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INTERNATIONAL
400 Commonwealth Drive, Warrendale, PA 15096-0001

AEROSPACE STANDARD

SAE AS4828

Issued 1996-01
Reaffirmed 2002-06

Technical Manual Development for Ground Support Equipment

FOREWORD

AS4828 establishes a standard for the preparation of technical manuals used in support of ground support equipment (GSE). It is possible to use this document for all types of GSE, regardless of function; however, as a practical matter ATA 101 exists within the industry today, and it is not the intent of this document to usurp any existing methodologies.

ATA 101, while used as a standard by many GSE manufacturers and airlines, is not directly applicable to some ramp type GSE (tow vehicles, baggage/cargo handling equipment, passenger loaders, etc). Such items are not part of any airplane manufacturer's official maintenance or operational manuals - but, the airplane companies, equipment manufacturers and airlines must have standards for direct airplane specific GSE.

AS4828 provides the airline industry with a document that is directed to an uncovered portion of the spectrum - ramp equipment. It is recognized that this document needs a fair amount of development before all of the industry users are satisfied with the content. So, changes are fully expected. Therein lies the uniqueness of AS4828; amendments will be far easier to accomplish as an SAE document, while the process for changing an ATA standard is quite complex and time-consuming. Consequently, desirable changes are often not made. Now the GSE industry has a useful medium that can more readily update in order to reflect current needs.

Questions on interpretation and proposed changes to this document should be submitted in writing to:

SAE
400 Commonwealth Drive
Warrendale, PA 15096-0001
Attention: Staff Representative for the AGE-2 Committee

Such changes, when approved shall be published by revision to the document.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
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SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/AS4828

1. SCOPE:

This document shall serve as a guide for format, style, and method of presentation for all material included in manufacturers' publications for ground support equipment (GSE). These requirements shall be observed throughout all publications except where modified by detail requirements for specific publications. AS4828 is not applicable to the development or revision of electronic test equipment user manuals and documents.

This document is written in general terms by intention, and in most cases conform to recognized practices in the industry. In the event there is a question which is not specifically covered by this document, the user engineering department should be contacted for guidance before proceeding to the final phase of manual development.

Each manual prepared by a manufacturer shall contain an introduction which shall include a brief statement explaining the organization, content, and method for using the manual.

The prime manufacturer may supply data for components which the manufacturer does not manufacture or alter, and for which the supplier has already developed technical data provided it meets the requirements under Manufacturers' Appendices (see 4.1).

2. REFERENCES:

There are no referenced publications specified herein.

3. CHAPTER 1 - GENERAL ORGANIZATION AND LAYOUT:

3. (Continued):

3.1 Format:

3.1.1 Manual Form: All publications shall be prepared in loose-leaf form and shall be furnished in a binder which carries the manufacturer's name, equipment model, and the title of the publication.

3.1.2 Paper and Printing: Paper shall be white in color, with good strength characteristics, and of sufficient weight and substance to eliminate show-through if copied on both sides (e.g., approximately 20 lb bond). The manual may be printed single sided or two sided as deemed appropriate by the developer/user. Consideration should be given to the storage media to be used. A form of printing shall be used which results in a black image suitable for reproduction by electrostatic copy, photo offset, microfilming or CD ROM processing. Copy density shall be uniform throughout the page.

3.1.3 Page Layout:

a. Size:

(1) Standard - 8-1/2 in x 11 in (see Figure 1)
(2) Oversize - 11 in x 16 in (see Figure 2) or,
(3) Standard-A4 (see Figure 3)
(4) Oversize-A3 (see Figure 4)

b. Binding:

(1) All pages shall be set up for standard 3-hole (4-hole in the case of A4/A3 size pages) loose-leaf filing. Hole size is 3/8 in with center of hole 7/16 in from the binding edge. Plastic spiral binding is not acceptable.

(2) Where the quantity of pages exceeds that which can be held in a 3 in binder, the publication shall be distributed in volumes labeled with the titles of the chapters contained therein.

c. Margin Limitations:

Margins shall be 1-1/8 in on binding edge; 5/8 in on outside edge; 1 in above text at top and 1-1/4 in at bottom, or 28 mm on the binding edge; 16 mm on the outside edge; 30 mm above the text at the top and 30 mm at the bottom in the case of A4/A3 size pages.

NOTE: If called out elsewhere in this specification, any of these marginal limitations may be altered except the 1-1/8 in binding edge.

A 3/8 in clear space shall be left between the top of the masthead and the top edge of the page to allow for printing machine paper grip.

3.1.4 Chapter/Section Specification: Manuals shall be divided into chapters as defined in this document. Chapters shall be further divided into sections as required to appropriately divide the chapter material. (See 3.2.7.)

3.2 Indexing:

3.2.1 Chapter Listing: Each manual shall consist of five chapters following the breakdown listed. Each chapter shall be further broken down to adequately divide the material.

3.2.2 Tab Dividers at the Outside Edge: For manuals of over 50 pages, the chapters and manufacturers' appendices shall be marked with a plasticized tab divider. For ease of reference, these dividers shall be staggered.

3.2.3 Record of Revisions: A Record of Revisions page shall be provided in each manual. An example of this requirement is shown at the front of this document and 4.1.

