

**SPECIFICATION
FOR
MANUFACTURERS MAINTENANCE
DATA**

GAMA Specification No. 2



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PREFACE

This specification was developed by representatives of member companies of the General Aviation Manufacturers Association for use in preparing Manufacturers Maintenance Data, in manual form, that:

- a. Will serve as a guide for the maintenance of airplanes in a continuous airworthy condition;
- b. Will be of maximum usefulness as a reference book by maintenance personnel;
- c. Meet applicable government regulatory requirements; and
- d. Meet industry standards for scope of material, arrangement, nomenclature and definitions.

This document contains appropriate instructions for Continued Airworthiness as described in Appendix G or H of FAR 23 and FAR 25 as appropriate.

Manufacturers may prepare maintenance data in conformance with either Air Transport Association of America Specification No. 100, "Specification for Manufacturers Technical Data", or with this specification which closely follows and is compatible with ATA Specification No. 100. This GAMA specification provides for the preparation and issuance of less complex manuals for less complex airplanes than those operated by the large scheduled airlines while achieving industry wide standardization of nomenclature and format. GAMA appreciates and acknowledges the pioneering work and leadership of the Air Transport Association of America in developing standardized maintenance manuals.

This specification provides broad general guidance for preparing handbooks for all types of general aviation airplanes certified under applicable Federal Aviation Regulations. For purposes of this specification, "airplane" refers to the airframe and related components specified in the Type Certificate or made available as options by the airplane manufacturer.

Any revisions to a Maintenance Manual made necessary due to modifications of an airplane after delivery are the responsibility of the holder of the type design approval of the modification as appropriate for type certification. Revisions are to be made consistent with the format of their specification using the provisions of FAR 21.50 as a basis.

The specification is divided into two parts covering (1) "General Specification" and (2) "Detail Requirements." The "General Specification" part contains technical publication guidance applicable to the preparation of all Maintenance Manuals.

The "Detail Requirements" part provides for a uniform method of arranging and identifying specific subject material. It is intended that the manufacturers have latitude in the content of their publications insofar as depth and scope of coverage are concerned; nevertheless, each manufacturer is expected to follow the same sequence of basic system and subject arrangements even though some systems may be grouped together and some systems and/or chapters may be omitted when not applicable.

Although this specification conforms to recognized industry practices, it is written in broad general terms and it is recognized that problems will arise which are not treated adequately by the specification. In such cases, each manufacturer is expected to use its best judgment.

Although the specification contemplates the provision of simple handbooks for simple airplanes, and much more comprehensive handbooks for complex airplanes, it nevertheless will result in a high degree of standardization by providing for uniformity of arrangement of systems and components of systems, in chapter and subchapter or group and section forms.

Because airplanes are intended to have long lives, their flight safety must be assured. Utilizing an airplane as intended by the manufacturer, combined with sound inspection and maintenance practices, forms the basis for assuring the airplane remains airworthy and safe to operate. Through a process called continuing airworthiness, virtually every component comprising an airplane is involved in some form of preservation, inspection, preventative maintenance, overhaul, repair, and/or replacement activity.

Initially the criteria for continuous airworthiness is dependent upon the care and thought designed into the airplane at its inception. Once designed and approved, the establishment of thorough maintenance procedures is a must. This information must be available in clear, concise language to those who need it. Sometimes, especially for complex airplanes, it may be necessary to provide specific training in the proper maintenance of the airplane and its systems. These activities must be originated by the manufacturer for, after all, he knows how it should function.

Maintenance information needs to be continually updated. Open communication should exist with the operator telling the manufacturer as soon as some new kind of situation arises and the manufacturer responding back with solid help to the operators. Only when both ends do their job can an entire fleet of airplanes remain continuously airworthy.

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RECORD OF REVISION PAGE

Current Revisions to GAMA Specification No. 2, issued January, 1978 are noted below:

<u>Revised Pages</u>	<u>Description of Revision</u>
p.i	Added new paragraph after item "d". Revised fourth paragraph.
p.ii	Added text on continuous airworthiness
p.iii	Modified Preface Heading
p.1	Section 1.0, revised first and second paragraphs.
p.1	Section 1.1, added word "principal".
p.2	Section 1.3, deleted "or listed as a reference" in last paragraph.
p.2	Section 1.3.1, revised first sentence.
p.2	Section 1.4, revised first sentence.
p.2	Section 1.5, revised text.
p.6	Section 10.3, inserted new text in second line.
p.6	Section 12.1, added second sentence.
p.9	Section 15.4.2, revised text at end of sentence.
p.40	Updated itemized list.
p.41	Revised "Definition" text.
p.42	Section -10, revised title and added new last sentence to text.
p.43	Deleted last sentence in "Note".

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1.0 MAINTENANCE MANUAL POLICY

The Maintenance Manual and/or Maintenance Data furnished to the Purchaser at the time of aircraft delivery, or upon issuance of the first standard certificate of airworthiness, and if made available to any other persons required by rule to comply with any of the terms of these instructions, shall provide sufficient information to enable a qualified mechanic, as appropriate, to inspect, troubleshoot, test, and repair or replace all systems and units considered by the manufacturer to be repairable or replaceable as a part of the normal maintenance procedures.

Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions shall be provided.

The manufacturer shall include, wherever applicable, the office or department to contact to obtain special repair or overhaul information not covered in the Maintenance Manual.

If desired, the manufacturer may include more than one airplane model in the Maintenance Manual.

1.1 Approved Airworthiness Limitations

The FAA-Approved Airworthiness Limitations shall be prepared as a separate document for inclusion in the principal Maintenance Manual and for insertion in the "Limitations Section" of the Pilot's Operating Handbook. (See System/Chapter 4 under "Detail Requirements".)

1.2 Complementary Publications

Detailed information on more complex and specialized subjects, such as Structural Wiring Diagrams or Overhaul Information, may either be included in the basic Maintenance Manual or made available as separate documents at the option of the manufacturer and to the extent the manufacturer determines appropriate. When published as separate documents, the format of Paragraph 19 or that of Air Transport Association of America Specification No. 100 shall be used.

Any technical data published in the ATA No. 100 format will meet the requirements of this specification although it is expected that the Paragraph 19 format will be used where no ATA-100 requirement is foreseen.

1.3 "Shared Interest Technical Data"

Preparation of Technical Data for certain chapters in the Maintenance Manual require joint contribution and close coordination between the manufacturer of the airframe and the manufacturers of various other

components used in making the completed airplane. The airframe manufacturer will incorporate into the Maintenance Manual, where appropriate, the "shared interest" data supplied by component manufacturers.

"Shared interest" technical data furnished by a component manufacturer or vendor may either be included in the Maintenance Manual verbatim, or modified as appropriate by the airplane manufacturer. When such data is included verbatim, the data will be identified as that of the component manufacturer by use of that manufacturer's masthead as described in Paragraph 7.1.4.

- 1.3.1 In cases where an item has an exceptionally high degree of complexity requiring specialized techniques, test equipment, or expertise, it is not required that internal diagrams and construction details, or data in interconnect systems, maintenance, troubleshooting, inspection or repair, will be included in the basic airframe Maintenance Manual on major components such as avionics, specialty electronics including air-to-ground telephone systems, engines, propellers and appliances. It is expected that the manufacturers of major components will provide maintenance, troubleshooting, inspection and repair data in the format of this specification. However, power sources, bus systems, relays, circuit breakers, switches and other items that are common to a particular make and model are to be shown and described as necessary in the basic airframe Maintenance Manual.

1.4 Listing Vendor Technical Data

If the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance technique, test equipment, or expertise, he may elect to either list technical data publications supplied by vendors of items normally installed as standard, or standard options, or provide one or more separate documents containing maintenance data supplied by the vendor conforming to the format of Paragraph 19 of this specification. For the remaining non-complex items, the airframe manufacturer will incorporate information as part of the manual.

- 1.4.1 The Introduction Section of the Maintenance Manual should contain either a list of vendor publications or refer to the location of such lists whether they are included in system descriptions or provided in separate documents. Due to frequent changes in, or varying combinations of, some types of equipment such as avionics and instrumentation, one or more separate documents for these products may be required.

1.5 Component and System Operations

Basic control and operation information describing how the airplane components are controlled and how they operate, including any special procedures, and limitations that apply.

1.6 Contacts for Service Information

The manufacturer shall include a description of the type service information issued by the manufacturer and the office or department to contact to obtain such information so that the aircraft may be maintained in accordance with the latest information issued. This information should be included in vendor publications where applicable and included in the aircraft maintenance manual where vendor data has been integrated as part of the aircraft manual.

1.7 Format and Style

The rules contained in this specification shall serve as guides for format, style and method of presentation for all material included in Maintenance Manuals prepared by manufacturers.

1.8 Introduction Section

Each manual shall contain an Introduction which shall include a brief statement explaining the organization, content and method of using the the manual in addition to lists, or references to locations of lists, of vendor technical publications.

2.0 MANUAL FORM

2.1 It is preferred that all publications be prepared in loose-leaf or Aerial form but it is permissible to use permanently bound manuals for products whose complexity and/or maintenance requirements are not great.

3.0 MANUAL TITLE

3.1 The title shall be Airplane Maintenance Manual if all technical data is included. If a manufacturer elects to publish maintenance data in more than one volume, each separate volume shall be titled Wiring Diagram Manual, Component Maintenance Manual, etc., as appropriate.

4.0 COVER

The information to be included on the cover will be left to the manufacturer's discretion. However, the title and applicable airplane or airplane series designation will be prominently shown on the cover and/or spine of the handbook. In addition, the covers of all handbooks will display the following statement prominently on the cover: "THIS HANDBOOK INCLUDES THE MAINTENANCE INFORMATION REQUIRED TO BE AVAILABLE BY FAR PART _____." (Insert Part 23 or 25 as appropriate).

5.0 BINDER

5.1 At the discretion of the manufacturer, the manual may either be prepared in loose-leaf form with a durable multi-ring cover, Aerofiche card form or in a permanently bound form. If in loose-leaf form, full-size airframe manufacturers publications and engine manufacturers' overhaul manuals should be furnished in a rigid-type binder which carries the manufacturers' name, aircraft or engine type designations, and the title of the publication--on the backbone.

6.0 FORMAT POLICY

All publications shall use the standard numbering system for indexing and assignment of subject matter prescribed in this specification even though all Chapters may not be applicable to the aircraft or to the publication. (The Index Numbering System is described in Paragraph 18 and the Assignment of Subject Matter is contained in Paragraph 19.)

6.1 Manufacturers may omit systems not applicable to their product. In such cases, the Introduction should note the systems covered in the Manual. Manufacturers may also choose to group related systems where the simplicity of the product permits. The two or more systems so grouped shall be identified by their numbers and names listed in this specification in the basic manual Table of Contents and in the individual systems Table of Contents.

7.0 PAGE LAYOUT

7.1 General

7.1.1 Vertical pages rather than horizontal are preferred for all types of publication. If folded pages are used, the page number must be visible when folded. If the manual is loose-leaf, each page should contain the date and effective revision date when revised, or otherwise be identified as to revision status.

7.1.2 Each System/Chapter/Section will start with a new block of page numbers. The System/Chapter, sub-System/Section and Subject Number, the page number and date of issue will appear in the lower left-hand corner, on the left-hand pages and the revision date in the lower right-hand corner. Right-hand pages will have this data in the opposite corners.

7.1.3 The manufacturer's masthead, model and publication title shall appear at the top of each page except on those pages where a component manufacturer's masthead appears in accordance with Paragraph 7.1.4.

- 7.1.4 In "shared interest" chapters for description and operation and system troubleshooting, the airframe manufacturer's masthead only shall be used; however, for unit troubleshooting and maintenance practices, either the airframe or component manufacturer's masthead may be used. If the airframe manufacturer changes the component manufacturer's text or illustration in any way, he shall apply his own masthead. If he simply changes the component manufacturer's element and page number for continuity purposes, he shall retain the component manufacturer's masthead. In both the latter cases (i.e., if any change is made), the change shall be indicated by imprinting either (1) a small vertical block containing the original manufacturer's identifier, element and page number and date, or (2) a vertical black revision line with an asterisk, or other key, to refer to the original manufacturer's identification which may be printed as a footnote at the bottom of the page.
- 7.2 Size
- 7.2.1 Preferred standard size--8-1/2" x 11" or 5-1/2" x 8-1/2" or standard Aerofiche card style. Bound manuals may be of any size smaller than 8-1/2" x 11" at the option of the manufacturer.
- 7.3 Binding
- 7.3.1 All pages of full size loose-leaf manuals shall be set up for standard loose-leaf filing.
- 8.0 CHAPTER LISTING
- 8.1 Each manual shall carry a list of Chapters or Sections contained in it.
- 9.0 TAB DIVIDERS
- 9.1 Primary divisions or groups of a publication which enable broad separation of content shall be identified by a tab divider carrying the title of the System/Chapter if tab dividers are used. If tab dividers are not used, a method of identification shall be provided to permit easy location of each System/Chapter.
- 9.2 Each chapter, including the Introduction section to the manual, shall be marked with a plasticized tab divider (when tabs are used). For ease of reference, these dividers shall be staggered.
- 10.0 COPY STANDARDS
- 10.1 All text shall be prepared in one or two columns with justification at the discretion of the manufacturer; however, two columns are preferred for ease of reading. Except for foldout pages and start of chapters, all pages shall be printed on both sides. Each chapter shall be started on a right-hand page. When an

illustration is required to be reproduced horizontally on a page, the top of the illustration shall always be toward the left edge of the sheet. If the manual is to be available also on microfilm or aerofiche, a vertical presentation is preferred. Even though large illustrations are laid out horizontally it is preferred to have indexing callouts and titles read vertically. Each figure and/or table shall be numbered in numerical progression within sections. All figures and/or tables shall bear a title with a number. The manufacturer's masthead, publication title, aircraft model and issue and revision dates or codes shall appear on all pages that contain text or illustrations. However, aircraft model number should not be included in engine maintenance manuals.

- 10.2 A normal blank page shall be identified on the preceding page only.
- 10.3 The manufacturer's masthead, publication title, aircraft model and issue and revision dates or codes may be omitted from individual pages at the option of the manufacturer in small, permanently bound manuals.
- 11.0 PAPER AND PRINTING
- 11.1 Paper shall be white in color, with good strength characteristics, and of sufficient weight and substance to eliminate excessive show-through when printed on both sides. In meeting these requirements, considerations shall be given to limiting paper bulk. A form of printing shall be used which results in a black image suitable for reproduction. Copy density shall be uniform throughout the page.
- 11.2 Interim changes, except microfilm copy, shall be printed on colored stock. Weight and substance may be governed by printing process used. (Note: ATA uses blue for Alert Bulletins and yellow for Temporary Revisions).
- 11.3 Material supplied by the manufacturer for microfilming, including revisions, shall be provided on one side only in a form suitable for photographing.
- 11.4 All text shall be prepared in 10- or 12-point type. Type style shall be determined by the manufacturer preparing the manual based on the equipment available and good judgment. First, second and third level heads and captions should be distinctive in size and/or style.
- 12.0 IDENTIFYING REVISIONS/REISSUES MATERIAL
- 12.1 REVISION - A revision means a modification of information in an existing manual. Appropriate revision pages and related effectivity page lists will be provided when amending the basic document.
- 12.2 REISSUE - A reissue is a second or subsequent edition of a manual which supersedes the preceding edition.

- 12.3 As a general rule, a revision shall be prepared when a minor number of the total pages of the manual is affected. Normally, when pages are added to the end of a section, or to the back of a publication--not affecting pages already in the manual--a revision shall always be prepared. However, when a point is reached where the accumulated revisions make distribution, filing and use of the manual difficult, a reissue is warranted.
- 12.4 When accumulated revisions, including back-up pages, total over 60% of the total pages in the manual, a reissue of the manual should be prepared.
- 12.5 Revisions and/or additions shall be identified by a vertical black line or the letter "R" using automatic means, along the outside of the page (or gutter on two-column pages) opposite only that portion of the printed matter that was changed. In the case of a revision to an illustration, a black vertical line or a black hand may be utilized to call attention to the changed portion.
- 12.6 Each page containing changed or added material may bear the words "Revision No. ____", followed by the revision date.
- 12.7 In a reissue, all paragraphs, illustrations, tables, and pages may be renumbered, as necessary, to eliminate all number suffixes and to establish correct sequence. All revision numbers and dates shall be removed from pages. All partial pages, and all miniature hand, shading, or black-line-in-margin change symbols shall be eliminated. The issue number and date must be clearly identified on the manual title page.
- 13.0 WARNINGS, CAUTIONS & NOTES
- 13.1 These adjuncts to the text may be used to highlight or emphasize important points when necessary. Warnings and cautions shall precede the text to which each applies, but notes may precede or follow applicable text depending on the material to be highlighted. Warnings, cautions and notes shall not contain procedural steps nor shall they be numbered. When a warning, caution or note consists of two or more paragraphs, the heading WARNING, CAUTION, NOTE, shall not be repeated above each paragraph. If it is ever necessary to precede a paragraph by a warning and a note, or a caution and a note, etc., they shall appear in the sequence as noted, namely, warnings, cautions, notes. Such inserts in the text shall be short and concise and be used to emphasize important and critical instructions.

