

INCH-POUND

MIL-DTL-28999C (MC)
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SUPERSEDING
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MILITARY SPECIFICATION

PUBLICATIONS, TECHNICAL, INSTRUCTION-TYPE: PREPARATION OF

This specification is approved for use by the U.S. Marine Corps, Department of Navy, and is available for use by all Departments and Agencies of the Department of Defense and government contractors.

1. SCOPE

1.1 Scope. This specification covers general style and format requirements for the preparation of instruction-type technical publications for support of in-service equipment/weapons systems.

1.2 Classification. Instruction-type technical publications will be of the following types, as specifies (see 6.1.)

Type I	-	Modification Instruction (MI)
Type II	-	Technical Instruction (TI)
Type III	-	Supply Instruction (SI)
Type IV	-	Lubrication Instruction (LI)

Unless otherwise specified herein, requirements will apply to all types.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

2.1.1 Specifications, Standards and Handbooks. The following specifications, standards, and handbooks form a part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents will be those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Marine Corps Systems Command (Code PSD), 2033 Barnett Avenue, Suite 315, Quantico, VA 22134-5010 by using the self-addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A

TMSS

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

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SPECIFICATIONS

MILITARY

MIL-STD-38784	Manuals, Technical: General Style and Format Requirements
MIL-STD-961D(1)	Defense Specifications
MIL-HDBK-38790	Printing Production of Technical Manuals: General Requirements For
MIL-HDBK-61	Configuration Management Handbook 7 Apr 1997

STANDARDS

COMMERCIAL

ASME-Y14.38M	Abbreviations for Use on Drawings, Specifications, Standards And In Technical Documents
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PUBLICATIONS

DEPARTMENT OF DEFENSE

DOD 5220.22-M	Industrial Security Manual for Safeguarding Classified information
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2.1.2 Other Government Documents, Drawings, and Publications. The following other Government documents, drawings, and publications form a part of this specification to the extent specified herein. Unless otherwise specified, the issues will be those in effect on the date of the solicitation.

U. S. GOVERNMENT PRINTING OFFICE

Style Manual Library of Congress Catalog No. Z253.U58

(Application for copies should be addressed to the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.)

{Copies of specifications, standards, handbooks, drawings, publications, and other Government documents required by contractors in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.}

2.2 Order of Precedence. In the event of a conflict between the text of this specification and the references cited herein (except for associated detail specifications, specification sheets or MS standards), the text of this specification will take precedence. Nothing in this specification, however, will supersede applicable laws and regulations unless a specified exemption has been obtained.

3. REQUIREMENTS

3.1 Material. Any material to be used for development of a Modification Instruction (MI) that effects a baseline change in equipment under configuration management will not be converted into an MI except by means of an approved Engineering Change Proposal (ECP) in accordance with Marine Corps Systems Command Configuration Management Handbook dated 30 September 1997. Additionally, material or all instruction-type technical publications will be furnished in the form (manuscript copy for review, original

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artwork, specified in the contract or order (see 6.2). All material prepared under this specification shall be Government property.

3.2 Manuscript Copy for Review. The manuscript (or draft) copy shall be printed, one side of each sheet, approximately 8-1/2 x 11-inch page size, and furnished in the quantity specified (see 6.2). Submit text in Rich Text Format (.RTF), using the current word processing program used by the Marine Corps, on a 3 1/4 inch floppy disk, 1.44 mb or 100 mb zip disk using non-compressed RTF files. A hard copy draft of the text is also required. Do not provide illustrations in data format. It shall contain all text and illustrations (if any) necessary for a complete instruction-type technical publication. Illustrations shall be placed before the applicable paragraph that it refers to or on a separate page. Each I-type publication will be typed using Times New Roman 10-pitch font. All text will be printed (left margin justified) on 8 1/2 x 11-inch paper. The cover page of the publication will be formatted as shown in figure 1 setting the left margin at 1 inch" and the right margin at 1 inch. Continuing pages of the text shall be formatted using example shown Figure 2 on white printer paper setting the left margin at "1 inch" and the right margin at "1 inch". Typing image area will not exceed 7 x 10 inches including publication and page number.

3.3 Original Artwork. Artwork provided by contractors or other professionals shall be prepared in accordance with MIL-I-28947C. Provide two laser printed hard copies with the image area not exceeding 7 inches wide by 8 1/4 inches high or line art in Bit Map (Bmp) format on a 3-1/2 inch or Zip disk so art work can be input into system and reworked for the current Marine Corps printing system. Artwork must be camera-ready quality with no less than 400 dots per inch. Artwork provided by nonprofessionals can be line art or drawing of the item or area. Photographs are not acceptable. If artwork is inserted into the text on the manuscript copy a separate sheet containing one illustration per sheet must be enclosed with the manuscript copy.

3.4 Reproducible (camera-ready) Copy. Reproducible (camera-ready copy shall consist of single-sided text pages including artwork inserted on the text page ready for the intermediate photolithography step leading to the production of the printing plate. Full page illustrations, including those for foldout pages, which have been prepared in exact printing size (or in same size as text pages) shall have the marginal copy mounted thereon.

3.4.1 Reproducible Copy Leading and Spacing. Layout shall conserve space without lessening usability or clarity of the material. Blank pages and blank spaces on pages shall be avoided, wherever possible. Leading and spacing, as indicated in figures 3 through 13 shall be used for best readability and conservation of space. Double spacing of text within a paragraph or similar wastefulness is unacceptable; however, slight variations are permitted in order to avoid layout practices that would result in the following:

(a) The first line of a paragraph being at the bottom of a page or the last line beginning on a new page.

(b) A subhead falling on the last line of a page.

(c) WARNINGS, CAUTIONS, and NOTES being divided so that first lines appear on one page, and remaining lines on another.

3.4.2 Page Size for Reproducible Copy. Text and art material for a reproducible page requiring no reduction photographically for printing shall not exceed 8-1/2 x 11 inches.

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3.4.3 Reproduction Area. The actual overall image area including marginal copy, utilizes for each 8-1/2 x 11 inch sheet shall be 42 picas (approximately 7 inches) wide by 60 picas (approximately 10 inches) deep.

3.4.3.1 Oversize Sheets. Oversize sheets may be used with the actual overall image area utilized to be of such size that the text will be approximately 10-point when the sheets are photographically reduced to the prescribed size of the image area (42 by 60 picas).

3.4.4 Marginal Copy. Marginal copy generally consists of the publication number and the page number. When applicable, it may also consist of the security classification, change number, figure number and title, and enclosure number.

3.4.4.1 Publication Number. The publication number shall appear on the first page, flush right, on the fourth line below the letterhead. On succeeding pages, the number shall appear on the top line of the image area: flush left for even-numbered pages, and flush right for odd-numbered pages (see figures 2,3 and 4).

3.4.4.2 Page Number. The page number shall appear in the lower outer corner of each page. Flush left for even-numbered pages, and flush right for odd numbered pages (see figures 3 and 4).

3.4.4.2.1 Blank Page Number. Each blank page shall be assigned a number, but it shall appear on the preceding page (see figures 3 and 4).

3.4.4.3 Foldout Pages. The page number and the figure number and title on each foldout page shall be placed so they will be visible when the printed page is folded (MIL-STD-38784 applies).

3.4.4.4 Blank Pages. A blank page requires no marginal copy, except when the reverse printed side is classified, in which case the classification markings shall appear at the top and bottom center of the blank page. Blank pages shall be annotated as such. The vertical space between the enclosure number and the page number shall be equal to two lines (approximately 2 picas).

3.4.4.5 Enclosure Number. The number on each enclosure shall appear above the page number as follows except when the enclosure is authenticated or contractor document, then the enclosure number will be on the first page only:

Odd-numbered page

ENCLOSURE (2)

5

Even numbered page

ENCLOSURE (2)

6

3.5 Format and Elements. The format and elements of instruction-type technical publications shall be standardized to the maximum extent possible (see figures 3 through 13).

3.5.1 Category. The category (i.e., NORMAL, or URGENT) of an instruction-type technical publication shall be as designated by the procuring activity at the time of the review of the manuscript.

(a) Urgent instructions invariably involve the safety/degradation to personnel/equipment and shall have the required modification kit/parts readily available from the supply system. The category shall be placed on the first page, centered, two lines below the heading.

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(b) When the category is URGENT a time compliance statement (see figure 6) must be made for a period of time less than 1 year for completion of the instruction.

3.5.2 Publication Number. Each publication number shall be assigned by the procuring activity at the time of the review of the manuscript.

3.5.3 Date of Publication. The date of each publication, shall be the last working day of the month that the publication is signed on (not the actual date signed) and added to the reproducible copy by the procuring activity. It shall appear on the next line beneath and flush right with, the publication number.

3.5.4 Standard Heading. The standard heading identifies the type of instruction (U.S. MARINE CORPS MODIFICATION/TECHNICAL/LUBRICATION/SUPPLY INSTRUCTION) and matches the first element of the instruction number (MI, TI, SI, LI). This heading is centered on the top set of double lines (preprinted) 2 3/4-inches from the top edge of the reproducible letterhead Typing Guide (form USMC I-Type Publication Cover Grid Sheet). The contractor shall provide Cover Grid Sheet in accordance with figures 1 and 2.

3.5.5 Publication Title. The title, which shall never exceed four lines, shall be based on the contents of the purpose paragraph of the publication and shall include, as appropriate, a brief account of the work to be accomplished or the information being conveyed and the identification of the component of the major item, the major item itself, and the system (e.g. JAVELIN) to which the major items belong. The title shall be centered and balanced within the two sets of double lines on the first (letterhead) page which form the block for the title. (See figures 3 through 13).

3.5.6 Enclosure or Appendix Lines. The space immediately beneath the lower of the two sets of double lines on the first (letterhead) page shall be used to list the enclosures or appendixes, if any, in numerical sequence (see figures 7, 10, and 12 for examples of enclosures). An enclosure is a document that is related to, but is independent of the instruction-type technical publication that transmits it. An appendix is a dependent, supplementary element (e.g., table, chart, etc.) that augments an instruction-type technical publication and is physically attached at the end of the publication. (see figures 2, 7, 8, 10, and 11).

3.5.7 Paragraphs. Paragraphs shall appear consecutively in the following sequence. However, only those paragraphs that are germane to the publication shall be used; in no instance shall paragraphs be used solely to preserve format. (See figures 2 through 13)

3.5.7.1 Purpose. The purpose paragraph shall always be the first paragraph. The purpose paragraph describes the directed action for which instructions are being provided or the information being conveyed. (See figures 3 through 13).

3.5.7.2 Cancellation. The cancellation paragraph shall be used, when applicable, to cancel superseded or otherwise obsolete and rescinded technical publications. (See figures 2, 5, and 9).