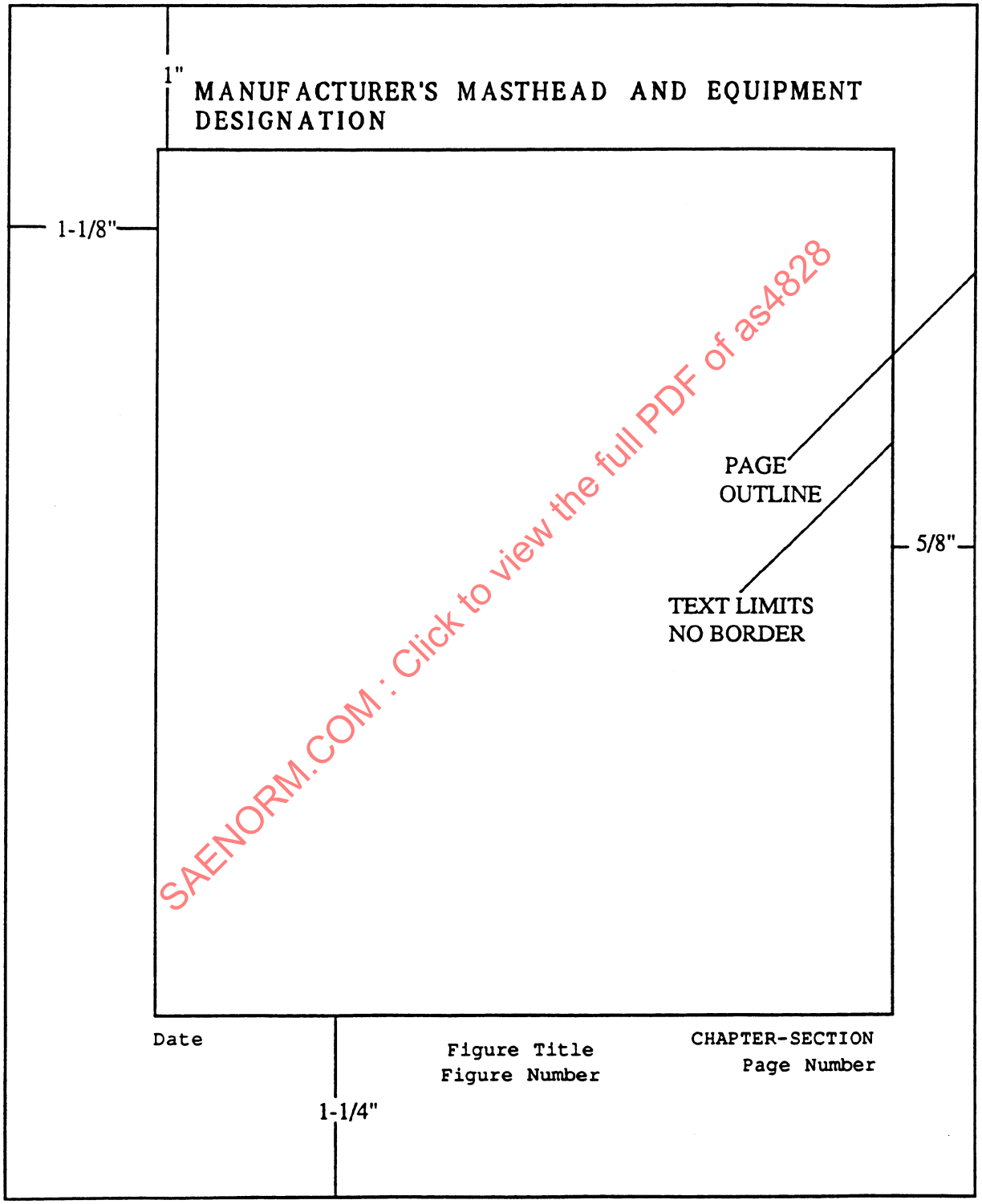


FIGURE 1 - Sample Manual Page-Vertical Layout

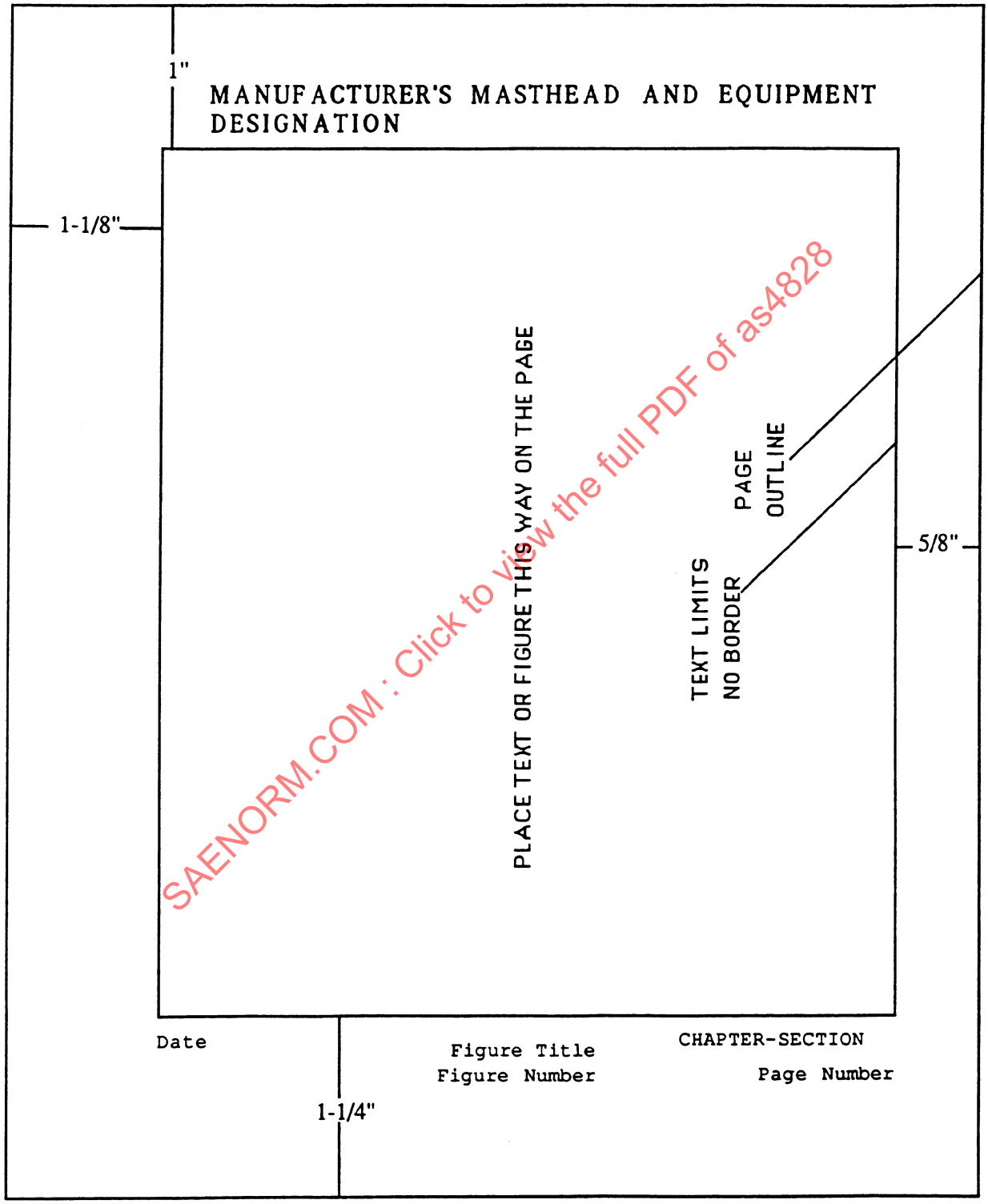


FIGURE 2 - Sample Manual Page-Horizontal Layout

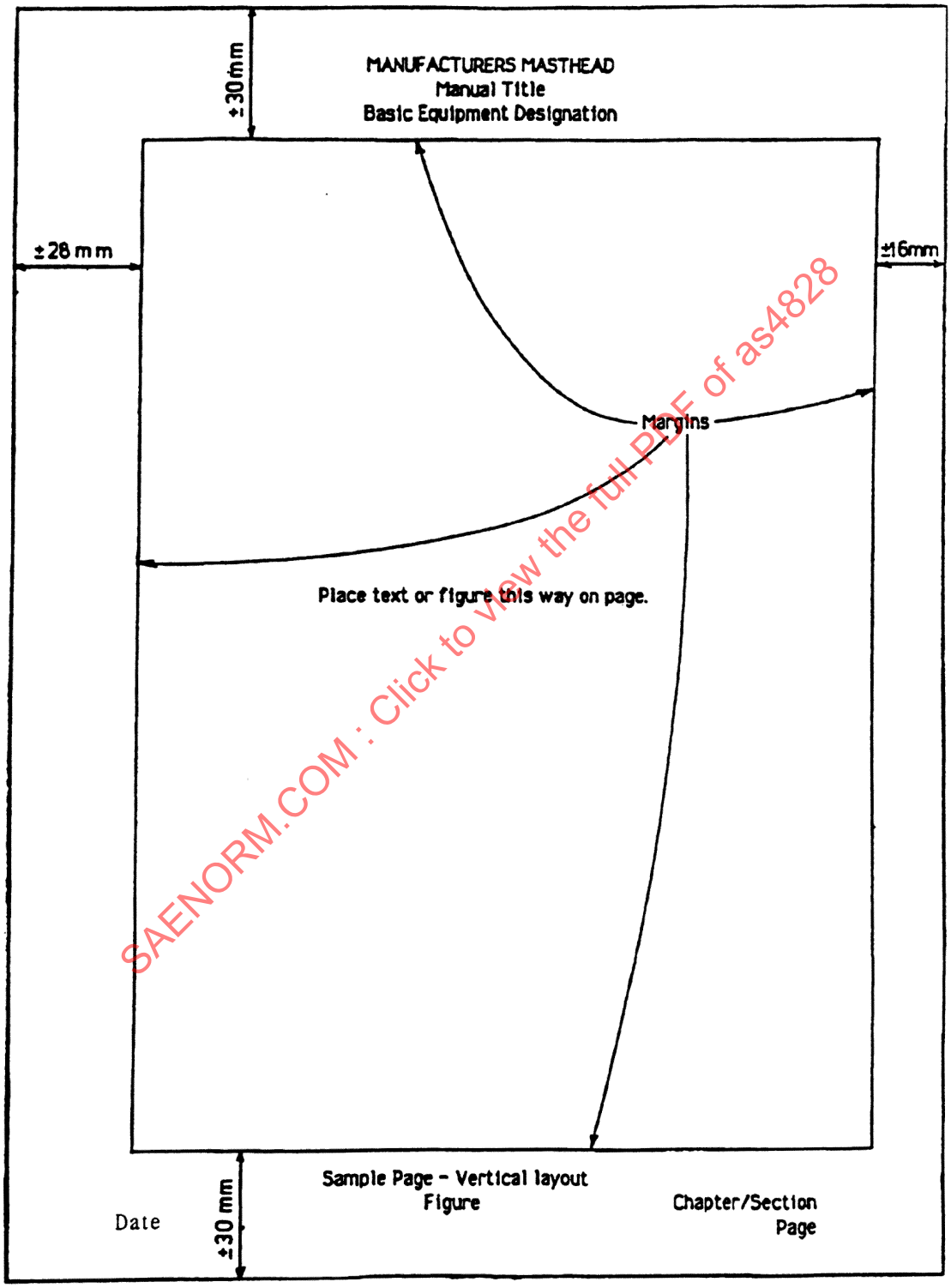


FIGURE 3 - Sample Manual Page-Vertical Layout (A4/A3 Page)

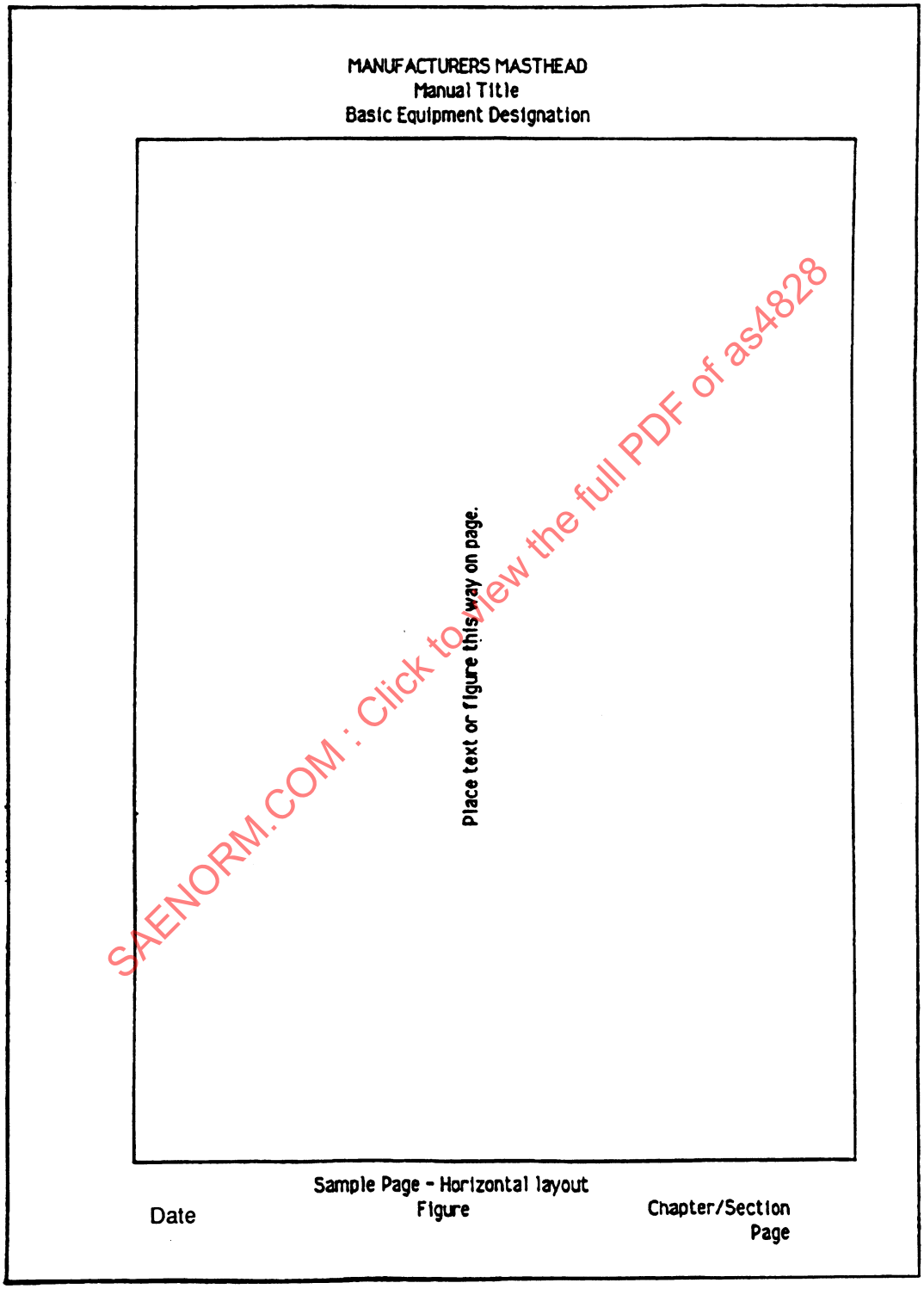


FIGURE 4 - Sample Manual Page-Horizontal Layout (A4/A3 Page)

3.2.4 List of Effective Pages: A List of Effective Pages shall be prepared to include each page number as identified by Chapter/Section number and the date of the original issue or the latest revision of that page. Examples of this requirement are shown at the front of this document and in 4.1.

3.2.5 Table of Contents: For manuals over 50 pages, each chapter shall open with a chapter Table of Contents (see Figure 5).

3.2.6 Alphabetical Index: For manuals over 50 pages, an Alphabetical Index shall be provided. A listing of Chapter/Section and page number for all major entries shall be provided (see Figure 6).