WARNING

An operating procedure, inspection, repair or maintenance practice, which if not correctly followed, could result in personal injury, or loss of life.

CAUTION

An operating procedure, inspection, repair or maintenance practice, which if not strictly observed, could result in damage or destruction of equipment.

NOTE

An operating procedure, inspection, repair or maintenance condition, etc., which is deemed essential to highlight.

- 14.0 TABLE OF CONTENTS AND LIST OF PAGE EFFECTIVITY
- 14.1 A listing of the applicable Systems/Chapters or Subsystems/Sections by Number and Title shall be contained in the Introduction Section of the Manual(s). At the option of the manufacturer, each System/Chapter may open with a "Table of Contents." Table of Contents pages shall bear the applicable Chapter numbers and title followed by a listing of all major heads and sub-heads within the System/Chapter and Subsystems/Section. If the Table of Contents is listed only in the Introduction, the major heads and sub-heads should also be listed.
- 14.2 A list of Page Effectivity should be provided in the front of each Manual and can be combined with the Table of Contents, or in front of each System/Chapter.
- 14.3 Where chapters have been eliminatd through combining with other chapters, the original chapter heading will be listed in the Table of Contents in the front of the Manual and a reference given as to where the material is now located. This shall also apply to the Table of Contents for each chapter, with the subsystem relocations being identified as to the new location. It is not necessary to include a relocated chapter table of contents if the total chapter has been relocated, but the subsystem relocations should then be identified in the Table of Contents at the front of the book.
- 15.0 TEXT MATERIAL - STYLE
- 15.1 Text Content
- 15.1.1 Text shall be as brief and concise as practicable. Sentence forms shall be simple and direct, avoiding the obvious and the elementary, and omitting discussions of theory except where essential for practical understanding and application. All related data shall be grouped in a logical manner.

- 15.2 Paragraphing and Outlining
- 15.2.1 Material shall be prepared in modified block style as used in this specification. Subdivisions of text shall be identified and each breakdown shall be indented two spaces between characters as follows:
1. Major Breakdown
 - A. Major Subdivision
 - (1) Steps of Procedure
 - (a) Any necessary further breakdown of the steps.
 - 1 Sub-Step
- 15.3 Person and Voice
- 15.3.1 The second person imperative shall be used for operational procedures; for example: "Break casing bead loose from wheel flange." Avoid sentences in the passive voice. The third person shall be used for descriptive discussion as, for example: "The torsion link assembly transmits torsional loads from the axle to the shock strut."
- 15.4 Nomenclature
- 15.4.1 Nomenclature shall be consistent throughout all technical data provided to the Customer. For example, a part once identified as a "cover" shall not be referred to elsewhere as a "plate."
- 15.4.2 Units of measurements shown in manual must be consistent where practical.
- 15.5 Titles
- 15.5.1 The lead title of major text subdivisions shall indicate in a brief descriptive phrase the subject to be covered and the function to be performed. Titles for subordinate breakdowns of text shall be second person imperative active voice whenever possible. For example, when specific job functions are covered, use titles such as, "Replace Oil Temperature Thermostat Control," "Check Operation of CO₂ System," etc.
- 15.5.2 The full name of the unit shall be shown in the lead title of the material. If the full name is susceptible to abbreviation for common usage, the abbreviation shall also be included in parenthesis in the title. Future reference to the unit may be by abbreviation.

15.6 Illustrations

15.6.1 Illustrations should be used whenever they will simplify, shorten, or make the text easier to understand. They should be located as close as possible to related portions of the text. To the maximum extent possible, illustrations shall be presented in vertical layout for ease of reading and cross-reference.

15.6.2 The illustrations shown on pages 11 through 15, 19 and 20 are examples of the type that may be included in maintenance manual Fig. 1, pages 11 and 12 are typical plating/skin illustrations as specified in System Chapters 53, 54, 55 and 57.

15.7 Use of Color

15.7.1 Techniques such as shading, cross-hatching, screening or similar means are recommended. However, if color will make an illustration easier to understand, it is permissible. (If the manual is also to be available on microfilm or aerofiche, color cannot be used.)

15.8 Schematic Diagrams

15.8.1 Schematic diagrams shall be used when necessary to indicate "flow" and to illustrate the operation of air control, electrical, fluid-power, fuel and turbo systems in as straightforward a manner as possible. See example on Figure 2.

15.8.2 The flow of systems shall be presented in patterned shading and by having a minimum of turns in the lines. The schematic diagrams should include generators, tanks, and reservoirs that are considered to be the starting points of the flow shown. The diagram shall be arranged so that the flow of the system can be traced with a minimum of effort. Cross-overs shall be avoided as much as possible. Return lines need not be shown in entirety unless necessary to the understanding of the system.

15.8.3 A separate shading pattern to distinguish between supply, pressure, return, etc., shall be used. The same coding for each individual system shall be used throughout the manual.

15.8.4 All flow control devices within the system, such as check valves, fuel pumps, accumulators, and relays should be included. Solenoid valves shall be indicated as such and shall include a notation indicating whether the valve is spring-loaded to the open or closed position. Once a symbol or device is established for a valve or control, it shall be used for this type of unit throughout the manual. The symbols used should be shown and identified in a legend block on the schematic diagram. They may also be shown in the Introduction.

15.8.5 In designing schematic diagrams, it may be necessary to compromise between detail that is necessary to make the diagram self-explanatory,

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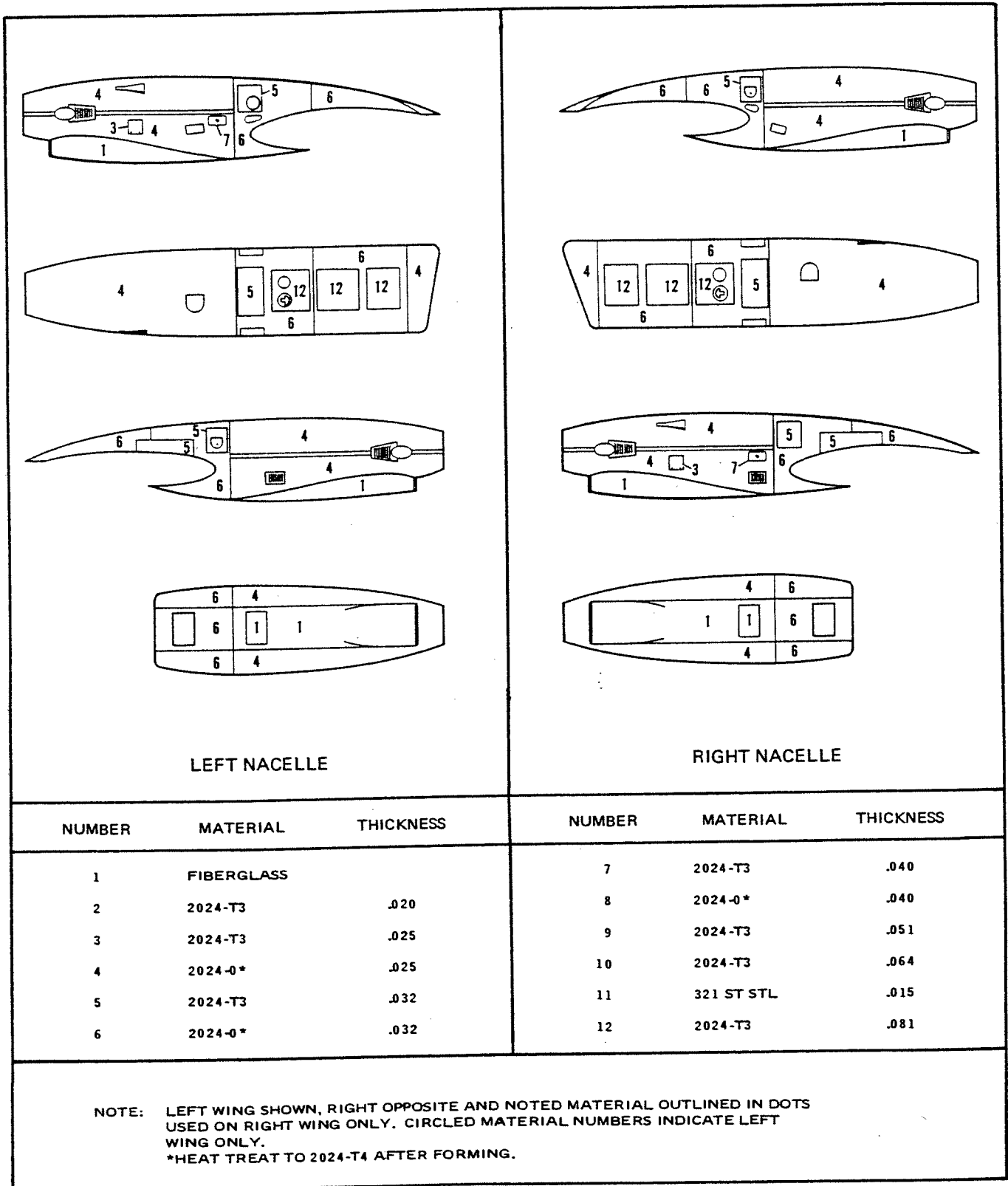


Figure 1 Skin Thickness

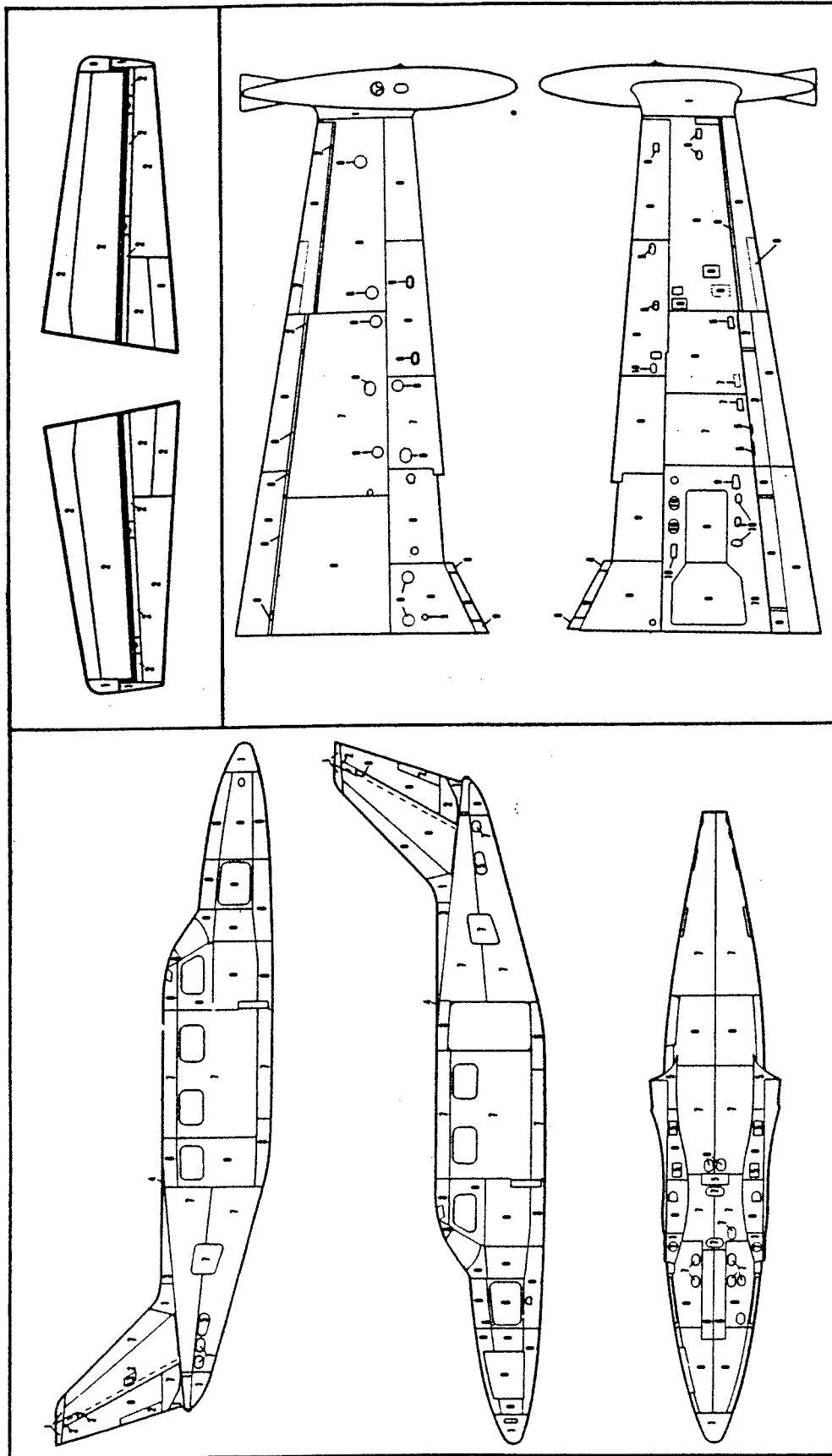


Figure 1 Skin Thickness (Cont)

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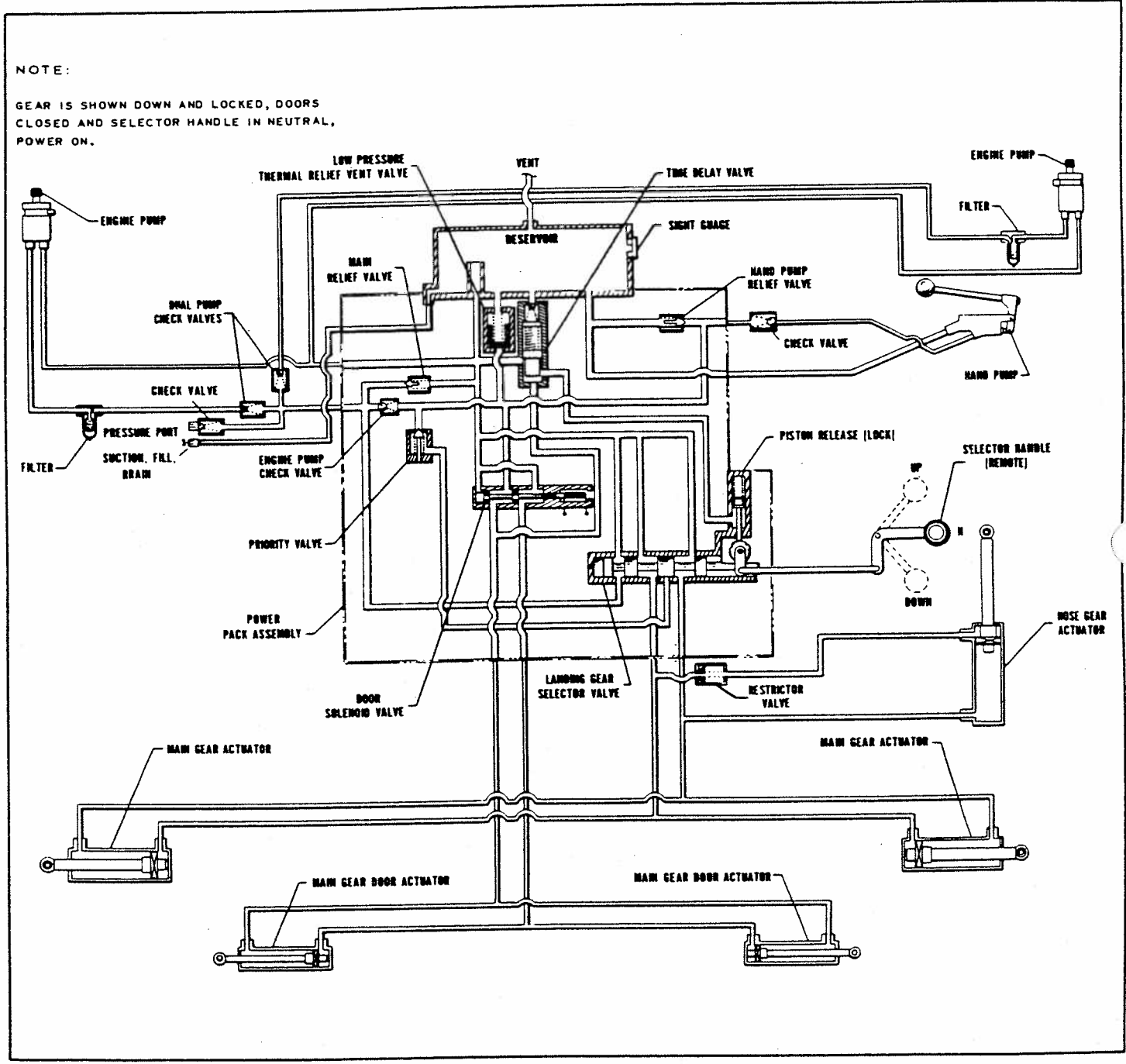


