the pins.
(7) Screw tube assembly (17) and link (15) holding latch pins (16 and 18) clockwise or counterclockwise to decrease or increase.
(8) (Refer to Figure 3.) Adjust latch pins to a minimum of 0.72 inch engagement with receptacles in the locked position. The maximum unsupported space between the receptacle and door frame is 0.21 inch. If this space is greater than 0.21 inch add a spacer (5) between the lock plate and frame.

CAUTION: DO NOT USE MORE THAN ONE SPACER (5) BETWEEN THE LOCK PLATE AND FRAME.

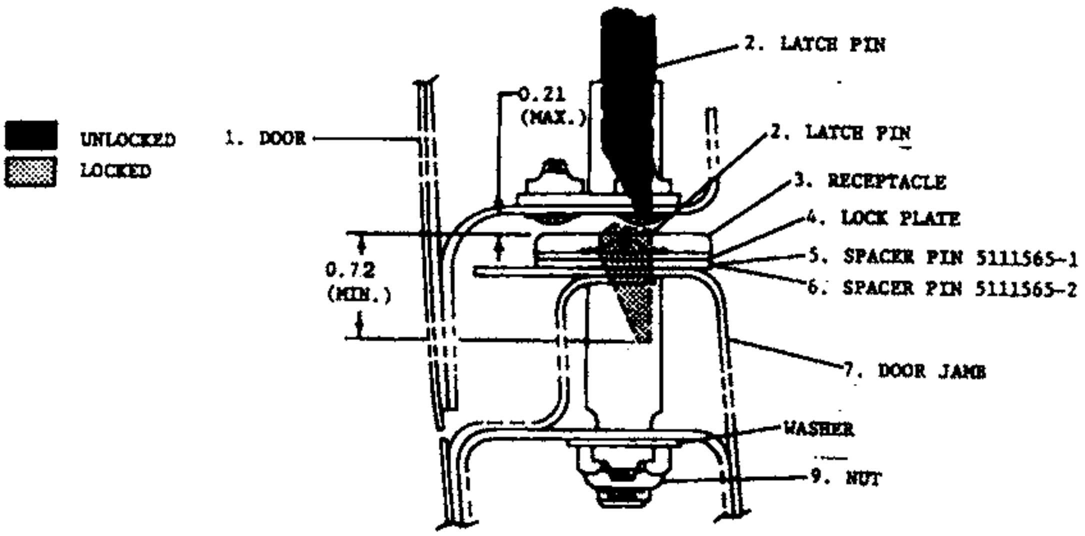
(9) Secure jamnuts on link (15) and tube assembly (17), install cotter pins in pins, secure latch pins (16 and 18).
(10) Adjust door latch receptacles as follows:
(a) Remove window trim. Refer to Chapter 12, Maintenance Practices.
(b) Loosen nut securing receptacle to lock plate.
(c) Adjust receptacle in forward door jamb and aft door jamb so that the latch pins (16 and 18) are engaged in the receptacles and the door produces a tight fit. Secure nuts on receptacle. Torque to 100 inch-pounds.

(11) After the door latch adjustment has been accomplished, remove handle (10) and install window trim on the door.
(12) Install handle (10) on spindle (20) and secure with roll pin (11).
(13) Close and fully lock cabin doors. The indicators should indicate a locked condition.
(14) Close and fully lock cabin doors. With battery switch ON, observe the DOOR WARN light on the annunciator panel is not illuminated. If the light illuminates, refer to Cabin Door Warning System, Adjustment/Test.
(15) Verify that the upper cabin door latch pins will retract freely (by spring force) by locking the door then rotating the handle to a position slightly below the stow position. If the latch pins do not retract, check the friction in the system that will pevent the latch pins from retracting and correct.

2. Adjustment Lower Cabin Door Latch Assembly (Refer to Figure 2)

A. Adjust Lower Cabin Door Latch Assembly

(1) With cabin door open and supported, remove cap nuts (5) and screws (6) attaching forward (10) and aft cable (4) to support (9) and bellcrank (3).
(2) Remove door upholstery panel. Refer to Chapter 12.



NOTE: MAXIMUM OF ONE SPACER ALLOWED PER PIN AS REQUIRED.

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Cabin Door Latch Pin Requirements
Figure 5

(3) (Refer to Figure 2.) Adjust the upper latch pins (2) to a minimum of 0.72 inch engagement with the receptacle (3) in the door locked position. The maximum unsupported space between the receptacle and door frame is 0.21 inch. If this space is greater than 0.21 inch, add a spacer (5) between the lock plate and frame.

CAUTION: DO NOT USE MORE THAN ONE SPACER (5) BETWEEN THE LOCK PLATE AND FRAME.

(4) Adjust the lower latch pins for the same engagement and clearance requirements as specified in Step (3).
(5) Secure jamb nuts (17) and install pins (13) and cotter pins (16) at all tube assembly (14) attach points.
(6) Ensure door receptacles are adjusted so the latch pins are engaged in the receptacles, and the door will produce a good fit.
(a) Lower receptacles adjust to outboard position.
(b) Upper receptacles adjust to inboard position.
(7) Adjust lower receptacles inboard as far as possible to allow free latch pin movement within the receptacles.
(8) Recheck all latch pins for engagement and clearance.
(9) Close doors and check for proper operation, positive locking and observe the door lock indicators (12) show a locked condition. (See Figure 1.) Ensure that bellcrank (24) fully engages door catch (26) with no restrictions.
(10) Install upholstery, refer to Chapter 12.
(11) Connect forward (10) and aft cable (4) to support (9) and bellcrank (3), using screws (6) and cap nuts (5).

3. Adjustable Lower Cabin Door Snubber (Airplanes C1401 and On)

A. The adjustable extender can be adjusted to extend between one (1) and six (6) seconds.

B. Adjust Extender.

(1) Open cabin door allowing door to free-fall to the full extended position, door steps extend during door free-fall, if not adjust snubber as follows:
(a) From inside the airplane close and lock cabin door.
(b) Remove the allen screw from the cylinder end clevis of the snubber screw using a number 1032 allen wrench.
(c) Adjust snubber screw to mid-range of travel.

NOTE: Metering screw travel is four (4) full turns; mid-range definition is two (2) full turns from either end of screw travel.

(d) Reinstall allen screw removed in steb (b).

NOTE: Allen screw must be replaced prior to snubber operation. If not replaced, severe loss of hydraulic fluid may result.

(d) Open cabin door. Allow door to free-fall to full extended position. If door steps do not extend during cabin door free-fall, repeat steps (a) through (c), except adjust snubber metering screw counterclockwise at 1/2 turn intervals until step extension is accomplished; then, reaccomplish step (d).

EMERGENCY EXIT DOOR

Description

1. The emergency exit door is located on the right-hand side of the fuselage at the second window. The door incorporates a latching mechanism for releasing or locking the door. Turning the handle counterclockwise and pulling inward on the handle opens the door.

Maintenance Practices

1. Removal/Installation Emergency Exit Door (See Figure 1)

   A. Remove Emergency Exit Door.

   (1) Remove plexiglass cover (11) from pan (16) and turn the handle (13) counter-clockwise as far as handle will turn, (approximately 1/4 turn).
   (2) Remove door by pulling inboard on the handle.

   B. Install Emergency Exit Door.

   NOTE: Check seal for cuts or deterioration before installation of door. Replace seal if questionable.

   (1) Position emergency exit door in place and turn handle (13) to locked position.
   (2) Install cover (11) in pan (16).

2. Removal/Installation Emergency Exit Door Release Mechanism (See Figure 1)

   A. Remove Release Mechanism.

   (1) Remove emergency exit door, refer to Removal/Installation Emergency Exit Door.
   (2) Remove pan (16) by removing roll pin (12) from handle (13) and screws (15).
   (3) Remove door upholstery, refer to Chapter 12.
   (4) Remove cotter pins (5) and pins (4) securing links (7) to bellcrank (9).
   (5) Lift out channel (17) and bellcrank (9).
   (6) Remove links (7) from door with latch pins (1) connected.

   B. Install Release Mechanism.

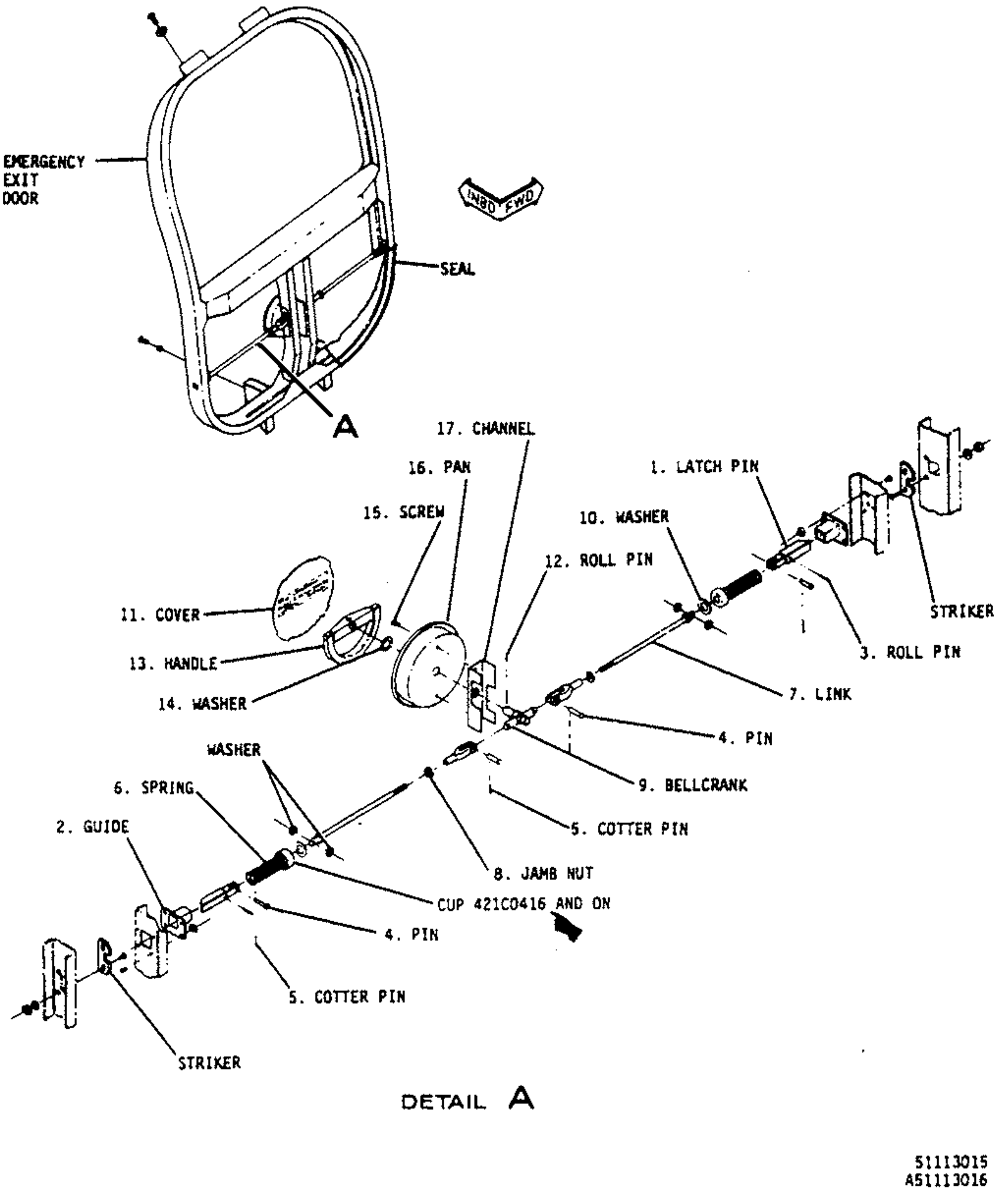
   (1) Install links (7) with latch pins (1) and springs (6) assembled into the door.
   (2) Install bellcrank (9) and channel (17) in door.
   (3) Adjust release mechanism. Refer to Adjustment/Test.
   (4) Install upholstery on door. Refer to Chapter 12.
   (5) Install pan (16) on bellcrank (9) and secure with screws (15).
   (6) Install handle (13) on bellcrank (9), using washer (14) and roll pin (12).
   (7) Install door in aircraft, refer to Removal/Installation of Emergency Exit Door.

Adjustment/Test

1. Adjustment Emergency Exit Door Release Mechanism (See Figure 1)

   A. Adjust Release Mechanism.

   (1) Remove emergency exit door, refer to Removal/Installation Emergency Exit Door.
   (2) Remove roll pin (12) from handle (13) and remove handle (13) and washer (14).
   (3) Remove screws (15) and remove pan (16).
   (4) Remove upholstery panel from door, refer to Chapter 12.
   (5) Disconnect links (7) at the bellcrank (9) by removing cotter pins (5) and pins (4).
   (6) Using links (7), push latch pins (1) into guides (2) and install a 1/8 inch rig pin through rigging hole of guide and latch pin.
   (7) Loosen jamb nuts (8) on links (7).



Emergency Exit Door Installation
Figure 1

(8) With bellcrank rotated clockwise until it is against the stop, adjust links (7) to a length whereby the pins (4) can be installed with no binding through clevis of links (7) and bellcrank (9).
(9) Secure pins (4), using cotter pins (5) and tighten jamb nuts (8) on links (7).

NOTE: The release mechanism is rigged in such a manner that it has a overcenter locking condition.

(10) Remove the rig pins from guides (2).
(11) Install upholstery panel, refer to Chapter 12.
(12) Install pan (16) on bellcrank (9) and secure with screws (15).
(13) Install washer (15) on bellcrank (9). Align handle (13) on bellcrank (9) and secure with roll pin (12).
(14) Install door, refer to Removal/Installation of Emergency Exit Door.

AVIONICS AND BAGGAGE DOOR

Description

1. Doors are provided for nose baggage compartment and wing locker baggage compartment. Access panel is provided for access to the nose avionics bay.

2. The avionics bay is located in the forward section of the nose aft of the nose cap. Avionics bay access has two configurations, one access panel (standard) or one right-hand access panel and one left-hand door (optional).

   A. (Standard) The access panel is one piece, secured to the structure with quick-disconnect fasteners. The access panel utilizes two key locks, one on each side of the access panel.

   B. (Optional) A right-hand access panel is utilized on the right side of the avionics bay. The panel is secured to the structure with quick-disconnect fasteners and incorporates a key lock. The left-hand side of the avionics bay utilizes a door, secured to the structure with two hinges and latch assemblies. The door incorporates a key lock and door stop assembly.

3. The nose baggage compartment doors consists of the left and right doors. Each door is attached to the nose structure with two hinges. Two door latches installed in the bottom of the door, secures the door in place. Each door incorporates a stop assembly and key lock.

4. A wing locker baggage door is located on the aft nacelle position of each wing. Each door is attached to the structure with two hinges. The door is equipped with a latch, key lock and door stop assembly.

Maintenance Practices

1. Removal/Installation Avionics Access Panels (Standard) (See Figure 1).

   A. Remove Avionics Access Panel.

      (1) Unlock the lock assemblies.
      (2) Disconnect quick-disconnect fasteners.
      (3) Remove access panel.

   B. Install Avionics Access Panel.

      (1) Position access panel over avionics bay.
      (2) Secure access panel with quick-disconnect fasteners.
      (3) Lock the lock assemblies.

2. Removal/Installation (Optional) RH Avionics Access Panel (See Figure 1)

   A. Remove RH Avionics Access Panel.

      (1) Unlock the lock assembly.
      (2) Disconnect the quick-disconnect fasteners.
      (3) Remove access panel.

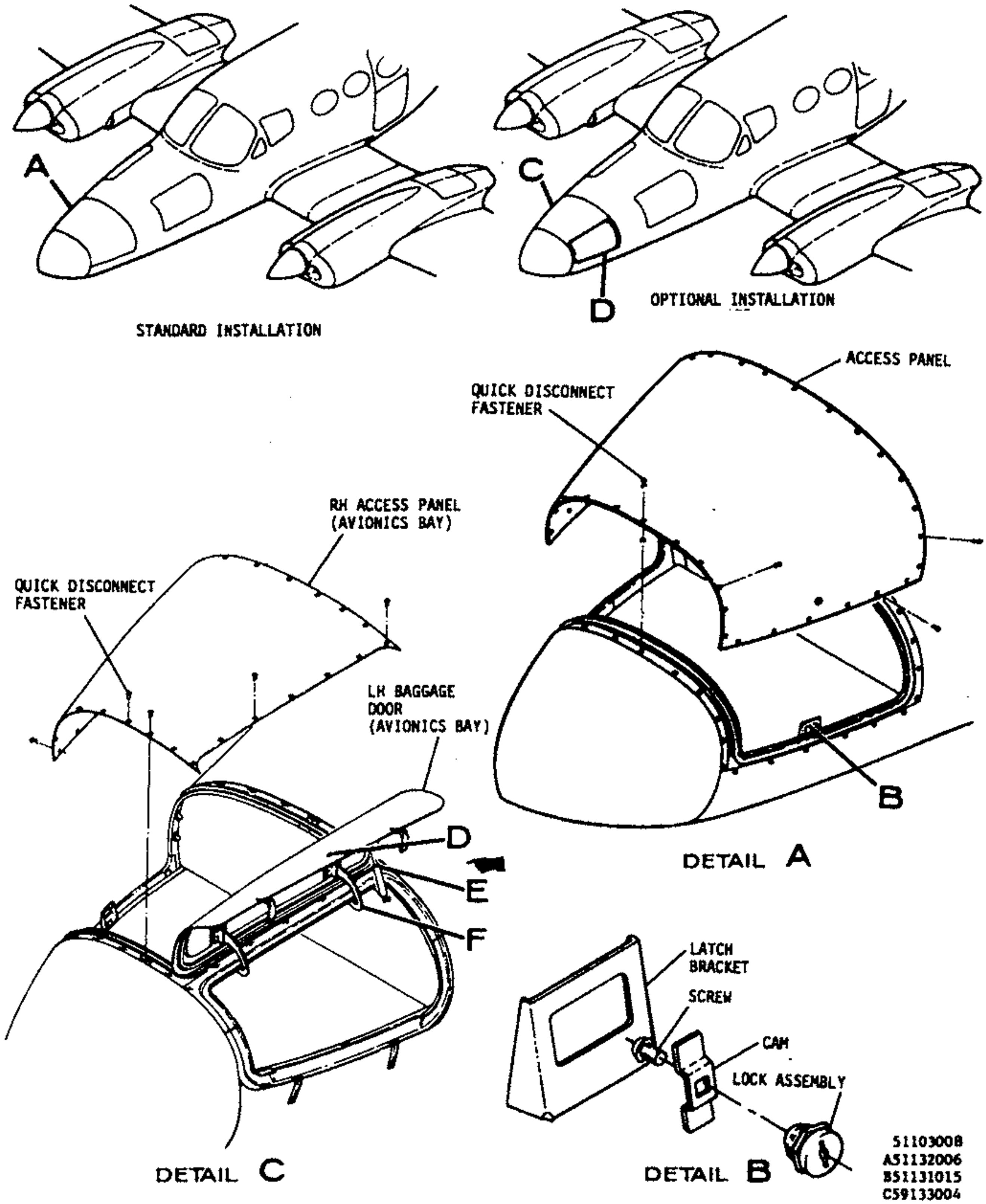
   B. Install RH Avionics Access Panel.

      (1) Position access panel over avionics bay.
      (2) Secure access panel with quick-disconnect fasteners.
      (3) Lock the lock assembly.

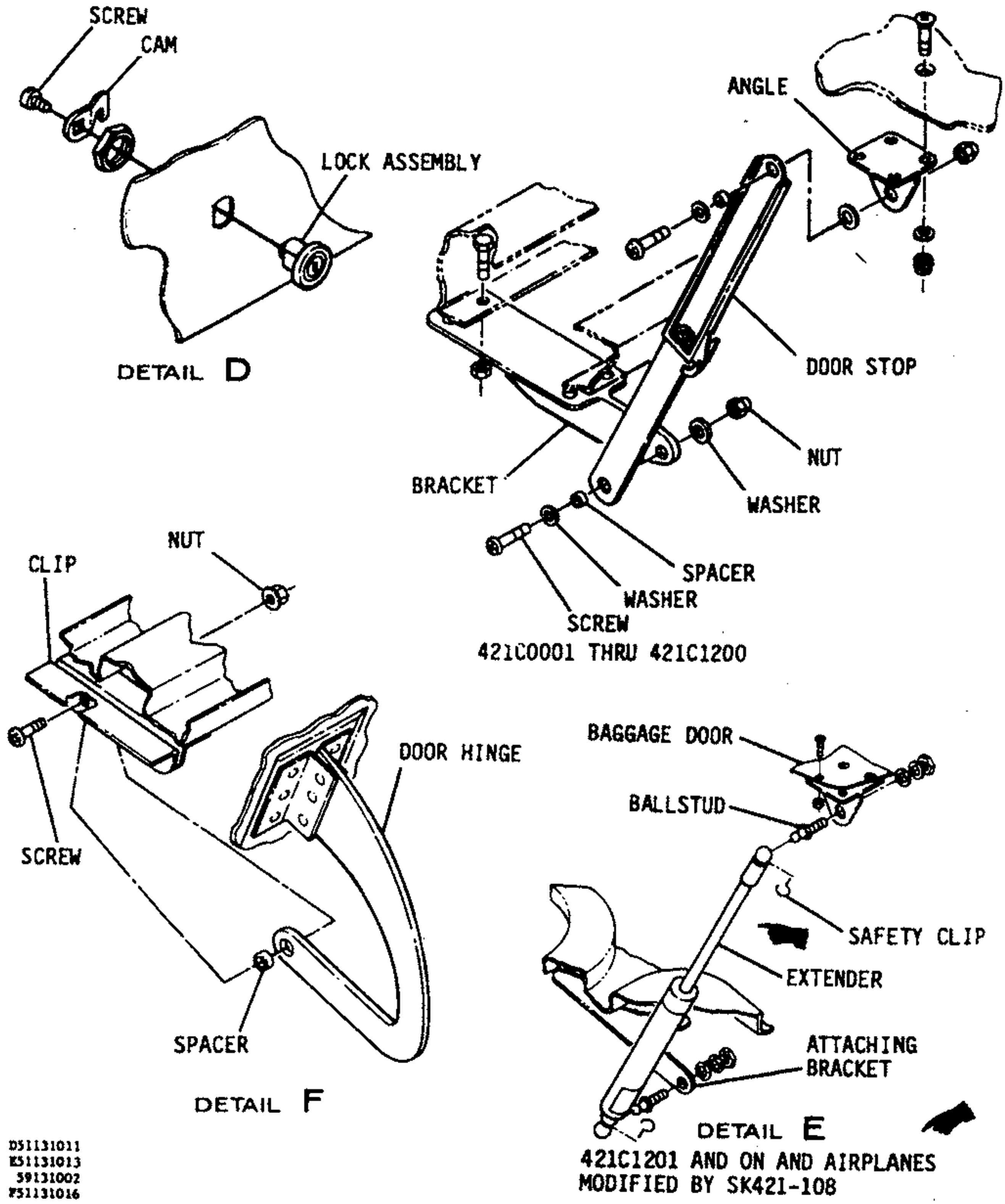
3. Removal/Installation (Optional) LH Avionics Door (See Figure 1)

   A. Remove LH Avionics Door.

      (1) Open door and disconnect door stop by removing nut screw, washers and spacer.
      (2) Disconnect door hinges from clips by removing nuts, spacers and screws.



Avionics Access Panel Installation
Figure 1 (Sheet 1 of 2)



Avionics Access Panel Installation
Figure 1 (Sheet 2)

B. Install LH Avionics Door.

(1) Install door hinges in clips and secure with screws, spacers and nuts.
(2) Secure door stop to angle with screw, washer, spacer, washer and nut.

4. Removal/Installation Nose Baggage Door (See Figure 2)

NOTE: Removal/Installation procedures are the same for either door.

A. Remove Nose Baggage Door.

(1) Disconnect door stop or extender from door.
(2) Remove door by removing nuts, screws and washers securing door hinge to structure.

B. Install Nose Baggage Door.

(1) Secure door hinges to structure using screws, washers and nuts.
(2) Connect door stop or extender to door.

5. Removal/Installation Wing Locker Baggage Door (See Figure 3)

A. Remove Baggage Door.

(1) Open wing locker baggage door.
(2) Remove screw and spacer from lower end of stop assembly.
(3) Remove nuts, washers, stat-o-seals and screws from door hinge and remove door from nacelle.

B. Install Baggage Door.

(1) Install baggage door to nacelle structure, using screw, washer, stat-o-seals, washer and nut.

NOTE: Stat-o-seals are to be lubricated each side with Dow Corning No. 4 Compound.

(2) Attach lower end of stop assembly to structure with screw and spacer.

6. Removal/Installation Wing Locker Baggage Door Latch (See Figure 3)

A. Removal and installation of wing locker latch is not recommended unless replacement or repair is necessary. Use figure as a guide for removal and installation.

7. Removal/Installation Baggage Door Extender (See Figure 1) (421C1201 and On).

A. Remove Baggage Door Extender.

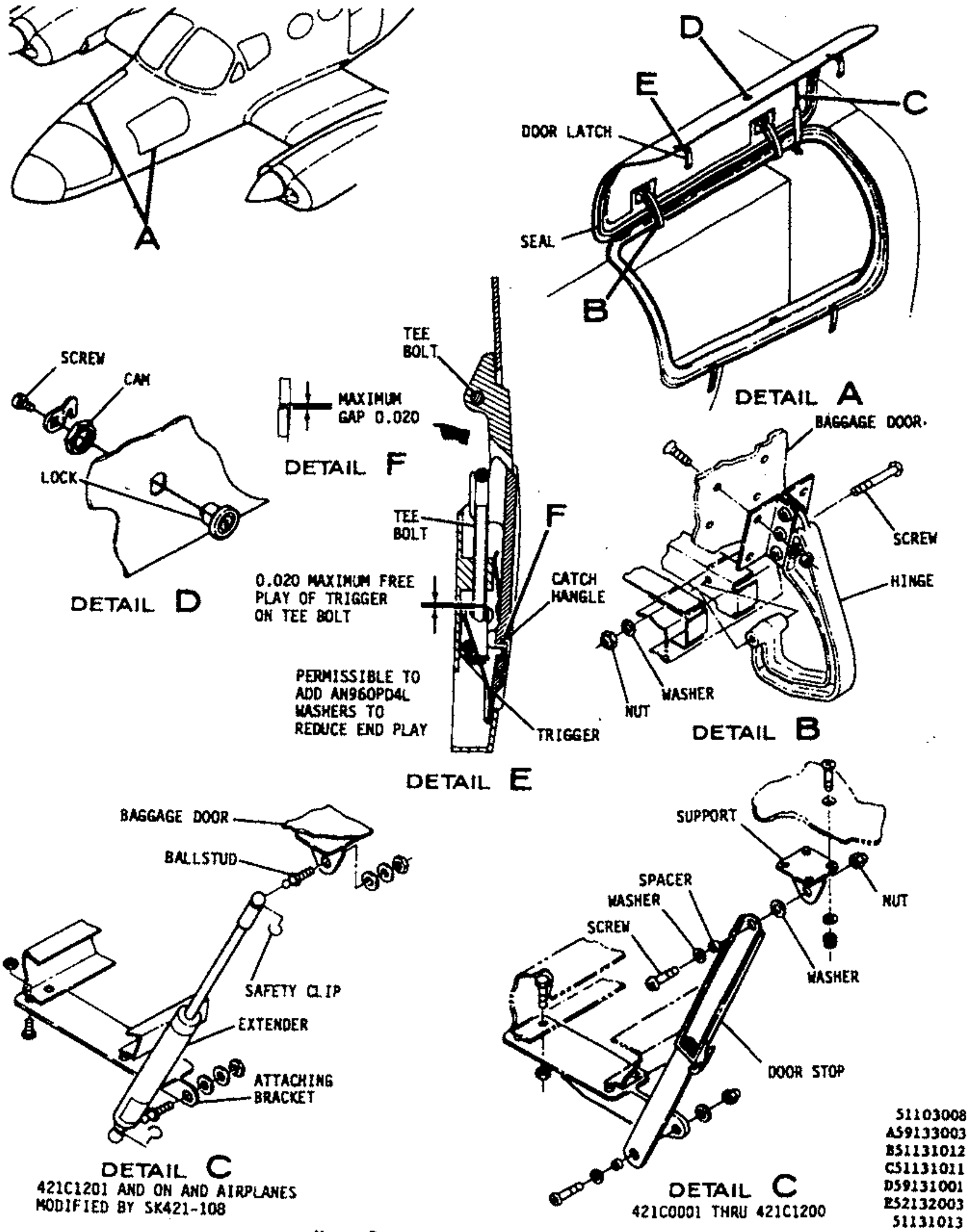
(1) Open baggage door and support the door open.
(2) Disconnect ball end cable assembly from extender arm link assembly.

CAUTION: BALL END CABLE IS UNDER SPRING TENSION. EASE IT LOOSE AND DO NOT ALLOW IT TO SNAP BACK.

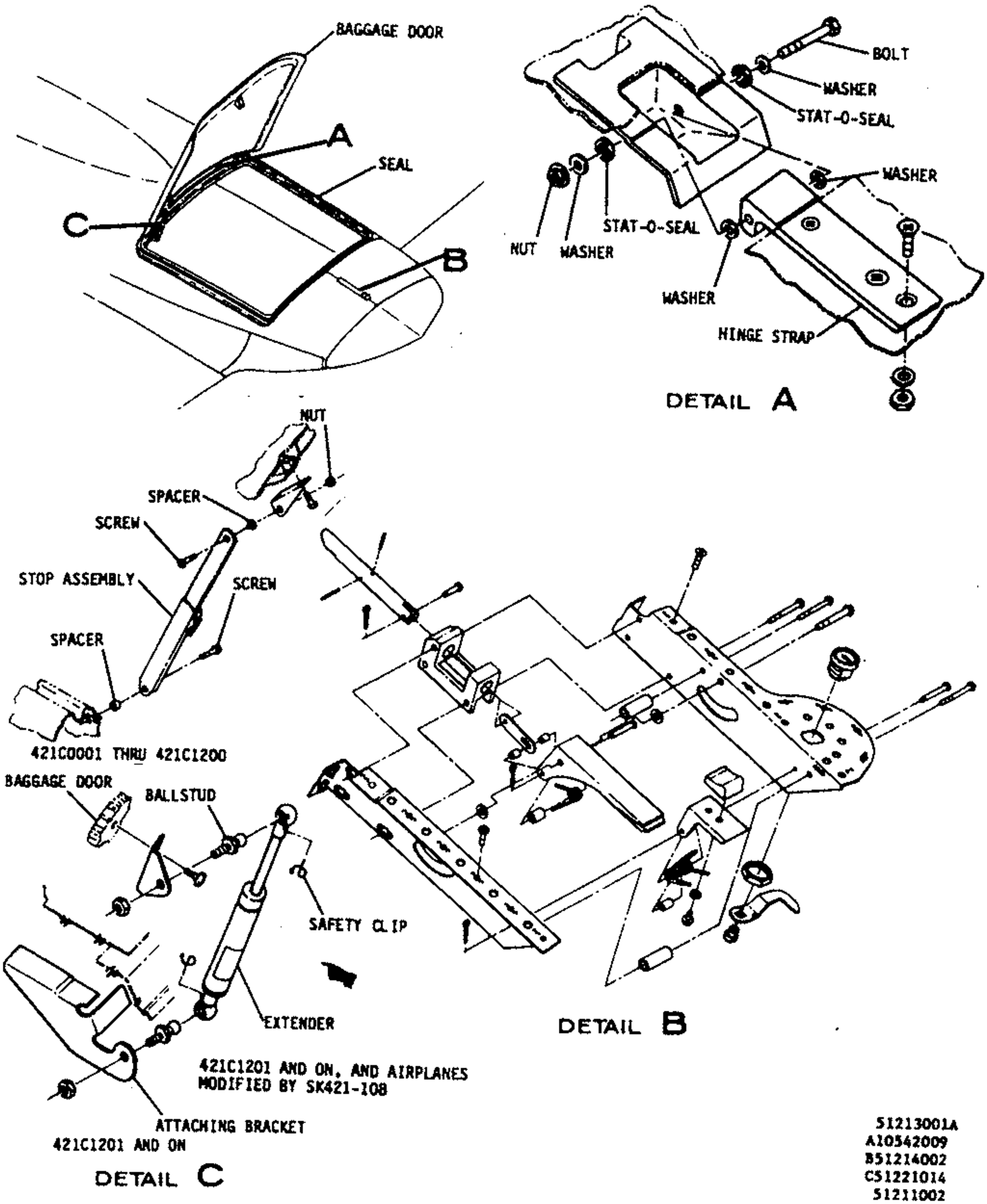
(3) Disconnect extender assembly from door and doorsill by removing screws at each end.

B. Install Baggage Door Extender.

(1) With baggage door open, align extender assembly with door and doorsill and fasten with screws.
(2) Connect ball end cable assembly to extender arm link assembly.
(3) Close door and check for proper operation.



Nose Baggage Door Installation
Figure 2



Wing Locker Baggage Door Installation
Figure 3

Adjustment/Test

1. Adjust Nose Baggage Compartment Door Latch (See Figure 2).

   NOTE: Adjustment of door latch is the same for left or right doors.

   A. Adjust and Check Door Latches as Follows:

      (1) Adjust tee bolt to obtain the proper fit of door.
      (2) After final adjustment, check latch for proper operation and make sure the distance between trigger and latch handle does not exceed 0.020 inch.
      (3) If distance in step (2) exceeds 0.020 inch, check free play between trigger assembly and tee bolt. Free play should not exceed 0.020 inch. If free play exceeds 0.020 inch, remove cotter pin from end of tee bolt and add washers as required to reduce free play to a minimum and reinstall cotter pin.
      (4) If removing free play as described in step (3) does not reduce maximum distance as required in step (2), replace latch assembly.

Description

1. The landing gear doors consists of : The main landing gear outboard doors and the nose gear doors.
2. The main landing gear is equipped with main gear outboard doors. Each door pivots on a continuous hinge, located at the doors outboard end. The door operation is controlled by a door link rod attached to the main landing gear and outboard door bracket.
3. Right and left nose gear doors are used to enclose the nose gear when in retracted position. The doors are connected to the nose gear retraction linkage and are hinged on a continuous hinge on the outer edge of each door. The doors pivot down during gear extension and remain down while the nose gear is down.

Maintenance Practices

1. Tools and equipment.

NOTE

The following material or equivalent is required.

Name	Number	Manufacture	Use
Methyl n-Propyl Ketone	CAS NO. 107-87-9	Eastman Chemical Products Inc. P.O. Box 431 Kingsport, TN 37662	Clean metal surfaces.
Adhesive	EC-1300L	Minnesota Mining and Manufacturing Co. St. Paul, MN 55101	To install rub tube.
Hydro Test Unit	SE589* or SE1300	Cessna Aircraft Co. 5800 East Pawnee Road, Wichita, Ks. 67277	Hydraulic power supply.

*When modified to SK421-68.

2. Removal/Installation Main Gear Outboard Doors (Refer to Figure 1).

NOTE

Removal/Installation Procedures are the same for either door.

A. Remove Main Gear Outboard Door.
   (1) Disconnect door link from main landing gear by removing nut and washers.
   (2) Remove cotter pins from hinge.
   (3) Remove hinge pin from hinge.

B. Install Main Gear Outboard Door.
   (1) Position door hinge to hinge half on wing structure; install hinge pin.
   (2) Secure hinge pin at both ends of hinge with cotter pins.
   (3) Attach door link to main landing gear, using washers and nut.

NOTE

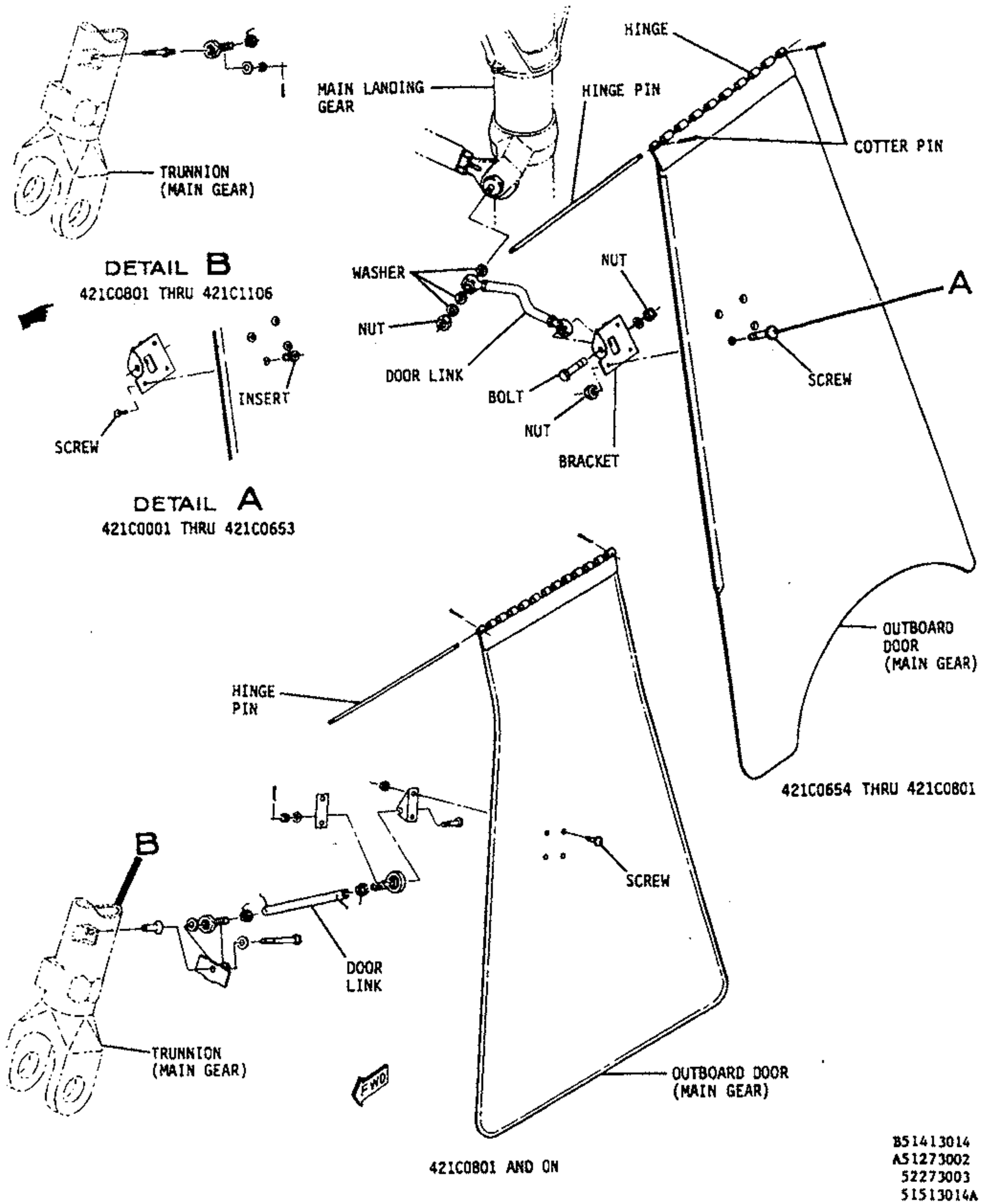
If length of door link rod has been changed or new components are being installed, refer to outboard door adjustment/test.

3. Removal/Installation Nose Gear Doors (Refer to Figure 2)

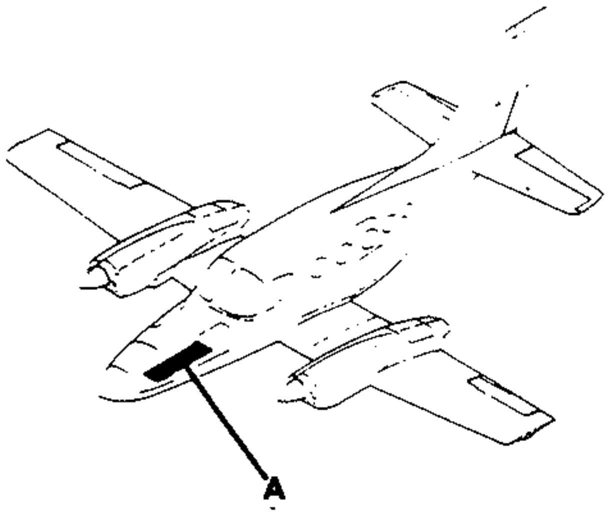
NOTE

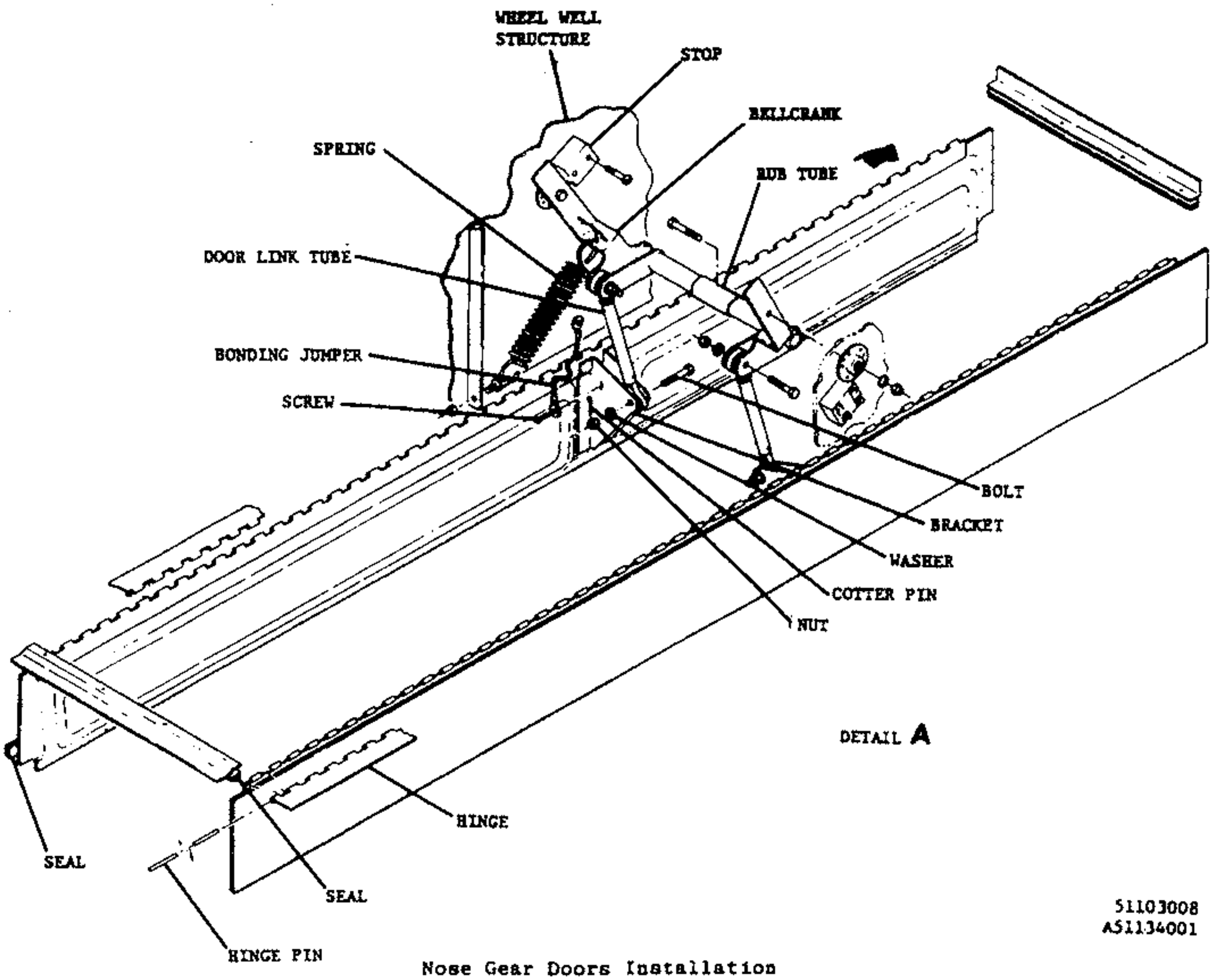
Removal/Installation procedures are given for the right hand nose gear door. The procedures are the same for the left hand door.

A. Remove Nose Gear Doors.



Main Landing Gear Outboard Door Installation
Figure 1





Nose Gear Doors Installation
Figure 2

(1) Remove screw securing bonding jumper to bracket.
(2) Disconnect door link tube from bracket by removing bolt, washer, nut and cotter pin.
(3) Remove hinge pin from door hinge and remove door.

B. Install Nose Gear Doors.

(1) Place door in position and secure in place with hinge pin. Secure hinge pin in hinge by staking hinge at both ends.
(2) Connect door link tube to bracket, using bolt, washer and cotter pin. (Install large washer between small washer and nut.)

NOTE: On airplanes C1106 and On, torque bolt 60 +0, -5 inch-pounds.

(3) Connect bonding jumper to bracket, using screw.

NOTE: If length of door link tube has been changed or new components are being installed, refer to nose gear door adjustment/test.

4. Replacement Bellcrank Rub Tube (Refer to Figure 2)

A. Remove old rub tube bellcrank.
B. Clean surface of bellcrank in area where rub tube was removed with Methyl-Ethyl-Ketone.
C. Install new rub tube on bellcrank, using EC-1300L.

Adjustment/Test

1. Adjustment Main Gear Doors (Refer to Figure 1)

A. Adjust Main Gear Door as follows:

NOTE: Adjustment of main gear door is the same for both right and left door installation.

(1) Jack airplane, refer to Chapter 1.
(2) Connect external electrical power supply. Refer to Chapter 13.
(3) Attach a hand pump to ground test service fitting on the manifold and return line on reservoir.
(4) Apply power to airplane with auxiliary 24-volt power supply and select gears UP.
(5) With the hand pump, apply pressure to unlock gear actuator. Gear may then be lifted into the retracted position manually or with hydraulic pressure from the hand pump.
(6) Move the gear up until the gear has engaged the uplock hook and is locked.
(7) Check gap around edge of door where door meets lower wing surface. Door must be preloaded in order to assure that door will not gap open in flight. A door that is too tight will prevent gear from going to full-up and lock position.
(8) If door requires adjustment, place gear select in the DOWN position and extend gear to a point of access to allow readjustment of door link. Recycle gear to UP position and repeat adjustment until door is properly preloaded.

NOTE: Torque locknut on door link 50 - 100 inch-pounds.

(9) After door adjustment is completed, install proper washers and nuts and cycle gears with hydraulic test cart at 2.0 GPM. Gear must go up and lock at 1000 psi maximum. Recycle gear with hydraulic test cart at 5.0 GPM.

2. Adjustment Nose Gear Doors (Refer to Figure 2)

B. Adjust Nose Gear Door as follows:

(1) Jack airplane. Refer to Chapter 1.
(2) Attach Hydro Test Unit to hydraulic system. Refer to Chapter 11.

(3) Connect external electrical power supply. Refer to Chapter 13.

CAUTION: DURING RETRACTION BE PREPARED TO STOP TO PREVENT DAMAGE TO DOORS.

(4) Install the RH door link tube assembly on the door actuating bellcrank assembly. Verify that the bellcrank is resting over center and is against its stops.
(5) Connect the free end of the tube assembly to the right-hand door clevis with bolt and nut.
(6) Retract gear slowly while watching the door for clearance with the nose gear. When nose gear is up and locked, the right-hand door must be slightly preloaded. The leading edge of the door will fit firmly against the seal when door is rigged properly.
(7) If door is misrigged, lower gear and adjust rod end to desired length. Recycle and adjust until proper rigging is obtained.
(8) After proper rigging of the right-hand door, extend the gear and attach the left-hand door tube assembly.
(9) With hydraulic pressure, very slowly retract gear, observing the clearance between the nose gear and the doors.
(10) As the two doors meet just prior to closing, verify that the doors will not bind by hitting each other on edge.
(11) Adjust the left-hand door by the same method as the right-hand door.
(12) After doors are properly rigged, attach all washers and nuts, cycle gear to verify proper operation and fit with the hydraulic test cart at 2.0 GPM. Gear must go up and lock at 1000 psi maximum. Cycle gears with hydraulic test cart at 2.0 to 5.0 GPM.
(13) When doors are properly adjusted, lower gear, disconnect hydraulic and electrical power, and remove airplane from jacks.

CABIN DOOR WARNING SYSTEM

Description

1. A cabin door warning system is utilized to provide visual indication on the annunciator panel, when the cabin door is open and the battery switch is positioned to ON.

2. Electrical power for the warning system is controlled by the DOOR WARN circuit breaker, located on the side console. The door warning switch is located on the window frame just forward of the cabin door. The door warning switch actuation is controlled by the forward latch pin of the upper cabin door. When the door is closed the latch pin pushes the switch actuator forward to open the electrical circuit at the switch extinguishing the DOOR WARN light on the annunciator panel. When the door is open, the switch is closed, providing electrical power to illuminate the DOOR WARN light on the annunciator panel.

Maintenance Practices

1. Removal/Installation Cabin Door Warning Switch (See Figure 1)

   A. Remove Door Warning Switch.

      (1) Ensure battery switch is OFF.
      (2) Remove window trim, refer to Chapter 12.
      (3) Identify and disconnect electrical wires from switch.
      (4) Remove switch by removing screw and nuts.

   B. Install Door Warning Switch.

      (1) Identify and connect electrical wires to switch.
      (2) Install switch on bracket with nuts and screws.
      (3) Adjust the door warning switch, refer to Adjustment/Test.
      (4) Install window trim, refer to Chapter 12.

Adjustment/Test

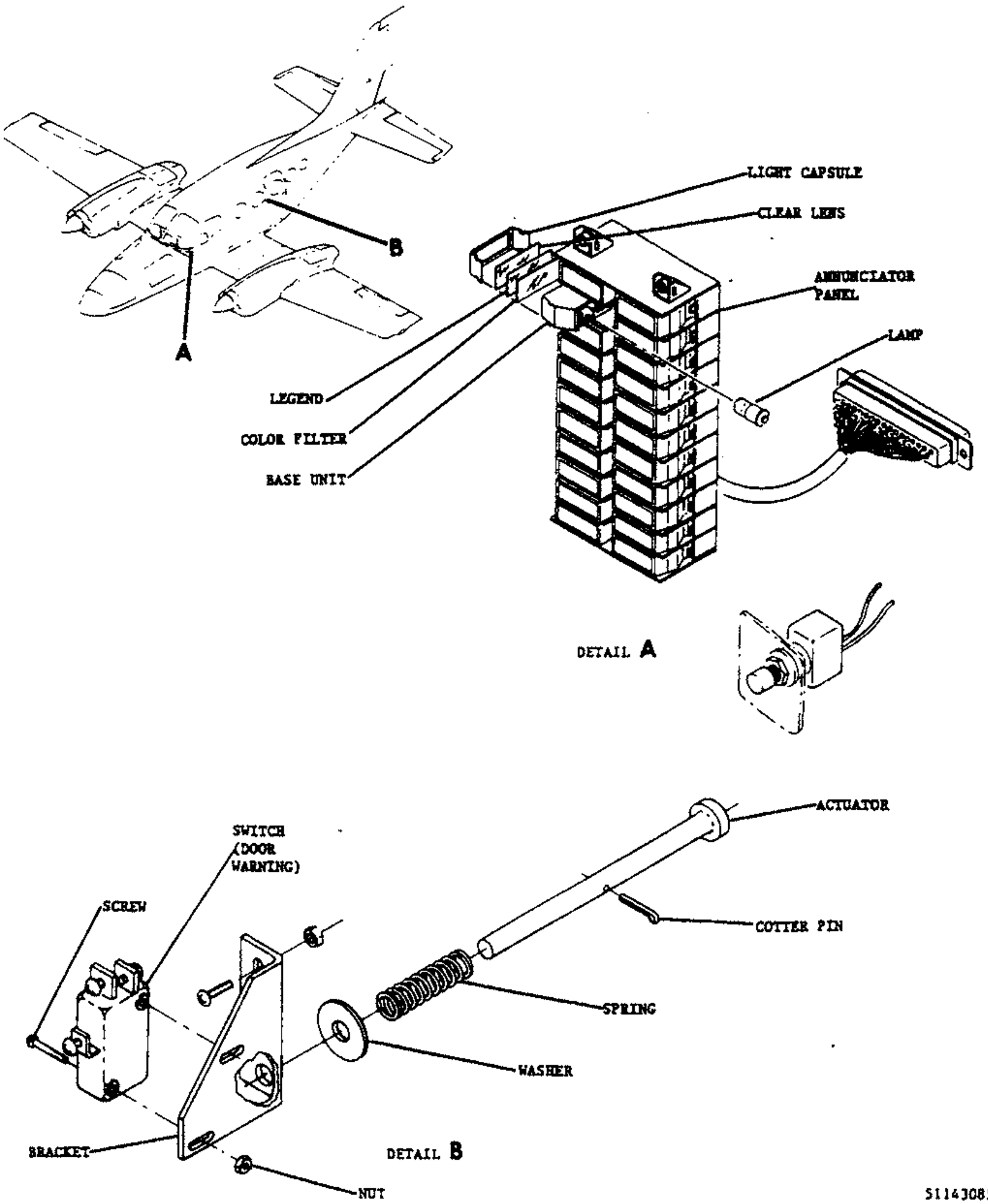
1. Adjustment of Cabin Door Warning Switch (See Figure 1)

   A. Adjust Door Warning Switch.

      (1) Remove window trim, refer to Chapter 12.
      (2) Close and fully lock cabin doors.
      (3) Position Battery switch to ON.
      (4) Loosen screws and nuts securing switch to bracket.
      (5) Adjust switch until contact with actuator is made and light on annunciator panel is extinguished.
      (6) Secure switch in this position by tightening screws and nuts.

         NOTE: The warning light on annunciator panel shall go out as the pin reaches maximum travel (door handle at approximately over center point) and does not illuminate when the handle is in the fully locked position.

      (7) Open upper cabin door and light should illuminate on the annunciator panel.
      (8) Turn Battery switch OFF.
      (9) Install window trim, refer to Chapter 12.



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Cabin Door Warning System Installation
Figure 1

INFLATABLE CABIN DOOR SEAL

Description

On Airplanes 421C0401 and On, an inflatable door seal is installed on the cabin door. This inflatable seal provides adequate door sealing for reducing air leakage noise around the cabin door while pressurized. It is not necessary to have an airtight, leak-free door. Quantity of leakage is not important as long as the total cabin leak rate is not excessive.

Operation

The periphery seal is pressurized above cabin pressure with left engine bleed air directed to the seal through a valve activated by the forward latch pin of the upper door. A check valve prevents pressure in the seal from decreasing with reductions in bleed air pressure. The vacuum breaker prevents seal pressures from decreasing below cabin pressure. The seal depressurizes through the valve automatically when the upper cabin door is opened. The cross-seal on the lower door which seals the gap between the upper and lower doors is not pressurized above cabin pressure.

Troubleshooting

In general, the following procedures can be used to reduce cabin door noise and air leakage. For detailed troubleshooting of the entire system, see the Troubleshooting Chart (see Figure 3). Pressurize cabin on the ground but do not exceed 2000 Ft/Min of cabin change while pressurizing or depressurizing. Using colored chalk or soap bubbles trace the leaks and leak paths. Prior to any rework, assure that both doors are adjusted to close flush with or slightly inside of the fuselage contour. Adjust the latch pin receptacles located on the forward and aft door posts in accordance with instructions.

1. Check Seal Installation and Operation.

   A. Assure that both seals, periphery and cross-seal, are secured in the seal retainer channel. If the retainer ears are not clamping snugly on the seal lip, bend as required.

   B. Check the periphery seal for punctures (especially at latch pin locations) or other damage. Check the cross-seal for punctures or for torn and frayed end flaps. Replace if seal reliability is affected.

   C. Assure that the periphery seal inflation system is operating properly. The seal line is located in the fuselage and is tapped off the left engine bleed air plumbing. Connect this line to a regulated air source, close the upper door and inflate the seal to 12-15 PSIG. Check the seal for leakage by disconnecting the air supply; the seal should remain inflated. If it doesn't, check the line or check valve for leakage. The seal should deflate when the cabin door is opened. If it doesn't, check for correct plumbing of the seal valve.

2. Seal Retainer.

   A. The gaps at the butt joints between segments of the seal retainer are common leak sources. Pull the seal out of the retainer in the area of the butt joint and apply a very thin coat of sealer across the gap. Feather the edges of the sealer to prevent forming a bump under the seal.

   B. It is also beneficial to fillet seal between the retainer and the door frame around the entire inner periphery of the retainer. Use pressure sealant Type I (refer to Chapter 1)being careful not to "glue" the seal to the retainer.

3. Cabin Doors

   A. Leakage is most common at the forward and aft corners at the gap between the upper and lower doors. This can be improved as follows:

      (1) Remove excess sealer, tape, putty, etc. from the area of the joint between the cross-seal and periphery strikers.
      (2) Assure that there is no height mismatch between bulbs on segments of the strikers. If any exists, file the end of the higher striker bulb as shown to match the shorter one.

(3) Use "Bond-Tite", sealer, or a suitable material to build up a smooth "wedge" at the corner of the strikers as shown. This will provide a uniform surface for the cross-seal flap and periphery seal to nest on the door. Sand filler smooth and repaint as desired. Feather edges on striker bulbs to prevent bumps.

Maintenance Practices

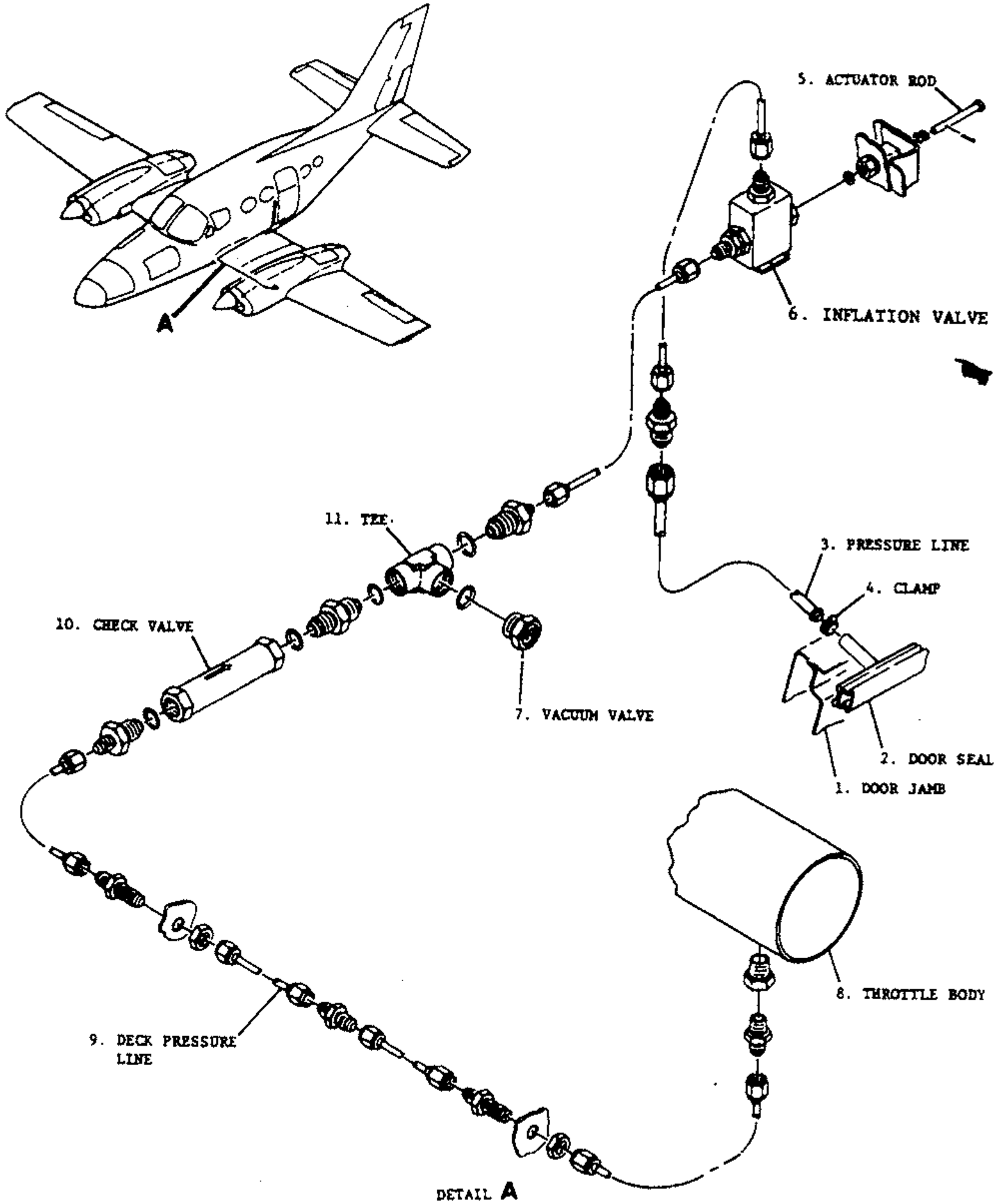
1. Removal/Installation Inflatable Cabin Door Seal (See Figure 1).

   A. Remove Seal.

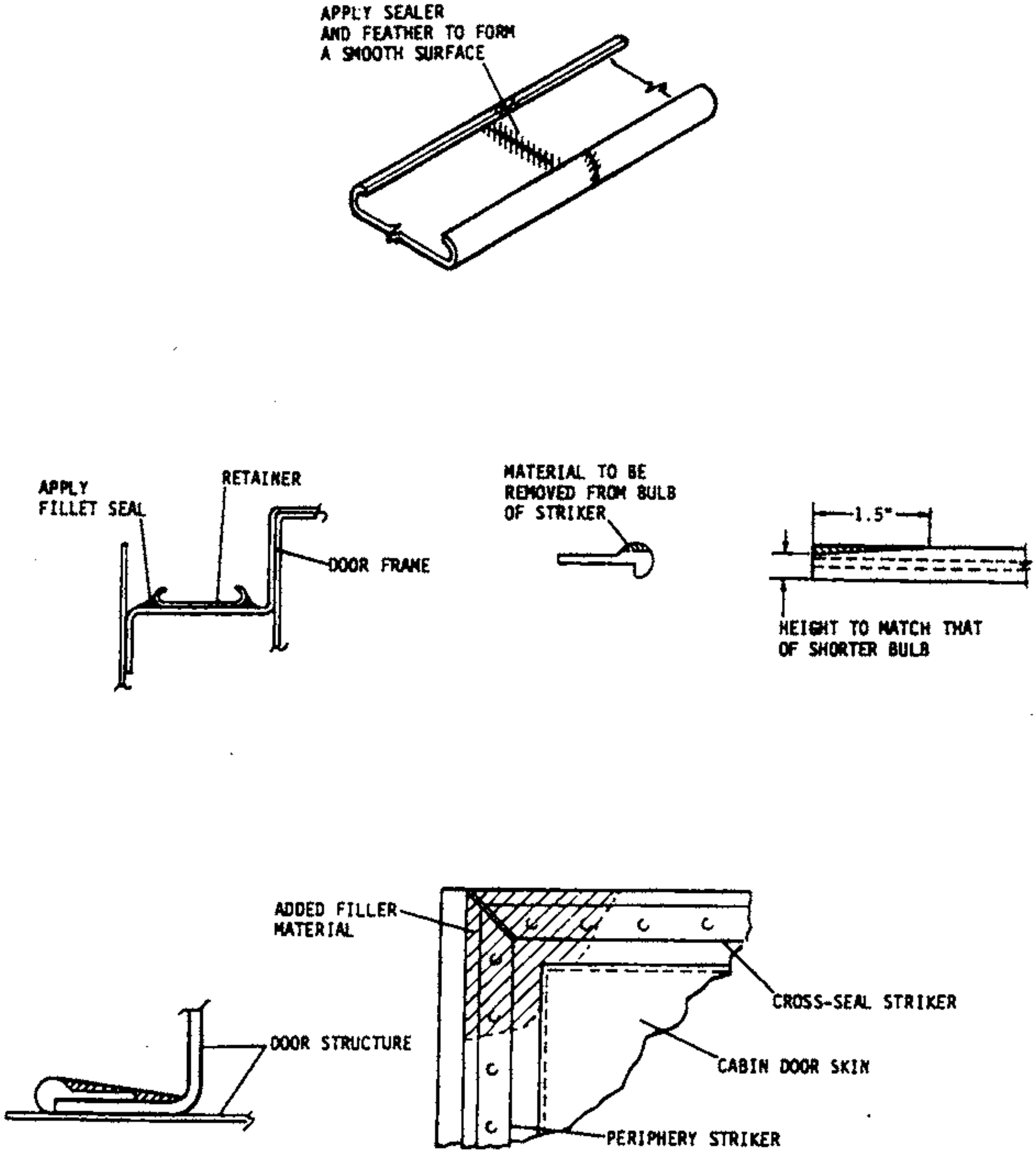
      (1) Remove necessary access plates, carpets and upholstery to gain access.
      (2) Loosen clamp connecting pressure line to seal.
      (3) Remove seal from retainer using only blunt pointed or plastic tools to prevent damage to seal.

   B. Install Seal.

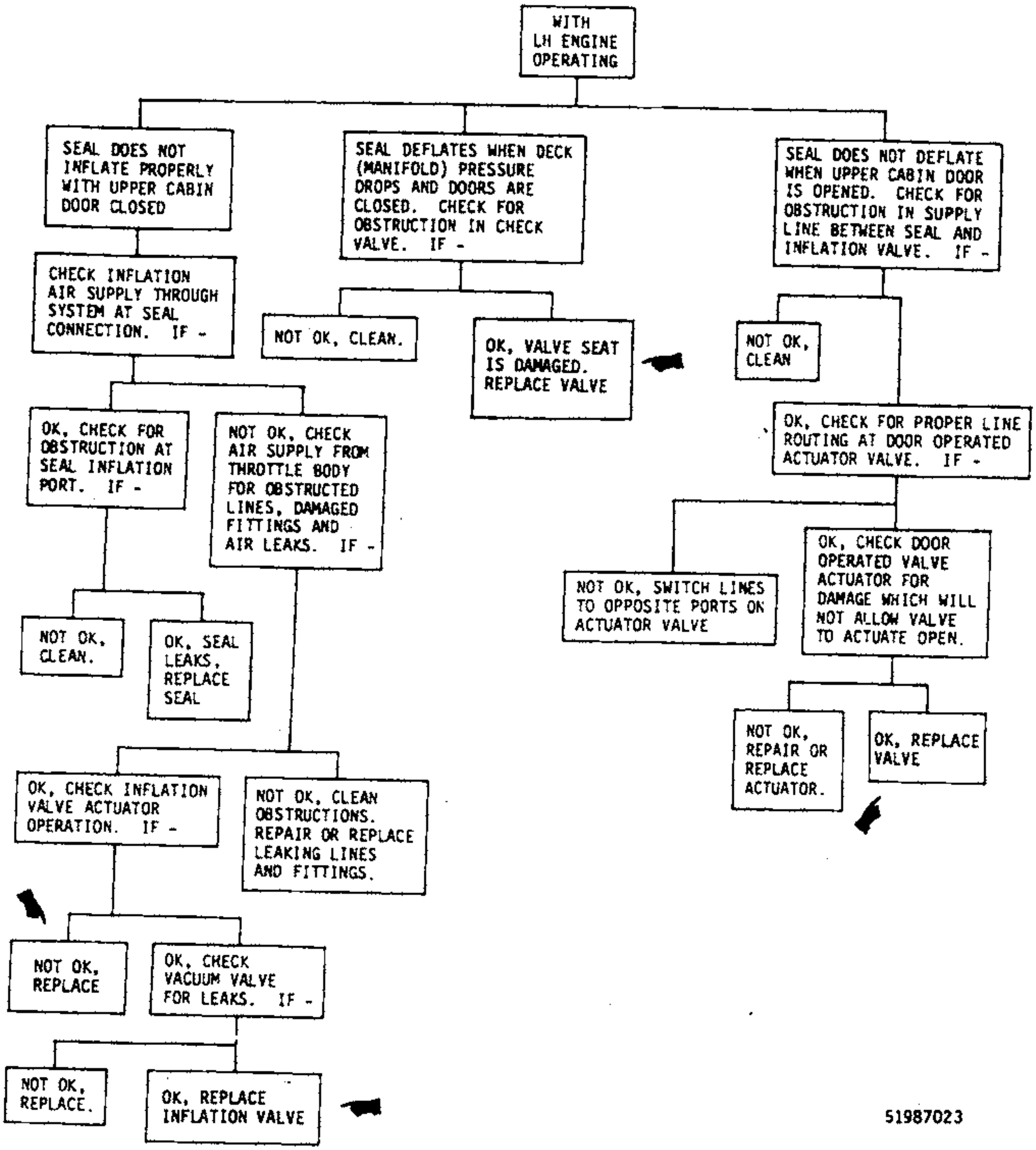
      (1) Using plastic or blunt pointed tools, carefully work seal into retainer.
      (2) Connect pressure line to seal with clamp.
      (3) Install access plates, carpets and upholstery removed to gain access.



Inflatable Cabin Door Seal
Figure 1



Cabin Door Leak Proofing.
Figure 2



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Troubleshooting Inflatable Door Seal System
Figure 3

FUSELAGE

Description

1. The fuselage is an all metal semimonocoque structure. The fuselage consists of: a nose section, center section (pressurized) and an aft section. The nose section contains the nose gear wheel well, avionics equipment compartment and the nose baggage compartment. The center section (cabin section) contains the flight and passenger compartment. The aft section (tailcone) contains flight control cables, emergency locator beacon and various optional components, such as yaw damper, autopilot actuators and etc.

2. Auxiliary structure consists of the avionics and baggage shelves, floorboards and the pedestal.

3. The fuselage exterior covering consists of aluminum alloy skin panels of various sizes. The panels are attached to frames, stringers and doublers with permanent fasteners.

4. Carry-thru spars are provided through the fuselage for the attachment of the wings. Fittings are provided in the fuselage for the attachment of doors, seats, brackets and supports. Most of these fittings are secured to the fuselage structure with permanent fasteners.

NOSE SECTION

Description

1. The nose section of the fuselage utilizes a nose cap or radome (optional) and provides storage space for the avionics equipment, baggage and nose gear. Doors and access panels provide entry into the different storage areas of the nose section.

Maintenance Practices

1. Removal/Installation Nose Cap (See Figure 1)

   A. Remove Nose Cap.

      (1) Remove screws and washers, securing nose cap to nose structure.
      (2) Move nose cap forward and disconnect the antenna lead to the glide slope antenna (optional) if installed.
      (3) Remove the nose cap.

   B. Install Nose Cap.

      (1) Position nose cap to nose structure.
      (2) If installed, connect glide slope antenna lead to glide slope antenna.
      (3) Secure the nose cap to nose structure, using screws and washers.

2. Removal/Installation Radome (Optional) (See Figure 1)

   A. Removal/Installation procedures for radome are the same as for standard nose cap.

   B. Refer to Chapter 15 for repairs of radome.

3. Removal/Installation Forward Baggage Shelf (Optional) (See Figure 1)

   A. Remove Forward Baggage Shelf.

      (1) Remove screws securing carpet and shelf to structure.
      (2) Remove shelf.

   B. Install Forward Baggage Shelf.

      (1) Install shelf and carpet in forward nose section.
      (2) Secure shelf and carpet with screws.

4. Removal/Installation Forward Baggage Retainer (Optional) (See Figure 1)

   A. Remove Forward Baggage Retainer.

      (1) Remove forward baggage shelf. Refer to Removal/Installation Forward Baggage Shelf.
      (2) Remove screws and washer securing baggage retainer to structure and remove retainer.

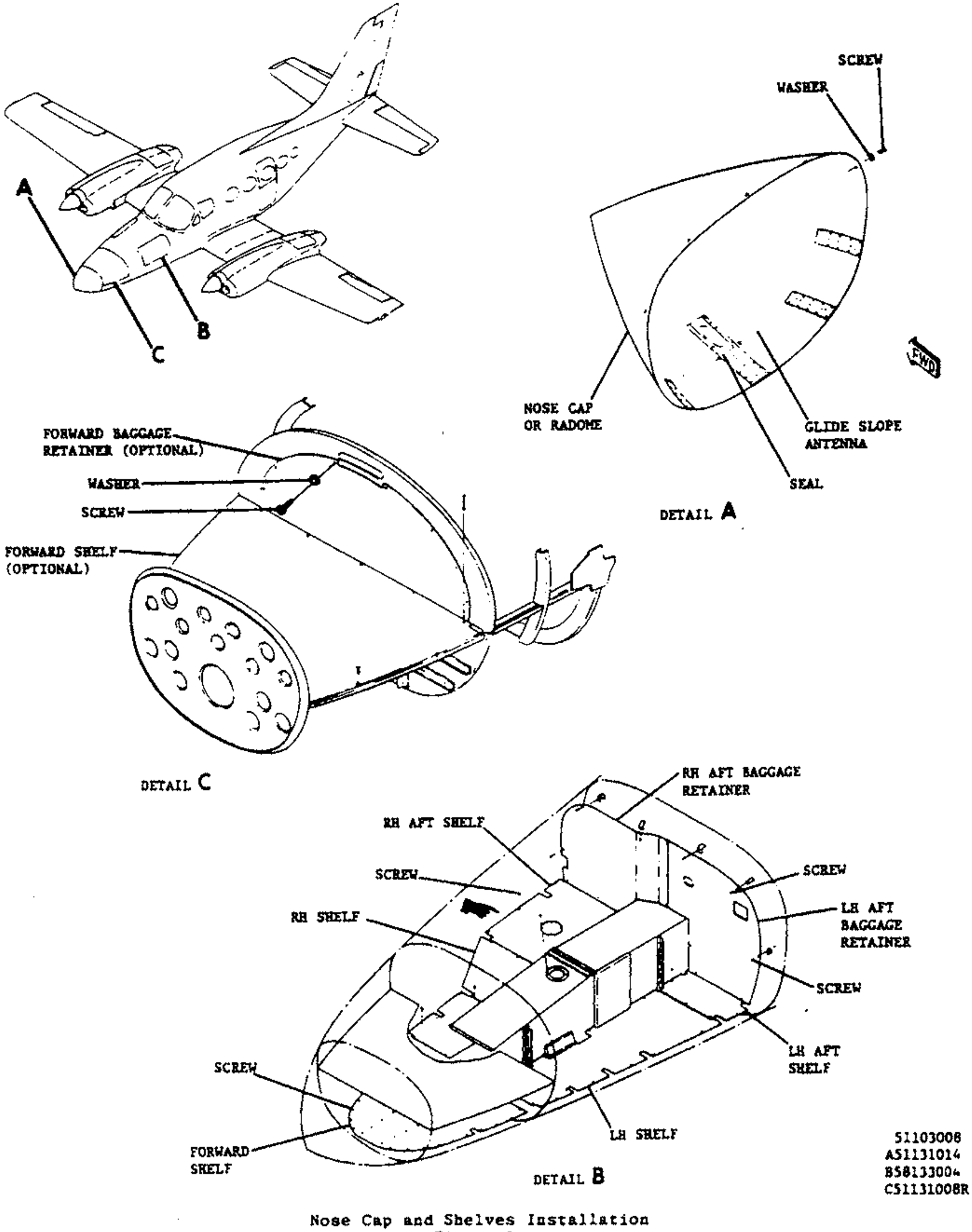
   B. Install Forward Baggage Retainer.

      (1) Install baggage retainer and secure to structure with washers and screws.
      (2) Install forward baggage shelf. Refer to Removal/Installation Forward Baggage Shelf.

5. Removal/Installation Aft Nose Baggage Shelves (See Figure 1)

   A. Remove Aft Nose Baggage Shelves.

      (1) Remove LH shelf and LH aft shelf by pulling carpet back and removing screws.
      (2) Remove RH shelves and RH aft shelf by pulling carpet back and removing screws.
      (3) Remove RH aft baggage retainer by removing screws.
      (4) Remove LH aft baggage retainer by removing screws.



Nose Cap and Shelves Installation
Figure 1

B. Install Aft Nose Baggage Shelves.

(1) Install LH aft baggage retainer to upper structure, using screws.
(2) Install RH aft baggage retainer to upper structure, using screws.
(3) Install RH shelves and RH aft shelf, using screws.
(4) Install LH shelf and LH aft shelf, using screws.
(5) Pull carpet into position and secure down.

CENTER SECTION

Description

1. The center section of the fuselage is pressurized and consists of: the forward pressure bulkhead, aft pressure bulkhead, flight and passenger compartment, floor panels and the pedestal.

2. The forward pressure bulkhead is located at the forward end of the flight compartment. The bulkhead consists of angles, beams, channels and web assembly.

3. The aft pressure bulkhead is located at the aft end of the passenger compartment. The bulkhead consists of angles, beams, channels and web. An access panel is utilized at the aft pressure bulkhead for entry into the tailcone.

4. The floor consists of panels of various lengths and widths. The floor panels are made of Goodyear Bondolite Material.

5. The pedestal is located at the forward end of the flight compartment between the crew seats. The pedestal contains the engine controls and the controls for the aileron, elevator and rudder trim systems.

Maintenance Practices

1. Removal/Installation Floor Panels (See Figure 1)

   A. Remove Floor Panels (Typical)

      NOTE: Any furnishings that prohibit or obstruct removal of, or are attached to the floor panels, must be removed, refer to Chapter 12.

      (1) Remove screws as required. Remove panel from supporting structure.

   B. Install Floor Panels (Typical).

      (1) Place floor panel in position, attach to supporting structure with screws.
      (2) Install furnishings removed to facilitate removal of floor panels, refer to Chapter 12.

2. Removal/Installation Pedestal (See Figure 2)

   NOTE: The control pedestal is riveted to the forward cabin bulkhead and should not be removed unless damaged.

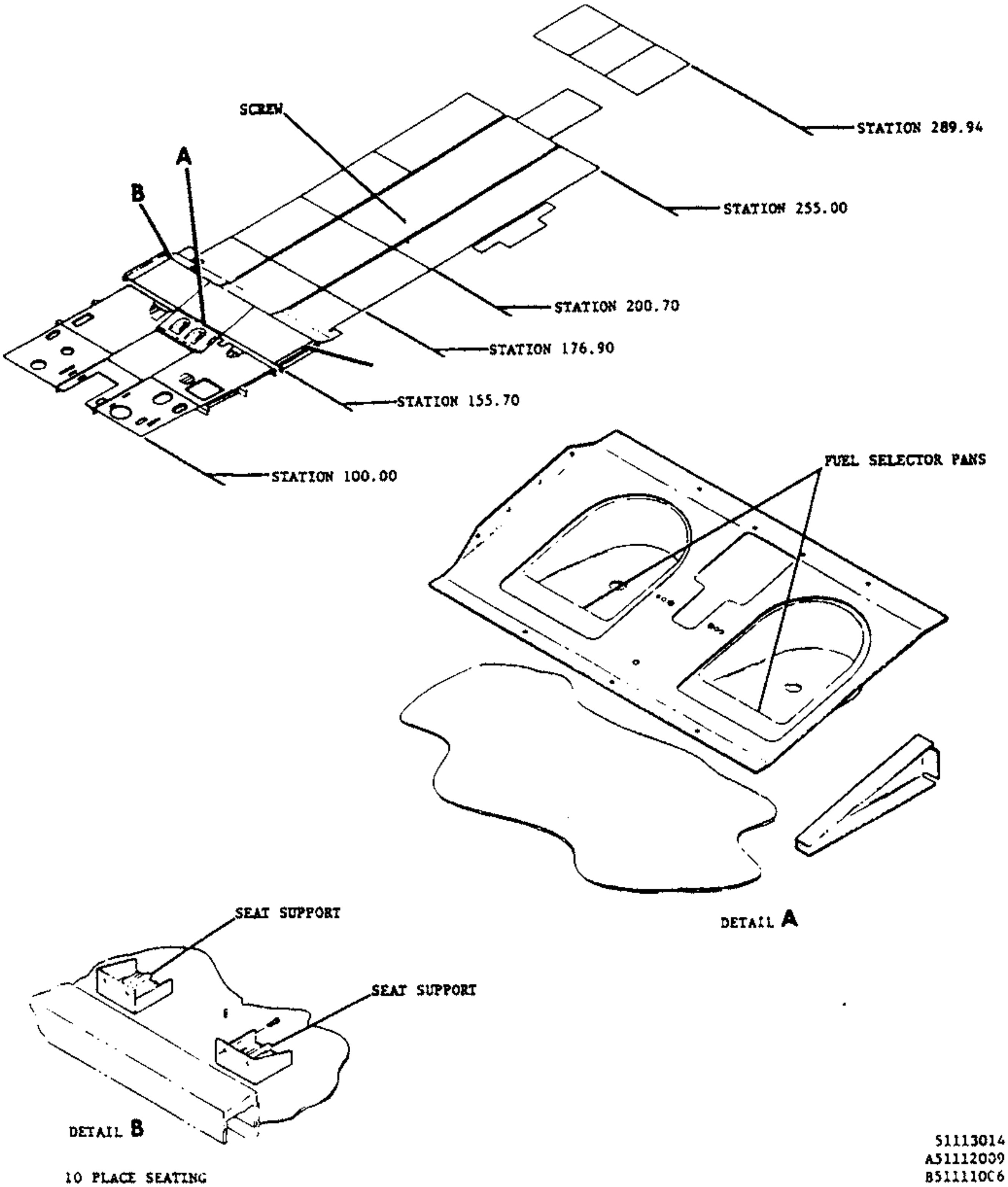
   A. Remove Pedestal.

      (1) Remove front seats, front carpet and kickplates, refer to Chapter 12.
      (2) Remove engine controls from pedestal, refer to Chapter 7.
      (3) Remove aileron, rudder and elevator trim controls from pedestal, refer to Chapter 5.
      (4) Remove bearing pad (15) by removing screws, securing bearing pad to pedestal.
      (5) Remove terminal blocks (4 and 13) and diode assembly (14).
      (6) Remove screws (12) securing pedestal to instrument panel.
      (7) Remove pedestal side panels by drilling out rivets at floor and forward cabin bulkhead. Drill out rivets securing side panels to bulkhead (2) and pulley bracket (3).

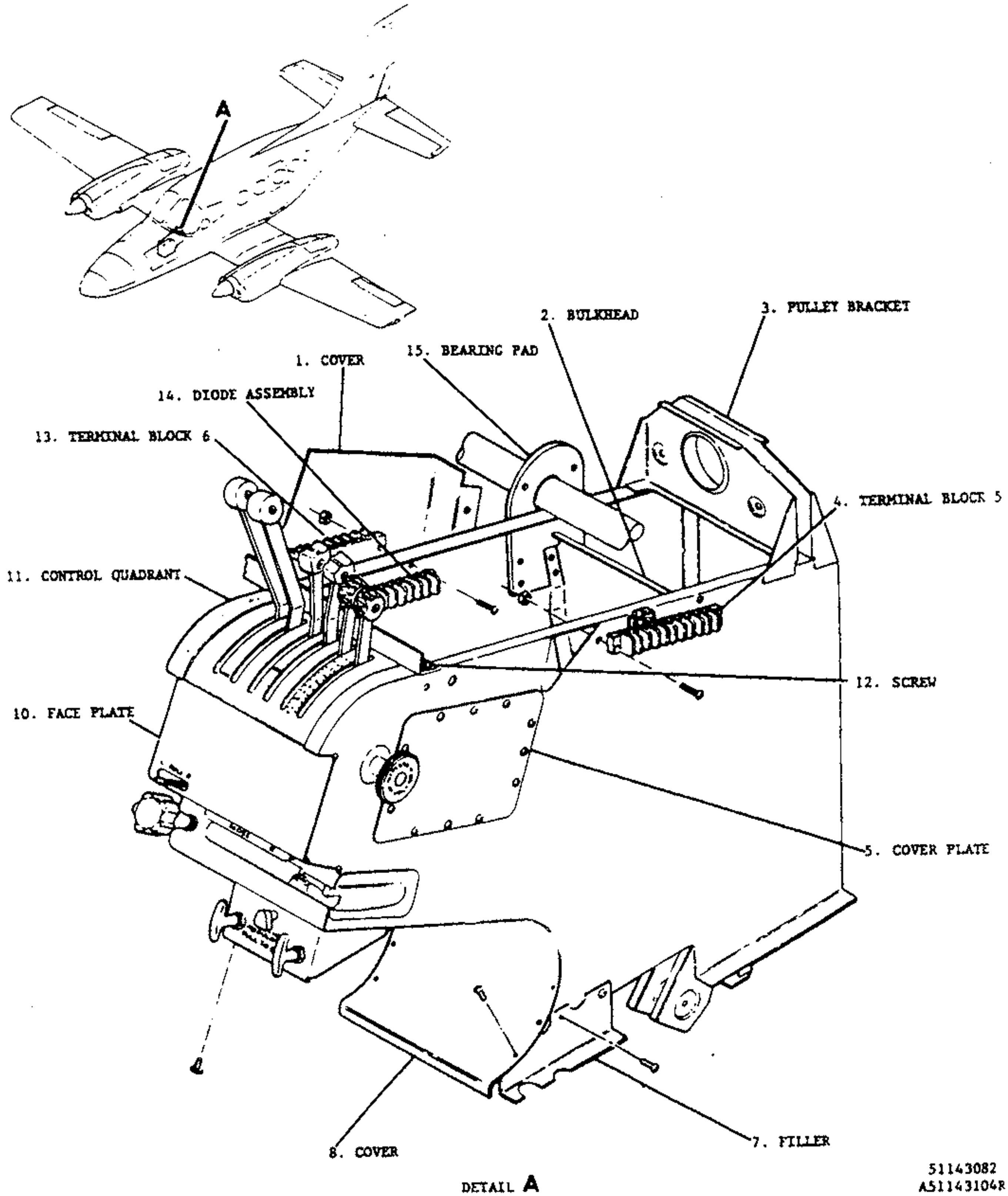
   B. Install Pedestal.

      NOTE: When assembling parts to forward cabin pressure bulkhead, be sure that parts are sealed, refer to Chapter 1.

      (1) Rivet pedestal side panels at floor and forward cabin bulkhead.
      (2) Secure pedestal to instrument panel with screws (12).



Floor Panel Installation
Figure 1



Pedestal Installation
Figure 2

(3) Install terminal blocks (4 and 13) and diode assembly (14).
(4) Install bearing pad (15) and secure to pedestal with screws.
(5) Install aileron, rudder and elevator trim controls in pedestal, refer to Chapter 5.
(6) Install engine controls, refer to Chapter 7.
(7) Install kickplates, front carpet and front seats, refer to Chapter 12.

AFT SECTION

Description

1. The tailcone of the fuselage consists of: stringers, bulkheads and skins. The dorsal fin is located on the top centerline of the tailcone section. The aft end of the dorsal fin attaches to the vertical stabilizer.

2. The tailcone structure incorporates provisions for attaching the vertical and horizontal stabilizers. Entrance to the tailcone is gained by removing the tailcone access panel. A small stinger assembly is attached to the aft end of the tailcone and access fairings are located just forward of the stinger.

Maintenance Practices

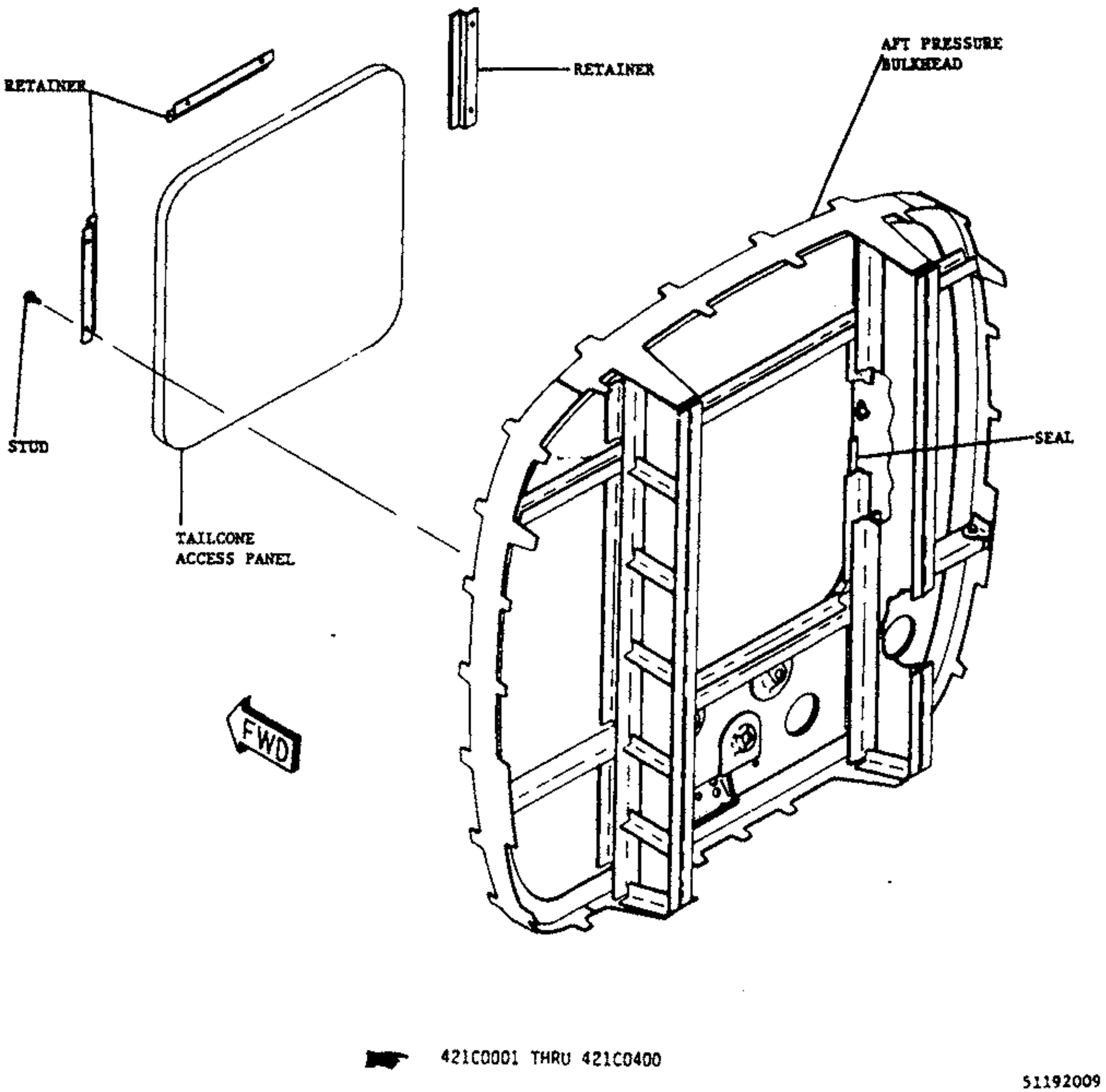
1. Removal/Installation Tailcone Access Panel (See Figure 1)

   A. Remove Tailcone Access Panel.

      (1) Loosen studs at retainers and remove retainers.
      (2) Remove tailcone access panel.

   B. Install Tailcone Access Panel.

      (1) Install tailcone access panel in aft pressure bulkhead.
      (2) Install retainers and secure with studs.



Tailcone Access Panel Installation
Figure 1

A. The windows consist of: left and right windshields, left and right foul weather windows and cockpit side windows, and left and right cabin windows. Each window is constructed of stretched acrylic plastic. The left windshield may be acrylic or glass.

B. Refer to paragraphs 2.B. and 2.C. for inspection criteria and allowable defect limits for acrylic windshields and windows. Defects beyond these limits will require window replacement.

C. See Acrylic Windows – Approved Repairs for repair of allowable defects.

2. **Inspection/Check** (Allowable Correction of Defects)

NOTE: The following materials or equivalent are required:

NAME	PART NUMBER	MANUFACTURER	USE
Optical Prism (Note 1)		Fabricate locally (Refer to Figure 2)	Optical Inspection of Windshield
Optical Prism (Note 1)	6580000-1 **NOTE:** The 6580000-1 Optical Prism will not look exactly like the prism illustrated in Figure 2	Cessna Aircraft Company Cessna Parts Distribution 5800 E. Pawnee P.O. Box 1521 Wichita, KS 67218	Optical Inspection of Windshield
Inspection Prism (Note 1)	AWR P-17 **NOTE:** The AWR P-17 Inspection Prism will not look exactly like the prism illustrated in Figure 2. The AWR P-17 Prism may not be suitable for the small curved surfaces of some windshields.	Aircraft Window Repairs Company 2207 Border Ave. Torrance, CA 90501	Optical Inspection of Windshield
Couplant (Note 2)	AC15892-0010 (Glycerol) (Refractive Index 1.47)	Fisher Scientific 200 Park Lane Pittsburgh, PA 15275-1126 www.fishersci.com	Coupling of Prism to Windshield and Windows
White Light Source		Commercially Available	Illumination of Inspection Area

NOTE 1: Only one of the listed prisms is required to perform the optical inspection of the windshield and windows. An equivalent prism may be used, if the prism provides a clear view of the fastener hole surfaces being inspected.

NOTE 2: An equivalent couplant may be used. However, the operator/inspector must make sure that the material will not be invasive or damaging to the window surface, painted surfaces, or airplane structure. For acrylic windshields and windows when more than one couplant is available, choose the couplant that has a refractive index nearest to 1.5.

A. Visual inspection of windows will locate most defects. Unnecessary replacements may be avoided if the cause of the defect can be eliminated, such as, improper cleaning or use of unapproved cleaning fluids.

B. Inspection Criteria Chart for Acrylic Non-Heated Windshields and Windows.

DEFECTS		WINDSHIELD AND CREW SIDE WINDOWS: Maximum Repairable	WINDSHIELD AND CREW SIDE WINDOWS: Maximum Permissible Without Repairing	CABIN SIDE WINDOWS: Maximum Repairable	CABIN SIDE WINDOWS: Maximum Permissible Without Repairing
Nicks And Dents	Maximum Diameter	Not Repairable	0.025 Inch	0.025 Inch	0.025 Inch
	Depth	Not Repairable	0.016 Inch	0.060 Inch	0.032 Inch
	Frequency	None	2 Per Square Foot	2 Per Square Foot	1 Per Square Foot
Scratches	Length	12 Inches Total Per Area	12 Inches Total Per Area	24 Inches Total Per Area	24 Inches Total Per Area
	Width	0.02 Inch	0.02 Inch	0.05 Inch	0.05 Inch
	Depth	0.016 Inch	0.008 Inch	0.008 Inch	0.008 Inch
	Frequency	12 Inches Total Per Area	12 Inches Total Per Area	20% of Total Area	Total length of scratches equals 3 times longest dimension of area.
Cracks	Length	Not Repairable	No cracks are allowed. Windshield or window must be replaced. (Refer to Warning and Note 1)	Not Repairable	Window must be replaced if any crack extends away from the window edge towards the viewing area.
	Frequency	Not Repairable	No cracks are allowed. Windshield or window must be replaced. (Refer to Warning and Note 1)	Not Repairable	Window must be replaced if five or more successive upper half or lower half attach holes have cracks or a total of eight or more attach holes have cracks.
Crazing		Not Repairable	Crazing adjacent to the edge of the windshield or window must not extend more than 1 inch into critical vision area.	Not Repairable	Crazing shall be contained within a 6 inch diameter circle.
Discoloration		Not Repairable	None	Not Repairable	May extend 1 inch from all edges of window.