3.2.7 Chapter/Section Numbering: The following numbering system for chapters and sections shall be used:

a. Chapter 1 General Information & Operating Instructions

(1) Section 1 Description
(2) Section 2 Operation
(3) Section 3 Specifications and Capabilities
(4) Section 4 Shipping
(5) Section 5 Storage

b. Chapter 2 Maintenance

(1) Section 1 Servicing
(2) Section 2 Troubleshooting
(3) Section 3 Removal/Installation
(4) Section 4 Repairs

c. Chapter 3 Overhaul/Major Repair

(1) Component/System 1 Drive Axle
(2) Component/System 2 Transmission
(3) Component/System 3 Hydraulic System
ETC. ETC.

d. Chapter 4 Illustrated Parts List

(1) Section 1 Introduction
(2) Section 2 Parts Procurement
(3) Section 3 Alphanumeric Part No. List
(4) Section 4 Detailed Parts List

e. Chapter 5 Manufacturers' Appendices

(1) Section 1 Valve "X"
(2) Section 2 Pump "Y"
(3) Section 3 Controller "Z"
ETC. ETC.

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

CHAPTER 1
GENERAL DESCRIPTION AND OPERATING INSTRUCTIONS
TABLE OF CONTENTS

FIGURE 5 - Sample Page-Chapter Table of Contents

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

Alphabetical Index

FIGURE 6 - Sample Page-Alphabetical Index

3.3 Method of Presentation:

3.3.1 Text Material - Style:

a. Text Content: Text shall be brief and concise. Discussions of theory where essential for practical understanding and application shall be included. Related data shall be grouped in a logical manner.

b. Paragraphing: Material shall be prepared in modified block style as used in this document. 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

c. Person and Voice: The second person imperative shall be used for operational procedures (for example, "Break casing bead loose from housing"). Avoid sentences in the passive voice. The third person shall be used for description discussion (for example, "The torsion link assembly transmits torsional loads from the axle to the frame").

d. Nomenclature: Nomenclature shall be consistent throughout all technical data; for example, a part once identified as a "cover" shall not be referenced elsewhere as a "plate".

e. Titles: The lead title of a major text subdivision shall briefly describe the subject to be covered and the function to be performed. Titles for subordinate breakdowns of text shall be second person, imperative mood, whenever possible (for example, "Replace Oil Temperature Thermostat Control", "Check Operation of Fuel System", etc).

The full name of the unit shall be shown in the lead title of the material. If the full name is usually abbreviated, the abbreviation shall also be included in parenthesis in the title. Future reference to the unit within the text may be by abbreviation.

f. Outlining Form: Procedures shall be written to show the operations required in correct step-by-step sequence with special attention directed to key points of the job. An example of the text material for a typical maintenance manual page in correct form is shown in Figure 7.

3.3.1 (Continued):

g. Warnings, Cautions and Notes: These adjuncts to the text shall be used to highlight or emphasize important points when necessary. Warnings call attention to methods, procedures, or limits which must be followed precisely to avoid injury to persons. Cautions call attention to methods and procedures which must be followed to avoid damage to equipment. Notes call attention to methods which make the job easier. Warnings and cautions shall be located directly above and notes directly beneath the text to which they apply.

All cautions and warnings shall be printed in capital letters throughout and be preceded with the word CAUTION OR WARNING in capital letters. Examples:

CAUTION: DO NOT OPERATE CONTROLS.

WARNING: SOLUTION IS EXTREMELY FLAMMABLE.

All notes shall be in upper and lowercase letters and preceded by the word NOTE in capital letters. Example:

NOTE: It is not necessary to relieve pressure.

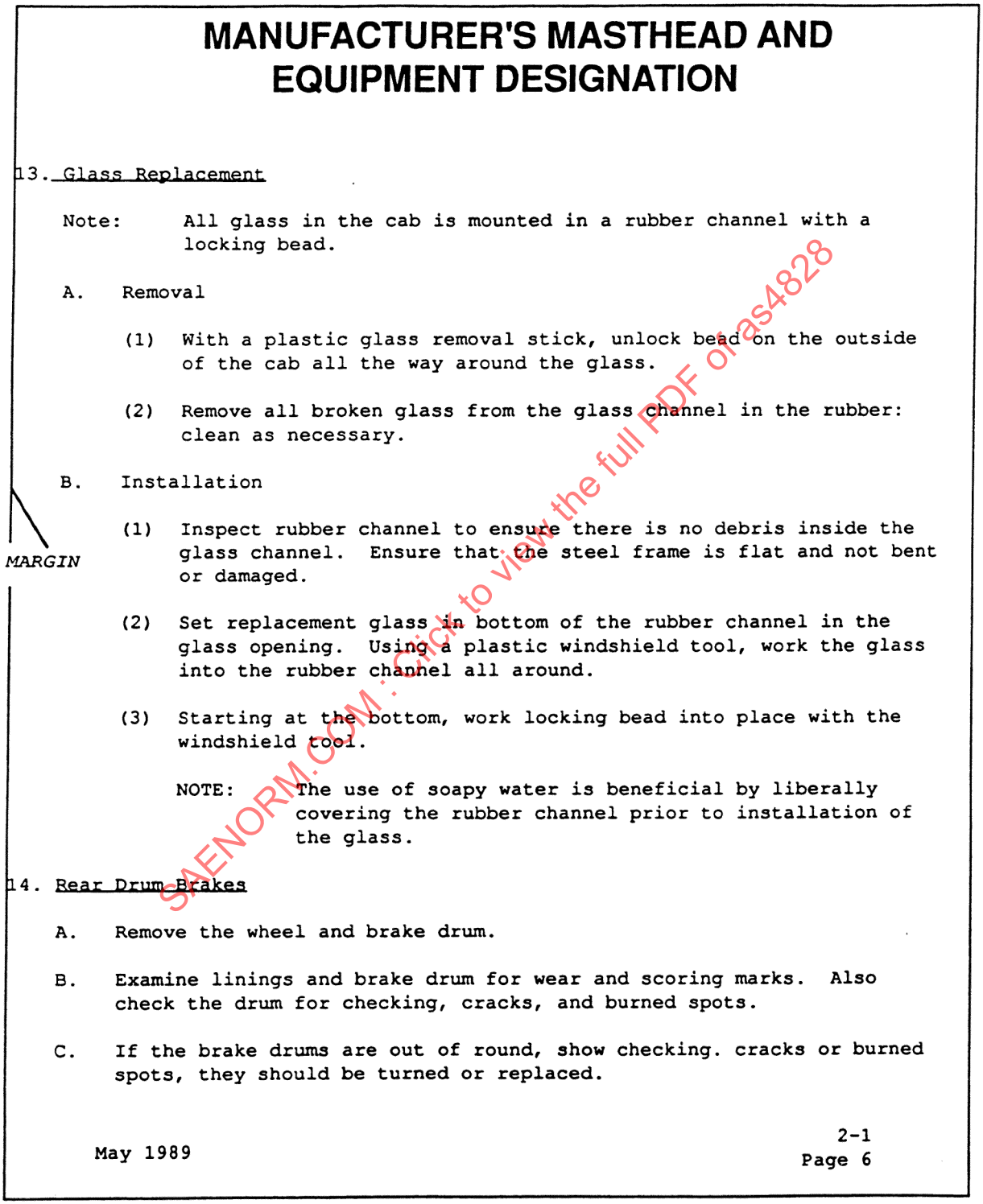
h. Effectivity: A means shall be provided, in cases when information contained in one manual applies to more than one model of the same basic equipment, for the manual user to determine easily and with certainty whether a procedure applies to a certain type/model or to all models of the basic equipment. Any such reference shall be expressed in definite terms such as:

(1) "EFF: A" model or type designation, serial number range, or other pertinent data unique to that model is stated in tabular form in the manual "INTRODUCTION".

i. Figure Reference: All references to illustrations shall be by figure number. The page number shall not be used. When reference is made to a figure in the same section, only the figure number shall be referenced. When reference is made to a figure in another section the full Chapter/Section number shall be shown, such as: "See Section 3.1, Figure 1."

j. Figure Numbering: Figures shall be numbered consecutively within the Chapter/Section.

k. Units of Measure: Units of measure shall be shown in the text and illustrations in both metric and inch/pound values. Temperatures shall be shown in Celsius and Fahrenheit units. The second value shall be located immediately following or below the first value and shall be contained in parentheses or brackets.



MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

13. Glass Replacement

Note: All glass in the cab is mounted in a rubber channel with a locking bead.

A. Removal

(1) With a plastic glass removal stick, unlock bead on the outside of the cab all the way around the glass.

(2) Remove all broken glass from the glass channel in the rubber: clean as necessary.

B. Installation

MARGIN

(1) Inspect rubber channel to ensure there is no debris inside the glass channel. Ensure that the steel frame is flat and not bent or damaged.

(2) Set replacement glass in bottom of the rubber channel in the glass opening. Using a plastic windshield tool, work the glass into the rubber channel all around.

(3) Starting at the bottom, work locking bead into place with the windshield tool.

NOTE: The use of soapy water is beneficial by liberally covering the rubber channel prior to installation of the glass.

14. Rear Drum Brakes

A. Remove the wheel and brake drum.

B. Examine linings and brake drum for wear and scoring marks. Also check the drum for checking, cracks, and burned spots.

C. If the brake drums are out of round, show checking. cracks or burned spots, they should be turned or replaced.

May 1989

2-1
Page 6

FIGURE 7 - Sample Page-Paragraphing and Outlining

3.3.2 Illustrations:

a. Presentation: Illustrations shall be used whenever they will simplify, shorten, or make text easier to understand. They shall be located as close as possible to related portions of the text. Wherever possible, illustrations shall be presented in vertical layout for ease of reading and cross reference.

An illustration shall bear a title with a figure number on the line directly below.

Where several drawings or illustrations identified as the same figure on adjacent pages are used for the same assembly, the same item number shall be applied to the same part.

b. Illustration Techniques: Color shall not be used. Techniques such as crosshatching, screening, or similar means shall be used instead and shall be suitable for microfilming.

c. Recommended Illustration Types: Acceptable types of illustrations are shown in Figures 8 through 13. The line drawing (see Figure 8) is the most desirable type for general use.

d. Electrical, Electronic, Hydraulic, and Pneumatic System Diagrams (see Figures 9 through 13).

To support the text coverage of these systems, selections from the following type of diagrams shall be used. These diagrams shall indicate component location, functional operating sequence, and system mode. In addition, electrical/electronic diagrams shall indicate test points, voltages, fuse and breaker ratings, wire coding and size, etc. Also, hydraulic, pneumatic and other fluid system diagrams shall indicate test points, pressures, flow rates, valve setting, filter rating and line type and size, etc.

(1) The Block Diagram (see Figure 9) shall be used to simplify complex circuits to a point where nonspecialized personnel can obtain an understanding of the function and operation of the system. This type diagram shall show the essential units in the form of blocks, and their relationship to each other indicated by connecting lines. The path of the signal or energy shall be indicated by lines and or arrows.