Figure 2 Schematic Diagram of Hydraulic System

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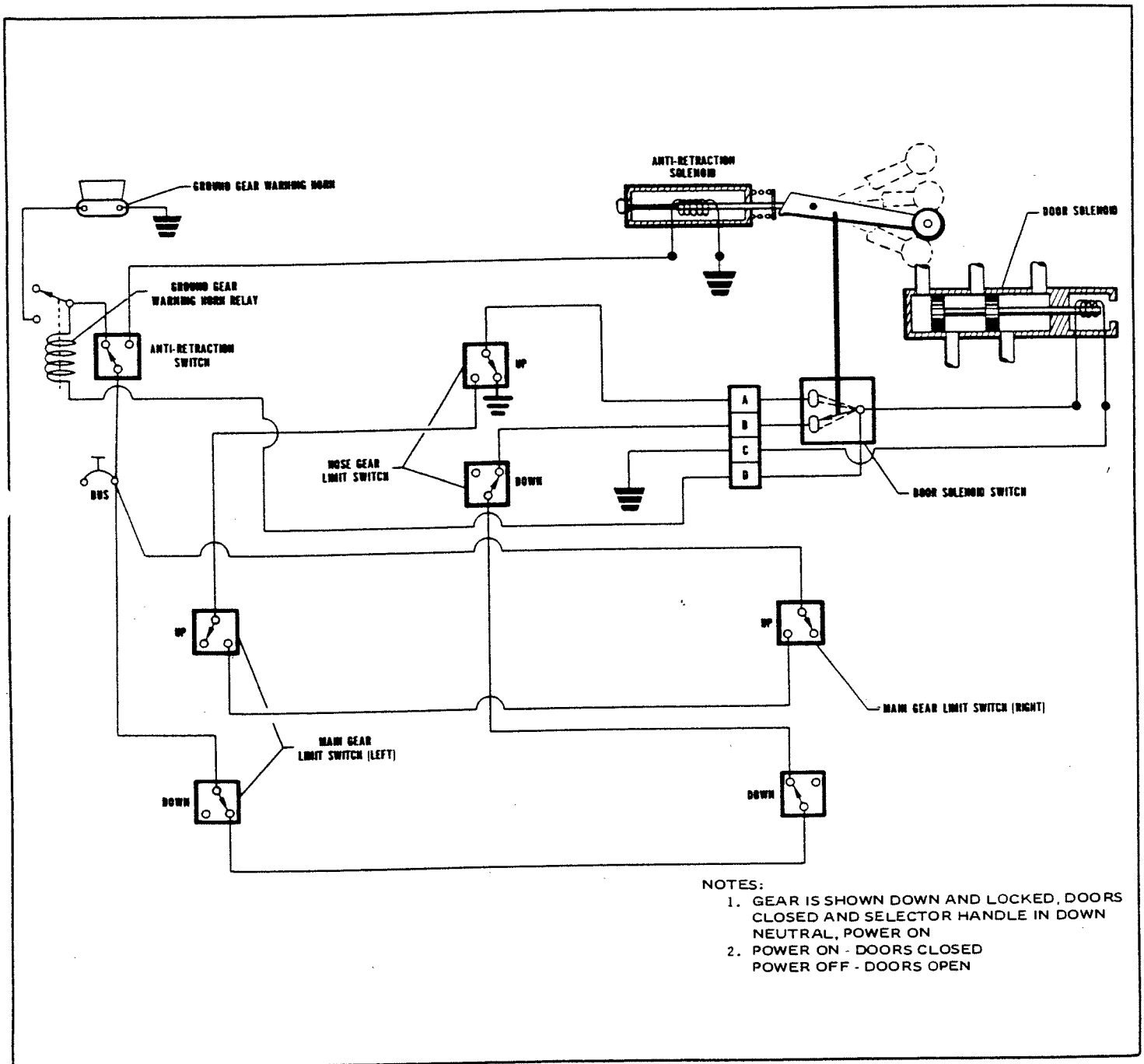
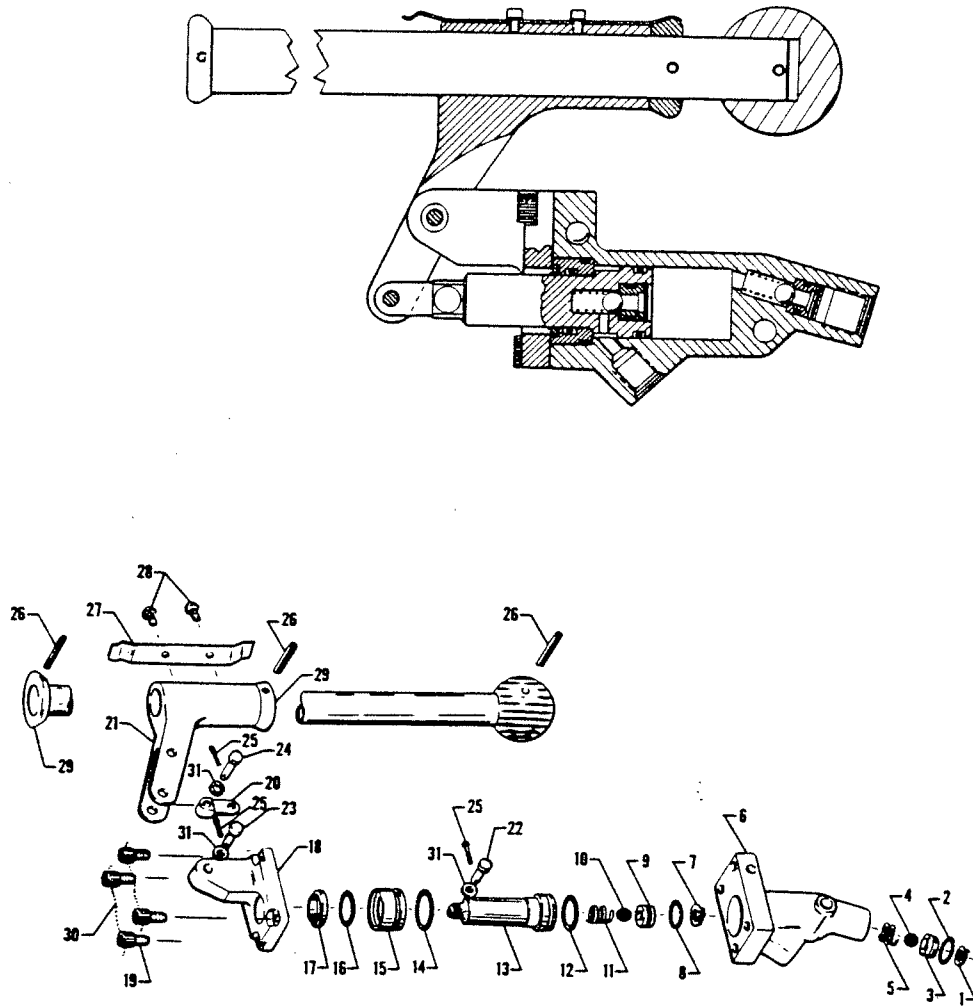


Figure 3. Schematic Power Pack Electrical System

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- | | | |
|-------------------|--------------------|--------------------|
| 1. SNAP RING | 12. O-RING PACKING | 22. PIN, FLAT HEAD |
| 2. O-RING PACKING | 13. PLUNGER | 23. PIN, FLAT HEAD |
| 3. SEAT | 14. O-RING PACKING | 24. PIN, FLAT HEAD |
| 4. BALL, CHECK | 15. GLAND, PACKING | 25. PIN, COTTER |
| 5. SPRING | 16. O-RING | 26. PIN, ROLL |
| 6. BODY, PUMP | 17. SCRAPER | 27. SPRING |
| 7. SNAP RING | 18. BRACKET | 28. SCREW |
| 8. O-RING PACKING | 19. SCREW, ALLEN | 29. STOP |
| 9. SEAT | 20. LINK | 30. SAFETY WIRE |
| 10. BALL, CHECK | 21. LEVER | 31. WASHER |
| 11. SPRING | | |

Figure 4. Hand Pump, Exploded View

and simplicity that is essential for ease of reading and understanding. Where diagrams are complex by virtue of their automatic features or interrelated controls, such characteristics shall be covered by means of explanatory text in the diagram or accompanying text instead of by schematic representation.

15.8.6 On schematic diagrams such as electrical, where a large number of items are listed, the items shall be presented in a logical order such as the sequence of the arrangement of the items in the airplane or in the schematic diagram. Electrical schematics may be shown in either (a) the basic Maintenance Manual, Chapter 24, 39; (b) individual chapters where simplicity is desired; or (c) in a separate Wiring Diagram Manual.

15.8.7 For simplicity of presentation and understandability, complex systems should be divided into system-function rather than overall master schematic diagrams. Interconnects to other systems should be plainly noted.

15.9 Wiring Diagrams

15.9.1 Wiring diagrams may be shown in the basic Maintenance Manual in the System/Chapter/Sections or in a separate Wiring Diagram Manual. In either case, a chart (charts) will be included showing standard symbols used throughout the manual.

15.9.2 For simplicity of presentation and understandability, complex systems should be divided into system-function rather than overall master wiring diagrams. Interconnects to other systems should be plainly noted.

15.10 Separate Wiring Diagram Manual

If a separate Wiring Diagram Manual is used, a System/Chapter, Subsystem/ Section Index or Group/Section Index will be provided. (Refer to Paragraph 19.)

15.10.1 Alphabetical Subject Index

An alphabetical index by subject is to be included in the Introduction, as an assistance in locating the desired circuit. The index should show the chapter and subchapter in which a circuit of the system appears.

15.10.2 Component Locator and Wire Coding

To facilitate troubleshooting, repair of circuits, and replacement of components, an identification and coding system should be used.

The suggested system is to establish:

15.10.2.1 Reference Designator for Each Component

- 15.10.2.2 Individual wire identification codes are established to assist in tracing circuitry (Figure 5). A manufacturer may use his own wire identification code if desired. The following code is suggested for those who do not have an established code.
- 15.10.2.3 Briefly, a wire code consists of a circuit function letter, wire number, wire segment letter and wire size (American Wire Gage). Frequently a suffix indicating ground (N), phase (A, B, etc.) or thermocouple material (alumel, etc.) is added.
- 15.10.2.4 In some cases, wires are color coded and these should be indicated on the wiring diagram.
- 15.10.2.5 Individual electrical symbols are provided in this specification as a suggestion for those who do not have an established code.

16.0 SUBJECT SEQUENCE

16.1 Each Chapter or Section is to start with a general description of the system and its operation and should be labeled Description and Operation. If there are interrelationships with other systems, they should be explained. The function and operation of each unit in the system should be described as well as the location of the units.

16.2 Troubleshooting Section

The troubleshooting section should follow the material on Description and Operation. Troubleshooting in a complex system consists of:

- a) Identifying sections that can cause specific types of trouble,
- b) Isolating the section that is causing the trouble,
- c) Identifying units in the faulty section that can cause the trouble,
- d) Isolating the unit that is at fault, and
- e) Correcting the cause of the trouble.

Troubleshooting information may be presented by either troubleshooting charts (sometimes called "logic tree" charts) or by text, or a combination of text and supplementary charts. If text is used, the procedures shall be grouped under the following three basic functions:

SPECIFICATION FOR MANUFACTURERS MAINTENANCE DATA

BASIC CODES

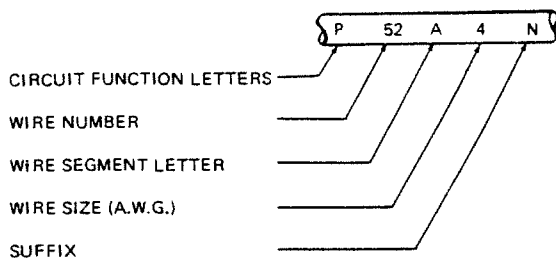


Figure 1

A list of circuit function designations follows:

- A Armaments
- B Photographic
- C Control surfaces; automatic pilot
- D Instruments other than flight or engine instrument; ammeter, landing gear position, free air temperature, cabin pressure, etc.
- E Engine instrument; fuel flow, fuel quantity, tachometer, synchroscope, etc.
- F Flight Instrument
- G Landing gear, actuator, retraction, warning, down lock, etc.
- H Heating, ventilating, deicing
- J Ignition
- K Engine Control; starter, prop pitch, prop synchronizer, etc.
- L Lighting
- M Miscellaneous electric; windshield wiper,
- P DC power
- Q Fuel and oil; fuel valves, fuel pump motors, throttle control, oil pumps, etc.
- R Radio; RC radio command, RM-marker beacon
- S Radar; SA-altimeter, SS-search etc.
- T Special electronics; TK-telemetry, TR-receivers, etc.
- U Miscellaneous electronics (other than R,S,T)
- V DC power for AC systems
- W Warning and emergency
- X AC power
- Y Armaments special systems

SUFFIX CODES

Ground Codes

1. The ground cable letter "N" shall be used as a suffix to the wire identification code to identify any wire or cable that completes the circuit to the ground network. Such wires and cables shall be capable of being connected to the ground network of the aircraft electrical system without causing malfunctioning of any circuit. For critical and sensitive electronic systems which have interconnecting ground leads, but only one segment actually grounded to structure, only the segment actually grounded to structure shall be identified with the "N" suffix.

Phase Codes

1. Phase letter "A", "B", or "C", shall be used as a suffix on the wire identification code to identify the phase of wires that are in the three-phase wiring of ac systems. The phase sequence shall be "A" - B - "C". The letters "A", "B", and "C", shall indicate the phase sequence corresponding to "T₁", "T₂", and "T₃", respectively. For grounded delta systems, "T₂" shall be considered as corresponding to the grounded phase. (Examples of wire identification coding, as applied to ac power wiring, are illustrated on Figure)
2. Phase letter "V" shall be used as a suffix on the cable identification code to identify the ungrounded wire or cable that is in a single-phase system.

Figure 5. Identification Codes

SPECIFICATION FOR MANUFACTURERS MAINTENANCE DATA

ZONE		LTR		REVISIONS		DATE	APPROVED
				DESCRIPTION			
		B		NO CHANGE. REISSUED FOR "B" REVISION.		3-4-77	Chambers
						3/4/77	<i>[Signature]</i>

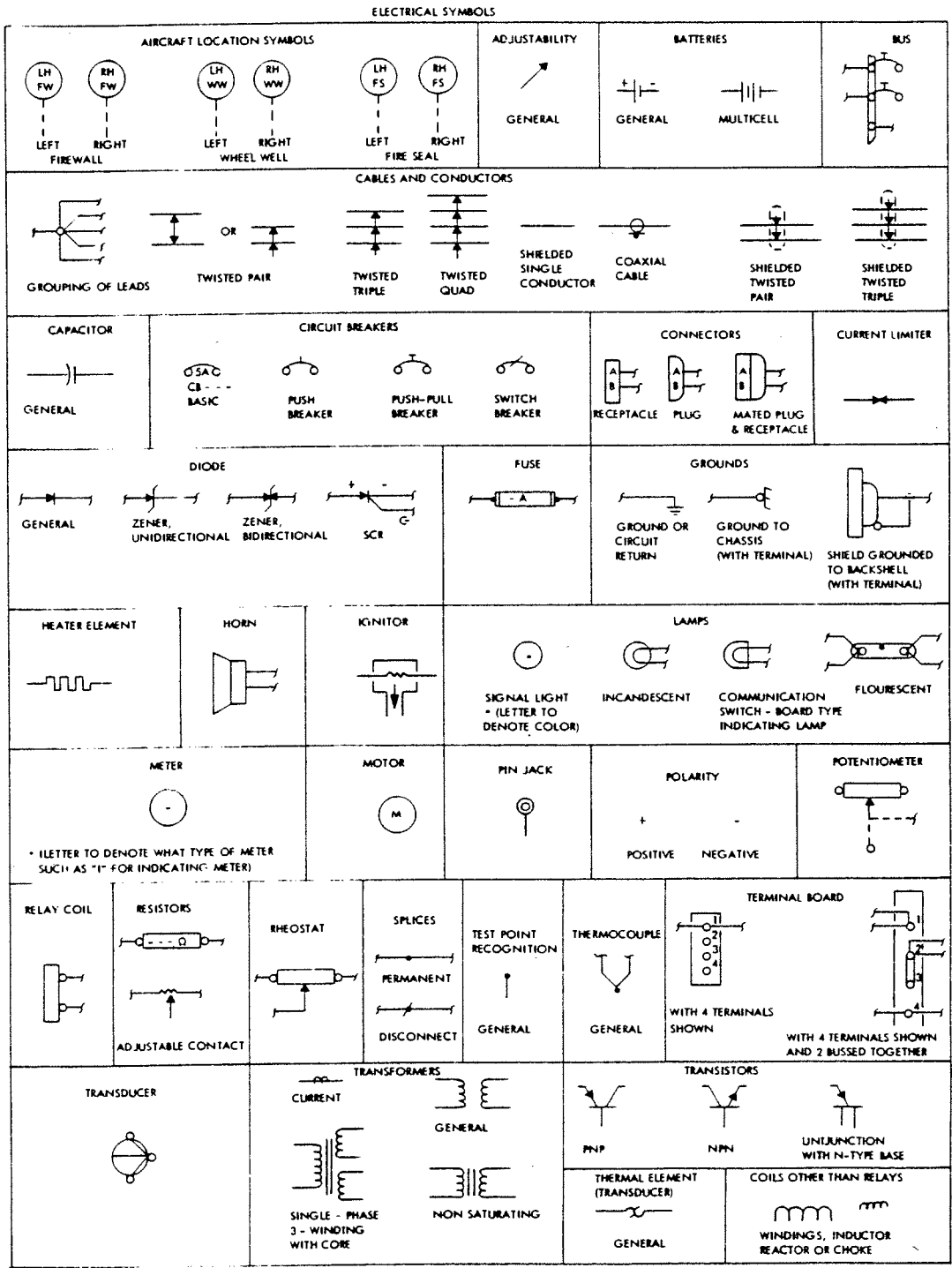


FIGURE 4 ELECTRICAL SYMBOLS, SHEET 1 OF 2

DR	L. CHAMBERS	3-4-77	TITLE	WIRING DIAGRAM - ELECTRICAL SYSTEMS		
CHR			SIZE	CODE IDENT NO	DRAWING NO	
MF-1 & AFTER	APPD		C	70898	105-360012	
EFFECTIVELY	APPD		SCALE	REV	DESIGNATOR	SHEET
			NONE		NOTES	31

