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AEROSTAR
AIRCRAFT CORPORATION

AEROSTAR MAINTENANCE MANUAL

CARD 1 OF 7

AEROSTAR 600
AEROSTAR 601
AEROSTAR 601P
AEROSTAR 602P
AEROSTAR 700P

AEROSTAR AIRCRAFT CORPORATION

(PART NUMBER 761 732)

1A1

INTRODUCTION.

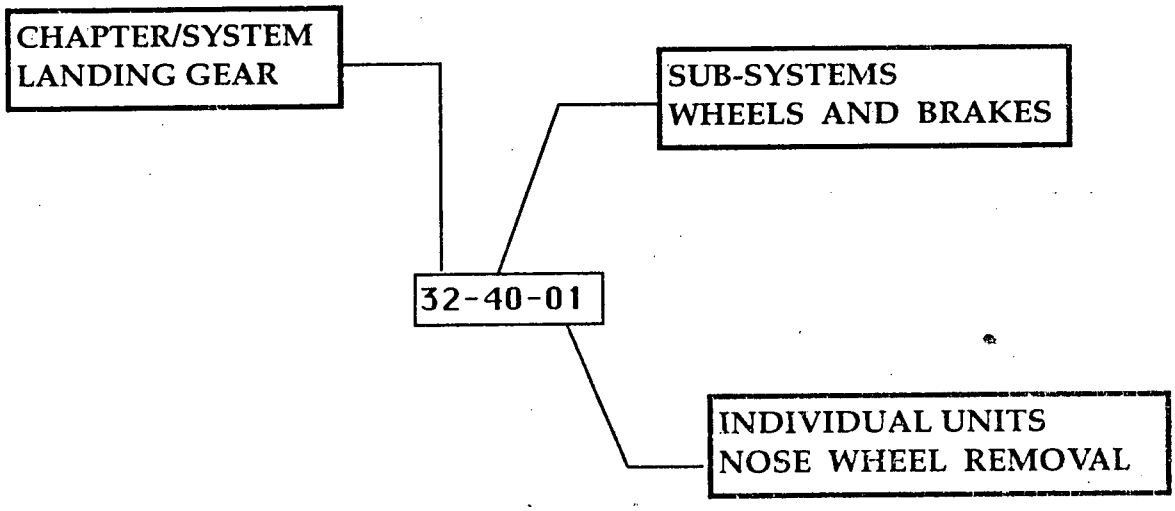
This AEROSTAR AIRCRAFT Maintenance Manual is prepared in accordance with the GAMA (General Aviation Manufacturers Association) format. This maintenance manual is divided into various Groups which enable a broad separation of contents (Chapters) within each group.

The various Chapters are broken down into major systems such as Electrical Power, Flight Controls, Fuel, Landing Gear, etc. The System/Chapters are arranged more or less alphabetically rather than by precedence or importance. All System/Chapters are assigned a number, which becomes the first element of a standardized numbering system. Thus the element "32" of the number series 32-00-00 refers to the System/Chapter on "Landing Gear." All information pertaining to the landing gear will be covered in this System/Chapter.

The major System/Chapters are then broken down into Sub-System/Sections. These sections are identified by the second element of the standardized numbering system. The number "40" of the basic number series 32-40-00 is for the "Wheels and Brakes" portion of the landing gear.

The individual units within a Sub-System/Section may be identified by a third element of the standardized numbering system, such as 32-40-01. This number could be assigned by the manufacturer to fit the coverage requirements of the publication.

Example:



This manual does not contain hardware callouts for installation. Hardware callouts are only indicated where a special application is required. To confirm the correct hardware used, refer to the Parts Catalog P/N 761 731, and FAR 43 for proper utilization.

SERIAL NUMBER INFORMATION

The airframe numbers of aircraft manufactured prior to 1982 fiscal year are as follows:

AEROSTAR 600 and 601 - 1968 thru 1970
Airframe Numbers 0003 to 0129 inclusive.
AEROSTAR 600 and 601 - 1973
Airframe Numbers 0130 to 0152 inclusive.
AEROSTAR 600, 601 and 601P - 1974
Airframe Numbers 0153 to 0195 inclusive.
AEROSTAR 600, 601 and 601P - 1975
Airframe Numbers 0196 to 0255 inclusive.
AEROSTAR 600, 601 and 601P - 1976
Airframe Numbers 0256 to 0355 inclusive.
AEROSTAR 600, 601 and 601P - 1977
Airframe Numbers 0356 to 0455 inclusive.
AEROSTAR 600, 601 and 601P - 1978
Airframe Numbers 0456 to 0560 inclusive.
AEROSTAR 600, 601 and 601P - 1979
Airframe Numbers 0561 to 0714 inclusive.
AEROSTAR 600, 601 and 601P - 1980
Airframe Numbers 0715 to 0749 inclusive, 0751 to 0285 inclusive.
AEROSTAR 600, 601 and 601P - 1981
Airframe Numbers - 0826 to 0933 inclusive.
AEROSTAR 602P - 1981
Airframe Numbers - 0750, 0816 to 0932 inclusive.

The serial numbers of aircraft manufactured in the 1982 fiscal year and subsequent are as follows:

AEROSTAR - PA-60-602P - 1982
Serial Numbers 60-8265001 to 60-8265047 inclusive.
AEROSTAR - PA-60-602P - 1983
Serial Numbers 60-8365001 to 60-8365021 inclusive.
AEROSTAR - PA-60-700P - 1984
Serial Numbers 60-8423001 to 60-8423025 inclusive.

– NOTE –

Refer to the Parts Catalog for a detailed explanation of model code, model sequence and airframe numbers used throughout the production of these models.

AEROFICHE EXPLANATION AND REVISION STATUS

Maintenance manual information incorporated in this set of Aerofiche cards is arranged in accordance with the specifications of Aerofiche adopted by the General Aviation Manufacturers Association. Information compiled in this Aerofiche Maintenance Manual is kept current by revisions distributed periodically. These revisions supersede all previous revisions and are complete Aerofiche card replacements and shall supersede Aerofiche cards of the same number in the set.

Identification of revised material:
Revised text and illustrations are indicated by a black vertical line along the left-hand margin of the frame, opposite revised and added material. Revision lines indicate only current revisions with changes and additions to existing text and illustrations. Changes in capitalization, spelling, punctuation, indexing, the physical location of the material, or complete page additions are not identified by revision lines.
A reference and record of the material revised is included in each chapter's Table of Contents/Effectivity. The code used in the effectivity columns of each chapter is defined as follows:

TABLE OF CONTENTS/EFFECTIVITY CODES

Original Issue:	None
First Revision:	Revision Identification, (1R Month-Year)
Second Revision:	Revision Identification, (2R Month-Year)

All subsequent revisions will follow with consecutive revision numbers such as 3R, 4R, etc., along with the appropriate month-year.

Added Subject:	Revision Identification, (A Month-Year)

Revisions to Maintenance Manual 761 732 reissued June 1, 1995, are as follows:

Revisions	Date	Aerofiche Card Effectivity
Reissued	June 1, 1995	1, 2, 3, 4, 5, 6, and 7

The date on Aerofiche cards must not be earlier than the date noted for the respective card effectivity. Consult the latest Aerofiche card in this series for current Aerofiche card effectivity.

VENDOR PUBLICATIONS.

AUTOPILOTS:	
Ed-Aire Mitchell Automatic Flight Systems	AK521, 522/FD
Bendix FCS-810 Flight Control System Installation Manual	I.B. 2810
ENGINE:	
Lycoming Operators Manual	P/N 60297-10
Lycoming Overhaul Manual	P/N 60294-7
Lycoming Parts Catalog	P/N PC 215
HEATER:	
Janitrol Maintenance and Overhaul Manual	P/N 11074
MAGNETOS:	
Bendix Installation and Maintenance Manual	P/N L-609
Bendix Overhaul Manual	P/N L-645
Bendix Parts List	P/N L-608
PROPELLER:	
Hartzell Owners Manual	P/N 107-P
Hartzell Overhaul Manual	P/N 117-D
RADIOS (HF):	
Pantronics SB-10 Instruction Manual Sun Air Manual	P/N 99398 & P/N 99694
RADIOS (VHF):	
King Maintenance/ Overhaul Manual	P/N 006-5053-06
Collins Instruction Manual	P/N 523-0766705-00111A
Collins Avionics Equipment	P/N 523-0766031-004118
GLS-350 Glideslope Receiver	P/N 523-0766026
TDR-950 Transponder System	P/N 523-0766469
DME-451	P/N 523-0767568

Addendum to Aerostar Maintenance Manual

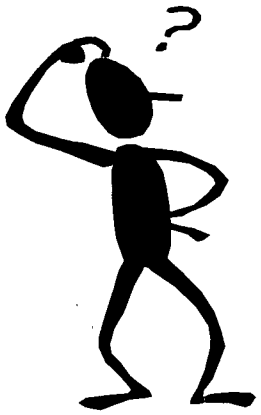
Please note:

Conair Aviation Ltd. has added a section to the end of this manual called:

CAL-WMS

*This addendum CAL-WMS is a **Alternator Wiring Modification** for the **Wiring Manual Supplement** issued by Conair Aviation Ltd.*

*As per the instructions of Dick Kopp, Sr. Inspector, on the 8th of December, 1998, this section is to incorporated into the **Aerostar Maintenance Manual** and will act as a supplement this manual.*



*Any revision or additions, amendments, etc. of this section of the Maintenance Manual are to be updated on the **Record of Revisions** as applicable.*

*This addendum is dated the **8th of January, 1999** at **Abbotsford, British Columbia** by the **Technical Library**.*

Conair Aviation Ltd. Technical Library

Record of Revisions (as recorded by Conair)

Revision	Date	Page(s) Inserted	Inserted By	Date Inserted
Checked	05-Mar-99			
CAL Supplement WMS	07-May-98			05-Mar-99

NOTE: Always refer to manufactures status report for latest revisions!

AEROSTAR PUBLICATIONS.

Parts Catalog 761 731
Aerostar Aircraft Corp.
3608 S. Davison Boulevard
Spokane, WA 99204

Aerostar Programmed
Inspection
Manual 761 749
Aerostar Aircraft Corp.
3608 S. Davison Boulevard
Spokane, WA 99204

Aerostar Periodic
Inspection
Report Form 230 1043
Aerostar Aircraft Corp.
3608 S. Davison Boulevard
Spokane, WA 99204

VENDOR-SUPPLIER INFORMATION.

A partial list of companies, their address and phone numbers are provided to aid service personnel in obtaining information about components not manufactured by Aerostar Aircraft Corporation.

C & D Airmotive Products 4445 Shawnee Road Berrien Springs, MI 49103 (616) 695-7469	Heaters - Environmental Systems
Bendix/King Radio Corporation 400 North Rogers Road Olathe, Kansas 66061 (913) 782-0400	All King and Bendix Avionics
Edo-Aire Mitchell P.O. Box 610 Mineral Wells, Texas 76007 (817) 325-2517	Autopilots
Textron Lycoming Williamsport Division 652 Oliver Street Williamsport, PA 17701	Engines
Hartzell Propeller, Inc. Piqua, Ohio 45356 (513) 773-7411	Propellers, Governors
Scott Aviation 225 Erie Street Lancaster, New York 14086 (716) 683-5100	Oxygen Components
Collins Radio Group 350 Collins Road NE Cedar Rapids, IA 52406	Avionics
Sun Air Electronics, Inc. 3101 S.W. 3rd Avenue Ft. Lauderdale, Florida 33315	Radios (HF)

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GAMA SYSTEM/CHAPTER INDEX GUIDE

– NOTE –
The following Chapters are not covered within this Maintenance Manual: 31, 37, 38, 49, 60, 70, 72, 75, 83, 95.

SYST CHAP	SUB-SYST SECTION	TITLE	AEROFICHE GRID NO.
4		AIRWORTHINESS LIMITATIONS	1B5
5		TIME LIMITS/MAINT CHECKS	1B8
6		DIMENSIONS AND AREAS	1C17
7		LIFTING AND SHORING	1D10
8		LEVELING AND WEIGHING	1E3
9		TOWING AND TAXIING	1E11
10		PARKING AND MOORING	1E21
11		REQUIRED PLACARDS	1F4
12		SERVICING	1G11
20		STANDARD PRACT - AIRFRAME	1I7
21		ENVIRONMENTAL SYSTEM & PNEUMATIC SYSTEM	2B4
22		AUTOFLIGHT	2I1
23		COMMUNICATIONS	2I5
24		ELECTRICAL POWER	3B5
25		EQUIPMENT/FURNISHINGS	3C22
26		FIRE PROTECTION	3E20
27		FLIGHT CONTROLS	3F2
28		FUEL	3I2

GAMA SYSTEM/CHAPTER INDEX GUIDE (cont)

SYST CHAP	SUB-SYST SECTION	TITLE	AEROFICHE GRID NO.
29		HYDRAULIC POWER	4B5
30		ICE AND RAIN PROTECTION	4D1
32		LANDING GEAR	4F1
33		LIGHTS	4K6
34		NAVIGATION AND PITOT/STATIC	5B5
35		OXYGEN	5E13
36		PNEUMATIC (COMBINED INTO CHAPTER 21)	
39		ELECTRIC/ELECTRONIC PANELS AND MULTIPURPOSE PARTS	5F15
51		STRUCTURES	5H17
52		DOORS	5I8
53		FUSELAGE	5K1
54		NACELLES	5K15
55		STABILIZERS	5L1
56		WINDOWS	6B5
57		WINGS	6B22
61		PROPELLERS	6C17
71		POWER PLANT	6D17
73		ENGINE FUEL SYSTEM	6F3
74		IGNITION	6G3
76		ENGINE CONTROLS	6H9

GAMA SYSTEM/CHAPTER INDEX GUIDE (cont)

SYST CHAP	SUB-SYST SECTION	TITLE	AEROFICHE GRID NO.
77		ENGINE INDICATING	6I1
78		EXHAUST	6I19
79		OIL	6J3
80		STARTING	6J20
81		TURBINES	7B5
91		CHARTS AND WIRING DIAGRAMS	7C9

LIST OF ILLUSTRATIONS

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LIST OF ILLUSTRATIONS (cont)

– NOTE –

Refer to Card 7, Grid 7D23 for Electrical Schematic Index.

LIST OF CHARTS

LIST OF CHARTS (cont)

LIST OF CHARTS

– NOTE –

For schematics refer to index on grid 7D23.

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CHAPTER

4

AIRWORTHINESS LIMITATIONS

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

TABLE OF CONTENTS/EFFECTIVITY

AIRWORTHINESS LIMITATIONS.

GENERAL.

The airworthiness limitations are FAA approved. Responsibility for required inspections and maintenance are specified in Part 91.403 and 135 of the Federal Aviation Regulations.

The following limitations related to fatigue life of the airplane and its components have been established with respect to the Models 600, 601, 601P, 602P and 700P airplanes.

1. The safe life of the airframe structure will be released when the information becomes available.
2. The safe life limit of the propeller blades is unlimited.
3. The safe life limit of the windshield for the Model 601P, 602P and 700P is 4,860 flight hours.
4. The safe life limit of the windows for the Model 601P, 602P and 700P is 16,000 flight hours.

– NOTE –

If aircraft is equipped with Option 262, safe life limit of windshield and windows is 13,200 flight hours

– NOTE –

Refer to the LIMITATIONS in the FAA Approved Airplane Flight Manual for a detailed delineation of the flight limitations of the airplane. The mandatory replacement/overhaul time and/or inspection intervals of life limited parts are contained in Chapter 5 of this manual.

- END -

Chapter 5

CHAPTER

5

TIME LIMITS/ MAINT CHECKS

CHAPTER 5 - TIME LIMITS/MAINTENANCE CHECKS

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

This chapter provides instructions for conducting inspections. Repair or replacement instructions for those components found to be unserviceable at inspection may be found in the chapters covering the applicable aircraft system. There are no hidden or critical parts of the airplane structure which require special inspection methods. Special methods of inspection are defined here as x-ray, ultrasonic, eddy current, etc. When working on engines, ground the magneto primary circuit before performing any operation.

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TIME LIMITS.

CHART 501. TIME LIMITS

COMPONENT	OVERHAUL/REPLACE, HOURS/YEARS
A. PROPELLER GROUP	
1. Propeller	2000 Hours or 5 years
2. Propeller Governor	1500 Hours
3. Propeller Governor Screen	Engine O/H or whenever Governor is removed
B. ENGINE GROUP (SEE NOTE)	
1. Engine IO-540 -G1B5	1400 Hours
-K1F5	2000 Hours
-K1J5	2000 Hours
-P1A5	1400 Hours
-S1A5	1800 Hours
-AA1A5	1800 Hours
TIO -540 -U2A	1800 Hours
LTIO -540 -U2A	1800 Hours
2. Turbocharger.	2000 Hours
Actuator	At Engine O/H
Controller	At Engine O/H
3. Engine Isolator Mounts	At Engine O/H
4. Oil Cooler	Replace if Contaminated
5. Fuel Pump	At Engine O/H
6. Scavenge Pump	At Engine O/H
7. Magnetos	At Engine O/H
8. Starter	At Engine O/H
9. Alternator	At Engine O/H
10. Hoses in Engine Compartment	At Engine O/H or 5 Years
11. Servo Fuel Injector	At Engine O/H

CHART 501. TIME LIMITS (cont)

COMPONENT	OVERHAUL/REPLACE HOURS/YEARS
B. ENGINE GROUP (cont)	
12. Induction Filter	100 Hours
13. Oil Filter	50 Hours
NOTE REFER TO THE LATEST REVISION OF AVCO LYCOMING SB 240.	
C. HYDRAULIC GROUP	
1. Hydraulic Pump	At Engine O/H
2. Actuator, Flap	On Condition
MLG	On Condition
MLG Door	On Condition
NLG	On Condition
NLG Steering	On Condition
3. NLG Steering Valve	On Condition
4. Control Valve, Flap	On Condition
MLG	On Condition
MLG Door	On Condition
5. Hydraulic Fluid	On Condition
D. BRAKES	
1. Master Cylinders	5000 Hours
E. PNEUMATIC	
1. Pump	1000 Hours
2. Inlet Filter, Engine	500 Hours
3. In Line Filter, Cabin	250 Hours

CHART 501. TIME LIMITS (cont)

COMPONENT	OVERHAUL/REPLACE HOURS/YEARS
F. FUEL	
1. Wing Tank Relief Valve	3000 Hours
2. Fuel Carrying Hose, Wing Root to Firewall	At Engine O/H or 5 Years
3. Fuel Filler Cap "O" Rings	One (1) Year
G. HEATER	Overhaul heater in accordance with manufacturer's recommendations. Janitrol Aero Division Midland Ross Corp., 4200 Surface Road Columbus, Ohio 43288. Refer to AD 82-07-03.
1. Heater	
2. Combustion Blower Brushes	
3. Vent Blower Brushes	
4. Fuel Pump	2000 Hours of Heater Operation
H. OXYGEN	
1. Regulator Assembly	3000 Hours or 5 Years
2. Oxygen Cylinder, 11 Cu. Ft. (Hydrostatic Test)	5 Years
3. Oxygen Cylinder, 115 Cu. Ft. (Hydrostatic Test)	3 Years
Replace	15 Years or 4,380 Pressurizations

CHART 501. TIME LIMITS (cont)

COMPONENT	OVERHAUL/REPLACE HOURS/YEARS
I. WINDSHIELD AND WINDOWS (601P/602P/700P)	
1. Windshield	4,860 Hours
2. Windows	16,000 Hours
– NOTE – ***If aircraft is equipped with Option 262, replacement time for windshield and windows is 13,200 hours.***	

INSPECTION REQUIREMENTS.

The required inspection procedures are listed in Periodic Inspections. The inspection procedure is broken down into major groups which include Propeller, Engine, Cabin, Fuselage and Empennage, Wing, Landing Gear, Engine Run-up Inspection and General. The first column in each group lists the inspection or procedure to be performed. The second column is divided into four columns indicating the required inspection intervals of 50 hours, 100 hours, 500 hours, and 1000 hours. Each inspection or operation is required at each of the inspection intervals as indicated by a circle (O). If an item is not entirely accessible or must be removed, refer to the applicable chapter of the manual for instructions on how to gain access to remove the item. When performing inspections, use inspection form (230 1043) furnished by the Aerostar Factory Service Department, available through Aerostar Dealers or Distributors. To insure using the latest inspection form available, refer to the last card of the Aerostar - Parts Price List Aerofiche - for a checklist of latest inspection forms.

– NOTE –
In addition to inspection intervals required in Periodic Inspections, preflight inspections must be performed.

PREFLIGHT CHECKS.

This check is for the pilot and/or mechanic and should become part of the airplane operational routine and/or preflight check before each flight. Refer to Flight Manual for a listing of items that must be checked.

OVERLIMITS INSPECTION.

If the airplane has been operated so that any of its components have exceeded their maximum operational limits, check with the appropriate manufacturer.

SCHEDULED MAINTENANCE CHECKS

PERIODIC INSPECTIONS

– NOTE –
Perform all inspections or operations at each inspection interval as indicated by a circle (O). (See Note 1.)

			Inspection Time (hrs)			
	L	R	50	100	500	1000
A. PROPELLER GROUP						
NOTE: Read note 3 prior to completing this inspection group.						
1. Remove and inspect spinner and spinner bulkhead for cracks	O	O	O	O	O	O
2. Inspect blades for cracks, nicks, and gouges	O	O	O	O	O	O
3. Inspect for grease and oil leaks	O	O	O	O	O	O
4. Inspect propeller mounting bolts and safety (check torque if safety is broken)	O	O		O	O	O
5. Inspect hub parts for cracks, corrosion and wear	O	O		O	O	O
6. Inspect propeller dome charge per latest revision Hartzell Service Letter 21 or placard on dome (check at least once a month)	O	O		O	O	O
7. Rotate blades and check for tightness in hub pilot tube	O	O		O	O	O
8. Inspect condition of propeller deicer system (if installed)	O	O	O	O	O	O
9. Inspect condition of governor, governor controls, and synchrophaser (if installed)	O	O		O	O	O
10. Lubricate per latest revision of Hartzell Manual 107-P	O	O		O	O	O
11. Install spinner	O	O	O	O	O	O
12. Overhaul propeller (See latest revision of Hartzell Service Letter 61)	O	O				
B. ENGINE GROUP						
WARNING: Ground magneto primary circuit before working on engine.						
NOTE: Read notes 9 and 28 prior to completing this inspection group.						
1. Remove engine cowl	O	O	O	O	O	O
2. Clean and inspect cowling for cracks, distortion, and loose or missing fasteners	O	O	O	O	O	O
3. Drain oil sump (see note 2)	O	O	O	O	O	O

PERIODIC INSPECTIONS. (cont.)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

			Inspection Time (hrs)			
	L	R	50	100	500	1000
B. ENGINE GROUP (cont.)						
4. Clean suction oil screen at oil change (Inspect screen for foreign particles)	O	O	O	O	O	O
5. Change full flow (cartridge type) oil filter element (Inspect element for foreign particles)	O	O	O	O	O	O
6. Clean wastegate actuator filter and canister. Replace filter and/or "O" ring as required (for aircraft equipped with optional wastegate actuator filters)	O	O		O	O	O
7. Clean oil seperator can assembly screen if option #252 is installed	O	O		O	O	O
8. Inspect oil temperature sender unit for leaks and security	O	O		O	O	O
9. Inspect cylinder head temperature probe and wires for security	O	O		O	O	O
10. Inspect oil lines and fittings for leaks, security, chafing, dents, and cracks (See Note 15)	O	O		O	O	O
11. Clean and inspect oil radiator cooling fins	O	O		O	O	O
12. Remove and flush oil radiator(s)	O	O			O	O
13. Fill engine with oil per Chapter 12 of the Maintenance Manual	O	O	O	O	O	O
14. Clean engine (See Note 13)	O	O		O	O	O
15. Check condition of spark plugs (Clean and adjust gap as required; adjust per latest revision Lycoming Service Instruction No. 1042) (See Note 17)	O	O		O	O	O
NOTE: If fouling of spark plugs has been apparent, rotate bottom plugs to upper plugs.						
16. Inspect spark plug cable, lead spring, and silicone collar for corrosion, deposits and condition	O	O		O	O	O
17. Check cylinder compression (Ref: AC43, 13-1A)	O	O		O	O	O
18. Inspect cylinders for cracked or broken fins	O	O		O	O	O
19. Inspect rocker box covers for evidence of oil leaks. If found, replace gasket; torque cover screws 50 inch-pounds (See Note 10)	O	O	O	O	O	O
NOTE: Lycoming requires a valve inspection be made after every 400 hours of operation (See Note 11).						
20. Inspect wiring to engine and accessories, replace damaged wires and clamps, inspect terminals for security and cleanliness	O	O		O	O	O
21. Inspect ignition harnesses and insulators (high tension leakage and continuity)	O	O		O	O	O

PERIODIC INSPECTIONS. (cont.)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

			Inspection Time (hrs)			
	L	R	50	100	500	1000
B. ENGINE GROUP (cont.)						
22. Check magneto main points for clearance (Set clearance at .016± .003)	O	O		O	O	O
23. Inspect magneto retard points for proper retard angle (30 degrees) (Maintain clearance at .016 ± .006)	O	O		O	O	O
24. Inspect magnetos for oil leakage	O	O		O	O	O
25. Inspect breaker felts for proper lubrication	O	O		O	O	O
26. Inspect distributor block for cracks, burned areas or corrosion, and height of contact springs (See Note 24)	O	O		O	O	O
27. Inspect security of injector nozzle and sense line (See Note 12)	O	O		O	O	O
28. Check magnetos to engine timing (20 degrees BTC) (See Note 4)	O	O		O	O	O
29. Replace induction air filters (600, 601, 601P and 700P), clean filters (602P) (See Note 5)						
30. Check intake ducts for leaks (See Note 7)	O	O		O	O	O
31. Check air ducts and intercooler for condition and security	O	O		O	O	O
32. Inspect condition and operation of alternate air door and box	O	O		O	O	O
33. Inspect forward air boxes (each side of engine) and mode air doors and seals for condition and security (601 and 601P)	O	O	O	O	O	O
34. Remove and clean servo injector fuel inlet line screen	O	O	O	O	O	O
35. Inspect flexible hoses for condition (See Note 15)	O	O		O	O	O
36. Inspect fuel system for leaks including flow divider, lines and fittings	O	O		O	O	O
37. Check fuel pumps for operation and pressures (See Note 6)	O	O		O	O	O
38. Inspect condition of pneumatic pumps and security of hoses	O	O		O	O	O
39. Inspect hydraulic pump and gasket for leaks and flange drain hose for obstruction and evidence of hydraulic fluid or oil	O	O		O	O	O
40. Check condition, operation and security of induction alternate air system	O	O	O	O	O	O

PERIODIC INSPECTIONS. (cont.)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

			Inspection Time (hrs)			
	L	R	50	100	500	1000
B. ENGINE GROUP (cont.)						
41. Inspect throttle, mixture, and propeller governor controls for travel and operating condition (Ensure full stop to stop travel at servo injector)	O	O		O	O	O
42. Check cowl flap controls for condition and proper operation	O	O	O	O	O	O
43. Inspect exhaust stacks for cracks, hot spots and security; and gaskets for leakage and condition including tail pipe support on Model 600 (Replace gaskets as required) (See Note 29)	O	O	O	O	O	O
44. Inspect breather tube for obstructions and security	O	O		O	O	O
45. Inspect crankcase for cracks, leaks, and security of seam bolts	O	O		O	O	O
46. Inspect engine mounts for cracks, corrosion and loose mounting	O	O		O	O	O
47. Inspect all engine baffles for cracks and security	O	O		O	O	O
48. Inspect rubber engine shock (isolator) mount for deterioration	O	O		O	O	O
49. Inspect firewalls for cracks, condition and security of attachments	O	O		O	O	O
50. Inspect condition of firewall sealing	O	O		O	O	O
51. Inspect alternator and pulley for cracks, condition and security	O	O		O	O	O
52. Inspect alternator belt for tension and condition (See Note 4)	O	O		O	O	O
53. Check air conditioning compressor oil level, if installed (See Note 26)		O				
54. Check condition and tension of compressor drive belt (See Chapter 21)		O		O	O	O
55. Check security of compressor mounting		O		O	O	O
56. Inspect compressor clutch security and condition of wiring		O		O	O	O
57. Inspect tachometer generator for condition and security	O	O		O	O	O
58. Re-torque servo fuel injector attach hardware (See Chapter 91)	O	O		O	O	O
59. Inspect engine accessory case and components for leakage, condition and security	O	O		O	O	O
60. Inspect bleed air duct for condition and security	O	O		O	O	O

PERIODIC INSPECTIONS. (cont.)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

			Inspection Time (hrs)			
	L	R	50	100	500	1000
B. ENGINE GROUP (cont.)						
61. Inspect starter, starter ring gear, hot prop brush blocks and slip ring	O	O		O	O	O
62. Lubricate all controls (DO NOT lubricate teflon liners of control cables)	O	O		O	O	O
63. Inspect sonic nozzle for condition and security (602P and 700P)	O	O		O	O	O
64. Re-install engine cowlings (600 only)	O	O	O	O	O	O
C. TURBOCHARGER GROUP (601, 601P, 602P and 700P)						
1. Visually inspect system for oil leaks, exhaust system leaks and general condition (See Note 27)	O	O	O	O	O	O
2. Inspect the compressor wheel for nicks, cracks or broken blades	O	O		O	O	O
3. Inspect for excess bearing drag or wheel rubbing against housing	O	O		O	O	O
4. Inspect turbine wheel for broken blades or signs of rubbing	O	O		O	O	O
5. Inspect oil inlet and outlet ports in center housing for leaks	O	O		O	O	O
6. Inspect turbine heat blanket for condition and security	O	O		O	O	O
7. Inspect turbo gaskets for leaks	O	O	O	O	O	O
8. Inspect turbo clamp for cracks and torque (See Notes 8 and 29)	O	O	O	O	O	O
9. Inspect mounts for cracks, corrosion, clearance and security	O	O		O	O	O
10. Inspect actuator orifice restrictor	O	O			O	O
11. Inspect wastegate actuator linkage, rod ends, return springs, butterfly, and bushings for condition (Replace bushings as required)	O	O		O	O	O
12. Inspect vent line from actuator to engine case for presence of oil	O	O	O	O	O	O
13. Inspect induction and exhaust components for worn or damaged areas, loose clamps, cracks and leaks (See Note 29)	O	O	O	O	O	O
14. Inspect turbo and controller system oil lines for leaks and security (refer to Aerostar SB600-127)	O	O		O	O	O

PERIODIC INSPECTIONS. (cont.)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	L	R	Inspection Time (hrs) 50	100	500	1000
C. TURBOCHARGER GROUP (cont.)						
15. Inspect for oil leakage from controller and sense lines	O	O		O	O	O
16. Check that scavenge oil system restrictor and orifice are free of obstructions	O	O			O	O
17. Reinstall engine cowling	O	O	O	O	O	O
D. CABIN GROUP						
NOTE: Remove all five floor panels (per Chapter 53) at first 500 hour and each subsequent 1000 hour inspection.						
1. Remove inspection covers and panels (Seats and carpet must be removed for access to inspection covers on cabin floor)				O	O	O
2. Inspect cabin entrance door and emergency exit door for proper operation of door seals (601P/602P/700P)				O	O	O
3. Inspect cabin door and emergency exit for proper rigging, retainer pins and striker plates for bending, cracks, proper engagement, pulled or sheared fasteners and bending of the frame web				O	O	O
4. Inspect seats and upholstery for tears				O	O	O
5. Inspect seats, seat belts, security brackets and bolts			O	O	O	O
6. Check electric trim operation and rigging				O	O	O
7. Check operation of rudder pedals and toe brakes				O	O	O
8. Check operation of parking brake				O	O	O
9. Inspect condition of control wheels, column and switches (if installed)				O	O	O
10. Inspect aileron springs, sprockets, chains and aileron chain turnbuckle jam nuts for torque (30-40 in. lbs)				O	O	O
11. Check operation of strobe, landing, navigation, cabin & instrument lights			O	O	O	O
12. Inspect condition of instruments, lines, hoses and attachments				O	O	O
13. Check main bus and other circuit breaker wire connections		O	O	O	O	
14. Inspect pneumatic and electric gyro instruments (overhaul or replace as required)				O	O	O

PERIODIC INSPECTIONS. (cont.)

- NOTE -
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
D. CABIN CROUP (cont)				
15. Inspect gyro pressure regulator (601P, 602P, and 700P, and all models with surface deice) setting per Chapter 21		O	O	O
16. Inspect pitot and static hoses, lines, and alternate static lines (if installed) for condition and security		O	O	O
17. Inspect altimeter (calibrate in accordance with FAR 91.171 if appropriate)		O	O	O
18 Check operation of fuel selector valves per Chapter 28		O	O	O
19. Check operation of crossfeed (X- FEED) valve per Chapter 28		O	O	O
20. Check operation of hydraulic shutoff valve per Chapter 29		O	O	O
21. Check operation of cabin heat and defrost controls		O	O	O
22. Check all knobs, switches and levers for security of attachment		O	O	O
23. Check operation of auxiliary hydraulic pump (if installed)		O	O	O
24. Inspect condition of environmental system ducts		O	O	O
25. Inspect oxygen regulator mask and mask connector		O	O	O
26. Check cabin pressurization system operation		O	O	O
27. Inspect rudder and aileron bellcranks, elevator and aileron idler arms, and rudder-aileron interconnect		O	O	O
28. Inspect balance tube (601P, 602P and 700P)		O	O	O
29. Inspect flap and MLG control valves for leaks, operation security, and condition		O	O	O
30. Inspect flap and MLG control cables (Lubricate per lubrication chart Chapter 12)		O	O	O
31. Inspect electrical panel components (F.S. 176.88 bulkhead) for condition and security	O	O	O	O
32. Inspect forward side of outflow and safety valves for condition and security (601P, 602P and 700P). Remove and clean per Chapter 21 (See Note 18)		O	O	O
33. Inspect "cigarette" filters on controller, and outflow valve for contamination (601P, 602P and 700P) Replace as required		O	O	O
34. Check vacuum generator for condition and security (700P)		O	O	O

PERIODIC INSPECTIONS. (cont.)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
D. CABIN GROUP (cont.)				
35. Make operational check of pressurization controller (601P, 602P and 700P)		O	O	O
36. Inspect forward face at F.S. 176.88 and 204.00 bulkheads, hat shelf, and aft face of F.S. 54.25 bulkhead for bulging, cracks, dents, loose or missing fasteners, condition, and security of components		O	O	O
37. Reinstall inspection covers and panels		O	O	O
E. LANDING GEAR GROUP				
NOTE: Check for proper strut extension per Chapter 12 prior to jacking airplane.				
1. Place airplane on jacks per Chapter 7		O	O	O
2. Open landing gear doors per Chapter 32		O	O	O
3. Remove inspection covers and panels	O	O	O	O
4. Check struts for maximum extension (check for proper fluid level and pressure)		O	O	O
5. Inspect nose gear steering control and travel		O	O	O
6. Inspect nose gear steering control valve, actuator and jury brace (if installed) for leakage, security, condition and operation		O	O	O
7. Inspect jury brace spring (if installed) for attachment		O	O	O
8. Inspect nose wheel steering collar for cracks	O	O	O	O
9. Inspect nose wheel squat switch for security and adjustments		O	O	O
10. Inspect tires for cuts, uneven or excessive wear and slippage		O	O	O
11. Remove wheels, clean, inspect and repack bearings and rotate tires		O	O	O
12. Inspect wheels for cracks, corrosion and broken bolts		O	O	O
13. Inspect brake/disc/lining for wear, condition and security		O	O	O

PERIODIC INSPECTIONS. (cont)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
E. LANDING GEAR GROUP (cont)				
14. Check tire pressure per tire pressure chart, Chapter 12	O	O	O	O
15. Inspect brake hydraulic lines for leakage, condition and security		O	O	O
16. Inspect brake reservoir for proper fluid level, leaks, condition and security	O	O	O	O
17. Inspect gear fork for damage		O	O	O
18. Inspect struts for fluid pressure leaks and scoring		O	O	O
19. Inspect torque links, bolts and bushings (rebush as required) (See Note 32)		O	O	O
20. Inspect gear struts, attachments, trunnion pins and attachments for condition and security		O	O	O
21. Inspect drag brace, attachments, bolts, bushings, trunnion pins and attachments for condition and security (Rebush as required) (refer to Aerostar SB 600-128)		O	O	O
22. Inspect retraction actuators/bungees and attachments for condition and security		O	O	O
23. Inspect main and nose gear doors, and rod assemblies for corrosion, security and freedom of movement (Refer to the latest revision of Aerostar SL 600-60)		O	O	O
24. Inspect MLG door control valves and actuators for leakage, condition and security		O	O	O
25. Inspect down lock for operation and adjustment		O	O	O
26. Inspect warning horn and lights for operation		O	O	O
27. Lubricate per lubrication chart, Chapter 12	O	O	O	O
28. Perform operational check per Chapter 32		O	O	O
29. Inspect anti-retraction system on gear lever		O	O	O
30. Inspect actuating cylinders for leaking and security		O	O	O
31. Inspect position indicating switches and electrical leads for security		O	O	O

PERIODIC INSPECTIONS. (cont)

– NOTE–
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
F. FUSELAGE AND EMPENNAGE GROUP				
1. Remove inspection covers and panels	O	O	O	O
2. Inspect structure for cracks, dents, security of attachments, cleanliness and loose or pulled fasteners (See Note 25)	O	O	O	O
3. Inspect windshield and windows for nicks, scratches, cracks, crazing and discoloration (For 601P, 602P and 700P pressurized flight is prohibited with discoloration, cracks or crazing)	O	O	O	O
4. Inspect condition of bulkheads, frames, stringers, and longerons for cracks, dents, bending, buckling, sealed areas and loose or pulled fasteners	O	O	O	O
5. Inspect avionic compartment, components and wiring for condition, security and operation		O	O	O
6. Inspect ventilating air scoop (nose) for obstructions and ducting for condition and security (600/601 only)	O	O	O	O
7. Inspect landing light cover for cracks, distortion and security	O	O	O	O
8. For 601P, A/F 0157-0228, and all 602P's, open fuselage drains Close after draining, (drain is automatic after A/F 0228)		O	O	O
9. Inspect push rod and balance rod boots for condition and security of clamps (601P, 602P and 700P)		O	O	O
10. Inspect fuel sump drains for water and proper operation	O	O	O	O
11. Inspect oxygen dump outlet visual indicating disc on A/F with oxygen system installed	O	O	O	O
12. Inspect fuel vent drains for obstructions and for fuel draining from fuselage tank area drain	O	O	O	O
13. Drain pitot/static lines (ensure airplane is in nose high position)		O	O	O
14. Inspect rotating beacon(s) and antennas for condition and security		O	O	O
15. Inspect fuel vents for obstructions	O	O	O	O
16. Inspect pitot tube and static vents for obstructions and pitot heater for operation		O	O	O

PERIODIC INSPECTIONS. (cont)

– NOTE –
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
F. FUSELAGE AND EMPENNAGE GROUP (cont)				
17. Inspect dorsal fin and air duct for condition and security		O	O	O
18. Inspect vertical fin and rudder surface for damage		O	O	O
19. Inspect rudder and trim tab hinges and attachments for damage and operation including free play (See Note 30)		O	O	O
20. Inspect rudder hinge bolts and trim tab hinge for excessive wear		O	O	O
21. Check rudder torque tube bearings and felt seals for grease and full movement			O	O
22. Inspect rudder trim mechanism installation		O	O	O
23. Inspect vertical fin attach points, wiring, pitot and static hoses for condition and security (Refer to latest Aerostar SB No. 600-88)		O	O	O
24. Inspect condition of deice systems (if installed)		O	O	O
25. Inspect horizontal stabilizer and elevator surfaces for damage		O	O	O
26. Inspect elevator hinge bolts, trim tab hinges and attachments for damage and operation		O	O	O
27. Inspect elevator and trim tab hinge bolts and bearings for excessive wear		O	O	O
28. Inspect horizontal stabilizer attachments (Refer to the latest revision of Aerostar SB No. 600-88)		O	O	O
29. Inspect elevator trim mechanism installation		O	O	O
30. Inspect elevator and rudder control tubes (See Note 34)		O	O	O
31. Inspect battery compartment and vent system for corrosion, etching, condition, water, and security (Inspect at least every 30 days, flush compartment as required)	O	O	O	O
32. Inspect external power supply plug, battery relay, fuses, tail light and strobe light power supply (if installed under tail cone) for cleanliness, corrosion, condition, and security		O	O	O
33. Inspect heater combustion air blower inlet screen, heater exhaust and heater fuel drain for obstructions, condition and security		O	O	O
34. Inspect baggage compartment door, latches and hinge for operation, condition and security		O	O	O
35. Inspect baggage compartment upholstery for condition		O	O	O
36. Inspect baggage compartment light and switch for operation, condition, and security		O	O	O
37. Inspect emergency locator transmitter battery for replacement date/time		O	O	O

PERIODIC INSPECTIONS. (cont)

– NOTE–
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
F. FUSELAGE AND EMPENNAGE GROUP (cont.)				
38. Check fluid level in deice reservoir and filter in deice pump (if installed)		O	O	O
39. Check fluid level in hydraulic reservoir (fill as required)	O	O	O	O
40. Change/clean hydraulic filter		O	O	O
41. Inspect all fluid lines for leakage, condition, and security		O	O	O
42. Inspect hydraulic accumulator for proper charge, per Chapter 29	O	O	O	O
43. Inspect hydraulic pressure regulator and relief valve for leakage, condition, and security		O	O	O
44. Inspect auxiliary hydraulic pump, pressure switch, lines and electrical components (if installed) for operation, condition, and security		O	O	O
45. Inspect autopilot servo and controls (if installed) per manufacturer's instructions		O	O	O
46. Inspect aileron, rudder, elevator tubes, autopilot trim cables, turnbuckles guides and pulleys (if installed) for safeties, damage and operation (See Note 34)		O	O	O
47. Inspect all electronic installations for security and operations		O	O	O
48. Inspect antennas/coaxial cables for condition and security		O	O	O
49. Inspect push-pull tubes, torque tubes, levers, pillow blocks, bellcranks and connections for condition and security (See Note 34)		O	O	O
50. Check recommended time for overhaul of heater (See Note 21)		O	O	O
51. Inspect heater for fuel or fume leaks and pressurized air leaks		O	O	O
52. Inspect heater ducting for obstructions, condition and security		O	O	O
53. Inspect air conditioning system (if installed) for condition and security, check belt tension (See Chapter 21)		O	O	O
54. Inspect area above fuselage tank for cleanliness, condition, and security of attachment of fuel shelf cover assembly, transmitter/probe mounting, wiring, and fuel vent system		O	O	O
55. On Model 601P, 602P and 700P, inspect aft side of outflow and safety valves for cleanliness, looseness and condition (See Note 18)		O	O	O
CAUTION: Ensure oxygen supply cylinder or lines do not impede operation of outflow or safety valves.				

PERIODIC INSPECTIONS. (cont)

- NOTE -
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

	Inspection Time (hrs)			
	50	100	500	1000
F. FUSELAGE AND EMPENNAGE GROUP (cont.)				
56. Check oxygen supply cylinder for hydrostatic test date and/or pressurizations per Chapter 35		O	O	O
57. Inspect oxygen supply cylinder, valve, full valve and lines for leaks, condition, and security		O	O	O
58. Inspect under fuselage tank for cleanliness, leaking hoses and lines, and condition of compartment		O	O	O
59. Inspect hydraulic, fuel shutoff, and X-Feed valves for condition, security and proper operation		O	O	O
60. Inspect fuel sumps for leakage, condition, and security		O	O	O
61. Inspect fuel boost pumps for condition, security and operation		O	O	O
62. Inspect fuel filters, clean/replace as required		O	O	O
63. Inspect fuel flow transducer (if installed) for condition, leakage, and security (See Note 20)		O	O	O
64. Inspect all hoses and lines for leakage, condition and security		O	O	O
65. Right wheel well only, inspect elevator and rudder bellcrank for cracks, condition, security of attachment, and security of push-pull connectors		O	O	O
66. Inspect fuselage tank filler cap, and receptacle for condition. Replace O-ring. Check for proper tension on lock, per Chapter 28 (See Note 35)	O	O	O	O
67. Lubricate per lubrication chart, Chapter 12		O	O	O
68. Reinstall inspection covers and panels (See Note 19)	O	O	O	O
69. Close landing gear doors per Chapter 32		O	O	O
CAUTION: Ensure landing gear handle is in down position and that DOWN AND LOCKED lamps are illuminated.				
70. Remove airplane from jacks per Chapter 7		O	O	O
71. Inspect electric windshield deice panel (if installed) for correct fit, distortion, condition, security and proper operation		O	O	O

PERIODIC INSPECTIONS. (cont)

– NOTE–
Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

			Inspection Time (hrs)			
G. WING GROUP	L	R	50	100	500	1000
1. Remove inspection covers and panels (See Note 16)	O	O		O	O	O
2. Inspect surfaces, skins and tips for damage and loose or missing fasteners	O	O	O	O	O	O
3. Inspect security of ailerons, hinges and attachments	O	O		O	O	O
4. Inspect aileron push-pull tubes and bellcranks for damage and operation (See Note 34)	O	O		O	O	O
5. Inspect aileron balance weight for security and condition	O	O		O	O	O
6. Inspect flaps and attachments for damage and operation	O	O		O	O	O
7. Inspect condition of bolts used with flap and aileron hinges (replace as required)	O	O				O
8. Inspect flap indicator attachment bracket for installation condition. Look carefully for cracks and fastner looseness, particularly at the lower end.	O	O			O	O
9. Inspect condition of all exterior bearings	O	O			O	O
10. Lubricate per lubrication charts, Chapter 12	O	O		O	O	O
11. Inspect security of wing attachment bolts and brackets, retorque per chart, Chapter 91	O	O		O	O	O
12. Inspect condition of hydraulic, fuel and pneumatic hoses and lines	O	O		O	O	O
13. Inspect condition and security of wiring, connectors and engine control cables	O	O		O	O	O
14. Inspect flap flow control valve for leaks, condition, and security	O	O		O	O	O
15. Inspect pneumatic regulator control valve for condition and security	O	O		O	O	O
16. Inspect ducts, intercooler, sonic nozzle and electrical wiring for condition and security (601P, 602P and 700P)	O	O		O	O	O
17. Inspect bleed air diverter valve (602P and 700P) and bleed air shut off valve (601P) for leakage, condition, security, and proper operation	O	O		O	O	O
18. Inspect security of engine mount attaching structure	O	O		O	O	O
19. Inspect fuel tanks and lines for leaks	O	O	O	O	O	O
20. Inspect fuel deliver tube inboard and outboard hose couplings in nacelle area for security, condition, and fuel leaks. Refer to Chapter 28. See Note 16. (700P Only)	O	O			O	O
21. Drain wing fuel tanks (See Note 16)	O	O			O	O
22. Inspect fuel strainer screens, transmitters and electrical connectors for cleanliness, condition, and security (See Note 16)	O	O			O	O

PERIODIC INSPECTIONS.

— NOTE —

Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

Nature of Inspection	L	R	Inspection Time (hrs) 50	100	500	1000
G. WING GROUP (cont.)						
22. Inspect security and free operation of flapper valve and condition of fuel tank sealing material (See Note 16)	O	O			O	O
23. Fuel tanks marked for capacity and minimum octane rating	O	O	O	O	O	O
24. Inspect fuel tank pressure relief valve for condition	O	O		O	O	O
25. Inspect condition of pneumatic deicer (if installed)	O	O		O	O	O
26. Inspect nav light cover for condition and security	O	O	O	O	O	O
27. Inspect fuel filler cap and receptacle for condition. Replace O-ring	O	O	O	O	O	O
28. Reinstall inspection covers and panels (See Note 14)	O	O		O	O	O
H. OPERATIONAL INSPECTION						
1. Check fuel pumps, fuel tank selector and crossfeed operation			O	O	O	O
2. Check fuel quantity and pressure or flow gauges			O	O	O	O
3. Check oil pressure and temperature gauges			O	O	O	O
4. Check alternator output - left and right engines			O	O	O	O
5. Check manifold pressure gauge			O	O	O	O
6. Check alternate air			O	O	O	O
7. Check parking and toe brake			O	O	O	O
8. Check gyro air gauge			O	O	O	O
9. Check gyros for noise and roughness			O	O	O	O
10. Check cabin heater and defroster			O	O	O	O
11. Check magneto RPM variation			O	O	O	O
12. Check magneto switch operation			O	O	O	O
13. Check throttle and mixture controls			O	O	O	O
14. Check propeller controls and propeller action			O	O	O	O
15. Check engine idle						
16. Check electronic equipment operation (Refer to Chapter 23 for ELT check)			O	O	O	O
17. Check operation of flight controls and flaps			O	O	O	O
18. Check Pitch Trim System if installed			O	O	O	O
19. Check operation of Autopilot including automatic pitch trim and manual electric trim (See Note 23)			O	O	O	O

PERIODIC INSPECTIONS.

— NOTE —

Perform all inspections or operations at each of the inspection intervals as indicated by a circle (O). (See Note 1.)

Nature of Inspection	Inspection Time (hrs)			
	50	100	500	1000
I. GENERAL.				
1. Aircraft conforms to FAA specifications	O	O	O	O
2. All latest FAA Airwothiness Directives complied with	O	O	O	O
3. All latest Manufacturers Service Letters and Bulletins complied with	O	O	O	O
4. Check for proper Flight Manual	O	O	O	O
5. Aircraft papers in proper order	O	O	O	O

PERIODIC INSPECTIONS. (cont)

NOTES:

1. All inspections or operations are required at each of the inspection intervals as indicated by a (O). Both the annual and 100 hour inspections are complete inspections of the airplane, identical in scope, while both the 500 and 1000 hour inspections are extensions of the annual or 100 hour inspection, which require a more detailed examination of the airplane, and overhaul or replacement of some major components. Inspections must be accomplished by persons authorized by the FAA.
2. Intervals between oil changes can be increased as much as 100% on engine equipped with full flow (cartridge type) oil filters, provided the element is replaced each 50 hours of operation. Refer to the latest revision of Lycoming Service Bulletin 480 "Oil and Filter Change and Cleaning."
3. Instructions given for propeller are based on the propeller manufacturer's owner's manual (Hartzell Manual 107-P). Any changes issued to the propeller manufacturer's owner's manual shall supersede or supplement the instructions outlined in this manual. Occasionally, service bulletins or service instructions are issued by Hartzell that require inspection procedures that are not listed in this manual. Such publications usually are limited to specific models and become obsolete after corrective steps have been accomplished. All such publications are available from Hartzell Propellers, Inc. Piqua, Ohio. Maintenance facilities should have an up-to-date file of these publications available at all times.
4. Check at first 50 hours of operation, then at each subsequent 100 hour inspection.
5. Filters may require changing prior to 100 hours if operated in extremely dusty or dirty conditions.
6. To check the fuel pump pressures, refer to Chapter 28 of the Maintenance Manual.
7. On Model 600, all the wires that form the intake ducts must be in place and secure.
8. If clamp nut is removed, replace with new nut. Torque on installation and recheck torque after first engine run-up.
9. Inspections given for power plant are based on the engine manufacturer's operator's manual (Lycoming Part No. 60297-10). Any changes issued to the engine manufacturer's operator's manual shall supersede or supplement the instructions outlined in this manual. Occasionally, service instructions are issued by Avco Lycoming Division that require inspection procedures that are not listed in this manual. Such publications usually are limited to specific models and become obsolete after corrective steps have been accomplished. All such publications are available from Avco Lycoming distributors or from the factory by subscription. Consult latest revision Service Letter No. L114 for subscription information. Maintenance facilities should have an up-to-date file of these publications available at all times.
10. Check cylinders for evidence of excessive heat which is indicated by burned paint on the cylinders. This condition is indicative of internal damage to the cylinder and, if found, its cause must be determined and corrected before the airplane is returned to service. Heavy discoloration and appearance of seepage at the cylinder head and barrel attachment area is usually due to emission of thread lubricant used during assembly of the barrel at the factory, or by slight gas leakage which stops after cylinder has been in service for awhile. This condition is neither harmful nor detrimental to engine performance and operation. If it can be proven that leakage exceeds these conditions, the cylinder should be replaced.
11. At every 400 hours of engine operation, remove the rocker box covers and check for freedom of the valve rockers when valves are closed. Look for evidence of abnormal wear or broken parts in the area of the valve tips, valve keeper, springs and spring seat. If any indications are found, the cylinder and all of its components should be removed (including the piston and connecting rod assembly) and inspected for further damage.
12. Check security of injector nozzles every 100 hours of engine operation per Lycoming's Operator's Manual (Lycoming Part No. 60297-10).
13. Cover or remove all filters, plug all openings, and cover ignition lead at spark plug and magneto. (Solvent will contaminate air and fuel filters and corrode springs in ignition leads.)
14. Only use brass screws to install the wing tip that covers the flux detector on the outboard section of the left wing on airplanes equipped with remote compass systems. Steel screws may cause erratic compass readings.
15. Replace flexible hoses as required, but not later than engine overhaul or five years. Refer to Aerostar Service Bulletins 600-39, 600-49, and 761.

PERIODIC INSPECTIONS (cont)

NOTES (cont):

16. Inspect fuel tanks every two years or after 500 hours in service, whichever comes first. Remove only middle inboard inspection cover to sealed area of wing tanks for access to strainer and transmitter. Check operation of flapper valve through wing tank filler port. The fuel delivery tube hose couplings must be inspected at each annual inspection (refer to chapter 28 for inspection instructions).
17. Do not clean iridium spark plugs with abrasive or glass bead materials.
18. Outflow and safety valves may require cleaning prior to 100 hours if heavy smoking or dusty conditions exist.
19. If strobe light power supply is installed on right wheel well kidney panel, check power supply for condition and operation after panel has been reinstalled and power supply connected.
20. Refer to the latest revision of Aerosonic Corporation Service Bulletin 2 (fuel flow transducer inspection/replacement).
21. Overhaul heater in accordance with manufacturer's recommendations. Janitrol Aero Division, Midland Ross Corp., 4200 Surface Road, Columbus, Ohio 43228. Refer to AD 82-07-03.
22. Any aircraft which has had the area around the rudder torque tube attachment fittings:
    washed with deice fluid (isopropryl alcohol);
    stripped with paint stripper; or
    washed with any solvent;
    will need to have the felt washer which protects the bearings regreased with MIL-G-81322 or MIL-G-7711 Grease.
23. Refer to flight manual supplement for preflight and flight check for intended function in all modes.
24. Refer to latest revision of Lycoming Service Bulletin 459.
25. For pressurized models with 2,000 hours or more, perform the extended inspections as outlined in Extended Inspections (601P, 602P and 700P).
26. The compressor oil level should not be checked unless a Freon leak, which requires an addition of Freon to the system, has occurred.
27. Refer to the latest revision of Aerostar Service Bulletin 761.
28. Refer to VSP 69.
29. Refer to latest revision of Aerostar Service Bulletins 920 - Part 1, 600-119, and 600-123. Perform these inspections at 50 Hr/Annual Inspection events.
30. Total rudder and elevator trim tab free play measured at the upper edge and outboard edge respectively shall not exceed 0.085 inch.
31. Refer to latest revision of Aerostar Service Bulletin 600-120.
32. Torque links should be heavy duty single lug type with proper connecting bolts. Refer to Aerostar Service Bulletin 746C. Check main landing gear torque link center connecting bolt for clearance with bushing. The fit between the bolt and torque link bushings should be firm but not so tight as to restrict the action of the torque links. The bolt should be easily turned with a standard open or box end wrench, yet difficult to turn by hand (20 to 40 in-lbs resistance). If the bolt is difficult to turn by wrench, remove cotter pin, loosen the castle nut on the bolt, retighten to 9 ft-lbs torque, back nut off 1/4 turn and tighten finger tight enough to line up with hole in bolt for proper cotter pin installation. Recheck clearance by turning bolt with wrench. If the bolt is still tight, remove bolt, clean bolt and bushings, and carefully ream bushings (.375 inches inside diameter) to provide the resistance as outlined above between the bolt and torque link bushings with the bolt and bushings properly lubricated. Reinstall bolt and tighten castle nut to 9 ft-lbs torque, back nut off 1/4 turn and tighten finger tight enough to line up with hole in bolt for proper cotter pin installation. If the torque link connecting bolts show any looseness replace bolts and/or torque links as required.
33. Refer to Aerostar Service Bulletin 600-121 for nose gear lower drag link piston and spring replacement (aircraft with Wiebel nose gear system only).
34. Refer to latest revision of Aerostar Service Bulletin 600-122.
35. Replacement of fuel cap "O" ring is VERY IMPORTANT. Refer to latest revision of Aerostar Service Bulletin 600-77.

PROGRAMMED INSPECTION.

The programmed inspection was designed to permit the best utilization of the aircraft, by scheduling inspections through the use of a planned inspection schedule. This programmed inspection schedule has been prepared in a manual form which is available from Aerostar Customer Service under Part Number 761 749. To insure using the latest inspection manual available refer to the Parts Price List Aerofiche for a checklist of latest inspection manual revision date.

EXTENDED INSPECTIONS (601P, 602P and 700P).

The model 601P, 602P and 700P cabin structure are subject to tension and compression forces due to pressurization, therefore, extended periodic inspections are required in order to ensure minor damage does not propagate into a serious weakness. Extended periodic inspections, Schedule "A" and Schedule "B" are listed in Figure 5-1.

– NOTE–
It is important that a qualified inspector experienced in fatigue related damage conduct the structural inspection.

Schedules "A" and "B" may be delayed or moved ahead to nearest annual inspection if airplane is operated less than 600 hours per year. The 100 hour inspections may be performed plus or minus 10 hours.

1. Schedule "A" inspection (in addition to 1,000 hour inspection). Pressure bulkheads and window retainer fasteners (Figure 5-2 and Figure 5-3).
   - A. Reference Chapter 6, for component access.
   - B. Check bulkhead at fuselage station 54.25 on both sides for cracks and loose fasteners, specifically around the peripheral attachment areas of the panel (item 1) to the frame.
   - C. Check stiffeners supporting the panel and the nose gear side support channels (items 2 and 3) for any evidence of cracking or working fasteners.
   - D. Check bulkhead at fuselage station 176.88 on both sides, for cracks and loose fasteners, specifically around the peripheral attachment areas with frame and hat-shelf panel (item 4).
   - E. Check stiffeners supporting the bulkhead, for cracks and working rivets (item 5).
   - F. Check hat-shelf on both sides between bulkheads at fuselage station 176.88 and fuselage station 204.00 for cracks and loose fasteners, specifically around the peripheral attachment areas of the panel to frame and bulkheads (item 6).
   - G. Check stiffeners supporting the panel, for cracks and working fasteners.
   - H. Check bulkhead on both sides at fuselage station 204.00 for cracks and loose fasteners, specifically around the peripheral attachment areas of the panel to frame and hat-shelf panel.
   - I. Check stiffeners supporting the bulkhead, for cracks and working fasteners (item 7).
   - J. Check fuel-tank top shelf, for cracks, bending, and loose fasteners (item 8).
   - K. Check all window retainers (fuselage and doors), for cracks and loose fasteners; refer to Figure 5-3.

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AIRFRAME HOURS	EXTENDED INSPECTION	AIRFRAME HOURS	EXTENDED INSPECTION
2,000 HRS	(1) Schedule A	19,000 HRS or	(1) Schedule A
4,000 HRS	(1) Schedule A	Annual	(2) Schedule B
6,000 HRS	(1) Schedule A		
	(2) Schedule B	NOTE: After	
8,000 HRS	(1) Schedule A	18,000 HRS Schedule	
10,000 HRS	(1) Schedule A	A & B both apply	
12,000 HRS	(1) Schedule A	for each additional	
	(2) Schedule B	1,000 HRS or annual	
14,000 HRS	(1) Schedule A	whichever occurs	
16,000 HRS	(1) Schedule A	first.	
18,000 HRS	(1) Schedule A		
	(2) Schedule B		

Figure 5-1. Pressurized Cabin, Extended Inspection

2. Schedule "B" inspection (in addition to Schedule "A" Inspection).
   A. Cabin exterior, interior and lower cabin (Figure 5-4).
      (1) Check cabin skin outer surface area between fuselage station 54.25 and fuselage station 204.00, for cracks, dents and loose or pulled fasteners.
      (2) Check outer skin, for bulging, oil canning, buckling, corrosion, and for evidence of fatigue.
      (3) Remove all interior furnishings (seats, carpets, bulkhead panel covers, side and overhead upholstery panels, insulation panels, and floor panels).

– NOTE –

With floor panels removed, use a suitable wooden board across floor structure when performing maintenance.

      (4) Check inner skin surface, for cracks, cuts, dents, loose/sheared/pulled fasteners, buckling, oil canning, corrosion, and for any other evidence of fatigue.
      (5) Check formed structure frames, for buckling, cracking, and loose or pulled fasteners. Pay particular attention to all structural items around door, windshield, and window openings.
      (6) Check all longerons and stringers, for cracks, buckling, and loose or pulled fasteners.
      (7) Check lower instrument panel attachment to fuselage skin for damage, and loose or pulled fasteners.
      (8) Check all sub-floor structure (beams, intercostals, longerons, and associate structure pieces) for bending, buckling, cracks, corrosion, and loose or pulled fasteners (refer to Figure 5-4).

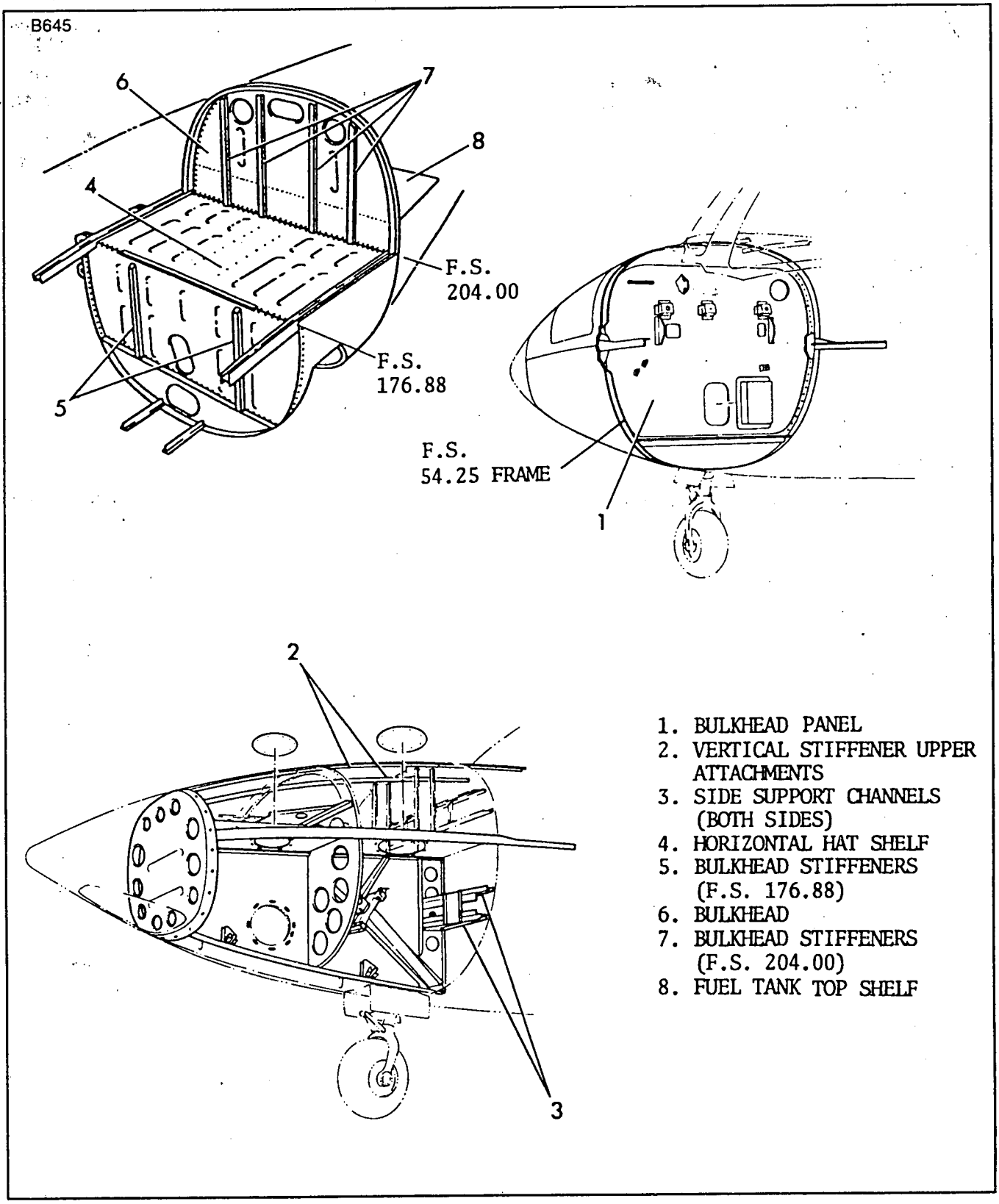
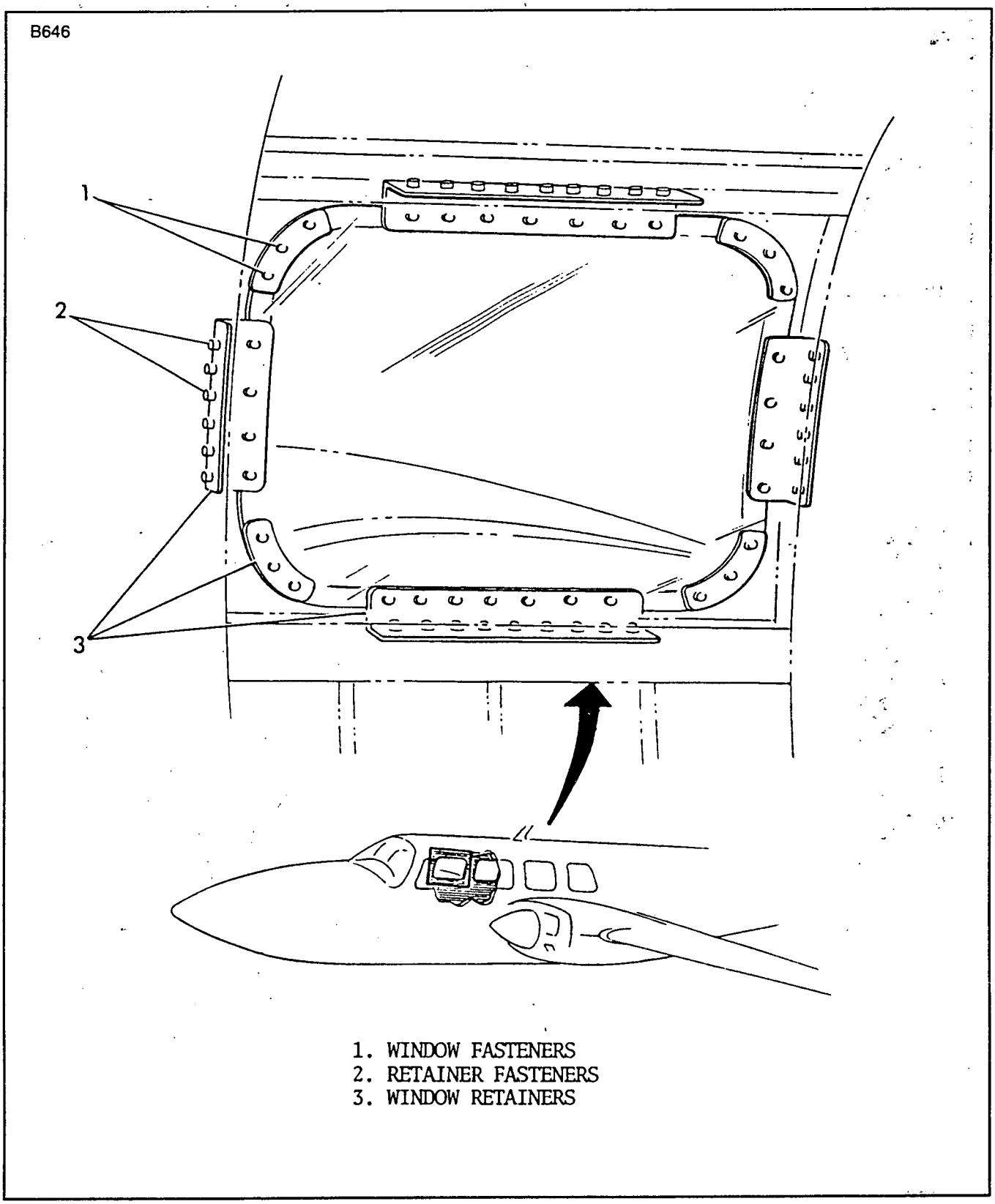
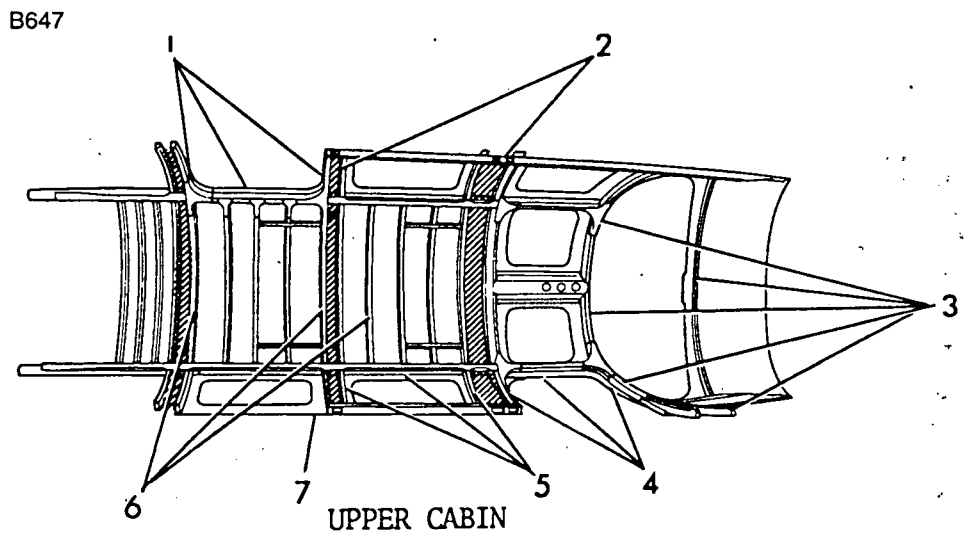


Figure 5-2. Pressure Bulkheads



1. WINDOW FASTENERS
2. RETAINER FASTENERS
3. WINDOW RETAINERS

Figure 5-3. Window Fasteners and Retainers



1. EMERGENCY EXIT FRAMES
2. FLANGE PLATES
3. WINDSHIELD FRAMES
4. DOOR FRAMES
5. WINDOW FRAMES AND RETAINERS
6. OVER HEAD FRAMES
7. FUSELAGE SKIN
8. FUSELAGE FRAMES (LEFT SIDE)
9. FUSELAGE FLOOR INTERCOSTALS
10. FUSELAGE FRAMES (RIGHT SIDE)

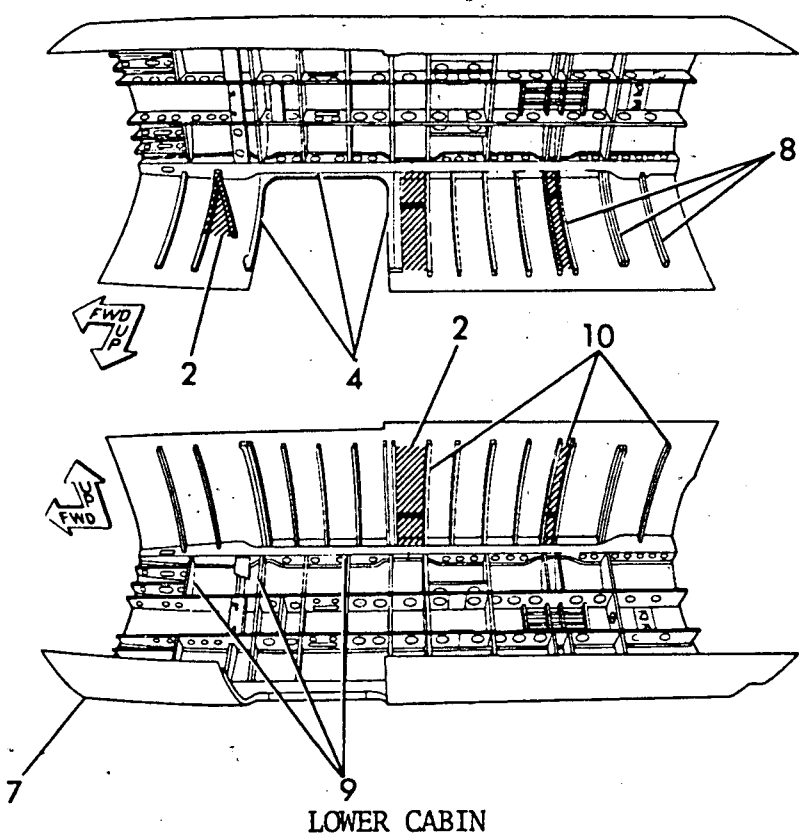


Figure 5-4. Cabin Interior Structure

3. Structural damage limits (for Model 601P, 602P and 700P).

– NOTE –

Some minor damage is acceptable, and will not seriously degrade the cabin's structural integrity, before repairs must be made at next 100 hour or annual inspection, whichever occurs first.