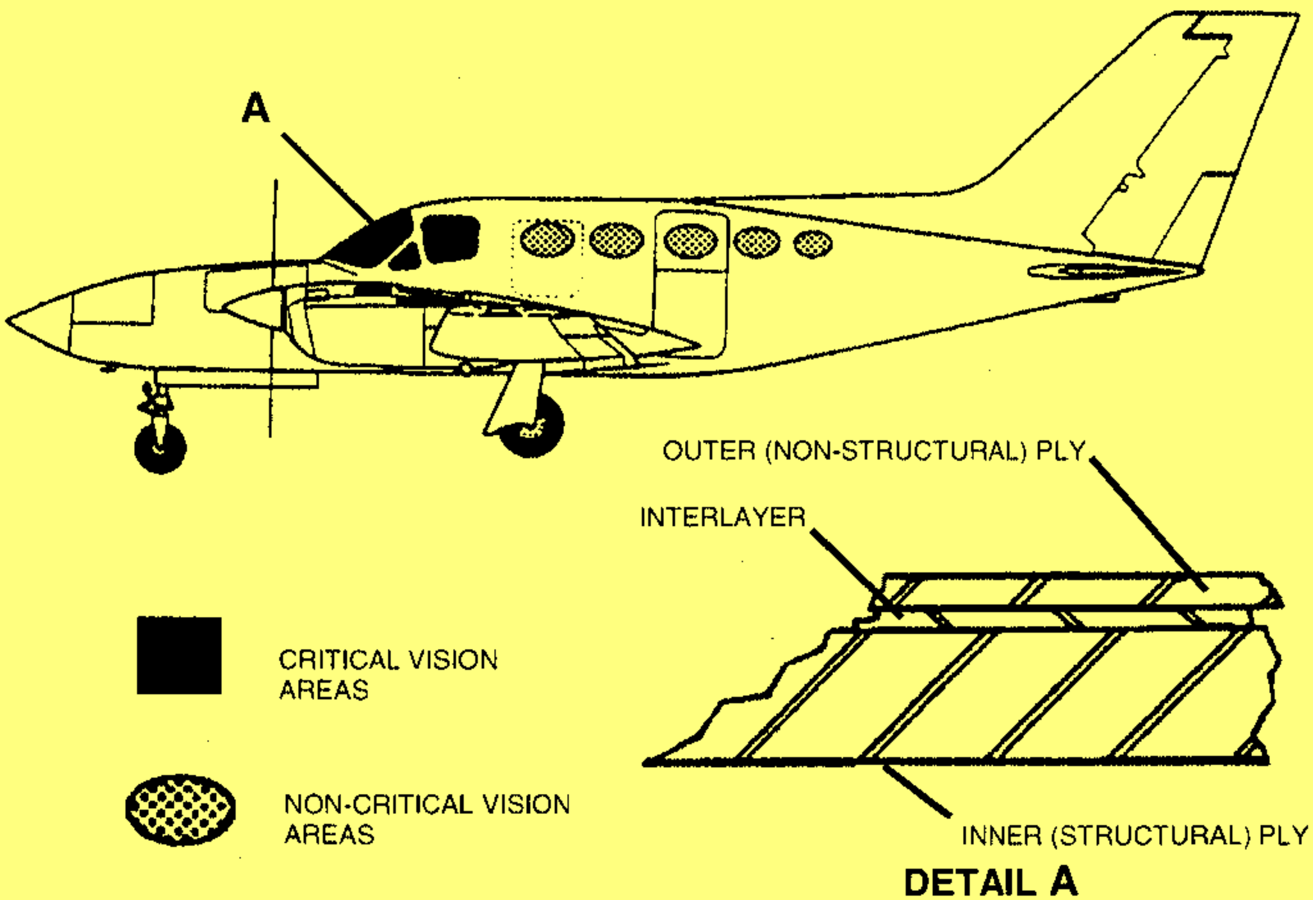
WARNING: DO NOT OPERATE THE AIRPLANE IN A PRESSURIZED MODE IF A WINDSHIELD OR WINDOW REQUIRES REPLACEMENT. WINDSHIELD OR WINDOW FAILURE AND SUDDEN CABIN DECOMPRESSION CAN OCCUR IF THE AIRPLANE IS OPERATED IN A PRESSURIZED MODE WITH A WINDSHIELD OR WINDOW THAT REQUIRES REPLACEMENT AS SPECIFIED BY THIS CHART.

NOTE 1: If a replacement windshield or window is not available, the airplane may be operated in an unpressurized mode until replacement of the affected windshield or window can be made.

NOTE: CRACKS OR CRAZING ARE ALLOWED ONLY WHEN IT IS CONFIRMED THAT THEY ARE IN THE OUTER NON-STRUCTURAL ACRYLIC PLY WHICH, EVEN IF CRACKED, WILL NOT IMPAIR THE STRUCTURAL INTEGRITY OF THE WINDSHIELD.

LEFT WINDOWS/TYPICAL FOR RIGHT WINDOWS.

RIGHT WINDSHIELD AND NON-HEATED ACRYLIC LEFT WINDSHIELD DO NOT HAVE AN OUTER NON-STRUCTURAL PLY.



Acrylic Electric Heated Windshield

Windows and Windshield Installation
Figure 1

C. Inspection Criteria For Electric Heated Acrylic Windshields.

(1) On acrylic electric heated windshields, cracks or crazing is allowed only when it is confirmed that the defect is in the outer non-structural acrylic ply, which even if it is cracked, will not impair the structural integrity of the windshield (Figure 1). Limitations that will require replacement of the windshield are the following:

(a) Crack(s) or crazing in the non-structural acrylic ply distorts the field of vision to the point that safety of flight may be impaired.

(b) Cracks exceeding one inch in length in the non-structural acrylic ply and not located under the windshield retainer.

(c) The windshield will not heat properly.

NOTE: Cracks in the outer ply can be determined by visually examining the crack from an angle to gauge its depth and by feeling for the crack edges on the outer surface of the windshield.

(2) On acrylic electric heated windshields, structural acrylic ply, the following defects will require replacement of the windshield:

(a) Crack(s).

(b) Crazing and chips in critical vision area.

(c) Scratches, nicks and dents in the critical vision area, obstructing or distorting vision.

(d) Delamination.

D. Optical Prism Inspection for Acrylic Heated and Non-Heated Windshields and Windows.

NOTE: The optical prism inspection method is the preferred method to inspect the area around the acrylic windshield and window fastener holes. If a clear view of a windshield fastener hole cannot be obtained by using a prism, removal of the windshield retainer will be required to complete this inspection.

(1) This optical inspection procedure can detect voids and cracks in the area of the fastener holes of the acrylic windows without removing the edge retainers and their associated fasteners.

(2) Using aliphatic naphtha followed by a diluted solution of liquid soap and water, thoroughly clean dust and foreign material from the window within 6 to 8 inches from the fastener holes to be inspected.

(3) Get a prism. The prism may be purchased or refer to Figure 2 for details to fabricate the required prism.

(4) Apply couplant to face of prism and area of window to be inspected (Refer to Figure 3).

NOTE: Inspections are accomplished from the outside surface of the windows.

(5) Couple the prism to the window per Figure 3, and with the light source (brightness sufficient to illuminate the fastener holes) at an angle of 30 to 60 degrees from the vertical of the prism, illuminate and inspect the fastener holes (Refer to Figure 5).

NOTE: In order to get a clear view of both the top and bottom surfaces of the fastener hole, it may be necessary to slide the prism toward and away from the fastener being inspected.

(a) The image presented of an undamaged hole will appear as a frosty cylinder.

(b) The image of a fastener hole with a crack extending from one surface of the material under inspection into the hole will appear as a frosty or reflective ear or projection extending from the fastener hole as in View A-A of Figure 4.

(c) The image of a crack which has progressed from one fastener hole to another hole to another will appear as a frosty irregular surface. View B-B of Figure 4 illustrates a crack from hole to hole.

(d) If a clear view of a windshield fastener hole cannot be obtained by using a prism, removal of the windshield retainer will be required to complete this inspection.

(6) After the inspection is complete, remove immersion oil from the window using aliphatic naphtha followed by a diluted solution of soap and water.

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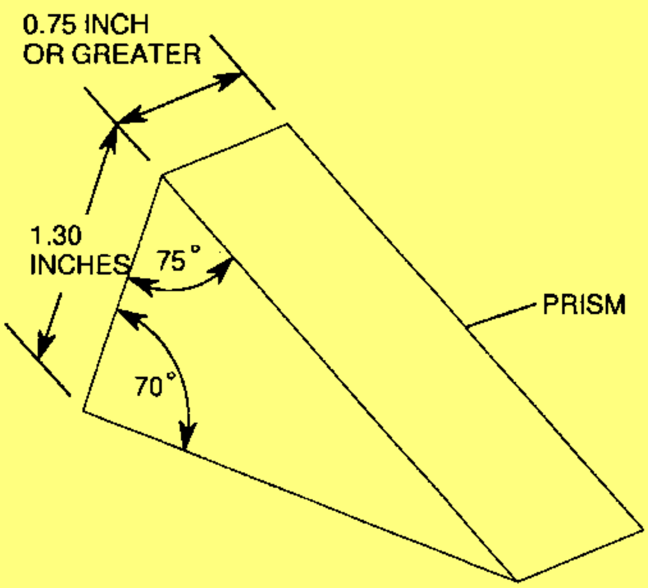

FABRICATE PRISM FROM TYPE II UVA ACRYLIC,
MIL-P-5425D, 0.75 INCH MINIMUM THICKNESS

Fabrication of 70 Degree Optical Prism
Figure 2 (Sheet 1)

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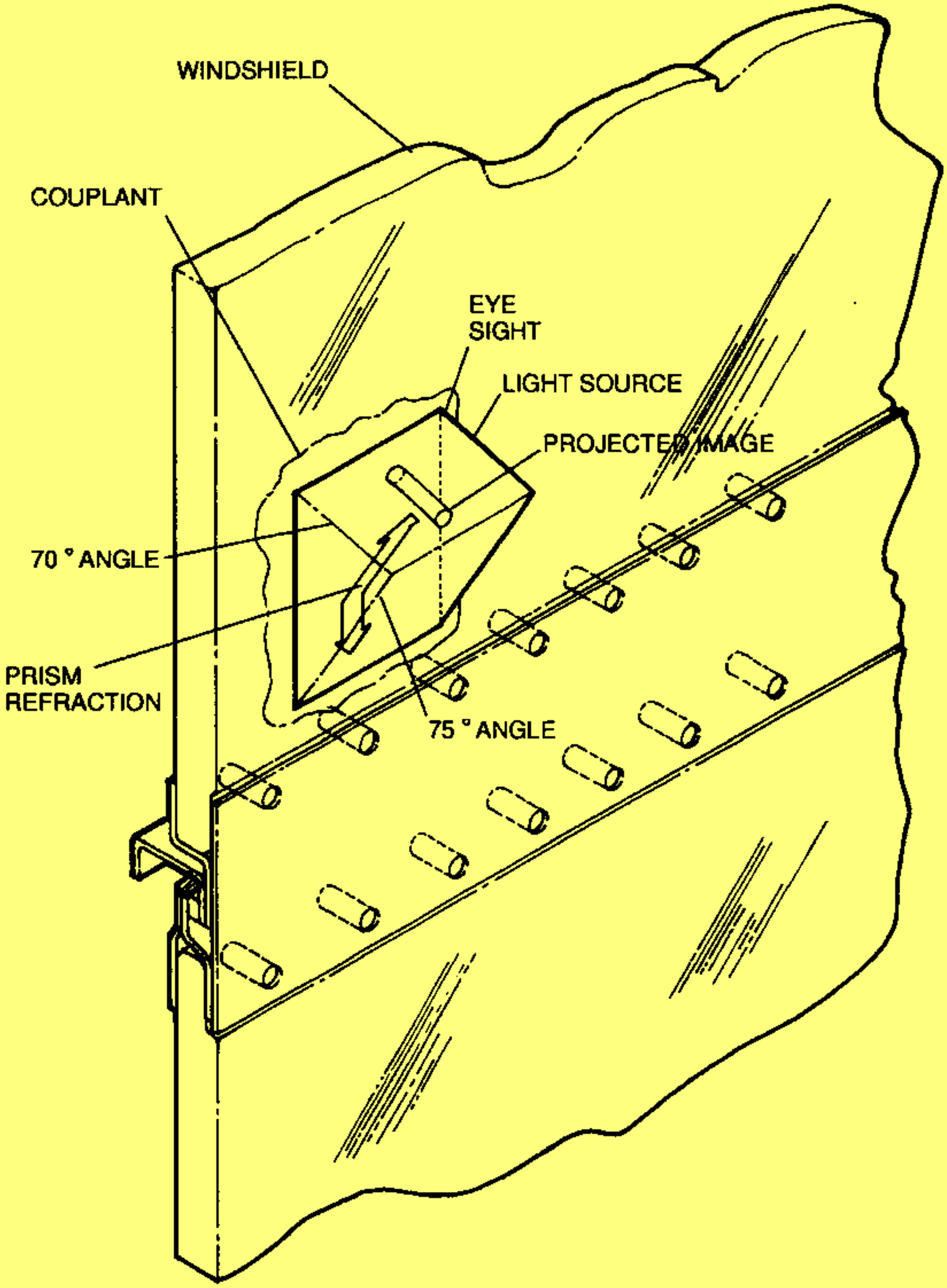
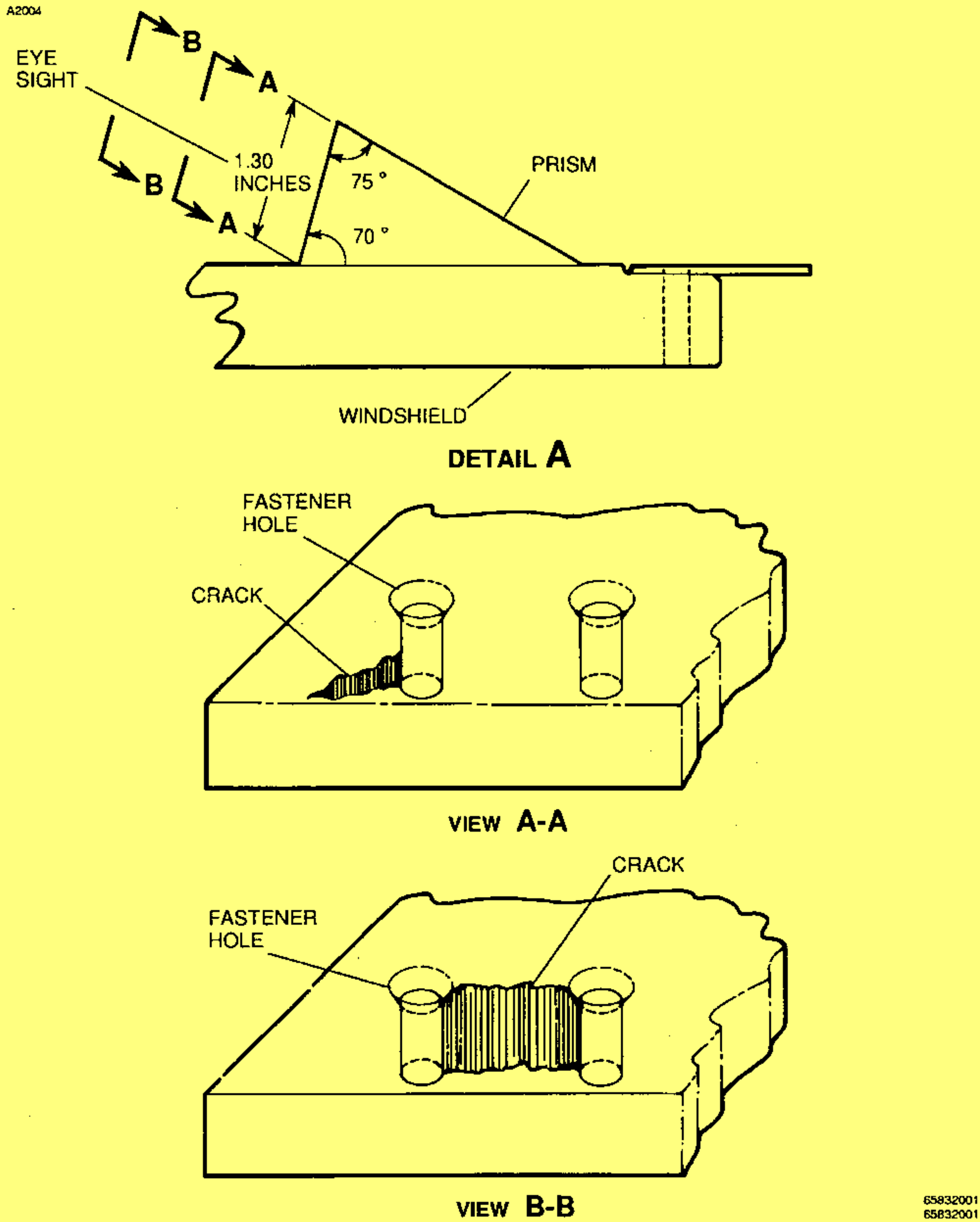


Optical Inspection Using 70 Degree Prism
Figure 3 (Sheet 1)



Crack Images Using 70 Degree Prism
Figure 4 (Sheet 1)

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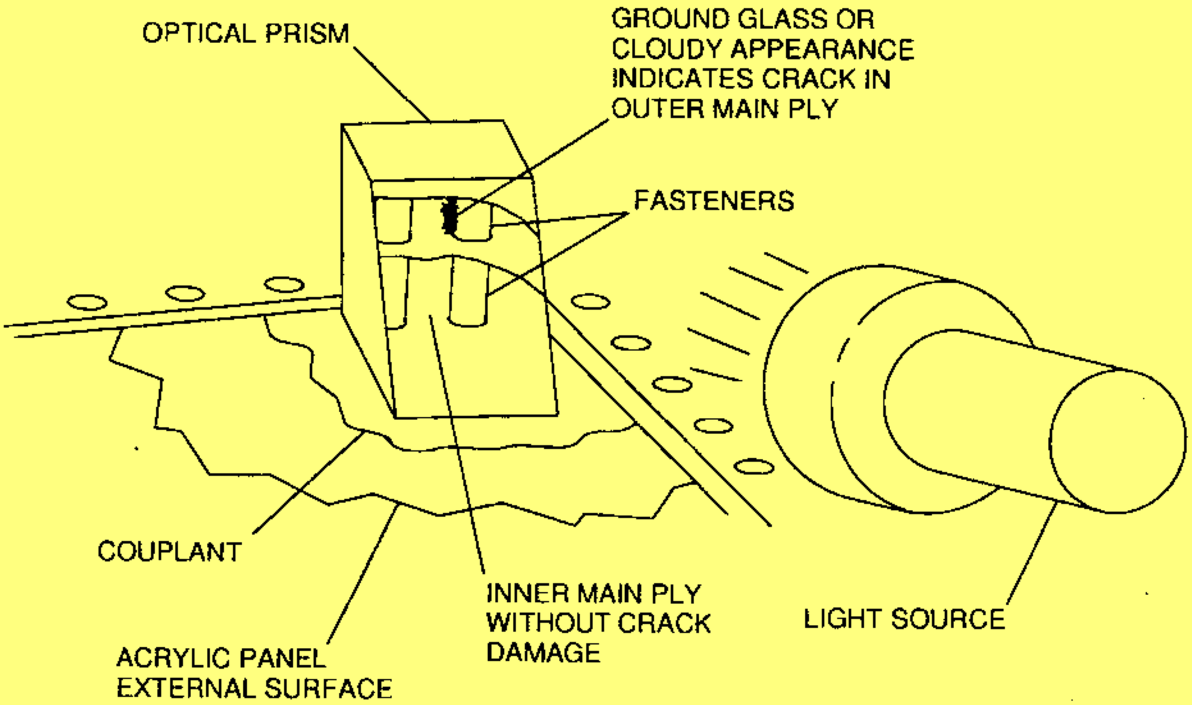

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Prism Light Source Using AWR P-17 Prism
Figure 5 (Sheet 1)

E. Inspection Of Glass Windshields.

(1) Limitations that will require replacement of the windshield are the following:

(a) If any ply of the windshield has a crack or nick.

(b) If the windshield is delaminated in excess of 2.0 inches from the edge of the glass.

(c) When the windshield will not heat properly.

3. Windows - Cleaning/Painting.

A. The surface hardness of acrylic is approximately equal to that of copper or brass. Care must be exercised to avoid scratches and gouges which may be caused by dirty, hard or rough cloth used for cleaning.

B. Tools and Equipment.

NOTE: The following materials or equivalent are required.

Name	Part Number	Manufacturer	Use
Mild soap or detergent (without abrasives)		Commercially available	Clean windshields and windows.
Aliphatic naphtha Type II	TT-N-95	Commercially available	Removing deposits which cannot be removed with mild soap solution on acrylic windshields and windows.
Polishing wax: (Refer to Note 1)			Waxing acrylic windshields and windows.
Turtle Wax (paste) (Refer to Note 1)		Turtle Wax, Inc. 5655 W. 73rd Street Chicago, IL 60638	
Great Reflections Paste Wax (Refer to Note 1)		E.I. du Pont de Nemours and Co. (Inc.) Wilmington, DE 19809	
Acrylic Polish (Refer to Note 1)	P-P-560	Commercially available	Cleaning and polishing acrylic windshields and windows.
Permatex Plastic Cleaner (Refer to Note 1)	403D	Permatex Company, Inc. Solon Distribution Center 6875 Parkland Blvd. Solon OH, 44139 www.permatex.com	Cleaning and polishing acrylic windshields and windows.
Cotton flannel or cotton terry cloth material		Commercially available	Applying and removing wax and polish.

Name	Part Number	Manufacturer	Use
Rain repellent: (Refer to Note 2)			Optional for rain shedding on glass windshields only.
REPCON Rain-X (Refer to Note 2)		UNELKO Corporation 14641 N 74th St Scottsdale, AZ 85260	

NOTE 1: These are the only polishing waxes tested and approved for use by Cessna Aircraft Company.

NOTE 2: For glass windshields only, this is the only rain repellent approved for use by Cessna Aircraft Company.

C. Cleaning Instruction.

CAUTION: WINDSHIELDS AND WINDOWS (ACRYLIC FACED OR GLASS FACED) ARE EASILY DAMAGED BY IMPROPER HANDLING AND CLEANING TECHNIQUES.

(1) Place airplane inside hanger or in shaded area and allow to cool from heat of sun's direct rays.

(2) Use clean (preferably running) water to flood the surface. Use bare hands with no jewelry to feel and dislodge any dirt or abrasive materials.

(3) Using a mild soap or detergent (such as a dishwashing liquid) in water, wash the surface. Use only the bare hand to provide rubbing force. A clean cloth may be used to transfer the soap solution to the surface, but extreme care must be exercised to prevent scratching the surface.

(4) On acrylic windshields and windows only, if soils which cannot be removed by a mild detergent remain, Type II aliphatic naphtha applied with a soft clean cloth may be used as a cleaning solvent. Be sure to frequently refold the cloth to avoid depositing soil and/or scratching windshields with any abrasive particles. DO NOT USE aliphatic naphtha on glass windshields.

(5) Rinse surface thoroughly with clean fresh water and dry with a clean cloth.

CAUTION: DO NOT USE ANY OF THE FOLLOWING ON OR NEAR THE WINDSHIELD OR WINDOWS. THE VAPORS FROM THESE CHEMICALS, AS WELL AS THE CHEMICALS, COULD DAMAGE THE WINDSHIELD OR WINDOWS: METHANOL, DENATURED ALCOHOL, GASOLINE, BENZENE, XYLENE, METHYL N-PROPYL KETONE ACETONE, CARBON TETRACHLORIDE, LACQUER THINNERS, COMMERCIAL OR HOUSEHOLD WINDOW CLEANING SPRAYS. ADDITIONALLY, STRONG ACIDS OR BASES MAY DESTROY ANTISTATIC COATINGS ON GLASS WINDSHIELDS. WHEN IN DOUBT, DO NOT USE. NEVER USE AN ABRASIVE CLEANER, WAX, OR POLISH ON GLASS WINDSHIELDS.

(6) Hard polishing wax should be applied to acrylic surfaces. (The wax has an index of refraction nearly the same as transparent acrylic and will tend to mask any shallow scratches on the windshield surface).

(7) Acrylic surfaces may be polished using a polish meeting Federal Specification P-P-560 applied per the manufacturer's instructions.

NOTE: When applying and removing wax and polish, use a clean soft cloth.

(8) Glass windshields may have rain repellent applied per the manufacturer's instructions. Caution should be used to not get rain repellent on painted surfaces surrounding the glass windshield. DO NOT USE rain repellent on acrylic surfaces.

D. Window and Windshield Preventive Maintenance.

NOTE: Utilization of the following techniques will help minimize windshield and window crazing.

(1) Keep all surfaces of windshields and windows clean.

(2) If desired, wax acrylic surfaces.

(3) Do not park or store airplane where it might be subjected to direct contact with or vapors from: methanol, denatured alcohol, gasoline, benzene, xylene, Methyl n-Propyl Ketone, acetone, carbon tetrachloride, lacquer thinners, commercial or household window cleaning sprays, paint strippers, or other types of solvents.

(4) Do not use solar screens or shields installed on inside of airplane or leave sun visors up against windshield. The reflected heat from these items causes elevated temperatures which accelerate crazing and may cause formation of bubbles in the inner ply of multiple ply windshields.

4. Acrylic Windows - Approved Repairs

CAUTION: DO NOT ATTEMPT TO REPAIR SCRATCHES IN THE ELECTRIC ANTI-ICE WINDSHIELD. ANY SANDING OR POLISHING WILL DAMAGE THE ANTI-STATIC WIRES DUE TO THEIR LOCATION IN PROXIMITY TO THE SURFACE. WAXING IS THE ONLY APPROVED MAINTENANCE PROCEDURE FOR ELECTRICALLY HEATED WINDSHIELDS.

A. Refer to Inspection/Check, Acrylic Window Inspection Criteria for allowable defects. Repairable defects after repair are considered permanent repairs. "Not repairable" defects may be repaired and/or used only as a temporary repair.

CAUTION: IF TEMPORARY REPAIRS ARE MADE, AIRPLANE MUST BE OPERATED IN UNPRESSURIZED MODE UNTIL REPLACEMENT CAN BE MADE.

B. Rework of acrylic windows is permissible (except for electric heated windshield). The approved repair instructions apply to repair of small scratches only. For temporary repair of window panel cracks, refer to Chapter 15.

(1) Areas with small scratches may be polished to remove scratches. (Except Electric Anti-Ice windshield.)

(a) Clean area to be polished, refer to Cleaning.
(b) Polish with an approved compound and soft cloth.
(c) Clean and wax polished area.

C. All scratches, gouges, nicks, etc., exceeding 0.003 inch depth and those less than 0.003 inch depth but having sharp enough edges to cause hanging of the fingernail should be locally rounded out or buffed. Complete blending may be accomplished in the optical area of flight compartment windows in lieu of localized buffing if such rework will improve vision.

(1) Clean area to be repaired, refer to Cleaning.

(2) Wrap 400A wet or dry abrasive paper around a smooth rubber or wooden block, and using generous amounts of water, lightly sand over and around the imperfection in a circular motion. An area having a diameter equal to two or three times the scratch or defect length should be sanded where optical distortion is to be minimized. Continue sanding only until the initial scratch or defect is no longer apparent. Thoroughly wash or flush the area with water.

(3) Using 600A wet or dry abrasive paper, repeat step (2). Continue sanding only until the hairline scratches caused by the coarse sanding are no longer apparent. Sand a larger area than that covered by the original sanding operation. Thoroughly wash and dry the rework area.

(4) Apply buffing compound to the rework area of the acrylic or to the buffing wheel. Using a buffer with a speed of 1300 feet-per-minute or less, keep the buffing wheel moving across the rework area changing direction often, using light pressure and maintaining a back and forth motion 90 degrees to wheel rotation. Buff a larger area than that covered by the final sanding. Buff until the reworked surface regains its original luster.

D. Tools and Equipment.

NOTE: The following tools and materials are required (or equivalent).

BUFFING COMPOUNDS

Name	Part Number	Manufacturer
Learok	765	Jackson Lea Company 121 Mattituck Heights Rd. Waterbury, Connecticut 06705 www.jacksonlea.com

POLISHES AND CLEANERS

Name	Part Number	Manufacturer
Novus Plastic Polish	No. 1 And No. 2	Novus Inc 10425 Hampshire Ave. S Minneapolis, MN 55438 www.novuspolish.com
Permatex Plastic Cleaner	403D	Permatex Company, Inc. Solon Distribution Center 6875 Parkland Blvd. Solon, OH 44139 www.permatex.com
Mirror Glaze Clear Plastic Polish	M-1008	Meguiars 3258 Ezel Pike Nashville, TN 37211 www.meguiars.com

ABRASIVE PAPERS

Name	Part Number	Manufacturer
320 to 600A Grit Wet or Dry Type Sandpaper or Cloth		Commercially Available
Scratch Removal Kit	AC74	Micro-Surface Finishing Products P.O. Box 456 Wilton, IA 52778 www.micro-finish.com

PROTECTIVE COATINGS

Name	Part Number	Manufacturer
Spraylat A		Spraylat Corporation
Spraylat (White)	5C-1058	730 S. Columbus Ave.
Spraylat (Black)	SC-1072	Mount Vernon, New York 10550
Scotch Brand No-Mar Protective Tape		Minnesota Mining & Mfg. Co. St. Paul, Minnesota

POLISHING CLOTHS

Name	Part Number	Manufacturer
Chamois Skins or Diaper Type Cloths		Commercially Available
Rymplecloth	301	Kendall Company Textile Division 111 West 40th Street New York, New York

EQUIPMENT

Name	Part Number	Manufacturer
Buffing Wheel - Unstitched Canton Flannel, 6-inch Diameter x 20 Ply		Commercially Available

WINDSHIELD

Description

1. The windshield is a two piece stretched acrylic plastic section. It is secured to the fuselage by screw fastened retainers. The retainers and screws are sealed upon installation to adequately maintain pressurization capabilities of the cabin section.

   The DC Electric Windshield is sensitive to abrasives and solvents. Special care must be exercised whenever the windshield is in the vicinity of solvent fumes, paint fumes and conditions causing abrasive materials blasts. If the windshield will be exposed to these conditions, it should be covered with the polyethurene vapor barrier coating.

Maintenance Practices

1. Tools and Equipment.

NOTE

The following equipment and material or equivalent is required.

Name	Number	Manufacture	Use
		CLEANING SOLVENT	
Aliphatic Naphtha	TT-N-95	Commercially Available	To clean windows.
Methyl n-Propyl Ketone	CAS No. 107-87-9	Commercially Available	To clean metal surfaces.
		SEALANT	
Sealant Type I, Class B-2	Pro-Seal 890	Coast Pro-Seal Division Essex Chemical Corp. 19451 Susanna Rd. Compton, CA 90221	Seal between windows, frame and retainer.
Sealant Type I, Class B-2	EC-1675	Minnesota Mining & Mfg. Co. St. Paul, MN 55101	Seal between windows, frame and retainers.
		PROTECTIVE COATING	
Spraylat A Spraylat (White) Spraylat (Black)	SC-1058 SC-1058 SC-1072	Spraylat Corporation 717-T C. Columbus Ave. Mt. Vernon, NY 10550	To protect window panes.
Scotch Brand No-Mar Protective Tape		Minnesota Mining & Mfg. Co. St. Paul, MN 55101	To protect window panes.
		SEALANT REMOVER	
Fine Wire Wheel	4" Diameter	Commercially Available	To remove sealant from window and metal surfaces.
Scotch Brite General Purpose Wheel	61-8614-5506-3	Minnesota Mining & Mfg, Co. St. Paul, MN 55101	To remove sealant from window and metal Surfaces.

Name	Number	Manufacturer	Use
		MATERIAL	
Rymplecloth	301	Kendall Textile Co. 111 W. 40th St. New York, NY 10018	To clean window and metal surfaces.
Polyethylene Vapor Barrier	HG1032CL	Tackmer Co. 4525-T E. Ramon Rd. Palm Springs, CA 92262	Vapor barrier coating.
Polyethylene Vapor Barrier	5XN-Poly-Spot Stick	St. Regis 156 Oak St. Newon, MA 02164	Vapor barrier coating.
Acrylic* Plug	5191602-2	Cessna Aircraft Co. Wichita, KS 67277	To plug misaligned holes in windshield.
Adhesive	495	Loctite Corp. 705 N. Mountain Rd. Newington, CT 06111	To install acrylic plug in windshield.
Hexcel** Fiberglass	F-185-1581-38	Cessna Aircraft Co. Wichita, KS 67277	To plug misaligned holes in glass heated windshield.
Adhesive	EA9309	Excer Corp. Hysol Division 15051 E. Pon Julian Rd. Industry, CA 91749	To install plug in glass heated windshield.
Parting Agent	Any good grade of automotive paste wax	Commercially available	To prevent sealant adhering to retainers and windshield.
Rotary File, Fine Tooth (0.25 Diameter)	B3P-M	Nicholson P.O. Box 728 Apex, NC 27502	To elongate holes in windshield and crack removal.
Counterbore (0.3125 Diameter)	883 or 884	Cleveland Corp. 1242 East 49th St. Cleveland, OH 44114	To enlarge pilot holes.

*As required, one per hole.
**Six inches by 38 inches of fiberglass will plug approximately 16 holes.

CAUTION: DURING STORAGE AND/OR TRANSIT, WINDSHIELDS MUST BE PLACED ON END TO PREVENT CONTOUR CHANGES WHICH WILL AFFECT INSTALLATION.

2. Removal/Installation of Windshield (Refer to Figure 1).

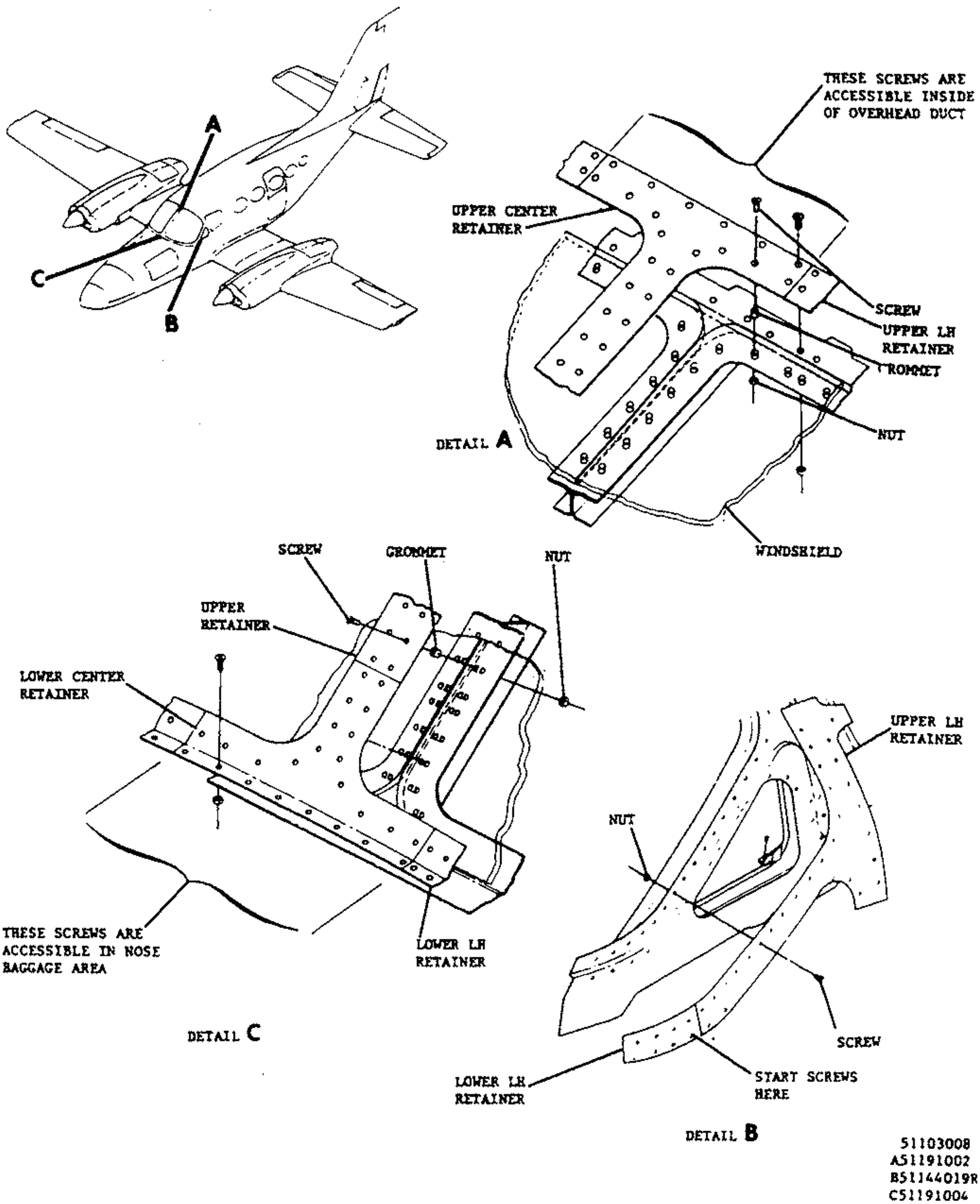
NOTE: When windshield replacement is required due to high time inspection requirements, all sealant must be removed to facilitate inspection of windshield frame.

NOTE: These procedures pertain to installation of left windshield P/N 5111604-201, right windshield P/N 5111604-200 and electric (heated) windshield P/N 9910214-200 and DC electric (heated) windshield P/N 9910460-240.

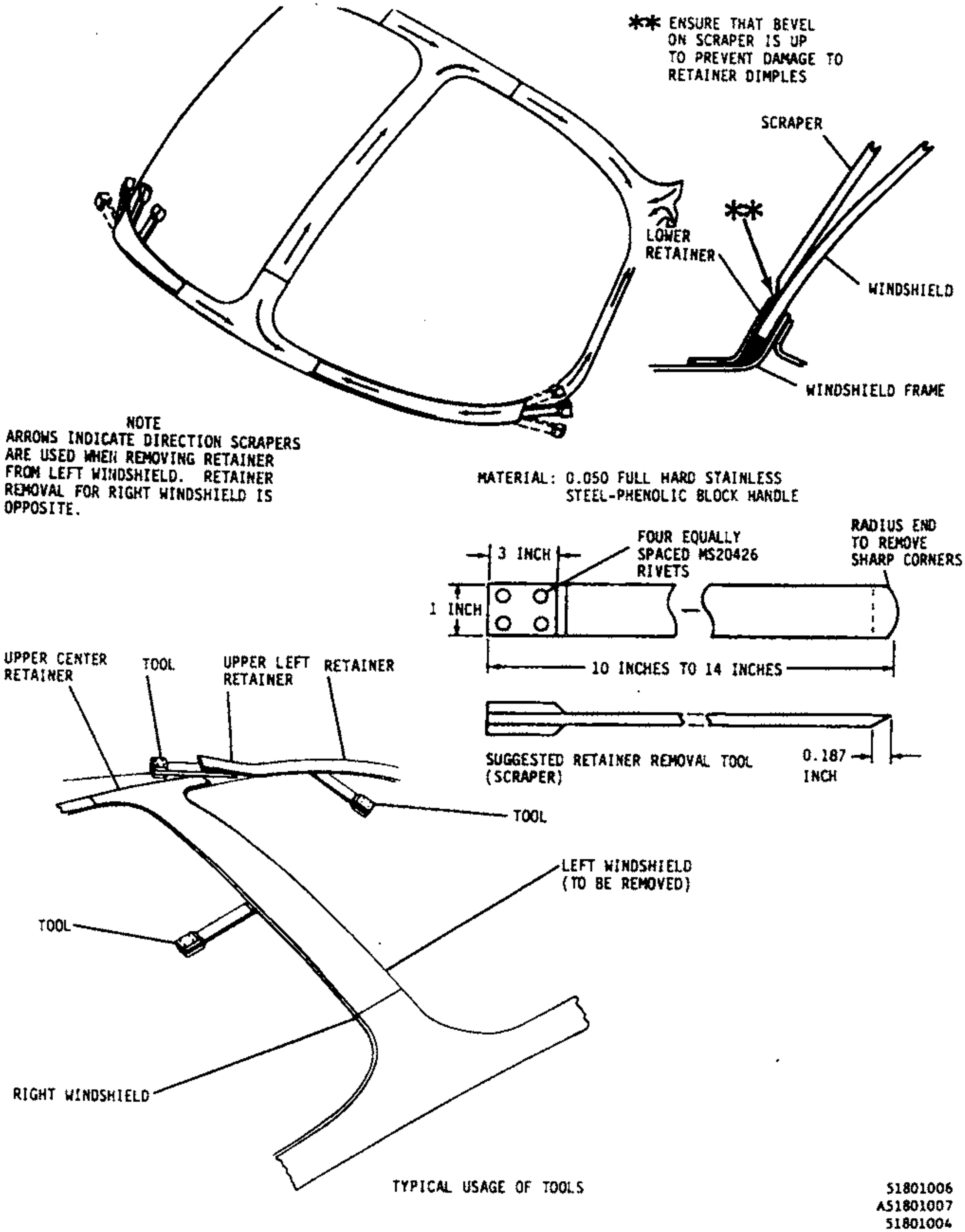
CAUTION: EXTRA PRECATIONS MUST BE EXERCISED IN HANDLING AND INSTALLING THE DC ELECTRIC WINDSHIELD TO ENSURE PRESERVATION OF SURFACE QUALITY AND PREVENT DAMAGE. BE FAMILIAR WITH REMOVAL AND INSTALLATION INSTRUCTIONS BEFORE STARTING PROCEDURES.

NOTE: The following procedures are given for the removal of the left windshield. The right windshield is removed in the same manner.

NOTE: If windshield is being reinstalled it is advisable to use protective covering over the entire windshield to ensure preservation.



Windshield Removal/Installation
Figure 1



Windshield Retainer Removal
Figure 2

A. Remove Windshield.

(1) Remove glare shield.
(2) Remove screws securing pilots instrument panel and pull panel aft to gain access to windshield retaining nuts. Do not disconnect any instruments or controls.
(3) Remove overhead console cover by removing oxygen outlet and fresh air wemacs. Remove nuts and washers securing microphone jacks to cover.
(4) Disconnect electrical wires from compass and remove compass by removing two screws. Remove center trim.
(5) Remove sun visor and sun visor stop block by removing attaching screws.
(6) Remove foul weather window and window stop by removing attaching screws.
(7) Release forward end of side window trim by removing screws as necessary to gain access to windshield retainer nuts.
(8) Release forward end of headliner as required to gain access.
(9) Remove glove box from right instrument panel.
(10) If heated windshield is installed, identify, tag and disconnect electrical leads.
(11) Open nose baggage doors and remove baggage partition as necessary to gain access to windshield lower center retainer nuts.
(12) Remove alcohol deice tubes just forward of windshield by disconnecting clamps and plumbing.
(13) Place a suitable work stand beside windshield to be replaced. Make sure work stand is properly padded to prevent possible damage to airplane finish.
(14) Mask airplane and windshield around retainers to be removed to protect finish of windows and airplane.
(15) Remove nuts and screws securing retainers to frame.

<u>NOTE</u>: Mark location of different sizes and lengths of screws as they are removed to ensure proper lengths and sizes upon reinstallation. Note location of different shaped nuts. Small headed nuts are used where edge distance from a radius is critical.

(16) Remove retainers from windshield using fabricated scraper to break seal between retainer and windshield. Use care not to damage airplane structure and good windshield during removal of retainers. On the lower retainer, always drive scraper from outboard end of retainer toward inboard end. When loosening seal on center retainer, do not drive tool past the center of retainer. Damage to opposite windshield may result. On the center retainer, work from top and bottom of retainer. On the top retainer, work both from inboard and outboard ends; on side retainer, work from top and bottom.

<u>NOTE</u>: Always make sure back side of cutting edge of tool is sharp and has no burrs or nicks.

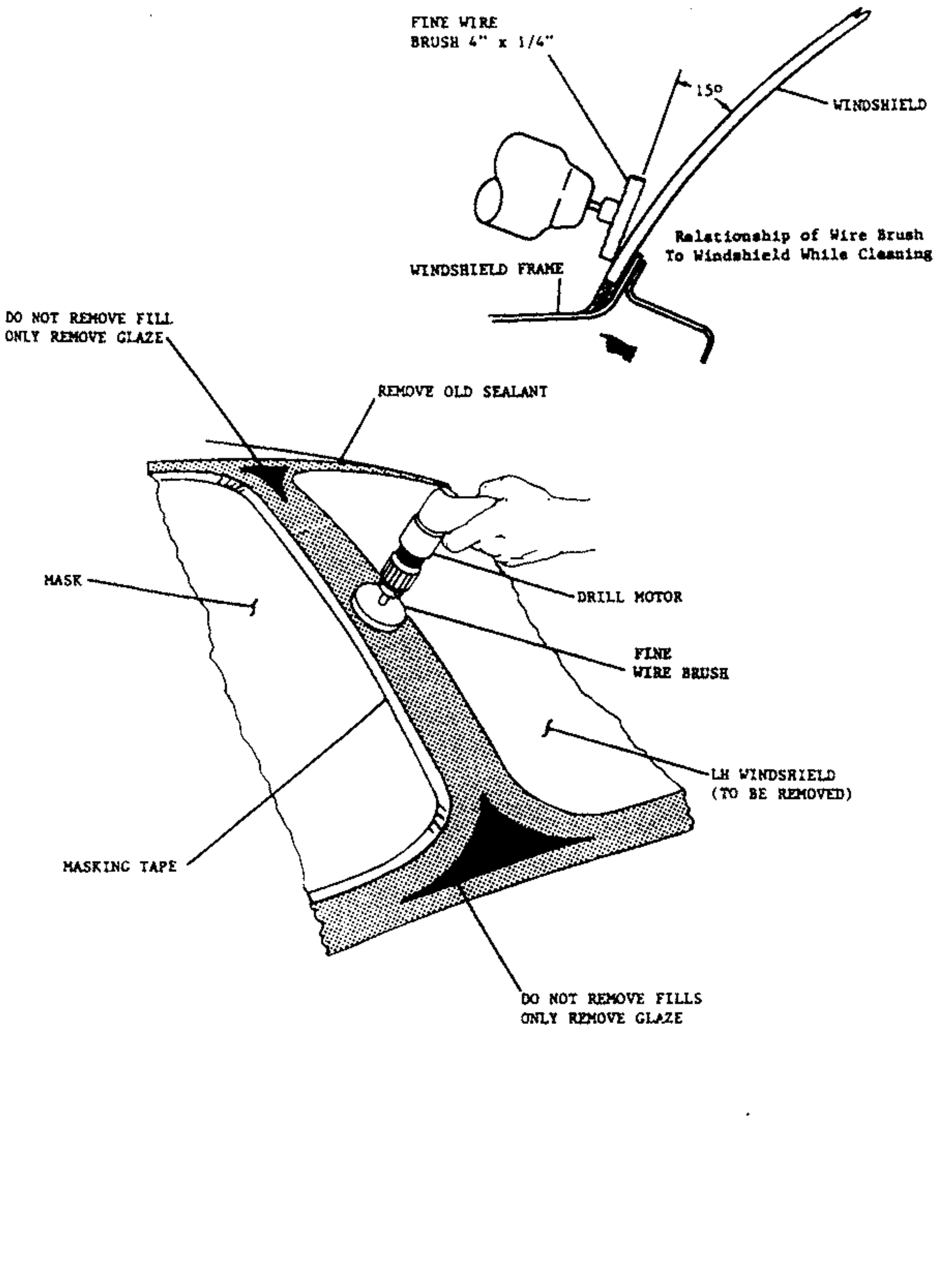
<u>NOTE</u>: Drive scraper(s) under retainer with the bevel of the scraper against the retainer. This will prevent cutting dimples off of the retainers.

<u>NOTE</u>: When replacing right windshield, do not remove center retainer by using tool over top of left electric windshield. Use tool over windshield being replaced and from bottom and top of retainer.

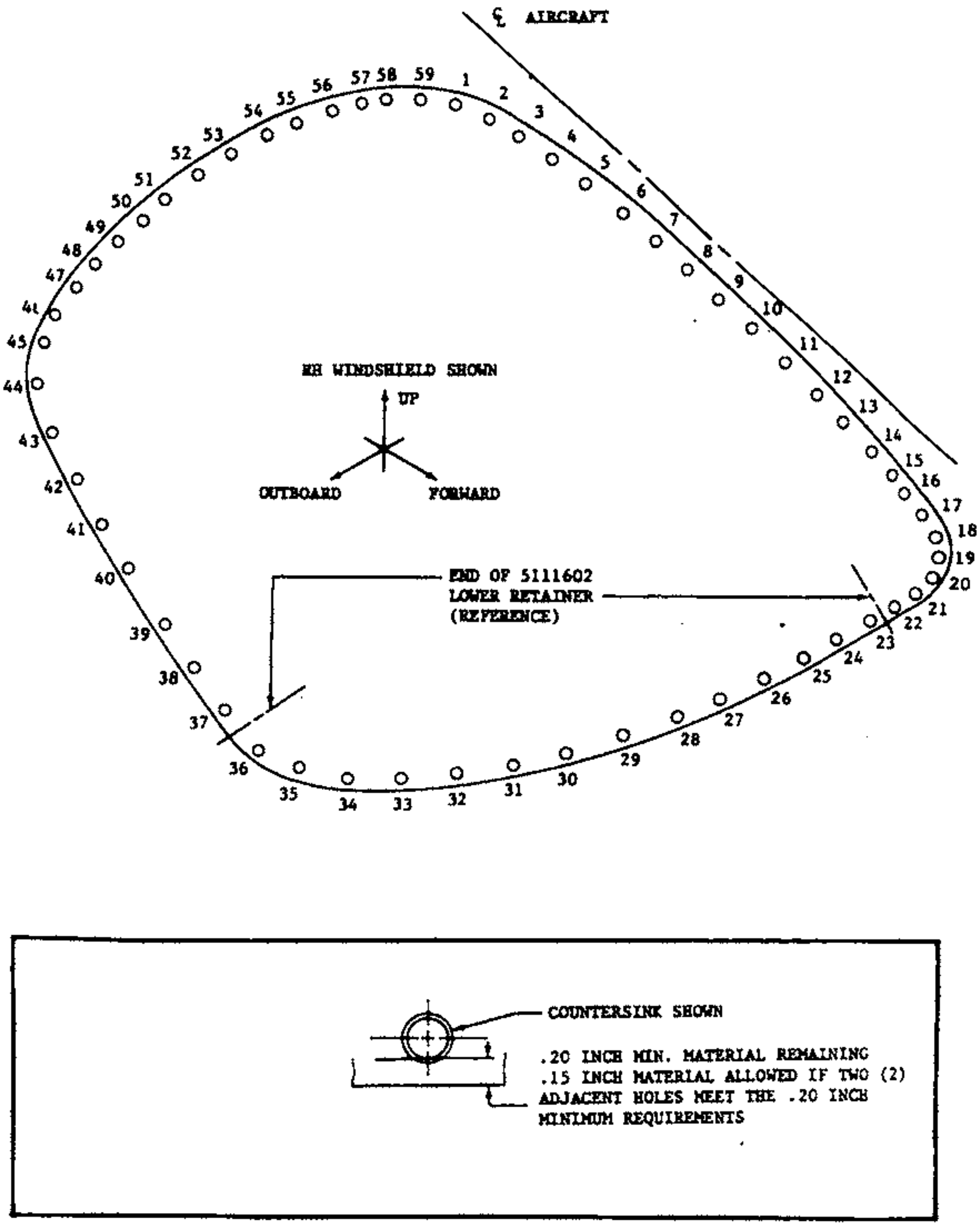
(17) Remove retainers carefully to prevent sharp bends or stretching of material.
(18) (Refer to Figure 3.) After removal of retainer, clean bulk sealant from retainer using a sharpened scraper with edges slightly rounded. Final cleaning of sealant from retainer should be accomplished using a four-inch fine wire brush or 3M 3" x 1/2" x 1/4" Scotch Brite wheel on a drill motor. Work off the side of the brush at approximately 15 degrees to work area. This will prevent damage to retainer.

<u>NOTE</u>: It is not recommended to remove sealant from triangular cavities at center bottom, center top and upper outboard corners of windshield, as this would only have to be refilled. Only remove glaze from sealant in these areas.

(19) Using a knife, cut sealant around edges of windshield. Do not cut or scratch frame.
(20) Remove windshield from frame.



Windshield Sealant Removal
Figure 3



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Windshield Minimum Edge Distance Limits
Figure 4

B. Install Windshield (Windshield without Holes).

(1) Pull protective covering back from edge of windshield approximately one inch. Apply masking tape over the exposed windshield.
(2) Lay the windshield being replaced on the windshield frame. Locate the windshield up on the frame as far as possible while still meeting the edge distance requirements outlined in Figure 4.

CAUTION: IT IS PERMISSIBLE TO TRIM THE WINDSHIELD TO ALLOW REMOVING OF INTERFERENCE BETWEEN EDGE OF WINDSHIELD AND WINDSHIELD FRAME RECESS USING A ROTARY DRUM SANDER ONLY TO THE EDGE DISTANCE LIMITS SHOWN IN FIGURE 4.

(3) Measure the gap between the windshield and windshield frame at the lower outboard corner (from holes 33 through 37). The maximum gap permissible in the free state with windshield flat against center frame is one (1) inch for acrylic windshields and 0.25 inch for glass electric heated windshields. On the acrylic windshields, if the gap exceeds one inch, remove windshield and return to Cessna for corrective action. On the glass electric heated windshield, if the gap exceeds 0.25 inch, contact Cessna Customer Services Department and advise dimension of gap. If gap is within specification, proceed with installation. If the gap exceeds one inch, remove and replace windshield. Out-of-contour windshields should be returned to Cessna for corrective action. If the gap is within specification, proceed with installation.
(4) After ensuring proper fit of windshield, use a drill guide and drill two number 40 (0.098) inch locating holes between windshield attach holes number 24 and 25, and number 54 and 55 common to the windshield frame and windshield. Inspect the frame and if these holes number 40 (0.098) already exist in frame, drill the hole through windshield to match these holes. Drill holes from the outside toward the inside. When drilling the holes through the windshield, use light pressure to prevent chipping of the windshield. Temporarily fasten the windshield to the frame with 3/32" wing nut clecos (silver colored) at these locations. Locate the remainder of windshield attach holes as follows:

(a) Beginning at hole number 23, using the same drill guide as above, drill 3/16 (0.187) hole through the windshield and aligned with the windshield frame hole. Install a 3/16" wing nut cleco (brass colored) in this hole and draw the windshield down against the frame. Following this same procedure, drill pilot holes and cleco at locations 25, 27, 17, 12, 8, 4, 57, 52, 29, 31, 33, 35, 49, 46, 42 and 39.

NOTE: It is important that windshield be retained against frame with wing nut clecos during hole installation to insure pilot holes are concentric with windshield frame holes. Drill must be held at 90° angle to the windshield surface.

(b) Locate and drill remainder of pilot holes in windshield. Holes must be aligned with windshield frame holes.
(c) Remove clecos and windshield from windshield frame and place on a padded work table.
(d) Using a 5/16 (0.3125) drill, enlarge the pilot holes in the windshield. Drill holes from both sides of windshield, start 5/16 drill on inside and drill towards outside; using light pressure, until the 0.3125 diameter hole just penetrates the windshield, complete hole by drilling from opposite side. This procedure will hold chipping to a minimum.

NOTE: All chips must be polished out using 600 grit sandpaper. Insure the polished area is well radiused and has smooth curves.

NOTE: Drilled holes should be smooth. Speed of the drill should be approximately 800 to 1000 RPM with a light pressure. The drill bit should have a tip angle of 55° to 60° with a tip clearance angle of 15° to 20°.

(5) Apply a suitable parting agent, such as a good grade of automotive paste wax, to the inboard surface of retainers and edge of the new windshield.

NOTE: Do not use spray silicones as a parting agent. Use paste-type wax to prevent overspray on surfaces to be painted.

(6) Reinstall windshield on windshield frame, cleco in position using the same sequence as paragraph (4)(a) and using wing nut clecos, recheck concentricity between windshield frame hole and windshield attach holes. Favor concentricity at holes numbers 25 through 33. Holes must be concentric within .03 inch. Check concentricity between windshield attach hole and windshield frame hole by installing a grommet on one of the windshield attach screws and checking how the grommet and screw will fit in the hole. Elongate hole until concentricity exists. If holes do not meet proper concentricity, rework windshield attach holes as follows:
(a) Elongate the affected windshield attach holes using a 1/4-inch diameter rotary file such as a Nicholson B3P-M to provide concentricity between windshield attach hole and windshield frame hole. Elongate hole(s) as required to insure that when the screws are installed, the grommet(s) are not squeezed against the windshield attach hole(s). Grommet wall thickness is approximately 1/16 inch.

NOTE: Concentricity of holes numbers 23 through 35 containing clecos can be inspected by moving clecos to adjacent holes.

NOTE: Use only a fine-tooth rotary file and do not bind file in hole as chipping of the hole edges will result.

NOTE: When elongating hole, do not just make the hole diameter larger, just elongate in the area required. Maintain the original hole 5/16" hole as much as possible.

(b) Use care when elongating holes to ensure the hole is smooth all around.

(7) Using care, countersink holes 90 degrees x 0.385 inch using a countersink tool such as Nicholson J9-M on the outside surface of the windshield. A minimum of 0.20 inch material must remain between the hole and the windshield edge (0.15 inch minimum material is allowed if the two adjacent holes meet the 0.20 inch minimum requirements on acrylic windshields). (Refer to Figure 4.)

NOTE: Use extreme caution when countersinking to prevent cracking or chipping of windshield.

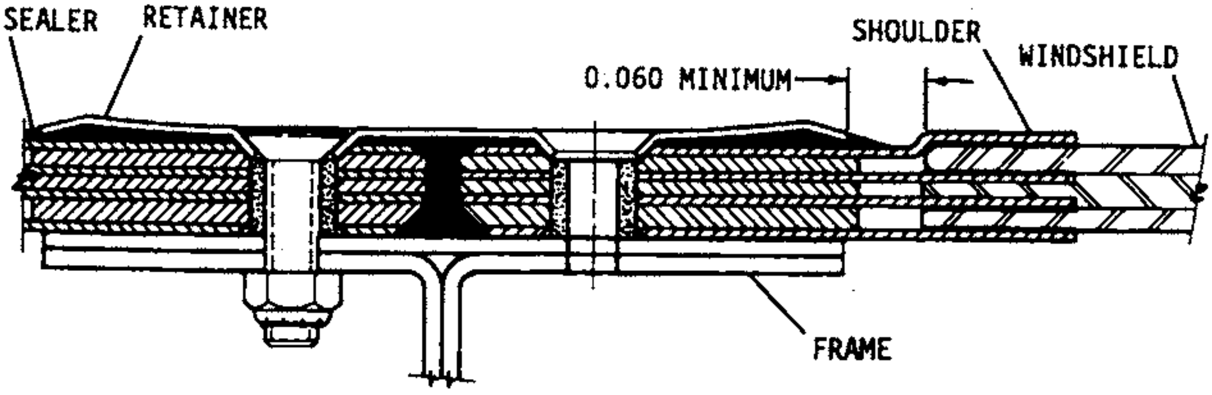
NOTE: If new retainers are being fitted, remove only those clecos that are necessary to fit the retainer to the windshield.

(8) The lower retainer should be installed first. Remove clecos from holes numbers 23 through 36. Install grommets in all windshield attach holes.

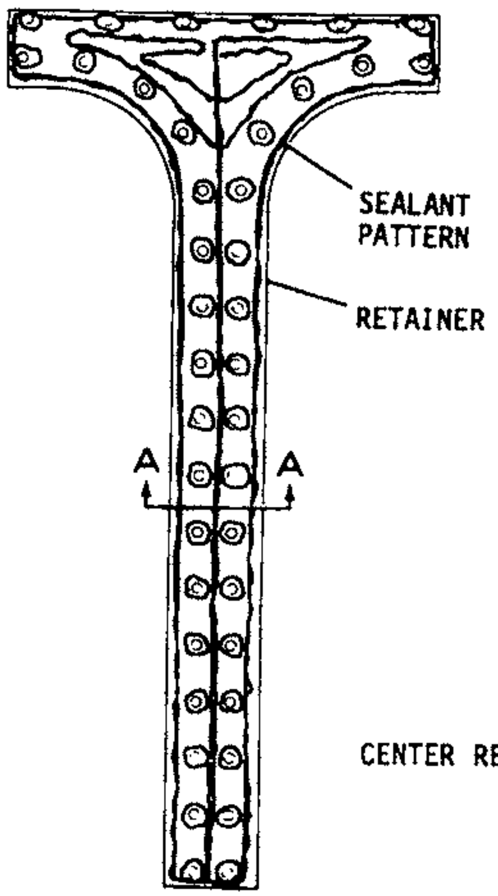
(9) Apply Pro-Seal 890, Type 1, Class B2 sealant on windshield and retainers. Mix sealant per manufacturer's instructions. When applying sealant to windshield and retainers, 1) insure temperature is above 60° F, 2) application time for Class B2 sealant is two hours, 3) application with an extrusion gun is the preferred method.
(a) Apply bead of sealant around all holes and along inner and outer edges of windshield and retainer (see Figure 5 for typical sealant application pattern).
(b) Apply sealant around windshield edges and fill all voids.

CAUTION: WHEN INSTALLING THE RETAINER ON THE DIRECT CURRENT ELECTRIC WINDSHIELD EXERCISE CARE TO AVOID EXCESSIVE FORCE CAUSING LOCALIZED STRESS. LOCALIZED STRESS CAN RESULT IN CRACKS OR CRAZING AT THE EDGES OF THE WINDSHIELD.

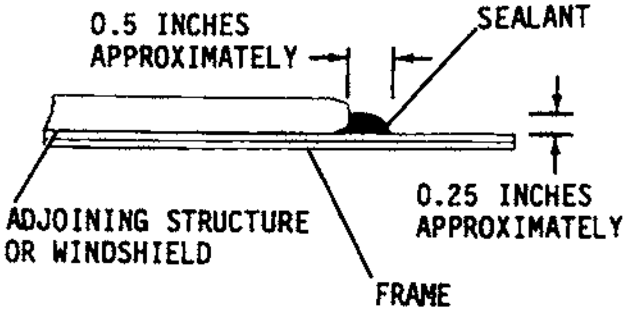
CAUTION: ON THE GLASS ELECTRIC HEATED WINDSHIELD, A MINIMUM OF 0.060 INCH MUST BE MAINTAINED BETWEEN RETAINERS AND WINDSHIELD SHOULDER; REFER TO FIGURE 5. TRIM RETAINERS AS REQUIRED. SMOOTH TRIMMED AREAS TO ENSURE NO SHARP EDGES TOUCH GLASS.

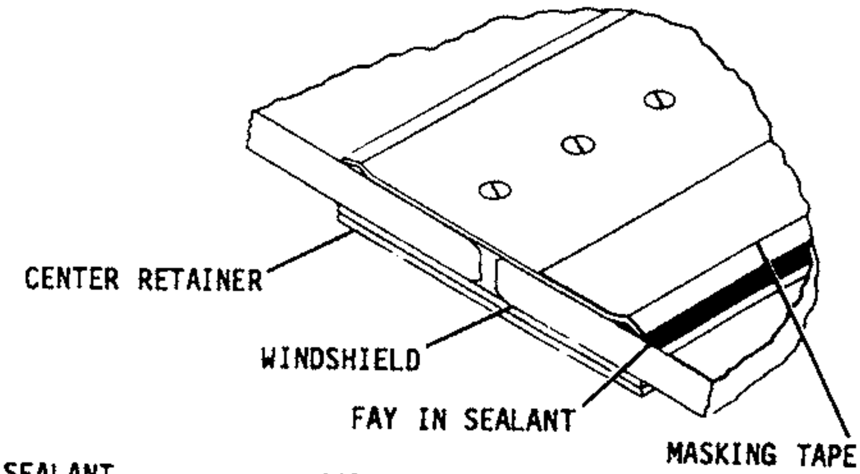


GLASS ELECTRIC HEATED WINDSHIELD
VIEW A-A



TYPICAL APPLICATION OF SEALANT





ACRYLIC WINDSHIELD
VIEW A-A

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Windshield Sealant Application
Figure 5

(10) Position retainer on windshield and loosely install screws in windshield. Install clecos at each end and center hole locations between retainer and forward fuselage structure.

NOTE: Prior to installing screws, wax screws with paraffin and apply a bead of sealant around the head of each screw.

(11) Tighten windshield attach screws in the following sequence: Number 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 25, 24 and 23. Each screw shall be tightened to the point where retainer begins to dimple before going to the next screw location. After screws are installed in retainer and windshield, install screws in retainer and forward fuselage structure.

NOTE: Care shall be taken to ensure the grommets remain in the correct position within the windshield attach holes during installation of the attach screws.

(12) The outboard-upper retainer should be installed next. The clecos should be installed at each end and center hole of retainer, then the screws sequenced from the outboard lower hole to the upper inboard hole.
(13) The middle retainer is installed last. Cleco at each end and center hole, then install screws sequenced from lower holes to upper holes.

NOTE: No specific torque is given for tightening screws. Tighten screws until the retainer starts to dimple and sealant starts to extrude from the edges. Do not overtorque.

NOTE: Cure time for Pro-Seal 890, Type I B2 is 72 hours at 77 degrees and 50 percent relative humidity. Lower temperature means longer cure time.

(14) Remove excess sealant from around the windshield. Remove mask from around windshield retainers. Do not remove mask from windshield.
(15) Clean sealant from retainers using a clean cloth saturated with Naptha (TT-N-95).
(16) Apply masking tape to retainers around windshield.
(17) Apply a small bead of sealant around edge of retainers and smooth evenly with a tongue depresser stick or fairing tool (see Figure 5).
(18) Remove masking tape and remove mask from windshield. Remove protective cover, masking and masking tape from the DC electric windshield carefully to avoid damage.

NOTE: It is advisable to leave the vapor barrier coating (if applied) on the windshield as long as possible, preferable up to taxiing or flight.

NOTE: Exercise care to prevent masking tape or mask contacting sealant.

(19) Touch up paint as necessary after sealant has cured, refer to Chapter 1.

NOTE: It is very important to be sure that the DC electric windshield is completely covered inside and outside with vapor barrier protective covering when painting.

(20) Reinstall items removed for access as follows:
(a) Install side window trim with screws.
(b) Install foul weather window and window stop, refer to Cabin Window.
(c) Pull compass electrical wires through center trim and temporarily hold center trim in place with compass attaching screw.
(d) Position overhead console cover in place and secure with air wemac nuts and install screws.
(e) Install sunvisor and sunvisor stop block.
(f) Install compass.
(g) Clamp alcohol deice tubes forward of windshield in place and connect plumbing.
(h) Install defrost nozzle and secure with clamp.
(i) Install glove box.
(j) Install pilot's instrument panel.

(k) If electric windshield is installed, connect electrical leads to electric windshield; refer to Chapter 13, AC Power (Heated Windshield Anti-Ice) - Maintenance Practices. Do not apply excessive force when positioning electrical wiring for connection. Conduct an operational check of electric windshield. Other system(s) disturbed, as a result of windshield replacement, must be operationally checked.

NOTE: For electrical component information concerning the Direct Current electric windshield, refer to Chapter 13, AC Power (Heated Windshield Anti-Ice) - Maintenance Practices..

(l) Install glareshield.

C. Install Windshield (Windshield with Holes).

NOTE: Upon initial installation of glass electric heated windshield in place of an acrylic heated windshield, perform installation in accordance with SK425-20.

(1) Pull protective covering back from edge of windshield approximately one inch. Apply masking tape over the exposed windshield.
(2) Lay the windshield being replaced on the windshield frame and align as many holes as possible to existing holes in windshield frame.

NOTE: During the installation of a new windshield, it may become apparent that some attach holes may not align with the existing holes in the windshield frame. This is caused by slight variances between new windshields and existing hole patterns in windshield frame. For instructions to correct misaligned holes, refer to Windshield Installation Misaligned Attach Holes.

NOTE: For instructions pertaining to repair of cracks radiating from attach holes on acrylic windshields, refer to Acrylic Windshield Installation Cracks Radiating from Attach Holes.

CAUTION: IT IS PERMISSIBLE TO TRIM THE WINDSHIELD TO ALLOW REMOVING OF INTERFERENCE BETWEEN EDGE OF WINDSHIELD AND WINDSHIELD FRAME RECESS USING A ROTARY DRUM SANDER ONLY TO THE EDGE DISTANCE LIMITS SHOWN IN FIGURE 4.

(3) Measure the gap between the windshield and windshield frame at the lower outboard corner (from holes number 33 through 37). The maximum gap permissible in the free state with windshield flat against center frame is 1.00 inch for acrylic windshield and 0.25 inch for glass electric heated windshields. On the acrylic windshield, if the gap exceeds 1.00 inch, remove windshield and return to Cessna for corrective action. On the glass electric heated windshield, if the gap exceeds 0.25 inch, contact Cessna Customer Services Department and advise dimension of gap. If gap is within specifications, proceed with installation.
(4) On acrylic windshields, after ensuring proper fit of windshield, use a drill guide and drill two number 40, 0.098 inch diameter holes, locating holes between windshield attach holes numbers 24 and 25, and numbers 54 and 55 common to the windshield frame and windshield. Inspect the frame, and if these holes, number 40, 0.098 inch diameter, already exist in frame, drill the hole through windshield to match these holes. Drill holes from the outside toward the inside. When drilling the holes through the windshield, use light pressure to prevent chipping of the windshield. Temporarily fasten the windshield to the frame with 3/32 inch wing nut clecos (silver colored) at these locations.
(5) Apply a suitable parting agent, such as a good grade of automotive paste wax, to the inboard surface of retainers and edge of the new windshield.

NOTE: Do not use spray silicones as a parting agent. Use paste-type wax to prevent overspray on surfaces to be painted.

(6) Recheck concentricity between windshield frame hole and windshield attach holes. Favor concentricity at holes number 25 through 33. Holes must be concentric within 0.03 inch. Check concentricity between windshield attach hole and windshield frame hole by installing a grommet on one of the windshield attach screws and checking how the grommet and screw will fit in the hole.
(7) The lower retainer should be installed first. Remove clecos from holes number 23 through 36. Install grommets in all windshield attach holes.
(8) Apply Pro-Seal 890, Type 1, Class B2 sealant on windshield and retainers. Mix sealant per manufacturer's instructions. When applying sealant to windshield and retainers, (1) ensure temperature is above 60°F, (2) application time for Class B2 sealant is two hours, (3) application with an extrusion gun is the preferred method.
   (a) Apply bead of sealant around all holes and along inner and outer edges of windshield and retainer (refer to Figure 5 for typical sealant application pattern).
   (b) Apply sealant around windshield edges and fill all voids.

CAUTION: WHEN INSTALLING THE RETAINER ON THE ELECTRIC WINDSHIELD, EXERCISE CARE TO AVOID EXCESSIVE FORCE CAUSING LOCALIZED STRESS. LOCALIZED STRESS CAN RESULT IN CRACKS OR CRAZING AT THE EDGES OF THE WINDSHIELD.

CAUTION: ON THE GLASS ELECTRIC HEATED WINDSHIELD, A MINIMUM OF 0.060 INCH MUST BE MAINTAINED BETWEEN RETAINERS AND WINDSHIELD SHOULDER. REFER TO FIGURE 5. TRIM RETAINERS AS REQUIRED. SMOOTH TRIMMED AREAS TO ENSURE NO SHARP EDGES TOUCH GLASS.

(9) Position retainer on windshield and loosely install screws in windshield. Install clecos at each end and center hole locations between retainer and forward fuselage structure.

NOTE: Prior to installing screws, wax screws with paraffin and apply a bead of sealant around the head of each screw.

(10) Tighten windshield attach screws in the following sequence: numbers 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 25, 24 and 23. Each screw shall be tightened to the point where retainer begins to dimple before going to the next screw location. After screws are installed in retainer and windshield, install screws in retainer and forward fuselage structure.

NOTE: Care shall be taken to ensure the grommets remain in the correct position within the windshield attach holes during installation of the attach screws.

(11) The outboard-upper retainer should be installed next. The clecos should be installed at each end and center hole of retainer, then the screws sequenced from the outboard lower hole to the upper inboard hole.
(12) The middle retainer is installed last. Cleco at each end and center hole, then install screws sequenced from lower holes to upper holes.

NOTE: No specific torque is given for tightening screws. Tighten screws until the retainer starts to dimple and sealant starts to extrude from the edges. Do not overtorque.

NOTE: Cure time for Pro-Seal 890, Type I B2 is 72 hours at 77°F and 50 percent relative humidity. Lower temperature means longer cure time.

(13) Remove excess sealant from around the windshield. Remove mask from around windshield retainers. Do not remove mask from windshield.
(14) Clean sealant from retainers using a clean cloth saturated with Naphtha (TT-N-95) or Toluene (TT-T-548).
(15) Apply masking tape to retainers around windshield.
(16) Apply a small bead of sealant around edge of retainers and smooth evenly with a tongue depresser stick or fairing tool (refer to Figure 5).

(17) Remove masking tape immediately and remove mask from windshield. Remove protective cover, masking and masking tape from the electric windshield carefully to avoid damage.

NOTE: It is advisable to leave the vapor barrier coating (if applied) on the electric windshield as long as possible, preferable up to taxiing or flight.

NOTE: Exercise care to prevent masking tape or mask contacting sealant.

(18) Touch up paint as necessary after sealant has cured.

NOTE: It is very important to be sure that the electric windshield is completely covered with vapor barrier protective covering when painting.

(19) Reinstall items removed for access as follows:
(a) Install side window trim with screws.
(b) Install foul weather window and window stop. Refer to Cabin Window.
(c) Pull compass electrical wires through center trim and temporarily hold center trim in place with compass attaching screw.
(d) Position overhead console cover in place and secure with air outlet nuts and install screws.
(e) Install sunvisor and sunvisor stop block.
(f) Install compass.
(g) Clamp alcohol deice tubes forward of windshield in place and connect plumbing.
(h) Install defrost nozzle and secure with clamp.
(i) Install glovebox.
(j) Install pilot's instrument panel.
(k) If electric windshield is installed, connect electrical leads to heated windshield; refer to Chapter 13, Heated Electric Windshield - Maintenance Practices. Do not apply excessive force when positioning electrical wiring for connection. Conduct an operational check of heated windshield. Other system(s) disturbed as a result of windshield replacement, must be operationally checked.

NOTE: For electrical component information concerning the electric windshield, refer to Chapter 13, Heated Electric Windshield - Maintenance Practices..

(l) Install glareshield.

3. Acrylic Windshield Installation Misaligned Attach Holes (Refer to Figure 6)

A. The following procedures provide instructions for repair of misaligned windshield attach holes which become apparent during the installation of a new windshield.

B. Reposition the windshield within the frame in an attempt to align as many holes as possible. Start temporary insertion of fasteners at one corner and proceed around the windshield. Note the number of misaligned holes and repeat procedure starting at a different corner. Continue trial fitting of the windshield until the number of misaligned holes is at a minimum. Mark these holes for subsequent plugging and redrilling, and also accurately mark the exact position of the acrylic windshield.

NOTE: A properly aligned hole provides sufficient clearance around screw shank to allow installation of the grommet without compressing the grommet wall against the windshield hole.

C. Remove the existing grommet(s) in the hole(s) requiring plugging and retain for reinstallation.

D. Determine the amount of misalignment for each hole. This is the amount that the hole in the windshield is eccentric in relation to the hole in the frame.

(1) If the amount of misalignment is 0.08 inch or less, the hole in the windshield may be elongated to allow proper installation of the screw and grommet. Proceed to step E.
(2) If the amount of misalignment is greater than 0.08 inch, the hole in the windshield must be plugged and redrilled to allow proper installation of the screw and grommet. Proceed to step F.

E. Elongate holes in the windshield as shown. (Refer to Figure 6.)

(1) Elongate the hole in the proper direction and only as much as necessary to achieve concentricity. Do not elongate hole more than 0.08 inch diameter. Use a 0.25 inch diameter fine tooth rotary file such as Nicholson B3P-M to remove windshield material. Check concentricity between windshield attach hole and windshield frame hole by installing a grommet on one of the windshield attach screws and checking the fit of the grommet and screw. Do not allow rotary file to bind in hole as chipping of the hole edges will result. Use care when elongating hole to ensure the hole is smooth all around.
(2) Countersink hole 90 degrees x 0.385 inch.

<u>NOTE</u>: Use extreme caution when countersinking to prevent cracking or chipping of windshield.

(3) A minimum of 0.20 inch material must remain between the hole and the windshield edge (0.15 inch minimum material is allowed if the two adjacent holes meet the 0.20 inch minimum requirements) (refer to Figure 6). If edge distance does not meet the 0.20 inch or 0.15 inch edge distance requirements, contact Cessna Customer Services Department. With initial Cessna contact, provide the hole number and edge distance information.

F. Plug existing holes in the windshield and redrill properly aligned holes as follows: (Refer to Figure 6.)

(1) Using 600 grit sandpaper, rough up the inside of the hole in the windshield and the outer surface of the 5191602-2 acrylic plug.
(2) Apply Loctite 495 to both the surfaces of the acrylic plug and the hole. Insert the plug and ensure the plug is flush or extends slightly from each side of the windshield. Allow the adhesive to cure 30 minutes.

<u>NOTE</u>: Ensure adhesive does not come in contact with adjacent areas of windshield.

(3) With the windshield in position, use a drill guide in the windshield frame hole to drill a 0.098 diameter pilot hole through the windshield to represent the center of the new hole in the windshield.
(4) With the windshield removed, use a 0.3125 diameter counterbore with a 0.098 diameter pilot, such as a Cleveland 883 or 884 with a number 40 pilot, to enlarge the hole. Drill through half way from one side, then drill through the remainder from the other side.
(5) Countersink the hole in the windshield (exterior) 90 degrees x 0.385. Hold the drill motor steady to prevent lateral movement of the countersink which might cause chipping of the windshield.
(6) A minimum of 0.20 inch material must remain between the hole and windshield edge (0.15 inch minimum material is allowed if two adjacent holes meet the 0.20 inch minimum requirements). (Refer to Figure 4.) If edge distance does not meet the 0.20 inch or 0.15 inch edge distance requirements, contact Cessna Customer Services Department.

4. Acrylic Windshield Installation - Cracks Radiating from Attach Holes (Refer to Figure 6)

A. The following procedure provides instructions for repair of cracks in the windshield radiating from the attach holes. Cracks are usually caused by incorrect (eccentric) alignment of the windshield and frame attach holes. During repair of cracks around windshield holes, refer to instructions concerning misaligned holes to correct hole alignment if required.

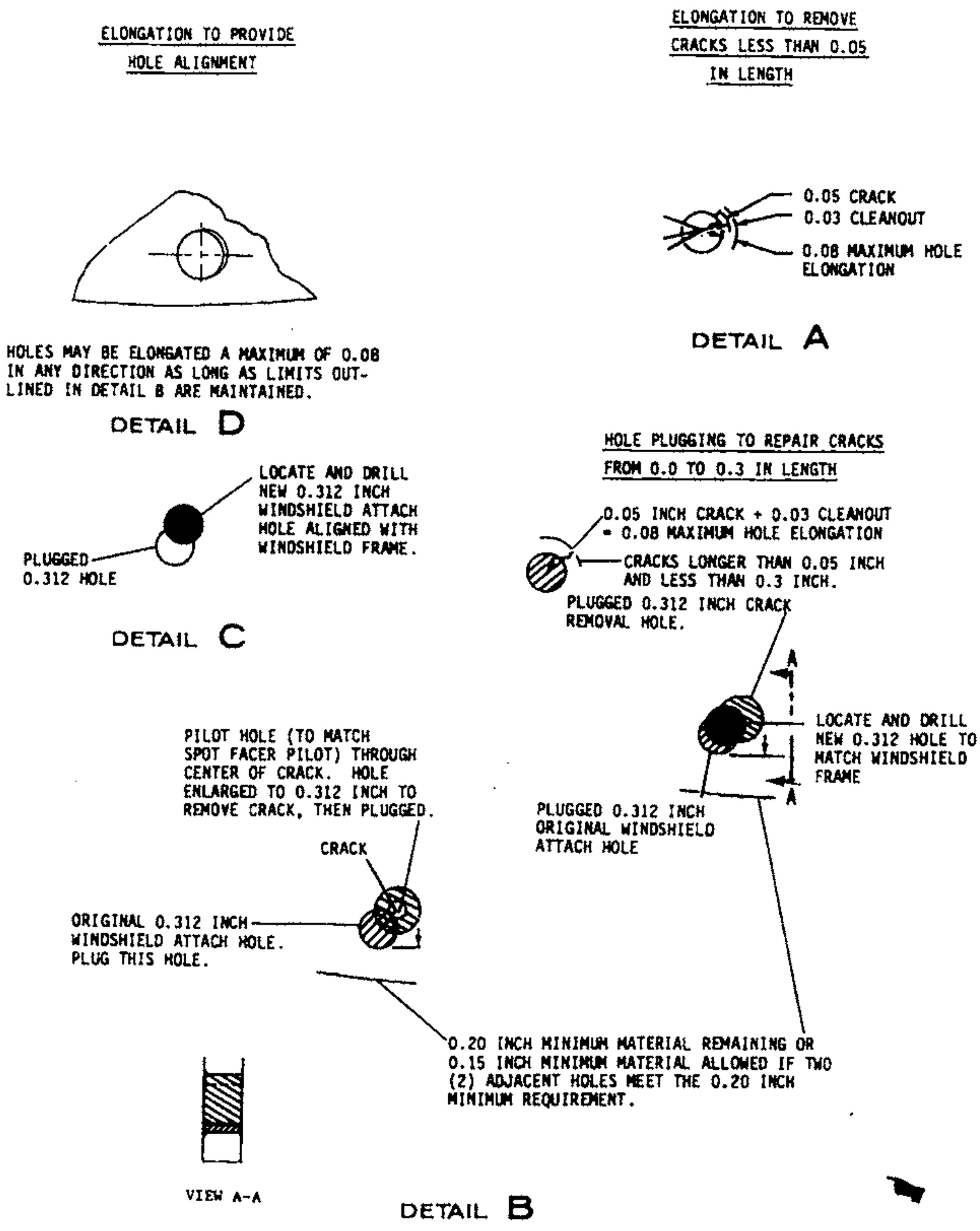


Figure 6. Hole Misalignment and Crack Repair

B. Cracks up to 0.05 inch in length maximum may be removed by elongating the windshield attach hole. Maximum elongation of hole is 0.08.

(1) Use a 0.25 inch diameter fine tooth rotary file such as a Nicholson B3P-M for crack removal elongation of the windshield attach hole. Use care to avoid binding of rotary file within the attach hole to prevent chipping of the windshield. Use care when elongating hole to ensure the hole is smooth all around.
(2) Countersink hole 90 degrees x 0.385 inch.

NOTE: Use extreme caution when countersinking to prevent chipping of windshield.

(3) A minimum of 0.20 inch material must remain between the hole and the windshield edge (0.15 inch minimum material is allowed if the two adjacent holes meet the 0.20 inch minimum requirements). (Refer to Figure 4.) If edge distance does not meet the 0.20 inch or 0.15 inch edge distance requirements, contact Cessna Customer Services Department. With initial Cessna contact, provide the length of windshield attach hole crack, clocking of the crack in the attach hole and the hole number where the crack exists.

C. Cracks longer than 0.05 inch and less than 0.3 inch in length, plug the existing attach hole and repair crack as follows:

(1) Using 600 grit sandpaper, rough up the inside of the hole in the windshield and the outer surface of the 5191602-2 acrylic plug.
(2) Apply Loctite 495 to both surfaces of the acrylic plug and hole. Insert plug and ensure plug is flush or extends slightly from each side of the windshield. Allow the adhesive to cure 30 minutes. Sand the plug to be flush with both surfaces of the windshield.

NOTE: Ensure adhesive does not come in contact with adjacent areas of the windshield.

(3) Drill out the crack by drilling an 0.098 diameter pilot hole through the center of the crack, so that when enlarged to 0.3125, the crack will be removed.
(4) Enlarge the piloted hole to 0.3125 diameter using a 0.3125 counterbore with a 0.098 diameter pilot, such as a Cleveland 883 or 884 with a number 40 pilot.
(5) Install another 5191602-2 acrylic plug in the same manner as before and allow to cure.
(6) With the windshield in position, use a drill guide in the windshield frame hole to drill a 0.098 diameter pilot hole through the windshield to represent the center of the new hole in the windshield.
(7) With the windshield removed, use a 0.3125 diameter counterbore with a 0.098 diameter pilot, such as a Cleveland 883 or 884 with a number 40 pilot, to enlarge the hole. Drill through half way from one side, then drill through the remainder from the other side.
(8) Countersink the hole in the windshield (exterior) 90 degrees x 0.385. Hold the drill motor steady to prevent lateral movement of the countersink which might cause chipping of the windshield.
(9) A minimum of 0.20 inch material must remain between the hole and windshield edge (0.15 inch minimum material is allowed if two adjacent holes meet the 0.20 inch minimum requirements). (Refer to Figure 4.) If edge distance does not meet the 0.20 inch or 0.15 inch edge distance requirements, contact Cessna Customer Services Department.

5. Glass Electric Heated Windshield Installation - Misaligned Attach Holes

A. The following procedures provide instructions for repair of misaligned windshield attach holes which become apparent during the installation of a new glass electric heated windshield.

B. Reposition the windshield within the frame in an attempt to align as many holes as possible. Start temporary insertion of fasteners at one corner and proceed around the windshield. Note the number of misaligned holes and repeat procedure starting at a different corner. Continue trial fitting of the windshield until the number of misaligned holes is at a minimum. Mark these holes for subsequent plugging and redrilling, and also accurately mark the exact position of the windshield.

NOTE: A properly aligned hole provides sufficient clearance around screw shank to allow installation of the grommet without compressing the grommet wall against the windshield hole.

C. Remove the existing grommet(s) in the hole(s) requiring plugging and retain for reinstallation.

D. Determine the amount of misalignment for each hole. This is the amount that the hole in the windshield is eccentric in relation to the hole in the frame.

(1) If the amount of misalignment is 0.25 inch or less, the hole in the windshield may be elongated to allow proper installation of the screw and grommet. Proceed to step E.
(2) If the amount of misalignment is greater than 0.25 inch, the hole in the windshield must be plugged and redrilled to allow proper installation of the screw and grommet. Proceed to step F.

E. Elongate holes in the windshield as shown.

(1) Elongate the hole in the proper direction and only as much as necessary to achieve concentricity. Do not elongate hole more than 0.25 inch diameter. Use a 0.25 diameter fine tooth rotary file such as Nicholson B3P-M to remove windshield material. Check concentricity between windshield attach hole and windshield frame hole by installing a grommet on one of the windshield attach screws and checking the fit of the grommet and screw. Do not allow rotary file to bind in hole as chipping of the hole edges will result. Use care when elongating hole to ensure the hole is smooth all around.
(2) Countersink hole 90 degrees x 0.385 inch.

NOTE: Use extreme caution when countersinking to prevent cracking or chipping of windshield.

(3) A minimum of 0.20 inch material must remain between the hole and the windshield edge. If edge distance does not meet the 0.20 inch edge distance requirements, contact Cessna Customer Services Department. With initial Cessna contact, provide the hole number and edge distance information.

F. Plug existing holes in the windshield and redrill properly aligned holes as follows:

(1) Cut Hexcel F-185-1581-38 fiberglass into 2-inch squares; a 2-inch square block should make approximately 16 plugs. Lay up fiberglass to a thickness of 0.34 inch (approximately 40 sheets) to build up a laminated block in which to cut out plugs.
(2) Set fiberglass by applying 250°F heat for one hour. Apply 15 to 30 pounds pressure on laminates while curing.
(3) Using a suitable cutting tool, cut 0.312 inch plugs.
(4) Clean around each hole to be plugged with isopropyl alcohol. Install plug in hole; should be a snug fit. Remove plug and apply EA9309 adhesive to both the surface of the plug and the hole. Insert the plug and ensure the plug is flush or extends slightly from each side of the windshield. Cure time for the adhesive is 24 hours at 75°F.

NOTE: Ensure adhesive does not come in contact with adjacent areas of windshield.

(5) With the windshield in position, use a drill guide in the windshield frame hole to drill a 0.098 diameter pilot hole through the windshield to represent the center of the new hole in the windshield.

(6) With the windshield removed, use a 0.3125 diameter counterbore with a 0.098 diameter pilot, such as a Cleveland 883 or 884 with a number 40 pilot, to enlarge the hole. Drill through half way from one side, then drill through the remainder from the other side.
(7) Countersink the hole in the windshield (exterior) 100 degrees x 0.385. Hold the drill motor steady to prevent lateral movement of the countersink which might cause chipping of the windshield.
(8) A minimum of 0.20 inch material must remain between the hole and windshield edge (Refer to Figure 4). If edge distance does not meet the 0.20 inch edge distance requirements, contact a Cessna Service Station.

6. Pilots Windshield Outboard Weather Seal Improvement and/or Repair (Glass Windshield).
A. General Instructions.
(1) Follow all established safety rules and practices.
(2) Read Material Safety Data Sheets for each Material to be used.
(3) Mix sealants per manufacturers instructions.
(4) Use clean cotton cloths for all cleaning operations. Clean surfaces until no residue is visible on cloth. Change cloths frequently to prevent transfer of residue back onto clean surface.
(5) Wear powder free clean rubber gloves during all cleaning operations and sealant applications to avoid contamination of the bonding surfaces and to prevent chemical contact with skin.

NOTE: THIS MOISTURE SEAL APPLICATION PROCEDURE IS APPLICABLE TO INSTALLED WINDSHIELDS THAT HAVE NOT PREVIOUSLY BEEN REPAIRED WITH SILICONE BASE PRODUCTS/SEALANTS. SILICONE BASE SEALANTS, IF PREVIOUSLY APPLIED, WILL CONTAMINATE BONDING SURFACES AND INHIBIT OR PREVENT ADHESION OF THE PR-1425 B 1/2. ALSO, IF A SILICONE BASE RAIN REPELLENT MATERIAL (REPCON OR RAIN-X TYPE) HAS BEEN APPLIED TO THE OUTER SURFACE, ADHESION OF THE SEALANT MATERIAL WILL BE IMPAIRED. IF THERE IS ANY DOUBT THAT THE OUTER SURFACE OF GLASS HAS BEEN CONTAMINATED BY ANY TYPE OF SILICONE BASE PRODUCT, PERFORM THE FOLLOWING GLASS AND METAL RETAINER SURFACE PREPARATION/CLEANING PROCEDURE.

B. Outboard glass, fiberglass, and metal frame surface preparation. (Refer to Figure 7).
(1) Materials.
(a) 1 inch Masking Tape (3M Scotch #232 or equivalent crepe paper tape
(b) Razor Blades (single edge safety)
(c) Methyl-n-Propyl Ketone
(d) Felt Block
(e) Water
(f) Isopropyl Alcohol
(g) Cotton Cloths (diapers)
(2) Surface Preparation.
(a) Mask off the outer glass surface of the windshield leaving a minimum of 1/4 inch (0.25 inch) area all around the weather seal.
(b) Mask the metal windshield retainer from the inside edge of the mounting holes to the outside edge of the metal retainer.
(c) When the masking is completed, an open work area approximately 1 3/4 inch (1.75 inches wide should exist around the windshield.
(d) Carefully remove any damaged or debonded fiberglass fibers or strands that are standing up or are separated from the fiberglass band or deteriorated sealant with a single edge safety razor blade by shaving along the surface. This is made easier by slightly bending the razor blade at the center to ensure that the corners do not scratch or cut into the outboard glass surface. Do Not Remove the fiberglass band even if it is debonded from the glass surface.

(e) Degrease the work area with a suitable solvent (Methyl-n-Propyl Ketone) utilizing a progressive cleaning procedure by cleaning a small area at a time followed by Isopropyl Alcohol to rinse and remove solvent residue then dry with a clean cloth. Discard soiled cloths regularly to prevent redepositing of contaminants.

(f) Soak a block of clean felt with water and using a slurry of either pumice or cerium oxide and water, polish the exposed glass surface by hand all around until observing a water-break free surface. A water-break free surface is when the water completely "wets" or "sheets" over the glass surface with no signs of drawing up into droplets showing dry areas in between. Continue polishing until the water-break free surface is obtained. Achieving the water-break free surface is critical to ensure adhesion of the reseal/sealant to the outer glass surface.

(g) After a water-break free surface is obtained, clean the entire area with isopropyl alcohol (100%) and allow to dry.

(h) Apply 1 inch masking tape to the outboard glass surface along the edge of the fiberglass strip. Mask the remaining area of the outboard glass ply surface (daylight opening) to protect outboard glass surface during sanding operation.

(i) Thoroughly sand surface of the exposed fiberglass strap using Norton 80-J grit sandpaper or equivalent.

CAUTION : **BE CAREFUL NOT TO ABRADE OR SCRATCH OR SCRATCH THE OUTER (OUTBOARD) GLASS PLY SURFACE WITH SANDPAPER.**

(j) After sanding remove masking tape and thoroughly clean the exposed glass surface, fiberglass, and metal retainer using clean cloth saturated in Methyl-n-Propyl Ketone. Repeat the cleaning operation changing cloths frequently until no residue is visible on the surface of the cloth.

(k) Repeat the cleaning operation with clean cloths saturated with isopropyl alcohol (100%). Again wipe the surfaces until no residue is visible on the cloth. Allow surface to air dry a minimum of five minutes.

(l) After a thorough cleaning of the area to be repaired has been accomplished, apply the new sealant per the following Moisture Seal Application Procedure.

C. Moisture seal application procedure.

(1) Materials.

(a) Products Research PR-1425 B 1/2 (Model 654 SEMKIT)
(b) Products Research PR-142 Primer/Cleaner
(c) Hump Seal Forming Tool (See Figure 8 for manufacturing instructions)
(d) Methyl-n-Propyl Ketone
(e) Isopropyl Alcohol (100%)
(f) Rubber Gloves (Powder Free)
(g) Sandpaper (Norton 80-J Grit)
(h) Plastic Spatula
(i) 1 Inch Masking Tape (3M Scotch #232 or equivalent, crepe paper tape)
(j) Gauze Pads
(k) Cotton Cloths
(l) Cellulose

(2) Application.

(a) Apply 1 inch masking tape to the outboard glass surface 1/8 inch (0.125 inch) away from the inside edge of the outboard fiberglass strap.

(b) Apply 1 inch masking tape to the outer glass ply surface 1/4 inch (0.25 inch) from the edge of the fiberglass strap. Use several layers (12 to 15) of tape to form edge to guide "hump" seal forming tool.

(c) Apply masking tape to the outboard surface of the metal retainer 1 3/4 inch (1.75 inches) from the tape guide edge applied in step 1.

(d) Thoroughly clean the surface of the glass, fiberglass, and metal retainer with clean cotton cloth saturated with Methyl-n-Propyl Ketone followed by isopropyl alcohol and allow surface to air dry for a minimum of five minutes. Sealant must be applied to windshield immediately after cleaning operation to prevent dust and other airborne contaminants from setting on the cleaned surfaces. Any contaminant on the surface can adversely effect the adhesion of the sealant to the substrates.