3.5.7.3 Applicability. This paragraph shall be used when it is necessary to indicate any special conditions under which the modification or instruction is applicable. If the instruction does not apply to all items under the Item Designator (I.D.) number, it is necessary to provide the range of serial numbers to which the instruction does apply (see figures 2 and 5).

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3.5.7.4 Time Compliance Period. Marine Corps policy establishes a time compliance period of 1 year, beginning with the date of the instruction-type technical publication, for NORMAL category instructions, and requires that the time compliance period shall be stated specifically in URGENT category instructions and must be less than 1 year. Therefore, the time compliance period paragraph shall be used for all URGENT instructions and those NORMAL instructions whose time compliance periods are other than the 1-year stipulated by policy (see figures 2 and 6).

3.5.7.5 Information. An information paragraph shall be used when it is necessary to: (see figures 3 through 13).

- (a) Expand upon the purpose paragraph.
- (b) Give the background of the problem, which the publication is intended to correct.
- (c) Give the source (e.g., quality deficiency report, beneficial suggestion, engineering change, etc.) of the publication.
- (d) List the advantages to be accrued by performing the action required by the publication.
- (e) Announce a record purposes only publication (see figure 7).

3.5.7.6 Technical Manuals Affected. A paragraph shall be used citing the technical manuals to be changed or revised as a result of the application of the instructions contained in the instruction-type technical publication (see figures 3,4,5,6,8, and 9).

3.5.7.7 Major Items Affected. The major items affected paragraph shall constitute a description, in tabular form, of the major items affected by the publication. The paragraph shall not be required or used, however, in those instruction-type technical publications whose sole purpose is to authorize the application of the guidance contained in other documents, whether enclosed or not, or whose range of equipment is too vast to list. (See figures 3,4,5,6,7,8,9,11, and 12).

3.5.7.7.1 Description. Major items shall be described by complete, official nomenclature, to include serial or hull numbers, when known or determinable. All letters of the basic nomenclature shall be in upper case, with descriptive words or model designations in upper and lower case. The accuracy of all elements of the description shall be verified, using current Marine Corps or other supporting publications provided by the acquiring activity as reference sources.

3.5.7.7.2 National Stock Number (NSN). When available the NSN shall be shown for each major item, except in those instances when all major items affected by the publication bear the same item designator number as in the case of using generic NSN for procurement specification. The acquiring activity will provide the NSN to be assigned.

3.5.7.7.3 Table of Authorized Materiel (TAM) Number. The TAM number, as provided by the acquiring activity, shall be shown for each major item.

3.5.7.7.4 Item Designator (I.D.) Number. The I.D. number, as provided by the acquiring activity, shall be shown for each major item.

3.5.7.8 Components Affected. A component, as the term is used in instruction-type technical publications, is the assembly on which the work

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is being done, regardless of whether the assembly can be identified by NSN or Part Number (PN), or the assembly is listed as a component in Marine Corps or other supporting publication (see figure 3). The component shall be described by its basic name, model or serial number, or other identifying data (caliber, millimeter, etc.), as is required for describing the major end item (see 3.6.7.7). The NSN and PN shall be shown when they are known or determinable.

3.5.7.9 Materiel Affected. All or any of the following subparagraph titles may be used. However, if only one is used, it becomes the primary paragraph (see figures 3, 4, and 9).

3.5.7.9.1 Materiel Required. All items necessary to meet requirements of the publication shall be listed either alphabetically or in the order in which they are discussed in the text, or by item No. as follows:

(a) Items shall be described by Item No., Description, NSN, PN, and quantity (Qty.), as shown in figures 2, 3, 4, and 9. If the item has no NSN, list Commercial and Government Entity Code (CAGE)/PN as shown in figures 3 and 4.

(b) Items making up a kit shall be listed beneath the kit description indented four spaces from the left margin.

(c) Dimensions of each item may also be given.

(d) Metric equivalents should be included in parenthesis after the inch-pounds units.

3.5.7.9.2 Materiel Discarded. Materiel discarded shall be listed alphabetically or in the order in which items to be discarded are discussed in the text. Unless special disposal instructions are provided, the phrase (Dispose of discarded materiel in accordance with current Marine Corps directives) will be used after the heading. (See figure 2).

3.5.7.9.3 Materiel Retained. This paragraph shall describe the materiel retained to form a new unit, materiel removed, but neither reinstalled nor discarded, or materiel disposed of in other than a routine manner. (See figure 2).

3.5.7.9.4 Bulk and Consumable Materiel. When applicable, a listing of two or more bulk and consumable materials required to apply the instruction-type technical publication shall be listed. The listing shall be presented either alphabetically or in the order in which they are discussed in the text. Items shall be described by Description, NSN, PN, and quantity (For LI's Description, NSN, MIL-STD, and Qty.). If the item has no NSN, list CAGE/PN (see figures 2, 3, 4 and 13).

3.5.7.10 Special Tools, Jigs, and Fixtures Required. Detailed fabrication instructions shall be given for any tool, jigs, or fixtures which must be fabricated to perform the modification, test, etc., of the equipment or to meet the other requirements of the publication.

3.6.7.10.1 Special Tools. Special tools are those required as a direct result of the instruction to perform its prescribed procedures (see figure 8). Such tools shall be listed alphabetically and shall be identified by NSN and PN, when known or determinable. Special tools shall be added to existing tool kits required to maintain the end item; the Marine Corps stocklist (SL-3) for the tool kit shall be changed to reflect additions. If any special tool is to be procured by open purchase, the complete identification and address of the manufacturer shall be given. (See

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figures 2 and 8).

3.5.7.10.2 Jigs and Fixtures. Jigs and fixtures required to apply the modification, test procedure, etc., shall be listed alphabetically and shall be identified by NSN and PN. (See figure 2).

3.5.7.11 Special Instructions. Any special instructions, which are not suitable for other paragraphs in the publication, may be given in this paragraph. (See figures 2 and 9).

3.5.7.12 Supply Action. Instructions for procuring materiel, kits, or parts, when they differ from established procedures, shall be given in this paragraph. If a modification kit is required, the kit must be fully supportable with an NSN required (if available). If the MI is to be applied by other than established procedures, add this information in a Supply Action paragraph in the MI. (see figures 2 and 8).

3.5.7.13 Skill and Time Required. This paragraph shall describe the title of the Military Occupational Specialty (MOS) required to perform the modification, test, operational check, etc. MOS's will be defined by the acquiring activity. If no special skill is required, the MOS title shall be followed by (or technician with equivalent skills). The time it takes to perform the modification, test, or other action required by the publication shall be given in hours. If more than one MOS skill is required, the time shall be shown for each. Time requirements of less than 1 hour shall be shown in tenths of an hour (e.g., 1/2 hour shall be shown as 0.5 hours). (See figures 2,3,4,8, and 10).

3.5.7.14 Procedures Paragraph. The paragraph title shall coincide with the action it requires. Modification Procedures shall always indicate modification in an MI. (see figures 2,3, and 4). The use of the word modification in a TI shall be avoided. The procedures paragraph of a TI shall be titled in accordance with its contents; e.g., Action, or Test Procedures, or Installation Procedures, etc. (see figures 9 and 11). An SI explains technical aspects of supply matters and shall not address data applicable to Modification or Technical Instructions except as it relates to information on acquisition, regulation or availability. An SI should avoid use of the words Modification, Test Procedures, Installation Procedures, etc., except when referencing an MI, TI or other technical publication (MIL-DTL-28999C(MC) except when the publication directs and authorizes the use of the procedures contained in a document published by another military service or a commercial manufacturer). (See figure 12). Specific requirements are as follows:

(a) Parts or materiel shall be identified in the text by item numbers as listed in the "Materiel Required" paragraph. If the item number cannot be assigned, the NSN (if the NSN is known or determinable), PN, or military specifications used with the publication shall be used.

(b) All parts shall be listed in the "Materiel Required" paragraph if they are required to perform the action levied by the publication, unless a removed part is retained for reinstallation or is discarded.

(c) A part or materiel shall not be referenced in the text by anything other than its name and item number if assigned. If no item number has been assigned, use NSN or PN first time referenced only. Neither shall parts or materiel be described by physical characteristics (length, thickness, inner and outer dimensions, composition, weight, etc.). Physical characteristics may be listed for parts or materiel in the Materiel Required paragraphs.

(d) Tools required to perform the action directed by the

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publication must be available at all maintenance echelons to whom the publication is addressed; if not available, such tools must be described as special tools (See 3.6.7.10.1).

3.5.7.15 Recording and Reporting the Modification. Recordable MI's and TI's, as designated by the procuring activity, shall stipulate that the completed action shall be recorded (see Figure 3). Recording the completed action by marking or stamping the equipment, itself, is usually required within the procedures paragraph; therefore, it is not necessary to specify this type of recording in a separate paragraph. Reportable MI's and TI's shall stipulate that the completed action shall be reported (see figures 2,3,4,7,8, and 9). The recordability and reportability of an MI or TI shall be added to the manuscript copy by the procuring activity at the time of review.

3.5.8 Authentication. The authentication lines shall subscribe to the format shown in figures 3, 4, 7, and 9. However, in view of personnel assignments, etc., the sustaining activity shall provide the name and title of the official who shall authenticate the publication.

3.5.9 Distribution. The Publication Control Number (PCN) assigned to the publication is the distribution code assigned in Marine Corps Publication Distribution System (MCPDS). The Project Manager/Weapon System Manager (PM/WSM) is responsible for assigning the Individual Activity Codes (IAC's) and Quantities (Qty's) required for initial distribution of the instruction publication.

3.6 Development of Text. The text shall contain only essential information and shall be factual, specific, concise, comprehensive, and unambiguous. It shall be so clearly worded as to be readily understandable at the organizational levels where the publication will be used. The U.S. Government Printing Office Style Manual shall be used as a general guide for capitalization, punctuation, compound word forms, numerals in text, and spelling. Text shall avoid the following:

(a) Avoid the use of quotation marks and underlining for the purpose of emphasis.

(b) Avoid technical phraseology requiring specialized knowledge, except when no other wording will convey the intended meaning.

(c) Avoid superfluous words and phrases. Avoid ambiguity which may result from the divergent meanings of a word; for example, the word replace will not be used if the word reinstall is intended.

3.6.1 Writing Style. The writing style for the text shall be such that the information and instructions shall be understood by an individual having at least an eight grade reading level.

3.6.1.1 Grammatical Person and Mood. The second person imperative mood shall be used for procedures; for example, Remove test set from carrying case. The third person indicative mood shall be used for description and discussion; for example, "When switch A is in the ON position, lamp 34 lights. Pronouns may be used when their use will not cause confusion.