(2) The Simplified Schematic Diagram (see Figure 10) shall be presented without regard to unit location or physical connections but shall be functionally accurate to allow a clear presentation of theory of operation for the overall system.

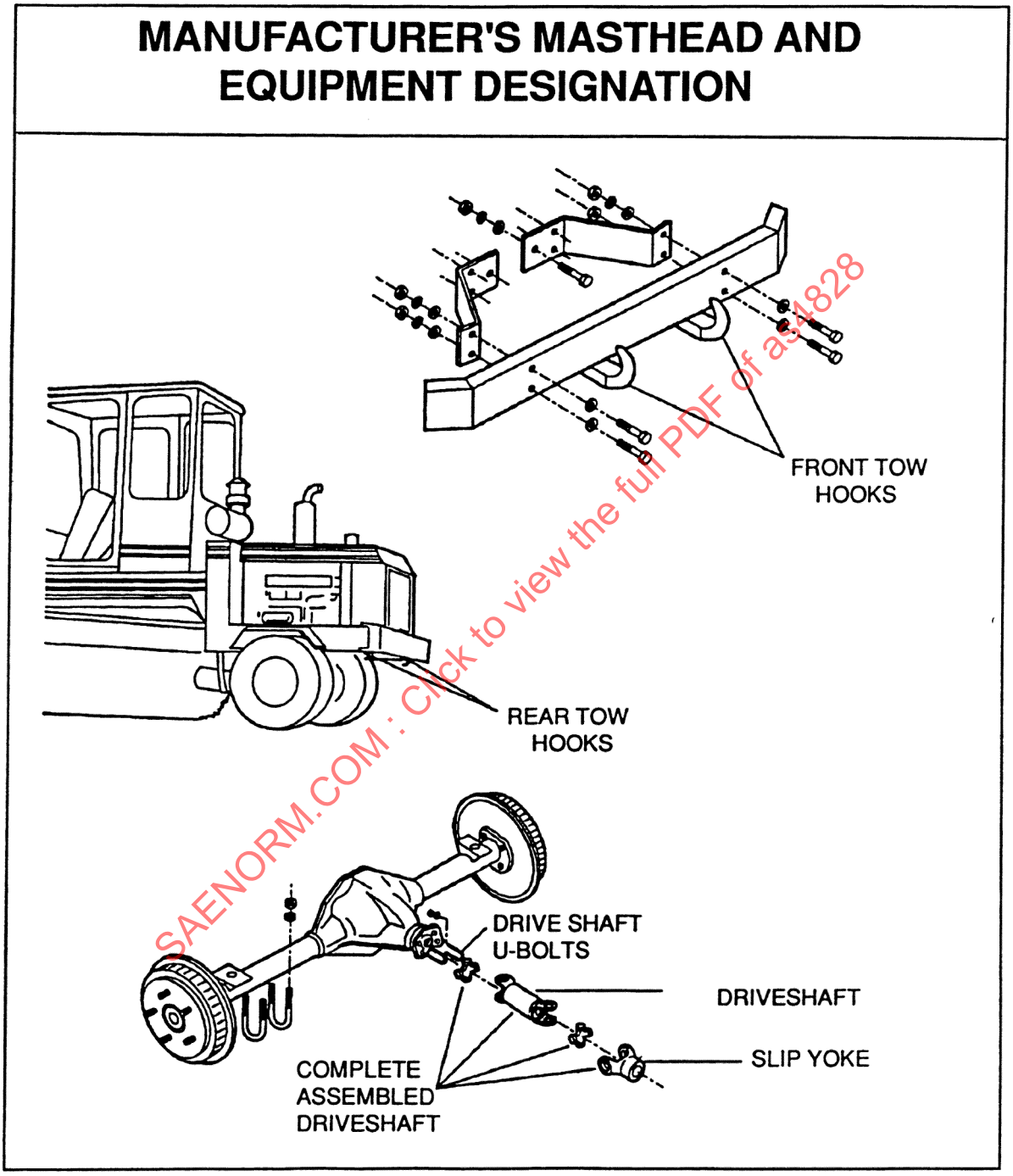


FIGURE 8A - Towing a Disabled Vehicle

FIGURE 8 - Sample Page-Line Drawing Illustrations

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

LEGEND

1. HYD. RESERVOIR
2. HYD. PUMP
3. OIL COOLER
4. HYDROSTATIC TRANS. PUMP
5. HYDROSTATIC TRANS. MOTOR
6. BROOM DRIVE MOTOR
7. TRANS. SUCTION FILTER
8. STEERING ORBITROL VALVE
9. STEERING CYLINDER
10. BROOM LIFT CYLINDER
11. BROOM SWING CYLINDER
12. CONTROL VALVE
13. RETURN FILTER