(e) Using a gauze pad, apply a thin coat (is enough to cover surface without running or dripping) of the PR-142 Primer/Cleaner to the surface of the glass, fiberglass strap, and metal retainer. PR-142 dries instantly. No "drying" time is required. Apply mixed sealant as soon as possible after application of the primer to prevent contamination of print surface from airborne contaminants.

(f) Thoroughly mix the contents of two of the Semkits containing the PR-1425 B 1/2 until no streaks of either material are visible. Mix components for a minimum of five minutes. Complete mixing is essential. Follow mixing instructions on the side of the Semkit package :
(1 Wear safety glasses and gloves while mixing and dispensing.
(2 Hold cartridge and pull dasher rod back approximately 1/4 of the way up the cartridge.
(3 Insert ramrod into hollow of dasher rod. Move piston and inject about 1/3 of the contents of the rod into the cartridge.

CAUTION : **BE CAREFUL NOT TO ABRADE OR SCRATCH OR SCRATCH THE OUTER (OUTBOARD) GLASS PLY SURFACE WITH SANDPAPER.**

(4 Repeat Steps (b) and (c) until all the contents of the rod are emptied into the cartridge. Remove ramrod.
(5 Hand Mix : Mix material for the total number of strokes listed (40 strokes/30 strokes per minute). A stroke is one complete in and out cycle. Hold cartridge and rotate rod 90 degrees in a spiral clockwise motion with each stroke. Each stroke should extend from the deck end of the cartridge to the plunger end or the cartridge. Accepted procedure is 30 strokes per minute.

(g) Remove the mixed PR-1425 B 1/2 from the Semkit tube by the following procedure :
(1 Remove bottom cap.
(2 Push dasher rod to plunger end of cartridge. Grasp cartridge firmly at plunger end and detach dasher rod from mixing dasher by turning counterclockwise. Remove dasher rod from cartridge. Using dasher rod, push/extrude contents of Semkit tube into suitable container (cardboard cup).

(h) Using plastic spatula, apply the PR-1425 B 1/2 to the cleaned and primed and surfaces (glass, fiberglass, gasket, and metal frame).

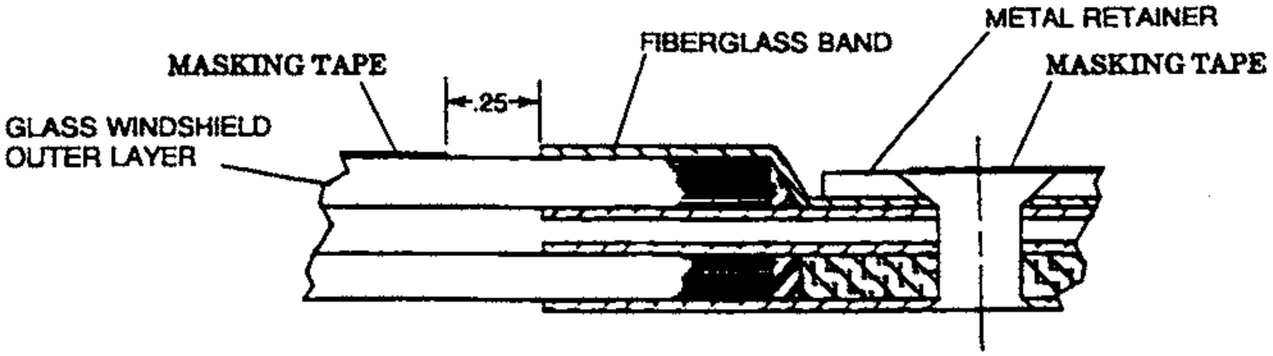
(i) From the outboard "hump" seal by pulling the forming tool around the periphery of the windshield. The forming tool is guided along the edge of the layers of tape previously applied to glass surface in Step C, 2, (a). The width of the formed "hump" seal should be 1 1/2 inch (1.5 inches). The thickness of the formed seal should be 0.120 inches ±0.030 inches. See Figure 7 for "hump" seal configuration and dimensions. See Figure 8 for forming tool dimensions.

(j) After completing forming of "hump" seal, immediately remove the 1 inch masking tape from the glass, fiberglass, and metal frame surfaces while the sealant (PR-1425 B 1/2) is still "wet".

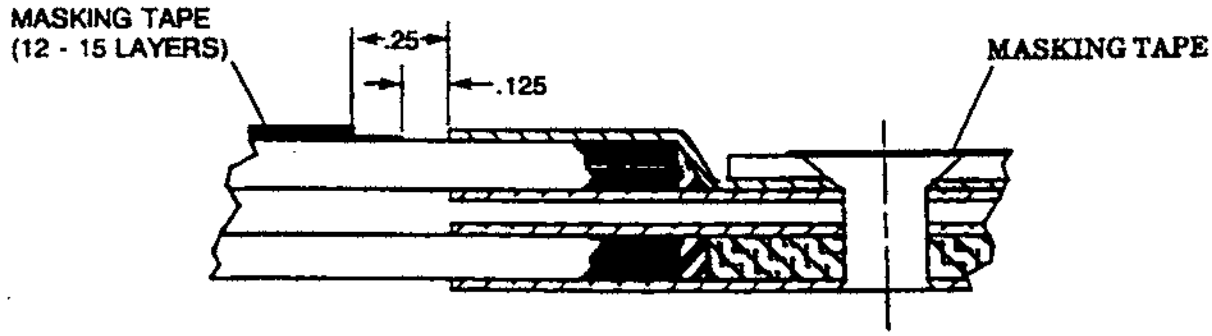
(k) Smooth the surface of the "wet" sealant by rubbing the surface of the sealant lightly and briskly with a cellulose sponge saturated with water or isopropyl alcohol (100%). Use light pressure only.

(l) Allow the sealant to cure. Tack free cure time for PR-1425 B 1/2 is accomplished at room temperature (75 degrees F/50%RH) in eight hours. Cure time to 35 Rex is 24 hours.

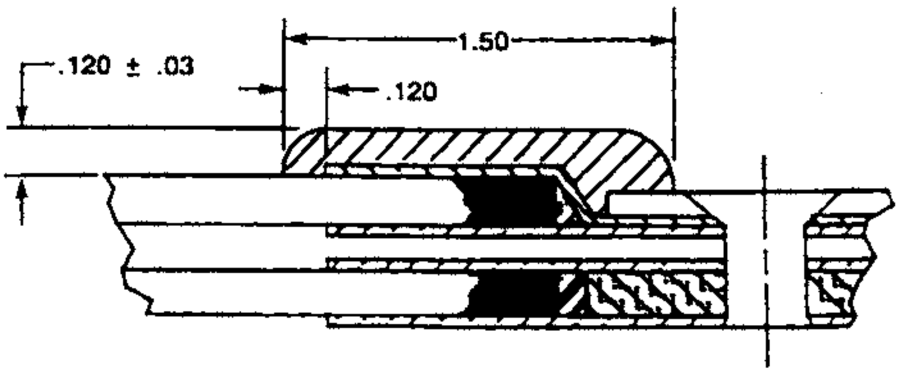
(m) After PR-1425 B 1/2 has cured, inspect for voids and repair as necessary.



TAPE FOR CLEANING



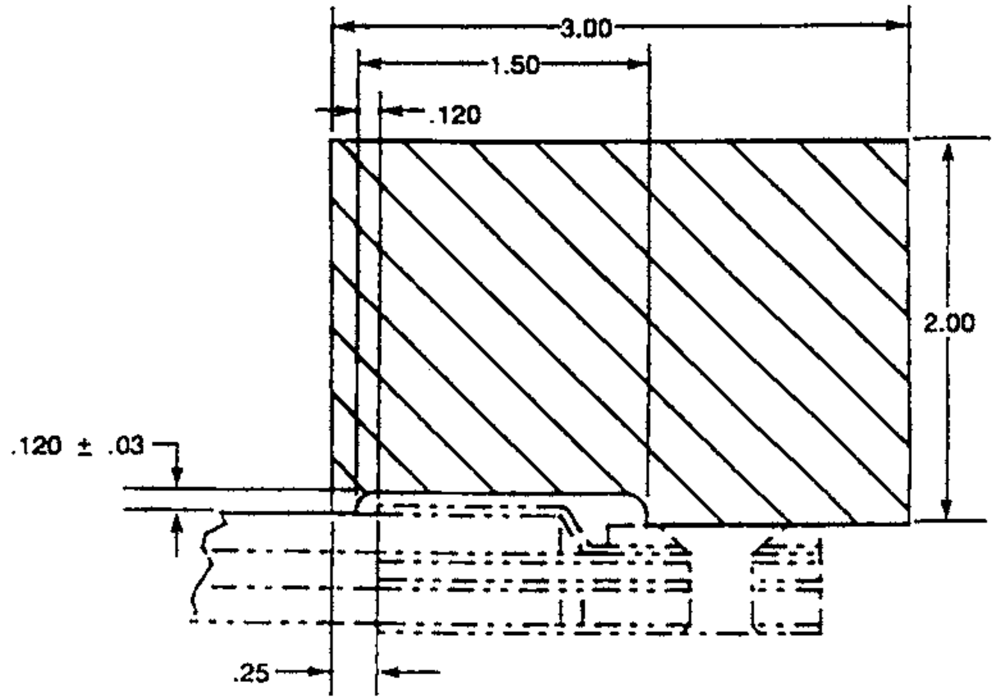
TAPE FOR HUMP SEAL



HUMP SEAL

5982X1004

Windshield Hump Seal Installation
Figure 7



USE ALUMINUM OR PLEXIGLASS WHICH IS THICK ENOUGH THAT IT WILL NOT BEND WHILE FORMING THE " HUMP SEAL".

5982X1005

Hump Seal Forming Tool
Figure 8

CABIN WINDOWS

Description

1. The cabin windows are stretched acrylic plastic. Cabin windows consists of : Left and right foul weather windows, left and right side windows and the passenger windows.

2. The passenger windows are removed and installed from inside the cabin. For removal and installation procedures, all passenger windows including emergency exit door window and the window in the upper cabin door are typical.

Maintenance Practices

1. Tools and Equipment.

NOTE

The following equipment and material or equivalent is required.

Name	Number	Manufacture	Use
		CLEANING SOLVENT	
Methyl n-Propyl Ketone	CAS No. 107-87-9	Commercially Available	To clean metal surfaces.
		SEALANT	
Sealant Type I, Class B-2	Pro-Seal 890	Coast Pro-Seal Division Essex Chemical Corp. 19451 Susanna Rd. Compton, CA 90221	Seal between windows, frame and retainer.
Sealant Type I, Class B-2	EC-1675	Minnesota Mining & Mfg. Co. St. Paul, MN 55101	Seal between windows, frame and retainers.
Silicone Rubber Base Adhesive	RTV-154	General Electric Silicone Products Dept. Waterford, N.Y.	To bond foul weather window seal.
		PROTECTIVE COATING	
Spraylat A Spraylat (White) Spraylat (Black)	SC-1058 SC-1058 SC-1072	Spraylat Corporation 717-T C. Columbus Ave. Mt. Vernon, NY 10550	To protect window panes.
Scotch Brand No-Mar Protective Tape		Minnesota Mining & Mfg. Co. St. Paul, MN 55101	To protect window panes.
		SEALANT REMOVER	
Cork wheel		Commercially Available Available 1/2 Inch Stock Cork	To remove sealant from windows and metal surfaces.

Name	Number	Manufacture	Use
		MATERIAL	
Rymplecloth	301	International Paper Veratec Divion 100 Elm Street Walpole, MA 02081	To clean metal surfaces.

2. Removal/Installation Foul Weather Window (Refer to Figure 1).

NOTE

Removal/Installation procedures are the same for either window.

A. Remove Foul Weather Window.
   (1) The foul weather window assembly is removed by removing screws securing hinges to the frame at the forward side.

B. Install Foul Weather Window.
   (1) Install window assembly by securing hinges to frame and window with screws.
   (2) Install handle on foul weather window. Install and adjust striker by closing window and sliding striker until window latch locks firmly.
   (3) Apply light coat a petrolatum (VV-P-236) on seal. Close foul weather window and latch. Open foul weather window, if complete contact was not made between seal and foul window. Refer to step 4.

3. Replacement of Foul Weather Window Seal.

A. Replace Foul Weather Window Seal.

CAUTION

DO NOT ALLOW METHYL N-PROPYL KETONE TO COME IN CONTACT WITH ANY OTHER SURFACE.

   (1) Clean surface to be bonded with Methyl n-Propyl Ketone.
   (2) Apply a coat of adhesive (RTV-103) on the surface of seal and structure, and press them firmly together within 10 minutes.

CAUTION

DO NOT DAMAGE SEAL BY CLAMPING.

   (3) Apply pressure by clamps for a minimum of 24 hours at 77°F before handling.

4. Foul Weather Window Shimming (Refer to Figure 2).

NOTE

This procedure preformed only if leaks or wind noise are indicated.

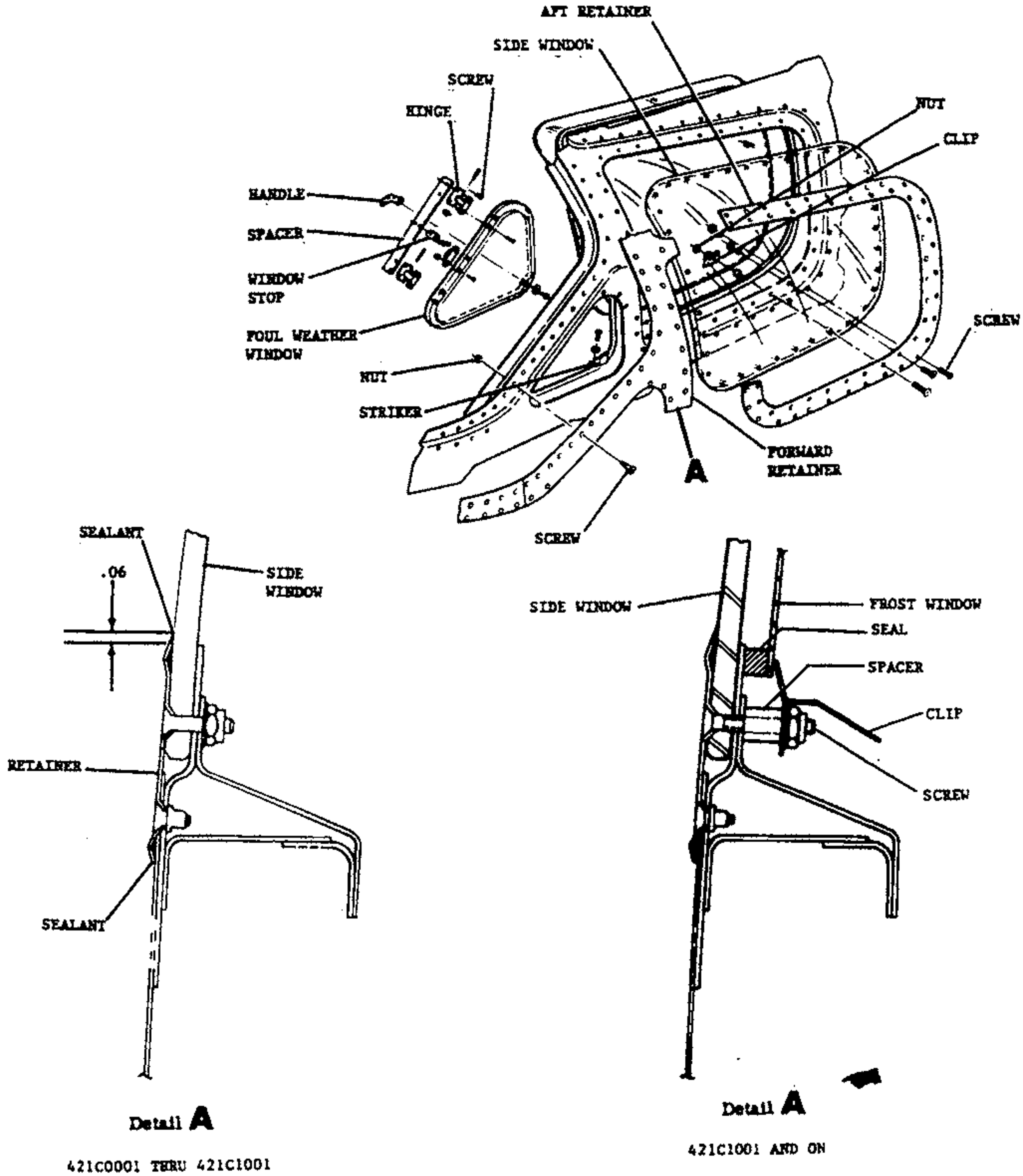
A. Determine location of required seal shims.
   (1) Open the foul weather window.
   (2) Apply a thin, uniform coat of petrolatum (VV-P-236) to the entire circumference of the foul weather window seal.
   (3) Carefully close and latch the window.

NOTE

Do not use more force than is required to secure the latch. Excessive pressure will result in false indications.

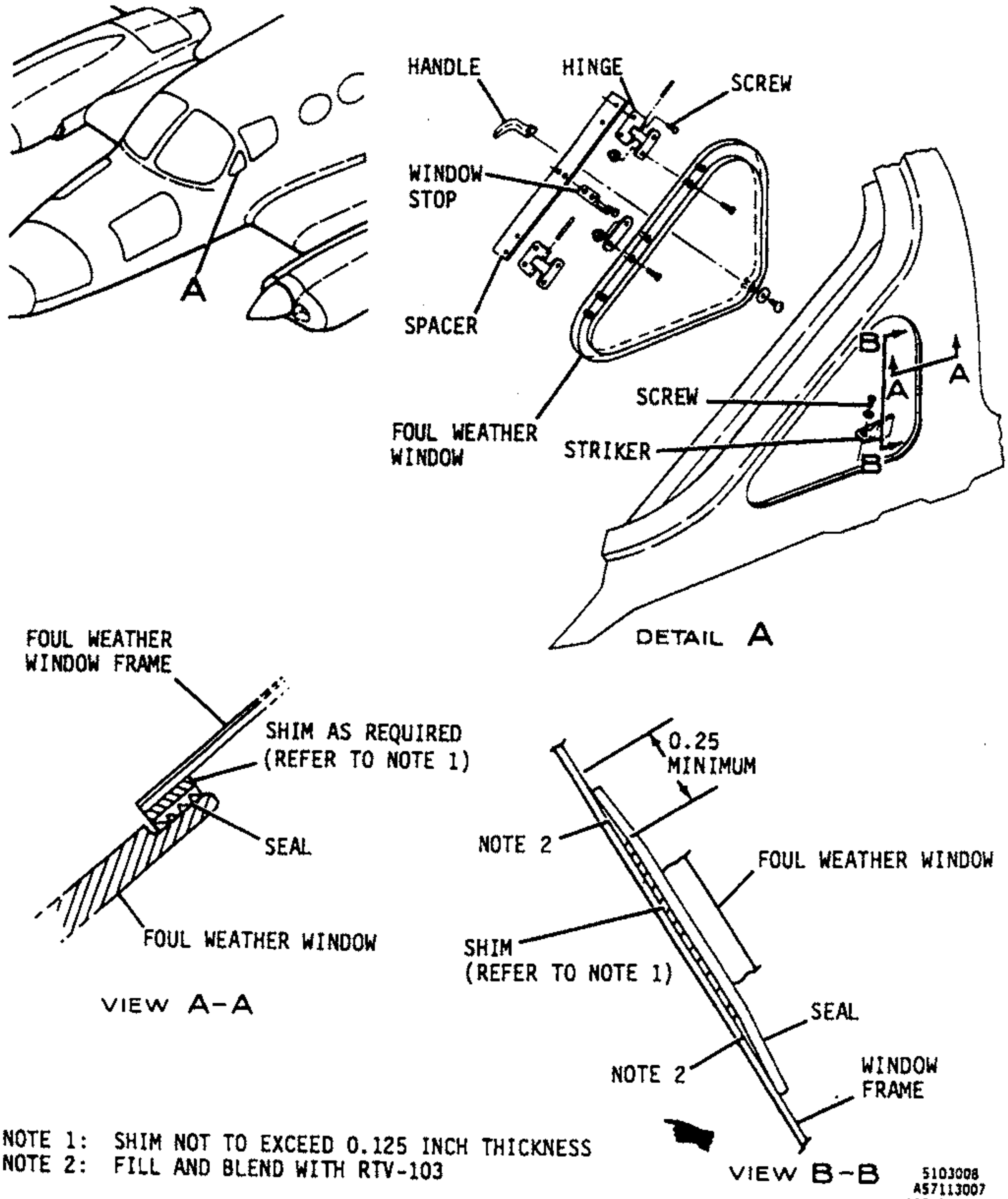
   (4) Mark window frame to which the seal is bonded with a grease pencil to indicate the areas where the foul weather window does not firmly contact seal.

B. Installation of Shim.
   (1) Using the blade of a putty knife, carefully work the seal free from the structure in the area of inadequate contact. Clean adhesive from seal.
   (2) Fabricate a shim from aluminum (2024-T3) or silicone rubber sheet material to match each marked area.
      (a) Cut shim approximately 0.25 inch shorter on each end than marked area on window frame.
      (b) Bevel ends of shims slightly.
      (c) Shim(s) may not exceed 0.125 inch in total thickness.



51103008
A51144019
B51111003

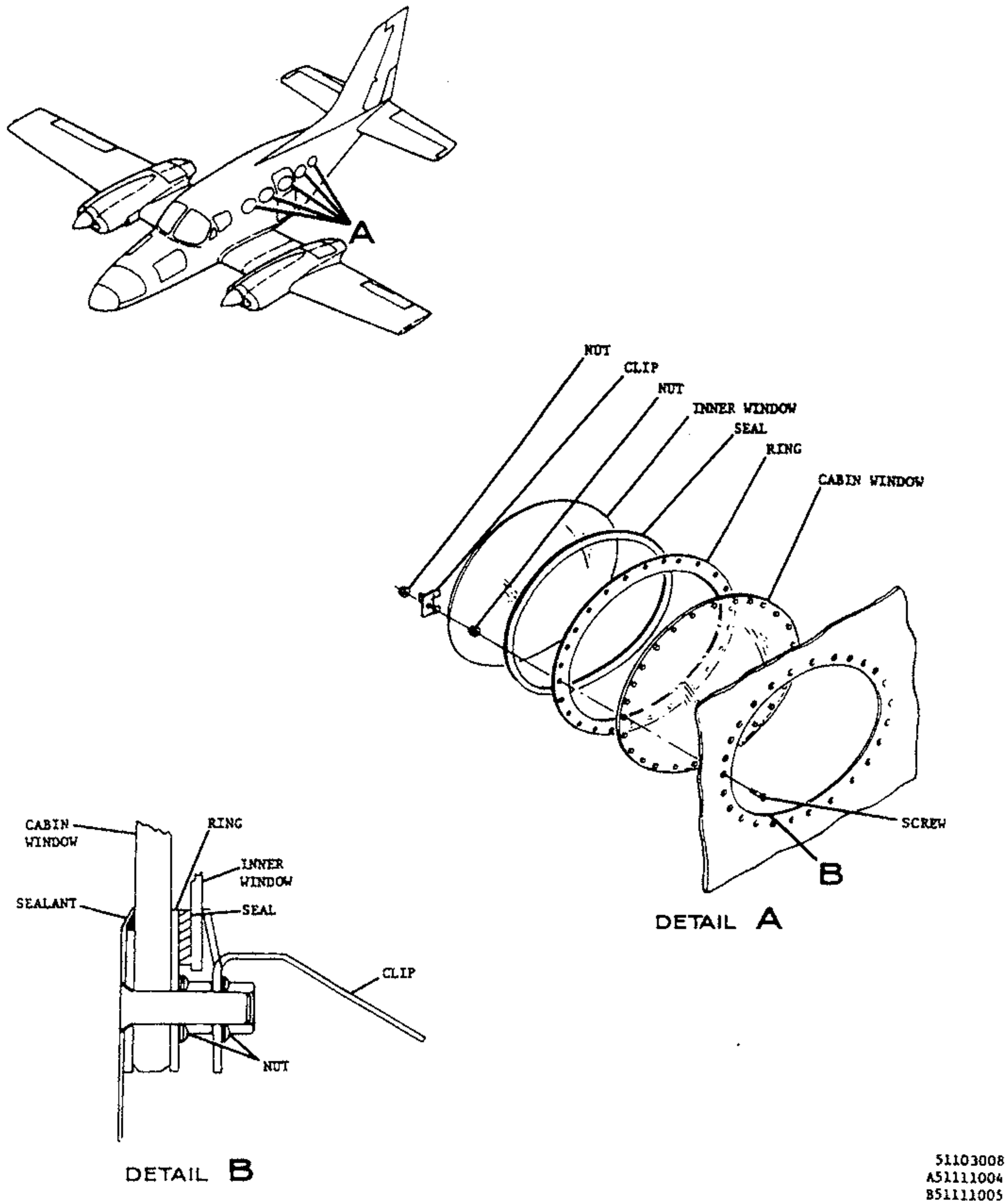
Foul Weather and Side Window Installation
Figure 1



NOTE 1: SHIM NOT TO EXCEED 0.125 INCH THICKNESS
NOTE 2: FILL AND BLEND WITH RTV-103

5103008
A57113007
AA51911001
8851911001

Foul Weather Window Seal Shim Installation
Figure 2



Cabin Window Installation
Figure 3

(3) Bond shim in place with RTV103.
(4) Fill and blend the area at the cut ends of the shim(s) with RTV103.
(5) Bond seal to shim; refer to step 3.A.(3).
(6) Apply a light coat of RTV103 to visible edge of shim for appearance.
(7) Install foul weather window and recheck seal, refer to step A. (2).

5. Removal/Installation Side Window (Refer to Figure 1)

NOTE: Removal/Installation procedures are the same for either window.

A. Remove Side Window.

(1) Remove window trim, refer to Chapter 12.

NOTE: Twelve clips are installed on existing fasteners of the window. Mark clip location for proper reinstallation.

(2) Remove the screws, nuts, clips and washers attaching forward retainer to side window.
(3) Remove screws, nuts, clips and washers attaching aft retainer to side window.
(4) Remove the screws attaching aft retainer to frame.
(5) Remove aft retainer and remove the side window.
(6) Clean old sealant from retainers with cork wheel.

B. Install Side Window.

(1) Ensure all mating surfaces have old sealant removed and are clean.
(2) Place side window in position in frame.
(3) Fay seal between window and retainer and between skin and retainer, using Type I, Class B-2 sealant.
(4) Dab sealer in screw holes and attach forward and aft retainers with screws, clips, washer and nuts.
(5) Fillet seal butt joints of retainers with Type I, Class B-2 sealant.
(6) Install window upholstery trim.

6. Removal/Installation Cabin Windows

A. Remove Cabin Windows.

(1) Remove window trim, refer to Chapter 12.
(2) Remove nuts securing clips.
(3) Remove clips and inner window.
(4) Remove screws and nut securing cabin window and ring to structure.
(5) Clean old sealant from structure with cork wheel.

B. Install Cabin Window.

(1) Ensure window and all mating surfaces are clean.
(2) Fay seal between window and structure, using Type 1, Class B-2 sealant.
(3) Secure window in place with screws, ring and nuts.
(4) Cement new seal in position, using EC 2141 adhesive. Cut seal to provide a 0.40 inch gap at lower side.
(5) Position inner window against seal. Secure inner window in place with four clips and nuts over existing nuts, one clip each at top, bottom, front and aft sides.
(6) Install window trim, refer to Chapter 12.

STABILIZERS

Description

1. The structure of the vertical and horizontal stabilizers is based on semimonocoque design consisting of spars, stringers, ribs and skins.

2. The horizontal stabilizer is of one-piece construction. A removable panel on the horizontal stabilizer permits access to the elevator trim tab actuator. Aerodynamically balanced elevators are hinged to the trailing edge of the horizontal stabilizer. Refer to Chapter 5 for removal/installation of elevator and elevator trim tab.

3. The vertical stabilizer is constructed with a swept-back design that includes the dorsal fin. A removable panel on the vertical stabilizer permits access to the rudder trim actuator. The aerodynamically balanced rudder is attached to the trailing edge of the vertical stabilizer. Refer to Chapter 5 for removal/installation of rudder and rudder trim tab.

Maintenance Practices

1. Removal/Installation Horizontal Stabilizer (See Figure 1)

   A. Remove Horizontal Stabilizer.

      (1) Remove rudder from vertical stabilizer; refer to Chapter 5.
      (2) Remove elevator trim tab cables from the horizontal stabilizer; refer to Chapter 5.
      (3) If deice system (optional) is installed disconnect lines to horizontal stabilizer; refer to Chapter 12.
      (4) Disconnect elevator push-pull tube from elevator arm; refer to Chapter 5.
      (5) Remove nuts, washers and bolts attaching rear spar to tailcone.
      (6) Remove nuts, washers and bolts attaching front spar of horizontal stabilizer.
      (7) Lift rear spar sufficiently to clear trim tab pulley brackets and move horizontal stabilizer aft to remove.

      NOTE: Elevators need not be removed to remove stabilizer from empennage. However, if elevators are to be removed, refer to Chapter 5 for removal procedures.

   B. Install Horizontal Stabilizer.

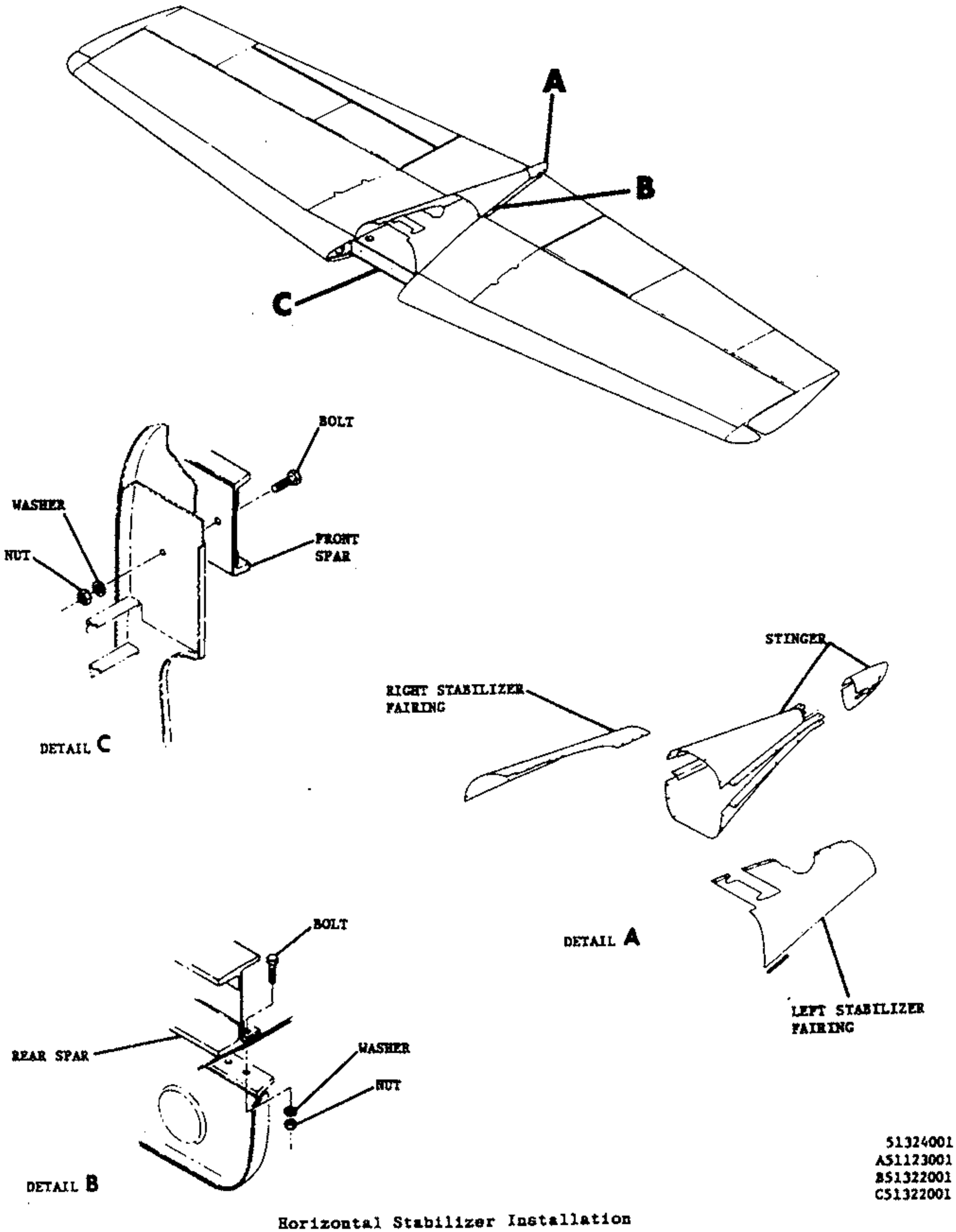
      (1) Position horizontal stabilizer on tailcone and align mounting holes.
      (2) Secure stabilizer front spar with bolts, washers and nuts.
      (3) Secure stabilizer rear spar with bolts, washers and nuts.
      (4) Install elevator trim tab cables, refer to Chapter 5.
      (5) Connect elevator push-pull tube to elevator arm; refer to Chapter 5.
      (6) If deice system (optional) is installed connect lines to horizontal stabilizer deice boots; refer to Chapter 12.
      (7) Install rudder; refer to Chapter 5.
      (8) Install fairings and stinger.

2. Removal/Installation Vertical Stabilizer (See Figure 1)

   A. Remove Vertical Stabilizer.

      (1) Place suitable support beneath tail section.
      (2) Remove horizontal stabilizer fairings. Refer to Chapter 1.
      (3) If omni-antenna (optional) is installed disconnect the coaxial cable in the aft fuselage.

      NOTE: If the coaxial cable is disconnected at the vertical fin tip a wire should be attached to the cable before removal to facilitate installation.

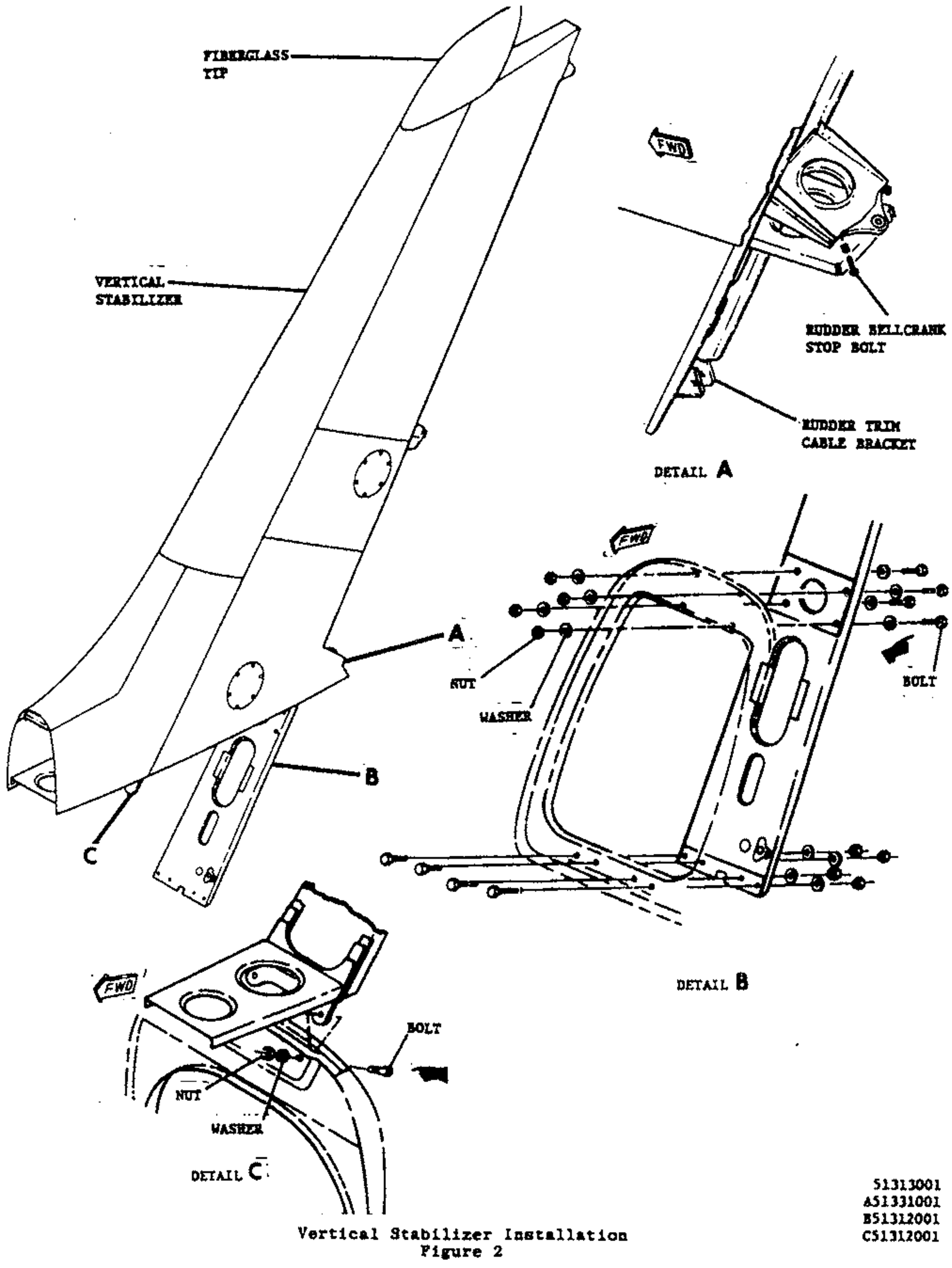


Horizontal Stabilizer Installation
Figure 1

(4) Refer to Chapter 5 and remove the following:
  (a) Rudder.
  (b) Remove rudder cables from vertical stabilizer pulley bracket.
  (c) Disconnect elevator cables from elevator bellcrank.
  (d) Disconnect elevator downspring from elevator bellcrank.
  (e) Remove elevator trim cables.
  (f) Remove rudder trim tab actuator cables from vertical stabilizer.
(5) Remove screws securing rudder trim cable bracket.
(6) Remove screws in dorsal fin.
(7) Remove forward spar nuts, washers and bolts.
(8) Remove nuts, washers and aft spar bolts.
(9) Disconnect deice line inside of tailcone if optional deice is installed.
(10) Lift vertical stabilizer vertically until front spar has cleared fuselage and remove from aircraft.

B. Install Vertical Stabilizer.

(1) Place vertical stabilizer in position on fuselage and align mounting holes.
(2) Attach vertical stabilizer rear spar to tailcone bulkhead with bolts, washers and nuts.
(3) Attach vertical stabilizer front spar to fuselage with bolts, washers and nuts.
(4) Attach forward dorsal skin to fuselage with screws.
(5) Install rudder trim cable bracket with screws.
(6) Connect deice line inside tailcone if deice (optional) is installed.
(7) Refer to Chapter 5 and install the following:
  (a) Install rudder trim cables.
  (b) Install elevator trim cables.
  (c) Connect elevator cables to elevator bellcrank.
  (d) Connect elevator downspring to elevator bellcrank.
  (e) Install rudder cables.
  (f) Install rudder.
(8) If omni-antenna (optional) is installed, connect the coaxial cable in the aft fuselage.
(9) Refer to Chapter 5, rig the rudder, rudder trim, elevator trim and elevator systems.
(10) Install horizontal stabilizer fairings and all access covers.
(11) Remove support from beneath tail section.



Vertical Stabilizer Installation
Figure 2

WINGS

Description

1. The wing is constructed of a forward spar, rear spar and auxiliary spar with rib assemblies installed between the spars. The wing outboard of the nacelle incorporates bonded upper and lower wing panels and integral fuel tank. Wing structure provides attach fittings for the main landing gear, aileron, flap, engine nacelle and wing tip.

2. Except for the wing area inboard of the engine nacelle, the integral fuel tank includes all the wing area forward of the rear spar and outboard to the wing tip. Liquid-tight ribs at the inboard and outboard ends of the wing complete the boundaries of the fuel tanks. Holes in the ribs and front spar permits movement of the fuel within the wings. Access panels are utilized on the lower wing panel surface for entry into the integral fuel tank.

3. Wing tips enclose the outboard end of each wing. The wing tips are bonded assemblies consisting of ribs, bulkheads and straps covered with aluminum alloy skin.

Maintenance Practices

1. Removal/Installation Wing (See Figure 1).

   A. Remove Wing.

      (1) Defuel the aircraft, refer to Chapter 2.
      (2) Remove engine, refer to Chapter 7.

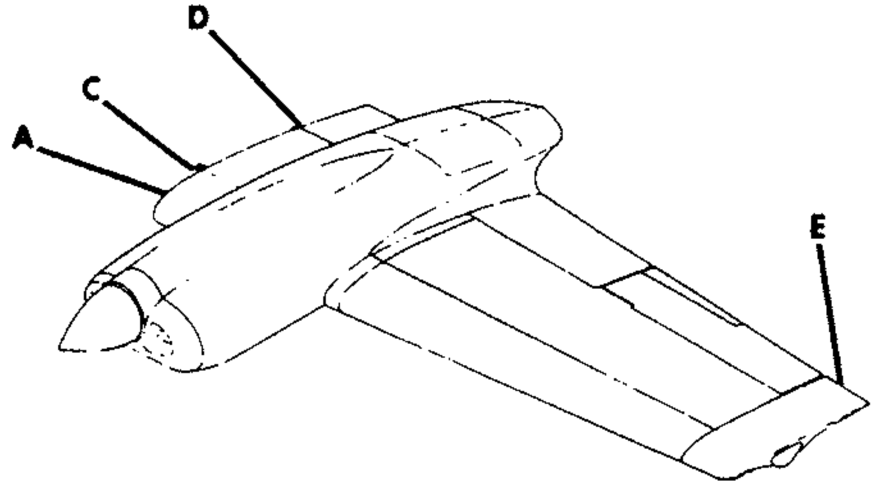
      CAUTION: IF ONE OR BOTH ENGINES ARE REMOVED, THE AIRCRAFT MAY BECOME TAIL HEAVY. THEREFORE, TO BALANCE THE AIRCRAFT, PLACE EQUIVALENT WEIGHT (SHOT BAGS OR SAND BAGS) IN THE NOSE COMPARTMENT AND SUPPORT THE TAILCONE WITH PADDED SUPPORT.

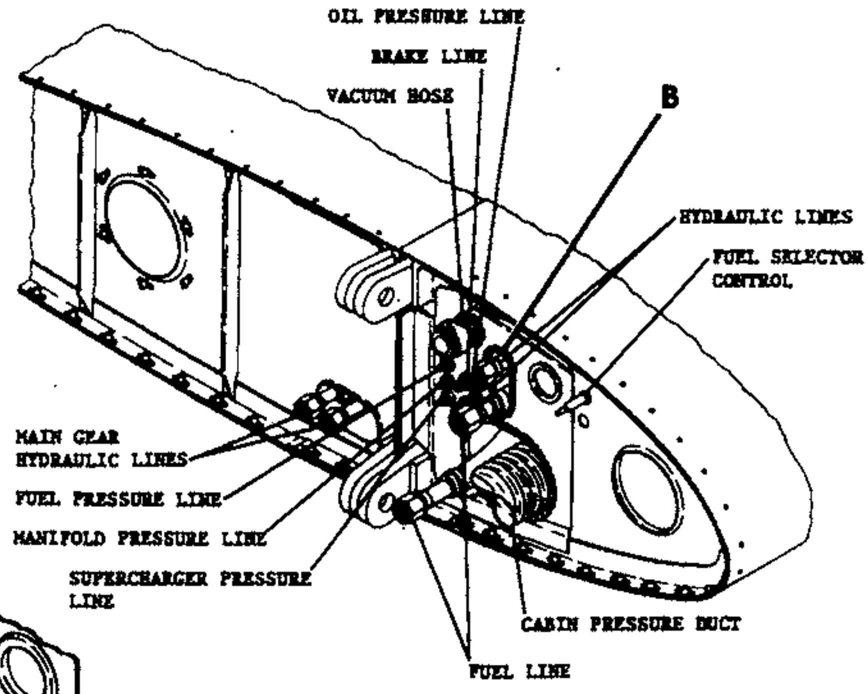
      (3) Jack aircraft, refer to Chapter 1.
      (4) Place suitable padded supports (cradles) beneath each stub wing, tailcone, and wing, then remove jacks.

      NOTE: To prevent damage to skin and rib sections, place padded supports beneath front and rear spars 35.50 inches from fuselage centerline on stub wings, beneath tailcone bumper, and wing root, and tip ribs. If both engines were removed and weight was placed in nacelles, remove weight after removing jacks.

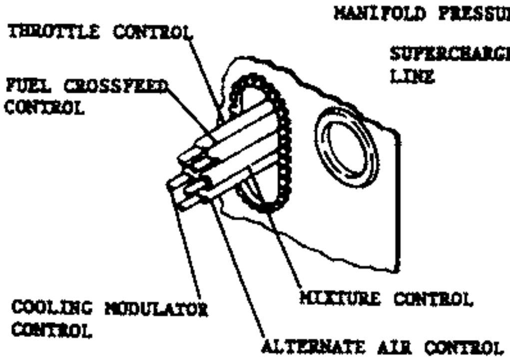
      CAUTION: IF ONLY ONE WING IS BEING REMOVED AND THE ENGINE ON THE OPPOSITE WING REMAINS INSTALLED; RELIEVE THE ENGINE WEIGHT ON OPPOSITE WING BY USING ENGINE HOIST BEFORE REMOVING WING OR SERIOUS DAMAGE, DUE TO TIPPING, MAY RESULT.

      (5) Remove wing structural skins at wing root by removing attaching screws.
      (6) Remove flap cables, aileron cables and aileron trim cables (left wing only), refer to Chapter 5.
      (7) Remove engine control cables in nacelle, refer to Chapter 7.
      (8) At wing root disconnect and tag the following items:
         (a) Vacuum hose.
         (b) Wing electrical wiring.
         (c) Fuel lines.
         (d) Brake line.
         (e) Oil pressure line.
         (f) All hydraulic lines.
         (g) Supercharger pressure line.
         (h) Manifold pressure line.
         (i) Fuel pressure line.
         (j) Cabin pressure duct.
      (9) With engine control cables disconnected at engine, route cables through wing toward the fuselage until the wing root is cleared.
      (10) With fuel selector and crossfeed control cables disconnected at fuel selector valve, route cables through wing toward the fuselage until wing root is cleared.





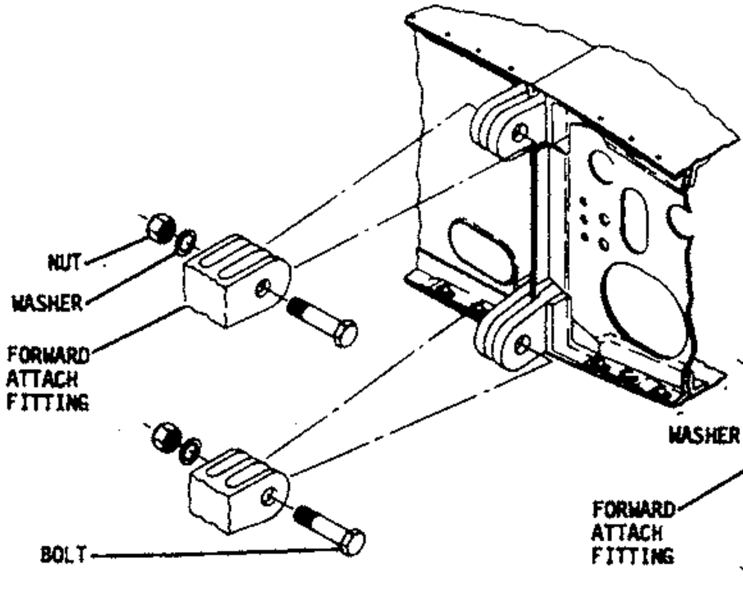
DETAIL A



DETAIL B

51204002
A51223008
B51223008

Wing Installation
Figure 1 (Sheet 1 of 3)



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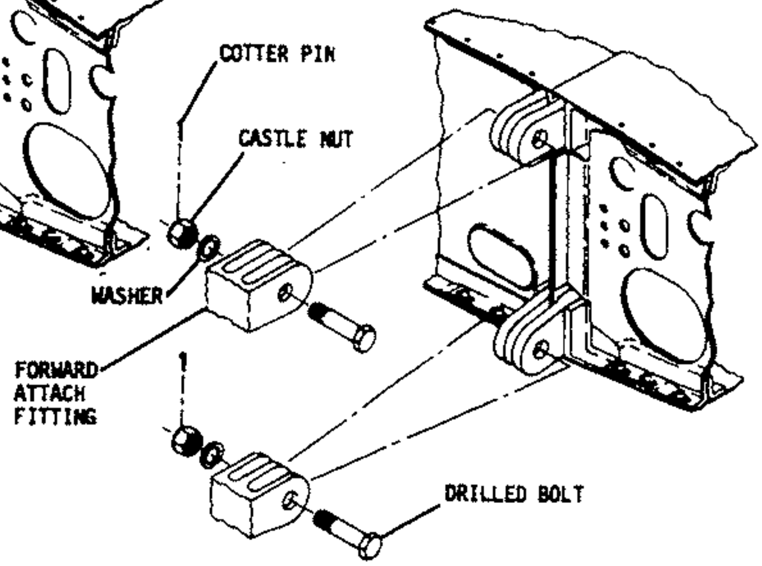
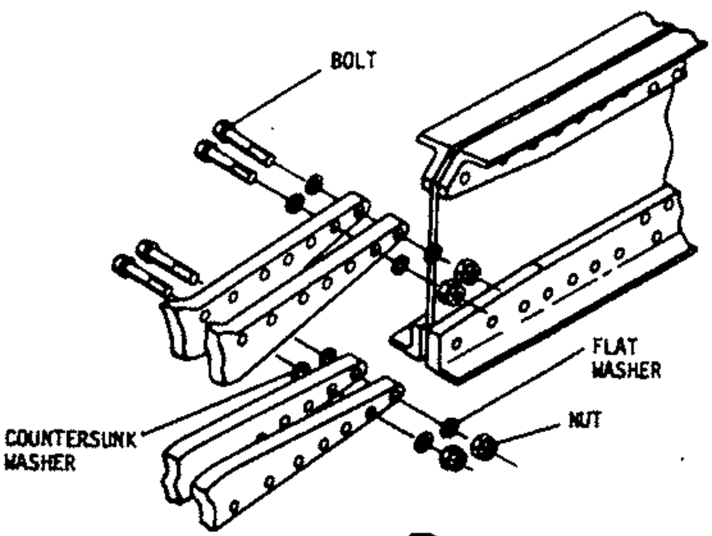


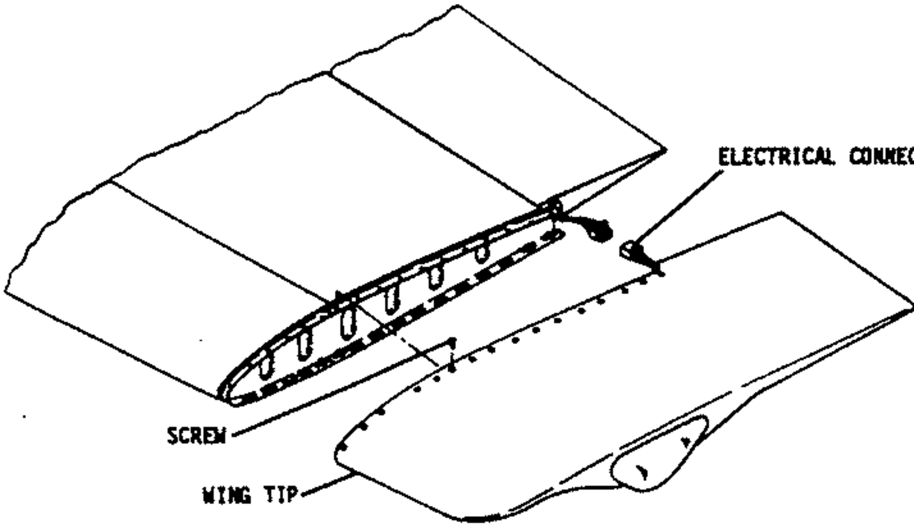
DETAIL C



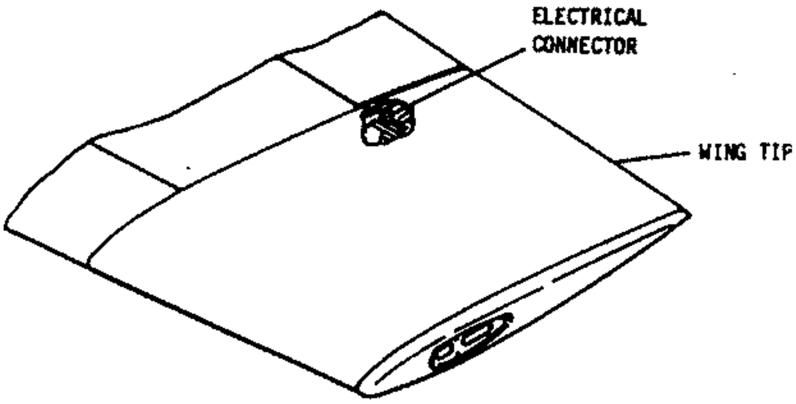
DETAIL D

C51222008
C51222008R
D51221008

Wing Installation
Figure 1 (Sheet 2)



DETAIL E
421C0001 THRU 421C1400



DETAIL E
421C1401 AND ON

E51282004
E59202005

Wing Installation
Figure 1 (Sheet 3)

(11) If wing deice system (optional) is installed, cut nylon line in wing root area.
(12) If air conditioning system (optional, right wing only) is installed, discharge system, refer to Cessna Air Conditioning System Service Parts Manual. Disconnect air conditioning lines at wing root.
(13) If windshield anti-ice system (alcohol) (optional, right wing only) is installed, drain reservoir and disconnect line at wing root.
(14) Remove nuts, washers and bolts from wing attachment fittings. For alternative installation, remove cotter pins, castle nuts, washers and drilled bolts.

NOTE: If difficulty is encountered in removing wing bolts or disengaging fittings, it may be necessary to rock wing slightly.

(15) Move wing and padded supports outboard until wing attach fittings have disengaged.

B. Install Wing.

(1) Route engine control cables, fuel selector and fuel crossfeed control cables through proper wing leading edge holes as wing is moved toward fuselage.
(2) Align bolt holes in front and rear spar fittings and install bolts, washers and nuts. For front spar attach fittings, install bolts, washers, nuts and cotter pins (if required). Shim lugs to ensure no gap exists between wing and fuselage fittings.

NOTE: Install new front spar bolts with heads forward. When drilled-type bolt and castle nut are installed, torque to 25 ±5 foot-pounds then back nut off until washer will turn by hand; then, install cotter pin. When undrilled bolt and nut are used, torque nut to 60 ±5 foot-pounds. Install new rear spar bolts with heads aft. Place countersink washers under heads of rear spar bolts and torque nuts to 175 ±15 inch-pounds.

NOTE: Spar bolts are installed in a shear position. DO NOT OVERTORQUE. It is possible wing spar bolts will turn if a slight torque is applied to bolt head.

(3) If wing deice system (optional) is installed, connect the two ends of cut nylon line with two Cessna P/N S1130-4 nuts and one S1132-4 union.
(4) Remove tags and connect the following items:
(a) Vacuum hose.
(b) Wing electrical wiring.
(c) Brake line.
(d) Oil pressure line.
(e) Fuel lines.
(f) Supercharger line.
(g) Manifold pressure line.
(h) Fuel pressure line.
(i) All hydraulic lines.
(j) Route engine control cables to engine nacelle, refer to Chapter 9.
(k) Route and connect engine control cables, refer to Chapter 7.
(l) Connect cabin pressure duct.
(5) Route and connect aileron, aileron trim (left wing only) and flap cables, refer to Chapter 5.
(6) If installed, connect air condition system and windshield anti-ice (alcohol) plumbing at right wing root.
(7) Jack airplane, refer to Chapter 2.
(8) If landing gear was removed, refer to Chapter 4 for installation and rigging.

CAUTION: IF ONE OR BOTH ENGINES WERE REMOVED, THE AIRPLANE MAY BECOME TAIL HEAVY. TO BALANCE AIRPLANE, USE WEIGHTS (SUCH AS SHOT BAGS OR SAND BAGS) IN THE NOSE COMPARTMENT AND SUPPORT THE TAILCONE.

(9) Leave tailcone support in place, remove padded supports from beneath fuselage and wings.

(10) Install engine and connect engine control cables; refer to Chapter 7.
(11) Rig aileron, aileron trim and flap systems; refer to Chapter 5.
(12) Service the airplane; refer to Chapter 2.
(13) Check all system plumbing. Perform landing gear operation check.
(14) Install structural skins at wing root.
(15) Remove jacks. Refer to Chapter 2.
(16) Start engines and check operation of electrical equipment and engine controls.

2. Removal/Installation Wing Tip (See Figure 1).

A. Remove Wing Tip (421C0001 Thru 421C1400).

(1) Ensure airplanes electrical power is turned OFF.

NOTE: If optional deice boots are installed, remove screws from bonding plate at wing tip.

(2) Remove screws securing wing tip to wing.
(3) While supporting wing tip; pull wing tip outboard and disconnect electrical connect.

B. Install Wing Tip (421C0001 Thru 421C1400).

(1) Position wing tip to wing and connect electrical connect.
(2) Secure wing tip to wing with screws.

C. Remove Wing Tip (421C1401 and On).

(1) Turn electrical power ON and extend landing light.
(2) Turn electrical power OFF.
(3) Remove landing light, navigation light and power supply; refer to Chapter 13.
(4) If left wing tip is being removed, remove stall warning transducer; refer to Chapter 13. If optional angle-of-attack is installed, refer to Chapter 10.
(5) Remove static wick.
(6) Remove deice boot from wing tip as required. For removal of the deice boot, refer to Chapter 12.
(7) Strip paint from wing tip to expose rivets and gap area between wing skin and wing tip.
(8) Remove wing tip by removing rivets. Refer to Chapter 15 for removal of rivets.

D. Install Wing Tip (421C1401 and On).

(1) If a new wing tip is being installed, accomplish the following steps.
  (a) Position wing tip on airplane and ensure a proper fit.
  (b) Using a hole finder, drill holes of like size in wing tip to match wing skin. Secure wing tip in place with temporary metal fasteners. Refer to Chapter 15.
  (c) Remove wing tip and deburr holes. Countersink holes in wing tip to match rivets. Refer to Chapter 15.
(2) Position wing tip on wing and secure with CM3827AD3 and CM3827AD4 rivets. Refer to Chapter 15.
(3) Install deice boot on wing tip. Refer to Chapter 12.
(4) If left wing tip was removed, install stall warning transducer. Refer to Chapter 13. If optional angle-of-attack was installed, refer to Chapter 10.
(5) Install landing light, navigation light and power supply. Refer to Chapter 13.
(6) Install static wick.
(7) Touch up paint. Refer to Chapter 1.

3. Removal/Installation Wing Tip Cap (See Figure 2).

A. Remove Wing Tip Cap.

(1) Remove navigation light. Refer to Chapter 13.
(2) Remove deice boot as required to remove wing tip cap. Refer to chapter 12.
(3) Cut out the end of the wing tip cap to facilitate removal.
(4) Check wing tip for the presence of fuel vapors.
(5) If fuel vapors are present, ventilate the area.

WARNING

BEFORE USING THE HEAT GUN, ENSURE THAT WING TIP IS CLEAR OF FUEL VAPORS.

(6) Using a heat gun, heat the wing tip cap where the wing tip cap joins the metal. Avoid heating the metal as much possible. As the adhesive softens, peel the cap free of the wing tip using a putty knife or other suitable tool.

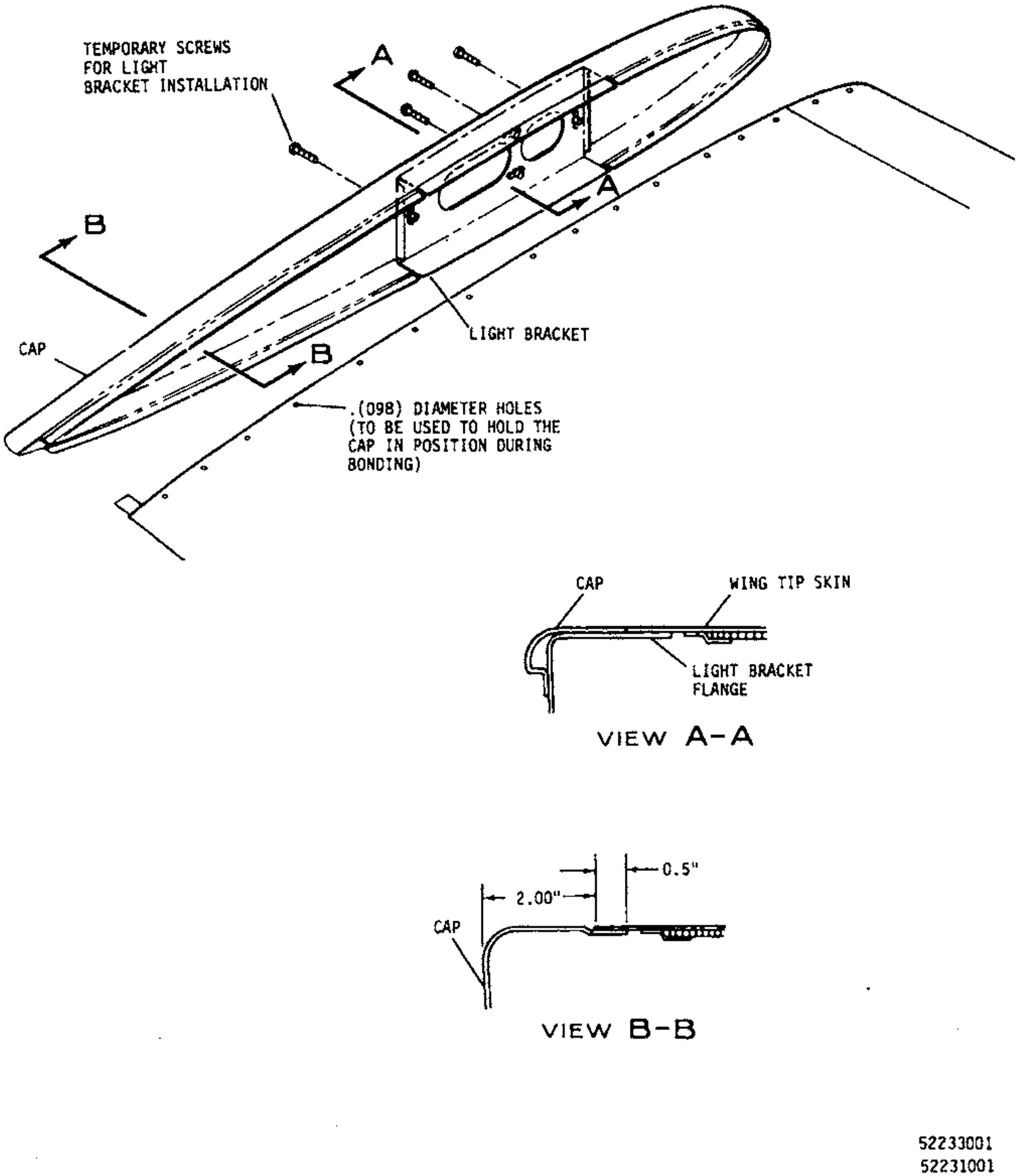
B. Install Wing Tip Cap.

(1) Remove paint and adhesive from exterior surface approximately one half inch inboard from edge of wing tip.
(2) Clean (0.098) holes in wing tip with number 40 drill or other suitable tool.
(3) Remove light bracket from old wing tip cap. Install light bracket in new wing tip cap securing with screws.
(4) Insert wing tip cap into wing tip until joggle of cap meets skin. Ensure that wing tip cap clears honeycomb inside wing tip; if not, trim wing tip cap to clear.

NOTE

There should be about one half inch of bonding area between wing tip and wing tip cap.

(5) Drill (number 0.40) holes in wing tip cap to match holes in wing tip, securing with temporary metal fasteners.
(6) Remove wing tip cap and clean surfaces with Methyl n-Propyl Ketone.
(7) Apply adhesive (EA9309 Hysol Division Corporation, 211 Franklins, Olean, NY 14760) and reinstall wing tip cap. Apply some type of parting agent to temporary metal fasteners to facilitate removal later. Allow adhesive to set for 24 hours.
(8) Remove temporary metal fasteners from wing tip cap. Fill holes and smooth the contour of the joint using suitable aerodynamic putty. Mix and apply in accordance with manufactures instructions.
(9) Reinstall deice boots. Refer to Chapter 12.
(10) Touch up paint. Refer to Chapter 1.
(11) Reinstall navigation light. Refer to Chapter 13.



Wing Tip Cap Assembly
Figure 2

ENGINE COWLING

Description

1. Each engine cowling consists of a two-piece nose cowl, an upper cowl and a lower cowl. Access panels in the lower skin of the nacelle are provided for maintenance and servicing.

2. The engine nose is a two-piece metal cowling secured to the lower and upper engine cowling and connected in the center.

3. The upper engine cowling is a one-piece metal cowl secured to the lower cowling with quick-release fasteners.

4. The lower engine cowling consists of two access doors on each side of the engine and the lower skin of the engine nacelle. Access doors in the lower skin are provided for servicing.

Maintenance Practices

1. Removal/Installation of Engine Cowling (See Figure 1)

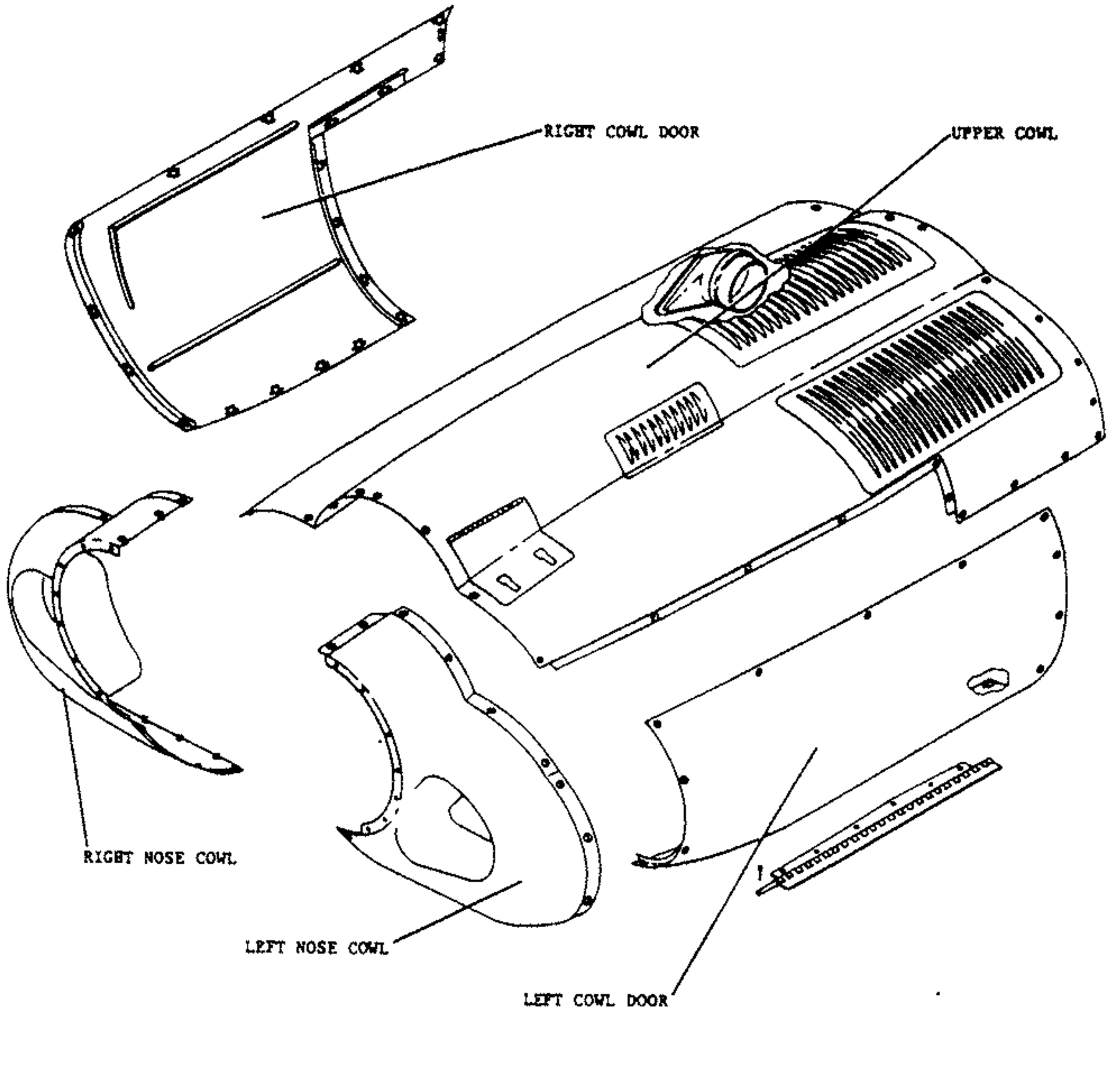
   A. Remove Engine Cowling.

   NOTE: Removal procedures are the same for either engine.

   (1) Release fasteners and open left and right cowl doors.
   (2) Release upper cowl fasteners and remove upper cowl.
   (3) Release fasteners in center of nose cowl and remove right half of nose cowl.
   (4) Remove fasteners securing left half of nose cowl and remove.

   B. Install Engine Cowling.

   (1) Position left half of nose cowl in place and secure to nacelle structure.
   (2) Position right half of nose cowl in place and secure fasteners.
   (3) Install upper cowl in place, secure with fasteners.
   (4) Close left and right cowl doors and secure fasteners.



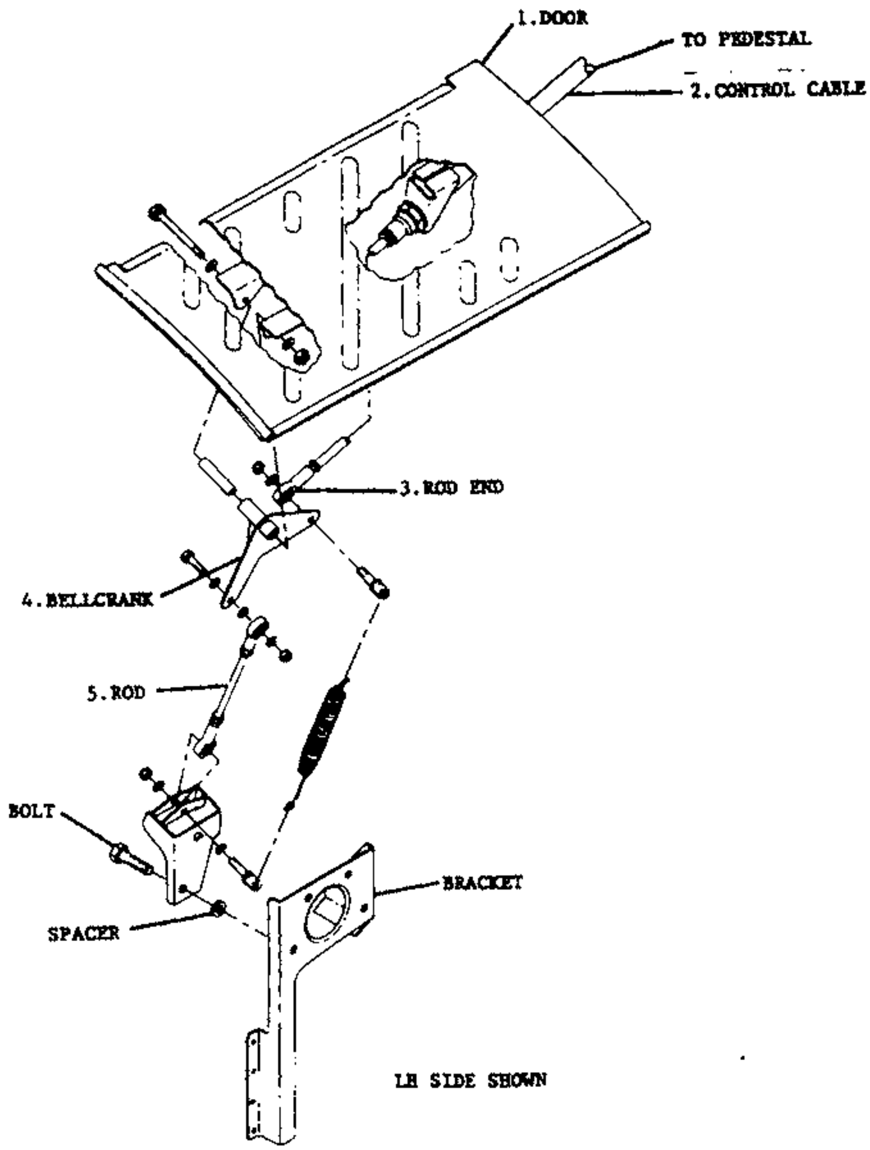
Engine Cowling Installation
Figure 1

ENGINE COOLING MODULATOR AND CONTROL SYSTEM

Description

1. The engine cooling modulator and control system (421C0001 to 421C0061), consists of a hinged flap mounted horizontally on the outboard side of each firewall, a bellcrank and a control cable operated from the cockpit.

2. During takeoff and landing and/or ground operation of the aircraft, the system is open. During flight, the system is closed or adjusted to provide engine cooling.



421C0001 THRU 421C0060

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Engine Cooling Modulator Installation
Figure 1

Adjustment/Test

1. Rigging Cooling Modulator (Cowl Flap) Control Cable (See Figure 1) (421C0001 Thru 421C0060)

   A. Rig Control Cable as follows:

      (1) Pull cowl flap control handle to the full CLOSED position and push back in approximately 0.025 ± .010 inches.
      (2) Turn handle and lock into position.

      NOTE: Upper engine cowling must be installed.

      (3) Disconnect control cable rod end at the bellcrank in nacelle.
      (4) Loosen the jam nut on rod end (3), turn fully clockwise, connect to bellcrank (4) and tighten jam nut.
      (5) With cable connected to bellcrank, adjust rod (5) to position door (1) to fit snug against upper engine cowl and the seal is compressed approximately one half.

      NOTE: Do not allow exposed threads on rod (5) to exceed 5/8 inch.

      (6) If threads exceed 5/8 inch, it will be necessary to lengthen control cable rod end at the bellcrank and repeat step "5".
      (7) Tighten jam nuts and check control cable for freedom of movement.

CHAPTER 4

LANDING GEAR AND BRAKE SYSTEM

TABLE OF CONTENTS

COMPONENTS LOCATION CHART
Landing Gear & Brakes

Components	Location
Landing Gear Control Valve	Forward Side of F.S. 100.00 Bulkhead
Shuttle Valve	Forward Side of F.S. 100.00 Bulkhead - Next to Nose Wheel Well Web
Main Gear Uplock Switch	In Main Gear Wheel Well On Uplock Hooks
Nose Gear Uplock Switch	In Nose Gear Wheel Well On Uplock Hook
Nose and Main Gear Downlock Switch	On Each Actuating Cylinder
Parking Brake Valve	Under Floorboard on Left Side of Airplane
Landing Gear Warning Horn and Warning Flasher	Inside Console in Cabin
Landing Gear Safety Switches	Located on LH Main Gear Shock Strut
Throttle Switches (Warning Horn)	Lower Portion of Throttle Lever
Flap Warning Switch	Aft Side of Re-Select Lever

LANDING GEAR AND BRAKES

Description and Operation

1. The landing gear is a fully retractable tricycle landing gear consisting of a main gear located aft of each engine nacelle and a nose gear located in the nose section of the fuselage. Each gear is hydraulically actuated and is controlled by a selector valve mounted in the nose section of the airplane. Mechanical uplock hooks sequenced to release prior to gear motion provides gear up retention.

2. Emergency gear down operation is provided by means of an air bottle blowdown system actuated by an emergency control handle.

3. The airplane has a hydraulically actuated braking system. A hydraulic master cylinder is attached to each pilot's rudder pedal with lines routed to the brake assemblies on each main gear. A parking brake system consists of a parking brake valve located in each main brake line and a parking brake control.

   CAUTION: IF ANY PART OF HYDRAULIC SYSTEM IS DISCONNECTED OR REMOVED, THE GEAR MUST BE CYCLED A MINIMUM OF 5 TIMES.

   NOTE: Any time landing gear system components have been removed, replaced, or adjusted, the entire landing gear system rigging must be checked for adjustment.

4. For replacing press-fit type bearings, refer to Chapter 5.

Troubleshooting

1. Refer to Extension and Retraction for troubleshooting the landing gear system.

2. Refer to Brake System for troubleshooting the brake system.

Servicing

1. Service Nose Gear and Main Gear Tires.

   A. Refer to Chapter 2 for servicing tires.

2. Service Nose and Main Gear Struts.

   A. Service Nose Gear Strut.

      NOTE: Gear must be in an upright position for servicing. If gear is on the airplane, it must be extended and clear of the ground.

      (1) Jack airplane. Refer to Chapter 1.
      (2) Deflate strut by loosening valve body 2-1/2 turns (minimum).
      (3) With strut fully compressed, remove valve assembly and replace with an AN919-3 and MS28778-8 packing, then attach a hand pump containing MIL-H-5606 hydraulic fluid. Operate hand pump until strut is fully extended.
      (4) Open check valve on pump and force strut to a collapsed position slowly. Repeat until no air is expelled from strut.
      (5) With strut in fully collapsed position, remove hand pump, hose and fitting, then replace MS28889-2 valve assembly and tighten against packing and safety wire.
      (6) Open valve and charge strut to 100 psig with a regulated source of dry air or nitrogen; then bleed down to 75 psig.
      (7) Remove airplane from jacks.

   B. Service Main Gear Strut. (421C0001 Thru 421C0800)

      NOTE: Gear must be in an upright position for servicing. If gear is on the airplane, it must be extended and clear of the ground.

      (1) Jack airplane Refer to Chapter 1.
      (2) Deflate strut by loosening valve body 2-1/2 turns (minimum).
      (3) With strut fully compressed, remove valve assembly and replace with an AN919-3 reducer and MS28778-8 packing, then attach a hand pump containing MIL-H-5606 hydraulic fluid. Operate hand pump until strut is fully extended.

(4) Open check valve on pump and force strut to a collapsed position slowly. Repeat until no air is expelled from the strut.
(5) With the strut in a fully collapsed position, remove hand pump, hose and fitting, then replace MS28889-2 valve assembly and tighten against packing and safety wire.
(6) Open valve and charge strut to 400 psig with a regulated source of dry air or nitrogen; then bleed down to 275 psig.

C. Servicing Main Gear Strut with Air Only (421C0801 and On).

WARNING: THE SWIVEL NUT AND AIR SERVICE VALVE BODY ARE 3/4 INCH HEX. TURNING THE BODY NUT WILL REMOVE VALVE FROM SERVICE PORT, ALLOWING VALVE TO BE BLOWN OUT.

DO NOT COVER VALVE WITH HANDS OR ALLOW PRESSURE TO BE BLOWN INTO FACE.

(1) Remove cover from air service valve.

NOTE: No hydraulic fluid is permitted in lower chamber of piston barrel. If fluid exists, the strut assembly must be overhauled.

(2) Release torque on swivel nut while holding the service valve body and slowly turn to allow any existing air pressure to escape.

CAUTION: WHEN CHARGING WITH DRY AIR OR NITROGEN, STRUT MAY EXTEND RAPIDLY. TAKE CARE TO PREVENT INJURY.

(3) Connect regulated air supply, relief valve and pressure gage to service valve body. Slowly charge strut to 250 psig with regulated source of dry air or nitrogen.
(4) Close relief valve and disconnect air source.
(5) Slowly open relief valve and bleed pressure down to 170 psig with strut fully extended. If hydraulic fluid is expelled from lower air chamber, strut must be overhauled. No hydraulic fluid is permitted in lower chamber.
(6) Rotate outer hex swivel nut clockwise on air service valve body to close internal poppet and remove pressure gage and relief valve.
(7) Secure service valve, swivel nut and install cover.
(8) Safety wire filler plug.

D. Servicing Main Gear Strut with Air and Oil (421C0801 and On).

(1) Jack airplane until strut is fully extended and clear of ground.
(2) Remove cover from air service valve.

WARNING: THE SWIVEL NUT AND AIR SERVICE VALVE BODY ARE 3/4 INCH HEX. TURNING THE BODY NUT WILL REMOVE VALVE FROM SERVICE PORT, ALLOWING VALVE TO BE BLOWN OUT.

DO NOT COVER VALVE WITH HANDS OR ALLOW PRESSURE TO BE BLOWN INTO FACE.

CAUTION: DO NOT OPEN VALVE MORE THAN 1/2 TURN. TOO RAPID PRESSURE RELEASE WILL CAUSE FROSTING AND POSSIBLE BLOCKAGE OF VALVE STEM.

(3) Release torque on swivel nut while holding the service valve body and slowly turn to allow air pressure to escape.

NOTE: No hydraulic fluid is permitted in lower chamber of piston barrel. If fluid exists, the strut assembly must be overhauled.

(4) Remove filler plug and packing from top of strut and replace with AN919-1D reducer and MS28778-2 packing.
(5) Connect the reducer to a hydraulic hand pump filled with MIL-H-5606 hydraulic fluid.

(6) Pump hydraulic fluid into strut until dully extended. Increase pressure to 750 ±50 psig to assure isolation piston is properly bottomed out when strut is fully extended.

CAUTION: IF STRUT IS CYCLED WHILE MOUNTED ON THE TRUNNION/DRAG LINK, USE OF A HYDRAULIC JACK TO LIFT THE WHEEL SHOULD BE DONE WITH EXTREME CAUTION. THE STRUT MUST BE STROKED COMPLETELY WHILE AVOIDING ANY POSSIBILITY THAT THE WING WEIGHT IS REMOVED FROM THE PRIMARY WING JACK. WING WEIGHT ON THE WHEEL JACK COULD RESULT IN DAMAGE SHOULD THE WING JACK COME OFF THE JACK PAD.

(7) Open pump vent on hydraulic pump and slowly force strut to the collapsed position. Crack the reducer and continue to continue to collapse strut until it bottoms out allowing air to expel from strut.
(8) Repeat cycling of strut (three cycles minimum) as required with hand pump until no air is being discharged from oil chamber.
(9) Keeping strut fully collapsed, carefully remove hydraulic pump, AN919-D reducer and packing. Top off strut with fluid and reinstall filler plug and new MS28778-2 packing and tighten.

CAUTION: WHEN CHARGING WITH DRY AIR OR NITROGEN, STRUT MAY EXTEND RAPIDLY. TAKE CARE TO PREVENT INJURY.

(10) Connect regulated air supply, relief valve and pressure gage to service valve body. Slowly charge strut to 250 psig with regulated source of dry air or nitrogen.
(11) Close relief valve and disconnect air source.
(12) Slowly open relief valve and bleed pressure down to 170 psig with strut fully extended. If hydraulic fluid is expelled from lower air chamber, strut must be overhauled. No hydraulic fluid is permitted in lower chamber.
(13) Rotate outer hex swivel nut clockwise on air service valve body to close internal poppet and remove pressure gage and relief valve.
(14) Secure service valve, swivel nut and install cover.
(15) Safety wire filler plug.

3. Service Shimmy Damper.
   A. Refer to Chapter 2 for servicing shimmy damper.

4. Service Brake System.
   A. Refer to chapter 2 for servicing brake system.
   B. Refer to brake system for bleeding brakes.

5. Service Blowdown System.
   A. Refer to Chapter 2 for servicing blowdown bottle.

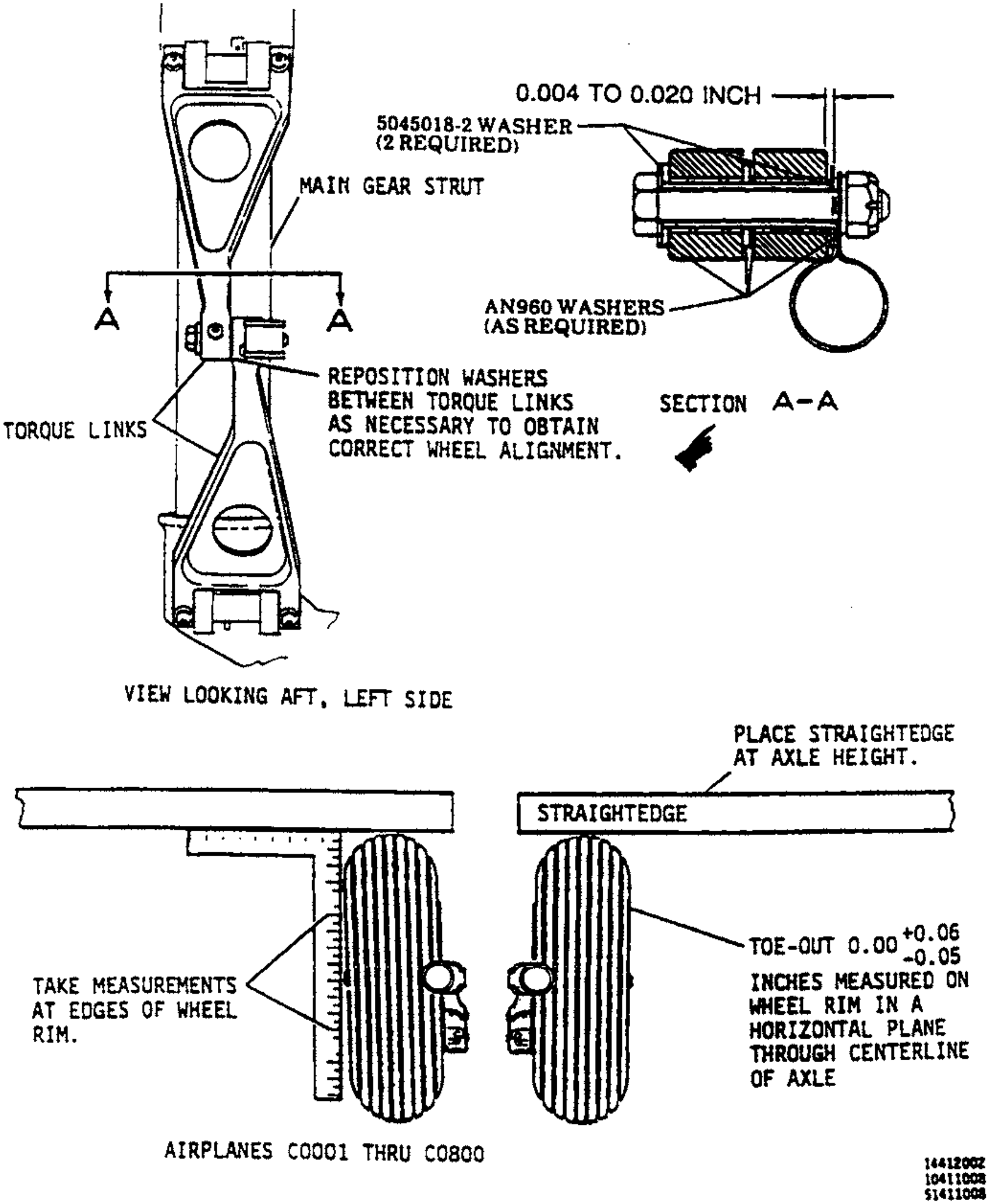
6. Hydraulic system Reservoir.
   A. Refer to Chapter 2 for servicing reservoir.

Adjustment/Check

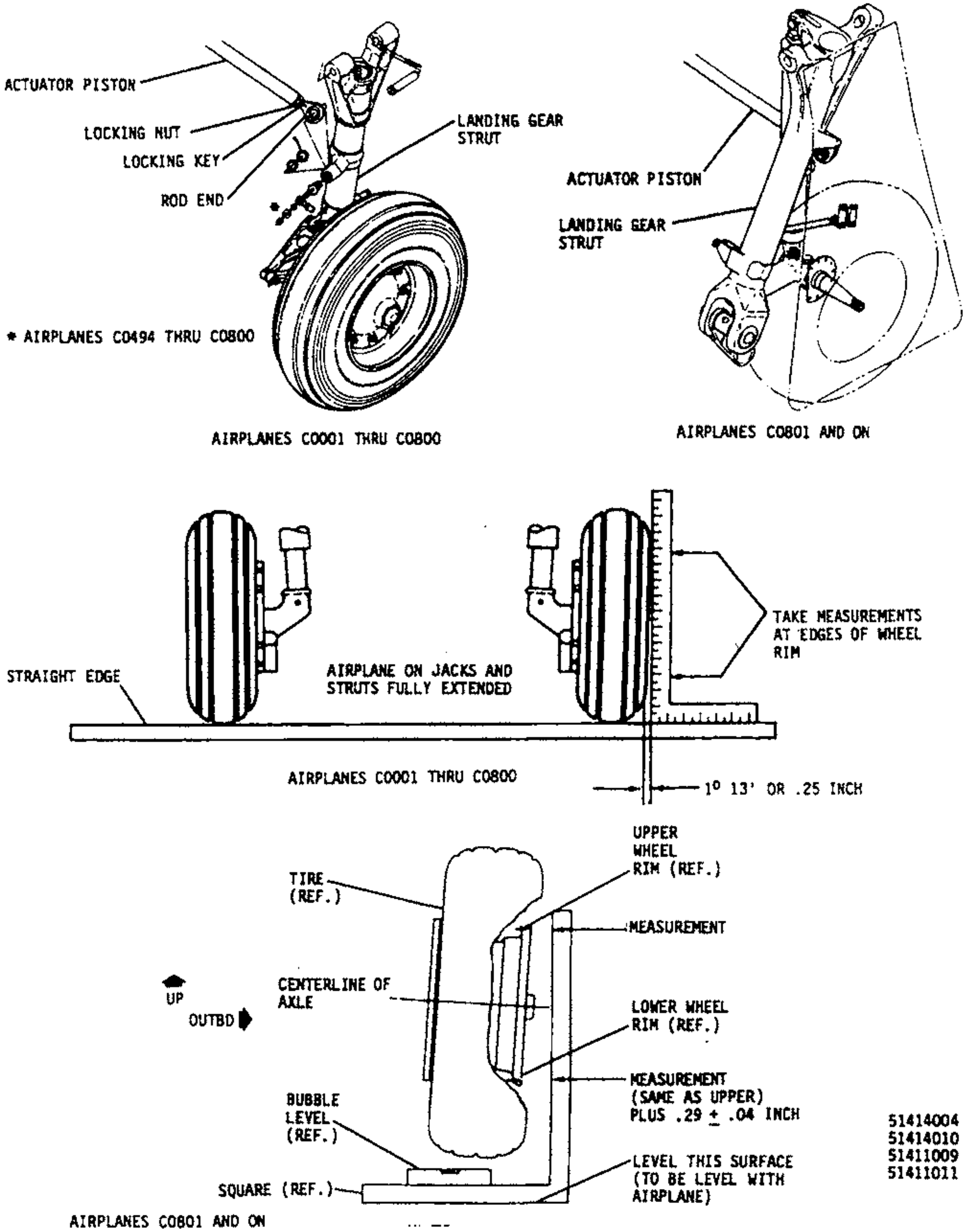
1. Tools and Equipment.

NOTE: EQUIVALENT SUBSTITUTES MAY BE USED INSTEAD OF THE FOLLOWING ITEM.

Name	Number	Manufacturer	Use
Hydraulic Test Stand	SE1300 or SE589 Modified or include SK421-68	Cessna Aircraft Company	Test hydraulic system



Main Wheel Toe-Out Aligment
Figure 1



Main Wheel Camber Alignment
Figure 2

2. Adjust Landing Gear.

A. Adjust Main Gear Toe-out (see Figure 1).

NOTE: Correct alignment of the main landing wheels is necessary to minimize tire wear. If tires are wearing excessively or unevenly, the wheel alignment should be checked and corrected.

(1) Position the airplane with the main wheels resting on grease plates.

NOTE: For each set of grease plates, use two aluminum sheets approximately 18 inches square with sufficient grease spread between them to permit the top plates to slide freely on the bottom plates.

(2) Set a straightedge in place against the main wheel tires at axle height as illustrated.
(3) Place one leg of a carpenter's framing square against the straightedge, with the other leg against the outboard side of the wheel being checked. Measure the distance between framing square leg adjacent to wheel and wheel rim at extreme aft circumference of wheel rim. The difference between the two measurements will be the toe-in or toe-out for that wheel. Toe-out for either wheel is 0.00, +.06, -.05 inch. Toe-out must remain in tolerance throughout the entire range of free play in the system. If tolerance cannot be retained, replace bushings. (See Disassembly and Assembly of Main Landing Gear.)

NOTE: Remove weight from gear by jacking airplane before attempting to add or remove washers to torque links.

(4) Add washers between torque links to correct for excessive toe-in. Wheel alignment after adjustment must be within limits prescribed in step (3).

NOTE: AN960-716 and AN960-716L washers are used as shims between the upper and lower torque links. Combinations of thick and thin washers can be used between the torque links to obtain the correct wheel alignment. Washers that are added or removed between the torque links must also be removed or added to the outside end of the spacer to maintain an .004 to .020 side play of the torque links. Be sure that the spacer washers are centered on the spacer as the nut is being torqued up to standard torque value.