Typical acceptable damage, with cabin pressurization, would be a small bending of frame flanges, occasional pulled or loose fasteners, and single small cracks (less than 1 inch), provided that crack is stop-drilled and does not seriously weaken the affected structure or propagate into greater damage.

A. On windshield and window surfaces, maximum dimension for nicks, dents, or scratches is .050 inch depth. The length/width, or damage area must not exceed 1.5 inches long, .200 inch wide, or .250 square inch, with no more than two damage items per 10 square inches of area. Rework of minor nicks, dents or scratches (less than maximum stated) may be made to the depth, approximately two times the width, and three times the length. Remove all sharp edges.
B. For windshield or window discoloration without crazing; perform crazing inspection prior to flight until discolored component is replaced.
C. For retainer pins and striker plates (Main door and Emergency Exit window); bent or broken pins and plates must be replaced prior to cabin pressurization. A single hairline crack (less than first row of fasteners), or slight bending in plate may be repaired not later than next 100 hour or annual inspection whichever occurs first. Do not attempt to straighten a bent retainer pin or striker plate.
D. For pressure bulkheads and window retainers; cracks in panels exceeding 1 inch, cracks in retainers, cracks in stiffeners, sheared fasteners, or buckled/bent conditions must be repaired prior to cabin pressurization.
E. For cabin skin; cracks exceeding 1 inch in length, dents in frame areas, buckling, sheared fasteners, or many (10 or more) loose or pulled fasteners in one area must be repaired prior to cabin pressurization.
F. For beams and intercostals; cracks in web or cap, buckling, major bending, sheared fasteners, many loose or pulled fasteners (10 or more in one area), or loose fasteners in splice areas must be repaired prior to cabin pressurization.
G. For frames; cracks in web, cracks in flanges extending to first row of fasteners, buckling or bending in web, sheared fasteners, and many pulled or loose fasteners must be replaced prior to cabin pressurization.
H. For longerons and stringers; cracks, buckling, bending, sheared fasteners, and more than an occasional loose or pulled fastener must be repaired prior to cabin pressurization.

– NOTE –

Welding repairs are not authorized on any primary structure member.

UNSCHEDULED MAINTENANCE CHECKS.

SPECIAL INSPECTIONS AS REQUIRED, UPON CONDITION.

The special inspections given, supplement the scheduled inspections as outlined in Periodic Inspections, to include inspections which are required at intervals not compatible with airframe operating time or inspection intervals. Typical of this type are:

1. Inspections required because of special conditions or incidents that arise, and because of these conditions or incidents, an immediate inspection would be required to insure further safe flight.
2. Hard or Overweight Landing. This inspection should be performed after a known rough landing is made or when a landing is made while the aircraft is known to exceed the design landing weight.
   Check the following areas and items:
   Wings - for wrinkled skins, loose or missing rivets.
   Fuel leaks around the fuel tanks.
   Wing spar webs, bulkheads, wing and fuselage stringers and skins for any signs of overstress or damage.
   A possible alignment check to clarify any doubt of damage.
3. Severe Turbulence Inspection. The same items and locations should be checked as stated for Hard or Overweight Landings along with the following:
   Top and bottom fuselage skins for loose or missing rivets and wrinkled skins.
   Empennage skins and attachments.
4. Engine overspeed, sudden stoppage, loss of oil, over temperature and lightning strike.
   Check with Avco Lycoming for necessary corrective action.

- END -

Chapter 6

CHAPTER

6

DIMENSIONS AND AREAS

CHAPTER 6 - DIMENSIONS AND AREAS

TABLE OF CONTENTS/EFFECTIVITY

DIMENSIONS.

The principal airplane dimensions are shown in Figure 6-1 and are listed in Chart 601.

CHART 601. LEADING PARTICULARS AND PRINCIPAL DIMENSIONS

MODEL	600	601	601P	602P
ENGINE				
Manufacturer		LYCOMING		
Model Left/Right (All C/W)	IO-540-G1B5 IO-540-K1F5 IO-540-K1J5 IO-540-S1A5 IO-540-P1A5	IO-540-S1A5 IO-540-P1A5	IO-540-S1A5 IO-540-P1A5	IO-540-AA1A5
FAA Type Certificate	1E4	1E4	1E4	1E4
Rated Horsepower	290	290	290	290
Rated Speed 29.5 in. Hg. Manifold Pressure	2575 RPM	2575 RPM	2575 RPM	
Rated Speed 37 in. hg. Manifold Pressure (602P)				2425 RPM
Propeller Drive Ratio	1:1	1:1	1:1	1:1
Bore, Inches	5.125	5.125	5.125	5.125
Stroke, Inches	4.375	4.375	4.375	4.375
Displacement, Cubic Inches	541.5	541.5	541.5	541.5
Compression Ratio	8.7:1	8.7:1	8.7:1	7.3:1
Weight, Dry				
IO-540-G1B5		448 Lbs.		
IO-540-P1A5		448 Lbs.		
IO-540-K1F5		470 Lbs.		
IO-540-K1J5		472 Lbs.		
IO-540-S1A5		472 Lbs.		
IO-540-AA1A5		479 Lbs.		
Firing Order 1-4-5-2-3-6				
Spark Occurs Degrees BTC 20				
Valve Rocker Clearance (Hyd. Tappets Collapsed) .028-.080				
Magnetos, Bendix	Left S6LN-1208		Right S6LN-1209	
Magneto Point Gap				
Main .016 ± .003				
Retard .016 ± .006				
Spark Plug Gap .017 to .021				

CHART 601. LEADING PARTICULARS AND PRINCIPAL DIMENSIONS (cont)

MODEL	700P
ENGINE	
Manufacturer Model Right CW Model Left CCW FAA Type Certificate Rated Horsepower Rated Speed @ 42.0 in. Hg. Manifold Pressure Propeller Drive Ratio Bore, Inches Stroke, Inches Displacement, Cubic Inches Compression Ratio	LYCOMING TIO-540-U2A and LTIO-540-U2A 1E4 350 2500 1:1 5.125 4.375 541.5 7.3:1
Weight, Dry	613 lbs.
Firing Order 1-4-5-2-3-6 Spark Occurs Degress BTC 20° Valve Rocker Clearance (Hyd. Tappets Collapsed) .028-.080 Magnetos, Bendix Magneto Point Gap Main .016 ± .003 Retard .016 ± .006 Spark Plug Gap .017 to .021	 Right S6RN-1259; S6LN-1259 Left S6RN-1258; S6LN-1258

CHART 601. LEADING PARTICULARS AND PRINCIPAL DIMENSIONS (cont)

MODEL	600	601	601P	602P
DIMENSIONS				
Wing Span	34.2 ft.	36.7 ft.	36.7 ft.	36.7 ft.
Length	34.8 ft.	34.8 ft.	34.8 ft.	34.8 ft.
Height	12.1 ft.	12.1 ft.	12.1 ft.	12.1 ft.
Wing Area	170 sq. ft.	178 sq. ft.	178 sq. ft.	178 sq. ft.
Baggage Space (total)	30 cu. ft.	30 cu. ft.	30 cu. ft.	30 cu. ft.
Wing Dihedral Angle	2°	2°	2°	2°
PROPELLER				
Manufacturer	HARTZELL			
Model, Hub and Blade	HC-C3YR-2/C8468-8R or HC-C3YR-2UF/FC8468-8R			
Diameter	ALL 78 in.			
Low Pitch	14° ±.1°	14 °±.1°	15.9°±.1°	15.9° ±.1°
High Pitch	18° to 21°	18° to 21°	18° to 21°	18° to 21°
Feather	82.5° ±1.0°	82.5° ±1.0°	82.5° ±1.0°	82.5° ±1.0°
Weight	ALL 85 lbs.			
Governor	Hartzell			
Governor Model	F-6-35Z or F-8-45Z			
FUEL SYSTEM				
Wing Total Capacity (65 gal. each)	130 gal.			
Wing Total Usable (62 gal. each)	124 gal.			
Fuselage Total Capacity	43.5 gal.			
Fuselage Total Usable	41.5 gal.			
Airplane Total Capacity	173.5 gal.			
Airplane Total Usable	165.5 gal.			
WEIGHTS				
Gross Weight	5500 lbs.	6000 lbs.	6000 lbs.	6000 lbs.
Baggage Capacity	240 lbs.	240 lbs.	240 lbs.	240 lbs.
Fuel Capacity (165.5 gal. usable)	993 lbs.	993 lbs.	993 lbs.	993 lbs.
Oil Capacity (24 Quarts)	45 lbs.	45 lbs.	45 lbs.	45 lbs.
Wing Loading	32.4 lb/sq. ft.	33.6 lb/sq. ft.	33.6 lb/sq. ft.	33.6 lb/sq. ft.
Power Loading	9.5 lb/hp	10.3 lb/hp	10.3 lb/hp	10.3 lb/hp

CHART 601. LEADING PARTICULARS AND PRINCIPAL DIMENSIONS (cont.)

MODEL		700P
DIMENSIONS		
Wing Span		36.7 ft.
Length		34.8 ft.
Height		12.1 ft.
Wing Area		178 sq. ft.
Baggage Space (total)		30 cu. ft.
Wing Dihedral Angle		2°
PROPELLER		
Manufacturer		Hartzell
Model, Hub and Blade		HC-C3YR-2UF/FC7451 HC-C3YR-2LUF/FJC7451
Diameter		76 in.
Low Pitch		15.9° ±.2°
Feather (High Pitch)		80° ± 1.0°
Weight		90.6 lbs.
Governor		Hartzell
Governor Model	Left: F-6-63LZ	Right: F-6-63Z F-8-63Z (with synchrophaser)
FUEL SYSTEM		
Wing Total Capacity (65 gal. each)		130 gal.
Wing Total Usable (62 gal. each)		124 gal.
Fuselage Total Capacity		43.5 gal.
Fuselage Total Usable		41.5 gal.
Airplane Total Capacity		173.5 gal.
Airplane Total Usable		165.5 gal.
WEIGHTS		
Gross Weight		6,315 lbs.
Baggage Capacity		240 lbs.
Fuel Capacity (165.5 gal. usable)		993 lbs.
Oil Capacity (24 Quarts)		45 lbs.
Wing Loading		35.4 lbs./sq. ft.
Power Loading		9.02 lbs./hp.

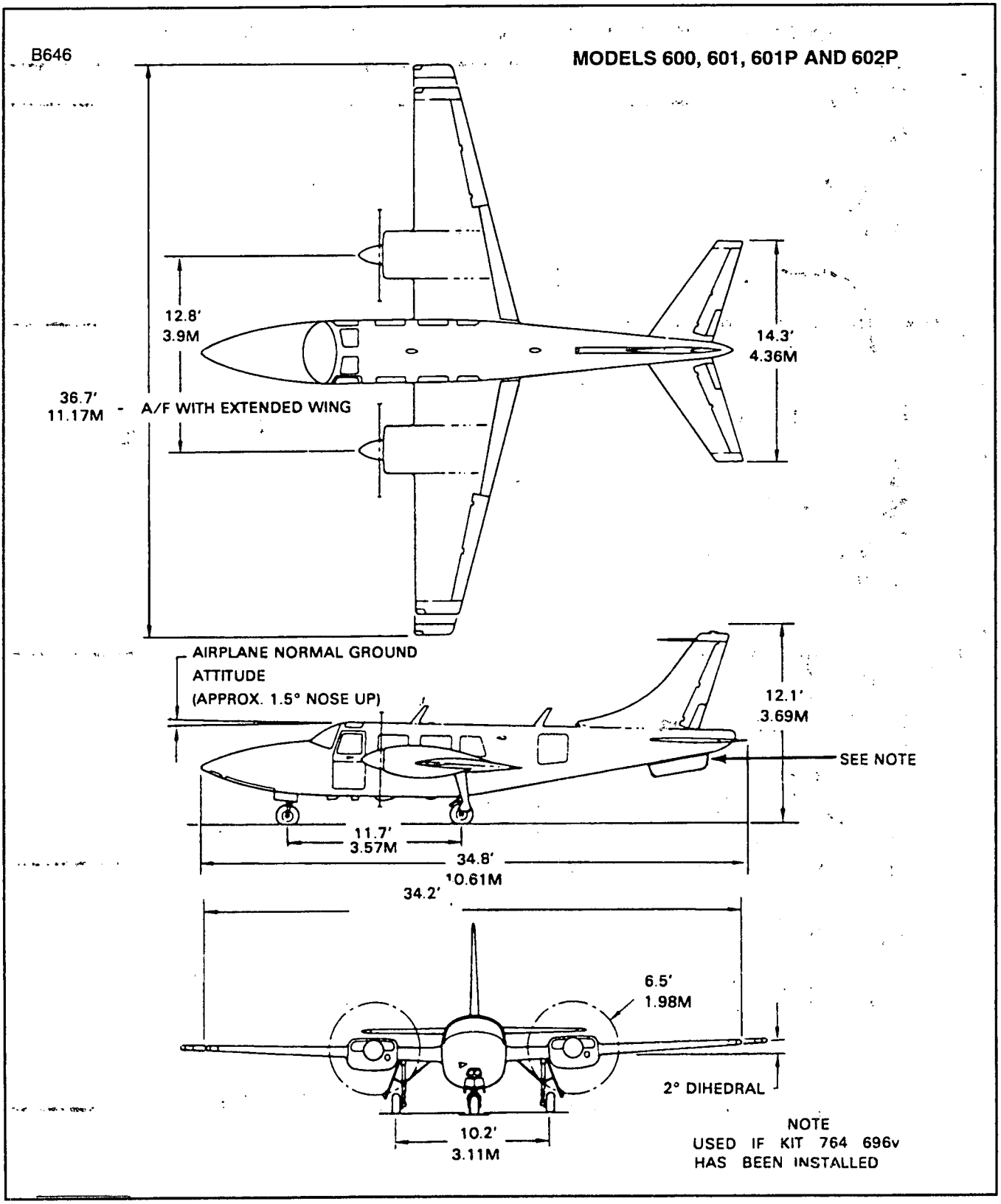


Figure 6-1. General Dimensions

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MODEL 700P ONLY

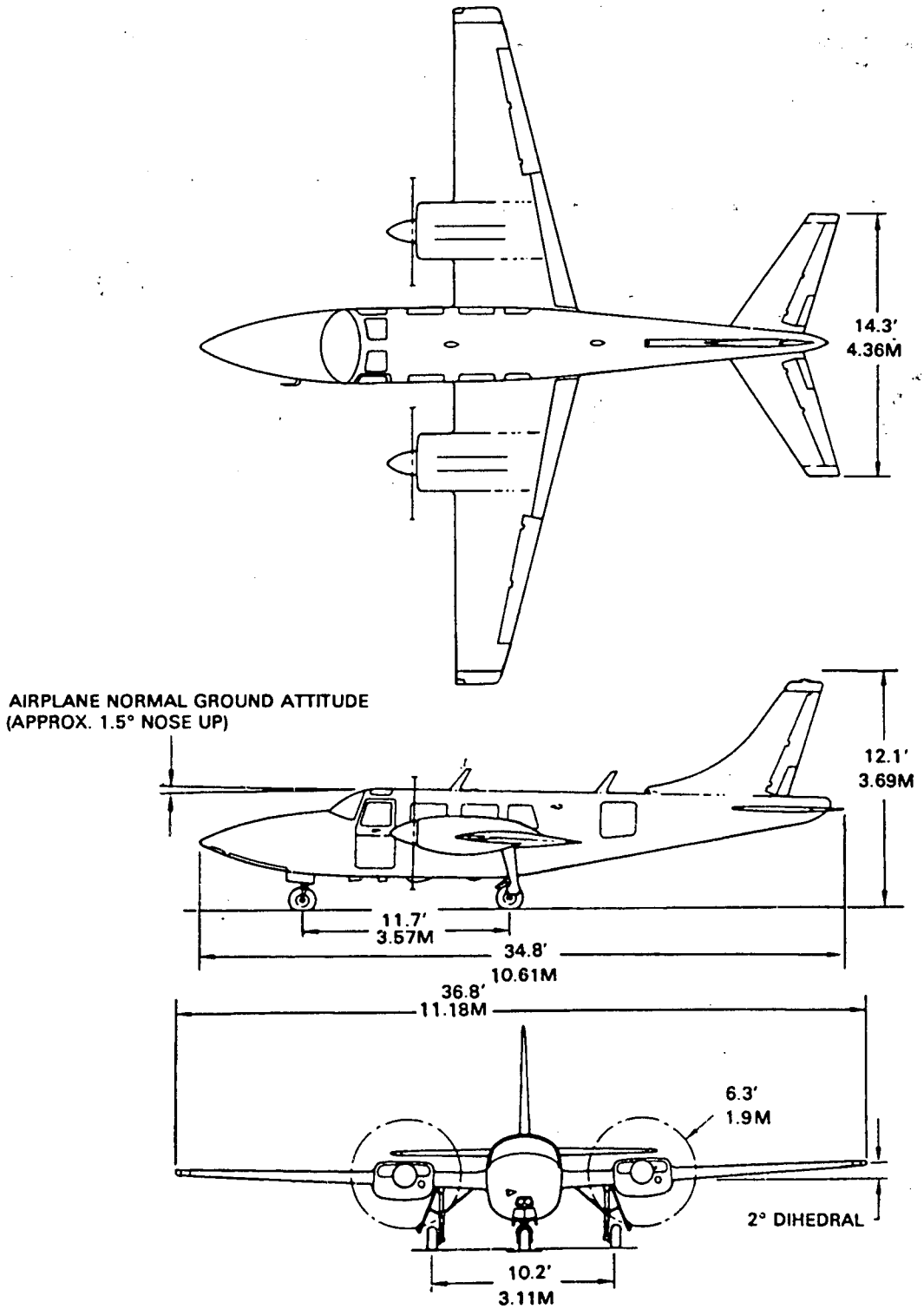

Figure 6-1. General Dimensions (cont.)

STATIONS.

The reference to airplane locations is stated in one or more of three (3) axes. The distance from that axes' datum is measured in inches. These reference axes provide a means of quickly identifying the location of components, Figure 6-2.

The following terms are used for the reference axes:

FS- Fuselage Station distance is measured along the fuselage centerline axes. The datum (FS-Zero) is a vertical plane perpendicular to the fuselage center and 150 inches forward of the wing leading edge. All distances are positive aft of the datum and negative forward of the datum.

ZL- (or waterline) is the distance measured in a vertical plane. The datum (ZL-Zero) is a horizontal plane parallel to the ground (with airplane level) and at the top of the fuselage outer skin at the fuselage centerline. All distances are positive above the datum and negative below the datum.

WS- Wing Station distance is measured spanwise along the Wing Reference Plane (WRP), approximately a plane connecting the forward and trailing edges at the wing. The datum (WS-Zero) is a vertical plane thru the airplane center line. All distances are positive in either direction from the datum.

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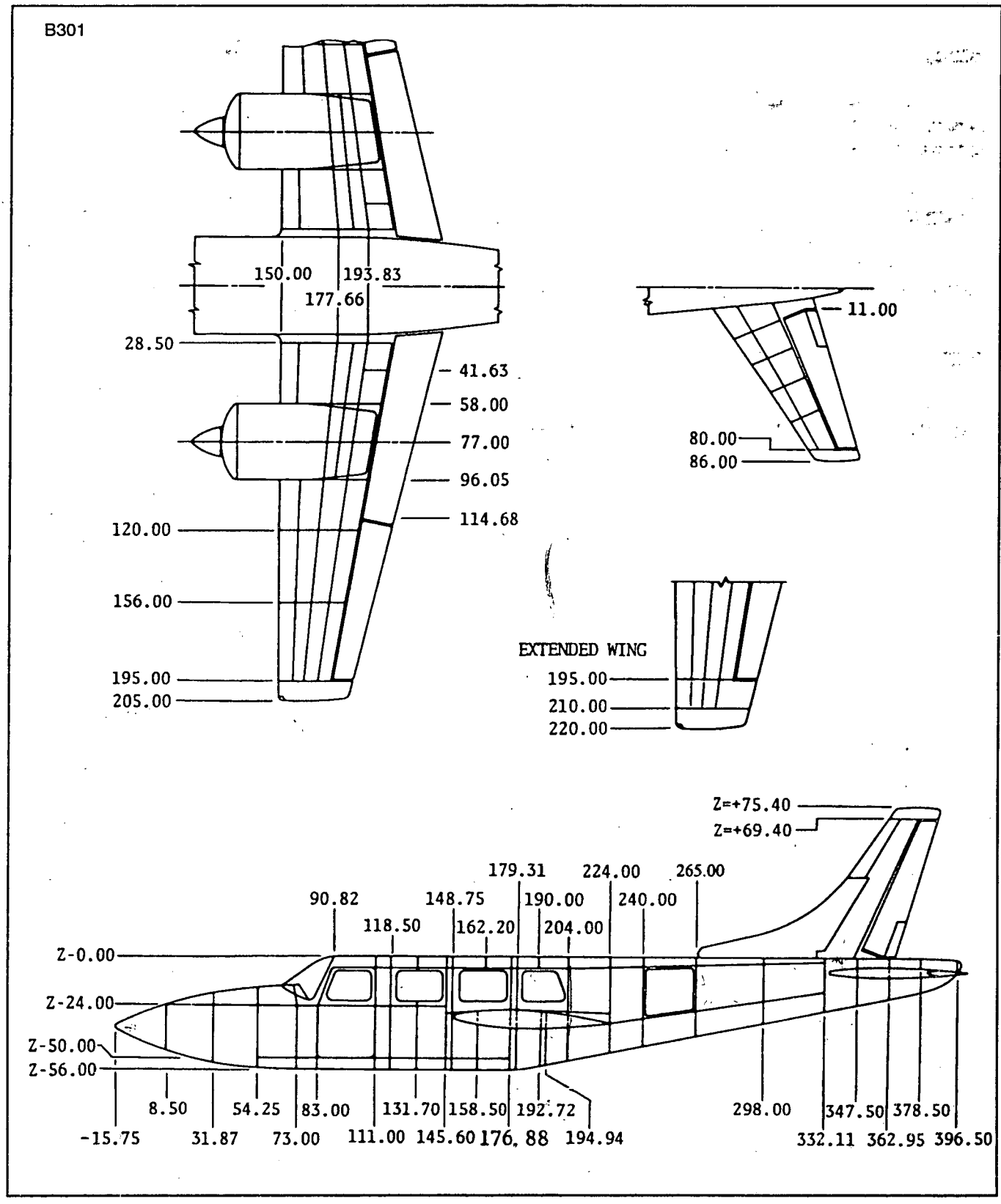

Figure 6-2. Station Reference Lines

ACCESS AND INSPECTION PROVISIONS.

The access and inspection provisions for the airplane are shown in Figure 6-3. The component to be serviced or inspected through each opening is identified in the illustration. All access covers and panels are secured by either metal fasteners or screws.

WEIGHT AND BALANCE DATA.

When figuring various weight and balance computations, the empty, static and gross weight, and center of gravity of the airplane may be found in the Weight and Balance Form of the Airplane Flight Manual.

SERIAL NUMBER PLATE.

The serial number plate is located on the left side of the fuselage just below the horizontal stabilizer. The serial number should always be used when referring to the airplane on service or warranty matters.

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1. LANDING LIGHTS
RADAR ANTENNA
AIR INLET SCOOP (600 & 601)

2. INSIDE NOSE SECTION ACCESS COVER
STEERING VALVE
NOSE GEAR UP SWITCH
LEFT NOSE GEAR TRUNNION PIN
NOSE GEAR BUNGEE (A/F 0001-0611)

3. INSIDE NOSE SECTION ACCESS COVER
RIGHT NOSE GEAR TRUNNION PIN
AIR DUCTS (600 & 601)

4. RUDDER BELLCRANK ASSEMBLY

5. FLAP CONTROL VALVE

6. MLG CONTROL VALVE

7. ELEVATOR AND AILERON IDLER

8. CONTROL SYSTEM CROSSOVER AND BALANCE TUBE (601P, 602P & 700P)

LOCATED UNDER FLOOR PANELS UNDER CARPET

9. CENTER OF HAT SHELF
AILERON BELLCRANK

10. OIL COOLER

11. SPINNER
PROP ATTACH BOLTS
PROP DOME
BULKHEAD

12. OIL DIPSTICK

13. UPPER ENGINE COWLING

14. UNDER ENGINE COWLING
INDUCTION AIR FILTER IN AIR BOX; AIR PUMP INLET FILTER

15. FLAPPER VALVE

16. WING FUEL TANK VENT VALVE
AILERON HINGE
STROBE LIGHT POWER SUPPLY (A/F 0157-0305)
FLUX DETECTOR (LEFT WINGTIP ONLY, IF INSTALLED)

17. FUEL TRANSMITTER WIRING/PLUG
TACH. GENERATOR/PULSE GENERATOR.

18. ELECTRICAL CONNECTORS
WING TO FUSELAGE CONNECTIONS
FUEL, HYDRAULIC & PNEUMATIC HOSES

19. FUSELAGE TANK, TRANSMITTER AND LOW FUEL WARNING PROBE

20. HYDRAULIC LINES

21. AUTOPILOT SERVO (IF INSTALLED)

22. AUTOPILOT CONTROLS, (IF INSTALLED)

23. HYDRAULIC LINES

LOCATED UNDER FLOOR OF BAGGAGE COMPARTMENT

24. TACH. GENERATOR/PULSE GENERATOR

25. FUEL TRANSMITTER WIRING/PLUG

26. HORIZONTAL STABILIZER TO FUSELAGE CONNECTIONS.
ELEVATOR & TRIM CONNECTIONS

27. ELEVATOR TRIM MOTOR

28. BATTERIES (EXCEPT 700P)

Figure 6-3. Access Covers and Panels

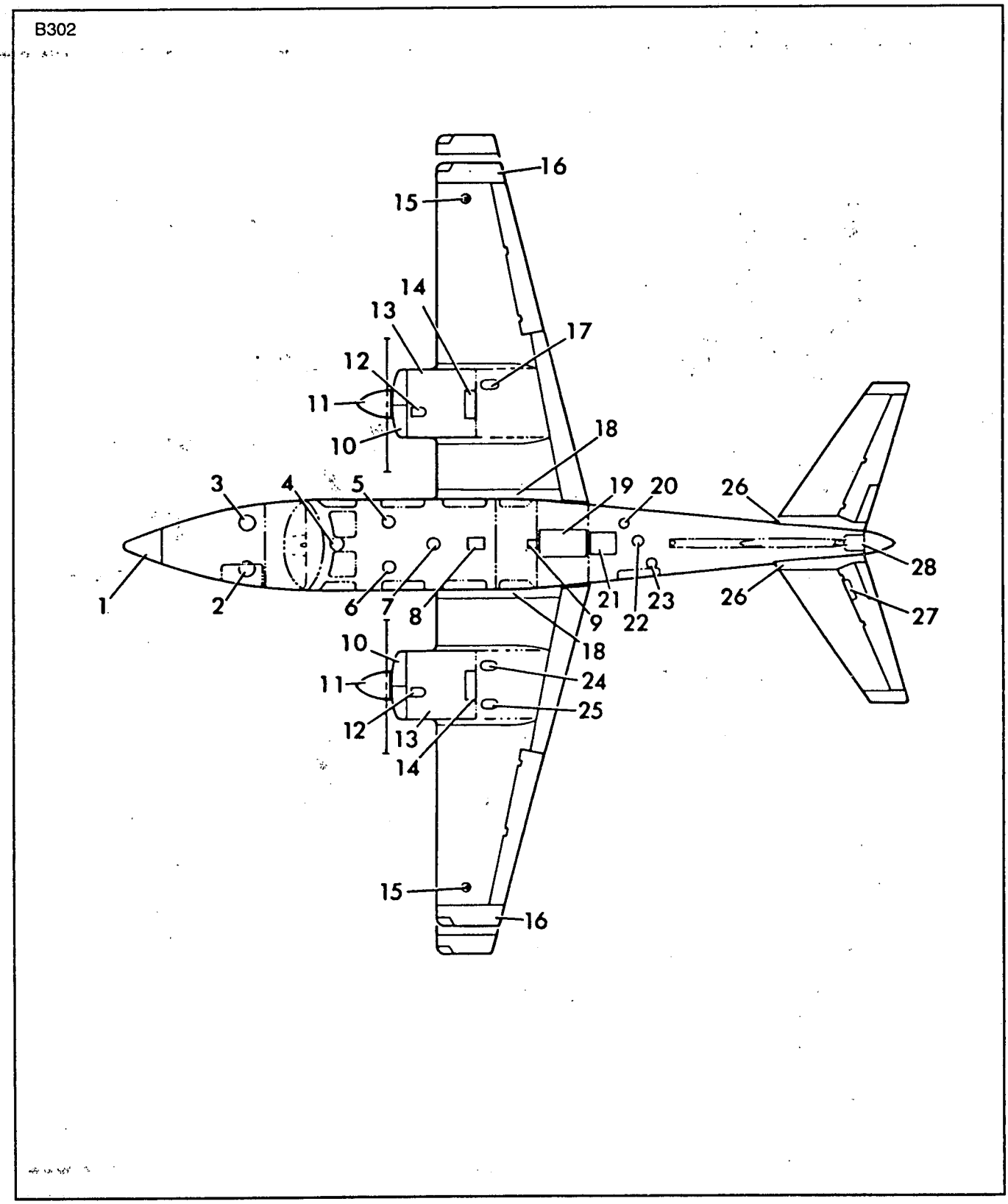

Figure 6-3. Access Covers and Panels (cont)

29. LANDING LIGHT LAMPS

30. NOSE LANDING GEAR (NLG)
AIR DUCTS (600 & 601) RIGHT SIDE ONLY
NLG STEERING FLOW CONTROL VALVES

31. LOWER ENGINE COWLING

32. PNEUMATIC PRESSURE REGULATOR/ CONTROL VALVES
INTERCOOLER SONIC NOZZLES AND BLEED VALVE (DIVERTER VALVE - 602P ONLY) (601P, 602P AND 700P)

33. WING TANK VENT VALVE
34. AILERON HINGE
— EXTENDED WING ONLY

35. SEALED AREA OF WING FUEL TANK

36. SEALED AREA OF WING FUEL TANK
FLAPPER VALVE

37. SEALED AREA OF WING FUEL TANK
FLAPPER VALVE

38. AILERON BELLCRANK

39., 40., 41., 42., & 44. SEALED AREAS OF WING FUEL TANK

43. SEALED AREA OF WING FUEL TANK
FUEL STRAINER
FUEL LEVEL TRANSMITTER & ELEC. CONNECTOR

45. FLAP ACTUATOR

46. FLAP FLOW CONTROL VALVES

47. PUSH ROD AND BALANCE ROD BOOTS (601P, 602P AND 700P)

48. TRIM TAB BELLCRANK AND FLEXIBLE CONTROLS
49. EXTERNAL POWER SUPPLY PLUG

Figure 6-3. Access Covers and Panels (cont)

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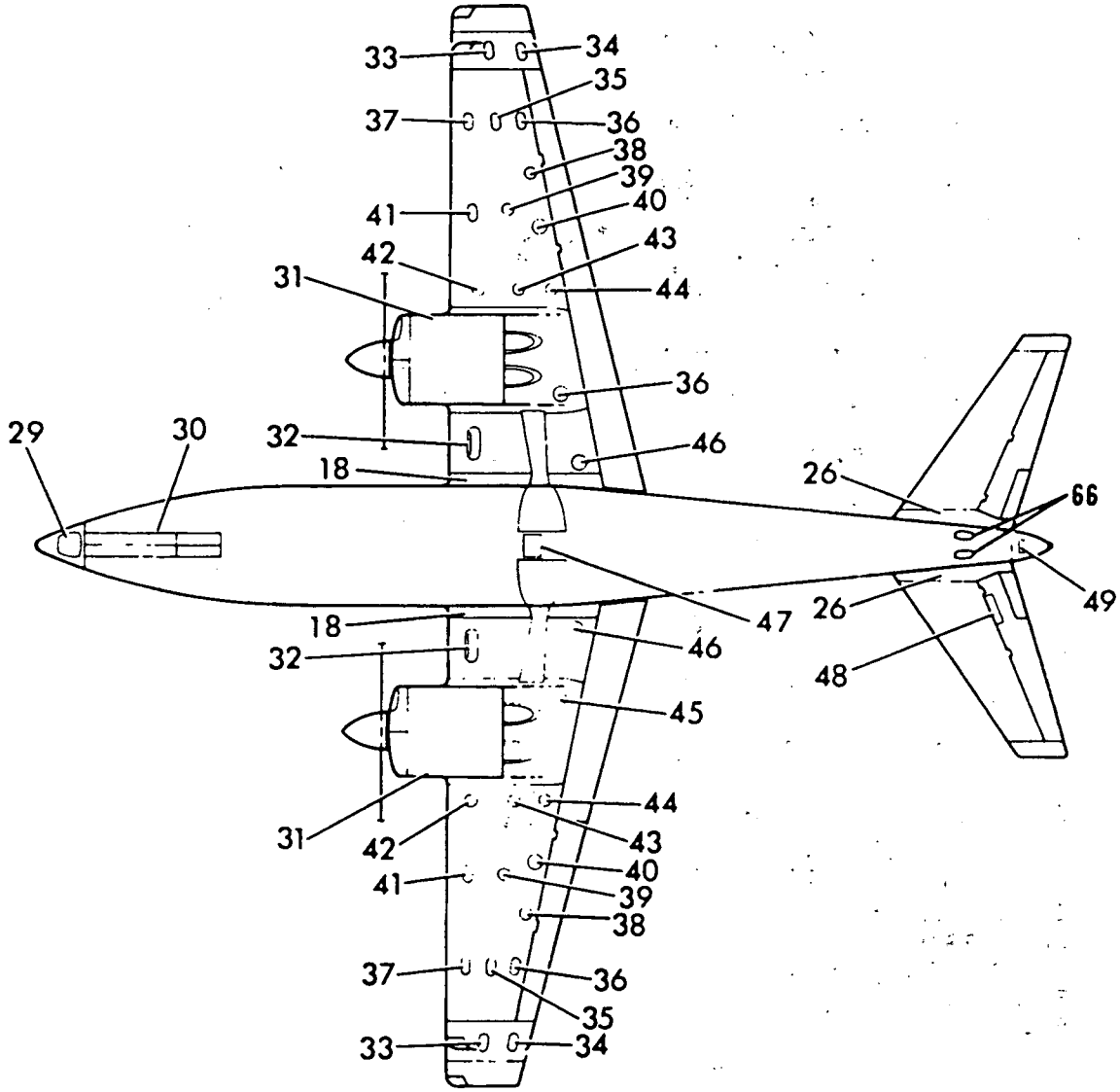


Figure 6-3. Access Covers and Panels (cont)

50. NOSE GEAR FORWARD DOOR HINGES
AIR DUCT (600 & 601) RIGHT SIDE ONLY (INSIDE WHEEL WELL)

51. AVIONICS COMPARTMENT
BRAKE RESERVOIR
RADIO EQUIPMENT
TOP OF NOSE GEAR ACTUATOR
TOP OF NOSE GEAR BUNGEE
(A/F 0001-0611)

52. ENGINE CONTROLS
PRESSURIZATION CONTROLLER AND CIGARETTE FILTER (601P, 602P & 700P)

53 CABIN FLOOR PANELS (5)
LINES, HOSES, WIRING, COAX, PUSH-PULL TUBES, ANTENNAS AND VARIOUS FRAME MEMBERS
CABIN DRAINS (601P, 602P & 700P)

54. ELECTRICAL PANEL
PNEUMATIC INLINE FILTER
DOOR SEAL CONTROL VALVE (601P & 602P) FUEL LEVEL SIGNAL CONDITIONER PNEUMATIC MANIFOLD

55. MLG DOOR CONTROL VALVE
MLG DOOR ACTUATOR
MGL DOOR CONTROL LINKAGE
PITOT AND STATIC DRAINS
STROBE LIGHT POWER SUPPLY
(A/F 0306 & UP)
(RIGHT WHEEL WELL ONLY)
FUEL FILTER
FUEL FLOW TRANSDUCER
(A/F 0266 & UP)
FUEL, HYDRAULIC & PNEUMATIC LINES & HOSES

56. ELEVATOR/RUDDER BELLCRANK
(RIGHT WHEEL WELL ONLY)

57. FUEL SUMPS, SHUT-OFF AND X-FEED VALVES
FUEL BOOST PUMPS
HYDRAULIC SHUT-OFF VALVE
HEATER FUEL PUMP
HEATER REGULATOR & SHUT-OFF VALVE

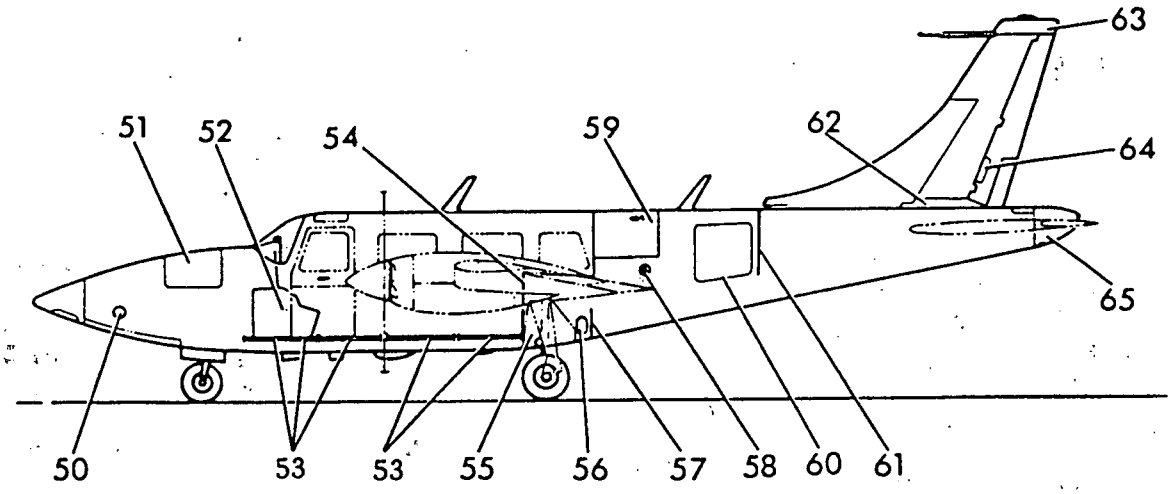
58. FUEL TRANSMITTER AND LOW FUEL WARNING PROBE

59. OXYGEN SUPPLY CYLINDER (601, 601P, 602P & 700P)
FUEL VENT HOSES
FUEL SHELF COVER ASSEMBLY
FUEL LEVEL TRANSMITTER AND CONNECTOR
LOW FUEL WARNING PROBE AND CONNECTIONS
CABIN OUTFLOW & SAFETY VALVES (601P, 602P & 700P)

60. ELT
DE-ICE RESERVOIR & PUMP
(IF INSTALLED)
OXYGEN FILL VALVE
VHF ANTENNA

Figure 6-3. Access Covers and Panels (cont)

B304



61. HEATER
HYDRAULIC RESERVOIR
AUXILIARY HYDRAULIC PUMP
(IF INSTALLED)
HYDRAULIC ACCUMULATOR,
HYDRAULIC REGULATOR &
RELIEF VALVE
RUDDER & AILERON PUSH-PULL
TUBES, BELLCRANKS, LEVERS
& TORQUE TUBE CONTROL
E L T ANTENNA
BATTERY AND RELAY (700P)

62. VERTICAL STABILIZER ATTACH
POINTS
WIRING
PITOT AND STATIC HOSES

63. PITOT TUBE WIRING
(600/601/601P AND 602P)
ROTATING BEACON (IF INSTALLED)
ADF ANTENNA (IF INSTALLED)

64. RUDDER TRIM MOTOR

65. BATTERY RELAY (EXCEPT 700P)
VARIOUS FUSES
STROBE LIGHT POWER SUPPLY
(A/F 0157-0305)

66. VENTRAL RUDDER TORQUE
TUBE ASSEMBLY (IF KIT
764 969v HAS BEEN INSTALLED)

Figure 6-3. Access Covers and Panels (cont)

Chapter 7

CHAPTER

LIFTING AND SHORING

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CHAPTER 7 - LIFTING AND SHORING

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

Lifting is accomplished by using conventional tripod jacks (adjustable from 40 in. to 56 in.) at the jack points on the wings, and a tail stand. When installing the wing jack pads do not use a bolt longer than 5/8 in. as it would puncture the wing fuel tank.

In an emergency situation it may be necessary to use slings or air bags for the initial lift followed with tripod jacks.

If wing and fuselage shoring is required, shoring material should be contoured to conform with lower wing and fuselage surfaces.

DESCRIPTION.

The wing jack points are located just outboard of the engine nacelles and have threaded, blind, bolt holes for installing the ball type jack pads which are stowed in the baggage compartment.

A tail stand must be used when jacking to counter-balance the nose weight of the airplane. The tail stand must be adjustable from 50 in. to 66 in. and weigh a minimum of 300 lbs.

If one main landing gear is being lifted using the jack adapter (which is stowed in the baggage compartment) and hydraulic jack, and the airplane is equipped with Cleveland wheels and brakes, the brake caliper must be removed prior to jacking to prevent damaging the brake line.

JACKING.

Jacking should be accomplished in an area protected from the wind and on a level surface so the jack cylinders will be vertical to prevent side loads and binding while jacking.

JACKING THREE WHEELS.

1. Tools and equipment required.

– NOTE –
Equivalent substitutes may be used for the items listed in Figure 7-2.

2. Position airplane for jacking operation. (Level area and out of wind or prop wash from other aircraft.)
3. Install static ground on airplane.

– CAUTION–
Use only AN3-5 (5/8 inch) bolts to attach jack pads. Use of longer bolts could puncture the wing fuel tank.

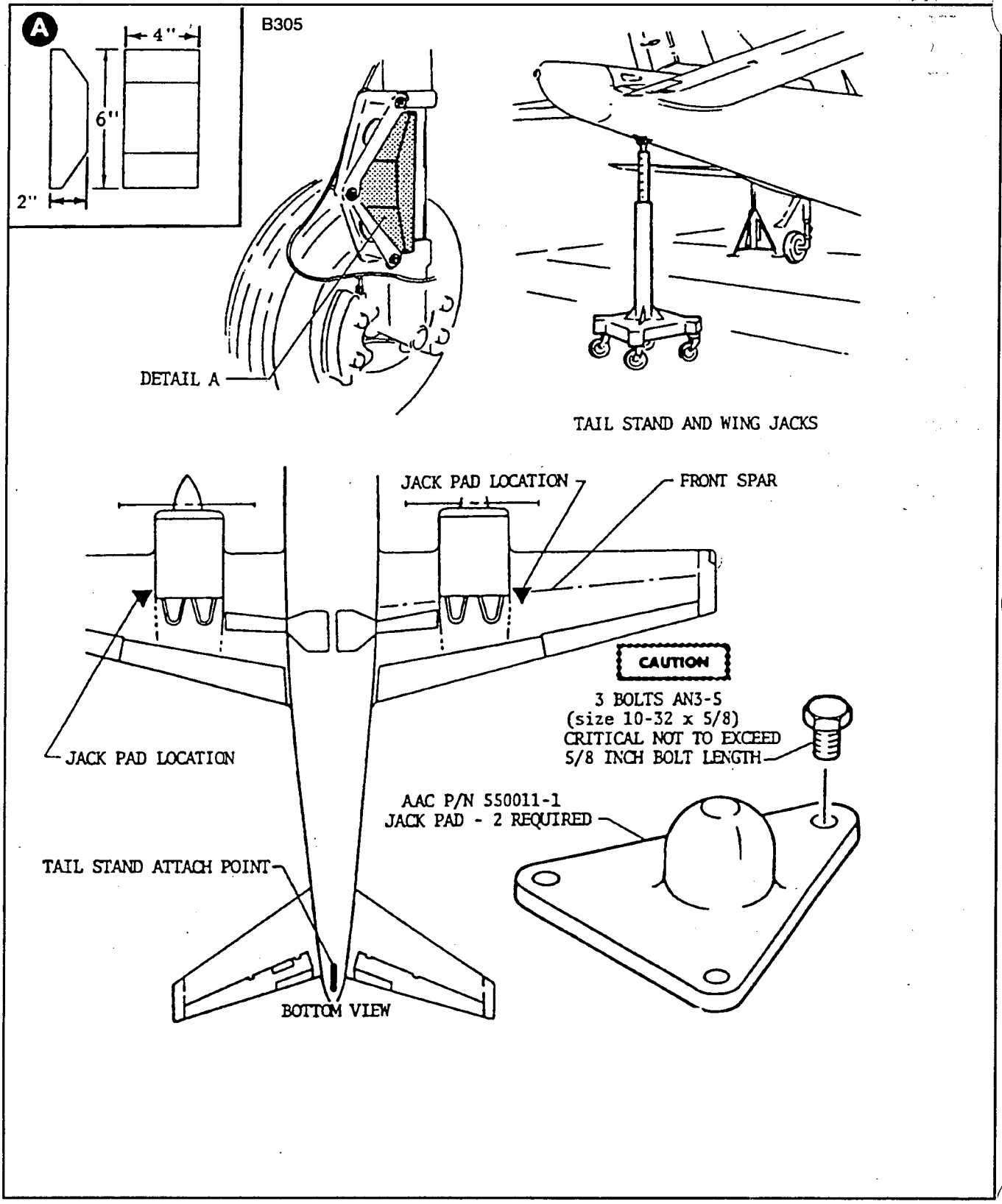

Figure 7-1. Wing Jack Points and Jack Pad

NAME	NUMBER	SOURCE
Jack Pad (2)	550011-1	Aerostar Aircraft Corporation
Jack Pad Bolts (6)	AN3-5	Aircraft Standard
Tripod Jacks (2)	0234-200 (5,000 lb. capacity)	Danair Inc. Maumee, Ohio 43537
Tail Stand (1) (300 lbs. of weights)	4006	Local Manufacturer or Danair Inc. 720 Illinois Avenue Maumee, Ohio 43537
Wood Blocks (2)		Local Manufacturer (See Figure 7-1, Detail A)

Figure 7-2. Tools and Equipment

4. Install jack pads at each jack point, Figure 7-1.
5. Position tripod jack beneath each jack pad.
6. Position tail stand. (If 4006 stand is used, 300 lbs. of weights must be added to stand.)

– CAUTION –

Ensure jack cylinders are vertical at start of jacking operations to prevent side loads and possible jack binding.

7. Simultaneously raise wing jacks, maintaining level airplane, until torque links are extended and tires are clear of ground. Maintain follower nut of each jack against jack shoulder.
8. Adjust tail stand as necessary.

– NOTE –

Raise tires no more than required for maintenance being performed. It may be necessary to deflate the main landing gear strut and collapse gear for clearance under the main gear. It might also be desirable to block the struts at a specific extension by using the wood blocks shown in Figure 7-1, Detail A.

9. Continue raising airplane as required.

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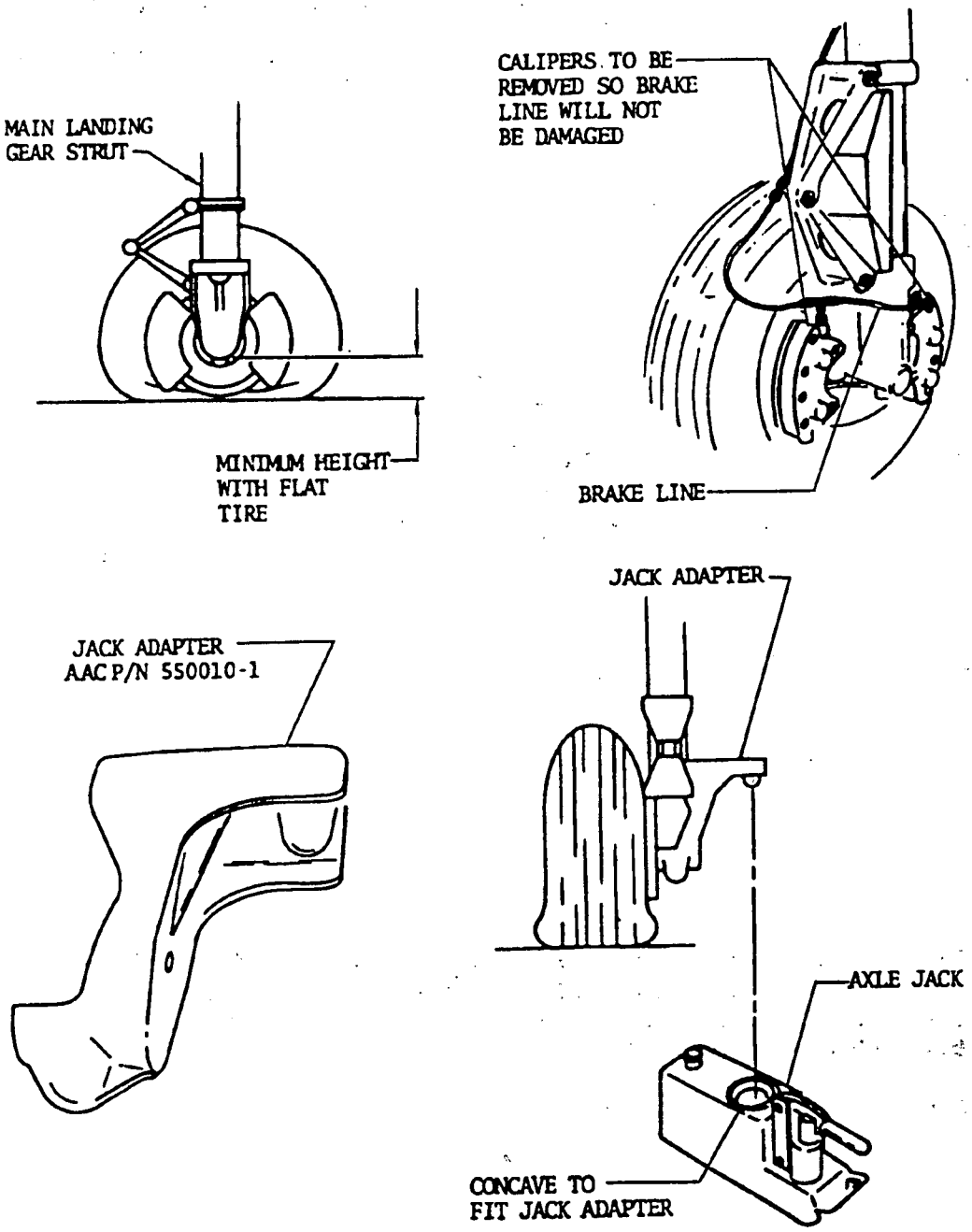

Figure 7-3. Jack Adapter

DOWN JACKING.

1. Place landing gear lever in DOWN position. Check safety latch is engaged. Visually check all three landing gears for DOWN and LOCKED position.
2. Loosen jack follower nuts and lower wing jacks, follower nuts and tail stand simultaneously.
3. Remove jacks, tail stand, static ground, and jack pads. (Stow jack pads in baggage compartment.)

JACKING ONE MAIN LANDING GEAR WHEEL.

1. Tools and equipment required.

- NOTE -
Equivalent substitutes may be used for the items listed in Figure 7-4.

NAME	NUMBER	SOURCE
Jack Adapter	550010-1	Aerostar Aircraft Corporation
Axle Jack	0504-150	Danair Inc. 720 Illinois Avenue P.O. Box 504 Maumee, Ohio 43537

Figure 7-4. Tools and Equipment Required for Jacking (1) Main Landing Gear Wheel

2. Ensure airplane is electrically (static) grounded.

– CAUTION –
Failure to remove Cleveland brake caliper could cause jack adapter to bend or collapse brake line.

3. If airplane is equipped with Cleveland wheels and brakes, remove caliper per Chapter 32.
4. Position jack adapter P/N 550010-1 (Figure 7-3), to main gear.
5. Position jack beneath adapter. (A scissor jack of two ton capacity may be used.)
6. Extend jack until tire is clear of ground.
7. Landing gear lever in down position and safety latch engaged. Visually check landing gear down and locked.
8. Upon completion of maintenance, retract jack until weight is assumed by tire.
9. Remove jack and jack adapter (stow jack adapter in baggage compartment).
10. Install brake caliper if equipped with Cleveland wheels and brakes per Chapter 32.

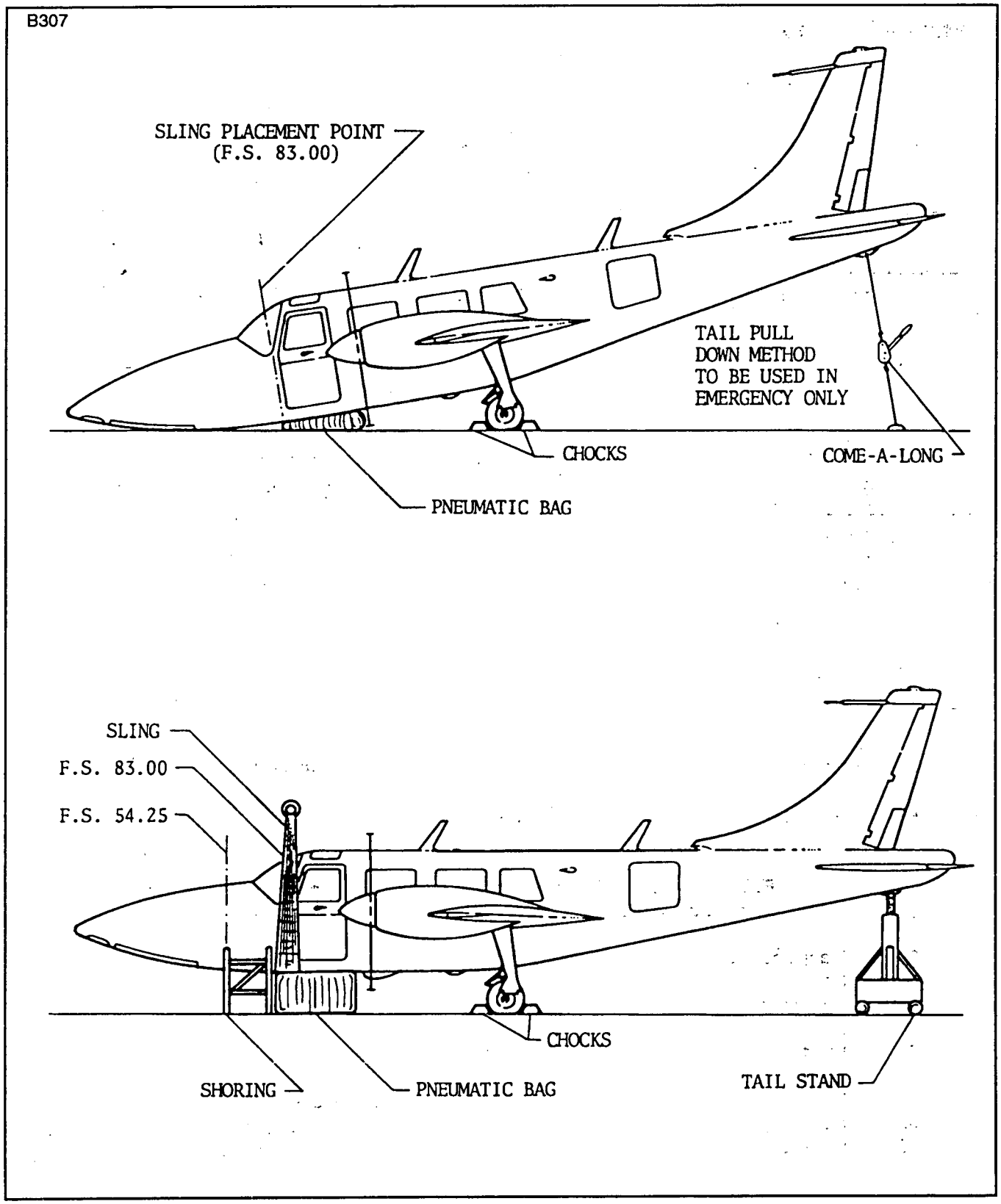

Figure 7-5. Lifting Nose Down Airplane

EMERGENCY LIFTING.

1. Tools and equipment required.

– NOTE –
Equivalent substitutes may be used for the items listed in Figure 7-6.

NAME	PURPOSE	SOURCE
Nylon Sling (6,000 lb. Min.)	Lifting at Wing Roots/Nose Section	Local Manufacturer
Air Bags	Lifting Under Fuselage/ Wings	Firestone Tire & Rubber Co.
Aircraft Chocks	Chocking Wheels	Local Manufacturer
Handwinch (Come-A-Long)	Tail Pull Down	Local Purchase
Assorted Ropes & Cables		Local Purchase
Turnbuckle	If one (1) MLG Collapsed	Local Purchase
Scissors Jack	Lifting Under Wing	4 Ton Capacity Automotive Type. Local Purchase
Tail Stand	For Use After Initial Lift	See Tools and Equipment Required in the section titled Jacking (3) Wheels
Tripod Jacks	Shoring	Local Manufacturer (See the section titled Shoring)

Figure 7-6. Tools and Equipment Required for Emergency Lifting

2. Lifting nose down airplane (Figure 7-5).
   A. Chock main landing gear wheels.

– CAUTION –
Tail pull-down method should not be used except in case of extreme emergency when sling or pneumatic bags are not available.

B. Place sling or pneumatic bag under airplane at fuselage station 83.00.
C. Raise nose of airplane to level longitudinally.
D. Attach tail stand or install cradle.
E. Lower nose landing gear and repair for towing.
F. Remove sling, cradle, pneumatic bag, tail stand or come-a-long if tail pull down method was used.

3. Lifting, one main landing gear, collapsed or retracted (Figure 7-7).

– NOTE –

Careful jacking and shoring procedures should be followed. Refer to the section titled Shoring for information.

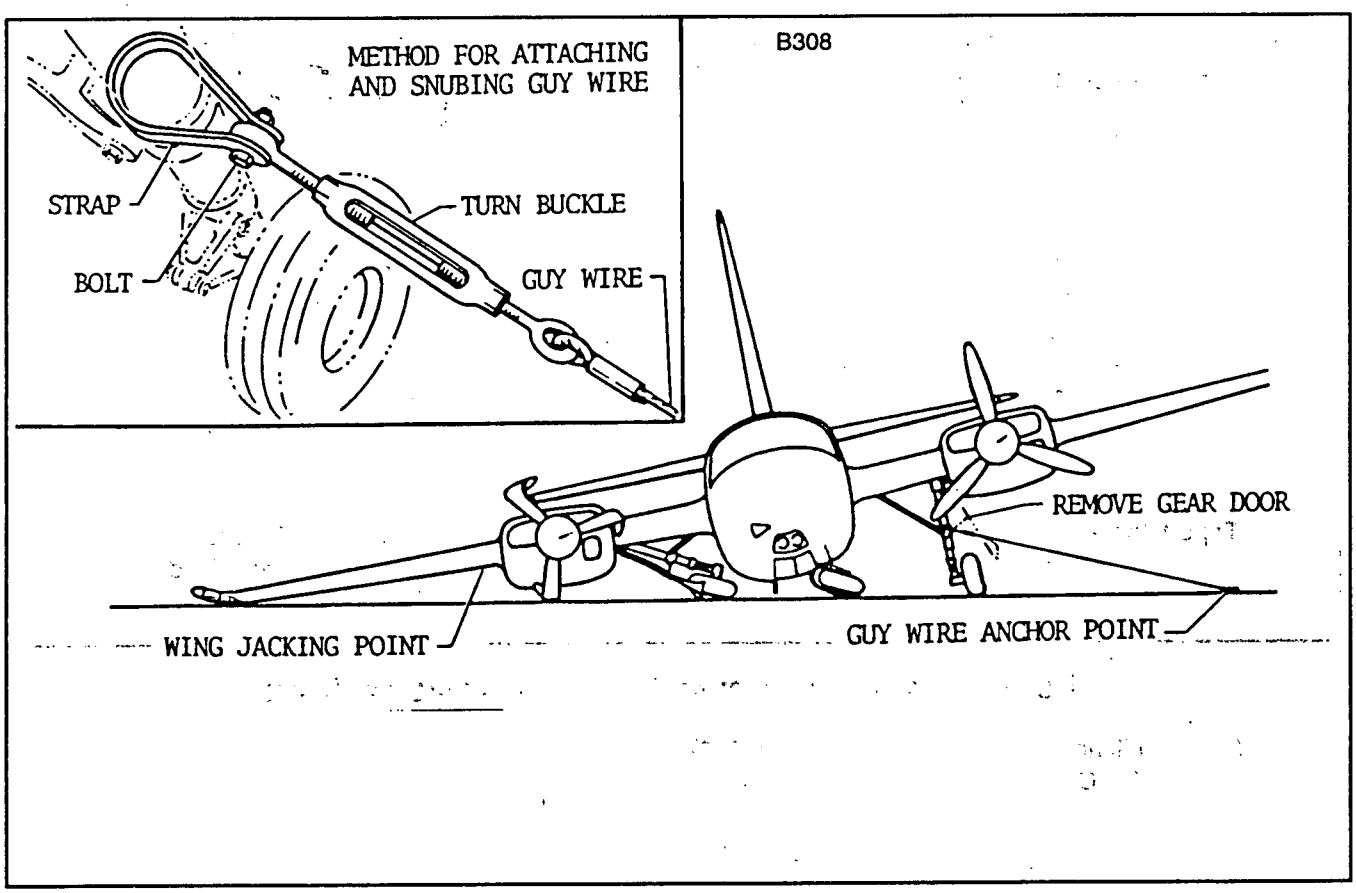

Figure 7-7. One Main Gear Retracted

A. Install jack pads.
B. Remove main landing gear strut door per Chapter 32.
C. Attach adjustable guy wires to extended gear and tail skid.

– CAUTION –

Place protective cover at area to be jacked and blocked. Raise wing only enough to allow placement of standard aircraft jacks.

D. Place jack under affected wing at jack point.
E. Alternately jack, block at wing station 120.00 and snub guy wires until wing is high enough to place standard aircraft jacks under wings.
F. Remove main landing gear guy wire for installation of tripod jack.
G. Lower, affect repair to damaged gear for towing.
H. Remove shoring.
I. Lower and remove tripod jacks.
J. Remove tail skid guy wire.

4. Lifting belly-landing airplane (Figure 7-8).

– NOTE –

Pneumatic bags are preferred for lifting the airplane enough to allow placement of standard aircraft jacks. An alternate method may be employed, if pneumatic bags are not available, by removing the wing root fairings and attaching four nylon (2,000 lb. each) straps under the carry through beams Figure 7-9. The airplane must be stabilized while lifting at this area.

A. Place a pneumatic bag under each wing main spar, inboard of engine nacelle if possible. If not, place bag adjacent to wing jack point, leaving enough room to install jack pad and jack.
B. Install pneumatic bag under nose aft of cap or radome.
C. Install pneumatic bag under aft fuselage.
D. Inflate bags simultaneously, while maintaining level attitude, until tripod jacks can be placed under wings.
E. Install jack pads.
F. Install tripod jacks under wings.
G. Install tail stand.
H. Raise airplane enough to lower main landing gear and nose landing gear.
I. Lower landing gear and affect repair for towing of airplane.
J. Lower airplane; remove jacks and tail stand.

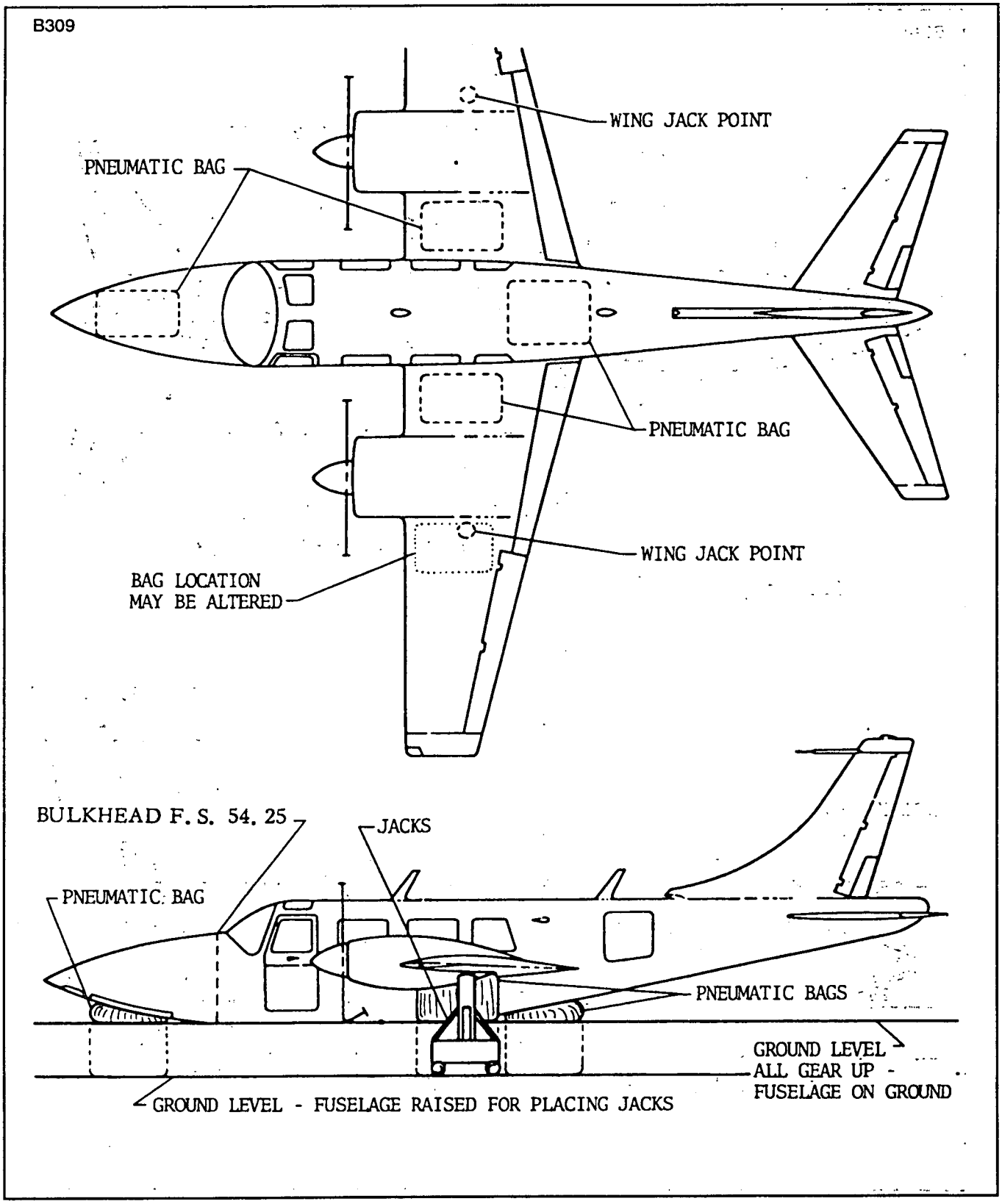

Figure 7-8. Pneumatic Bag Lifting

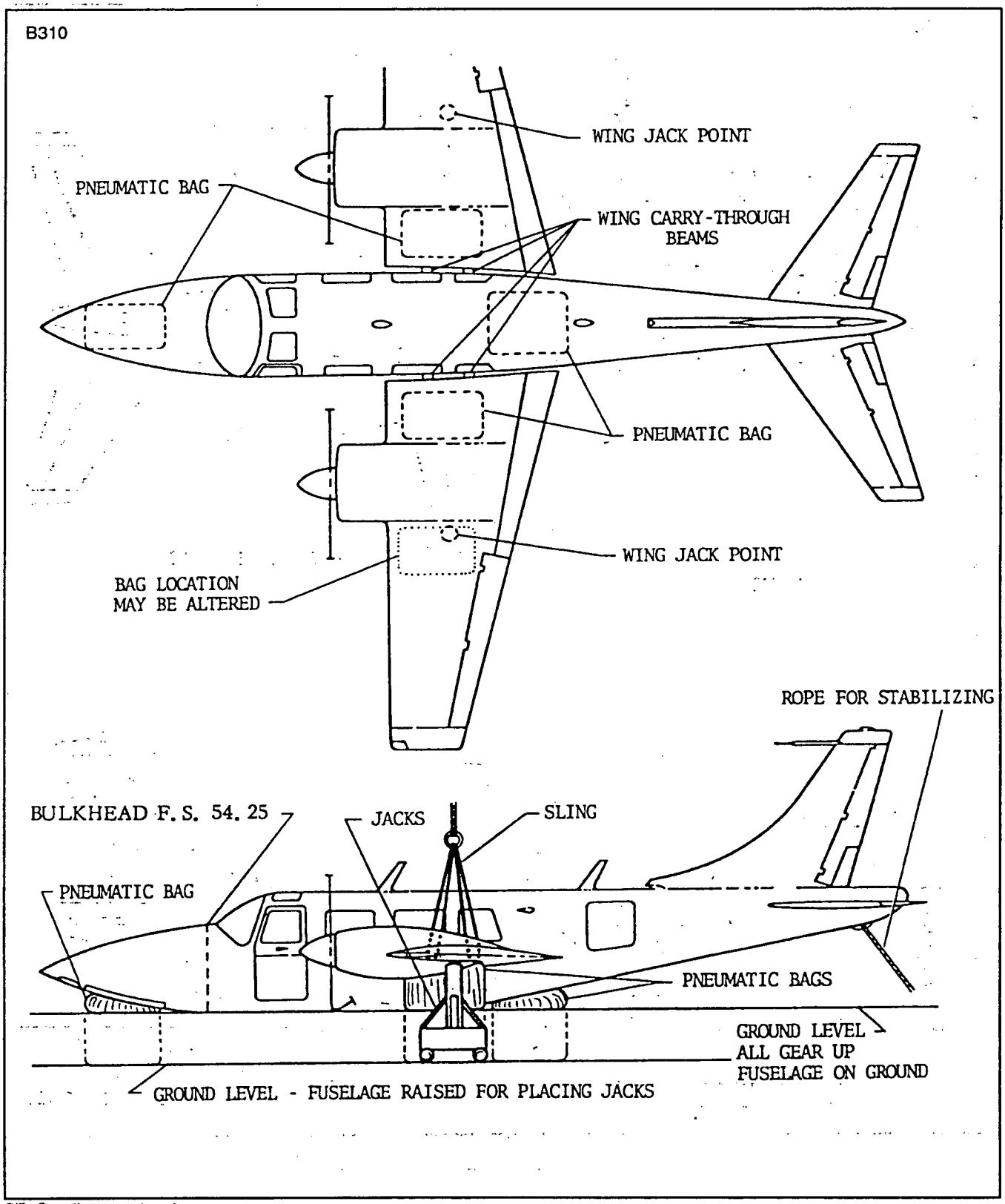

Figure 7-9. Lifting Airplane With Straps

SHORING.

Shoring can be accomplished using contour boards that conform to the lower surfaces of the wing and fuselage. Contour boards should be fabricated from two thicknesses of 1 inch plywood, laminated together and secured with bolts. The contoured surfaces should be padded with 1/2 inch felt and covered with heavy canvas duck. (Figure 7-10)

Fuselage lifting devices and wing jacks should be used in conjunction with wing and fuselage shoring. See Figure 7-10 for suggested wing shoring.