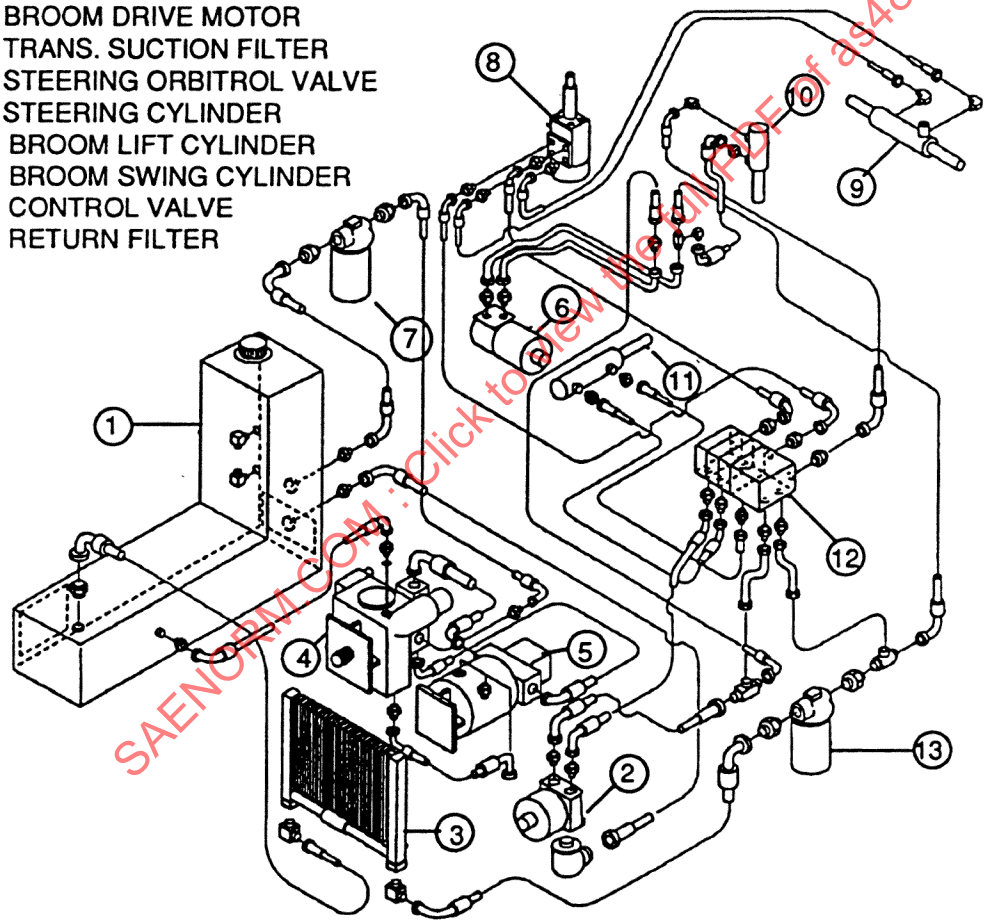


FIGURE 8B - Hydraulic System

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

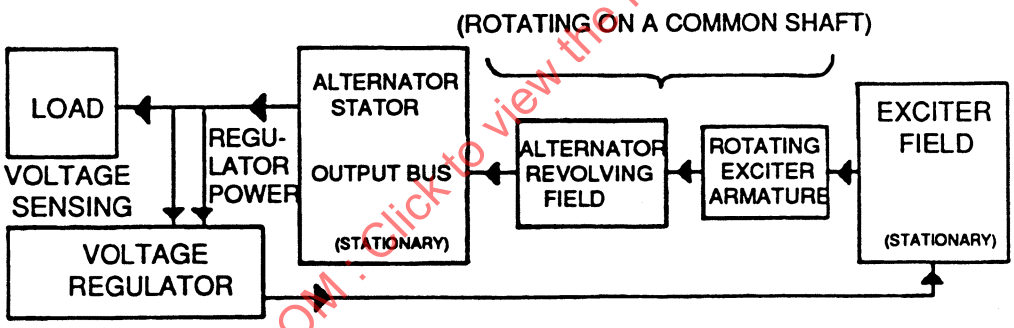


FIGURE 9 - Charging Circuit Block Diagram

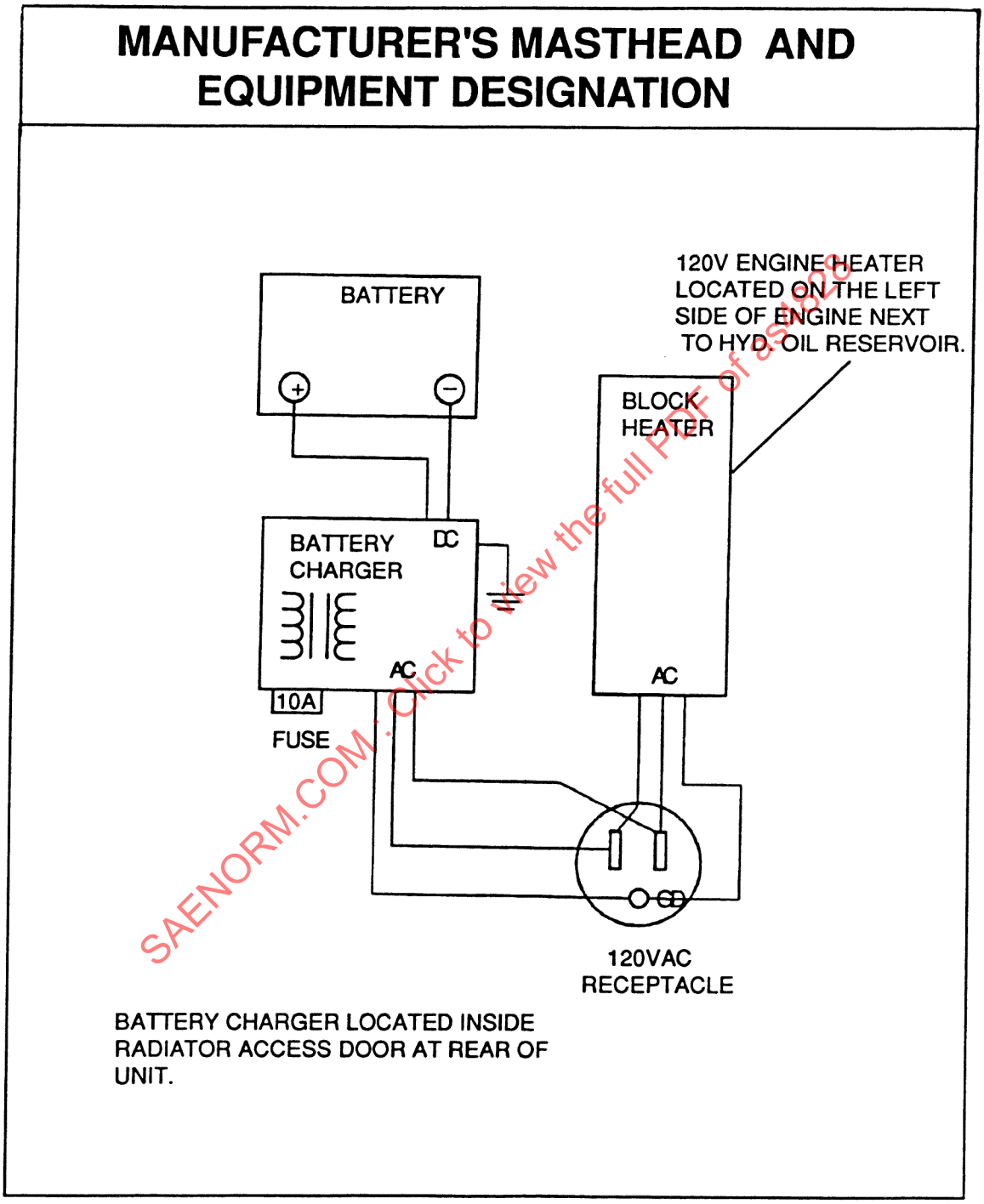


FIGURE 10 - Battery Charger Schematic

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

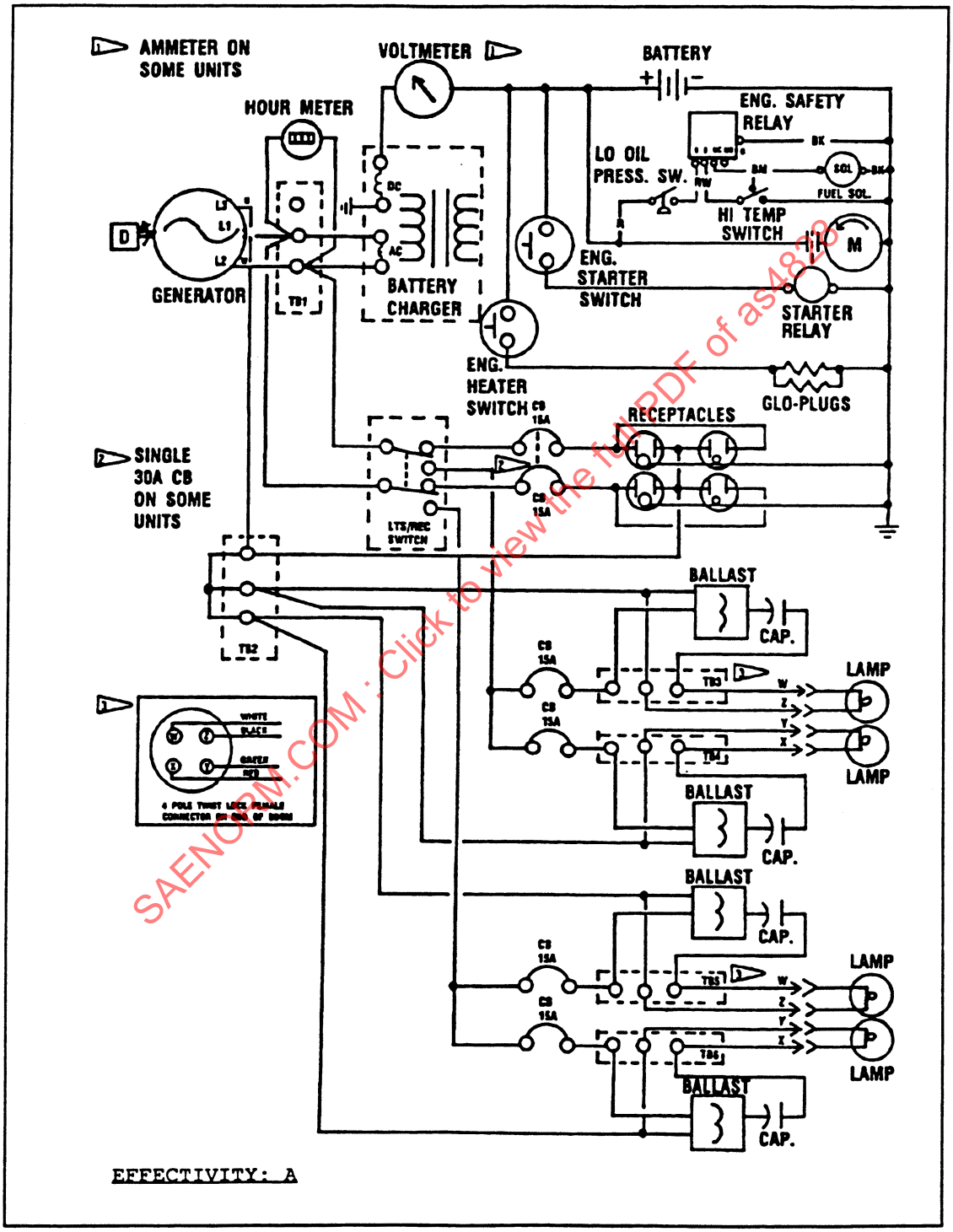


FIGURE 11A - Schematic Diagram

FIGURE 11 - Sample Page-Schematic Diagram Illustrations

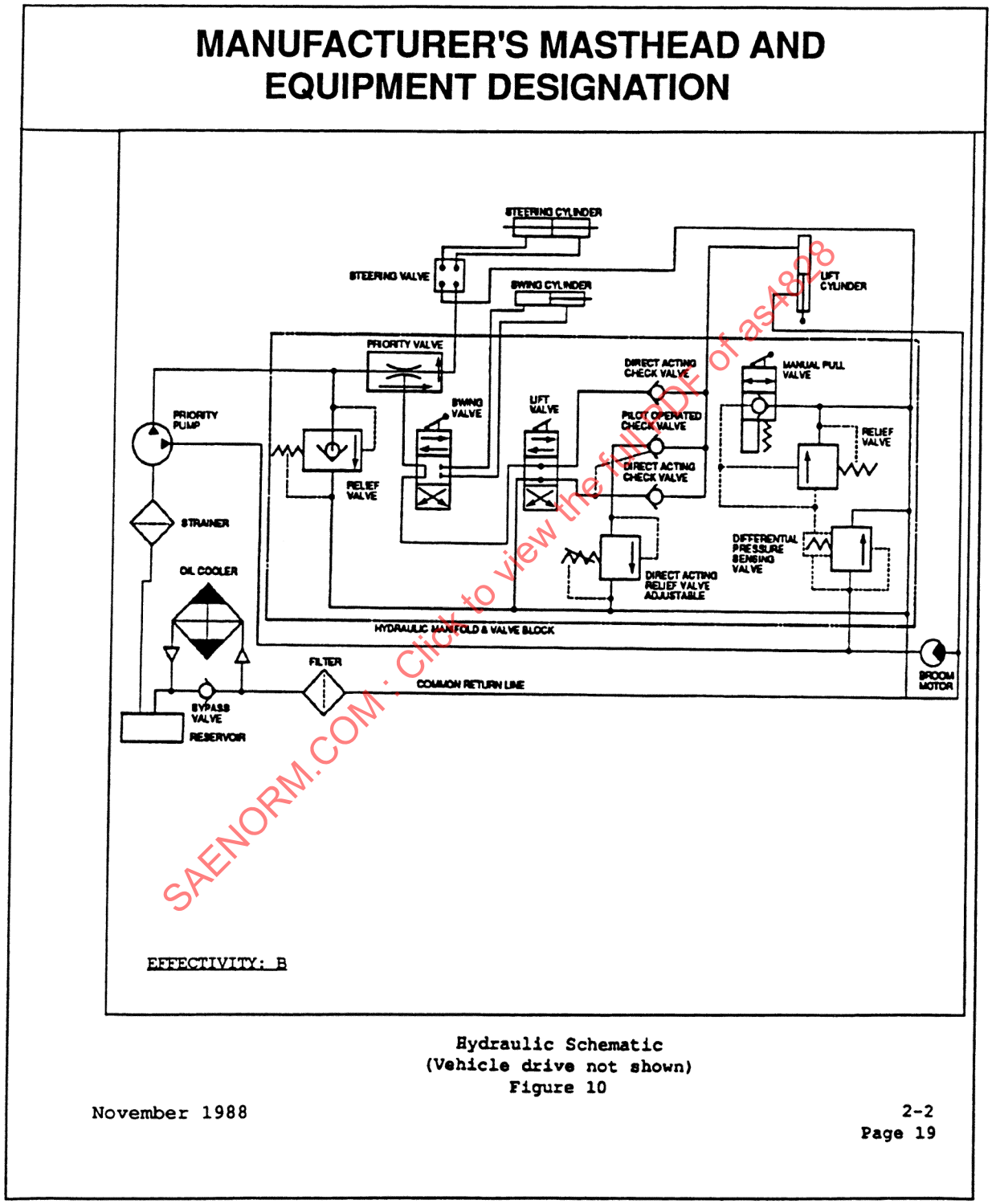


FIGURE 11B - Hydraulic Schematic (Vehicle Drive Not Shown)

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

LEGEND

REF #	COMPONENT NAME
1	Head Lamps
2	Front Turn Lamps (rectangular)
3	Stop, Tail, Turn Lamps
4	Light Switch
5	Turn Indicator Switch
6	Breaker 40 Amp.
7	Flasher, Turn Signal
8	Accessory Relay
9	Battery 12 V Group 31E
10	Switch. Reverse Alarm
12	Horn. Traffic
13	Relay. Horn
14	Ignition Switch
15	Switch. Push to Start
16	Tachometer
17	Oil Pressure Gauge
18	Water Temp. Gauge
19	Fuel Level Gauge
20	Ammeter
21	Fuel Sender
22	Water Temp. Sender
23	Oil Sender
24	Tach Sender
25	Brake Switch
26	Neutral Switch (Eaton)
27	Harness (Frt. Lamp)
28	Harness (Dash)
29	Harness (Main Frame)
30	Positive Battery Cable
31	Negative Battery Cable
34	Horn Switch and Button

November 1986 | Electrical Wiring Diagram (Instrument. Light and Harness Group) Figure 1 (Sheet 3 of 3) | 2-2 Page 7