3.6.1.2 Use of Words: shall, will, should, and may. The words shall or will are to be used to indicate a mandatory requirement. The word should is to be used to indicate a nonmandatory desire or preferred method of accomplishment. The word may is to indicate an acceptable or suggested means of accomplishment.

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3.6.1.3 Nomenclature Consistency. Nomenclature shall be consistent within a publication. Nomenclature and modifying words shall agree with those appearing on the applicable approved Defense Logistics Services Center (DLSC) total Item record/engineering drawings. When the DLSC TIR and equipment drawings, technical manual, or other publications disagree list both one time and indicate which term will be used in rest of publication.

3.6.1.4 Abbreviations, Acronyms, and Symbols. Use of abbreviations and acronyms shall be held to a minimum and, unless long custom has established their use, they shall be identified the first time they appear. Abbreviations used shall be in accordance with the requirements of ASME-Y14.38M or the U.S. Government Printing Office Style Manual. When abbreviations in the GPO Style Manual conflict with the ASME-Y14.38M, those in the latter shall prevail.

3.6.1.5 References. The text shall refer to the following:

- (a) Only models or types covered by the publication,
- (b) The basic number of Government specifications and standards.
- (c) Materiel, such as lubricants, cleaning fluids, etc., by Government specification number, when applicable.
- (d) Temperature readings as calibrated on the equipment with degrees Centigrade, Fahrenheit, or Kelvin, as applicable, to follow. General temperature references shall normally be given in degrees Fahrenheit.
- (e) Speed and distance readings as calibrated on the equipment with conversion to U.S. standards to follow in parenthesis if the metric system was used.
- (f) Measures in U.S. standard units, except for instances in which metric measurements are required.
- (g) Illustrations by figure number, including sheet number for multisheet illustrations. Illustrations shall be prepared in accordance with the requirements of MIL-STD-38784.
- (h) Index numbers appearing on illustrations as figure numbers and followed by the key number (for example, figure 3 key 5).
- (i) Tables by table number.
- (j) Other supporting paragraphs in the same publication by paragraph number, preferable with the word paragraph (for example, paragraph 3a(1)). In the procedures paragraphs may be referred to as (step 3a(1))
- (k) Other publications by publication numbers. Reference may only be made to publications included in the Marine Corps publications system.
- (l) Switch positions and panel markings exactly as marked on the equipment, such as ON or OFF position SWITCH S1.

3.7 Tables, Charts, Graphs. Any type of data which lends itself to tabular or graphic presentation may be so presented. Tables, charts, and graphs shall be designed so that they are easily understood.

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3.8 Arrangement and Titles. Major paragraphs, illustrations, and tables shall each have a brief title describing content or action portrayed.

3.8.1 Types of Paragraphs. Paragraphs are referred to as primary side heads, untitled paragraphs, and procedural steps.

3.8.1.1 Primary Side Heads. Primary side heads shall be run in with the text, shall appear in upper and lower case letters and shall be underlined.

3.8.1.2 Untitled Paragraphs. Untitled paragraphs are used when the text material cannot be divided into, or does not warrant the assignment of, subject headings.

3.8.1.3 Procedural Steps. Procedural steps are normally used to present step-by-step instructions, such as disassembly or alignment procedures. They may be divided into substeps.

3.8.2 Figure Titles. Illustrations shall be assigned figure titles. The title shall follow the figure number and normally be placed below the applicable illustration. Normally, figure titles should begin with an identifying name, for example, Fuel Indicator--Exploded View. (See figures 3 and 4).

3.8.3 Table Titles. Table titles shall follow the table numbers and shall be placed and centered above the applicable tables.

3.9 Warnings, Cautions, and Notes. 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, or NOTE, whichever applies, shall not be repeated above each paragraph. If it is necessary to precede a paragraph with both a warning and a note, or a caution and a note, etc., they shall appear in the sequence of their importance namely, warnings before either cautions or notes, and cautions before notes. Figure 4 illustrates styles. Such inserts in the text shall be short and concise and used only to emphasize highly important, critical instructions; etc:

WARNING

- AN OPERATING PROCEDURE, PRACTICE, ETC., WHICH, IF NOT CORRECTLY FOLLOWED, COULD RESULT IN PERSONAL INJURY OR LOSS OF LIFE. THIS PARAGRAPH SHALL BE TYPED IN UPPER CASE IN ITS ENTIRETY.

CAUTION

- An operating procedure, practice, etc., which, if not strictly observed, could result in damage to, or destruction of, equipment.

NOTE

- An operating procedure, condition, etc., which is essential enough to require highlighting.

3.9.1 Health, Hazards Precaution Data. When hazardous chemicals or adverse health factors in the environment or use of the equipment cannot be eliminated, appropriate precautionary requirements shall be included.

3.10 Numbering. All pages, paragraphs, illustrations and tables shall be numbered.

3.10.1 Numbering Pages. Pages shall be numbered as follows:

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(a) Pages of basic instruction-type technical publications. The pages of the basic publication shall be numbered consecutively in Arabic numerals, beginning with 1 (see Figures 3 through 9).

(b) The pages of enclosures prepared expressly for, and along with, the basic publication shall be numbered consecutively in Arabic numerals, beginning with 1 (see 3.4.4.6). Enclosures that constitute other previously published documents to be forwarded by the basic instruction-type technical publication shall bear their own numbers as printed.

(c) Pages of appendixes. The pages of each appendix shall be numbered in Arabic numerals preceded by the Capital letter of the appendix; for example, A-3 shall be the third page in appendix A, B-3 shall be the third page in appendix B, etc.

3.10.2 Numbering Paragraphs. Paragraphs shall be numbered as follows:

(a) Paragraphs shall be alternately numbered and lettered consecutively, as follows: 1, a, (1), (a), 1, a to the extent of their subdivisions. When a paragraph is subdivided, it must have at least two subdivisions.

(b) Paragraphs of enclosures prepared expressly for, and along with, the basic instruction-type technical publication shall be numbered and lettered in accordance with 3.11.2(a). Paragraphs of enclosures that constitute other previously published documents to be transmitted by the basic instruction-type technical publication shall bear their own numbers and letters, as printed.

3.10.3 Numbering Illustrations (figures) and Tables. Illustrations (figures) and tables shall be numbered as follows:

(a) Illustrations (figures.) and tables shall be numbered consecutively in Arabic numerals, beginning with 1. Illustrations and callouts in the illustrations will be referenced sequentially in the text.

(b) Illustrations (figures) and tables of enclosures prepared expressly for, and along with the basic instruction-type technical publication shall be numbered consecutively in Arabic numerals, beginning with 1. Illustrations (figures) and tables of enclosures that constitute other previously published documents to be forwarded by the basic instruction-type technical publication shall bear their own numbers as printed.

(c) Multiple-sheet illustrations (figures). Multiple-sheet illustrations (figures) shall be consecutively sheet numbered following the title, for example, Figure 2. Installing the Antenna, AS/TRC-0 (Sheet 1 of 3). Remaining sheets shall be numbered in consecutive order; etc: "(Sheet 2 of 3)" and "(Sheet 3 of 3)."

3.10.4 Paragraphs, Illustrations (figures) and Tables in Appendixes. Paragraphs, illustration's (figures), and tables of appendixes shall be numbered in Arabic numerals, preceded by the capital letters of the appendixes; for example, A-1 shall be the first paragraph in appendix A; figure B-2 shall be the second illustration in appendix B; table C-3 shall be the third table in appendix C, etc.

3.11.5 Callouts. Index numbers, reference designations, nomenclature, leader lines, legends (keys), procedures, etc, shall be used, when necessary, to identify significant features. Handwritten callouts shall not be used. Unless otherwise specified by the acquiring activity, type size shall be no smaller than 8-point and no larger than 10-point.

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Lettering shall be in upper case. Nomenclatures shall appear on illustrations only if it can be done without crowding or reducing type size so as to make reading difficult. (Diagram callouts shall be no smaller than 8-point.) Callouts shall be placed in the background areas of illustrations when practical.

3.11 Revisions. Only revisions are authorized to change I-type publications in the present USMC printing system. Minute changes (i.e. single PN, NSN, Cage changes, etc) should be held by the sponsor until a revision of the instruction is required to provide proper procedure. A revision means a modification of information in an existing instruction-type technical publication. All new information shall be in the form of a revision to the basic instruction-type technical publication and shall be prepared and issued when required by the procuring activity as follows:

(a) Regardless of the basic publication's category (NORMAL or URGENT), the category of a revision shall be the same as the original publication, unless the revision requires a specifically URGENT procedure.

(b) Distribution can be changed on a revision.

3.12 Foldout Pages and Illustrations (over one page in size). Foldout pages shall be used only when the material cannot be satisfactorily presented on a single page, a two-page spread, or a series of pages. Foldout pages shall be prepared only when approved by the acquiring activity. If approved; foldout pages may be prepared for 8-1/2 X 11 inch manuals. Maximum printable area shall not exceed 36 inches in width by 10 inches in height. All foldout pages shall be prepared for printing on one side only and full blank aprons shall be used. Foldout pages shall not be spliced. A manual or volume of a manual shall be so arranged that all foldout pages fall at the end of the chapter or document as specified. Such pages shall follow the last chapter, last appendix, or alphabetical index, whichever forms the last portion of the manual or volume. The figure numbers for foldouts shall be: FO-1, FO-2, etc., and shall be placed preceding the figure title under the illustration. Foldout pages shall be assigned page numbers FP-1/(FP-2 blank), FP-3/(FP-4 blank), etc. When a foldout consists of several sheets, the sheets shall be numbered in consecutive order following the figure title. Each sheet shall be assigned a page number. The figure number for a foldout page shall be so placed (lower-outer corner) that the number will be visible when the printed page is folded. Foldout-foldup pages are not permitted.

3.13 Illustrations (over one page in size). When an illustration will exceed one page, unless the usefulness of an illustration will be adversely affected, the illustration shall be divided and planned for presentation on facing pages and numbered figure FO-1, Sheet 1 and FO-1 Sheet 2. Sheets 3, etc., can be planned for succeeding pages when required, if this treatment will not affect the usefulness of the manual.

4. VERIFICATION

4.1 Manuscript Inspection. Manuscript inspection shall be performed on one manuscript copy when a first manuscript review is required. (see 3.2).

4.2 Conformance Inspection. Conformance inspection shall be made to ensure the publication meets all specifications in MIL-DTL-28999C(MC).