Contour shoring may be used at the following locations:

Wing Station	Fuselage Station
29.40 120.00	54.25 83.00 111.00 176.88 204.00

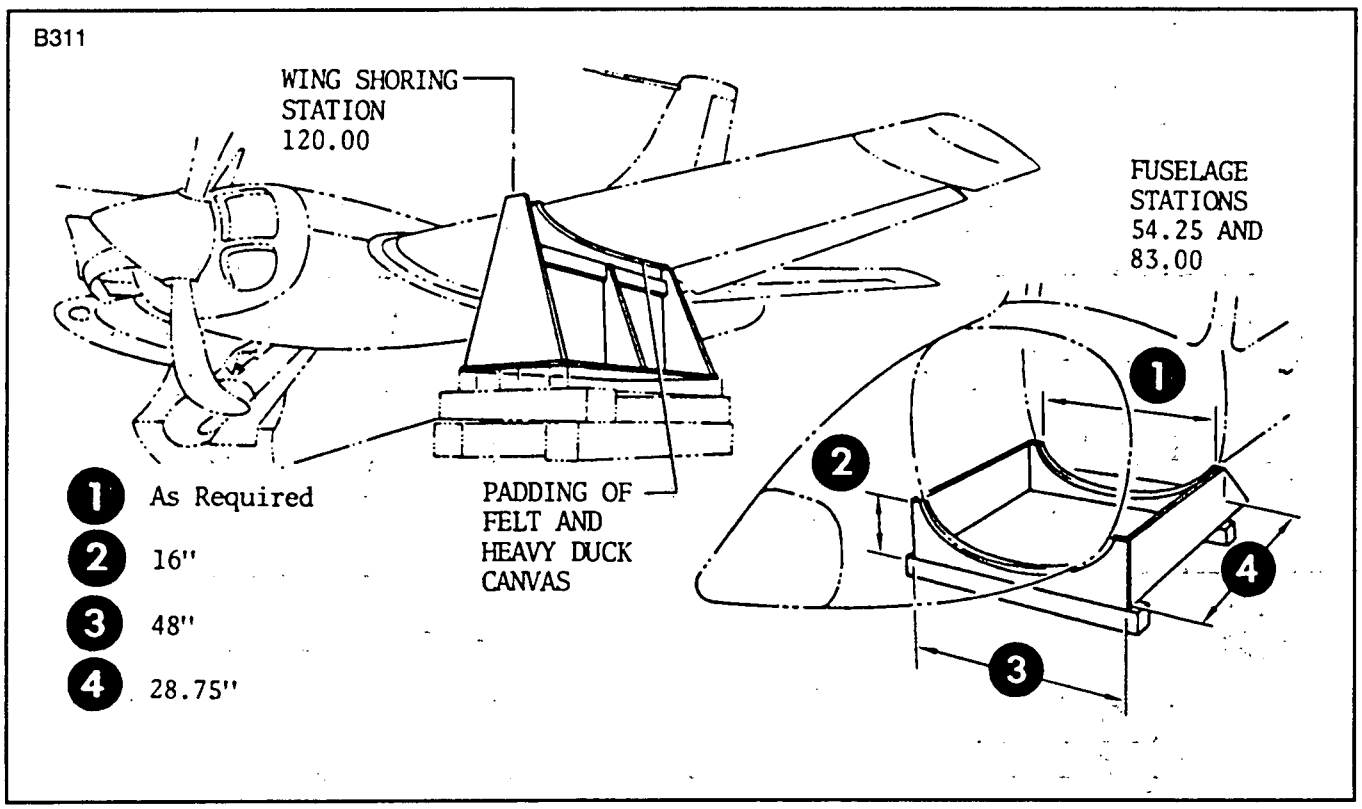

Figure 7-10. Fuselage and Wing Shoring

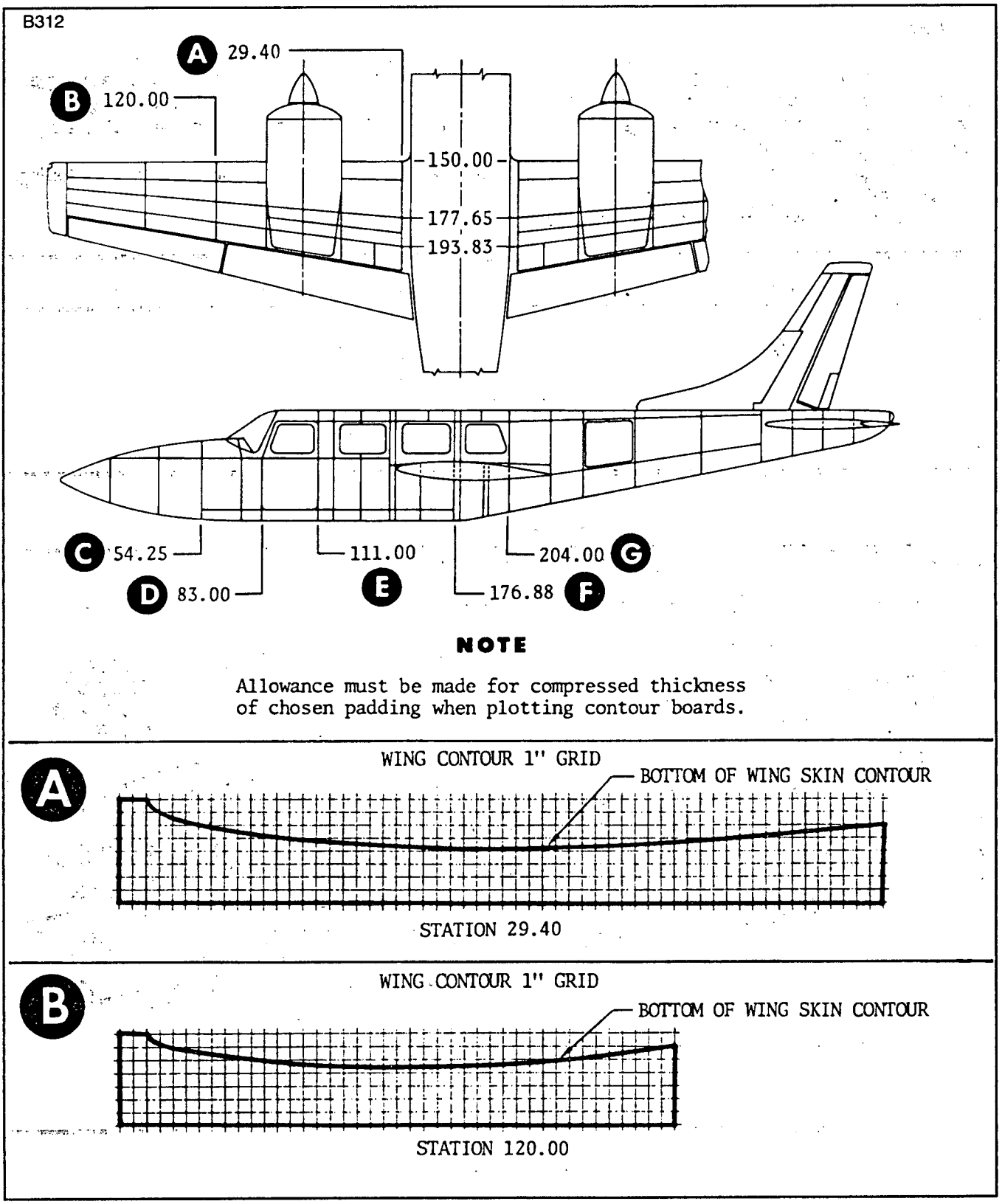

Figure 7-10. Fuselage and Wing Shoring (cont)

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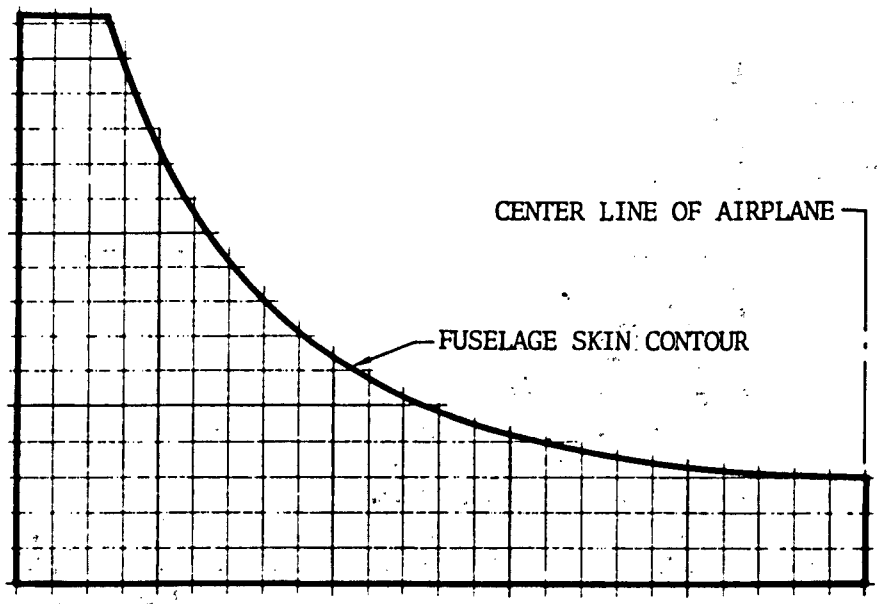
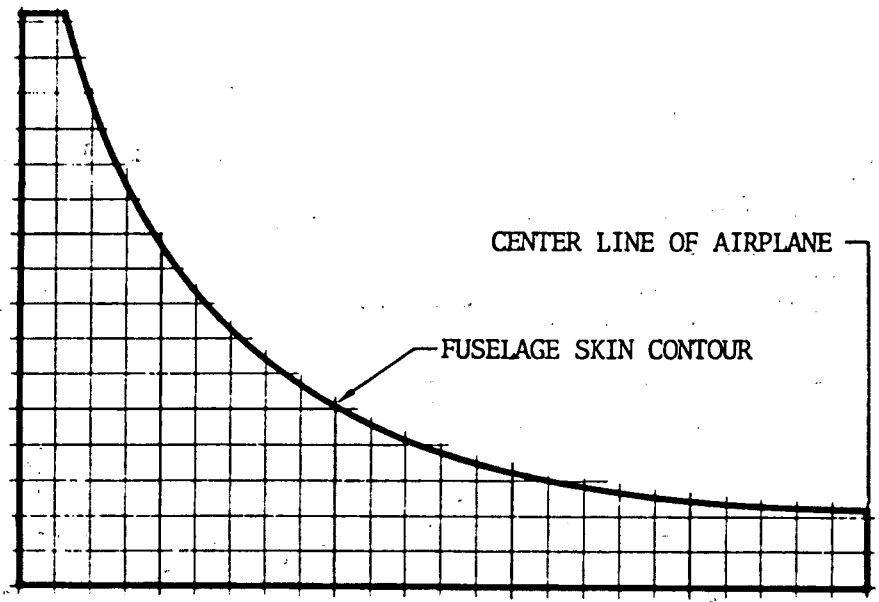
FUSELAGE CONTOUR 1" GRID



STATION 54.25

D

FUSELAGE CONTOUR 1" GRID



STATION 83.00

Figure 7-10. Fuselage and Wing Shoring (cont)

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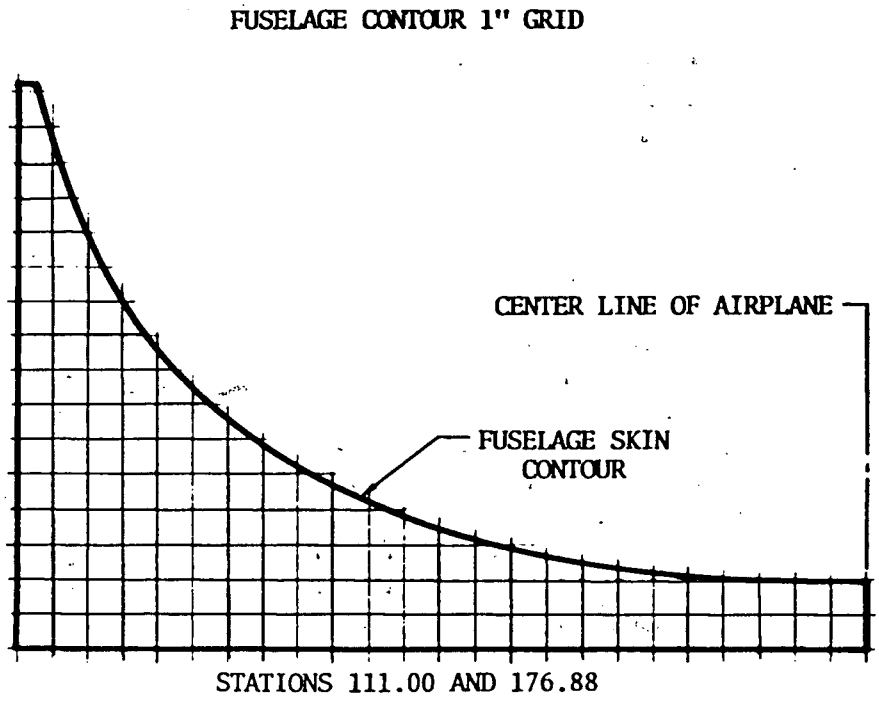

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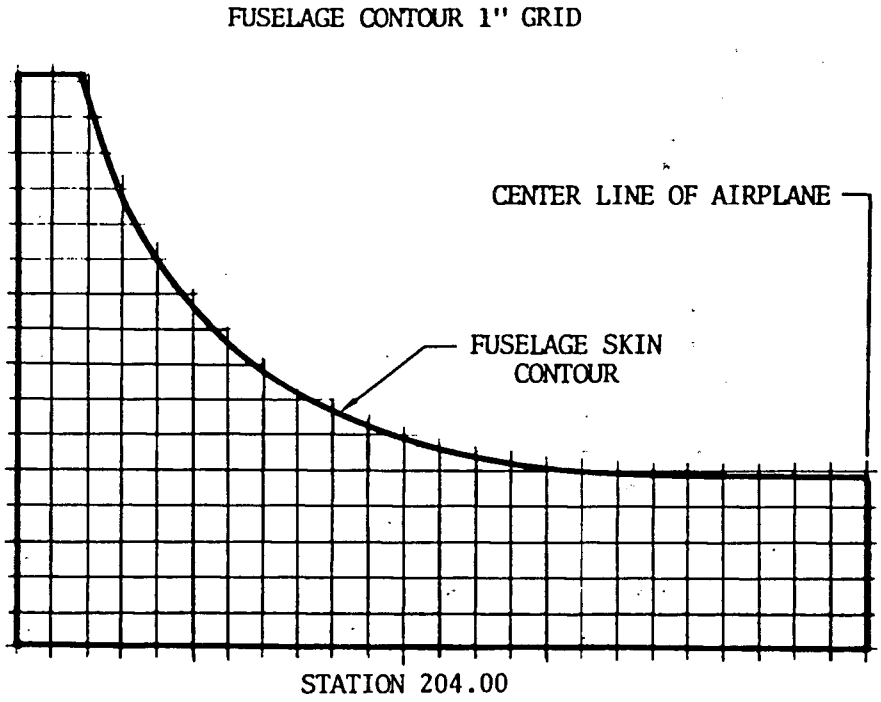
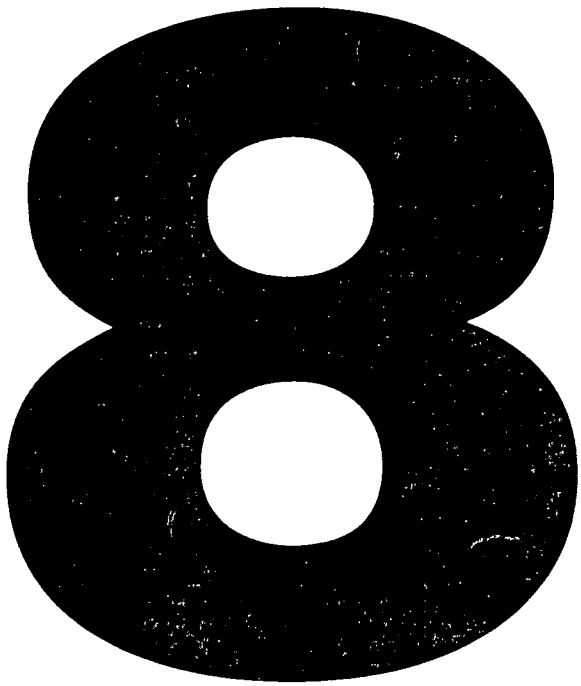


Figure 7-10. Fuselage and Wing Shoring (cont)

Chapter 8

CHAPTER



LEVELING AND WEIGHING

CHAPTER 8 – LEVELING AND WEIGHING

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

The airplane must be operated within definite weight and balance limits. Therefore, it is essential weight and center of gravity be accurately determined. The empty weight and center of gravity are determined from information obtained by weighing.

The airplane must be level during weighing operations. Other operations, such as calibrating the fuel system, and installing the turn coordinator also require leveling of the airplane.

DESCRIPTION.

For weighing the airplane, the airplane must be jacked and placed on scales. Leveling for the weighing operation is accomplished with landing gear strut pressure and tire pressure adjustments. Leveling for fuel calibration and turn coordinator installation is accomplished with tripod jacks and a tail stand. The center two seat rails are used for leveling in both the roll and pitch axes.

LEVELING.

DESCRIPTION.

The leveling operation should be accomplished inside a hangar on as level a surface as possible and where temperature conditions can be controlled, preferably 70°F. Allow approximately two hours for airplane to stabilize prior to leveling.

LEVELING ON JACKS AND TAIL STAND. (See the section titled Weighing for instructions on leveling aircraft when it is on scales.)

1. Tools and equipment required.

— NOTE —

Equivalent substitutes may be used for the items listed in Figure 8-1.

NAME	NUMBER	SOURCE
Spirit Level	Minimum of 15 inches long	Local Purchase
Cylindrical Pins(2)	1 inch Diameter by 4 inches Long Piston Wrist Pin	Local Purchase
Propeller Protractor	_____	_____

Figure 8-1. Tools and Equipment Required for Leveling

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LONGITUDINAL LEVELING

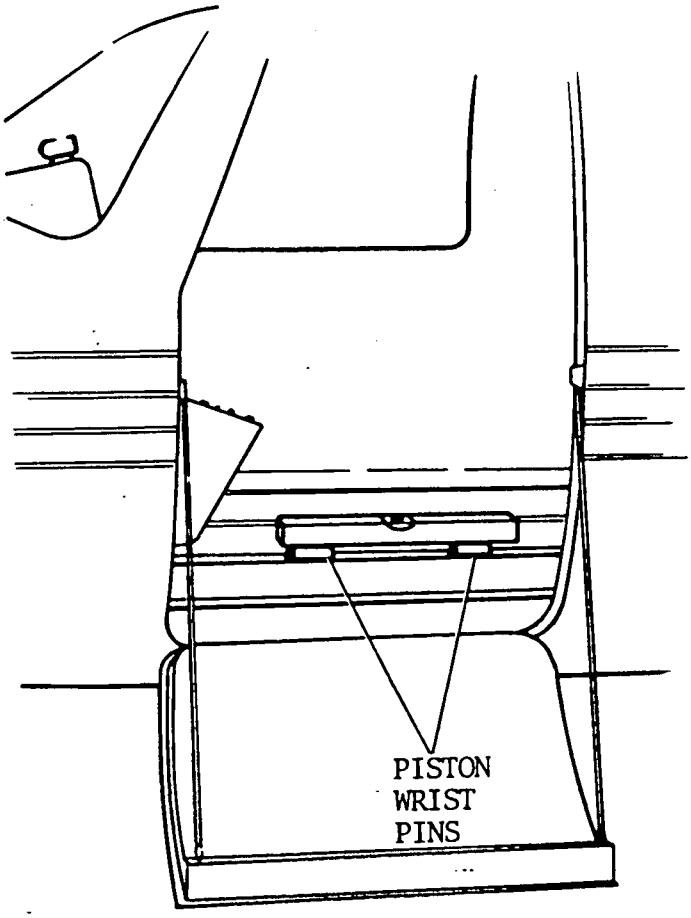

Figure 8-2. Positioning Level

2. Jack airplane per Chapter 7 until wheels are clear of ground (approximately one inch).
3. Level the airplane laterally as follows:
   A. Place a propeller protractor into position along the 35% spar near the fuselage.
   B. Adjust the wing jacks until the same angle is obtained for each wing.
   C. Ensure protractor is located at the same chord and span station on both wings.

— NOTE —

If the carry-thru spar through the cabin is accessible, it may be used for leveling laterally, utilizing a spirit level.

4. Level the airplane longitudinally as follows:
   A. Place two cylindrical pins (piston wrist pins) on inboard seat track per Figure 8-2.

— NOTE —

The cylindrical pins are placed in the seat track to raise the spirit level above the floor carpeting. These two pins must be equal diameter. If piston wrist pins are used, measure with a micrometer to verify diameter. Any variation will cause an error that will be greatly increased at the outer dimensions of the airplane.

   B. Place the spirit level fore and aft on top of the cylindrical pins.
   C. Exact level is obtained by adjusting the jack under the tail section.

WEIGHING.

DESCRIPTION.

The airplane is normally weighed with undrainable fuel, full engine oil, full hydraulic fluid, flaps up and landing gear down. A scale of 3,000 lbs. minimum capacity is required under each main gear wheel, and a scale of 1,000 lbs. minimum capacity is required under the nose wheel. The airplane must be clean and all items listed on the Aircraft Installed Equipment List must be installed in the airplane. The Equipment List and Weight and Balance Report, Form CR101-568 (used for recording airplane weight) is located in Section 7 of the Flight Manual.

The airplane may also be weighed with full fuel tanks, but it is not recommended, and care must be taken to verify all fuel tanks are "exactly full" and not partially under or over full (fuel topped off to bottom of filler neck with airplane in level attitude). See Chapter 12 for fuel capacities.

Temperature will have an effect when weighing the airplane (especially if fuel tanks are full) and therefore will affect the balance. The airplane and scales should be allowed approximately two hours to stabilize prior to performing the weighing operation.

PREPARATION FOR WEIGHING.

1. Clean airplane.
2. Inventory airplane to ensure Equipment List (in Flight Manual) accurately reflects what is installed in the airplane. All items must be installed.
3. Drain fuel per Chapter 12 if weighing empty.
4. Place airplane and scales in hangar on level surface and allow two hours for temperature stabilization.

5. Position seats.
   A. Pilot and copilot centered at fuselage station 96.00 (front of seat at fuselage station 83.00). (Seat may be moved forward for leveling. Ensure seat is returned to position when leveling is completed.)
   B. Center seats centered at fuselage station 132.00.
   C. Rear seat at full aft position.

WEIGHING.

1. Tools and equipment required.

— NOTE —
Equivalent substitutes may be used for the items listed in Figure 8-3.

NAME	PURPOSE	SOURCE
Scales(3)	(2) 3000 lb. Minimum for each MLG (1) 1000 lb. Minimum for each NLG	Local Purchase
Blocks (2)	For Blocking Struts	Local Manufacture
Chocks(6)	Chocking Wheels on Scales	Local Manufacture

Figure 8-3. Tools and Equipment Required for Weighing.

2. Jack airplane per Chapter 7.

— NOTE —
It may be necessary to deflate the main landing gear struts and collapse them for clearance in order to place weighing scales under the gear. It might also be desirable to block the struts at a specific extension by using the wood blocks shown in Chapter 7, Figure 7-1, Detail A.

3. Place a 3,000 lb. minimum scale under each main landing gear and a 1,000 lb. minimum scale under the nose landing gear and set airplane on scales, Figure 8-4.

— WARNING —
If wheels are not blocked, the airplane could roll off scales and cause serious injury and damage.

4. Chock forward and aft sides of all three wheels.
   A. If scales are on wheels, chock scales.
5. Release emergency brake.
6. Remove tripod jacks and tail stand clear of airplane.

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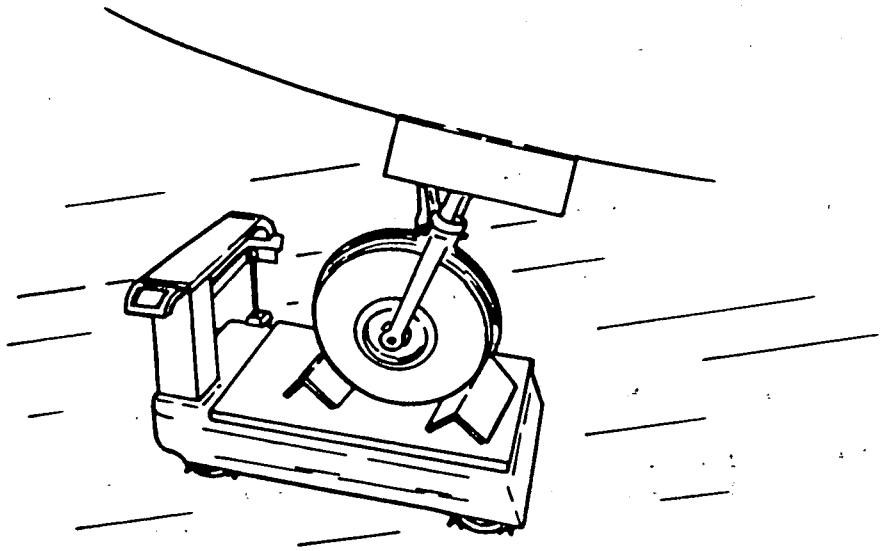

DETAIL A - NOSE GEAR

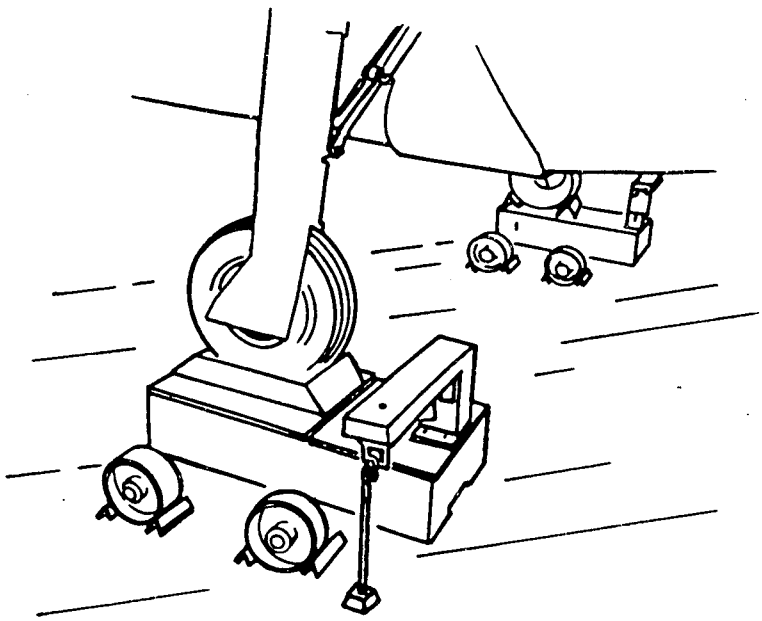

Figure 8-4. Positioning Airplane on Scales

7. Level airplane laterally.
   A. Assure main gear struts are set and will not raise or lower. (Install blocks in scissor assembly or collapse strut.)
   B. Standing outside of airplane, place pins and level on center two seat tracks.
   C. Adjust laterally by deflating tire on high side or inflating tire on low side.
8. Level airplane longitudinally.
   A. Place level on seat tracks per Figure 8-2 (level must be read while standing outside the airplane).
   B. The nose may be adjusted up or down by "kicking" the front of the tire to "shake" the strut free to raise or lower, or by letting air out of the tire. Recheck lateral level attitude after leveling longitudinally.
   C. If weighing with full fuel tanks, check fuel tanks are "exactly" full (if fuel is added or drained, repeat Steps 7 and 8).
   D. Remove level and pins. Reposition seat if moved and close cabin door.
   E. Record weights on Weight and Balance Report. Ensure "TARE" weight (weight of chocks, blocks or other weighing aids) is also entered to obtain NET weight.
9. Place jacks in position, attach tail stand, jack airplane and remove scales.
10. Service struts per Chapter 12 if required.
11. Downjack airplane per Chapter 7.
12. Disconnect tail stand, remove jack pads and stow in baggage compartment.

— END —

Chapter 9

CHAPTER

9

TOWING AND TAXIING

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CHAPTER 9 – TOWING AND TAXIING

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

Towing and taxiing procedures are basically the same as those used for other aircraft equipped with a tricycle landing gear, except for nose gear steering, turn limitations, and strut extension limitations.

If emergency towing is ever required using ropes or cables, never use the nose gear strut body or the tail skid. Use the lower portion of the main landing gear strut, avoiding the polished portion of the strut and the scissors assembly.

Station a qualified person inside the airplane whenever the towing operation involves a significant distance or a hazardous condition.

DESCRIPTION.

The airplane may be tractor towed on a hard surface using a yoke type towbar attached to the nose gear flanges and observing the turn limits and strut extension.

A centering cam inside the nose gear strut automatically centers the nose wheel when the strut fully extends such as; after rotation at take-off, raising the nose when lowering the tail for hangar door clearance, and raising the airplane on jacks. The centering cam starts engaging during the last approximate 2 inches of extension of the strut, at which point the wheel turning angle becomes continuously smaller as the strut continues to extend.

It is recommended using both engines when taxiing, but it may be accomplished on one engine provided the right engine is used. Nose wheel steering is achieved through hydraulic power derived from the hydraulic pump mounted on the right engine. If an auxiliary hydraulic pump is installed, it will provide power for nose wheel steering, but its sole use for taxiing is not recommended. Nose wheel steering is accomplished by depressing the rocker switch on the center console. Small inputs will give gentle turns, and prevent oversteering.

Refer to Figure 9-1 for minimum turning dimensions when taxiing or towing and Figure 9-2 for nose wheel turn limits, maximum strut extensions, and towbar attachment.

TOWING.

DESCRIPTION.

During the towing operation, all turning must be accomplished through the towbar. Do not attempt to turn with the steering switch. A red mark on each side of the fuselage ahead of the nose landing gear denotes the turn limit and if the limit is exceeded structural damage will result.

The airplane may be towed with one or both engines removed provided a ballast of 400 pounds is placed in the cabin at floor level prior to towing to prevent a tail heavy condition (Figure 9-4).

If the airplane is off the runway in soft sand or dirt, mud or snow, towing can be accomplished by attaching cables or ropes to the main landing gear and to a towing vehicle (Figure 9-4). Use the hand held towbar to steer the airplane.

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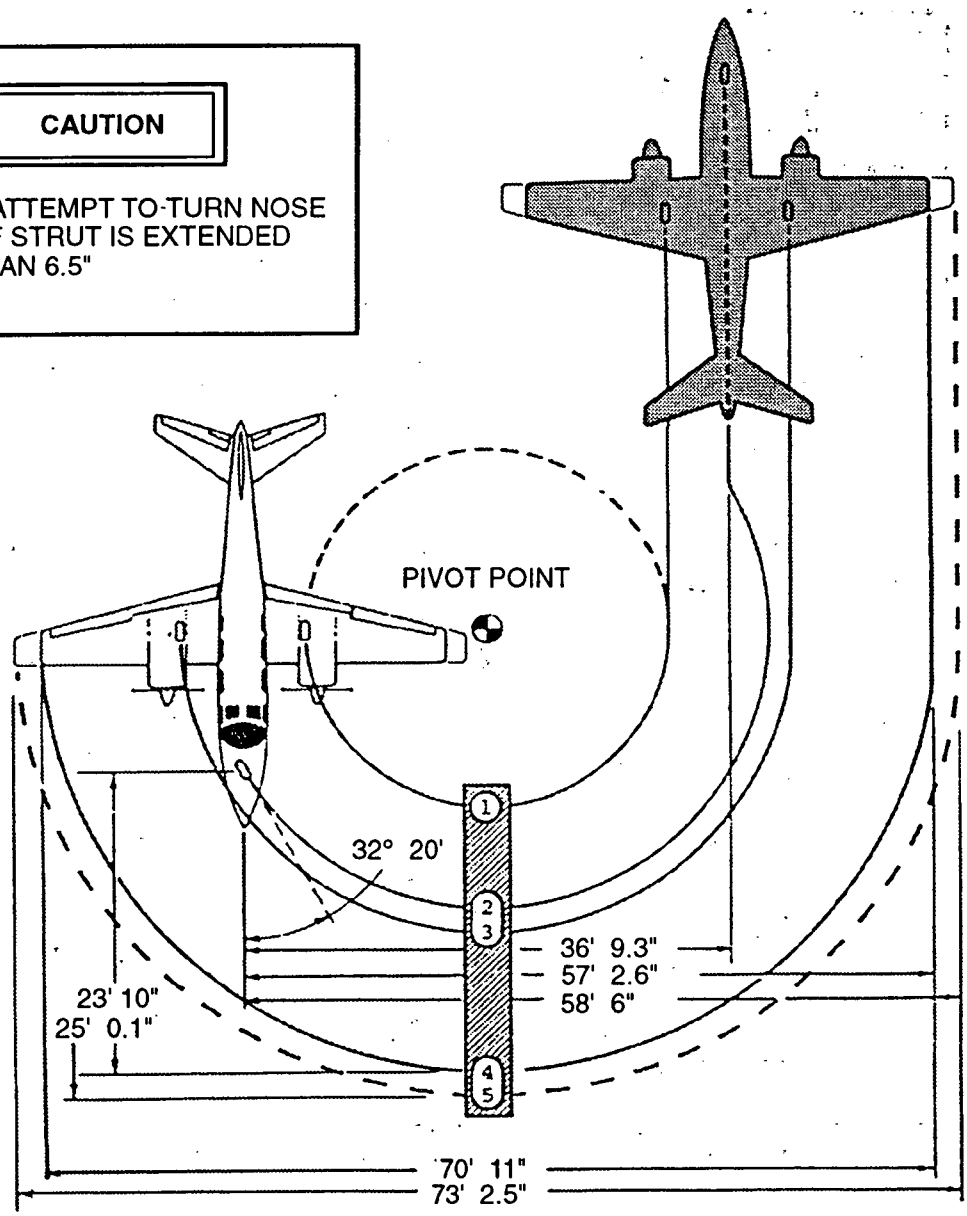
CAUTION

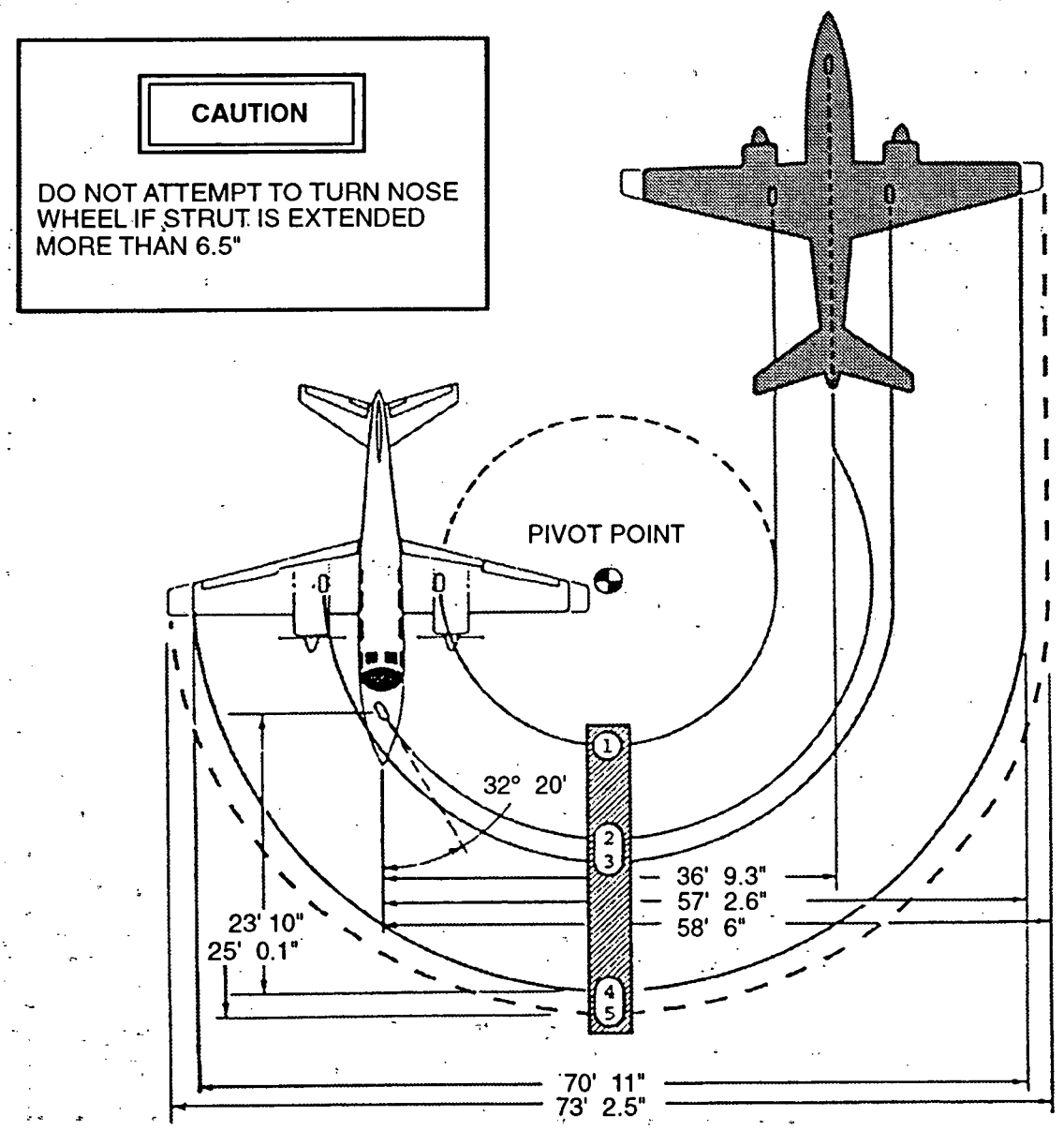
DO NOT ATTEMPT TO-TURN NOSE WHEEL IF STRUT IS EXTENDED MORE THAN 6.5"



1. INNER MAIN GEAR 13' 3.7"
2. NOSE GEAR 21' 9.2"
3. OUTER MAIN GEAR 23' 5.8"
4. OUTER WING TIP 35' 5.5"
5. OUTER WING TIP 36' 8.8" AIRPLANE A/F O611 & UP AND ALL AIRPLANES WITH 450500 NOSE GEAR STRUT

Figure 9-1. Minimum Turning Dimensions A/F No. 0611 and up

B318

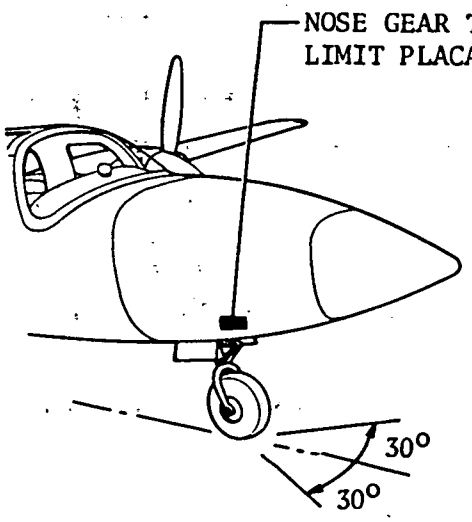


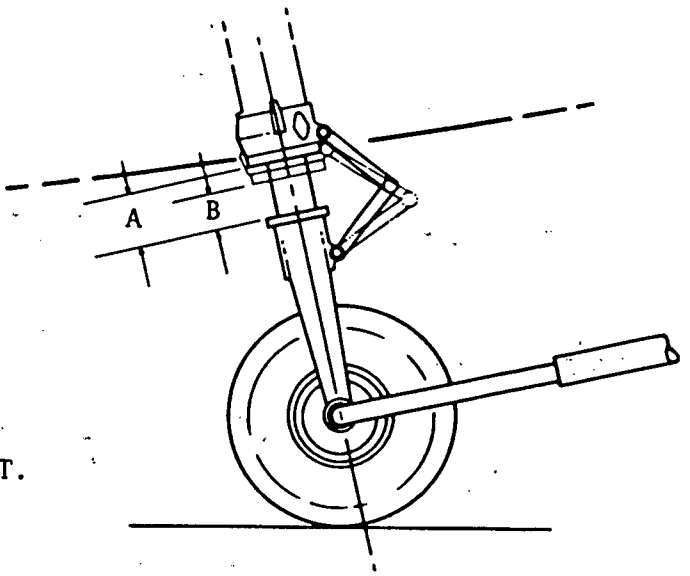
1. INNER MAIN GEAR 13' 3.7"
2. NOSE GEAR 21' 9.2"
3. OUTER MAIN GEAR 23' 5.8"
4. OUTER WING TIP 35' 5.5"
5. OUTER WING TIP 36' 8.8" AIRPLANE A/F 0611 & UP AND ALL AIRPLANES WITH 450500 NOSE GEAR STRUT

Figure 9-1. Minimum Turning Dimensions A/F No. 0001 to 0610, 602P and 700P (cont)

B319

CAUTION
DO NOT ATTEMPT TO TURN NOSE WHEEL IF STRUT IS EXTENDED MORE THAN 6.5".





A - MAXIMUM STRUT EXTENSION
7.5 INCHES FOR A/F 0001-0610
8.5 INCHES FOR A/F 0611 & UP
& A/F WITH P/N 450500 NLG STRUT.

B - MAXIMUM STRUT EXTENSION FOR
TURNING NOSE WHEEL
5.5 INCHES FOR A/F 0001 - 0610
6.5 INCHES FOR A/F 0611 & UP &
A/F WITH P/N 450500 NLG STRUT.

Figure 9-2. Turn Limit - Towbar Attachment - Strut Extension

NOSE GEAR TOWING.

1. Tools and equipment required, Figure 9-3.

— NOTE —

Equivalent substitutes may be used for items listed in Figure 9-3.

NAME	NUMBER	SOURCE	USE
Towbar	550016-1	Aerostar Aircraft Corp.	For Nose Gear Towing by Hand
Towbar	Model 1112	Danair Corporation Maumee, Ohio	For Tractor Towing

Figure 9-3. Towing Equipment

2. Install towbar on nose wheel axle and ensure towbar is securely attached.
3. Remove control lock, wheel chocks, and mooring cable.
4. Disengage parking brake. Verify brake is disengaged if using powered vehicle.
5. If area is congested, station wing walkers to ensure clearance for safe towing.

— CAUTION —

During the towing operation, the operator should never exceed the turn limit angle of the nose gear placarded on the fuselage. Exceeding this limit will cause damage to nose landing gear.

6. Tow airplane, making smooth starts and stops with towing vehicle.
7. When towing operation is complete, engage parking brake, chock wheels, remove towbar and install control lock.

MAIN GEAR TOWING.

1. Tools and equipment required.
   A. Cable or rope per Figure 9-4.

— CAUTION —

Never use nose gear strut body or tail skid attach point for towing. Always tow slowly and avoid jerky motions. Do not crush brake lines or foul brake disc or caliper when attaching cable or rope to main landing gear strut. Do not attach towing cables or ropes to the main landing gear scissors or to the polished portion of the strut.

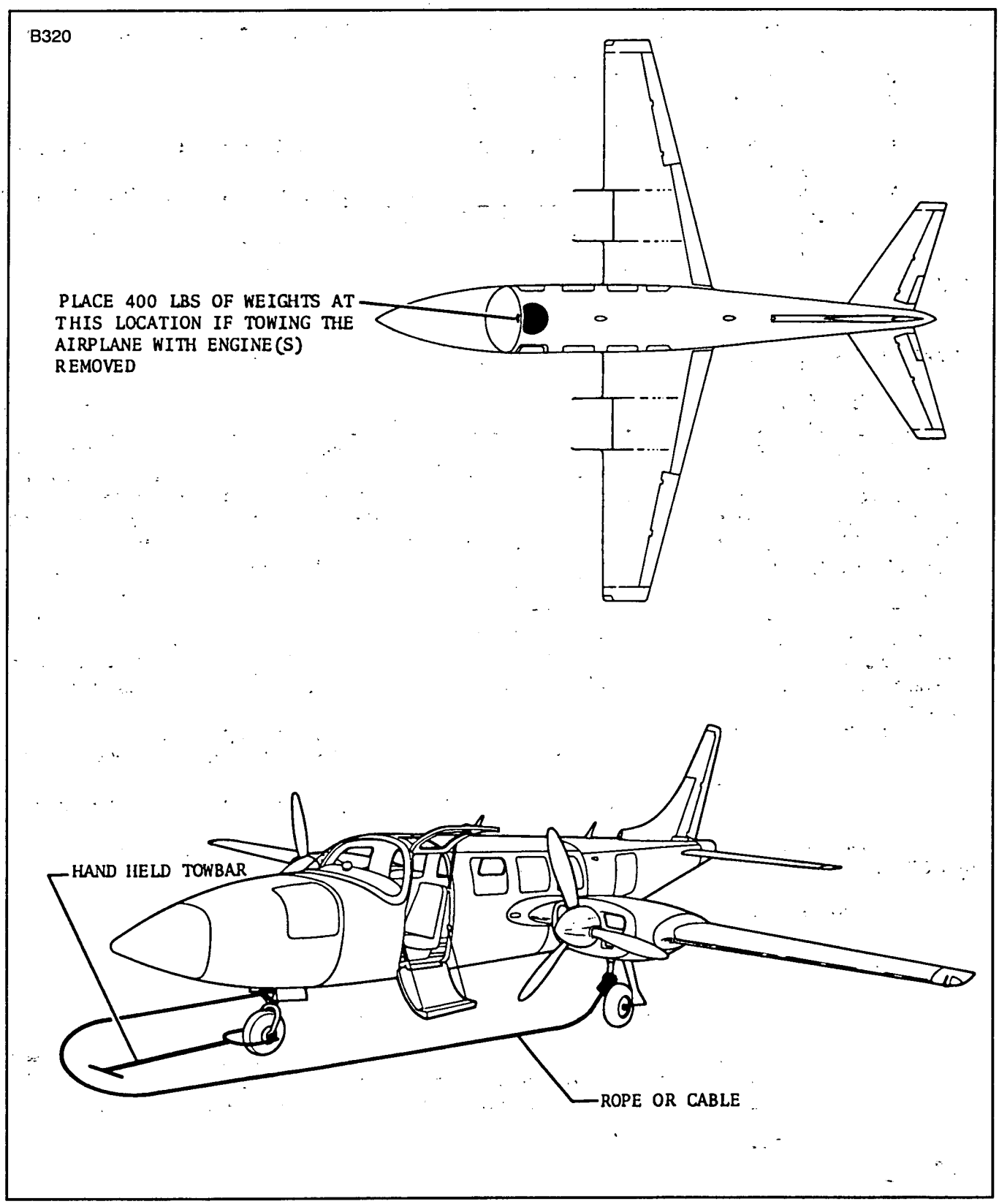


Figure 9-4. Weight Locations - Towing Attach Points

2. Install towing cables or ropes as low as possible on main landing gear, and attach to towing vehicle.
3. Attach hand held towbar to nose gear axle spacers.
4. Station qualified person in pilot's seat.
5. While towing, steer airplane with hand held towbar at nose gear.
6. Tow vehicle and person stationed in airplane should coordinate signals for braking airplane for starts and stops.
7. When towing operation is complete, remove cables or ropes, remove towbar, chock wheels, set parking brake (if desired), install tie downs and control lock.

TAXIING.

DESCRIPTION.

While taxiing, the props must be in high RPM pitch and areas with loose gravel or other objects which could damage propellers, airframe or other aircraft should be avoided.

A nose wheel steering switch (split rocker spring loaded to OFF), is located on the center console and electrically operates a solenoid valve mounted in the fuselage nose section, which in turn directs system hydraulic pressure to a combination steering actuator and shimmy damper mounted on the nose gear. When the steering switch is depressed, another electrically operated solenoid valve, located in the nose wheel steering valve return line, opens to allow fluid flow to return. Steering rate is controlled by a fixed orifice restrictor downstream of this solenoid valve. When the switch is released, the solenoid valve returns to its normally closed position, locking system pressure to both sides of the nose gear steering actuator to provide shimmy damping.

The steering rocker switch split feature is provided as a fail-safe device. The solenoid steering valve will not activate unless BOTH halves of the switch are depressed simultaneously. If during the taxi preflight, the nose steering system can be actuated with only one-half of the switch, the system is defective and must be repaired. The steering switch is automatically de-energized when the nose landing gear is not in the full down and locked position.

Should the nose wheel become cocked, the following procedure will correct the situation:

A. If steering is cocked to full left, apply right brake, right steering input and left engine power.
B. If steering is cocked to full right, apply left brake, left steering input and right engine power.

If hydraulic power is lost, steering can be accomplished by asymmetrical power and/or braking application.

MAINTENANCE PRACTICES.

1. Clear area around airplane.
2. Remove control lock, tie downs and chocks.
3. Engage parking brake.
4. Start and warm up engines per the Flight Manual.
5. Ensure flaps are UP.

— NOTE —

Props must be in high RPM pitch for taxiing.

6. Apply engine power as necessary for smooth, safe taxi speeds.
7. Let airplane roll forward slightly and apply brakes to determine effectiveness. It may become necessary to apply brakes to slow taxi speed. Intermittent braking provides a cooling period between brake applications and helps prevent brake overheating.
8. Check operation of steering rocker switch.
9. Minimum turning distance, Figure 9-1, must be observed.
10. Taxi airplane to desired area, apply parking brake (if desired), shut down engine(s), install wheel chocks, tie downs, and control lock.

— END —

CHAPTER

10

PARKING AND MOORING

CHAPTER 10 - PARKING AND MOORING

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

The airplane is normally parked or moored on a cement apron where the necessary mooring accommodations are available. This chapter does not provide information for parking or mooring on surfaces other than prepared parking aprons.

If the airplane is to be parked with the engines removed, the procedures will be the same except a ballast of 400 lbs. must be placed on the floor of the cabin at the door opening to prevent a tail heavy condition. A tail stand must be installed whenever an engine, or engines have been removed.

Do not set the parking brake if the brakes are hot, wet, or if freezing weather conditions exist.

1. Setting the parking brake while brakes are hot will cause heat to be transferred from discs to the pads and seals in the brake caliper which could cause the seals to leak.
2. In wet and freezing weather the brakes could remain stuck after pressure is released causing possible damage upon moving the airplane, especially if towing with a motorized vehicle.
3. The airplane may be moved without entering the airplane if the parking brake is not set.

When mooring, do not tie the rope to the torque links or around the brake lines, and avoid the use of chains for tie downs whenever possible.

DESCRIPTION.

The airplane may be secured during normal weather conditions (winds less than 20 knots) by heading the airplane into the wind, installing wheel chocks, and engaging the parking brake. Refer to mooring procedures if the airplane is to be moored in anticipation of high winds, or anytime the airplane is to be left outside for lengthy periods.

The airplane should be hangared if possible when predicted winds are to exceed 60 knots.

PARKING.

DESCRIPTION.

Parking procedures are generally used during good weather conditions. If bad weather conditions exist, or are expected, airplane should be moored.

The control lock, stored in the baggage compartment, is provided for securing all flight controls in the NEUTRAL position when the airplane is parked.

For short term parking in calm weather, the pilot's seat belt may be fastened around pilot's control wheel in place of using control lock.

NORMAL WEATHER CONDITIONS.

1. Tools and equipment required.

– NOTE –

Equivalent substitutes may be used for the items listed in Figure 10-1.

NAME	NUMBER	SOURCE
Wheel Chocks	----------	Local Manufacture
Control Lock	550014-1	Aerostar Aircraft Corporation

Figure 10-1. Parking Equipment

2. Head airplane into the wind.
3. Chock wheels forward and aft.
4. Set parking brake. (Refer to Chapter 10, General.)
5. Install control lock, Figure 10-2.

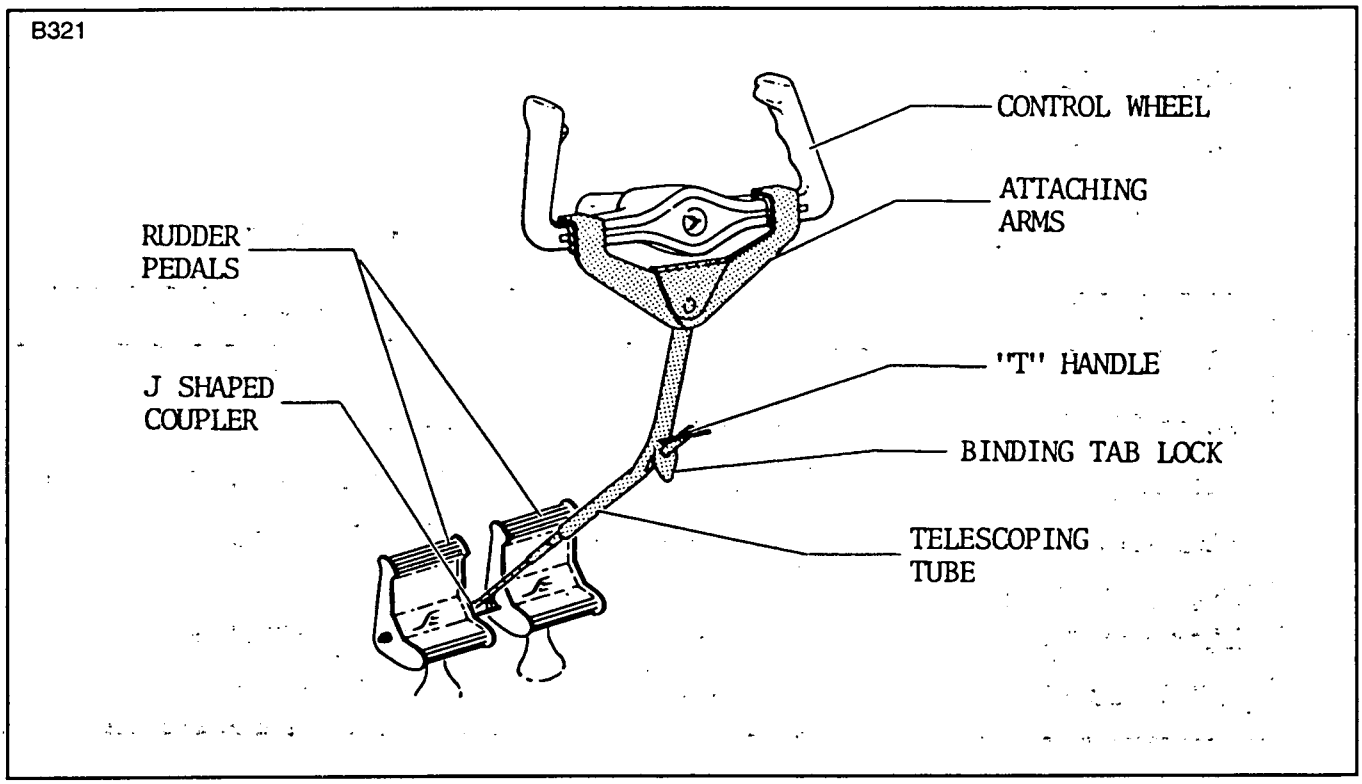


Figure 10-2. Control Lock

CONTROL LOCK.

1. Installation/Removal.
   A. Installation.
      (1) Extend telescoping tube with the welded "J" shaped coupler to its full length.
      (2) Unfold two attaching arms until they lock forming a "Y" shape.
      (3) Hook "J" shaped coupler around the bolt heads on inboard sides of both rudder pedals.
      (4) Loop "Y" shaped attaching arms around control wheel and pull up on "T" shaped handle until movement of control wheel is completely restricted.
   B. Removal.
      (1) Loop index finger around binding tab lock pulling upward until attaching arms clear control wheel.
      (2) Unlock "J" shaped coupler from rudder pedal bolt heads and pull control lock free.
      (3) Compress telescoping tube, fold attaching arms and stow control lock in baggage compartment.

MOORING

DESCRIPTION.

1. Mooring procedures are generally used in strong or gusty winds and for extended periods of time.

MOORING PROCEDURE.

1. Tools and equipment required.

– NOTE –
Equivalent substitutes may be used for items listed in Figure 10-3.

NAME	NUMBER	SOURCE
Wheel Chocks	----------	Local Manufacture
Control Lock	550014-1	Aerostar Aircraft Corporation
Pitot Cover	----------	Local Purchase
External Surface Locks (Fig. 10-4)	----------	Local Manufacture
3/4" Manila Rope	----------	Local Purchase

2. Head airplane into wind if possible.
3. Set parking brake. (Refer to the section titled Parking, this chapter.)
4. Install internal control lock, Figure 10-2.
5. Install wheel chocks forward and aft of wheels.
6. Install pitot cover.
7. Install external surface lock, Detail A, Figure 10-4.

— CAUTION —

Do not tie rope around the torque links, as structural damage may result.

8. Install ropes on landing gear, Figure 10-4, leaving sufficient slack to provide for rope shrinkage.
   A. Nose gear - Using clove hitch or other anti-slip knot, tie rope around top of strut fork between torque links.
   B. Main Gear - Tie rope above axle below torque links.
9. Attach rope at tail through tail skid and attach to anchor.

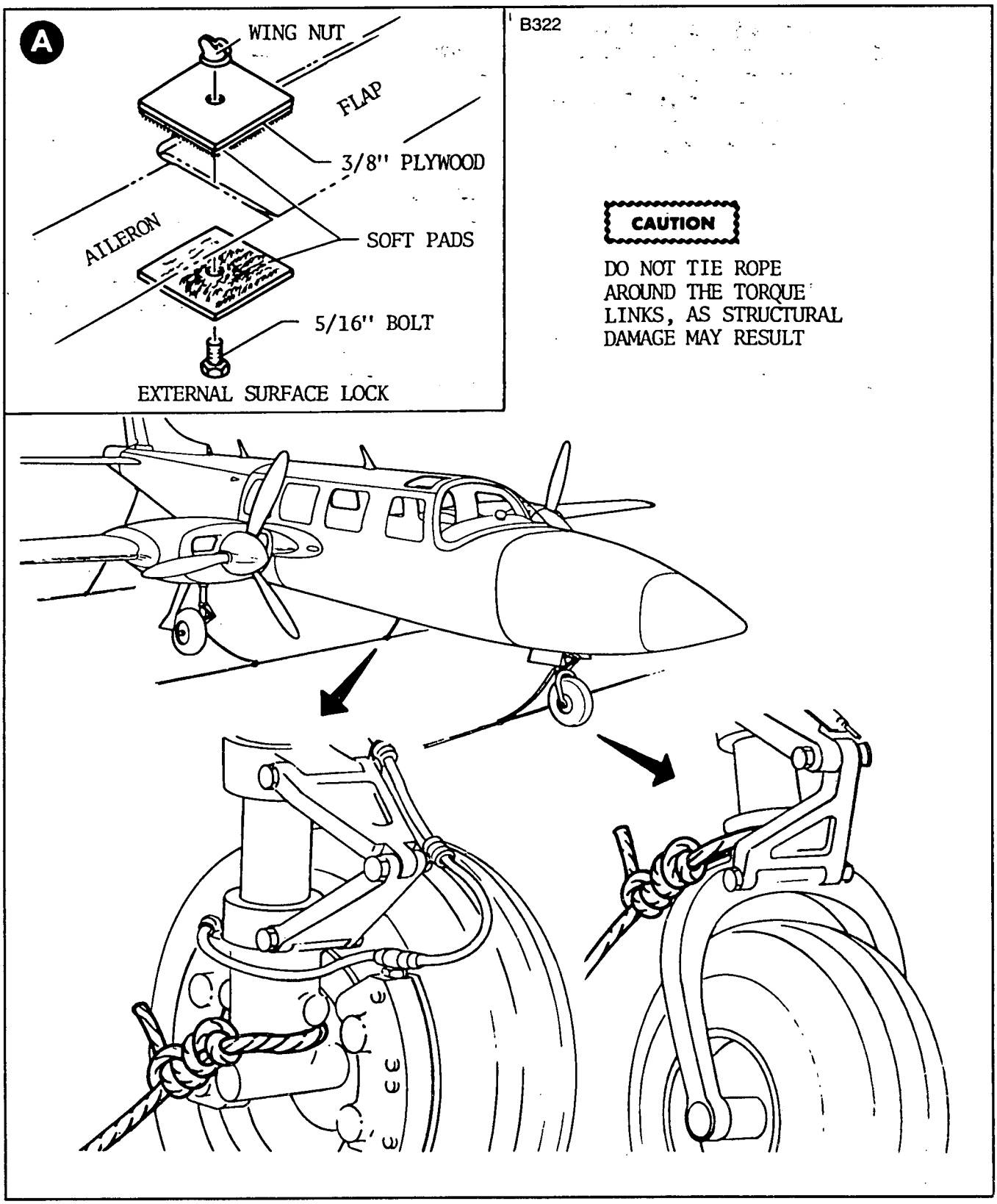


Figure 10-4. Mooring Tie Down Points and External Surface Lock

CHAPTER

11

REQUIRED PLACARDS

CHAPTER 11 – REQUIRED PLACARDS

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

This chapter provides information on markings and placards which are required by FAR Part 23 and the minimum equipment list. These placards must be maintained on the airplane at all times and must not be erased, disfigured or obscured.

DESCRIPTION.

All markings and placards are stencil, pressure sensitive film or silk screen except for the airplane I.D. plate which is metal and is secured to the airplane by rivets. The pressure sensitive film base is mylar, vinyl or aluminum.

EXTERIOR PLACARDS AND MARKINGS.

DESCRIPTION.

This section contains the markings and placards which are outside the cabin area. Some of these markings and placards are located in the tail section, baggage compartment, wheel well areas and nose section.

The external placards require a clear finish top coat for protection against weather, cleaning and aircraft servicing fluids.

MAINTENANCE PRACTICES.

1. Thoroughly clean surface with MEK solvent or equivalent. Allow area to dry prior to applying placard. Do not contaminate adhesive surface of placard. Care should be taken to prevent air bubbles from forming under placard.
2. For external placards, apply 3M Co. 4150 edge sealer over entire placard.
3. Refer to Figure 11-1 for identification and location of exterior markings and placards.

INTERIOR PLACARDS AND MARKINGS.

DESCRIPTION.

The interior placards are pressure sensitive, stencil or silk screen type. These placards supply general and emergency information, instructions, cautions and warnings.

MAINTENANCE PRACTICES.

1. Silk screen lettering "touch-ups" may be accomplished by the application of rub-on letters which match the silk screen letters.
2. Refer to Figures 11-3 through 11-12 for identification and location of interior markings and placards.

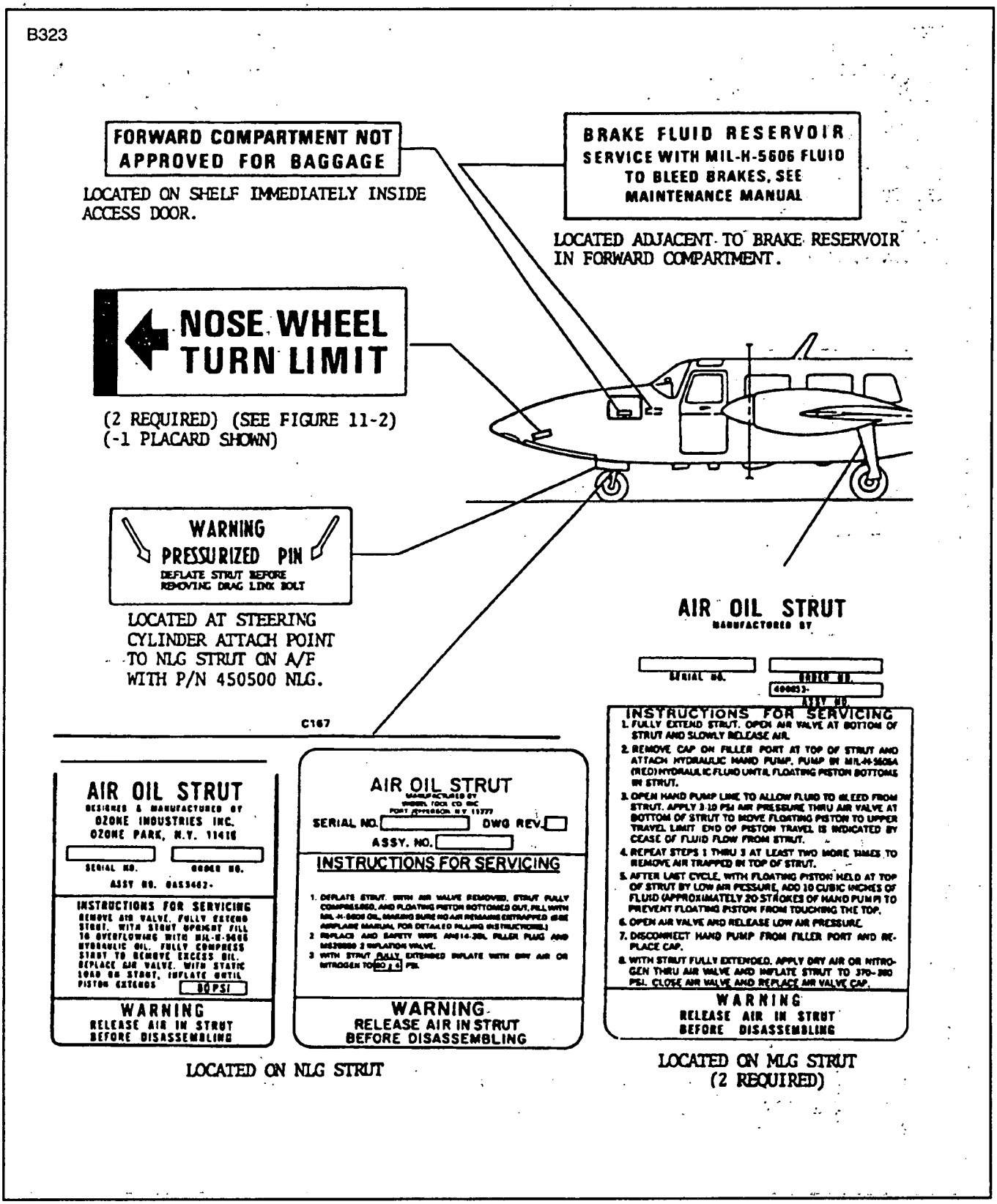


Figure 11-1. Identification and Location, Exterior Placards

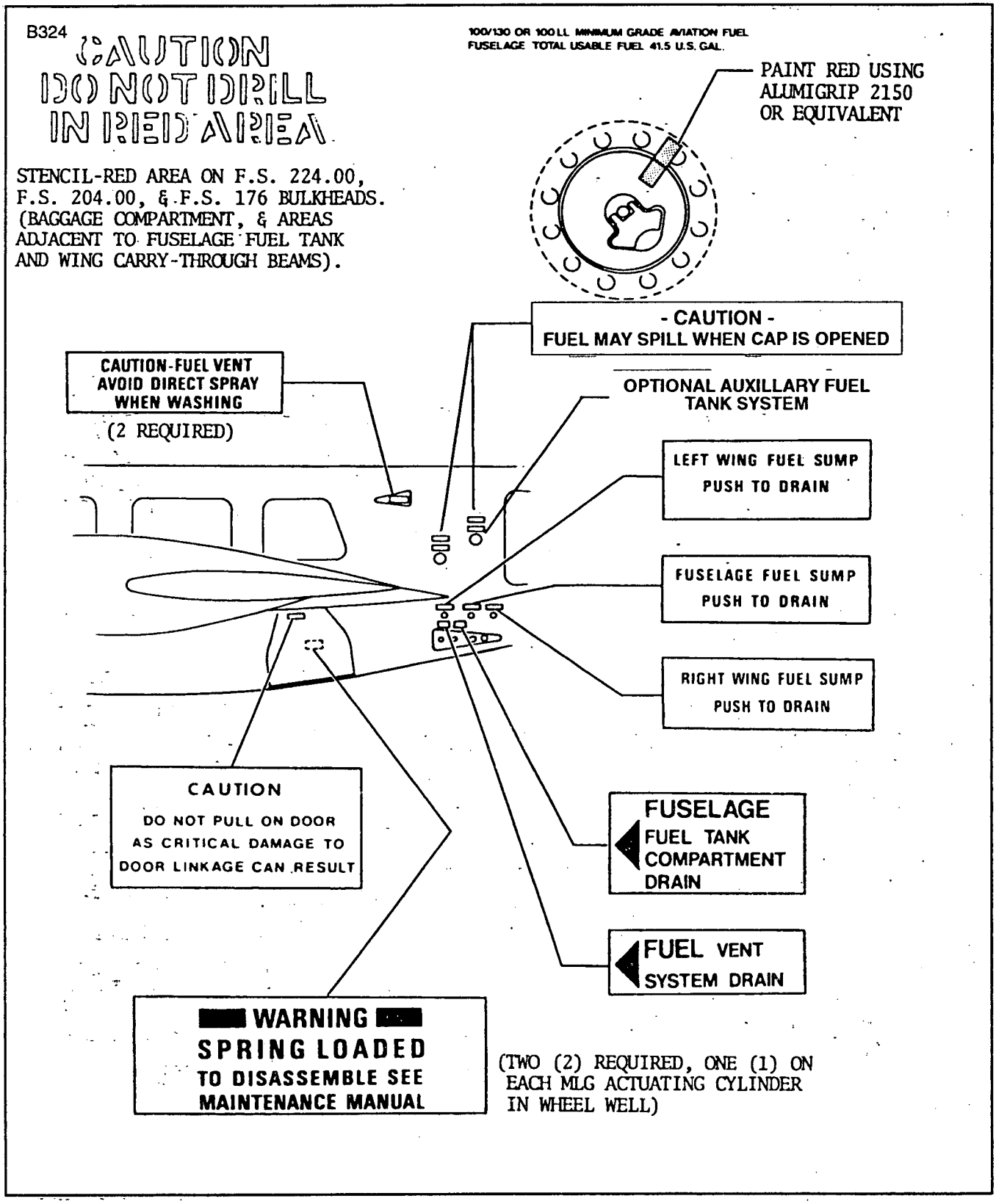


Figure 11-1. Identification and Location, Exterior Placards (cont)

B325

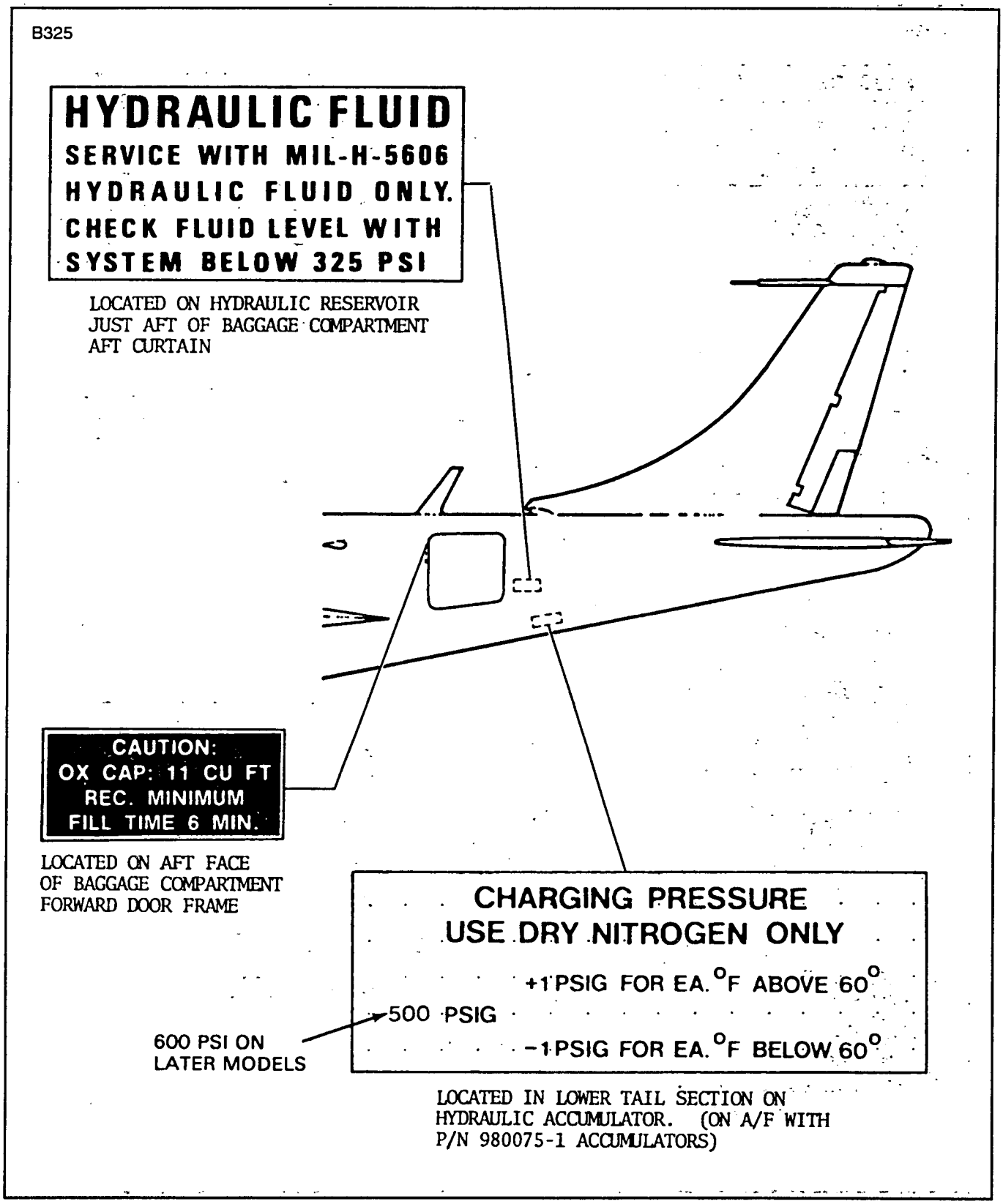


Figure 11-1. Identification and Location, Exterior Placards (cont)