FIGURE 12 - Sample Page - Electrical System Wiring Diagram Illustrations

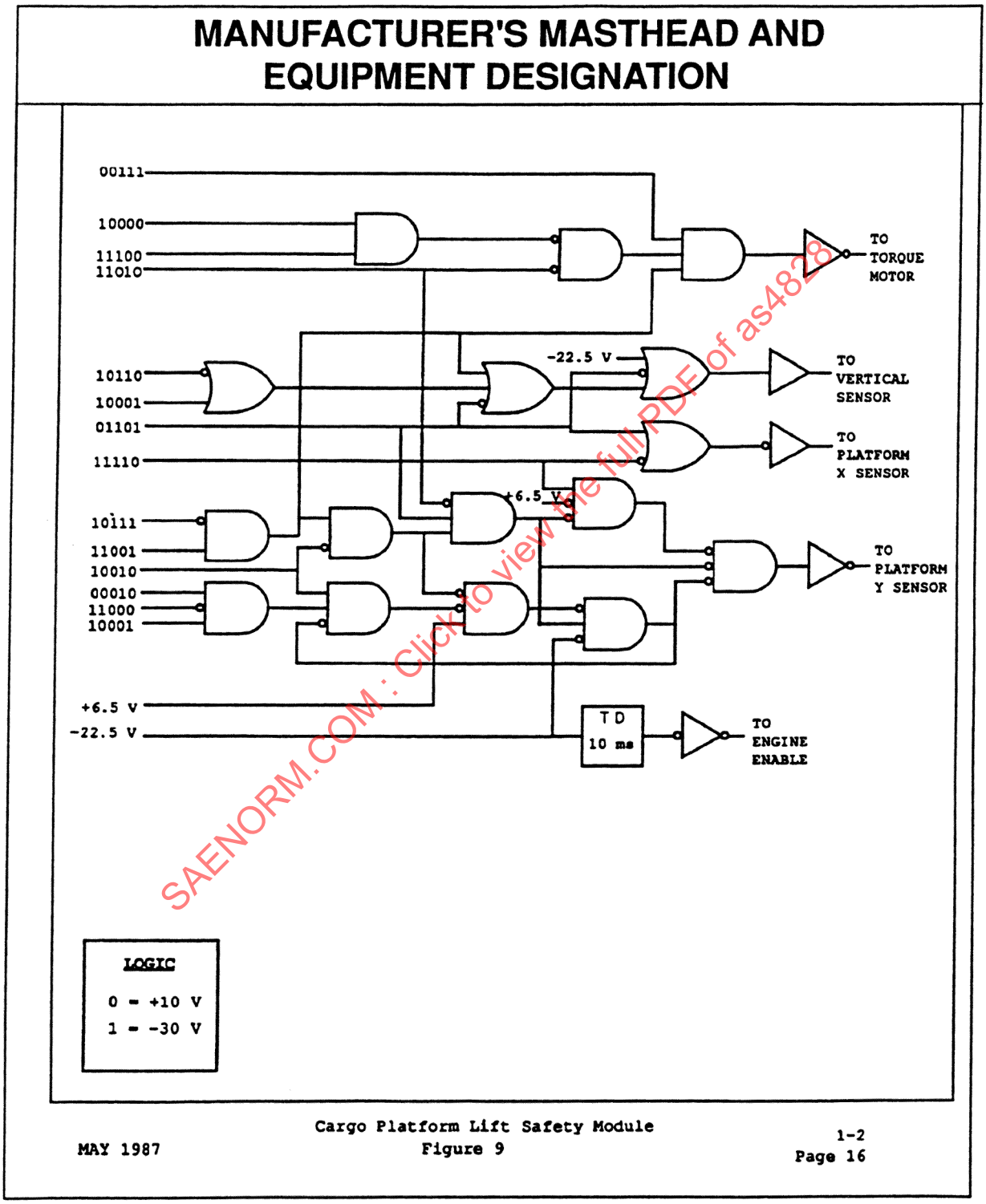


FIGURE 13 - Sample Page-Logic Diagram Illustration

3.3.2 (Continued):

(3) The Schematic Diagram (see Figure 11) shall be a tool for troubleshooting. The schematic shall show the scheme of a circuit with components represented by graphic symbols. Where practicable these symbols should be labeled. If a wiring diagram is not provided, the component location shall be shown on the schematic diagram.

(4) The Wiring Diagram (see Figure 12) shall depict and label, relative to location, all electrical equipment and/or components, together with all interconnecting wire and cable reference numbers and/or colors. It shall be designed as a technically complete and detailed aid for use in troubleshooting, servicing, repairing, and modifying equipment.

(5) The Logic Diagram (see Figure 13) shall be prepared when required to define system operation. Logic diagrams shall be prepared using standard logic symbols with connections.

(6) The Hydraulic Diagram (see Figure 10) shall be prepared whenever hydraulic power, or other fluid systems are used. Pneumatic systems will also employ the same type diagram. All diagrams shall use standard graphic symbols. These diagrams shall be designed as a technically complete and detailed aid in troubleshooting, servicing, repairing, and modifying.

e. Diagram Symbols: All symbols used for diagrams shall be identified. The identification may consist of a reference to a recognized standard that is being used or a listing of all symbols with an explanation for each symbol. Where electric/electronic, hydraulic, pneumatic or other fluid systems interface and separate diagrams are prepared, common designators shall be used for the same components.

f. Effectivity (see 3.3.1(h) and Figure 11).

3.4 Normal Revision Service:

3.4.1 Policy: A publication once issued shall be kept current by revision service. The List of Effective Pages shall be revised concurrently with each revision.

3.4.2 Frequency of Revisions: Revisions shall be issued as required to reflect equipment changes and improved procedures and techniques.

3.4.3 Numbering and Dating of Revisions: Each revision after the original issue shall be numbered in consecutive sequence and show date of issue on each page under the page number.

MANUFACTURER'S MASTHEAD AND EQUIPMENT DESIGNATION

TO: HOLDERS OF XYZ GROUND POWER UNIT (500 SERIES) MANUAL

REVISION NO. 2 DATED AUG. 1/92

HIGHLIGHTS

Pages which have been revised are outlined below together with the highlights of each change. Please remove and/or insert affected pages noted below and enter Revision No. 2 dated Aug. 1/72 to the Record of Revisions.

Chapter/Section and Page No.	Description of Change	Effectivity
Table of Contents Pages 1 & 2	Revised to indicate added, revised and/or deleted pages.	-----
1-1 Remove pages 1, 5, 6, & TR 1-4 Insert New Pages 1, 5, 6 & 7	Revised general description to reflect Service Bulletin which incorporated improved voltage regulator.	Models 511, 512, 516, 523 thru 525
1-2 Remove pages 1, 2, 4 & 7 Insert new pages 1, 2, 4 7, 12, & 13	Added operating differences between brushless and 135 KVA alternators with brushes.	-----

HIGHLIGHTS
Page 1 of 1

FIGURE 14 - Sample Page-Revision Transmittal/Highlights

3.4.4 Revision Transmittals (see Figure 15): Each revision shall be covered by a Revision Transmittal advising all manual holders of pages (temporary and permanent) to be removed and pages added by the revision. With the exception of the Illustrated Parts Listing, the Revision Transmittal also shall include revision highlights of all changes. When all, or nearly all, the pages of a manual are revised necessitating the issue of a complete replacement, the changed information shall be identified and handled as a normal revision (see 3.2.3). Special caution shall be exercised not to remove information affecting components still in service but out of production. The Revision Highlights shall indicate the effectivity of the change and reference the Service Bulletins involved.

3.5 Temporary Revision Service:

3.5.1 Policy: In order to bridge the gap between revisions to all publications except Service Bulletins, and to provide a rapid and convenient means of calling attention to errors or temporary instructions, a Temporary Revision system shall be provided.

3.5.2 Numbering and Filing Instructions (see Figures 15 and 16).

NOTE: The same general format (see Figures 15 and 16) is to be followed when using A3 and A4 size pages.

Temporary revisions shall be numbered consecutively starting with No. 1 for each Chapter/Section. (For example, The first temporary revision to Chapter 1 - General Information and Operating Instructions shall be numbered "Temporary Revision No. 1 -1").

Each temporary revision page shall contain filing instructions which identify the chapter/section and page being revised. (For example, "Insert adjacent to 2-1, page 1").

Each temporary revision page shall bear the same chapter/section number as the publication page being revised.

Each temporary revision shall start with page number 1 and specify the number of pages which comprise the revision (for example, "Page 1 of 6").

3.5.3 Temporary Revision Not Subject to Revision: Temporary revisions shall not be revised and reissued under the same number. If changes are necessary, the previous temporary revision shall be deleted and replaced by a new temporary revision under a new number.

Such new temporary revisions shall contain instructions for the removal of the superseded temporary revision. (For example, "This temporary revision replaces temporary revision No. 3-8 which shall be removed").