90-37116

Figure 6. Electrical Symbols

SPECIFICATION FOR MANUFACTURERS MAINTENANCE DATA

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
	B	NO CHANGE, REISSUED FOR "B" REVISION.	3-4-77
			APPROVED Chambers

ELECTRICAL SYMBOLS - CONTINUED

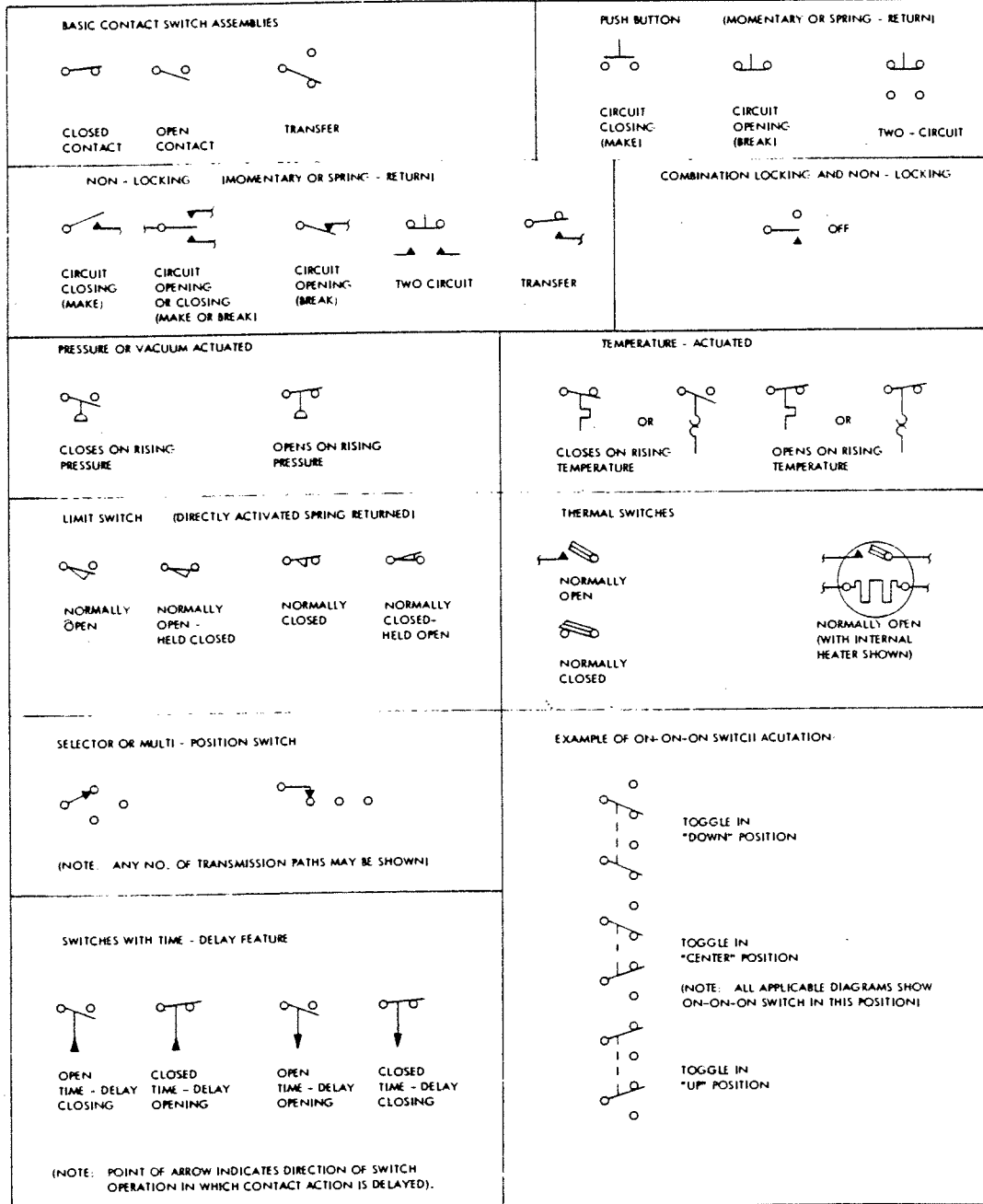


FIGURE 4 ELECTRICAL SYMBOLS, SHEET 2 OF 2

DR	L. CHAMBERS	3-4-77	WIRING DIAGRAM - ELECTRICAL SYSTEMS			
CHK			SIZE	FIG. IDENT. NO.	DRAWING NO.	
ME-1 3 AFTER	APPD		C	70898	105-360012	
ELI 3 SIXTY	APPD		SLATE	REV	DESIGNATION	SHEET
			NONE	B	NOTES	32

Figure 7. Electrical Symbols (Continued)

- 16.2.1 Possible Causes: The first step in listing possible causes of each trouble is to show what sections of the system may be at fault. List these sections under each trouble in order of probability. In addition, under each section, in order of probability, list the unit conditions that may be causing the trouble.
- 16.2.2 Isolation Procedure; Under this heading, list any notes or key points necessary in isolating the trouble in the sections and components.
- 16.2.3 Correction: In this column, list any notes or key points involved in correcting the trouble in the unit.
- 16.3 Maintenance Practices
- 16.3.1 "Maintenance Practices" which are a combination of servicing, removal/installation, adjustment/test, inspection/check, cleaning/painting, and approved repairs should follow the Troubleshooting Section.
- 16.3.2 When the required maintenance procedure is not lengthy and is relatively simple, a combination of the above may be grouped under one heading and called Maintenance Practices.
- 16.3.2.1 Servicing: That servicing required on units as the result of the accomplishment of any other maintenance practice. It includes items such as the inflation or refilling of shock struts, the lubrication of control systems, the sterilizing of potable water systems, etc.
- 16.3.2.2 Removal/Installation: The removal/installation portion shall state clearly the sequence of steps required to remove and reinstall a component or unit, along with precautions to be observed.

Deactivation/Reactivation procedures for circuits, systems, units, etc., shall be included.

Procedures shall be prepared in reference number sequence within each Chapter with proper major and minor subject heads, without the necessity of each procedure starting at the top of a new page.

Any adjustments/tests that are necessary as part of installation or reactivation procedures shall be in the text in proper sequence.

The statement that installation or reactivation procedures are the reverse of removal or deactivation procedures is not acceptable.

16.3.2.3 Adjustment/Test: The adjustment test description shall provide instructions for accomplishment of a test or check to assure the integrity as an operational component of a system, subsystem or unit assembly.

Such tests or checks will vary in complexity and stringency according to the conditions under which the unit functions. It is not intended that a complex functional test of a complete system and its attendant closer tolerances be performed if the unit replaced reactivates the system and operates within the confines of a go-no-go specification.

Following are definitions of three categories of tests that shall apply:

16.3.2.3.1 Operational Test: That procedure required to ascertain only that a system or unit is operable. These tests should require no special equipment or facilities other than that installed on the aircraft and should be comparable to the tests performed by the flight crews. It is not intended that the operational test of the unit shall meet the specifications and tolerances ordinarily established for overhaul, or major maintenance periods.

16.3.2.3.2 Functional Test: That procedure required to ascertain that a system or unit is functioning in all aspects in accordance with minimum acceptable system or unit design specifications. These tests may require supplemental ground support equipment and should be more specific and detailed than an operational test. It should contain all necessary information to perform proficiency tests to maintain system or unit reliability at an acceptable level, without reference to additional documents. A functional/test is tests at minor maintenance periods.

16.3.2.3.3 System Test: That procedure containing all adjustment specifications and tolerances required to maintain system and/or unit performance at maximum efficiency and design specifications. It shall be self-contained and may duplicate other tests. It is normally used at major maintenance periods.

It is understood that compliance with the above can in some instances cause duplication of test procedures, which is acceptable. Unit or assembly removal/installation procedures may reference a system/subsystem test only if the major test procedure is so utilized that the individual assembly/unit test may be called out without overlap and if accomplishment shall not require completion of the whole system test.

- 16.3.2.3.4 Inspection/Check: The inspection/check portion shall provide information and procedure necessary to gain access to and inspection or check of a system, a unit, or an area.
- 16.3.2.3.5 Cleaning/Painting: The cleaning/painting portion shall provide information as to material and procedure necessary to clean and paint an area or areas, and contain safety precautions necessary to protect personnel and material. Materials shall be identified by generic names and by MIL or AMS specification number where applicable.
- 16.3.2.3.6 Approved Repairs: The approved repair portion shall include processes and techniques necessary for performing a repair. Special tools, equipment and materials shall be included. Includes specifications and limitations as to when a repair is required for safe operation. (Excludes repairs contained in the Structural Repair Manual if provided, or in the Components Maintenance Manual if provided.)

17.0 TEXT PREPARATION - GENERAL

The material required above shall be presented as follows:

It is intended to present an overall idea of the job. It should provide an introduction to the work, and a base on which to build the instructions which follow.

- 17.1 Reasons for the Job/Use and Limitations of the Process: This gives the purpose of the work and understanding of the work. List the reasons/uses and limitations in detail.
- 17.2 Scope of Work Involved: What the job consists of; what is to be worked on; and what operations are to be done. The purpose of this portion of the test is to give direction to the job.
- 17.3 Equipment and Materials: List the tools, equipment and materials required in the job which are not normally included in the mechanic's tools.
- 17.4 Procedure: This requires a breakdown of the job into logical steps or operations.
 - 17.4.1 Basic Steps or Operations: Some jobs or processes consist of several basic operations, with a number of minor steps or work items under each. Others are built around a single operation, and the breakdown results in work items only. In either case, first determine the basic operations or steps in the job or process, as an experienced man would do them, and then list the steps. The first step should always be Job Set-Up, and the last should be Close-Up or Clean-Up. The replacement of a unit, for example, would involve: Job Set-Up, Removal, Installation, Test, Adjustment, and Close-Up.

17.4.2 Detail Steps or Work Items: After the basic operations have been broken out, they should be examined and the minor steps or work items, which make up each, should be listed. The detail should be extended down to, but not include, such common practices as tightening a nut, removing a bolt, etc. However, such details should be included when they are of a specific nature.

Example: The removal step in the replacement of the hydraulic reservoir might break down into:

DETAIL STEPS OF WORK ITEMS	KEY ITEMS
Relieve system pressure	Tell How-Warning or Caution
Open and tag by-pass valve	Tag
Bleed reservoir air	Tell How-Warning or Caution
Drain reservoir	
Disconnect liquidometer	
Disconnect and cap lines, plug ports	
Remove sight guage and bracket assembly	Fragile
Remove reservoir and fittings from reservoir	Mark Angle

17.4.3 Key Items or Cautions: Describing the steps is a job that may leave much to be desired. In most operations there are key items that are significant to the job. These consist of:

- Personal safety precautions
- Cautions regarding steps in which personnel, the work, or equipment can be damaged.
- Describe details that if forgotten could affect airworthiness.

18.0 INDEX NUMBERING SYSTEM - GENERAL

The index for maintenance manuals shall be compatible with the basic Standard Breakdown of Section 20. However, manufacturers may omit System/Chapters that are not applicable to the product or combine System/Chapters where it is feasible. Those combined should be shown in the Table of Contents Index as noted in Section 14.3.

18.1 Types of Index Numbering

18.1.1 There are two types of numbering methods that may be used. For airplanes having an array of sophisticated or complex systems, the full System/Chapter method of indexing is recommended.

18.1.2 For small or relatively noncomplex airplanes, an abbreviated indexing method may be used.

18.1.3 Regardless of method used, any publication conforming to the GAMA format will use the same basic numbering system. Thus, whether the manual be a maintenance manual or a wiring diagram manual for a large airplane or a small airplane, the person wishing information concerning the indicating portion of the fuel system would refer to the Tab Chapter 28, Fuel. The Table of Contents in the front of this chapter, or the basic Table of Contents in the front of the book, will provide a list of subsystems covered in the chapter.

For example, the Fuel System Chapter of the full indexing method would contain:

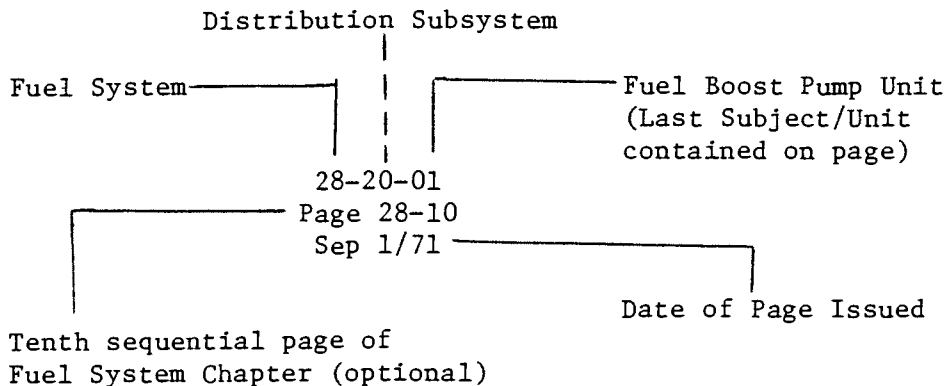
28	General
28-10	Storage (Tanks, cells, necks, caps, instruments, etc.)
28-20	Distribution (Fuel lines, pumps, valves, controls, etc.)
28-30	Dump (If in-flight dumping system installed, it would appear here.)
28-40	Indicating (Quantity, temperature, pressure, etc., does not include engine fuel flow or pressure.)

18.1.4 Carrying this example further, Fuel Indication, Left, Indicator panel, could be assigned the number 28-40-01. The table of contents in front of each chapter will list the items covered and the numbers assigned.

18.2 Page Identification and Numbering System

18.2.1 An acceptable page numbering method for the full index manuals consists of three-element numbers separated by dashes, under which the page number and date is printed. For simplicity the Subject/Unit element number may be omitted for small or relatively noncomplex airplane manuals.

TYPICAL PAGE IDENTIFICATION & NUMBER



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- 18.2.2 When the chapter/system element number is followed with zeros in the section/subsystem and subject/unit element number (28-00-00), the information is applicable to the entire system.
- 18.2.3 When the section/subsystem element number is followed with zeros in the subject/unit element number (28-20-00), the information is applicable to subsystems within the system.
- 18.2.4 The subject/unit element number is used to identify information applicable to units within the subsystems. The subject/unit element number progresses sequentially from the number 01, in accordance with the number of subsystem units requiring maintenance information.
- 18.2.5 All system/subsystem/unit (chapter/section/subject) maintenance data is separated into specific types of information: description and operation, troubleshooting, maintenance practices. This data is to be presented in the following sequence.
- Description and Operation
 - Troubleshooting
 - Maintenance Practices
- 18.2.6 Relatively simple units may not require description and operation, and/or troubleshooting information. In addition, those items requiring many types of maintenance practices are broken out as follows:
- Servicing
 - Removal/Installation
 - Adjustment/Test
 - Inspection/Check
 - Cleaning/Painting
 - Approved Repairs
- 18.2.7 Illustrations use the same figure numbering as the chapter block in which they appear. For example, Figure 28-2 would be the second figure in the Fuel System Chapter.
- 19.0 ASSIGNMENT OF SUBJECT MATTER
- 19.1 Definitions: The contents of a publication shall be organized on four levels, the first three of which shall be selected in accordance with the following assigned Aircraft Group, System and Subsystems listing. The levels are defined as follows:
- 19.1.1 Group Those primary divisions of a publication which enable broad separation of content. Typical of this division is the separation between Airframe Systems and the Aircraft Power Plant.

19.1.2 System/Chapter Those secondary divisions which permit the subject matter within the Groups to be discussed separately.

NOTE

The Systems are also known as Chapters of a manual. Each Chapter is assigned a number and may be marked by an index tab divider (refer to Paragraph 9.1) carrying the System Title and Chapter number. The Chapter number is assigned the first element in the page numbering system (Ref. 18.2).

A system is a combination of interrelated components arranged to perform a specific function. Each system as defined includes the basic components and all instruments, mechanical controls, electrical and hydraulic units related to the system.

When a power source (electrical, pneumatic, or hydraulic) services a single component, or serves a single functioning system, that power source will be included in the discussion of the component or system which it serves. Examples are the air storage bottle supplying the air starter, the battery energizing the emergency exit light circuit, the air bottle supplying emergency brake pressure.