4.3 Examination. Each publication shall be examined for compliance with the requirements specified in MIL-DTL-28999C(MC). Any reformatting or modification of the publication to comply with specified requirements, or any necessary reformatting or modification following failure to meet the specified requirements shall receive particular attention for adequacy and

MIL-DTL-28999C(MC)

suitability. This element of inspection shall encompass all visual examinations and format standards. Noncompliance with any specified requirements or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.4 Classification of Inspections. The inspection requirements specified herein are classified as follows:

- (a) Contractor Inspection (see 4.5).
- (b) Contractor facilities (see 4.6).
- (c) Government Inspection (see 4.7)

4.5 Contractor Inspections. Unless otherwise specified in the contract or Purchase order, the contractor is responsible for the performance of all inspection requirements as specified herein.

4.6 Contractor Facilities. Except as otherwise specified in the contract purchase order, the contractor may use his own or any other facilities suitable for the performance of the inspection requirements specified herein, unless disapproved by the Government.

4.7 Government Inspections. The Government reserves the right to perform any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.8 Methods of Inspection. Inspection of the publication shall be done in accordance with section 3.

4.8.1 Format. The format shall be in accordance with paragraph 3.2.

4.8.2 Artwork. All artwork shall be in accordance with paragraph 3.3.

4.8.3 Reproducible (camera-ready) copy. A reproducible camera-ready copy shall be provided and be in accordance with paragraph 3.4.

4.8.4 Format and Elements. Format and elements shall be on accordance with paragraph 3.5.

4.9 Compliance. All items must meet all requirements of section 3. The inspection set forth in this specification shall become a part of the contractors overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of assuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling in quality conformance does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to acceptance of defective material

4.10 Validation. Modification, installation, test, or other procedures to which the instruction-type technical publication pertains shall be validated by a Government or contractor technician who represents the level of maintenance authorized by the publication to perform said procedures (see 3.6.7.14). The validation shall be certified in writing and submitted to the government with the completed package.

4.11 Review and Verification. The review and verification of technical publications shall be accomplished by the acquiring activity.

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5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order. When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department of Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity.

6. NOTES

6.1 Intended Use. MI's, TI's, SI's, and LI's prepared in accordance with the general style and format requirements specified herein in accordance with MCO P5215.17, are intended for use in the operation and maintenance of equipment/weapons systems that are in military service as follows.

6.1.1 MI. An MI gives instructions for uniformly modifying equipment/weapons systems to correct deficiencies in design and to add tactical and technical advantages. An MI's importance in materiel management requires that it be recorded and reported by the serial number of the equipment/weapons system to which it pertains, if possible. Modification instructions shall identify the approved Engineering Change Proposal (ECP) from which they were developed. This ensures traceability to and correction of the associated engineering package. If no approved ECP applies, provide information from what source modification is derived (i.e. Beneficial Suggestion, PQDR, contractor, etc.) per the reference. An MI includes any instruction that meets the following criteria: (see Figures 1 through 8).

(a) Urgency.

(b) Indispensability to an item or to a system's operation or effectiveness.

(c) Inclusion of guidance on the use of kits or parts which the Marine Corps manages.

6.1.2 TI. A TI disseminates the following: (see Figures 9 and 10).

(a) Professional techniques and maintenance procedures to be applied by designated personnel.

(b) Interim or supplementary technical information that later will be incorporated into a permanent technical manual or other document.

(c) Precautions concerning anticipated or developing technical problems and the instructions to be published to correct them.

(d) Informational technical details (primarily concerning equipment maintenance) that can be more suitably disseminated by an instruction-type technical publication than by another type of publication or document. For example, details on forms to use, special safety measures, serviceability standards, etc.

(e) Testing and inspection procedures.

NOTE: A TI usually does not require the use of parts, special tools, or kits, other than test kits.

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6.1.3 SI. An SI disseminates the following (see Figures 12).

(a) Supply information on equipment acquisition, regulation, and availability. It explains technical aspects of supply matters, but does not provide administrative instructions.

(b) Directs and provides instructions for reporting equipment conditions, testing equipment, or requisitioning or disposing of equipment.

6.1.4 LI. An LI disseminates the following: (see Figure 13).

(a) Directs and provides instructions for lubrication of equipment.

(b) Types of lubricant used on equipment.

(c) Location of lube points on equipment.

(d) Lubrication intervals for equipment.

6.2 Ordering Data. Acquisition documents should specify the following:

(a) Title, number, and date of this specification.

(b) Type of instruction to be furnished (MI, TI, SI, LI) (see 6.1.1, 6.1.2, 6.1.3, and 6.1.4).

(c) Form in which material is to be furnished (see 3.1).

(d) Quantity of manuscript copy required (see 3.2).

(e) When material shall be packaged other than as specified in 5.1.

NOTE: The following I type instructions (Figures 1 through 13) are for examples only and not to be used as actual instructions.

6.3 Subject term (key word) listing.

Format Procedures, I-TYPE, USMC
I-TYPE Publications, USMC
Lubrication Instruction, USMC
Modification Instruction, USMC
Supply Instruction, USMC
Technical Instruction, USMC

Preparing activity:
Navy - MC
Project No. TMSS-N238-001

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS, UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-1775

NORMAL

MI 0000-00/00
28 April 2000

U. S. MARINE CORPS MODIFICATION INSTRUCTION

Figure 1. Sample of Form USMC I-Type Publication Cover Grid Sheet.

MIL-DTL-28999C(MC)



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HEADQUARTERS, UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-1775

NORMAL

MI 0000-00/00
28 April 00

U. S. MARINE CORPS MODIFICATION INSTRUCTION

TITLE

Encl: (1)

Appendix: A

1. Purpose.2. Cancellation.3. Applicability.4. Time Compliance Period.5. Information.6. Technical Manuals Affected.7. Major Items AffectedDescriptionNSNTAM No.I.D. No.

PCN 00 000000 00

Figure 2. Sample of Typing Guide for Marine Corps I-Type Publication

MIL-DTL-28999C(MC)

MI 0000-00/00

8. Components Affected

<u>Description</u>	<u>NSN</u>	<u>PN</u>
--------------------	------------	-----------

9 Materiel Affected**a.. Materiel Required**

<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
--------------------	------------	-----------	-------------

b. Materiel Discarded. Dispose of discarded materiel in accordance with current Marine Corps directives.

<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
--------------------	------------	-----------	-------------

c. Materiel Retained

<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
--------------------	------------	-----------	-------------

10. Special Tools, Jigs, and Fixtures Required.**11. Special Tools**

<u>Description</u>	<u>NSN</u>	<u>PN</u>
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Figure 2. Sample of Typing Guide for Marine Corps I-Type Publication - Continued

MIL-DTL-28999C(MC)

MI 0000-00/00

12. Jigs and Fixtures

<u>Description</u>	<u>NSN</u>	<u>PN</u>
--------------------	------------	-----------

13. Special Instructions.**14. Supply Action.****15. Skill and Time Required.**

16. Procedures. Use the following format for numbers assigned to sub paragraphs: (See paragraph 3.11.2, MIL-P-28999C(MC).

a. If a. item must have b..

b. Subparagraph of small letter is number in parenthesis.

(1) If (1) item must have (2).

(2) Subparagraph of number in parenthesis is letter in parenthesis.

(a) If (a) item must have (b).

(b)

1

2

Figure 2. Sample of Typing Guide for Marine Corps I-Type Publication - Continued

MIL-DTL-28999C(MC)

MI 0000-00/00

17. Recording the Instruction. Ensure that appropriate records are updated in accordance with the current edition of TM 4700-15/1 or as set forth in the instruction.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
Director, Technical Data Management Division
Marine Corps Logistics Bases
Albany, Georgia

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Figure 2. Sample of Typing Guide for Marine Corps I-Type Publication - Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
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WASHINGTON, DC 20380-1775

NORMAL

MI 08594A-35/15
31 May 2000

U.S. MARINE CORPS MODIFICATION INSTRUCTION

INSTALL NEAR VERTICAL INCIDENT SKYWAVE ANTENNA
ON LIGHT ARMORED VEHICLE-25MM

1. **Purpose.** To provide instructions to install the Near Vertical Incident Skywave (NVIS) antenna on Light Armored Vehicle-25MM (LAV-25) variant.
2. **Information.** Installation of the NVIS antenna will improve High Frequency (HF) durability and may provide improved LAV-25 HF communications. Approved Engineering Change Proposal number LAV-M-9908 applies.
3. **Technical Manuals Affected.** TM 08594A-10/2A, TM 08594A-20, TM 08594A-34, SL-4-08594A, and RS 08594A-50.

4. **Major Item Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
LIGHT ARMORED VEHICLE, LAV-25	2320-01-123-1602	E09477M	08594A

5. **Materiel Affected**

a. **Materiel Required**

<u>Item</u>	<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
(1)	BASE, Antenna		93010H0000 (01365)	1
(2)	ANTENNA ELEMENT	5985-00-733-6042	120-20M	1
(3)	ANTENNA ELEMENT	5985-00-733-6043	120-2M	1

PCN 160 085941 00

1

Figure 3. Sample MI (includes step-by-step procedures).

Figure 4. Typical MI with Sample Bulk and Consumable Materiel/Warnings, cautions and notes paragraph

MIL-DTL-28999C(MC)

MI 08594A-35/15

<u>Item</u>	<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
(4)	ANTENNA ELEMENT	5985-00-733-644	120-34M	1
(5)	ANTENNA ELEMENT	5985-00-733-6045	120-8M	1
(6)	NUT, Hex, 2 ...-inch dia.		93010H0004 (01365)	1
(7)	WASHER, Lock, Int Tooth		93010H0003 (01365)	1
(8)	WHIP END PROTECTOR		4291 (01365)	1
(9)	HOLD DOWN CLIP		4277M (80063)	1

b. Bulk and Consumable Materiel

<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
ANTISEIZE COMPOUND	8030-00-292-1102	MIL-T-22361	AR
SEALING COMPOUND	8030-00-753-5005	AMS-S-8802CLB-2	AR

6. Skill and Time Required. One Ground Radio Repairer, (MOS-2841) or Radio Technician (MOS-2861), 2.0 hours.

WARNING

MASTER SWITCH SHALL BE IN OFF POSITION AND REMOVE ALL CONDUCTIVE MATERIEL FROM PERSON.

BEWARE OF OVERHEAD POWER LINES. DEATH OR INJURY TO PERSONNEL AND EQUIPMENT DAMAGE MAY RESULT IF HF ANTENNA COMES INTO CONTACT WITH POWER LINES. RADIATING ANTENNAS PRODUCE HIGH LEVELS OF RF RADIATION. CONTACT OR FAILURE TO MAINTAIN A MINIMUM DISTANCE OF ONE METER MAY RESULT IN INJURY OR DEATH.

STRICT COMPLIANCE TO RESTRICTIONS PROVIDED BY THE FOLLOWING ORDER AND INSTRUCTIONS MUST BE OBSERVED WHEN REMOVING OR APPLYING CHEMICAL COATINGS CHEMICAL AGENT RESISTANT COATING (CARC) IN THE PREPARATION AND PROTECTION OF

2

Figure 3. Sample MI (includes step-by-step procedures).