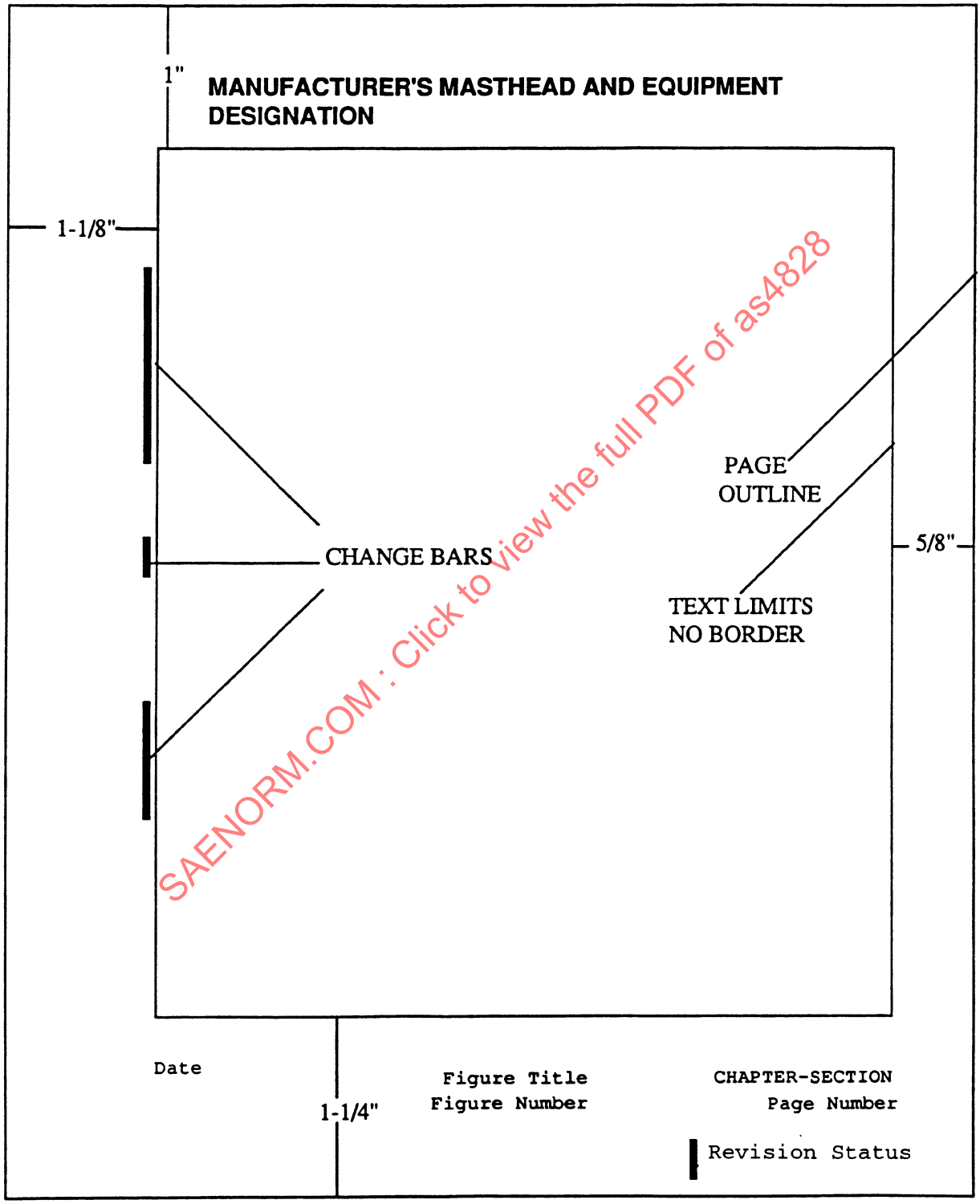


FIGURE 15 - Sample Revision Page-Vertical Layout

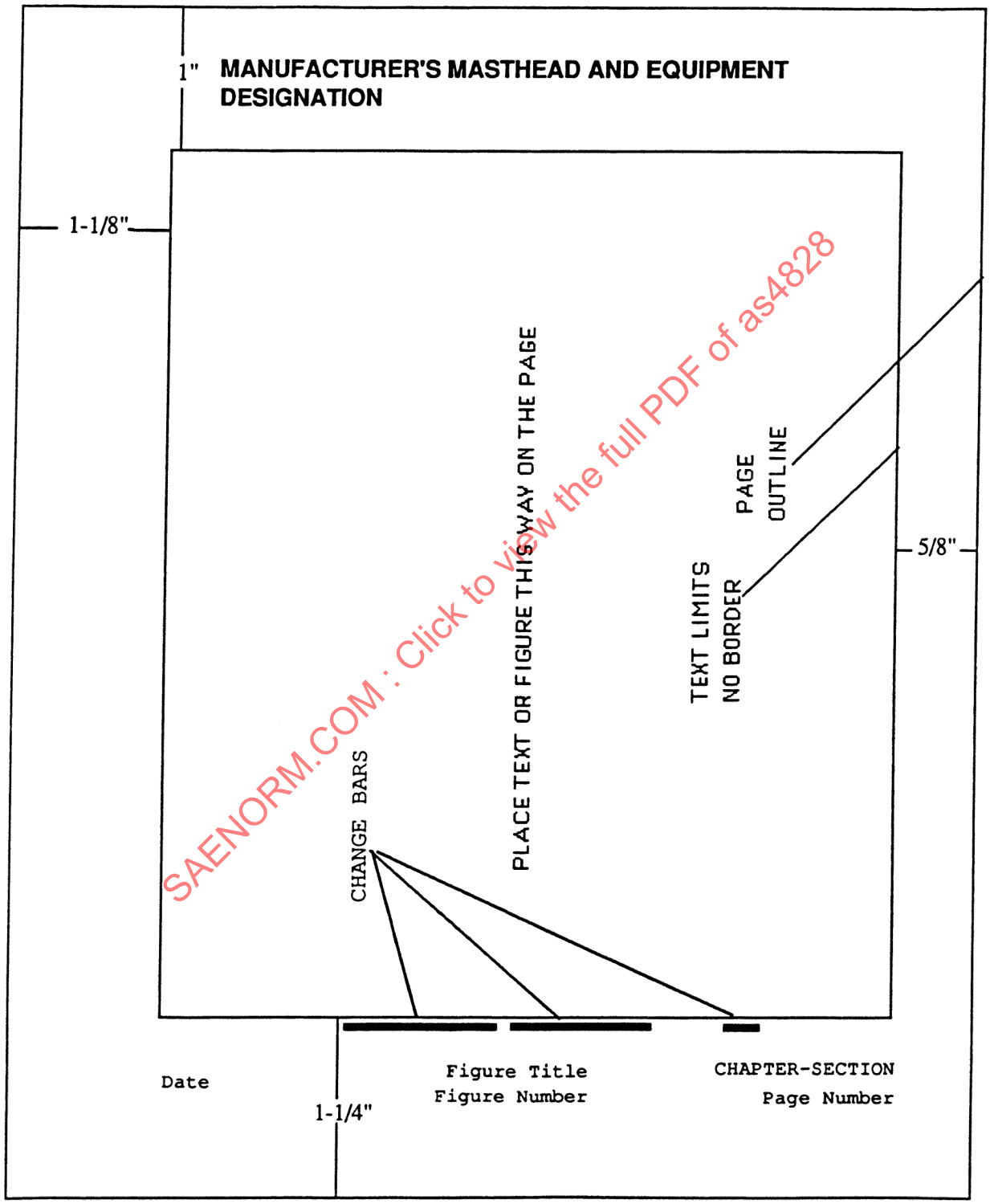


FIGURE 16 - Sample Revision Page-Horizontal Layout

3.5.4 Method of Presentation and Printing: The presentation of the temporary revision will be headed by a subject title. It shall include a narrative type discussion of the reason for issue and the origin reference number where it is applicable, such as Service Bulletin number, etc. Instructions to pen-amend a manual text or illustrations are prohibited.

Any legible method of reproducing temporary revisions is acceptable. The purpose of this system is to permit the manufacturer to cover the interim additions or changes rapidly.

3.5.5 Temporary revisions shall be reproduced on yellow stock.

4. DETAILED REQUIREMENTS FOR SPECIFIC PUBLICATIONS:

Contents:

4. (Continued):

4.1 Operation and Maintenance Manual:

4.1.1 Manual Guidelines:

a. Content: All information shall be produced as a single manual (see 3.1) in the following Chapter/Section breakdown (see 3.2). The manual shall provide sufficient information for personnel unfamiliar with the equipment to understand, operate, maintain, identify parts and overhaul the equipment in accordance with proper procedures, operating techniques, precautions and limitations. This information shall contain and follow the format listed.

b. Arrangement: The arrangement of material shall be in accordance with the following:

(1) Title Page (see Figure 17)
(2) Record of Revision (see Figure 18)
(3) List of Effective Pages (see Figure 19)
(4) Table of Contents (see Figure 20)
(5) Introduction (see Figure 21)
(6) Chapters 1 through 5

4.1.2 Chapter 1 - General Information and Operating Instructions: This chapter shall contain a physical and functional description of the complete unit/ system, etc. Use, application, performance and design features shall be described. Illustrations, diagrams, and schematics shall be provided.

a. Section 1 - Description: This section shall contain a thorough description of the unit/system and all its major components.

b. Section 2 - Operation: This section shall contain an explanation of each control, and indicator, and its operation and function. Preoperation instructions and checks shall be provided. Where the sequence of control operation is not influenced by any differences in component(s) or system(s) with which the GSE can be used, a step-by-step sequence shall be given. If such a sequence is susceptible to change in order to suit the use with different components or systems, only a typical sequence (clearly indicated as such) shall be given. This typical sequence shall be preceded by a statement which reads: "The following is a typical sequence. Operating instructions to be adopted for use with specific aircraft systems and components are given in the appropriate manuals". Special attention shall be given to WARNINGS and CAUTIONS.