When two or more systems are served by a single power source, that power source will be discussed separately under the appropriate chapter heading: either electrical, pneumatic, hydraulic or vacuum. An example is the pneumatic system supplying air to both the air conditioning system and the engine starters.

19.1.3 Subsystem/Section

Those tertiary divisions which permit a system to be broken into subsystems.

Subsystems/Sections shall be identified by the second element in the Standard Numbering System (Ref. 20.0 and pages 21 through 39).

When two or more subsystems/sub-subsystems in a different system are so interrelated and integrated that they cannot logically and practically be treated as separates--such as a combined Autopilot and Flight Director system--they shall be combined into a common sub/sub-subsystem and be assigned the chapter/section number of the predominant sub/sub-subsystem.

19.1.4 Unit/Subject

Those final divisions which permit the identification of the individual units in a system or subsystem.

Subjects shall be identified by the third element in the page numbering system (Ref. 18.2).

NOTE

Unit/Subject numbers are not preassigned; these numbers and their sequence may be selected by the manufacturer to fit the coverage requirements of his publication.

19.1.5 System/Chapter, Subsystem/Section, Unit/Subject Number

This term describes the complete number when it is referred to as a whole. For example, the number 29-31-03, which contains elements on all levels, may be called the chapter/section/subject number for easier identification and reference.

20.0 STANDARD BREAKDOWN:

See Detail Requirements.

ARRANGEMENT OF MATERIAL

POLICY

In order to standardize the treatment of subject matter and to simplify the user's problem in locating instructions, a uniform method of arranging material in all manuals has been developed. It is recognized that the content of certain of the manuals does not lend itself to the full breakdown. Where this occurs, the detail specification shall call out authorized deviations.

In general, however, it is desired that the following chapter arrangements and breakdown be followed uniformly and to the maximum extent practicable in all manuals.

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
4		AIRWORTHINESS LIMITATIONS
5		TIME LIMITS/MAINTENANCE CHECKS
	00	General
	10	Time Limits
	20	Scheduled Maintenance Checks
	30	
	40	
	50	Unscheduled Maintenance Checks
6		DIMENSIONS AND AREAS
7		LIFTING AND SHORING
	00	General
	10	Jacking
	20	Shoring
8		LEVELING AND WEIGHING
9		TOWING AND TAXIING
	00	General
	10	Towing
	20	Taxiing
10		PARKING AND MOORING
	00	General
	10	Parking
	20	Mooring
11		REQUIRED PLACARDS
	00	General
	10	Exterior Color Schemes and Markings
	20	Exterior Placards and Markings
	30	Interior Placards and Markings
12		SERVICING
	00	General
	10	Replenishing
	20	Scheduled Servicing
	30	Unscheduled Servicing
20		STANDARD PRACTICES - AIRFRAME

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
21		ENVIRONMENTAL SYSTEMS
	00	General
	10	Pressurization
	20	Distribution
	30	Pressurization Control
	40	Heating
	50	Cooling
	60	Temperature Control
	70	Moisture/Air Contaminant Control
22		AUTO FLIGHT
	00	General
	10	Autopilot
	20	Speed - Attitude Correction
	30	Auto Throttle
	40	System Monitor
23		COMMUNICATIONS
	00	General
	10	Speech Communication
	20	Data Transmission & Automatic Calling
	30	Passenger Address and Entertainment
	40	Interphone
	50	Audio Integrating
	60	Static Discharging
	70	Voice Recorders
24		ELECTRICAL POWER
	00	General
	10	Generator Drive
	20	AC Generation
	30	DC Generation
	40	External Power
	50	Electrical Load Distribution
25		EQUIPMENT/FURNISHINGS
	00	General
	10	Flight Compartment
	20	Passenger Compartment
	30	Buffet/Galley
	40	Lavatories
	50	Cargo Compartments
	60	Emergency
	70	Accessory Compartments

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
26		FIRE PROTECTION
	00	General
	10	Detection
	20	Extinguishing
	30	Explosion Suppression
27		FLIGHT CONTROLS
	00	General
	10	Aileron and Tab
	20	Rudder and Tab
	30	Elevator and Tab
	40	Horizontal Stabilizers
	50	Flaps
	60	Spoiler, Drag Devices and Variable Aerodynamic Fairings
	70	Gust Lock and Dampener
	80	Lift Augmenting
28		FUEL
	00	General
	10	Storage
	20	Distribution
	30	Dump
	40	Indicating
29		HYDRAULIC POWER
	00	General
	10	Main
	20	Auxiliary
	30	Indicating
30		ICE AND RAIN PROTECTION
	00	General
	10	Airfoil
	20	Air Intakes
	30	Pitot and Static
	40	Windows and Windshields
	50	Antennas and Radomes
	60	Propellers
	70	Water Lines
	80	Detection

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
31		INDICATING/RECORDING SYSTEMS
	00	General
	10	Panels
	20	Independent Instruments
	30	Recorders
	40	Computers
32		LANDING GEAR
	00	General
	10	Main Gear and Doors
	20	Nose Gear and Doors
	30	Extension and Retraction
	40	Wheels and Brakes
	50	Steering
	60	Position and Warning
	70	Supplementary Gear
33		LIGHTS
	00	General
	10	Flight Compartment
	20	Passenger Compartments
	30	Cargo and Service Compartments
	40	Exterior
	50	Emergency Lighting
34		NAVIGATION AND PITOT STATIC
	00	General
	10	Flight Environment Data/Pitot Static
	20	Attitude and Direction
	30	Landing and Taxiing Aids
	40	Independent Position Determining
	50	Dependent Position Determining
	60	Position Computing
35		OXYGEN
	00	General
	10	Crew
	20	Passenger
36		PNEUMATIC
	00	General
	10	Distribution
	20	Indicating

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
37		VACUUM
	00	General
	10	Distribution
	20	Indicating
38		WATER/WASTE
	00	General
	10	Potable
	20	Wash
	30	Wash Disposal
	40	Air Supply
39		ELECTRIC/ELECTRONIC PANELS & MULTIPURPOSE PARTS
	00	General
	10	Instrument & Control Panels
	20	Electrical & Electronic Equipment Racks
	30	Electrical & Electronic Junction Boxes
	40	Multipurpose Electrical & Electronic Parts
	50	Integrated Circuits
	60	Printed Circuit Card Assemblies
49		AIRBORNE AUXILIARY POWER
	00	General
	10	Power Plant
	20	Engine
	30	Engine Fuel and Control
	40	Ignition/Starting
	50	Air
	60	Engine Controls
	70	Indicating
	80	Exhaust
	90	Oil
51		STRUCTURES
	00	General

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
52		DOORS
	00	General
	10	Passenger/Crew
	20	Emergency Exit
	30	Cargo
	40	Service
	50	Fixed Interior
	60	Entrance Stairs or Step
	70	Door Warning
	80	Landing Gear
53		FUSELAGE
	00	General
	10	Main Frame
	20	Auxiliary Structure
	30	Plates/Skin
	40	Attach Fittings
	50	Aerodynamic Fairings
54		NACELLES
	00	General
	10	Main Frame
	20	Auxiliary Structure
	30	Plates/Skin
	40	Attach Fittings
	50	Fillets/Fairings
55		STABILIZERS
	00	General
	10	Horizontal Stabilizers
	20	Elevator/Elevon
	30	Vertical Stabilizer
	40	Rudder
	50	Attach Fittings
	60	Auxiliary Stabilizers
56		WINDOWS
	00	General
	10	Flight Compartment
	20	Cabin
	30	Door
	40	Inspection and Observation

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
57		WINGS
	00	General
	10	Main Frame
	20	Auxiliary Structure
	30	Plates/Skin
	40	Attach Fittings
	50	Flight Surfaces
60		STANDARD PRACTICES - PROPELLER
61		PROPELLERS
	00	General
	10	Propeller Assembly
	20	Controlling
	30	Braking
	40	Indicating
70		STANDARD PRACTICES - ENGINE
71		POWER PLANT
	00	General
	10	Cowling
	20	Mounts
	30	Fireseals
	40	Attach Fittings
	50	Electrical Harness
	60	Air Intakes
	70	Engine Drains
72		ENGINE
72		ENGINE TURBINE/TURBO-PROP
	00	General
	10	Reduction Gear and Shaft Section (Turbo-Prop)
	20	Air Inlet Section
	30	Compression Section
	40	Combustion Section
	50	Turbine Section
	60	Accessory Drives
	70	By-Pass Section

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
72		ENGINE RECIPROCATING
	00	General
	10	Front Section
	20	Power Section
	30	Cylinder Section
	40	Supercharger Section
	50	Lubrication
73		ENGINE FUEL SYSTEMS
	00	General
	10	Distribution
	20	Controlling
	30	Indicating
74		IGNITION
	00	General
	10	Electrical Power Supply
	20	Distribution
	30	Switching
75		AIR
	00	General
	10	Engine Anti-Icing
	20	Accessory Cooling
	30	Compressor Control
	40	Indicating
76		ENGINE CONTROLS
	00	General
	10	Power Control
	20	Emergency Shutdown
77		ENGINE INDICATING
	00	General
	10	Power
	20	Temperature
	30	Analyzers

<u>System Chapter</u>	<u>Subsystem Section</u>	<u>Title</u>
78		EXHAUST
	00	General
	10	Collector/Nozzle
	20	Noise Suppressor
	30	Thrust Reverser
	40	Supplementary Air
79		OIL
	00	General
	10	Storage
	20	Distribution
	30	Indicating
80		STARTING
	00	General
	10	Cranking
81		TURBINES
	00	General
	10	Power Recovery
	20	Turbo-Supercharger
83		ACCESSORY GEARBOXES
	00	General
	10	Drive Shaft Section
	20	Gearbox Section
91		CHARTS & WIRING DIAGRAMS
95		SPECIAL PURPOSE EQUIPMENT

DEFINITIONS OF AIRCRAFT GROUPS, SYSTEMS AND SUBSYSTEMS

<u>GROUP</u>	<u>DEFINITION</u>
AIRCRAFT	<p>The complete type certificated unit. Does not include optional items installed by the Manufacturer or Fixed Base Operator at the request of the purchaser.</p> <p>Maintenance information shall include, in addition to the normal maintenance items, the following:</p> <ol style="list-style-type: none">1. Scheduling information2. Troubleshooting information3. Remove/replace products4. General procedural instructions5. Access diagrams6. Special inspection techniques The Maintenance recommendations for special inspection techniques such as X-ray, ultrasonic, magnetic particle inspection, etc., of life limited parts or other peculiar techniques utilized to determine condition of life limited parts.7. Application of protective treatments after inspection8. Structural fasteners9. Special tools10. Direction as to who and how to contact technical personnel at the manufacturers Plant, for assistance in repairing or replacing items damaged and not covered by a standard repair.11. Manufacturers reference to type and source of supply for latest available service releases to aid in maintaining aircraft.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
4		AIRWORTHINESS	<p>This Section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure required for type certification. This Section may also include additional items at the option of the manufacturer subsequent to type certification, and with FAA concurrence.</p> <p>This Section shall contain a legible statement in a prominent location to the effect that:</p> <p>The Airworthiness Limitations Section is FAA approved.</p> <p>This Section may also be included as part of the Pilot's Operating Handbook Limitations Section, or be included as a reference therein.</p>

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
5		TIME LIMITS/ MAINTENANCE CHECKS	Manufacturers' recommended time limits, maintenance checks and inspections (both scheduled and unscheduled).
	-00	General	
	-10	Time Limits/ Inspection Program	Those manufacturer recommended time limits for inspections, maintenance and overhaul of the aircraft, its systems and units, and life of parts, as applicable. These time limits are not mandatory (See Chapter 4 for mandatory times).
	-20	Scheduled Maintenance	Those manufacturer-recommended maintenance checks and inspections of the aircraft, its systems and units dictated by the time limits specified in -10 above. This section shall cross-reference the detailed procedures included in the individual Maintenance Practices.
	-30 & -40		Reserved for use in those cases where the number of breakouts provided by the fourth digit in the -20 breakout is not sufficient to cover all of the maintenance checks dictated by subsystem -10 above.
	-50	Unscheduled Maintenance Checks	Those maintenance checks and inspections on the aircraft, its systems and units which are recognized by the Manufacturer as special or unusual conditions which are not related to the time limits specified in -10 above. Includes inspections and checks such as hard landing, turbulent air, lightning strike, overweight landing, bird strike, slush ingestion, maintenance checks prior to engine-out ferry, etc., as applicable.

SYSTEM/
CHAPTER

SUBSYSTEM/
SECTION

TITLE

DEFINITION

5
(Cont'd)

Unscheduled
Maintenance
Checks

NOTE

The manufacturer will have the option to include Time Limits/Inspections and Maintenance Checks in a separate manual, providing they are also placed in the Maintenance Manual.

SYSTEM/
CHAPTER

SUBSYSTEM/
SECTION

TITLE

DEFINITION

6

DIMENSIONS
AND AREAS

Those charts, diagrams, and text which show the area, dimensions, stations, access doors and physical locations, of the structural members of the aircraft. Includes an explanation of the system of measurement used.

Includes cardinal rigging dimensions used in checking damaged aircraft or aircraft undergoing major repair.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
7		LIFTING & SHORING	The material necessary to describe the lifting and shoring of aircraft in any of the conditions anticipated by the manufacturer to which it may be subjected. Includes procedures covering maintenance, overhaul and repair, remove and replace, as well as abnormal conditions such as belly landing, nose landing, etc. Charts showing lifting and jacking points shall be provided.
	-00	General	
	-10	Jacking	Provides information relative to jack points, adapters, tail supports, balance weights, jacks and jacking procedures utilized during aircraft maintenance and repair.
	-20	Shoring	Those instructions necessary to support the aircraft during maintenance and repair. Includes information on shoring materials and equipment, contour dimensions, shoring locations, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
8		LEVELING & WEIGHING	This chapter shall provide that information considered necessary by the manufacturer to properly level the aircraft for any of the various maintenance, overhaul or major repairs which might become necessary during the life of the aircraft. Includes those maintenance practices necessary to prepare the aircraft for weighing.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
9		TOWING AND TAXIING	Those instructions necessary to tow and taxi the aircraft in any of the probable conditions to which it may be subjected. Illustrations showing location of attachment points, turning radius, etc., shall be included. Includes those maintenance practices necessary to prepare the aircraft for towing and taxiing.
	-00	General	
	-10	Towing	Those instructions necessary to tow or push the aircraft in normal or abnormal conditions such as towing from soft ground and slippery or icy surfaces, with engines removed, or aircraft damaged. Shall include equipment and materials required such as towing vehicles, tow bars, towing cables, etc.; procedures to be used such as ground turning techniques, use of brakes, connection of electrical power, etc.; precautions and limitations such as use of landing gear and control surface locks, minimum turning radius, maximum towing and pushing loads on nose landing gear, etc.
	-20	Taxiing	Those instructions necessary to taxi the aircraft in normal or abnormal conditions such as adverse weather conditions, etc., for maintenance reasons. Shall include procedures to be used such as use of engines, brakes, ground turning techniques, etc.; precautions and limitations such as jet intake, propeller, and exhaust danger areas, minimum turning radius.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
10		PARKING & MOORING	Those instructions necessary to park and moor the aircraft in any of the probable conditions to which it may be subjected. Charts showing location of landing gear and control surface locks, blanking plugs and covers, mooring points, etc., shall be included. Includes those maintenance practices necessary to prepare the aircraft for parking and mooring, if applicable.
	-00	General	
	-10	Parking	Those instructions necessary to park or store the aircraft in normal or abnormal conditions such as with engines removed, aircraft damaged, etc.; for short or long terms in extremes of weather conditions. Shall include equipment and materials required such as landing gear and control surface locks, wheel chocks, blanking plugs and covers, etc.; procedures such as periodic engine running, control or drainage of fluid systems, static grounding, etc.; precautions and limitations, such as landing gear strut pressures and wheel rotation, etc.
	-20	Mooring	Those instructions necessary to moor or picket the aircraft in normal or abnormal conditions such as with engines removed or aircraft damaged, etc.; for short or long terms in extremes of weather conditions. Shall include equipment and materials required such as wheel chocks, mooring blocks, mooring cables, etc.; procedures such as ballasting, etc.; precautions and limitations such as control in high wind conditions, etc., and inspections for gust damage.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
11		REQUIRED PLACARDS	The Maintenance Manual shall provide the location and pictorial illustrations of each placard--stencil or marking indicating those which are required by the minimum equipment list.
	-00	General	
	-10	Exterior Color Schemes and Markings	This subsystem/section breakdown reserved for airline use.
	-20	Exterior Placards and Markings	Those placards and markings required for ground servicing instructions, inspections, cautions, warnings, etc.
	-30	Interior Placards and Markings	Those placards, markings, etc.; required for interior general and emergency information, instructions, cautions, warnings, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
12		SERVICING	<p>Those instructions for the replenishment of fluids, scheduled and unscheduled servicing applicable to the whole airplane. The information shall be concise and may be presented in tabular or chart form.</p> <p>Precautions to be observed in servicing a particular tank or reservoir, such as grounding and prevention of fire hazards, shall be clearly stated. Instructions regarding access to any out-of-the-way or unusual places requiring service shall be given.</p> <p>A diagram showing location of regular and emergency servicing points shall be included. "No-step" areas or walkways leading to any tank in a wing or hull, with necessary precautions, shall be indicated.</p>
	-00	General	
	-10	Replenishing	<p>Those instructions necessary for the replenishment of fuel, oil, hydraulic fluid, water, other fluids, tire pressure, etc. Tank and reservoir capacities in U.S., imperial and metric measure, shall be included. ANA or other standard specification number and grade (if applicable) of fuel, oil, fluid, and other material used shall be given. Specifications and grades shall be shown grouped on one page to facilitate revisions. For fuel, given expansion volume, total fuel capacity, sump capacity, net fuel capacity (as applicable). For oil, given allowance for expansion.</p>
	-20	Scheduled Servicing	<p>Those instructions necessary to carry out servicing that may be scheduled. Includes instructions such as those for periodic lubrication of components, aircraft external and</p>

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
12 (Cont'd)	-20 (Cont'd)	Scheduled Servicing	internal cleaning, etc. Shall not include lubrication procedures required for the accomplishment of maintenance practices. Reference may be made to supplier documents in lieu of component lubrication.
	-30	Unscheduled Servicing	Those instructions necessary to carry out servicing that is considered by the manufacturer to be normally unscheduled. Includes instructions such as those for ice and snow removal from parked aircraft, preoiling of radial engines after extended shutdown, etc.