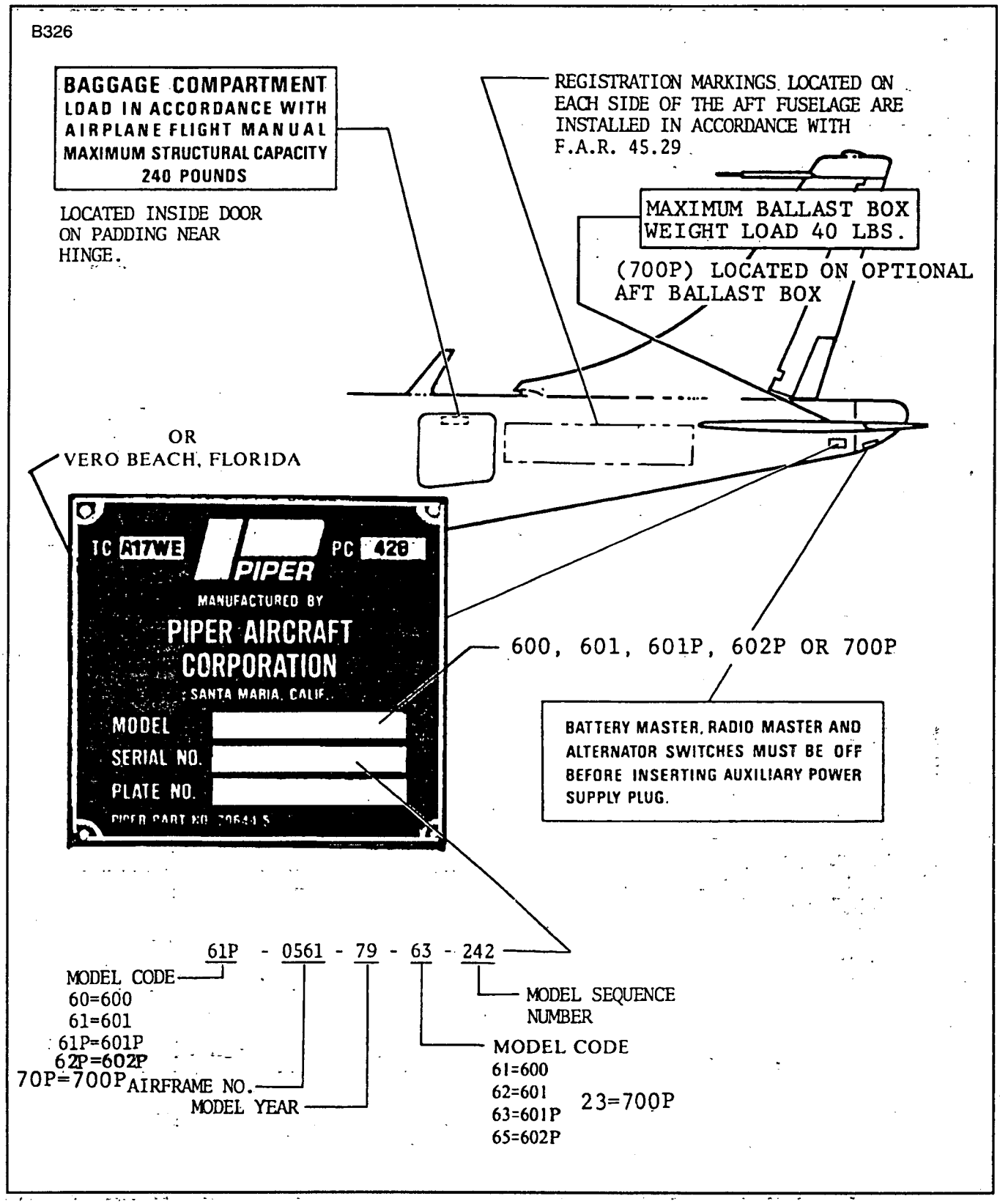


Figure 11-1. Identification and Location, Exterior Placards (cont)

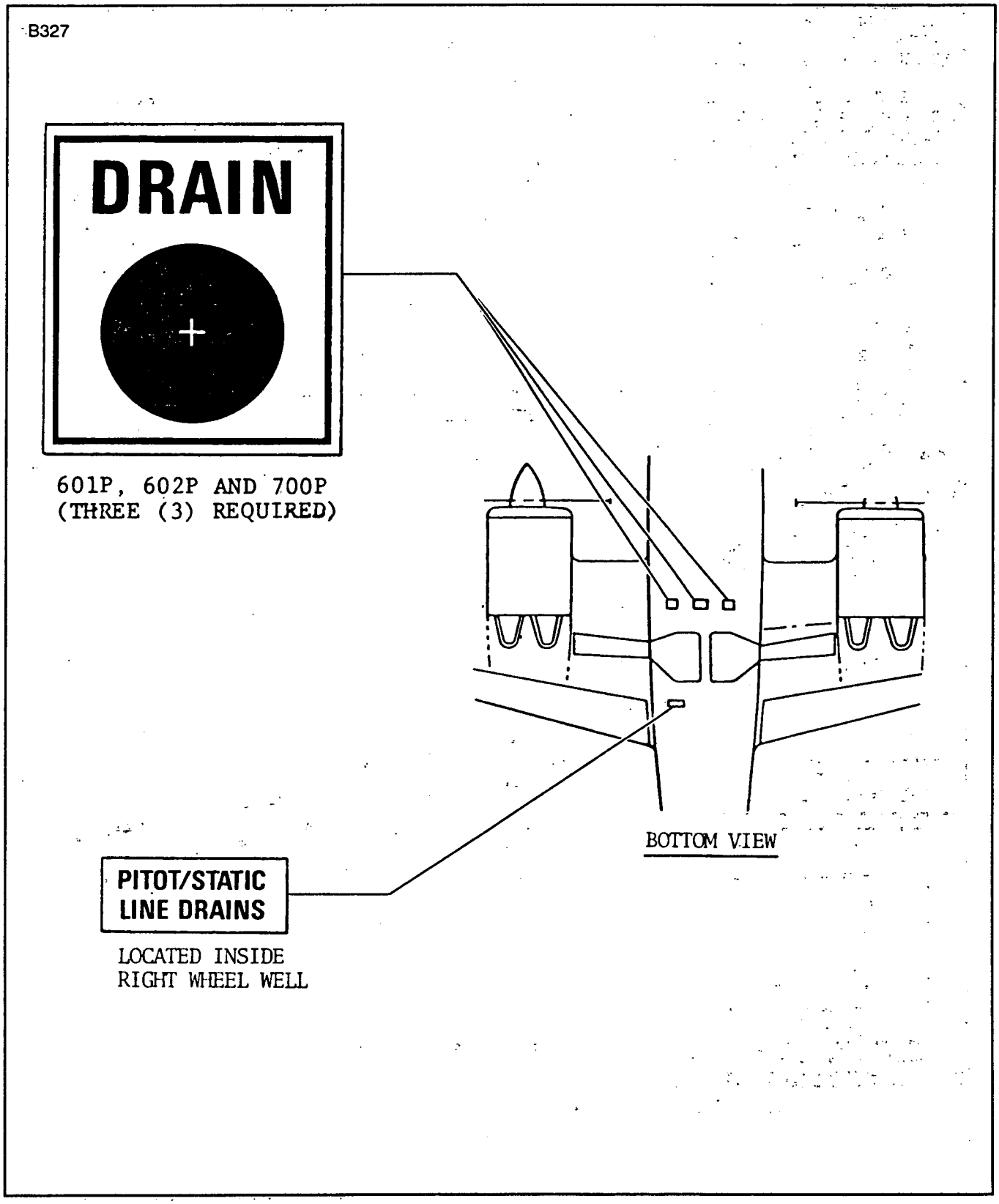


Figure 11-1. Identification and Location, Exterior Placards (cont)

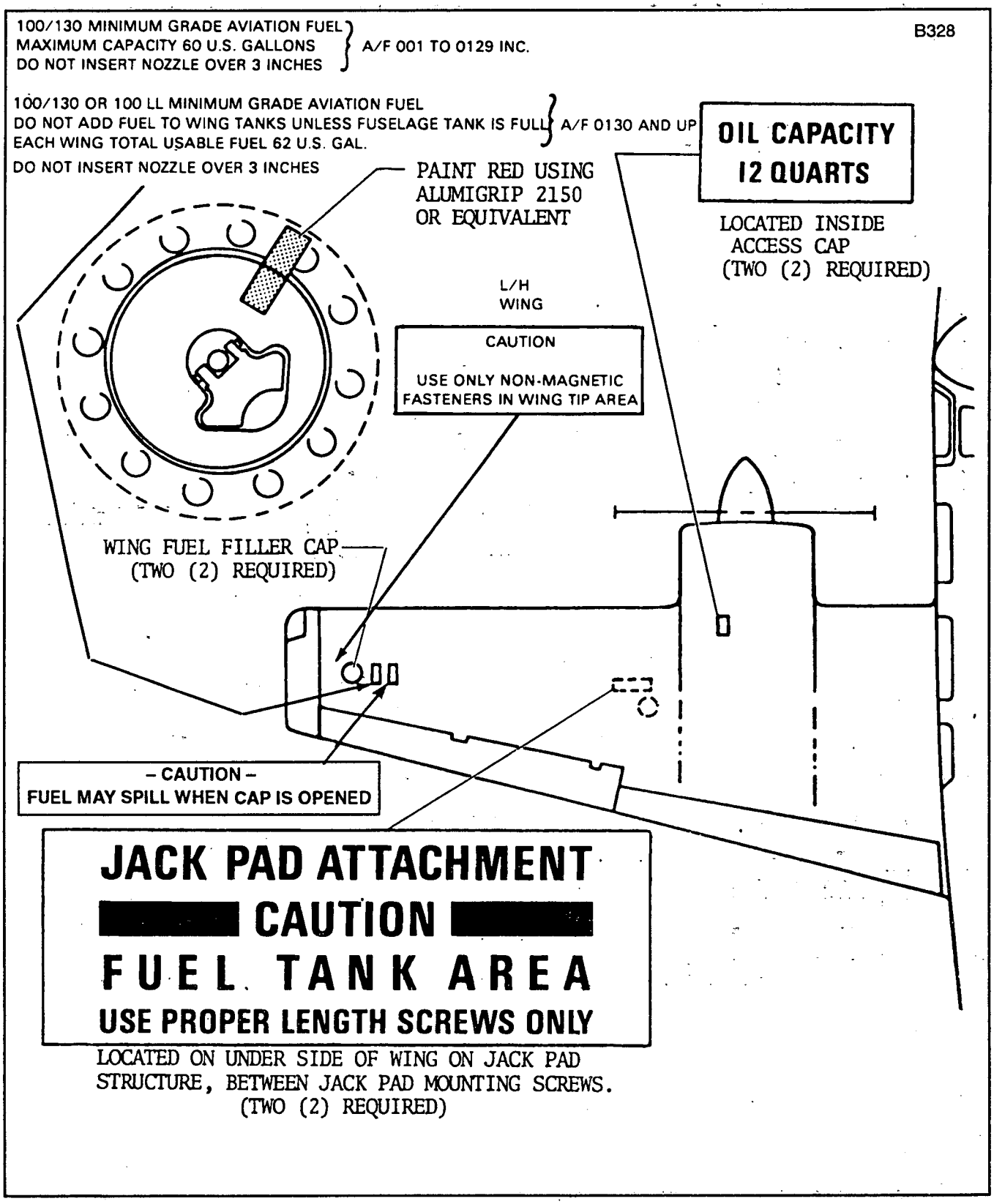
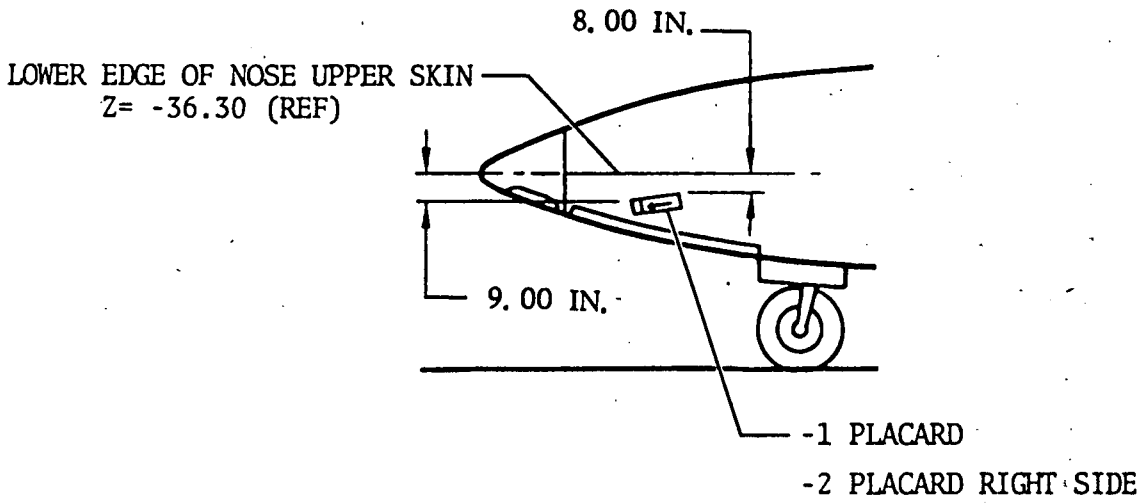


Figure 11-1. Identification and Location, Exterior Placards (cont)

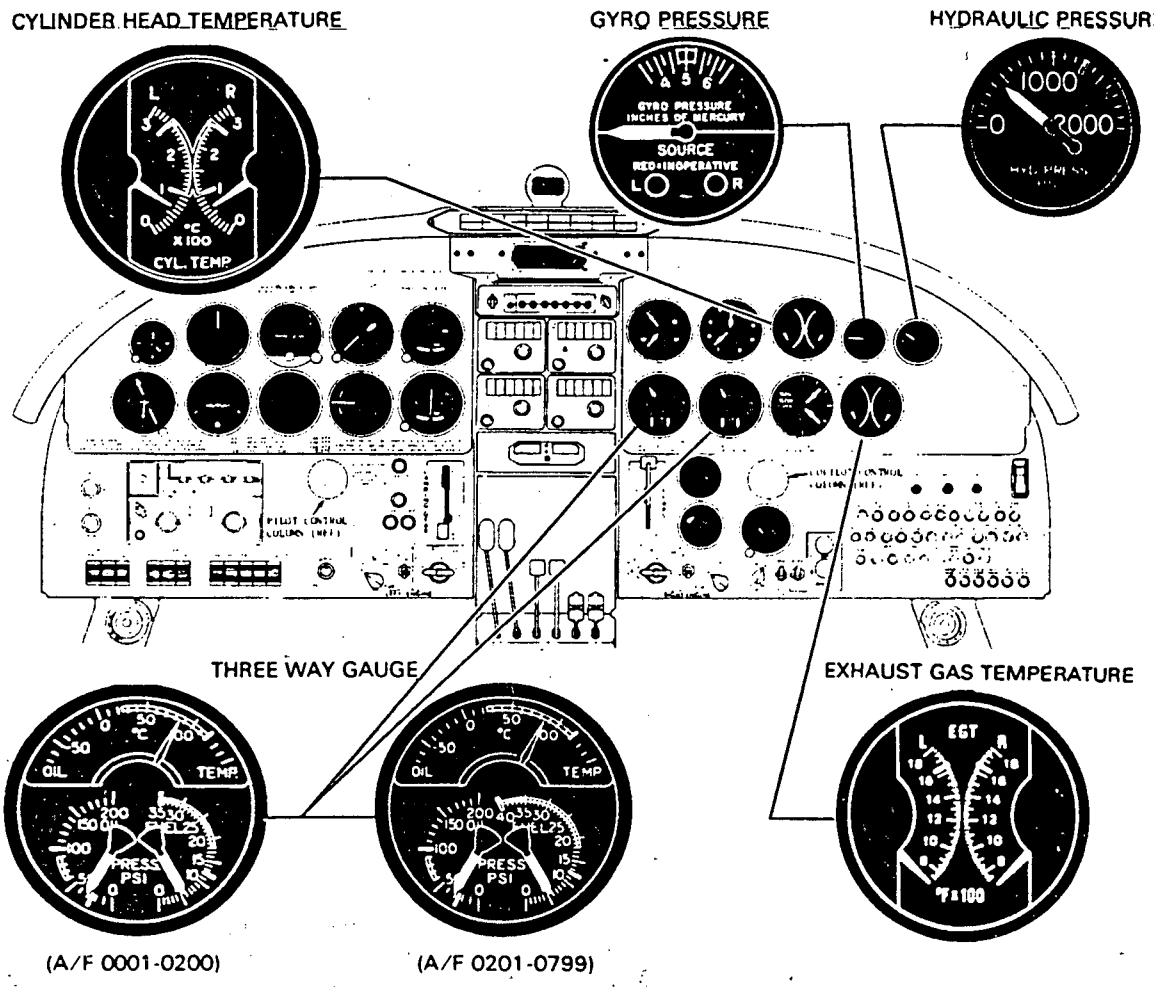
B329



Locate two top corners vertically to dimensions shown. For fore and aft locations; place nose wheel on a grease plate, swing nose wheel carefully to limit stops with tow bar. Back off stops moving tow bar at extension pit pin approximately two inches. Align bar on placard with nose gear strut, the center rib of the nose tire and the tow bar center bar.

Figure 11-2. Nose Wheel Turn Limit Placard Installation

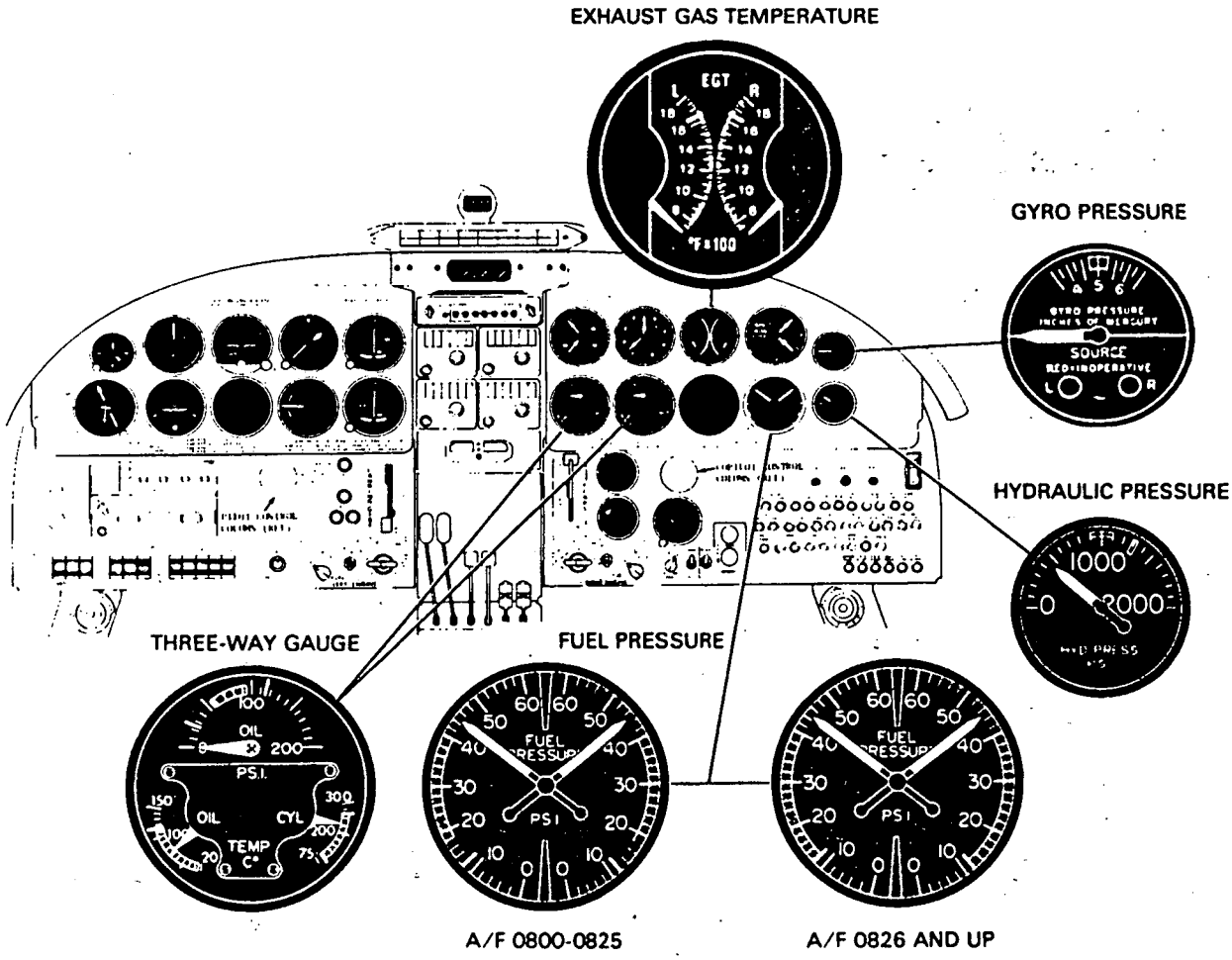
B330



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE	—	24-118°C	118°C
OIL PRESSURE	25 PSI (IDLE)	60-90 PSI	100 PSI
CYLINDER HEAD TEMPERATURE			
A/F 0001-0714	100°C	100-246°C	246°C
A/F 0715 AND UP	100°C	100-260°C	260°C
HYDRAULIC PRESSURE	—	900-1100 PSI	1300 PSI
FUEL PRESSURE			
A/F 0001-0200	12 PSI (IDLE)	18-35 PSI	35 PSI
A/F 0201-0799	12 PSI (IDLE)	18-40 PSI	40 PSI
GYRO PRESSURE (PNEUMATIC GYRO ONLY)	—	4.8-5.2 IN. HG.	—
EXHAUST GAS TEMPERATURE	—	—	1650°F

Figure 11-3. Power Plant Instruments - Model 600 only A/F No. 0001 to 0799

B331



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	YELLOW ARC CAUTION	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE			24-118°C	118°C
OIL PRESSURE	25 PSI (IDLING)		55-95 PSI	115 PSI
CHT	100°C		100-260°C	260°C
HYDRAULIC PRESSURE			900-1100 PSI	1300 PSI
FUEL PRESSURE	12 PSI (IDLING)		18-40 PSI	40 PSI
A/F 0826 AND UP	12 PSI (IDLING)	12-18 PSI	18-40 PSI	40 PSI
GYRO PRESSURE			4.8-5.2 IN. HG.	
FUEL QUANTITY (FUSELAGE TANK)		0-12 GAL		
EGT				1650°F

Figure 11-3. Power Plant Instruments Model 600 (cont)
A/F 0800 and Subsequent

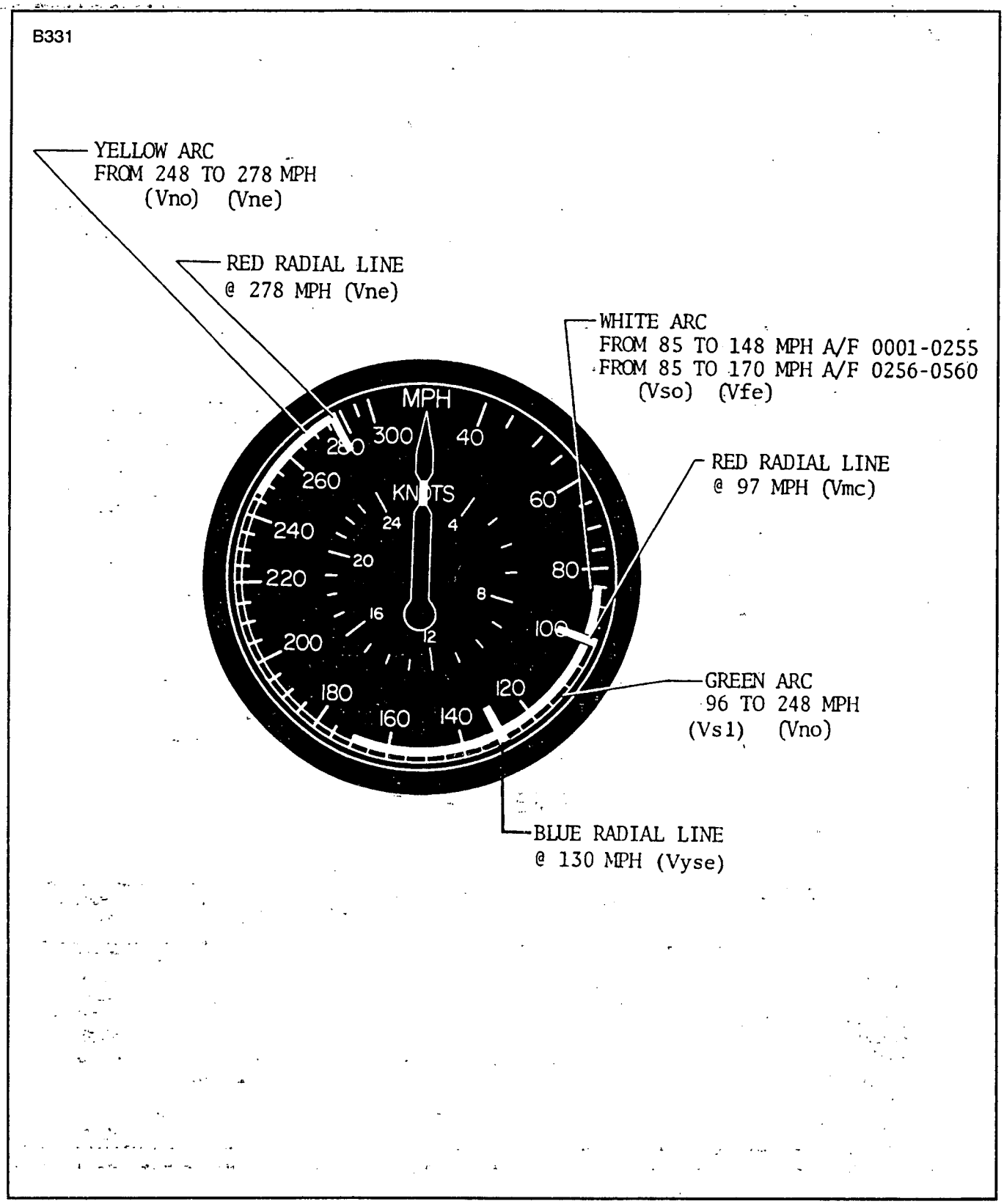


Figure 11-4. Airspeed Indicator - Model 600 Only (A/F 0001-0560)

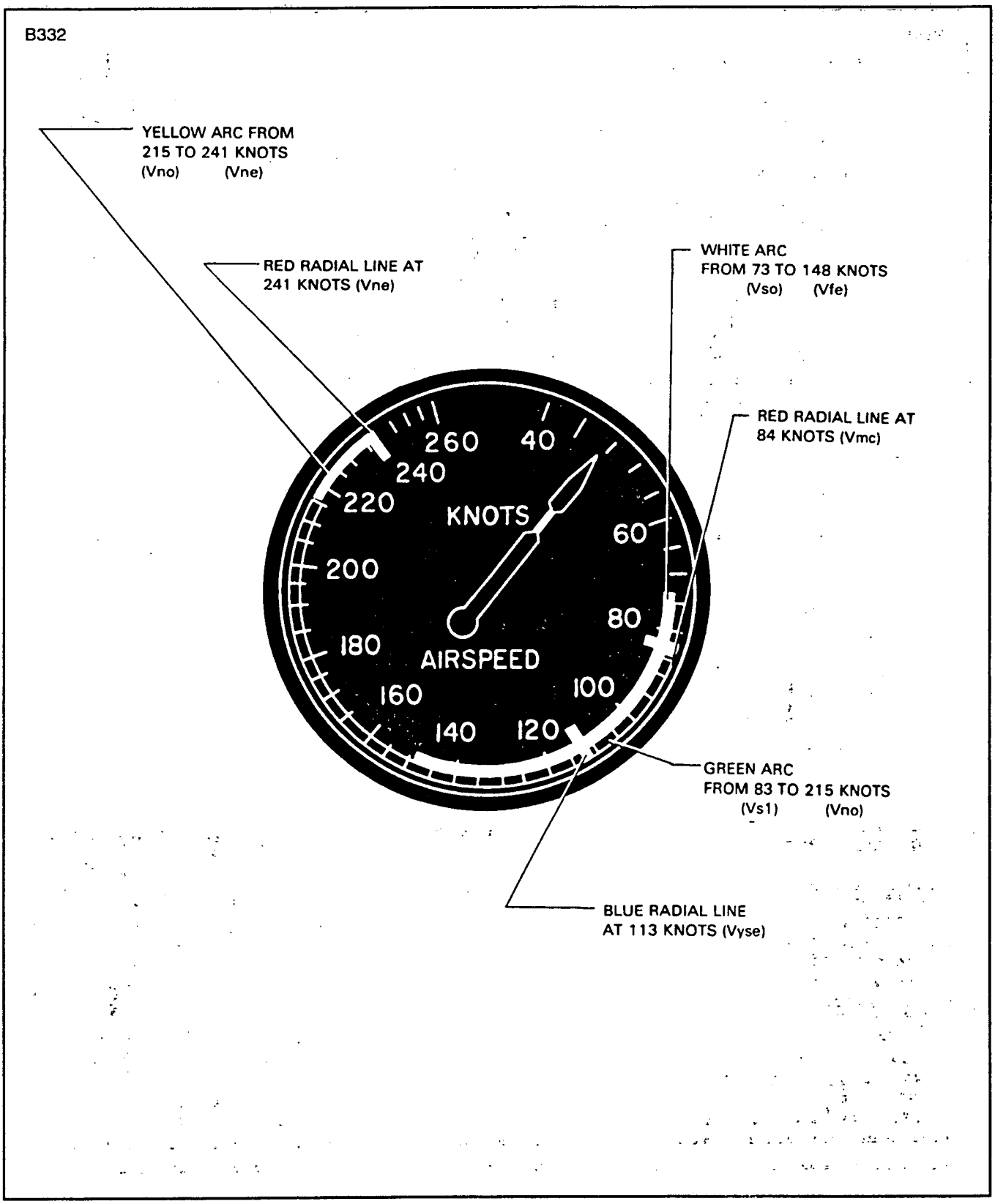
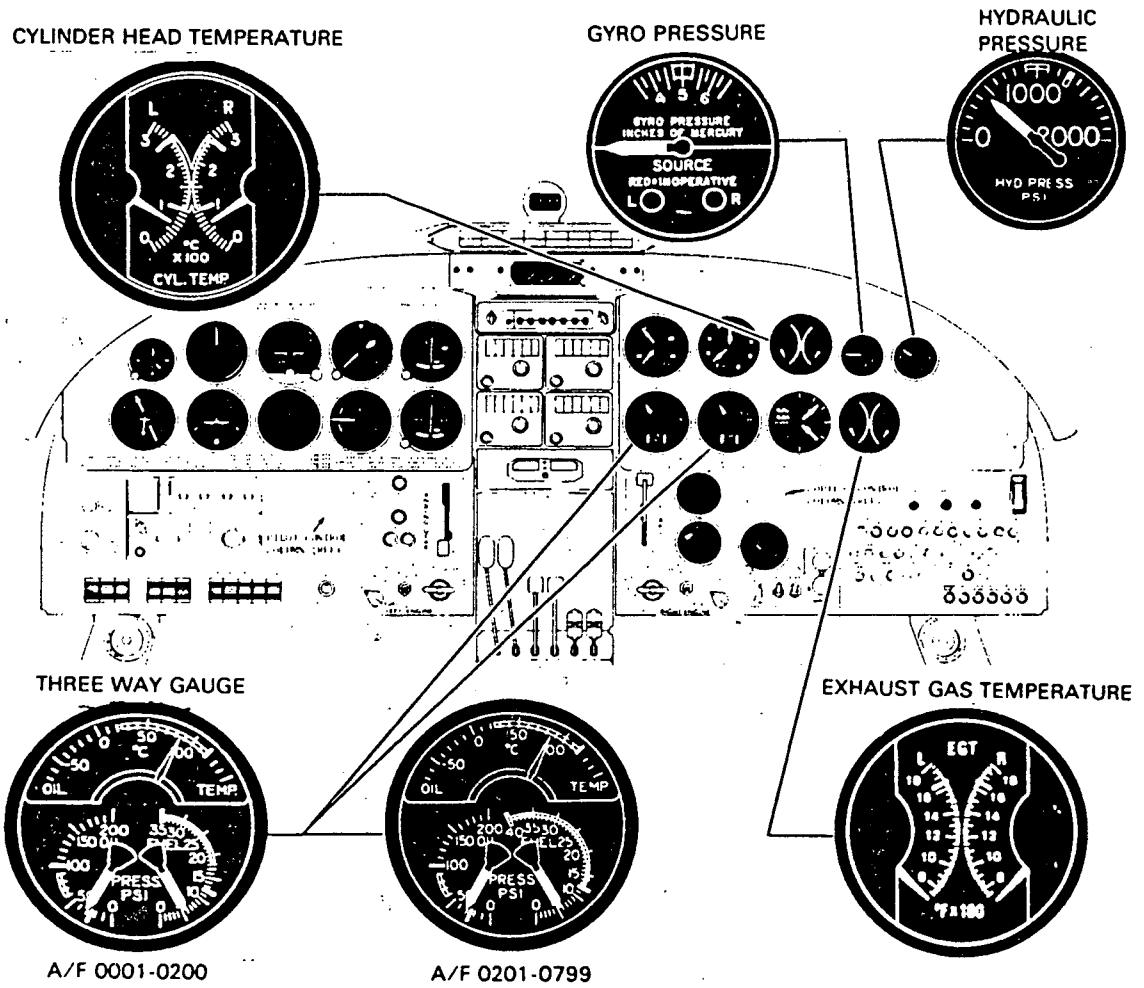


Figure 11-4. Airspeed Indicator (cont) - Model 600 Only (A/F 0561 and up)

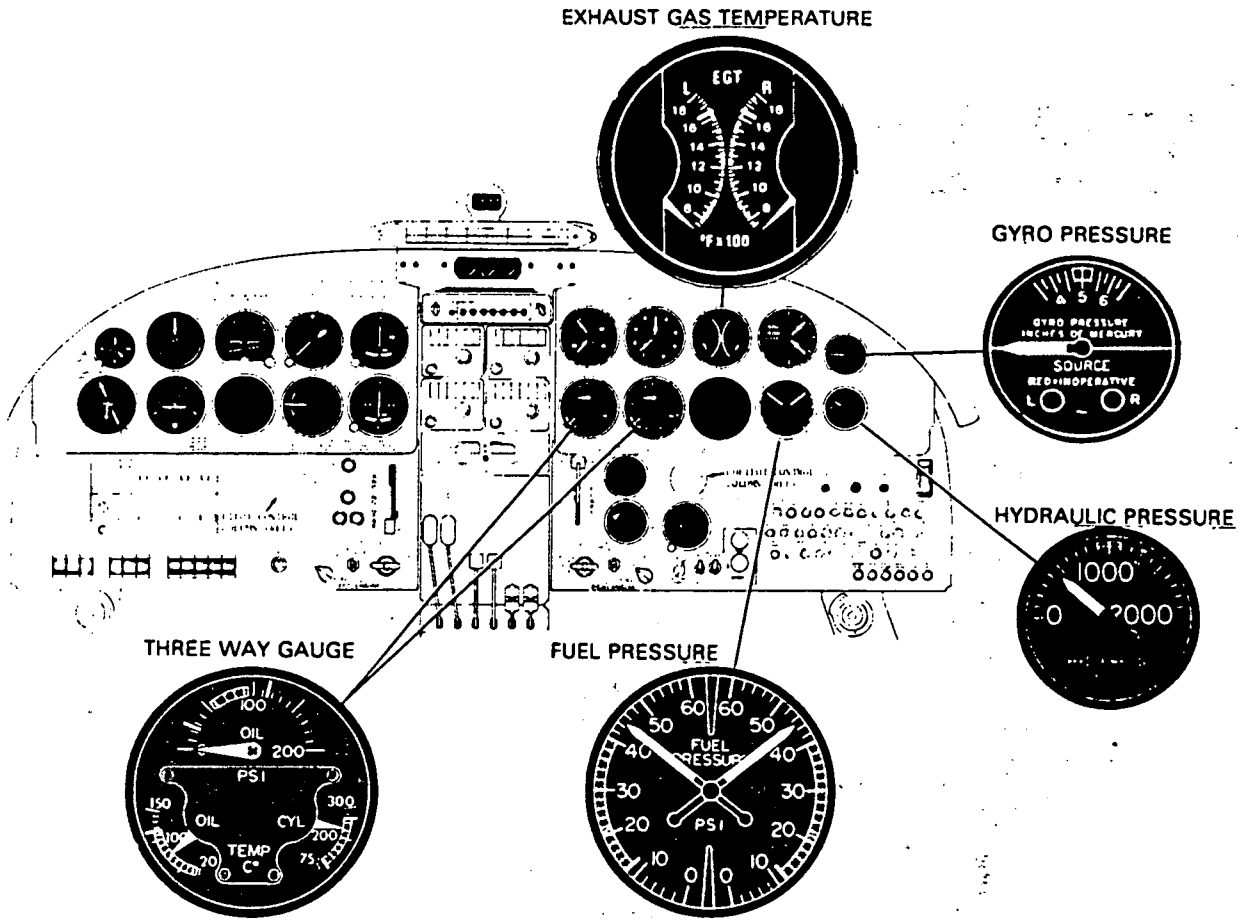
B333



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	YELLOW ARC CAUTION	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE	—	—	24-118°C	118°C
OIL PRESSURE	25 PSI (IDLE)	—	60-90 PSI	100 PSI
CYLINDER HEAD TEMPERATURE				
A/F 0001-0714	100°C	—	100-246°C	246°C
A/F 0715 AND UP	100°C	240-260°C	100-260°C	260°C
HYDRAULIC PRESSURE	—	—	900-1100PSI	1300 PSI
FUEL PRESSURE				
A/F 0001-0200	12 PSI (IDLE)		18-35 PSI	35 PSI
A/F 0201-0799	12 PSI (IDLE)	12-18 PSI	18-40 PSI	40 PSI
GYRO PRESSURE PNEUMATIC GYRO ONLY)	—	—	4.8-5.2 IN. HG.	—
EXHAUST GAS TEMPERATURE	—	—	—	1650°F

Figure 11-5. Power Plant Instruments - Model 601 Only A/F No. 0001 to 0799

C525



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	YELLOW ARC CAUTION	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE	—	—	24-118°C	118°C
OIL PRESSURE	25 PSI (IDLING)	—	55-95 PSI	115 PSI
CHT	100°C	—	100-260°C	260°C
HYDRAULIC PRESSURE	—	—	900-1100 PSI	1300 PSI
FUEL PRESSURE	12 PSI (IDLING)	12-18 PSI	18-40 PSI	40 PSI
GYRO PRESSURE	—	—	4.8-5.2 IN. HG.	—
FUEL QUANTITY (FUSELAGE TANK)	—	0-12 GAL	—	—
EGT	—	—	—	1650°F

Figure 11-5. Power Plant Instrument Model 601 (cont)
A/F 0800 and Subsequent

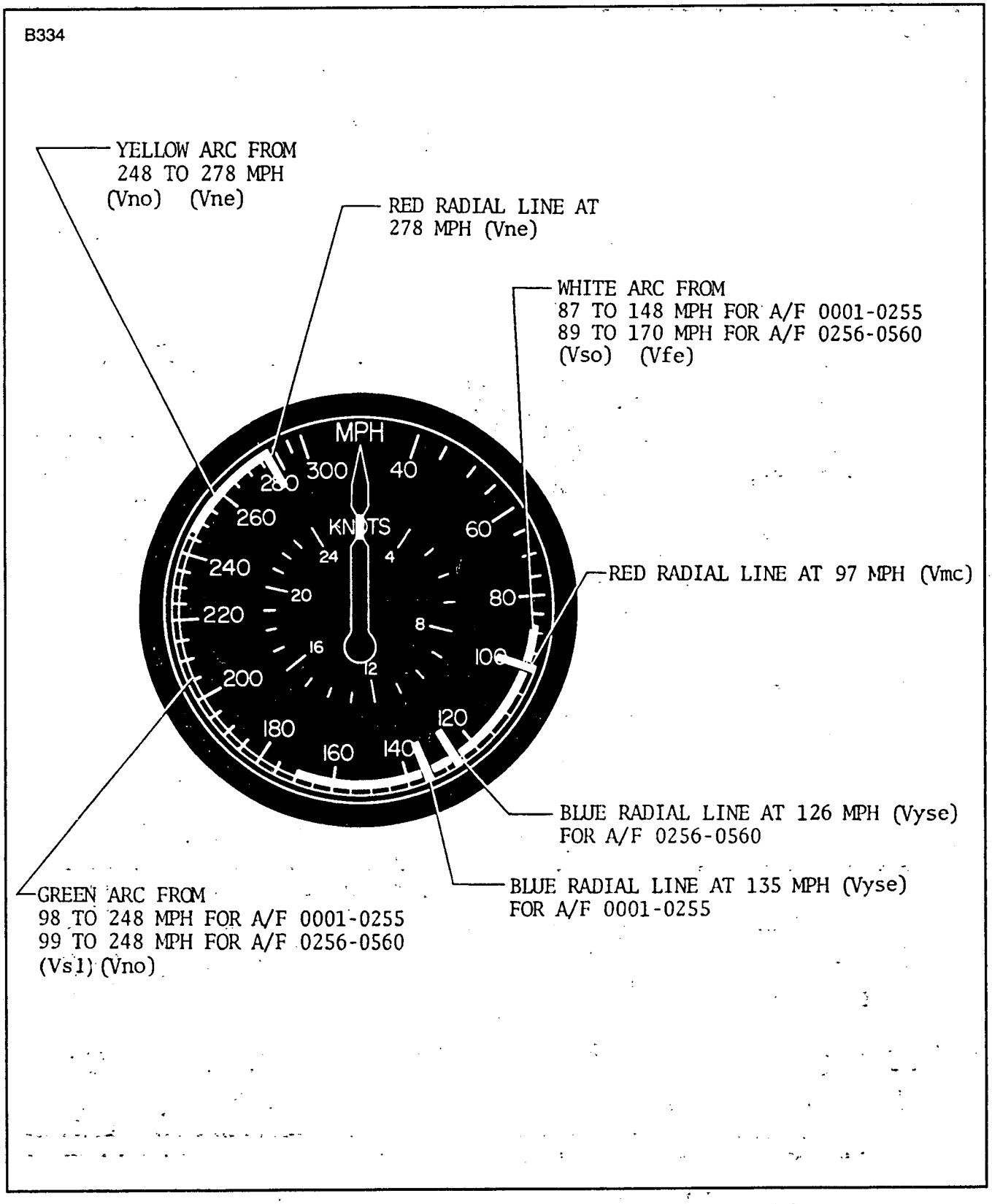


Figure 11-6. Airspeed Indicator - Model 601 Only (A/F 0001-0560)

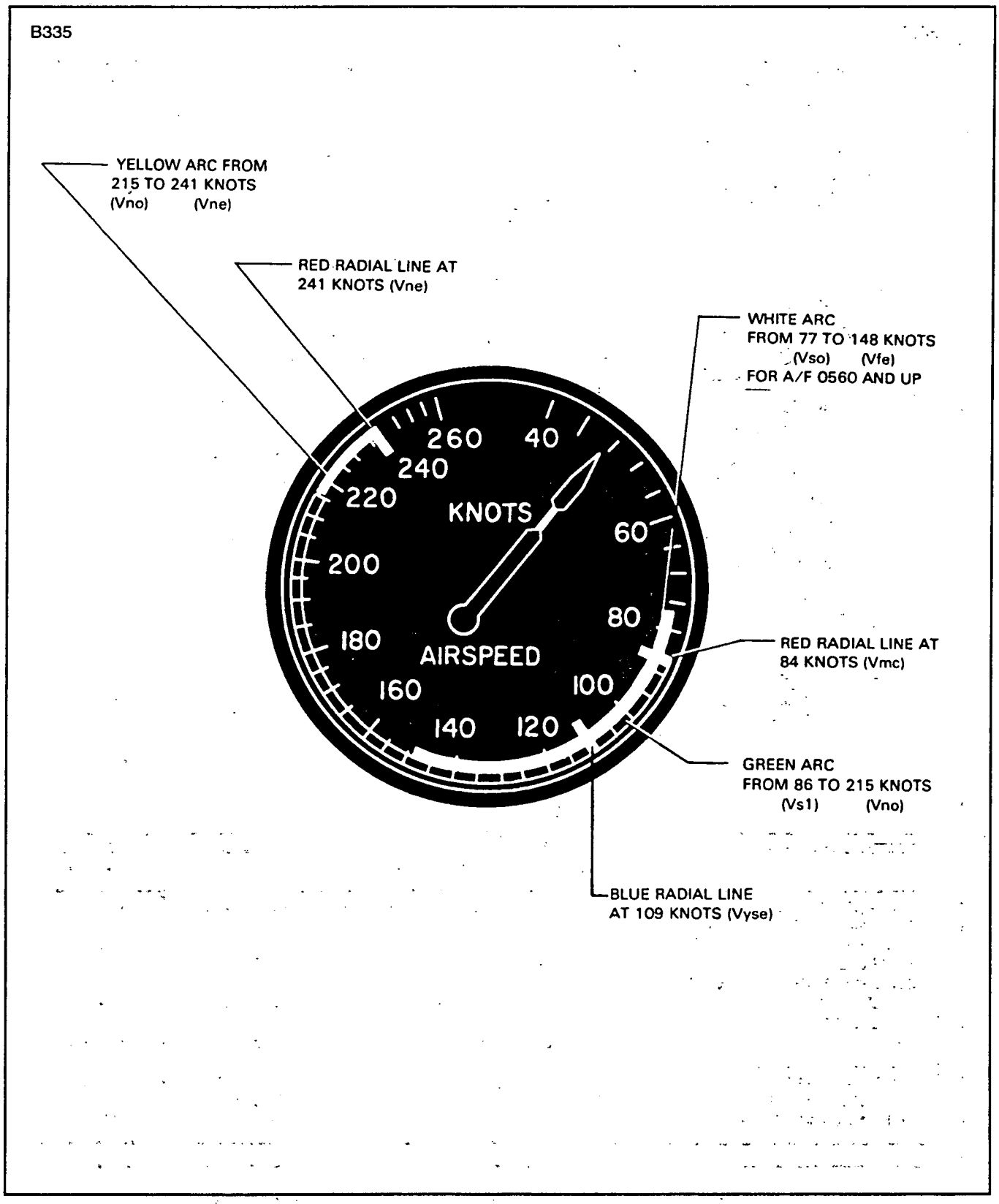
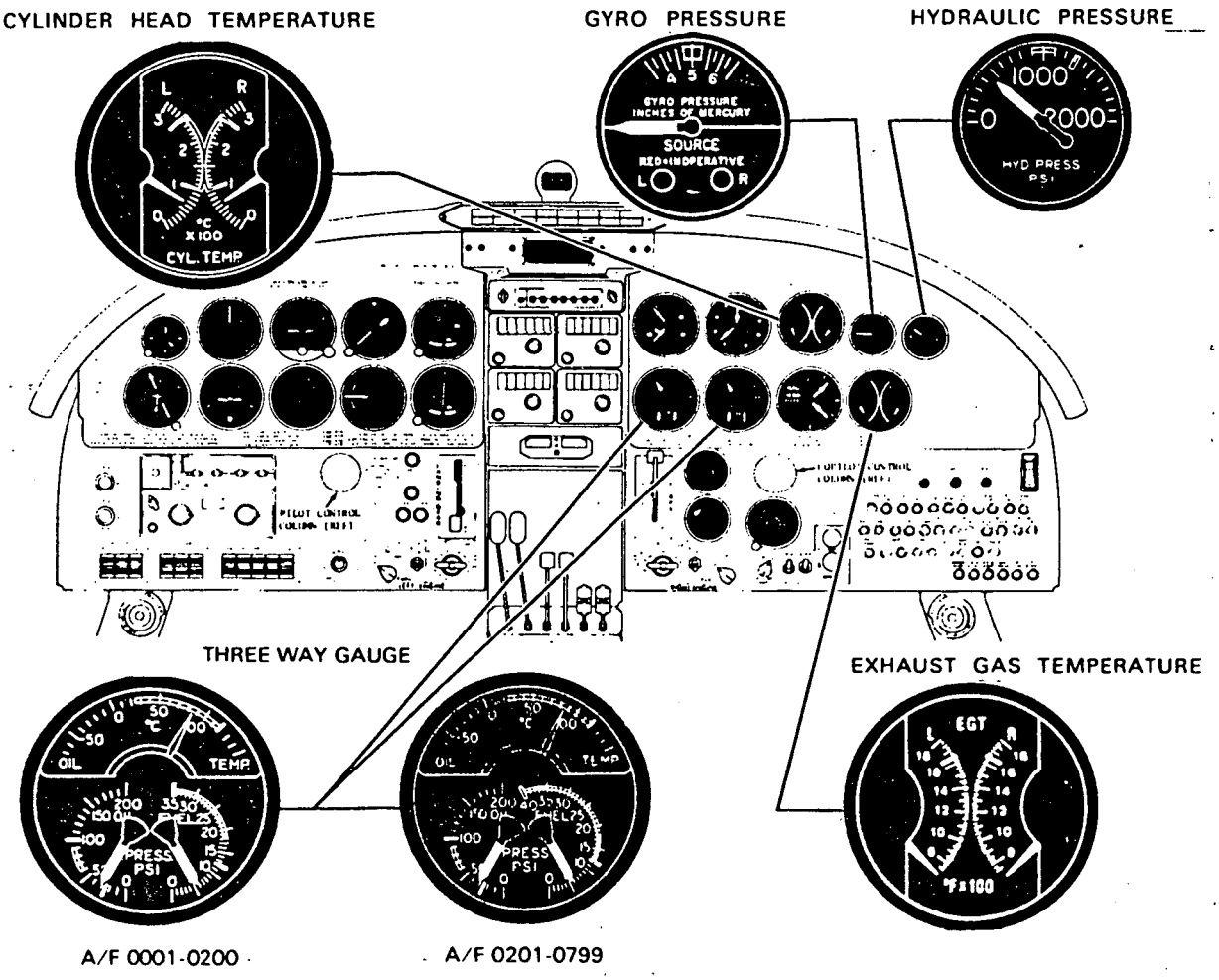


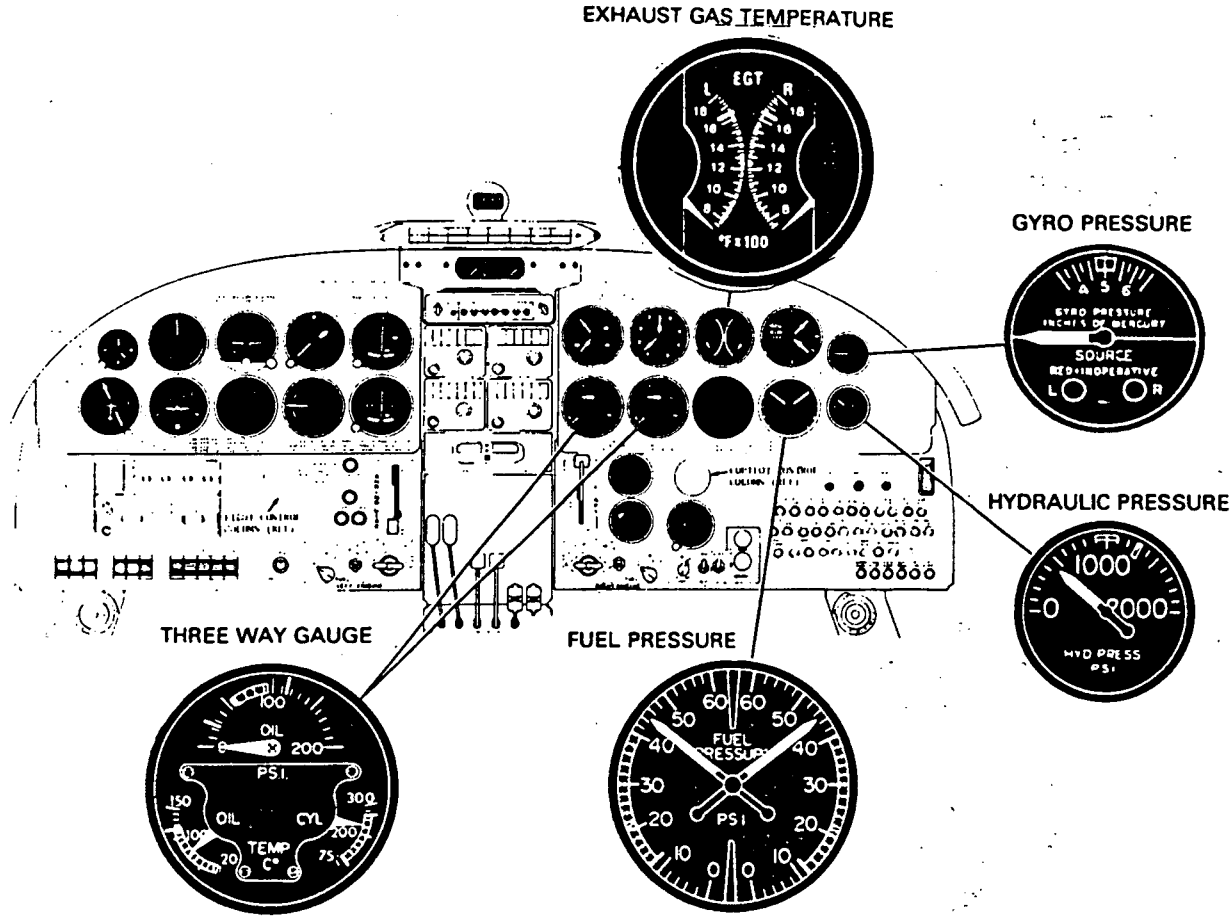
Figure 11-6. Airspeed Indicator (cont) - Model 601 Only (A/F 0561 and up)

B336



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	YELLOW ARC CAUTION	GREEN ARC NORMAL	RED LINE MAXIMUM
HYDRAULIC PRESSURE	—	—	900-1100 PSI	1300 PSI
FUEL PRESSURE				
A/F 0001-0200	12 PSI (IDLE)	—	18-35 PSI	35 PSI
A/F 0201-0799	12 PSI (IDLE)	12-18 PSI	18-40 PSI	40 PSI
GYRO PRESSURE (PNEUMATIC GYRO ONLY)	—	—	4.8-5.2 IN. HG.	—
OIL TEMPERATURE	—		24-118°C	118°C
OIL PRESSURE	25 PSI (IDLE)	—	60-90 PSI	100 PSI
CYLINDER HEAD TEMPERATURE				
A/F 0001-0714	100°C		100-246°C	246°C
A/F 0715 AND UP	100°C	246-260°C	100-260°C	260°C
EXHAUST GAS TEMPERATURE	—	—	—	1650°F

Figure 11-7. Power Plant Instruments - Model 601P Only
A/F No. 0001 to 0799



POWERPLANT INSTRUMENTS	RED LINE MINIMUM	YELLOW ARC CAUTION	GREEN ARC NORMAL	RED LINE MAXIMUM
OIL TEMPERATURE	25 PSI (IDLING)		24-118°C	118°C
OIL PRESSURE	100°C		55-95 PSI	115 PSI
CHT			100-260°C	260°C
HYDRAULIC PRESSURE			900-1100 PSI	1300 PSI
FUEL PRESSURE	12 PSI (IDLING)	12-18 PSI	18-40 PSI	40 PSI
GYRO PRESSURE			4.8-5.2 IN. HG.	
FUEL QUANTITY (FUSELAGE TANK)		0-12 GAL		
EGT				1650°F

Figure 11-7. Power Plant Instruments - Model 601P Only (cont)
A/F No. 0800 and Subsequent

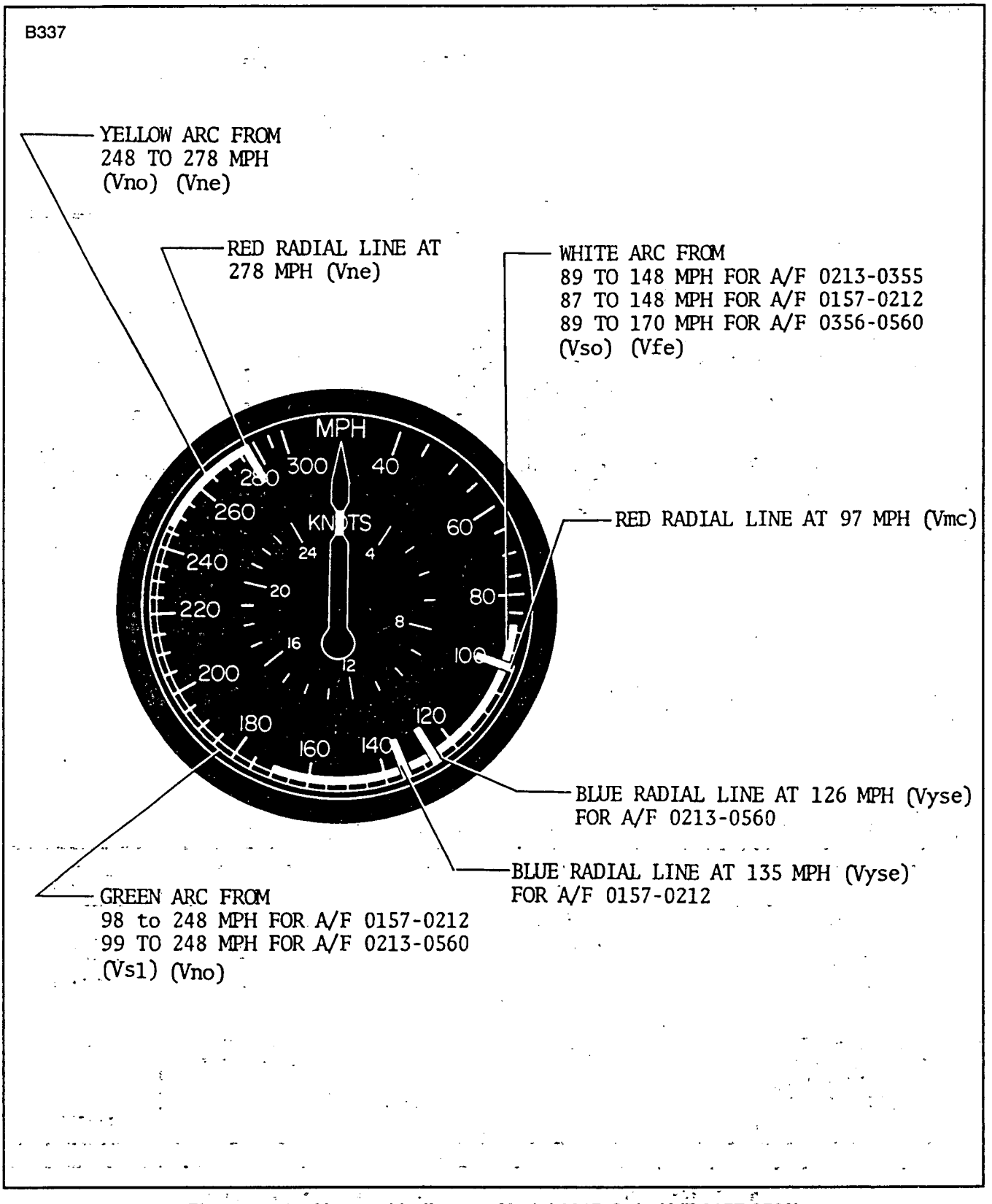


Figure 11-8. Airspeed Indicator - Model 601P Only (A/F 0157-0560)

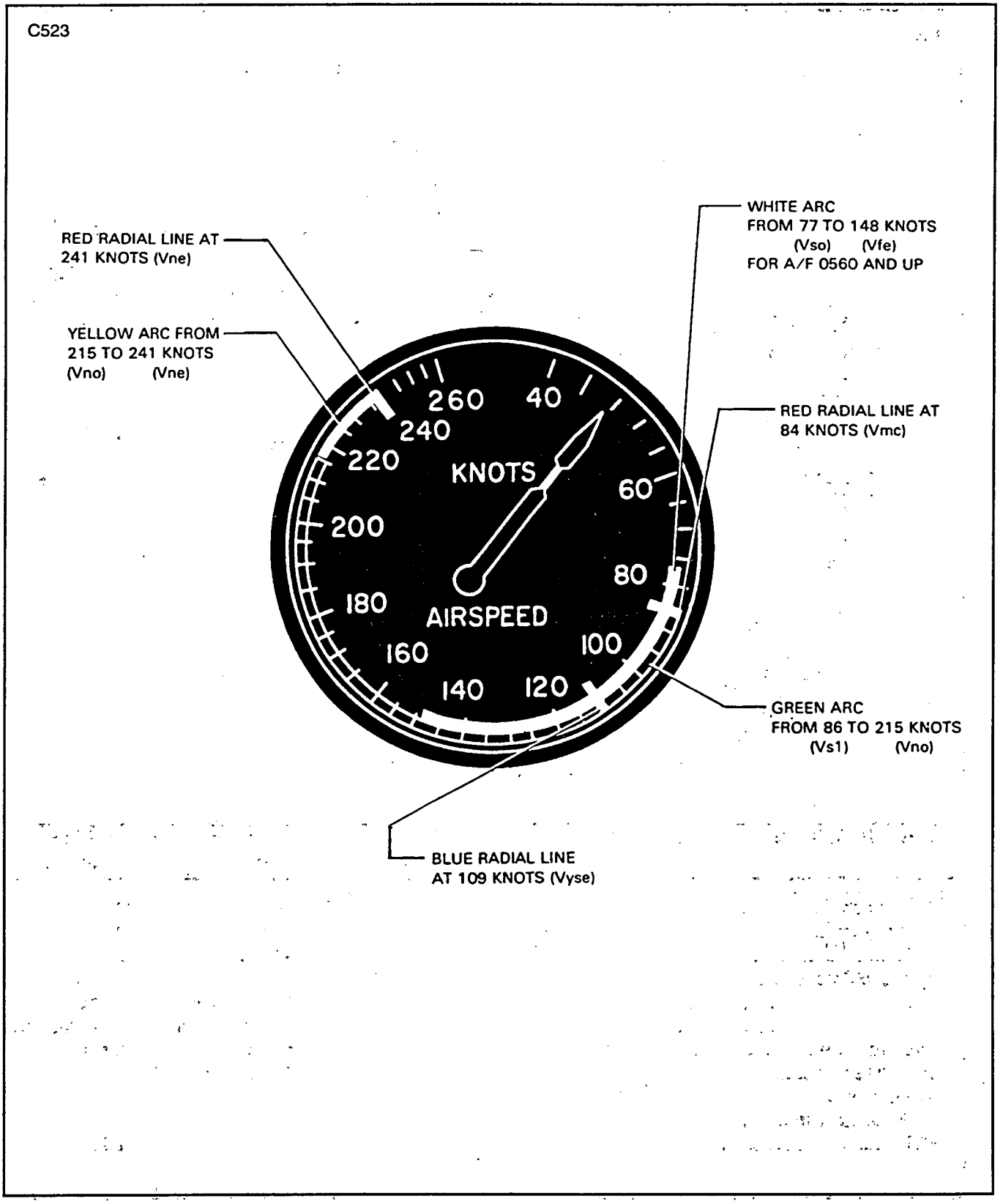
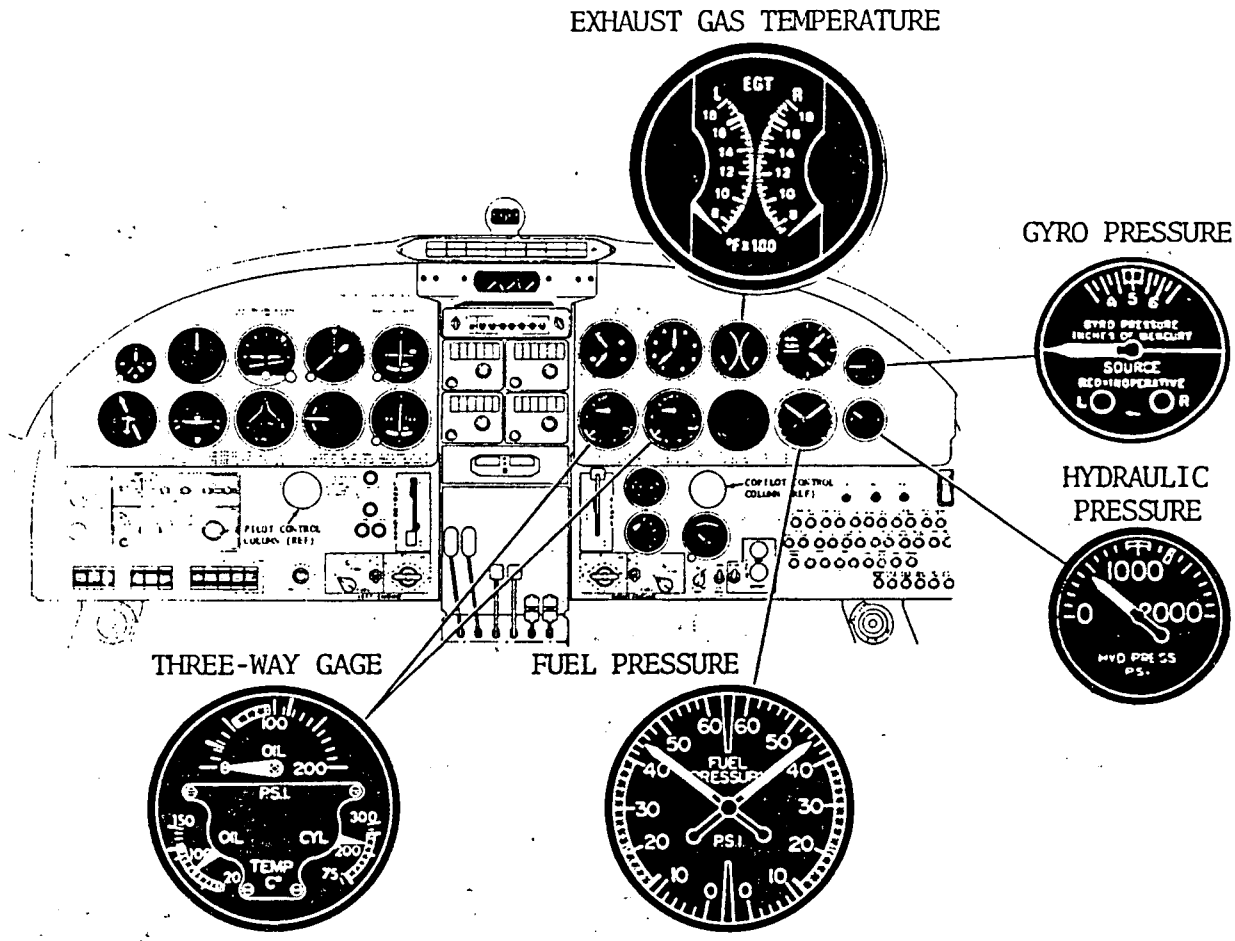


Figure 11-8. Airspeed Indicator (cont) Model 601P Only (A/F 0561 and up)

C522



POWER PLANT INSTRUMENTS	Red Line Minimum	Yellow Arc Caution	Green Arc Normal	Red Line Maximum
Oil Temperature			24-118°C	118°C
Oil Pressure	25 psi (Idling)		55-95 psi	115 psi
CHT	100°C		100-260°C	260°C
Hydraulic Pressure			900-1100 psi	1300 psi
			1100-1300 psi Later Models	1500 psi Later Models
Fuel Pressure	12 psi (Idling)	12-21 psi	21-40 psi	40 psi
Gyro Pressure			4.8-5.2 in-Hg	
Fuel Quantity (Fuselage Tank)		0-12 gal		
EGT				1650°F

Figure 11-9. Powerplant Instruments, 602P

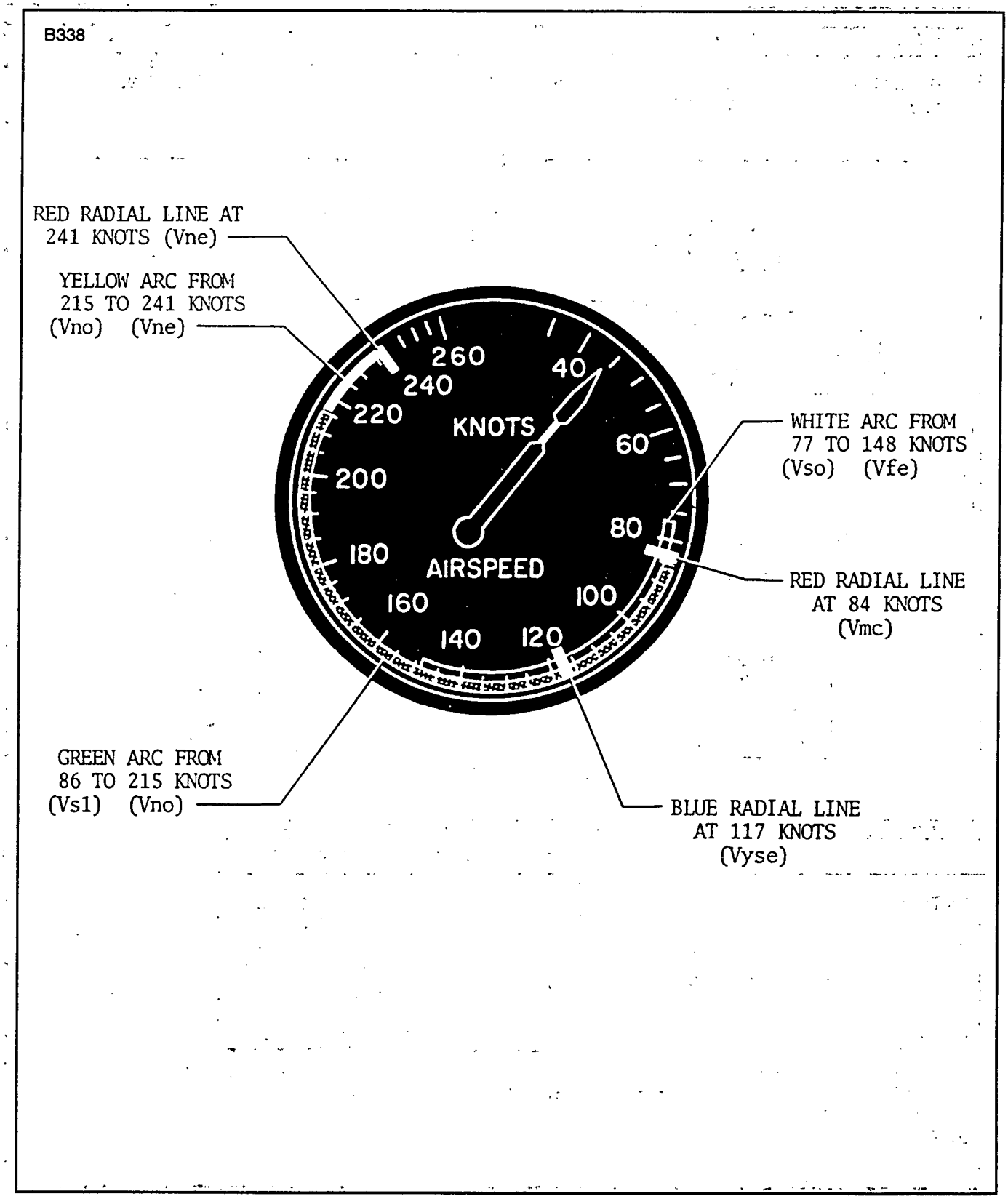


Figure 11-10. Airspeed Indicator - Model 602P/700P

MANIFOLD PRESSURE GAUGE			TACHOMETER		
MODEL	GREEN ARC	RED LINE	MODEL	GREEN ARC	RED LINE
601/601P	12-29.5 IN. Hg	29.5 IN. Hg	600/601/601P	2000-2575 RPM	2575 RPM
600	12-29.5 IN. Hg	—			