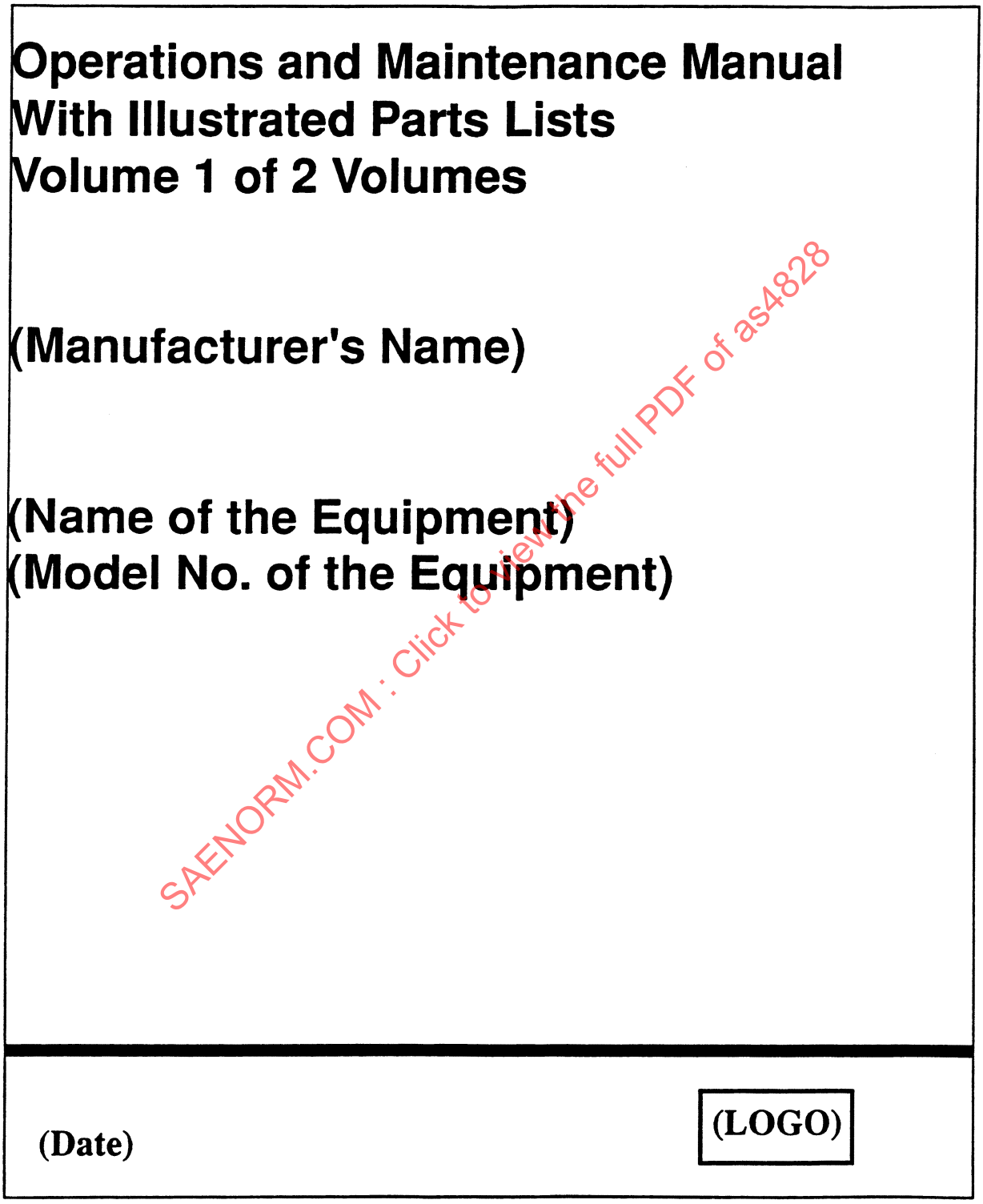
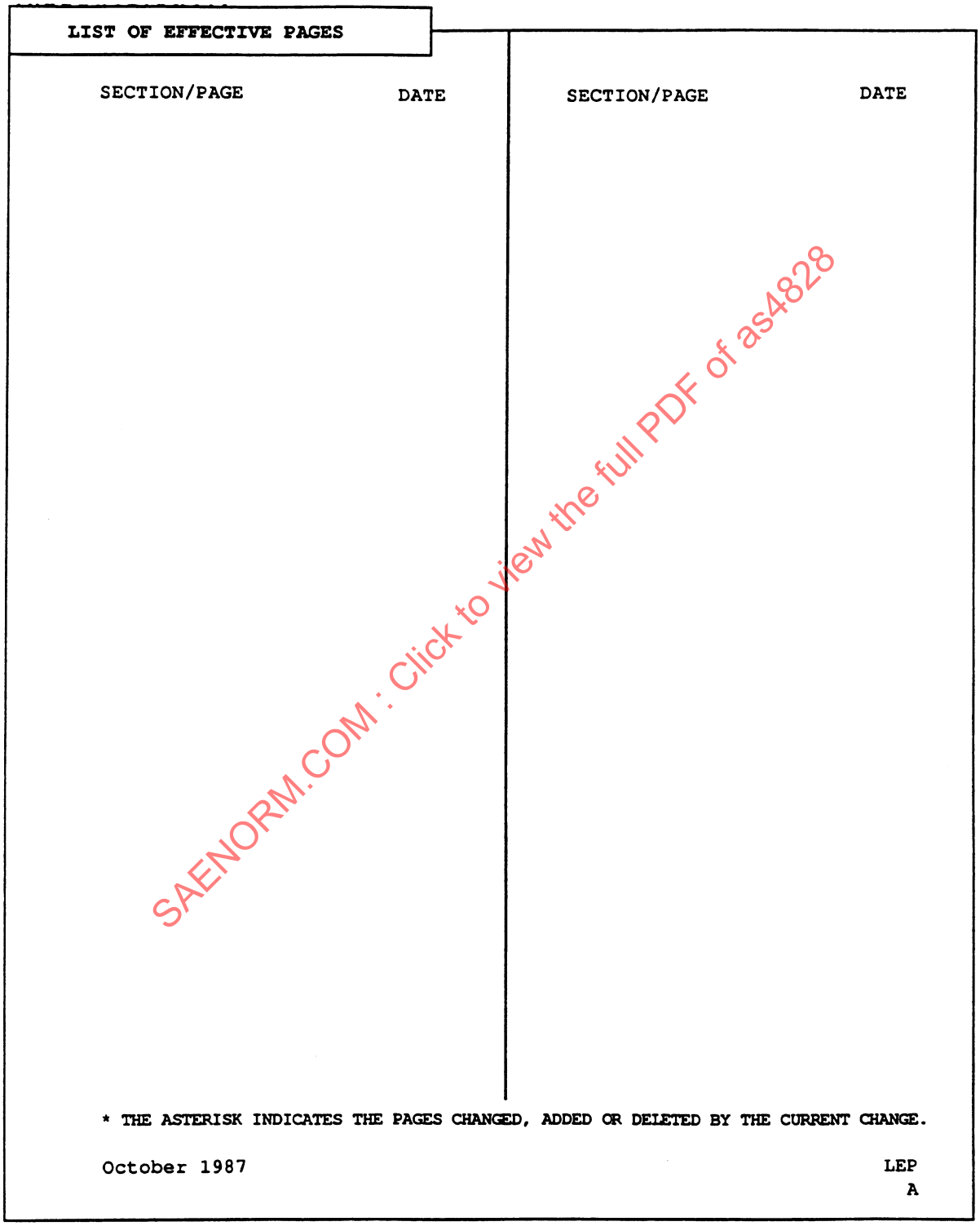


FIGURE 17 - Sample Page-Title Page

REVISION RECORD

REV NO.	ISSUE DATE	DATE INSERTED	INIT.	REV NO.	ISSUE DATE	DATE INSERTED	INIT.

FIGURE 18 - Sample Page-Record of Revisions



LIST OF EFFECTIVE PAGES

SECTION/PAGE	DATE	SECTION/PAGE	DATE

* THE ASTERISK INDICATES THE PAGES CHANGED, ADDED OR DELETED BY THE CURRENT CHANGE.

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FIGURE 19 - Sample Page-List of Effective Pages

TABLE OF CONTENTS

FIGURE 20 - Sample Page-Table of Contents

INTRODUCTION

This manual is a two volume set incorporating information for the (manufacturer's name) (equipment name and model) and includes general information, operation, maintenance, overhaul and illustrated parts lists. This two volume set replaces all (manufacturer's name) (equipment name and model) manuals previously issued in their entirety.

It is a compilation of the best information available at the time of writing. If errors or misinformation are found, change requests should be submitted in writing to the manufacturer.

Manufacturer is: (Name, Address and Telephone/Telefax No.)

FIGURE 21 - Sample Page-Introduction

4.1.2 (Continued):

c. Section 3 - Specifications and Capabilities: This section shall detail all pertinent data on the unit/system. This will include dimensions, lift height, capacities, speeds, etc. A three dimensional drawing of the equipment shall be included, where necessary, to clearly illustrate the equipment.

d. Section 4 - Shipping: This section shall contain all the information required to prepare the equipment for shipping. This shall include data on lift points, dismantling, packing precautions, shipping dimensions, weight, etc.

e. Section 5 - Storage: This section shall contain procedures covering the preparations required to minimize deterioration of the equipment when it is stored for short and long periods of time under varying climatic conditions.

4.1.3 Chapter 2 - Maintenance: This Chapter shall contain all necessary maintenance procedures for servicing, troubleshooting, removal/installation and repair of the overall unit as detailed.

a. Section 1 - Servicing: This section shall contain procedures for all required periodic maintenance.

(1) Requirements shall be detailed to include information such as replenishing (e.g., fluid, air, etc.), lubrication, checks, tests, adjustments, etc.

(2) Schedules for the requirements shall be prepared in a tabular form by calendar frequency such as daily, weekly, or multiples of weeks. An alternate to calendar frequencies may be running hours and/or operating cycles.

b. Section 2 - Troubleshooting: This section shall contain all necessary information for isolating and identifying failures or malfunctions of electrical, hydraulic, or other such systems.

Troubleshooting text shall be supplemented with appropriate troubleshooting charts and schematics/wiring and piping diagrams.

c. Section 3 - Removal/Installation: This section shall contain the procedures and precautions for removing and installing components.

d. Section 4 - Repairs: This section shall contain the procedures and methods for accomplishing maintenance repairs.

(1) Information shall cover actual repair of items not readily removed or replaced. Removal and installation shall be covered in Section 3.

(2) Cleaning and painting which require special procedures shall be described.

4.1.4 Chapter 3 - Overhaul/Major Repair: This chapter shall contain all the necessary information for the overhaul/major repair of the equipment and/or components/systems. Coverage for each component/system (e.g., axle, transmission, hydraulic system, etc.) shall contain troubleshooting, disassembly, cleaning, checks, repairs, assembly, fits and clearances, testing, storage instructions and special tools and fixtures data as required. These subsections/paragraphs are further defined as follows:

NOTE: All subsections/paragraphs regarding a particular component/system shall appear together in a continuous body of information and not in separate locations.

a. Troubleshooting: The symptoms, causes and remedies for troubles which may develop with a component shall be described.

b. Disassembly: Disassembly procedures shall be described in a step-by-step sequence.

c. Cleaning: Recommended procedures and materials used for cleaning the equipment shall be provided.

d. Checks: Detail information and procedures for checking the condition of components/systems shall be provided.

e. Repairs: Information necessary for repairs shall be provided.

f. Assembly: Assembly procedures shall be described in a step-by-step manner. Reference to "in reverse of disassembly" is not acceptable.

g. Fits and Clearances: All required fits, clearances, torque values, etc. shall be listed in tabular form.

h. Testing: The procedures for testing an overhauled component/system shall be described.

i. Storage Instructions: The recommended procedures and precautions for storage shall be provided in detail.

j. Special Tools and Fixtures: Items required to perform the overhauls described in this chapter shall be listed. This list must contain a full description of the items with names of manufacturers or details for fabrication.

4.1.5 Chapter 4 - Illustrated Parts List:

a. Purpose: The Illustrated Parts List is intended for use in provisioning, requisitioning, storing, and issuing the replaceable ground equipment components and in identification of new and reclaimed parts.

4.1.5 (Continued):

b. Required Information: The Illustrated Parts List shall include all parts information covering the complete unit and/or its components where such components are installed on the unit.

(1) In instances where major components are supplied by a subvendor, sufficient data shall be included in the list to identify all of the components included in the basic unit. This data should be sufficient to extract pertinent information from the subvendors parts list without the necessity of physically examining the basic unit.

(2) In instances where components from subvendors are installed on the unit, the prime vendor shall assure that a complete Illustrated Parts List including subvendor name and part numbers are provided.

c. Complex Equipment/Systems: When the complexity or number of systems within a unit is such that several separate illustrations and parts list are required for full coverage and clarity, the Illustrated Parts Lists shall begin with an overall illustration of the unit titled "Final Assembly" (see Figure 22).

(1) The parts list (see Figure 23) for this information shall begin with the part number and nomenclature of the unit and be followed by the part numbers and descriptions of the systems or installations that are illustrated separately.

(2) Each system or installation description shall be followed by a location reference indicating where its separate Illustration and Parts List appear.

(3) In addition to listing these systems and installations, the overall unit illustration and parts list may be used to illustrate and list detailed parts that are not part of a system.

(4) Each system and installation (e.g. hydraulic system, electrical installation, etc.) included in the parts list shall be illustrated with an exploded view prepared in such a way as to show the technically correct assembly/disassembly relationship.