SYSTEM/
CHAPTER

SUBSYSTEM/
SECTION

TITLE

DEFINITION

20

STANDARD
PRACTICES-
AIRFRAME

Refer to Text Material - Style
(Spec. common to all manuals) for
text material style, paragraphing,
outline, nomenclature, titles, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
21		ENVIRONMENTAL SYSTEMS	Those units and components which furnish a means of pressurizing, heating, cooling, moisture controlling, filtering and treating the air used to ventilate the areas of the fuselage within the pressure seals, as applicable. Includes cabin supercharger, equipment cooling, heater, heater fuel system, expansion turbine, valves, scoops, ducts, etc. This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the following sections -00 through -70, as applicable. Overhaul data, considered applicable by the manufacturer, may be included in this chapter.
	-00	General	
	-10	Pressurization	That portion of the system and its controls which supply compressed air to the cabin. Includes items such as controls and indicating systems related to the compressors, etc., if applicable. Does not include the pressure control and indicating system for the cabin pressurization.
	-20	Distribution	That portion of the system used to induct and distribute air. Includes equipment rack cooling systems and items such as blowers, scoops, ducting, inlets, check valves, etc. Does not include valves which are part of pressurization and temperature control.
	-30	Pressurization Control	That portion of the system used to control the pressure within the fuselage. Includes items such as control valves, relief valves, indicators, switches, amplifiers, etc., as applicable.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
21 (Cont'd)	-40	Heating	That portion of the system and its controls which supply heated air to the cabin. Includes items such as heater units, fuel system and control, ignition, indicating systems related to heater operation, etc., as applicable. Does not include the temperature control and indicating systems.
	-50	Cooling	That portion of the system and its controls which supply cooled air to the cabin. Includes items such as the cooling unit, indicating systems related to the cooler operation, etc., as applicable. Does not include temperature control and indicating systems.
	-60	Temperature Control	That portion of the system used to control the temperature of the air within the cabin. Includes items such as control valves, sensing devices, switches, indicators, amplifiers, etc., as applicable.
	-70	Moisture/Air Contaminant Control	That portion of the system used to control moisture in the air, to control ozone concentrations, to filter radioactive debris from conditioned air, and to treat the air with deodorizers, insecticides, etc., as applicable.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
22		AUTO FLIGHT	Those units and components which furnish a means of automatically controlling the flight of the aircraft. Includes those units and components which control direction, heading, attitude, altitude and speed. This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the following Sections -00 through -40, as applicable. Overhaul of any or all components in this chapter must be accomplished in a qualified shop in accordance with data supplied by the component manufacturer.
	-00	General	
	-10	Autopilot	That portion of the system that uses radio/radar beam, directional and vertical gyro, Pitot static and manually induced inputs to the system to automatically control yaw, pitch and roll of the aircraft. This includes power source devices, interlocking devices and amplifying, computing, integrating, controlling, actuating, indicating and warning devices such as computers, servos, control panels, indicators, warning lights, etc.
	-20	Speed-Attitude Correction	That portion of the system that automatically maintains a safe flight attitude by correcting for effects of speed, such as mach trim and speed stability. This includes sensing, computing, actuating, indicating, and warning devices such as computers, servos, actuators, warning lights, etc.
	-30	Auto Throttle	That portion of the system that automatically controls the position of the throttles to properly blend engine power with flap position and

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
22 (Cont'd)	-30 (Cont'd)	Auto Throttle	aircraft pitch attitude during landing/approach and go around procedures. This includes engaging, sensing, computing, amplifying, controlling, actuating and warning devices such as amplifiers, computers, servos, limit switches, clutches, gear boxes, warning lights, etc.
	-40	System Monitor	That portion of the system that monitors the flight of aircraft during approach and landing. This includes sensing, computing, indicating and warning devices such as computers, indicators, warning lights, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
23		COMMUNICATIONS	<p>Those units and components which furnish a means of communicating from one part of the aircraft to another and between the aircraft and other aircraft or ground stations, includes voice and C-W communicating components, PA system, intercom and tape recorder-record player. This chapter may refer to supplier data, furnished with the aircraft, in lieu of the following Sections -00 through -70, as applicable. Overhaul of any or all components in this chapter must be accomplished with data supplied by the component manufacturer.</p> <p>The equipment included in the basic maintenance manual may be only that which is normally included and installed in quantity. Data for "Special Order" or other than standard options may be in separate manuals or as separate data furnished with the individual aircraft.</p>
	-00	General	
	-10	Speech Communication	<p>That portion of the system which utilizes voice modulated electro-magnetic waves to transmit and/or receive messages from air-to-air, or air-to-ground installations. Includes H.F., V.H.F., U.H.F., etc., communication transmitting and receiving equipment.</p>
	-20	Data Transmission & Automatic Calling	<p>That portion of the system which presents information derived from pulse-coded transmissions. Includes Teleprinter, Selcal, Calsel, etc.</p>
	-30	Passenger Address and Entertainment	<p>That portion of the system used to address and entertain the passengers. Includes items such as amplifiers, speakers, handsets, reproducers, control panels, etc.</p>

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
23 (Cont'd)	-40	Interphone	That portion of the system which is used by flight and ground personnel to communicate between areas on the aircraft. Includes items such as amplifier, handset, etc. Does not include the interphone system within the flight compartment which is part of the integrating system.
	-50	Audio Integrating	That portion of the system which controls the output of the communications and navigation receivers into the flight crew headphones and speakers, and the output of the flight crew microphones into the communications transmitters. Includes items such as audio selector control panel, microphones, headphones, cockpit loud speakers, etc.
	-60	Static Discharging	That portion of the system which is used to dissipate static electricity.
	-70	Voice Recorders	That portion of the system used to record crew member conversation.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
24		ELECTRICAL POWER	<p>Those electrical units and components which generate, control and supply AC and/or DC electrical power for other systems, including generators and relays, inverters, batteries, etc., through the secondary busses. Also includes common electrical items such as wiring, switches, connectors, etc.</p> <p>This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the following Sections -00 through -50, as applicable.</p>
			NOTE
	-00	General	
	-10	Generator Drive	<p>Mechanical devices that drive the generators at a desired RPM. Includes items such as oil system, connecting devices, indicating and warning systems for the drive, etc., as applicable.</p>
	-20	AC Generation	<p>That portion of the systems used to generate, regulate, control, and indicate AC electrical power. Includes items such as inverters, AC generators/alternators, control and regulating components, indicating systems, etc., all wiring to but not including main busses, as applicable.</p>

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
24 (Cont'd)	-30	DC Generation	That portion of the systems used to generate, regulate, control and indicate DC electrical power. Includes items such as generators/ alternators, transformers, rectifiers, batteries, control and regulating components, indicating systems, etc., all wiring to but not including main busses, as applicable.
	-40	External Power	That portion of the system within the aircraft which connects external electrical power to the aircraft's electrical system. Includes items such as receptacles, relays, switches, wiring, warning lights, etc., as applicable.
	-50	Electrical Load Distribution	That portion of the systems which provides for connection of AC or DC power to using systems. Includes items such as AC and DC main and secondary busses, main system circuit breakers, power systems devices, etc.

SYSTEM/
CHAPTER
25

SUBSYSTEM/
SECTION

TITLE
EQUIPMENT/
FURNISHINGS

DEFINITION

Those removable items of equipment and furnishings contained in the flight, passenger, cargo and accessory compartments. Includes emergency, buffet and lavatory equipment if furnished as manufacturer-designated standard equipment. Does not include structures or equipment assigned specifically to other chapters.

-00 General

-10 Flight
Compartment

The compartment above the floor and between the forward passenger partition and the forward pressure dome. Includes items such as flight crew seats, tables, pilot check lists, pilot food containers, curtains, manuals, electronic equipment racks, if furnished as manufacturer-designated standard equipment. Does not include cargo compartments.

-20 Passenger
Compartment

The areas in which the passengers are seated. Includes items such as seats, berths, hatracks, curtains, wall coverings, and soundproofing, carpets, magazine racks, movable partitions, wall-type thermometers, spare bulbs, fuses, etc., if furnished as manufacturer-designated standard equipment.

-30 Buffet/Galley

The areas in which food and beverages are stored and prepared. Includes items such as removable and fixed cabinets, ovens, refrigerators, garbage containers, dish racks, coffee maker and dispensers, curtains, etc., if furnished as manufacturer designated standard equipment.

-40 Lavatories

Includes items such as mirrors, seats, cabinets, dispensing equipment, etc., if furnished as manufacturer-designated standard equipment.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
25 (Cont'd)	-50	Cargo Compartments	Those compartments for storage of cargo and those components which are or can be mounted on the aircraft and used to load/unload, restrain, guide or service cargo. Includes restraint nets, etc., if furnished as manufacturer-designated standard equipment.
	-60	Emergency	Those items of equipment carried for use in emergency procedures. Includes items such as evacuation equipment, life rafts and jackets, first aid kit, landing and signal flares, evacuation signaling systems, etc., if furnished as manufacturer-designated standard equipment. Does not include fire extinguishers, oxygen equipment or masks.
	-70	Accessory Compartments	Those compartments used for the housing of various components or accessories. Includes wheel wells, tail-hydraulic-electrical/electronic equipment racks, main battery structure, insulation blankets, if furnished as manufacturer-designated standard equipment.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
26		FIRE PROTECTION	Those fixed and portable units and components which detect and indicate fire or smoke, and store and distribute fire extinguishing agent to all protected areas of the aircraft; including bottles, valves, tubing, etc., if furnished as manufacturer-designated standard equipment.
	-00	General	
	-10	Detection	That portion of the system which is used to sense and indicate the presence of overheat, smoke, or fire, if furnished as manufacturer-designated standard equipment.
	-20	Extinguishing	That portion of those fixed or portable systems which is used to extinguish fire, if furnished as manufacturer-designated standard equipment.
	-30	Explosion Suppression	That portion of the system which is used to sense, indicate and extinguish a flame propagating into the fuel vent or scoop to prevent an explosion in the fuel system, if furnished as manufacturer-designated standard equipment.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
27		FLIGHT CONTROLS	Those units and components which furnish a means of manually controlling the flight attitude characteristics of the aircraft, including items such as hydraulic boost system, rudder pedals, control column linkages, control cables, tab controls, mounting brackets, etc. Also includes the functioning and maintenance aspects of the flaps, spoilers and other control surfaces, but does not include the structure which is covered in the Structures Chapters.
	-00	General	Include free play tolerances of items covered in -10, -20 and -30.
	-10	Aileron & Tab	That portion of the systems which controls the position and movement of the ailerons and aileron tabs. Includes items such as the control wheels, cables, boosters, linkages, control surfaces, indicators, etc., as applicable.
	-20	Rudder & Tab	That portion of the systems which controls the position and movement of the rudder and rudder tabs. Includes items such as the rudder pedals, tab control wheel, cables, boosters, linkages, control surfaces, position indicators, etc., as applicable.
	-30	Elevator & Tab	That portion of the systems which controls the position and movement of the elevator/elevon and tabs. Includes items such as the control column, stickshaker units, automatic stall recovery devices, tab control wheels, cables, boosters, linkages, control surfaces, position indicators, stall warning systems, etc., as applicable.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
27 (Cont'd)	-40	Horizontal Stabilizers	That portion of the systems which controls the position and movement of the horizontal stabilizer/canard. Includes items such as control handle, cables, jackscrews, motors, warning systems, linkages, control surfaces, position indicators, etc., as applicable.
	-50	Flaps	That portion of the systems which controls the position and movement of the trailing edge flaps. Includes items such as control handles, cables, actuators, warning systems, linkages, control surfaces, position indicators, etc., as applicable.
	-60	Spoiler, Drag Devices and Variable Aerodynamic Fairings	That portion of the systems which controls the position and movement of the spoilers, drag devices and variable aerodynamic fairings. Includes items such as control handles, cables, warning systems, linkages, spoilers, drag devices, position indicators, etc., as applicable.
	-70	Gust Lock & Dampener	That portion of the systems which protects the control surfaces from movement by wind while the aircraft is on the ground. Does not include locking the control by means of flight control boost system, as applicable.
	-80	Lift Augmenting	That portion of the systems which controls the position and movement of variable operating wing slots, leading edge wing flaps, and other similar auxiliary devices used for increasing aerodynamic lift. Includes items such as control handles, cables, actuators, linkages, warning systems, control surfaces, position indicators, etc. Does not include trailing edge flaps, as applicable.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
28		FUEL	Those units and components which store and deliver fuel to the engine. Includes engine-driven fuel pumps for reciprocating engines, includes tanks (bladder), valves, boost pumps, etc., and those components which furnish a means of dumping fuel overboard. Includes integral and tip fuel tank leak detection and sealing. Does not include the structure of integral or tip fuel tanks and the fuel cell backing boards which are covered in the Structures Chapters, and does not include fuel flow rate sensing, transmitting and/or indicating which are covered in Chapter 73.
	-00	General	Instructions on authorization to use deicing and anti-bacterial agents. Refer back to Servicing, as applicable.
	-10	Storage	That portion of the system which stores fuel. Includes tank sealing, bladder type cells, ventilating system, cell and tank interconnectors, over wing filler necks and caps, etc. Also includes reservoir feed pumping systems and reservoirs within the tanks which are not a part of the distribution system.
	-20	Distribution	That portion of the system which is used to distribute fuel from the filler connector to the storage system and from the storage system to and including the power plant fuel quick disconnect. Includes items such as plumbing, pumps, valves, controls, etc.
	-30	Dump	That portion of the system which is used to dump fuel overboard during flight. Includes items such as plumbing, valves, chutes, controls, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
28 (Cont'd)	-40	Indicating	That portion of the system which is used to indicate the quantity, temperature, and pressure of the fuel. Includes pressure warning systems for pumping systems within the tank, etc. Does not include engine fuel flow or pressure.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
29		HYDRAULIC POWER	Those units and components which furnish hydraulic fluid under pressure (includes pumps, regulators, lines, valves, etc.) to a common point (manifold) for redistribution to other defined systems.
	-00	General	
	-10	Main	That portion of the system which is used to store and deliver hydraulic fluid to using systems. Includes items such as tanks, accumulators, valves, pumps, levers, switches, cables, plumbing, external connectors, etc. Does not include the supply valves to the using systems.
	-20	Auxiliary	That portion of the system which is classified as auxiliary, emergency or standby, and which is used to supplement or take the place of the main hydraulic system. Includes items such as tanks and accumulators which are separate from the main system, hand pumps, auxiliary pumps, valves, plumbing, etc.
	-30	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the hydraulic fluid. Includes items such as transmitters, indicators, warning systems, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
30		ICE AND RAIN PROTECTION	<p>Those units and components which provide a means of preventing or disposing of formation of ice and rain on various parts of the aircraft. Includes alcohol pump, valves, tanks, propeller anti-icing system, wing heaters, water line heaters, pitot heaters, scoop heaters, windshield wipers and the electrical and heated air portion of windshield ice control. Does not include the basic windshield panel.</p> <p>For turbine type power plants using air as the anti-icing medium, engine anti-icing is contained under Air System.</p>
	-00	General	
	-10	Airfoil	That portion of the system which is used to eliminate or prevent the formation of ice on all airfoil surfaces. Includes wings and airfoil sections of the empennage.
	-20	Air Intakes	That portion of the system which is used to eliminate or prevent the formation of ice in or around air intakes. Includes power plant cowling anti-icing.
	-30	Pitot and Static	That portion of the system which is used to eliminate or prevent the formation of ice on the pitot and static systems.
	-40	Windows and Windshields	That portion of the system which is used to eliminate or prevent the formation of ice, frost or rain on the windows and windshields.
	-50	Antennas and Radomes	That portion of the system which is used to eliminate or prevent the formation of ice on antennas and radomes, if applicable.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
30 (Cont'd)	-60	Propellers	That portion of the system which is used to eliminate or prevent the formation of ice on propellers.
	-70	Water Lines	That portion of the system which is used to prevent the formation of ice in water supply and drain lines.
	-80	Detection	That portion of the system which is used to detect and indicate the formation of ice.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
31		INDICATING/ RECORDING SYSTEMS	Those units or components which give visual or aural warning of conditions in unrelated systems. Units which record, store, or compute data from unrelated systems.
	-00	General	
	-10	Unassigned	
	-20	Unassigned	
	-30	Recorders	Those units and components used for recording data not related to specific systems. Includes items such as flight recorders, performance or maintenance recorders, VG recorders, etc.
	-40	Central Computers	Those units used for computing data from a number of different sources without a preponderance of functions in any one system.
	-50	Central Warning Systems	Those units and components which give audible or visual warning of conditions in unrelated systems.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
32		LANDING GEAR	Those units and components which furnish a means of supporting and steering the aircraft on the ground or water, and make it possible to retract and store the landing gear in flight. Includes brakes, wheels, floats, doors, shock struts, tires, linkages, position indicating and warning systems. Also includes the functioning and maintenance aspects of the landing gear doors but does not include the structure which is covered in Chapter 52 DOORS.
	-00	General	
	-10	Main Gear and Doors	That portion of the system which provides the major support for the aircraft while on the ground. Includes items such as shock struts, bogie axles, drag struts, doors, linkages, attach bolts, etc.
	-20	Nose Gear and Doors	That portion of the system which supports the nose of the aircraft while the aircraft is on the ground. Includes items such as shock struts, drag struts, doors, linkages, attach bolts, etc.
	-30	Extension and Retraction	That portion of the system which is used to extend and retract the landing gear and open and close the landing gear doors. Includes items such as actuating mechanisms, bogie trim, bungees, up and down latches, operating controls, valves and motors, cables, plumbing, etc.
	-40	Wheels and Brakes	That portion of the system which provides for rolling and stopping the aircraft while on the ground and stopping wheel rotation after retraction. Includes items such as swivel glands, anti-skid devices, pressure indicators, plumbing, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
32 (Cont'd)	-50	Steering	That portion of the system which is used to control the direction of movement of the aircraft on the ground. Includes items such as actuating cylinders, controls, bogie swivel unlock, etc.
	-60	Position and Warning	That portion of the system which is used to indicate and warn of the position of the landing gear/doors.
	-70	Supplementary Gear	Devices used to stabilize the aircraft while on the ground and prevent damage by ground contact. Includes items such as shock strut, skid blocks, wheels, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
33		LIGHTS	Those units and components which provide for external and internal illumination such as landing lights, taxi lights, position lights, rotating lights, ice lights, master warning lights, passenger reading and cabin dome lights, etc.
	-00	General	
	-10	Flight Compartment	The lighting subsystems in the compartment above the floor and between the forward passenger partition and the forward pressure dome. Does not include cargo compartment. Includes direct and indirect illumination of work areas, panels and instruments. Does not include bulbs and wiring inside of instruments which are removed with the instrument. Includes the master warning light system and the warning light dimming systems.
	-20	Passenger Compartments	The lighting subsystems in the areas in which the passengers are seated and in buffet/galley, lavatories, lounges and coat rooms. Includes items such as direct and indirect illumination, passenger call system, lighted signs, etc.
	-30	Cargo and Service Compartments	The lighting subsystems in the compartments for stowage of cargo and the housing of various components or accessories.
	-40	Exterior	The lighting subsystems used to provide illumination outside of the aircraft. Includes lights such as landing, navigation, position indicating, wing illumination, rotating, courtesy, taxi, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
33 (Cont'd)	-50	Emergency Lighting	The separate and independent subsystems used to provide illumination in case of primary electrical power failure. Includes items such as inertia flashlights, lanterns, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
34		NAVIGATION AND PITOT/STATIC	Those units and components which provide aircraft navigational information. Includes VOR, pitot, static, ILS, flight director, compasses, indicators, etc. This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the following Sections -00 through -60, as applicable. Overhaul of any or all components in this chapter must be accomplished in a qualified shop in accordance with data supplied by the component manufacturer.
	-00	General	
	-10	Flight Environmental Data/Pitot Static	That portion of the system which senses environmental conditions and uses the data to influence navigation. Includes items such as pitot, static, air temperature, rate-of-climb, airspeed, high speed warning, altitude, altitude reporting, altimeter correction system, etc.
	-20	Attitude & Direction	That portion of the system which uses magnetic gyroscopic and inertia forces. Includes items such as gyro horizons, directional gyros, magnetic compasses, and magnetic heading systems, turn and bank, amplifiers, servos, and flight director, etc.
	-30	Landing and Taxiing Aids	That portion of the system which provides guidance during approach, landing and taxiing. Includes items such as localizer, glide slope, ILS, markers, paravisual director, ground guidance systems, etc.
	-40	Independent Position Determining	That portion of the system which provides information to determine position and is mainly independent of ground installations. Includes items such as inertial guidance systems, weather radar, doppler, proximity warning, collision avoidance, star tracker, etc. Also includes sextants/octants, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
34 (Cont'd)	-50	Dependent Position Determining	That portion of the system which provides information to determine position and is mainly dependent on ground installations. Includes items such as DME, transponders, radio compass, LORAN, VOR, ADF, etc.
	-60	Position Computing	That portion of the system which combines navigational information to compute the aircraft's geographical location. Includes items such as course computers, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
35		OXYGEN	Those units and components which store, regulate, and deliver oxygen to the passengers and crew, including bottles, relief valves, shut-off valves, outlets, regulators, masks, etc.
	-00	General	Information on quality of O ₂ used for servicing.
	-10	Crew	That portion of the system which furnishes oxygen to the crew.
	-20	Passenger	That portion of the system which furnishes oxygen to the passengers.