B339A

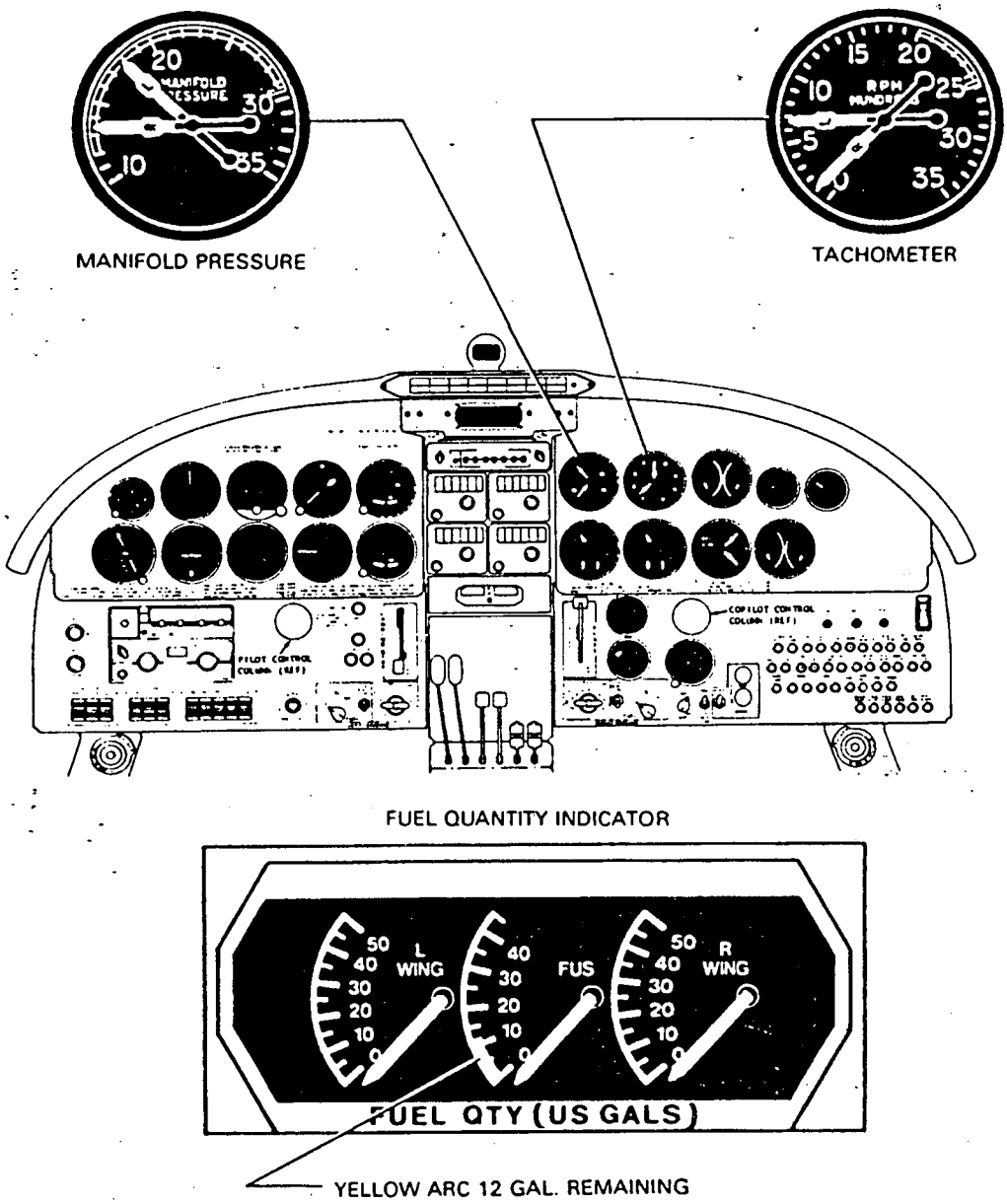


Figure 11-11. Manifold Pressure, Tachometer and Fuel Level Indicators, 600, 601, 601P

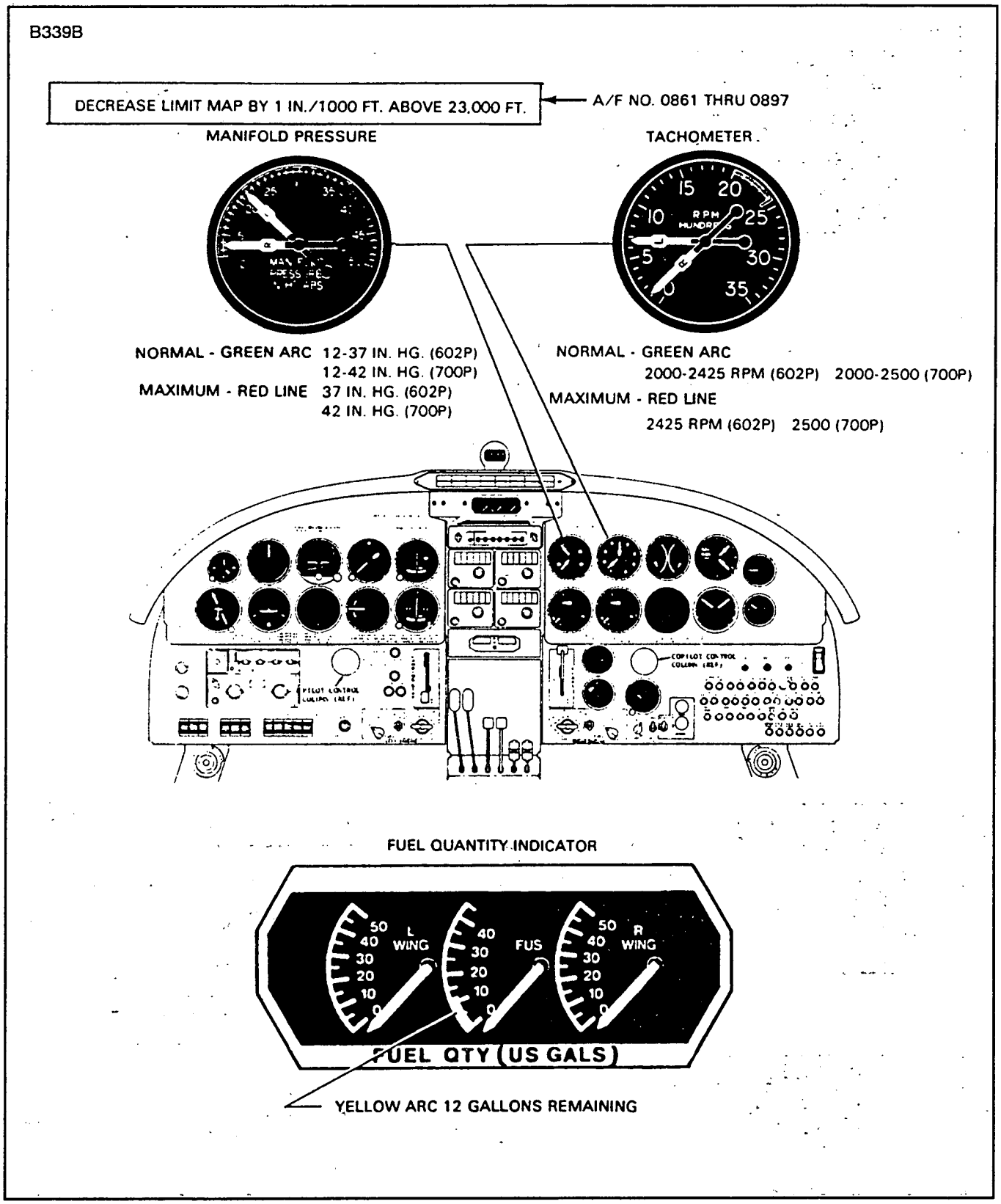


Figure 11-11. Manifold Pressure, Tachometer and Fuel Level Indicators - Model 602P/700P (cont)

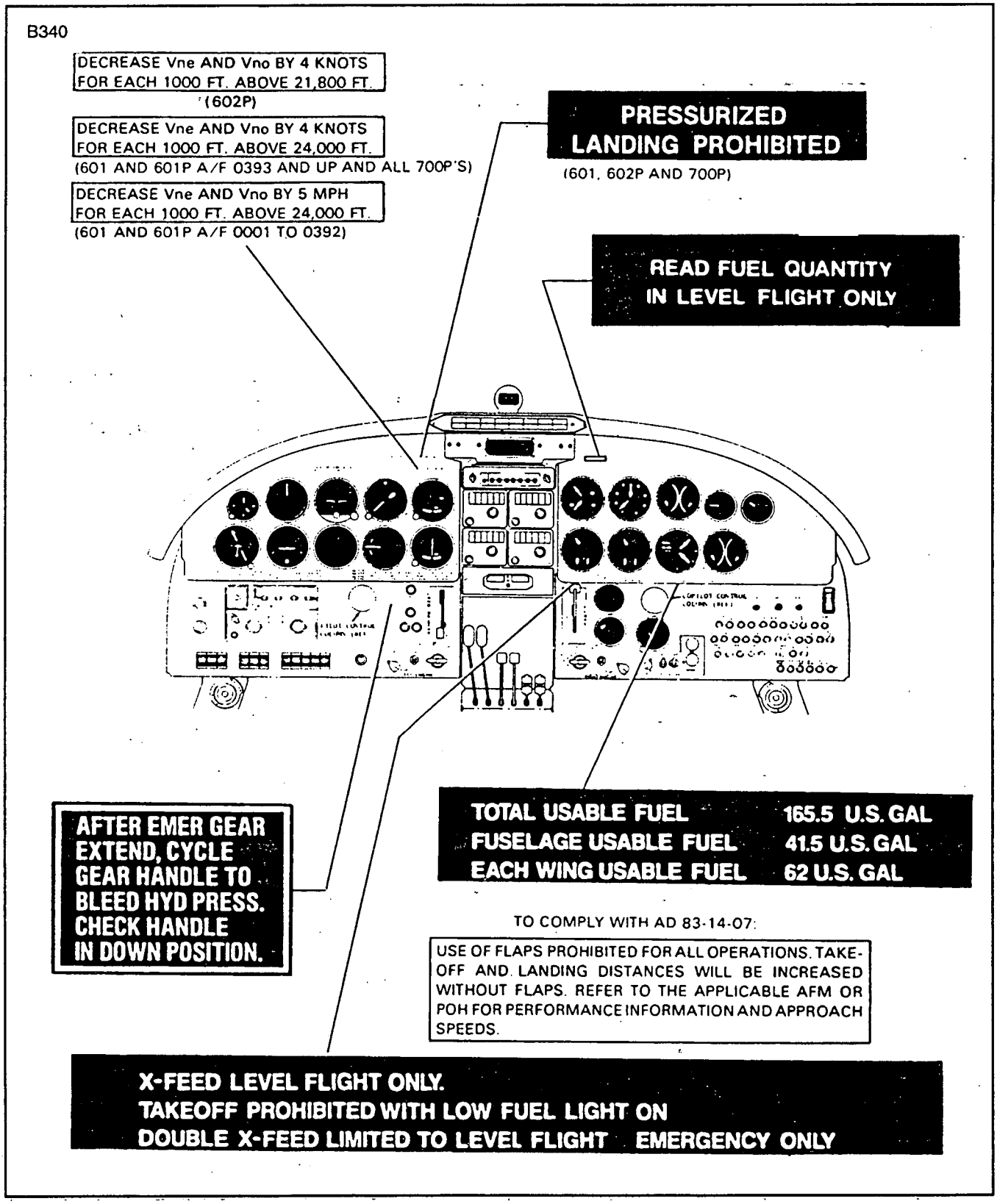


Figure 11-12. Identification and Location, Interior Placards

B341

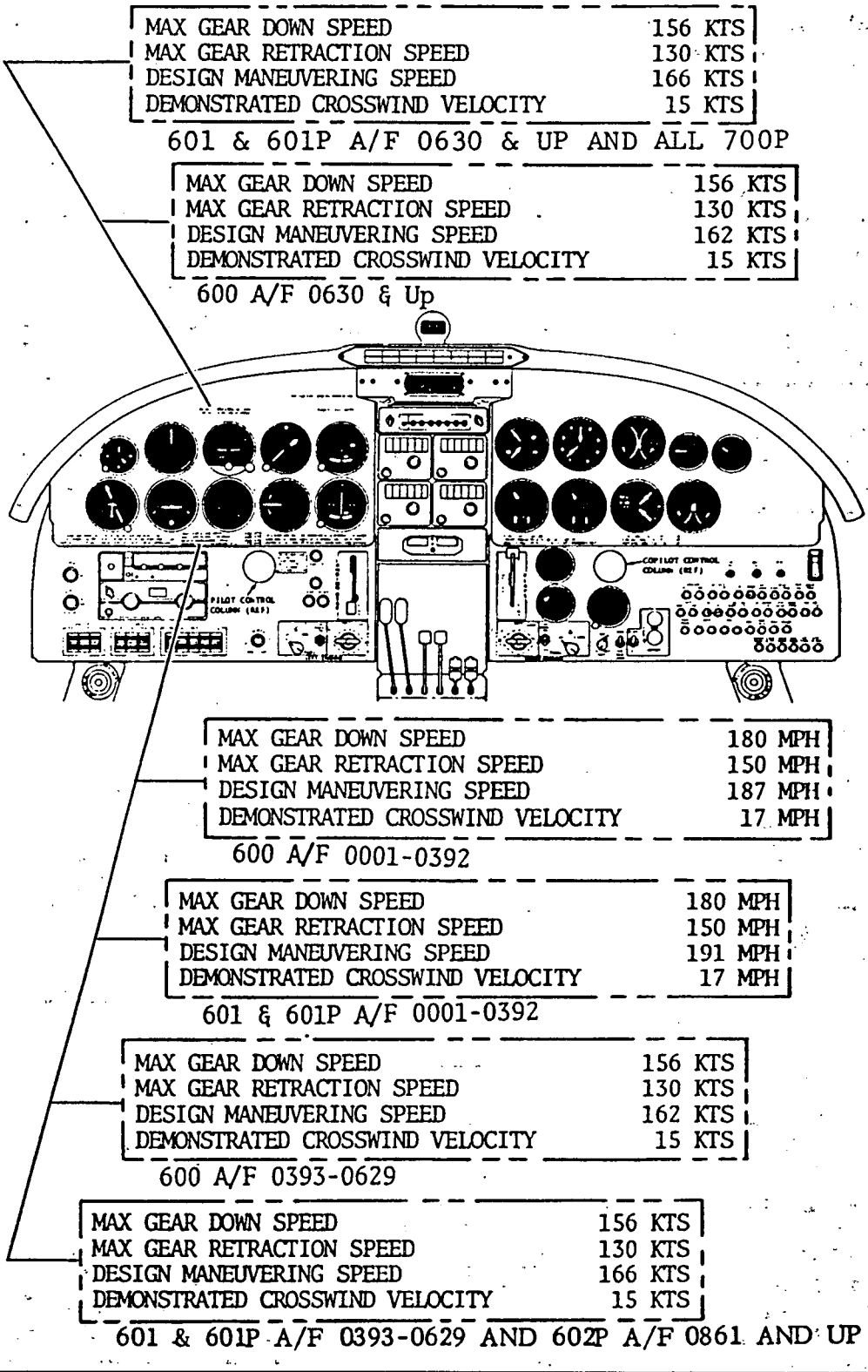


Figure 11-12. Identification and Location, Interior Placards (cont)

C521

One of the following placards is required if the airplane is equipped with electrical attitude and directional gyros.

NOTE

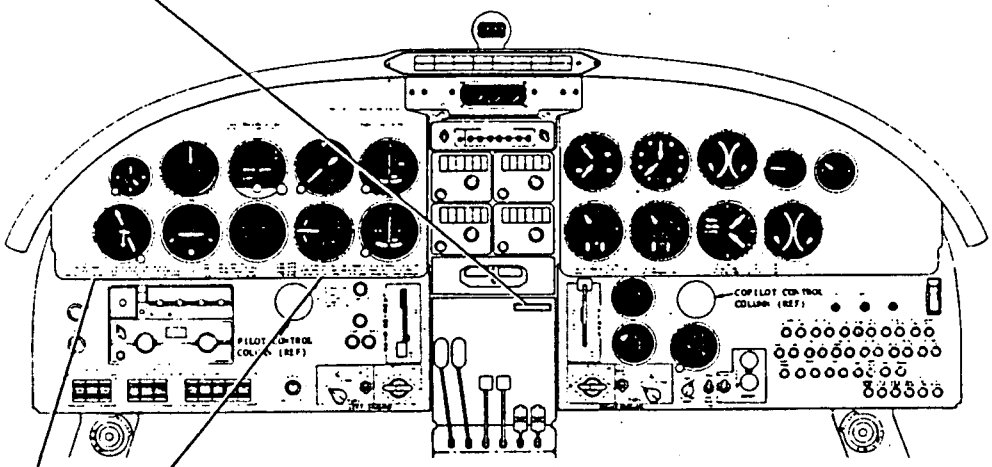
The electrical system load limitations and electrical load placard may be removed upon the installation of an alternate electrical warning system approved by the Chief, Aircraft Engineering Division, FAA Western Region.

(Airplanes equipped with 70 amp alternators).

DO NOT EXCEED 55 AMPS CONTINUOUS ELECTRICAL LOAD DURING IFR CONDITIONS.

(Airplanes equipped with 50 amp alternators).

DO NOT EXCEED 40 AMPS CONTINUOUS ELECTRICAL LOAD DURING IFR CONDITIONS.



THIS AIRPLANE MUST BE OPERATED AS A NORMAL CATEGORY AIRPLANE IN COMPLIANCE WITH OPERATING LIMITATIONS STATED IN THE FORM OF PLACARDS, MARKINGS AND MANUALS

THIS AIRPLANE APPROVED FOR DAY/NIGHT VFR/IFR NON-ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH THE AIRPLANE FLIGHT MANUAL. NO ACROBATIC MANEUVERS, INCLUDING SPINS APPROVED.

THIS AIRPLANE APPROVED FOR DAY/NIGHT VFR/IFR ICING FLIGHT WHEN EQUIPPED IN ACCORDANCE WITH THE AIRPLANE FLIGHT MANUAL. NO ACROBATIC MANEUVERS, INCLUDING SPINS, APPROVED. (PLACARD INSTALLED ON A/F EQUIPPED FOR KNOWN ICING FLIGHT)

Figure 11-12. Identification and Location, Interior Placards (cont)

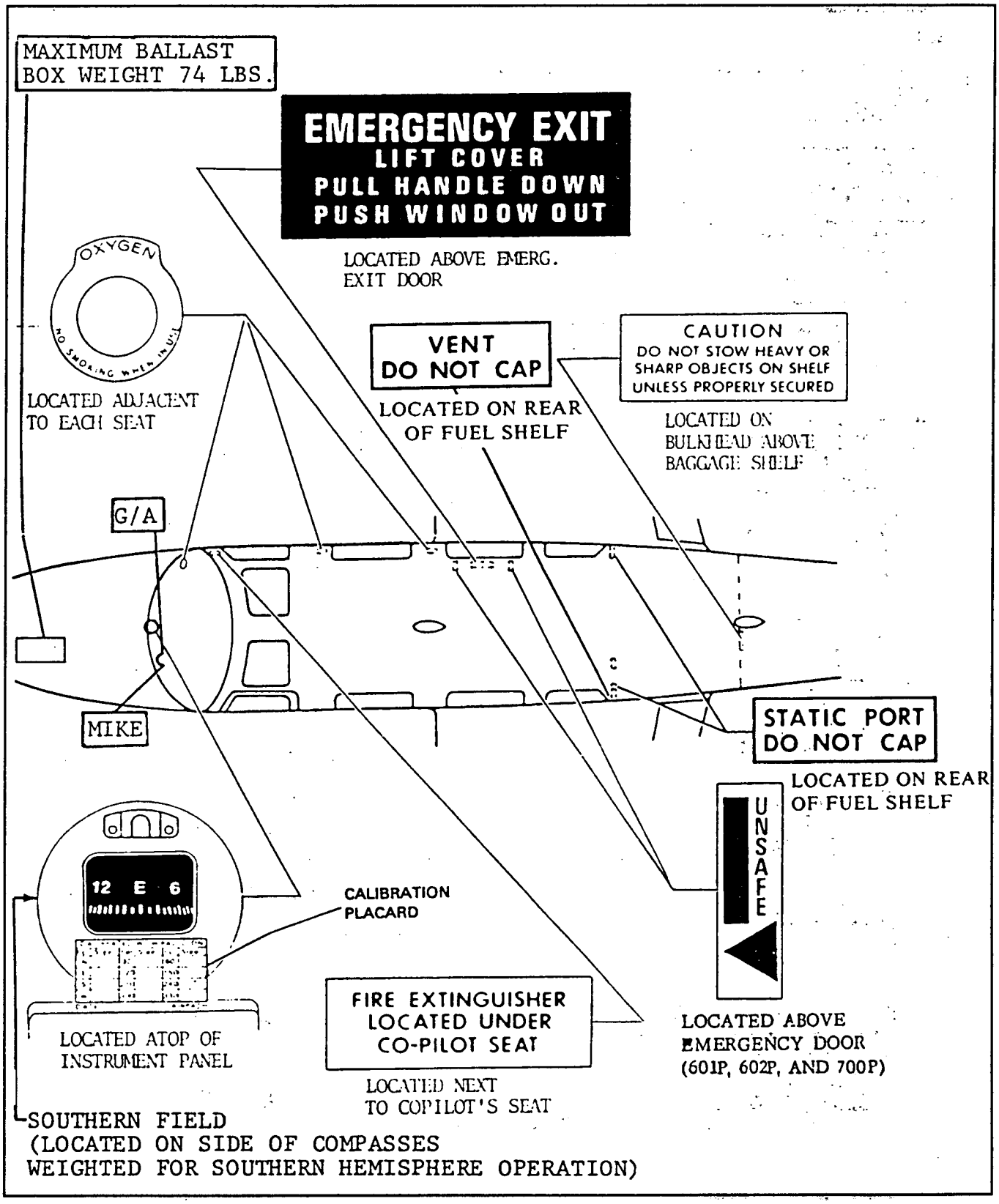


Figure 11-12. Identification and Location, Interior Placards (cont)

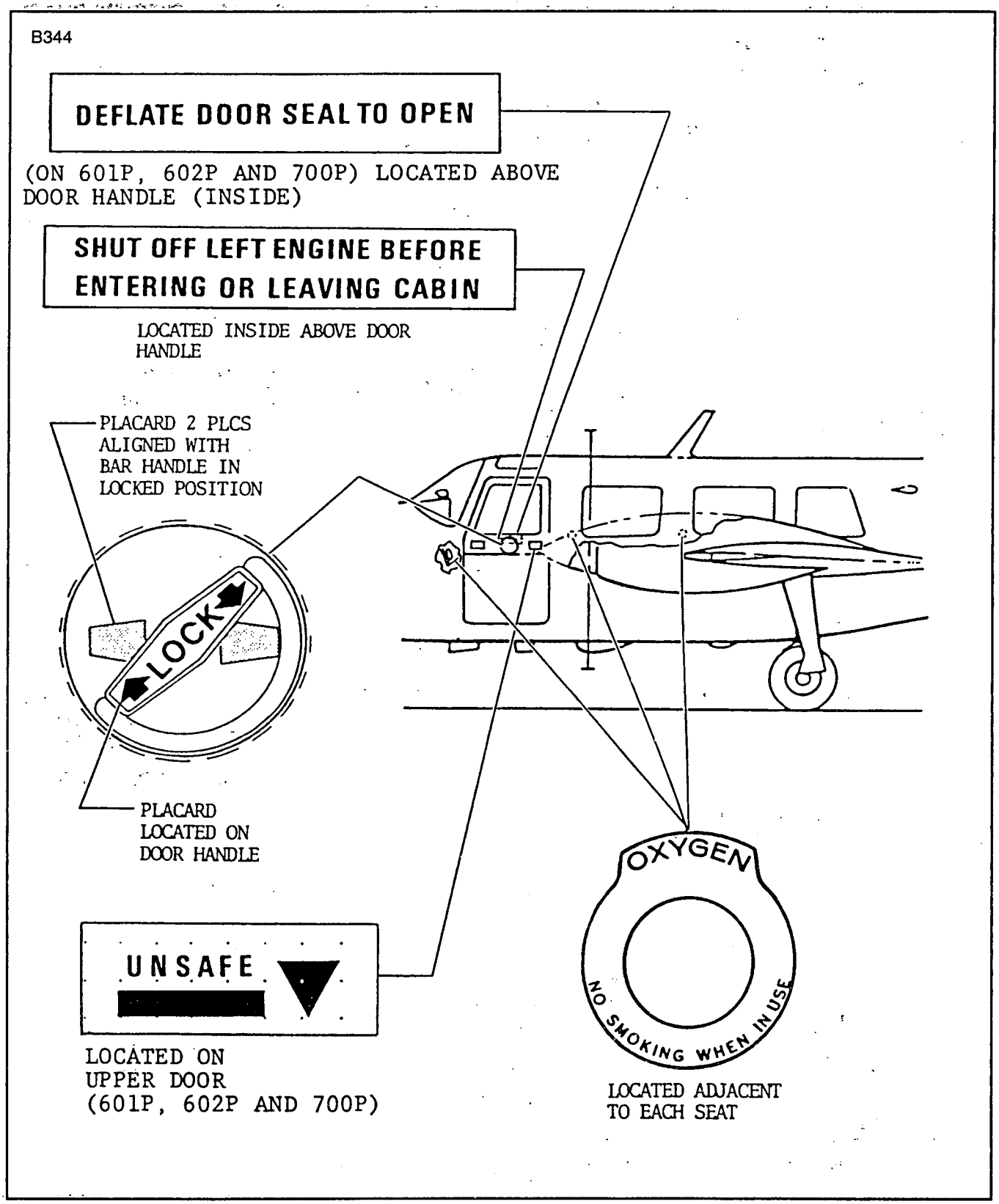


Figure 11-12. Identification and Location, Interior Placards (cont)

CHAPTER

12

SERVICING

1G11

CHAPTER 12 - SERVICING

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

This chapter consists of servicing procedures to enable easy location of service points to replenish or service equipment as required. Adherence to instructions, cautions, and warnings will avoid injury to personnel and damage to the airplane and associated equipment. Stepping or walking on the wing, tail, or fuselage surfaces should be avoided.

DESCRIPTION.

The operation and integrity of the airplane systems can be seriously impaired if unapproved or contaminated fuels, oils, fluids, lubricants, or materials are used. Mixing of various brands, kinds and qualities of materials should be avoided.

See Figure 12-1 for major service points and Figure 12-2 for the replenishment chart. For additional information refer to the applicable chapter.

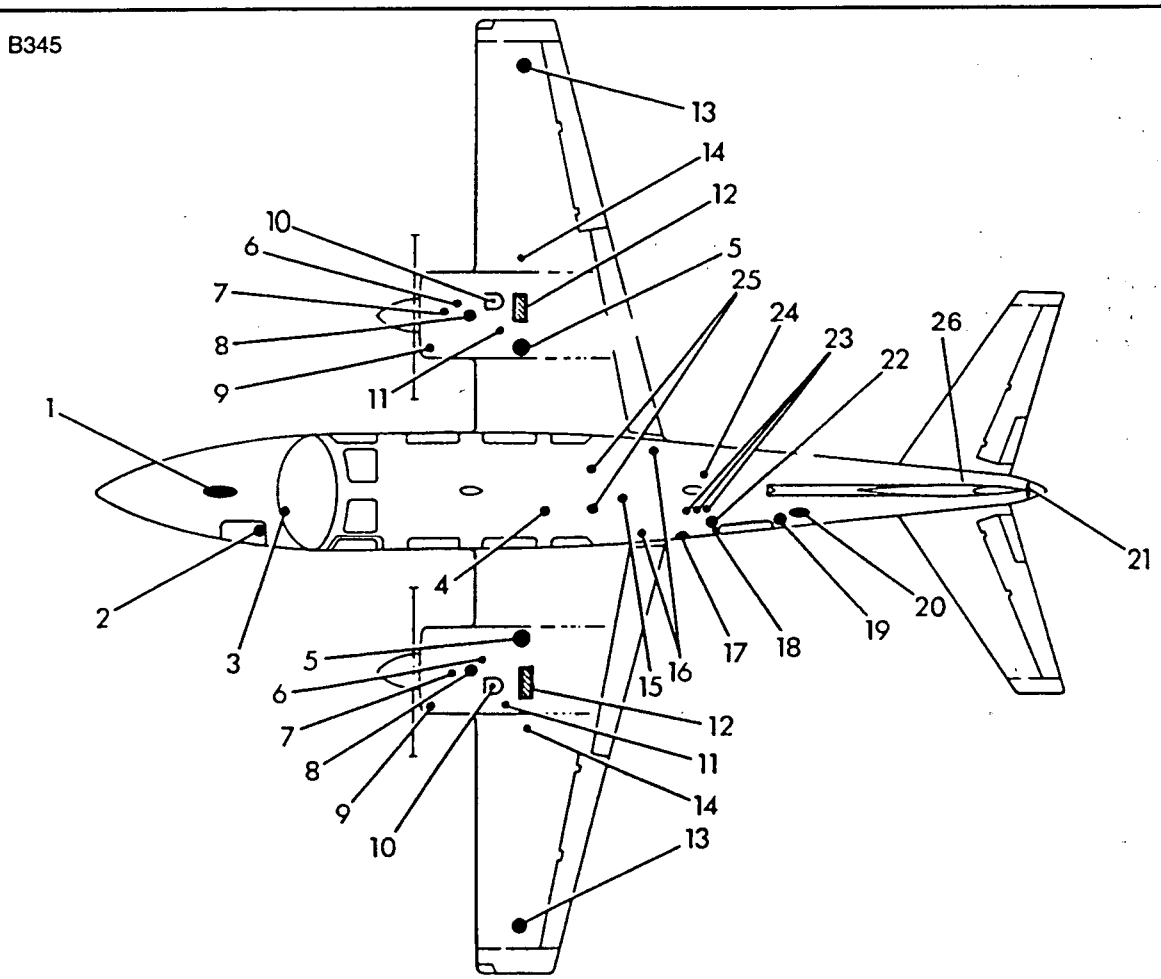
REPLENISHING.

Fill tanks/reservoirs immediately after flight unless the airplane will be stored in a hangar facility to prevent moisture condensation.

FUEL SYSTEM.

FUEL LOADING.

1. During periods of cold weather operations, "PRIST" may be used as a fuel additive to prevent ice and bacterial contamination. Since "PRIST" is only slightly soluble in gasoline, it cannot simply be dumped into the fuel tank. To assure complete dispersement in the fuel, it must be proportioned while the fuel is flowing.
   A. "PRIST" may be referred to as PFA-55MB, and is covered by specification MIL-I-27686. Be sure to follow manufacturer's instructions on the container, also refer to latest revision Lycoming Service Letter L172B.
2. For flights not requiring full tanks, fuel must first be added to the fuselage tank. Should the fuselage tank reach its capacity and additional fuel be desired, the remainder of the fuel is to be divided equally between the left and right wing tanks. If the fuel tanks are to be fueled to maximum capacity, the sequence in which they are filled is unimportant.
   A. The full amount of usable fuel is based on the airplane sitting on a level ramp, laterally level and longitudinally (approximately 1.5° nose up) with each wing tank fueled to 0.6 inches below the filler neck. The wing tanks are especially sensitive to attitude, and, if not level, they cannot be fueled to full capacity.



1. NOSE LANDING GEAR
2. BRAKE RESERVOIR
3. CIGARETTE FILTER ON CONTROLLER (601P, 602P, AND 700P)
4. PNEUMATIC INLINE FILTER
5. MAIN LANDING GEAR
6. PNEUMATIC INLET FILTER (FWD UPPER R/H SIDE OF ENGINE ON 700P'S)
7. FLOW DIVIDER SCREEN
8. ENGINE OIL FILTER
   ENGINE OIL DRAIN
   ENGINE OIL SCREENS
9. PROP GOVERNOR SCREEN
10. ENGINE OIL CHECK AND FILL
11. SERVO INLET SCREEN
12. INDUCTION FILTER
13. FUEL FILLER
14. WING TANK SCREEN
15. SCREEN IN FUSELAGE TANK SUMP
16. FUEL INLINE FILTERS
17. FUEL FILLER
18. OXYGEN FILL
19. HYDRAULIC SYSTEM RESERVOIR, FILTER AND ACCUMULATOR
20. AIR CONDITIONING
21. BATTERY
22. ALCOHOL DEICE RESERVOIR AND FILTER IN PUMP
23. FUEL SUMP DRAINS
24. HEATER FILTER (IN PUMP)
25. CIGARETTE FILTERS ON OUTFLOW AND SAFETY VALVES (601P, 602P AND 700P)
26. RUDDER BEARING TORQUE TUBE FELT WASHERS

Figure 12-1. Service Points

3. Fuel servicing.
   A. Use only those fuels specified in Figure 12-2.

— WARNING —

Due to possible electrostatic charges, the following restrictions shall be observed for fueling aircraft: Do not operate any electrical or avionics equipment; do not allow any smoking or open flame in the vicinity of the airplane; ensure the airplane is properly grounded during all fueling operations. Read precautions in Chapter 28.

(1) Ground airplane, fuel supply unit, and fuel nozzle to airplane.

— NOTE —

Observe caution when opening a fuel filler cap, especially in a warm environment, as the fuel could be under pressure. When servicing the wing tanks in hot weather, the fuel will expand if the airplane is parked in the sun for any appreciable time. Pressurization of the wing tanks can be prevented by filling only to within one inch from the bottom of the filler neck and leaving vent tab on the filler cap in the up position. If vent tab is left in the up position, install a red "Remove Before Flight" streamer. This is not necessary if take off will be soon after fuel loading.

(2) Remove appropriate fuel fill cap by lifting vent tab and turning counterclockwise.

— CAUTION —

Do not insert fueling nozzle into wing tanks more than three inches to prevent damage to bottom of wing.

(3) Fill fuel tanks to desired capacity.
(4) Install fuel caps and remove grounding wires.

RESERVOIR	U.S. GALLONS (X 1.000)	IMPERIAL GALLONS (X .83268)	METRIC LITERS (X 3.785)	NAME, NUMBER OR TYPE
FUEL				
Left Wing Tank	65.00	54.12	246.03	
Right Wing Tank	65.00	54.12	246.03	
Fuselage Tank	43.50	36.22	164.65	
Total Fuel Capacity	173.50	144.47	656.70	100/130 Octane Aviation Fuel or 100 Octane Low Lead (100LL) per MIL-G-5572 or ASTM D910 (Refer to latest revision of Lycoming Service Instruction 1070).
Left Wing Tank Usable	62.00	51.63	234.67	
Right Wing Tank Usable	62.00	51.63	234.67	
Fuselage Tank Usable	41.50	34.56	157.08	
Total Usable Fuel	165.50	137.81	626.42	
Sump Capacity —				
Left Wing Tank	0.25	0.21	0.95	
Right Wing Tank	0.25	0.21	0.95	
Fuselage Tank	0.50	0.42	1.90	
ALCOHOL	3.00	2.50	11.35	Isopropyl Alcohol (Anhydrous) Conforming to FED. SPEC. TT-I-735
HYDRAULIC				
Reservoir	1.75	1.46	6.62	MIL-H-5606 or Aeroshell Fluid 4 (Shell Oil Co.)
System	0.25	0.21	0.95	
Total Hydraulic Fluid	2.00	1.66	7.57	
OIL (ENGINE)				
Per Engine	3.00	2.50	11.35	See Oil Selection Chart Figure 12-4
Both Engines	6.00	5.00	22.71	

Figure 12-2. Reservoir Capacities and Usable Weights

USABLE WEIGHTS	LBS. (X 1.00)	CWT. (X .893)	KG. (X .4536)
OXYGEN			
11 Cu. Ft. Cyl. @ 1800 PSI	6.16	5.50	2.79
115 Cu. Ft. Cyl. @ 1850 PSI	42.55	37.10	19.30
FUEL			
Left Wing Tank	390	348.27	176.90
Right Wing Tank	390	348.27	176.90
Fuselage Tank	261	233.07	118.39
Total Fuel Weight	1041	929.61	472.20
Usable Fuel Weight			
Left Wing Tank	372	332.20	168.74
Right Wing Tank	372	332.20	168.74
Fuselage Tank	249	222.36	112.95
Total Usable Fuel Weight	993	886.75	450.42
ALCOHOL	19.74	17.63	8.95
HYDRAULIC FLUID	14	12.50	6.35
ENGINE OIL	45	40.19	20.41

Figure 12-2. Reservoir Capacities and Usable Weights (cont)

DEFUELING.

1. Defueling can be a hazardous operation if proper safety precautions are not followed. To provide for maximum safety during this operation, the following precautions should be observed.
   - A. Fuel system maintenance must be accomplished in a clean area that is well ventilated.
   - B. The airplane, all stands, and fuel handling equipment must be electrically grounded.
   - C. Hoses, nozzles, and containers used in the transfer of fuel must be clean of all foreign matter.
   - D. Auxiliary power should be used for all defueling operations.
   - E. Disconnect batteries and auxiliary power when not required.
   - F. Use pneumatic power tools only and vapor proof flash lights or vapor proof electric lamps.
   - G. Wear cotton clothing to prevent static charge buildup.

— NOTE —

Aircraft must be in a level attitude on the ramp - with the wings laterally level - when defueling system.

2. Defueling one wing tank and fuselage tank.
   - A Before any maintenance is performed on the fuel system, personnel should read and thoroughly understand the precautions in Chapter 28.
     - (1) Connect ground wire to airplane, truck, stands, storage tanks, etc.
     - (2) Check all switches "OFF". Place electrical power "ON" allowing time for electrically operated valves to operate, then "OFF". (This ensures the matching of valve positions with switch positions.) Disconnect external power supply if connected.
     - (3) Remove lower engine cowling on same side as wing tank to be defueled.
     - (4) Disconnect main fuel supply hose at firewall (Figure 12-3). Cap disconnected fuel hose.
     - (5) Connect defueling hose at firewall, lead into fuel storage tank with a capacity to hold as much as 110 gallons.

— CAUTION —

Ensure all switches and equipment are turned OFF and all autopilot circuit breakers are pulled prior to connecting an external power unit. The master battery and alternator switches must be left in the OFF position until the external power unit is disconnected to protect the voltage regulators and system electrical equipment from voltage transients and possible damage.

— NOTE —

It is recommended an external power unit be used for all defueling operations to prevent discharge of airplane batteries.

     - (6) Connect external power unit.
     - (7) On side to be defueled, place fuel selector switch to ON. Turn boost pump ON. Wing and fuselage fuel tanks will defuel. The time for this operation is approximately one to two hours with full tanks. X-FEED (Crossfeed) may be selected on the other side to speed up defueling as explained in "Defueling one wing tank only", Steps (3) through (9).

— CAUTION —

Running boost pumps dry can cause severe damage to pump.

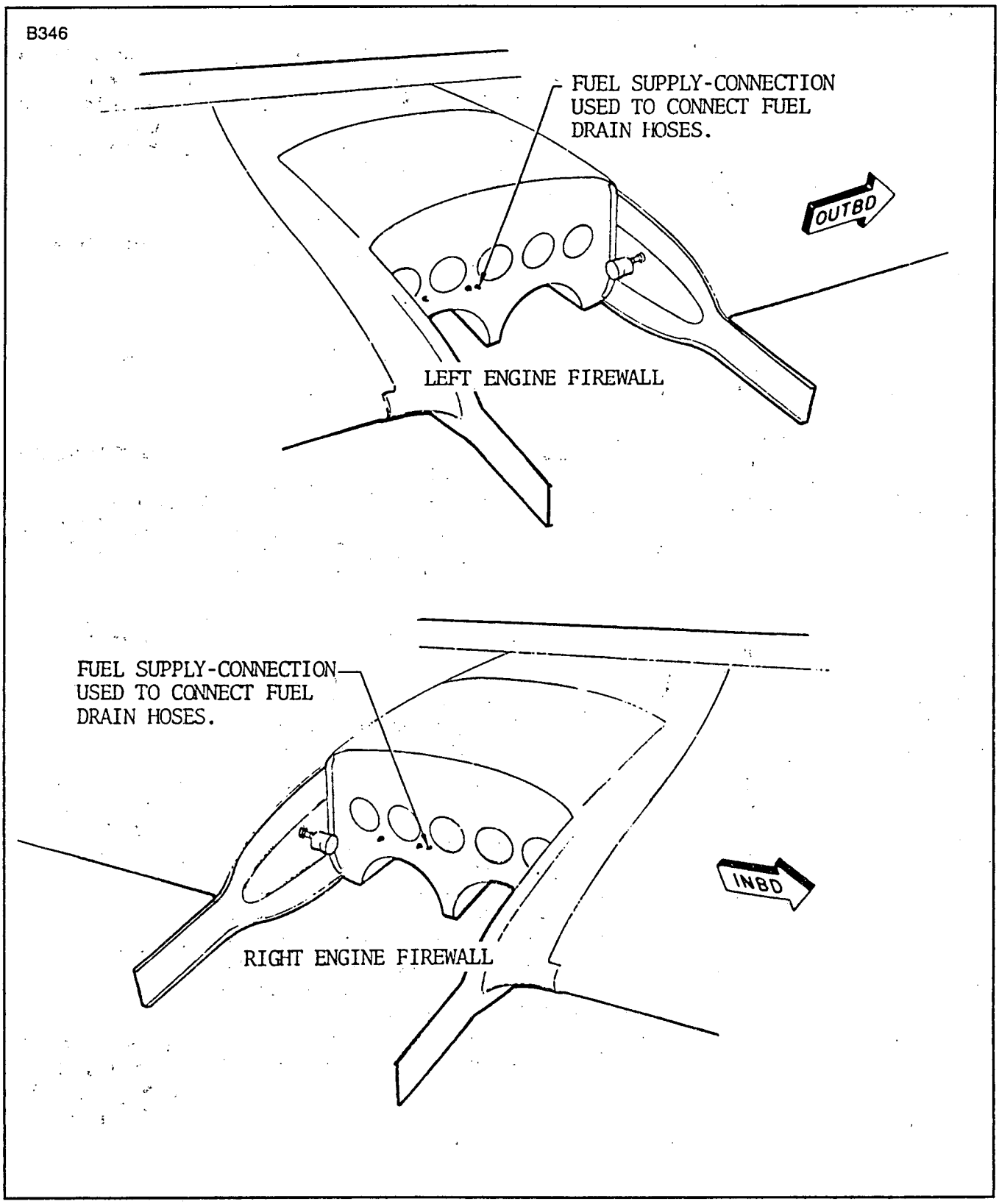


Figure 12-3. Fuel Drain Hose Connections

(8) Monitor fuel quantity indicator. Do not operate fuel boost pump after fuel flow stops. Turn boost pump OFF as soon as fuel flow stops.

(9) Turn fuel selector switch OFF and electrical power OFF or disconnect external power source.

(10) Drain fuselage and wing tank sump.

— WARNING —

Do not operate the fuel selector switches or the boost pumps while the fuel system is partially dismantled. Fuel spillage and possible fire or explosion could result.

(11) Remove defueling hose, connect fuel hose at firewall, and install lower engine cowling.

2. Defueling one wing tank only.

A. Before any maintenance is performed on the fuel system, personnel should read and thoroughly understand the precautions in Chapter 28.

(1) Check all switches OFF. Place electrical power ON, allow time for electrical valves to operate then OFF. (This ensures the matching of valve positions with switch positions.)

(2) Connect ground wire to airplane, truck, stands, storage tanks, etc.

(3) Remove lower engine cowling opposite wing to be defueled.

(4) Disconnect main fuel supply hose at firewall (Figure 12-3). Cap disconnected fuel hose.

(5) Connect defueling hose at firewall and lead into fuel storage tank with capacity to hold 65 gallons.

—CAUTION —

Make sure all switches and equipment are turned OFF and all autopilot circuit breakers are pulled prior to connecting an external power unit. The master battery and alternator switches must be left in the OFF position until the external power unit is disconnected to protect the voltage regulator and system electrical equipment from voltage transients and possible damage.

(6) Connect external power unit.

(7) On side opposite wing to be defueled place fuel selector switch to X-FEED. Turn boost pump ON. The time for this operation is approximately forty-five minutes to one hour with a full tank.

—CAUTION —

Running boost pumps dry can cause severe damage to pump.

(8) Monitor fuel quantity indicator and turn boost pump OFF as soon as fuel flow stops.

(9) Turn fuel selector switch OFF and disconnect external power.

(10) Remove defueling hose and connect fuel hose at firewall.

(11) Install lower engine cowling.

3. Defueling both wing tanks simultaneously.
   A. Follow same procedure as for one wing tank except two fuel hoses will be used, one at each engine firewall and turning both fuel selector switches to X-FEED and both boost pumps ON.
4. Defueling the fuselage tank ONLY is not possible because the check valves in the fuel sump allow wing tank fuel to flow through the sumps at all times.

OIL SYSTEM.

ENGINE OIL, SERVICING.

Each engine has a 12-quart sump capacity and is serviced through an access cover in the top of the engine cowling. The oil level is indicated by a graduated, combination dipstick-filler cap.

1. Service the engine oil according to the recommendations in Figure 12-4.
2. Refer to the latest revision of Lycoming Service Bulletin No. 480, "Oil and Filter Change and Cleaning."

ENGINE OIL, CHANGE Avco-Lyc. S.I. 1014J

In engines that have been operating on straight mineral oil for several hundred hours, a change to ashless dispersant oil should be made with a degree of caution, because the cleaning action of some ashless dispersant oils tend to loosen sludge deposits and cause plugged oil passages. When an engine has been operating on straight mineral oil, and is know to be in excessively dirty conditions, the switch to ashless dispersant oil should be deferred until after the engine is overhauled.

When changing from straight mineral oil to ashless dispersant oil, the following precautionary steps should be taken:

1. Do not add ashless dispersant oil to straight mineral oil. Drain the straight mineral oil from the engine and fill with ashless dispersant oil.
2. Do not operate the engine longer than five hours before the first oil change.
3. Check all oil screens for evidence of sludge or plugging. Change oil every 10 hours if sludge conditions are evident. Repeat 10 hour checks until clean screen is noted, then change oil at recommended time intervals.

— CAUTION —

The terms "detergent", "additive", "compounded" and "ashless dispersant" used herein are intended to refer to a class of aviation engine lubricating oils to which certain substances have been added to improve them for airplane use. These terms do not refer to such materials commonly know as "top cylinder lubricant", "dopes", "carbon remover" which are sometimes added to fuel or oil. These products may cause damage to the engine (pistons, rings sticking, etc.) and their presence in an engine will void the manufacturer's warranty. Under no circumstances should automotive oil be used. The use of automotive oils in Avco Lycoming engines is not recommended because its use could cause engine failure.

Average Ambient Air Temperature (NOTE I)	MIL-L-6082 Spec. Grades (NOTE II)	MIL-L-22851 Spec. Ashless Dispersant Grades (NOTE III)
All Temperatures		SAE15W-50 or 20W-50
Above 80°F	SAE60	SAE60
Above 60°F	SAE50	SAE40 or SAE50
30°F to 90°F	SAE40	SAE40
0°F to 70°F	SAE30	SAE40 or SAE30
Below 10°F	SAE20	SAE 30
Refer to latest revision of Lycoming Service Instruction No. 1014.		

NOTE I

Average Temperatures

The ambient ground air temperatures listed in the chart are meant only as a guide. Individual judgement must be used when selecting the seasonal grade of oil to put in the engine. For example, if a plane is to be flown into an area which is much warmer or colder, the operator must determine which condition will be the more significant in choosing the proper weight engine oil. When engine oil temperatures approach the maximum allowable during operation, it is a good indication that a higher viscosity oil should be considered.

NOTE II

Single Viscosity Oils

This classification of lubricating oils includes any aviation grade (straight mineral non-detergent, detergent and dispersant) that is designated by a single viscosity number. The SAE grades 20, 30, 40, 50 and 60 shown in the chart are equivalent to Commercial Grades 55, 65, 80, 100 and 120 and to Military Grades 1040, 1065, 1080, 1100 and 1120 respectively.

NOTE III

Ashless Dispersant Grades

This classification contains additives, one of which has a viscosity stabilizing effect, which removes the tendency of the oil to thin out at high oil temperatures and thicken at low oil temperatures. The additives in these oils extend operating temperature range, improve cold engine starting and lubrication of the engine during the critical warm-up period, thus permitting flight through wider ranges of climatic changes without the necessity of changing oil. The ashless dispersant grades are recommended for aircraft engines subjected to wide variations of ambient air temperature, particularly the turbocharged series engines which require oil to activate the various turbo controllers. The SAE Grades 30, 40, 50 and 60 shown in the chart are equivalent to grades of 65, 80, 100 and 120 respectively. It must not be presumed however, that these oils will alleviate all of the problems encountered in extremely cold environments (below +10°F). At these temperatures preheating of the engine and the oil supply tank will be required regardless of the type of oil used.

Figure 12-4. Oil Selection

Generally, the engine oil system should be serviced after the first twenty-five hours of operation and thereafter each fifty hours of operation. (If the airplane is operated in dusty conditions, it may be necessary to service the system every twenty-five hours or less.) Servicing should include an oil change, and replacement of the fullflow oil filter. The engine should be serviced with the proper grade oil as indicated on the chart, Figure 12-4.

1. Run engines until cylinder head temperature is in green arc.
2. Remove top and bottom engine cowling.
3. Place a container of at least 12-quart capacity under engine sump drain plug, and remove plug.
4. After all oil has drained, replace plug.
5. Remove oil inlet screen and inspect for metal particles. If no metal is found, clean screen and reinstall, using new gasket.
6. Safety wire old inlet screen to sump drain plug with 0.032 inch stainless steel lockwire. Complete steps A and B if the aircraft is equipped with Option No. 252 (Crankcase Breather Oil Recovery System).
   A. Remove oil seperator screen and oil return line check valve. Clean both with a hydrocarbon based solvent.
   B. Dry screen and check valve with shop air and reinstall. Replace fiber washers as necessary. Replace nut with new AN363-420 nut if old nut can be tightened with fingers.
7. Place a cloth under oil filter and remove filter assembly.
8. Inspect filter element by cutting the element open and examining it for metal particles.
9. Clean filter assembly and reinstall using a new filter element. Torque the center bolt to 240-300 in. lbs. (Figure 12-5).

— NOTE —

Ensure filter assembly is properly seated before tightening center bolt, and no adjacent component such as a hose clamp is allowed to rub against the filter housing as perforation may result.

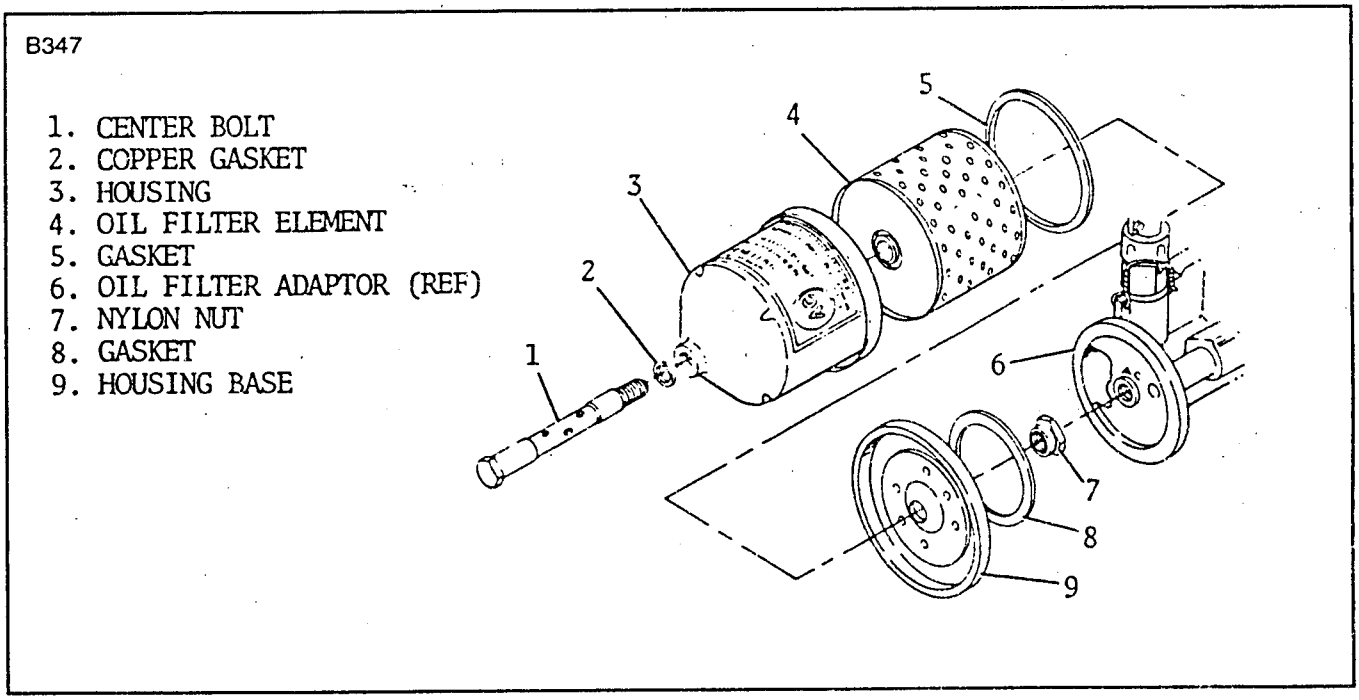


Figure 12-5. Oil Filter Assembly (Refer to Figure 79-4 for Spin-on Filter)

A. For spin-on type filters, a small amount of Dow Corning DC-4 compound may be applied to the gasket of the filter to preclude sticking. Torque to 216-240 in.lbs.

10. Safety wire filter assembly with 0.032 inch stainless steel lockwire.
11. For aircraft with optional wastegate actuator oil filters. Clean or replace filter elements and clean filter canister. Use MEK or equivalent to loosen carbon and sludge on filter element, then clean and backflush element with solvent. NOTE: Filter element cannot be cleaned by backflushing while in housing! Clean all other filter assembly parts with solvent. Replace O-ring (on filter housing caps) and filter elements as required. New O-rings, P/N 300180-005, and filter elements, P/N 300180-003, can be obtained from Aerostar Aircraft Corporation.
12. Service the engine with 12 quarts of oil per Figure 12-4.
13. Run the engine. Check for oil pressure and oil leaks.
14. Check oil level with dipstick, and replace engine cowling.

HYDRAULIC SYSTEM.

HYDRAULIC RESERVOIR, SERVICING.

1. The reservoir is located aft of the baggage compartment curtain (Figure 12-6) and is serviced through the dipstick-filler cap. (Refer to Figure 12-2 for type fluid and capacity.)

— NOTE —

System pressure must be depleted, landing gear down and flaps up when checking dipstick and servicing, otherwise the reservoir will overflow if serviced to the full mark.

2. Ensure landing gear is down and locked.
3. Deplete hydraulic pressure by cycling flaps. If flaps are down when pressure has been depleted, raise flaps by hand.
4. Fill reservoir to full mark on dipstick and install filler cap.

HYDRAULIC ACCUMULATOR, SERVICING.

The hydraulic accumulator is located behind the baggage compartment curtain just aft of and below the hydraulic reservoir. The Aerostar uses one of two types of accumulators, Figure 12-6.

1. Greerolator P/N 980005-1.
2. Hydrodyne P/N 980075-1.

Dry nitrogen is used to pressurize these accumulators.

1. The Greerolator is pressurized to 275 psi and requires as charging adapter (P/N A64528-200) to pressurize.
2. The Hydrodyne is pressurized to 600 psi for Model 700P and to 500 psi for all other models.

A quick way to check accumulator pressure is to cycle flaps with the right engine shut down and aux. hyd. pump off. As flaps are cycled pressure will come down slowly. Where indicator drops off suddenly to zero, that is the charge in the accumulator (if needle suddenly drops to zero at 400 psi, the accumulator charge is 400 psi).

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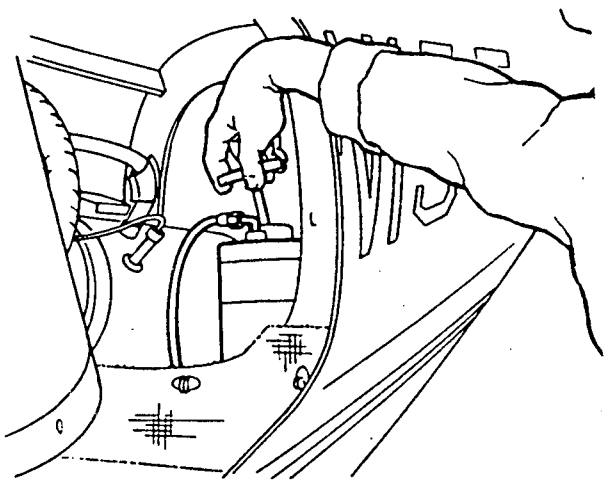
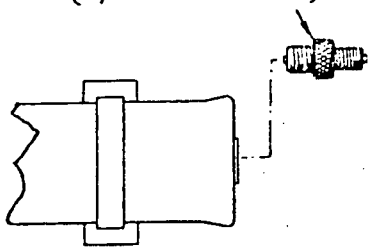


HYDRAULIC RESERVOIR

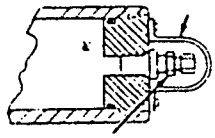
ACCUMULATOR
GAS CHARGING
VALVE ADAPTER
(P/N A64528-200)



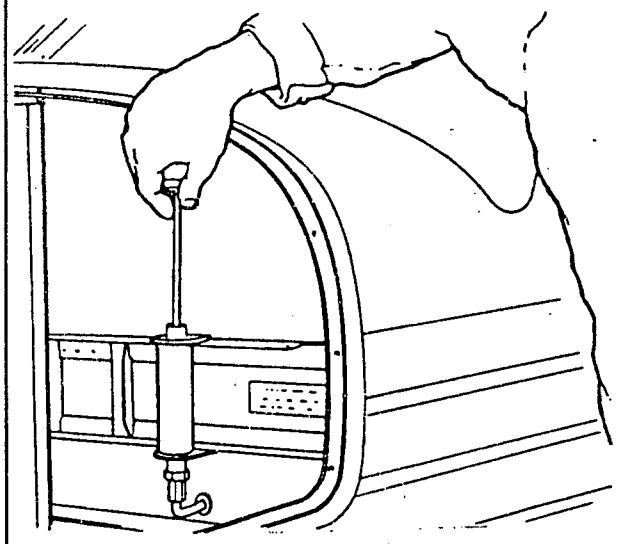
980005-1 OR 65516-200
ACCUMULATOR

PROTECTIVE COVER

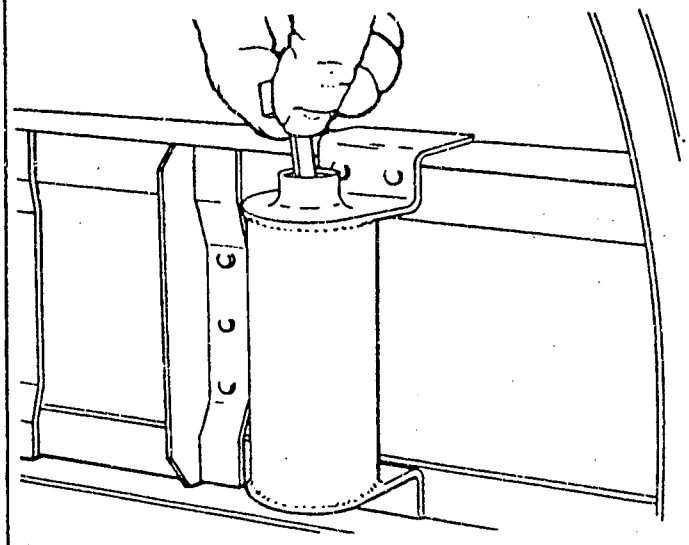
980075-1
ACCUMULATOR



MS 28889-1 GAS CHARGING VALVE
OR EQUIV. WITH 5/16-32 THREAD
FOR CONNECTING CHARGING LINE



BRAKE RESERVOIR
A/F 0001-0157



BRAKE RESERVOIR
A/F 0158 & UP

Figure 12-6. Hydraulic Reservoir, Accumulator and Brake Reservoir

1. Bleed hydraulic pressure to zero.
2. Install charging adapter if P/N 980005-1 accumulator is installed.
3. For P/N 980075-1 accumulator, remove protective cover.
4. Attach nitrogen charging hose to gas charging valve

– NOTE –

System pressure must be depleted, landing gear down and flaps up when checking dipstick and servicing, otherwise the reservoir will overflow if serviced to the full mark

5. Charge accumulator
   A. P/N 98005-1 to 275 psi.
   B. P/N 980075-1 to 600 psi for Model 700P and to 500 psi for all other models.
6. Shut off nitrogen pressure, disconnect charging hose.
7. Remove charging adapter (if used).
8. Check charging port for leakage and install cap/protective cover.

BRAKE RESERVOIR, SERVICING.

The reservoir is located just inside the nose section access cover on the forward face of the cabin forward bulkhead. The reservoir should be checked regularly to ensure it is full. Service when required with MIL-H-5606 hydraulic fluid.

1. Remove nose section access cover.
2. Remove dipstick-filler cap to check fluid level and service reservoir (Figure 12-6).

INDUCTION AIR FILTER.

INDUCTION AIR FILTER (600/601/601P).

The filters are disposable type filters with specially treated elements for efficient filtration. Do not attempt to clean and reuse or lubricate a new filter.

1. Remove top engine cowling and access plate on air box mounted on firewall.
2. Remove and replace filter.
3. Install access cover and engine cowling.

INDUCTION AIR FILTER (602P).

The filters used are designed to sustain continuous exposure to high induction temperatures. They are cleanable and reusable as long as they pass the required inspection given in the following procedures. Clean and inspect the filters every 100 hours for normal operation or sooner for more severe dust operation.

REMOVAL, INSPECTION AND INSTALLATION PROCEDURES (602P).

1. Remove the upper cowling and filter housing access door.

— NOTE —

Due to filter fabrication it must be handled with care to prevent damage and preserve its efficiency.

2. Remove the filter retainer and carefully remove the filter.
3. Clean the filter in Stoddard solvent and blow dry with shop air applied on the reverse side of engine air flow.
4. Inspect the filter for condition. Replace filter if more than 50% of the pleats are deformed.
5. Inspect the entire peripherial edge of the filter to insure the edge seal is intact. The seal may be rebuilt using RTV 108 and building up to .10 inch thick as required.
6. Install the filter into the housing. The longest cutout at the corners is inserted first. Insure full spread of the filter over the screen in the housing. The filter needs to be compressed slightly for installation.
7. Install the retainer over the filter insuring the ends are inserted under the housing clips at each end and center. Center the retainer fore and aft, inboard and outboard. The retainer curled ends may be opened or closed to provide adequate clamping action on the filter.
8. Inspect the seal on the access door and replace if required. Bond the new seal using RTV 108.
9. Install the access door to the filter housing and reinstall the engine cowling.

INDUCTION AIR FILTER SERVICE (700P).

The induction air filters are disposable foam elements which are impregnated with oil. The filters are located in the primary air induction boxes which are mounted on the rear engine baffles. Replacement of the air filters should be accomplished at least once every 100 hours. Depending upon the conditions in which the airplane is operated, the filters may have to be replaced at shorter intervals.

TIRES, SERVICING.

Tire inflation, Figure 12-7, shows tire pressure applicable to all models. Service tires according to standard aircraft procedures. Adherence to the correct pressures will prolong the life of the tires. Tires should be replaced whenever the tread is worn down, or when cuts or cracking of the side wall is evident. Cuts in the tread are permissible if tread depth is not exceeded.

MODEL	AIRPLANE GROSS WEIGHT	NOSE GEAR INFLATION P.S.I.	MAIN GEAR INFLATION PRESSURE P.S.I.*		
		TIRE SIZE 6.00-6	TIRE SIZE 7.00-6 8PR	TIRE SIZE 6.50-8 8PR	TIRE SIZE 19.5X6.75X8
600	5,500	40	50	63	63
601	5,700	52	65	65	
	6,000	40	--	70	70
601P	5,700	40	--	65	65
	6,000	40	--	70	70
602P	6,000	40	--	70	70
700P	6,200	40	--	73	--
*NOTE - PRESSURES GIVEN ARE FOR UNLOADED CONDITION. ADD 2 P.S.I. FOR LOADED CONDITION.					

Figure 12-7. Tire Pressures

BATTERIES, SERVICING. (Refer to Figure 12-8.)

The batteries are accessible through a cover at the top and just forward of the tail cone except for the 700P and those Aerostars modified by Kit No. 021-001which have their batteries located behind the rear panel of the aft baggage compartment. The batteries contain sulfuric acid, but distilled water must be used to replenish the battery fluid level.

Battery electrolyte with a specific gravity of 1.265 to 1.275 (1.285 for 24 volt single battery) for all cells represents a completely charged battery. Electrolyte with a specific gravity of 1.150 indicates a completely discharged battery. Remove batteries from the airplane to charge.

— WARNING —

Batteries being charged give off fumes that may be dangerous to breath and may explode if sparks or open flames are present. Wear eye protection when servicing batteries.

1. Remove battery access cover. Remove battery cap cover (if applicable).
   - A. Service batteries with distilled water.
   - B. Spilled battery acid may be neutralized with a solution of one lb. baking soda to one gallon of water. Rinse with distilled water. Baking soda will neutralize the electrolyte if allowed to enter the batteries.
   - C. Coat battery terminals with petroleum jelly (or equivalent) to retard corrosion.
   - D. Reinstall batteries (if removed).
   - E. Reinstall battery cap cover (if applicable).
   - F. Install battery access cover. Ensure all three clips engage access hole flange (Figure 12-8).

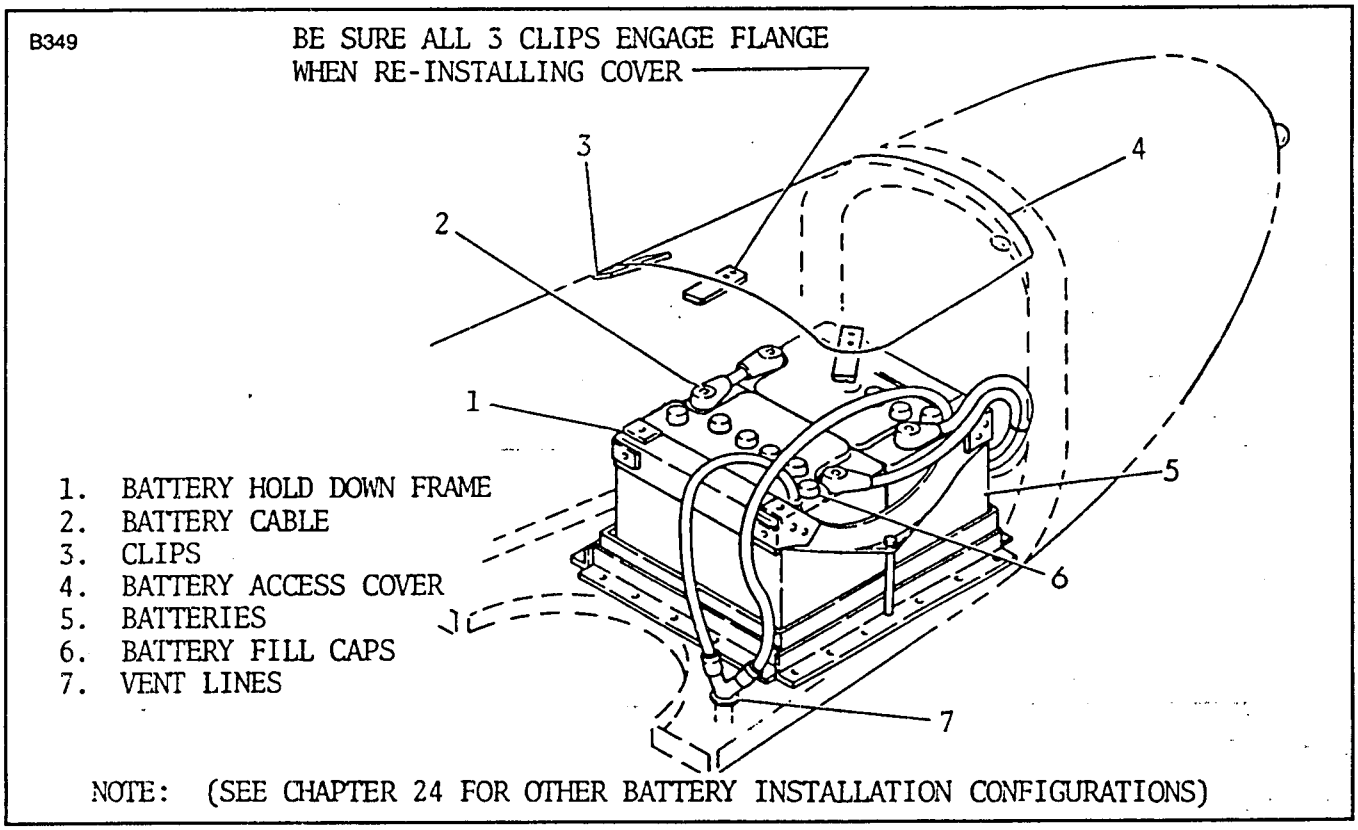


Figure 12-8. Batteries

WINDSHIELD DEICE RESERVOIR, SERVICING. (Refer to Figure 12-9.)

The reservoir is located in the baggage compartment just forward of the door. A slotted sight gage is uncovered when the filler cap is removed, and the alcohol should be replenished whenever the level falls below the sight gage. See Figure 12-2 for reservoir capacity and type alcohol.

1. Remove filler plug, fill to slot in filler neck.

— CAUTION —

Prolonged exposure of the windshield and paint to alcohol may be detrimental. Therefore, the deice alcohol must be washed off with mild soap and water and rinsed with clear water as soon as possible after activating the spray system or spilling of alcohol during servicing.

2. Test deice system and clean any spilled or sprayed alcohol.
3. See Chapter 30 for filter screen servicing.

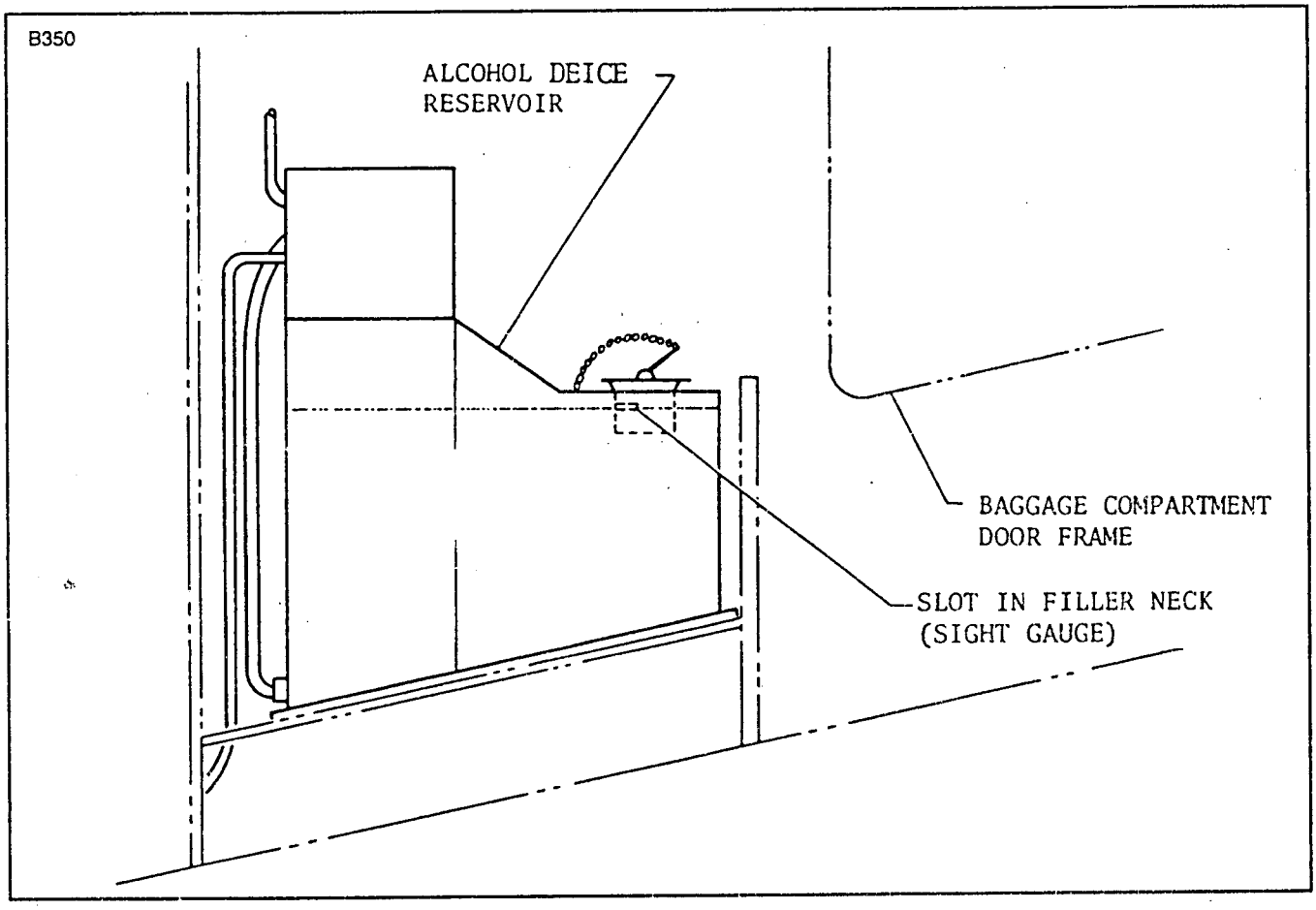


Figure 12-9. Alcohol Deice Reservoir

LANDING GEAR STRUTS, SERVICING.