B. Adjust Main Gear Camber 421C0001 Thru 421C0800 (see Figure 1).

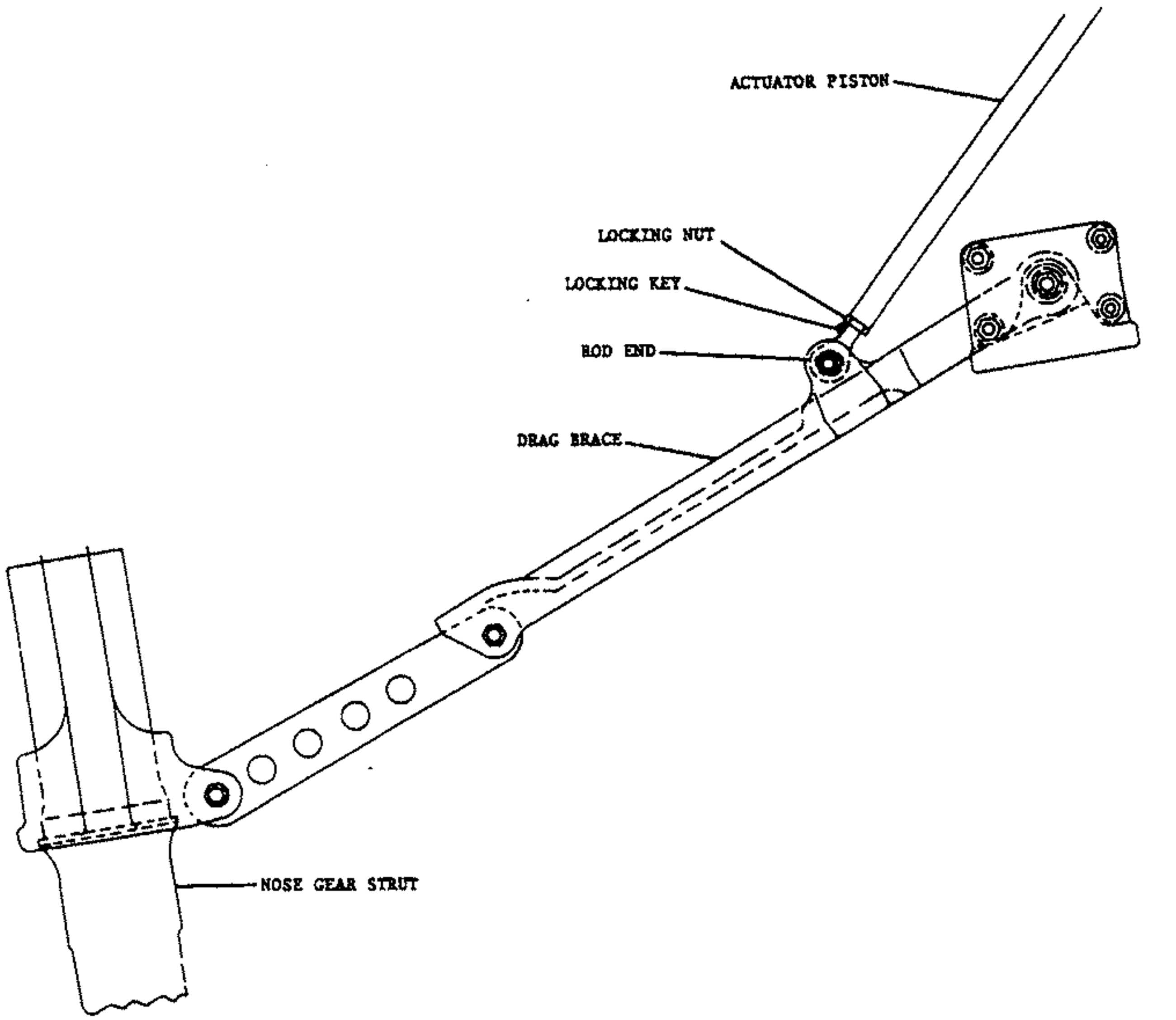
(1) Jack the airplane, then, with a straightedge placed against the lower surface of the tires, place a carpenters square against the wheel and the straightedge. The wheel must be cambered from side of tire to carpenters square.
(2) Remove safety wire and loosen nut on rod end.
(3) Rotate rod end on piston to attain proper camber.

CAUTION: MAKE SURE OF SUFFICIENT THREAD ENGAGEMENT OF ROD END INTO PISTON. THREAD ENGAGEMENT LENGTH MUST NEVER BE LESS THAN ONE THREAD DIAMETER OR MUST HAVE SUFFICIENT THREADS TO COVER INSPECTION HOLE.

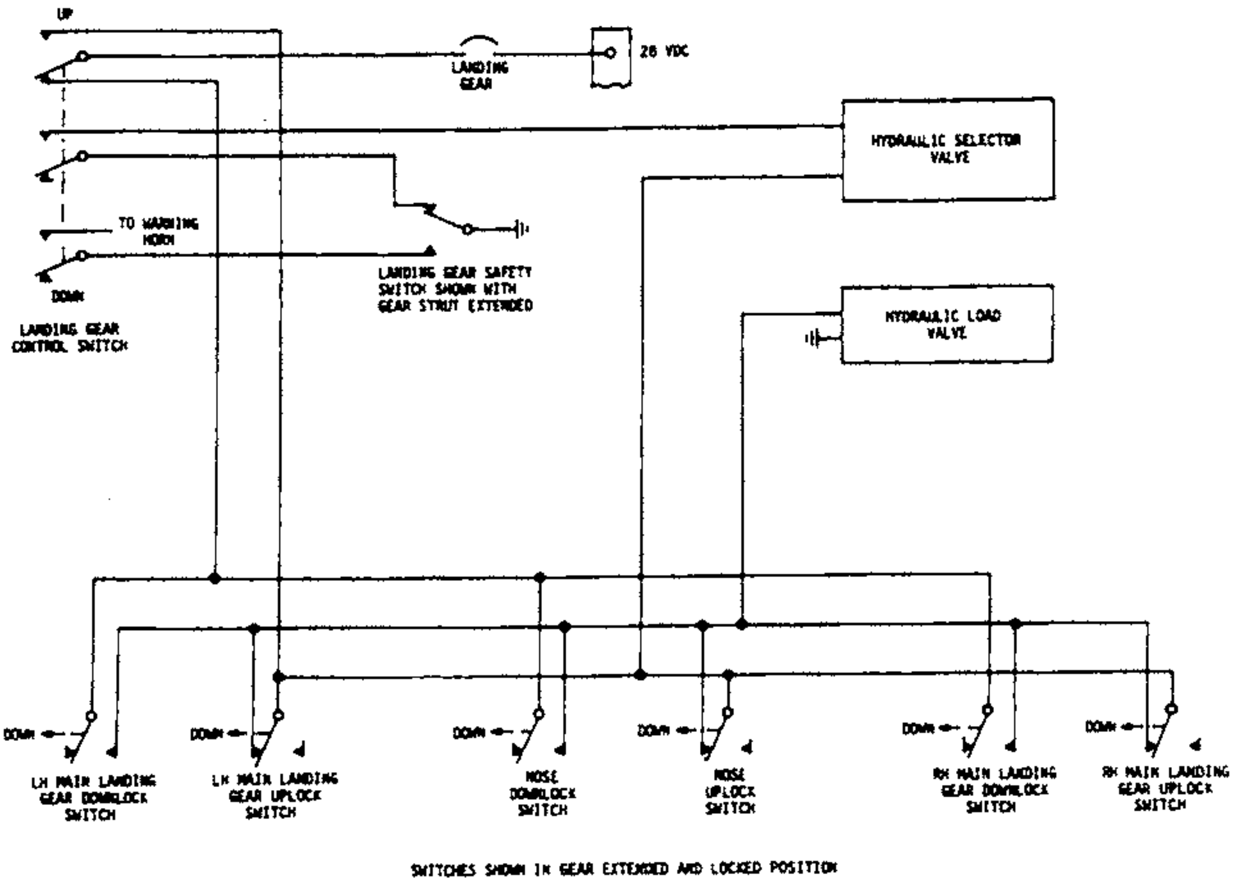
(4) Tighten locking nut and safety wire locking nut to locking key.
(5) Remove airplane from jacks.

C. Adjust Main Gear Camber 421C0801 and On (see Figure 2).

(1) Extend the landing gear ensuring that the actuators are fully extended and locked.
(2) Level the airplane laterally using a bubble level across the seal rails in the cabin or across the bottom of the fuselage (near the wing aft spar area).
(3) Using a square and bubble level as shown, take a measurement from the vertical portion of the square to the upper then to the lower wheel rim.
(4) Adjust the rod end at the outboard end of the main landing gear actuator as required so that the measurement to the lower wheel rim is .29 $\pm$.04 inches greater than the measurement to the upper wheel rim.



Nose Gear Actuator Adjustment
Figure 3



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Landing Gear Control Simplified Schematic
Figure 4

(5) Ensure rod end has sufficient thread engagement and secure rod end in place by tightening the jam nut and safety wiring in place.

NOTE: If the actuator does not have an inspection hole to check for proper rod end thread engagement, mark rod end at the point flush with the end of the piston rod and unscrew the rod end. Check to insure thread engagement is equal to or greater than the diameter of the rod end shaft.

NOTE: Toe-in/Toe-out is not adjustable on this gear.

D. Adjust Nose Gear Actuator 421C0001 Thru 421C0800.

NOTE: The nose gear drag brace and drag link assembly is manufactured to provide overcenter condition between the three pivot points. To ensure this overcentered down and locked condition, the nose gear actuator must be adjusted.

(1) Jack airplane. Refer to Chapter 1.
(2) Remove safety wire and loosen nut on rod end.
(3) Remove cotter pin, nut, washer and bolt securing rod end to drag brace.
(4) With actuator in fully extended position and the drag brace in the overcenter position, adjust rod end to obtain a slip fit of the connecting bolt; then screw rod end out one full turn.

CAUTION: MAKE SURE OF SUFFICIENT THREAD ENGAGEMENT OF ROD END INTO PISTON. THREAD ENGAGEMENT LENGTH MUST NEVER BE LESS THAN ONE THREAD DIAMETER OR MUST HAVE SUFFICIENT THREADS TO COVER INSPECTION HOLE.

(5) Install bolt, actuator will have to be retracted slightly.
(6) Tighten locking nut and safety wire locking nut to locking key.

E. Adjust nose gear actuator 421C0801 and On.

(1) Operate landing gear to fully extend the nose gear actuator (without being connected to the drag brace).
(2) Connect the actuator to the drag brace using the bolt only.
(3) Adjust rod end to position the drag brace and drag link in the full position (against the stop). Then unscrew the rod end one turn (lengthen actuator) to provide the correct overcenter preload.
(4) Check rod end to insure that it has proper thread engagement within the actuator piston rod.

NOTE: If the actuator does not have an inspection hole to check for proper rod end thread engagement, mark rod end at the point flush with the end of the piston rod and unscrew the rod end. Check to insure thread engagement is equal to or greater than the diameter of the rod end shaft.

(5) Final install the bolt and washer to connect the actuator to the drag brace using a new MS17825-4 nut and MS24665-136 cotter pin.

3. Check Landing Gear System.

A. Landing Gear Operational Check.

CAUTION: ENSURE SHOCK STRUTS ARE PROPERLY SERVICED WITH OIL AND AIR PRIOR TO RETRACTING THE LANDING GEAR.

(1) Jack airplane until tires are clear of ground. Refer to Chapter 7.
(2) Pull all circuit breakers; place battery switch in OFF position and attach external power supply.

NOTE: Battery switch should remain in OFF position throughout ground operation with hydraulic service unit and external power supply.

(3) After airplane is "powered up", push in the following circuit breakers: LDG GEAR - "HYD" and "WARN"; gear instrumentation lights will illuminate when "HYD" circuit breaker is in.

NOTE: With gear down and locked, three green lights should be illuminated. "HYD" flow lights should be illuminated at all times when external power is applied to airplane.

(4) Attach hydraulic service unit to the appropriate lines.
(5) Ensure that position of landing gear selector switch corresponds with gear. Ensure that reservoir filler plug is tight.
(6) Clear all personnel from gear area.
(7) On hydraulic service unit, open dump valve and reservoir drain valve, close flow valve and turn power ON. Make sure service unit pump rotation is in correct direction.
(8) Close dump valve and then open flow valve slowly until one and one-half (1.5) gallons per minute (GPM) are being supplied. Bring pressure up to 1500 PSI slowly in 500 PSI increments.
(9) When return fluid from airplane is free of air, cycle the landing gear up and down several times while increasing flow to three (3) GPM until return fluid is again free of air.

NOTE: HYD PRESS light should illuminate any time the gear is being cycled.

(10) Increase service unit output to (5) GPM. High pressure gage should read above 150 PSIG. Low pressure gage should not read above 10 PSIG.
(11) Cycle gear and determine time (lock-to-lock by light indication) to retract and extend.
(12) Time to retract should not exceed 5.0 seconds. Time to extend should not exceed 7.0 seconds.
(13) All gear lights should be off when the gear is up and locked.
(14) During gear cycling, observe that the gear down and locked lights are all illuminated at the completion of an extension cycle. Observe that unsafe light is illuminated while gear is in transit.
(15) During gear retraction, the service unit high-pressure gage should read 500-800 psig for most of the cycle, peaking to 1750 psig just before complete uplock and subsequent deenergization of the loading valve.
(16) During gear extension, the high-pressure gage should nominally read 250-400 psig, peaking at 1750 psig just before complete downlock. The low pressure gage should read 8-10 psig throughout the cycle.
(17) At completion of test, disconnect and remove service unit from airplane.
(18) Remove external power supply from airplane and return airplane electrical system to an OFF position.
(19) Remove airplane from jacks.

B. Emergency Gear Extension.

(1) This test is to be run after the landing gear has been rigged and check is complete.
(2) Retract the landing gear and shut down hydraulic service unit.
(3) Drain airplane hydraulic reservoir.
(4) Disconnect service unit couplers from airplane and provide a catch container below the reservoir vent line.
(5) Pull the HYD circuit breakers.
(6) Verify that blowdown bottle pressure is within the green arc.
(7) Verify tightness and security of reservoir filler plug.
(8) Verify gear select switch is in down position.
(9) Clear all personnel from the area.
(10) Pull emergency gear extension handle in a brisk, firm motion (maximum movement .75 inch). All three gears should blowdown and lock within three seconds. Observe three green lights.
(11) Reposition emergency gear extension handle.

(12) Loosen blowdown line at bottle fitting and at each extend port fitting on all landing gear cylinders. This allows residual pressure to completely bleed off. Retighten the fitting at each cylinder extend port.

WARNING : EXTREME CARE SHOULD BE TAKEN IN LOOSENING BLOWDOWN LINE AT BOTTLE TO AVOID INJURY DUE TO BLAST OF HIGH PRESSURE NITROGEN.

CAUTION : DO NOT OPERATE LANDING GEAR SYSTEM, BEFORE BLEEDING OFF EMERGENCY BLOWDOWN PRESSURE AT BOTTLE OUTLET FITTING. DAMAGE TO HYDRAULIC RESERVOIR MAY RESULT.

(13) Attach a small hose to blowdown line and run hose into a can to catch residual fluid when resetting shuttle valve.
(14) Refill airplane hydraulic reservoir.
(15) Reattach service unit and select 3 GPM.
(16) Select gear up. The instant one green light goes out, select gear down. This will build hydraulic extend pressure sufficiently to reset the shuttle valve.
(17) Select gear up again. Wait until at least two green lights go out before selecting gear down. Pressure on service unit should rise to 500-600 psig before complete downlock.
(18) Shuttle valve should now be repositioned. Cycle gear until return fluid is free of air.
(19) Change blowdown bottle. Refer to Chapter 2.

4. Landing Gear Actuators and Control/Indication Systems Functional Test.

A. Landing gear actuator functional test.

(1) Jack airplane until the tiers clear the ground. Assure each actuator is down and locked.
(2) Connect hydraulic service cart to the airplane and supply auxiliary electrical power.
(3) Disconnect forward actuator rod end from trunnion before test, or you will get much higher pressures during the test.

NOTE : Have an observer in the cockpit to observe gear downlock and in transit lights and one at each gear to witness gear movement.

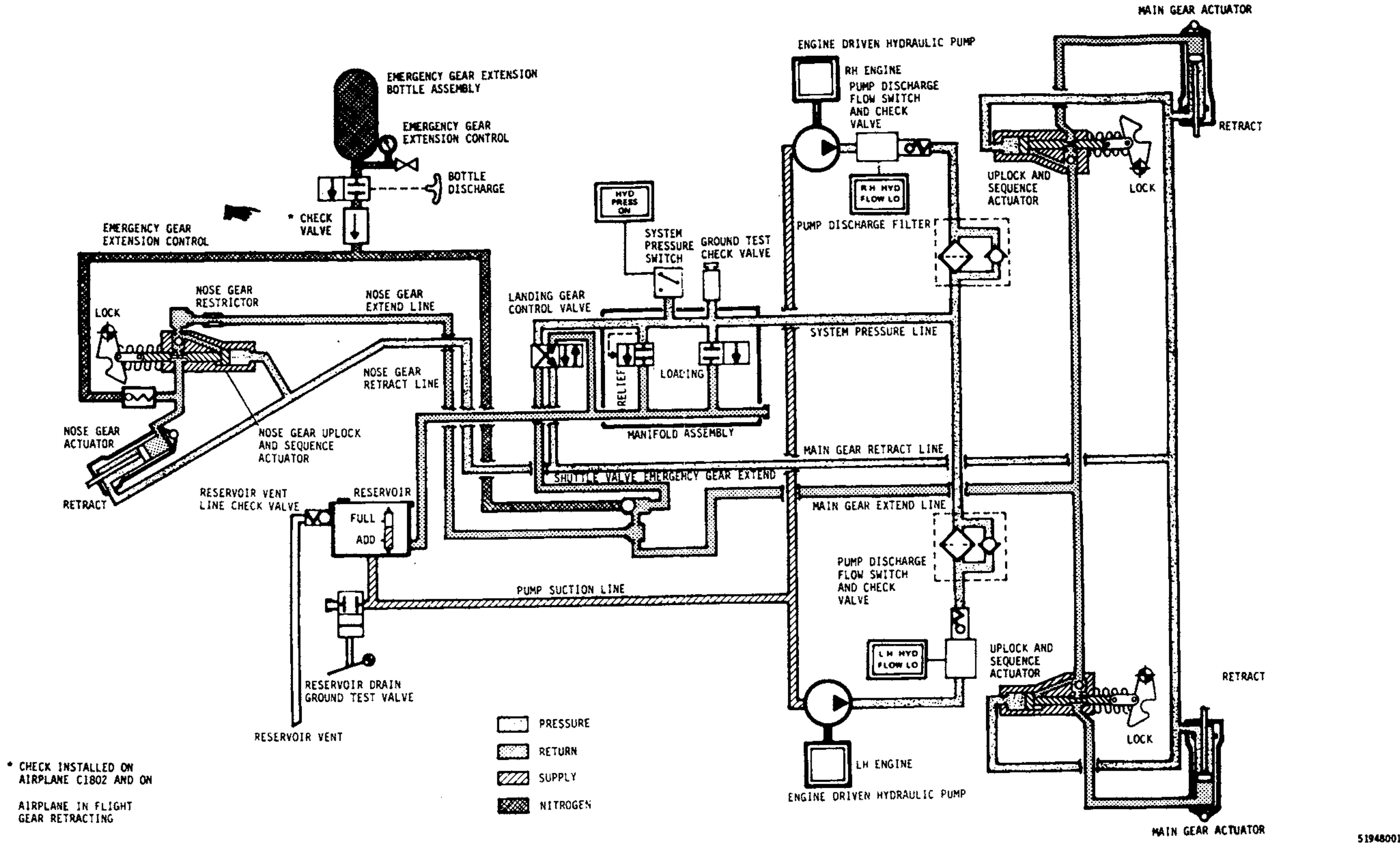
(4) Very slowly increase hydraulic pressure to the gear system, monitoring hydraulic pressure at the cart. Observe and record the pressure at which each landing gear actuator unlocks. The landing gear internal lock is designed to release between 250 and 400 PSIG (with the exception of the 9910139-3 nose gear actuator, which is between 250 and 610 PSIG).

NOTE : The piston will move immediately upon release of the internal lock and the hydraulic pressure may fall to zero. Also, the electrical switch will actuate simultaneously with the release of the internal lock.

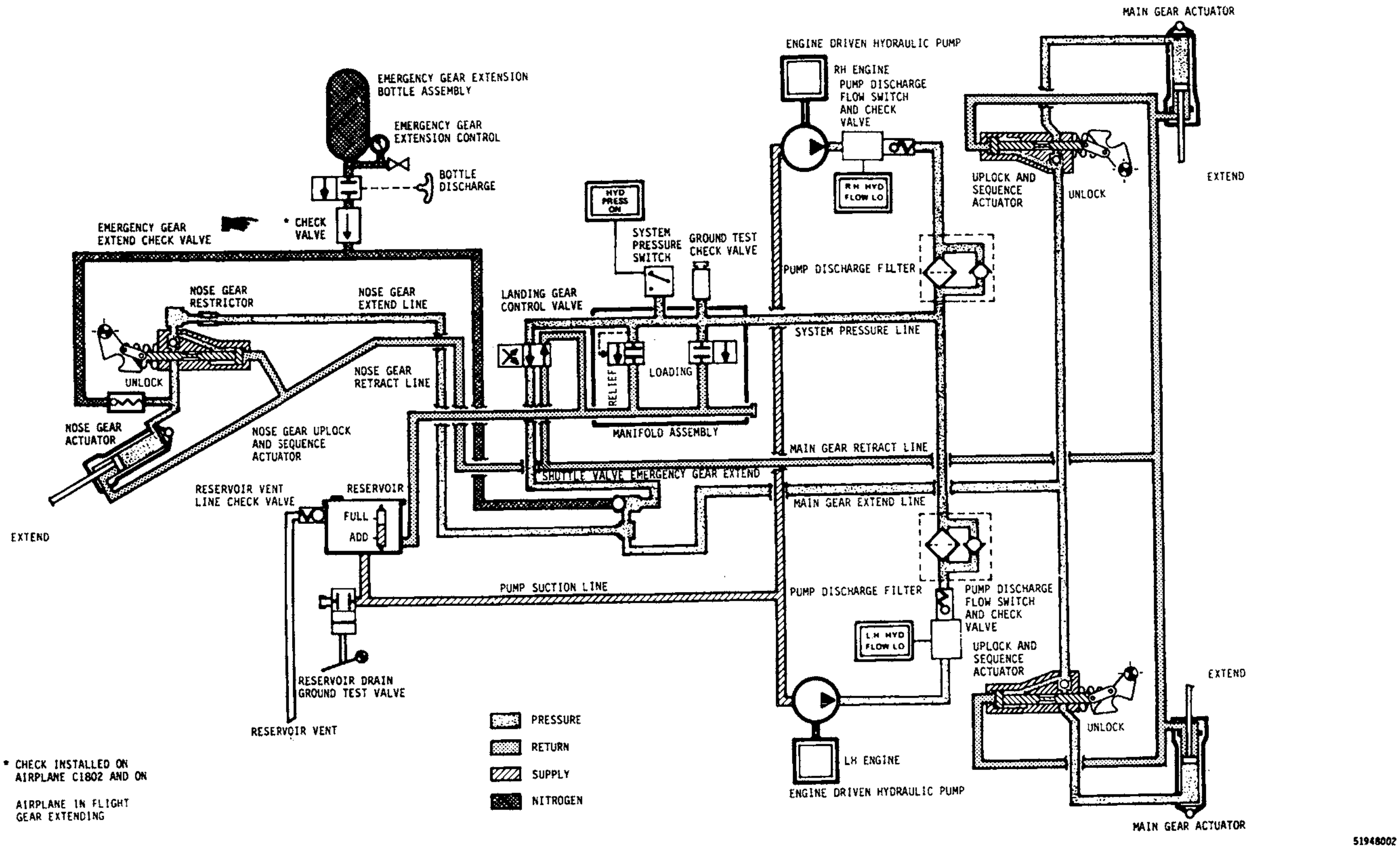
(5) Replace actuator if it does not meet the uplock pressure requirement, refer to the Model 421C Illustrated Parts Catalog for part number of actuator and then to this Chapter (4) for removal and installation procedures, then repeat step 4A (3).

B. Landing Gear Control/Indication System Functional Test.

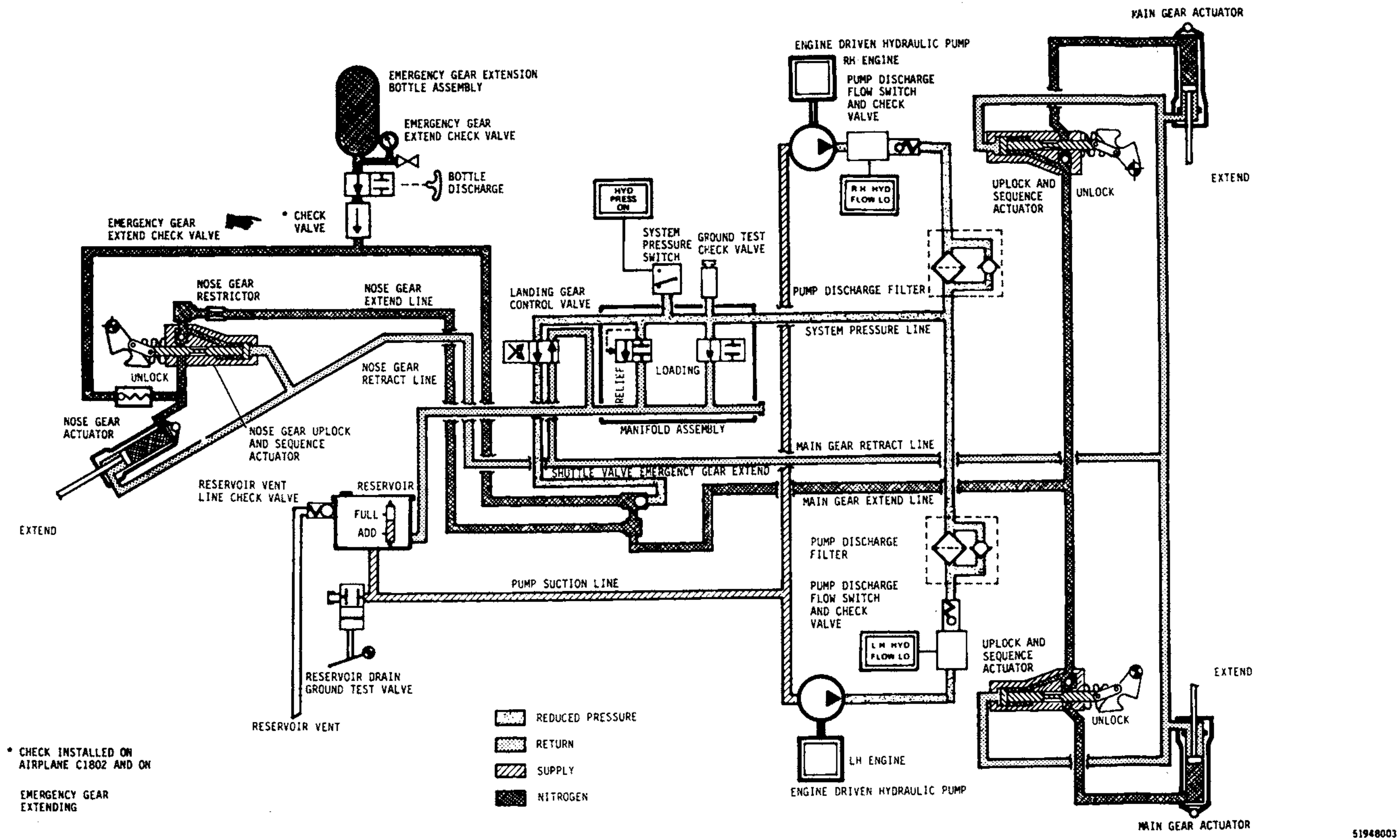
(1) Check the landing gear control and indication circuit as follows;
(a) Retract the gear to the up and locked position.
(b) Shut off hydraulic pressure to the airplane.
(c) Position the gear handle in the down position. Reapply hydraulic pressure until the uplocks release. Shut off hydraulic pressure to the airplane. Move two of the gear to the down and locked position while manually restraining one of the gear from going into the down and locked position. Check that the two gears indicate "locked" on the panel.
(d) Slowly apply hydraulic pressure to the airplane. The gear that is not down and locked should move to the locked position. Failure of the gear to go to the locked position indicates a faulty control circuit. Check and repair the control circuit as required.
(e) After gear indicates downlock, manually attempt to retract (unlock) the gear. Gear shall remain locked. If gear does not remain locked, trouble shoot and accomplish required repairs.
(f) Repeat steps 4B 1A thru 1D until all three landing gear have been tested.
(g) Following satisfactory completion of the above tests, disconnect hydraulic cart, remove auxiliary electrical power and remove airplane from jacks (Refer to Lifting and Shoring Chapter 7).



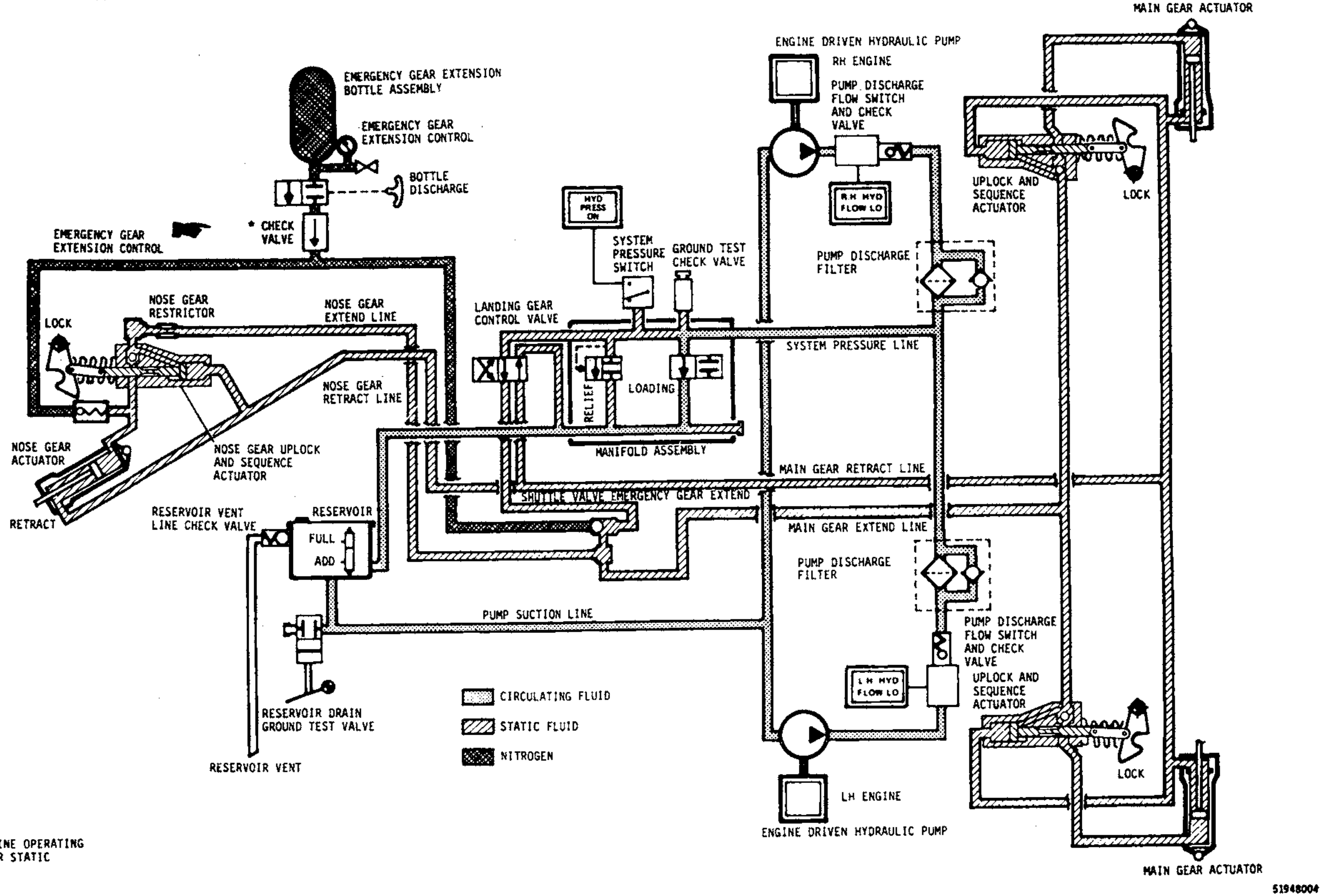
Landing Gear System Schematic
Figure 5 (Sheet 1)



Landing Gear System Schematic
Figure 5 (Sheet 2)



Landing Gear System Schematic
Figure 5 (Sheet 3)



* CHECK INSTALLED ON AIRPLANE C1802 AND ON

ENGINE OPERATING
GEAR STATIC

Landing Gear System Schematic
Figure 5 (Sheet 4)

MAIN LANDING GEAR

421C0001 Thru 421C0800

Description

1. Each main landing gear consists of a lower piston assembly, cantilever axle, upper trunnion assembly and torque links. The air-oil shock strut contains an orifice and tapered metering pin which varies the resistance to shock according to severity. During retraction and extension, the landing gear pivots on heavy duty needle bearings by means of trunnion pins attached to the upper trunnion assembly.

Troubleshooting

1. Troubleshooting Main Landing Gear

   A. For a guide to troubleshooting the main landing gear, see Figure 1.

Maintenance Practices

1. Tools and Equipment.

   NOTE: EQUIVALENT SUBSTITUTES MAY BE USED FOR THE FOLLOWING LISTED ITEMS:

Name	Number	Manufacturer	Use
Ring Pack Support Tool	0880004-1	Cessna Aircraft Co. or locally manufactured (See Figure 2)	To insert ring pack support.
Hydraulic Fluid	MIL-H-5606	Commercially Available	To lubricate parts and fill strut.

2. Removal/Installation Main Landing Gear (See Figure 3)

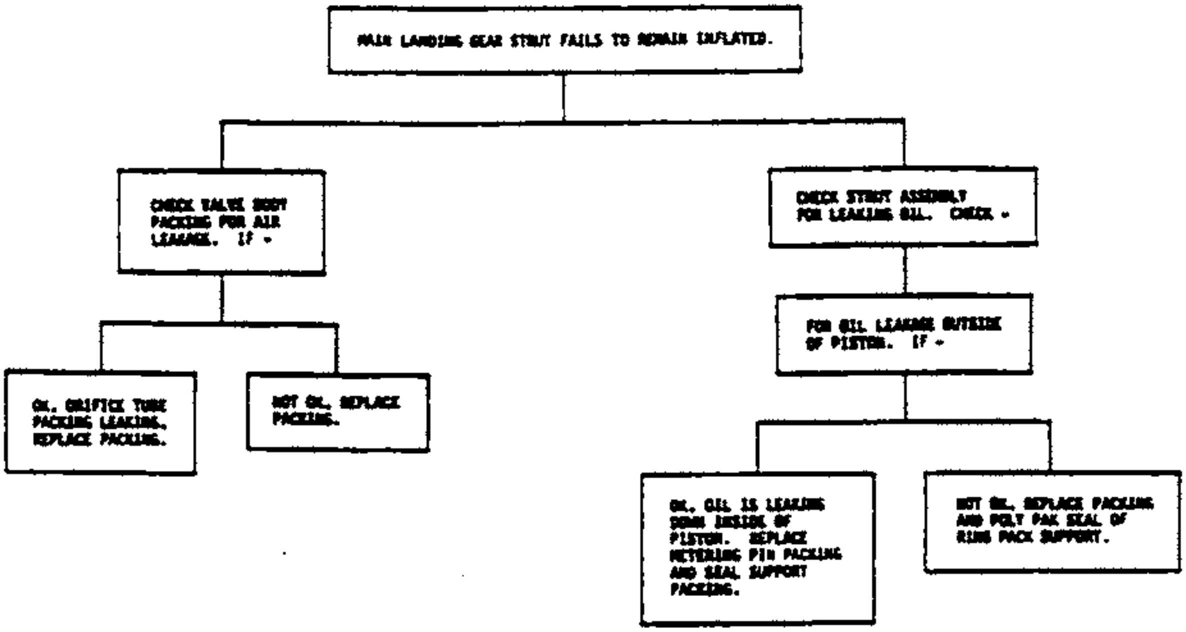
   A. Remove Main Landing Gear.

   (1) Jack the airplane. Refer to Chapter 1.
   (2) Remove wheel and tire assembly. (Refer to Removal of Main Wheels and Tires.)
   (3) Remove screws, clamps and spacers (7) securing brake line (6) and wire bundle (5) to strut assembly.
   (4) Remove brake assembly from axle flange and leave suspended by a supporting safety wire or place on a box out of the immediate work area.

   NOTE: USING THE METHOD OUTLINED IN STEP (4) IT IS NOT NECESSARY TO DRAIN BRAKE FLUID AND BLEED BRAKES.

   (5) Remove safety switch (13) and tie so switch will not interfere with gear removal.
   (6) Disconnect door link (11) by removing nut and washer.
   (7) Disconnect actuator (9) from trunnion assembly (8) by removing cotter pin, nut (10), washer and bolt (12).
   (8) Remove pins (1) from trunnion assembly (8) and pins (4) and insert an AN6 Bolt or puller tool in pins (4).

   NOTE: NOTE THE NUMBER AND LOCATION OF WASHERS BETWEEN BEARING (3) AND TRUNNION (8). THESE WASHERS SHOULD BE INSTALLED EXACTLY AS THEY WERE LOCATED BEFORE REMOVAL TO INSURE PROPER ALIGNMENT OF GEAR ASSEMBLIES AND TO LIMIT END PLAY TO .020 INCH.



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Troubleshooting Chart - Main Landing Gear
Figure 1

(9) Support the gear and pull attaching pins (4). Remove gear from airplane.

NOTE: BEARINGS (3) IN WHICH THE ATTACHING PINS PIVOT, SHOULD BE REMOVED ONLY FOR REPLACEMENT. BEARINGS MUST BE REMOVED BY DRIVING THEM TOWARD THE WHEEL WELL. 421C0001 THRU 421C0715 AND WHEN NOT MODIFIED PER SK421-125, ARE INSTALLED IN SUPPORTS USING LOCTITE 601 RETAINING COMPOUND. THRU 421C0716 AND WHEN MODIFIED PER SK421-125, THE INNER BEARINGS MAY BE REMOVED BY ROTATING INNER BEARING AND REMOVING THROUGH CUTOUTS IN OUTER BEARINGS.

B. Install Main Landing Gear.

(1) If bearings (3) were removed, install as follows:
(a) 421C0001 thru 421C0715, install bearings in landing gear supports using Loctite 601 retaining compound per manufacturers instructions. Bearings must seat against shoulders in supports.
(b) 421C0001 thru 421C0715 when modified per SK421-125, if inner bearings only were removed, insert inner bearings through cutouts in outer bearings and rotate. If outer bearings were removed, the 5290040-8 installer assembly may be used to press outer bearings into supports; then install inner bearings.

NOTE: THE ATTACHING PINS (4) ARE A SLIP FIT AND SHOULD BE LUBRICATED WITH LIGHT OIL TO AID IN THE INSTALLATION OF THE SHAFTS.

(2) Position gear in place and insert pins (4) making sure washers, noted in Step A, (9), are in place and pin holes in pins (4) and trunnion assembly(8) are aligned.
(3) Remove AN6 bolt used in removal of shafts and install pin (1). Safety wire pin by wiring through center of pin around trunnion.

(4) Connect actuator (9) to trunnion assembly (8) with bolt (12), washer, nut (10) and cotter pin. Torque to 100 to 260 inch-pounds.
(5) Connect door link (11) to bolt (12) with washers and nut. Make sure washers are installed correctly (install large washer between nut and small washer).
(6) Install safety switch (13).
(7) Install brake assembly to axle flange. (Refer to Installation of Main Wheel Brakes.)
(8) Attach brake line (6) and wire bundle (5) to strut assembly with screws, spacers and nuts.
(9) Install wheel and tire assembly. (Refer to Installation of Main Wheel and Tire Assembly.)
(10) Check setting of safety switch (15).
(11) Check alignment of main landing gear.

3. Disassembly/Assembly of Main Landing Gear (Refer to Figure 4).

A. Disassemble Main Landing Gear.

(1) Completely deflate strut. After air is expelled, remove valve body (2) and drain fluid.
(2) Remove piston assembly (34) from trunnion assembly (1) and disassemble as follows:
(a) Disconnect torque links at apex by removing cotter pin, washer, clamp (13), spacer (35) and bolt.

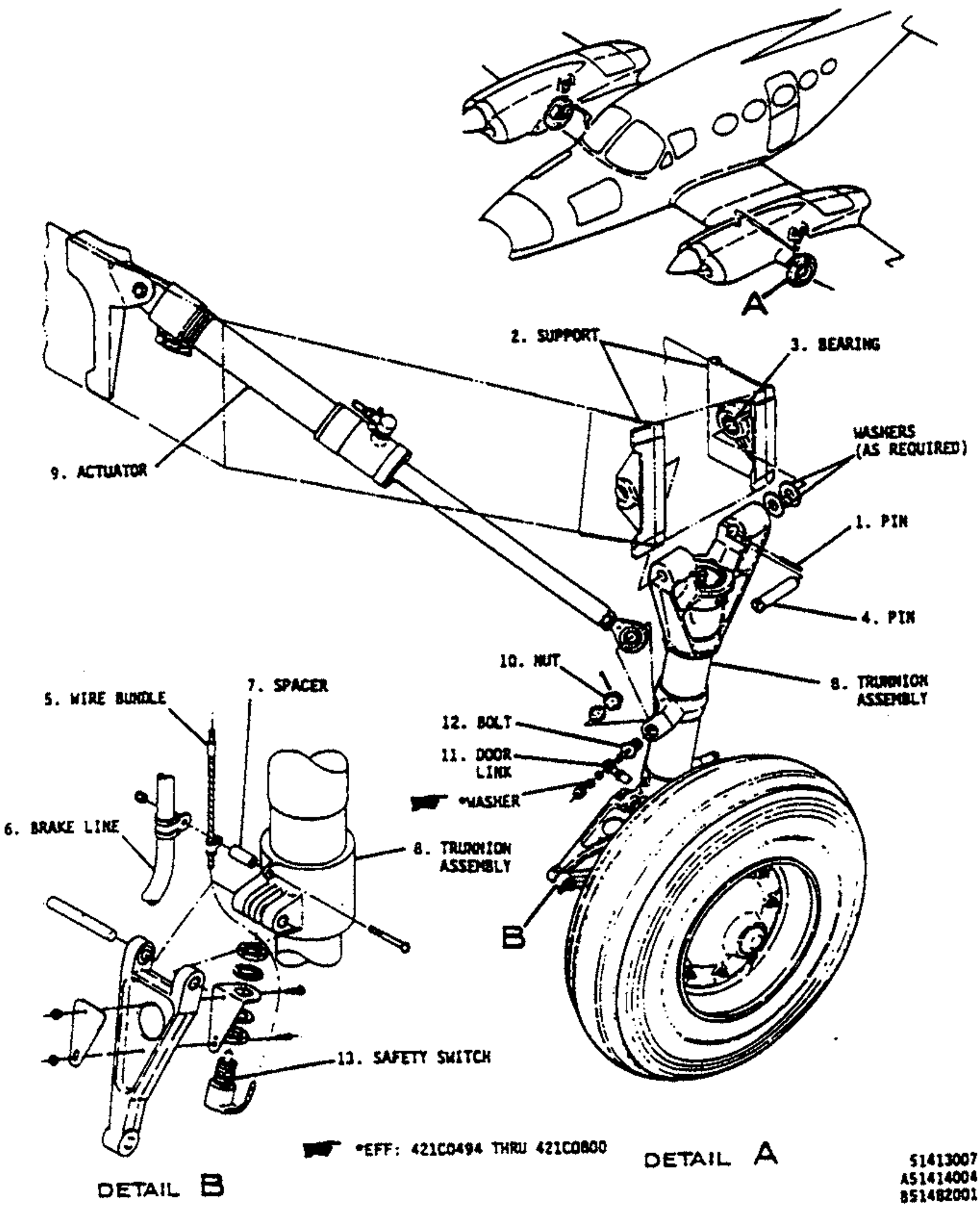
WARNING: MAKE CERTAIN ALL AIR IS EXPELLED FROM STRUT ASSEMBLY BEFORE PROCEEDING TO THE NEXT STEP.

(b) Remove internal lock ring (27), lock ring (26) scraper ring (25). Withdraw piston assembly against ring pack support (23) to remove ring pack support and piston from upper trunnion.

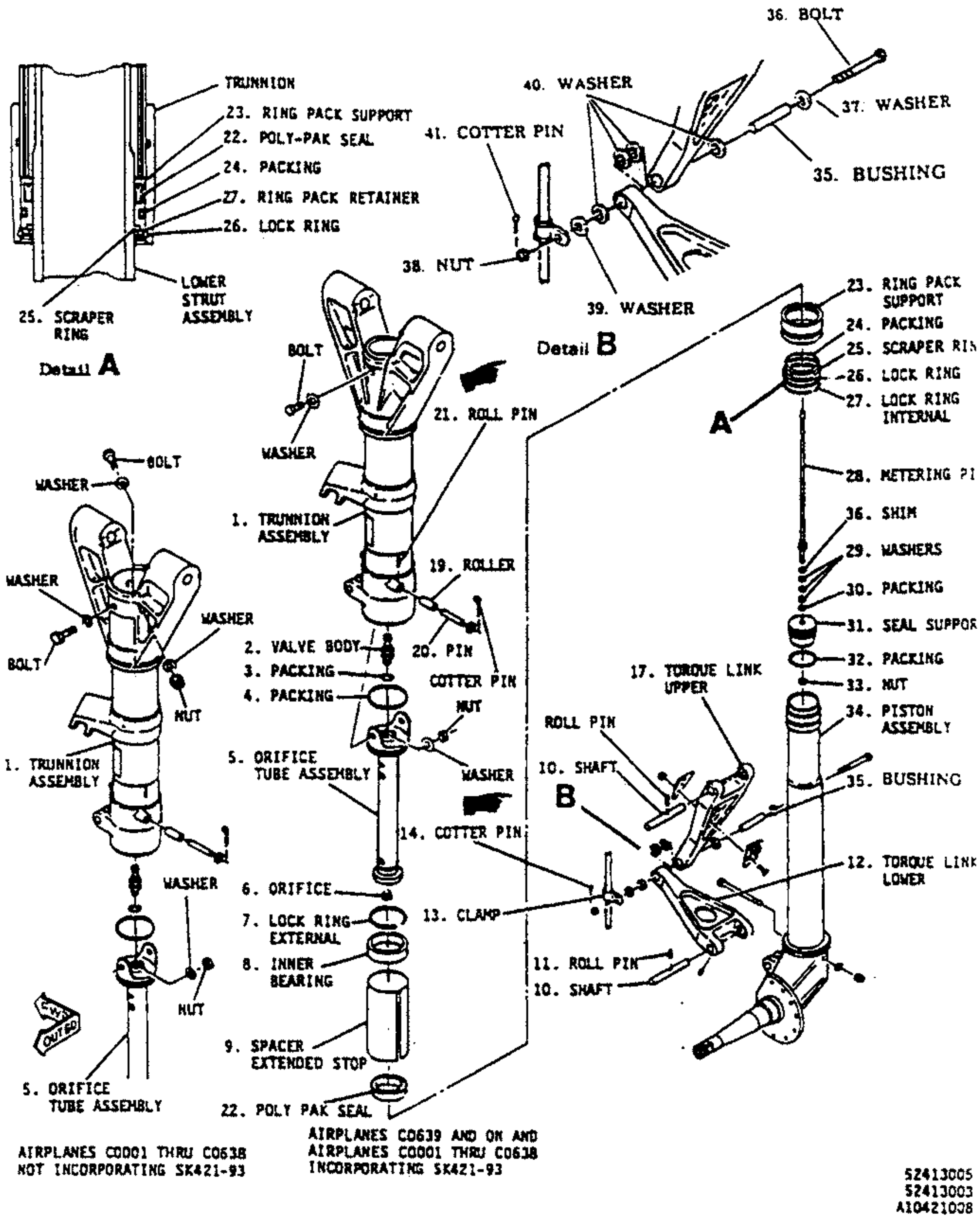
CAUTION: REMOVAL AND HANDLING OF THE LOWER PISTON ASSEMBLY SHOULD BE ONE WITH CARE TO PREVENT THE POSSIBILITY OF DAMAGE TO EXPOSED PARTS.

(3) Remove external lock ring (7) from piston assembly (34) and remove inner bearing (8), extended stop spacer (9) and ring pack support (23).
(4) Remove poly pak seal (22) and packing (24) from ring pack support.
(5) Remove lower torque link (12) by removing roll pin (11) and shaft (10).

NOTE: LOWER PISTON AND AXLE FITTING IS A PRESS FIT AND DRILLED ON ASSEMBLY. DISASSEMBLY IS NOT RECOMMENDED.



Main Landing Gear Installation
Figure 3



Main Landing Gear Strut
Figure 4

(6) Remove upper torque link (17) from trunnion assembly by removing roll pin and shaft.
(7) Remove orifice tube assembly (5) from trunnion assembly by removing nuts, washers and bolts and pull orifice tube straight out from the trunnion.
(8) Remove orifice (6) by screwing orifice from orifice tube (5). A suitable tool may be fabricated to remove orifice.
(9) Press metering pin (28) and seal support assembly from piston assembly.
(10) If removal of metering pin (28) from seal support (31) is required, note the quantity and location of shims (36) and washers (29) and retain for reinstallation. Remove metering pin by removing attaching nut.
(11) Remove roller (19) by removing cotter pin and washer.
(12) Remove pin (20) from trunnion assembly (1) by removing roll pin (21).

B. Assemble Main Landing Gear.

WARNING: DO NOT APPLY AIR OR NITROGEN CHARGE TO STRUT UNTIL IT IS PROPERLY SERVICED WITH HYDRAULIC OIL.

NOTE: PRIOR TO ASSEMBLY, INSPECT FOR SHARP METAL EDGES. SHARP METAL EDGES SHOULD BE SMOOTHED WITH NUMBER 400 EMERY PAPER, THEN CLEANED WITH SOLVENT.

(1) Assemble lower torque link (12) to piston assembly (34) with shaft (10). Secure Secure shaft in place with roll pin (11) through shaft and piston assembly. Safety wire roll pin with wire through center of roll pin and around shaft.
(2) If metering pin (28) was removed from seal support (31), assemble shim (36), washers (29) as noted in step A, (11) of disassembly procedures and packing (30) on metering pin and secure metering pin assembly to seal support with attaching nut. Install packing (32) in groove on outside of seal support (31).

NOTE: MAKE SURE METERING PIN HAS AN "E" STAMPED ON THE THREADED END TO ENSURE PROPER PART IS INSTALLED.

NOTE: LUBRICATE PACKINGS, SEALS AND MATING PARTS LIBERALLY WITH CLEAN MIL-H-5606 HYDRAULIC FLUID BEFORE INSTALLATION AND ASSEMBLY.

(3) Press metering pin (28) and seal support (31) assembly into piston assembly (34). Make certain the seal support is completely seated.
(4) Assemble upper torque link (17) to trunnion assembly (1) with shaft. Secure shaft in place with roll pin through shaft and trunnion. Safety wire roll pin with wire through center of pin and around shaft.
(5) Carefully work packing (4) into groove in orifice tube (5) and insert into trunnion assembly (1) taking care to align holes.

NOTE: IF ORIFICE (6) WAS REMOVED, INSTALL ORIFICE AND STAKE ORIFICE TUBE MATERIAL INTO WRENCH SLOTS TO SAFETY (TWO PLACES).

(6) Align holes and install bolt, washers and nut.
(7) Slide internal lock ring (27), lock ring (26) and scraper ring (25) on piston assembly (34).
(8) Install poly pak seal (22) on inside of ring pack support (23), work packing (24) over outside into groove on ring pack support and slide ring pack support assembly on piston assembly (34).

CAUTION: INSTALL POLY PAK SEAL WITH WIDE LIP UP (TOWARD PRESSURE SIDE).

(9) Install spacer (9) on piston assembly.
(10) Install inner bearing (8) on piston assembly and secure with external lock ring (7).

CAUTION: INSTALL INNER BEARING WITH CHAMFERED END UP IN ORDER TO SEAT AGAINST EXTERNAL LOCK RING (7).

NOTE: If orifice tube (5) was removed, replace the tube from the lower end of the trunnion assembly (1) to keep from damaging the O-ring. Damage usually occurs as the O-ring goes past the bolt holes when inserted from the top. Let the orifice tube (5) hang out slightly to aid in aligning the metering pin (28) and piston assembly (34) when inserted into the trunnion assembly (1). To aid the installation, compress the spacer (9) with safety wire or hose clamp and then remove wire or clamp after spacer is started into the trunnion assembly (1). After trunnion and piston are connected position the orifice tube in alignment with the holes and install the bolts.

(11) Carefully work piston assembly into trunnion assembly and install ring pack support. Secure ring pack support with scraper ring (25), lock ring (26) and internal lock ring (27). Make certain lock ring is seated in the retaining groove.

NOTE: TO PREVENT DAMAGE TO PISTON ASSEMBLY AND RING PACK SUPPORT DURING INSTALLATION, A RING PACK SUPPORT TOOL P/N 0880004-1 SHOULD BE USED (SEE FIGURE 2).

(12) (Refer to Figure 4) Connect torque links (12 and 17) as follows:
a. Install the same number of AN960 washers, positioned on the existing brushing (35) as before disassembled.
b. Install bolt (36) with washer (37) under the bolt head.

NOTE: IF WASHERS ARE WORN THEY ARE TO BE DISCARDED AND REPLACED WITH NEW ONES.

c. Install the existing nut (38) with washer (39) under the nut.
d. Tighten nut (38) and check for proper cotter pin hole alignment and proper side play of the torque link assemblies. Ensure that washers (40) provide a gap between torque links of 0.004 to 0.020 inch before nut (38) is torqued to 100-140 inch pounds.

NOTE: IF COTTER PIN (41) ALIGNMENT CANNOT BE ACHIEVED WITH EXISTING NUT, REMOVE AND INSTALL A NEW NUT FOR PROPER COTTER PIN / NUT ALIGNMENT.

e. After proper installation is achieved, secure nut with cotter pin (41).

4. Cleaning/Painting
A. Cleaning Main Gear Assembly.
(1) Clean all metal parts with suitable solvent.

CAUTION: IF METAL PARTS ARE NOT TO BE ASSEMBLED IMMEDIATELY, COAT WITH SYSTEM HYDRAULIC FLUID TO PREVENT RUSTING. BEFORE ASSEMBLY IT WILL BE NECESSARY TO AGAIN CLEAN WITH SOLVENT.

(2) Clean all O-rings and seals with system hydraulic fluid.

B. Painting Main Gear Assembly.
(1) Refer to Chapter 1 for painting procedures.

5. Approved Repairs.
A. Repair Main Gear Assembly.
(1) Repair is limited to replacement of parts, smoothing out of minor scratches, nicks and dents and repainting of areas where paint has chipped or peeled.

MAIN LANDING GEAR

421C0801 AND ON

Description

1. Each main landing gear is an articulated (trailing link) type gear consisting of a trunnion and link assembly connected by a shock strut assembly. During retraction and extension, the landing gear pivots on bearings in the main gear support assemblies and trunnion pins attached to the trunnion.

Troubleshooting

1. Troubleshooting Main Landing Gear.

   A. For a guide to troubleshooting the main landing gear see Figure 1.

Maintenance Practices

1. Tools and Equipment.

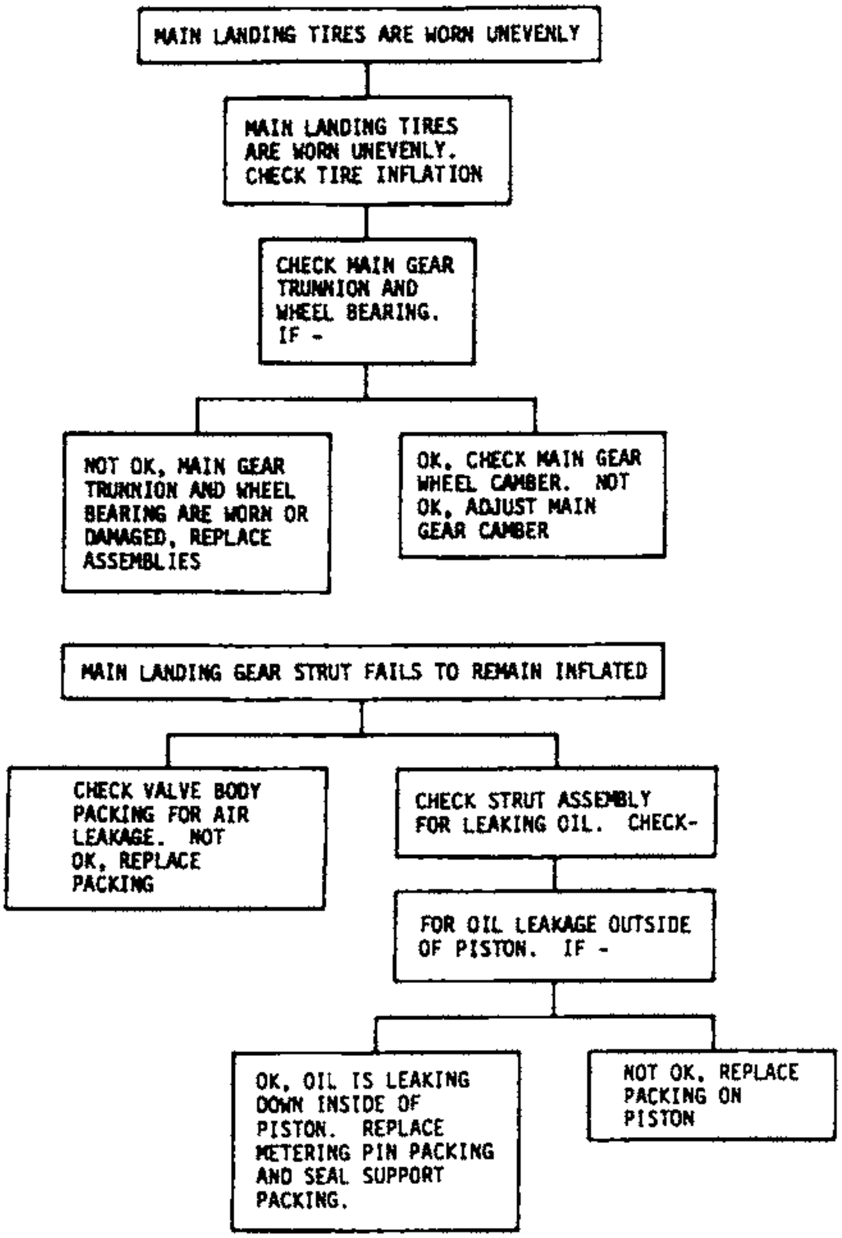
   NOTE: Equivalent substitutes may be used for the following listed items.

Name	Number	Manufacturer	Use
Hydro-Test Unit	SE1300 or SE589 Modified to Include SK421-68	Cessna Aircraft Co. Wichita, Kansas	Test hydraulic system.
Airplane Jacks		Commercially Available	To jack airplane.
Locquic Primer T		Loctite Corp. Newington, Connecticut	To install bearings.
Loctite 680		Loctite Corp. Newington, Connecticut	To install pivot pin bushing and switch bracket.
Loctite No. 35		Loctite Corp. Newington, Connecticut	To install bearings in support and shock strut.
Primer	Finch 454-4-1	Finch Paint & Chemical 20846 S. Normandie Torrance, Calif.	To install bearings and bushings.
Punch	5/32 (.16) Dia. X 2.5 Length		To remove roll pin from trunnion.
Puller Tool		Fabricate per Fig. 4	To remove pivot pin from trunnion.

2. Removal/Installation Main Landing Gear (See Figure 4).

   A. Remove Main Landing Gear.

      (1) Jack airplane until tires are clear of ground. Refer to Chapter 1.
      (2) Disconnect and cap hydraulic brake lines at the top of the trunnion.
      (3) Cut safety wire. Remove safety switch from switch bracket in trunnion. Pull switch and electrical wiring out the top of the trunnion.



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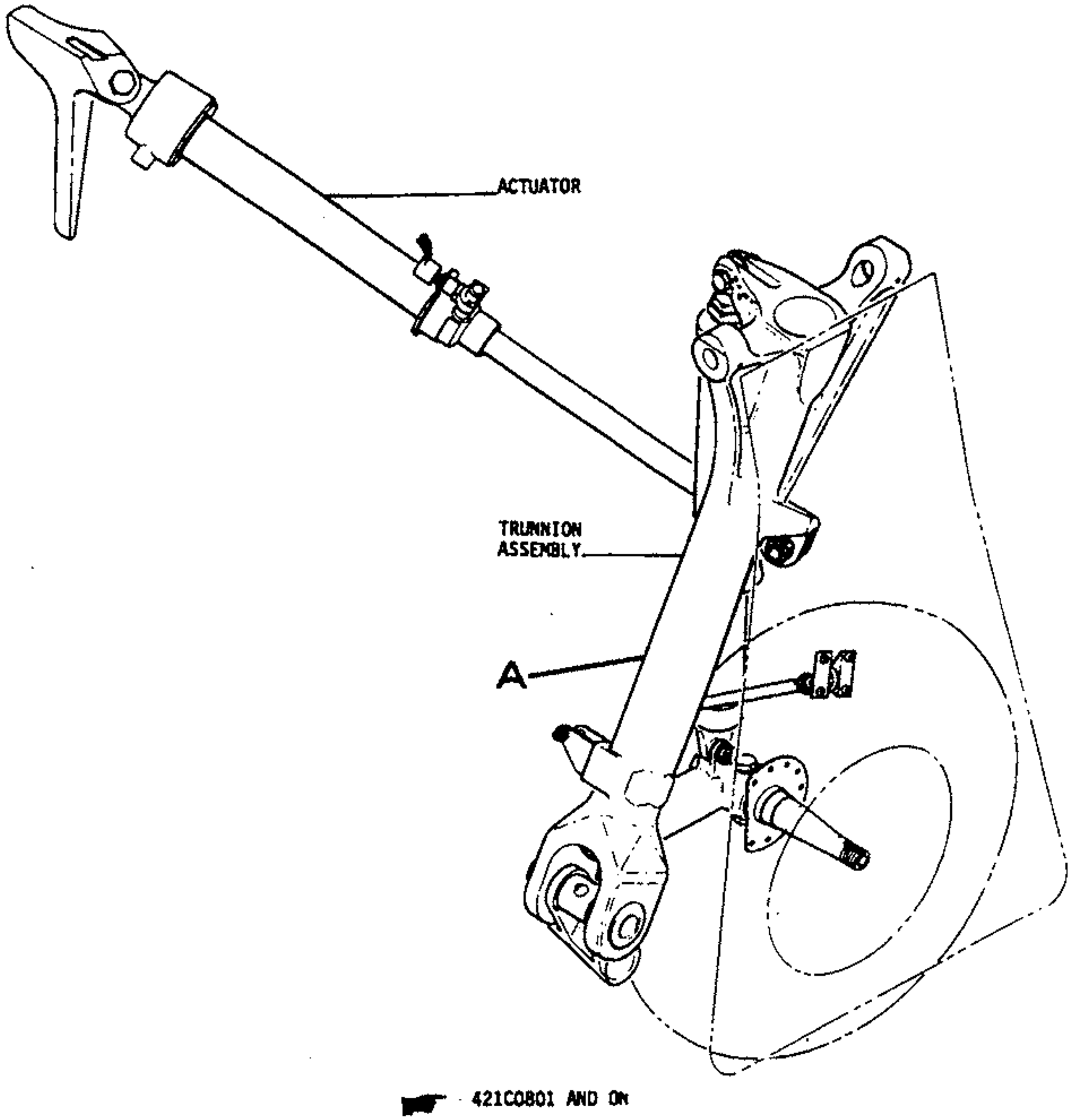
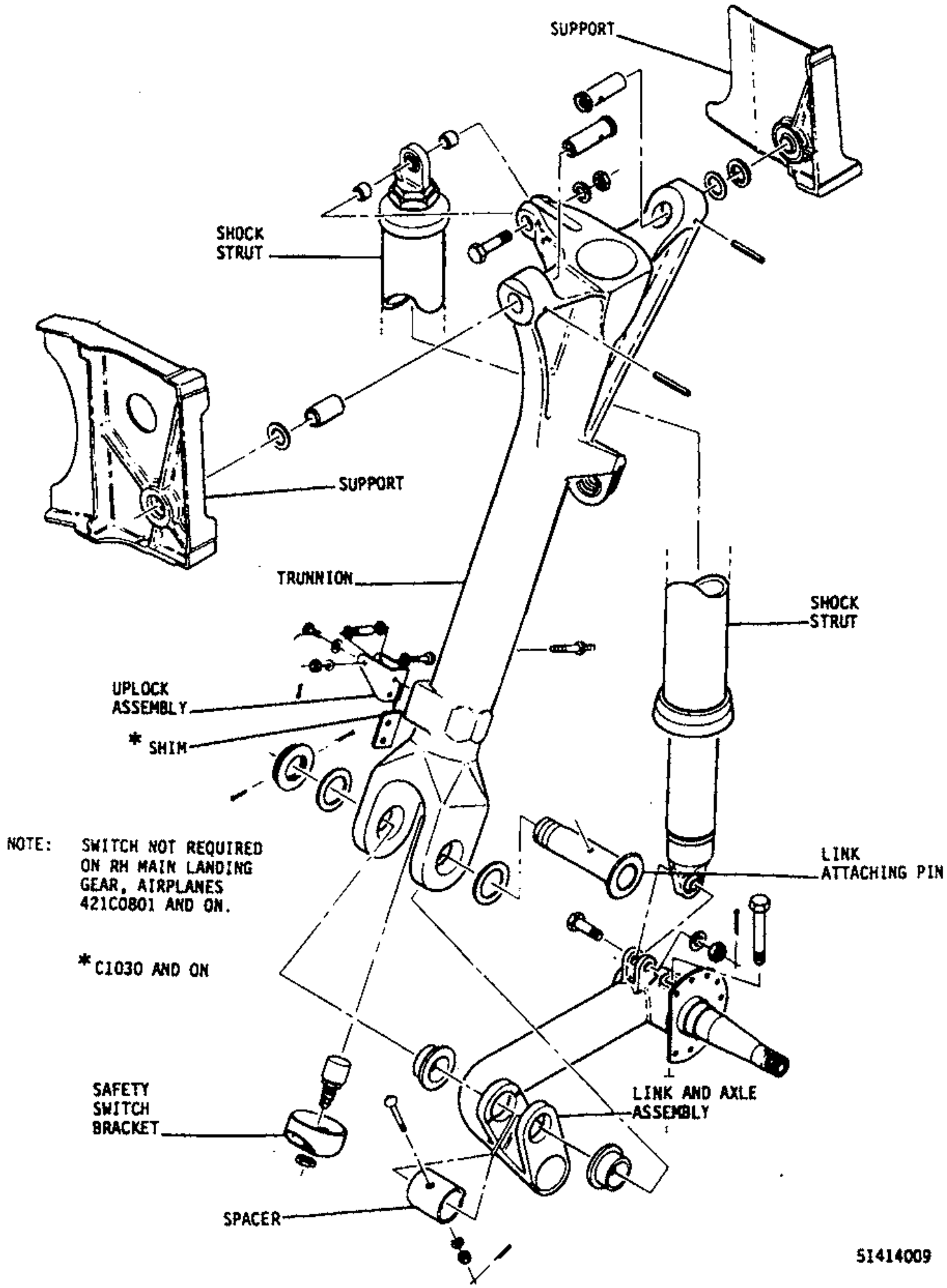
Trouble Shooting Chart - Main Gear
Figure 1

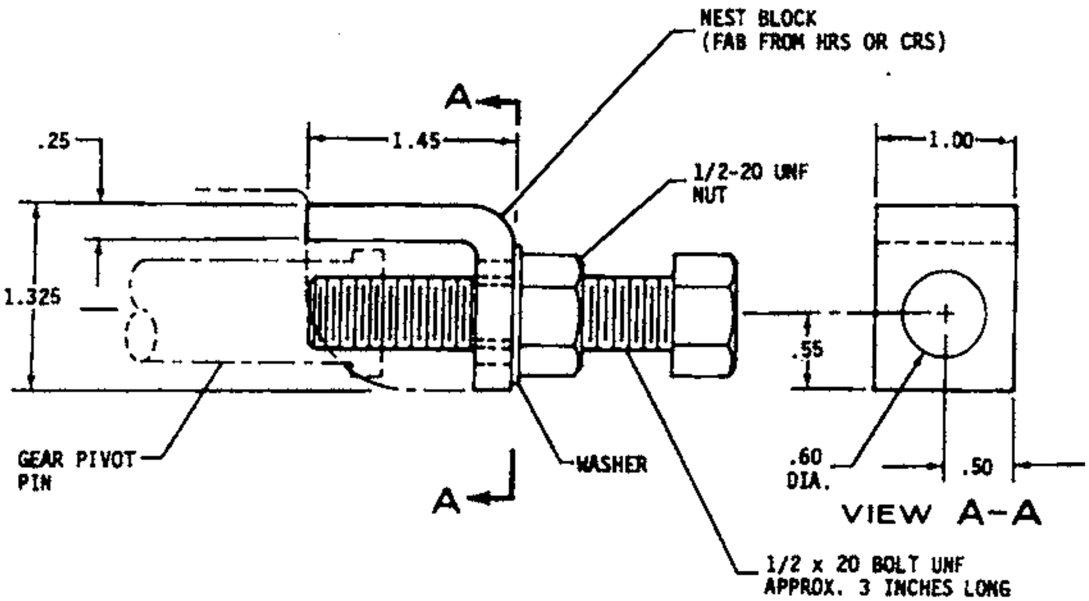


Main Landing Gear
Figure 2 (Sheet 1 of 2)



DETAIL A

Main Landing Gear
Figure 2 (Sheet 2)



USE OF TOOL:
1. SCREW BOLT INTO GEAR PIVOT PIN.
2. SCREW NUT ON BOLT TO EXTRACT PIN.

51141066

Puller Tool Landing Gear Pivot Pin
Figure 4

(4) Remove cotter pin, nut and washer securing door rod to trunnion. Refer to Chapter 3.
(5) Remove cotter pin, nut washer and bolt securing actuator to trunnion. It may be necessary to loosen jamb nut on actuator rod end and rotate shaft to release tension from bolt noting the number of turns.
(6) Cut safety wire from pins and remove pins from trunnion using the fabricated punch.
(7) Using the fabricated pivot pin puller tool, pull pivot pins at top of trunnion. Remove main landing gear.

NOTE: Note the number of washers between bearing and trunnion. The washers should be installed exactly as they were located before removal to ensure proper alignment of gear assemblies and to limit end play to 0.004 minimum and 0.020 inch maximum. A minimum of one washer at each end of the trunnion is required.

Bearings in support are secured with Loctite and should be removed only for replacement. Bearings must be removed by driving them toward wheel well.

B. Install Main Landing Gear.

NOTE: Ensure that forward and aft ends (pivot pin opening), roll pin holes and all attach holes of the trunnion are free of paint and bare metal is visible. Clean paint off by using Methyl-Ethyl-Ketone and fine emery cloth.

(1) If bearings in support were removed, install as follows:

(a) Install bearings in landing gear supports using Loctite 601 retaining compound per manufacturers instructions. Bearings must seat against shoulders in supports.

NOTE: Pivot pins are a slip fit and should be lubricated with light oil to aid in installation.

(2) Position trunnion in place and insert forward pivot pin ensuring washers noted in Step A are in place and holes in pivot pin and trunnion are aligned.
(3) Remove bolt and flat washer from pivot pin. Install pin in trunnion and pivot pin. Safety wire pin around trunnion.
(4) Connect hydraulic brake line.
(5) Insert safety switch in top of trunnion and feed wiring down to switch bracket. Install safety switch to switch bracket. For adjustment of safety switch, refer to Chapter 4.
(6) Install actuator rod end in trunnion and insert bolt. If actuator shaft was rotated to remove the bolt, rotate shaft on actuator the same amount of turns noted in Step A. Tighten jamb nut on actuator rod end and safety wire.
(7) Secure actuator bolt using washer, nut and cotter pin. Torque to 100 to 260 inch-pounds.
(8) Secure door rod to trunnion using washer, nut and cotter pin. Refer to Chapter 3.
(9) Bleed brake system. Refer to 4-43.
(10) Remove airplane from jacks.

3. Disassembly/Assembly Main Gear.

A. Disassemble Main Landing Gear (See Figure 2).

(1) Completely deflate strut assembly.
(2) Remove cotter pins, nuts, washers and bolts securing strut to trunnion and link.
(3) Cut safety wire and remove safety switch from bracket.
(4) Remove cotter pin, nut, washer and bolt from spacer.
(5) Remove cotter pins, nut thrust washer and pin securing trunnion to link. Remove spacer from link.

(6) Remove cotter pin, nut washer and bolt securing roller to bracket.
(7) Cut safety wire. Remove bolts and washers securing bracket to trunnion.

NOTE

Axle and link assembly are a press fit; therefore, disassembly is prohibited.

(8) If bearing and bushings are to be replaced, press bearings and bushings out of trunnion.
(9) Disassemble strut assembly as follows: (Refer to Figure 3)
(a) Remove filler plug and packing.
(b) Remove air pressure valve from piston barrel.
(c) Remove lock ring and pull piston barrel from upper barrel.
(d) Slide retainer, scraper, bearing and spacer from piston barrel.
(e) Remove lock ring, orifice and isolation piston from barrel.
(f) Remove packing and backup rings from isolation piston. Discard seal .
(g) Remove backup rings and seal from piston on piston barrel. Discard seal,
(h) Remove metering pin from upper barrel.
(i) If bearings are to be replaced, press bearings from upper barrel and piston barrel using an arbor press.
(10) On Airplanes C1801 and On replace piston barrel end O-ring as follows:
(a) Put removal index marks on piston barrel and piston barrel end as an aid for reinstallation.
(b) Using a heat gun, apply heat to the piston barrel, rotate piston barrel end and remove.

NOTE

Prior to assembly, inspect for sharp metal edges. Sharp metal edges should be smoothed with number 400 emery paper, then cleaned with solvent.

B. Assemble Main Landing Gear.

(1) On Airplanes C1801 and On install piston barrel end O-ring as follows:
(a) Clean piston barrel and piston barrel end with Methyl n-Propyl Ketone.
(b) Install new O-ring on piston barrel end, apply loctite 609 to piston barrel end, in accordance with manufacture instruction.
(c) Align index marks and insert piston barrel end into piston barrel.
(2) Assemble strut assembly (Refer to Figure 3).
(a) If bearing were removed from upper barrel or piston barrel, install bearings as follows:
1) Prime bearing surfaces with Locquic Primer T. When solvent odor of primer is no longer present, apply Loctite Retaining Compound No. 35 to bearing surfaces and press bearing into place.
(b) Install T-seal and backup rings on isolation piston and insert isolation piston into piston.

NOTE

Lubricate all T-seals and mating parts liberally with clean MIL-H-5606 Hydraulic Fluid before installation and assembly.

(c) Install orifice in piston and secure with lock ring.
(d) Install T-seal and backup rings on piston.
(e) Install metering pin in upper barrel using packing. Ensure metering pin is fully seated. Torque metering pin to 500/700 inch pounds. Safety wire metering pin to upper barrel.

NOTE

If leak occurs between metering pin and upper barrel after packing has been replaced and metering pin has been properly torqued, replace metering pin.

(f) Insert piston barrel into upper barrel.
(g) Slide spacer, bearing, scraper, retainer and lock ring over piston barrel. Secure these components in upper barrel with the lock ring.
(h) Install air pressure valve and packing in piston barrel. Safety wire valve to strut.

NOTE

Air pressure valve and filler valve must be on opposite side of strut.

(i) Install filler valve and packing.

WARNING

DO NOT APPLY AIR OR NITROGEN CHARGE TO STRUT UNTIL IT IS PROPERLY SERVICED WITH HYDRAULIC OIL.

(3) Assemble main landing gear as follows (Refer to Figure 2).

(a) If bearings and bushings were removed, reinstall as follows:

NOTE: All bearings and bushings are installed with Finch 454-4-1 Primer, except the switch bracket and forward trunnion pivot pin bushing. These items are installed with Loctite 680.

1) Prime bearings and bushings with Finch 454-4-1 Primer and press bearing or bushing in while primer is wet.

NOTE: Bearings installed in trunnion fork must be pressed in with shoulder of bearings inside trunnion fork.

2) Install switch bracket or forward trunnion pivot pin bushing using Locquic Primer T and Loctite 680.

(b) Install bracket on trunnion using washers and bolts. Safety wire bolts.
(c) Install roller in bracket using bolt, washers, nut and cotter pin. Both washers are to be installed on nut side of bracket.

NOTE: Do not overtorque nut; roller must rotate freely about bolt.

(d) Install spacer in fork of link and install link and spacer in trunnion, securing with pin, thrust washers and nut. Do not tighten nut.
(e) Align hole in spacer and pin at trunnion and link.
(f) Install bolt through spacer and pin. Secure bolt with washer, nut and cotter pin.

NOTE: Install bolt with holding slot parallel to centerline of pin.

(g) Tighten nut securing trunnion and link together. Secure nut with cotter pins.
(h) Install safety switch in switch bracket. For adjustment of safety switch, refer to 4-70. Safety wire switch.
(i) Install upper end of strut in trunnion and secure with bolt, washer, nut and cotter pin.

NOTE: Filler valve to face inboard towards fuselage.

(j) Install lower end of strut to link and secure with bolt, washer, nut and cotter pin.

NOTE: Ensure that air pressure valve is facing aft from trunnion.

4. Servicing Main Gear Strut after Strut Overhaul (C0801 and On).

WARNING: ENSURE AIR CHAMBER IS DEPRESSURIZED PRIOR TO SERVICING.

(1) Ensure metering pin fitting is removed, shock strut is fully extended and air service valve is open.
(2) Position and maintain strut in an upright position.
(3) Fill upper barrel with MIL-H-5606 hydraulic fluid.
(4) Install an AN919-21D reducer and packing in metering pin port.
(5) Connect the reducer to a hydraulic hand pump filled with MIL-H-5606 hydraulic fluid.
(6) Pump hydraulic fluid into strut until fully extended. Increase pressure to 750 $\pm$50 psig to assure isolation piston is properly bottomed out when strut is fully extended.
(7) Open pump vent valve on hydraulic pump and slowly force strut to the collapsed position. Crack the reducer and continue to collapse strut until it bottoms out allowing air to expel from strut.
(8) Repeat cycling of strut (three cycles minimum) as required with hand pump until no air is being discharged from oil chamber.
(9) Keeping strut fully collapsed, carefully remove hydraulic pump, AN919-21D and packing and replace with metering pin and new packing. Torque metering pin to 500 to 700 inch-pounds and safety wire.
(10) Remove filler plug on side of metering pin and top off with MIL-H-5606 hydraulic fluid. Install the plug and new MS28778-2 packing.

(11) Install shock strut on main gear trunnion.

CAUTION: WHEN CHARGING WITH DRY AIR OR NITROGEN, STRUT MAY EXTEND RAPIDLY. TAKE CARE TO PREVENT INJURY.

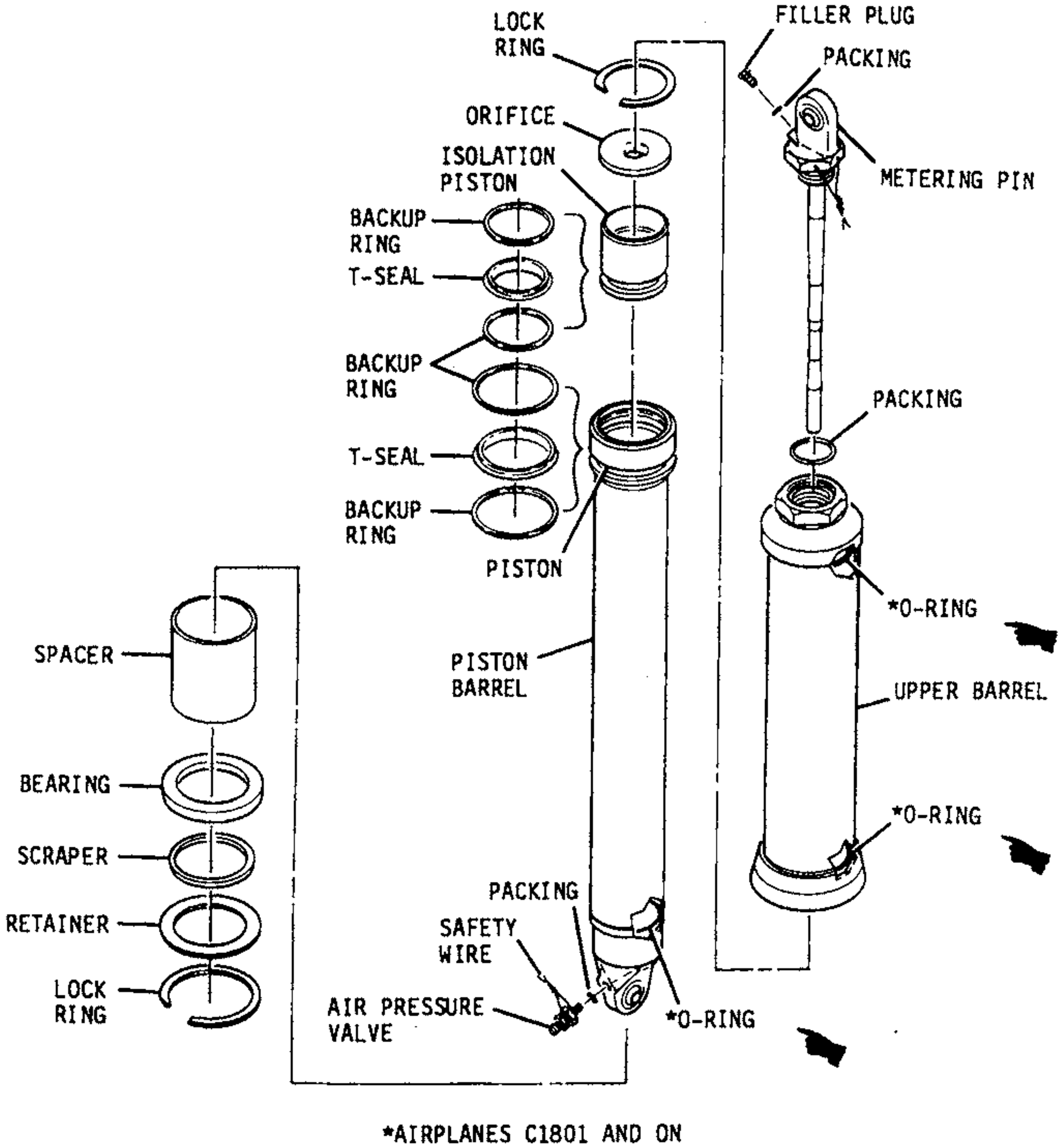
(12) Connect regulated air supply, relief valve and pressure gage to service valve body. Slowly charge strut initially to 250 psig with regulated source of dry air or nitrogen.
(13) Close relief valve and disconnect air source.
(14) Slowly open relief valve and bleed pressure down to 170 psig with strut fully extended. If hydraulic fluid is expelled from lower air chamber, strut must be overhauled. No hydraulic fluid is permitted in lower chamber.
(15) Rotate outer hex swivel nut clockwise on service air valve body to close internal poppet and remove pressure gage and relief valve.
(16) Secure service valve, swivel nut and install cover.
(17) Safety wire filler plug.

5. Cleaning/Painting.

A. Frequent cleaning and painting of landing gear will help prevent corrosion.

B. When it is necessary to touch up or refinish landing gear area, the edge of the finish adjacent to the defect shall be feathered by sanding with #320 grit sandpaper followed by #400 grit sandpaper. Avoid, if possible, sanding through the primer. If the primer is penetrated over an area of 1 inch square or larger, the surface must be cleaned with Methyl-Ethyl-Ketone and reprimed with 54P epoxy primer.

C. Apply epoxy white 54E series enamel in accordance with epoxy finish.



Main Landing Gear Strut
Figure 3

NOSE LANDING GEAR

Description

1. The nose landing gear consists of a wheel and tire assembly, fork, axle, lower piston assembly, upper trunnion assembly, torque links and shimmy damper. The air-oil shock strut contains an orifice and tapered metering pin which vary the resistance to shock according to the severity. During extension and retraction, the nose gear pivots on heavy duty needle bearings by means of lugs on the trunnion assembly. A wheel straightener and steering mechanism is provided so that the nose wheel is steerable while taxiing, but is straightened during retraction.

Maintenance Practices

1. Removal/Installation of Nose Landing Gear (See Figure 2).

A. Remove Nose Landing Gear.
(1) Jack airplane. Refer to chapter 1.
(2) Remove taxi light (optional).
(3) (See Figure 3) Remove switch (43) from bracket (44).
(4) Disconnect drag link (1) from trunnion assembly (3) by removing nut, washer and bolt.
(5) Disconnect gimbal assembly assembly (12) from trunnion assembly (3) by removing nut, washers and bolt. Retain spacer (7) in place.
(6) Remove mud guard (13) and support (14) from nose gear fork by removing nuts, washers and bolts securing mud guard braces to the nose gear fork, and bolt securing support (14) to the nose gear fork.

NOTE

Note the location and amount of shims between trunnion and wheel well for reinstallation.

(7) Large lug trunnion (1.31 diameter) Remove bolts (17) and bearings (18) from bearing assembly (5).

CAUTION

WHEN REMOVING GEAR, ENSURE THAT BEARING ASSEMBLIES (5) DO NOT FALL OFF TRUNNION ASSEMBLY.

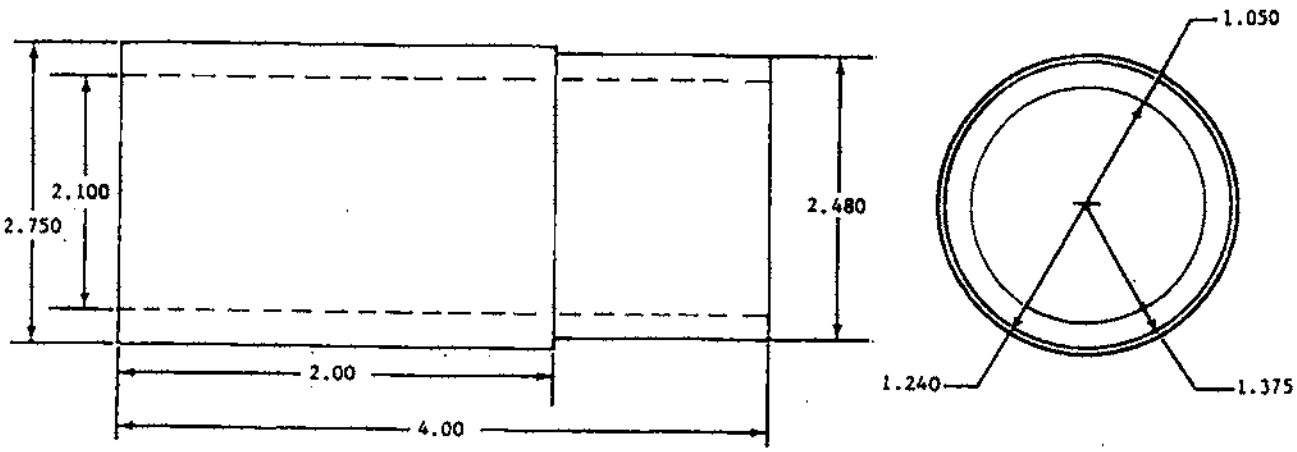
(8) Remove bolts and washers securing bearing assembly (5) to wheel well web. Slide nose gear and bearing assembly aft; turn trunnion to clear structure and remove.
(9) If desired, remove shimmy damper bracket (2) by removing nut, washer and bolt.

B. Bearing Assembly Bearing Replacement.

(1) Remove bearing (6) from bearing assembly (5) using a press or large vise as follows:
(a) Place the flanged side of the bearing assembly (5) against a surface with a hole slightly larger than the diameter of the bearing (6).
(b) Using a rod or shaft from 1.35 to 1.80 inch diameter and at least 1.00 inch in length, place on the end of the bearing (6).
(c) Press on the rod or shaft steadily and continually without stopping until the bearing (6) is removed.
(2) Clean inside bore of the bearing assemblies (5) and the outside diameter of the replacement bearing (6) with Methyl n-Propyl Ketone.
(3) Apply a thin coating of Loctite 601 to the inside bore of the bearing assembly (5) and the outside diameter of the replacement bearing (6).
(4) Press the replacement bearing (6) into the bearing assembly (5) using a press or vise. Use a flat plate over the replacement bearing (6) while installing to ensure bearing (6) is installed flush with the surface (smallest) of the bearing assembly (5).

C. Install Nose Landing Gear.

(1) Small lug (1.19 diameter) trunnion - Install shims (7) on the trunnion lugs; on large lug (1.31 diameter) trunnion, install shims (4) between bearing assembly and wheel well structure. Position in same location as noted previously on removal.



NOTES: 1. All dimensions are in inches.
2. Material to be 4130 Type I steel.
3. Finish inside bore to smooth finish.
4. Cut cylinder on center line to form two halves.
5. Wrap cylinder with mystic tape 5812 (Stock Code P840022) or equivalent. Cut tape on one side to permit halves to hinge open.
6. Coat tool with light oil to prevent rust.

14801003

Landing Gear Ring Pack Support Tool
Figure 1

(2) Large lug (1.31 diameter) trunnion - Install shims (4) as required between wheel well web and bearing assembly (5) to center nose gear and limit side play to not exceed 0.020.
(3) (See Figure 3.) Remove stop (27) as applicable and install on upper barrel assembly.
(4) Place bearing assembly (5) on trunnion assembly (3) and place nose gear assembly in wheel well.
(5) Add shims (4 or 7) to center nose gear and limit side play to not exceed 0.020.
(6) Install bolts, washers and nuts securing bearing assembly (5) to structure. Torque bolts to 85 ±15 inch-pounds.
(7) Large lug (1.31 diameter) trunnion - Install bearings in bearing assembly (5) and secure with bolt. Tighten bolt until a 0.062 maximum to 0.016 minimum gap can be obtained between shoulder of bearing and wheel well web structure.
(8) Secure drag link (1) to trunnion assembly (3) with bolt, washer, nut and cotter pin.

NOTE: Before connecting drag link, ensure that bolt head or notch is facing up.

(9) Install mud guard (13) to strut fork with support (14), bolts, washers and nuts. Safety wire head of bolts to strut fork.

WARNING: ENSURE BOLTS ATTACHING MUD GUARD BRACES TO NOSE GEAR FORK ARE INSTALLED WITH NUT ON OUTSIDE OF NOSE GEAR FORK.

(10) Connect gimbal assembly (12) to trunnion (3).
(11) Reinstall taxi light, if taxi light was installed (optional).
(12) (See Figure 3.) Install switch (43) in bracket (44) and adjust. Refer to Adjustment Procedures.

2. Disassembly/Assembly of Nose Landing Gear (See Figure 3).

A. Tools and Equipment.

NOTE: Equivalent substitutes may be used for the following listed items:

Name	Number	Manufacturer	Use
Ring Pack Support Tool	0880004-2	Cessna Aircraft Co. or locally manufactured (See Figure 1)	To insert ring pack support.
Hydraulic Fluid	MIL-H-5606	Commercially available	To lubricate parts and fill strut.

B. Disassemble Nose Landing Gear.

(1) Completely deflate strut. After air has been expelled, remove valve assembly and drain fluid.
(2) Remove cotter pin, washer and pin (30) from upper barrel.
(3) Disconnect shimmy damper from trunnion by removing nut, washer and bolt.
(4) Remove snap ring (21) and stop (27). Separate trunnion (24) from barrel (31) approximately half way; then, remove shimmy damper bracket from upper barrel.
(5) Remove stop spacers (23) by removing nut and bolt.
(6) Remove packing (25) and bearing (26) from upper barrel (31).
(7) Disconnect torque links (32 and 36) at apex by removing cotter pin, nut, bolt, washers and spacer.

WARNING: MAKE CERTAIN ALL AIR IS EXPELLED FROM STRUT BEFORE PROCEEDING TO THE NEXT STEP.

(8) Remove lock ring (20) and separate piston barrel (1) from upper barrel (31).
(9) Remove orifice tube assembly (9) from piston barrel (1); then unscrew orifice (10) from orifice tube assembly (9).

NOTE: Orifice (10) is staked in and should only be removed for replacement.

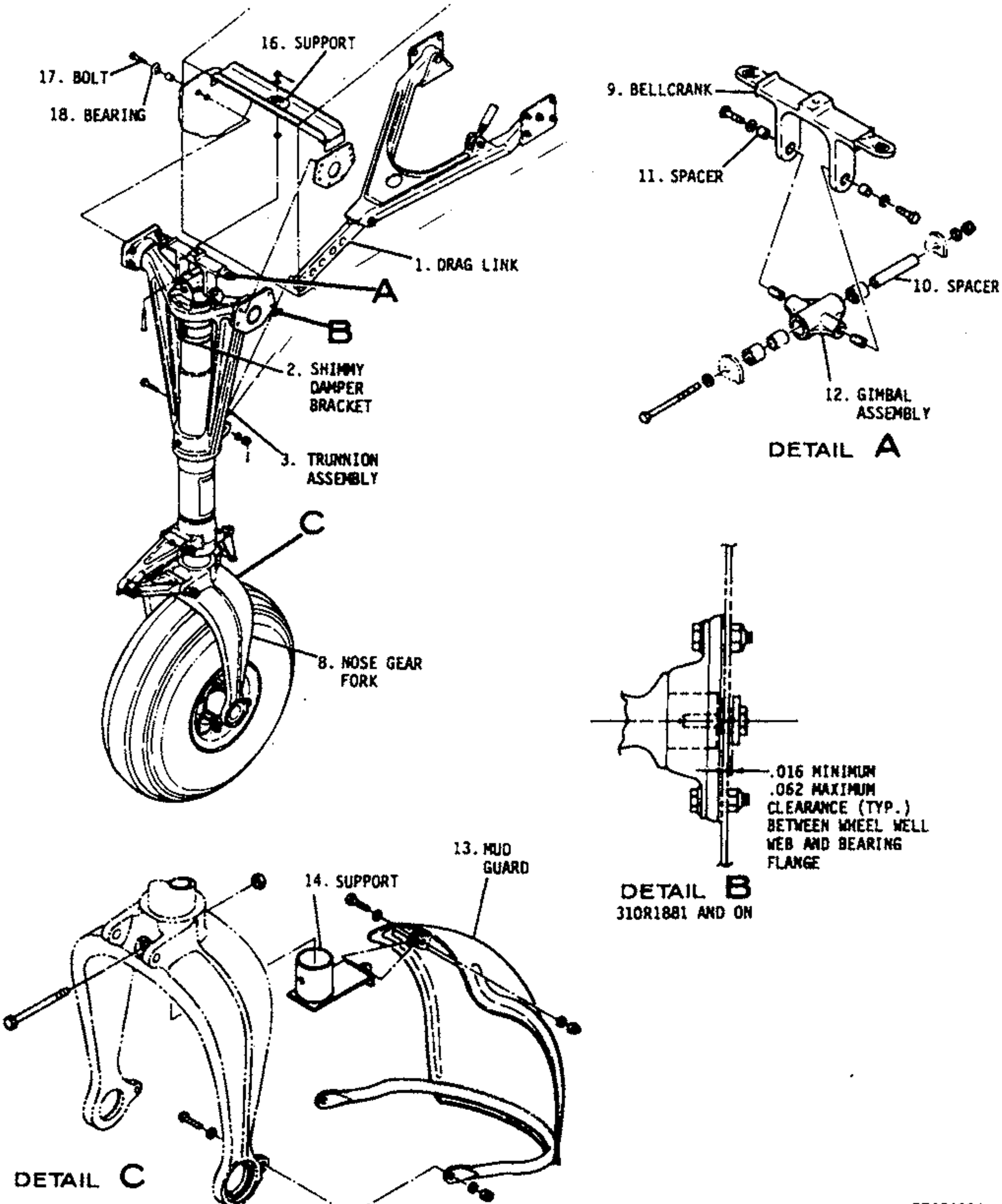
(10) Remove lock ring (11) from piston barrel and remove bearing (12).
(11) Slide spacer-extended stop (13), shim (14), ring pack support (16), scraper ring (18) and ring pack retainer (19) from piston barrel (1).
(12) Remove nut, washer and bolt and drive pin plug (5) from piston barrel (1).
(13) If removal of metering pin (2) from pin plug (5) is required, note quantity and location of shims (41) and washers (42) and retain for reinstallation. Remove metering pin by removing attaching nut.

NOTE: Piston barrel (1) and fork (7) are a press fit and drilled on assembly. Disassembly is not recommended.

(14) Remove torque links (32 and 36) from upper barrel (31) and fork (7) by removing cotter pins, nuts, washers, spacers and bolts.

NOTE: The bushings in the torque links are a press fit and should be removed only for replacement. Actuator (47) may be removed from torque link (32), if required, by removing attaching screws.