NOTE

For General Aviation aircraft subsystem Section -10 and -20 can be combined.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
36		PNEUMATIC	Those units and components (ducts and valves) which deliver large volumes of compressed air from a power source to connecting points for such other systems as environmental controls, deicing, etc.
	-00	General	
	-10	Distribution	That portion of the system which is used to distribute high or low pressure air to using systems. Includes items such as ducts, valves, actuators, heat exchangers, controls, etc. Does not include the supply valves to the using systems.
	-20	Indicating	That portion of the system which is used to indicate temperature and pressure of the pneumatic system. Includes temperature and pressure warning systems.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
37		VACUUM	Those units and components used to generate, deliver and regulate below atmospheric pressure air, including pumps, regulators, lines, etc., through and including the manifold.
	-00	General	
	-10	Distribution	That portion of the system which is used to distribute below atmospheric pressure air to using systems.
	-20	Indicating	That portion of the system which is used to indicate pressure. Includes pressure warning system.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
38		WATER/WASTE	Those fixed units and components which store and deliver for use, fresh water, and those fixed components which store and furnish a means of removal of water and waste. Includes wash basins, toilet assemblies, tanks, valves, etc., if applicable. For general aviation aircraft this material may be covered in Sys/Chap. 25.
	-00	General	
	-10	Potable	That portion of the system which is used to store and deliver fresh drinking water. Includes wash water system if the potable water is also used for washing.
	-20	Wash	That portion of the system which is used to store and deliver wash water which is not potable.
	-30	Waste Disposal	That portion of the system which is used for disposal of water and waste. Includes items such as wash basins, water closets, flushing systems, etc.
	-40	Air Supply	That portion of the system common to more than one subsystem which is used for pressurizing supply tanks to insure fluid flow.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
39		ELECTRICAL/ ELECTRONIC PANELS & MULTIPURPOSE PARTS	Pictorial coverage of all indicating and control panels and electrical/electronic rack installations. Complete coverage of all general purpose electrical and electronic parts.
	-00	General	
	-10	Instrument and Control Panels	Pictorial coverage of all panels fixed or movable, with their replaceable components such as instruments (inclusive of independent instruments), switches, circuit breakers, fuses, etc. Also includes general coverage of instrument panel vibrators and other panel accessories.
	-20	Electrical & Electronic Equipment Racks	Pictorial and general coverage for all electrical and electronic equipment racks.
	-30	Electrical & Electronic Junction Boxes	Pictorial and general coverage of junction boxes.
	-40	Multipurpose Electrical & Electronic Parts	Contains general coverage for switches, circuit breakers, fuses, lamps/bulbs, synchros, motors, capacitors, resistors, transistors and other discrete electrical and electronic parts.
	-50	Integrated Circuits	Contains general coverage of those devices having integrated components, in monolithic structure, which perform complete circuit functions. Includes integrated Logic devices.
	-60	Printed Circuit Card Assemblies	Contains general coverage of plug-in assemblies or subassemblies which perform a complete circuit function and are used on more than one specific system. Includes Power Supply Cards, Isolation Amplifiers, Servo Control Modules.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
49		AIRBORNE AUXILIARY POWER	Those airborne power plants (engines) which are installed on the aircraft for the purpose of generating and supplying a single type or combination of auxiliary electric, hydraulic, pneumatic or other power. Includes power and drive section, fuel, ignition and control systems; also wiring, indicators, plumbing, valves, and ducts up to the power unit. Does not include generators, alternators, hydraulic pumps, etc. or their connecting systems which supply and deliver power to their respective aircraft systems, if applicable.
	-00	General	
	-10	Power Plant	For definitions see Chapter 71.
	-20	Engine	For definitions see Chapter 72.
	-30	Engine Fuel and Control	For definitions see Chapter 73.
	-40	Ignition/ Starting	For definitions see Chapters 74 and 80.
	-50	Air	For definitions see Chapter 75.
	-60	Engine Controls	For definitions see Chapter 76.
	-70	Indicating	For definitions see Chapter 77.
	-80	Exhaust	For definitions see Chapter 78.
	-90	Oil	For definitions see Chapter 79.

SYSTEM/
CHAPTER

SUBSYSTEM/
SECTION

TITLE

DEFINITION

51

STRUCTURES

Those subjects that are general in nature to the entire structure of the aircraft and are not specifically covered under the following structure chapters. Includes standard practices applicable to structures. Refer to Method of Presentation for Text Material Style, Paragraphing, Outlining, Nomenclature, etc., as applicable. For Overhaul Data contact (Company Name, Address, Cust. Serv. Dept. No., Watts Line, Zip Code, etc., as applicable).

-00

General

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
52		DOORS	Those removable units used for entrance or exit, and for enclosing other structure contained within the fuselage. Includes passenger and crew doors, cargo doors, emergency exits, etc. Electrical and hydraulic systems associated with door control are included as appropriate.
	-00	General	
	-10	Passenger/Crew	The doors used for entrance and exit of the passengers and crew to and from the aircraft. Includes items such as structure latching mechanisms, handles, insulation, lining, controls, integral steps, ramps, and handrails, etc.
	-20	Emergency Exit	The exit doors used to facilitate evacuation that are not normally used for exit. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, etc.
	-30	Cargo	The exterior doors used primarily to gain access to cargo compartments. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, etc.
	-40	Service	The exterior doors used primarily to gain access for servicing aircraft systems and equipment. Includes items such as structure, latching mechanisms, handles, insulation, lining, controls, etc.
	-50	Fixed Interior	The doors inside the fuselage installed in fixed partitions. Includes items such as structure, latching mechanisms, handles, lining, etc. Does not include doors installed in movable partitions which are covered in Chapter 25.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
52 (Cont'd)	-60	Entrance Stairs or Step	The stairs or step which operate in conjunction with but are not integral part of entrance doors. Stairs whose primary structure is a door shall be covered under the appropriate topic. Includes items such as structure, actuating mechanisms and controls, handrails, etc.
	-70	Door Warning	That portion of the system which is used to indicate whether the doors are closed and/or properly latched. Includes items such as switches, lights, bells, horns, etc. Does not include landing gear door warning which is covered in Chapter 32.
	-80	Landing Gear	The structure of the doors used to enclose the landing gear compartments. If the doors are made as an integral structure they could be shown only in chapter 32.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
53		FUSELAGE	The structural units and associated components/members which make up the compartments for equipment, passengers, crew and cargo; including skin, belt frames, stringers, floor beams, floor, pressure dome, scuppers, tail cone, fuselage to wing and empennage fillets, etc.
	-00	General	
	-10	Main Frame	Includes frames, bulkheads, formers, longerons, stringers, keel, frames around openings, etc.
	-20	Auxiliary Structure	Includes floors, internal stairs, and fixed partitions. Does not include movable partitions which are covered in Chapter 25.
	-30	Plates/Skin	The exterior covering of the fuselage including access covers and doublers.
	-40	Attach Fittings	The fittings on the fuselage used for the attachment of doors, wings, stabilizers, landing gear, engine and rotor pylons and for the support of equipment within the fuselage. Includes items such as seat tracks, cargo basket rails, instrument brackets, etc.
	-50	Aerodynamic Fairings	The structure of fixed or variable aerodynamic fairings such as those on the nose and tail and between the fuselage and the wing and the stabilizers. Includes items such as wing/fuselage fillets, nose and tail cones, radome, visor and droop nose, etc. Does not include the functioning and maintenance aspects of variable aerodynamic fairings which are covered in Chapter 27.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
54		NACELLES	Those structural units and associated components/members which furnish a means of housing and mounting the power plant. Includes skin, longerons, belt frames, stringers, clamshells, scuppers, doors, nacelle fillets, etc. Also includes the structure of power plant cowling.
	-00	General	
	-10	Main Frame	Includes items such as frames, bulkheads, firewalls, stringers, keel, frames around openings, etc.
	-20	Auxiliary Structure	Includes leading and trailing edge structure, etc. Does not include plates/skin.
	-30	Plates/Skin	The exterior covering of the nacelle. Including access covers, cowling and doublers.
	-40	Attach Fittings	The fittings on the nacelles used for the attachment to its connecting structure, power plant, thrust reverser and for the support of equipment within the nacelle.
	-50	Fillets/ Fairings	The aerodynamic fairings between the nacelle and its connecting structure.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
55		STABILIZERS	The horizontal and vertical stabilizers include the structure of the elevator and rudder.
	-00	General	
	-10	Horizontal Stabilizers	The horizontal airfoil of the tail/nose section to which the elevator/canard is attached. Includes items such as spars, ribs, stringers, plates/skin, access covers, tips, etc.
	-20	Elevator/ Elevon	The removable airfoil which is used for longitudinal/longitudinal and lateral control. Includes items such as spars, ribs, stringers, plates/skin, access covers, tabs, balance devices, etc.
	-30	Vertical Stabilizer	The vertical airfoil to which the rudder is attached. Includes items such as spars, ribs, stringers, plates/skin, access covers, tips, etc.
	-40	Rudder	The removable airfoil which is attached to the vertical stabilizer and is used for yaw control. Includes items such as spars, ribs, stringers, plates/skin, access covers, tabs, balance devices, etc.
	-50	Attach Fittings	The fittings on the stabilizers used for the attachment of stabilizers, elevators, rudder, tabs, fillets/fairings and for the support of equipment within the stabilizer.
	-60	Auxiliary Stabilizers	Includes fixed ventral & dorsal fins and plates/skin, etc.

NOTE

Sections -20 and -40 will include Balancing Instructions. Sections -50 and -60 may be included in Sections -10, -30 when appropriate.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
56		WINDOWS	Those fuselage and crew compartment windows inclusive of windshield; also those windows installed in doors.
	-00	General	Include damage limits for glass and acrylic.
	-10	Flight Compartment	The compartment above the floor and between the forward passenger partition and the forward pressure dome. Includes items such as the transparent material and its frame of sliding and fixed windows and windshields, handles, latching mechanisms, etc. Does not include door or inspection/observation windows.
	-20	Cabin	The area in which the passengers are seated. Includes lounges, lavatories, buffets/galleys and coatrooms. Includes items such as transparent material, its frame, frost shield, etc.
	-30	Door	The doors used for entrance and exit of the passengers, flight crew and service personnel to and from the airplane. Includes items such as transparent material, its frame, etc. Does not include emergency exit windows.
	-40	Inspection and Observation	The windows used for examining compartments and equipment in and about the airplane. Includes items such as transparent material, its frame, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
57		WINGS	Those center wing and outer wing structural units and associated components/members which enable the atmosphere to lift the aircraft, integral fuel tank structure and components that make up these units, such as spars, skin, ribs, stringers, clamshells, scuppers, etc. includes the structure of the flaps, ailerons and spoilers.
	-00	General	
	-10	Main Frame	Includes spars, ribs, stringers, integral fuel tank structure, tip tank supporting structure and frames around openings.
	-20	Auxiliary Structure	Includes leading edge, trailing edge, wing tip, tip fuel tank and fuel or water cell backing boards. Does not include plates/skin.
	-30	Plates/Skin	The exterior covering of the wing including access covers, doublers and tip tank fillets/fairings.
	-40	Attach Fittings	The fittings on the wing used for the attachment of fuselage, nacelle/pylon, and landing gear to the wing and for the support of equipment within the wing.
	-50	Flight Surfaces	The structure of removable airfoils attached to the wing. Includes items such as ailerons, flaps, spoilers, tabs, drag and balancing devices, etc.