Figure 4. Typical MI with Sample Bulk and Consumable Materiel/Warnings, cautions and notes paragraph

Continued

MIL-DTL-28999C(MC)

MI 08594A-35/15

ELECTROMAGNETIC ENVIRONMENTAL EFFECTS (E³) BONDING SURFACES.

OPNAVINST	5100.1 9C Vol. III	(As Amended/Revised)
MCO	P5090.2	(As Amended/Revised)
TM	4750-15/1	(As Amended/Revised)

NOTE

Check modification kit to ensure completeness. To ensure minimal vehicle downtime, review entire procedure before starting modification. Identify all parts, wiring connections, and tools required. Electromagnetic Environmental Effects (E³) bonding procedures will be used in all instances where metal will be attached to metal. Mating surfaces shall be sanded or ground to bare metal and coated with Antiseize Compound (NSN 8030-00-292-1102). The threads of all bolts and nuts shall be coated with antiseize compound. Refer to TI 5820-25/22A for similar procedures.

7. Modification Procedures. NVIS antenna base installation. See figure 1.

- a. Grind external mounting surface area of the hull to bare metal and apply antiseize compound to area.
- b. Position Antenna Base (1) on hull noting proper orientation of antenna pivot. (Front to back with the canting pull pin facing outward).
- c. Using a 2 3/8-inch deep well socket, and socket wrench, install antenna base to vehicle hull with 2 3/8-inch nut
- d. Do not install the rubber gasket provided.
- e. Apply Sealing Compound (NSN 8030-00-753-5005) to antenna base in accordance with local directives.
- f. Install Antenna Whip Elements (2, 3, 4, and 5) onto the Antenna Base (1).
- g. From inside vehicle, install HF radio frequency cable to antenna base.
- h. Turn master switch on.
- i. Perform operational check of HF radio.
- j. Shut master switch off.

Figure 3. Sample MI (includes step-by-step procedures).

Figure 4. Typical MI with Sample Bulk and Consumable Materiel/Warnings, cautions and notes paragraph

Continued

MIL-DTL-28999C(MC)

MI 08594A-35/15

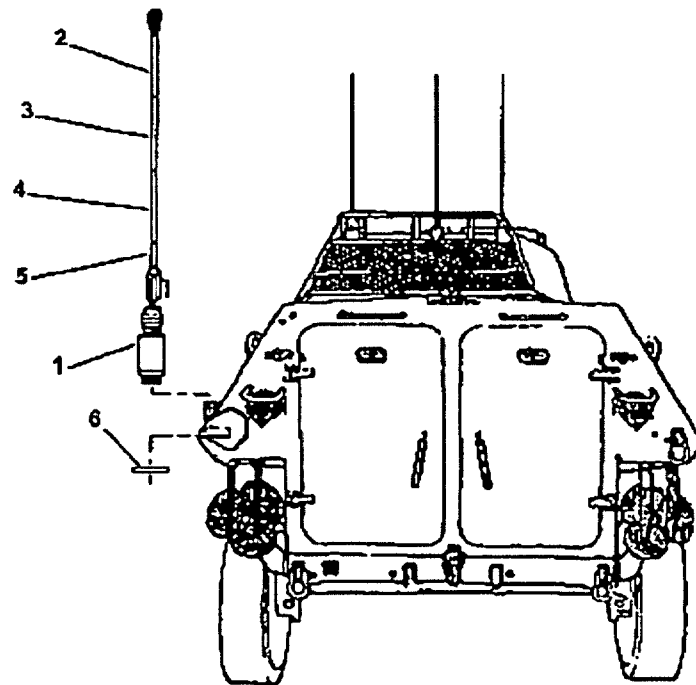


Figure 1. LAV-25 NVIS INSTALLATION.

8. Recording the Modification. Ensure that appropriate records are updated in accordance with the current edition of TM 4700-15/I or as specifically set forth in the MI.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
Director, Technical Data Management Division
Marine Corps Logistics Bases
Albany, Georgia

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4/(5 blank)

Figure 3. Sample MI (includes step-by-step procedures).

Figure 4. Typical MI with Sample Bulk and Consumable Materiel/Warnings, cautions and notes paragraph

Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS, UNITED STATES MARINE CORPS
WASHINGTON, DC 203 80-1775

NORMAL

MI 8400-45/24A
30 June 2000

U.S. MARINE CORPS MODIFICATION INSTRUCTION

INSTALLATION OF NIEHOFF MODEL N7359-1 ALTERNATOR,
UPGRADE KIT ON THE LIGHT ARMORED VEHICLE

1. **Purpose.** To provide instructions to upgrade original alternator assembly in the Light Armored Vehicle (LAV).
2. **Cancellation.** MI 8400-45/24.
3. **Applicability.** This Modification Instruction (MI) applies to all variants except the Light Armored Vehicle Air-Defense (LAV-AD) and the Mobile Electronic Warfare Support System (ME WSS), AN/MLQ-36.
4. **Information.** This MI provides instructions for installation of the Alternator, Upgrade Kit Model N7359-1 on the LAV Family of Vehicles (FOV). The upgrade kit will provide over voltage protection for the electrical system, and temperature compensated voltage regulation to charge the batteries at different voltage dependent of temperature. This MI does not apply to the Light Armored Vehicle (LAV) Air-Defense or the Mobile Electronic Warfare Support System (ME WSS), AN/MLQ-36. Engineering Change Proposal (ECP), LAV-M-9907 applies for this modification.
5. **Technical Manual Affected.** TM 08594A-34&P/1.
6. **Major Items Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
LIGHT ARMORED VEHICLE, Anti-Tank (LAV-AT)	2320-01-123-1609	E0942	08652A
LIGHT ARMORED VEHICLE, Command and Control (LAV-C2)	2320-01-123-1606	E0946	08650A

PCN 161 969823 00

Figure 5. Sample of Applicability Paragraph

MIL-DTL-28999C(MC)



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HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380.0001

NORMAL

MI-07769A-45/3
6 Sep 1988

U.S. MARINE CORPS MODIFICATION INSTRUCTION

INSTALLATION OF HARDWARE ADAPTER KIT FOR VIEWER, NIGHT VISION ON RECOVERY VEHICLE, FULL-TRACKED, MEDIUM, M88A1

1. **Purpose.** To provide instructions to install a hardware adapter kit for the viewer, night vision on Recovery Vehicle, Full-Track, Medium, M88A1.
2. **Time Compliance Period.** Action required by this Modification Instruction (MI) shall be completed within 6 months from the date of this instruction and/or prior to shipment of this equipment.
3. **Information.** The application of this MI for installing the Night Vision Viewer, AN/VVS-2(V)1A provides the M88A1 with a passive night sight capability.
4. **Technical Manuals Affected.** TM 9-2350-256-10, TM 9-2350-256-20, TM 9-2350-256-20P, and TM 9-2350-256-34P/1.

5. Major Item Affected

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
RECOVERY VEHICLE, Full-Track, Medium, M88A1	2350-00-122-6826	E1377	07769A

6. Component Affected

<u>Description</u>	<u>NSN</u>
DOOR, Hatch, Vehicle	2510-00-080-7551

PCN 160 977077 00

FIGURE 6. Sample of Time Compliance Period Paragraph

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380-0001

NORMAL

MI 077228-50/15
3 Aug 1988

U. S. MARINE CORPS MODIFICATION INSTRUCTION

MODIFICATION OF MISSILE GUIDANCE SET AN/TSQ-136
NSN 1430-01-143-9408, BITE CIRCUIT CARD A6
NSN 1440-01-109-9374 (TOW 2 WEAPON SYSTEM)

Encl: (1) Department of the Army MWO 9-1430-450-50-005 of 1 Dec 1986

1. **Purpose.** Modification of the Bite Circuit Card A6 by replacing Transistor Q1 and Resistor R1. This modification will improve the power dissipation capabilities of both devices.
2. **Information.** This MI is for record purposes only. Application of this modification to the Guided Missile, Surface Attack will be accomplished by Depot-Level Personnel directed by the Deputy Commanding General (CB), Marine Corps. Research, Development and Acquisition Command, Quantico, Virginia 22134-5080, and controlled by the Marine Corps Missile Systems Modification Officer, AMSMI-SSS-MCL, U. S. Army Missile Command, Redstone Arsenal, Alabama.

3. **Major Item Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
MISSILE GUIDANCE SET	1430-01-143-9408	N/A	85578C

4. **Instructions.** Procedures and instructions contained in the enclosure are valid. Dispose of discarded materiel in accordance with current Marine Corps directives.

5. **Recording and Reporting the Modification.**

- a. Ensure that appropriate records are updated in accordance with the current edition of TM 4700-15/I or as specifically set forth in the MI.

PCN 160 977042 00

FIGURE 7. Sample Record Purpose Only Publication

MIL-DTL-28999C(MC)

MI-077228-50/15

b. Completion of DA Form 2407 (Maintenance Request) is required. Distribution of copies will be in accordance with the enclosure, paragraph 14, except that the NMP copy (copy 2) should be forwarded to: Commander, U. S. Army Missile Command, ATTN: AMSMI-SSS/MCL, Redstone Arsenal, Alabama 35898 5238. Additional DD Form 2407 s are available through that office.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
Colonel, US. Marine -Corps
Deputy Commander
Marine Corps Logistics Base
Albany, Georgia 31704 5000

DISTRIBUTION: PCN 160 977042 00

FIGURE 7. Sample Record Purpose Only Publication - Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS, UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-1775

NORMAL

MI 08953A-35/27
31 July 2000

U.S. MARINE CORPS MODIFICATION INSTRUCTION

INSTALLATION INSTRUCTIONS FOR
INTERCOMMUNICATION SET, VEHICULAR AN/VIC-3(V)1
IN TANK, COMBAT, FULL-TRACKED, M1A1

Encl: (1) Department of the Army TB 11-5830-263-20-1, of 1 June 2000.

1. **Purpose.** To authorize modification of the M1A1, 120MM, Combat Tank in accordance with the instructions contained in the enclosure.
2. **Time Compliance Period.** This Modification Instruction (MI) must be completed upon receipt of the modification kit and no later than 3 years from the MI date for the Maritime Preposition Ship (MPS) effort.
3. **Information.** The application of this MI is to install the Intercommunication Set, Vehicular AN/VIC-3(V)1 in the M1A1, 120MM, Combat Tank. The AN/VIC-3(V)1 or Vehicular Intercommunication Set (VIS) is an intercommunication and radio-control system designed for ground mobile combat vehicles. Digital audio enhances speech quality and intelligibility. Headsets that incorporate Active Noise Reduction (ANR) circuitry increase the effectiveness of vehicle communications. They also offer increased hearing protection in the noisy environment of combat vehicles.
4. **Technical Manuals Affected.** TM 08953A-34/5-1, TM 08953A-34/5-2, TM 08953A-34/6-1, and TM 08953A-34P/8.