(15) Remove ramp (40) by removing attaching bolt.



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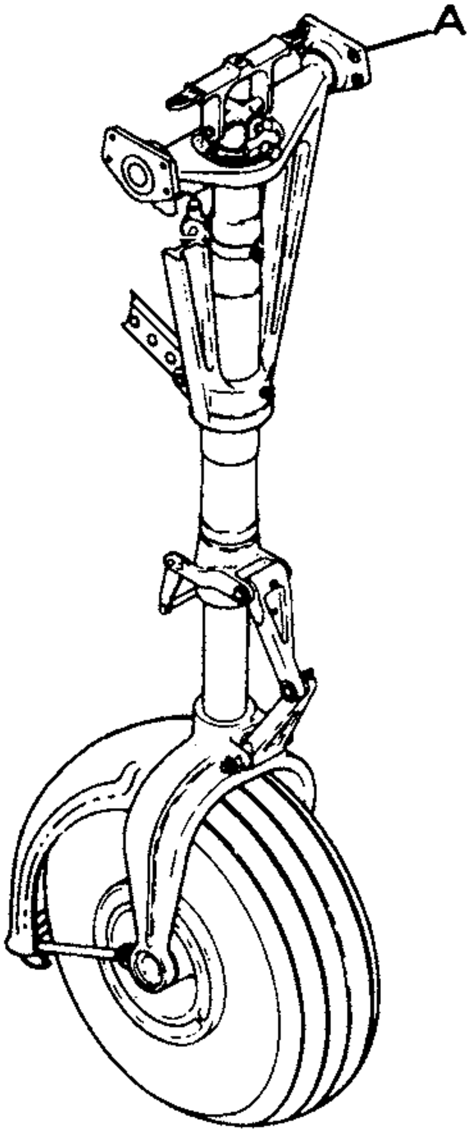
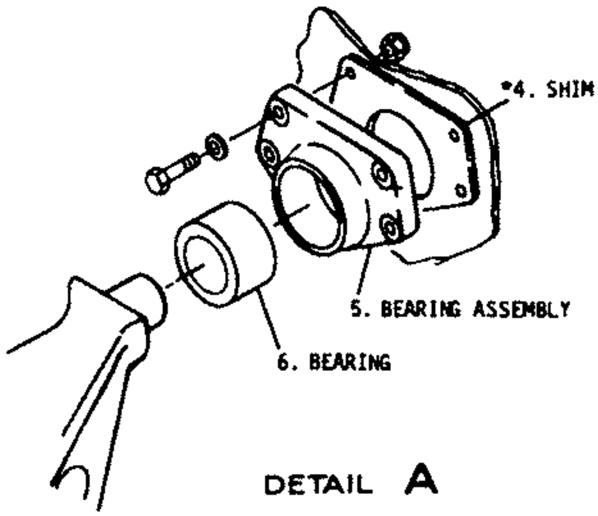
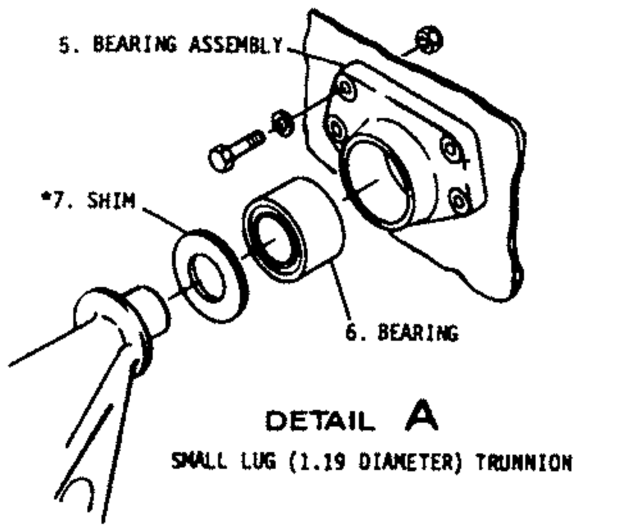
Nose Gear Installation
Figure 2 (Sheet 1)





DETAIL A
LARGE LUG (1.31 DIAMETER) TRUNNION



DETAIL A
SMALL LUG (1.19 DIAMETER) TRUNNION

*NOTE: SHIM AS REQUIRED TO CENTER NOSE GEAR AND LIMIT SIDE PLAY TO NOT EXCEED 0.020.

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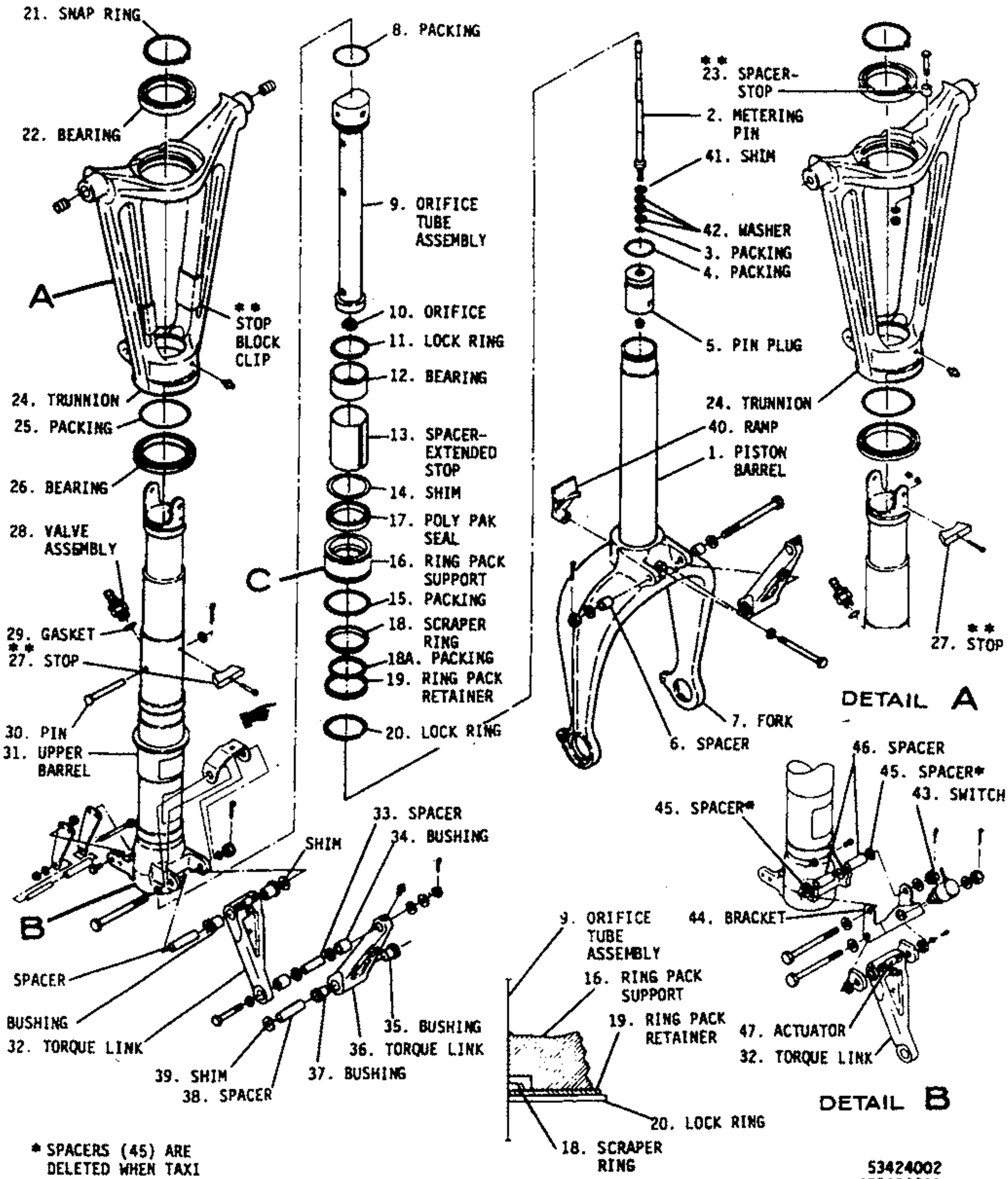
Nose Gear Installation
Figure 2 (Sheet 2)



* SPACERS (45) ARE DELETED WHEN TAXI LIGHT IS INSTALLED

** STOP

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Nose Landing Gear
Figure 3

C. Assemble Nose Landing Gear.

WARNING: DO NOT APPLY AIR OR NITROGEN CHARGE TO STRUT UNTIL IT IS PROPERLY SERVICED WITH HYDRAULIC OIL

(1) If a new upper barrel is installed a new stop block installation will be incorporated allowing the stop block to be mounted at a lower position on the barrel. This installation requires mounting a stop block clip on each side of the trunnion. Refer to Figure 4.
   (a) When upper barrel and trunnion are assembled locate the stop block clip on each inboard side of trunnion to serve as a bumper for the stop block.
   (b) Apply adhesive (EA9309) to clips when they are mounted on trunnion for extra security.
   (c) (See Figure 1.) Remove the existing turn limits placards or paint marks as applicable. Touch up the paint to match the nose gear trunnion and upper barrel.
   (d) Paint two red marks onto the lower portion of the turnnion per dimensions shown.
   (e) Determine the center position of the upper barrel by turning the nose gear to the right until the stop is reached. Place a temporary mark on the upper barrel adjacent with the trunnion and aligned with grease fitting. Repeat with the nose gear against the LH stop. Remove the adhesive backing from the placard and install with the red mark on the placard centered between the temporary marks just made. Secure in place using the two screws and nuts. Remove the temporary alignment marks.

   NOTE: Prior to assembly, inspect for sharp metal edges. Sharp metal edges should be smoothed with number 400 emery paper, then cleaned with solvent.

(2) Position ramp (40) to fork (7) and secure with bolt. Safety wire bolt head to fork.
(3) If removed, install bushings (34, 35 and 37) in each torque link. Ensure that holes in bushings align with grease fittings.
(4) If removed, secure actuator (47) to torque link (32) with screws; safety wire screws to actuator through holes provided.

NOTE: Lubricate torque links with MIL-G-21164 grease on assembly.

(5) Assemble torque link (36) to fork (7) with bolt, spacers (38 and 6), shim (39), washer and nut. Torque nut to standard torque value and install cotter pin.

NOTE: Install shims (39) as required to provide a gap of .004 to .019 inch between attachment fittings and torque links. Ensure that shims are centered over spacer.

(6) Assemble torque link (32) to upper barrel (31) with bolt, spacer, shim and nut. Torque nut to standard torque value and install cotter pin.

NOTE: Lubricate packings, seals and mating parts liberally with clean MIL-H-5606 hydraulic fluid before installation and assembly.

(7) If metering pin (2) was removed from pin plug (5), assemble shim (41), washers (42), as noted in step B (12) of disassembly procedures, and packing (3) on metering pin (2); and secure metering pin assembly to pin plug with attaching nut. Install packing (4) in groove on outside of pin plug (5).
(8) Install metering pin assembly in piston barrel (1). Secure in place with bolt through fork (7), piston barrel (1) and pin plug (5).
(9) Slide lock ring (20), ring pack retainer (19) and scraper ring (18) on piston barrel (1).

CAUTION: INSTALL SCRAPER RING WITH GROVES DOWN (See Figure 3).

(10) Install poly pak seal (17) inside of ring pack support (16) and packing (15) in the groove on the outside.

NOTE: Install poly pak seal with wide lip up (toward the pressure side).

(11) Slide the ring pack support assembly on piston barrel (1); then install shim (14) and spacer (13).

NOTE: Ensure that spacer (13) is locked in position on lower piston barrel on airplanes 421C1246 and On.

(12) Install bearing (12) on piston barrel (1) and install lock ring (11).

NOTE: Install bearing with chamfered end up in order to seat against external lock ring.

(13) If orifice (10) was removed, screw orifice into bottom of orifice tube (9) and stake in place.
(14) Install packing (25) and bearing (26) in trunnion. Coat bearing area and O-ring packing in lower end of trunnion using MIL-G-21164C grease or equivalent.
(15) Install bearing (22) in trunnion. Install spacer stop (23).
(16) Start lower end of trunnion over end of upper barrel assembly and slide on approximately half way. Start shimmy damper attach bracket and shimmy damper over end bearing, spacers, stop bolts and snap ring at upper end of the nose gear assembly and the grease fitting at the lower end of the trunnion.

NOTE: Position the shimmy damper on upper barrel assembly with filler plug up and on the side of the trunnion that has the shimmy damper attaching lug. Ensure that new trunnion is properly indexed on the upper barrel assembly prior to tightening of shimmy damper bracket. With the nose gear scissors forward, the trunnion must be positioned with the shimmy damper attaching lug on the aft side.

(17) Install packing (8) on orifice tube assembly (9) and insert assembled tube into upper barrel (31); align holes and install pin (30), washer and cotter pin securing piston orifice assembly in upper barrel assembly.

NOTE: Use of a tapered pin or punch may be required to align piston and orifice assembly in upper barrel assembly.

NOTE: To prevent damage to piston barrel and ring pack support during installation, a ring pack support tool, P/N 0880004-2, should be used.

(18) Install assembled piston barrel assembly into upper barrel (31). Carefully work scraper ring (18) and ring pack retainer (19) into place and secure with lock ring (20).
(19) Connect torque links (32 and 36) with bolt, washers, spacer (33) and nut. Torque nut to standard torque value and install cotter pin.

NOTE: Install AN960-716 and AN960-716L washers until a gap of .004 to .019 inch exists between torque links. Ensure that washers are centered over spacer (33).

(20) Locate shimmy damper bracket on upper barrel assembly with locating pin inserted in hole on upper barrel assembly. Install washer on bolt head, insert bolt through clamping ears of bracket, install washer and nut. Connect shimmy damper rod assembly to lug on aft side of trunnion using existing bolt, washers and nut. Torque both nuts 20 to 25 inch-pounds.
(21) Install stop block on upper barrel assembly using existing bolt, washer and nut.
(22) With strut fully deflated, fill with MIL-H-5606 hydraulic fluid and install gasket (29) and valve body (28).
(23) Service strut in accordance with Chapter 2.

3. Cleaning/Painting

   A. Cleaning Nose Gear Assembly.

      (1) Clean all metal parts with suitable solvent.

      CAUTION: IF METAL PARTS ARE NOT TO BE ASSEMBLED IMMEDIATELY, COAT WITH SYSTEM HYDRAULIC FLUID TO PREVENT RUSTING. BEFORE ASSEMBLY, IT WILL BE NECESSARY TO AGAIN CLEAN WITH SOLVENT.

      (2) Clean all packings and seals with system hydraulic fluid.

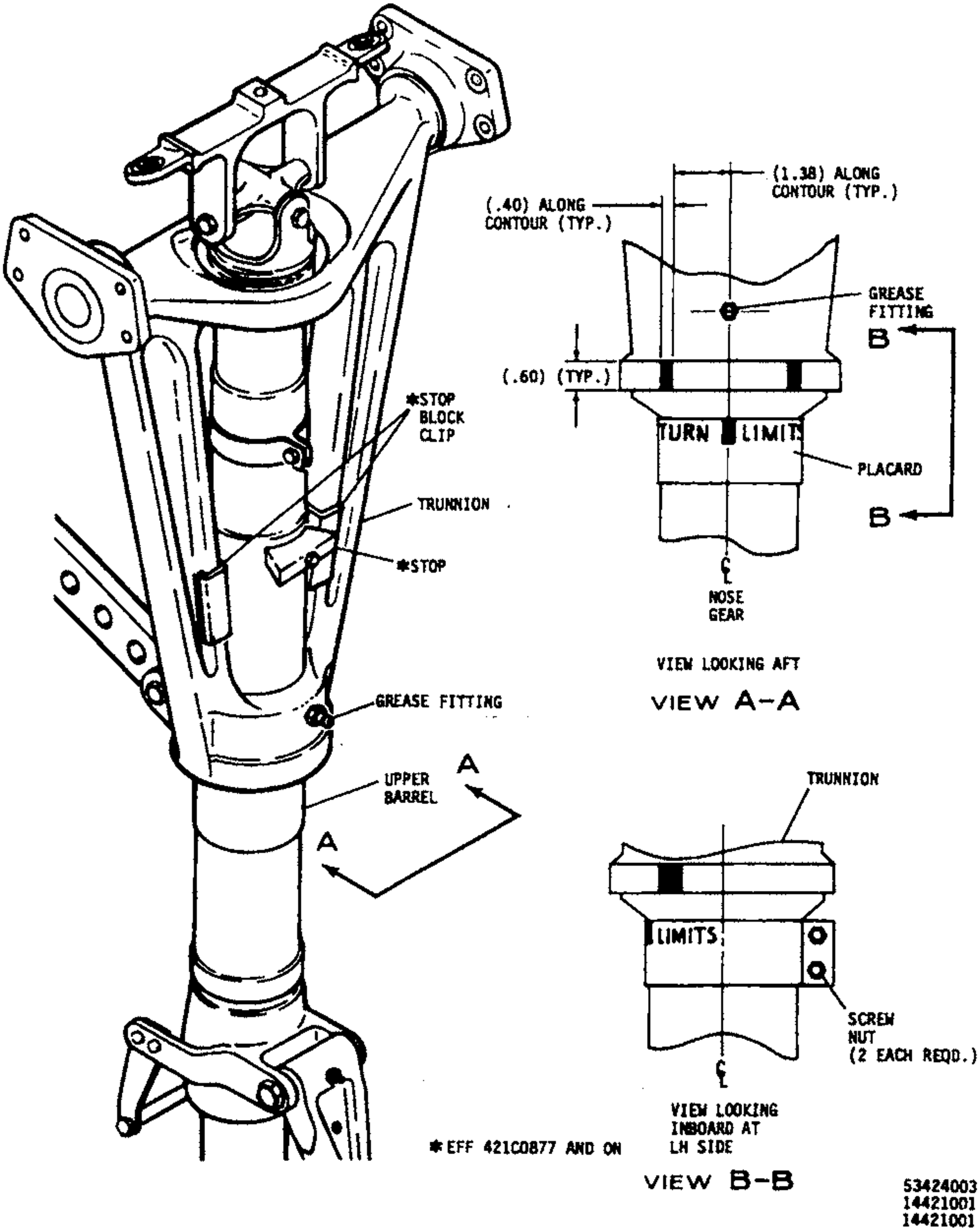
   B. Painting Nose Gear Assembly.

      (1) Refer to Chapter 1, for painting procedures.

4. Approved Repairs

   A. Repair Nose Gear Assembly.

      (1) Repair is limited to replacement of parts, smoothing out of minor scratches, nicks and dents and repainting of areas where paint has chipped or peeled.



Stop Block and Turn Limits Installation
Figure 4

NOSE GEAR SHIMMY DAMPER

Description

1. The shimmy damper provided for the nose gear offers resistance to shimmy by forcing hydraulic fluid through small orifices in the piston. The outer housing is attached to the upper nose strut and moves as the strut turns, while the piston and piston rod are attached to the trunnion assembly which does not turn, thus causing motion between the housing and the piston.

Troubleshooting

1. Troubleshooting Nose Gear Shimmy Damper

   A. For a guide to troubleshooting the nose gear shimmy damper, see Figure 1.

Maintenance Practices

1. Removal/Installation of Nose Gear Shimmy Damper (See Figure 2).

   A. Remove Nose Gear Shimmy Damper.

      (1) Disconnect piston rod (16) from trunnion assembly by removing nut, washers, bolt and bushing (19).
      (2) Remove shimmy damper from strut by removing nut, washer, bolt and bushing (17).

   B. Install Nose Gear Shimmy Damper.

      NOTE: Lubricate bushings (17 and 19) and attaching bolts with light oil during installation.

      (1) Place bushing (17) in barrel (3), align mounting holes and secure in place with bolt, washer and nut.
      (2) Place bushing (19) in trunnion and secure piston rod to trunnion assembly with bolt, washers and nut.

2. Disassembly/Assembly of Nose Gear Shimmy Damper (See Figure 2)

   A. Disassemble Shimmy Damper.

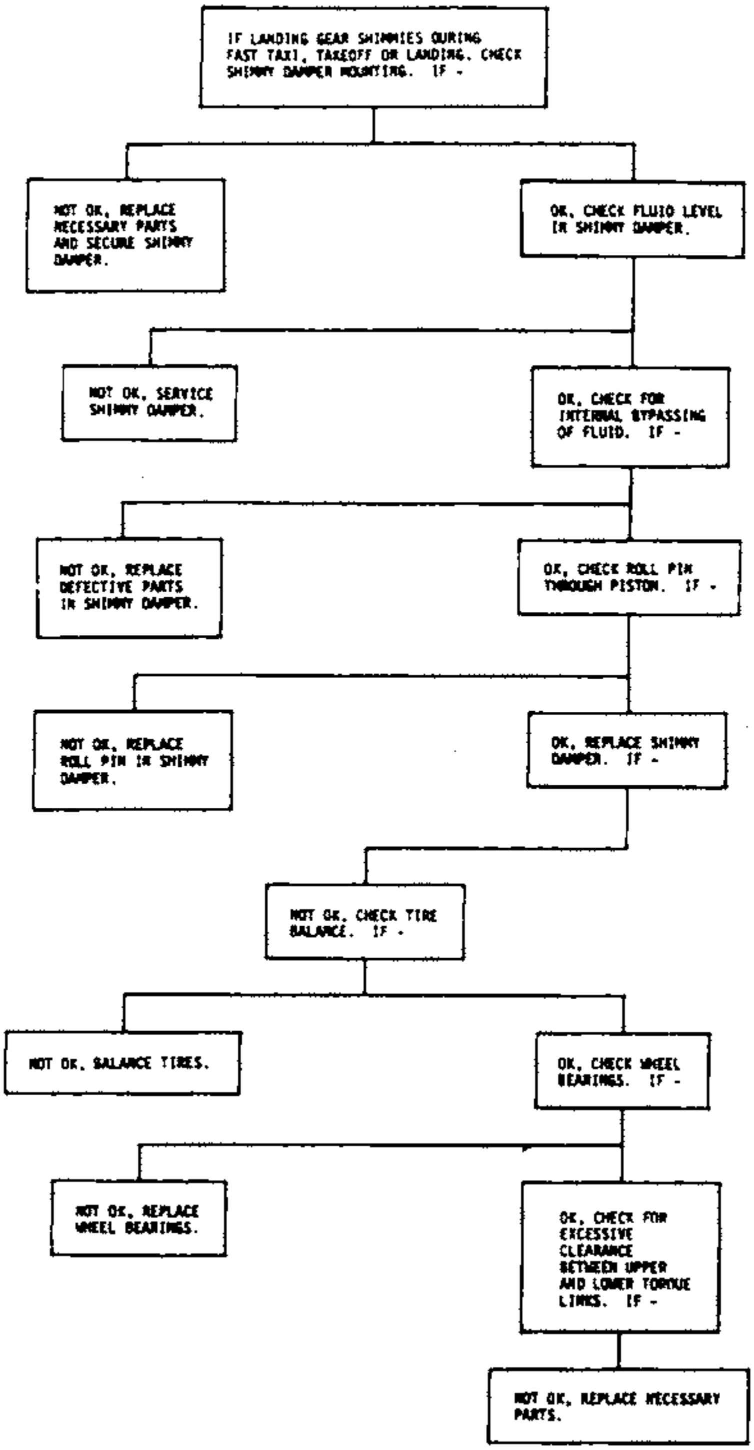
      (1) Push piston rod (16) into shimmy damper, remove filler plug (1) and packing (2) and drain fluid.
      (2) Remove lock ring (15) from the forward end of shimmy damper and pull bearing head (13), piston and rod assembly from barrel (3).
      (3) Remove lock ring (7) from aft end of barrel (3) and pull bearing head (6) from barrel.
      (4) Remove packings (4, 14, 5 and 12) from bearing heads (6 and 13).
      (5) Remove packing (11) and retainer (10) from piston.
      (6) Drive roll pin (8) out and remove piston (9) from piston rod (16).

   B. Assemble Shimmy Damper.

      NOTE: Before starting assembly of shimmy damper, thoroughly clean each component, then lubricate with MIL-H-5606 hydraulic fluid.

      (1) Install packings (4, 14, 5 and 12) on bearing heads (6 and 13).
      (2) Install bearing head (6) into aft end of barrel (3) and secure with lock ring (7).
      (3) Slide bearing head (13) onto piston rod (16).
      (4) Install piston (9) on piston rod (16) and insert roll pin (8) through piston and piston rod.
      (5) Install retainer (10) and packing (11) on piston (9).
      (6) Insert piston and piston rod assembly into barrel (3), slide bearing head (13) into place and secure with lock ring (15).

         CAUTION: INSERT PISTON AND PISTON ROD ASSEMBLY WITH CARE TO PREVENT DAMAGE TO PACKINGS.



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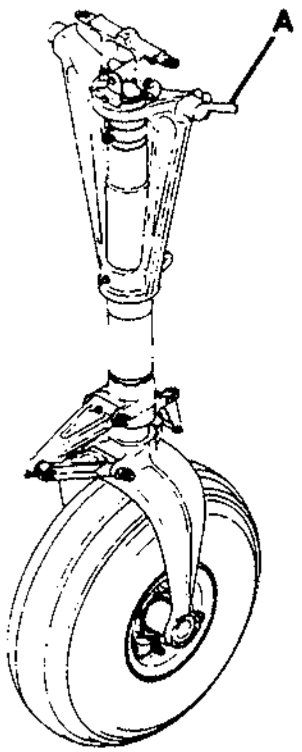
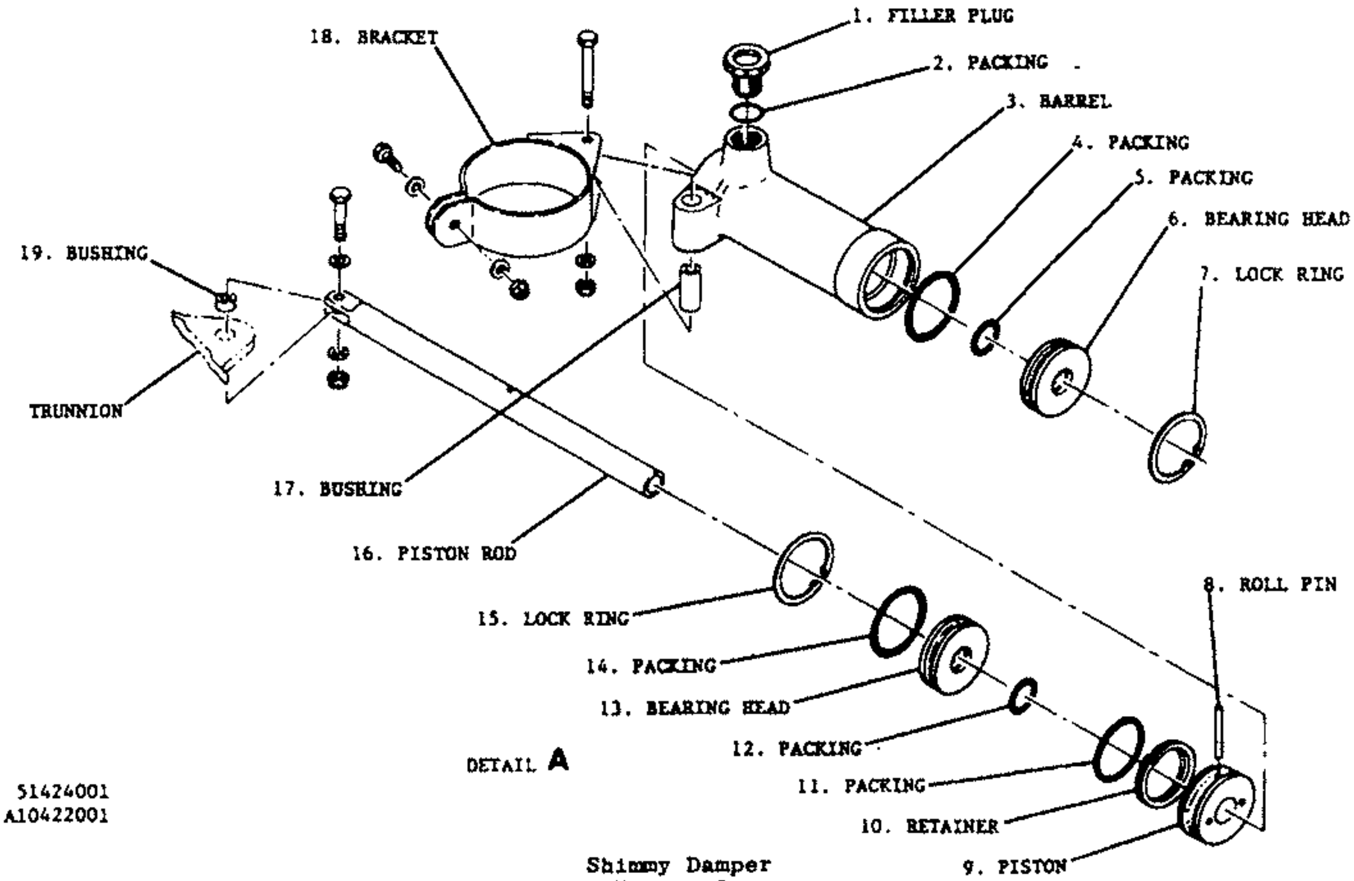
Troubleshooting Chart - Nose Shimmy Damper
Figure 1





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Shimmy Damper
Figure 2

(7) Completely fill shimmy damper with MIL-H-5606 hydraulic fluid and install packing (2) and filler plug (1).

<u>NOTE</u>: For proper operation, shimmy damper must be completely full of hydraulic fluid, with no trapped air present.

(8) Service shimmy damper. Refer to Chapter 2.

EXTENSION AND RETRACTION

Description

1. The normal extension and retraction of the landing gear is by a hydraulic actuator at each gear. All three gears are held in the up position by a mechanical hook. For normal extension of the gear, hydraulic pressure is routed to a hydraulic unlock actuator at each uplock hook. When the hydraulic actuator has reached the full unlock position, fluid is routed on to the gear actuator to extend the gear.

   The landing gear hydraulic actuators have a mechanical latching mechanism in the gear extended position. The latch is spring-loaded and will hold the gear extended after any method of extension; hydraulic, or air, (airplane on jacks). Hydraulic pressure is required to release the lock before the gear will retract.

   The landing gear control valve is solenoid operated and directs hydraulic fluid to the extend or retract side of the individual gear actuators.

   A shuttle valve is incorporated in the gear extend line to prevent a back pressure into the hydraulic system and to direct pneumatic pressure to the gear down ports of each landing gear actuator.

   The landing gear control valve and shuttle valve are mounted on the forward side of forward cabin pressure bulkhead.

Troubleshooting

1. For a guide to troubleshooting the extension and retraction system, refer to Figure 1.
2. For troubleshooting the electrical functions of the landing gear, refer to Chapter 13.
3. If emergency gear blowdown was used or blowdown bottle indicates discharge, jack airplane and proceed as follows:

   WARNING: THE FOLLOWING PROCEDURE SHOULD BE ACCOMPLISHED WITH CARE TO PREVENT INJURY FROM BLEED PRESSURE BLAST.

   A. Loosen blowdown line at bottle fitting and at each extend port fitting on all landing gear actuators. This allows residual pressure to completely bleed off.
   B. Reposition tee-handle by pushing forward until tee-handle is against stop.
   C. Remove line from bottle valve and attach a small hose. Insert hose into a container to catch residual fluid.
   D. Ensure LDG Gear-HYD circuit breaker is pushed in and the landing gear down and lock lights are on.
   E. Attach hydraulic service unit and select 1.5 GPM.
   F. Select GEAR UP. The instant one green light goes out, select GEAR DOWN. This will build hydraulic extend pressure sufficiently enough to reset the shuttle valve.
   G. Cycle gear slowly and increase flow to three GPM until return oil is free of air.
   H. Check container and air line fitting at the blowdown bottle for evidence of oil. If oil is present at blowdown bottle fitting in container, the shuttle valve did not properly seat.

      NOTE: A small amount of oil present in container is normal.

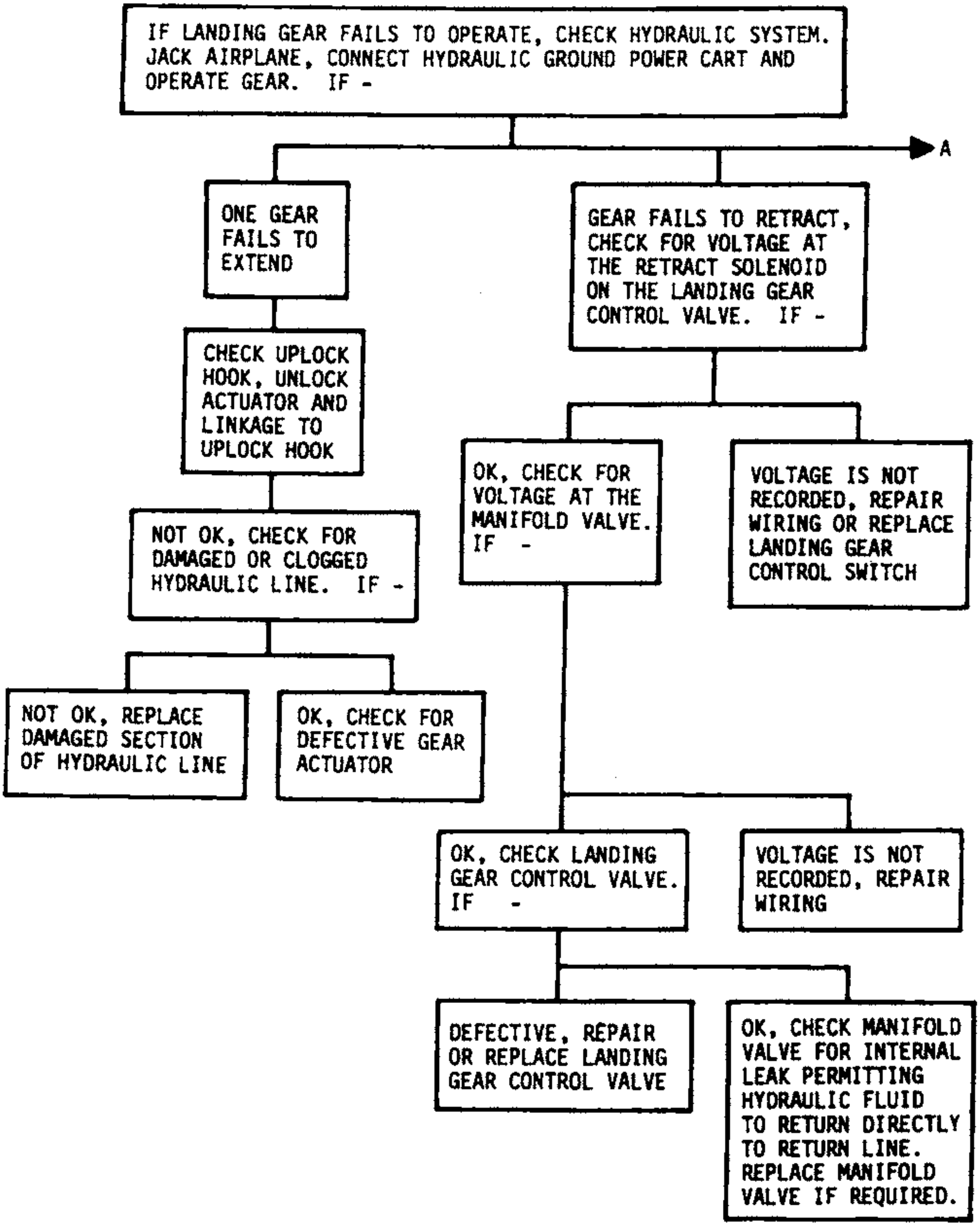
   I. Disconnect air line at blowdown bottle and shuttle valve. Using filtered dry air, blow oil from line and reconnect. Repeat steps D. through G. If oil is still present in line, remove shuttle valve and replace.
   J. Charge blowdown bottle. Refer to Chapter 2.
   K. Remove jacks from airplane. Refer to Chapter 1.

Maintenance Practices

1. Removal/Installation of Extension and Retraction System. (See Figure 2.)

   A. Remove Control Valve.

      (1) Refer to Landing Gear Control for removal and installation of control valve.



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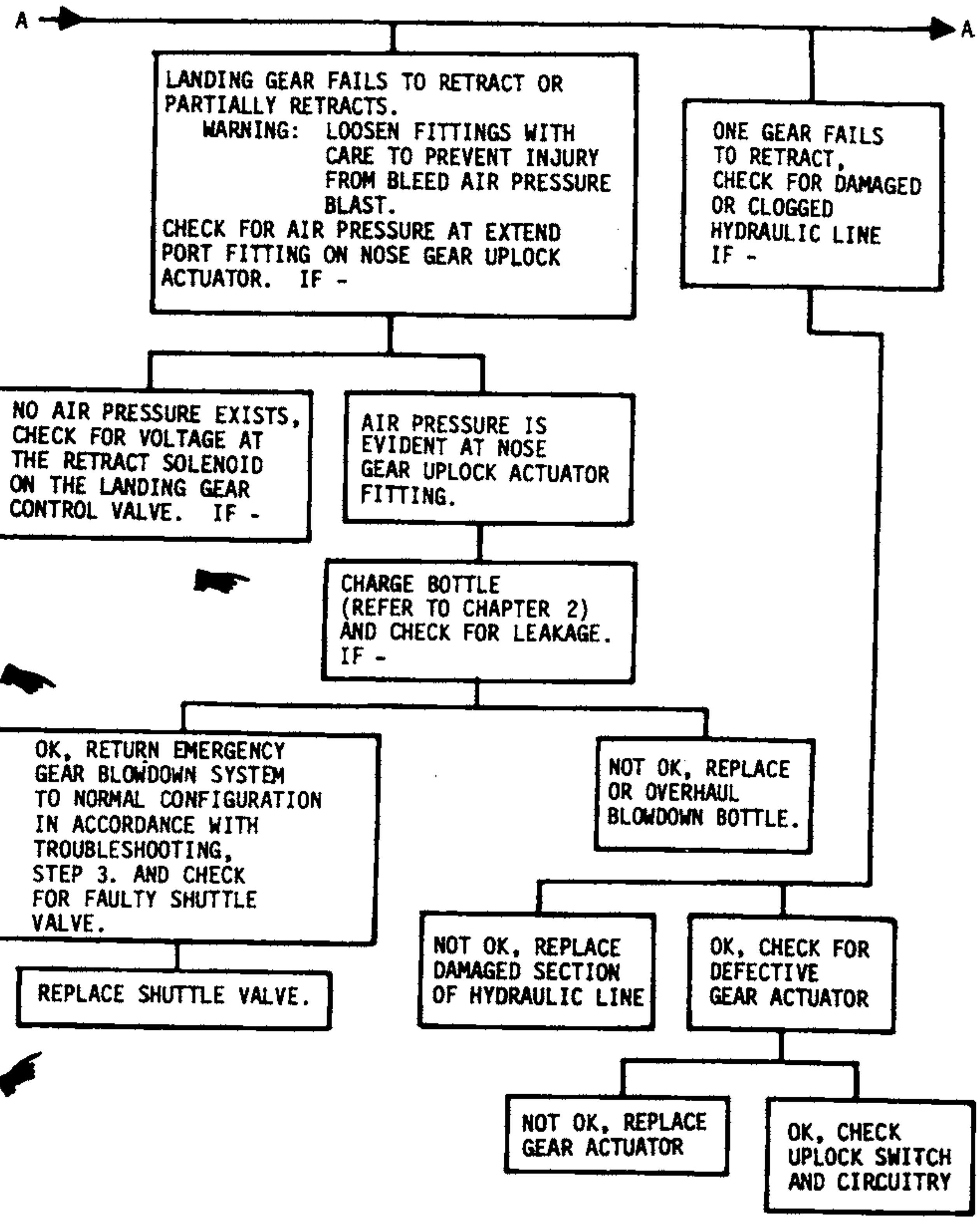
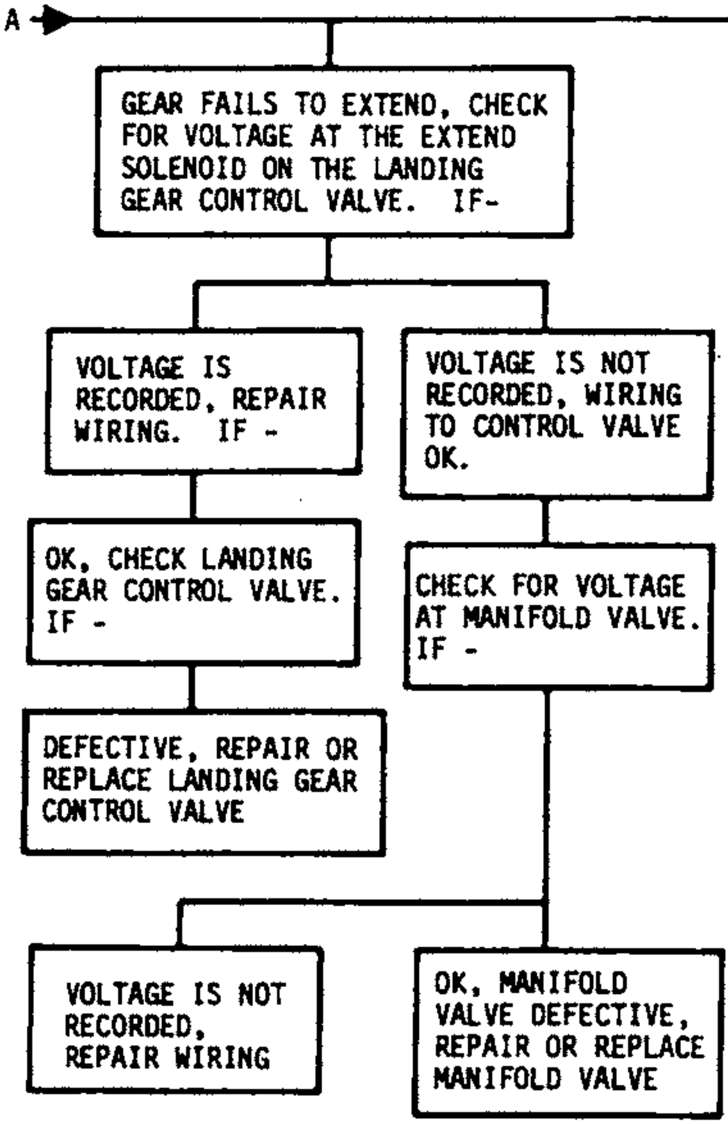
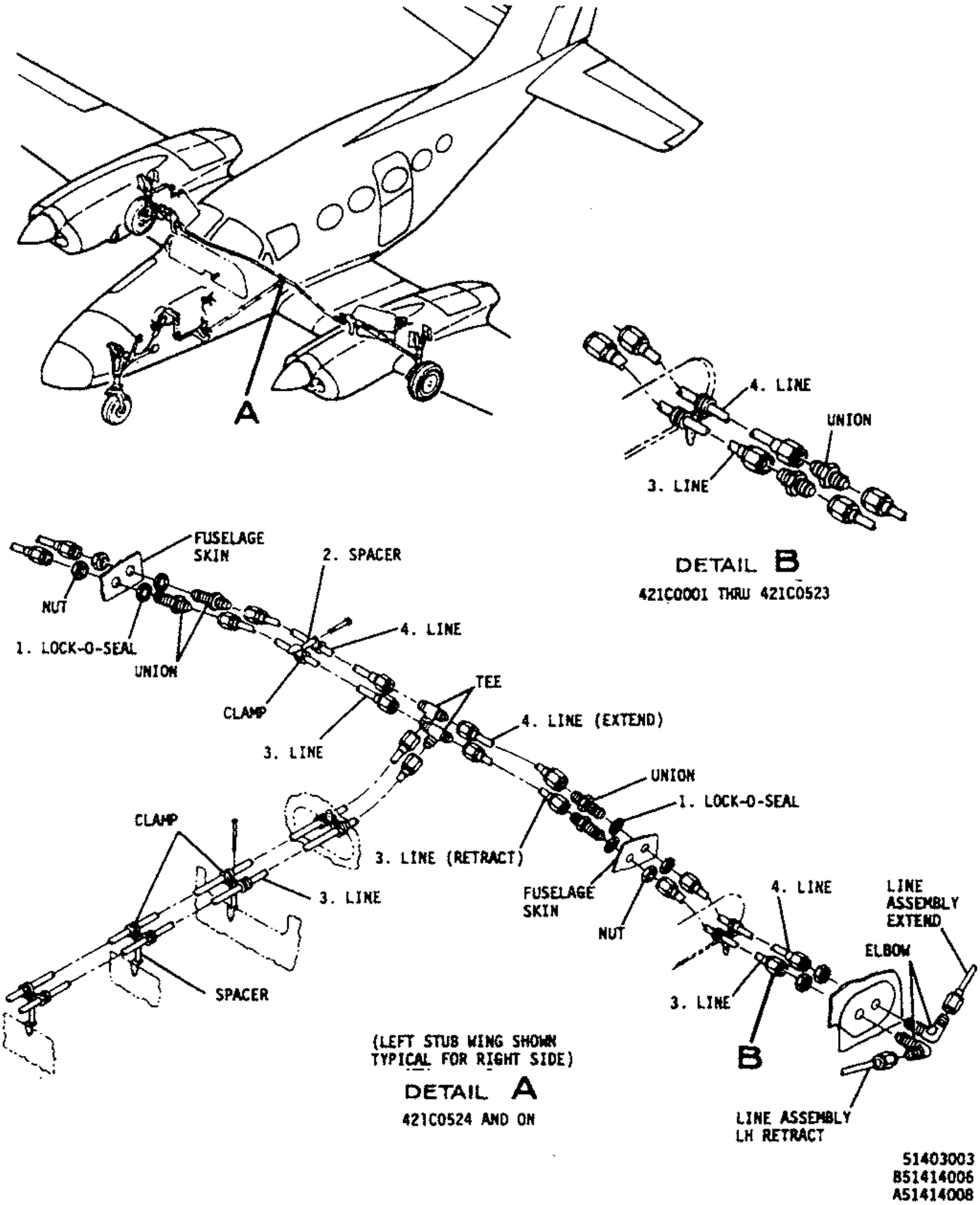
Troubleshooting Chart - Extension and Retraction
Figure 1 (Sheet 1)



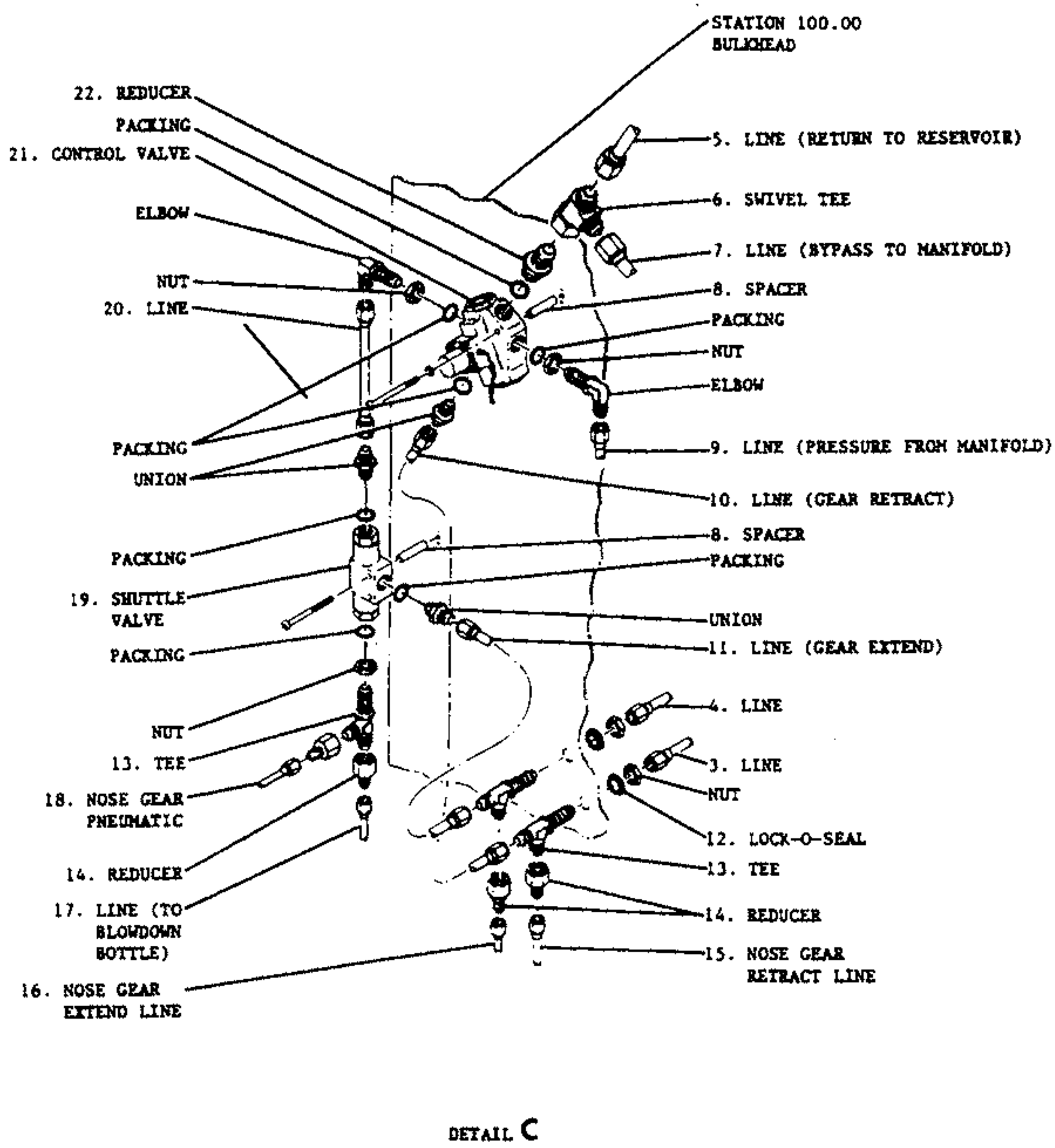
Troubleshooting Chart - Extension and Retraction
Figure 1 (Sheet 2)



Troubleshooting Chart - Extension and Retraction
Figure 1 (Sheet 3) [redacted]



Extension and Retraction Plumbing
Figure 2 (Sheet 1 of 2)



Extension and Retraction Plumbing
Figure 2 (Sheet 2)

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B. Remove Shuttle Valve.

(1) Drain hydraulic fluid from system.
(2) Disconnect lines (20, 11, 17 and 18) from shuttle valve (19).
(3) Remove screws, washers and spacers securing shuttle valve to station 100.00 bulkhead; remove shuttle valve.
(4) If replacing valve, remove unions and tee fitting from shuttle valve.

C. Install Shuttle Valve.

NOTE: Lubricate fittings, packings, backup rings and fitting threads with hydraulic fluid during installation.

(1) If fittings were removed from shuttle valve, install as follows:
  (a) Place backup ring and packings on unions. Install unions in shuttle valve.
  (b) Place nut, backup ring and packing on tee (13). Install tee into shuttle valve. Do not tighten nut at this time.
(2) Secure shuttle valve (19) to station 100.00 bulkhead with two screws, washers and spacers (8).
(3) Install reducers (14) on tee (13) and connect lines (11, 17, 18 and 20).
(4) Service hydraulic system and perform operational check. Check for leaks.

D. Remove Extension and Retraction Plumbing.

NOTE: This section only covers plumbing to the nose gear wheel well and to the main gear wheel well. For continuance of these lines refer to Nose Landing Gear Actuator or to Main Landing Gear Actuator.

(1) Drain hydraulic fluid from hydraulic system.
(2) Remove pilot's seat. Refer to Chapter 3.
(3) Remove carpet and access panels as required to gain access to hydraulic plumbing.

NOTE: Work lines carefully through access openings to prevent damage to lines. Slight bending of lines is permissable for removal, however, excessive bending should be avoided.

(4) Remove lines as required by removing screws, nuts, spacers and clamps as illustrated.

E. Install Extension and Retraction Plumbing.

NOTE: Use only clean hydraulic fluid as a lubricant for all hydraulic fittings. During installation of certain lines, slight bending of lines is permissable, however, excessive bending should be avoided.

(1) Install lines that were removed and secure in place by clamps, spacers, screws and nuts as illustrated.

NOTE: Make sure lines are not rubbing or chaffing against structure, other lines, cables or anything that would cause abrasion or damage to lines.

(2) Check line for leaks before installing access panels.
(3) Install access panels, carpeting and pilot's seat.

MAIN LANDING GEAR ACTUATOR

Description

1. The main gear actuators are mounted inboard of the gear and move the gear to the extended position when extended. The actuator has an integral locking device to hold the gear in a fully extended position until hydraulic pressure is applied to the retract port of the actuator.

Maintenance Practices

1. Removal/Installation of Main Landing Gear Actuator (see Figure 1).

   A. Remove Main Landing Gear Actuator.

      (1) Jack airplane until tire is off the ground. Refer to Chapter 1.
      (2) Disconnect hose (1) and hose (7) from actuator (5). Cap and plug lines and fittings to prevent entry of foreign material and to prevent leaking.
      (3) If applicable, remove door link (4) from bolt (3) by removing washer and nut.
      (4) Disconnect electrical leads from downlock switch (11).

      NOTE: Do not remove downlock switch (11) or change adjustment of switch.

      (5) Disconnect main gear actuator (5) from landing gear (2) by removing cotter pin, nut, washer and bolt.
      (6) Disconnect actuator (5) from fitting (8) by removing cotter pin, nut, washer and bolt. Remove actuator.
      (7) Line (6), hose (1) and bracket (9) may be removed as an assembly by removing clamp securing bracket (9) to actuator (5).
      (8) Remove elbows (10) and (12) if a new actuator is to be installed.

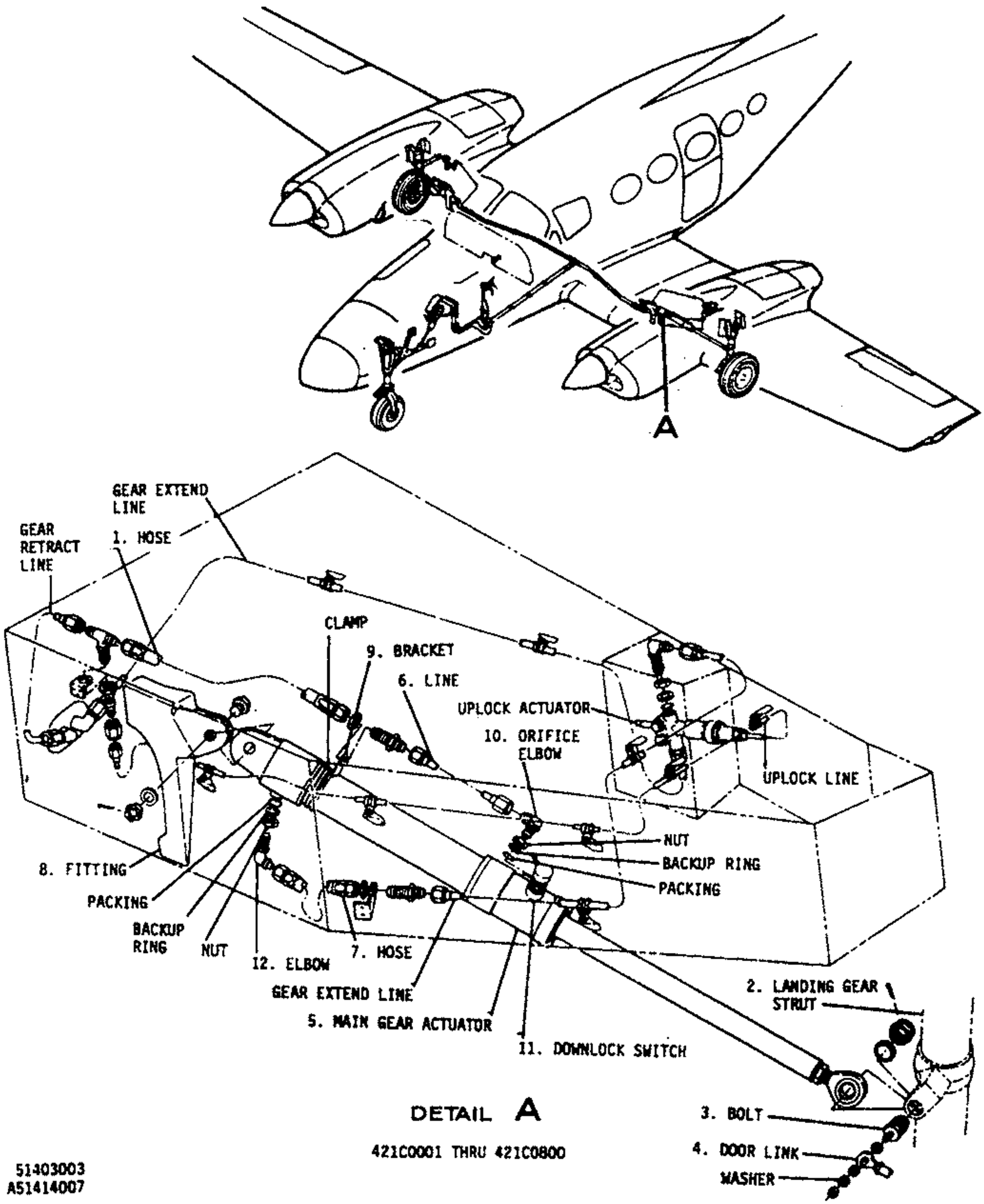
      NOTE: On airplanes 421C0001 through 421C0202, if a Western Hydraulics actuator is being replaced with a Teijin-Seiki actuator, a new retract hose must also be installed on initial installation. Refer to Airplane Parts Catalog for part number.

   B. Install Main Landing Gear Actuator.

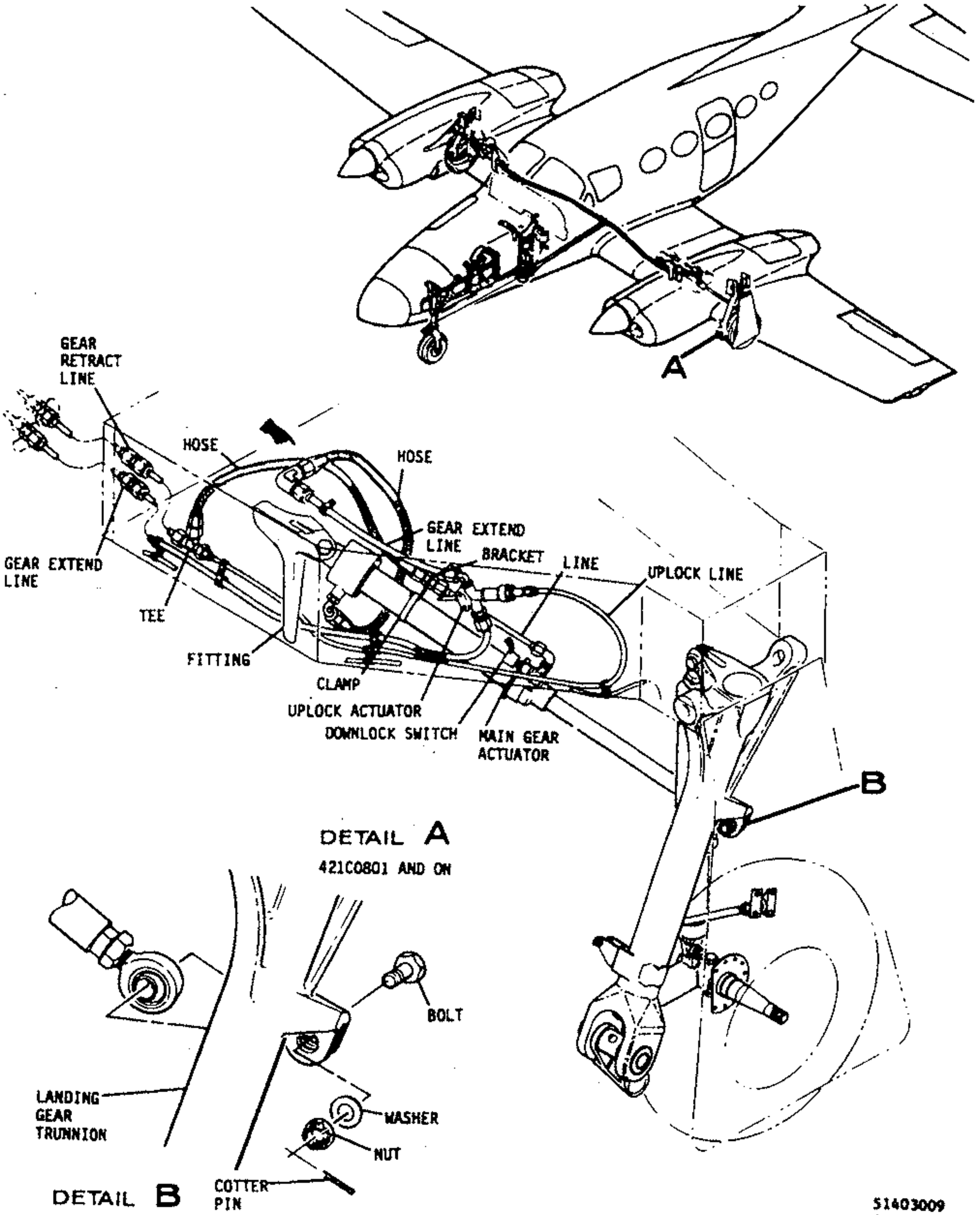
      (1) Install nut, backup ring and packing on orifice elbow (10) and elbow (12). Install elbows in actuator (5). Do not tighten nuts at this time.

      NOTE: Ensure that restrictor elbow is installed at correct location.

      (2) Position actuator (5) to fitting (8) and secure in place with bolt, washer, nut and cotter pin. Torque to 100 to 112 inch-pounds.
      (3) Connect actuator piston to landing gear (2) with bolt, washer, nut and cotter pin. Torque to 100 to 260 inch-pounds. On airplanes 421C0001 thru 421C0800, on airplanes 421C0801 and On, refer to Standard Torque Values Chart, Chapter 1.
      (4) Connect door link (4) to strut (2) with washer and nut (install large washer between small washer and nut).
      (5) Install line (6), hose (1) and bracket (9) to actuator with clamp.
      (6) Connect hose (1) and hose (7). After hoses and lines are secured to actuator and properly positioned, tighten nuts on elbows (10) and (12).
      (7) Connect electrical leads to downlock switch (11).
      (8) Conduct functional check of landing gear system to bleed air from actuator and lines.



Main Landing Gear Actuator Installation
Figure 1 (Sheet 1)



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Main Landing Gear Actuator Installation
Figure 1 (Sheet 2)

C. Main Gear Actuator Attach Fitting Bushing(s) Replacement.

NOTE: Before bushing removal, personnel should read and become familiar with Bearing - Removal/Installation procedures outlined in Chapter 5-50.

(1) Replace bushing(s)
   (a) Remove main gear actuator. Refer to Removal/Installation Main Gear Actuator.
   (b) Press the bushing(s) out of actuator attach fitting.
   (c) Clean all surfaces required for bushing(s) retention. Refer to Chapter 20.
   (d) Press fit bushing(s) in fitting (wet) with Loctite RC-35 Retaining Compound.

   CAUTION: DO NOT CONTAMINATE INNER RACE.

   (e) Observe curing time limits of retaining compound; refer to Chapter 5-50.
   (f) Install main gear actuator. Refer to Removal/Installation Main Gear Actuator.

D. Approved Repair.

(1) For overhaul of main gear actuator, refer to the Actuator Overhaul Manual.

NOSE LANDING GEAR ACTUATOR

Description

1. The nose gear actuator mounted in the nose gear wheel well extends the nose gear when actuator is in the extended position. The nose gear actuator is connected to the nose gear strut through a drag link and drag brace assembly.

Maintenance Practices

1. Removal/Installation of Nose Landing Gear Actuator (see Figure 1).

   A. Remove Nose Landing Gear Actuator.

      (1) Jack aircraft until tire is off the ground. Refer to Chapter 1.
      (2) Disconnect retract hose (2) and extend hose (3) from actuator (4). Cap and plug hoses and fittings to prevent entry of dirt and prevent leaking of hydraulic fluid.
      (3) Disconnect electrical leads from downlock switch (10).

      NOTE: Do not remove downlock switch (10) or change adjustment of switch.

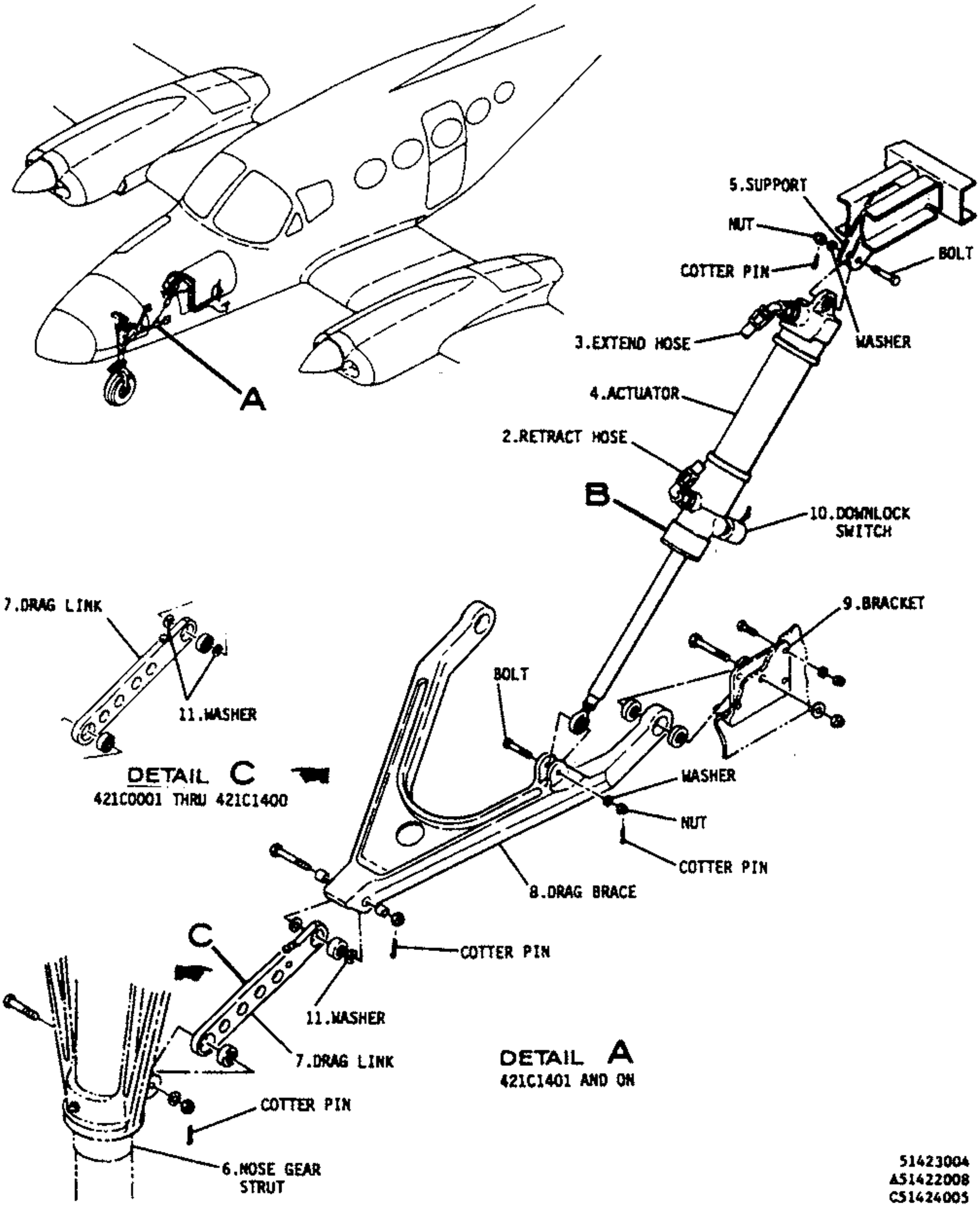
      (4) Disconnect actuator (4) from drag brace (8) by removing cotter pin, nut, washer and bolt.
      (5) Disconnect actuator (4) from support (5) by removing cotter pin, nut, washer and bolt.
      (6) If new actuator is being installed, remove unions (1).
      (7) If drag link (7) and drag brace (8) are being replaced, remove by removing cotter pins, nuts and bolts.

   B. Install Nose Landing Gear Actuator.

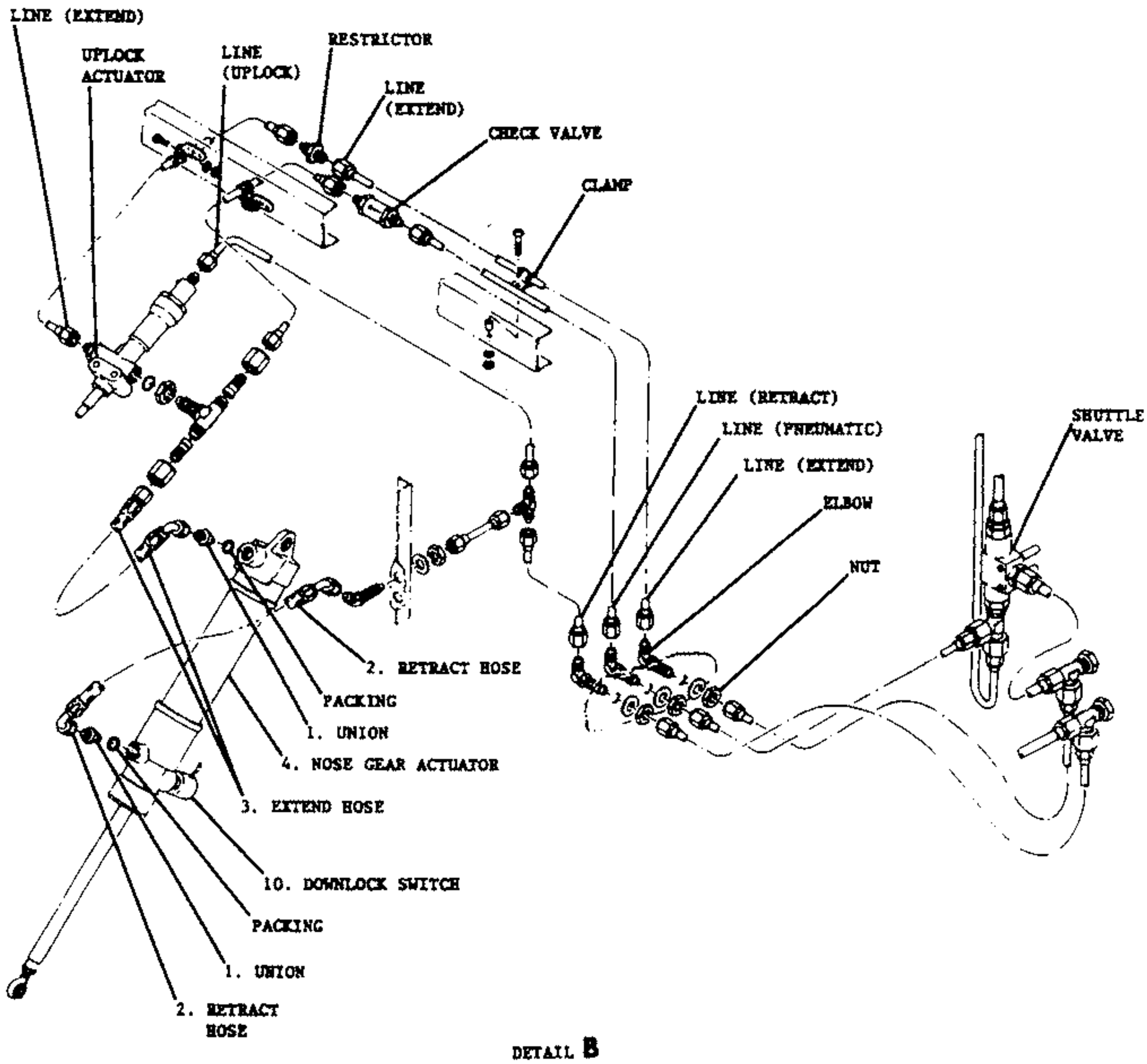
      (1) If drag link (7) and drag brace (8) were removed, install with bolts, nuts and cotter pins.

      NOTE: When assembling drag brace (8) and drag link (7), add washers (11) as required to center drag link in drag brace and to remove side movement.

      (2) If unions (1) were removed, install new packings and install unions in nose gear actuator (4).
      (3) Position actuator to support (5) and secure with bolt, washer, nut and cotter pin.
      (4) Secure actuator rod end to drag brace (8) with bolt, washer, nut and cotter pin.
      (5) Connect electrical leads to downlock switch (10).
      (6) Remove caps and plugs from hoses and fittings; connect extend hose (3) to upper end of actuator (4) and retract hose (2) to the lower end of actuator.
      (7) Conduct operational check of landing gear system to bleed air from actuator and lines.



Nose Landing Gear Actuator Installation
Figure 1 (Sheet 1 of 2)



Nose Landing Gear Actuator Installation
Figure 1 (Sheet 2)

LANDING GEAR UPLOCKS

Description

1. The uplock assemblies consists of an actuator, uplock hook assemblies, links and connecting hardware.

2. The nose gear uplock actuator and main gear uplock actuator are identical except for hydraulic port fittings.

Maintenance Practices

1. Removal/Installation Main Gear Uplock Assemblies (See Figure 1)

   A. Remove Main Gear Uplock Assemblies.

      (1) Disconnect hydraulic lines from actuator (9). Cap and plug lines and fittings to prevent entry of dirt and leaking of hydraulic fluid.
      (2) Compress spring (11) toward actuator (9) and hold. Remove cotter pins, washers and pins (14). Remove links (13) and spring (11).
      (3) Remove bolts and washers securing actuator (9) to support (1). Remove actuator.
      (4) Remove elbow (3), packing (4) and backup ring (18) from actuator (9).
      (5) Refer to Disassembly/Assembly of Actuator for removal and installation of actuator.
      (6) Remove uplock switch (12) from uplock hook (15) by removing nut.
      (7) Remove screws securing bearing block (17) to support (1) and bracket (2).
      (8) Remove bearing block from support (1); remove cotter pin, nut, washer, bushing (16) and bolt.

   B. Install Main Gear Uplock Assemblies.

      (1) Assemble uplock hook (15) to bearing block (17) with bushing (16), bolt, washer and nut. Torque nut to 160 - 190 inch-pounds and install cotter pin. Make sure bearing rotates freely within bearing block.
      (2) Position bearing block assembly between support (1) and bracket (2). Secure in place with screws and nuts.
      (3) Install uplock switch (12) and secure with nut. Safety nut. Refer to Chapter 4-70 for switch adjustment.
      (4) Install elbow (3), packing (4) and backup ring (18) in actuator (9).
      (5) If hydraulic fittings were removed, refer to Disassembly/Assembly of Actuator and install fittings.
      (6) Position actuator (9) to support (1) and secure in place with two bolts and washers. Safety wire bolt heads.
      (7) Connect links (13) to actuator piston with pin (14), washer and cotter pin.

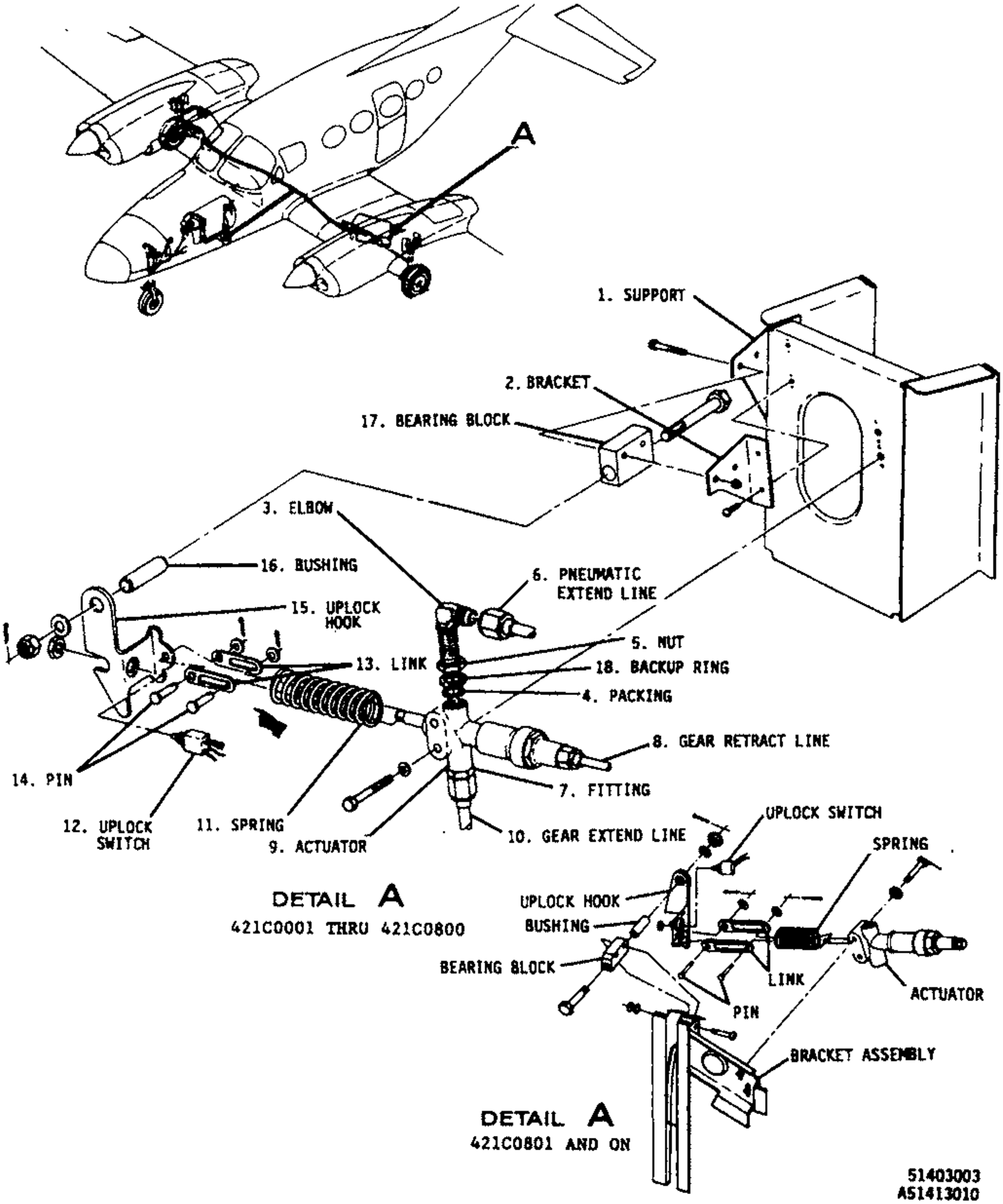
      NOTE: Links must be installed with the slotted ends connected to the actuator.

      (8) Place spring (11) over actuator piston and links, compress spring toward actuator and hold; install pin (14), washer and cotter pin through links (13) and uplock hook (15).
      (9) Connect pneumatic extend line (6), gear extend line (10) and uplock line (8).

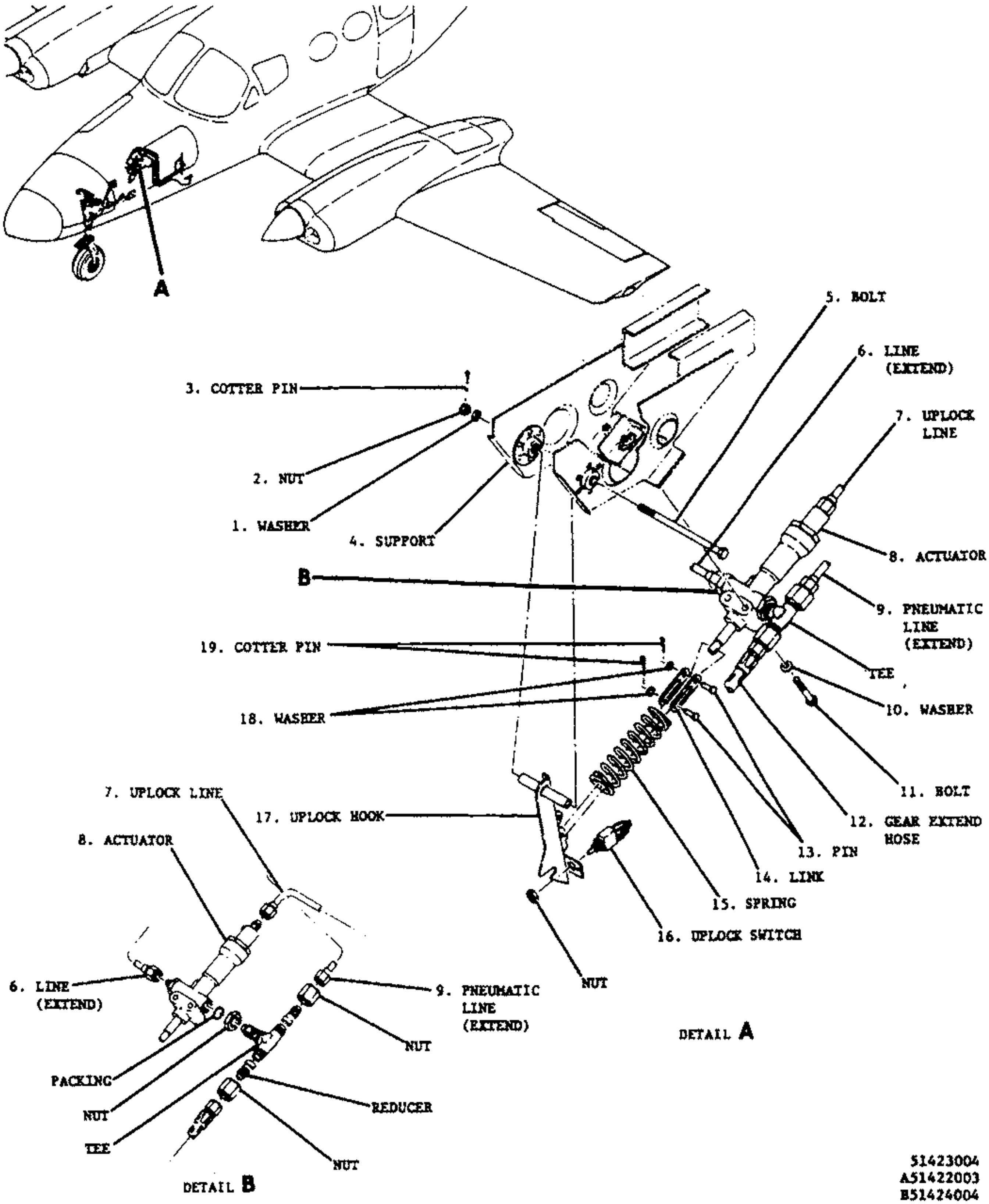
2. Removal/Installation Uplock Hook Bracket Assembly (See Figure 1).

   A. Remove Uplock Hook Bracket Assembly.

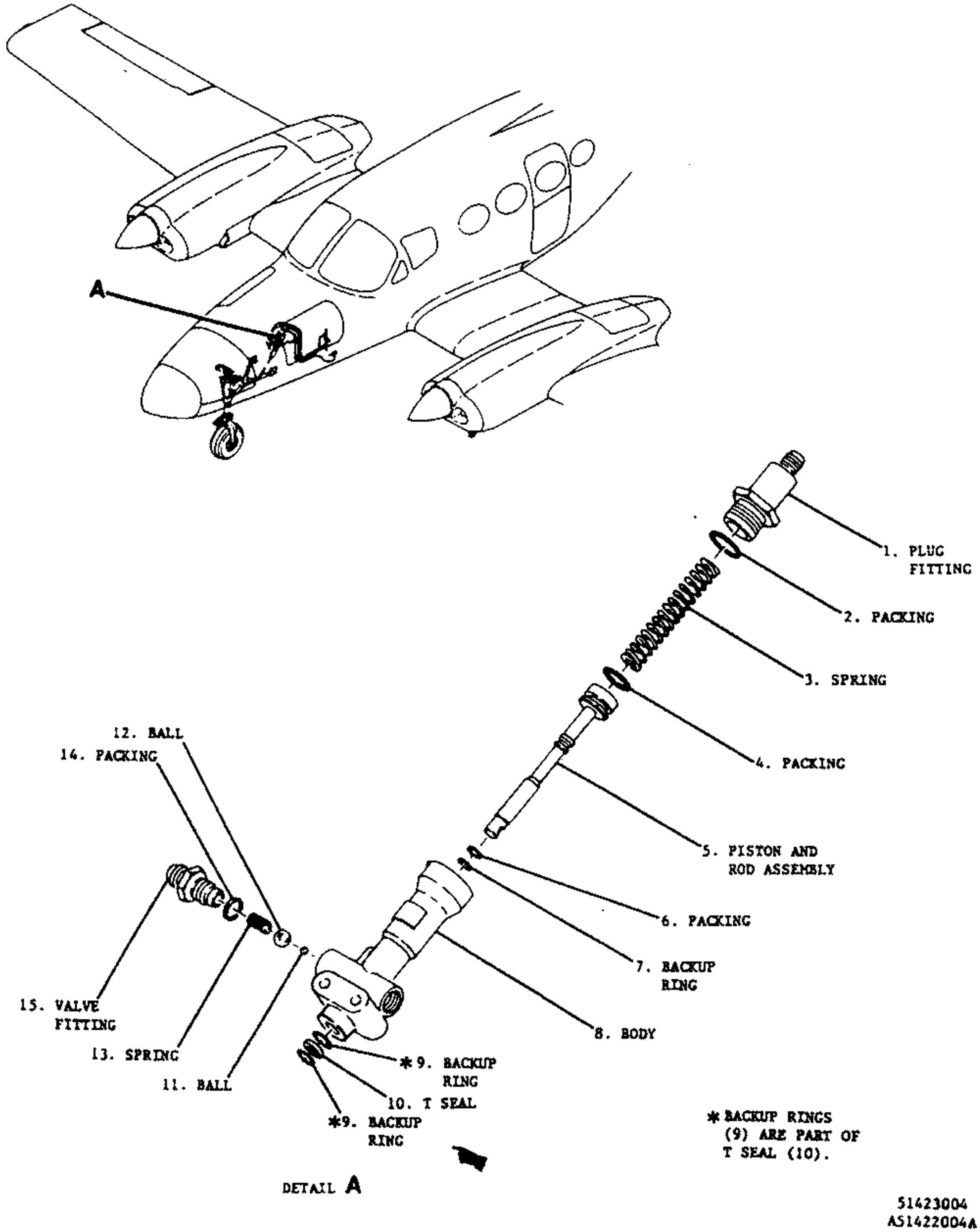
      (1) Jack airplane in accordance with jacking procedures.
      (2) Remove bolts securing bearing block to brackets and swing block down clear of brackets.
      (3) Remove bolt securing bearing block to uplock hook and remove bearing block. Note position of washers for reinstallation.
      (4) Mark outline of brackets on support assembly to aid in locating new brackets.
      (5) Remove screws securing outboard bracket to support assembly and remove bracket.
      (6) Drill out rivets securing inboard bracket to support assembly and remove bracket.



Main Gear Uplock Assembly
Figure 1



Nose Gear Uplock Assembly
Figure 2



Uplock Actuator
Figure 3

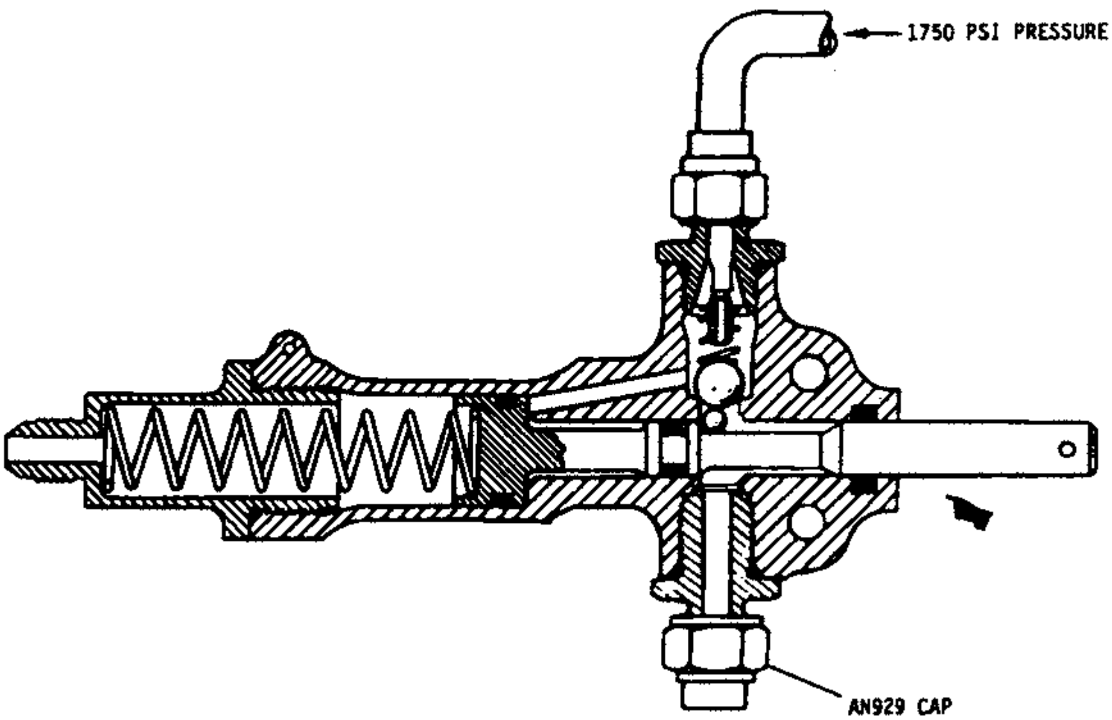
B. Install Uplock Hook Bracket Assembly.

(1) Position new bracket assembly on support in alignment with marks outlining previous brackets.
(2) Clamp assembly in place with a "C" clamp on the inboard bracket making sure outboard bracket is against support.
(3) Drill lower holes through inboard bracket from inside the support assembly.
(4) Scribe the two hole locations on the outboard bracket through the nutplates in the support assembly.
(5) Remove "C" clamp, disassemble brackets from bearing block and drill the two holes in the outboard bracket per scribe marks.
(6) Using temporary metal fasteners, fasten the old inboard bracket to the new bracket and drill the remaining holes.
(7) Rivet inboard bracket to the support assembly and secure outboard bracket to support with screws.
(8) Attach bearing block to uplock hook with bolt and washers in same position as when removed.
(9) Slide bearing block between inboard and outboard brackets and secure with bolt.
(10) Check landing gear uplock hook operation in accordance with landing gear rigging procedures.
(11) Remove jacks from airplane.

3. Removal/Installation Nose Gear Uplock Assemblies (Refer to Figure 2)

A. Remove Nose Gear Uplock Assemblies.

(1) Disconnect pneumatic line (9) and gear extend hose (12) from tee and lines (6 and 7) from actuator (8). Cap and plug lines and fittings to prevent entry of dirt and leaking of hydraulic fluid.
(2) Compress spring (15) toward actuator (8) and hold. Remove cotter pins (19), washers (18) and pins (13). Remove links (14) and spring (15).
(3) Remove bolts (11) and washers (10) securing actuator (8) to support (4). Remove actuator.
(4) If desired, remove tee from actuator by removing nut and packing.



Actuator Leak Test
Figure 4

(5) For actuator disassembly, refer to Disassembly/Assembly Uplock Actuator.
(6) Remove uplock switch (16) from uplock hook (17) by removing nut.
(7) Remove uplock hook (17) from support (4) by removing cotter pin (3), nut (2), washer (1) and bolt (5).

B. Install Nose Gear Uplock Assemblies.

(1) Install uplock hook (17) to support (4) with bolt (5), washer (1), nut (2), torque nut 160 to 190 inch-pounds and install cotter pin (3).
(2) Install uplock switch (16) and secure with nut. Safety wire nut. Refer to Chapter 4-70 for switch adjustment.
(3) If removed, install tee in actuator (8) with packing and nut. Assemble reducers to tee with nuts.
(4) Position actuator (8) to support (4) and secure in place with bolts (11) and washers (10). Safety wire bolt heads.
(5) Connect links (14) to actuator piston with pin (13), washer (18) and cotter pin (19).

NOTE: Links must be installed with the slotted ends connected to the uplock hook.

(6) Place spring (15) over actuator piston, and links, compress spring toward actuator and hold; install pin (13), washer (18) and cotter pin (19) through links (14) and uplock hook (17).
(7) Connect hydraulic gear extend hose (12), pneumatic line (9) to tee and lines (6 and 7) to actuator (8).

4. Disassembly/Assembly Uplock Actuator (See Figure 3)

A. Disassemble Uplock Actuator.

(1) Remove valve fitting (15) from body (8).
(2) Remove spring (13), ball (12) and ball (11).
(3) Cut safety wire and remove plug fitting (1) and spring (3) from body.
(4) Remove piston and rod assembly (5) from body.
(5) Remove and discard packings and backup rings from piston and body.
(6) Remove T-seal (10) and backup rings (9) from recess of body (8). If T-seal and back ring were not installed, remove backup ring and packing. Backup ring and packing will be replaced with T-seal, refer to 421C Parts Catalog for part number.

B. Assemble Uplock Actuator.

NOTE: Ensure that mating surfaces of splice on backup rings are orientated properly.

(1) Install T-seal (10) and backup ring (9) into recess of body (8). Install the T-seal such that one backup ring is positioned on each side of the T-seal.

NOTE: Lubricate packings and backup rings in MIL-H-5606 hydraulic fluid immediately before installation.

(2) Install packing (6) and backup ring (7) into groove on piston and rod assembly (5) and install packing (4) on piston.
(3) Insert piston and rod assembly (5) into body (8).
(4) Install packing (2) on plug fitting (1); install fitting and spring (3) into body (8). Torque to standard torque value and secure with .032 safety wire.
(5) Install ball (11) and ball (12) into recess of body (8).
(6) Install packing on valve fitting (15); install fitting and spring (13) into body (8). Torque to standard torque value.
(7) Conduct leak checks.

C. Leak Check Actuator (See Figure 4).

(1) Cap outlet port of actuator with an AN929 pressure cap.
(2) Apply 1500 psig (maximum) hydraulic pressure to inlet valve fitting.
(3) Leakage at the piston rod or past the piston seal shall not exceed one drop in 25 cycles.
(4) There shall be no leakage at fittings.

Inspection/Check

1. Inspection/Check Landing Gear Uplocks

A. Inspect actuators for leakage and damaged parts.
B. Check actuators, hooks and supports for loose bolts and worn parts.
C. Check hooks for freedom of movement.

LANDING GEAR CONTROL

Description

1. The landing gear operation is controlled by a four-way, two-position solenoid operated control valve mounted on the forward side of the Station 100.00 bulkhead.

2. A landing gear select switch mounted on the instrument panel will actuate the control valve to divert hydraulic fluid to either gear up or gear down position.