<u>GROUP</u>	<u>DEFINITION</u>
PROPELLER	Complete propeller system excluding anti-icing system.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
60		STANDARD PRACTICES PROPELLER	Refer to Text Maintenance-Style (Spec. common to all manuals) for text material style, paragraphing, outlining, nomenclature, titles, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
61		PROPELLER	The complete mechanical or electrical propeller, pumps, motors, governor, alternators, and those units and components external to or integral with the engine used to control the propeller blade angel. Includes propeller spinner, synchronizers, etc. Overhaul of propellers must be accomplished in a qualified shop in accordance with data supplied by the propeller manufacturer.
	-00	General	
	-10	Propeller Assembly	That portion of the system which rotates except the engine propeller shaft. Includes items such as blades, dome, hub, spinner, slip ring, deicer boot, distributor valve, etc.
	-20	Controlling	That portion of the system which controls the pitch of the propeller blades. Includes items such as governor, synchronizers, switches, cables, levers, etc. Does not include any parts which rotate with the propeller assembly.
	-30	Braking	That portion of the system which is used to decrease run-down time or stop propeller rotation during engine power-off conditions. Includes brake mechanisms, levers, pulleys, cables, switches, plumbing, etc.
	-40	Indicating	That portion of the system used to indicate operation or activation of propeller systems. Includes items such as light, switches, etc.

GROUP
POWER PLANT

DEFINITION

The complete power unit which develops thrust either through the exhaust or through a propeller. Excludes items such as generators, cabin superchargers, etc., which are covered under their respective systems.

SYSTEM/
CHAPTER

SUBSYSTEM/
SECTION

TITLE

DEFINITION

70

STANDARD
PRACTICES-
ENGINE

Refer to Text Material-Style (Spec. common to all manuals) for text material, style, paragraphing, outlining, nomenclature, titles, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
71		POWER PLANT	The overall power package inclusive of engine, air intake, mount, cowling, scoops, cowl flaps, cooling baffles, etc.
	-00	General	This topic shall include general information, limits, and procedures. In the maintenance manual this section shall cover subjects such as engine changes, run-up, externally-mounted spare power plants, etc. In the overhaul manual, this section shall cover subjects such as power plant build-up, teardown, etc.
	-10	Cowling	Those removable coverings which extend over and around the power plant assembly. Includes the functioning and maintenance aspects of items such as accessory section cowls, cowl flaps, cowling supports, and attach and locking mechanisms, etc. Does not include the structure integral with the airframe which shall be covered in the applicable Structures Chapter.
	-20	Mounts	The framework, either of build-up construction or forgings which support the engine and attach it to the nacelle or pylon. Includes items such as engine mounts, vibration dampeners, support links, mounting bolts, etc.
	-30	Fireseals	Those fire-resistant partitions and seals mounted on or about the power package for the purpose of isolating areas subject to fire. Does not include those fire-walls which are included in Chapter 54.
	-40	Attach Fittings	Those fittings and brackets which are used for the support of equipment in and about the power package.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
71 (Cont'd)	-50	Electrical Harness	Those electrical cables, conduits, plugs, sockets, etc., which serve several power plant systems, but which are banded together to facilitate removal and installation of the power plant. Does not include the wiring which is specifically covered under another system.
	-60	Air Intakes	That portion of the power plant system which directs and may or may not vary the mass air flow to the engine. Includes items such as nose ring cowls, scoops, compressor fan cowls, buried engine ducts, vortex generators, actuators, control handles, cables, plumbing, linkages, doors, warning systems, position indicators, etc. Does not include integral structure with the airframe, which shall be included in the applicable Structures chapter.
	-70	Engine Drains	Those components and manifold assemblies which are used to drain off excess fluids from the power plant and its accessories. Includes drainlines, manifolds, tanks, flame arrestors, vents, and their supporting brackets, etc. Also includes components that are an integral part of, or fitted to the power plant cowling.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
72		ENGINE	<p>Those units and components which are:</p> <p>Used to induce and convert fuel-air mixture into power. Includes, for the turbine engine, air inlet, compressor, diffuser, combustion chambers, turbine and exhaust; and for the reciprocating engine, blower and clutch, clutch control valve, cylinders, cylinder baffles, intake pipes, crankshaft assembly, etc.</p> <p>Used to transmit power to the propeller shaft, if any, and accessory drives. Includes reduction gearing, gear trains, extension shaft and torque-meter.</p> <p>Within the profile of the basic engine, used to supplement the functioning of other defined systems external to the engine. Includes items such as accessory drive, mechanical portion of the spark advance mechanism, oil transfer tubes from the propeller governor pad to the propeller shaft, BMEP section, etc.</p> <p>Used to control and direct the flow of lubrication through the engine from the inlet fitting to the outlet fitting. Includes engine pumps (pressure and scavenger) pressure relief valves, screens, oil lines (internal and external), etc.</p> <p>This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the Sections -00 through -50 or -70, as applicable.</p>

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
72 (Cont'd)		ENGINE TURBINE/ TURBO-PROP	
	-00	General	This topic is intended to cover general information, limits and procedures. In the engine overhaul manual this section would include such subjects as teardown, cleaning, inspection, assembly, testing, etc.
	-10	Reduction Gear & Shaft Section (Turbo-Prop)	The section of the engine which contains the propeller shafts and reduction gears. Includes items such as drives for nose mounted accessories, etc.
	-20	Air Inlet Section	The section of the engine through which the air enters the compressor section. Includes items such as guide vanes, shrouds, cases, etc.
	-30	Compressor Section	The section of the engine in which the air is compressed. Includes items such as cases, vanes, shrouds, rotors, diffusers, etc. Also includes the maintenance and overhaul of stator blades but not the operation of variable stator blades which is covered under Chapter 75 - 30. Does not include compressor bleed system.
	-40	Combustion Section	The section of the engine in which the air and fuel are combined and burned. Includes items such as burner cans, cases, etc.
	-50	Turbine Section	The section of the engine containing the turbines. Includes items such as turbine nozzles, turbine rotors, cases, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
72 (Cont'd)	-60	Accessory Drives	The mechanical power take-offs to drive accessories. Includes items such as engine-mounted gear boxes, gears, seals, pumps, etc. Does not include remotely installed gear boxes which are covered in Chapter 83.
	-70	By-pass Section	The section of the engine which by-passes a portion of the normal engine airflow (either ram or compressed air) for the prime purpose of adding to engine thrust or reducing specific fuel consumption.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
72 (Cont'd)		ENGINE RECIPROCATING	
	-00	General	This topic is intended to cover general information, limits and procedures. In the engine overhaul manual, this section would include such subjects as teardown, cleaning, inspection, assembly, testing, etc.
	-10	Front Section	The section of the engine which contains the propeller shafts and reduction gears. Includes items such as drives for nose mounted accessories, etc.
	-20	Power Section	The section of the engine which contains the crankshaft, master and link rod assemblies, cams, cam drive gears, tappet guides, rollers, carriers, etc.
	-30	Cylinder Section	The section of the engine which contains the cylinders, valves, pistons, push rods, intake pipes, baffles, etc. Also includes rocker arm assembly, valve springs, etc.
	-40	Supercharger Section	The section of the engine which contains cases, shroud plates, PRT coupling and gearing, impeller and drives, accessory drives, bushings, etc.
	-50	Lubrication	Those units and components which are used to distribute oil throughout the engine. Includes front and rear pressure and scavenger pumps, sumps, strainers, valves, etc. Also includes those oil lines not included in Chapter 79. Does not include those items which form integral passages within the engine.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
73		ENGINE FUEL SYSTEMS	<p>For turbine engines, those units and components and associated mechanical systems or electrical circuits which furnish or control fuel to the engine beyond the main fuel quick disconnect; and thrust augmentor, fuel flow rate sensing, transmitting and/or indicating units whether the units are before or beyond the quick disconnect. Includes: Coordinator or equivalent, engine-driven fuel pump and filter assembly, main and thrust augmentor fuel controls, electronic temperature datum control, temperature datum valve, fuel manifold, fuel nozzles, fuel enrichment system, speed sensitive switch, relay box assembly, solenoid drip valve, burner drain valve, etc.</p> <p>For reciprocating engines, those units and components which deliver metered fuel and air to the engine. The fuel portion includes the carburetor/master control from the inlet side to the discharge nozzle(s), injection pumps, carburetor, injection nozzles and fuel primer. The air portion includes units from the scoop inlet to the vapor vent return, and the impeller chamber.</p>
	-00	General	
	-10	Distribution	That portion of the system from the main quick disconnect to the engine, which distributes fuel to the engine burner section and the thrust augmentor. Includes items such as plumbing, pumps, temperature regulators, valves, filters, manifold, nozzles, etc. Does not include the main or thrust augmentor fuel control.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
73 (Cont'd)	-20	Controlling	The main fuel controls which meter fuel to the engine and to the thrust augmentor. Includes items such as levers, cables, pulleys, linkages, etc., which are components of the fuel control units.
	-30	Indicating	That portion of the system which is used to indicate the flow rate, temperature and pressure of the fuel. Includes items such as transmitters, indicators, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
74		IGNITION	Those units and components which generate, control, furnish, or distribute an electrical current to ignite the fuel air mixture in the cylinders of reciprocating engines or in the combustion chambers or thrust augmentors of turbine engines. Includes induction vibrators, magnetos, switches, lead filters, distributors, harnesses, plugs, ignition relays, exciters, and the electrical portion of spark advance.
	-00	General	
	-10	Electrical Power Supply	That portion of the system which generates electrical current for the purpose of igniting the fuel mixture in the combustion changers and thrust augmentors. Includes items such as magnetos, distributors, booster coils, exciters, transformers, storage capacitors and compositors, etc.
	-20	Distribution	That portion of the system which conducts high or low voltage electricity from the electrical power supply to the spark plugs, or igniters. Includes wiring between magneto and distributor in those systems where they are separate units. Includes items such as ignition harness, high tension leads, coils as used in "low tension" systems, spark plugs, igniters, etc.
	-30	Switching	That portion of the system which provides a means of rendering the electrical power supply inoperative. Includes items such as ignition switches, connectors, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
75		AIR	For turbine engines, those external units and components and integral basic engine parts which go together to conduct air to various portions of the engine and to the extension shaft and torque meter, assembly, if any. Includes compressor bleed systems used to control flow of air through the engine, cooling air systems and heated air systems for engine anti-icing, engine starting systems, nor exhaust supplementary air systems. This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the following Sections -00 through -40, as applicable.
	-00	General	
	-10	Engine Anti-Icing	That portion of the system which is used to eliminate and prevent the formation of ice by bleed air in all parts of the engine, excluding power plant cowling which is covered under Chapter 30. Includes items such as valves, plumbing, regulators, etc. Electrical anti-icing is covered in Chapter 30.
	-20	Accessory Cooling	That portion of the system which is used to ventilate engine compartments and accessories. Includes items such as valves, plumbing, jet pumps, vortex spoilers, etc.
	-30	Compressor Control	That portion of the system which is used to control the flow of air through the engine. Includes items such as governors, valves, actuators, linkages, etc. Also includes the operation of variable stator blades, but not the maintenance and overhaul, which shall be covered under 72-30.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
75 (Cont'd)	-40	Indicating	That portion of the system which is used to indicate temperature, pressure, control positions, etc. of the air systems. Includes items such as transmitters, indicators, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
76		ENGINE CONTROLS	Those controls which govern operation of the engine. Includes units and components which are interconnected for emergency shutdown. For turbo-prop engines, includes linkages and controls to the coordinator or equivalent and from the coordinator or equivalent to the propeller governor, fuel control unit or other units being controlled. For reciprocating engines, includes controls for blowers. Does not include units or components which are specifically included in other chapters.
	-00	General	
	-10	Power Control	That portion of the system which furnishes a means of controlling the main fuel control or coordinator. Includes controls to the propeller regulator on turbo-prop engines. Includes items such as linkages, cables, levers, pulleys, switches, etc. Does not include the units themselves.
	-20	Emergency Shutdown	That portion of the system which furnishes a means of controlling the flow of fluids to and from the engine during emergency procedures. Includes items such as levers, cables, pulleys, linkages, switches, etc. Does not include the units themselves.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
77		ENGINE INDICATING	Those units, components and associated systems which indicate engine operation. Includes indicators, transmitters, analyzers, etc. For turbo-prop engines includes phase detectors. Does not include systems or items which are specifically included in other chapters.
	-00	General	
	-10	Power	That portion of the system which directly or indirectly indicates power or thrust. Includes items such as BMEP, pressure-ratio, RPM, etc.
	-20	Temperature	That portion of the system which indicates temperatures in the engine. Includes items such as cylinder head, exhaust (turbine inlet), etc.
	-30	Analyzers	That portion of the system which is used to analyze engine performance or condition by means of instruments or devices such as oscilloscopes, etc. Includes items such as generators, amplifiers, oscilloscopes, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
78		EXHAUST	<p>Those units and components which direct the engine exhaust gases overboard.</p> <p>For turbine engines, includes units external to the basic engine such as thrust reverser and noise suppressor, if applicable.</p> <p>For reciprocating engines, includes augmentors, stacks, clamps, etc. Excludes exhaust-driven turbines.</p>
	-00	General	
	-10	Collector/ Nozzle	<p>That portion of the system which collects the exhaust gases from the cylinders or turbines and conducts them overboard. Includes items such as collector rings, exhaust and thrust augmentor ducts, variable nozzles, actuators, plumbing, linkages, position indicators, warning systems, etc. Does not include power recovery turbines, turbo-superchargers, etc., nor noise suppressors or thrust reversers where they are not an integral part of the nozzle system.</p>
	-20	Noise Suppressor	<p>That portion of the system which reduces the noise generated by the exhaust gases. Includes items such as pipes, baffles, shields, actuators, plumbing, linkages, position indicators, warning systems, etc., as applicable.</p> <p>Use -10 where integral part of nozzle system.</p>
	-30	Thrust Reverser	<p>That portion of the system which is used to change the direction of the exhaust gases for reverse thrust. Includes items such as clamshells, linkages, levers, actuators, plumbing, indicators, warning systems, etc., as applicable.</p>

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
78 (Cont'd)	-30 (Cont'd)	Thrust Reverser	Use -10 where integral part of nozzle system.
	-40	Supplementary Air	That portion of the system which varies and controls supplementary air flow to the exhaust system. Includes items such as tertiary air doors, actuators, linkages, springs, plumbing, position indicators, warning systems, etc., as applicable.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
79		OIL	Those units and components external to the engine concerned with storing and delivering lubricating oil to and from the engine. Covers all units and components from the lubricating oil engine outlet to the inlet, including the inlet and outlet fittings, tank, radiator, by-pass valves, etc., and auxiliary oil systems.
	-00	General	
	-10	Storage	That portion of the system used for storage of oil. Includes items such as tanks, filling systems, internal hoppers, baffles, tank sump and drain, etc. Does not include tanks which are an integral portion of the engine.
	-20	Distribution	That portion of the system which is used to conduct oil from and to the engine. Includes items such as plumbing, valves, temperature regulator, control systems, etc.
	-30	Indicating	That portion of the system which is used to indicate the quantity, temperature and pressure of the oil. Includes items such as transmitters, indicators, warning systems, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
80		STARTING	Those units, components and associated systems used for starting the engine. Includes electrical, inertia air or other starter systems. Does not include ignition systems which are covered in Chapter 74, IGNITION.
	-00	General	
	-10	Cranking	That portion of the system which is used to perform the cranking portion of the starting operation. Includes items such as plumbing, valves, starters, switches, relays, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
81		TURBINES	For reciprocating engines only. Includes power recovery turbine assembly and turbo-supercharger unit when external to the engine. This Chapter may refer to supplier data, furnished with the aircraft, in lieu of the following Sections -00 through -20, as applicable.
	-00	General	
	-10	Power Recovery	The turbines which extract energy from the exhaust gases and are coupled to the crankshaft.
	-20	Turbo-Supercharger	The turbines which extract energy from the exhaust gases and drive an air compressor.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
83		ACCESSORY GEARBOXES	Those units and components which are remotely installed and connected to the engine by a drive shaft and which drive multiple types of accessories. Does not include those accessory drives which are bolted to and are immediately adjacent to the engine. The latter item shall be covered under Chapter 72, ENGINE.
	-00	General	
	-10	Drive Shaft Section	That portion of the system which is used to conduct power from the engine to the gearbox. Includes items such as drive shaft, adapters, seals, etc.
	-20	Gearbox Section	The case which contains the gear trains and shafts. Includes items such as gears, shafts, seals, oil pumps, coolers, etc.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
91		CHARTS & WIRING DIAGRAMS	Miscellaneous charts not applicable to any particular system, such as wire diagrams, junction box charts, disconnect plug charts, conduit and wire routing charts, and list of special tools.

<u>SYSTEM/ CHAPTER</u>	<u>SUBSYSTEM/ SECTION</u>	<u>TITLE</u>	<u>DEFINITION</u>
95		SPECIAL PURPOSE EQUIPMENT	This Chapter shall include such equipment and systems not included in previous chapters. Agricultural, Glider & Banner Towing, Special Photographic, etc., would fall under this category.