5. **Major Item Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
TANK, Combat, Full-Track 120MM Gun, M1A1	2350-01-087-1095	E1888	08953A

PCN 160 089534 00

FIGURE 8. Sample of Special Tool/Supply Action paragraph

MIL-DTL-28999C(MC)

MI 08953A-35/27

6. Special Tools

<u>Description</u>	<u>NSN</u>	<u>P/N</u>
ADJUSTER, Frequency	3460-01-456-7654	65434-886

7. Skill and Time Required. One Main Battle Tank Repairer/Technician (MOS 2146), 4.0 hours. One Ground Radio Repairer/Technician (MOS 2841) 4.0 hours.

MI 08953A-35/27

8. Supply Action. This modification kit will be force fed to units by MARCORSYSCOM-(CBG).

9. Procedures. The procedures in the enclosure are valid except for the following. For the Marine Corps installation, disregard the echelon of maintenance shown in paragraph 1.1 (Scope). This modification will be installed at the third through fifth echelon.

10. Recording the Modification. Ensure that appropriate records are updated in accordance with the current edition of TM 4700-15/I or as specifically set forth in the MI.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
 Director, Technical Data Management Division
 Marine Corps Logistics Bases
 Albany, Georgia

DISTRIBUTION: PCN 160 089534 00

FIGURE 8. Sample of Special Tool/Supply Action paragraph Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380-0001

NORMAL

TI 08198A-25/4A

14 Mar 1989

 U.S. MARINE CORPS TECHNICAL INSTRUCTION

 NEW NARROW RADIAL TIRE FOR HOWITZER,
MEDIUM, TOWED; 155MM, M198

1. **Purpose.** To provide instructions for utilization of the new Narrow Radial Tire for the M198 Howitzer.
2. **Cancellation.** TI 08198A-25/4.
3. **Information.** Reports on the existing narrow bias ply tire concerning side wall blowouts, thread chunking, and the concern about axle weight versus tire load rating indicate a new tire is required. The new radial ply tire will run cooler and be rated for a higher load which will eliminate the current problems. The new tire will mount on the current rim.
4. **Technical Manuals Affected.** TM 9-1025-10, TM 9-1025-211-20&P, and TM 9-1025-211-34P.
5. **Major Item Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
HOWITZER, Medium, Towed, 155mm, M198	1025-01-026-6648	E0665	08198A

6. **Components Affected**

<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
TIRE, Pneumatic	2610-00-204-4029	12009208	2
FLAP, Inner Tube	2640-00-158-5617	12009209	2
INNER TUBE, Pneumatic	2610-00-260-7345	12009210	2

PCN 166 920121 00

FIGURE 9. Sample of Typical TI

MIL-DTL-28999C(MC)

TI-08198A-25/4A

7. Materiel Required

<u>Description</u>	<u>NSN</u>	<u>PN</u>	<u>Qty.</u>
TIRE, Pneumatic, Radial Ply w/Flap	2610-01-287-6409	12009347	2
FLAP, Inner Tube	2640-00-158-5617	20R	2
INNER TUBE, Pneumatic	2610-01-287-6410	12009348	2

8. Special Instructions

a. The radial ply tires and the bias ply tires should never be mismatched. The M198 will have two radial ply tires, or two bias ply tires. There should never be one radial ply and a bias ply tire mounted on a M198.

b. Insure that the radial ply tires remain constant where originally installed. If originally installed on the left side it must remain on the left side.

9. **Towing Restriction.** Towing restrictions are limited to 15 mph maximum over cross-country roads, 30 mph maximum over secondary roads, and 45 mph maximum over improved roads.

10. Skill and Time Required

a. Organization Automotive Mechanic (MOS 3521), .5 hour.

b. Field Artillery Cannoneer (MOS 0811), 1.5 hours.

11. **Action.** Assembly/disassembly of the narrow wheel and tire is performed in accordance with TM 9-2610-200-20. The following instructions will be used in conjunction with TM 9-2610-200-20.

a. During initial assembly, position the split ring approximately 180 degrees away from the valve stem, and be sure the ring is properly seated prior to and after inflation as evidenced by a 1/16 to 1/4-inch gap between the ends of the split ring.

CAUTION

Side and lock rings of different rim types are
not interchangeable or authorized.

b. After assembly, tires shall be inflated only when contained by an approved restraining device such as a safety cage or safety straps. Inflate tires to cold inflation pressure of 110 pounds per square inch (psi) with rings and valve stem pointing away from all personnel. Visual check for proper seating of split ring.

FIGURE 9. Sample of Typical TI. - Continued

MIL-DTL-28999C(MC)

TI-08198A-25/4A

- c. Deflate tire completely, check for proper seating of split ring; if properly seated, reinflate tire to 110 psi.
- d. Wheel must be mounted on hub with split ring and valve stem facing outward to prevent interference with the brake assembly.
- e. Torque lug nuts 450 to 500 foot-pounds. Do not over torque.
- f. The wheel and tire assemblies are most expeditiously, safely, and effectively mounted/dismounted with the Howitzer in the towing configuration; hand brakes applied, trails spread, firing base plate in place and wheels raised to full up position.

12. **Recording the Modification.** Ensure that appropriate records are updated in accordance with the current edition of TM 4700-15/I or as specifically set forth in the TI.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
Executive Director for
Logistics Operations
Marine Corps Logistics Base
Albany, Georgia 31704-5000

DISTRIBUTION: PCN 166 920121 00

FIGURE 9. Sample of Typical TI. - Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380

NORMAL

TI 4700
10 Aug 1985

U. S. MARINE CORPS TECHNICAL INSTRUCTION

TEMPORARY TECHNICAL INFORMATION
MARINE CORPS EQUIPMENT

- Encl: (1) Communications-Electronics Equipment
(2) Engineer Equipment
(3) Weapons and Ordnance Equipment
(4) Motor Transport Equipment
(5) Test and Calibration Equipment
(6) Maintenance Management Information

1. **Purpose.** To disseminate temporary information on Marine Corps equipment.
2. **Instructions.** Enclosures (1) through (6) provide temporary instructions for using unit action. These instructions shall be used until incorporated into the applicable technical publications.

PCN 168 000000 00

FIGURE 10. Sample of Temporary TI.

MIL-DTL-28999C(MC)

TI 4700

3. Self-Cancellation. 01 Sep 1985.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
Colonel, U.S. Marine Corps
Deputy Commander
Marine Corps Logistics Base
Albany, Georgia 31704 5000

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FIGURE 10. Sample of Temporary TI. - Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380-0001

NORMAL

SI 08993A-15/1
26 Nov 1986

U.S. MARINE CORPS SUPPLY INSTRUCTION

WARRANTY PROCEDURES FOR PISTOL, SEMIAUTOMATIC, 9MM, M9

- Appendix:
- A. List of Technical Manuals
 - B. Inspection Tags
 - C. List of Government. Forms

1. **Purpose.** To provide instructions detailing the securing of warranty services and/or repair parts on the 9mm pistol procured for the Marine Corps from Beretta, Italy, under the Department of the Army Contract Numbers DAAA09-85-C-0275.

2. **Information.** Certain procedures must be followed by the user to insure that the warranty claim system agreed upon between the Government and Beretta Corporation will function as intended. This Supply Instruction (SI) is intended to clarify the warranty procedures and method of processing warranty claims for services and/or repair parts.

3. Major Item Affected

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
PISTOL, Semiautomatic 9mm, M9	1005-01-118-2640	E1250	08993A

4. Action

a. Warranty Claims. All warranty claims will be processed through the Force Service Support Group (FSSG) maintenance channels. MCO 4400.32E applies.

b. Force/Brigade Service Support Group. To the maximum extent possible, a Warranty Coordinator (We) should be established as a single point of contact for an installation or predetermined Command/geographical area. The number of personnel/units contacting the Warranty Administrator (WA), Commanding General (Code 833-2), Marine Corps Logistics Bases (MCLB), Albany, GA, must be kept to a minimum to preclude

PCN 163 874289 00

FIGURE 11. Sample Format for Appendix Lines

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS UNITED STATES MARINE CORPS
WASHINGTON, D.C. 20380 0001

NORMAL

SI 04707C-25/1
24 Mar 1988

U. S. MARINE CORPS SUPPLY INSTRUCTION

REPLACEMENT AND EVACUATION PROGRAM
FOR HOWITZER, HEAVY, SELF-PROPELLED, 8-INCH, M1102

1. **Purpose.** To provide instructions for the Replacement and Evacuation (R&E) Program on the Howitzer, Heavy Self-Propelled, 8-Inch, M110A2.

2. **Information.** To enhance operational readiness and reduce rebuild cost of sighting and fire control equipment. Items listed in paragraph 4a will not be returned with the M110A2 Self-Propelled Howitzer during the R&E Program.

3. **Major Item Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
HOWITZER, Heavy, Self-Propelled 8-Inch, M110A2	2350-01-041-4590	E0692	04707C

4. **Action**

a. **Using Units.** During R&E, in addition to collateral materiel listed in current SL-3, the following items will be retained for installation on replacement vehicles:

<u>Description</u>	<u>NSN</u>
*CANNON, M201E1 C/O	
FIRING MECHANISM ASSEMBLY	1025-00-895-9182
CANNON ASSEMBLY	1025-01-012-1062
SPACER, Ring	5365-01-050-7210
BRAKE, Muzzle	1025-01-227-5545

PCN 163 625430 00

FIGURE 12. Sample of Typical SI

MIL-DTL-28999C(MC)

SI 04707C-25/1

<u>Description</u>	<u>NSN</u>
*PERISCOPE, C/O	6650-00-704-3549
TELESCOPE, Elbow M139	1240-00-328-5631
TELESCOPE, Panoramic M115	1240-00-895-9186
MOUNT, Telescope M137	1240-00-895-6492
MOUNT, Telescope M138	1240-00-896-2240
QUADRANT, Fire Control, M15	1290-00-896-2236

b. The above items with the exception of those annotated by an asterisk (*) are supported by the Maintenance Float and replaced by Force Service Support Groups submission of a Recoverable Item Report (WIR).

c. Depot Maintenance Activities (DMA s) , Albany/Barstow. Vehicles received under the R&E Program for rebuild will not have the items listed in paragraph 4 a on them and will be returned to Materiel Division without the items.

d. Materiel Division s Albany/Barstow. End item will be issued without items listed in paragraph 4a during the R&E Program.