Maintenance Practices

1. Removal/Installation Control Valve (See Figure 1).

   A. Remove Control Valve.

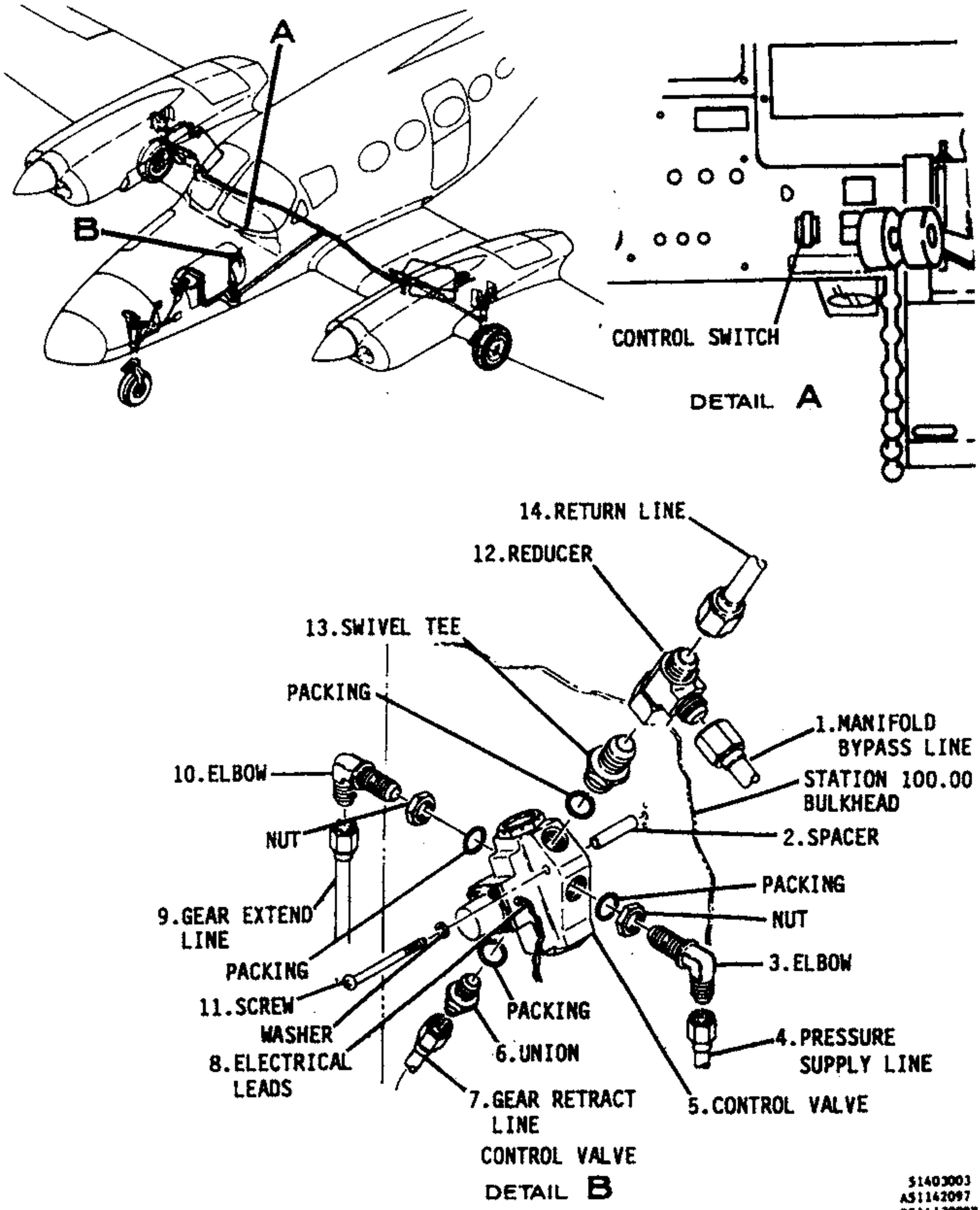
      (1) Drain hydraulic system.
      (2) Place rags under the landing gear control valve and have a small container to drain hydraulic fluid into when disconnecting lines.
      (3) Disconnect electrical connector (8).
      (4) Disconnect swivel tee (13) from reducer (12); disconnect pressure supply line (4), gear retract line (7) and gear extend line (9). Cap and plug lines and fittings to prevent entry of dirt and leaking of hydraulic fluid.
      (5) Remove screws (11), washers and spacers (2). Remove control valve.
      (6) Remove fittings as required from control valve.

   B. Install Control Valve.

      (1) If fittings were removed from control valve, install as follows:
         (a) Place packing on reducer (12) and install reducer into control valve.
         (b) Place nut, backup ring and packing on elbow (3) and install elbow into control valve. Do not tighten nut at this time.
         (c) Install packing on union (6) and install union into control valve.
         (d) Install nut, backup ring and packing on elbow (10) and install elbow into control valve. Do not tighten at this time.
      (2) Position control valve (5) to Station 100.00 bulkhead and secure in place with screws (11), washers and spacers (2).
      (3) Connect swivel tee (13) to reducer (12).
      (4) Align elbow (3) to pressure supply line (4) and secure elbow with nut. Connect line (4) to elbow (6).
      (5) Connect gear retract line (7) to union (6).
      (6) Align elbow (10) to gear extend line (9) and secure elbow to control valve with nut. Connect line (9) to elbow (10).
      (7) Connect electrical connector (8) to control valve (5) and safety wire.
      (8) Service hydraulic system. Refer to Chapter 2.
      (9) Conduct operational check.

2. Removal/Installation Select Switch.

   A. Refer to Position and Warning System for removal and installation of the landing gear select switch.



Landing Gear Control
Figure 1

WHEELS TIRES AND BRAKES

Description

1. The main gear wheel assembly is a 6.50-10 cast magnesium alloy wheel designed for use with tube type tires. The wheel is the divided type consisting of an inboard and an outboard wheel sub-assembly. The wheel rotates on tapered roller bearings. The bearings are sealed against loss of lubricant and contamination by a metal-reinforced rubber-lipped seal on the inboard half and a hub cap on the outboard half. The inboard wheel half has seven steel keyway liners riveted to the outside of the flange. The liners project into the disc drive slots of the flange to protect the magnesium casting against battering by the brake rotating disc tangs.

2. The nose gear wheel assembly is a 6.00-6 cast magnesium alloy wheel assembly designed for use with a tube type tire. The wheel is the divided type having a hub and two flanges held together by three bolts and washers.

3. The main gear tires are a 6.50-10, 8-ply rating tire using a 6.50-10 tube. The nose gear tire is a 6.00-6, 6-ply rating low pressure tire using a 6.00-6 tube.

4. The brake assembly is a hydraulically operated, tri-metallic brake designed for use with MIL-H-5606 hydraulic fluid. Each brake consists of a magnesium alloy housing containing five pistons, an inlet port, and a bleeder port; a torque tube, a back plate, pressure plate, two rotating discs and a stationary disc. The back plate and pressure plate are equipped with replaceable wear pads. Braking action is obtained when hydraulic pressure against the pistons forces the disc stack together between the pressure and back plates. The friction between the rotating and stationary parts of the brake retards the wheel rotation.

NOTE: Since airplane tires are made of nylon cord, stretch will occur in the cord body resulting in a pressure drop in the first 12 hours after initial inflation at operating pressure. To determine whether or not there is a leak in the wheel/tire assembly, the tire should be reinflated after a 12 to 24 hour waiting period. During this second period, it is important to keep the tire in an area where there has been no change in ambient temperature since changes in temperature will affect tire pressure.

MAIN WHEELS AND TIRES

Description

1. Each main wheel consists of two magnesium wheel halves secured together with eight bolts, bearing cups, bearing cones and a bearing seal. A 6.50 x 10, 8-ply rating, low pressure tire and 6.50 x 10 tube are installed on each main gear wheel assembly.

   CAUTION: FUEL ON TIRES FOR AN EXTENDED LENGTH OF TIME WILL CAUSE RUBBER TO SWELL AND RUIN TIRES.

Maintenance Practices

1. Removal/Installation of Main Wheel and Tire Assembly (See Figure 1)

   A. Remove Main Wheel and Tire Assembly.

   (1) Jack airplane. Refer to Chapter 1.
   (2) Remove snap ring (1), cap (2), cotter pin, nut (4), and washer (5) from axle.
   (3) Remove wheel and tire assembly from axle using caution to prevent damage to axle threads and to keep bearings clean.

   B. Install Main Wheel and Tire Assembly.

   CAUTION: ENSURE THAT BEARING CONES (6 AND 12) ARE PROPERLY LUBRICATED BEFORE INSTALLING WHEEL ASSEMBLY. REFER TO CHAPTER 2.

   (1) Place wheel and tire assembly in position on the axle, aligning brake disc with disc drive slots in wheel half.

   NOTE: Ascertain that the seven keyway liners (16) are properly installed in the wheel flange.

   (2) Install outer bearing cone (6), washer (5) and nut (4).

   NOTE: Tighten wheel bearing nut (4) to 40 inch-pounds while rotating wheel, then back off nut and retighten to 20 inch-pounds while rotating wheel. If nut is not positioned to allow installation of cotter pin at 20 inch-pounds torque, continue tightening to the next locking position that will align cotter pin hole.

   (3) Install cotter pin (3), bearing cap (2) and snap ring (1).
   (4) Check that wheel rotates freely.
   (5) Remove jacks from airplane and inflate tire to proper operating pressure. Refer to Chapter 2.

2. Disassembly/Assembly of Main Wheel and Tire Assembly (See Figure 1)

   A. Tools and Equipment.

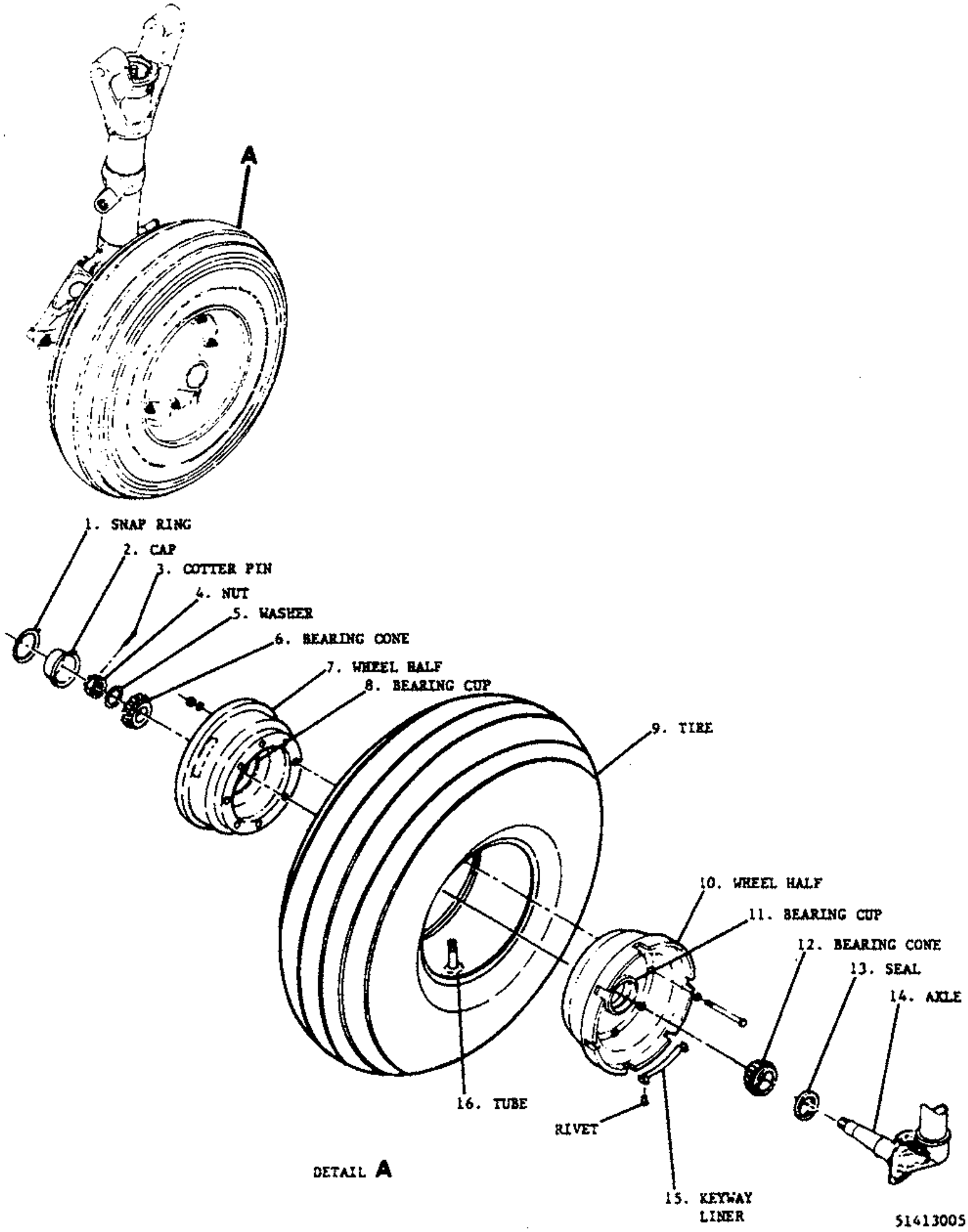
Name	Number	Manufacturer	Use
Wheel Balancer	9781-754	Cessna Aircraft Co.	Balancing wheels.
Adhesive Weight Refill Kit	9901	Cessna Aircraft Co.	Balancing wheels.

   B. Disassemble Main Wheel and Tire Assembly.

   (1) Deflate tire (9) and tube (16) by removing valve core.

   WARNING: ALWAYS DEFLATE TIRE AND TUBE BEFORE SEPARATING WHEEL HALVES.

   (2) Remove nuts, washers and bolts and separate wheel halves (7 and 10). Remove wheel halves from tire.



Main Wheel and Tire Assembly
Figure 1

(3) Remove tube (16) from tire (9).

NOTE: Bearing cups are a shrink fit and should be removed for replacement only.

(4) Replace bearing cups (8 and 11) as follows:
(a) Heat wheel half in boiling water for one hour, or in an oven not exceeding 250°F (121°C) for 30 minutes.
(b) Remove wheel half from source of heat and remove bearing cup.

NOTE: After heating wheel half, bearing cup should be loose enough to fall out of bearing bore when inverted. If cup does not drop out, tap evenly from bore with a fiber drift pin.

(c) Place wheel half (7 or 10) in boiling water for one hour, or in an oven not exceeding 250°F (121°C) for 30 minutes. Chill bearing cup on dry ice.
(d) Remove wheel half from source of heat.
(e) Dry chilled bearing cup thoroughly and coat contacting surfaces of cup with zinc chromate primer or paste.

NOTE: Bearing cup should be installed while primer or paste is still wet.

(f) Install chilled bearing cup in heated wheel half and tap into place evenly with a fiber drift pin.

NOTE: Keyway liners should be removed for replacement only.

(5) Replace keyway liners (15) as follows:
(a) Grind off rivet head.
(b) Punch out rivet and remove keyway liner (15).

CAUTION: SUPPORT FLANGE SOLIDLY WHEN PUNCHING OUT RIVETS. BE CAREFUL NOT TO ENLARGE RIVET HOLES.

(c) Inspect area under keyway liners for corrosion. Blend out corrosion pits to 0.010 inch deep and retreat and repaint reworked areas in accordance with the Approved Repairs Procedures.
(d) Position new liner (15) on inboard wheel half with tab extension on ends of liner toward the centerline of the wheel. The outer edge of the liner should be flush with the outer edge of the wheel.
(e) Install rivet through wheel flange and keyway liner (15).

CAUTION: PEENED HEAD OF RIVET MUST BE ON OUTSIDE OF KEYWAY LINER. CHAMFERED HEAD OF RIVET MUST BE INSTALLED IN COUNTERSINK IN WHEEL FLANGE.

NOTE: Inspect wheel component parts in accordance with inspection procedures, Chapter 2 before reassembling wheel.

C. Assemble Main Wheel and Tire Assembly.

(1) If removed, install keyway liners (15). Refer to Removal Procedures.
(2) If removed, install cups (8 and 11). Refer to Removal Procedures.
(3) Install tube (16) in tire (9).
(4) Place wheel halves in position on the tire and secure with bolts, countersunk washers, and nuts. The countersink of the washers must be facing the bolt head. Lubricate the nine wheel tiebolts (17) with lube torque or a good quality of grease. Install bolts, washers (8) and nuts (7). Torque nuts as follows:

(a) Wheels part number 9910393-2 (40-135) with 1/4 inch bolts 103-11400 and nuts MS21044N4: Torque nuts to 90 inch-pounds.

NOTE: High tensil strength 1/4 inch bolts 103-15500 and nuts AN365-428C are interchangeable with bolts 103-11400 and nuts MS21044N4 respectively. The high tensil strength bolts are identified with SPEC CS on the head. Torque these nuts by turning the nut by hand until it stops. Using a torque wrench, measure the running torque (the torque required to turn the nuts on the bolts). The running torque must be added to the final torque of 125, +5, -5 inch-pounds. Example: average running torque for nine bolts - 15 inch-pounds. Final required torque -125, +5, -5 inch-pounds equals 140, +5, -5 inch-pounds final torque wrench reading. This procedure must be repeated each time the tie-bolts are disturbed.

(b) Wheels part number 9910393-6 (40-135A) with 5/16 inch bolts 103-22400 and nuts 094-10400: Torque nuts to 150 inch-pounds.

CAUTION: TIGHTEN NUTS EVENLY AND TORQUE CORRECTLY IN A CRISS-CROSS PATTERN TO LESSEN THE POSSIBILITY OF BOLT FAILURE. MAKE SURE AT LEAST ONE FULL THREAD IS THROUGH THE NUT.

(5) Inflate tire enough to seat the beads on the wheel, deflate completely, then reinflate to approximately one-half operating pressure.
(6) Install bearing cones (6) and (12) and seal (13).

CAUTION: INSURE THAT BEARING CONES (6) AND (12) ARE PROPERLY GREASED BEFORE INSTALLING.

(7) Check wheel balance using wheel balancer kit 9781-754.

CAUTION: IF WHEEL IS NOT TO BE INSTALLED IMMEDIATELY, COVER WHEEL BEARINGS ADEQUATELY TO PREVENT CONTAMINATION OF GREASE.

3. Tire Operation Pressure Maintenance Criteria

A. The following criteria should be applied whenever tire inflation pressures are checked:

POSITION	TIRE PRESSURE	CORRECTIVE ACTION
Nose Gear Tire	43 to 50 PSI	Reinflate Tire
	Below 43 PSI	Replace Tire
Main Gear Tire	60 to 70 PSI	Reinflate Tire
	Below 60 PSI	Replace Tire

Tire Operation Pressure Maintenance Criteria

4. Cleaning/Painting

A. Clean Wheel Assembly.

(1) All metal parts may be cleaned with a suitable solvent.
(2) Clean bearing cones by washing in suitable solvent and dry thoroughly.

B. Paint Wheel Assembly.

(1) Refer to Chapter 1, Cleaning, Painting and Sealing, for painting the wheel assembly.

5. Approved Repairs

A. Repair Wheel Castings.

(1) Small nicks, scratches or pits in the castings should be blended out with fine (400 grit) wet-or-dry sandpaper.
(2) Refer to Chapter 1, Cleaning, Painting and Sealing, for removal of corrosion.

NOTE: Replace castings which show evidence of cracks or heavy corrosion.

NOSE WHEEL AND TIRE

Description

1. The nose wheel consists of a hub and two flanges secured together by bolts and washers, bearing cups, bearing cones and bearing seals. A 6.00 x 6, 6-ply rating, low pressure tire and a 6.00 x 6 tube are installed on the nose wheel assembly. The wheel, tube and tire assembly is mounted to the fork of the nose gear strut assembly. On all models prior to 421C0465, the three-piece wheel assembly is standard. At 421C0465 and on, the two-piece wheel assembly is standard.

   CAUTION: FUEL ON TIRES FOR AN EXTENDED LENGTH OF TIME WILL CAUSE RUBBER TO SWELL AND RUIN TIRES.

Maintenance Practices

1. Removal/Installation of Nose Wheel and Tire Assembly (See Figure 1).

   A. Remove Nose Wheel and Tire Assembly.

      (1) Jack airplane. Refer to Chapter 1.
      (2) Remove cotter pin, nut and bolt securing buckets (7) in place. Remove buckets and remove wheel and tire assembly from nose gear fork.
      (3) Remove spacers (9) and axle tube (8) from wheel.

   B. Install Nose Wheel and Tire Assembly.

      CAUTION: ENSURE BEARING CONES (2) ARE PROPERLY LUBRICATED BEFORE INSTALLING WHEEL ASSEMBLY. REFER TO CHAPTER 2.

      (1) Insert axle tube (8) through wheel and place spacers (9) on each end of axle tube.
      (2) Place wheel and tire assembly in position, align with mounting holes in nose gear fork and install axle buckets (7) and secure with bolt and nut. Tighten nut until a slight bearing drag is felt as wheel is rotated. Loosen nut to nearest slot that will align cotter pin hole and install cotter pin.
      (3) Remove jacks from airplane.

2. Disassembly/Assembly of Nose Wheel and Tire Assembly (Standard 3 piece hub) (See Figure 1).

   A. Disassemble Nose Wheel and Tire Assembly.

      (1) Remove retainer rings (1), retainers (2), felt seals (3) and bearing cones (4) from wheel half (14).
      (2) Deflate tire (10) and tube (11) by removing valve core.

         WARNING: ALWAYS DEFLATE TIRE AND TUBE BEFORE SEPARATING WHEEL.

      (3) Remove bolts and washers securing wheel flanges (5) and spacers (6) to hub (12) and remove hub from tire (10).
      (4) Bearing cups are a shrink fit and should be removed only for replacement.

         NOTE: If removal of bearing cups is necessary, place wheel hub in boiling water for at least 30 minutes, then remove bearing cup by tapping cup evenly from the inner side.

   B. Assemble Nose Wheel and Tire Assembly (See Figure 1).

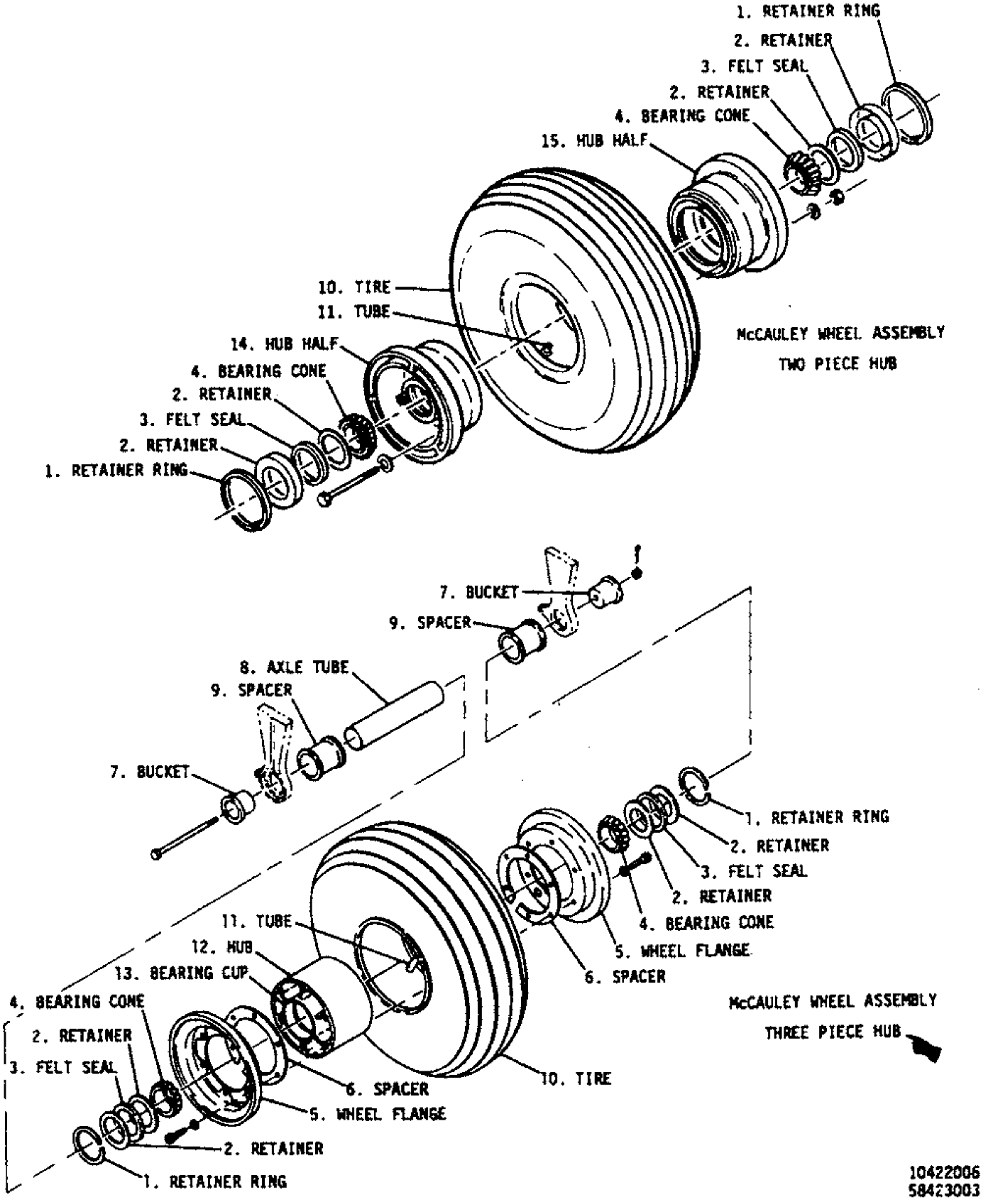
      (1) If removed, replace bearing cups.

         NOTE: Bearing cups are a shrink fit in the wheel. To install, place wheel hub in boiling water for at least 30 minutes, chill bearing cups with dry ice and tap lightly into position to ensure proper seating.

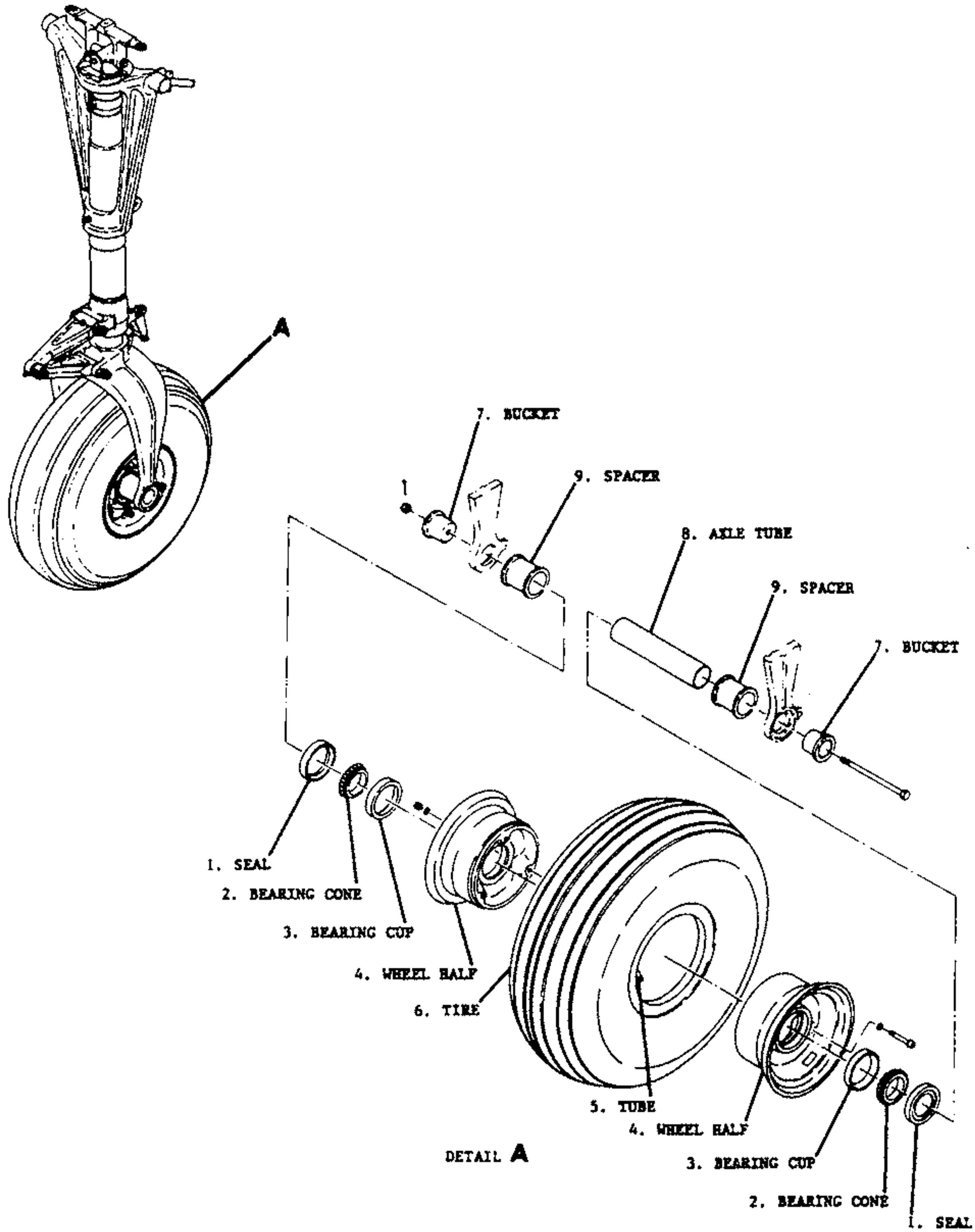
      (2) Place wheel hub (12) in position in tire (10) and tube (11).
      (3) Install spacers (6) and wheel flanges (5) to hub and secure with washers and screws. Torque screws to 190 to 200 inch-pounds. If the torque value on wheel half conflicts with the torque value given herein, use the torque value on wheel.

         CAUTION: TIGHTEN SCREWS EVENLY AND TORQUE CORRECTLY TO LESSEN THE POSSIBILITY OF SCREW FAILURE.

      (4) Inflate tire sufficiently to seat tire beads on the wheel assembly, deflate completely, then reinflate to operating pressure. Refer to Chapter 2.



Nose Wheel and Tire Assembly
Figure 1



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Nose Wheel and Tire Assembly (Alternate)
Figure 2

(5) Lubricate wheel bearing cones in accordance with Chapter 2. Place cones in hub and secure with retainers (2), felt seals (3) and retainer rings (1).
(6) Check wheel balance using wheel balancer kit SK150-20.

NOTE: If wheel is not to be installed immediately, cover wheel bearings adequately to prevent contamination of grease.

3. Disassembly/Assembly of Nose Wheel and Tire Assembly Two-Piece (Figure 1) and Hub Assemblies Alternate (Figure 2).

A. Disassemble Nose Wheel and Tire Assembly.

(1) Remove seals (1) and bearing cones (2).
(2) Deflate tire (6) and tube (5) by removing valve core.

WARNING: ALWAYS DEFLATE TIRE AND TUBE BEFORE SEPARATING WHEEL HALVES.

(3) Remove nuts, washers and bolts and separate wheel halves (4).
(4) Remove each wheel half and remove tube (5) from tire (6).
(5) Bearing cups (3) are a shrink fit and should be removed only for replacement.

NOTE: If removal of bearing cups is necessary, place wheel half in boiling water for at least 30 minutes, then remove bearing cup by tapping cup evenly from the inner side.

B. Assemble Nose Wheel and Tire Assembly.

(1) If removed, replace bearing cups.

NOTE: Bearing cups are a shrink fit in the wheel. To install, place wheel in boiling water for at least 30 minutes, chill bearing cups with dry ice, and tap lightly into position to insure proper seating.

(2) Place wheel halves (4) in position on tire (6) and tube (5) and secure with bolts, washers and nuts. Torque nuts 140-150 inch-pounds. If the torque value on wheel half conflicts with the torque value given herein, use the torque value on wheel.

CAUTION: TIGHTEN NUTS EVENLY AND TORQUE CORRECTLY TO LESSEN THE POSSIBILITY OF BOLT FAILURE.

(3) Inflate tire sufficiently to seat the tire beads on the wheel assembly, deflate completely, then reinflate to operating pressure. Refer to Chapter 2.
(4) Lubricate wheel bearing cones in accordance with Chapter 2. Place cones in wheel assembly and secure in place with seals (1).
(5) Check wheel balance using wheel balancer kit SK150-20.

NOTE: If wheel is not to be installed immediately, cover wheel bearings adequately to prevent contamination of grease.

4. Cleaning/Painting

A. Clean Wheel Assembly.

(1) All metal parts may be cleaned with a suitable solvent.
(2) Clean bearing cones by washing in suitable solvent and dry thoroughly.

B. Paint Wheel Assembly.

(1) Refer to Chapter 1 for painting the wheel assembly.

5. Approved Repairs

A. Repair Wheel Castings.

(1) Small nicks, scratches or pits in the casting should be blended out with fine (400 grit) wet-or-dry sandpaper.
(2) Refer to Chapter 1 for removal of corrosion.

NOTE: Replace castings which show evidence of cracks or heavy corrosion.

BRAKE SYSTEM

Description

1. The brake system consists of a dual-disc, non-adjustable type brake assembly, mounted on each main gear, a master cylinder mounted on each rudder pedal on the pilot's side and plumbing connecting each master cylinder to each brake.
2. The alternate brake (421C0401 and on) consists of a single disc, mounted on each main gear wheel.
3. The parking brake system consists of a parking brake valve located in each main brake line and a control handle which controls the parking brake valve.

Troubleshooting

1. Troubleshooting Brake System

   A. See Figure 1 for a guide to troubleshooting the brake system.

Servicing

1. Tools and Equipment

   NOTE: Equivalent substitutes may be used for the following listed items.

Name	Number	Manufacturer	Use
Hydro-Fill Unit	SE350	Cessna Aircraft Co. Wichita, Kansas	Bleeding brakes.
Hydro-Fill Adapter	SE774	Cessna Aircraft Co.	Adapt Hydro-Fill Unit to brake bleeder valve.
Overhaul Instructions for Master Brake Cylinders		Gerdes Products Co. Brookville Air Park Brookville, Ohio 45309	Overhaul procedures for alternate brake master cylinder.

2. Servicing Brakes

   A. In order to assure proper brake action, it is necessary to remove all air trapped in the system. The following procedure is the preferred method of bleeding brakes.

      (1) Fill reservoir of bleeder pump with clean MIL-H-5606 hydraulic fluid.
      (2) Remove filler plug from master cylinder.

      NOTE: When bleeding the brake system, it is advisable to wrap the master cylinder with rags to prevent fluid from spilling or leaking on the carpet. An alternate method is to attach a hose with a threaded fitting into the cylinder filler hole to catch overflow fluid.

      (3) Remove bleeder screw and open bleeder valve and allow hydraulic fluid to drain from the system into a suitable container.
      (4) Screw adapter into bleeder valve and connect hose from the bleeder pump to the adapter.
      (5) Pump fluid slowly until fluid in master cylinder reservoir is within 1/2-inch of the top.
      (6) Close bleeder valve and detach bleeder pump. Remove adapter and install bleeder screw.
      (7) Install filler plug in reservoir.
      (8) Check brake operation. If brakes are spongy and do not have a solid feel, repeat the bleeding procedure.
      (9) After brakes are properly bled, set parking brakes and allow to set for a minimum of 15 minutes. If brakes become spongy or do not hold; rebleed brakes or replace faulty components.

Maintenance Practices

1. Removal/Installation Brake System Plumbing 421C0001 Thru 421C0800 (See Figure 2)

A. Remove Brake System Plumbing.

(1) Drain fluid from system by removing bleeder screw and opening bleeder valve.
(2) Remove pilot and copilot's seats. Refer to Chapter 3.
(3) Remove front carpet and scuff plates from front floorboards.
(4) Remove access covers and access panels as required to gain access to brake system components.
(5) Remove hoses (9) and (10) from brake cylinders and parking brake valve.

NOTE: Removal of brake lines is not recommended except for replacement. When replacement is necessary, work lines carefully through access holes to prevent damage to lines. Slight bending of lines is permissible for removal, however, excessive bending should be avoided.

(6) Disconnect lines (11 and 7) from parking brake valve and at union; remove lines.
(7) Disconnect lines (12 and 5) from unions and remove lines.
(8) Remove clamps from crossover line (6); disconnect line from elbows and remove line.
(9) Remove wing access covers and wing gap fairing as required to gain access to brake lines.
(10) Disconnect lines (8 and 4) from bulkhead unions.
(11) Remove clamps from lines (13 and 3); disconnect lines from bulkhead fittings and remove lines.
(12) In the wheel well, remove clamps from lines (14 and 2) disconnect lines from bulkhead fittings and remove.
(13) Remove hose (15 and 1) as follows:
(a) Remove nuts, spacers and screws securing hose to main gear strut.
CAUTION: AIRPLANE MUST BE JACKED TO REMOVE WEIGHT FROM TORQUE LINKS WHEN REMOVING CLAMP AT TORQUE LINKS.
(b) Disconnect hose (15) at torque links by removing cotter pin and nut, then remove clamp and bushing from hose.
(c) Disconnect hose at union and main gear brake assembly; remove hose. Install temporary caps over brake assembly fittings to prevent entry of foreign material.

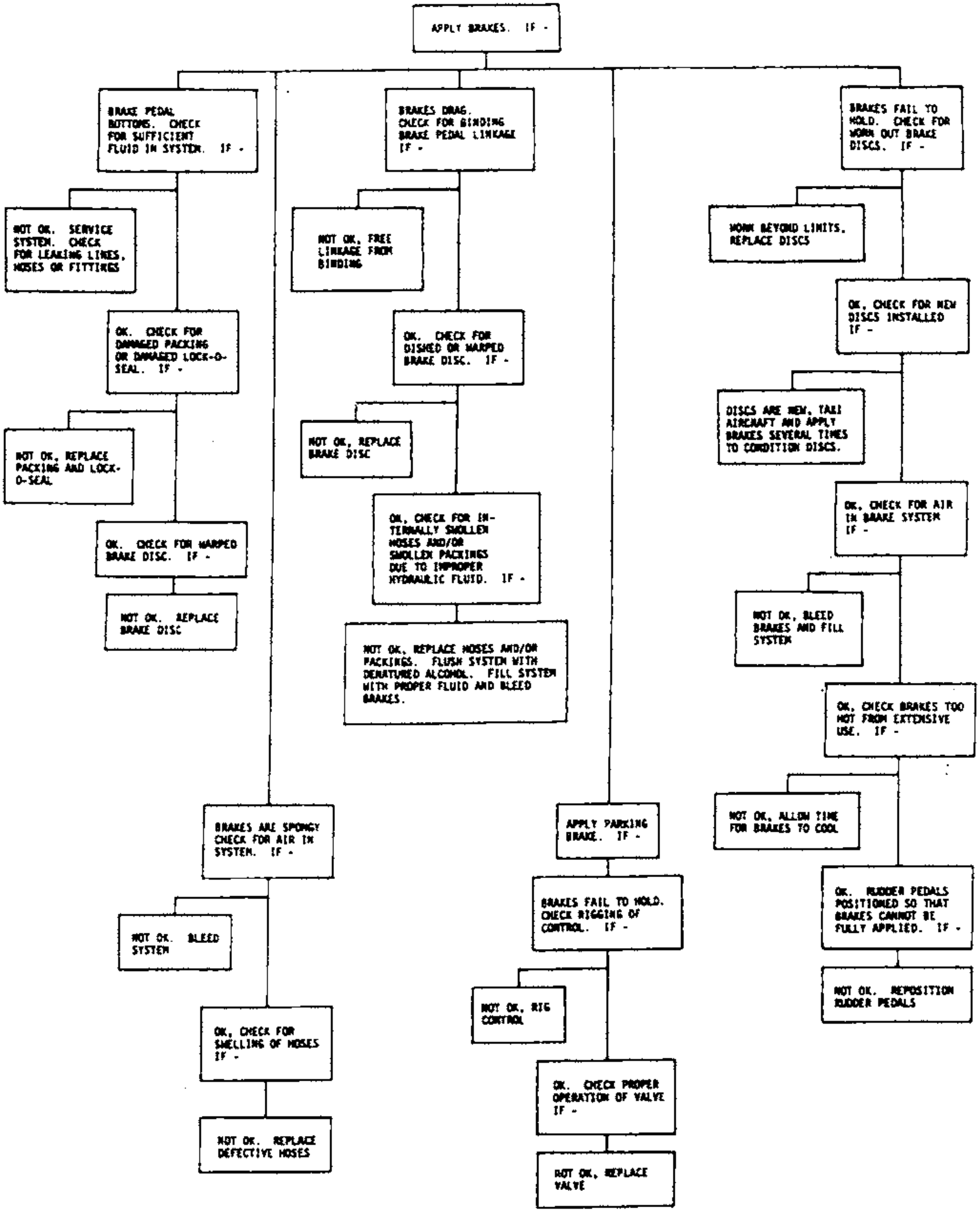
B. Install Brake System Plumbing.

NOTE: Use only clean hydraulic fluid as a lubricant for all hydraulic fittings. During installation of certain lines slight bending of lines is permissible, however, excessive bending should be avoided.

(1) Install hoses (15 and 1) as follows:
(a) Remove temporary caps from fittings in brake assemblies and connect hoses (15 and 1) to fittings. Route hoses around landing gear and attach upper end of hoses to unions at brackets.
(b) Secure hoses (15 and 1) to main gear strut with screws, spacers and nut (three places).
(c) Connect hoses (15 and 1) to torque links with bushings and clamps secured by nut and cotter pin. Torque nut to standard torque value and install cotter pin.
(d) Extend and compress strut; retract and extend gear to ensure that there is no stress, twisting or abrasion of hoses.
(2) In the wheel well, connect lines (14 and 2) to bulkhead fittings and secure with clamps.
(3) Route lines (13 and 3) into the wing leading edge, connect lines to bulkhead fittings and secure with clamps to prevent chafing.
(4) Route lines (8 and 4) into the stub wing and connect to bulkhead fittings.

NOTE: Hold bulkhead unions when tightening lines (8 and 4) to prevent breaking seal at fuselage skin.

(5) Install lines (12 and 5). Secure in place with clamps.
(6) Install crossover line (6). Secure in place with clamps.
(7) Connect lines (11 and 7) to unions and to parking brake valve.



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Troubleshooting Chart - Brake System
Figure 1

(8) Route hoses (9 and 10) from parking brake valve to brake cylinders and connect to fittings. Operate rudder pedals to full travel each direction and check brake hose for proper clearance.
(9) Bleed and service brakes. Refer to Servicing Brakes.
(10) Install access covers, carpet, scuff plates and pilot's seat.

2. Removal/Installation Brake System Plumbing 421C0801 and On. (Refer to Figure 2.)

A. Removal.

(1) Drain fluid from brake system at brake bleeder screw.
(2) Remove pilot's seat, scuff plates, carpet and floorboard access panels as required to gain access to lines and hoses.
(3) Disconnect and cap lines and/or hoses at terminating points.
(4) Remove lines and/or hoses by removing screws and nut securing clamps.

B. Installation.

(1) Uncap and install lines and/or hoses. Connect lines and/or hoses at terminating points.
(2) Reinstall clamps as required securing with screws and nuts.
(3) Bleed brakes.
(4) Check parking brake for proper operation. Insure that lines and/or hoses are secure. Check lines and/or hoses for damage and leaks.
(5) Reinstall floorboard access panels, carpet, scuff plate and pilot's seat.

3. Removal/Installation Brake Master Cylinder (Refer to Figure 3)

A. Remove Brake Master Cylinder.

NOTE: The removal procedures are the same for either right or left master cylinder.

(1) Remove pilot's seat, carpet, scuff plate and access covers as required to gain access to master cylinder.
(2) Drain hydraulic fluid from master cylinder by removing bleeder screw and opening bleeder valve.
(3) Disconnect clevis (1) from brake pedal by removing cotter pin, and pin (19).
(4) Disconnect lower end of master cylinder from structure by removing cotter pin, pin (17) and spacers (18).
(5) Refer to Figure 2. Disconnect hose (9) from elbow; remove master cylinder.
(6) Cap and plug hose and elbow to prevent entry of foreign material.

B. Install Brake Master Cylinder.

NOTE: The installation procedures are the same for either right or left master cylinder.

(1) Refer to Figure 2. Remove caps and plugs from hose and elbow; connect hose (9) to elbow.

NOTE: Use only hydraulic fluid for lubricant when installing hoses and fittings.

(2) Secure lower end of master cylinder to structure with pin (17), spacers (18) and cotter pin.
(3) Connect clevis (1) to brake pedal with pin (19). Adjust clevis (1) to align tips of brake pedals with rudder pedals in a neutral position. Secure pin (19) with cotter pin and secure clevis (1) with jam nut (2).
(4) Bleed and service brakes. Refer to Servicing Brakes.
(5) Install access covers, carpet, scuff plates and pilot's seat.

4. Disassembly/Assembly Brake Master Cylinder (Refer to Figure 3)

A. Disassemble Brake Master Cylinder.

(1) Remove setscrew (10) and unscrew cover (5) to remove cover and piston rod assembly.
(2) Remove spring (11) and washer (12) from piston rod (6).
(3) Remove nut (13) to remove spring (14), piston (16), lock-o-seal (8) and compensating sleeve (7).
(4) Loosen jam nut (2); remove clevis (1) and jam nut.
(5) Remove packing (15) from piston (16).

B. Assemble Brake Master Cylinder.

CAUTION: INSTALL PACKING CAREFULLY TO PREVENT CHIPPING ON SHARP CORNER OF PISTON.

(1) Install packing (15) into groove of piston (16) using clean hydraulic fluid as a lubricant.

CAUTION: BE CAREFUL WHEN INSERTING FEELER GAGE NOT TO DAMAGE LOCK-O-SEAL.

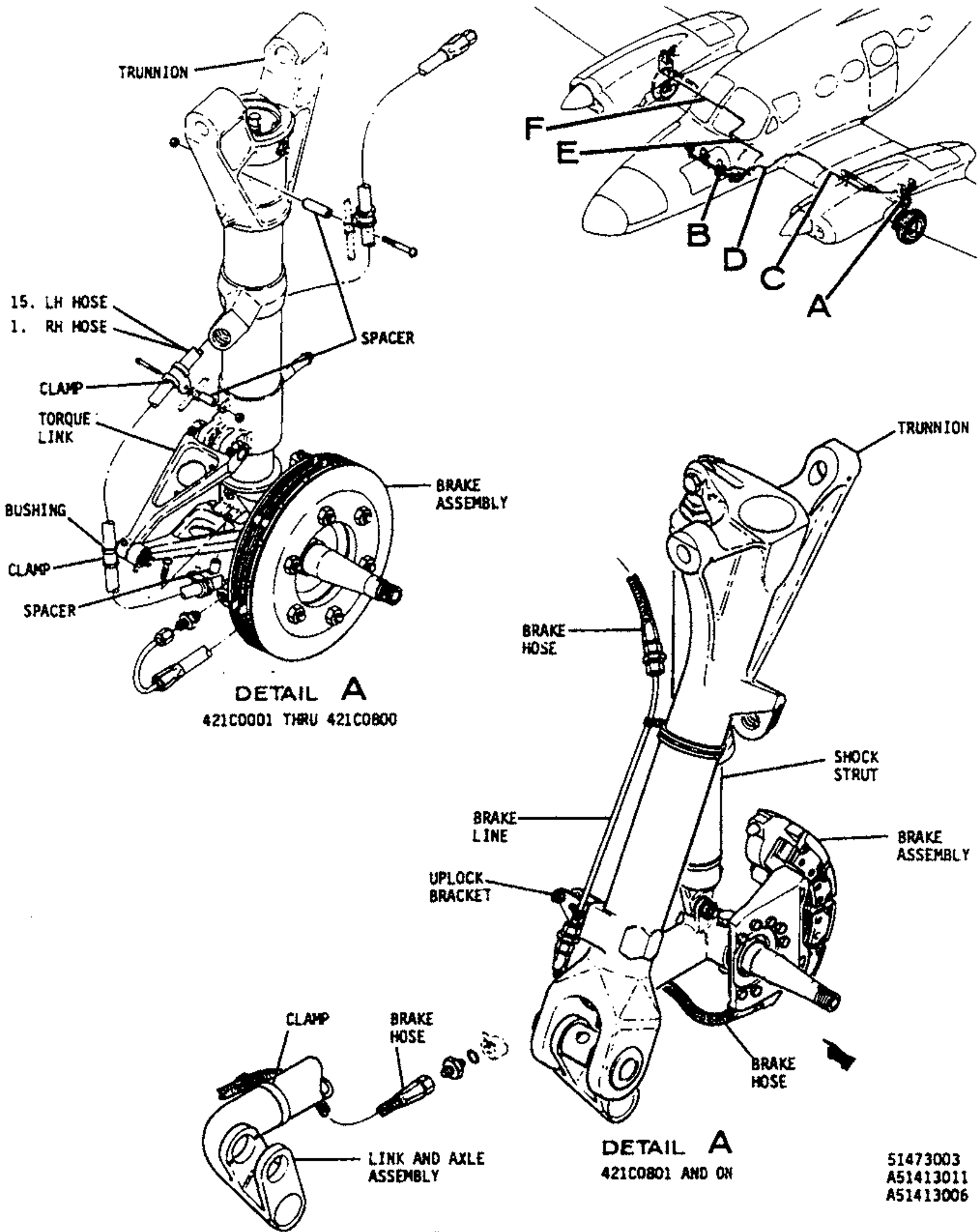
(2) Assemble lock-o-seal (18), piston (16) and spring (14) on piston rod (6) in sequence as illustrated in figure. Secure in place with nut (12). Tighten nut (12) so that when piston spring (14) is compressed to seat piston (16) against nut, the clearance between piston and lock-o-seal (8) is 0.030 to 0.040 inch as illustrated in figure.

C. Disassemble Brake Master Cylinder (Alternate).

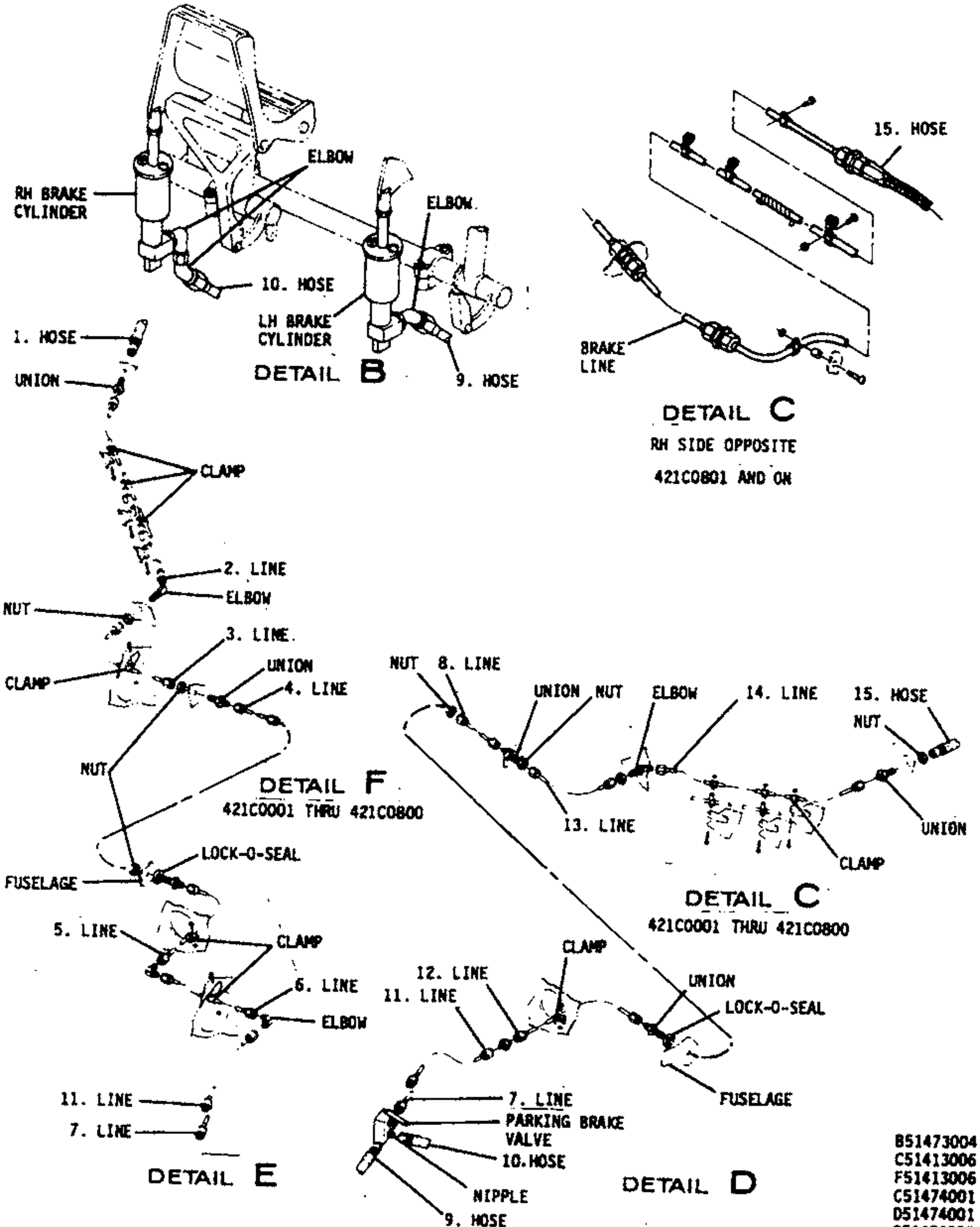
(1) Remove cleves and nut from shaft.
(2) Remove snaping securing cover in place and remove cover.
(3) Remove hold down screw and washer securing shaft, washer, stat-o-seal, piston, spring and spring guide. Remove all parts from cylinder.
(4) Remove spring guide, spring, piston, stat-o-seal and washer from shaft.

D. Assemble Brake Master Cylinder (Alternate).

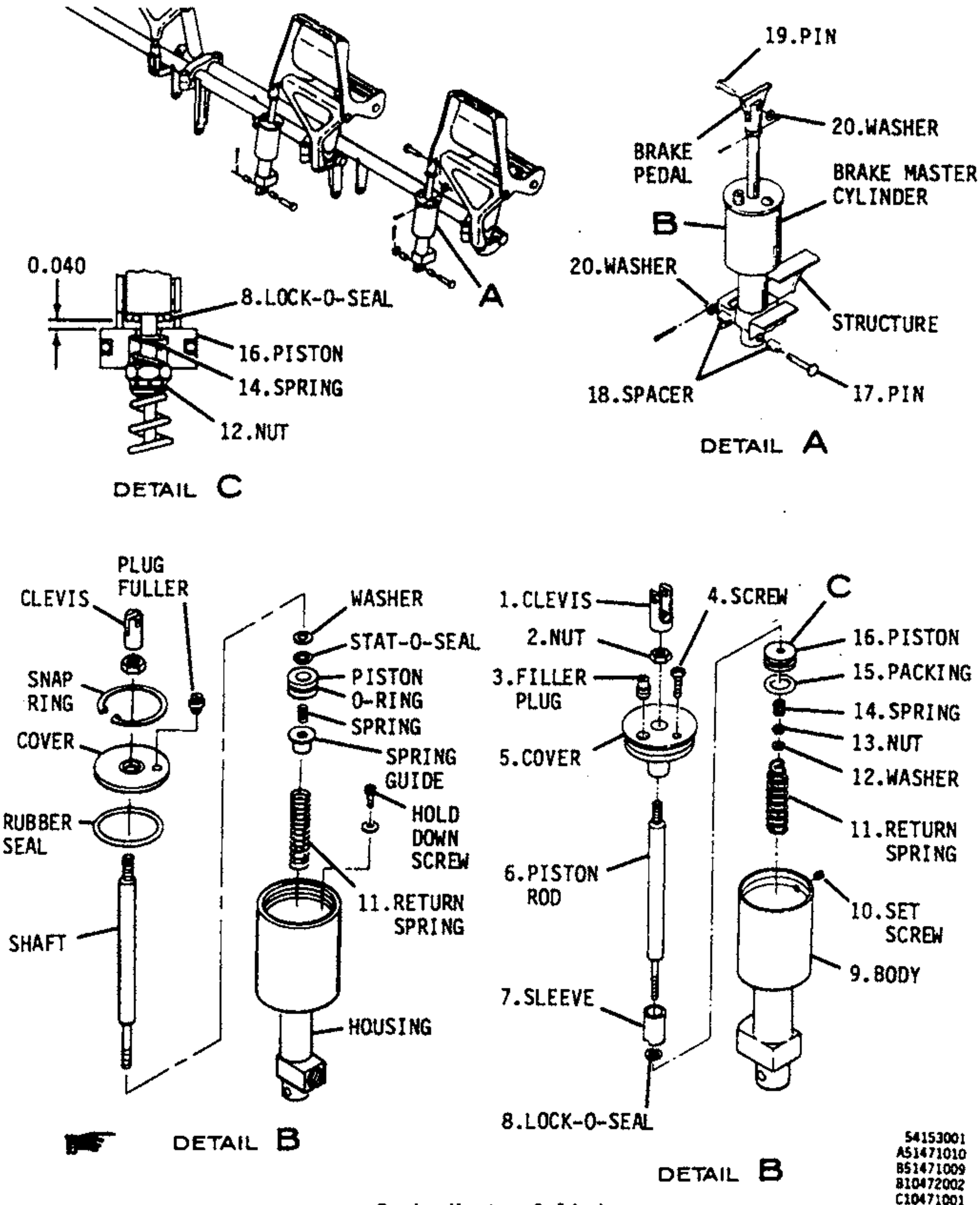
(1) Install washer, stat-o-seal, piston, spring and spring guide on shaft.
(2) Install return spring on spring guide and position shaft in housing. Secure in place with hold down screw and washer.
(3) Install cover, snap ring, nut and clevis.



Brake System Plumbing
Figure 2 (Sheet 1 of 2)



Brake System Plumbing
Figure 2 (Sheet 2)



Brake Master Cylinder
Figure 3

(3) Install washer (12) and spring (11) onto assembled piston rod and with cylinder walls and piston assembly lubricated with hydraulic fluid, insert piston rod assembly into body (9).
(4) Place compensating sleeve (7) notched end toward piston, over piston rod (6). Slide cover (5) over piston rod and tighten into body. Install setscrew (10) and tighten to lock cover in place.
(5) Screw jam nut (2) and clevis (1) onto piston rod end.
(6) Install filler plug (3) and screw (4) if removed during disassembly.

C. Disassembly/Assembly Brake Master Cylinder (Alternate Gerdes Model Number A-049-6).

(1) Refer to Gerdes Products Company overhaul instructions for master brake cylinders.

5. Removal/Installation Brake Assembly (See Figure 4)

A. Remove Brake Assembly.

NOTE: Removal procedures are the same for either right or left brake assembly.

(1) Jack aircraft. Refer to Chapter 1.
(2) Remove wheel and tire assembly. Refer to Main Wheels and Tires for removal procedures.
(3) Disconnect brake line (11) from reducer (12).
(4) Remove brake assembly from axle flange (14) by removing eight nuts, washers and bolts.

B. Install Brake Assembly.

(1) Position brake assembly to axle flange (14) so that brake line fitting is directed straight forward and secure with eight bolts, washers and nuts. Torque nuts to 100-120 inch-pounds.
(2) Install wheel and tire assembly. Refer to Main Wheels and Tires for installation procedures.
(3) Attach brake hose (11) to reducer (12). Bleed and service brake system.
(4) Remove aircraft from jacks.

6. Disassembly/Assembly of Brake Assembly (See Figure 4)

A. Disassemble Brake Assembly.

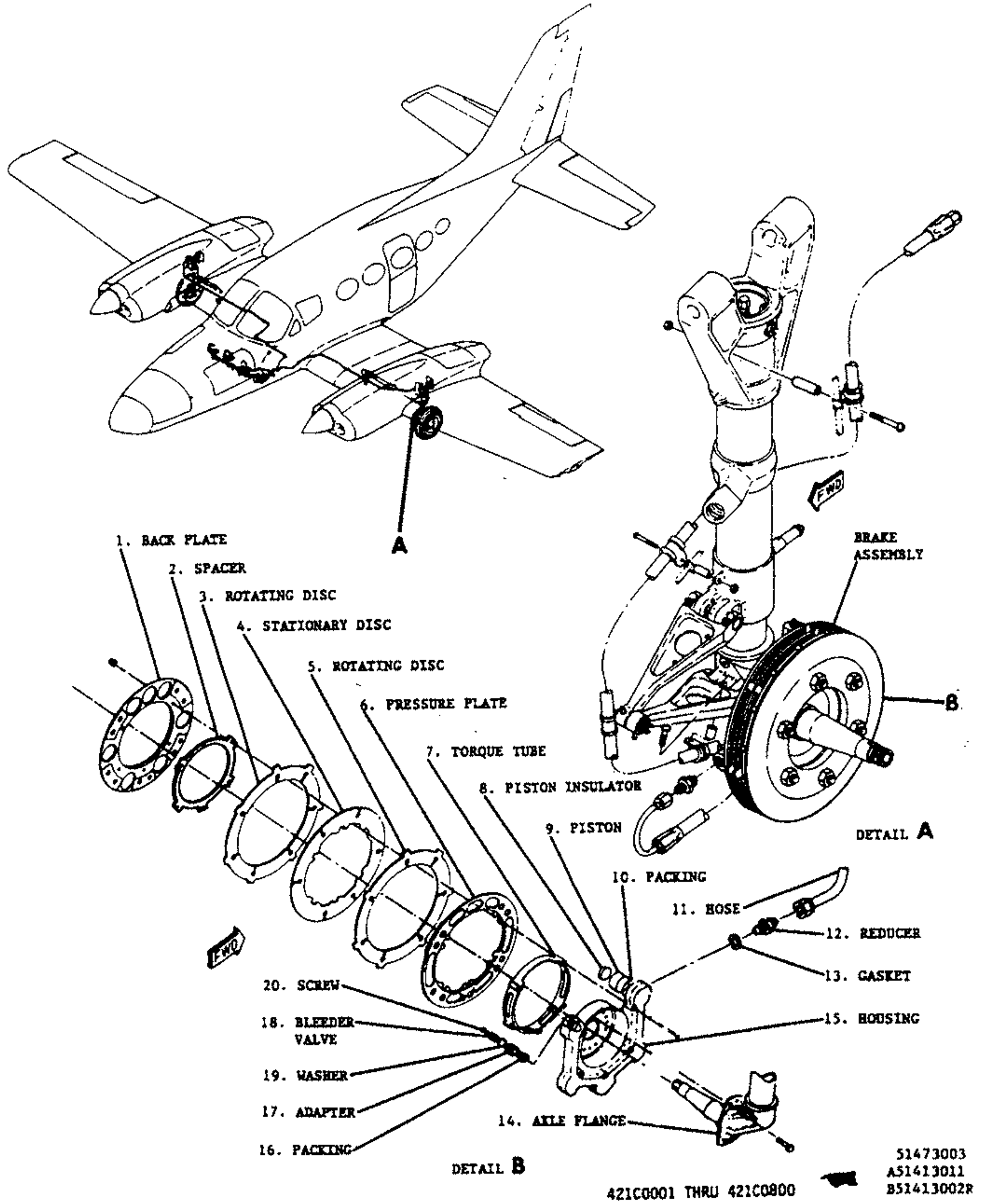
(1) Remove five nuts, washers and bolts to release back plate (1) and spacer (2).
(2) Remove rotating disc (3), stationary disc (4), second rotating disc (5) and pressure plate (6) from torque tube (7).
(3) Remove piston insulators (8) and pistons (9) from housing (15). Remove packings (10) from recesses of brake housing.
(4) Remove reducer (12) and gasket (13).
(5) Remove adapter (17) and packing (16).

B. Assemble Brake Assembly.

(1) Lubricate packings (10) with hydraulic fluid and install one in the groove of each cylinder of housing (15).
(2) Install pistons (9) in brake housing (15). Lubricate pistons with MIL-G-81322 grease.
(3) Install one piston insulator (8) in recess of each piston (9).
(4) Position torque tube scalloped side toward brake housing and align the bolt holes.
(5) Install pressure plate (6), wear pads facing away from and directly over the pistons.

CAUTION: MAKE SURE THE FIVE KEYWAYS OF THE PRESSURE PLATE AND STATIONARY DISC ENGAGE THE FIVE KEYS OF THE TORQUE TUBE.

(6) Install one rotating disc (5), one stationary disc (4) and a second rotating disc (3) in sequence.
(7) Position spacer (2) and back plate (1) on torque tube (7) aligning bolt holes.



Brake Assembly
Figure 4

(8) Install five bolts, washers and nuts securing the assembly as a unit. Draw up bolts evenly and torque to 120 inch-pounds.

CAUTION: THE COUNTERSINK OF WASHERS MUST BE INSTALLED FACING THE BOLT HEAD.

(9) Install gasket (13) and reducer (12).
(10) Install bleeder valve assembly, adapter (17) and packing (16).

Inspection/Check

1. Brake disc wear can be checked while brake is on the aircraft.

A. Check Brake Wear.

(1) Apply brakes to force the brake discs against the back plate.
(2) Check clearance between the inside face of pressure plate (6) and brake housing.
(3) Remove brake for inspection if this clearance measures 0.234 inch or greater.

2. Brake sub-assemblies and components must be inspected while brake is disassembled.

A. Inspect Rotating Discs.

(1) Inspect relief slot terminal holes and drive tang radii for cracks. Discard cracked discs.
(2) Inspect disc for wear. Discard disc when minimum thickness across unchipped mix becomes 0.143 inch or less or if mix is worn to 0.015 inch thick at any location on either face of disc.

NOTE: As much as 25 percent of mix may be lost through chipping, provided mix loss is scattered.

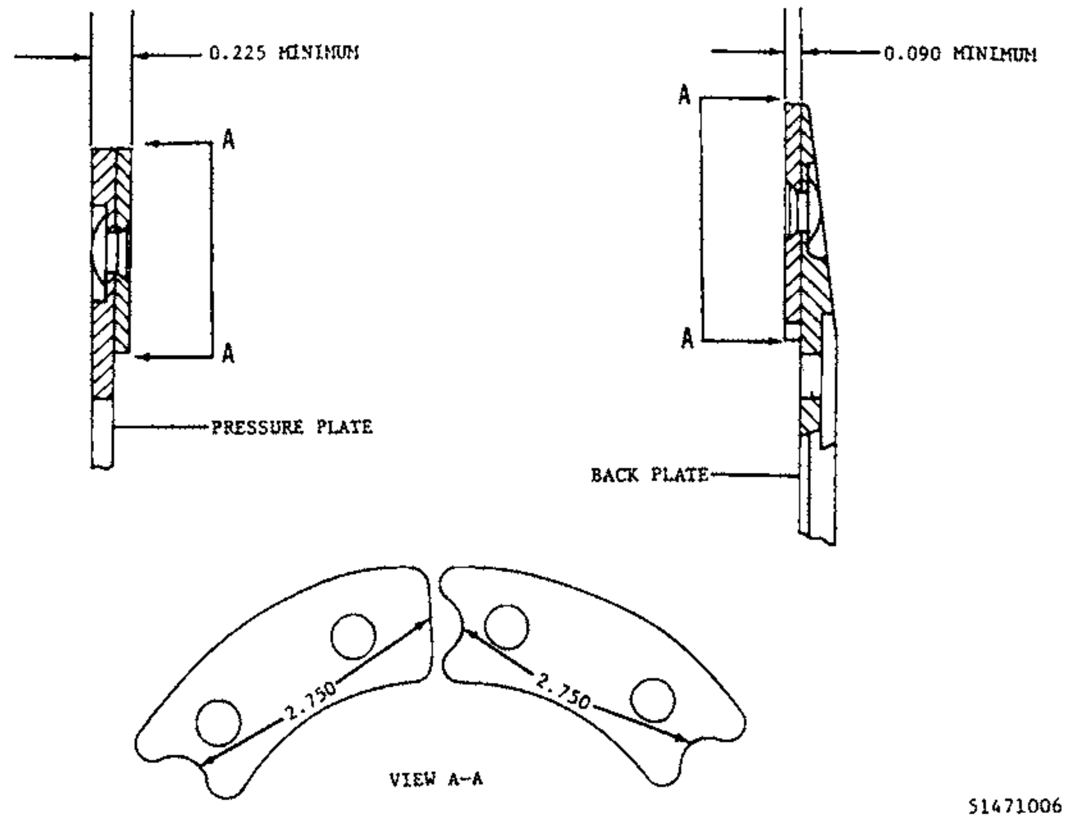
(3) Inspect disc for dishing. Discs can be dished a maximum of 0.015 inch if they are to be used with other dished discs. Discard discs that are dished over 0.015 inch.
(4) Discard discs that are 0.125 inch or more out of round.
(5) Inspect disc tangs for battering. Discard disc when one or more tangs becomes less than 0.615 inch in width.
(6) Inspect discs for shrinkage. Discard discs that have shrunk to an inside diameter of 7.750 inches or less.

B. Inspect Stationary Disc.

(1) Inspect relief slot terminal holes and key slot corners for cracks. Discard cracked discs.
(2) Inspect disc for wear. Discard disc when worn to a thickness of 0.170 inch or less.
(3) Inspect disc for dishing. Disc can be dished a maximum of 0.015 inch if it will be used with other dished discs.
(4) Check inside diameter of disc for size by ascertaining that it can be installed on the torque tube without interference.
(5) Check key slots for wear or battering. Discard discs with key slots less than 0.590 inch or greater than 0.640 inch in width.
(6) Inspect disc for shrinkage. Discard disc if shrunk to an inside diameter of 7.10 inches or less measured between ends of key slot tangs.

C. Inspect Pressure Plate (See Figure 5).

(1) Inspect pressure plate for cracks in corners of key slots. Discard if cracked.
(2) Inspect pressure plate for thickness. Replace if worn to 0.225 inch or less in thickness measured between wear pad rivets.
(3) Inspect wear pads for thickness. Replace all pads if any rivet is sheared, and pad is cracked, or if one or more pads are worn to a width of 2.75 inches or less.
(4) Discard pressure plate key slot width if less than 0.615 or greater than 0.640 inch.
(5) Inspect for dishing. Replace pressure plate if dished in excess of 0.015 inch.
(6) Discard pressure plate which is 0.120 inch or more out of round.



Brake Wear Pad Wear Limits
Figure 5

D. Inspect Back Plate (See Figure 5).

(1) Inspect for cracks. Pay particular attention to relief slot terminal holes. Discard cracked back plate.
(2) Inspect wear pads for thickness. Replace all pads if one or more pads are worn to 0.090 inch or less in thickness when measured from face of pad to surface of plate or if pad width is less than 2.75 inches.
(3) Inspect back plate for dishing. Replace back plate if dished 0.015 inch or more.

E. Inspect Torque Tube.

(1) Inspect for cracks. Discard cracked torque tube.
(2) Inspect key width. Discard torque tube if key is worn to a width of 0.550 inch or less at any point on the key.

F. Inspect Brake Housing.

(1) Inspect housing for cracks. Discard cracked housing.
(2) Discard housing having stripped or badly damaged threads in inlet and bleeder bosses.
(3) Inspect piston cavities for wear. Discard housing if any cavity exceeds 1.386 inches in diameter.
(4) Inspect for nicks, scratches and corrosion. Refer to Approved Repairs.

G. Inspect Pistons.

(1) Inspect pistons for wear. Measure diameter of pistons at three places around the circumference. Discard any piston if diameter at any location measures 1.362 or less.
(2) Inspect pistons for burrs, scratches, or nicks. Discard any piston having damage greater than 0.003 inch deep on seal contacting surfaces. Repair pistons with damage less than 0.003 inch deep.

H. Inspect Piston Insulators.
   (1) Inspect piston insulators for deterioration or wear. Discard insulators worn to 0.215 inch or less in thickness.
   (2) Remove blisters and raised areas not exceeding 0.010 inch from insulators with a file or by grinding, making certain a minimum thickness of 0.215 inch is maintained, and that both surfaces are parallel.

I. Inspect Attaching Hardware.
   (1) Inspect bolts for thread damage and cracks under head and in threads adjacent to bolt shank. Discard bent or cracked bolts or ones with thread damage. No refinishing of these parts is permissible.
   (2) Inspect self locking nuts for retention feature. Replace any nut that can be spun onto brake bolt with the fingers past the locking section of the nut.

Cleaning / Painting

A. Cleaning Brake System.
   (1) Clean metal parts with a suitable solvent.
   (2) Wash O-ring packings with clean hydraulic fluid or denatured alcohol.
   (3) If required, clean brake linings with Methyl n-Propyl Ketone.

Approved Repairs

1. Replace all parts of break assembly which are cracked, unrepairable or otherwise unserviceable, however, minor repairs may be made and wear pads may be replaced.

   A. Repair Torque Tube.
      (1) Repair worn disc drive keys which have not worn to 0.550 or less by blending out indentations in keys.

   B. Repair Break Piston.
      (1) Blend out and polish scratches, nicks, and burrs on edges and seal contacting surfaces of piston to 0.003 inch deep.
      (2) Blend repairs to avoid local indentation of piston seal surfaces. Discard pistons damaged deeper than 0.003 inch.
      (3) Retreat reworked areas with Dow No. 1 Solution, MIL-M-3171, Type I.

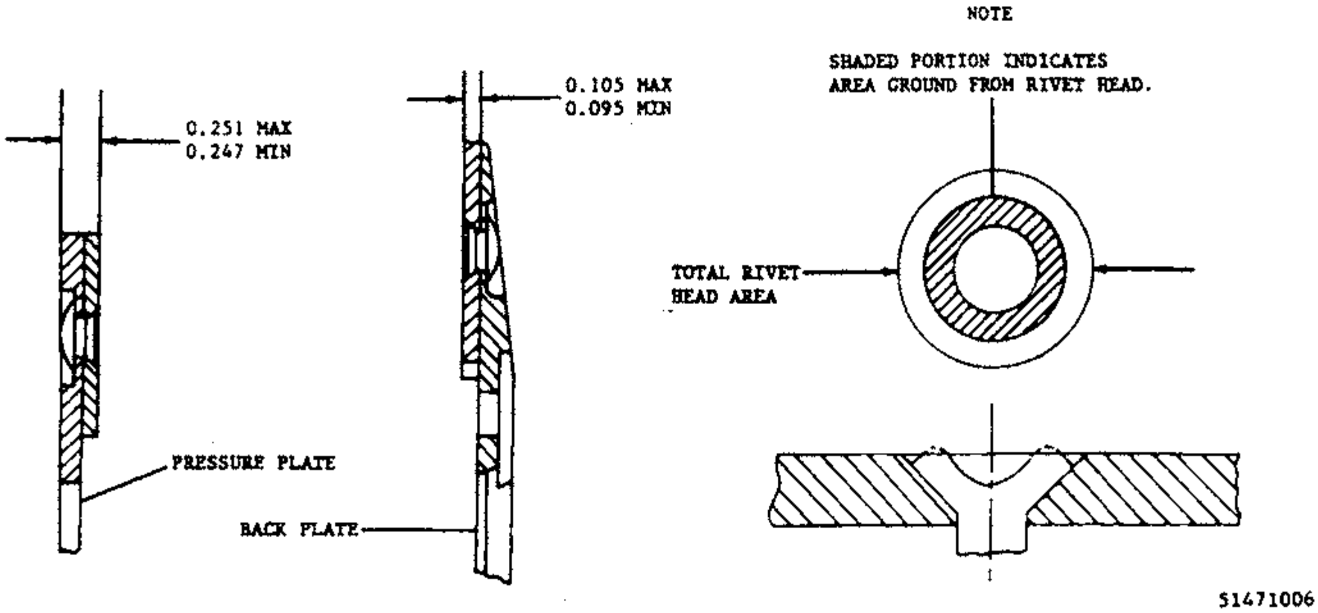
   C. Repair Brake Housing.
      (1) Blend out and polish burrs, nicks, and scratches to 0.030 inch deep on outside of housing with 280 grit (wet-or-dry) sandpaper.
      (2) Blend and polish out scratches in piston cavities not exceeding 0.003 inch deep with fine 400 grit (wet-or-dry) sandpaper. Remove burrs and rough edges from seal grooves to a 0.010 to 0.015 inch radius with 400 grit (wet-or-dry) sandpaper. Avoid heavy localized polishing as this can promote leakage.
      (3) Rinse reworked areas with hot water and dry thoroughly with filtered, dried compressed air.
      (4) Retreat reworked areas with Dow No. 1 Solution, MIL-M-3171, Type I.
      (5) Repaint reworked areas with two coats of zinc chromate primer, Specification MIL-P-8585, and two coats of aluminum lacquer, Specification TT-L-32.

   D. Replace Wear Pads (See Figure 6).
      (1) Using a 7/32 (0.0218) inch drill, remove wear pads from back plate or pressure plate by drilling out shop heads of old rivets and punching out rivets.

CAUTION

EXERCISE CARE TO AVOID DAMAGING OR ENLARGING RIVET HOLES.

      (2) Inspect base plate of pressure plate or back plate for cracks, using Magnaflux or equivalent method. Discard cracked base plates or base plates dished 0.015 inch or more.



Brake Wear Pad Grinding Limits
Figure 6

(3) Using the proper rivets, install new wear pads and rivets. Rivets shall be installed by the compression method so that formed head or rivet is flush with or below the surface of the wear pad.

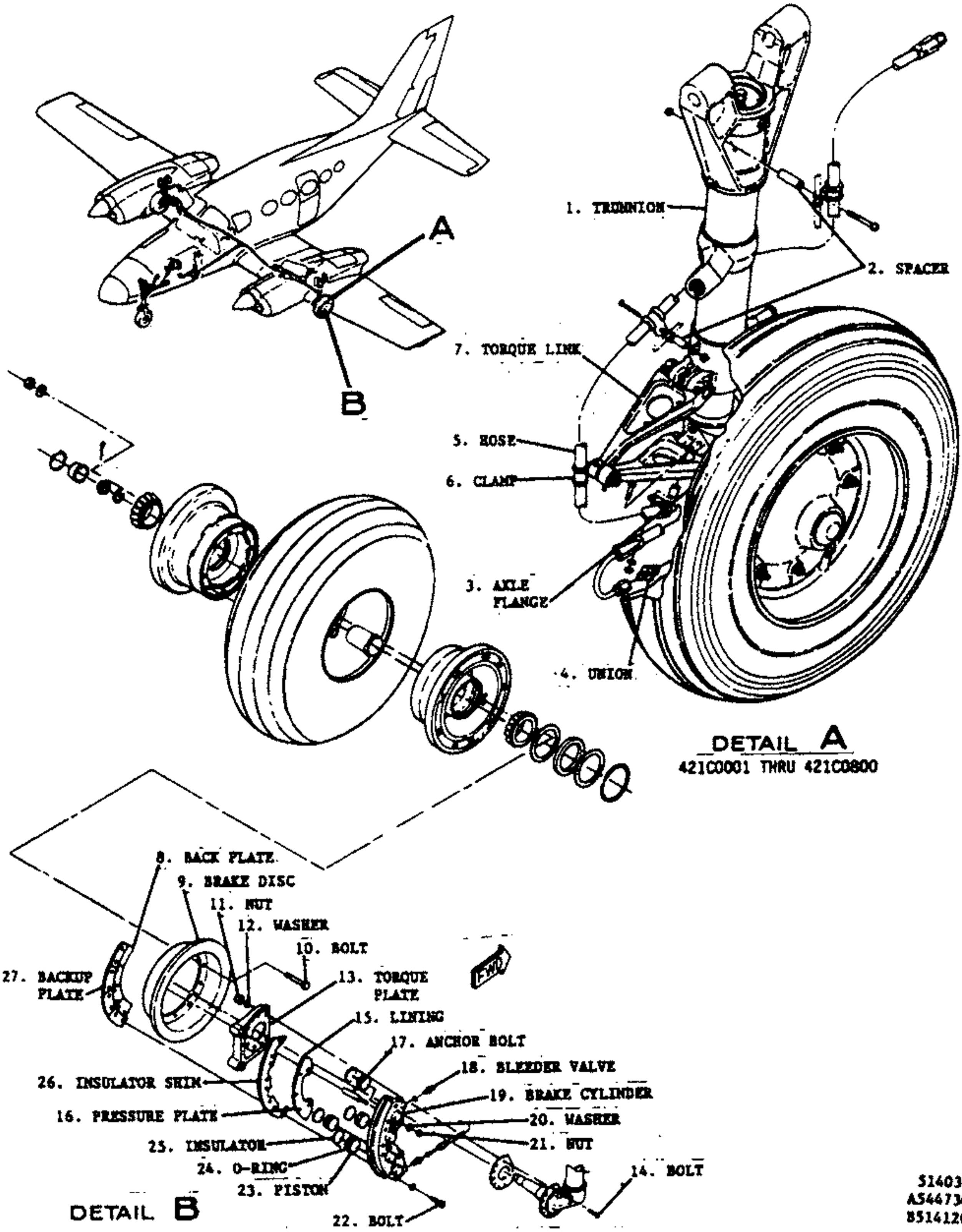
NOTE: When installation is complete, rivets must be snug. A slight movement of wear pads is desirable. It should be determined that a force of not less than 2 pounds or more than 100 pounds is required to cause movement of the wear pads. A maximum of one crack is permitted in the shop head of a tubular rivet, but it must not extend into the rivet shank. To check rivets that appear unseated, insert a 0.0015 inch feeler gage between the disc and the pad. It should not slide past the rivet.

(4) After repadding, grind the wear-padded subassembly to the thickness as shown in figure.

NOTE: Wear pads must be ground flat to each other with assurance that the minimum dimensions shown in figure are held. No more than 25 percent of the rivet head shall be removed by grinding as shown in figure.

(5) Treat newly ground back and pressure plates which are not to be put immediately into service as follows:
(a) Degrease discs in a vapor degreaser to remove all oil and grinding residue.
(b) Immerse disc in Houghton's Rust Veto 377 or equivalent. Use in the "as-received" condition without dilution. Let discs drip and air dry for five minutes or more. Clean, compressed air may be used to speed drying.

WARNING: RUST VETO IS HIGHLY FLAMMABLE. OBSERVE ALL FIRE PRECAUTIONS DURING ITS USE.



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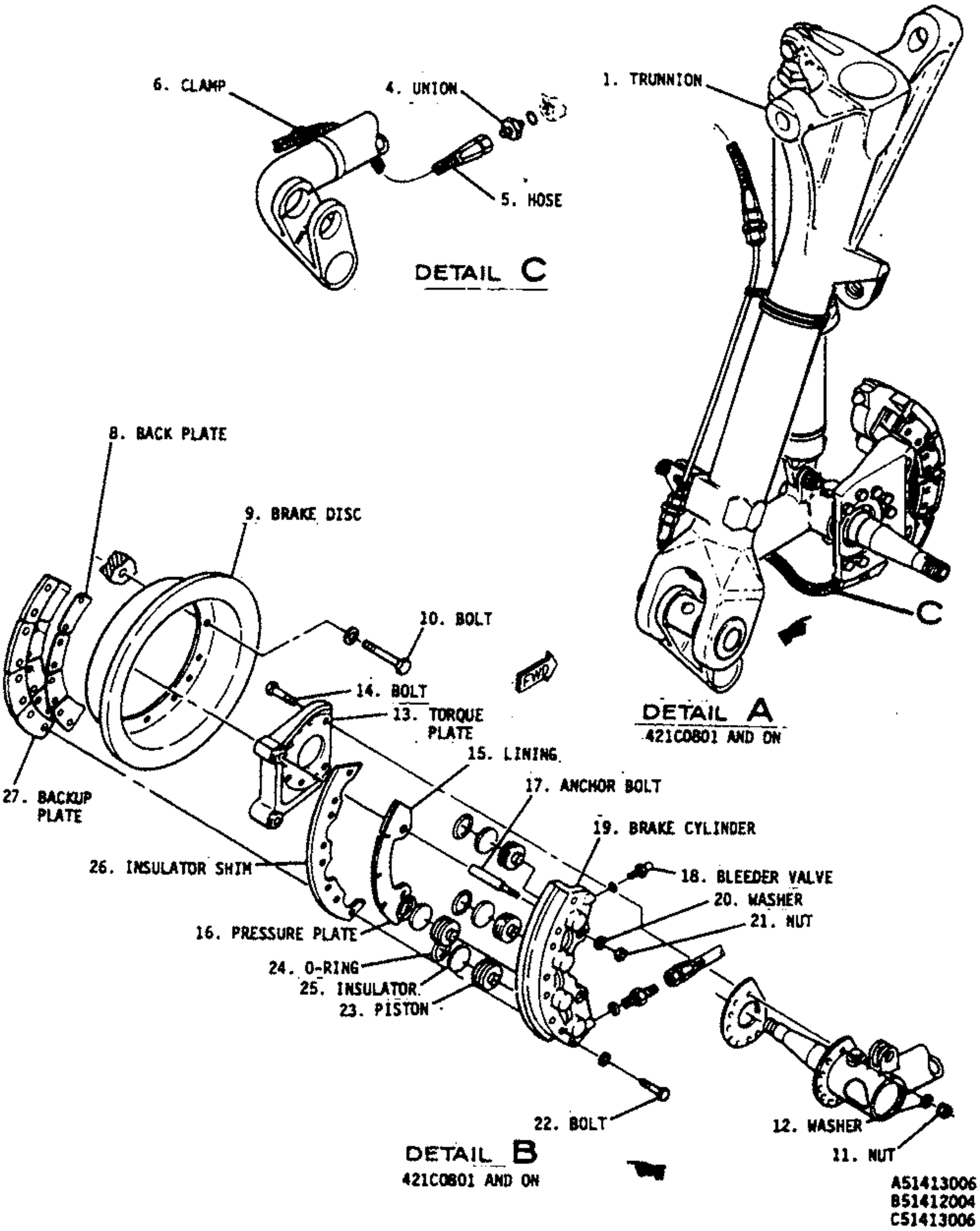
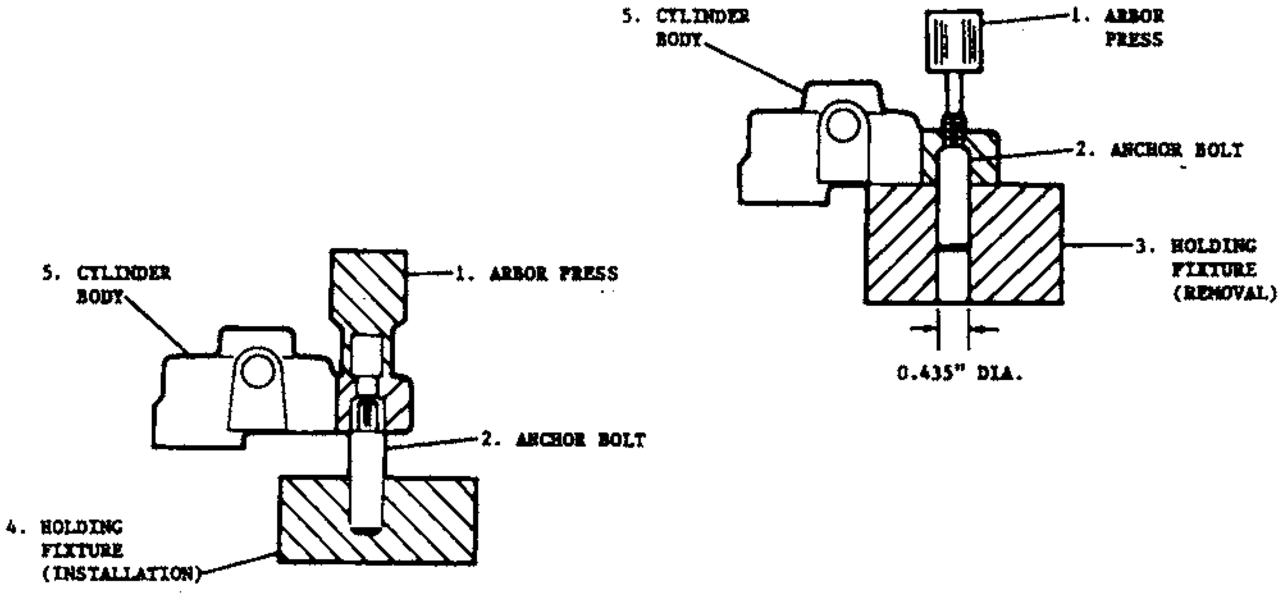
Brake Assembly
Figure 7 (Sheet 1 of 2)



Brake Assembly
Figure 7 (Sheet 2)



NOTE

HOLDING FIXTURE MAY BE FABRICATED FROM BLOCK AND DRILLING HOLES AS SHOWN.

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Anchor Bolt Removal and Installation
Figure 8

2. Removal/Installation Brake Assembly (See Figure 7).

   A. Remove Brake Assembly.

      NOTE: Removal procedures are the same for either right or left brake assembly.

      (1) Jack aircraft. Refer to Chapter 1.

         NOTE: It is not necessary to remove the wheel from the aircraft to remove brake assembly.

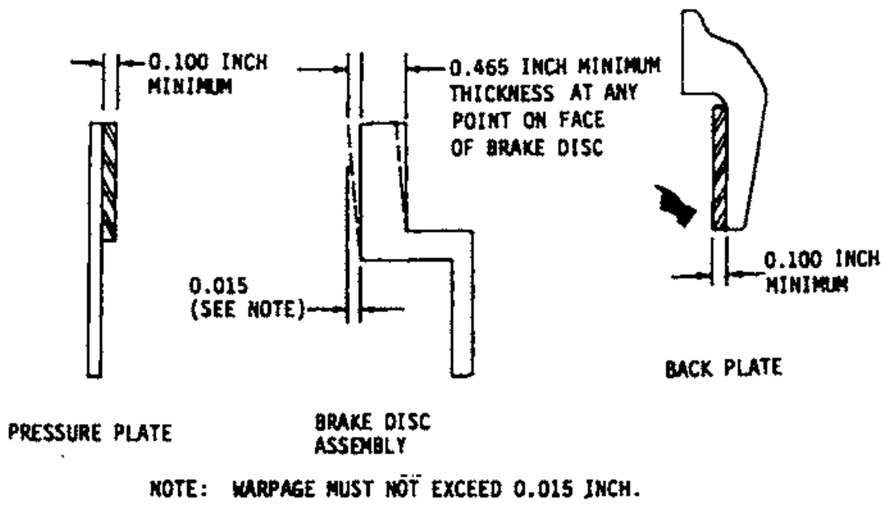
      (2) Remove and cap hose (5) from union (4).
      (3) Remove bolts (22), washers (20) and separate cylinder (19) from torque plate (13), back plate (27) and brake disc (9). The torque plate will remain mounted to the axle.
      (4) Remove pressure plate (16), inlet union (4) and bleeder valve (18).
      (5) Pistons (23) may be removed by applying a slight amount of air pressure to the inlet or outlet ports of the cylinder.
      (6) Remove O-rings (24) from cylinder.
      (7) If necessary, the anchor bolts (17) may be removed by using a holding fixture and arbor press. If possible, place the anchor bolts into the holding fixture so that the anchor bolt is piloted while being removed.

         CAUTION: CYLINDER MUST BE SQUARE WITH ARBOR WHEN APPLYING PRESSURE WITH ARBOR PRESS TO PREVENT ANCHOR BOLTS FROM BINDING DURING REMOVAL AND INSTALLATION.

      (8) Fabricate holding fixtures in accordance with Figure 8.

B. Install Brake Assembly.

(1) If removed, press anchor bolts into cylinder body (refer to Figure 8).
(2) Install inlet and bleeder fittings.
(3) Lubricate piston O-ring and piston bore with a small amount of hydraulic fluid.
(4) Place piston in bore and rotate to seat drag ring and insure that piston and seal are in proper alignment. Tap the piston with a wooden or plastic mallet while alternately rotating. If considerable effort is required, remove piston and inspect bore and pilot bore area for damage. If the bore is damaged, check the corresponding area of the piston for damage. Repair as necessary and repeat the above procedures.
(5) Install pressure plate assembly by aligning anchor bolt holes with anchor bolts and slide onto cylinder. The pressure plate must float freely on the anchor bolts.
(6) Install brake assembly to torque plate (13) by aligning anchor bolts with torque plate holes and sliding brake assembly onto torque plate. Ensure brake assembly will slide freely.
(7) Install washers (20), bolts (22) and insulator shim (26).
(8) Install backup plate (27) between brake disc (9) and wheel flange. Install bolts (10). Torque bolts to 75-80 inch-pounds.
(9) Connect hose (5) to union (4) in brake assembly.
(10) Bleed brake system in accordance with Chapter 2, Maintenance Practices, and check brake pedals for proper travel.



Brake Wear Limits
Figure 9

3. Brake Burn In - New Brakes

CAUTION: THIS BURN IN PROCEDURE MUST BE PERFORMED BY A QUALIFIED PILOT USING INFORMATION OUTLINED IN THE PILOT'S OPERATING HANDBOOK AND FAA APPROVED AIRPLANE FLIGHT MANUAL AND WHO IS FAMILIAR WITH THE PROPER FIELD LENGTHS REQUIRED FOR VARIOUS ACCELERATION AND STOP DISTANCES.

NOTE: Brake burn in is required to minimize glazing of the friction surfaces. Light braking can cause glazing and in turn brake noise, chatter and vibration.

A. Brake Burn In Procedure.

CAUTION: MINIMIZE TAXI BRAKING PRIOR TO BURN IN OF THE BRAKES. DURING BRAKING, USE THE BRAKES INTERMITTENTLY RATHER THAN CONTINUOUSLY DRAGGING THE BRAKES.

(1) Following wheel brake installation, perform a high-speed taxi of the airplane and apply brakes at approximately 45 to 50 knots ground speed. Apply brakes firmly but not excessively and hold pedal force until the airplane decelerates to a safe taxi speed. Repeat high-speed taxi and brake application three times. This will "burn in" the brake friction components and remove the corrosion prevention preservatives from the friction surfaces.

NOTE: Do not set the parking brakes hot, since irregular friction surface mix transfer can result in brake chatter, noise and vibration.

4. Cleaning and Inspection.

A. Clean all metal parts in alcohol or suitable solvent.
B. Clean O-rings in denatured alcohol and dry thoroughly.
C. Inspect O-rings for cuts, nicks, distortion or excessive wear. If necessary, replace with O-rings of corresponding part numbers.
D. Inspect brake cylinder(s) for cracks, especially in the lug area around the anchor bolts. Cracks in this area necessitate cylinder replacement.
E. Small nicks and light corrosion may be blended and removed with emery or sandpaper. Any area from which the protective coating is removed should be thoroughly cleaned and repainted with one coat of zinc chromate primer and one coat of aluminum lacquer.
F. Inspect the fitting ports and piston bores for contamination. Light scratches or nicks in the piston bores, pilot bores or on the chamfered surfaces within these bores may be polished out with 600 grit emery.

NOTE: Nicks and burrs in the pilot bore area can prevent the pistons from properly retracting, resulting in brake drag.

G. Thoroughly clean out any residue upon completion of step F. Any external surfaces around the piston bores from which the protective coating has been removed should be cleaned and repainted with one coat of zinc chromate primer and one coat of aluminum lacquer.

NOTE: Do not paint internal surfaces of piston bores.

H. Inspect pistons for nicks or burrs. Remove nicks or burrs by polishing with 600 grit emery. Thoroughly clean before reinstallation.
I. Inspect brake lining for edge chipping and surface deterioration. See Figure 9 for wear limits.
J. Lining replacement can be accomplished by prying the old segments off of the carrier with a screwdriver. To install new pads, apply a light film of glue to the backing material of the pad and snap the new pad onto the carrier pins. The glue will retain the pads in the correct position when reassembling the brake.