The landing gear struts are hydraulic pneumatic, with nitrogen pressure used for maintaining proper extension and support. The main landing gears have the air and hydraulic fluid separated by a floating piston while the nose gear, OAS 5462-5 has the air and hydraulic fluid contained in the same piston. The P/N 450500 nose landing gear is similar to the main landing gear with a floating piston separating air from oil. Two different methods of servicing the struts may be used. "Inflation only" is considered a temporary measure when a strut appears to be low. "Hydraulic servicing" is the approved method by which a landing gear strut should be maintained.

Moisture free compressed air may be used in lieu of nitrogen gas on a temporary basis; however, the strut should be deflated and re-serviced with nitrogen as soon as possible.

1. Nose gear strut.
   - A. Inflation only (OAS 5462-5).
     - (1) Strut should have one to three inches extension (Figure 12-10).
     - (2) Raise nose wheel clear of ground.
     - (3) Remove air valve cap near top of strut and inflate to 80 psi or as placarded on strut.
     - (4) Lower nose wheel to ground and check for proper extension.
   - B. Inflation only (P/N 450500).
     - (1) Strut should have two to four inches extension (Figure 12-10).
     - (2) Raise nose wheel clear of ground.
     - (3) Remove air valve cap, aft side of fork and inflate to 80 psi or as placarded on strut.
     - (4) Lower nose wheel to ground and check for proper extension.
   - C. Hydraulic service (OAS 5462-5).
     - (1) Jack airplane per Chapter 7 and open nose gear doors per Chapter 32.
     - (2) Release all nitrogen (air) from struts.
     - (3) Remove air valve body from top of strut (Figure 12-10).
     - (4) Attach hand hydraulic pump to air valve body opening port.
     - (5) Using MIL-H-5606, fill strut to overflowing. (Strut in upright, extended for landing position.)
     - (6) Attach drain hose to fill port and slowly collapse strut, catching fluid in a clean container so it may be reused.
     - (7) Repeat Step (6) a minimum of three times to expel all air from the fluid. After last filling, collapse strut completely to force out all excess fluid and install air valve body while strut is collapsed.
     - (8) Safety wire air valve body.
     - (9) Inflate strut to 80 psi (or as placarded) with dry nitrogen.
     - (10) Check landing gear down and locked, down jack airplane and close nose gear doors.

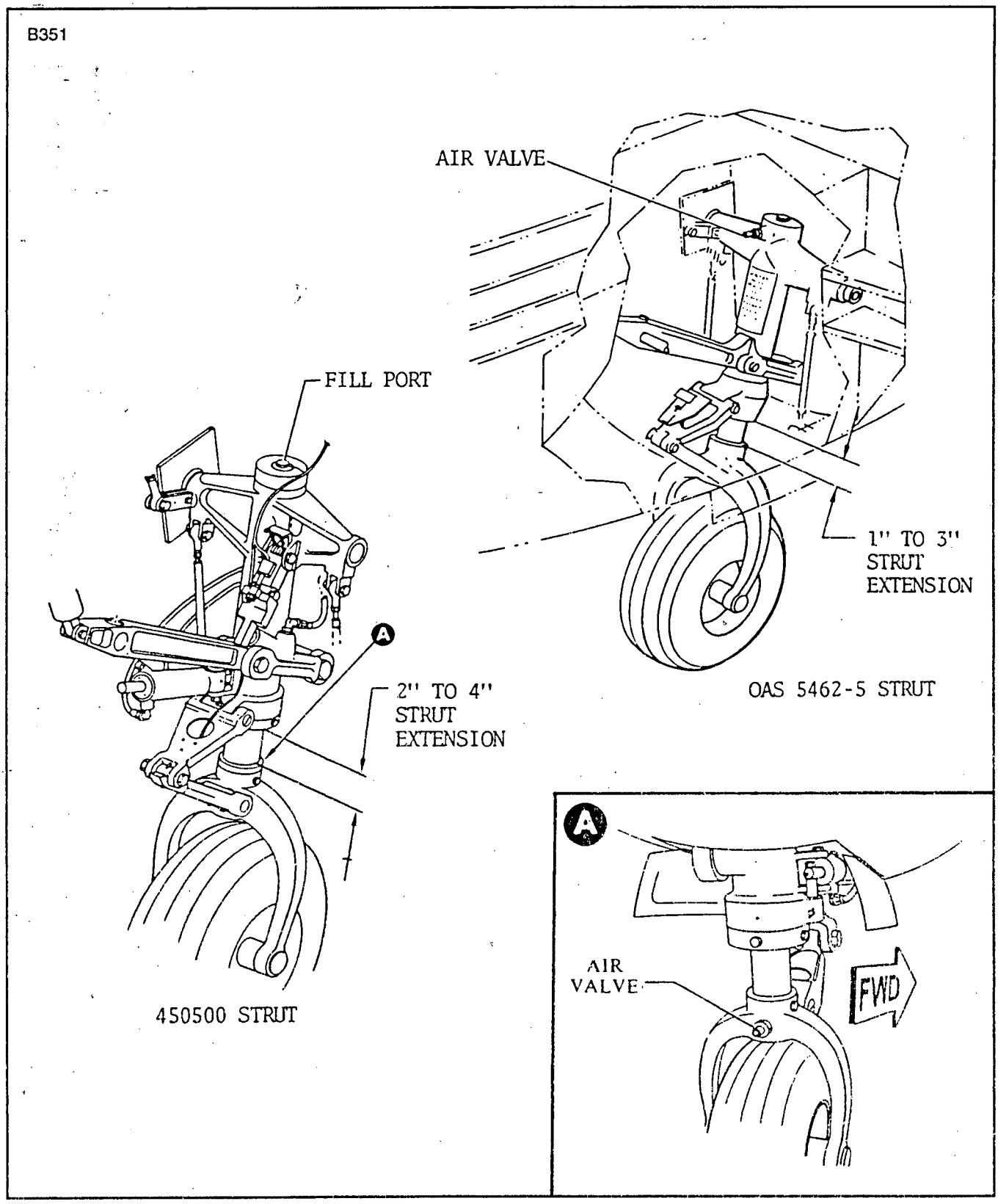


Figure 12-10. Nose Landing Gear Service Points

D. Hydraulic service (P/N 450500).

(1) Jack airplane per Chapter 7 and open nose gear doors per Chapter 32.

(2) With strut fully extended, open air valve aft side of fork (Figure 12-10) and slowly deflate strut. (Leave air valve open.)

— WARNING —

Strut must be completely deflated prior to disconnecting drag brace. The drag brace attach bolt retains the aligning pin which is pressurized by inflation of the strut and if released could cause serious injury.

(3) When strut has completely deflated, exercising caution, disconnect drag brace at strut. Reinstall bolt to retain alignment pin.

(4) Move strut to a vertical position, remove filler plug and attach hydraulic hand pump to filler port.

(5) While maintaining strut in vertical position, fill with MIL-H-5606 until a pressure of 50 ± 5 psi is attained.

(6) Open hand pump bleed to allow fluid and air to bleed from strut while compressing strut to the fully collapsed position.

(7) Repeat Steps (5) and (6) until all air has been bled from the strut.

(8) On last compression cycle, and while holding strut in the fully collapsed position, disconnect hydraulic hand pump and, using a mirror, verify hydraulic fluid is to top of strut. (This is to prevent air pocket in top of strut.) Install filler port plug and safety wire.

(9) Exercising care, connect drag brace, making sure alignment pin is seated.

— NOTE —

Moisture free compressed air may be used in lieu of dry nitrogen on a temporary basis; however, the strut should be deflated and reserviced with dry nitrogen as soon as possible. Nitrogen is more suitable for strut servicing because of its dryness and stability during changes in ambient temperature.

(10) Connect dry nitrogen pressure hose to air valve, pressurize strut to 80± 4 psi, or as placarded.

(11) Close the air valve, shut off nitrogen supply.

(12) Bleed charging hose and disconnect from air valve.

(13) Leak check air valve and install air valve cap.

(14) Close landing gear doors per Chapter 32.

(15) Check landing gear and control lever for down and locked position.

(16) Down jack airplane per Chapter 7.

(17) Check strut extension - 2" to 4".

2. Main landing gear.

A. Inflation only.

— NOTE —

Should a strut require emergency service, it may be inflated to provide minimum extension. The strut should be reserviced with hydraulic fluid as soon as possible. It is possible, when one main landing gear strut appears to be low, that the opposite strut may be too high, causing the airplane to sit high on one side. Before inflating a main landing gear strut, check the strut on the opposite side and adjust the pressure if necessary.

(1) Connect a regulated high pressure air or dry nitrogen source of at least 600 psi capacity to the air service port at the base of the strut and open the air valve service port. (Figure 12-11 & 12.)

(2) While gently rocking airplane to prevent strut piston from binding in strut barrel, inflate strut to 1" to 3" extension.

(3) Close air valve and remove high pressure air source.

(4) Struts should be hydraulically serviced as soon as possible.

B. Hydraulic service.

(1) Jack airplane per Chapter 7 until gear is clear of ground when fully extended.

(2) Ensure strut is fully extended and open air valve at bottom of strut and slowly release nitrogen/air (Figure 12-11).

(3) Remove cap on filler port at top of strut and attach hydraulic hand pump.

(4) Pump in MIL-H-5606 hydraulic fluid until floating piston bottoms in strut.

(5) Open hand pump line to allow fluid to bleed from strut.

(6) Apply 3 to 10 psi dry nitrogen pressure through air valve at bottom of strut to move floating piston to its upper travel limit. End of piston travel is indicated by cease of fluid flow from strut.

(7) Repeat Steps (4) through (6) two times to remove air trapped in top of strut.

(8) After last cycle, with floating piston held at top of strut by low air pressure, add 10 cubic inches of hydraulic fluid (approximately 20 strokes of hand pump) to prevent floating piston from touching top of cylinder when in service.

(9) Open air valve and release low air pressure. Disconnect hand pump from filler port and replace cap.

(10) With strut fully extended, apply dry nitrogen through air valve and inflate strut to 310 psi for Model 600, 370 psi for Model 601, 601P and 602P or to 390 psi for 700P (or to placard pressure).

(11) Close air valve and replace air cap.

(12) If both struts are pressurized with "T" hose set-up, struts will contain identical pressure.

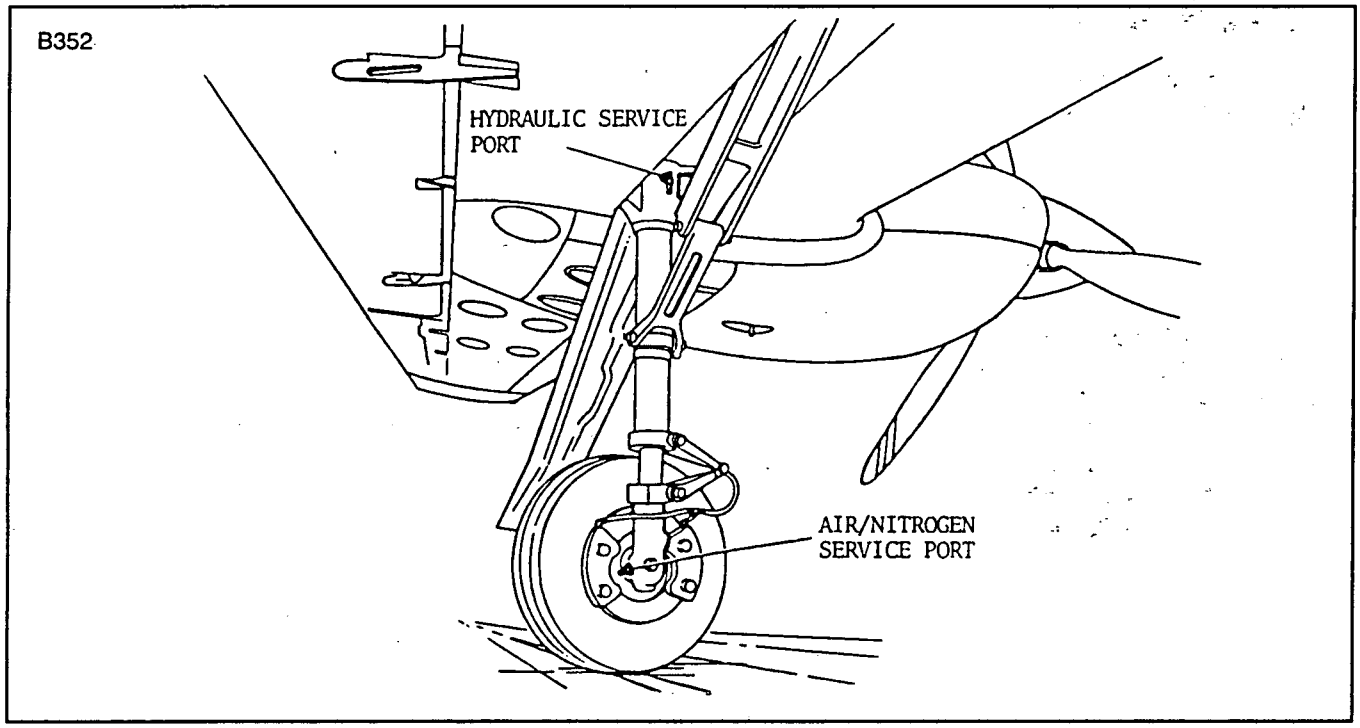


Figure 12-11. Main Landing Gear Service Points

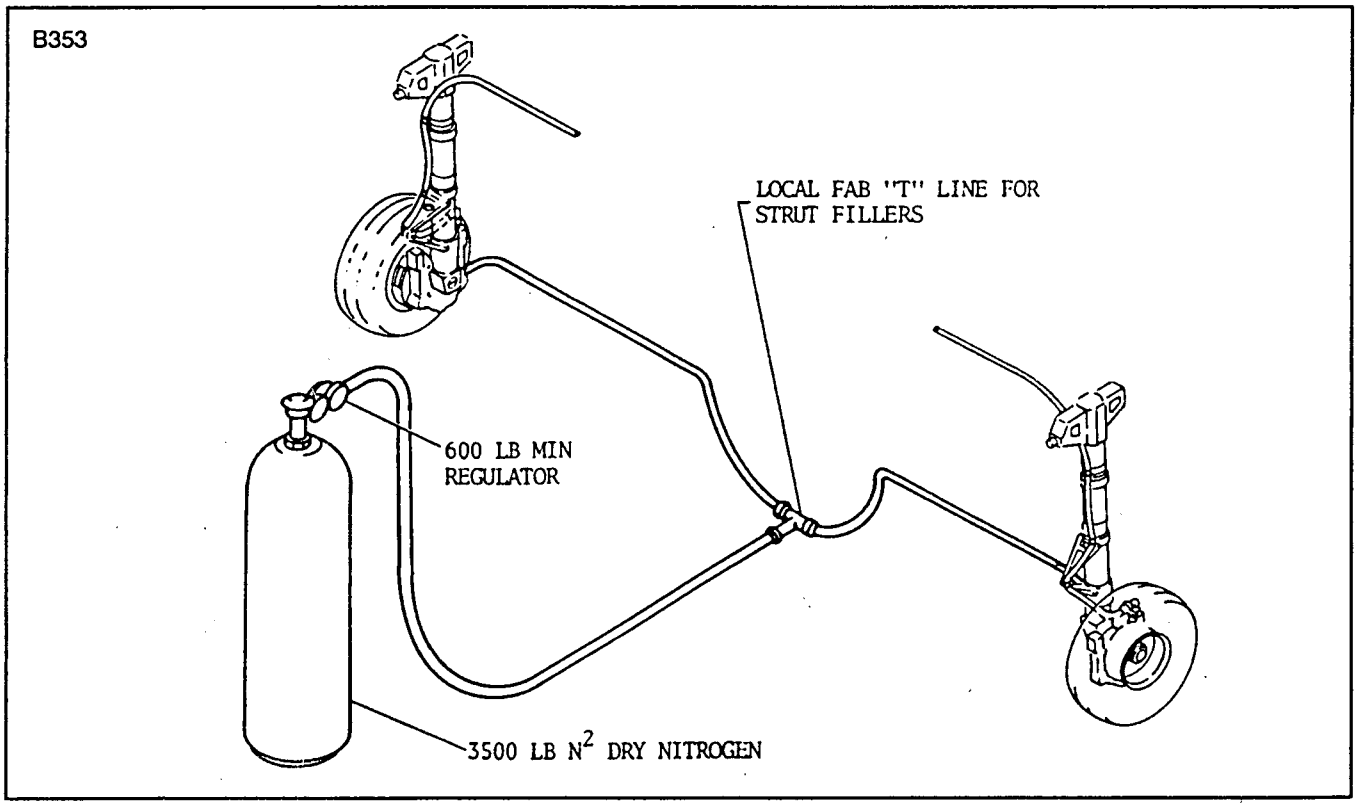


Figure 12-12. Dry Nitrogen Equipment for Servicing Main Landing Gear Struts

OXYGEN SYSTEM. (Refer to Figure 12-13.)

The oxygen cylinder is located on the aft side of fuselage station 204.00 bulkhead between the cabin and baggage compartment.

— WARNING —

No smoking or open flame of any kind is permitted in or near the airplane while the oxygen system is on. Keep all oil, grease, hydraulic fluid, flammable items and other foreign materials away from oxygen equipment.

The oxygen filler port is located on the baggage compartment forward door frame. Refilling the oxygen cylinder must be accomplished by a qualified oxygen service station using Type One, Aviator's Breathing Oxygen conforming to MIL-O-27210. For replacing the oxygen bottle see Chapter 35.

1. Close altitude adjusting valve. Rotate adjusting valve knob to full extent of travel; do not use excessive force or valve may be damaged.
2. Ensure the over pressure visual indicating disc is installed in dump outlet located on bottom of fuselage just aft of fuel sump drains.

— WARNING —

No smoking or open flame of any kind is permitted in or near airplane while oxygen system is on. Keep tools, hands, and components free of oil, grease and other hydrocarbons. Hydrocarbons are explosive when in contact with oxygen.

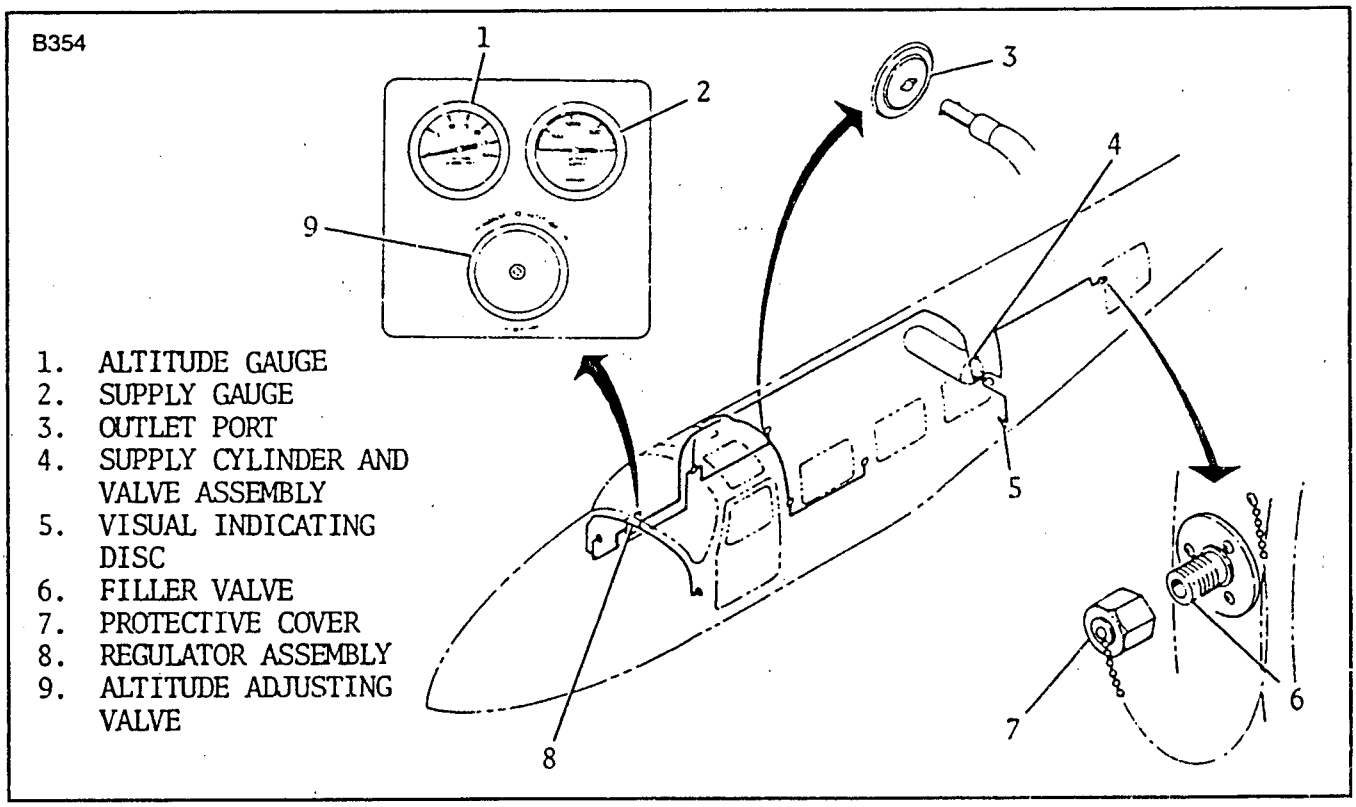


Figure 12-13. Oxygen System

3. Open baggage compartment door and remove protective cover from filler valve.
4. Inspect charging hose connector and filler valve for contamination and connect charging hose.
5 Pressurize supply cylinder at a rate of 100 psi per minute or as placarded adjacent to the filler valve.

— *NOTE* —

Pressure indication may be obtained from charging plant gauge or panel mounted regulator gauge. The pressure should be increased in the cylinder an additional 3.5 psi for each degree increase in ambient temperature above 70°F, and decrease 3.5 psi for each degree of ambient temperature below 70°F.

A. Pressurize 11 cu. ft. cylinder to 1800 ± 50 psi.
B. Pressurize 115 cu. ft. cylinder to 1850 ± 50 psi.

6. Allow approximately one hour for cylinder temperature to stabilize and recharge if required.
7. Disconnect charging hose, install protective cover and record charging date.

SCHEDULED SERVICING.

LUBRICATION INSTRUCTIONS.

Proper lubrication procedures are of immeasurable value both as a means of prolonging the service life of the airplane and as a means of reducing the frequency of extensive and expensive repairs. The periodic application of recommended lubricants to their relevant bearing surfaces, as detailed in the following paragraphs, together with the observance of cleanliness will insure the maximum efficiency and utmost service of all moving parts. Lubrication instruction regarding the locations, time intervals, and type of lubricants used may be found in the Lubrication Chart. To ensure the best possible results from the application of lubricants, the following precautions should be observed:

1. Use recommended lubricants. Where general purpose lubricating oil is specified, but unavailable, clean engine oil may be used as a satisfactory substitute.
2. Check the components to be lubricated for evidence of excessive wear and replace them as necessary.
3. Remove all excess lubricants from components in order to prevent the collection of dirt and sand in abrasive quantities capable of causing excessive wear or damage to bearing surfaces.

— *NOTE* —

If the airplane is inactive for long periods of time, it should be lubricated in accordance with Lubrication Chart every 90 days.

APPLICATION OF OIL.

— CAUTION —

Be careful not to add too much oil, because the excess will be thrown off during operation and will cause pitting and burning of the magneto points.

Whenever specific instructions for lubrication of mechanisms requiring lubrication are not available, observe the following precautions:

1. Apply oil sparingly, never more than enough to coat the bearing surfaces.
2. Squeeze the magneto cam follower felt at regular inspection periods. If oil appears on fingers, do not add oil. If the felt is dry, moisten with light oil.

APPLICATION OF GREASE.

Care must be taken when lubricating bearings and bearing surfaces with a grease gun. Ensure that gun is filled with new, clean grease of the grade specified for the particular application before applying lubricant to the grease fittings.

1. Where a reservoir is not provided around a bearing, apply the lubricant sparingly and wipe off any excess.
2. Remove wheel bearings from the wheel hub and clean thoroughly with a suitable solvent. When repacking with grease, be sure the lubricant enters the space between the rollers in the retainer ring. Do not pack the grease into the wheel hub.
3. Use extra care when greasing the constant speed propeller hub to avoid blowing the clamp gaskets. Remove one grease fitting and apply grease to the other fitting until fresh grease appears at the hole of the removed fitting.

LUBRICATION CHARTS.

The lubrication charts consist of individual illustrations for the various airplane systems, and each component to be lubricated is indicated by a number, the type of lubricant and the frequency of application. Special instructions are listed at the beginning of the lubrication charts and with the applicable component illustration. Read Special Instructions prior to starting the lubrication procedure.

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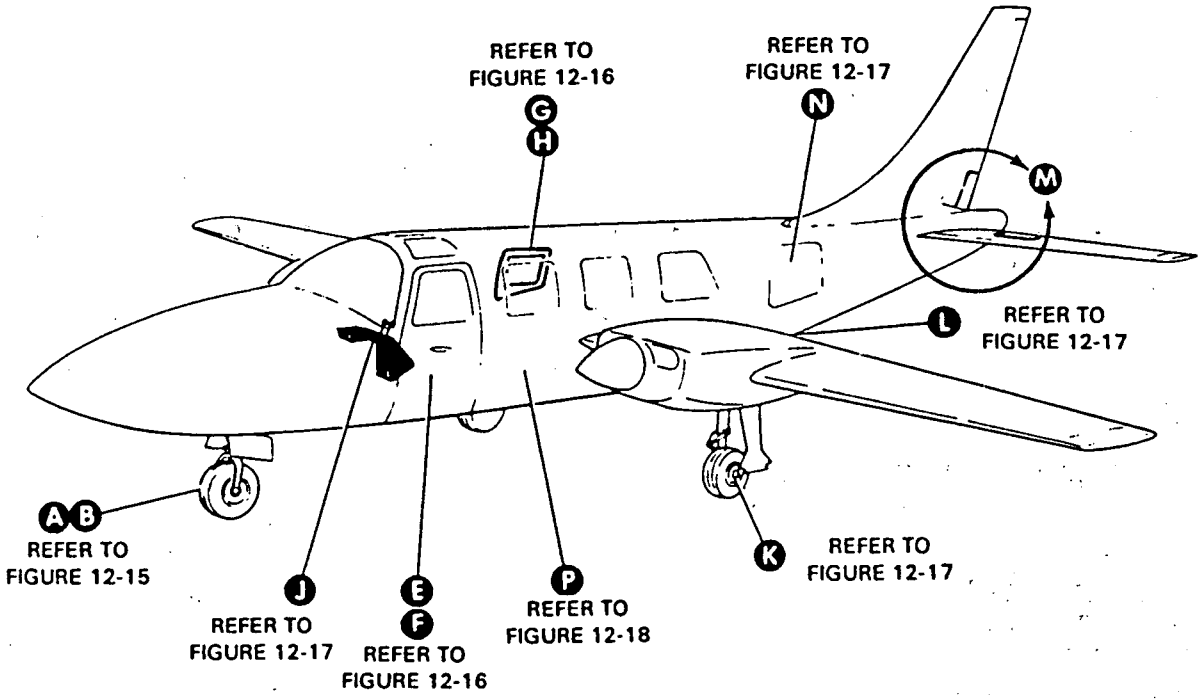

Figure 12-14. Lubrication Points

	COMPONENT	LUBRICANT	FREQUENCY
1.	DOOR HINGE	SAE 20	100 HRS
2.	SCISSORS BUSHING (UPPER)	MIL-G-81322	100 HRS
3.	SCISSORS BUSHING (LOWER)	MIL-G-81322	100 HRS
4.	STEERING ACTUATOR TRUNNION	MIL-G-81322	100 HRS
5.	WHEEL BEARINGS - SEE SPECIAL INSTRUCTION 1	MIL-G-81322	100 HRS
6.	SQUAT SWITCH ACTUATOR	SILICONE SPRAY	A/R
7.	STRUT - SEE SPECIAL INSTRUCTION 2	MIL-H-5606	100 HRS
8.	DRAG BRACE	MIL-G-81322	100 HRS
9.	JURY BRACE	SS-G-659	100 HRS
10.	STEERING COLLAR	MIL-G-81322	100 HRS
11.	TRUNNION BUSHINGS	MIL-G-81322	100 HRS

SPECIAL INSTRUCTIONS

1. Nose Wheel Bearings - Disassemble and clean with a dry type solvent. Ascertain that grease is packed between the roller and cone. Do not pack grease in wheel housing. Wheel bearings require cleaning and repacking after exposure to an abnormal quantity of water.
2. Oleo Struts- Fill per instructions on unit or refer to Servicing Landing Gear Struts (This Chapter.)
3. Lubrication Points - Wipe all lubrication points clean of old grease, oil, dirt, etc. before lubricating.
4. Lubricate landing gear needle point zerks with Snap-On Tool Corp. tool P/N YA801.

Figure 12-15. Lubrication Chart (Landing Gear, Nose)

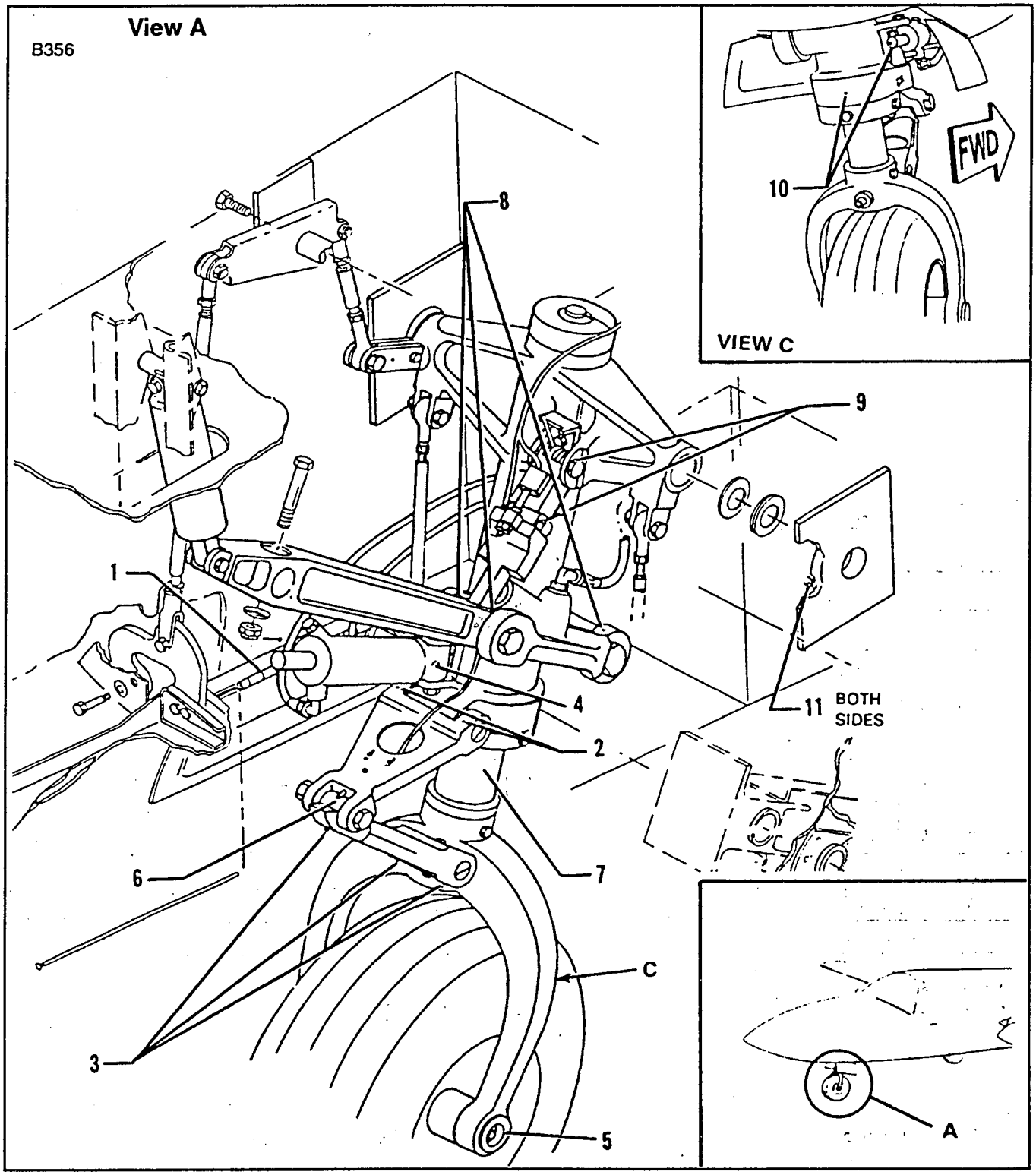

Figure 12-15. Lubrication Chart (Landing Gear, Nose)
Airframe with Part No. 450500 Gear and Airframe 0608 and up

	COMPONENT	LUBRICANT	FREQUENCY
1.	DOOR HINGE	SAE 20	100 HRS
2.	SCISSORS BUSHING (UPPER)	MIL-G-81322	100 HRS
3.	SCISSORS BUSHING (LOWER)	MIL-G-81322	100 HRS
4.	SQUAT SWITCH ACTUATOR	SILICONE SPRAY	A/R
5.	STRUT - SEE SPECIAL INSTRUCTION 2	MIL-H-5606	100 HRS
6.	WHEEL BEARINGS - SPECIAL INSTRUCTION 1	MIL-G-81322	100 HRS
7.	STTERING COLLAR	MIL-G-81322	100 HRS
8.	STEERING KNUCKLE	SAE 20	100 HRS
9.	TRUNNION BUSHINGS	MIL-G-81322	100 HRS
10.	DRAG BRACE	MIL-G-81322	100 HRS

SPECIAL INSTRUCTIONS

1. Nose Wheel Bearings - Disassemble and clean with a dry type solvent. Ascertain that grease is packed between the roller and cone. Do not pack grease in wheel housing. Wheel bearings require cleaning and repacking after exposure to an abnormal quantity of water.
2. Oleo Struts- Fill per instructions on unit or refer to Servicing Landing Gear struts (This Chapter.)
3. Lubrication Points - Wipe all lubrication points clean of old grease, oil, dirt, etc. before lubricating.
4. Lubricate landing gear needle point zerks with Snap-On Tool Corp. tool P/N YA801.

Figure 12-15. Lubrication Chart (Landing Gear, Nose) (cont)

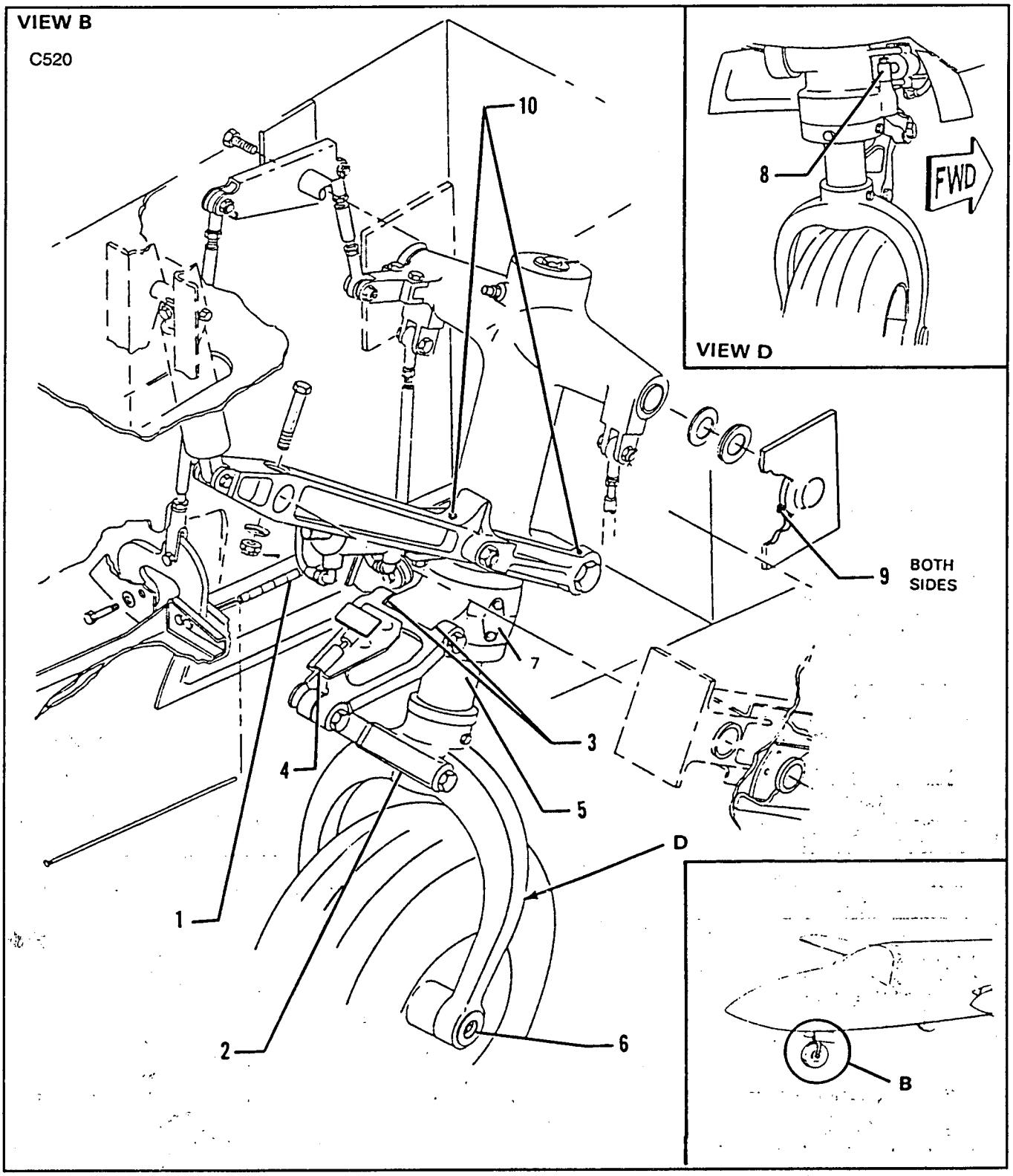

Figure 12-15. Lubrication Chart (Landing Gear, Nose)(cont)
Airframe 0607 and below

COMPONENT	LUBRICANT	FREQUENCY
1. CABIN DOOR HINGE (LOWER)	SAE 20	50 HRS
2. CABIN DOOR HINGE (UPPER)	SAE 20	50 HRS
3. DOOR LATCH MECHANISMS	SS-G-659	50 HRS
4. DOOR HOLDER MECHANISM	SILICONE SPRAY	50 HRS
5. STRIKER PLATES	SS-G-659	50 HRS
6. EMERGENCY EXIT LATCH MECHANISMS	SS-G-659	50 HRS
7 DOOR SEALS	FLUOROCARBON RELEASE AGENT MS-122	100 HRS OR A/R
SPECIAL INSTRUCTIONS Apply fluorocarbon dry lubricant to door seals at least once a month to prevent the seal from sticking, and improve sealing characteristics.		

Figure 12-16. Lubrication Chart (Doors, Emergency Exit)

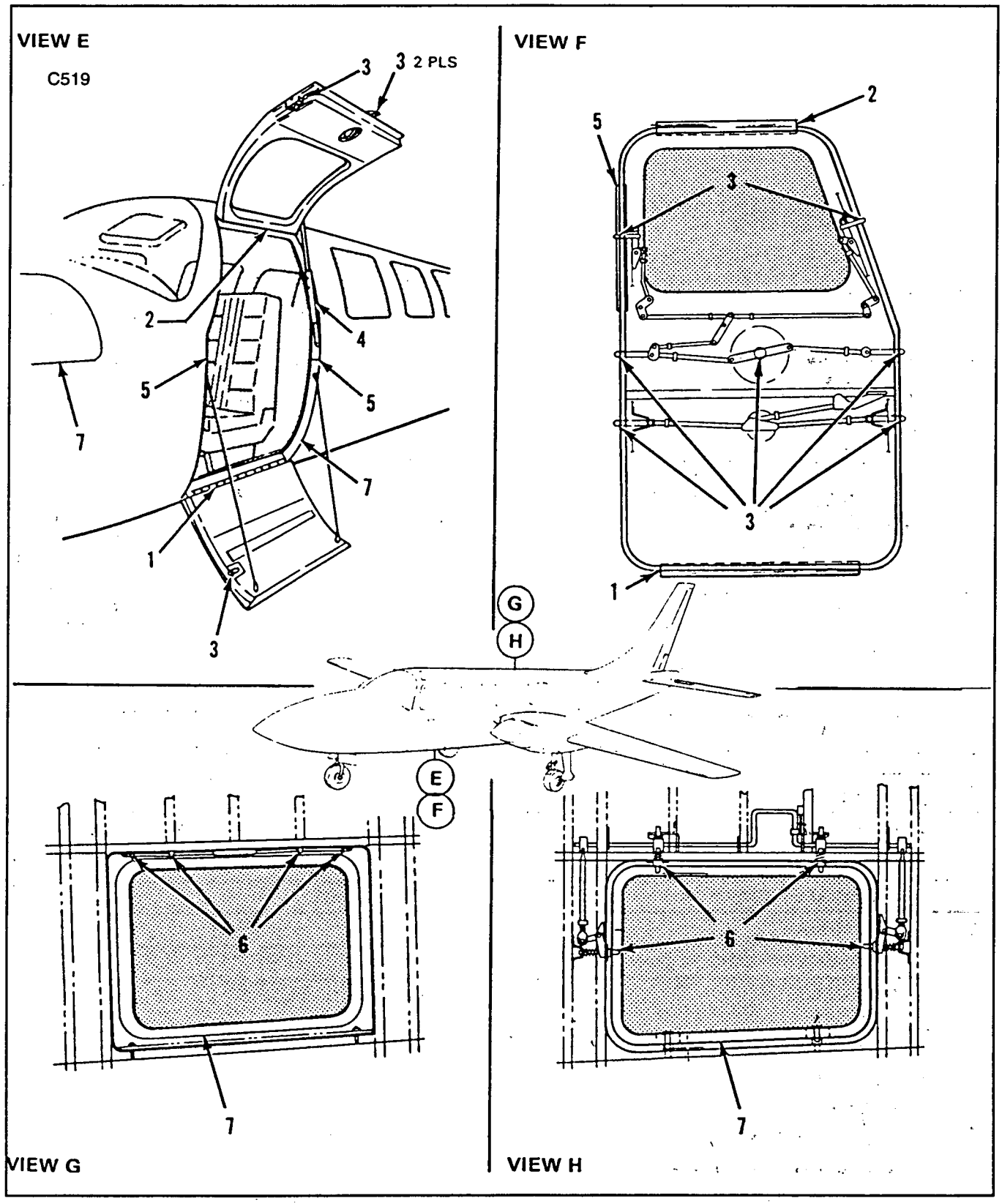

Figure 12-16. Lubrication Chart (Doors, Emergency Exit)(cont)

	COMPONENT	LUBRICANT	FREQUENCY
1.	CONTROL CONSOLE	SS-G-659	100 HRS OR A/R
2.	FLAP HINGE TRACK	MIL-G-81322	100 HRS
3.	BAGGAGE COMPARTMENT DOOR HINGE	SAE 20	100 HRS
4.	DOOR LATCH MECHANISMS	SS-G-659	100 HRS
5.	ACTUATOR BEARING	MIL-G-81322	100 HRS
6.	DOOR HINGE	SAE 20	100 HRS
7.	TRUNNION BEARINGS	MIL-G-81322	100 HRS
8.	STRUT - SEE SPECIAL INSTRUCTION 2	MIL-H-5605	25 HRS
9.	WHEEL BEARINGS - SEE SPECIAL INSTRUCTION 1	TEXACO MARFAX ALL PURPOSE GREASE, MOBIL MOBILGREASE (OR MOBILUX EPS) OR SHELL ALVANIA EP GREASE 2	100 HRS
10.	RUDDER TRIM TAB HINGE	SAE 20	100 HRS
11.	ELEVATOR TRIM TAB HINGE	SAE 20	100 HRS
12.	DOOR SEALS	FLUOROCARBON RELEASE AGENT - MS-122	100 HRS OR A/R
13.	TORQUE TUBE BEARING FELT WASHERS	MIL-G-81322	500 HRS
14.	TORQUE LINK BUSHINGS	MIL-G-81322	50 HRS
15.	SIDE BRACE CENTER HINGE BUSHING	MIL-G-81322	50 HRS

SPECIAL INSTRUCTIONS

1. MLG Wheel Bearings - Disassemble and clean with a dry type solvent. Ascertain that grease is packed between the roller and cone. Do not pack grease in wheel housing. Wheel bearings require cleaning and repacking after exposure to an abnormal quantity of water.
2. Oleo Struts- Fill per instructions on unit or refer to Servicing Landing Gear struts (This Chapter.)
3. Apply fluorocarbon dry lubricant to door seals at least once a month to prevent the seal from sticking, and improve sealing characteristics.

Figure 12-17. Lubrication Chart (Main Landing Gear, Flap Tracks, Doors, Trim Tabs and Console)

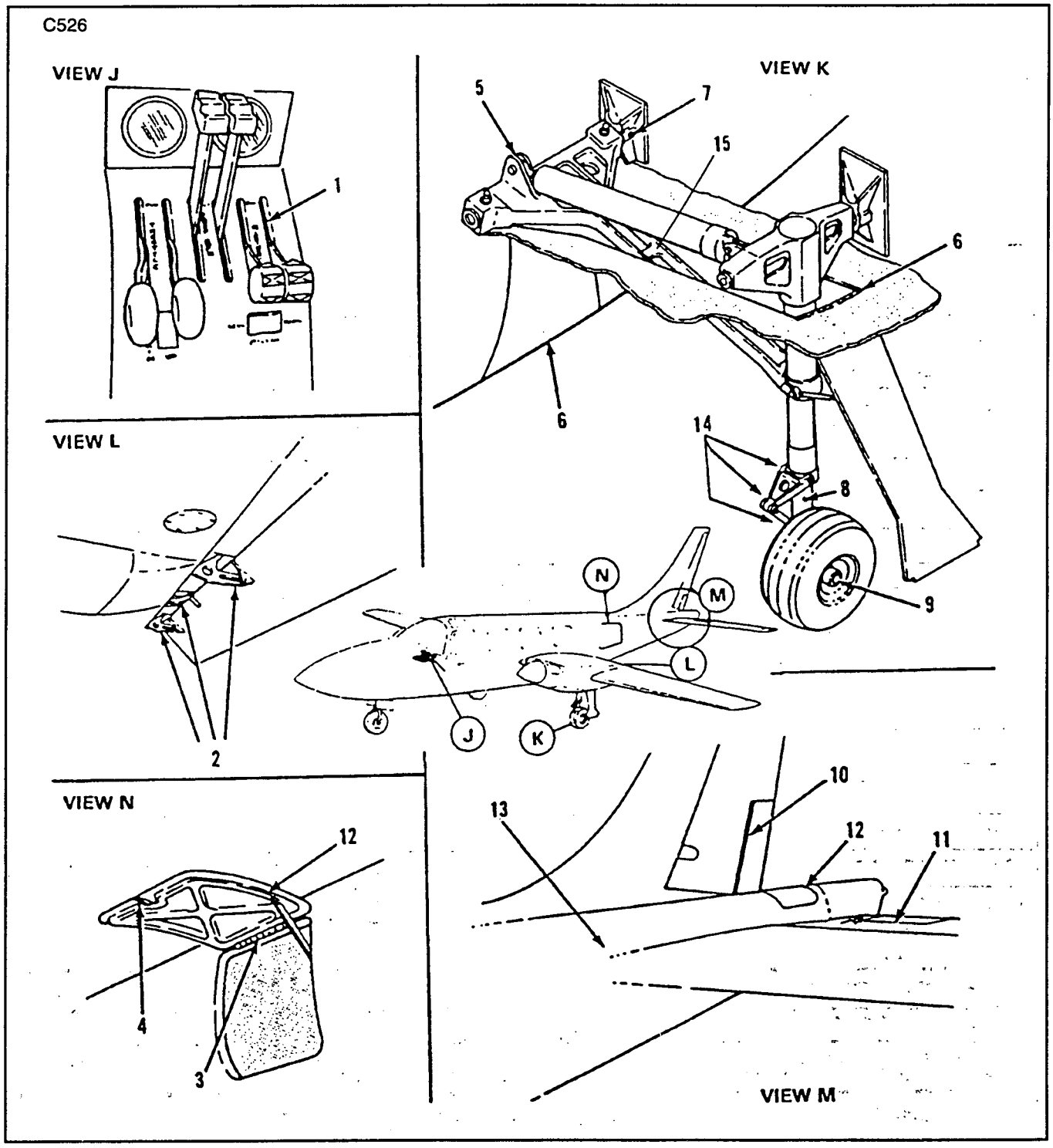

Figure 12-17. Lubrication Chart (Main Landing Gear, Flap Tracks, Doors, Trim Tabs and Console) (cont)

COMPONENT	LUBRICANT	FREQUENCY
1. TUBE GUIDE	SILICONE SPRAY	100 HRS
2. CONTROL COLUMN BEARINGS	MIL-G-81322	100 HRS
3. CONTROL COLUMN SLEEVE TRACK	SILICONE SPRAY	100 HRS
4. CONTROL COLUMN CHAIN	MIL-L-7870	500 HRS

Figure 12-18. Lubrication Chart (Flight Controls)

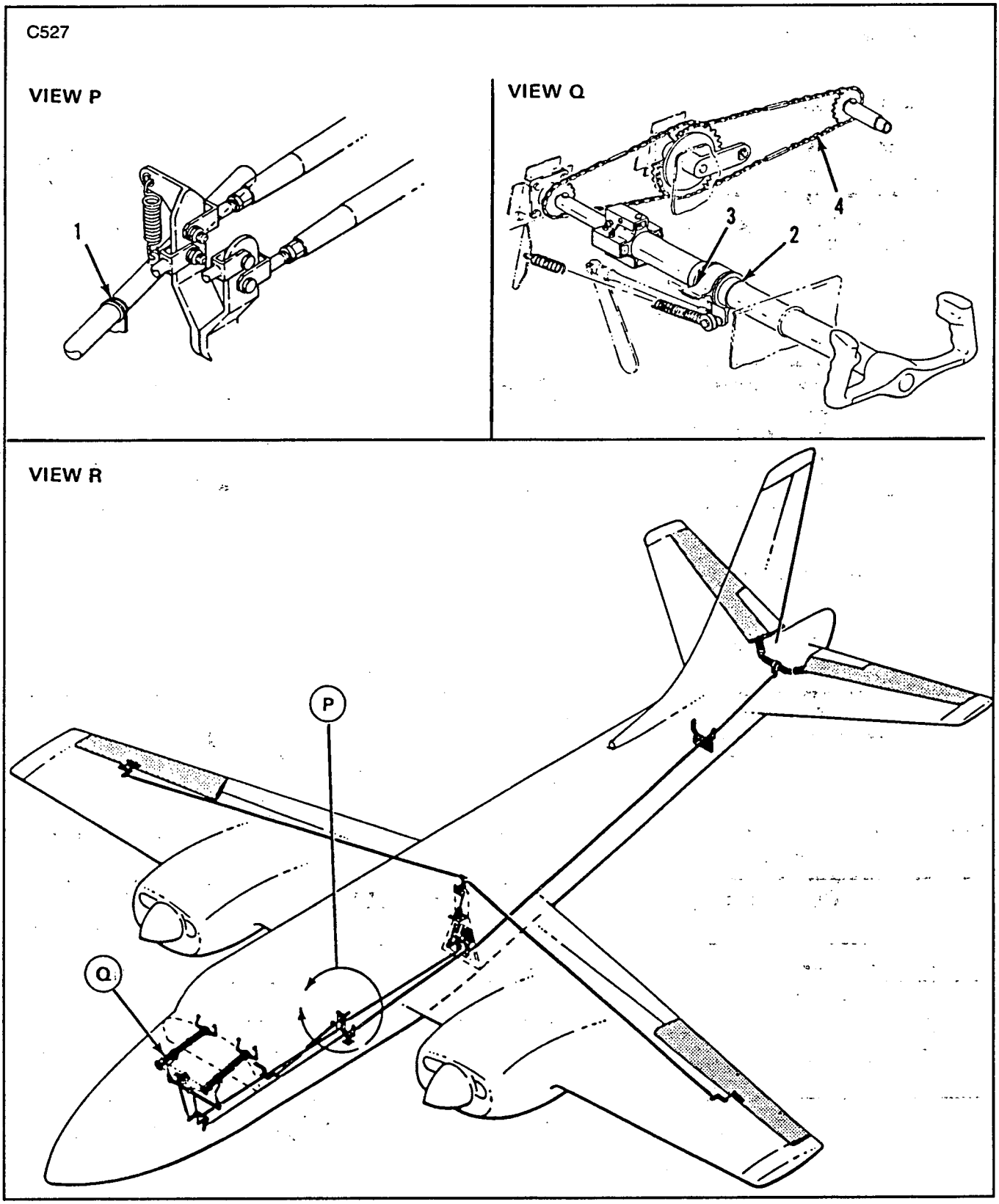

Figure 12-18. Lubrication chart (Flight Controls) (cont)

UNSCHEDULED SERVICING.

EXTERIOR CLEANING.

The painted exterior of a new airplane requires an initial curing period which may last as long as 90 days in cool, damp climates. During this curing period, special care should be taken to ensure the finish will not be dulled or scratched. After this initial period, normal cleaning and protection procedures may be observed.

During the initial paint curing period, it is advisable to keep the finish clean to avoid scratches caused by dirt on the paint surface.

— CAUTION —

Cover all vent ports and static ports prior to washing airplane.

1. Use a mild soap and water for washing.
2. Do not allow water to stand on the surface. Wash one area at a time and try to avoid water spotting.
3. Remove bug stains with a wet sponge or clean wet cloth. Do not use any abrasive cleaners.
4. Do not polish or wax the exterior finish during the first 90 days curing period because this would seal the paint from curing and could cause peeling later on in the life of the paint.
5. Do not rub or buff fresh paint because it is soft and subject to scratching and dulling.

CLEANING CURED OR AGED EXTERIOR FINISHES.

1. After the airplane finish is cured, it may be cleaned according to standard practices. See Figure 12-19, for suggested cleaners.

NAME	SOURCE
Aerowash A	Wyandotte Chemical Corp. 8921 Dick Road Los Nietos, CA
Laundry Detergent	Available Locally
Naphtha	Available Locally
Stoddard Solvent	Available Locally

Figure 12-19. Suggested Cleaners

— NOTE —

Washing solutions tend to remove lubricants from hinge joints and flap tracks. After washing, relubricate the affected hinge joints and flap tracks in accordance with the lubrication chart.

2. The airplane exterior finish should be waxed as often as necessary to maintain a coat of wax on the finish. Keeping the airplane waxed will aid in preventing corrosion, will lengthen the life of the paint, and in turn will greatly enhance the appearance of the airplane.
3. The frequency of waxing the airplane will depend to a large extent on whether the airplane is hangared, or parked on a ramp in the hot sun or other adverse weather conditions.
4. It is advisable to put an extra coat of wax on the leading edges of the wings, horizontal and vertical tail surfaces, the nose and the engine cowling to better protect these surfaces from gravel chips and insect stains.
5. Suggested waxes for polishing the airplane are listed in Figure 12-20.

	NAME	NUMBER	SOURCE
	Car Polish	Dupont 7	Locally Available
	Vista Car Polish	Simoniz	
	Turtle Wax Car Polish		
	Slipstream Aircraft Wax	7-1419	
	Raindance Car Wax	Dupont	Locally Available

Figure 12-20. Suggested Polish and Wax

CLEANING WINDOWS AND WINDSHIELD.

1. The plexiglass windows and windshield should be kept clean and waxed at all times. See Figure 12-21 for suggested wax.

	NAME	NUMBER	SOURCE
	Plastic Polish	MGH-10	Irvine, CA 92664
	Meguair's Mirror Glaze		Mirror Bright Polish Co., Inc.

Figure 12-21. Suggested Plastic Polish

A. It is preferable to use mild soap and plenty of water to wash the exterior windows when possible.
B. Always remove excess dust and grit with a wet or damp turkish towel before applying polish.
C. Use a dry, soft turkish towel to apply plexiglass cleaner - wax.

— NOTE —

Do not use wax if there is a possibility of using alcohol deice system. Wax will smear and induce glare.

D. Wipe with clean soft turkish towel.

2. Stubborn grease and oil deposits may require the use of kerosene or naphtha to remove.
   A. Moisten a soft cloth with either of these solvents and rub the stain until removed.
   B. After using solvent (kerosene or naphtha) clean with mild soap and water, rinse in clear water, and wax the window per Paragraph C on previous page.
3. Avoid the use of certain liquids in cleaning plexiglass. These liquids may soften and dull the surface of the windows, cause crazing and generally damage the optical qualities. Some liquids to avoid are:
   A. Gasoline.
   B. Benzene.
   C. Acetone.
   D. Carbon Tetrachloride.
   E. Commercial glass cleaner.
   F. Alcohol.
4. Never wipe windows with a dry cloth. This could cause scratching from dust and dirt particles on the windows.
5. Never use windshield deice fluid to clean windows. In time, it may cause dulling and crazing. When deice fluid is used in flight it should be washed off with soapy water, rinsed with clear water and rewaxed as soon as possible after landing.

INTERIOR CLEANING.

The interior materials will last indefinitely if properly cleaned and cared for. There are many types of commercially available cleaners and treatments for materials that will help keep the interior looking new if the cleaners and treatments are properly used.

The materials used in the interior vary according to customers preference and therefore each airplane is likely to be unique in interior materials. Cleaning and preservation should not be attempted until it is determined what type materials are involved.

1. Some of the materials used in the interior are: dyed leather, vinyl, Royalite, painted Royalite, Acrilan carpet, Formica and crushed velvet.

The carpet and upholstery should be vacuumed as often as necessary to keep dirt from becoming imbedded.

Stains on the carpet and upholstery should be cleaned immediately to minimize the tending to "set" into the material.

The curtains may be removed periodically and dry cleaned commercially.

Always be sure to follow the directions on the container when using any commercial cleaner.

STORAGE.

If the airplane is to be stored for a significant period of time, certain precautions should be observed to ensure the airplane will not deteriorate during storage. The storage time periods of significance are 7 to 30 days, 30 to 90 days and over.

If the airplane is to be stored outside, adhere to parking and mooring practices, Chapter 10. Do not set the parking brake. Cover all fuselage air inlets. Install sun shields in the windows. (These shields are commercially available.)

1. Seven to 30 days.
   A Engines. (Refer to the latest revision of Avco-Lycoming Service Letter No. L180.)
2. 30 to 90 days.
   A. Engines. (Refer to the latest revision of Avco-Lycoming Service Letter No. L180.)
   B. Fuel Airplane.
      (1) Fill wing tanks to one inch below filler neck and fuselage tank to one inch below filler cap opening. Never leave the fuselage bladder tank empty when the airplane is inactive. It should stay "Wet" at all times.
   C. Batteries.
      (1) Disconnect batteries, charge them to "full charge.".
   D. Tires.
      (1) Reposition tires every 30 days to lessen tendency to "flat spot."
3. Ninety days and over. (Inactive airplane.)
   A. Engines. (Refer to the latest revision of Avco Lycoming Service Letter No. L180.)
   B. Engine fuel system.
      (1) Fill wing and fuselage tanks.
      (2) If storage lasts longer than 1 year, drain fuel tanks once each year and replenish.
      (3) Check for moisture condensation in fuel sumps every 90 days.
   C. Battery.
      (1) Disconnect batteries and remove from airplane, charge them fully and store them in a safe place.
      (2) Clean and preserve area in battery compartment.
   D. Tires.
      (1) Reposition tires every 30 days to avoid "flat spotting."

ICE AND SNOW REMOVAL.

Ice and snow removal should be done carefully to avoid damage to the airplane structure. Do not attempt to chip or break away ice that is stuck to the airplane. Ice must be allowed to melt or otherwise dissipate from the airplane either by using heat or chemicals.

1. Deicing Application.
   A. Follow the manufacturer's instructions closely for best results and economy. Deicing fluid must conform to Federal Specification TT-I-735.

— CAUTION —

If deice fluid is sprayed on windows or paint it must be washed off immediately with soap and warm water.

   B. Light ice or frost may be removed by a warm solution of diluted deicing fluid.
   C. Apply deicing fluid by using a spray gun.
   D. If brake freeze-up is encountered from ice forming after airplane has been parked on the ramp, the following items may be accomplished to remove the ice.
      (1) Use a ground heater.

(2) Spray alcohol deicer on brakes.

— CAUTION —

Exercise care if the airplane is sitting on ice or parked near other aircraft.

(3) Avoid spraying deice fluid on wheel bearings. Cycle the brakes asymmetrically while applying engine power.

2. Snow removal.

A. Snow is best removed by sweeping or brushing it from the airplane structure. Be careful not to scratch the plexiglass windows when removing snow from the airplane.

B. Deicing fluids should not be used for removing snow.

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Chapter 20

CHAPTER

20

STANDARD PRACTICES/ AIRFRAME

CHAPTER 20 - STANDARD PRACTICES / AIRFRAME

TABLE OF CONTENTS/EFFECTIVITY

CHAPTER 20 - STANDARD PRACTICES / AIRFRAME

TABLE OF CONTENTS/EFFECTIVITY

GENERAL.

This chapter contains general information pertaining to standard aircraft hardware installation and removal practices. The information included will be very helpful if it is referred to on a regular basis.

For standard repair practices of a minor nature, refer to AC43.13.

If repairs dictate Non-Destructive Testing (N.D.T.) after repair such as welding, magnaflux should be used on materials made from 4130 steel such as engine mounts and seat frames.

Testing and inspecting of aluminum castings and machined aluminum parts may be accomplished by the dye penetrant method.

Usually, a good visual inspection with 10X magnifying glass will show any damage or defect in a repair that is of a significant nature.

STANDARD PRACTICES - AIRFRAME.

CHERRYLOCK RIVETS, REMOVAL. (Refer to Figure 20-1.)

Should it be necessary to remove an installed cherrylock rivet, the following procedures are recommended.

1 In thick material remove the lock by driving out the rivet stem, using a tapered steel drift pin (See View 1.)

— NOTE —

Do not drill completely through the rivet sleeve to remove a rivet as this will tend to enlarge the hole.

2. If the rivets have been installed in thin sheets, driving out the locked stem may damage the sheets. It is recommended that a small center drill be used to provide a guide for a larger drill on top of the rivet stem, and the tapered portion of the stem be drilled away to destroy the lock (See Views 2 and 3).
3. Pry the remainder of the locking collar out of the rivet head with the drift pin (See View 3).
4. Drill nearly through the head of the rivet, using a drill the same size as the rivet shank. (See View 4).
5. Break off rivet head, using a drift pin as a pry (See View 5).
6. Drive out the remaining rivet shank with a pin having a diameter equal to the rivet shank. (See View 6).

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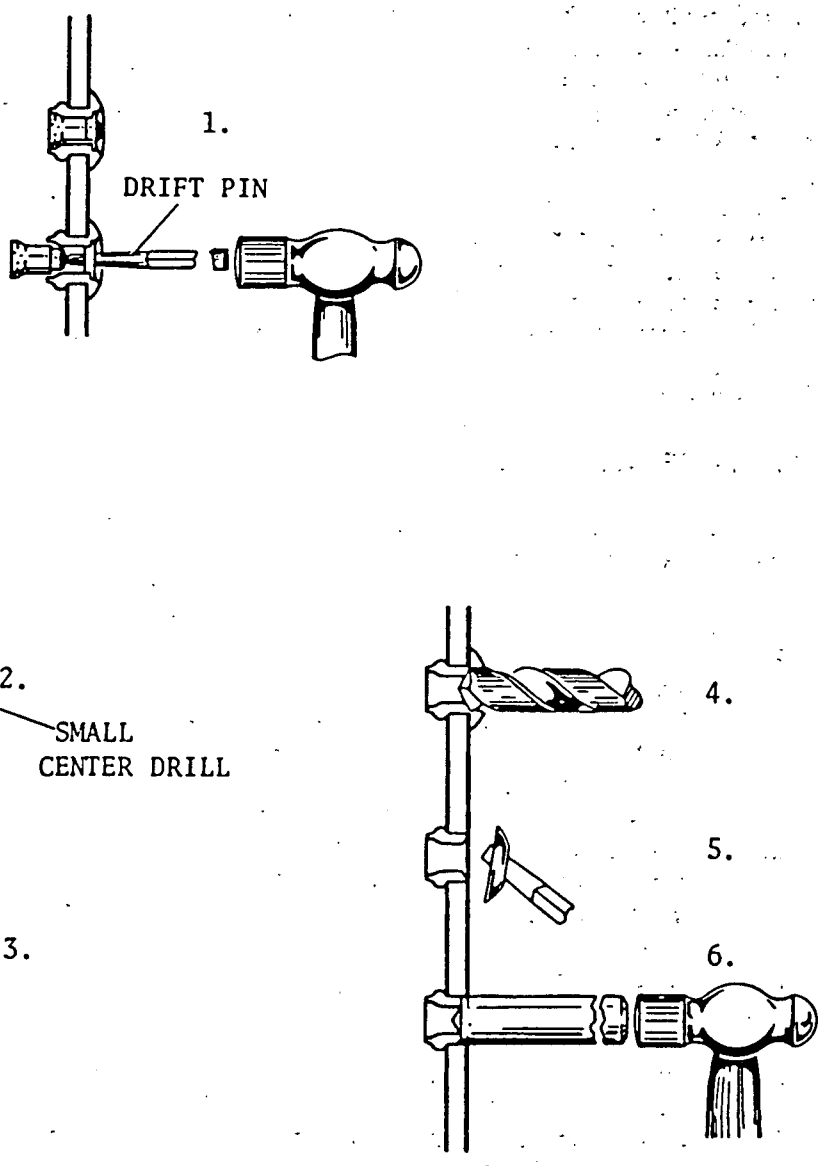

Figure 20-1. Cherrylock Rivet Removal

IDENTIFICATION OF FLUID LINES. (Refer to Figure 20-2.)

Fluid lines in aircraft are often identified by markers made up of color codes, words, and geometric symbols. These markers identify each line's function, content, and primary hazard, as well as the direction of fluid flow.

In most instances, fluid lines are marked with 1-inch tape or decals. Paint is used on lines in engine compartments where there is the possibility of tapes, decals, or tags being drawn into the engine induction system.

In addition to the above-mentioned markings, certain lines may be further identified as to specific function within a system; for example, DRAIN, VENT, PRESSURE or RETURN.

Lines conveying fuel may be marked FLAM; lines containing toxic materials are marked TOXIC in place of FLAM. Lines containing physically dangerous materials, such as oxygen, nitrogen, or freon, are marked PHDAN.

The aircraft and engine manufacturers are responsible for the original installation of identification markers, but the aviation mechanic is responsible for their replacement when it becomes necessary.

Generally, tapes and decals are placed on both ends of a line and at least once in each compartment through which the line runs. In addition, identification markers are placed immediately adjacent to each valve, regulator, filter or other accessory within a line. Where paint or tags are used, location requirements are the same as for tapes and decals.

FLARELESS-TUBE ASSEMBLIES. (Refer to Figure 20-3.)

Although the use of flareless-tube fittings eliminates all tube flaring, another operation, referred to as presetting, is necessary prior to installation of a new flareless-tube assembly which is performed as follows:

1. Cut the tube to the correct length, with the ends perfectly square. Deburr the inside and outside of the tube. Slip the nut, then the sleeve, over the tube (Step 1).
2. Lubricate the threads of the fitting and nut. See Figure 20-3 for proper lubricant to use, depending on the type system the tubing assemblies are to be used on. Place the fitting in the vise (Step 2), and hold the tubing firmly and squarely on the seat in the fitting. (Tube must bottom firmly in the fitting.) Tighten the nut until the cutting edge of the sleeve grips the tube. This point is determined by slowly turning the tube back and forth while tightening the nut. When the tube no longer turns, the nut is ready for final tightening.
3. Final tightening depends upon the tubing. For aluminum alloy tubing up to and including 1/2-inch outside diameter, tighten the nut from one to one and one-sixth turns. For steel tubing and aluminum alloy tubing over 1/2-outside diameter, tighten from one and one-sixth to one and one-half turns.

After presetting the sleeve, disconnect the tubing from the fitting and check the following points (illustrated in Step 3):

1. The tube should extend 3/32 to 1/8 inch beyond the sleeve pilot; otherwise blowoff may occur.
2. The sleeve pilot should contact the tube or have a maximum clearance of 0.005 inch for aluminum alloy tubing or 0.015 inch for steel tubing.
3. A slight collapse of the tube at the sleeve cut is permissible. No movement of the sleeve pilot, except rotation is permissible.

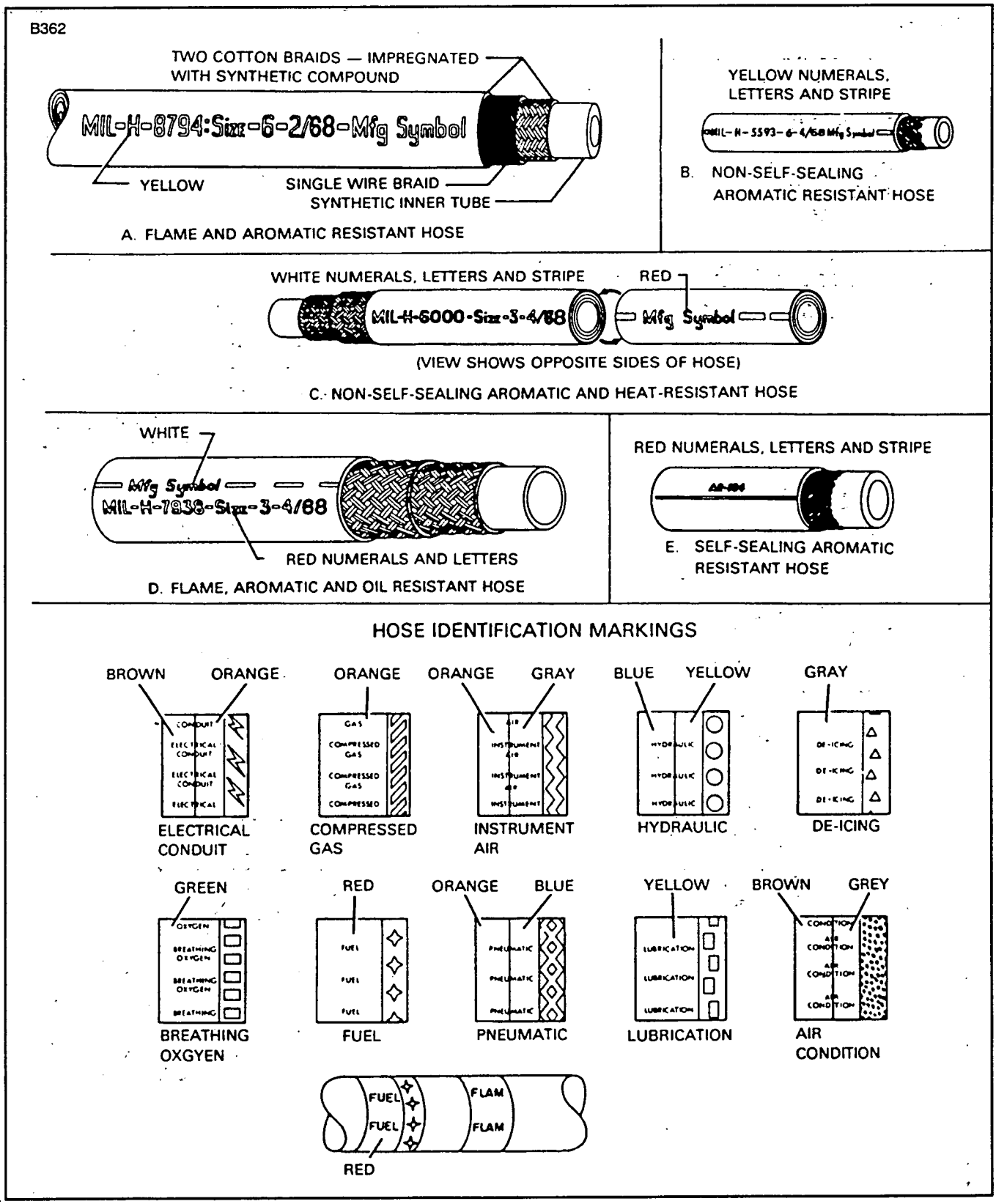

Figure 20-2. Hose/Line Markings

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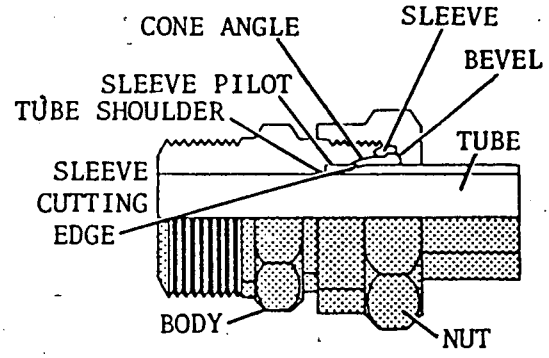
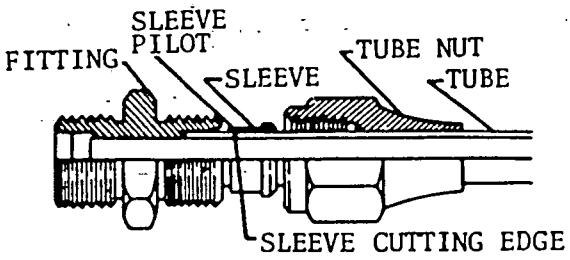
TUBING SYSTEM	LUBRICANT
HYDRAULIC	MIL-H-5606
FUEL	MIL-H-5606
OIL	System Oil
PNEUMATIC	MIL-L-4343
OXYGEN*	Teflon Tape

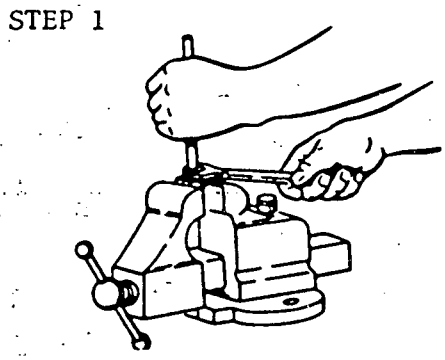
*CAUTION-DO NOT USE OIL OR GREASE

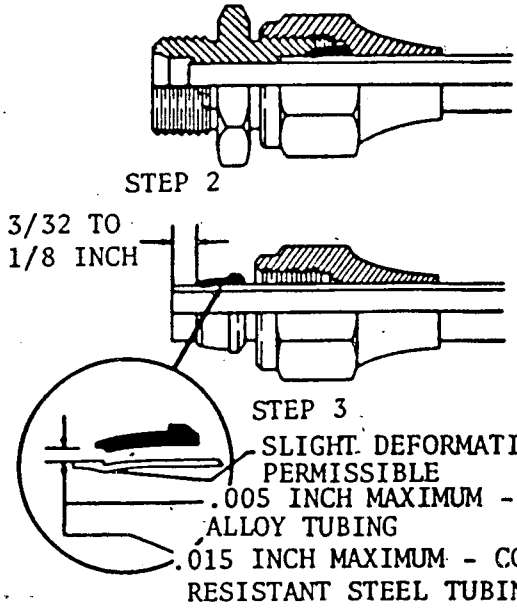
TUBING AND HOSE LUBRICANTS



FLARELESS-TUBE FITTING







PRESETTING FLARELESS-TUBE ASSEMBLY

Figure 20-3. Flareless-Tube Fittings

SUPPORT CLAMPS.