5. Clarification/Inquiries on Procedures. Address inquiries regarding this Supply Instruction to the Commanding General (Code 833-1) Marine Corps Logistic Base, Albany, GA 31704-5000.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

OFFICIAL

I. M. Marine
Colonel, U.S. Marine Corps
Deputy Commander
Marine Corps Logistics Base
Albany, Georgia 31704-5000

DISTRIBUTION: PCN 163 625430 00

FIGURE 12. Sample of Typical SI - Continued

MIL-DTL-28999C(MC)



DEPARTMENT OF THE NAVY
HEADQUARTERS, UNITED STATES MARINE CORPS
WASHINGTON, DC 20380-1775

NORMAL

LI 08594A-12/2B
30 June 2000

 U.S. MARINE CORPS LUBRICATION INSTRUCTION

 LUBRICATING INSTRUCTIONS AND PROCEDURES FOR
LIGHT ARMORED VEHICLE, 25MM

1. **Purpose.** To provide lubrication instructions and procedures for the Light Armored Vehicle, 25MM (LAV-25).

NOTE

A copy of this Lubrication Instruction will remain with the equipment at all times. Instructions contained herein are mandatory.

2. **Cancellation.** LI 08594A-12/2A.

3. **Major Item Affected**

<u>Description</u>	<u>NSN</u>	<u>TAM No.</u>	<u>I.D. No.</u>
LIGHT ARMORED VEHICLE, 25MM, LAV-25	2320-01-123-1602	E09477M	08594A

4. **Bulk and Consumable Materiel.** Use appropriate NSN for quantity needed or commercial equivalent.

<u>Description</u>	<u>NSN</u>	<u>MIL-STD</u>	<u>Qty.</u>
GREASE, Automotive and Artillery, GAA		MIL-G-10924	
2-1/4 oz.	9150-01-197-7688		AR
14 oz.	9150-01-197-7693		AR
1.75-lb	9150-01-197-7690		AR
6.5-lb	9150-01-197-7689		AR
35-lb	9150-01-197-7692		AR
120-lb	9150-01-197-7691		AR

PCN 157 085942 00

FIGURE 13. Sample of Typical LI

MIL-DTL-28999C(MC)

LI 08594A-12/2B

<u>Description</u>	<u>NSN</u>	<u>MIL-STD</u>	<u>Qty.</u>
LUBRICATING OIL, Internal Combustion Engine, Tactical Service, OE/HDO 15/40, (SAE 15W-40)		MIL-L-2104	
1 Qt	9150-01-178-4725		AR
5-Gal	9150-01-152-4118		AR
55-Gal	9150-01-152-4119		AR
LUBRICATING OIL, Internal Combustion Engine, Tactical Service, OE/HDO 10, (SAE 10W)		MIL-L-2104	
1-QT	9150-01-177-3988		AR
5-Gal	9150-00-186-6668		AR
55-Gal	9150-00-191-2772		AR
LUBRICATING OIL, Internal Combustion Engine, Tactical Service, OEA, (SAE 0W-20)		MIL-L-46167	
1-Qt	9150-00-402-4478		AR
5-Gal	9150-00-402-2372		AR
55-Gal	9150-00-491-7197		AR
LUBRICATING OIL, Gear, Multipurpose, GO-80-90 (SAE 80W-90)		MIL-L-2105	
1-Qt	9150-01-035-5392		AR
5-Gal	9150-01-035-5393		AR
55-Gal	9150-01-035-5394		AR
LUBRICATING OIL, Gear, Multipurpose, GO-75 (SAE 75W)		MIL-L-2105	
1-Qt	9150-01-035-5390		AR
5-Gal	9150-01-048-4593		AR
55-Gal	9150-01-035-5391		AR

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

<u>Description</u>	<u>NSN</u>	<u>MIL-STD</u>	<u>Qty.</u>
HYDRAULIC FLUID, Rust Inhibited, Fire Resistant, Synthetic Hydrocarbon Base, FRH (yellow)		MIL-H-46170	
1-Pt	9150-01-337-7819		AR
1-Qt	9150-00-111-6256		AR
1-Gal	9150-00-111-6254		AR
5-Gal	9150-00-111-6255		AR
55-Gal	9150-01-158-0462		AR
BRAKE FLUID, Silicone, Automotive, All Weather, Operational and Preservative, Metric, BFS		MIL-H-46176	
1-Gal	9150-01-102-9455		AR
5-Gal	9150-01-123-3152		AR
55-Gal	9150-01-072-8379		AR

5. Action. Refer to TM 08594A-10/2 and TM 08594A-20/4.

a. Lubrication Intervals. Intervals are based on normal operation. Change the time interval if your lubricants are contaminated or if you are operating the equipment under adverse conditions, including longer-than-usual operating hours. The time interval may be extended during periods of low activity. If extended, adequate preservation precautions must be taken.

b. Level of Maintenance. The lowest level of maintenance authorized to lubricate a point is indicated by one of the following symbols as appropriate: Operator/Crew (C) and Organizational Maintenance (O).

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

WARNING

CLEANING SOLVENT IS FLAMMABLE. DO NOT USE NEAR A FLAME OR EXCESSIVE HEAT. DO NOT SMOKE. USE ONLY WITH ADEQUATE VENTILATION. AVOID PROLONGED BREATHING OF VAPORS AND MINIMIZE SKIN CONTACT.

c. Clean fittings before lubricating. Clean parts with cleaning solvent, P-D-680, Type II (SD-2) or equivalent. Dotted arrows indicate lubrication on both sides of equipment.

NOTE

Where Daily services are specified, daily shall be interpreted to mean only on days when equipment is operated. The term OC means on condition.

These conditions are defined in paragraphs 4c(1) through 4c(32).

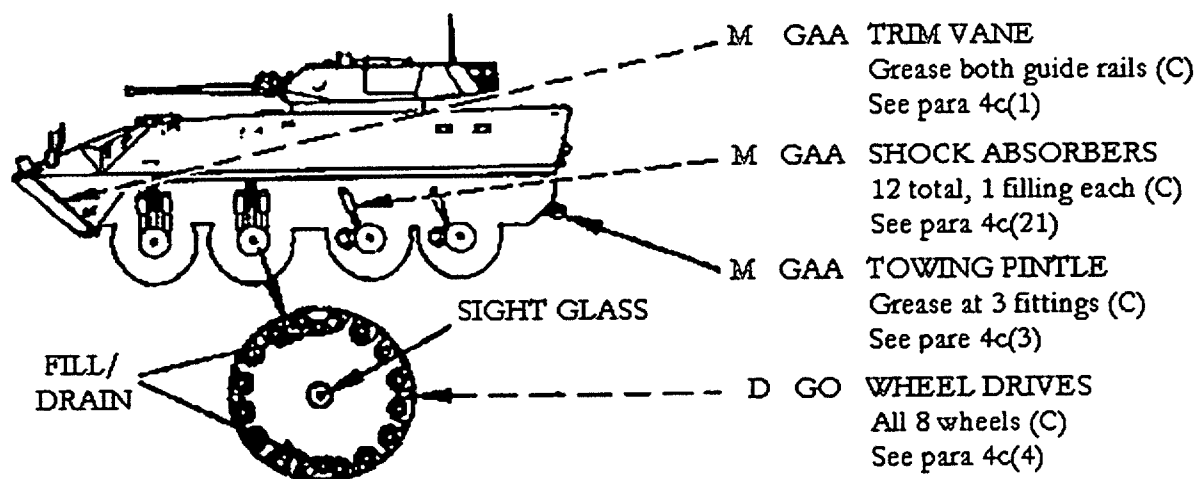
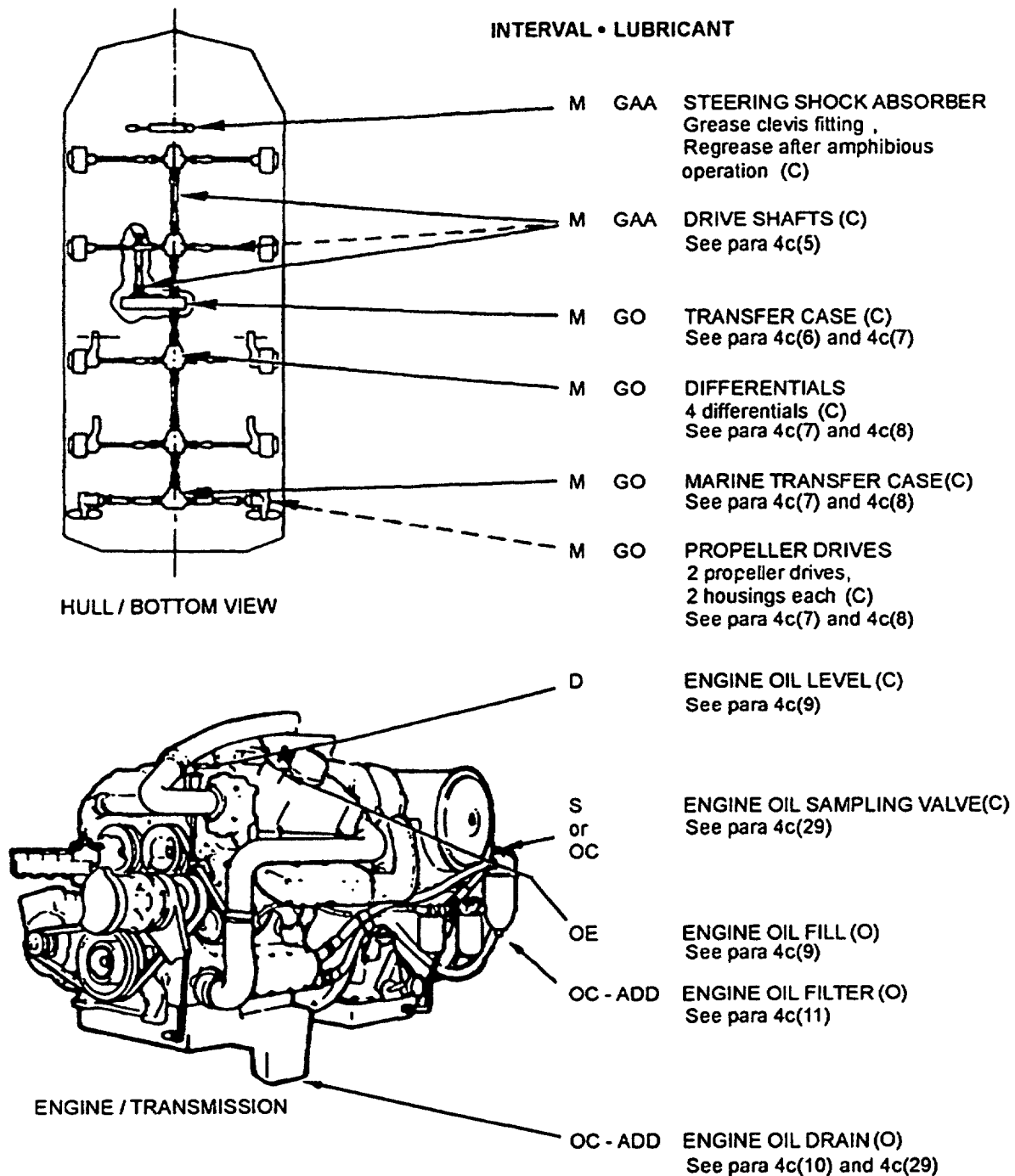
INTERVAL LUBRICANT