NOTE: If linings are changed, but the pistons are not removed from the cylinder, clean the exposed surfaces of the pistons before displacing the pistons back into the cylinder.

PARKING BRAKE SYSTEM

Description

1. The parking brake system consists of a manually operated handle assembly connected to the parking brake valve located in the brake line to each main gear. When pressure is applied to brake system and the parking brake handle is pulled, the valve locks hydraulic pressure on the brake assemblies until released.

Troubleshooting

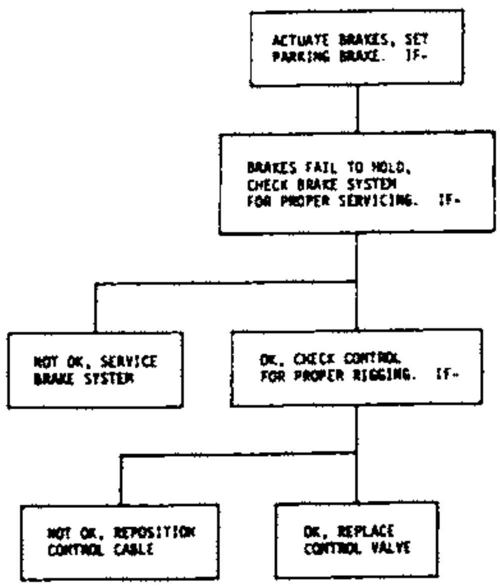
1. See Figure 1 for troubleshooting the parking brake system.

Maintenance Practices

1. Removal/Installation of Parking Brake System (See Figure 2).

   A. Remove Parking Brake System.

      (1) Drain fluid from brake system by removing bleeder screw and opening bleeder valve.
      (2) Remove pilot's seat.
      (3) Remove carpet and scuff plate from front floorboards.
      (4) Remove access panels as required to gain access to parking brake valve.
      (5) Remove hoses (4 and 6) and lines (8 and 9) from parking brake control valve (11). Cap and plug lines and fittings to prevent entry of foreign materials and leaking of fluid.
      (6) Disconnect parking brake control (1) from valve (11) by removing screw and nut.
      (7) Remove two screws securing valve (11) to support (10) and remove valve from aircraft.



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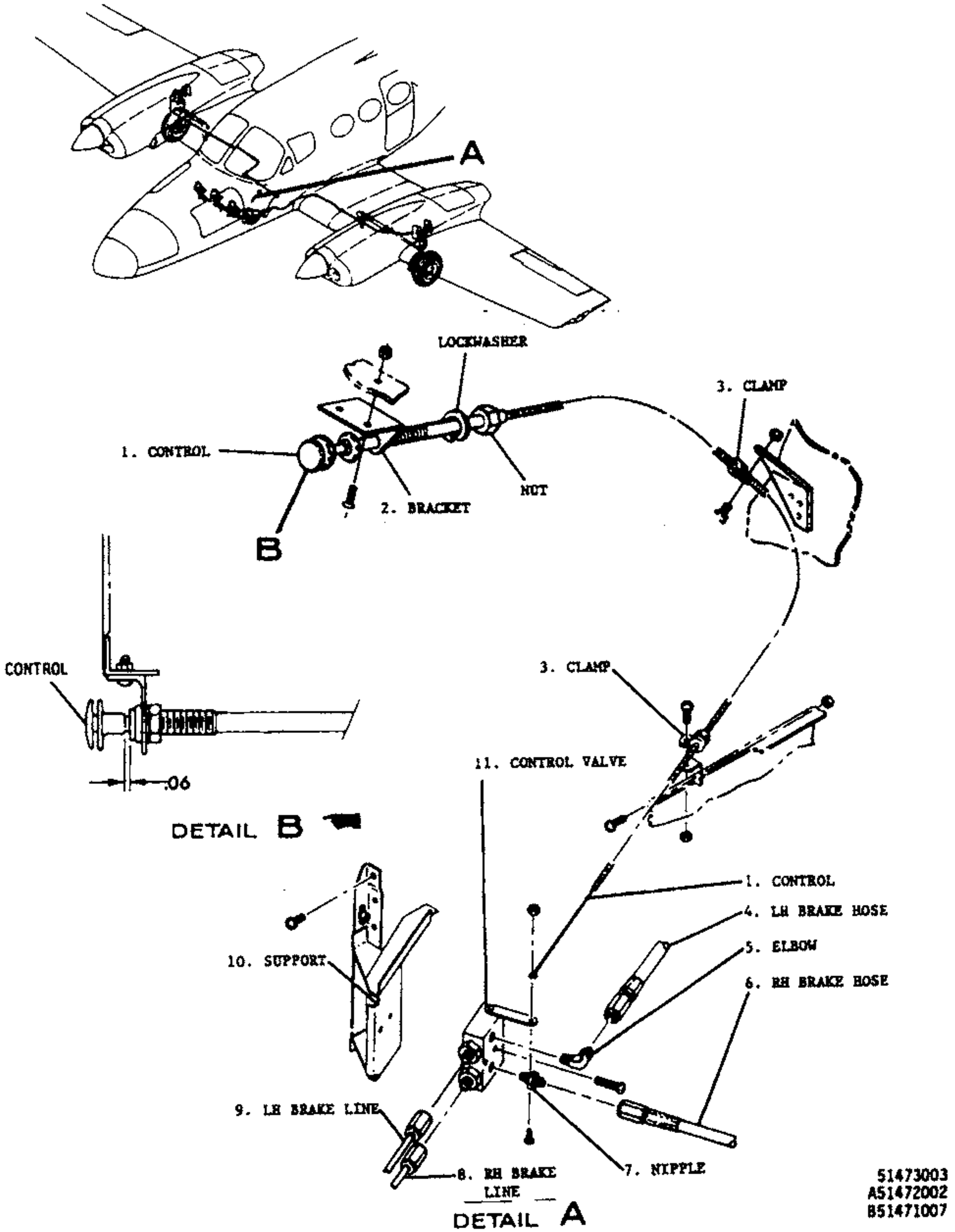
Troubleshooting Chart - Parking Brake System
Figure 1



Parking Brake System
Figure 2

(8) If replacing valve, remove elbow (5) and nipple (7). Do not remove the other two fittings.
(9) Remove parking brake control as follows:
(a) Remove clamps (3) from control.
(b) Remove nut and lockwasher from control and route control from floorboard and bracket (2).

B. Install Parking Brake System.

(1) If elbow (5) and nipple (7) were removed from parking brake control valve (11), install elbow and nipple into valve using hydraulic fluid as a thread lubricant. Elbow (5) must be installed pointing forward.
(2) Position control valve (11) to support (10) and secure with two screws.
(3) Remove caps and plugs from lines and fittings. Connect lines (8 and 9) and hoses (4 and 6) to control valve.
(4) Install parking brake control (11) as follows:
(a) Route control (1) through bracket (2), lockwasher and nut, through floorboard to valve (11). Secure control (1) to bracket (2) with lockwasher and nut.
(b) Connect control (1) to valve (11) with screw and nut.
(c) With control and control valve in brakes off position, secure cable to brackets with clamps (3).

NOTE: If new control (1) is being installed, rig control to have .06 cushion as shown.

(5) Bleed and service brakes. Refer to Servicing Brakes.
(6) Check parking brake for proper operation and check fittings, lines and hoses for leaks.
(7) Install access panels, carpet and scuff plates.
(8) Install pilot's seat.

Inspection/Check

1. Check security of parking brake control valve.

2. Check security and condition of parking brake control cable.

NOSE GEAR STEERING SYSTEM

Description

1. The nose gear steering system permits nose gear steering with the rudder pedals, for angles up to 18 degrees, either right or left of center. Spring-loaded nose gear steering cables permit continued resisted turning action of the nose gear for steering angles greater than 18 degrees, up to a maximum of 55 degrees. Steering arms welded to the rudder torque tubes, are connected by the steering cables, to a steering gimbal; which pivots in a support mounted directly above the nose gear trunnion assembly. The gimbal allows nose gear steering when the gear is down. When the gear is retracted, the gimbal serves as an idler, permitting free wheeling of the nose gear steering.

Maintenance Practices

1. Removal/Installation of Nose Wheel Steering System (See Figure 1).

   A. Remove Nose Wheel Steering System.

      (1) Remove pilot and copilot's seats, front carpet and access covers as required to gain access to steering cables.
      (2) Remove nose baggage shelf and radio equipment as necessary to gain access to steering cables.

      CAUTION: DO NOT REMOVE CLEVIS PIN FROM NOSE GEAR STEERING BELLCRANK WITHOUT FIRST RELEASING TENSION ON THE NOSE STEERING CABLES.

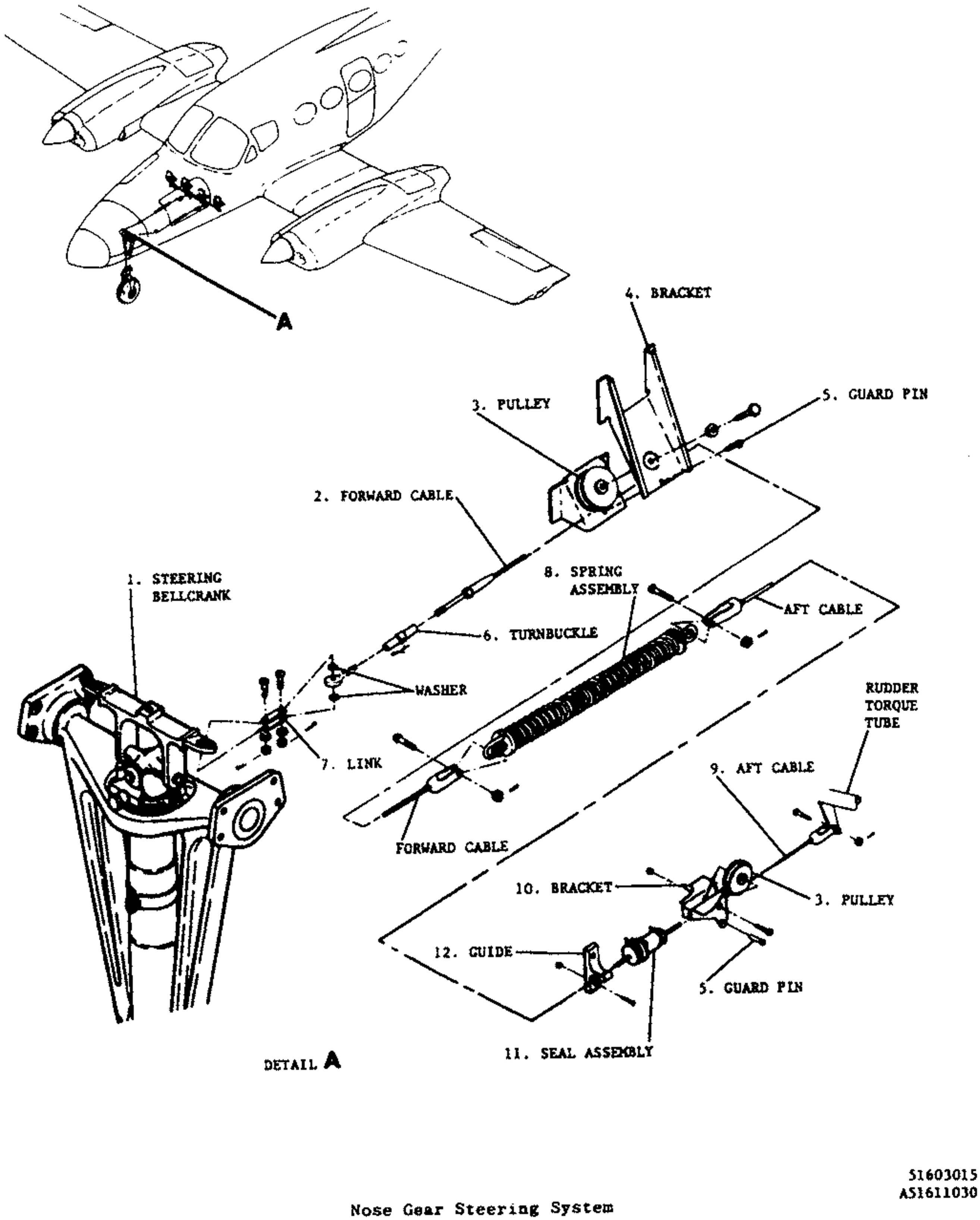
      (3) Disconnect the nose steering cables at the forward bellcrank in the nose wheel well by loosening turnbuckles (6).

      NOTE: Removal procedures are given for the left steering cable. Procedures are the same for the right cable.

      (4) Disconnect aft nose gear steering cable (10) from rudder torque tube by removing cotter pin, nut and bolt.
      (5) Remove cable guard pins (5) from bracket (4) and bracket (12).
      (6) Remove retaining rings from seal assembly (11) and remove seal assembly from Station 100.00 bulkhead.
      (7) Pull cable assembly from wheel well web and Station 100.00 bulkhead and remove cable assembly.
      (8) Spring assembly (8) may be removed from forward cable (2) and aft cable (9) by removing cotter pins, nuts and bolts.

   B. Install Nose Wheel Steering System.

      (1) If disassembled, attach spring assembly (8) to forward cable (2) and aft cable (9) with bolts, nuts and cotter pins.
      (2) Route turnbuckle end of cable assembly through wheel well web to steering bellcrank (1) and attach with links (7), bolts, washers, nuts and cotter pins.
      (3) Route aft cable (9) through spring cover and through Station 100.00 bulkhead to rudder torque tube and connect to torque tube with bolt, nut and cotter pin.
      (4) Make sure cables are seated in pulleys (3) and install cable guard pins (5) at bracket (4) and bracket (10).
      (5) Make sure cable (9) is resting on guide (12) and install seal assembly as follows:
         (a) Lubricate cables for full length of travel within the seal with MIL-G-81322A lubricant.
         (b) Repack seal with MIL-G-81322A lubricant.
         (c) Place the seal on the cable on the non-pressurized side of Station 100.00 bulkhead with the small end of seal toward bulkhead.
         (d) Insert seal in the bulkhead hole so that bulkhead metal is seated within the retaining groove of seal and so that the small end of seal is in the pressurized section.
         (e) Install proper retaining rings in the grooves on the seal (two on small end and one on large end).



Nose Gear Steering System
Figure 1

(6) Rig nose gear steering cables. Refer to Chapter 5.
(7) Install radio equipment and baggage shelves.
(8) Install access panels, carpet and seats.

C. Disassembly/Assembly of Steering Spring (See Figure 2).

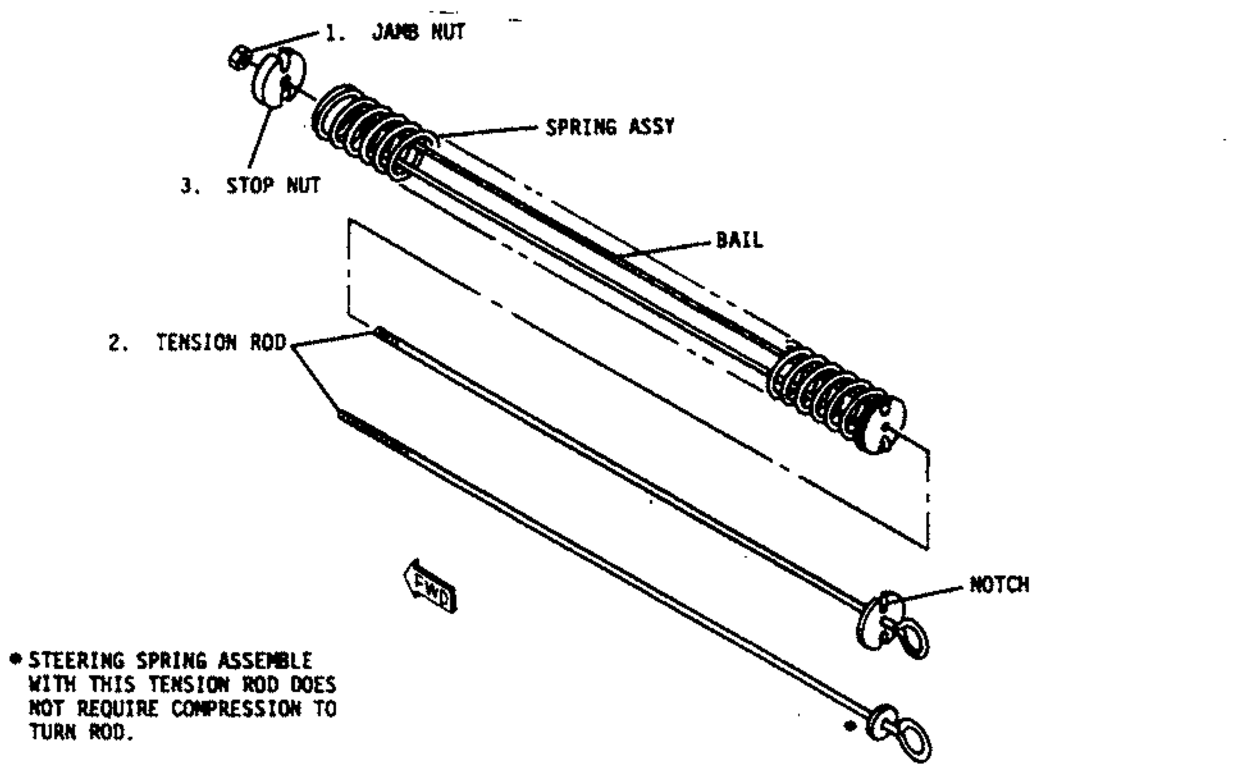
(1) Remove jamb nut (1) at loop end.
(2) Pull tension on spring assembly to allow notches (at eye end) in tension rod (2) to clear bail end and screw tension rod out.
(3) Apply compression on spring to extend loop end to position that stop nut (3) can be turned and slipped out of loop.

NOTE: Hold housing and spring assembly securely when removing stop nut then relieve compression pressure gradually.

(4) Assembly is in reverse of removal procedure.

D. Adjustment of Steering Spring (See Figure 2).

(1) Remove spring assembly from steering cables (see removal procedures).
(2) Attach a tension scale (accelerometer) to one end of spring and apply load at other end.
(3) The spring assembly should begin to compress at 85 ± 5 pounds.
(4) To adjust preload, loosen jamb nut (1) and pull tension on spring to clear bail end. Adjust by rotating spring ends in opposite directions (with respect to each other). Rotate clockwise to increase preload, counterclockwise to decrease preload.
(5) When preload is in adjustment tighten jamb nut (1) and seal threads with torque putty.
(6) Rig nose gear steering cable as follows:
   (a) Check rudder cables for proper rigging. Refer to Chapter 5.
   (b) Place rudder and nose gear tire in neutral position. Adjust nose gear cable tension to 20 ± 5 pounds and safety turnbuckle.



Steering Spring Assembly
Figure 2

Adjustment/Check

1. Refer to Chapter 5 for Adjustment/Check of Nose Wheel Steering System.

Inspection/Check

1. Inspect cables for proper routing, tension, fraying and turnbuckles for safety.
2. Inspect pulleys for wear, damage and freedom of movement. Check for proper installation of guard pins.
3. Inspect cable seals for damage and security.

LANDING GEAR BLOWDOWN SYSTEM

Description

1. A blowdown bottle Type DOT-3AA is provided for emergency landing gear extension. A control handle mounted on the instrument panel controls release of pressurized nitrogen from the blowdown bottle into the landing gear extension system to unlock the uplock hooks and extend the gear.

Troubleshooting

1. Troubleshooting the Landing Gear Blowdown System.

   A. For a guide to troubleshooting the landing gear blowdown system, refer to Extension and Retraction Troubleshooting Chart.

Maintenance Procedures

1. Removal/Installation Landing Gear Blowdown System (Refer to Figure 1)

   A. Remove Landing Gear Blowdown System.

      (1) Open left-hand nose access door.
      (2) Remove baggage retainer for access to bottle.
      (3) Discharge pressure from bottle, refer to step C.
      (4) Remove cotter pins, washers and pins (9) securing links (8) to control cable (6) and bottle assembly (2).
      (5) Disconnect line (3) from bottle. Cap and plug openings to prevent entry of foreign materials.
      (6) Disconnect clamps (1) and remove bottle assembly (2) from cradle assembly (10).
      (7) Remove seal assembly (7) from Station 100.00 bulkhead by removing screws and nuts.
      (8) Remove clamps from control cable (6) by removing nuts, washers, spacers (4) and screws.

      NOTE: If existing, remove nuts above and below clamp on cable.

      (9) Airplanes C0401 and on, remove bracket (5) and cover (11) by removing attaching screws, washers and nuts.
      (10) Airplanes C0001 to C0400, remove bracket by removing attaching screws, washers and nut.
      (11) Remove nut and lockwasher securing control cable (6) to bracket (5) and withdraw cable.
      (12) Disconnect line (3) from shuttle valve tee. Cap all openings.

   B. Install Landing Gear Blowdown System.

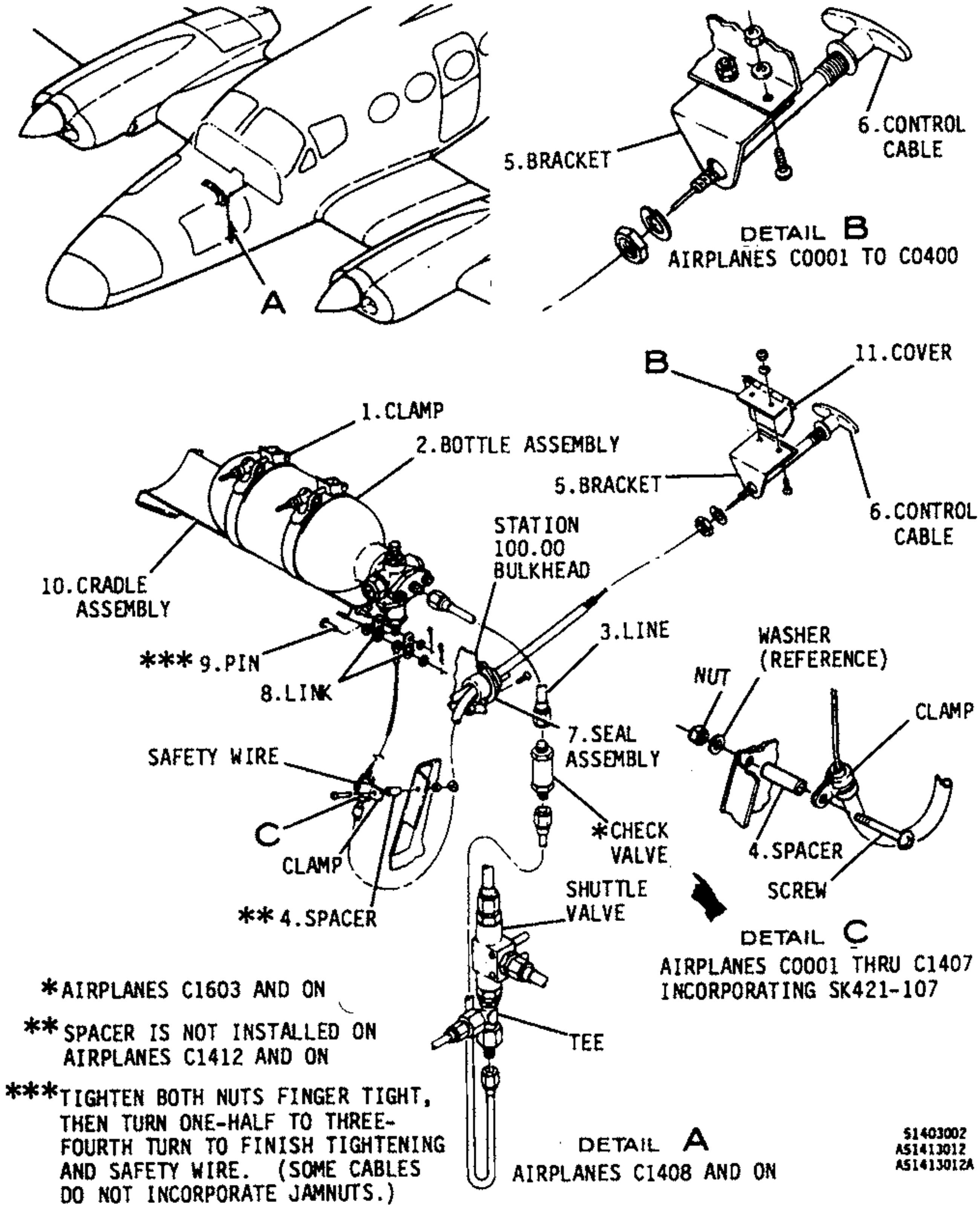
      (1) Position bottle assembly (2) in cradle assembly (10) and secure in place with clamps (1).
      (2) Remove caps and plugs from line (3) and connect line to blowdown bottle assembly (2) and shuttle valve tee.
      (3) Route control cable (6) through bracket (5) and Station 100.00 bulkhead to blowdown bottle assembly (2).
      (4) Airplanes C0401 and On, install bracket (5) and cover (11) with screws, washers and nuts.
      (5) Airplanes C0001 to C0400, install bracket (5) with screws, washers and nuts.

      NOTE: Ensure that links are straight up and down after cable has been connected.

      (6) Connect links (8) to blowdown bottle valve and to control cable (6) with pins (9), washers and cotter pins.

      NOTE: If existing, install nut above and below clamp on cable. Tighten both nuts finger tight; then, turn 1/2 to 3/4 and safety wire.

      (7) Secure cable in proper position with screws, spacers (4) washers and nuts. Cable position should be such that cable terminal end is near center of slot in links (8).



Landing Gear Blowdown System
Figure 1

(8) Secure seal assembly (7) to Station 100.00 bulkhead with screws and nuts and apply sealant. Refer to Chapter 1 for procedures.
(9) Charge blowdown bottle.
(10) Replace baggage retainer

C. Discharge Blowdown Bottle.

(1) Discharge the blowdown bottle as follows:

CAUTION : WHEN DISCHARGING THE BLOWDOWN BOTTLE, ENSURE NO PERSONNEL ARE NEAR THE DISCHARGE LINE OUTLET AND THAT THE OUTLET IS DIRECTED DOWNWARD.

(a) Disconnect the line attached to the blowdown bottle valve and temporarily connect another line (approximately 8 feet in length) to direct the discharge. Use only threaded type connections to connect the discharge line. Secure the end of the line so that it is directed downward.

(b) Actuate the emergency gear extension T-handle to discharge the blowdown bottle and to ensure no binding or excessive resistance exists. Push T-handle in, reset the blowdown bottle valve and recharge the blowdown bottle in accordance with the Service or Maintenance Manual.

D. Servicing Landing Gear Blowdown Bottle.

(1) Refer to Chapter 2 for servicing the blowdown bottle.

Inspection/Check

1. Inspection/Check Landing Gear Blowdown Bottle System.

A. Inspect blowdown bottle for security of mounting, control for security and lines for chafing and damage.
B. Check that blowdown bottle is charged within the green range as indicated on the gage.
C. Check that bottle plunger in with no red showing on the discharge pull pin.

NOTE : DELETED

WARNING AND INDICATING SYSTEM

Description

1. The landing gear warning system provides an aural and visual indication of an unsafe landing gear system. A safe gear is indicated by three green indicator lights which illuminate when all three gears are down and locked. An unsafe gear is indicated when any one or more gear is not in the position selected by the landing gear select switch.

2. An aural warning is provided by a warning horn when either throttle lever is retarded below a specified manifold pressure setting, while landing gear is in any condition other than a down and locked condition, or when flaps are lowered below 15° regardless of position of throttle levers, while gear is in any condition other than a down and locked condition.

Troubleshooting

1. Troubleshooting Landing Gear Warning and Indicator System.

   A. See Figure 1 for a guide to troubleshooting the gear warning system.
   B. Refer to Landing Gear Wiring Diagram, Chapter 13 for conducting continuity checks.
   C. Conduct a continuity check of electrical circuits before replacing a component suspected of being defective.

Maintenance Practices

1. Removal/Installation of Gear Warning and Position Indicator Components (See Figure 2)

   A. Remove Gear Position Switches.

      (1) Tag and disconnect wires from gear select switch (4).
      (2) Unscrew and remove knob from switch.
      (3) Remove nut and pull switch from instrument panel (3).
      (4) Tag and disconnect wires from uplock switches.
      (5) Remove nut and washer from uplock switch (2) and remove switch from uplock hook (1).

      NOTE: The down and locked switches mounted on the landing gear actuators are a part of the gear position indicator system. Removal and adjustment of these switches must be performed in accordance with actuator overhaul manual procedures.

   B. Install Gear Position Switches.

      (1) Remove tags and connect electrical wires to uplock switch (2).
      (2) Install nut and keyed washer on uplock switch.
      (3) Insert switch (2) through uplock hook (1) and install washer and nut. Make sure keyed washer mates with hole in hook and tighten nut.
      (4) Safety wire the two nuts together after switch is properly adjusted. Refer to Adjustment/Test.
      (5) Remove tags and connect electrical wires to select switch (4).
      (6) Install nut and keyed washer on switch.
      (7) Insert switch through instrument panel (3).
      (8) Install decorative nut on switch from face of the panel only as far as necessary to obtain full thread engagement.
      (9) Tighten nut on back side of instrument panel. Make sure keyed washer mates with hole in panel.

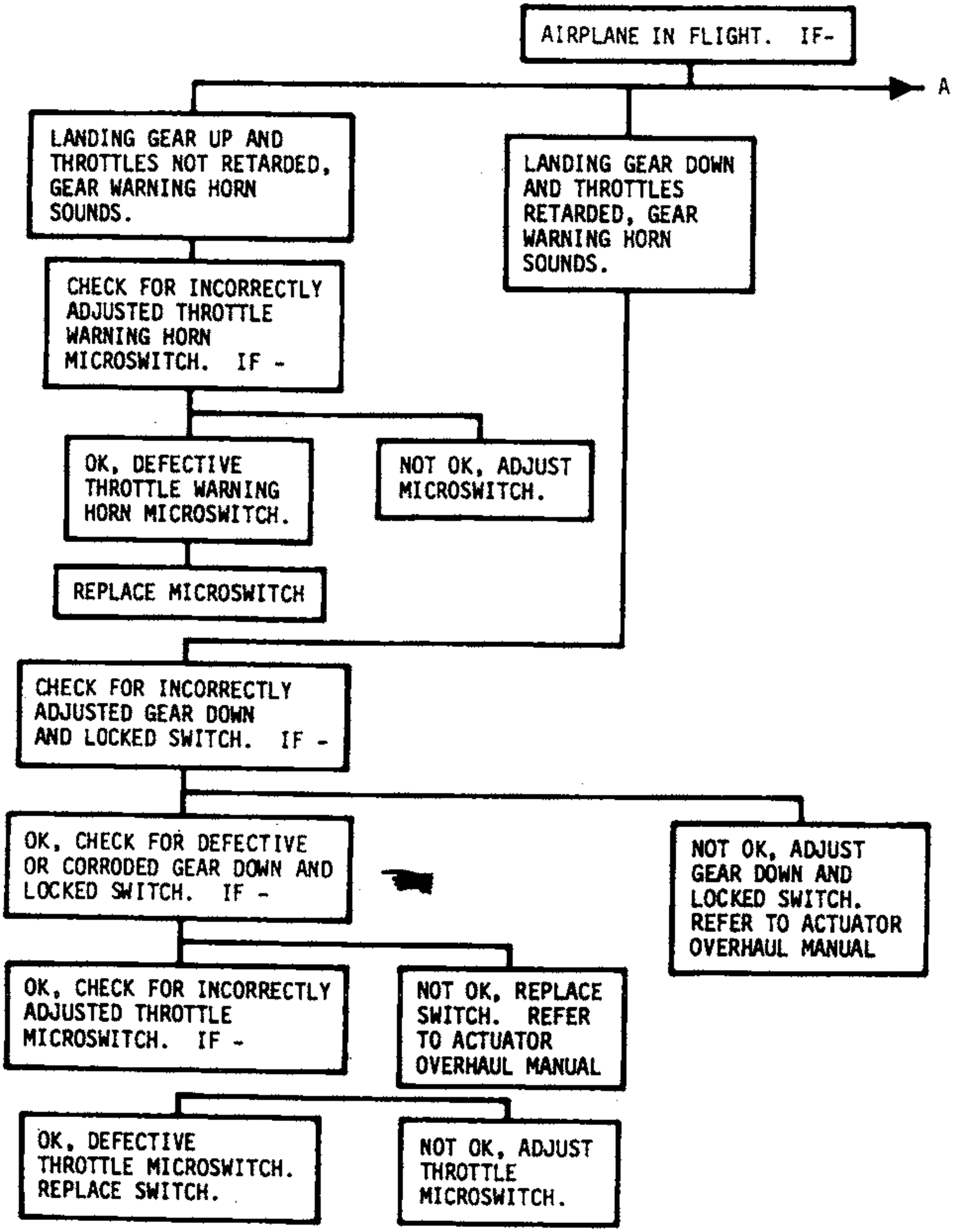
2. Removal/Installation Indicator Lights

   A. Remove Gear in Transit Light.

      (1) Identify, tag and disconnect electrical wires at connector.

      NOTE: To replace lamps, it is only necessary to comply with Steps (2) and (3).

      (2) Press the lens assembly (5). The lens will snap back and extend approximately 1/2 inch.



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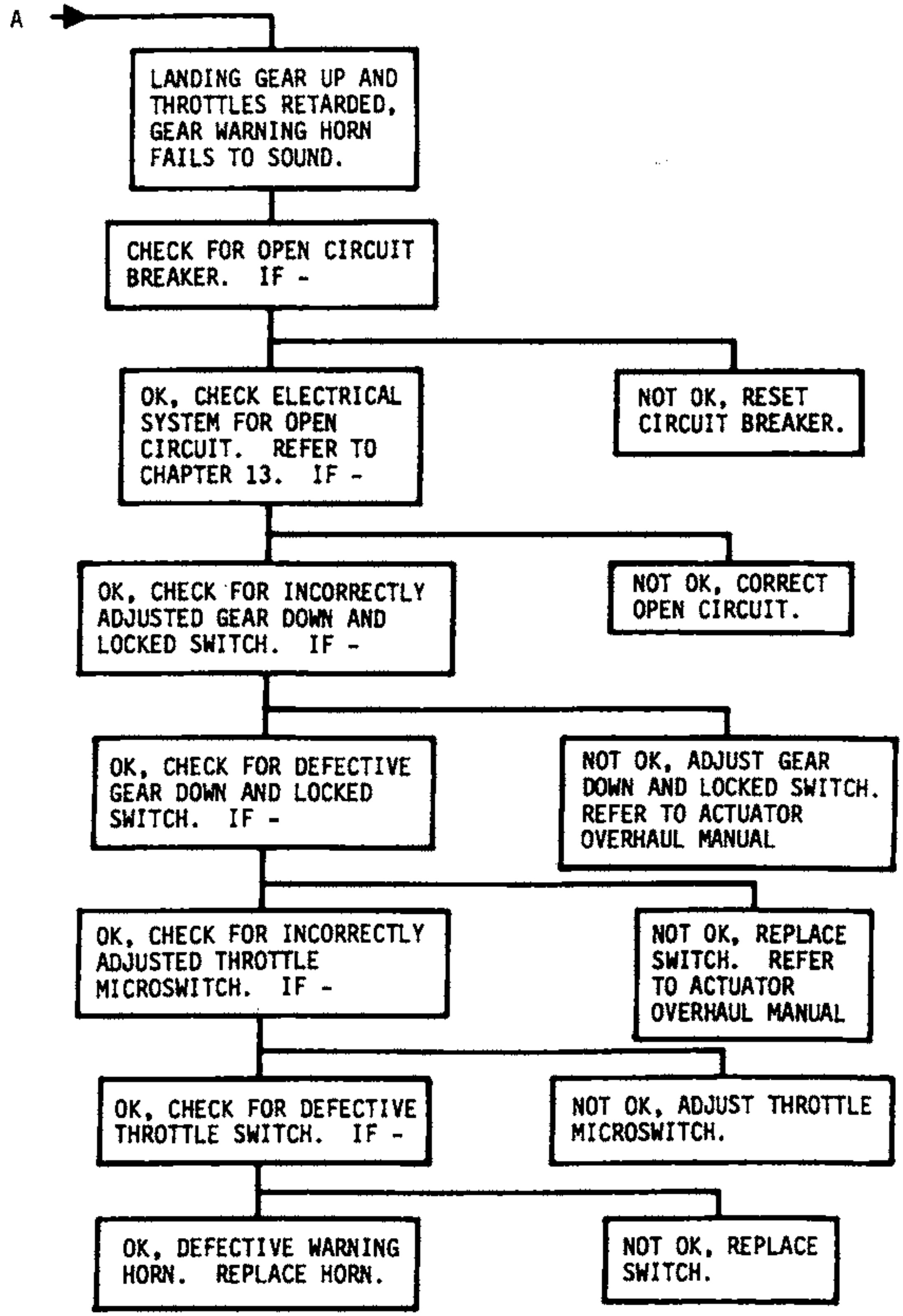
Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 1)



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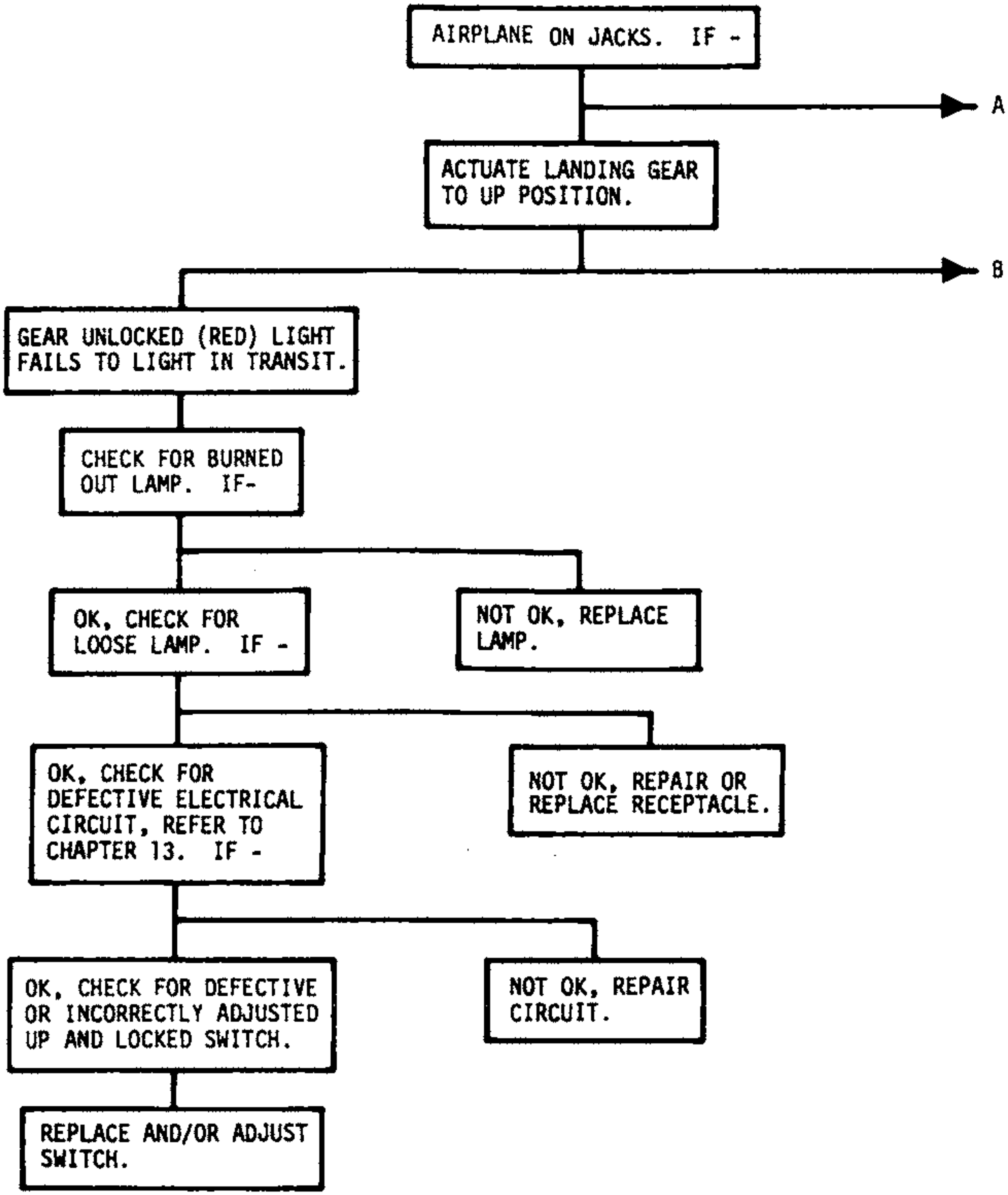
Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 2)



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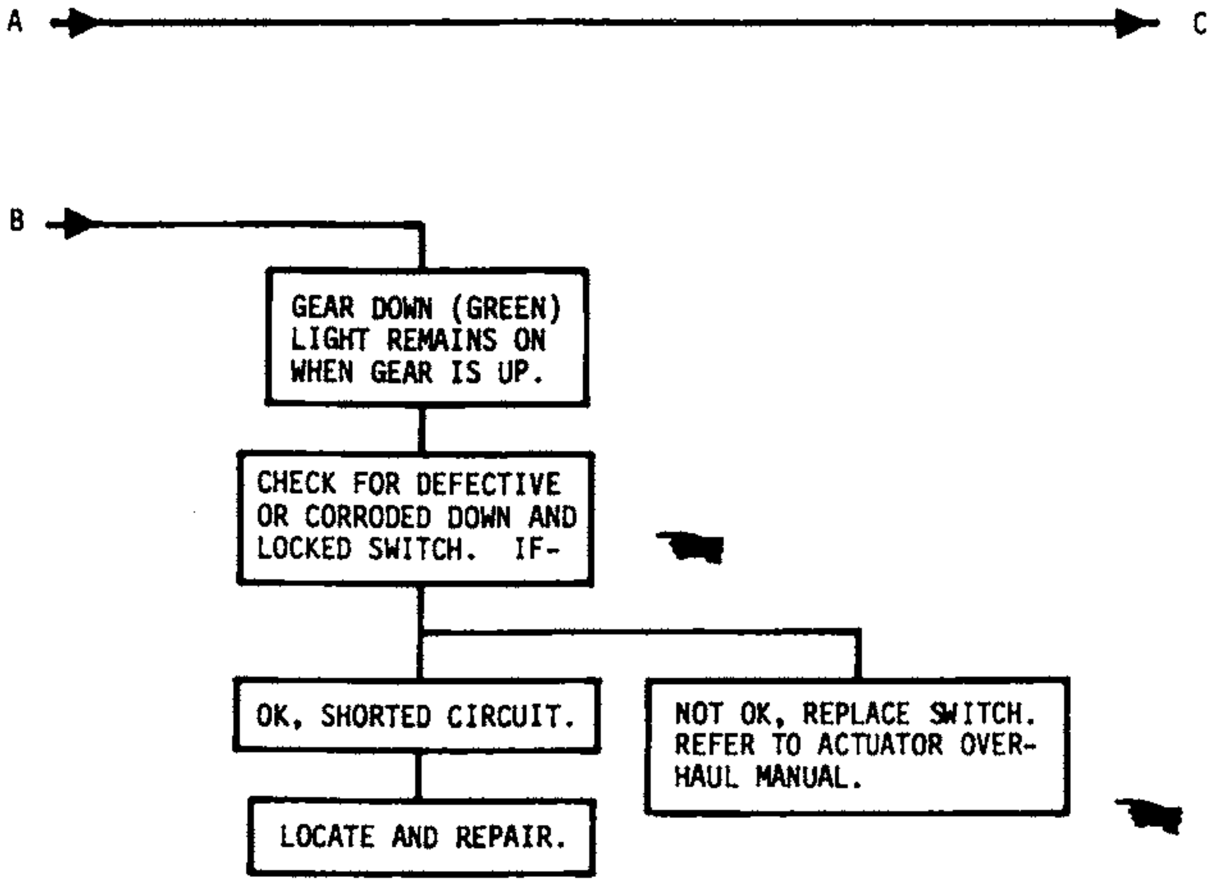
Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 3)



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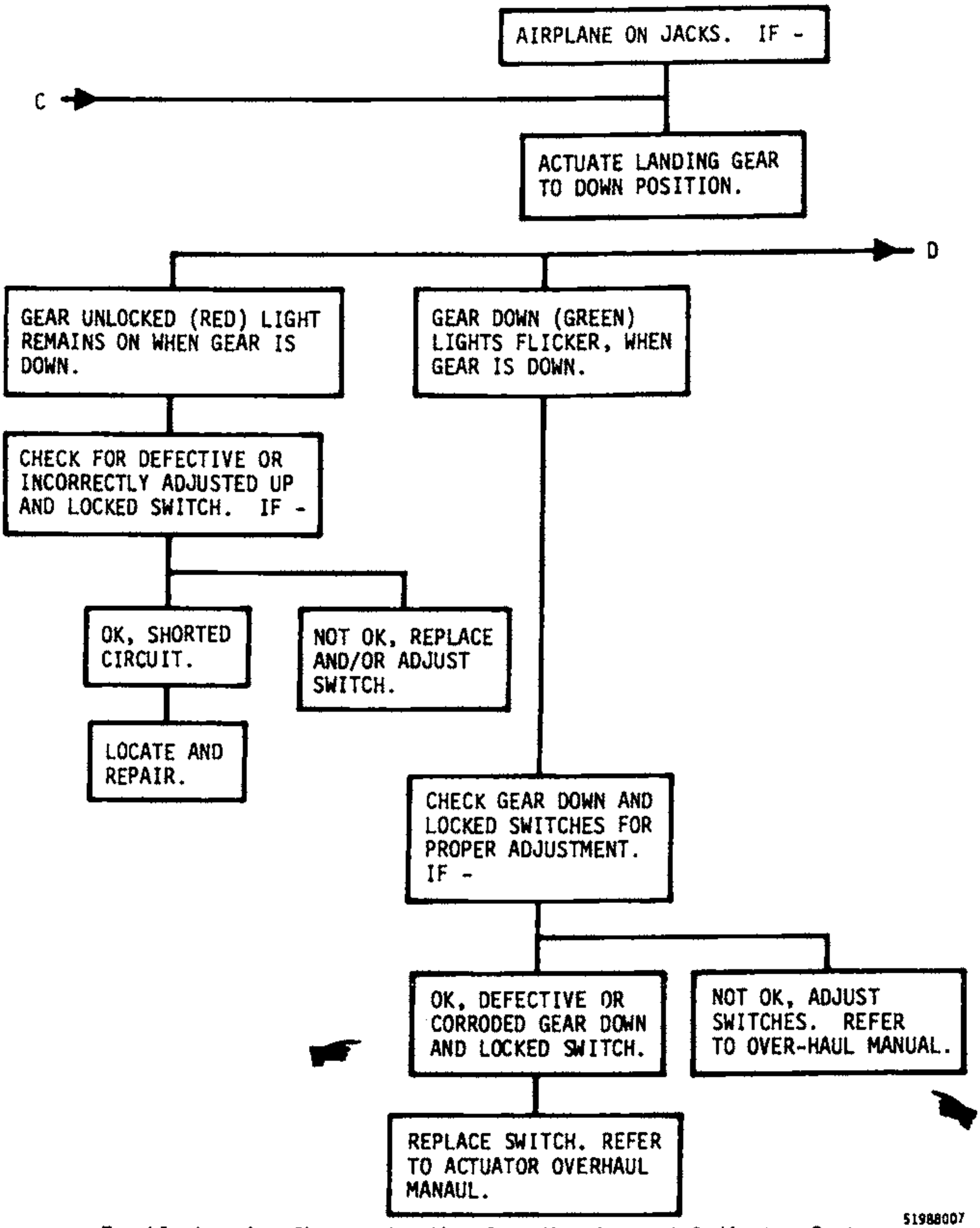
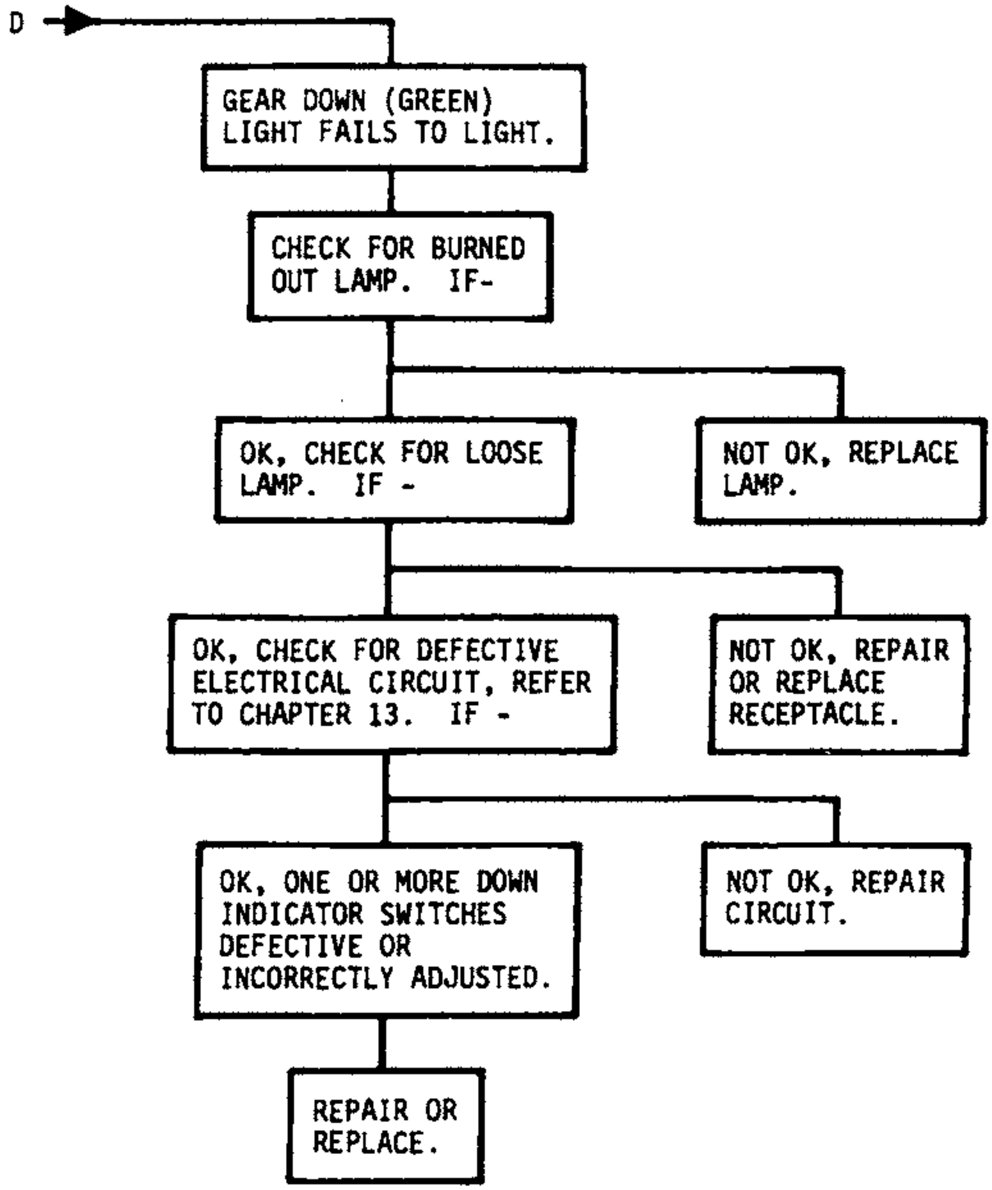
Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 4)



Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 5)



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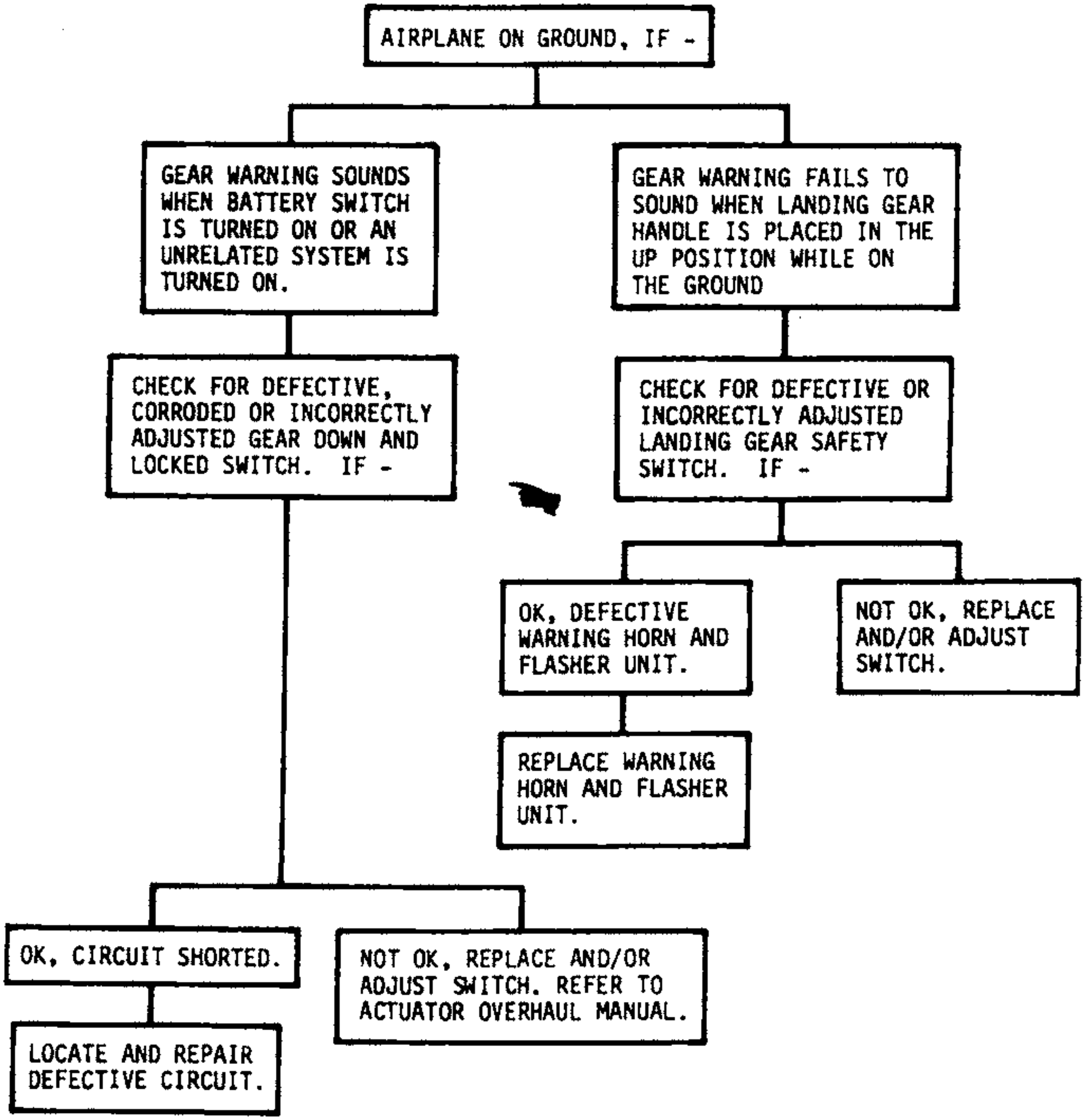
Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 6)



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Troubleshooting Chart - Landing Gear Warning and Indicator System
Figure 1 (Sheet 7)

(3) The lens assembly (5) can then be pulled from the light assembly (7) to expose lamps (6).
(4) Turn screws (9) counterclockwise until locking cams (8) are unlocked.
(5) Remove light assembly from instrument panel (3).

B. Install Gear In Transit Light.

(1) Insert light assembly (7) through the mounting hole in the instrument panel. Turn screws (9) until locking cams (8) are engaged with panel; tighten screws.
(2) Remove tags from electrical wires and connect wires to proper terminals.
(3) Insert lens assembly (5) into light assembly (7) and snap into place.

C. Remove Down and Locked Indicator Light.

(1) Identify, tag and disconnect electrical wires at connector.

NOTE: To replace lamps, it is only necessary to comply with Steps (2) and (3).

(2) With finger tips, pull out on lens (3) until it reaches a stop (approximately 1/2 inch).
(3) Rotate lens assembly (13) 90 degrees counterclockwise. The lens and socket assembly (14) will then extend further. The lens and lamp socket assembly can then be pivoted down to expose lamps (12).
(4) With the lamp assembly (14) pivoted out of the way, turn screws (15) counterclockwise until the locking cams (11) are unlocked.
(5) Slide backshell (10) from the light assembly and remove light assembly (16) from instrument panel (3).

D. Install Down and Locked Light Indicator.

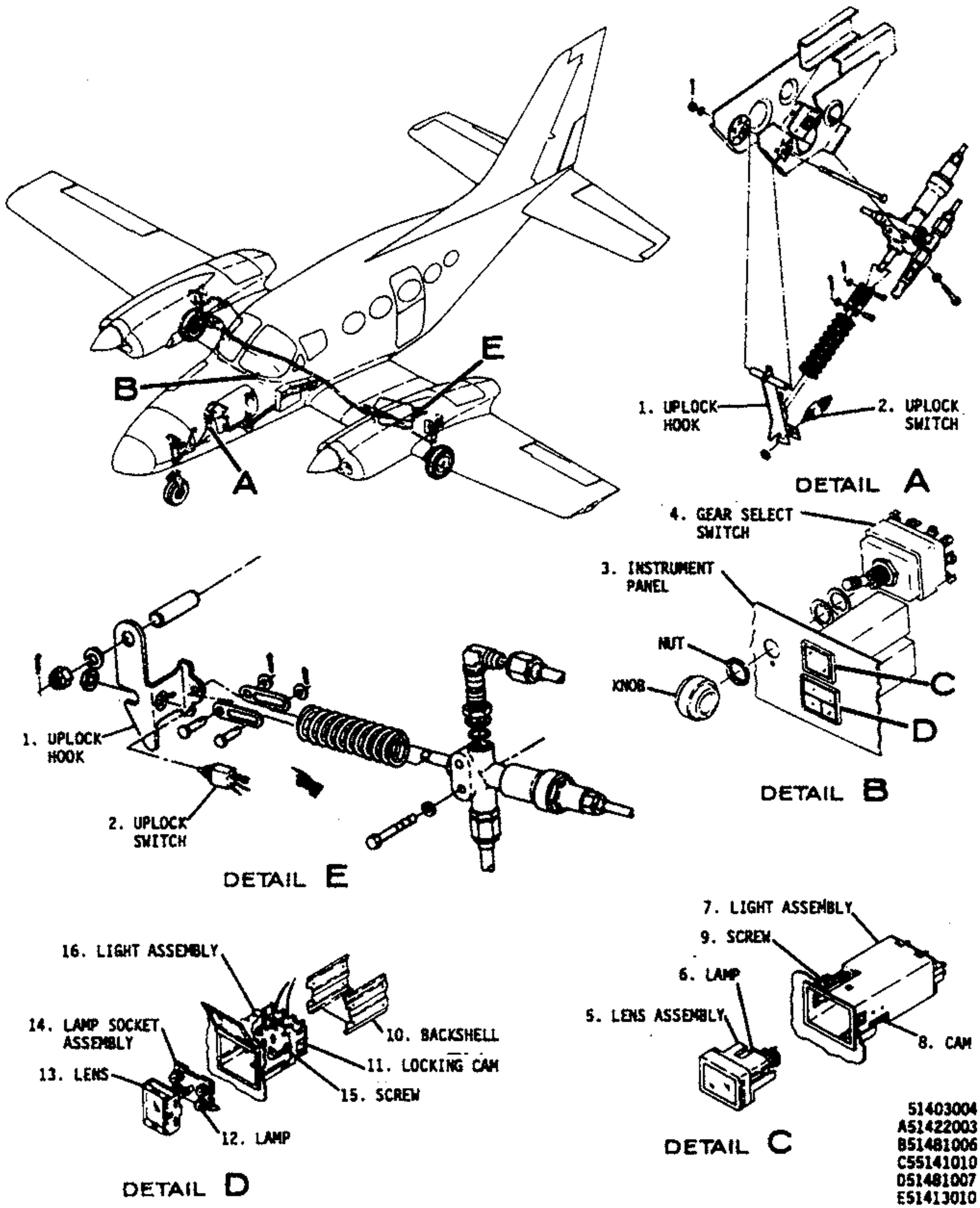
NOTE: An assembled light assembly must be disassembled in accordance with removal procedures prior to installation.

(1) Insert light assembly (16) through the mounting hole in the instrument panel (3) and then slide the backshell (10) onto the light assembly until it is against the back side of the instrument panel.
(2) Turn screws (15) clockwise until locking cams (11) are engaged against backshell (10). Tighten screws.
(3) Swing light socket assembly (14) into position and push in until a stop is reached (approximately 1/2 inch from panel). Rotate lens (13) clockwise 90 degrees and push lens until it snaps into position.
(4) Remove tags and connect electrical wires. Verify proper operation of light.

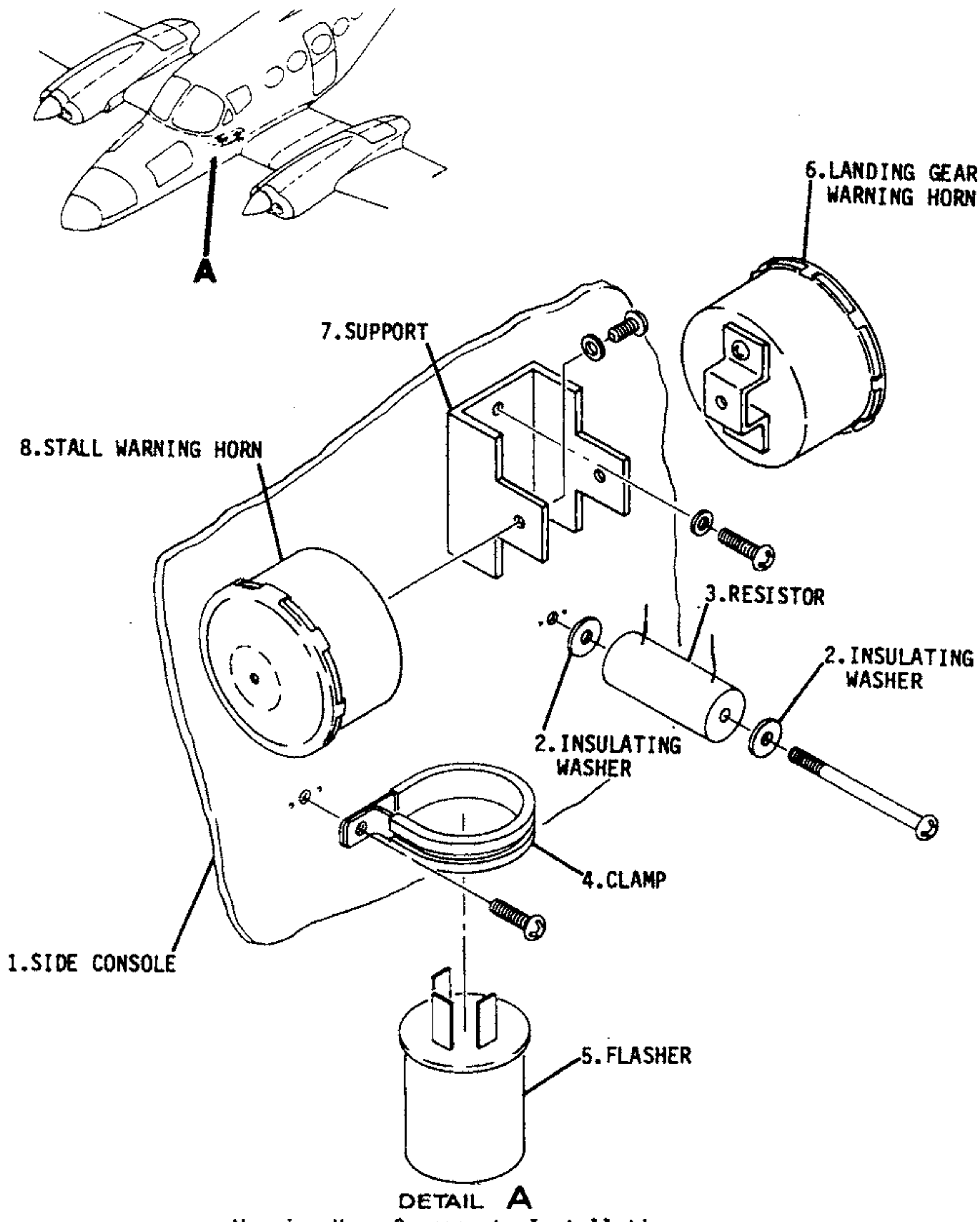
3. Removal/Installation Warning Horn Components (Refer to Figure 3)

A. The landing gear warning electrical components consist of a warning horn, flasher and resistor located in the side console. Remove components.

(1) Remove warning horn (6) as follows:
(a) Remove side panel of side console (1) to gain access to components.
(b) Tag and disconnect electrical wires.
(c) Remove screw and lockwasher securing warning horn (6) to support (7).
(2) Remove flasher (5) as follows:
(a) Tag and disconnect electrical wires.
(b) Remove attaching screw and clamp (4).
(3) Remove resistor (3) as follows:
(a) Tag and disconnect electrical wires.
(b) Remove attaching screw and insulating washers (2).



Landing Gear Switch and Indicator Light Installation
Figure 2



Warning Horn Components Installation
Figure 3

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B. Install Gear Warning Components.

(1) Install resistor as follows:
(a) Position resistor (3) and insulating washers (2) as shown and secure to side console with screw.
(b) Connect electrical wires and remove tags.
(2) Install flasher (5) as follows:
(a) Position flasher (5) to side console (1) and secure with clamp (4) and screw.
(b) Connect electrical wires and remove tags.
(3) Install warning horn (6) as follows:
(a) Position warning horn (6) to support (7) and secure in place with lock-washer and screw.
(b) Connect electrical wires.

Adjustment/Test

1. Tools and Equipment

NOTE: Equivalent substitutes may be used instead of the following listed items:

Name	Number	Manufacturer	Use
Hydraulic Test Stand	SE589 Modified to include SK421-68	Cessna Aircraft Company	Test hydraulic system.

2. Adjustment/Test Position Switches (See Figure 4)

A. Adjust Down and Locked Switches 421C0001 Thru 421C0800 (See Figure 4).

(1) The down and locked switches are mounted on the landing gear actuators. These switches are preset and should be adjusted in accordance with actuator.

B. Adjust Down and Locked Switches 421C0801 and On.

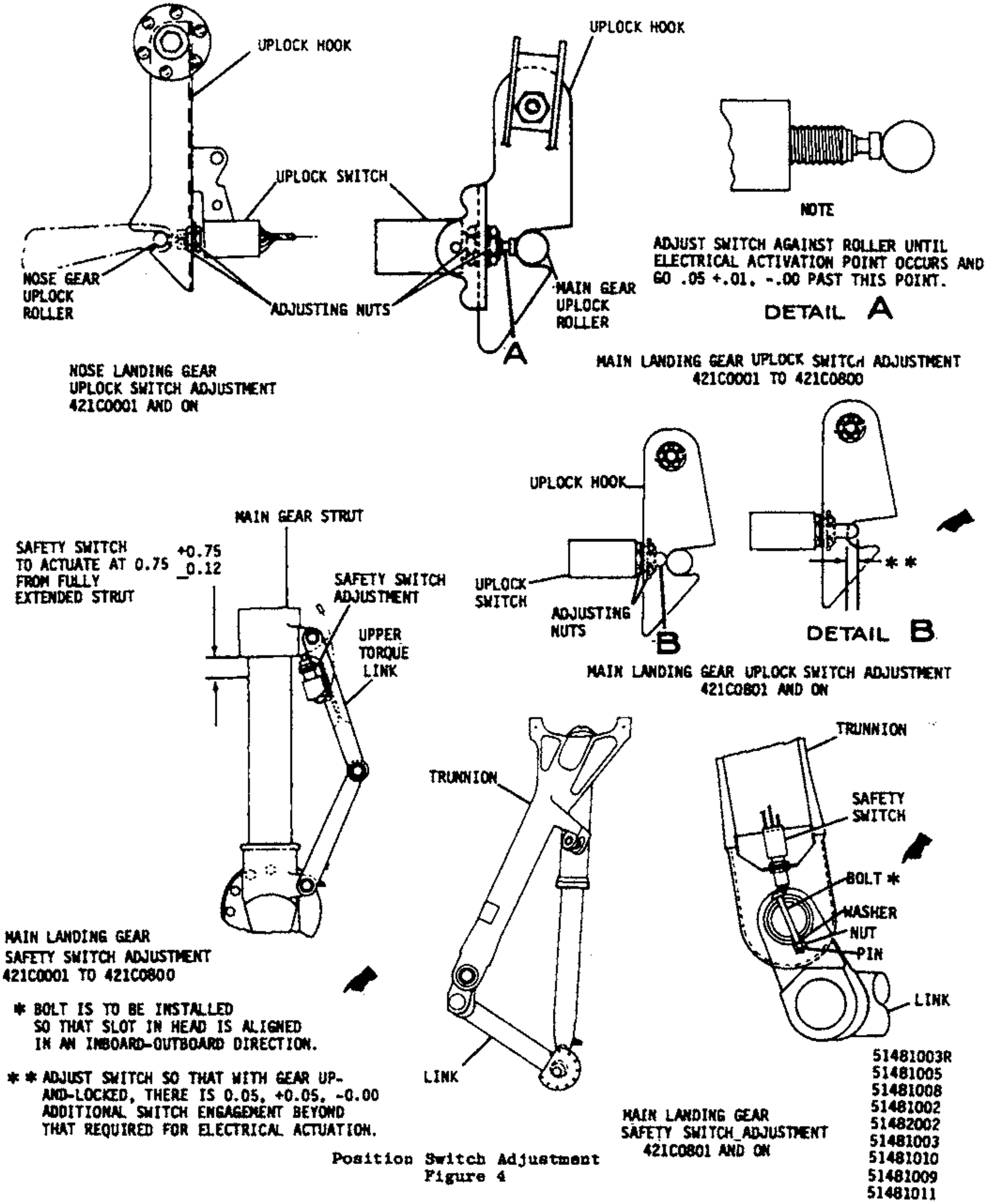
(1) The down lock switches located on the main and nose gear actuators are adjusted and secured by manufacturer and should not be adjusted.

C. Adjust Up and Locked Switches 421C0001 Thru 421C0800.

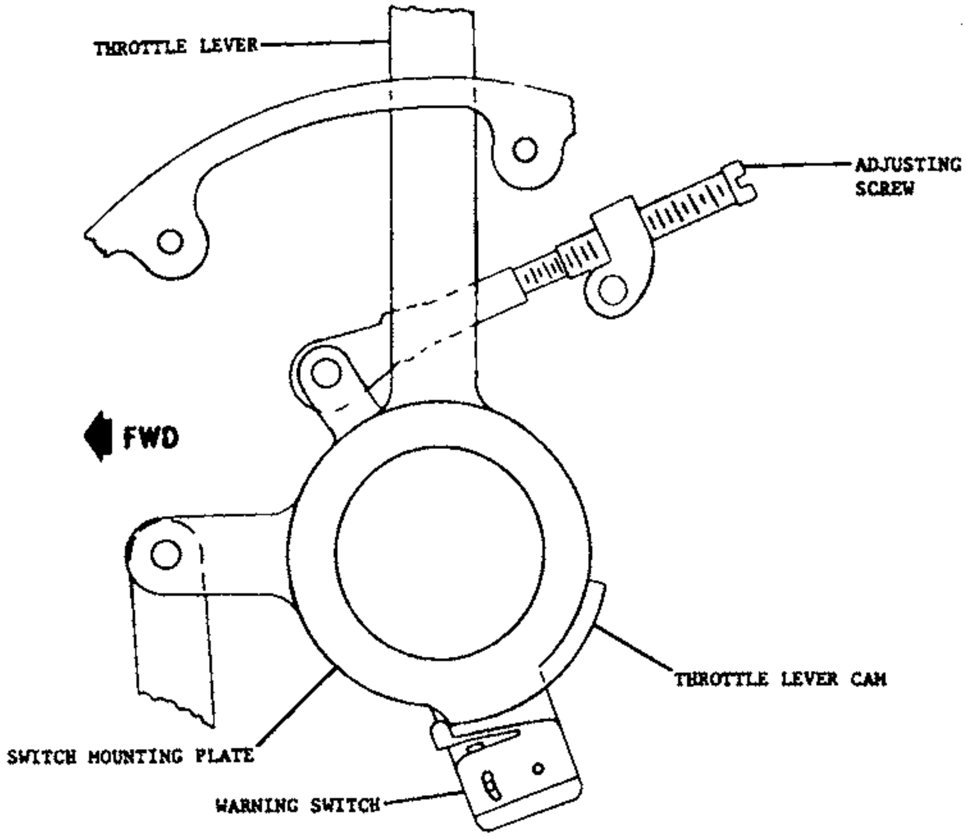
(1) The nose and main gear uplock switches are mounted in the uplock hooks and must be adjusted as follows:
(a) Operate landing gear to up position and turn off hydraulic power.
(b) Adjust main and nose gear uplock switches to provide a minimum dimension as shown in Figure 4.
(c) Operate gear to down position and cycle gear up and down and ensure proper operation of switches.
(d) Ensure backup nuts are tight and safety wired to each other.

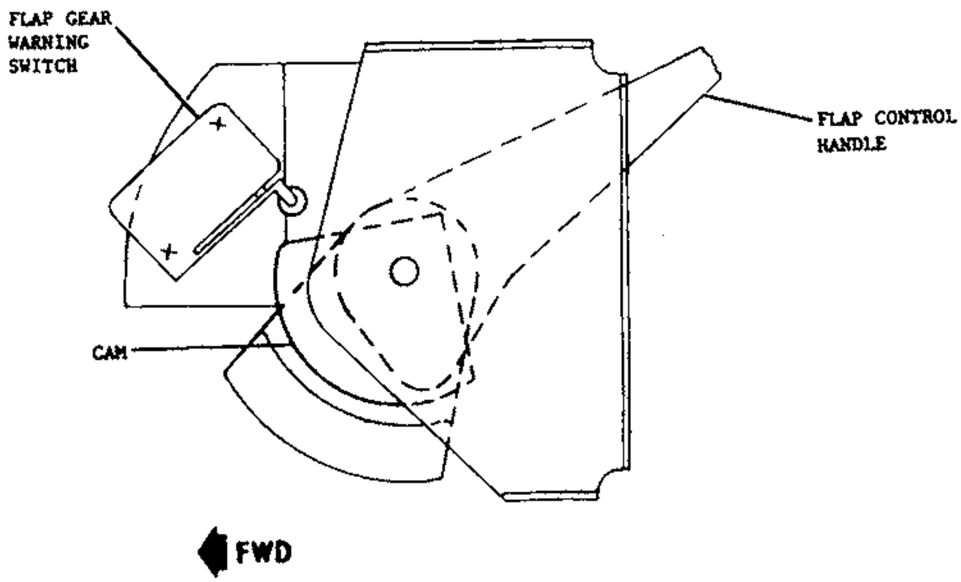
D. Adjust Up and Locked Switches 421C0801 and On.

(1) The nose and main gear uplock switches are mounted in the uplock hooks and must be adjusted as follows:
(a) Operate landing gear to up position and turn off hydraulic power.
(b) Adjust main and nose gear uplock switch to provide a minimum dimension as shown in Figure 4.
(c) Operate gear to down position and cycle gear up and down and ensure proper operation of switches.
(d) Ensure backup nuts are tight and safety wired to each other.



Position Switch Adjustment
Figure 4





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Warning Switch Adjustment
Figure 5

E. Adjust Landing Gear Safety Switch 421C0001 Thru 421C0800.
(1) A safety switch is mounted on LH main gear upper torque link and is actuated by the position of the strut.
(2) Jack airplane. Refer to Chapter 1.
(3) Place an axle jack under axle and raise strut to 0.75, +0.75, 0.12 inches from full extended position. Adjust switch to actuate at this position.

NOTE

To ensure that switch is actuating within the prescribed limits, refer to Chapter 13 and make a continuity check of safety switch.

(4) Tighten nuts on switch and safety wire nuts together.
(5) Remove jacks.

F. Adjust Landing Gear Safety Switch 421C08001 and On.

NOTE

A safety switch is mounted on left main gear trunnion at the bottom in a switch bracket. The switch is actuated by the position of the shock strut.

(1) Jack airplane (until tires clear the ground). Refer to Chapter 1.
(2) Disconnect the battery.
(3) Locate electrical wire "G7A20" at the landing gear control switch (on instrument panel). Refer to Landing Gear Wiring Diagram in Chapter 13.
(4) Connect ohmmeter to electrical wire "G7A20" at the landing gear control switch terminal then to structural ground to check for continuity between these points.
(5) Ensure bolt head that actuates safety switch is positioned properly with slot in the head aligned in an inboard outboard directions.
(6) Cut safety wire on safety switch lock nut and discard.
(7) Back nuts off so actuator of switch does not make contact with blot head.
(8) Adjust lock nuts to bring safety switch to a point where actuation of safety switch just occurs. This is a point where continuity appears on ohmmeter.
(9) Turn lock nuts one (1) full turn (to bring safety switch down, increases engagement) and tighten lock nuts.
(10) Lower airplane to ground. Ensure no continuity exists as left main gear tire contacts ground.
(11) Safety wire the safety switch lock nuts.
(12) Disconnect ohmmeter and secure wire bundle as required.
(13) Reconnect battery.
(14) Jack airplane and perform Landing Gear Operational Check in Chapter 4-00.
(15) Lower airplane to ground and remove jacks.

3. Adjustment Warning Switches (See Figure 5).

A. Adjust Throttle Switch.

NOTE

To properly adjust the throttle microswitch, it is necessary to fly the airplane. As a preliminary adjustment before flight, adjust microswitch to actuate when the aft edges of the throttle levers are approximately 3/4 inch from the fully closed position.

(1) Obtain a pressure altitude of 2500 feet.
(2) Adjust propeller pitch levers to obtain 1900 rpm on both engines.
(3) Place mixture levers in FULL RICH.
(4) Retard throttle levers to obtain 13 to 15 inches of manifold pressure.

NOTE

If throttle levers are retarded below the specified manifold pressure, advance them and repeat the retarding procedure.

(5) Using a pencil, tape, or other suitable means of marking, index the position of the throttle levers on the control quadrant.

NOTE

The remainder of the adjusting procedure must be accomplished with the airplane on the ground.

(6) Jack airplane. Refer to Chapter 1.
(7) Fully advance throttle levers, then retard to the position marked on the control quadrant during flight.

(8) Adjust the throttle microswitch to actuate at this position. Turn battery switch ON and check that warning horn sounds as throttle levers are retarded to this position, then turn battery switch OFF.

NOTE: Elongated slots are provided for vertical adjustment and an adjusting screw positions the microswitch horizontally.

B. Adjust Flap Gear Warning Switch.

(1) Turn off electrical power.
(2) Fully advance throttle levers.
(3) Position flap preselect lever to 16°, +2° -0°.
(4) Loosen screws and adjust switch to operate at this position. A definite click should be felt when switch actuates.
(5) Tighten screws and turn electrical power on.
(6) Operate the landing gear to full up position. Refer to Landing Gear Operational Check.
(7) Operate flaps to full down position and note flap position when warning horn sounds.

NOTE: Anytime the flap preselect lever is placed below the 15° detent, the landing gear warning horn should sound when the flaps reach 16°, +2° -0° travel.

(8) It may be necessary to repeat steps (4) through (7) to properly adjust the landing gear warning system.
(9) After microswitch adjustment is completed, place throttle levers in the CLOSED position and the mixture levers in IDLE CUT-OFF.
(10) Complete landing gear operational check.

CHAPTER

5

FLIGHT CONTROLS

TABLE OF CONTENTS

COMPONENTS LOCATION CHART
Flight Controls

Components	Location
Elevator Trim Tab Actuator	In Horizontal Stabilizer
Flap Actuator	Under Floorboards, Aft of Rear Spar
Flap Limit Switch	Flap Actuator Bracket
Rudder Trim Tab Actuator	In Vertical Fin
Aileron Trim Tab Actuator	In Wing Forward of Aileron Tab

FLIGHT CONTROLS

Description

1. The flight controls consist of the control surfaces, trim control surfaces, indicating, and the related mechanical and electrical systems that control the airplane during flight. For information on autopilot system, refer to Chapter 14.

2. Control Surfaces.

   WARNING: UPON COMPLETION OF ALL CONTROL SYSTEM INSTALLATIONS AND/OR RIGGING, ENSURE THAT ALL BOLTS, NUTS, FITTINGS, CONNECTIONS, ETC., ARE TIGHTENED AND SECURED PROPERLY.

   A. The control surfaces and their locations are listed as follows:

Control Surface	Location
Ailerons	Outboard trailing edge of each wing
Elevators	Trailing edge of horizontal stabilizer
Rudder	Trailing edge of vertical stabilizer
Flaps	Trailing edge of each wing, inboard of ailerons

   B. The ailerons provide lateral control of the airplane and are operated mechanically by control wheel movement. A trim tab control mechanically operates a trim tab attached to the trailing edge of left aileron. The trim tab provides aerodynamic movement of the aileron.

   C. The elevators provide longitudinal control of the airplane and are operated mechanically by fore and aft movement of the control wheel. A trim tab is located on the trailing edge of the right elevator. A trim tab control mechanically operates the trim tab.

   D. The rudder provides directional control of the airplane about the vertical axis and is controlled mechanically by the rudder pedals. A trim tab is located on the rudder trailing edge. A trim tab control mechanically operates the trim tab.

   E. The flaps increase the lift of the wing when partially extended during takeoff or landing approach and increase drag to reduce speed when fully extended during landing. The flaps are actuated electrically and controlled mechanically by the preselect cable and flap control lever.

3. Trim Control Surfaces

   A. The aileron trim tab is an adjustable trim control surface that provides a means of adjusting the aerodynamic characteristics of the main control surfaces. Aileron trim is obtained by rotating the aileron trim control knob on the control pedestal.

   B. Rudder trim is obtained by rotating the rudder trim control wheel on the control pedestal. The rudder trim tab is moved so that aerodynamic forces on the tab move the rudder to the selected trim position. The rudder trim tab operates as a servo tab when the rudder is deflected from trail position. When operating as a servo tab, the trim tab will deflect approximately one-half the angle of rudder deflection, but in the opposite direction. The servo tab function operates as a mechanical boost tab.

C. Elevator trim is obtained by rotating the elevator trim control wheel on the control pedestal. The elevator trim tab is adjusted so that aerodynamic forces on the tab moves the elevator to the selected trim position. Electric elevator trim (optional) may be installed on the airplane. Electric elevator trim is obtained by actuating the trim switch on the pilot's control wheel. Electric elevator trim override may be obtained manually by rotating the elevator trim control wheel on the control pedestal.

D. A yaw damper system (optional) may be installed on the airplane. The system is electrically operated and the actuator cables attach to the rudder bellcrank. The system when actuated dampens the yaw rate of the aircraft.

4. Indicating Systems

A. Mechanical indicators on the control pedestal show the amount of trim selected on the aileron, rudder, and elevator trim surfaces.

B. The flap position indicator on the instrument panel shows the position of the flaps and have preselected stops at the 15°, 30° and 45° positions.

AILERON, AILERON TRIM AND CONTROL SYSTEM

Description

1. The aileron system consists of. the control wheels, bellcrank, interconnect assembly, wing quadrant assembly, ailerons and the cable assemblies. The ailerons are attached to the rear spar of each wing outboard of the flaps. When either control wheel is rotated, the interconnect assembly transmits the wheel rotation by cables to the bellcrank in the fuselage, rotating the bellcrank. The bellcrank rotation is transmitted by cables to the quadrant assemblies of each wing, which positions one aileron up and the opposite aileron down. Stop bolts located on the quadrant plate assembly prevent overtravel of the ailerons.

2. An aileron rudder interconnect system is utilized to interconnect the rudder control system and aileron control system. Whenever the rudder pedals are moved the aileron will move to correspond with the rudder pedal movement.

3. The aileron trim tab system consists of: one trim tab on the trailing edge of the left aileron; the aileron trim control knob and mechanism on the pedestal; system control cables and actuator. The system is controlled mechanically by a control knob on the lower face of the pedestal. When the control knob is rotated, the cable system transmits the control knob movement to the trim tab actuator. As the actuator sprocket rotates, an internal screw in the actuator rotates, driving the actuator screw to push the trim tab up or down. Stop blocks, in the wing between Wing Station 115.92 and Wing Station 151.79 prevent overtravel of the trim tab.

CAUTION: PRIMARY AND SECONDARY FLIGHT CONTROL CABLES, PUSH-PULL TUBES, BELLCRANKS AND MOUNTINGS USE DUAL LOCKING FASTENERS. THE LOCK NUTS FOR THESE FASTENERS INCORPORATE A FIBER LOCK, AND ARE CASTELLATED FOR SAFETYING WITH A COTTER PIN. WHEN ANY OF THESE AREAS ARE DISCONNECTED, NEW DUAL LOCKING FASTENERS SHOULD BE INSTALLED. SEE THE AIRCRAFT PARTS CATALOG FOR PART NUMBERS AND LOCATION OF THESE FASTENERS.

Troubleshooting

1. Troubleshooting the aileron and trim tab system is accomplished initially by determining whether the trouble exists in the aileron control system or the aileron trim control system. See Figures 1 and 2 for Troubleshooting Chart.

2. Tools and Equipment.

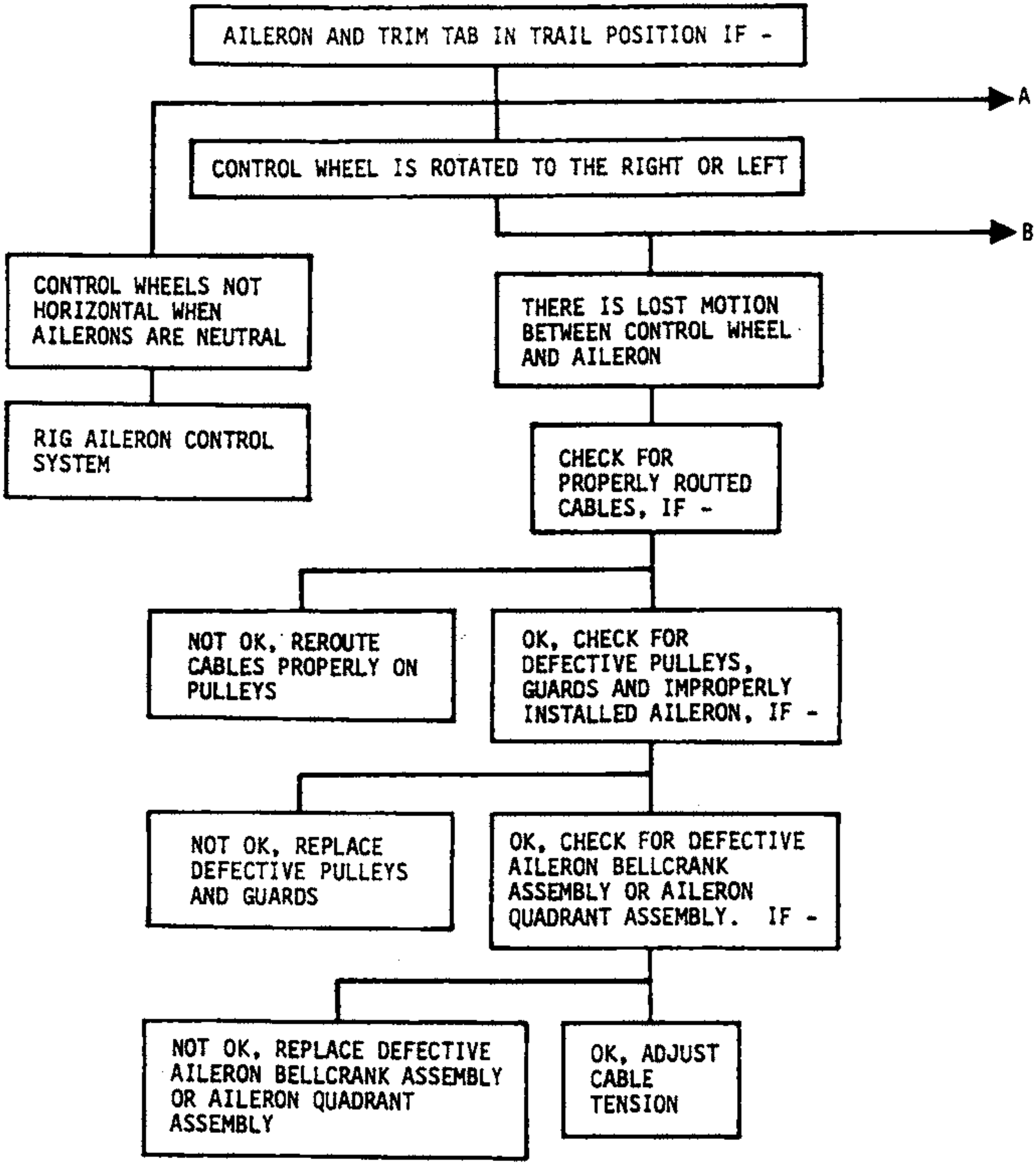
NOTE: EQUIVALENT SUBSTITUTES MAY BE USED INSTEAD OF THE FOLLOWING LISTED ITEMS.

Name	Number	Manufacturer	Use
Inclinometer KELL-STROM "PRO 360"	518831	KELL-STROM TOOL INC 214 Church Street Wethersfield, CT SA 06109	To measure travel of control surfaces.
Tensiometer	T5-2002-0101	Pacific Scientific Co. Kin-Tech Division 1346 S. State College Blvd. Los Angeles, CA 92803	To measure cable tension.

Adjustment/Test

1. Tools and Equipment.

NOTE: REFER TO TROUBLESHOOTING FOR TOOLS AND EQUIPMENT REQUIREMENTS.