Support clamps are used to secure the various lines to the airframe or powerplant assemblies. Several types of support clamps are used for this purpose. The rubber-cushioned and plain are the most commonly used clamps. The rubber-cushioned clamp is used to secure lines subject to vibration; the cushioning prevents chafing of the tubing. The plain clamp is used to secure lines in areas not subject to vibration.

A teflon-cushioned clamp is used in areas where the deteriorating effect of Skydrol 500, hydraulic fluid (MIL-H-5606) or fuel is expected, however, because it is less resilient, it does not provide as good a vibration damping effect as other cushion materials.

Use bonded clamps to secure metal hydraulic, fuel and oil lines in place. Unbonded clamps should be used only for securing wiring. Remove any paint or anodizing from the portion of the tube at the bonding clamp location. Make certain that clamps are of the correct size. Clamps or supporting clips smaller than the outside diameter of the hose may restrict the flow of fluid through the hose.

All plumbing lines must be secured at specified intervals. The maximum distance between supports for rigid fluid tubing is shown in Figure 20-4.

TUBE O.D. (IN.)	DISTANCE BETWEEN SUPPORTS (IN.)	
	ALUMINUM ALLOY	STEEL
1/8	9-1/2	11-1/2
3/16	12	14
1/4	13-1/2	16
5/16	15	18
3/8	16-1/2	20
1/2	19	23
5/8	22	25-1/2
3/4	24	27-1/2
1	26-1/2	30

Figure 20-4. Maximum Distance Between Supports for Fluid Tubing

ITEM TO BE ELECTRICALLY BONDED	MAXIMUM ALLOWABLE RESISTANCE VALUE IN OHMS
Static Wicks	.0005
Starter/Alternator to Engine	.0025
Ground Return to Primary Structure	.0025
Instruments	.0100
Battery to Primary Structure	.0025
Radio Racks to Primary Structure	.0025
R.F.I. Noise Filters	.0025

Figure 20-5. Maximum Allowable Resistance Values

ELECTRICAL BONDING.

Aircraft electrical bonding should be accomplished or verified to establish a maximum allowable resistance value. See Figure 20-5 for values.

All electrical/electronic equipment and components shall be installed in such a manner as to provide a continuous low-resistance path from the equipment enclosure to the airplane structure.

Parts shall be bonded directly to the primary structure rather than to other bonded parts.

All parts shall be bonded with as short a lead as possible.

All bonding surfaces shall be cleaned prior to the installation of the bonded joint.

All nuts used in bonding shall be of the self-locking type, (Do not use fiber-locking type).

All electrical bonding shall be accomplished without affecting the structural integrity of the airframe.

Bond connections shall be secure and free from corrosion.

Self-Tapping Screws will not be used for bonding purposes.

WELDING OF AIRFRAME COMPONENTS.

Various components of the airplane are welded, furnace brazed or silver brazed. Before attempting a weld repair, it must be definitely established as to what kind of weld method was used on the part at factory assembly. The welder making repairs must be able to properly identify the type of welding process previously used on the specific part. Some of the processes are as follows:

1. Heli-Arc (T.I.G.) - used on engine mounts, turbocharger brackets, seat parts, and other parts made from 4130 steel. Induction air boxes, vent scoops, fuel line tubing and other parts made from 6061-TO aluminum. Exhaust stacks and waste gates, parts made from 300 series stainless steel. Exhaust stacks and tail pipes are made from inconel.
   A. Welding Rod used in Heli-arc welding
      (1) Aluminum - 4043 Alloy
      (2) Stainless - 347 or 302 Alloy
      (3) 4130 Steel - 4130
      (4) Oxweld 65 - AWSE70S2
      (5) Tungsten electrodes used in Heli-arc welding are 2% thoriated for steel and stainless steel and Pure Tungsten for aluminum.
      (6) Inconel - 617 alloy
2. Wirefeed (M.I.G.) - used on seat frames and certain other parts made from 4130 steel.
3. Silver Brazing - Oxy-Acetylene heat source - used on stainless steel fuel screens for silver brazing and pitot static electrical connections for silver brazing.
      (1) Silver Solder - Alloy 1010
4. Furnace Brazing or dip braze - used on brake fluid reservoirs, hydraulic reservoirs and other parts made from 6061-TO aluminum.

Castings of aluminum are not considered weldable. Crystallization of the weld can take place after welding.

— NOTE —

There is an approved process for repairing by welding of the nose gear strut assembly. Contact Aerostar Customer Service for specific information.

The aluminum skin and other aluminum structure is made of 2024-T3 or T4 aluminum which is not weldable. Cracks will develop during and after welding.

If a question arises as to the integrity of a part repaired by welding, it would be advisable to replace the part with a new one. All parts for the entire airframe are available from Aerostar dealers.

Oxy-Acetylene welding is not recommended on any airplane part. The weldable components were not designed for oxy-acetylene welds and therefore the designed strength of any part would be reduced if oxy-acetylene welding is used.

SEALANTS.

This section contains the general procedures and requirements pertaining to sealants used on the airplane.

1. Sealants Per MIL-S-8802, Class A & B:
   Goal Chemical Sealants Corp., GC-408A and 408B
   Coast Pro-Seal, 890A and 890B
   Products Research and Chemical Corp., PR1422A and 1422B
   Chem Seal Corp., C.S. 3204A and C.S. 3204B

2. Coating Per MIL-S-4383: (Fill and Drain).
   Goal Chemical Sealants Corp., GC-3001
   Products Research and Chemical Corp., PR-1005-L
   Coast Pro-Seal, 444 R
3. Coating per MIL-C-27725
   Products Research and Chemical Corp., PR1560 MC
4. Sealant Repairs/Flexible Surface Fill & Contour
   Chem Seal Corp., C.S. 3205
   Products Research and Chemical Corp., PR1435, PR1435G
5. Faying Sealant, General Purpose, other than fuel
   Products Research and Chemical Corp., PR1431 G
6. Sealant Per MIL-S-38249, Type 1, Sealing Compound-Firewall:
   Products Research and Chemical Corp., PR812
7. Sealant Per MIL-S-7502:
   EC 801 A and B (Rubber to Metal Application Only)
8. Tools and Equipment
   A. Freezer - 42°F Max 70% continuous duty cycle. (For frozen sealant storage only).
   B. Freezer Thermometer - accurate to within ± 5°F in working range. (For use with item A above.)

— NOTE —

In lieu of B above a combination temperature gauge with high temp indicator (or alarm) could be used.

   C Solvent dispensers (Plunger cans or PVC squirt bottles).
   D. Methyl-Ethyl-Ketone (MEK per TT-M-211) or 1,1,1-Trichloroethane, inhibited.
   E. Paint stripper, "All-Pro Aircraft" - Frazee Paint Products, or Leeder Chemical Co. 161 stripper.
   F. Leak Detector solution: "Leak-Tech", "Sherlock" or liquid household detergent soap and water mixture.
   G. Sealing gun, Semco Model 250 or equivalent.
   H. Gun Nozzles and Nozzle extensions, various sizes.
   I. Nylon sealing brushes - various sizes and lengths.
   J. Inspection mirrors with extension handles.
   K. Flash lights (Explosion proof).
   L. Assorted fairing tools; plastic or wood spatulas; plastic or wood scrapers.
   M. Cheese cloth tack rags (to collect chips).
   N. Parting agent type gel (fluorocarbon or silicone spray or gel).
   O. Heating lamps - clamp-on type, 100W (provide 120°F Max.).
   P. Thermometer for use with oven, range up to 255°F. Accurate to within ± 5°F.
   Q. Hand cream for sealant removal.
   R. Shop coats, plastic gloves, aprons, PVC face shields.
   S. 2" X 2" metal coupons.
   T. Shore durometer, "A" scale.
   U. Clean, dry, lint free white cotton cloth.
   V. Oven, electric, capable of control in 100 -125°F range.
   W. Scotchbrite, type A, very fine; 3M Company.
   X. Chromate Primer per MIL-P-8585, TT-P-1757 or MIL-P-23377.
   Y. 20-131 Black, Acid Resistant Spray, Tempo Products Co., Cleveland, Ohio; Bostick-Finch 443-3-17 (Black) Acid Resistant Paint; or PPG "Coal Cat" Epoxy Black UC-40101 Acid Resistant Paint. (For use with Acid sealing only.)

Sealing operations should be well planned in advance. It is always difficult to correct damaged or omitted sealing.

Only fresh mixed sealant shall be used; therefore, it is important that only amounts that can be used within the pot life be mixed at any one time.

The following practices should be followed during storage, handling, mixing and applying sealants and solvents.

1. Keep all sealant and solvents away from heat*, sparks and flame. Exercise same precautions as with any flammable material (*except during controlled accelerated sealant curing).
2. Avoid breathing vapors from solvents and sealants - work only in well ventilated areas.
3. Avoid direct skin contact with both materials by wearing protective gloves, aprons, face shields, or safety glasses.
4. After direct skin contact with either material, wash skin thoroughly in warm water and mild detergent.
5. If solvents contact eyes, immediately flush eyes with water, do not rub.
6. Refer to Figure 20-14 for sealant mixing ratio chart.

LEVELS OF SEALING.

The word "opening" as used in this section applies to faying edges, joggles, holes, porosity, points, fasteners, and all other apertures through which air would escape if the vessel in question were pressurized.

1. Absolute Sealing
   - A. All seams or openings providing an external leak path must be 100% sealed by application of faying, fillet, brush coat or filled and drain coating. All fasteners are to be installed wet, except for threaded fasteners attaching to sealed dome nuts. The interior side of all fasteners shall be brush top coated.
2. Extensive Sealing
   - A. Primary structure attaching to skin such as frames, longerons, bulkhead flanges, skin lap joints, etc., must be faying sealed.
   - B. Rivets through faying sealed joints need not be installed wet, or brush coated providing they are installed within the application time of the sealant (i.e. the sealant is still wet).
   - C. Faying sealed joints are not required to be fillet and brush coat sealed except for structural subassemblies such as cabin doors, emergency exits, telescoped tubular joints, and end bulkheads consisting of flange-web-stiffener assemblies.
   - D. All threaded fastener installations must be brush coated over the face inside the sealed vessel, unless they screw into sealed type dome nuts. Dome nuts which are not of the O-ring type must be faying surface and fillet sealed to seal both the attaching rivets and the dome nut.
   - E. All rivets installed through faying sealed surfaces which have been cured, must be dipped in sealant prior to installation or brush coated after installation.
3. Intermediate Sealing

All openings providing an external leak path must be sealed per 2., except as follows:

- A. If mating surfaces are fillet sealed, rivets must be installed either wet or brush coated after installation. If mating surfaces are faying sealed (regardless of cure state of sealant) rivets do not need to be wet or brush coated.

4. Limited sealing

Only holes such as joggles, slots, tooling holes, etc., need to be sealed. Mating joints and fasteners do not require sealing.

TYPES OF SEALING.

1. Fuel Sealing
   - A. The ABSOLUTE level of sealing should be used in liquid fuel areas and INTERMEDIATE level in fuel vapor areas.
   - B. Materials to be used for all fuel sealing must conform to the requirements of Figure 20-13.
     - (1) Refer to Cleaning for all pre-step procedures.
     - (2) Refer to Sealant Materials for sealing materials.
     - (3) Refer to Sealing Techniques for sealing techniques.
     - (4) After sealant has become tack-free, apply class A topcoating over fillets and fasteners.
2. Pressure Sealing
   - A. The EXTENSIVE level of sealing shall be used in pressure areas.
   - B. Materials used for sealing rivets, windows, bulkheads, electrical bundles, and all areas classified as pressure sealed will use material per Figure 20-13.
   - C. Application
     - (1) Refer to Cleaning for all pre-step procedures.
     - (2) Refer to Sealant Materials for sealing material.
     - (3) Refer to Sealing Techniques for sealing techniques.
     - (4) Sealing of typical electrical installations is illustrated in Figure 20-6.
3. Weather Sealing
   - A. The INTERMEDIATE level of sealing shall be used in weather sealing areas.
   - B. Materials used for weather sealing shall be per Figure 20-13.
   - C. Application
     - (1) Refer to Cleaning for all pre-step procedures.
     - (2) Refer to Sealing Techniques for sealing techniques.
4. Duct Sealing
   - A. The INTERMEDIATE level shall be used in duct sealing.
   - B. Material that shall be used for all high temperature sealing (not exceeding 275°F) shall be per Figure 20-13.
   - C. Application
     - (1) Refer to Cleaning for all pre-step procedures.
     - (2) Refer to Sealing Techniques for sealing techniques.
5. Acid Sealing
   - A. The ABSOLUTE level shall be used in acid areas.
   - B. Materials used for all acid sealing shall be per Figure 20-13. Application of Chromate primers and acid resistant top coat paint is required.
   - C. Application
     - (1) Refer to Cleaning for all pre-step procedures.
     - (2) Refer to Sealing Techniques for sealing techniques.
6. Sealant Use - Filling and Contouring External Skin Areas.
   - A. Prior to the application of the airplane external paint scheme, PRC1435 or CS3205 may be used to achieve aerodynamic smoothness around the external joints of the windshield, pressurized cabin area, wing fairing and other areas subject to some normal service flexture. Prior to sealant application rough up surfaces with 100 grit sand paper.

— NOTE —

These areas are not to be filled with body fillers as they normally cure out rigid and may crack when flexed.

The applicable surface cleaning requirements of Cleaning shall apply, except that wetting and abrading sealed skin joints with solvent shall be avoided.

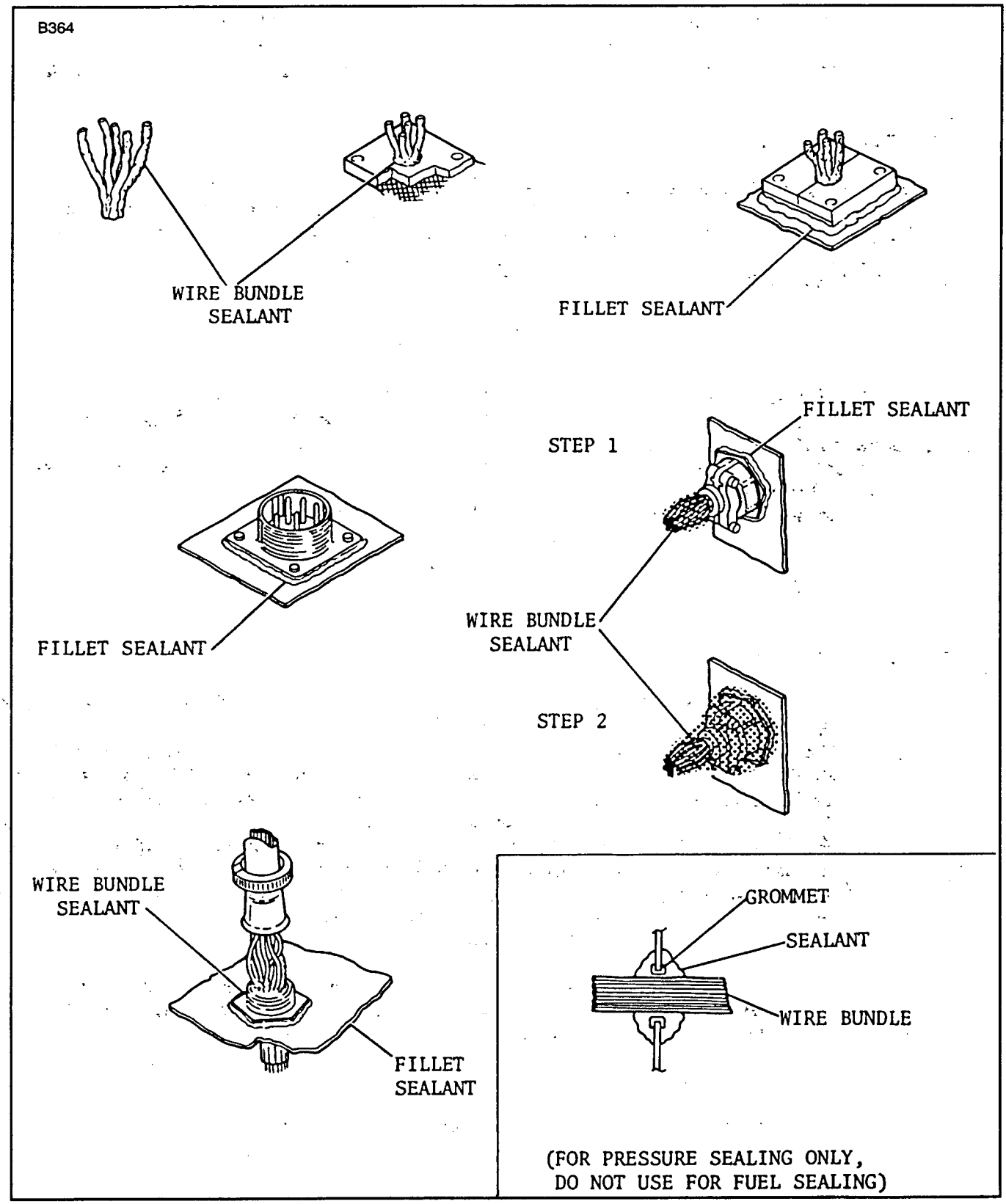


Figure 20-6 Sealant Application - Wire Bundles and Connectors

B. The amount and thickness of the applied sealant shall be the minimum necessary to achieve smooth contours. Avoid air bubbles in mixing and application.

C. After the material has hardened, it shall be sanded to obtain a smooth external contour.

SEALANT MATERIALS.

Refer to Figure 20-13 for sealant application versus sealant use.

The different work lives of the sealants are designated by the dash numbers. For example, MIL-S-8802 material, Type A-4 designates a 4-hour work life brushable sealant at 77°F, and 50% relative humidity. (R.H.)

Unless otherwise defined by the manufacturer, the expiration date from date of manufacturer for frozen activated MIL-S-8802 material shall be determined from the following information.

14 days at - 20°F
28 days at - 40°F
56 days at - 60°F
112 days at - 80°F

See NOTE of the section titled Inspection for shelf life requirements on materials.

Type "A" material may be applied as long as it is brushable. When the material becomes too thick to brush, discard and start with newly mixed material.

The approximate time required for MIL-S-8802 sealants to cure to Shore "A" durometer of 20 (5 second reading at 77°F ± 2°F and relative humidity of 50% ± 5% are shown below:

Type A-1	20 hours	Type B-1	15 hours
A-2	30 hours	B-2	24 hours
A-4	36 hours	B-4	30 hours

See Figure 20-14 for sealant mixing ratios.

CURING OF SEALANTS.

1. After application of sealant, protect assemblies from contamination until tack-free time has elapsed.
2. The following table shall be used to determine pot life, tack-free time and to predict cure time for MIL-S-8802 sealants. These times are based on 50% relative humidity. It should be noted that low humidities greatly increase the tack-free and curing times but not the pot life. See Figure 20-7.
3. For MIL-S-4383 Coatings, cure by air exposure at room temperature until all solvent vapors are exhausted and coating is firm. Cure for 6 hours at 75°F or 3 hours at 100°F. No hardness test required, however, material shall have uniform adhesion and shall not rub off under moderate pressure.

— NOTE —

If this material is used as a fill and drain coating, ventilate the tank as soon as possible after draining. Condensing solvent can wash the coating off the sides of the structures.

SEALANT CLASS	POT LIFE HOURS	TACK-FREE TIME-HOURS	CURING TIME HOURS @75°F	ACCELERATED CURETIME - HOURS	
A-1/2	1/2	16	48	12	10
A-2	2	40	72	30	24
B-1/2	1/2	16	48	12	10
B-2	2	40	72	30	24
B-4	4	45	90	36	30

	TYPE I	TYPE II	TYPE III	TYPE IV
Application Life	12 hours	24 hours	40 hours	48 hours
Assembly Time	20 hours	80 hours	120 hours	168 hours
Cure Time in Faying Surface To Shore "A" 40	8 days @ 75°F or 24 hrs. @ 75°F plus 24 hrs. @ 130°F	10 days @ 75°F or 24 hrs. @ 75°F plus 48 hrs. @ 130°F	30 days @ 75°F or 24 hrs. @ 75°F plus 96 hrs. @ 130°F	40 days at 75°F or 24 hrs. @ 75°F plus 120 hrs. @ 130°F

Figure 20-7. Sealant Curing Information

4. For MIL-C-27725 coating, cure at room temperature for 1 hour for tack-free condition; cure for 10 days at 75°F for complete cure. Accelerate to complete cure at 225°F for 20 minutes. No hardness test required, however, material shall have uniform adhesion and shall not rub off metal surface when rubbed with moderate pressure with MEK solvent.
5. PR1435 - The following curing data is applicable to this material:
   Minimum application life - 15 minutes 75°F, 50% R.H.
   Maximum tack-free time - 8 hours 75°F, 50% R.H.
   Maximum cure time to Shore "A" 30 - 24 hours 75°F, 50% R.H.
   Maximum cure time to Shore "A" 35 - 48 hours 75°F, 50% R.H.
6. PR1431G - The curing data, Figure 20-7 is applicable to this material. This material is only used for faying surface sealing; and, therefore, material cured for curing time tests and for all performance tests must be cured while completely covered with polyethylene film to prevent atmospheric conditions from interfering with curing mechanism.

7. PR812 cures chemically and by solvent release. Length of cure depends on air circulation and temperature. A fillet 1/8 thick will cure to a tough rubber in approximately 72 hours at 75°F and should be conditioned before subjecting to a temperature of 400°F by allowing to cure approximately two weeks at 75°F or by heating to 120°F to 140°F for six hours to completely evaporate all solvent. Application life at 75° is eight hours in closed containers. In open containers it should be used in approximately two hours.
8. Class A and B-2 will cure to Shore "A" 40 hardness in approximately 44 hours. It will be tack-free in approximately 24 hours. Ultimate cure requires about one week at 77°F, 50% relative humidity.

APPLICATION OF SEALANTS.

CLEANING.

1. When cleaning, use 1,1,1 trichlorethane as the preferred solvent over MEK unless it is not available. Always use adequate ventilation when using solvents.
   A. Cleaning is the most critical operation in the sealing process; therefore, all areas to be sealed must be thoroughly cleaned immediately prior to application of sealant.
   B. Remove all chips, burrs, filings, dust or other foreign material by vacuuming.
   C. Using a plastic scraper, remove all material that was applied during earlier sealing operations.
   D. Using paint stripper, remove all visible primer or paint from fuel sealing areas; chromate primer on non fuel areas is acceptable and should not be removed.
   E. Remove all cutting fluids, preservatives, lubricants, identification and inspection stamp dyes or inks from areas to be sealed.
   F. Apply solvent from polyethylene bottle and scrub the areas to be sealed with a stiff bristle brush. Assure all blind rivets to be used in the wing fuel tanks have been previously solvent cleaned.

   — NOTE —

   Some contaminates are more soluble in water than solvent. Water may be used like a solvent; however, actual solvent cleaning must always follow water cleaning.

   G. Wipe away the solvent with a clean, dry, soapfree, solvent cleaned, lint-free cotton cloth immediately after brushing to prevent evaporated and redepositing of dirt.
   H. Blow out crevices and openings that cannot be dried with a cloth using clean, dry filtered air. Be sure to use eye shields.
2. Final Cleaning.
   A. Final cleaning is necessary to remove fingerprints, dust or dirt that may have accumulated after initial cleaning has been accomplished. Final cleaning shall be accomplished not more than one hour before sealing. If sealing will not be done immediately, the cleaned parts shall be covered until sealing is started.
   B. Dampen a clean, lint-free white cotton cloth with solvent and thoroughly clean a small area. Immediately wipe dry with another clean, dry lint-free white cloth. Do not allow solvent to run onto previously cleaned areas. Change both cleaning and wiping cloths frequently to maintain cleanliness.
   C. All surfaces to be sealed must be absolutely clean, dry and free from all condensed moisture. If necessary, the surfaces may be dried using heat lamps or clean, dry hot air. The surface temperature must not exceed 120°F.

SEALANT PREPARATION.

1. Mix accelerator into base compound in proportions as specified by manufacturer or Figure 20-14. Hand stirring is acceptable, however, mechanical stirring is preferred. Avoid entrapping air during the mixing procedure. Mix until no specks or streaks are visible.
2. Test to determine that the base compound and accelerator are thoroughly mixed.
   A. Spread a small amount of sealant from the mix on a sheet of white bond paper, making a very thin film of sealant.
   B. Visually examine the sealant film for the presence of small accelerator particles. If particles persist after mixing for six minutes, discard the batch.
3. Where large quantities of sealant are required, mix only an amount that can be used within the pot life of the compound.
4. Discard any sealant that has exceeded its pot life.
5. The pot life for sealants per MIL-S-8802 is shown in Figure 20-7.
6. Prior to using any sealant, spread a thin film of material on a clean, dry surface. Visually inspect the material for proper wetting of the surface. Discard any material that does not wet the surface properly since it has exceeded pot life and will not adhere. An additional test that is easily seen before wet-ability is one of dimensional memory. Draw a spatula across the surface and if the material springs back toward its former shape, it is past using. This would apply to sealant intended for filleting. Remember, if borderline materials are used, there may not be time to tool it.
7. For MIL-S-4383 coatings, prepare for fill and drain use by diluting (1) part of sealant to (2) parts of Methyl-Ethyl-Ketone (MEK). When flow-out characteristics are reduced, due to the evaporation of the solvent when applying from open containers, additional MEK may be added.

SEALING TECHNIQUES.

1. The general sequence with which to apply sealants is:
   A. Pre-pack seals.
   B. Faying Surface seal.
   C. Injection seal.
   D. Fillet seal.
   E. Fastener fillets for brush-on top coat.
2. Faying Surfaces.
   A. The sealant shall be applied to one surface with a sealing gun or spatula and spread out with a spatula or similar tool. The sealant shall cover the entire faying surface area, approximately 1/32 thick.
   B. The sealant shall completely fill the space between the surfaces. When the surfaces are fastened together, a small excess of sealant shall be extruded continuously along the joint. The extruded sealant shall be faired out with a fairing tool, leaving a smooth fillet along the joint, or remove excess sealant leaving an indicating bead. See Figure 20-8.
   C. Removable seals shall be obtained by the use of a parting agent. A light application of silicone or flourocarbon type parting agent may be applied to the opposite surface. When the parting agent is dry to the touch, the parts may be assembled. Assembly shall be performed within the sealant's application time. If one faying surface is acrylic, apply the parting agent to the non-acrylic surface. If the part is removed, the sealant shall be removed and resealed as above. See Step 9, for molded sealant applications in wing fuel cell area.

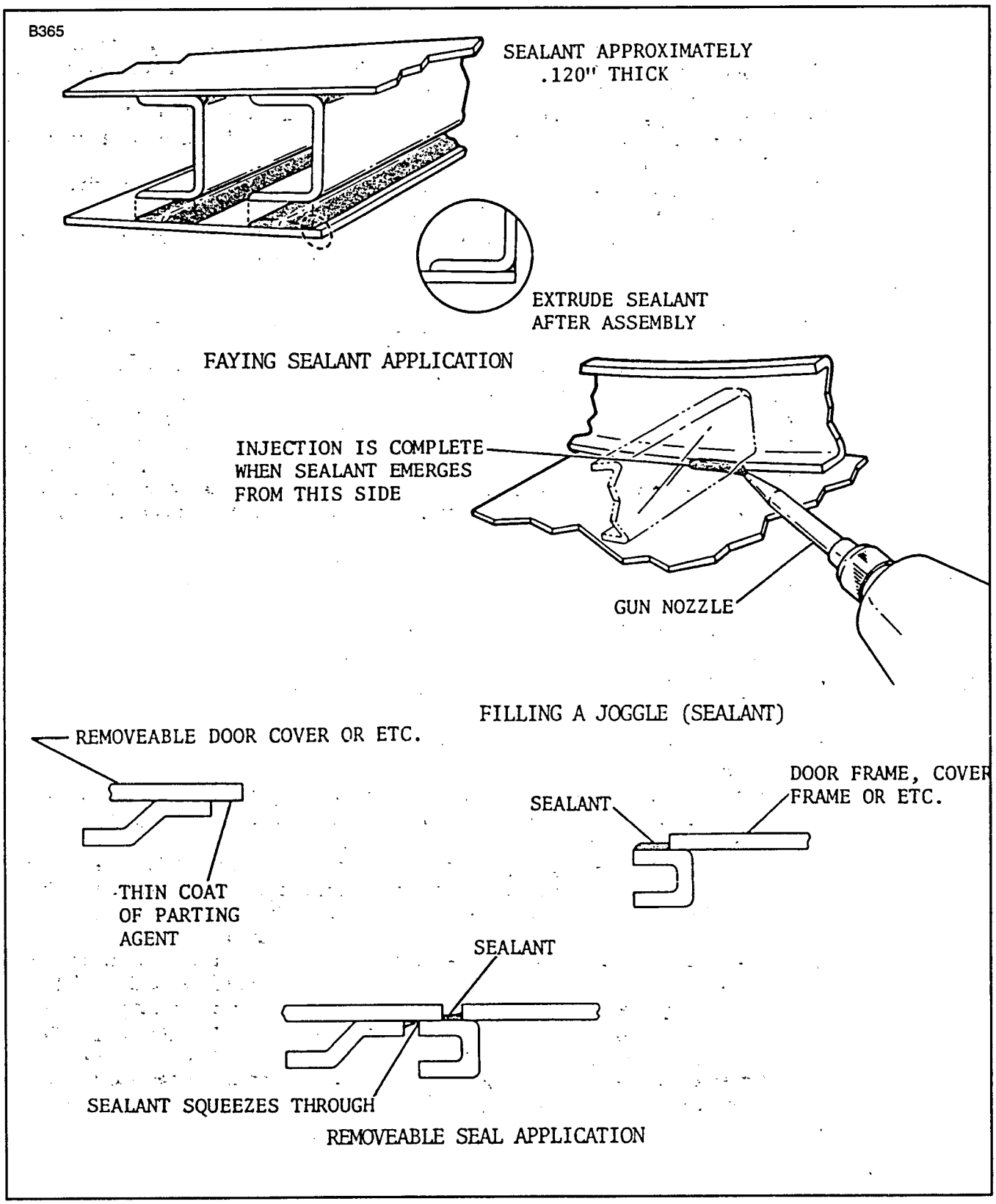


Figure 20-8 Sealant Applications

D. If fasteners must be sealed, their installation shall be complete within the pot life of the sealant. If permanent fasteners cannot be installed, use temporary fasteners (wingnut, clecos or bolts) to hold the parts firmly together until the sealant has cured. Removal of each individual fastener (temporary) shall be immediately followed by installation of a permanent fastener. Fresh sealant shall be applied either in the hole or on the shank of the fastener.

E. Seals requiring continuity of seal and block-off seals require complete filling of holes and joggles. Force sealant into one end of the cavity or injection hole, if provided with a sealant gun, until the sealant emerges from a prescribed opening or opening for continuity of seal; all other openings may be blocked off until injection is completed. (See Figure 20-9). Injection sealing should be accomplished as soon as possible after installation of parts before voids can be contaminated with dirt and chips.

(1) When an opening is to be closed only for support of sealant, it is not necessary to inject the entire depth of the opening.

(2) When a seal is made at the bottom of a slot, the sealant shall be applied so as to fill and have continuous contact with the bottom and sides of the slot. (See Figure 20-9).

3. Hole Filling.

A. Hole filling compound is normally applied to the pressure side of the hole as shown in Figure 20-9. This method is to be used only for weather sealing, or low pressure air ducts. For fuel or pressurized systems appropriate plug rivets or patches must be used.

B. Compound shall be applied with a spatula or sealing gun; pack in compound firmly and feather out all contrasting surfaces.

C. Large slots and holes may be backed with masking tape to prevent excessive extrusion of sealant providing the tape is removed after the compound has cured.

D. All tool and coordination holes in absolute sealed areas shall be sealed by plugging with either AN-470A or AN-470AD type rivets.

E. In absolute sealed areas, rivets shall be overcoated with the "A" type sealant.

4. Fillets.

A. In Figure 20-10, placement, shape and size of freshly applied fillets are shown.

— NOTE —

It is important that these requirements be met for sealant applications in the fuel tanks because irregular contouring of sealant can result in sealant removal due to the wear from the sloshing action of the fuel over a period of time.

B. Application shall be made with a sealing gun. The nozzle tip shall be pointed into the seam and shall be maintained nearly perpendicular to the line of travel. A bead of sealant shall be forced ahead of the nozzle tip.

C. Fillets shall be worked onto the surface with fairing tools or gun nozzles. Air bubbles shall be minimized as much as possible by fairing. Nozzle tips or fairing tools shall be used to shape and smooth the fillet.

— NOTE —

Acid sealing; after cured to a tack-free condition, the area shall be finished with acid resistant lacquer as required per the section titled Types of Sealing, Paragraph 5, B.

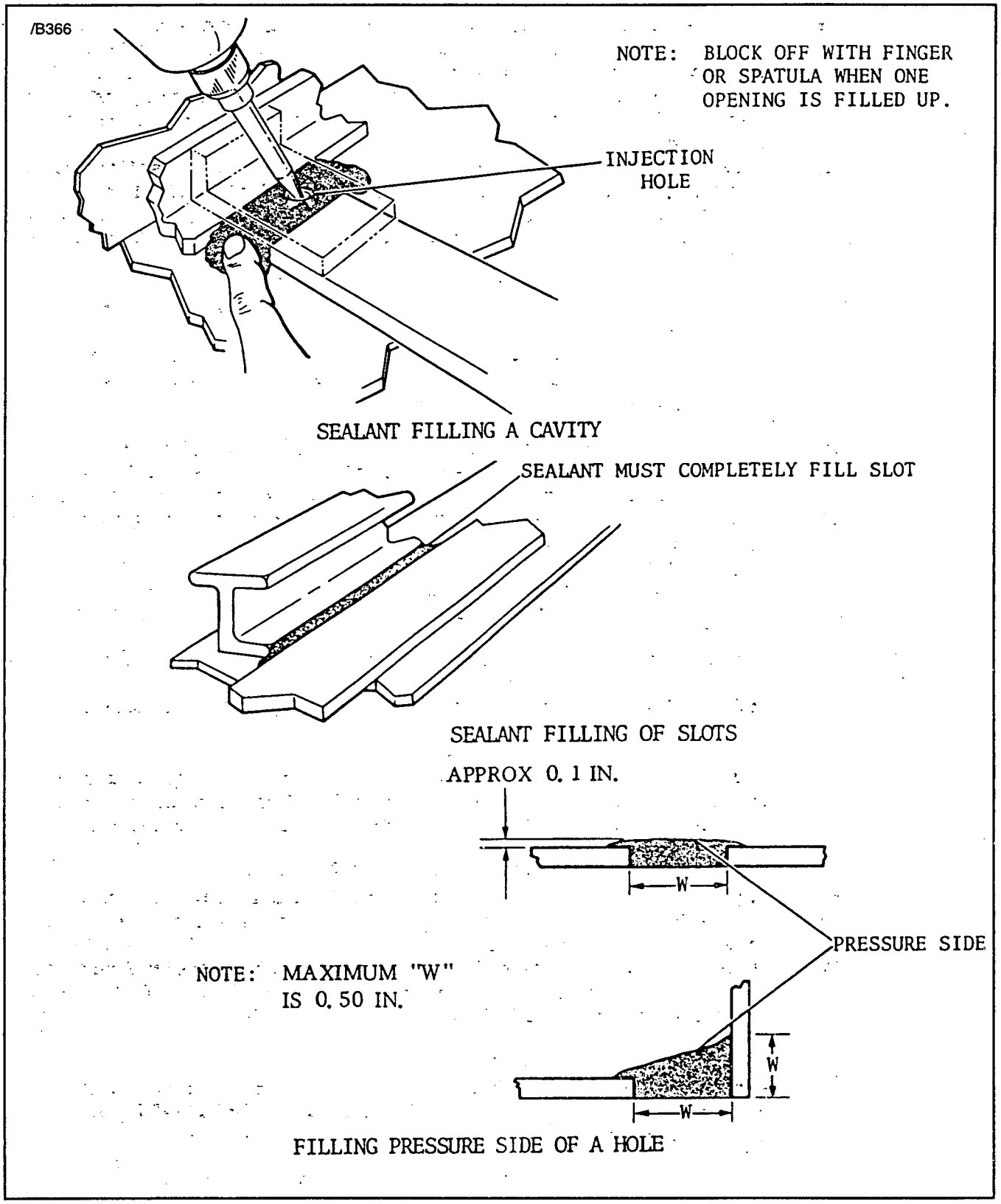


Figure 20-9. Sealant Filling of Cavities

5. Fasteners
   A. Fasteners installed through a faying surface well within the work life of the sealant need no further sealing.
   B. Fasteners installed through a faying surface after the sealant's work life has been exceeded and fasteners installed through a seal plane where no faying surface sealant is used shall be sealed by one of the following methods:
      (1) Apply class A or B sealant to the fastener or hole at installation. Figure 20-10. No gaps shall be visible around the fastener or hole after installation. Be sure to remove any cured or partially cured sealant from the hole before installing fastener.
      (2) Brush the fastener with class A or B sealant after installation. Figure 20-10.
      (3) Fillet around the fastener after installation. Figure 20-10. The fillets shall be applied with a sealant gun and worked with fairing tools to minimize air bubbles.
6. Spray Sealing.
   A. Spray a smooth, uniform coating of Class "A" sealant per MIL-S-8802 using a Binks 18 spray gun (or equivalent) fitted with a 63A needle and 63PB air nozzle at 50 psi atomization pressure and 1 to 5 psi fluid pressure.
7. Rework.
   A. Rework of damaged, faulty, or undersize fillets still within the work life shall be repaired by either of the following methods:
      (1) Removing damaged fillets and applying new sealant material.
      (2) Additional material and working of fillet with a fairing tool.
   B. Rework of damaged, faulty or undersize fillets exceeding the work life shall be repaired by either of the following methods:
      (1) The sealants shall be completely removed or notched in the affected areas to produce solid residual material. (Figure 20-11).
      (2) Cutting tools shall not be made from materials harder than 2024-T3 aluminum alloy. Steel cutting tools are not allowed.
      (3) Inspect rework area for clean cuts and adequate notching for access. Loose chunks or flaps of sealant or cut areas shall be removed.
      (4) Clean per the section titled Cleaning.
      (5) Fillet per the section titled Sealing Techniques, Paragraph 4.
   C. Undersize Fillets
      (1) Clean sealant and surrounding area per the section titled Cleaning.
      (2) Apply additional sealant and fair on to existing sealant fillet.
   D. Quick rework shall be accomplished as follows:
      (1) Quick rework shall be accomplished by using one-quarter hour work life material and following the same procedures as in 7.B. above. See Figure 20-13 for material.
8. Fill and Drain Fuel Sumps.
   A. Mask areas not to be sealed (i.e. valve seating areas, threaded holes) using approved masking materials. Masking is optional for areas from which the coating can easily be removed with MEK after curing.
   B. Fill cavity with MIL-S-4383 coating per the section titled Sealant Preparation, Paragraph 7 and allow to set for 10 to 15 minutes. Apply 3-4 psi air pressure for 10 - 15 minutes to force sealant into casting pores.
   C. Drain excess coating from cavity.
   D. Cure coating film per the section titled Curing of Sealants, Paragraph 3.
   E. Refill cavity with MIL-S-4383 coating per the section titled Sealant Preparation, Paragraph 7 and drain immediately.
   F. Cure according to the section titled Curing of Sealants, Paragraph 3.

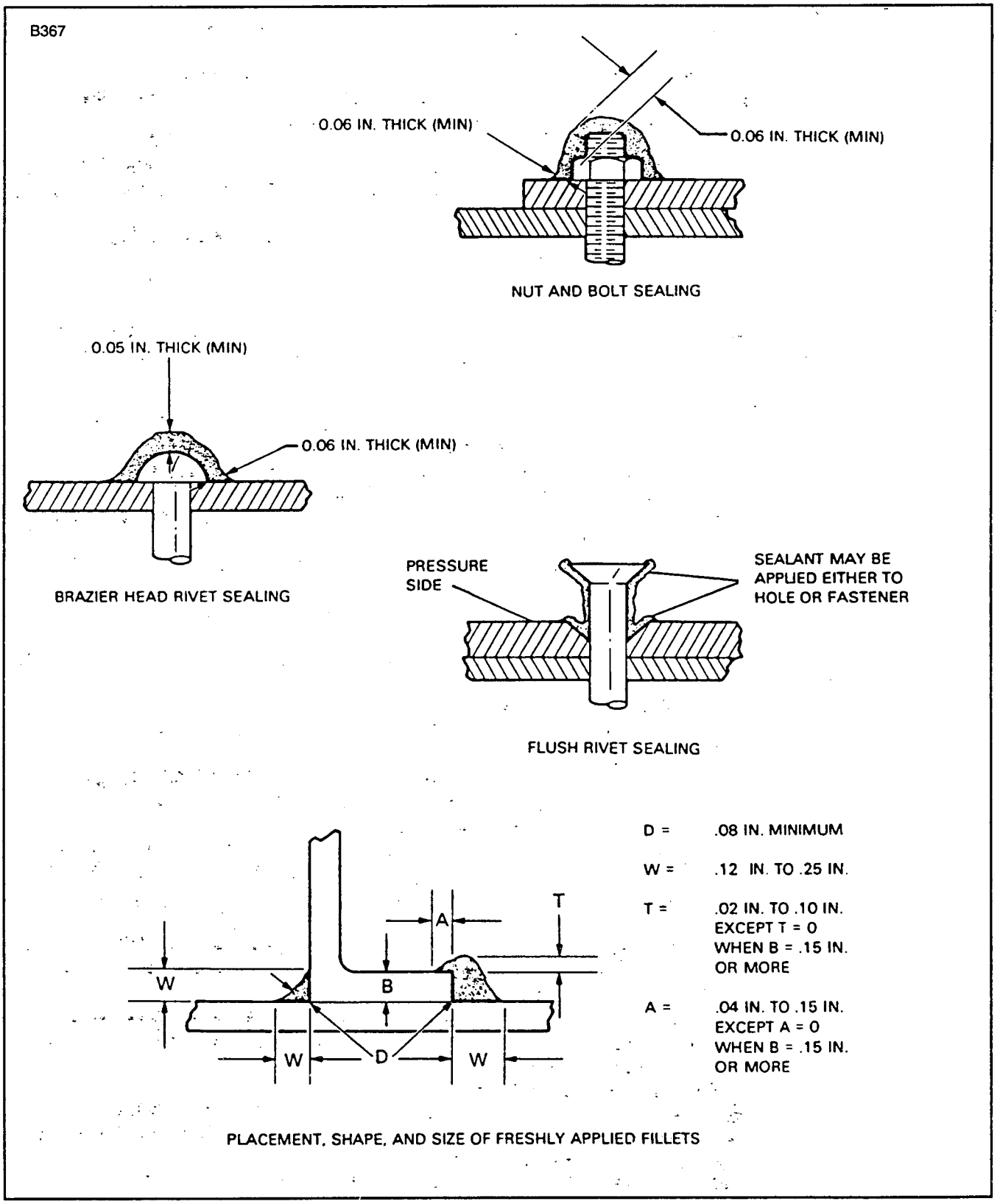


Figure 20-10. Fillets, Rivets, Nuts and Bolts Sealing

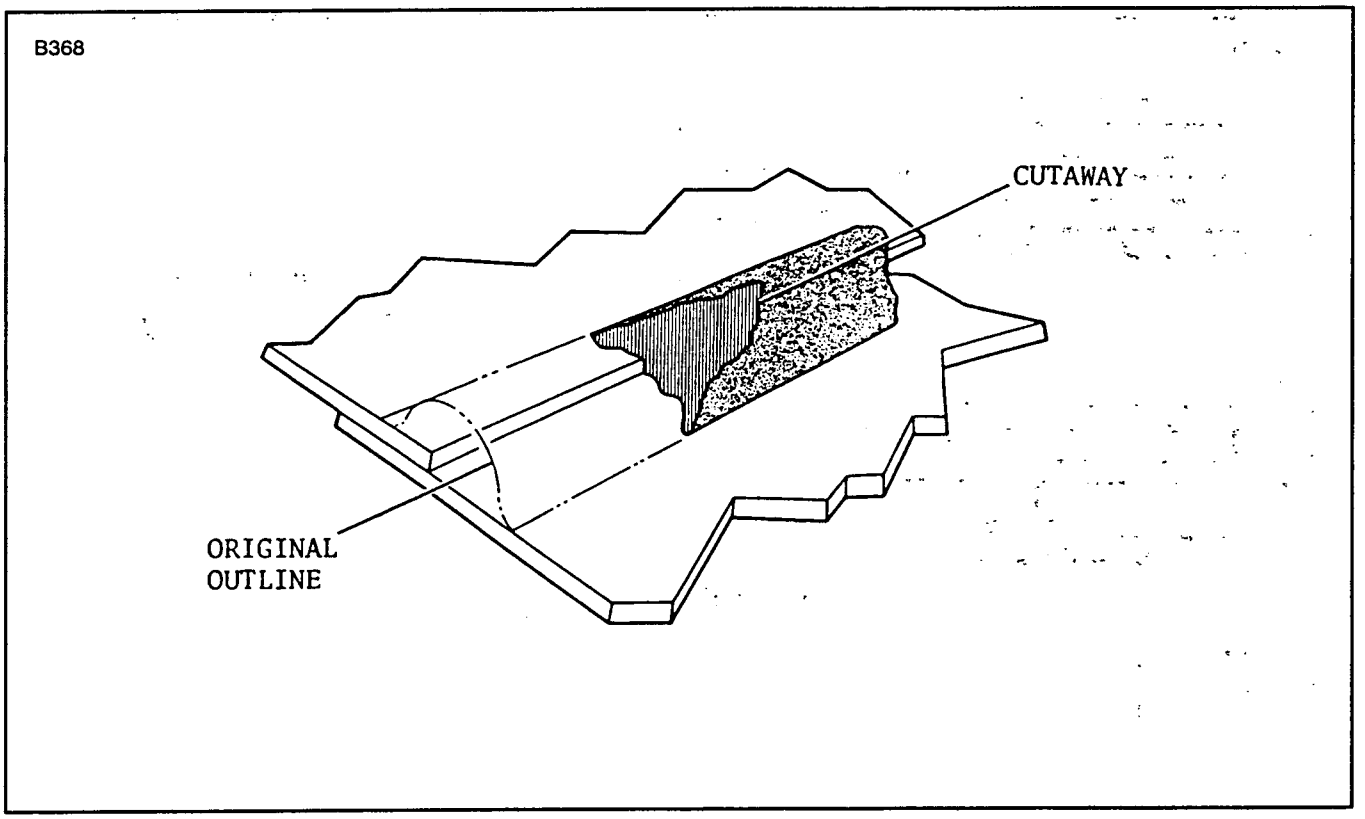


Figure 20-11. Rework of Damaged or Faulty Fillet

9. Molded Sealant (Wing fuel tank only)
   A. When required to mold "ramps" to fill large flat areas with sealant in order to preclude nonusable fuel entrapment, the following requirements shall be met:
      (1) Clean polyethylene or teflon molds shall be used to form sealant to desired shapes. Only fluorocarbon type parting agents are to be used as required.
      (2) MIL-S-8802 class "A" or "B" shall be used.
      (3) Sealant poured into molds will be tooled to remove air bubbles and provide flat, smooth surfaces even with mold shape.
      (4) Molded sealant shall cure in place by natural curing or accelerated curing. Accelerated curing may be accomplished in an oven up to 120°F (see Curing of Sealant).
      (5) After curing and removal of molded sealant, a hardness test of the material shall indicate shore "A" 40 minimum across the thickest cross section.
      (6) After careful removal from the mold every effort shall be used to ensure that the material is kept free of contamination, especially body oils due to handling. Clean plastic gloves should be used. Do not bend molded sealant as it easily cracks and is unacceptable.
      (7) Clean the surfaces (per Cleaning) which are to be in contact with the sealant molds.
      (8) When installing molded sealant into wing areas, the requirements for faying, filleting and brush coating shall apply.

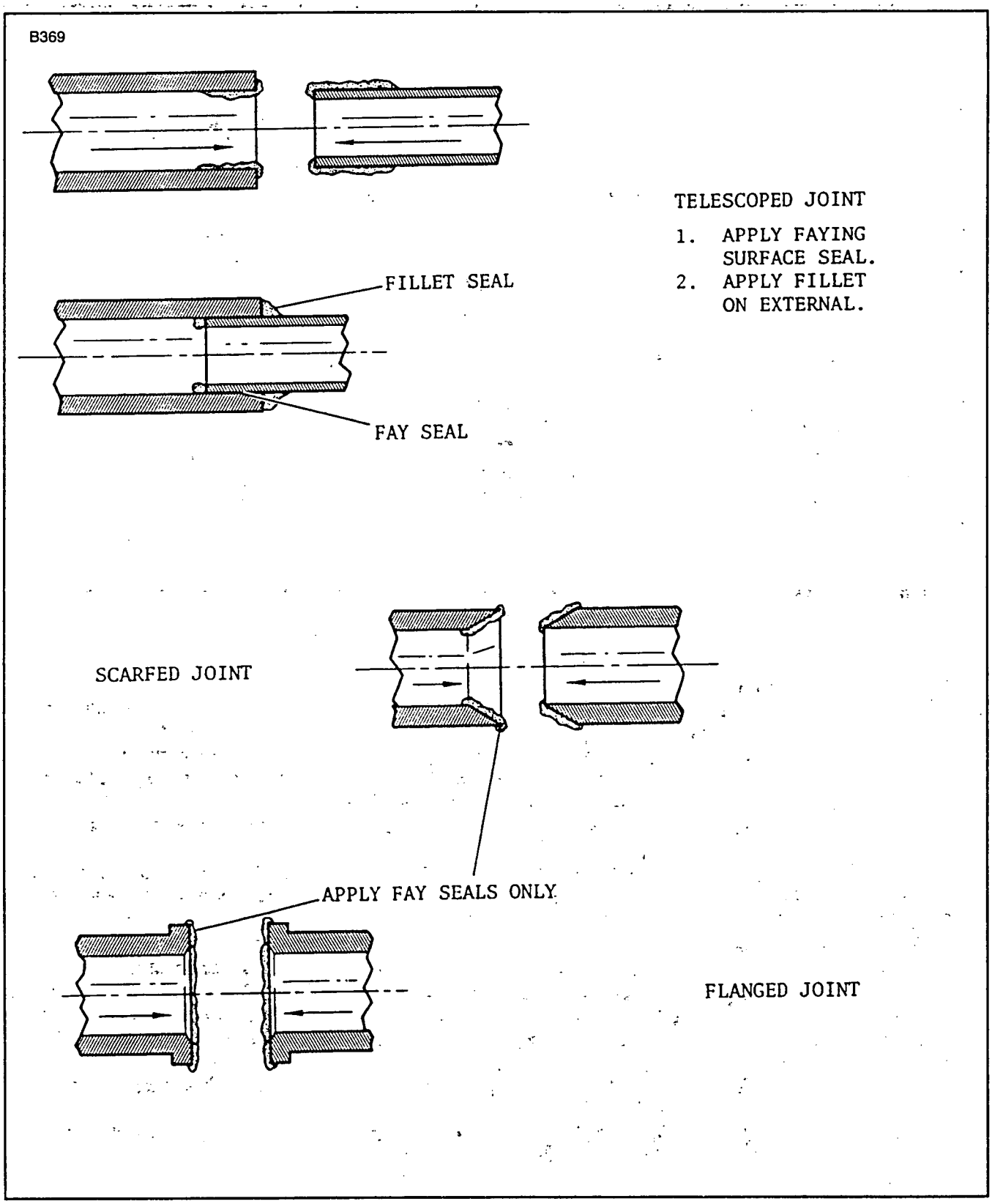


Figure 20-12. Duct Sealing Methods

10. Firewall Sealing
    A. Thorough mixing of PR812 is required. If mixing difficulty is encountered due to viscosity add MEK as required to facilitate thorough mixing. This will not affect the high temperature characteristics of the material.
    B. Firewall flange and nacelle to be sealed must be Scotchbrite abraded and thoroughly cleaned with MEK and white rags. See Figure 20-15 for area to be sealed.
11. Deice Boot Sealing
    A. EC 801 B-2 is used to seal the edges of the deice boots. Refer to deice boot manufacturer instructions for proper application of sealant.

LEAK AND PRESSURE TESTING.

1. For fuel vessels, at the same time the sealant is applied to the fuel tank, prepare a test specimen of aluminum about 2" x 2". Apply sealant to test specimen and cure under same conditions as fuel tank. After cure, use a Shore (A scale) hardness tester. The minimum hardness shall be Shore A20.
2. Inspect interior of tank for proper application of sealant.
3. Close all openings of the vessel using leak-proof closures as required.
4. Conduct pressure test per Chapter 28.
5. If repair is required, accomplish according to this procedure and retest.
6. All openings must be covered to prevent contamination of interior.

INSPECTION.

Inspect seal for continuity, reasonable size of fillets, and adhesion of seals. Check adhesion of fully cured seals by rubbing edge of sealant with a rubber eraser (durometer 60 or less).

Rags or towels to be used should be soapfree, solvent cleaned, white only, and shall not contain any sealant or foreign material.

— NOTE —

Shop towels are not acceptable because they have naphtha residue. Unmixed two part sealant materials should not be used after the manufacturer's recommended expiration date. The shelf life of frozen activated sealants shall not be extended beyond manufacturer's recommended use date.

Visually inspect the exterior of sealed vessels to verify the complete removal of pressure test fluids and water. The interior must also be inspected prior to closing access openings to ensure it is clean, free of contamination and hanging pieces of sealant that may come loose in service.

All two-part sealants (frozen and unfrozen) should be tested on a batch basis upon receipt but prior to stocking for use. A sample of the sealant should be mixed and applied at least 3/8" thick to a clean metal coupon. The sample shall be identified as to Mfg., type, class, batch number and date of manufacture. The sample test shall assure the wetting qualities and cure time versus Shore "A" hardness is within spec for that sealant.

NOTE
Refer to the Aerostar Parts Catalog for Part Nos. of Sealant Kits.

APPLICATION	PR1422B, CS3204B Pro-Seal 890B GC-408B	GC-408A PR1422A, CS3204A Pro-Seal 890A	PR1500L or Pro-Seal 444R	PR1560MC	PR1431G	PR1435, PR1435G CS3205	EC801	PR812	
Fuel Tank - Molded Sealant	X	X							
Fuel Tank - Fillet & Faying	X	X							
Fuel Tank - Top Brush Coat	X	X							
Fuel Tank - Access Covers (Surface)				X					
Fuel Tank - Access Covers O-Ring Seal			X						
Fuel Tank - Sump Fill & Drain			X						
Fuel Tank - Repair, Fillet Only							X		
Pressure Sealing - Fillet & Faying	X	X							
Pressure Sealing - Faying Only						X			
Pressure Sealing - Repair							X		
Weather Sealing - Fillet & Faying	X	X							
Weather Sealing - Faying Only						X			
Weather Sealing - Repair							X		
Duct Sealing - Fillet & Faying	X	X							
Duct Sealing - Faying Only						X			
Duct Sealing - Repair							X		
Acid Sealing - Fillet & Faying	X	X							
Acid Sealing - Repair							X		
Flexible Surface Fill - Contour							X		
De-Ice Boot Sealing - Fillet								X	
Firewall Sealing - Fillet & Faying									X

Figure 20-13. Application Vs. Material Use

FAYING		BRUSH COAT				DEICE BOOTS		FIREWALL	
PRC 1431 & 1431G		PRC1422A-2 CS3204A		PRO-SEAL 890A		EC-801		PR812	
RATIO 15:1		RATIO 10:1		RATIO 10:0.9		RATIO 10:1		RATIO 100:1	
GRAMS SEALANT	GRAMS HARDENER	GRAMS SEALANT	GRAMS HARDENER	GRAMS SEALANT	GRAMS HARDENER	GRAMS SEALANT	GRAMS HARDENER	GRAMS SEALANT	GRAMS HARDENER
15	1	10	1	10	.9	10	1	100	1
30	2	20	2	20	1.8	20	2	110	1.1
45	3	30	3	30	2.7	30	3	120	1.2
60	4	40	4	40	3.6	40	4	130	1.3
75	5	50	5	50	4.5	50	5	140	1.4
90	6	60	6	60	5.4	60	6	150	1.5
105	7	70	7	70	6.3	70	7	160	1.6
120	8	80	8	80	7.2	80	8	170	1.7
135	9	90	9	90	8.1	90	9	180	1.8
150	10	100	10	100	9.0	100	10	190	1.9
165	11	110	11	110	9.9	110	11	200	2
180	12	120	12	120	10.8	120	12	210	2.1
195	13	130	13	130	11.7	130	13	220	2.2
210	14	140	14	140	12.6	140	14	230	2.3
225	15	150	15	150	13.5	150	15	240	2.4

Figure 20-14. Sealant Mixing Ratio

FILLET & FAYING				FILLING AND CONTOUR			
PRC 1422B2		CS3204B		PRC 1435		CS 3205	
		PRO-SEAL 890B		PRC1435G			
RATIO 7.5:1		RATIO 10:1		RATIO 7.5:1		RATIO 10:1.5	
7.5	1	10	1	7.5	1	10	1.5
15	2	20	2	15	2	20	3
22.5	3	30	3	22.5	3	30	4.5
30	4	40	4	30	4	40	6
37.5	5	50	5	37.5	5	50	7.5
45	6	60	6	45	6	60	9
52.5	7	70	7	52.5	7	70	10.5
60	8	80	8	60	8	80	12
67.5	9	90	9	67.5	9	90	13.5
75	10	100	10	75	10	100	15
82.5	11	110	11	82.5	11	110	16.5
90	12	120	12	90	12	120	18
97.5	13	130	13	97.5	13	130	19.5
105	14	140	14	105	14	140	21
112.5	15	150	15	112.5	15	150	22.5

Figure 20-14. Sealant Mixing Ratio (cont)

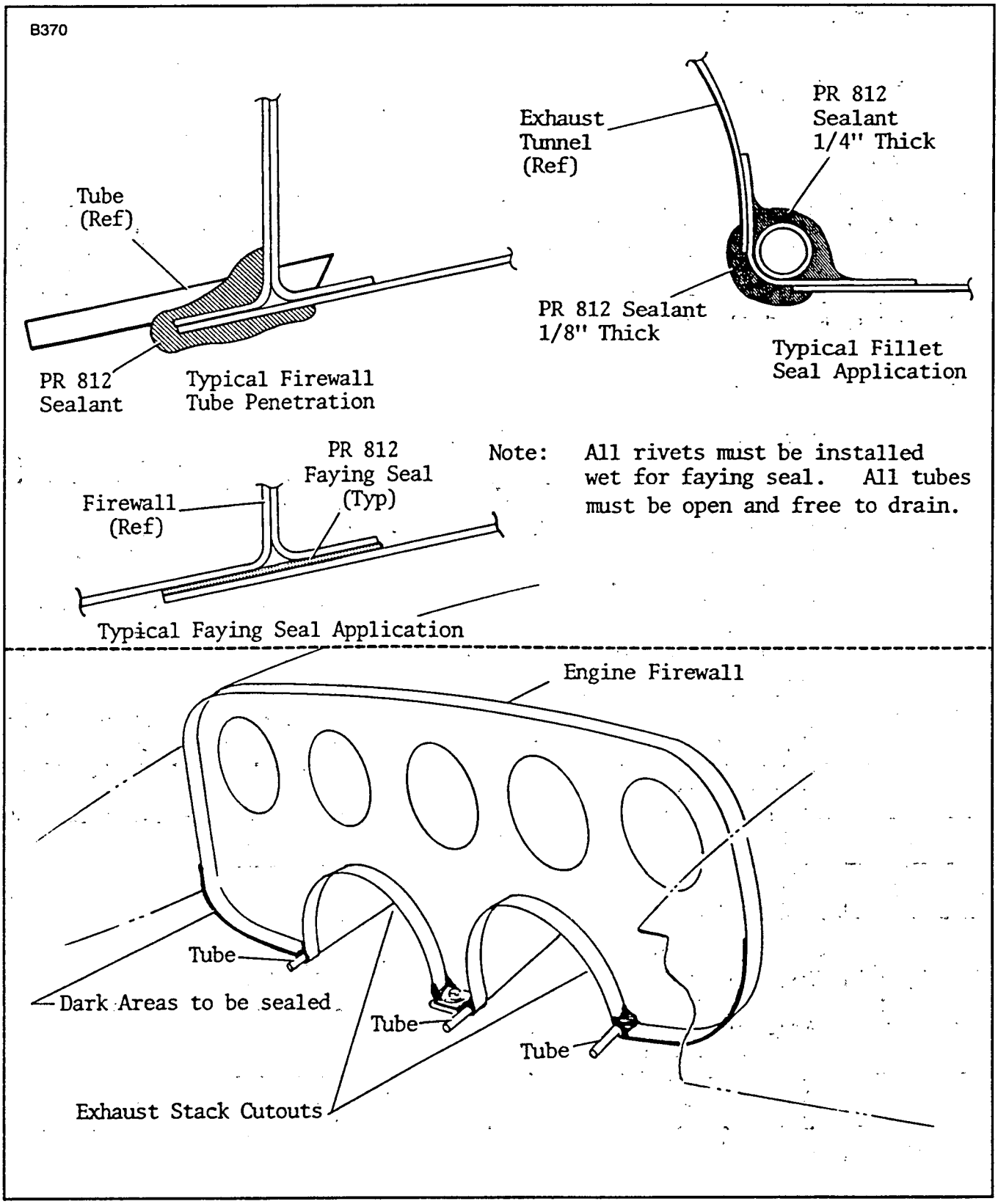


Figure 20-15. Firewall Sealing

AIRCRAFT FINISH CARE.

CORROSION CONTROL.

GENERAL.

Corrosion is the deterioration of metal by chemical or electrochemical attack. Water which is allowed to remain on the aircraft and industrial pollution are the major causes of corrosion in aircraft. The two general types of corrosion are: 1) a direct chemical attack (ex. spilled battery acid) and 2) electrochemical attack which requires a medium (usually water). The latter is the most common and is responsible for most forms of aircraft corrosion.

Since corrosion is a constant threat the only effective method to control it is a routine of regular inspection, cleaning, and surface refinishing.

FORMS OF CORROSION.

The following are the most common forms of corrosion.

1. Surface Corrosion appears as a general roughening or pitting on the surface usually accompanied by a powdery deposit of corrosion products. It may spread under the surface and not be recognized until the paint or plating is lifted off the surface in small blisters.
2. Dissimilar Metal Corrosion may occur when two dissimilar metals are contacting each other. This type may be serious because it usually takes place out of sight. The only way to find it before structural failure is by disassembly and inspection. Insulating is necessary between two contacting dissimilar surfaces (2-3 coats of zinc chromate or a coat of epoxy polyamid on each surface; plus a .003 thick piece of vinyl tape if one of the surfaces is magnesium).
3. Intergranular Corrosion is difficult to detect in its early stages. When severe, it causes the surface of the metal to "exfoliate" (flake or lift).
4. Stress Corrosion is the result of sustained tensile stresses and corrosive environment. It usually occurs in assemblies such as aluminum alloy bellcranks with pressed in bushings; landing gear shock struts with pipethread grease fittings, clevis pin joints and shrink fit parts.
5. Fretting Corrosion takes place when two parts rub together, constantly exposing fresh active metal to the corrosive effects of the atmosphere.
6. Filiform Corrosion is the appearance of numerous meandering threadlike filaments of corrosion on the surface of various types of metal.

CONDITIONS AFFECTING CORROSION.

Some conditions which affect the occurance of corrosion are:

1. Heat and humidity increase corrosion.
2. Different metals and their relative sizes affect resistance or susceptibility to corrosion.
3. Frequent contributing factors to corrosion are:
   - A. Soil and atmospheric dust
   - B. Oil, grease and exhaust residues
   - C. Salt water & salt moisture condensation
   - D. Spilled battery acids & caustic cleaning solution
   - E. Welding, brazing and soldering flux residue

A clean aircraft will resist corrosion better than a dirty one. Cleaning frequency depends on several factors (such as geographical location, type of operation, etc.). Soil should be removed as soon as possible, especially when it is on a high temperature area.

After cleaning, insure that no cleaning solution remains in any holes, crevices or joints, as it may lead to increased corrosion. Also, all exposed areas (landing gear, flap tracks, control surfaces, hinge parts, etc.) should be lubricated after cleaning.

INSPECTION.

Corrosion should be inspected for at every inspection. In trouble areas, the inspection frequency should be increased.

In addition to routine inspections:

1. Aircraft operating around a marine environment should be given special checks on a weekly basis.
2. Aircraft operating in a semi-acid condition should be inspected monthly. A semi-acid condition is likely to occur in industrialized areas where sulphurbearing particles in dust, smoke and smog attack painted surfaces.
3. Inspections for corrosion should be performed by personnel familiar with corrosive problems and their remedies.
   - A. Daily and preflight inspections should include the engine frontal areas, all intake vents, engine compartment, gaps, seams, and faying surfaces in the exterior skins, wheel and wheel well areas, battery compartment, fuel cell and all other drains, and any bilge areas not requiring extensive removal of inspection access covers.
   - B. Detailed inspection should include the above referenced areas along with areas requiring removal of screw attached inspection plates and panels to thoroughly inspect the internal cavities of the aircraft.
4. During inspection remember that paint tends to hide corrosion in its initial stages. However, the results of corrosion can sometimes be seen as blisters, flakes, chips and other irregularities in the paint.

CORROSION REMOVAL AND CONTROL.

Corrosion cannot be prevented or eliminated on aircraft; it can only be reduced to an acceptable level by proper control methods.

All corrosion products must be removed prior to refinishing. If they are not removed, corrosion will begin again, even though the affected area is refinished.

Before beginning any rework:

1. Position the airplane in a wash rack or provide some type of washing apparatus for rapid rinsing of all surfaces.
2. Connect a static ground line to the airplane.
3. Remove the airplane battery if required.
4. Protect the pitot-static ports, engine openings, airscoops, louvers, wheels, tires and other portions of the airplane (refer to Figure 20-16) from moisture and chemical brightening agents.
5. Protect the surfaces next to the rework areas from chemical paint strippers, corrosion removal agents and surface treatment materials.

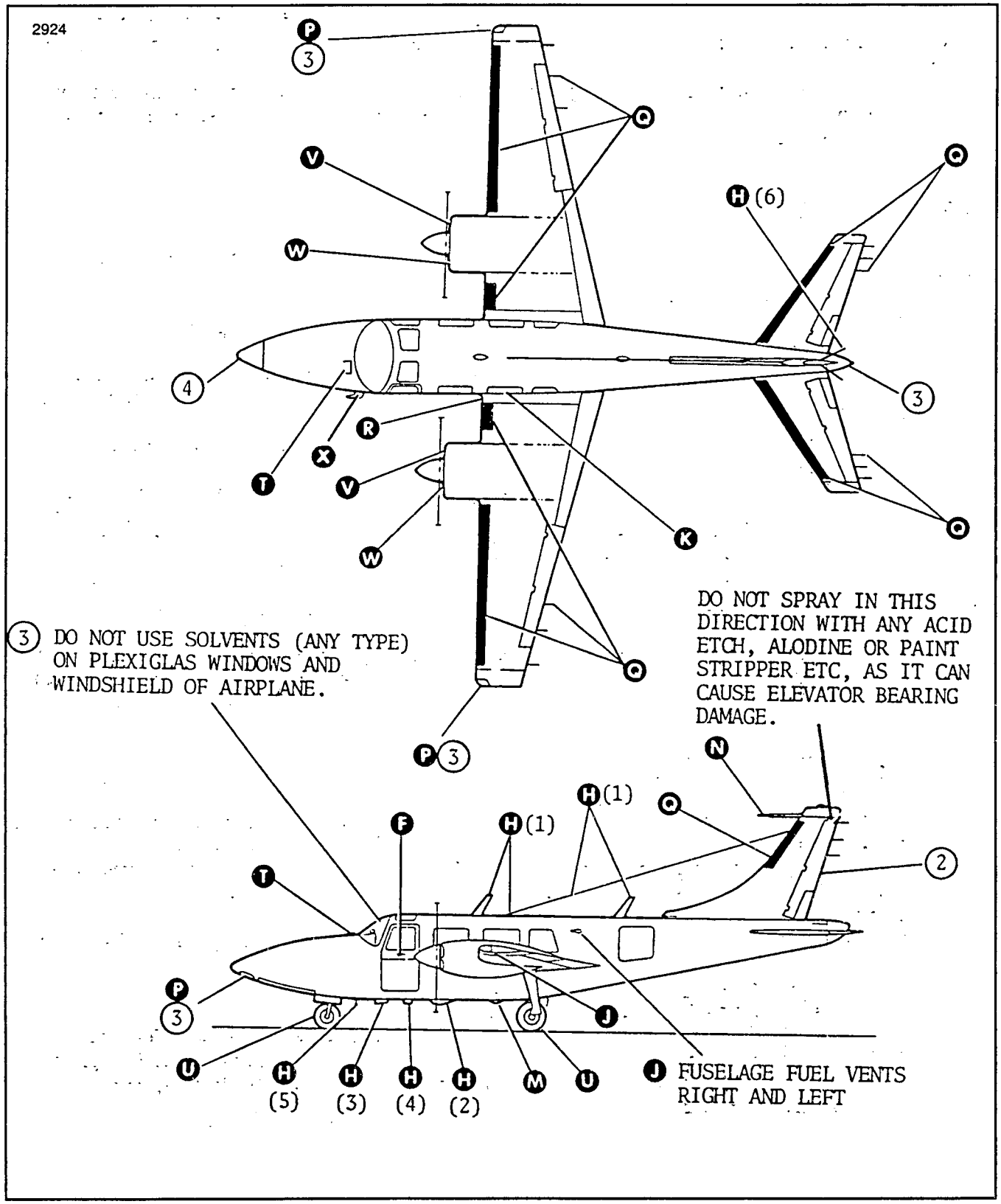


Figure 20-16. Finish Coating Precaution Areas

- DO NOT PAINT -

- Ⓐ ALTERNATE STATIC PORT RH & LH SIDES AND OXYGEN DUMP LENS. SEE DETAIL "A"
- Ⓑ NOSE GEAR GREASE POINTS (4 PLACES) & SQUAT SWITCH SEE DETAIL "B"
- Ⓒ MAIN GEAR GREASE POINTS (6 PLACES) SEE DETAIL "C"
- Ⓓ MAIN GEAR SIDE BRACE GREASE POINTS (3 PLACES) SEE DETAIL "D"
- Ⓔ SUMP VALVES SEE DETAIL "E"
- Ⓕ ALL CHROME PLATED SURFACES
- Ⓖ 4 FLAP TRACKS (EACH WING)
- Ⓗ (1) ANTENNAS
- Ⓗ (2) MARKER BEACON ANTENNA
- Ⓗ (3) ADF ANTENNA
- Ⓗ (4) DME ANTENNA
- Ⓗ (5) TRANSPONDER ANTENNA
- Ⓗ (6) NAVIGATION ANTENNA
- Ⓘ FUSELAGE MOISTURE DRAIN HOLES
- Ⓙ VENTS FOR FUEL, HYDRAULIC AND HEATER. SEE DETAIL "J"
- Ⓚ CABIN WINDOW SEALS SEE DETAIL "K"
- Ⓛ AUTOMATIC DRAINS P MODEL ONLY SEE DETAIL "L"
- Ⓜ ANTI-COLLISION ROTATING BEACON
- Ⓝ PITOT-STATIC TUBE HEAD (600, 601, 601P AND 602P) SEE DETAIL "N"
- Ⓟ LANDING AND NAVIGATION LIGHT LENSES. SEE DETAIL "P"
- Ⓠ ANTI-ICING BOOT AND STATIC DISCHARGE WICKS. SEE DETAIL "Q"
- Ⓡ RUBBER AROUND AIR INLET SEE DETAIL "R"
- Ⓢ M.L.G. LOCKING INDICATOR SWITCHES. SEE DETAIL "S"
- Ⓣ WINDSHIELD DEICE SPRAY BAR SEE DETAIL "T"
- Ⓤ NOSE AND MAIN GEAR TIRES
- Ⓥ ENGINE INLETS
- Ⓦ OIL COOLERS
- Ⓧ PITOT HEAD (700P)

- CAUTION NOTES -

1. DO NOT DISTURB TRIM TAB POSITION.
2. PROTECT WHEEL BEARINGS AND BEARINGS FROM STEAM, HIGH PRESSURE, AND PAINT STRIPPER SPRAYING. ALSO ACID ETCH, ALODINE & SOLVENT APPLICATIONS.
3. DO NOT USE SOLVENTS (ANY TYPE) ON PLEXIGLAS WINDOWS, WINDSHIELD AND LENS OF AIRPLANE.
4. HEAVY USE OF METALLIC PAINT ON NOSE RADOME CAN COMPROMISE RADAR INSTALLATION FUNCTION PROPORTIONALLY TO THE AMOUNT USED.
5. PROTECT ALL WHEEL WELLS FROM PREP WASH AND ALODINE.

Figure 20-16. Finish Coating Precaution Areas (cont.)

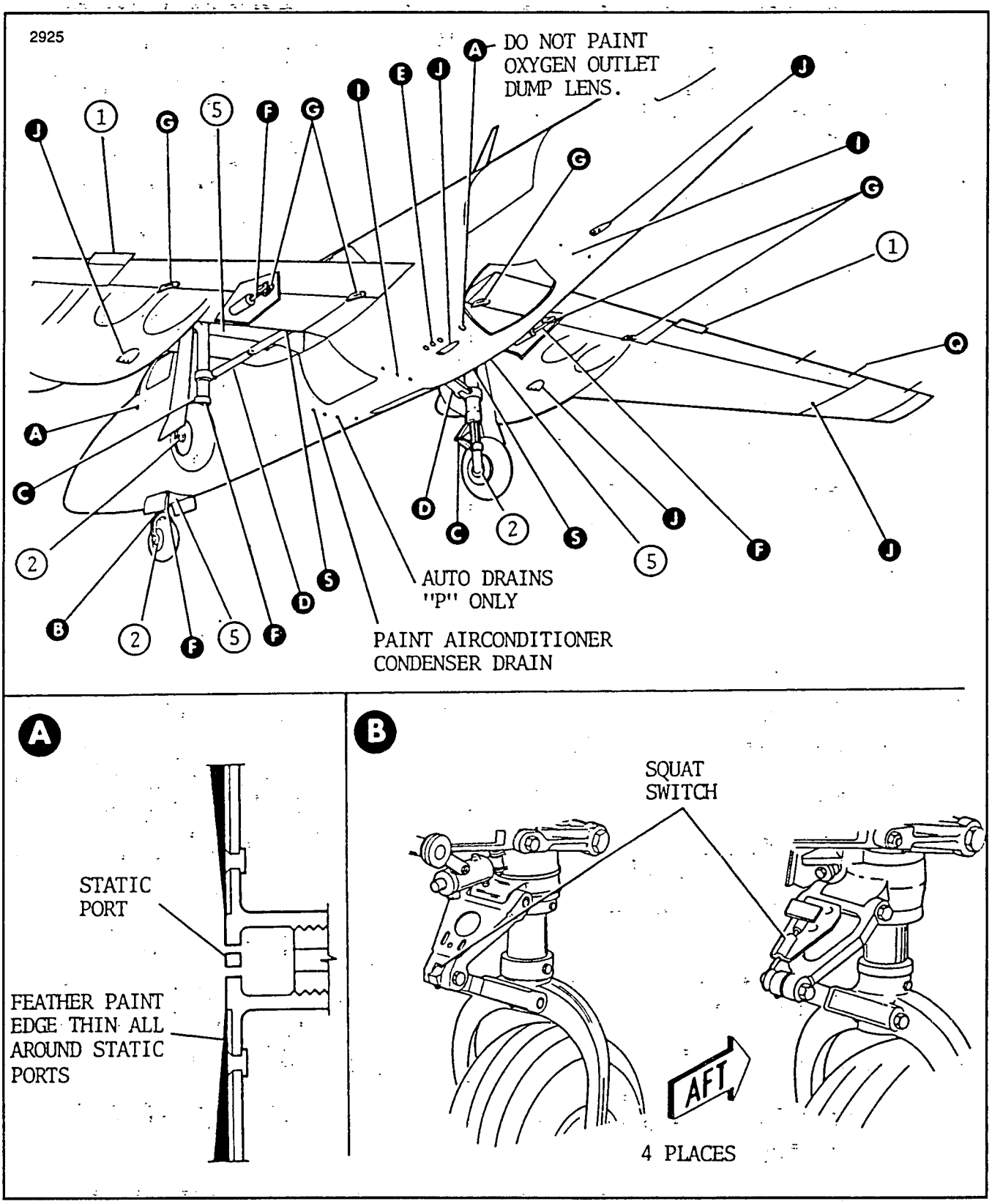


Figure 20-16. Finish Coating Precaution Areas (cont)

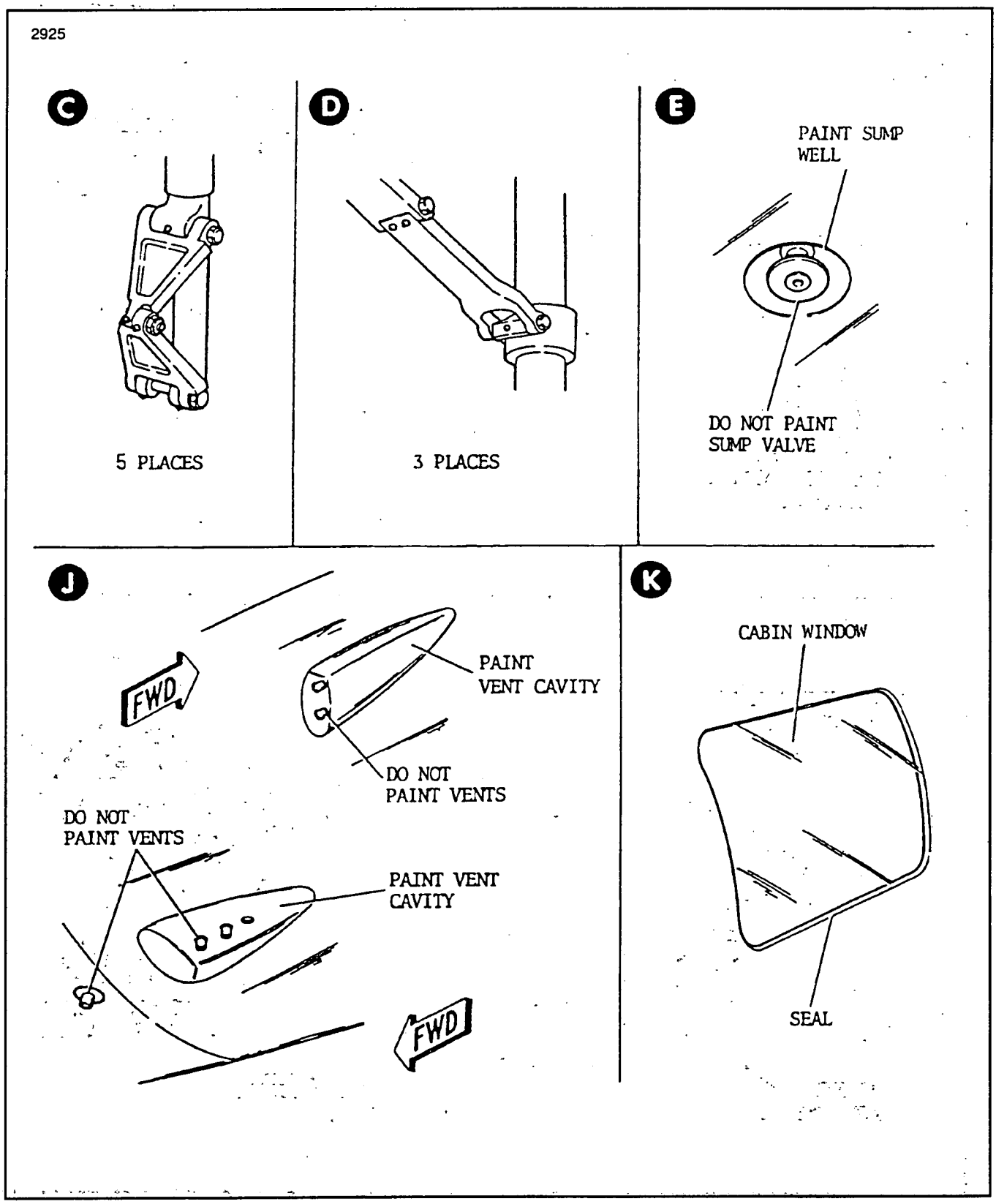


Figure 20-16. Finish Coating Precaution Areas (cont)

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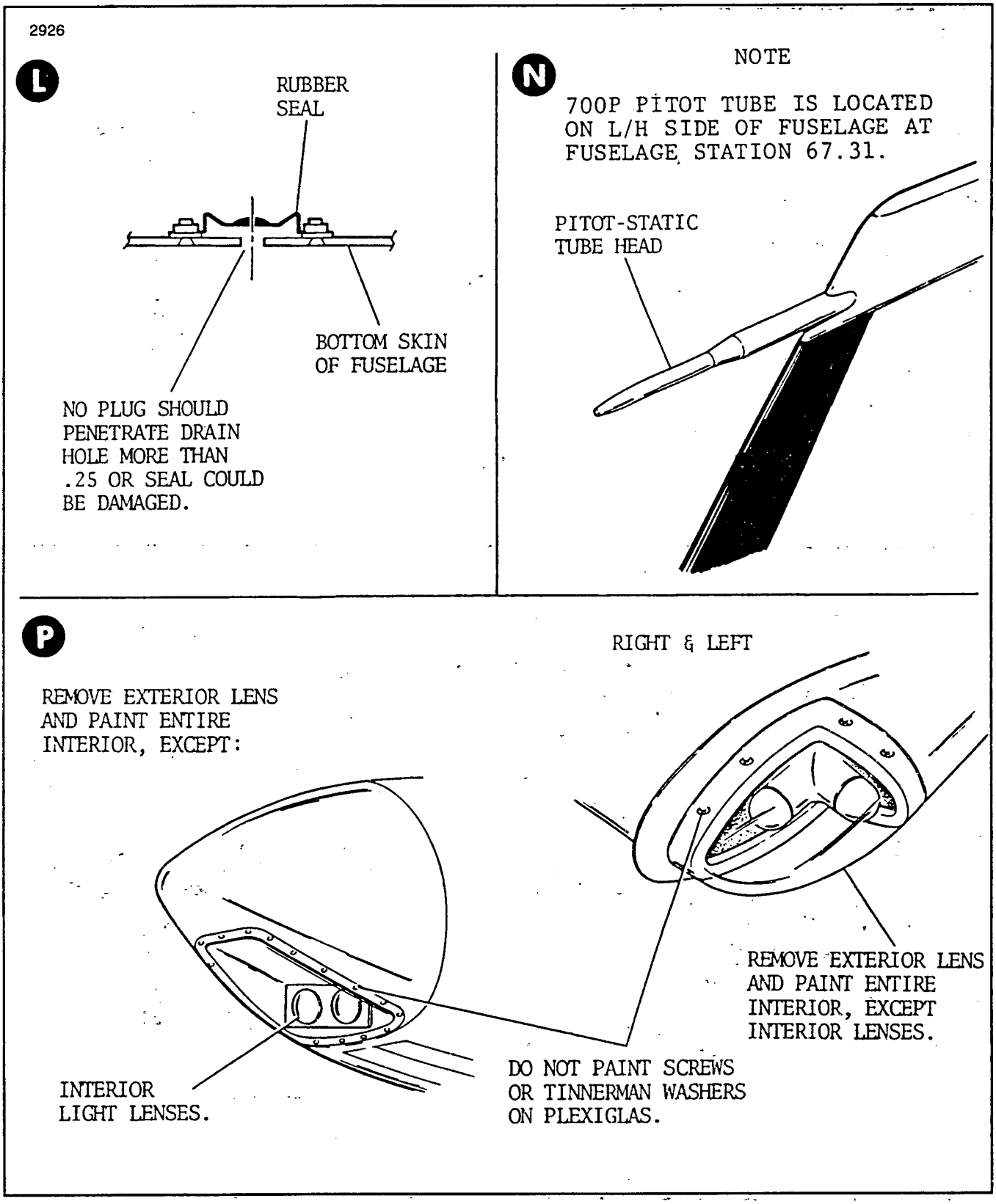

Figure 20-16. Finish Coating Precaution Areas (cont)

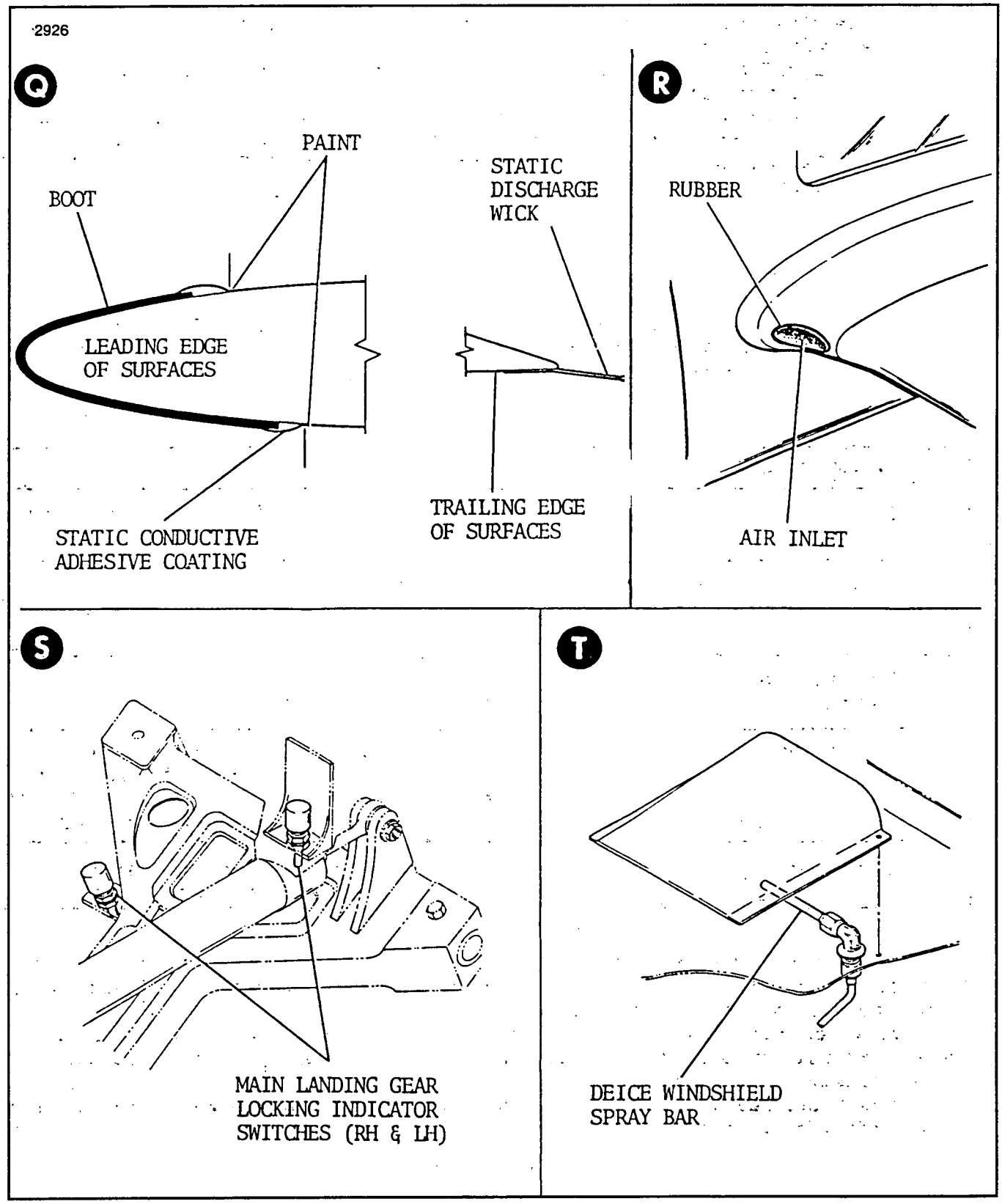

Figure 20-16. Finish Coating Precaution Areas (cont)

An evaluation of the corrosion damage is necessary to determine the type and extent of repairs required. The following are general guidelines:

1. Light Corrosion: discoloration or pitting; normally removed by light hand sanding or a small amount of chemical treatment.
2. Moderate Corrosion: similar to light corrosion, except there could be some blistering or evidence of scaling and flaking. Removed by extensive hand sanding or mechanical sanding.
3. Severe Corrosion: similar to moderate corrosion with severe blistering, exfoliation, sealing and/or flaking, normally removed by extensive mechanical sanding or grinding.

— NOTE —

The depth of material removed should not exceed safe limits.

— CAUTION —

Removal of "severe corrosion" may be considered a major repair. Any repair of this type must be approved by the FAA before returning the airplane to service.

CHART 2001. TYPES OF METAL CORROSION

Type of Material	Type of Corrosion	Remedy**
Steel	Rust*	Complete removal of corrosion by mechanical means
Aluminum	White to grey powdery material	Mechanical polishing or brushing with material softer than aluminum.
Magnesium (highly susceptible to corrosion)	White powdery snow-like mounds and white spots.	
Cadmium (plating)	White to brown to black mottling of surface (plating is still protecting until iron appears)	Mechanical removal of corrosion should be limited to metal surfaces from which the cadmium has been depleted
Chromium (plating)	May pit in chloride environment	Promotes rusting steel where pits occur in the coating

*Red rust generally shows on bolt heads, hold-down nuts and other aircraft hardware. Its presence in these areas is generally not dangerous. However, it is indicative of a need for maintenance and also of the possibility of corrosive attack in more critical areas.

Any corrosion on the surface of a highly stressed steel part is potentially dangerous. A careful removal of corrosion products using mild abrasives (rouge or fine grit aluminum oxide paper) is necessary, using care not to overheat the metal when removing the corrosion.

**For abrasion, do not use dissimilar material (ex. steel wool on aluminum). Remove only the material required to clean up the affected area.

AREAS PRONE TO CORROSION.

Certain areas are more prone to corrosion than others. The following list is intended to be a general guide to areas where corrosion is frequently found.

1. Areas around steel fasteners are susceptible to corrosion. The paint in these areas cracks which allows moisture to seep in and corrode the underlying metal. Each time the fastener is removed, it should be coated with zinc chromate before reinstallation. The paint should be wet when the fastener is installed.
2. Fluids tend to seep into faying surfaces, seams and joints due to capillary action. The effect of this type of intrusion is usually detectable by irregularities in the skin's surface.
3. Spot welded assemblies are particularly prone to corrosion. The only means to prevent this type of corrosion is by keeping potential moisture entry points in the spotweld filled with a sealant or preservative compound. On an aluminum spot welded assembly a chromate conversion coating applied before paint will help prevent corrosion.
4. Areas which are exposed to exhaust gases may have their finish damaged by deposits. These deposits may result in an aggressive attack on the metal by corrosion. Heat from the exhaust may also blister or otherwise damage the paint. Gaps, seams, hinges and fairings are some places where exhaust gas deposits may be trapped and not reached by normal cleaning methods.
5. The wheel well and landing gear are the most exposed parts of the aircraft. Due to the complexity of its shape, assemblies and fittings, maintaining a protective coverage is difficult. The especially troublesome areas are: 1. Magnesium wheels; around boltheads, lugs and wheel well areas; 2. Exposed rigid tubing, B-nuts, ferrules; under clamps and tubing identification tape; 3. Exposed position indicator switches and other electrical equipment; 4. Crevices between stiffeners, ribs and lower skin surfaces.
6. Flaps, flight control slots and equipment installed in these areas may corrode unnoticed unless a careful surveillance is maintained.
7. Engine frontal areas, air inlet ducts and the leading edge of wings, because they are constantly exposed to abrasion by dirt, dust, gravel and rain, should be checked frequently for the beginning of corrosion.
8. Hinges (piano hinges especially) are extremely vulnerable to corrosion due to the wearing away of their protective coating and their being a natural trap for dirt, salt, and moisture.
9. Control cables may have bare spots in their preservative coating which could lead to corrosion. Cables having external corrosion should be checked for internal corrosion. If internal corrosion is present, replace the cable. If only external corrosion is present, remove corrosion with a wire brush and recoat cable with preservative.
10. Any area where water may be trapped is a trouble spot for corrosion. Drain holes should be checked and cleaned regularly.
11. Battery compartment and vent openings are particularly prone to corrosion due to spilled electrolyte. Fumes from overheated battery electrolyte will spread to adjacent areas and cause rapid corrosion of unprotected surfaces. Frequent cleaning and neutralization of deposits will minimize corrosion from this cause.
12. Due to magnesium parts being prone to corrosion, special attention should be given to their surface treatment, proper insulation (due to dissimilar metal corrosion) and paint coatings.
13. Electrical components and connectors should be checked. Their inspection frequency should be based on their operational environment and past trouble with them.
14. Skin joints and lap-overs are two areas which may contain moisture. Corrosion in these areas may go unnoticed unless particular attention is paid to them during inspection.
15. Hoses having an internal wire braid which are located in a position where they are frequently water soaked need a protective treatment.
16. Drilled holes and the trimmed end of sandwich panels should be protected. An inhibitor solution and/or sealant application is recommended. Any gaps or cavities which allow dirt or moisture to enter should be filled with a sealant.

PAINTING TIPS.

INTRODUCTION.

This section contains descriptions and instructions for the various types of finishes used on Aerostar Aircraft. Also contained are suggestions which would aid the mechanic or painter in achieving good results when applying these finishes.

Before proceeding with any of the steps outlined in this chapter, determine the correct type of paint used on the aircraft. The paint type may be found in the aircraft's log book, Parts Catalog or the Weight and Balance section of the Pilot's Operating Handbook.

PAINTING SAFETY.

The overspray from certain enamels, if swept up and put in a pail of water, can catch fire by themselves. Keep all overspray residue in covered containers away from the buildings where spraying is done. Wash out thoroughly rags and sponges which have been used to apply one of the phosphoric acid conversion coatings such as Alodine before throwing them away. If the material is allowed to dry in the rag, there will be a danger of it catching fire from spontaneous combustion.

Use an air drill only when mixing dopes or lacquers. Mixing with an electric drill is a fire hazard. It is possible that the fumes may be ignited by the arcing drill motor.

If there is a fire in a can of paint, immediately cover the can; drop the lid back on it, use a piece of cardboard, or whatever is handy. Almost any kind of cover will either smother the fire, or at least contain it, until a fire extinguisher can be brought to the can.

Another safety factor is the importance of proper air movement in the spray area. A properly designed spray booth has an air movement system that not only keeps the air circulating but removes all of the solids and solvents. Since all the materials used in painting are heavier than air, the exhaust system for the booth should be near the floor. If spraying in an area not designed primarily as a spray booth, at least be sure there is enough air movement to leave no more than a mild odor of the finish material while spraying. A heavy concentration of fumes is dangerous. It creates a possible fire hazard and an excessive concentration of fumes will deplete the oxygen supply required by the operator.

— CAUTION —

Do not allow paint stripper to come into contact with any fiberglass reinforced parts such as radomes, radio antenna, wing parts or wing tips. Fiberglass structures may be finished with acrylic lacquer or polyurethane enamel.

SANDING.

Before sanding, first clean the surface thoroughly. When hand sanding an area, the first item to have is the proper grade sandpaper. A coarse sandpaper will remove paint faster, but it will also leave sand scratches which may show up on the finish coat. The paint manufacturer should have the recommended grade of sandpaper included on the can's label.

Wet the sandpaper and surface to be sanded with water and, while sanding, rinse sandpaper out frequently to prevent residue buildup in the sandpaper.

Do not use a back-and-forth motion when sanding. Use a circular motion. Circles of about 6 inches in diameter are good if there is enough room for them on the surface.

If a circular motion can't be used, do not sand in a straight line with the fingers pointing in the direction of the strokes. Tilt your fingers at an angle to the direction of the stroke. This allows the pressure areas beneath your fingers to overlap each other.

When using an air sander, keep the sanding pad as level to the surface as possible. Try different combinations of pressure and speed to find which is correct for the job. Use the entire pad for sanding, not just the edge as this will clog up or wear out the grit on the edge.

ALUMINUM ALLOY SURFACE TREATMENT.

Bare aluminum alloy surfaces should be conversion coated prior to paint primer application. Chromate conversion coatings must conform or be equivalent to MIL-C-5541.

— NOTE —

Ensure the surface to be conversion coated will sustain a 30 second water-break free time before etching solution is applied.

1. Conversion coating.
   - A. Do not apply solution to skin joints or lap-over areas which are not weather sealed. Use care to prevent solution entrapment between metals.
   - B. Apply conversion coating solution with soft (fine) bristle brush. Allow two to three minutes dwell time or until a pale yellowish-brown color is indicated on metal surface. Do not allow solution to dry on surface. Dwell time is controlled by rinse water application.
   - C. Flush completely with copious amounts of rinse water.
   - D. After surface has dried, check for powder existing on surface. A powder indicates excessive dwell time or poor rinsing technique.

— NOTE —

The complete surface preparation and conversion coating process must be repeated when surface powder is present.

PRIMER COAT APPLICATION.

Two alternate types of primers are approved for use with polyurethane top coatings, provided they are applied in accordance with their listed instructions below.

1. Epoxy/polyurethane primer.
   - A. Prior to primer application, the surface must be conversion coated per Aluminum Alloy Surface Treatment.

B. Mechanically mix the pigmented component for five minutes. Add catalyst component to resin component and mix both primer components thoroughly. Do not add thinner or retarder until completion of induction time per manufacturer's instructions.

C. Filter the primer when pouring from mixing pot into the paint pot.

D. Apply primer per product manufacturer's instructions for .3 to .6 mils (.0003 to .0006 of an inch) dry film thickness.

E. Allow primer coat to dry four to six hours before sanding. With powered sander use 220 grit paper, or with sanding block use 320 grit paper.

F. Prior to top coating, remove surface dust by air blowing, MEK wipe down, and clean tack cloth. Finish coat should be applied within 48 hours of primer application.

2. Wash Primers (corrosion resistant).

— NOTE —

Wash primer may be applied directly to non-conversion coated surfaces, however, the use of a wash primer must be followed by application of an intermediate epoxy or polyurethane type primer before top coating.

A. Mix the wash primer per product manufacturer's instructions, allow recommended induction time and filter the primer when pouring from mixing pot into paint pot.

B. Spray primer on surface to obtain .3 mils (.0003 of inch) dry film thickness.

C. Allow two or three hours cure time before sanding. Use 320 grit paper or finer for finish sanding.

D. After wash primer application, apply epoxy type or polyurethane primer per Paragraph 1, above.

PAINT APPLICATION.

— WARNING —

Aircraft should be grounded before painting to insure that no static electricity charges could build up and discharge.

— CAUTION —

Movable control surfaces should be balanced after painting. Refer to appropriate sections in Maintenance Manual.

Before force drying at elevated temperatures, insure that all fuel tank vents are unobstructed and will not result in expanded fuel spilling over the newly painted surfaces on to the paint booth floor.

— NOTE —

Do not paint pitot tubes, gas caps, or antenna covers that were not factory painted.

Metallic paints should not be used on radar nose cones or antenna covers.

Do not allow silicone lubricants to come in to contact with any surfaces which are to be painted, as the lubricant is very difficult to remove completely.

GENERAL.

The biggest mistake when using pressure-fed equipment is getting too much finish on the surface and having it run or sag. Use low enough air pressure at the pot to get just enough material to do the job. Then all the air pressure needed at the gun is only that which is sufficient for proper atomization. To get the proper pressures, begin with 35-40 PSI on the gun and bring the fluid pressure up to match the air pressure, instead of bringing the air pressure up to match the fluid pressure. Six or eight PSI is enough pressure on the pot for most acrylic lacquers. Do not exceed 10 PSI unless there is excessive line loss in the hose. Using low pressure should prevent air impingments, runs and sags. Pressure on a pressure cap or suction cup gun may vary from 20-55 PSI.

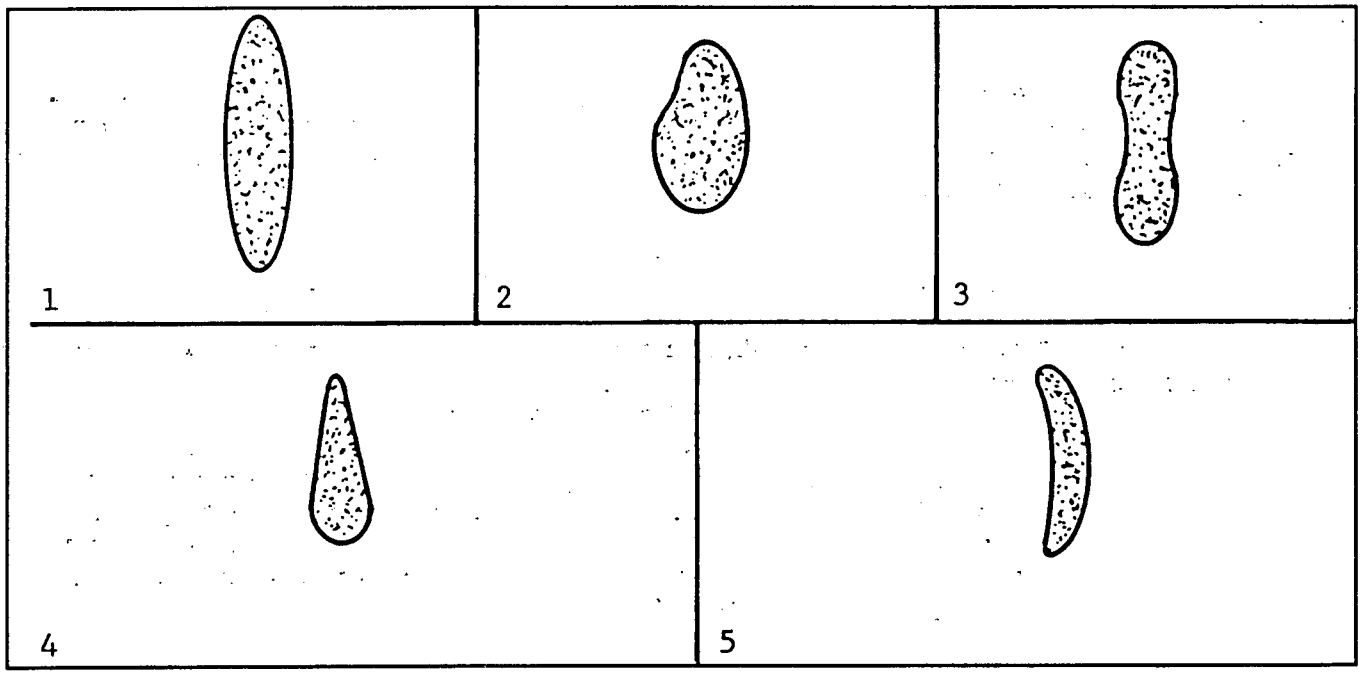

Figure 20-17. Spray Patterns

DISTORTED SPRAY PATTERNS.

Be sure acrylic lacquer is thinned sufficiently. Don't exceed a 4:5 ratio of color to thinner. If a suction cup gun is used, a 4:6 ratio of color to thinner is more reasonable.

Malfunctions. Spitting may be caused by a dried out packing around the material needle valve (lubricate with a few drops of light oil), dirt between the body of the gun and the fluid nozzle seat or a loose or defective nut attaching the gun to the suction cup. Refer to Figure No. 20-17.

1. Normal spray pattern. Width is determined by amount of air flowing out of wing ports. When increasing width, increase the amount of material to get a proper coverage.
2. Insufficient atomizing air pressure. To correct the condition, increase the air pressure to the gun.
3. Excessive atomizing pressure or else attempting to get too wide a pattern with this material. To correct this condition increase the amount of material and decrease the amount of air from the wing ports.
4. Indicates material build-up around one side of the fluid nozzle which cuts off the flow of atomizing air to one side of the pattern. To correct this condition, remove air nozzle and soak in thinner. A damaged or loose fitting nozzle will also cause this defect.

— CAUTION —

Do not probe with wire or metal scraper, as this will scratch and damage these passages.

5. One of the wing portholes is plugged up. To correct this condition, remove the air cap and soak it in thinner and blow the passages out with compressed air.

CLEANING THE SPRAY GUN.

Always clean the gun after use. First empty and clean the pot (or cup) and fill with thinner. (Insure that the hose between the pot and gun have been emptied back into the pot by loosening the gun's air cap and the pressure pot lid, holding cloth over the gun's nozzle and triggering the gun, thus forcing the material back into the pot.) Spray thinner through the gun until the thinner appears clear.

— NOTE —

Remove pressure from equipment before beginning cleanup.

Then soak only the nozzle in thinner to further clean the head. Lubricate the air valve stem and all the packings with light oil. Tighten packing nuts finger tight only.

— CAUTION —

Do not allow material to remain in gun after use. However, if the passages should become plugged up with acrylic lacquer, disassemble the gun and soak the parts in acetone or MEK. If passages should become plugged up with polyurethane or epoxies, discard the hoses and clean the passages by digging the material out if possible.

SPRAY TECHNIQUES.

Select the proper gun, fluid tip, needle, proper air pressures and fluid viscosity for the material being applied.

The nozzle of the gun should be held between six and ten inches from the surface, depending on the material.

The gun should be held perpendicular to the surface so the material will spray out in an even pattern. If the gun is tilted or tipped, Figure 20-18, the pattern will be heavier on the side nearest the gun, and dry and rough on the side farthest from the gun.

Move the gun parallel to the surface being sprayed. Begin the stroke, then pull the trigger. Release the trigger before completing the stroke. Figure 20-19. If the gun is arced when spraying, the surface will be uneven; heavy where the gun was nearest the surface and thin where the spray arced away.

Before starting to lay the film of paint over the flat part of the structure, cut in the edges and corners. This is done by spraying along the corner which gives the thicker coat along the edge and blends out in the flat portion, Figure 20-20.

A single layer of material laid on the surface by one pass of the gun will be typically about 10 to 12 inches wide, thicker in the middle and tapering off at each end. in order to get a good, even build-up of finish, spray on the first pass; then come back with the gun on the return pass, overlapping all but about two or three inches of this first pass. The third pass will overlap all but about two or three inches of the second. Continue this overlap and the resulting finish will be a nice even film with no runs or sags.

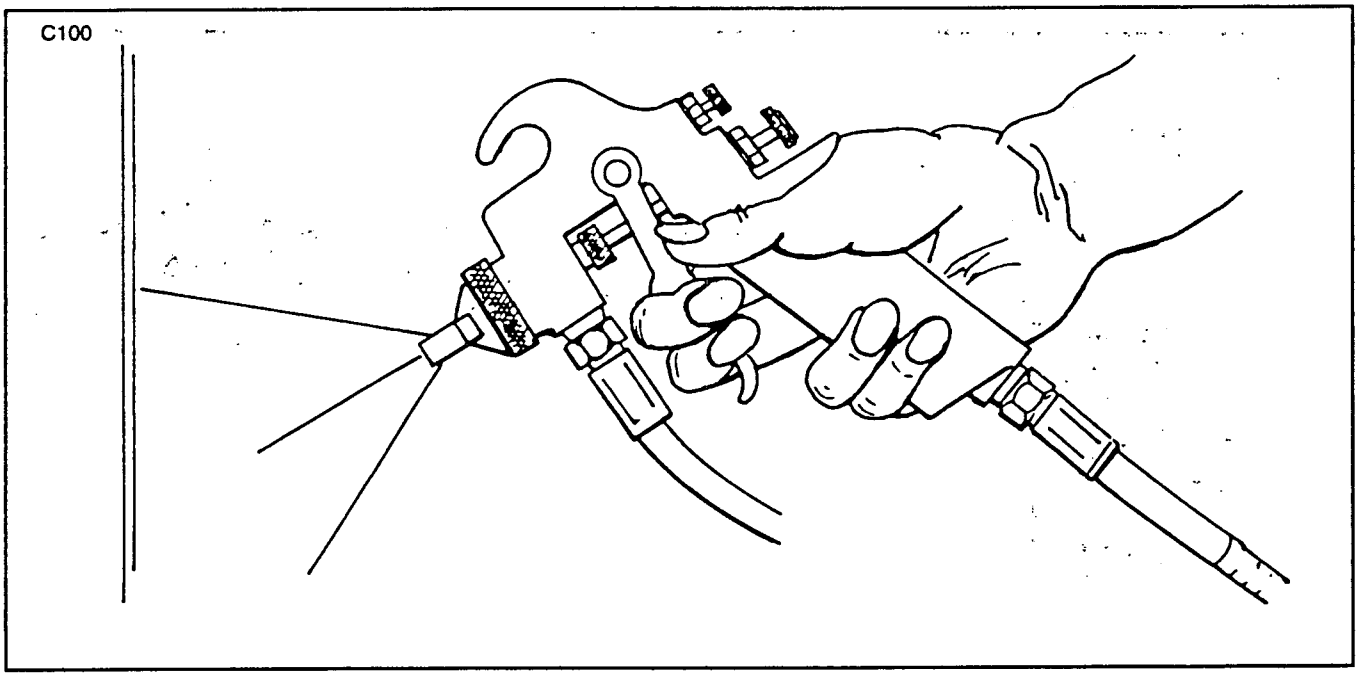

Figure 20-18. Improper Spraying

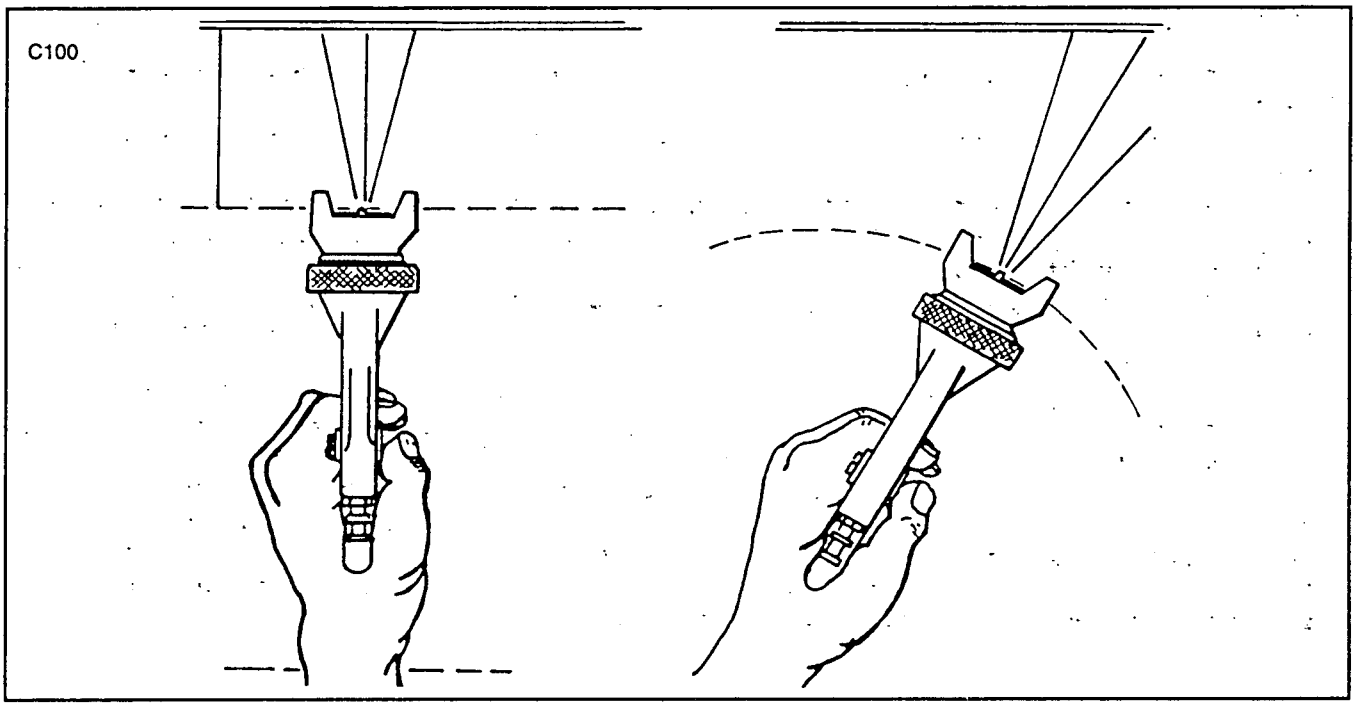

Figure 20-19. Proper and Improper Method

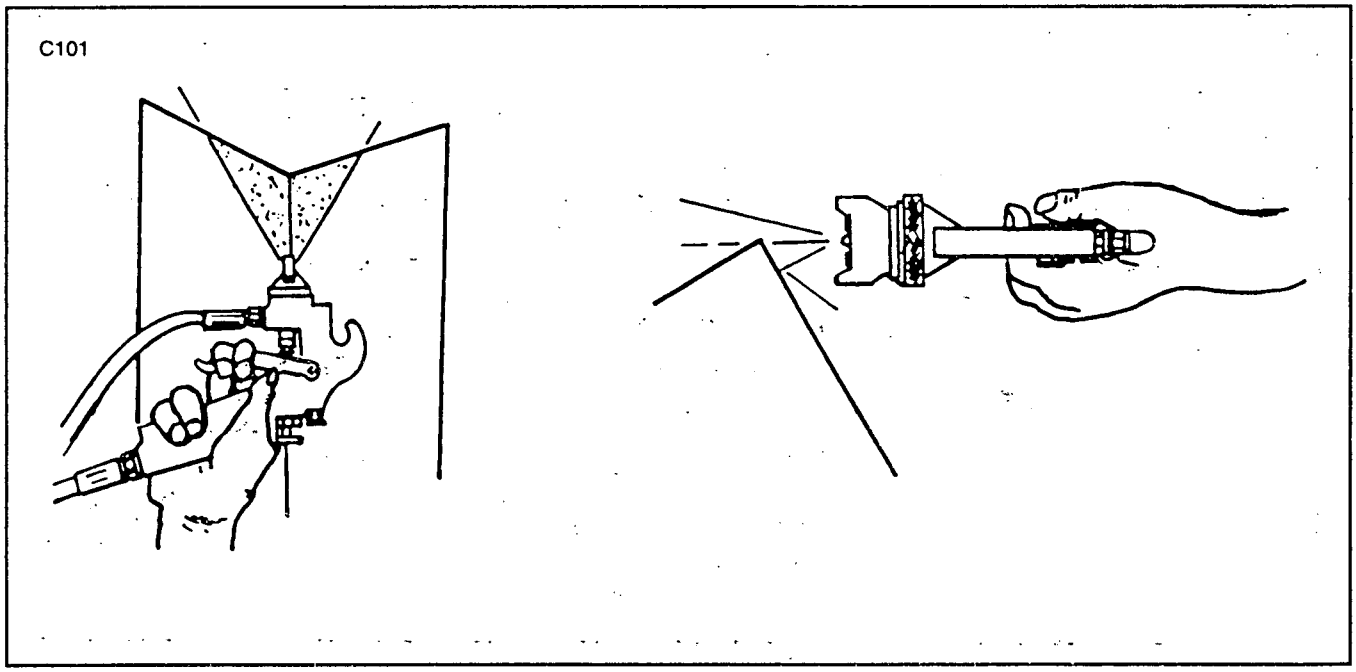

Figure 20-20. Spraying Corners

AIRCRAFT PAINTING SEQUENCE.

In painting an airplane, considerable planning should precede the actual shooting. Position the airplane in the booth in such a way that the airflow will be from the tail toward the nose so that you can paint in this direction and the overspray will be ahead of you. In a down-draft booth, center the aircraft under the air inlets so that all outlets will exhaust overspray.

If possible, have two painters work simultaneously on opposite sides of the airplane, working away from each other. In this way, the overspray problems will be minimized.

First, paint the ends and leading edges of the ailerons and flaps; then, the flap and aileron wells, the wing tips and leading and trailing edges. Paint difficult areas such as landing gear, wheel wells (etc.) first, before going on to flat surfaces.

Paint the bottom of the airplane first, using a creeper for the belly and the bottom of low wing airplanes. Prime the bottom of the horizontal tail surfaces first, starting at the root and working outward, spraying chordwise. Then work up the fuselage, allowing the spray to go up the sides. Work all the way up to the engine. Spray the bottom of the wing with each painter starting at the root and working toward the tip, spraying chordwise.

Jack up the nose of the airplane to lower the tail enough to allow the top of the fin to be reached. Both painters work together with one slightly ahead of the other so they will not spray each other. When spraying the top of the fuselage, tilt the gun so the overspray will be ahead of the area being painted and the new material will wipe out the overspray. Spray primer across the fuselage, and spanwise on the vertical and horizontal tail surfaces and the wing.

After the primer has cured for the proper time and is ready to receive the top coats, the same sequence is used to spray on the finish. Spray the tack coat on the bottom surfaces starting at the center of the fuselage and spraying across it, then out the horizontal surfaces spanwise. Spray the tack coat on the top of the aircraft, lengthwise on the fuselage and chordwise on the surfaces.

Spray the final coat on, using the same sequence and direction as the prime coat. Spray the bottom of the fuselage crosswise and the wing and tail surfaces chordwise. Spray the top of the airplane across the fuselage and spanwise on the wing and tail surfaces.

It is often impossible to reach completely across the top of the wing, so spray as far as you can reach while working from the root to the tip, along the trailing edge; then walk around the tip and work back toward the fuselage. Keep the gun tilted back so the overspray will not fall on the rear half of the wing where the paint has hardened to such a point that the overspray will not blend in.

Spraying on a coat of acrylic lacquer with an excess of solvents can be used to wash out acrylic overspray. This softens the film and allows the overspray to sink into the finish. Dried overspray from any material other than polyurethane can be "burned down" or "washed out" by spraying a mixture of one part retarder and two parts thinner on the surface while the overspray and base finish are still fresh. This mixture will soften the surface enough to allow the overspray to sink in and allow the surface to gloss. Enamel overspray does not usually present the problems of lacquer dope, since it has a much slower drying rate. The overspray can sink into the finish while it is still wet.

COLOR MATCHING.

— WARNING —

Use an air drill motor. Do not use an electric drill with an agitator attachment. This stirs up flammable fumes which may be ignited by the sparking brushes in an electric motor.

If there should be a fire in the container, cover the container to smother out the fire or to control it until a fire extinguisher can be brought to the can. Do not attempt to carry the burning can outside.

To get a proper color match, use the same type of paint as originally used and insure that it is thoroughly mixed. Use either a mechanical shaker for 15 minutes, or if no shaker is accessible, use the following steps:

1. Pour off half of the can of material into a CLEAN can of the same size as the one you have just opened.
2. Stir or shake the remaining material until EVERY BIT of the pigment is in suspension. This is important with any finish, but especially so with the metallics.
3. Pour all of the paint from the first can into the second can and carefully examine it to be sure all pigment has been loosened from the bottom.
4. After being certain that every bit of the pigment is in suspension, "box" the material by pouring back and forth between the two containers until it is THOROUGHLY mixed. If unable to get a color match using standard methods, there are three components which may be varied:
   A. The spray pressure.
   B. The amount of thinner.
   C. The number of coats.

If metallic material is applied wet and/or heavy it will be dark and will have a tendency to be dull. If it is applied light or dry, it will be too light colored and too bright or too metallic looking. Changing the spray techniques or the air pressure will change the color.

POLYURETHANE PAINT.

POLYURETHANE PAINT SAFETY.

When using polyurethane paints, certain safety precautions and attention to health hazards must be observed.

1. During transit and storage observe for signs of a bulging can, emission of other than normal odor, or a change in the resin from a clear to cloudy state. This defect results in the slow building of carbon dioxide in the cans which could cause the can to burst. Any cans found to be defective should be removed and disposed of with caution.
2. Always insure adequate ventilation and/or wear an appropriate breathing protection facemask when painting.
3. Health Hazards. Polyurethane paints can produce irritation of the skin, eyes, and respiratory tract during mixing and application. Personnel exposed to the vapors and mists produced during spray application may have difficulty in breathing, dry cough, and shortness of breath.
4. Protection Equipment. Production type mixing and spray painting operations should be conducted in specially designed, exhaust-ventilated areas, using personal protective equipment as follows:
   A A well-fitted respirator with fresh cartridges inserted daily.
   B. Solvent-resistant gauntlet style gloves.
   C. Safety goggles.
5. Painters should be fully clothed with collars buttoned and sleeves taped at the wrist.

DIFFICULTIES WITH POLYURETHANE.

Due to polyurethane's high content of solids, there are a few difficulties encountered in its application.

A light tack coat is sprayed on first, then allowed to sit for about fifteen minutes. Then a full wet coat is sprayed on. This may not appear to cover the area and may cause the painter to spray on another coat. Since polyurethane is so slow flowing, this second coat will probably run or sag. The same will happen if the paint is applied to a cold skin when the air is warm.

The pressure pot should have a slow moving agitator to keep the pigments from settling out during spraying. A fast agitation creates tiny air bubbles which are carried to the surface being sprayed.

High temperatures cause polyurethane to cure rapidly; while low temperatures allow a longer flowing-out time. The temperature of the metal should not be much lower than 50 to 60°F when spraying.

High humidities also accelerate the cure, but if the humidity is excessive, the finish will have millions of microscopic air bubbles entrapped in it.

An excessively heavy coat of finish will cause gassing in the curing process and the surface will contain all of the tiny holes that result from this gas.

APPLICATION OF POLYURETHANE.

1. DuPont Imron Method.
   A. Remove old finish with commercial grade paint remover.

— NOTE —

Do not allow stripper to come into contact with fiberglass. Refer to step D for finish removal on fiberglass parts.

— CAUTION —

Always wear protective goggles and rubber gloves when using a paint stripper. Wash strippers off skin immediately. If stripper comes into contact with eyes, flood repeatedly with water and CALL A PHYSICIAN.

   B. Rinse thoroughly with water (pay particular attention to rivets and seams).
   C. Wipe with Methyl Ethyl Ketone.

If finishing fiberglass parts proceed to step D, for aluminum parts proceed to step E, for magnesium parts proceed to step F.

   D. For fiberglass parts, remove old finish by sanding followed by wiping with MEK. Proceed to step G.
   E. For aluminum parts, clean and condition metal with step A, 225S cleaner, follow with step B, 226S conversion coating. Proceed to step G.

F. For magnesium parts, apply step B 226S conversion coating (diluted with 6 parts water). Rinse and dry.

G. Prime surface to be painted with Corlar Epoxy Primer or Multi-Purpose Primer Surfacer.

H. Allow to dry at least 4 hours before topcoating.

I. Sand; then wipe with 3812S Reducer.

J. Tack wipe surface to be painted before applying topcoat.

K. Mix enamel as per manufacturer's directions.

L. To apply solid colors, use 50 PSI at the gun for siphon equipment. Spray a medium first coat, allow to tack up and follow with a full second coat.

M. To apply metallic colors, use 65 PSI. Apply a light medium tack coat. Allow to set up for 20 minutes. Repeat for a second coat. Then reduce 15% with 8485S (17-18 seconds in a 2 Zahn cup) and apply a third light medium coat. Another light medium coat of the reduced paint may be added. After drying, this may be clear coated with 500S clear.

— NOTE —

Drying time with 1895 accelerator is 2-4 hours tape-free. Without accelerator 6-10 hours tape-free. For fisheyes use 259S Imron Additive (2-4 oz. 1 gal.). Don't use FEE (Fisheye Eliminator).

N. Clean equipment promptly with DuPont lacquer thinner or 8485S Reducer. Do not leave mixed paint in equipment.

— NOTE —

Recoating may be done at any stage of dry. Striping, lettering or decals may be applied when tape-free (See "NOTE" under step "M"). If film has cured over 72 hours, scuff sand before recoating, striping, lettering or applying decals. Don't scuff sand metallic coat when clear coating with 500S.

— CAUTION —

Keep paint away from heat, sparks and open flame. Avoid prolonged or repeated breathing of vapor or spray mist and contact with eyes and skin. Keep container closed when not in use. Wash hands thoroughly after using and before eating or smoking. USE ONLY WITH ADEQUATE VENTILATION.

— WARNING —

BREATHING OF VAPOR MAY CAUSE IRRITATION. CONTAINS LEAD, DRIED FILM OF THIS PAINT MAY BE HARMFUL IF INGESTED.

— WARNING —

When mixed with 192S, the mixture will have the hazards of both components. Observe all applicable label precautions. FIRST AID: In case of skin contact, flush with plenty of water, for contact with eyes, flush with plenty of water for 15 minutes and get medical attention. If affected by inhalation of vapor, remove the victim to fresh air. If swallowed, CALL A PHYSICIAN IMMEDIATELY. Induce vomiting.

2. Ranthane Method.
   - A. Clean surface and lightly etch with Rand-O-Prep.
   - B. Flush with water; dry and wipe surface with MEK or acetone.
   - C. Mix Ranthane Primer according to manufacturer's directions. Reduce with 1 1/2 parts Ranthane Primer Reducer and age this mixture for 20 minutes. Re-stir.
   - D. Spray light even coat. Allow to dry at least 1 hour. (Primer must be topcoated within 48 hours).

— NOTE —

Use primer within 6 hours of mixing. Discard any remaining mixture.

   - E. Mix Ranthane color according to manufacturer's directions and apply within 48 hours of priming. Spray one very thin mist coat. Let dry 15 minutes, then apply a full wet coat and allow to dry. May be taped after curing for 5 hours.

— NOTE —

Use mixed colors within 4 hours; discard any remaining mixture.

   - F. Trim and lettering may be applied within 48 hours. If later than 48 hours, sand, rinse and dry before application.
   - G. Rework should not be attempted before 16 hours of curing. Sand area with 400 wet sandpaper, rinse and dry. Follow step E.
   - H. For repainting, all previous old coatings (if they are not Ranthane coats) must be removed. Wash surface with commercial aircraft cleaning compounds, then rinse with water. Wipe with MEK or acetone. Apply Randolph Rand-O-Prep. Flush with water and dry. Wipe with MEK or Acetone. Repeat steps C, D, E and F. Allow finish to cure for one week before compounding if this is desired.

— NOTE —

Do not leave mixed material in spray equipment. Clean all equipment the same day, wash with M.E.K.

— CAUTION —

Avoid prolonged skin contact and use only in a well ventilated area, avoid inhalation of the overspray. Solvents are flammable.

I. To refinish areas previously covered with Ranthane, wash thoroughly area to be refinished. If stripping is necessary, (for inspection) use Rand-O-Strip B-5000. If the surface has been stripped, prime with Ranthane Primer according to step C and D.

J. If previous coat hasn't been stripped or removed, thoroughly wash and then water sand the previous coating with 380 or 400 wet sanding paper. Wash, dry and repaint according to step E.

3. Alumigrip Method.

— NOTE —

All measurements mentioned in the following instructions are by volume only.

A. Zinc Chromate Wash Primer - Thoroughly mix one part each of zinc chromate wash primer and acid reducer. If blushing is encountered during application, add one part of retarder to the previous solution.

B. Urethane Primer - Thoroughly mix two parts urethane primer and one part primer catalyst. Thin as required with urethane thinner. The recommended viscosity is 18 to 20 seconds using a number 2 Zahn Cup.

— NOTE —

If cratering is encountered during application, anti-crater solution may be added to the primer solution, (not to exceed one ounce per gallon of catalyzed, thinned primer solution).

Allow catalyzed primer to stand for a minimum of thirty minutes before application.

C. Urethane Enamel - Thoroughly mix equal parts of urethane enamel and enamel catalyst. Thin as required with enamel thinner. Recommended viscosity is 18 to 20 seconds using a number 2 Zahn Cup. For cratering refer to "NOTE" in previous step.
Allow catalyzed enamel to stand for thirty minutes minimum prior to application

D. Surface Preparation - After removing old finish, if any, clean areas to be painted with Scotch-Brite pads and water. Follow this by wiping clean with water or an appropriate solvent. Prior to the application of primer wipe the areas with M.E.K. and clean rags.

E. Primer Application - Coat parts to be painted with zinc chromate wash primer solution followed by a coat of urethane primer solution. Coat fiberglass parts only with urethane primer solution.
Allow the zinc chromate wash primer to dry 30 minutes minimum before applying the urethane primer.
Allow the urethane primer to dry two to four hours before applying urethane enamel.

— NOTE —

Longer drying times may be needed as temperature and humidity vary.

F. Urethane Enamel Application - If urethane primer coat is older than 48 hours, lightly sand it prior to the application of the urethane enamel.

4. Titanine Polyurethane Method.

— NOTE —

All measurements mentioned in the following instructions are by volume only.

A. Surface Preparation - After removing old finish, clean surfaces to be painted with Scotch-Brite pads and water. Wipe clean with water or an appropriate solvent and clean rags. Clean exterior skins with an alkaline cleaner, followed by Alodine 1200. Wash out all rags used with Alodine before disposing of them. There is a danger that they may catch fire from spontaneous combustion.

— NOTE —

In all cases, it is important to apply the coating quickly after cleaning.

B. Prime - Thoroughly mix 4 parts primer, 1 part primer catalyst and 2 parts primer reducer. Allow to stand for thirty minutes and then remix before use.

C. Polyurethane Enamel - Thoroughly mix 1 part enamel catalyst, 1/2 part enamel reducer (except when using flat black; then increase enamel reducer to 2 parts), and 4 parts urethane enamel. Allow to stand for 15 minutes then remix before use.
Thin as required with enamel reducer. Recommended viscosity is 38 to 40 seconds using a number 1 Zahn Cup.

D. Refinish - Installation of pressure - sensitive decals, placards and tapes on Titanine Polyurethane finish.
Affix all pressure - sensitive decals, placards and tapes after the application of the finish coating. Install the pressure sensitive item between four and seven hours after the application of the final coating. When possible, install the pressure sensitive item during the 5th or 6th hours after the final coating.

5. Ameron Method.

A. Clean the surface to be coated before chemical conversion treatment and priming.

— NOTE —

For best results, apply the epoxy primer to wash primed or Alodined surfaces.

When wash primer is used, it must be overcoated with epoxy primer.

B. Mix zinc chromate wash primer to manufacturer's directions. The application should result in a smooth low gloss continuous film. Allow to dry 30-45 minutes at 75°F.

C. Mix intermediate epoxy primer to manufacturer's directions. Thin 20-30% by volume with MX- 15 thinner. Air dry 4-6 hours at 75°F or force dry 2-3 hours at 125°F before top coating with Jet-Glo.

D. Tack wipe surface before applying topcoat.

E. Mix Ameron Jet-Glo polyurethane enamel to manufacturer's directions. Reduce with 110-655 thinner to a viscosity of 17-20 seconds using a No. 2 Zahn Cup at 75°F.

F. Apply Jet-Glo to a spreading rate of approximately 300 sq. ft./gal. to attain a 2.0 mil. dry film thickness. A recommended pot pressure of 10-13 PSI and an atomizing air pressure of 50-60 PSI are suggested as a starting point. Best results are obtained with a three coat application consisting of a good tack coat, followed by a medium wet coat and a full finish coat.

G. Allow Jet-Glow to air dry 12-14 hours at 75-80°F or force dry 4-6 hours at 125°F to obtain a tape free condition.

— NOTE —

Ameron Accelerator 110-975 used at a level of 1/2 oz. per 1/2 gallon of color (mixed) will air dry stripes in approximately 2 hours. This will allow double-striping the same day.

ACRYLIC PAINT.

DIFFICULTIES WITH ACRYLICS.

The hiding quality of acrylics is poor and the tendency is to spray it on too thick. If the lacquer is too viscous for proper spraying, excessive air pressure must be used.

If the acrylic film is sprayed on too thick, it may produce a glassy surface, but it may appear hazy if viewed from the side instead of directly. This is due to tiny air bubbles being introduced into the paint by excessive air pressure.

To prevent this, thin the acrylic lacquer at least in a ratio of four parts of color to five parts of thinner. This may seem too thin but it is necessary to keep the air pressure low enough to prevent formation of air bubbles. Multiple thin coats should be used instead of fewer coats of thick paint.

APPLICATION OF ACRYLICS.

1. Randacryl Method.

A. For applying Randacryl to enamel finished surfaces, first strip all the enamel finish from the surface with Rand-O-Strip B-5000. Apply one thin, wet coat of Randolph Wash Primer, Epibond or Rand-O-Plate Primer. Allow to dry overnight. Proceed with step B.

B. For applying Randacryl to acrylic finished surface, first rub the surface with clean dry Kraft Paper (first making sure that the surface is thoroughly cleaned).

C. Tack rag, then apply three coats of properly thinned Randacryl allowing one-half hour drying time between coats. The gloss of the final coat can be improved by adding Y-9910 Universal Retarder (in the proportion of 1/4 of the thinner used).

D. Allow an overnight drying period before applying trim or lettering if retarder has been used. Remove tape as soon as the trim or letters have been applied.

E. To touch up a small area, first wash the area thoroughly. Remove all wax, grease and dirt. Sand area lightly and apply a coat of zinc chromate primer to bare metal.

— NOTE —

When coating over an unknown finish with Randacryl, test paint a small area before proceeding.

F. Repeat steps B, C and D.

— NOTE —

Randacryl is not intended for use on fabric or directly over enamels. Rand-O-Plate and Epibond have been used as a sealer coat over aged "air dry" enamel surfaces prior to coating with Randacryl. This procedure quite often satisfies touch-ups for small sections.

2. Enamel System for Metal - On the clean metal, spray one coat of RANDOLPH Wash Primer, Rand-O-Plate or Epibond Primer. After it is dry, spray one very mist coat of RANDOLPH Enamel over the primed surface. Follow in 15 to 20 minutes with one normal coat of enamel. Enamel should dry at least 48 hours before masking for lettering.

TRIM AND REGISTRATION NUMBERS.

When an aircraft is being painted, apply the predominant color first over the entire surface. Apply the trim colors over the base color after it dries. When the top of the fuselage is to be painted white with a dark color adjoining it, apply the light color and feather it into the area to be painted with the dark color. When the light color has dried, place masking tape and paper along the line of separation and spray the dark color on.

Allow the paint to dry for several hours before removing the masking tape. Remove the tape by pulling slowly parallel to the surface. This will reduce the possibility of peeling off the finish with the tape.

Registration numbers may be applied by either painting or affixing self-adhering plastic figures. They must be formed of solid lines using a color that contrasts with the background. The location and size may be found in the Federal Aviation Regulations.

PAINT SYSTEM COMPATIBILITY.

Before painting, determine what type of finish was used previously. Refer to the Aerostar Parts Catalog for the correct paint number and color.

To identify paint finishes, first apply a coating of engine oil to a small area of the surface to be checked. Old nitrocellulose finishes will soften within a period of a few minutes. Acrylics, Urethanes, and epoxy finishes will show no effects.

If not identified, next wipe down a small area of the surface in question with a rag wet with methyl ethyl ketone. MEK will pick up the pigments from an acrylic finish, but not from epoxy or cured Urethane coatings. Wipe the surface, don't rub. Heavy rubbing will pick up even epoxy and Urethane pigments from coatings that aren't fully cured.

The use of several different types of paint, coupled with several proprietary coatings, makes repair of damaged and deteriorated areas particularly difficult, since paint surfaces are not necessarily compatible with each other. The following general rules for constituent compatibility are included for information and are not necessarily listed in the order of importance:

1. Old type zinc chromate primer may be used directly for touchup of bare metal surfaces and for use on interior finishes. It may be overcoated with wash primers if it is in good condition. Acrylic lacquer finishes will not adhere to this material.
2. Modified zinc chromate primer will not adhere satisfactorily to bare metal. It must never be used over a dried film of acrylic nitrocellulose lacquer.
3. Nitrocellulose coatings will adhere to acrylic finishes, but the reverse is not true. Acrylic nitrocellulose lacquers may not be used over old nitrocellulose finishes.
4. Acrylic nitrocellulose lacquers will adhere poorly to both nitrocellulose and epoxy finishes and to bare metal generally. For best results the lacquers must be applied over fresh, successive coatings of wash primer and modified zinc chromate. They will also adhere to freshly applied epoxy coatings (dried less than 6 hrs).
5. Epoxy topcoats will adhere to all paint systems that are in good condition. Epoxy may be used for general touchup, including touchup of defects in baked enamel coatings.
6. Old wash primer coats may be overcoated directly with epoxy finishes. A new second coat of wash primer must be applied if an acrylic finish is to be applied.
7. Old acrylic finishes may be refinished with new acrylic if the old coating is thoroughly softened using acrylic nitrocellulose thinner before paint touchup.
8. Damage to epoxy finishes can best be repaired by using more epoxy, since neither of the lacquer finishes will stick to the epoxy surface. In some instances, airdrying enamels may be used for touchup of epoxy coatings if edges of damaged areas are first roughened with abrasive paper.

COMMON PAINT TROUBLES.

1. Poor Adhesion - Paint properly applied to correctly pretreated surfaces should adhere satisfactorily, and when it is thoroughly dry, it should not be possible to remove it easily, even by firm scratching with the fingernail. Poor adhesion may result from one of the following:
   A. Inadequate cleaning and pretreatment.
   B. Inadequate stirring of paint or primer.
   C. Coating at incorrect time intervals.
   D. Application under adverse conditions.
   E. Bad application.
2. Spray Dust - Spray dust is caused by the atomized particles becoming dry before reaching the surface being painted and thus failing to flow into a continuous film. The usual causes are incorrect air pressure or the distance the gun is held from the work.

3. Sags and Runs - Sags and runs result from too much paint being applied, causing the film of wet paint to move by gravity and present a sagging appearance. Incorrect viscosity, air pressure, and gun handling are frequent causes. However, inadequate surface preparation may also be responsible.
4. Spray Mottle - Sometimes known as "orange peel" or "pebble", spray mottle is usually caused by incorrect paint viscosity, air pressure, spray gun setting, or the distance the gun is held from the work.
5. Blushing - Blushing is one of the most common troubles experienced. It appears as a "clouding" or "blooming" of the paint film. It is more common with cellulose then synthetic materials. It may be caused by moisture in the air supply line, adverse humidity, drafts, or sudden changes in temperature.

WAXING.

Wax may be applied to the exterior of the aircraft after a minimum of ten days have elapsed since the last application of paint, enamel or lacquer.

Follow the wax manufacturer's recommendation concerning preparation application and environmental limitation. Also, the air temperature in the area should be 60°F minimum.

Polish the waxed surfaces within two hours after application.

Wipe all laps, seams and window collars in the direction of the seam to avoid wax buildup.

DECALS.

To insure the proper adhesion of decals, insure that all surfaces are clean and free of wax, oil, (etc.). Porous surfaces should be sealed and rough surfaces sanded, then cleaned to remove any residue.

1. Paper Decals - Soak paper decals in water for 1-3 minutes. Place one edge of the decal on the receiving surface and slide decal off of paper backing. Blot water from around decal with a soft absorbant cloth. Remove bubbles trapped beneath the decal by wiping carefully towards the nearest edge of the decal with a cloth.
   Coat decal with clear varnish to protect it from deterioration and peeling.
   Paper decals can be removed by rubbing the decal with a cloth dampened with lacquer thinner. Use lacquer thinner sparingly if the decals are applied over painted surfaces.
2. Vinyl Film Decals - Separate paper backing from vinyl film. Remove any bits of paper adhering to film by either rubbing with a clean water saturated cloth or by using a piece of masking tape.
   Apply cyclohexanone or equivalent, to adhesive side of film. Position decal while adhesive is still tacky and apply to surface. Work a roller across the decal until all air bubbles are removed.
   To remove a vinyl decal, place a cloth saturated with cyclohexanone or methyl ethyl ketone on the decals. Scrape with a Micarta scraper. Remove remaining adhesive with a cloth dampened with dry-cleaning solvent.
3. Metal Decals.
   A. Cellophane Backed.
      (1) Immerse in water for 1-3 minutes.
      (2) Remove and dry.
      (3) Remove cellophane backing.
      (4) Position on receiving surface. (For large foil decals, position center on receiving surface and work outward from center.)
      (5) Roll with rubber roller and press all edges firmly.
   B. Paper Backed.
      (1) Peel backing from decal.
      (2) Apply light coat of cyclohexanone.
      (3) Position and smooth as in steps 4 and 5 of cellophane backed decals.

C. Metal Decals With No Adhesive.
(1) Apply cement MIL-A-5092 to decal and receiving surface.
(2) Allow cement to dry until tacky.
(3) Apply and smooth down decal.
(4) Remove excess adhesive with aliphatic naphtha.
To remove metal decals, moisten the edge of the decal with aliphatic naphtha and peel the decal off.

STORAGE.

Paint, enamel, and other finishing material should be stored in a dry place away from direct sunlight and heat. Each container should have a code and color number identifying the material.

The storage facilities should conform to occupational safety and health act (OSHA) requirements regarding air circulation, lighting and fire protection. It should also be locked to prevent children and unauthorized personnel from getting inside.

Pigmented materials should be inverted at every inventory so that the pigments will not have as much an opportunity to pack at the bottom of the can. Empty containers should be disposed of properly.

Because the useful life of some finishes is limited, use the older materials first.

Temperatures in the storage area should be approximately 50-90°F. If finishes are stored in temperature extremes, allow them to come to room temperature before using.

PAINTING FACILITY.

Painting facilities should conform to applicable local, state and OSHA standards with respect to air circulation, exhaust emissions, lighting and fire protection.

When spraying, there should be a sufficient movement of air in the painting area so there is no more than a slight odor of the finishing material. The exhaust fan should be belt-driven and located near the floor. The fan's motor should be located away from the fumes.

All personnel in the spraying area should wear approved respiration for their own personnel safety. It is not advisable to breathe the fumes as they deplete the oxygen supply required by the body.

— END —

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AEROSTAR
AIRCRAFT CORPORATION

AEROSTAR MAINTENANCE MANUAL

CARD 2 OF 7

AEROSTAR 600

AEROSTAR 601

AEROSTAR 601P

AEROSTAR 602P

AEROSTAR 700P

AEROSTAR AIRCRAFT CORPORATION

(PART NUMBER 761 732)

Page 2A2 Through 2B3

Have Been Intentionally Excluded

Please Refer To Pages 1A2 Through 1B3