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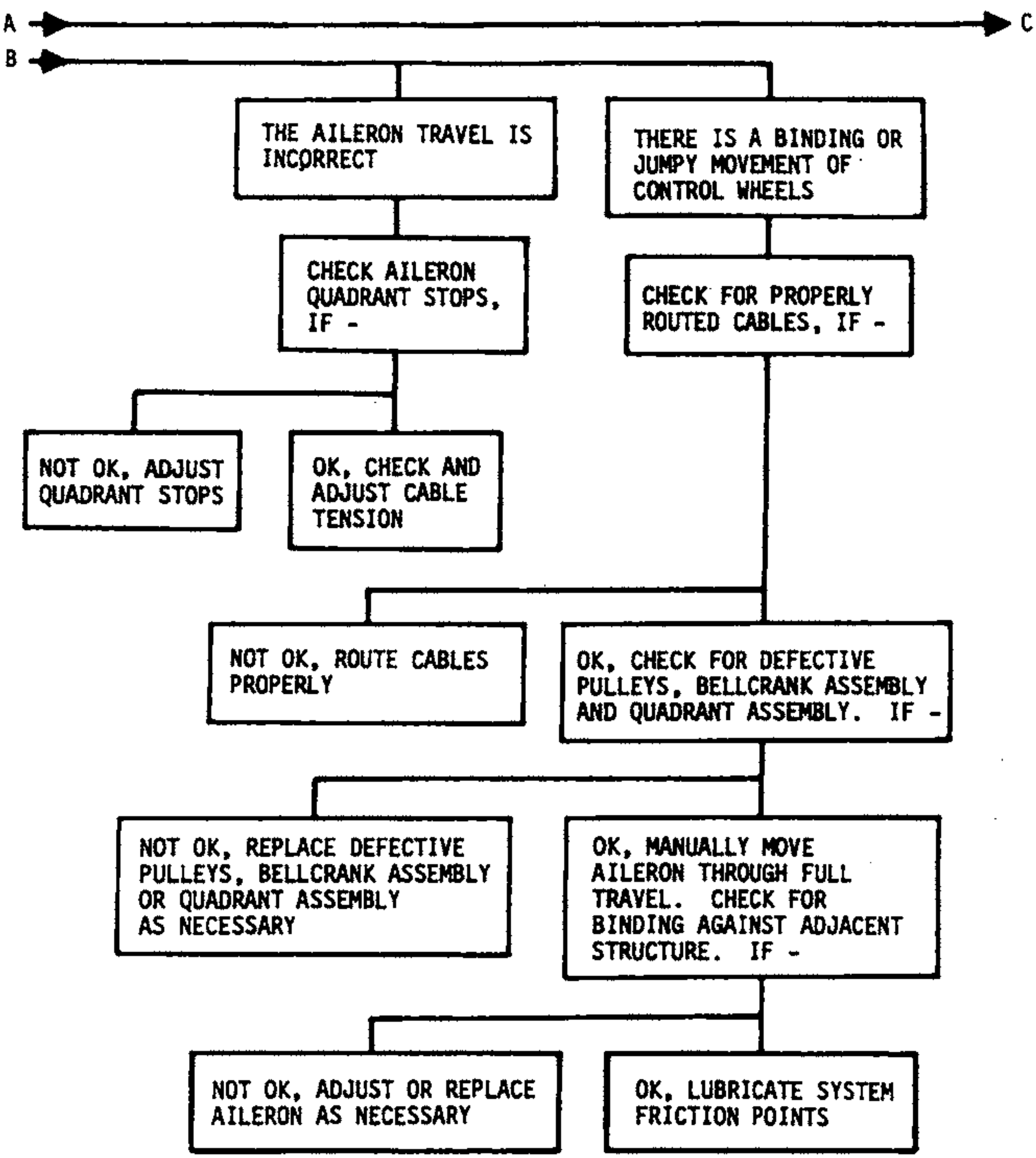
Troubleshooting - Aileron Control System
Figure 1 (Sheet 1)



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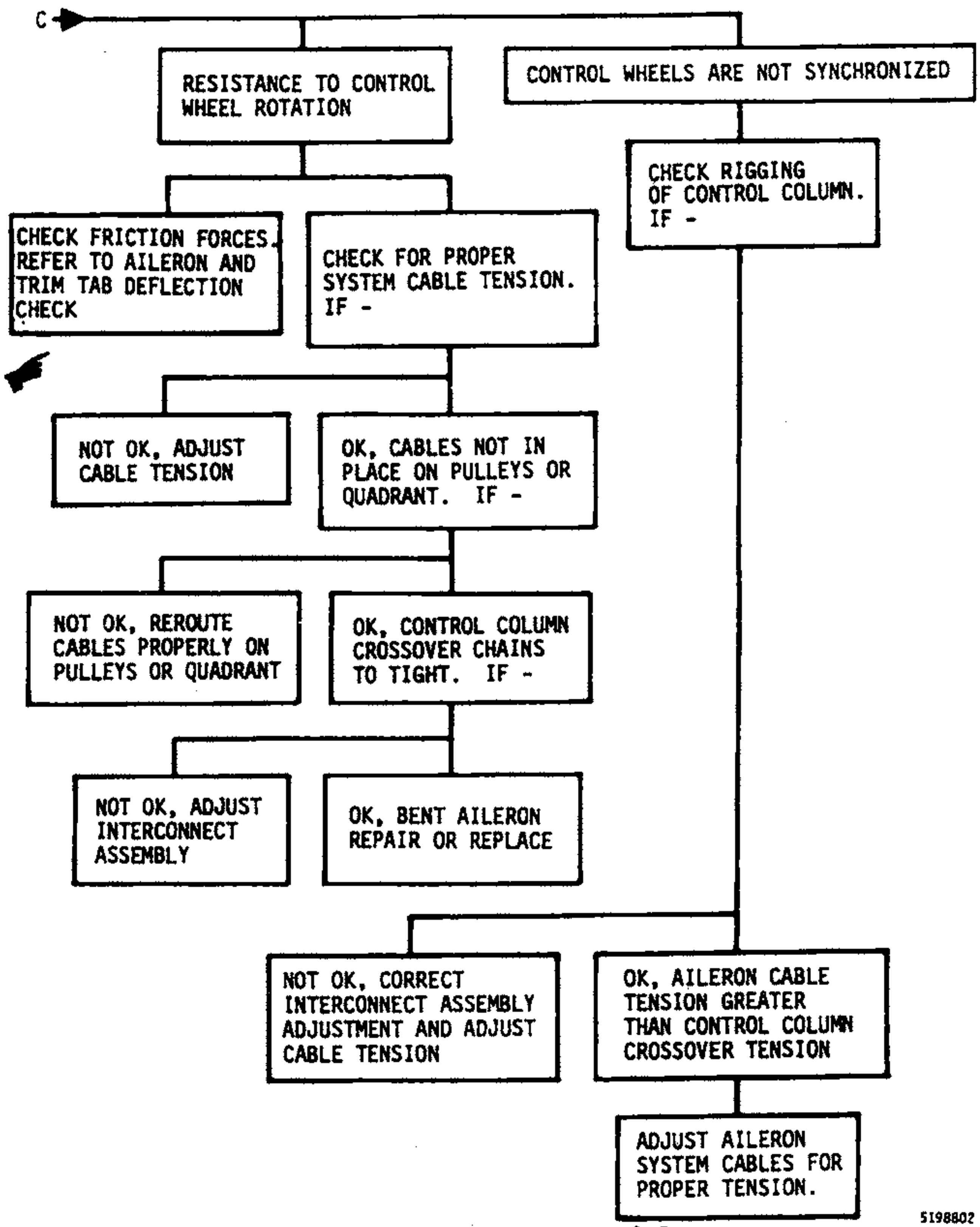
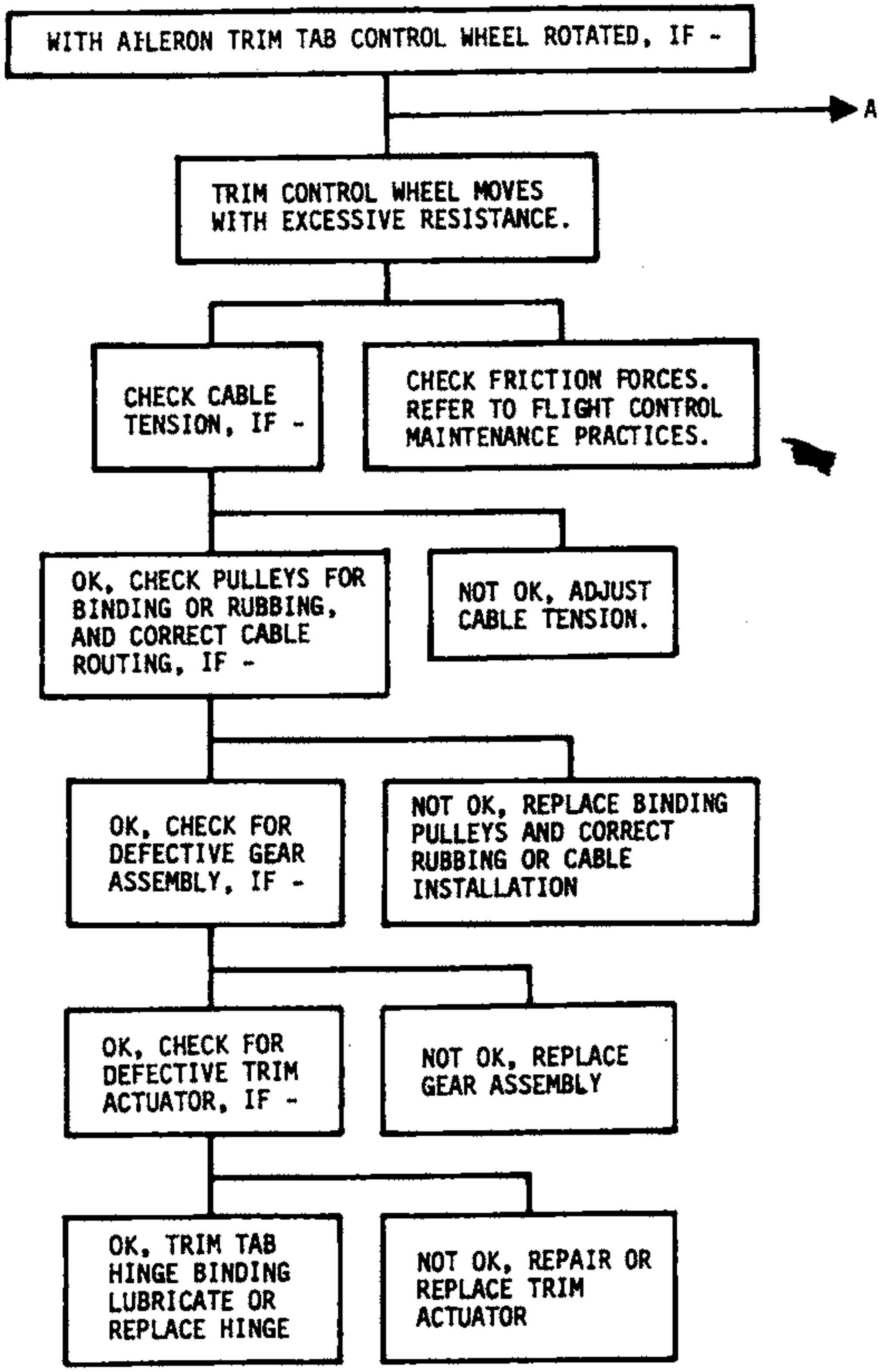
Troubleshooting - Aileron Control System
Figure 1 (Sheet 2)



Troubleshooting - Aileron Control System
Figure 1 (Sheet 3)



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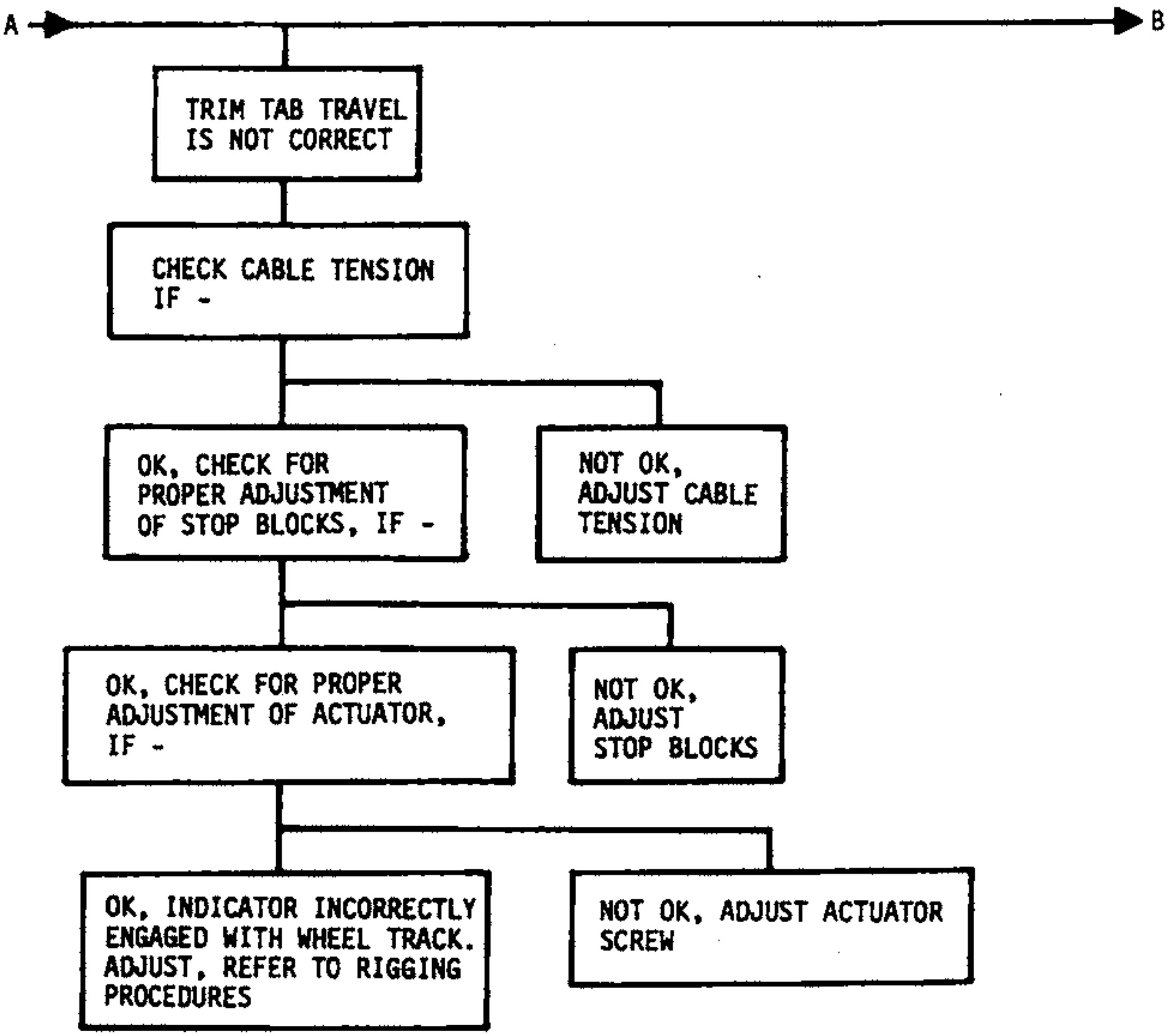
Troubleshooting Chart - Aileron Trim Control System
Figure 2 (Sheet 1)



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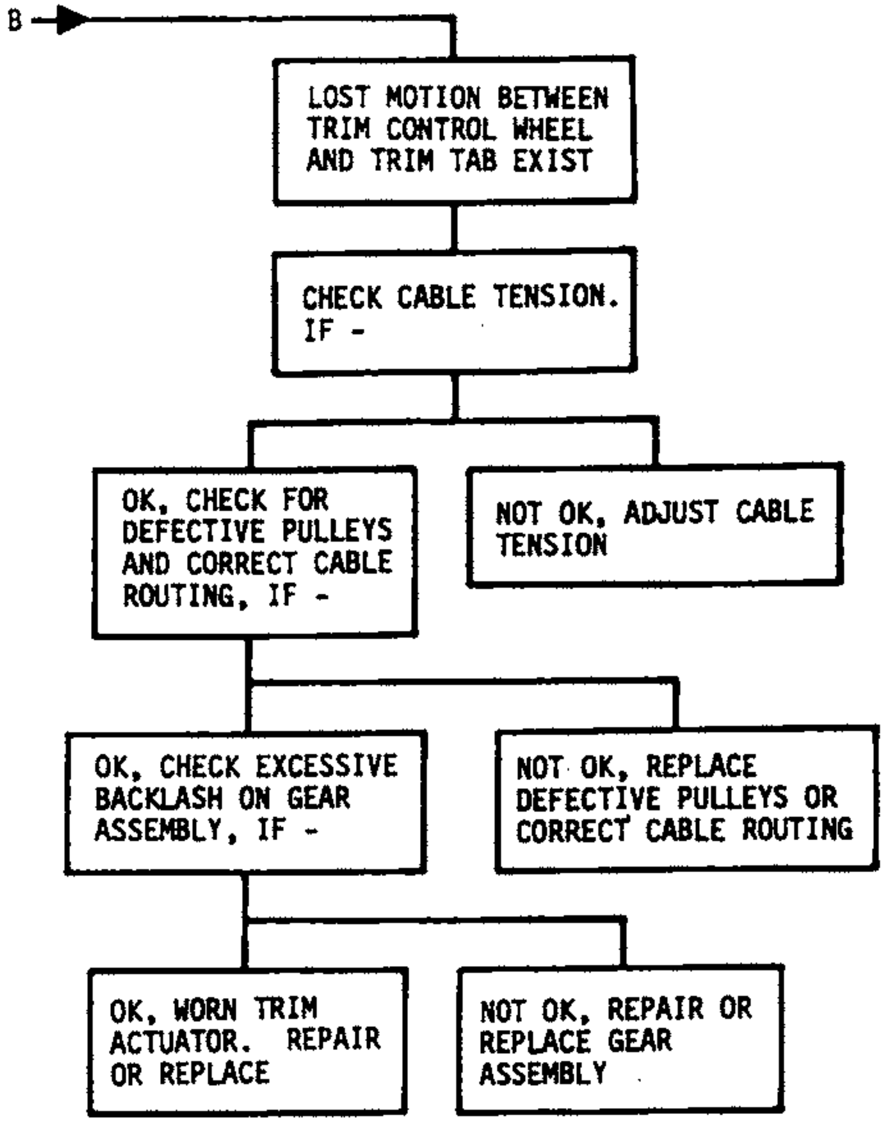
Troubleshooting Chart - Aileron Trim Control System
Figure 2 (Sheet 2)



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Troubleshooting Chart - Aileron Trim Control System
Figure 2 (Sheet 3)

2. Rigging Aileron Control Column Interconnect Assembly (See Figure 3).

   A. Install control lock in left control column. Ensure left and right control wheels are in neutral position by placing a trammel bar on top of both control wheels and taping bar in place.
   B. Check and/or adjust length of interconnect assembly to provide 16.10 inches of span, measuring from center to center of clevis holes.
   C. If interconnect assembly is not adjusted properly, proceed as follows:
      (1) Loosen turnbuckle on chain and remove chain from control column sprockets.
      (2) Align interconnect assembly with control column sprockets.
      (3) Engage chain evenly on sprockets.
      (4) Tighten turnbuckle and install turnbuckle clip.

      NOTE: When tightening turnbuckle, chain tension should not exceed the minimum necessary to remove excess slack.

   D. Rig Aileron Control System.

3. Rigging Aileron Control System (See Figure 6).

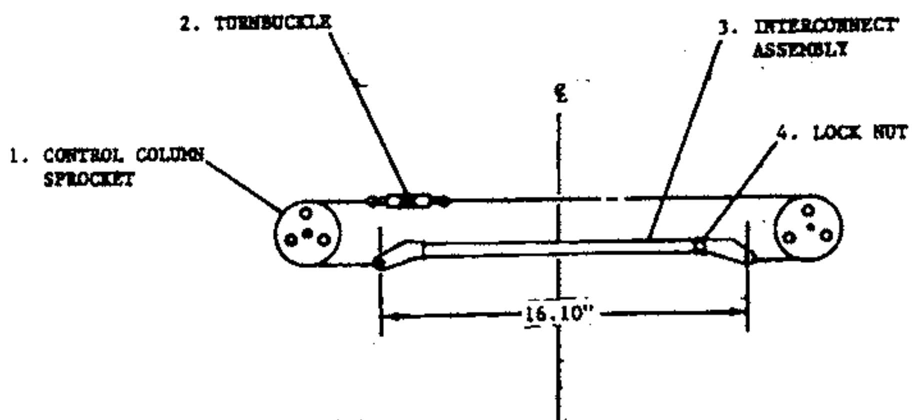
   A. Remove floor panel for access to aileron turnbuckles and bellcrank.
   B. Place pilot's control wheel in neutral position and install control column lock.

   NOTE: The next step may be omitted if copilot's control wheel is aligned in neutral position with pilot's control wheel.

   C. If pilot and copilot control wheels are not aligned in neutral position, align control wheels in accordance with Rigging Aileron Control Column Interconnect Assembly.
   D. Loosen clamps and slide blocks attaching springs to aileron cables so aileron cable tension may be obtained.
   E. Loosen fuselage and wing aileron cable turnbuckles to provide free swivel of bellcrank in fuselage.

      (1) Fair LH and RH aileron inboard trailing edge to wing trailing edge and block aileron from inboard side.

   F. Adjust fuselage aileron cables as necessary to bring bellcrank in fuselage to neutral position.



CAUTION: UPON COMPLETION OF RIGGING, ENSURE THREADS OF INNERCONNECT ROD ARE VISIBLE IN SLOT ON TOP OF CLEVIS.

51611017

Interconnect Assembly Adjustment
Figure 3

G. Rig fuselage aileron cable tension. Refer to Chapter 1, General Information.

NOTE: Cable tension should be adjusted when ambient temperature is 65°F to 95°F. Allow airplane temperature to stabilize for a period of 4 hours.

H. Retain control column lock in place; streamline trailing edge of aileron with trailing edge of wing and secure aileron in place with a temporary locking device.

NOTE: Rig each wing aileron separately.

I. Rig aileron wing cable tension. Refer to Chapter 1, General Information.
J. Remove control column lock and temporary aileron locking device and check ailerons for neutral position.
K. Adjust stop bolts on aileron quadrant plate to provide proper travel. Refer to Chapter 1, General Information. Tighten stop bolt jamb nuts and safety wire.

NOTE: When the up and down travel limits cannot be obtained, the opposite aileron wing quadrant stop bolts may require adjustment.

L. With nose wheel, aileron and rudder control system in neutral position, secure clamps and slide blocks with spring attached to aileron cables, such that there is no initial load on the spring. Depress rudder pedals and ensure spring is completely enclosed in guide tube when spring is stretched. Spring engagement is controlled by adjusting the clamp on the aileron cable.
M. Install turnbuckle clips on turnbuckles of aileron cable system.

WARNING: ENSURE THAT AILERONS MOVE IN THE PROPER DIRECTION WHEN OPERATED BY THE CONTROL WHEEL. ROTATE CONTROL WHEEL FOR A LEFT TURN, LEFT AILERON UP AND RIGHT AILERON DOWN. ROTATE CONTROL WHEEL FOR RIGHT TURN, RIGHT AILERON UP AND LEFT AILERON DOWN.

N. Install floor panels.

4. Rigging Aileron Trim Cables (Refer to Figure 7).

A. Remove floor panel above aileron trim cable turnbuckles.
B. Position the aileron trim indicator to neutral by rotating control knob.
C. Align trim tab for neutral position as follows:
   (1) Remove cotter pin (15), nut (14), washer (16) and bolt (20) attaching pushrod (19) to trim tab (17).
   (2) Set trim tab to neutral position and adjust the screw in actuator (21) so that the attaching holes in the pushrod (19) align with the attaching hole in the hinge bracket of the trim tab (17).
   (3) Attach pushrod (19) to trim tab (17) with bolt (18), washer (16), nut (14). Torque nut (14) to 20-25 inch-pounds and install cotter pin (15).
D. Check that chains at actuator and trim control assembly are evenly distributed on sprockets.
E. Alternately adjust cable tension at turnbuckles to obtain proper cable tension. Refer to Chapter 1, General Information. Safety turnbuckles.

CAUTION: ON 421C0907 AND ON, ENSURE THAT CHAINS AT ACTUATOR AND TRIM CONTROL ASSEMBLY ARE EVENLY DISTRIBUTED ON THE SPROCKETS PLUS OR MINUS ONE LINK AT THE NEUTRAL TAB POSITION.

NOTE: Cable tension should be adjusted when ambient temperature is 65°F to 95°F. Allow airplane temperature to stabilize for a period of 4 hours.

NOTE: The trim tab is rigged to neutral position when proper cable tension is obtained with the trim tab in neutral position and the trim tab indicator indicates neutral.

F. Operate flaps to the down position.
G. Loosen stop blocks (1), position center stop block approximately 11.30 inches inboard from rib at Wing Station 151.79 and secure on the upper cable. Position the outboard stop block approximately 5.30 inches outboard from the center stop block, and the inboard stop block approximately 5.80 inches inboard from center stop and tighten to bottom cable.
   (1) Rotate control knob to deflect trim tab down. Refer to Chapter 1, General Information. Adjust inboard stop block up against center stop block and secure.

(2) Rotate control knob to deflect the trim tab up. Refer to Chapter 1, General Information. Adjust outboard stop block up against center stop block and secure.

NOTE: If the trim indicator and the trim tab do not align at neutral, proceed with Step (H). If the trim indicator and the trim tab align at neutral proceed to Step (I).

H. Rotate control knob until trim tab is in neutral position.
I. (Refer to Figure 8). Loosen screws (17); lift trim indicator assembly and move trim indicator to nearest gear tooth and match to allow trim indicator to indicate neutral. Tighten screw (17) at trim indicator assembly.

WARNING: ENSURE THAT AILERON TRIM TAB MOVES IN THE PROPER DIRECTION WHEN OPERATED BY TRIM CONTROL WHEEL. ROTATE TRIM CONTROL WHEEL TO THE LEFT, TRIM TAB TRAILING EDGE IS POSITIONED DOWN RELATIVE TO AILERON. ROTATE TRIM CONTROL WHEEL TO THE RIGHT, TRIM TAB TRAILING EDGE IS POSITIONED UP RELATIVE TO AILERON.

J. Install all access and floor panels.

Inspection/Check

1. Tools and Equipment.

NOTE: Refer to Adjustment/Test for Tools and Equipment.

2. Aileron and Aileron Trim Tab Check.

NOTE: Angular dimensions for ailerons and trim tab are measured by placing inclinometer on aileron and trim tab surfaces. The aileron is in neutral position when the trailing edge is streamlined with wing trailing edge. The trim tab is in neutral position when streamlined with the aileron trailing edge.

A. Aileron and Aileron Trim Tab Cable Check.

NOTE: Cable tension should be adjusted when ambient temperature is 65°F to 95°F. Allow airplane temperature to stabilize for a period of 4 hours.

(1) Place ailerons in neutral position. Install control lock.
(2) Place tensiometer on aileron fuselage cables and aileron wing cables and read cable tension.

NOTE: Access to the aileron fuselage and aileron wing cables is gained by removing floor panel at Fuselage Station 186.15.

(3) Place tensiometer on the aileron trim cable and read cable tension.

NOTE: Access to the aileron trim tab cables may be gained by removing the floor panel at Fuselage Station 186.15 or extending flaps.

3. Aileron and Trim Tab Deflection Check.

A. For aileron and aileron trim tab deflection, refer to Chapter 2, Detailed Inspection Procedures.

4. Aileron and Trim Tab Alignment Check During Flight.

A. Conditions.

(1) With fuel loading and wing locker loading laterally balanced, trim the airplane in level flight at an altitude of between 5000 and 15,000 feet at a 75 percent power setting. Ailerons shall be within 0.5 inch above or below the wing trailing edge at the inboard end of the aileron and the trim tab shall be within 0.25 inch above or below the aileron trailing edge at the outboard end of the tab.

(2) Check that control wheel cock is within 2° from level. If optional autopilot is installed, check for proper centering position. Refer to Chapter 14, Autopilot.

NOTE: If the ailerons or trim tab exceed the specified tolerance, confirm that the airplane is laterally balanced. Additionally, it must be confirmed that the ailerons and trim tab, flaps and landing gear doors are properly rigged, and that flap, aileron and trim tab cable tensions are properly adjusted. Check the airplane for any visible damage such as bent or loose skins, worn parts and loose or foreign objects that might cause air turbulence over the control surfaces. Check the trim tab and ailerons to confirm they are not bent or warped.

NOTE: If the ailerons or trim tab exceed the specified tolerance after all of the above checks have been made, contact the Cessna Customer Services Department for disposition instructions.

Maintenance Practices

WARNING: WHEN MAINTENANCE IS PERFORMED ON ANY FLIGHT CONTROL SYSTEM OR FLIGHT CONTROL TRIM SYSTEM REQUIRING REMOVAL/INSTALLATION OF CABLES, ENSURE CABLES ARE NOT CROSSED DURING CABLE REINSTALLATION.

1. Removal/Installation Aileron (Refer to Figure 4).

   NOTE: Removal and installation procedures are for left aileron; right aileron is typical except right aileron does not incorporate a trim tab.

   A. Remove Aileron.

      (1) Extend flaps.
      (2) (Refer to Figure 7.) Remove cotter pin (15), nut (14), washer (16) and bolt (18) connecting push rod (19) and trim tab (17).
      (3) Disconnect bonding strap (2) from aileron by removing attaching screw.
      (4) Cut safety wire and remove bolt (3) attaching aileron to hinge (1).

      CAUTION: SUPPORT AILERON WHEN HINGE BOLT IS REMOVED.

      (5) Move aileron aft, clearing hinge (1), and slightly inboard until outboard hinge pin (6) is free of bearing.

   B. Install Aileron.

      (1) Guide aileron trim tab push rod through opening in aileron.
      (2) Insert hinge pin (6) in outboard bearing.
      (3) Insert yoke (16) in aileron quadrant.
      (4) Secure aileron to hinge (1) with bolt (3). Safety wire bolt.

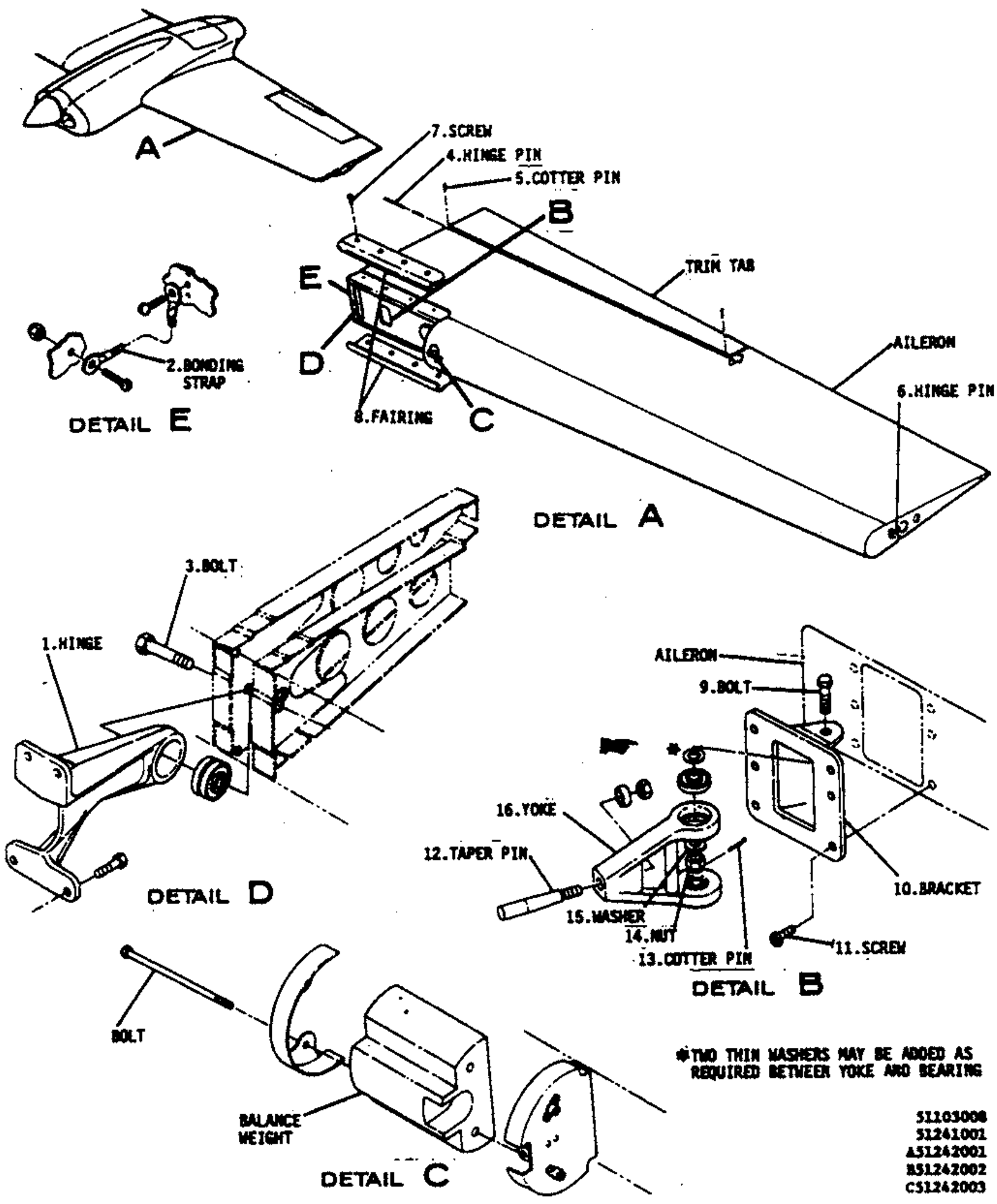
      NOTE: Use AN960-416 or AN960-416L washers as required to align hinge bearing.

      (5) Secure bonding strap (2) with attaching screw.
      (6) (Refer to Figure 7.) Connect push rod (19) to trim tab (17) with bolt (18), washer (16) and nut (14). Torque nut (14) to 20-25 inch-pounds and install cotter pin (15).
      (7) Check aileron and trim tab for proper operation clearances and correct travel. If necessary, rig aileron and aileron trim tab. Refer to Adjustment/Test and refer to Figure 9.

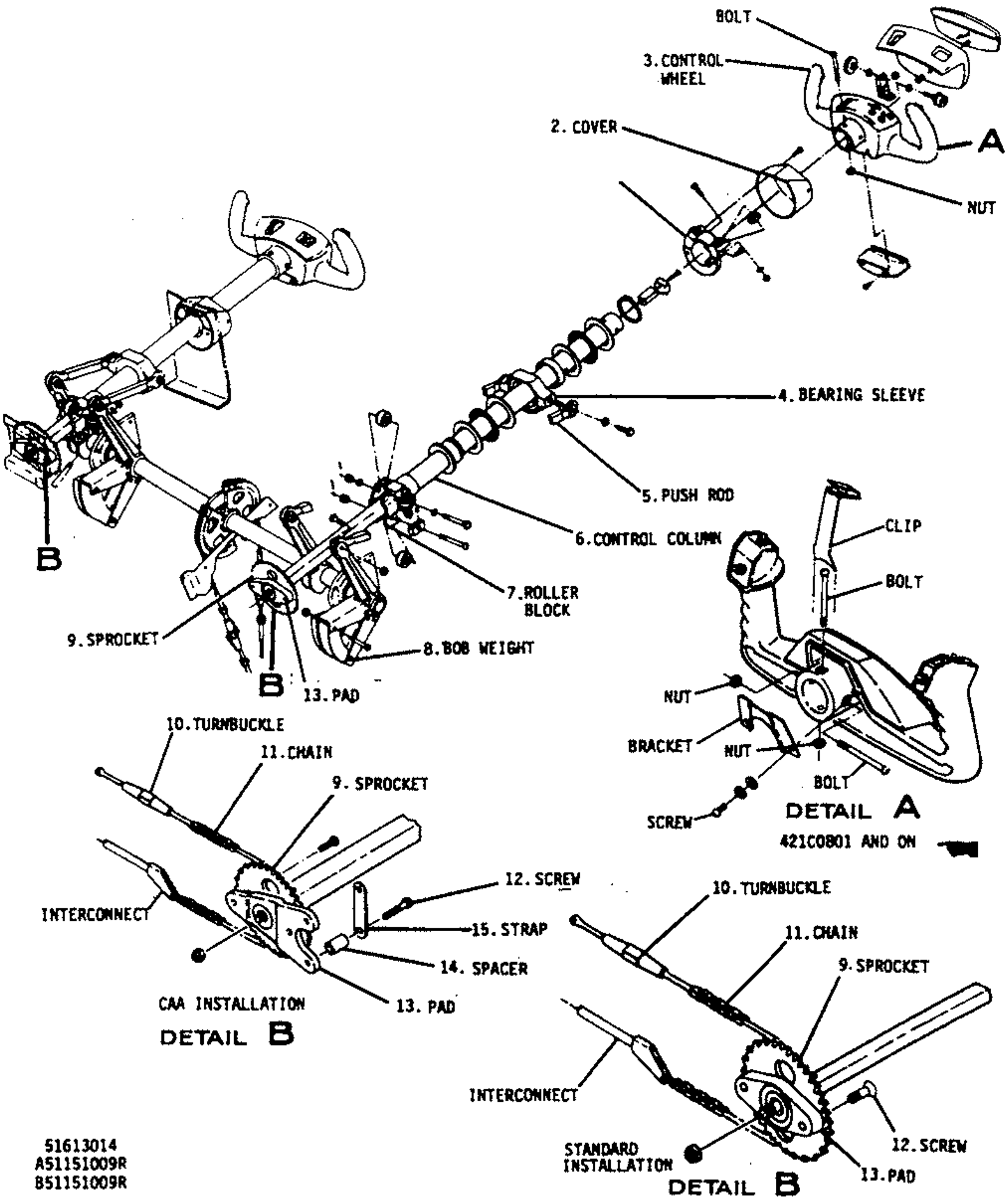
2. Removal/Installation Aileron Yoke Assembly (Refer to Figure 4).

   A. Remove Aileron Yoke Assembly.

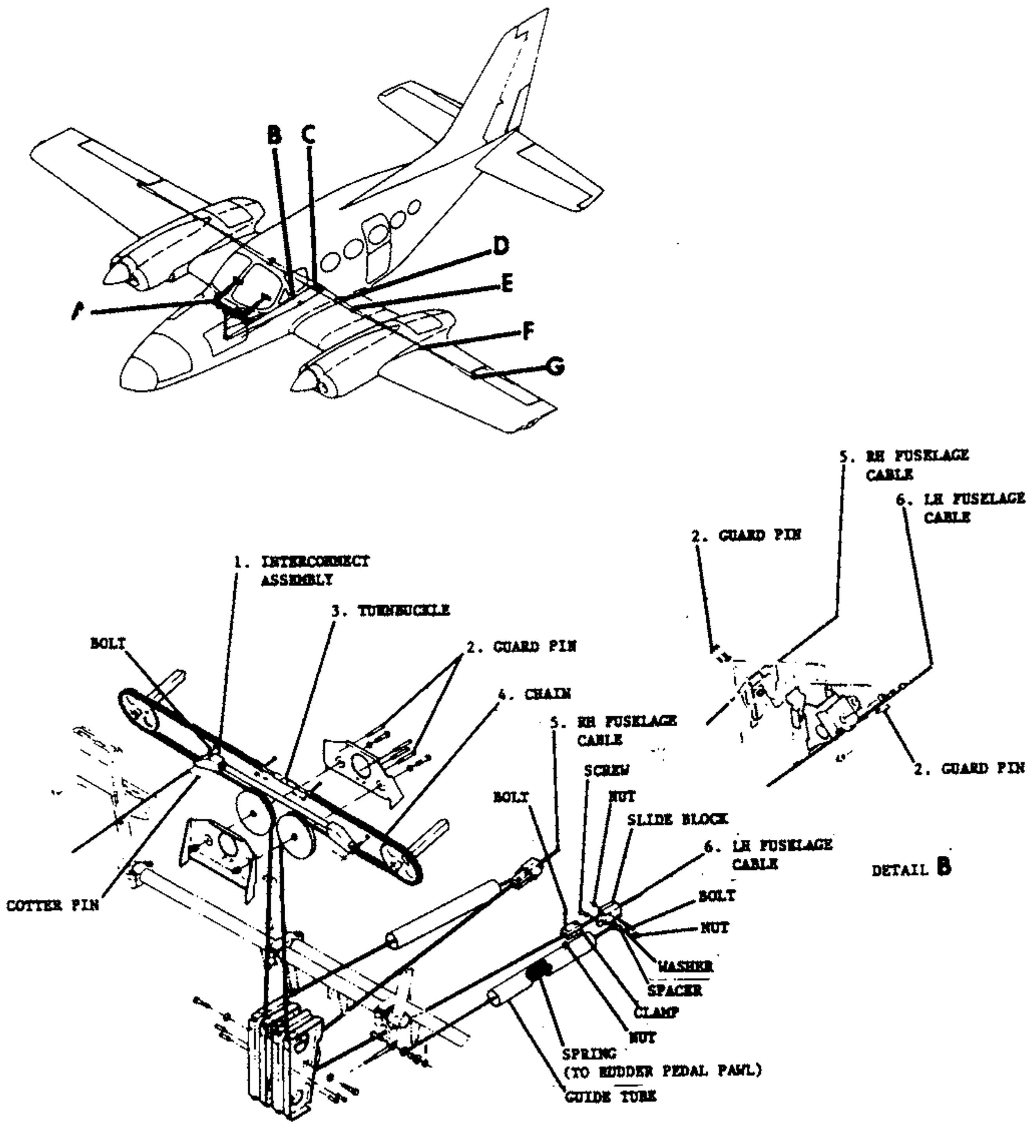
      (1) Remove aileron; refer to Removal/Installation Aileron.
      (2) Remove screws (7) and remove upper and lower fairings (8).
      (3) Remove screws (11) securing bracket (10) to aileron.
      (4) Remove bracket (10) and yoke (16) from the aileron.
      (5) If desired, disassemble yoke (16) from bracket (10) by removing cotter pins (13), nuts (14), washers (15) and bolts (9).



Aileron and Trim Tab Installation
Figure 4



Control Column Installation
Figure 5



DETAIL A

*NOTE: THREADS ON END OF INTERCONNECT ROD MUST BE VISIBLE IN SLOT OF CLEVIS ON AIRPLANES 421C0892 AND ON.

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B51611019
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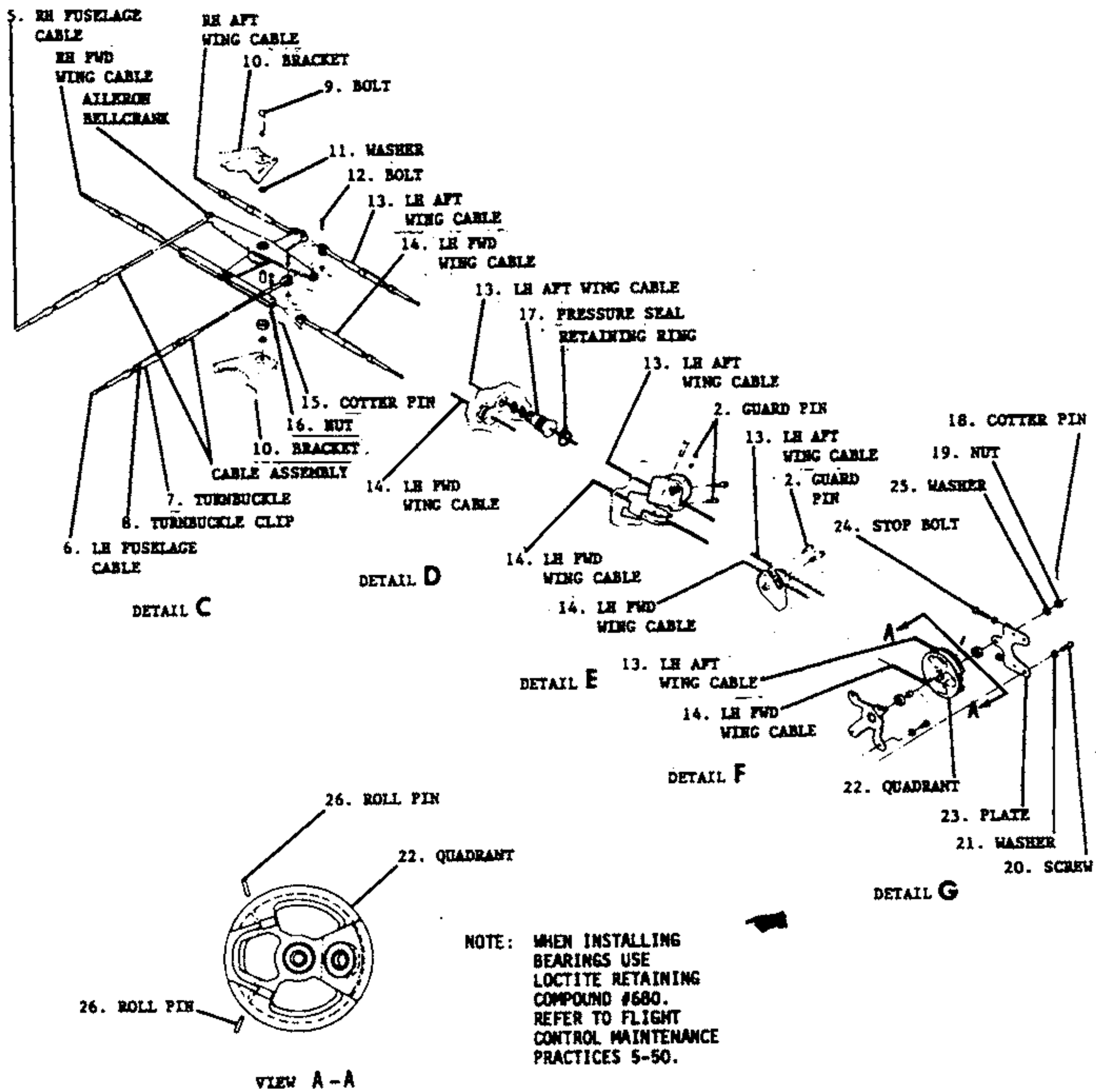
Aileron Control System
Figure 6 (Sheet 1 of 2)



NOTE: WHEN INSTALLING BEARINGS USE LOCTITE RETAINING COMPOUND #680. REFER TO FLIGHT CONTROL MAINTENANCE PRACTICES 5-50.

C51613016
D51611021
E51611018
F51611020
G51612009
51611039

Aileron Control System
Figure 6 (Sheet 2)

B. Install Aileron Yoke Assembly.

(1) If yoke (16) was removed from bracket (10), reinstall as follows:
   (a) Install yoke (16) in bracket (10) using bolts (9), washers (15), nuts (14) and cotter pins (13).
(2) Install bracket (10) on aileron and secure with screws (11).
(3) Install upper and lower fairings (8) on aileron and secure with screws (7).
(4) Install aileron; refer to Removal/Installation Aileron.
(5) Check aileron and trim tab for proper operation and correct travel. If necessary, rig aileron and aileron trim tab; refer to Adjustment/Test.

3. Removal/Installation Control Wheel (Refer to Figure 5).

A. Remove Control Wheel.

(1) Ensure electrical power is turned OFF.
(2) Disconnect electrical wiring to control wheel (3).
(3) Remove nuts and bolts securing control wheel (3) to control column (6). Remove control wheel.

B. Install Control Wheel.

(1) Secure control wheel (3) to control column (6) with bolts and nuts.
(2) Reconnect electrical wiring to control wheel (3).

NOTE: Two thin washers may be added as required between yoke and bracket to remove freeplay.

4. Removal/Installation Control Column (Refer to Figure 5).

A. Remove Control Column.

(1) Ensure electrical power is turned OFF.
(2) Remove instrument panels as required, refer to Chapter 10.
(3) Position crew seats to the most aft position.
(4) Remove control wheel (3), refer to Removal/Installation Control Wheel.
(5) Remove screws (12) securing pad (13) to bracket.
(6) Remove safety and loosen turnbuckle (10) to relieve tension on chain, remove chain (11) from sprocket (9).
(7) Disconnect push rod (5) from bearing sleeve (4) by removing bolt and washer.
(8) Remove screws, washers and nuts retaining cover (2) and support block (1) to instrument panel.
(9) Compress control column (6) and remove by lifting upwards and to the rear until the stationary instrument panel is cleared.

B. Install Control Column.

(1) Compress control column together and insert into slot provided in the stationary instrument panel.
(2) Attach support block (1) and cover (2) to stationary panel with screws, washers and nuts.
(3) Extend control column (6), align pad (13) with bracket attached to bulkhead and secure with screws (12).
(4) Connect push rod (5) to bearing sleeve (4) with bolts and washers.
(5) Install control wheel, refer to Removal/Installation Control Wheel.
(6) Place chain (11) on sprocket (9) and rig Control Column Interconnect Assembly, refer to Adjustment/Test.
(7) Install instrument panels, refer to Chapter 10, Instrument Panel.

5. Removal/Installation Aileron Bellcrank (Refer to Figure 6).

A. Remove Aileron Bellcrank.

(1) Remove cabin floor panel as required to gain access to the aileron bellcrank assembly and aileron fuselage cable turnbuckles, refer to Chapter 1.
(2) Relieve cable tension on aileron control system, by removing turnbuckle clips (8) and loosening turnbuckles (7) on fuselage and wing cables at the aileron bellcrank.
(3) Remove cotter pins (15), nuts (16) and bolts (12) from turnbuckle forks attached to the aileron bellcrank.
(4) Remove bolt (9) and washers (11), securing aileron bellcrank to bracket (10). Remove bellcrank.

B. Install Aileron Bellcrank.

(1) Position aileron bellcrank in bracket (10) and secure with bolt (9) and washers (11). Safety wire bolt (9).
(2) Connect turnbuckle forks to aileron bellcrank with bolts (12), nuts (16) and cotter pins (8).

(3) Rig aileron control system, refer to Adjustment/Test.
(4) Safety aileron fuselage and wing cable turnbuckles (7) with turnbuckle clips (8).
(5) Install floor panels.

6. Removal/Installation Aileron Fuselage Cables (Refer to Figure 6).

NOTE: Refer to Flight Control Maintenance Practices.

A. Remove Aileron Fuselage Cables.

(1) Remove floor panels as required, refer to Chapter 1, Airplane Zoning and Access Plates/Panels Identification.
(2) Remove guard pins (2) from fuselage pulleys.
(3) Disconnect spring from guide blocks by removing nuts, washers, spacers and screws.
(4) Remove clamps and slide blocks from aileron cables (5 and 6) by removing nuts and bolts.
(5) Disconnect turnbuckles (7) connecting fuselage cables (5 and 6) to cable assembly at aileron bellcrank.
(6) Attach guide wire to fuselage cable terminals.
(7) Disconnect fuselage cables (5 and 6) from interconnect assembly (1) by removing cotter pin, nut and bolt.
(8) Remove guard pins (2) from fuselage pulley brackets.
(9) Remove fuselage cables (5 and 6) from airplane.

NOTE: Leave the guide wires in the airplane to serve as a guide for cable installation.

B. Install Aileron Fuselage Cables.

(1) Attach guide wires to fuselage cables (5 and 6) and route cables through airplane to aileron bellcrank.
(2) Connect fuselage cables (5 and 6) to cable assemblies, using turnbuckles (7).
(3) Install cable guard pins (2) in fuselage pulley brackets.
(4) Connect fuselage cables (5 and 6) to interconnect assembly (1) using bolts, nuts and cotter pins.
(5) Install clamps and slide blocks on aileron cables (5 and 6) with bolts and nuts. Do not tighten clamps or slide blocks at this time.
(6) Connect springs to slide blocks using screws, spacers, washers and nuts.
(7) Rig aileron control system, refer to Adjustment/Test.
(8) Install turnbuckle clips (8) on turnbuckles (7).
(9) Reinstall floor panels.

7. Removal/Installation Aileron Quadrant (Refer to Figure 6).

A. Remove Aileron Quadrant.

(1) Remove cabin floor panel as required to gain access to the aileron bellcrank.
(2) Relieve cable tension on wing cables (13 and 14) by removing turnbuckle clips (8) and loosening turnbuckles (7) at the aileron bellcrank.
(3) Remove aileron, refer to Removal/Installation Aileron.
(4) Remove cotter pin (18), nut (19) and washer (25), securing quadrant (22).
(5) Remove screws (20) and washers (21) and remove plate (24).
(6) Remove roll pins (26) securing wing cables (13 and 14) to quadrant (22). Tag and remove the wing cables.
(7) Remove quadrant (22) from quadrant support.

B. Install Aileron Quadrant.

NOTE: Prior to installation, the bearings in the quadrant (22) shall be checked for damage, freedom of movement and visible wear. If bearing replacement is required refer to Flight Control Maintenance Practices for Removal/Installation Procedures.

(1) Place quadrant (22) a short distance from the quadrant support. Identify and secure wing cables (13 and 14) to quadrant (22) with roll pins (26).

NOTE: Aileron wing cable (fwd) (14) shall be routed under the bottom of the quadrant and on the forward track. Aileron wing cable (aft) (13) shall be routed over the top of the quadrant and on the aft track. Left quadrant only, right quadrant opposite.

(2) Position quadrant (22) on quadrant support.
(3) Install plate (23) on quadrant support and secure to upper and lower plate supports using washers (21) and screws (20).
(4) Install washer (25), nut (19) and cotter pin (18) on quadrant support bolt.
(5) Install aileron, refer to Removal/Installation Aileron.
(6) Rig aileron control system, refer to Adjustment/Test.
(7) Install turnbuckle clips on turnbuckles.
(8) Reinstall floor panel.

8. Removal/Installation Aileron Wing Cables (See Figure 6).

NOTE: Refer to Flight Control Maintenance Practices.

A. Remove Aileron Wing Cables.

(1) Extend flaps to gain access to wing cable pulleys.
(2) Remove cabin floor panels as required to gain access to aileron bellcrank.
(3) Remove turnbuckle clips (8) and disconnect turnbuckles (7) connecting wing cables (13 and 14) to the aileron bellcrank.

NOTE: The following procedure is for removing wing cables with turnbuckle forks remaining attached to the aileron bellcrank.

(4) Remove aileron, refer to Removal/Installation Aileron.
(5) Remove aileron quadrant, refer to Removal/Installation Aileron Quadrant.
(6) Remove cable pressure seals (17) and cable guard pins.
(7) Attach guide wire to wing cable terminals and remove wing cables (13 and 14). Do not remove guide wires at this time.

B. Install Wing Cables.

(1) Attach guide wires to wing cables (13 and 14) and route cables through wing toward the aileron bellcrank.
(2) Secure wing cables (13 and 14) to turnbuckle forks at aileron bellcrank.
(3) Install cable pulley guard pins.
(4) Install aileron quadrant, refer to Removal/Installation Aileron Quadrant.
(5) Install cable pressure seals (17) as follows:
(a) Fill the pressure seals (17) with lubricant between the serrations with MIL-G-81322A lubricant.
(b) Place the pressure seal on the cables on non-pressurized side of fuselage with small end of seals towards bulkhead.
(c) Insert pressure seal so that bulkhead metal is seated within the retaining groove of the seal and small end of seal is in the pressurized section.
(d) Install retaining rings in the grooves of the seals.

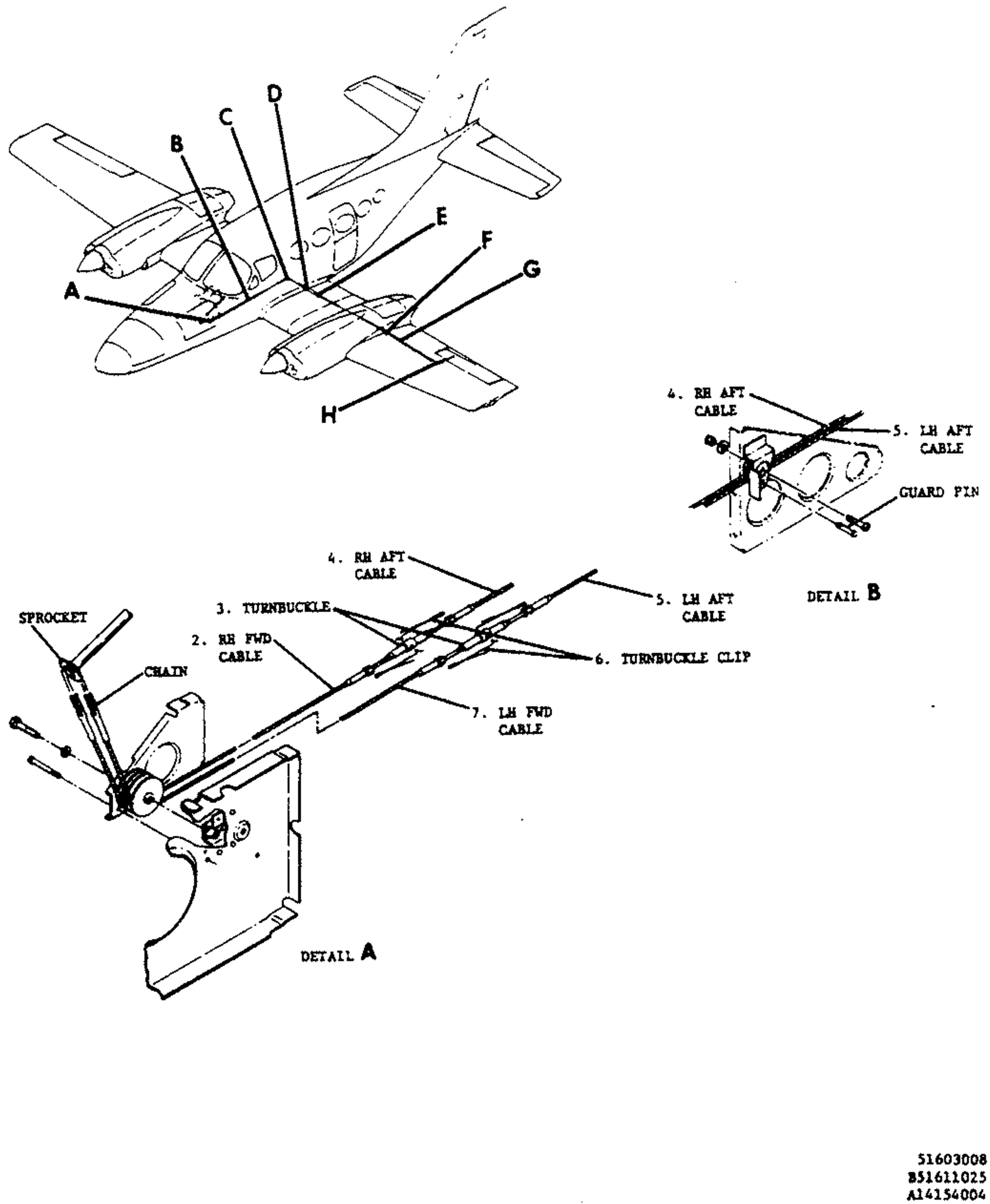
NOTE: Ensure cables are lubricated for the full length of cable travel within the seal.

(6) Install aileron, refer to Removal/Installation Aileron.
(7) Rig aileron control system, refer to Adjustment/Test.
(8) Install turnbuckle clips on turnbuckles.
(9) Reinstall floor panels.

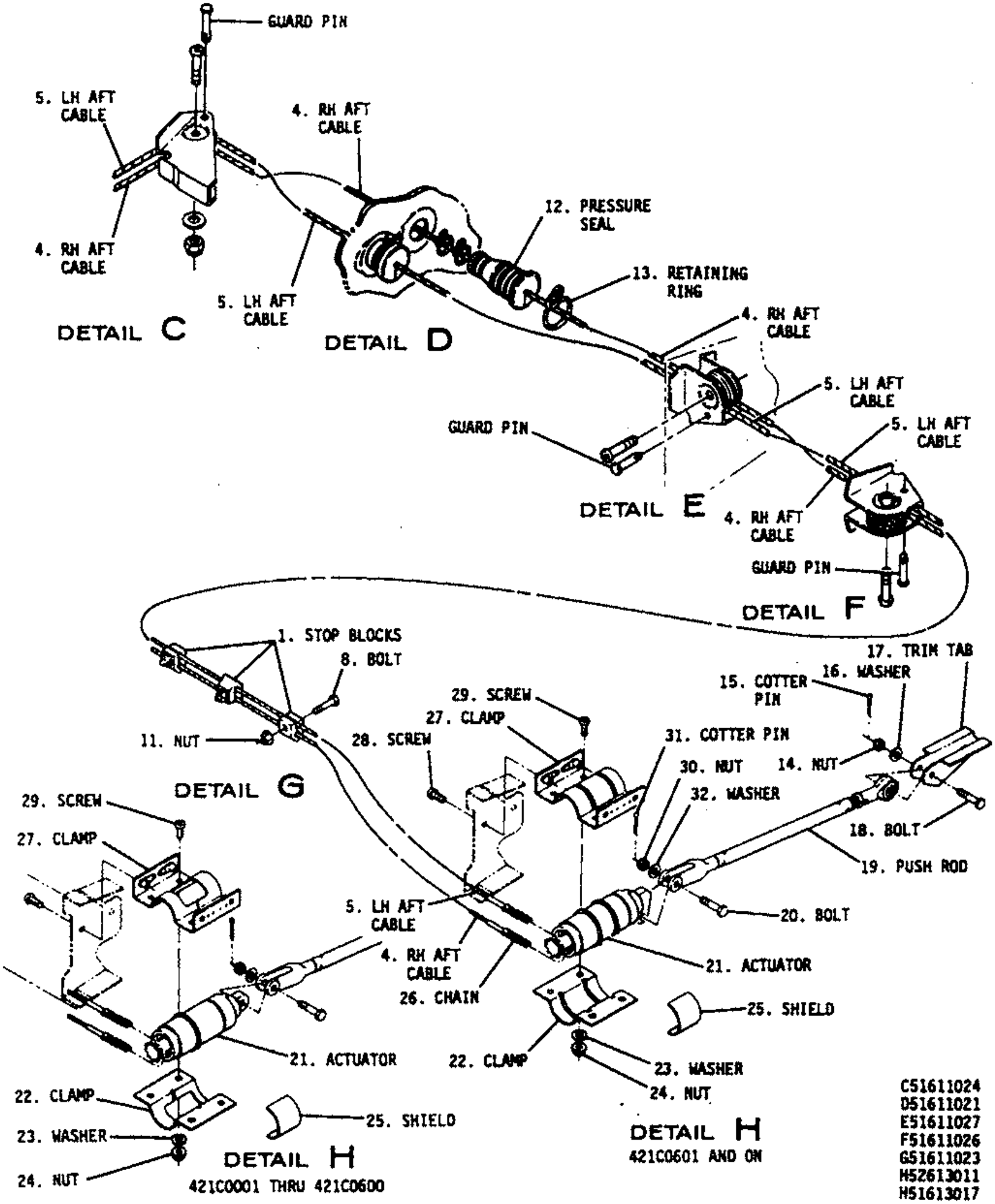
9. Removal/Installation Aileron Trim Tab (See Figure 7).

A. Remove Aileron Trim Tab.

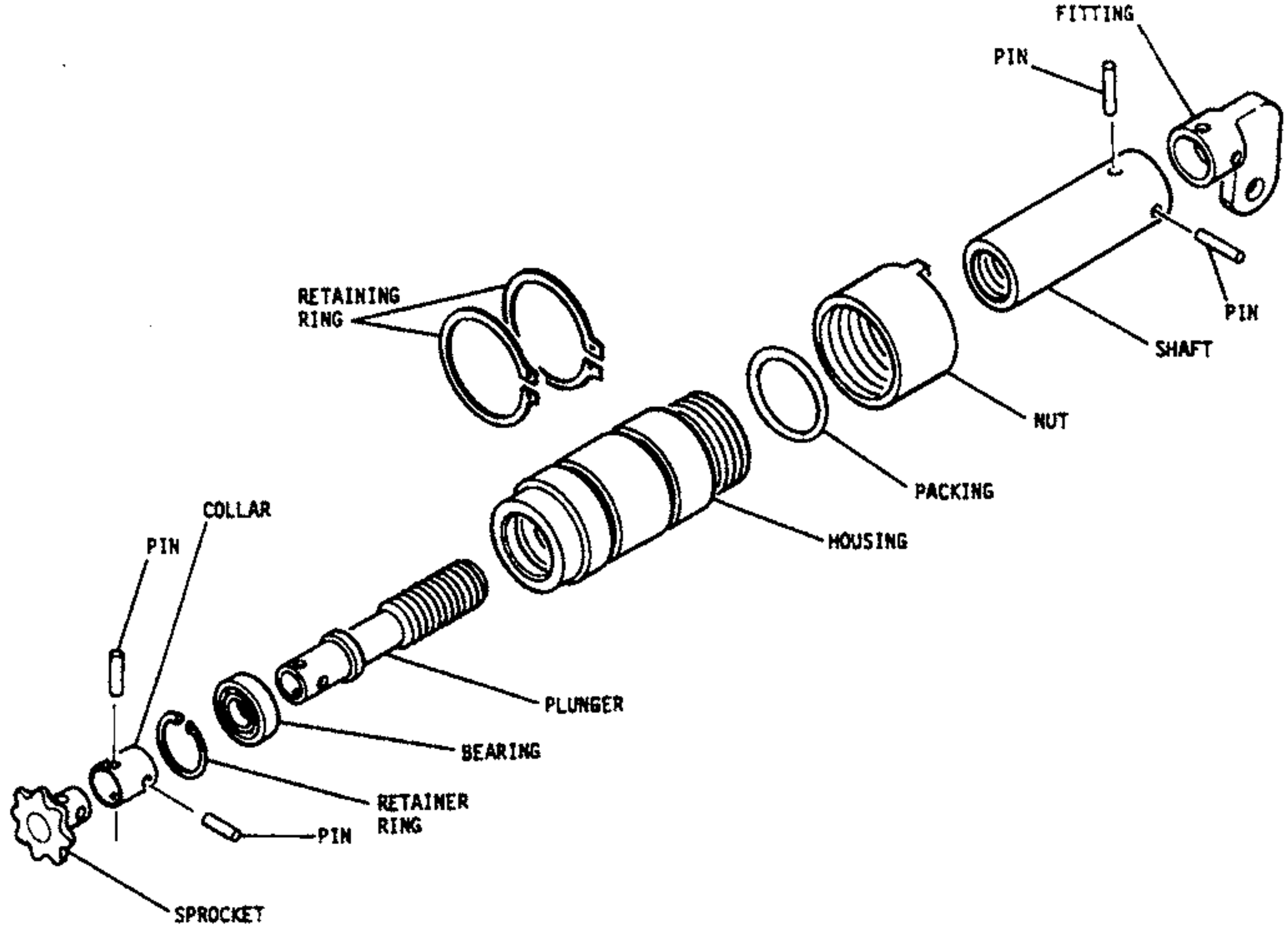
(1) Remove cotter pin (13), nut (14), washer (16) and bolt (18), securing push rod (19) to trim tab (17).
(2) (See Figure 4.) Remove cotter pins (5) from hinge.
(3) Remove hinge pin (4) and remove trim tab.

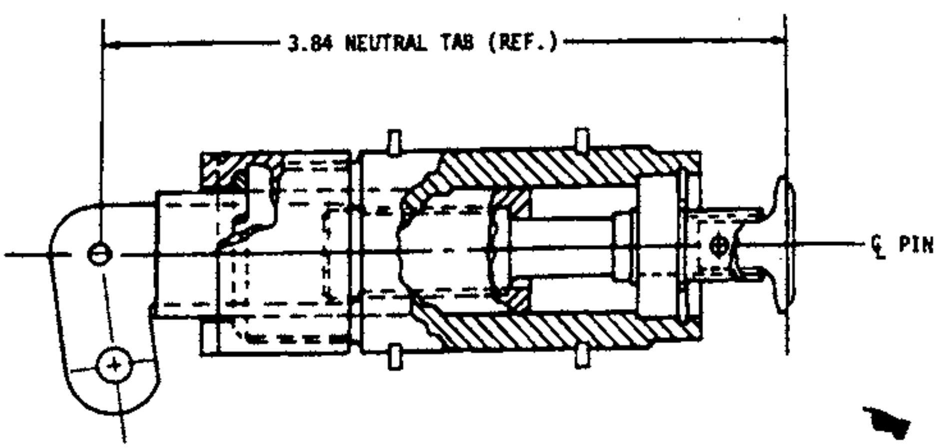


Aileron Trim Control System
Figure 7 (Sheet 1 of 2)



Aileron Trim Control System
Figure 7 (sheet 2 of 2)





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Aileron Trim Tab Actuator Assembly
Figure 7-A

B. Install Aileron Trim Tab.

(1) (See Figure 4.) Position trim tab in hinge and insert hinge pin (4) and secure with cotter pins (5).
(2) Secure push rod (19) to trim tab (17), using bolt (18), washer (16) and nut (14).
(3) Torque nut (14) to 20-25 inch-pounds and install cotter pin (15).
(4) Check trim tab for proper operation, refer to Adjustment/Test.

10. Removal/Installation Aileron Trim Tab Actuator (See Figure 7).

A. Remove Trim Tab Actuator.

(1) Remove left aileron, refer to Removal/Installation Aileron.
(2) Remove floor panel as required to gain access to trim tab cable turnbuckles (3).
(3) Remove turnbuckle clips (6) and relieve cable tension on the aileron trim control system.
(4) Remove cotter pin (31), nut (30), washer (32) and bolt (20) attaching push rod (19) to trim tab actuator (21).
(5) Remove screws (28) securing clamp (27) to inboard and outboard support brackets.
(6) Remove nuts (24), washers (23) and screws (29) securing clamps (22 and 27) and shield (25) to actuator (21).
(7) Remove chain (26) from actuator sprocket and remove actuator (21).

B. Install Trim Tab Actuator.

(1) Position chain (26) evenly on actuator sprocket.
(2) Assemble clamps (22 and 27) and shield (25) on actuator (21) and secure with screws (29), washers (23) and nuts (24). Ensure retaining rings fit into grooves on clamps.
(3) Secure clamp (27) to inboard and outboard support brackets with screws (28).
(4) Connect push rod (19) to actuator (21), using bolt (20), washer (32) and nut (30).
(5) Torque nut (30) to 20-25 inch-pounds and install cotter pin (31).
(6) Install left aileron, refer to Removal/Installation Aileron.
(7) Rig aileron trim system, refer to Adjustment/Test.
(8) Install turnbuckle clips (6) on turnbuckles (3).
(9) Install floor panels.

11. Removal/Installation of Trim Tab Actuator Shaft.

NOTE: When removal of the trim tab actuator shaft is required for lubrication, replacement, etc., the following procedure should be used to insure the shaft is installed in the original position so rigging will not be altered.

A. Removal Trim Tab Actuator Shaft.

(1) Position the trim tab and control surface assembly as necessary to allow removal of the pushrod and the shaft assembly. Disconnect pushrod at the trim tab end. Accurately count and record the number of turns necessary to remove the shaft from the actuator housing. Gently pull on the shaft during removal to ascertain the exact point when the threads become disengaged. Note shaft position accurately in order to replace the pushrod and shaft in the exact same position as before removal.

B. Installation Trim Tab Actuator Shaft.

WARNING: ALWAYS CHECK RIGGING AFTER INSTALLING SHAFT AND PUSHROD.

(1) Install pushrod and shaft in the exact same position as noted in removal. Turn the pushrod to the left (counterclockwise) 1/8 of a turn. Apply pressure on the shaft in a forward direction and turn to the right (clockwise) the same number of turns as noted in step A.

12. Disassembly, Overhaul, and Assembly of Trim Tab Actuator.

A. Disassemble aileron trim tab actuator assembly in accordance with Figure 7A. This view clearly illustrates the proper relationship of all component parts.

(1) Do not remove bearing from plunger unless replacement parts are required.
(2) Clean all component parts, except bearing, by washing in suitable solvent. Do not clean sealed bearing.
(3) Examine all threads for damage or dirt particles that may impair smooth operation.

NOTE: If thread condition requires replacement of either the plunger or the shaft, replace both parts.

(4) Inspect all component parts for obvious indications of damage such as stripped threads, cracks, deep nicks, dents, excessive wear and scoring.
(5) Check bearing for smoothness of operation and linear movement between plunger and bearing.
(6) Relative linear movement between plunger and bearing should be 0.004 to 0.010 inch on actuator when set at room temperature.
(7) If bearing and/or plunger show evidence of excessive wear or movement, disassemble in accordance with Figure 7A and check the following dimensions:

(a) Bearing - ID	0.3120 inch minimum 0.3125 inch maximum
(b) Plunger - ID of Bearing End	0.255 inch minimum 0.260 inch maximum
(c) Plunger - OD of Bearing End	0.310 inch minimum 0.312 inch maximum

(8) Check sprocket for broken, chipped and/or worn teeth.
(9) Do not attempt to repair damaged or worn parts of the actuator assembly. Discard all defective items and install new parts during reassembly.
(10) Always discard the following items and install new parts during reassembly: groov-pins and O-ring packing.
(11) During reassembly, lubricate inside of housing that comes in contact with shaft assembly with No. 33 (light consistency) silicon grease (product of Dow Corning Corporation., Saginaw Rd., Maryland, Michigan).
(12) Reassemble actuator assembly in accordance with Figure 7A.

NOTE: Torque nut to 20-25 inch-pounds.

(13) If plunger, collar or sprocket is replaced, drill .093 hole in new part to match existing hole after adjusting collar to obtain zero end play between plunger and bearing inner race (see Figure 7A, View A for alignment dimensions).
(14) If bearing is replaced, apply Loctite retaining compound No. 35 and primer to outer diameter of bearing.

CAUTION: DO NOT ALLOW LOCTITE COMPOUND OR PRIMER TO ENTER BEARING.

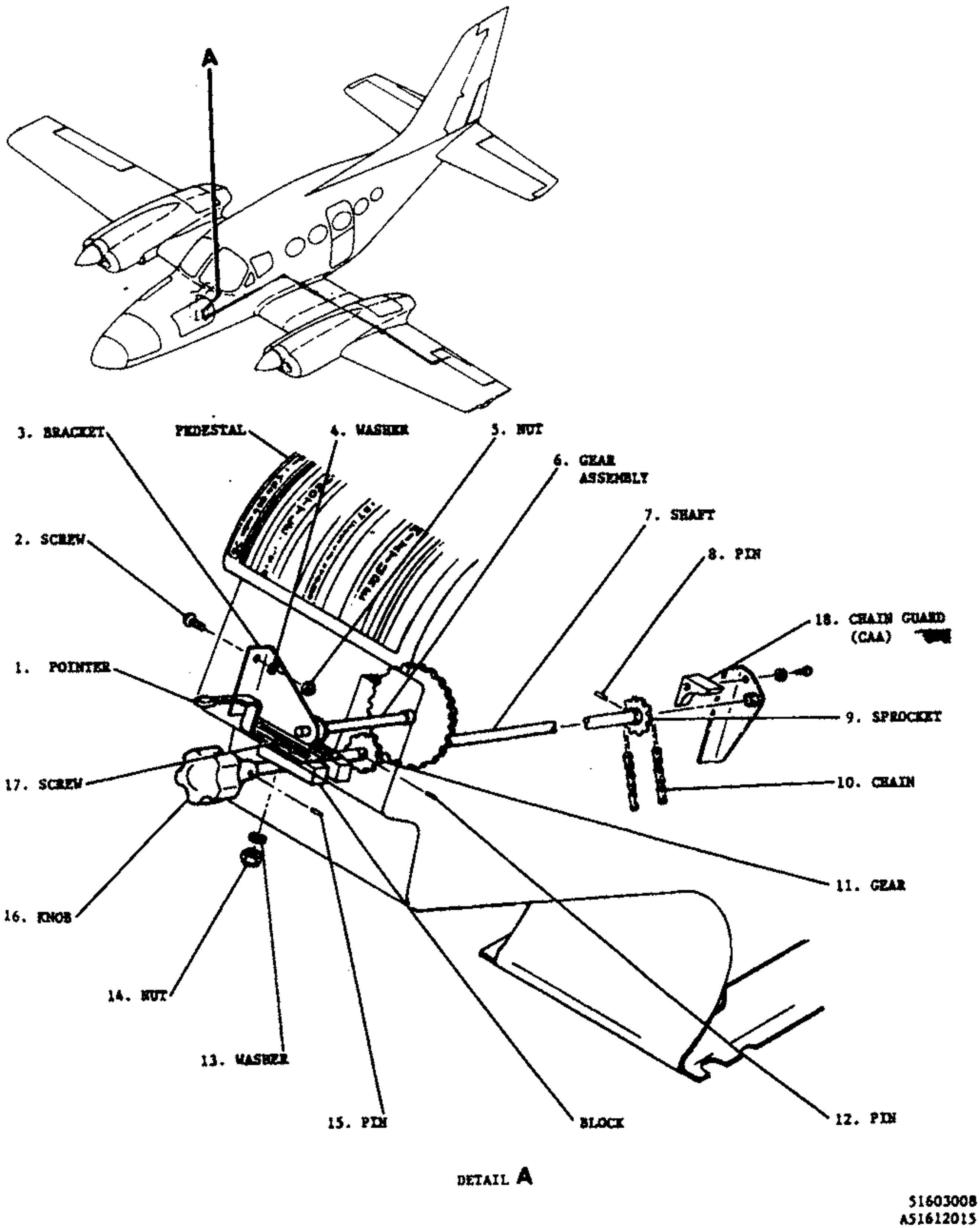
13. Removal/Installation Aileron Trim Tab Cables (See Figure 7).

NOTE: Refer to Flight Control Maintenance Practices.

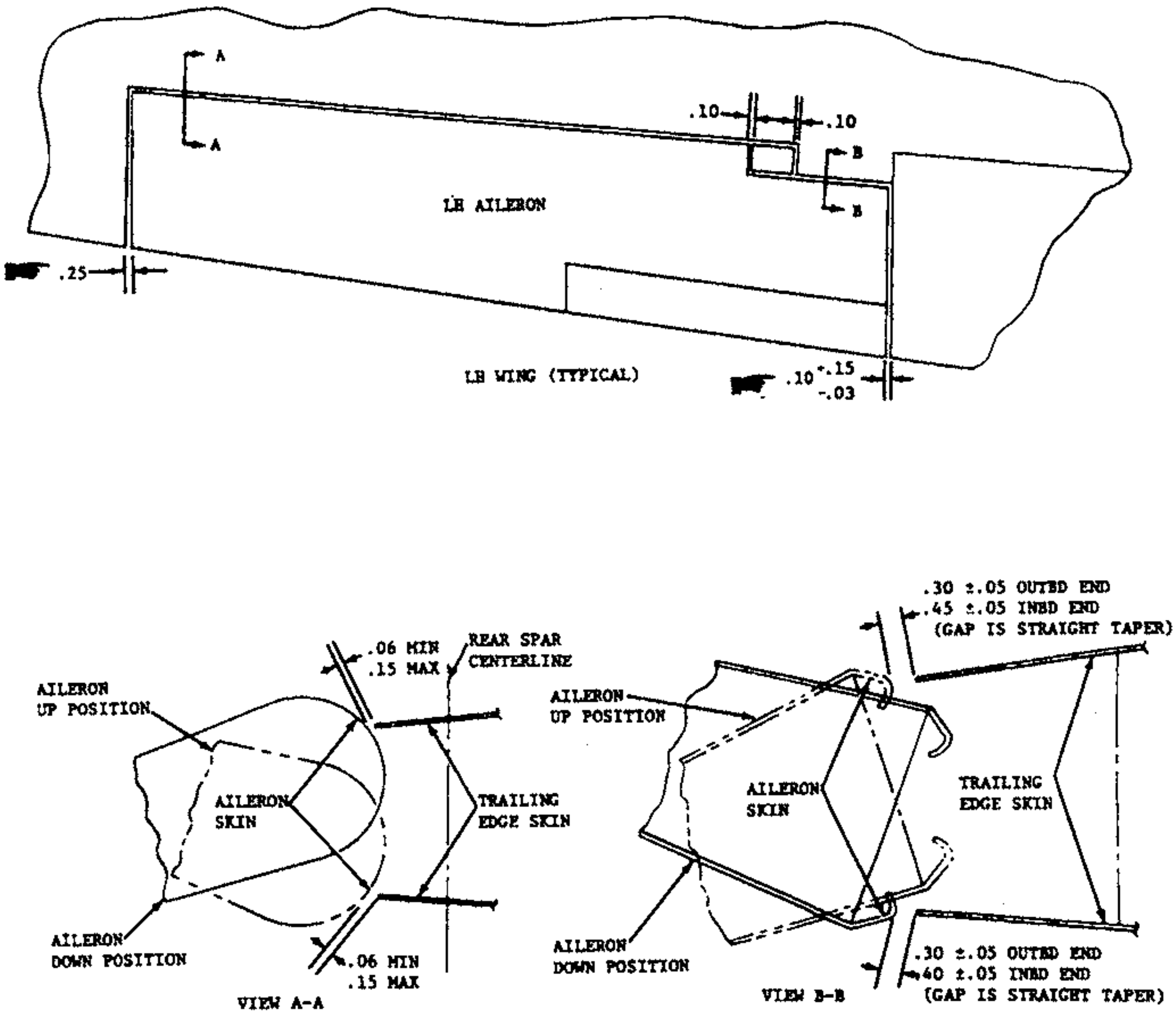
A. Remove Aileron Trim Tab Cables.

(1) Extend flaps.
(2) Remove fuselage access panel, right access cover on pedestal and floor panels, for access panel locations, refer to Chapter 1.
(3) Remove the left aileron, refer to Removal/Installation Aileron.
(4) Remove stop block (9) by removing screws (8), washers (10) and nuts (11).
(5) Remove stop blocks (1) by removing screws, washers, nuts and bushings.
(6) Remove turnbuckle clips (6) from turnbuckles (3) and disconnect turnbuckles.
(7) Remove forward fuselage cables (2 and 7) and chain from airplane through fuselage cable access.
(8) Remove cable guard pins from fuselage and wing aileron trim tab pulley brackets.
(9) Remove pressure seals (12).
(10) Remove actuator (21), refer to Removal/Installation Aileron Trim Tab Actuator.
(11) Connect guide wires to terminals of aft cables (4 and 5) in the fuselage area. Remove the cables from airplane by pulling outboard from the trim tab actuator.

NOTE: Leave guide wires in airplane to serve as a guide for cable reinstallation.



Aileron Trim Control Knob and Indicator Assembly
Figure 8



Aileron Gap Tolerances
Figure 9

B. Install Aileron Trim Tab Cables.

(1) Attach guide wires to terminals of aft cables (4 and 5) and route cables through wing into fuselage.
(2) Install actuator (21), refer to removal/installation Aileron Trim Actuator.
(3) Install chain on sprocket and connect forward fuselage cables (2 and 7) to installed cables, using turnbuckles (3).
(4) Install cable guard pins in wing and fuselage trim tab pulley brackets.
(5) Install cable pressure seals (12) as follows:
  (a) Ensure that the cables are lubricated for the full length of travel within the pressure seals (12).
  (b) Pack the pressure seals with MIL-G-81322A lubricant.
  (c) Place the pressure seals (12) on cables on non-pressurized side of bulkhead with small end toward bulkhead.
  (d) Insert pressure seals (12) in bulkhead hole so that bulkhead metal is seated within the retaining groove of the seals.
  (e) Install proper size retaining rings (13) in the grooves of the pressure seals (12).
(6) Install stop block (9), using screws (8), washers (10) and nuts (11).
(7) Install stop blocks (1) on fwd cables (2 and 7). Do not tighten at this time.
(8) Install aileron, refer to Removal/Installation Aileron.
(9) Rig aileron trim tab system, refer to Adjustment/Test.
(10) Install turnbuckle clips (6) on turnbuckles (3).
(11) Install floor panels and access covers.

14. Removal/Installation Aileron Trim Tab Control Wheel Assembly (See Figure 8).

A. Remove Trim Tab Control Wheel Assembly.

(1) Remove pedestal access covers and floor panel above trim cable turnbuckles.
(2) Relieve tension on aileron trim tab cables by removing turnbuckle clips and loosening turnbuckle at aileron trim tab cables LH fwd and RH fwd (see Figure 7).
(3) Remove screws (2), washers (4) and nuts (5), securing bracket (3) to pedestal and remove bracket.
(4) Remove gear assembly (6) from pedestal.
(5) Remove pointer (1) by removing screws (17), spacer, washers (13) and nuts (14).
(6) Disengage chain (10) from sprocket (9).
(7) Remove pin (8) from sprocket (9) and slide sprocket from shaft (7).
(8) Remove pin (12) from gear (11) and slide shaft (7) from pedestal.
(9) If knob removal is desired, remove pin (15) from shaft (7) and pull knob (16) free.

B. Install Trim Tab Control Wheel Assembly.

(1) If knob (16) was removed; install knob (16) on shaft (7) align holes and insert pin (15).
(2) Slide shaft (7) into pedestal face, slide gear (11) on shaft (7) and secure gear to shaft with pin (12).
(3) Proceed sliding shaft (7) into pedestal until shaft (7) is positioned in aft hole of pedestal.
(4) Insert sprocket (9) on shaft (7) and secure sprocket to shaft with pin (8).
(5) Install chain (10) on sprocket (9).

NOTE: Ensure chain ends are equal in length from sprocket.

(6) Assembly pointer (1) to blocks with screws (17), spacers, washers (13) and nuts.
(7) Position gear assembly (6) in pedestal, install bracket (3) on the gear assembly.
(8) Secure bracket (3) to pedestal structure with screws (2), washers (4) and nuts (5).
(9) Connect aileron trim tab RH and LH fwd cables (see Figure 7).
(10) Rig the aileron trim tab system, Adjustment/Test.
(11) Install turnbuckle clips on turnbuckles.
(12) Install pedestal access covers and floor panels.

RUDDER, RUDDER TRIM TAB AND CONTROLS SYSTEMS

Description

1. The rudder and trim tab system is actuated mechanically and provides directional control of the aircraft about the vertical axis. The system consists of two subsystems; a rudder control system and a rudder trim control system.

2. The rudder control system consists of: rudder, rudder pedal assembly, rudder bellcrank, rudder pedal position cable and control system cables. The rudder is operated by the movement of the right and left pilot or copilot rudder pedals. The rudder pedals are connected to torque tubes which have link arms for the attachment of the rudder cables. The rudder cables are attached to the torque tube link arms and routed forward over pulleys and then aft under the floor and through the tailcone by pulleys to the adjustable turnbuckles. From the turnbuckles the cables are routed by pulleys to the bellcrank attached directly to the bottom of the rudder torque tube. The rudder travel stops, consists of bolts attached to the lower hinge bracket and provide recommended travel adjustment of the rudder. The position cable is attached to the left rudder pedal torque tube and routed aft around a pulley and then forward to the right rudder pedal torque tube to complete the rudder control system. Nose gear steering cables are also attached to right and left rudder pedal torque tubes and routed forward to springs and then to the nose gear steering yoke, refer to Chapter 4 for nose gear steering information.

3. The rudder trim tab system consists of: control wheel, stop blocks, rudder trim tab actuator and tab. The rudder trim tab is operated by the control wheel mounted on the aft side of the pedestal. The control wheel is attached to a sprocket which drives a chain and cables. The chain and cables are routed by pulleys, forward and down through the pedestal under the floor to adjustable turnbuckles and then aft into the tailcone of the aircraft. In the tailcone, the cables are routed aft to a pulley, then up through the vertical stabilizer, to a chain which operates the trim tab actuator. The trim tab push rod connects the trim actuator to the rudder trim tab horn on the trim tab which is mounted to the rudder by a continuous hinge. The adjustable turnbuckles, for cable tension adjustment are located under the fuel selector gear box access cover. Stop blocks are located, under the floor at approximately Fuselage Station 238.13 and are used for adjustment of the rudder trim tab travel.

   CAUTION: PRIMARY AND SECONDARY FLIGHT CONTROL CABLES, PUSH-PULL TUBES, BELLCRANKS AND MOUNTINGS USE DUAL LOCKING FASTENERS. THE LOCK NUTS FOR THESE FASTENERS INCORPORATE A FIBER LOCK, AND ARE CASTELLATED FOR SAFETYING WITH A COTTER PIN. WHEN ANY OF THESE AREAS ARE DISCONNECTED, NEW DUAL LOCKING FASTENERS SHOULD BE INSTALLED. SEE THE AIRCRAFT PARTS CATALOG FOR PART NUMBERS AND LOCATION OF THESE FASTENERS.

Troubleshooting

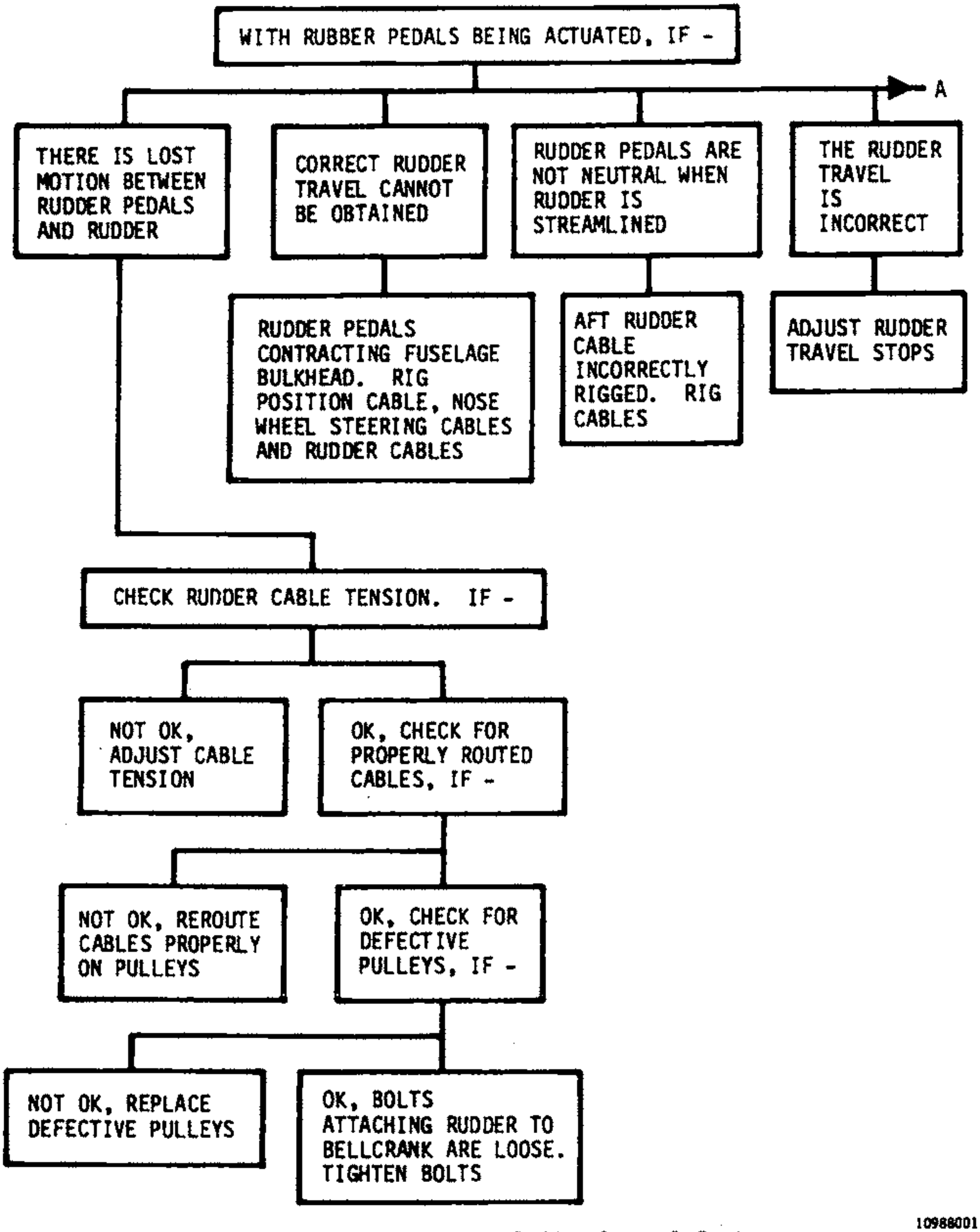
1. Troubleshooting the rudder and trim tab system is accomplished initially by determining if the trouble exists in the rudder, control system or the rudder trim control system. Refer to Figures 1 and 2 for Troubleshooting Chart.

2. When troubleshooting the rudder and trim tab system, release the rudder gust lock (optional) and position the nose wheel fore and aft to center the rudder.

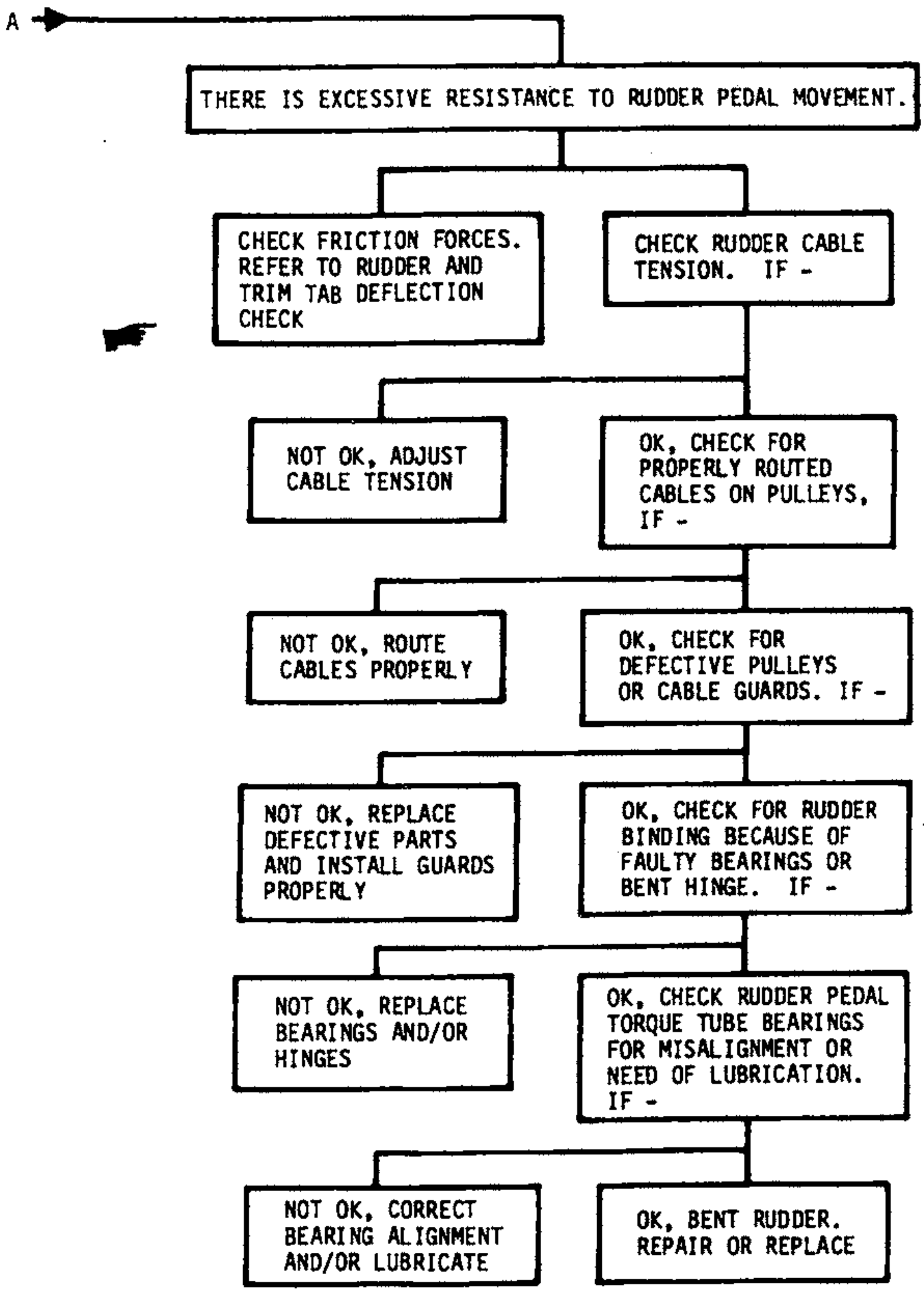
3. Tools and Equipment

   NOTE: Equivalent substitutes may be used instead of the following listed items.

Name	Number	Manufacturer	Use
Tensiometer	T5-2002-101	Pacific Scientific Co. Kin-Tech Division 1346 S. State College Blvd. Los Angeles, CA 92803	To measure cable tension.



Troubleshooting Chart - Rudder Control System
Figure 1 (Sheet 1)



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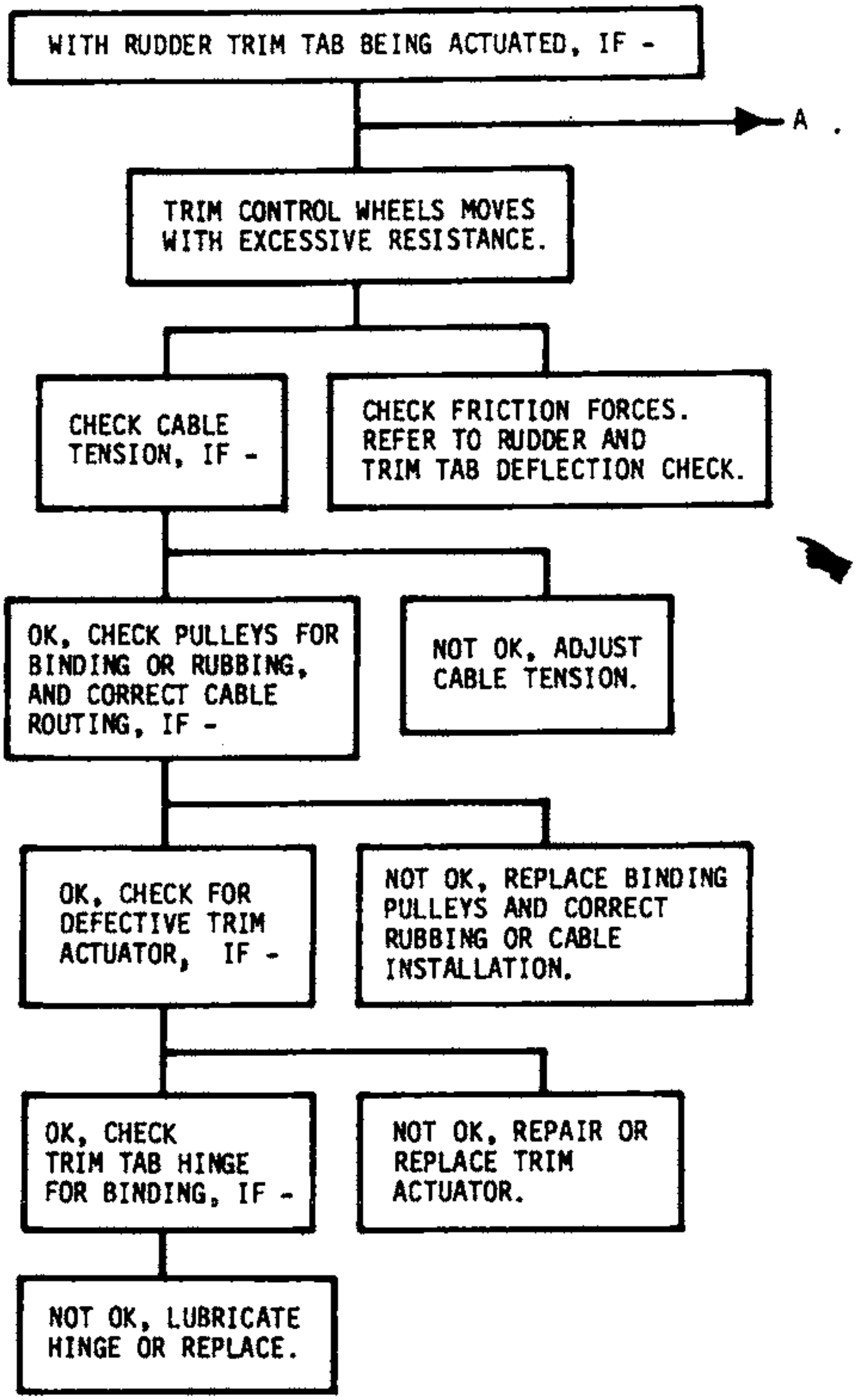
Troubleshooting Chart - Rudder Control System
Figure 1 (Sheet 2)



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Troubleshooting Chart - Rudder Trim Tab Control System
Figure 2 (Sheet 1)