FIGURE 13. Sample of Typical LI Continued

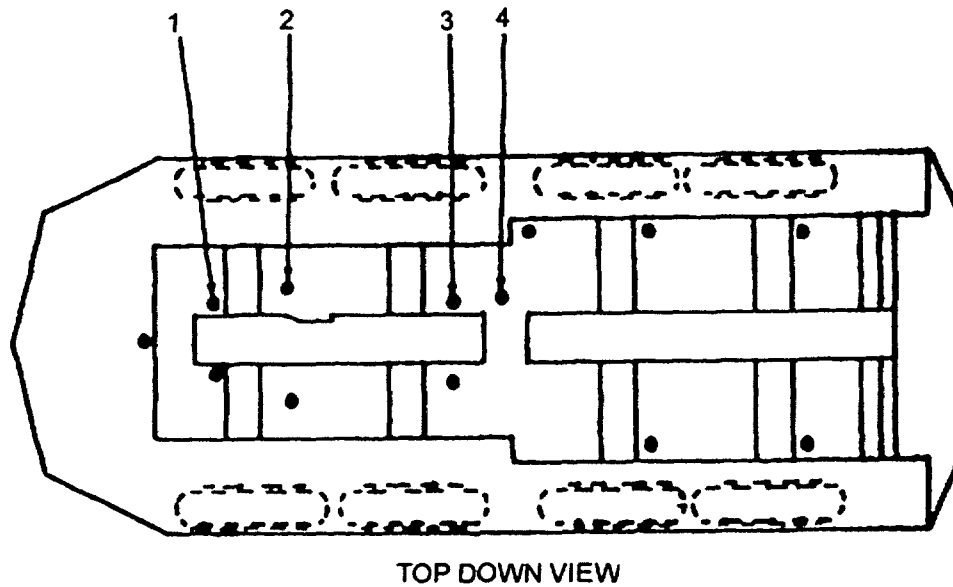
MIL-DTL-28999C(MC)

LI 08594A-12/2B

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B



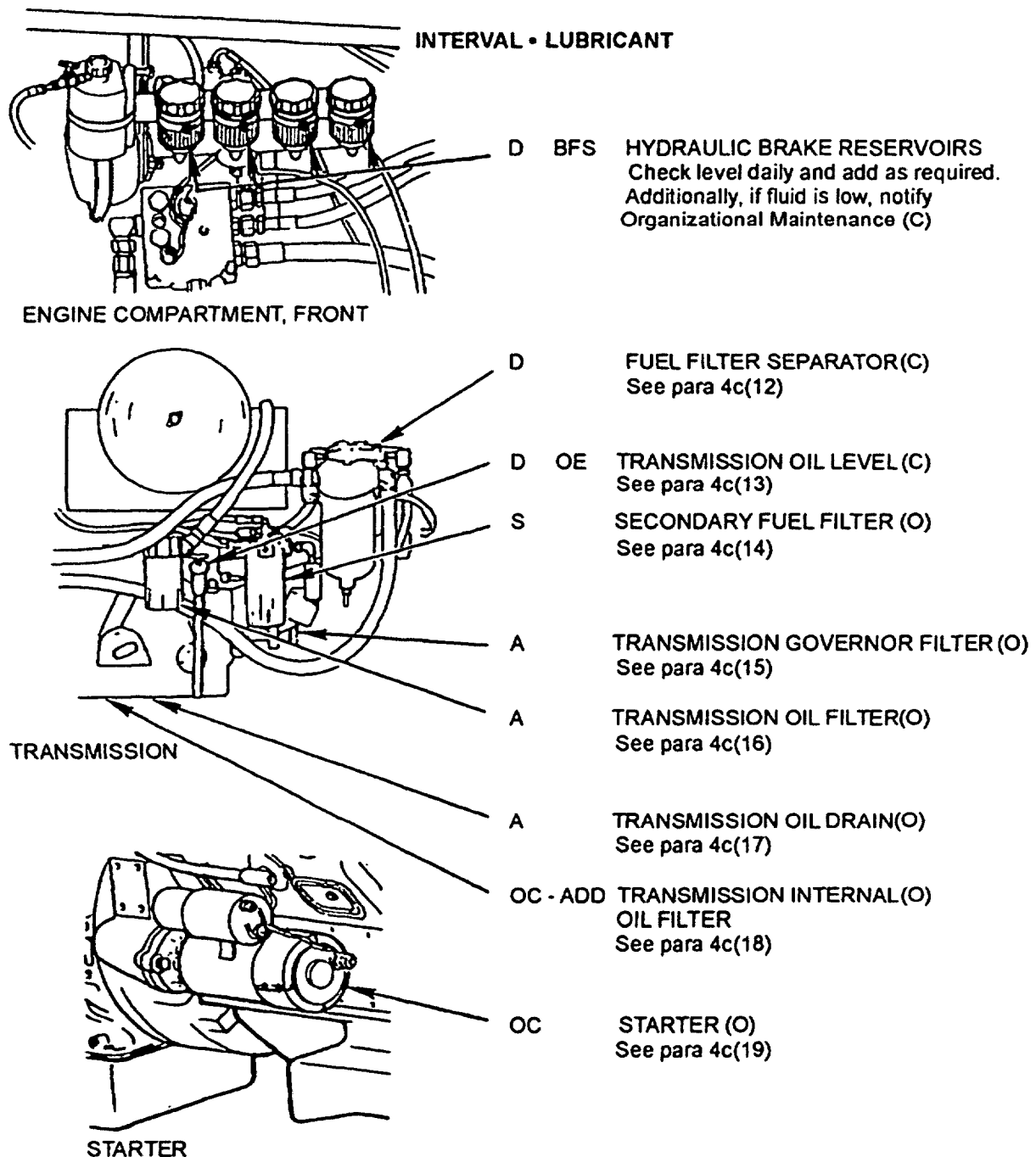
1. ENGINE OIL DRAIN ACCESS
2. TRANSMISSION OIL DRAIN ACCESS.
3. AIR BOX DRAIN SUMP ACCESS (See para 4c(30))
4. TRANSFER CASE OIL DRAIN ACCESS.

ALL REMAINING HULL PLUGS ARE FOR
DRAINING FLUIDS FROM THE HULL.

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

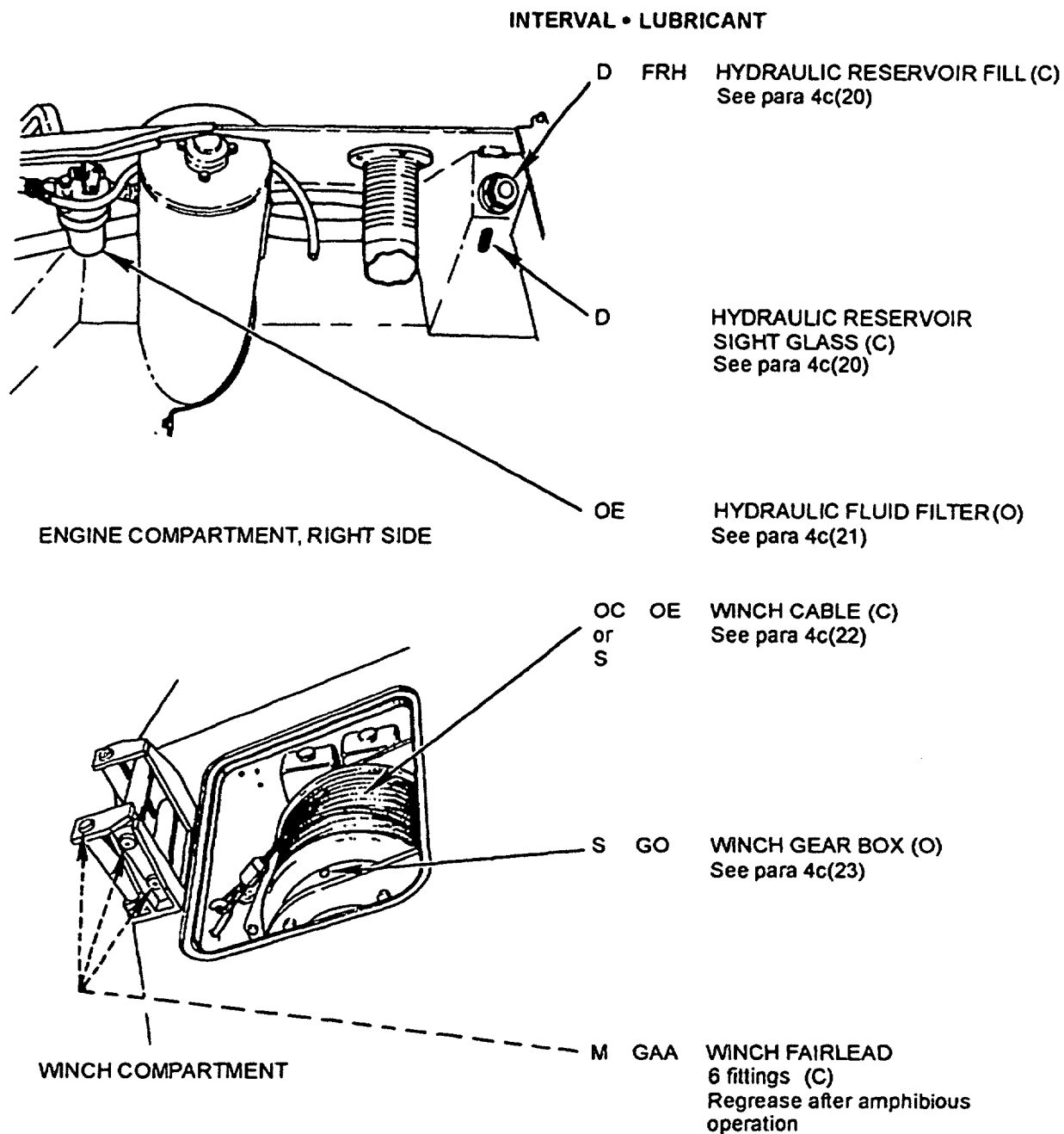
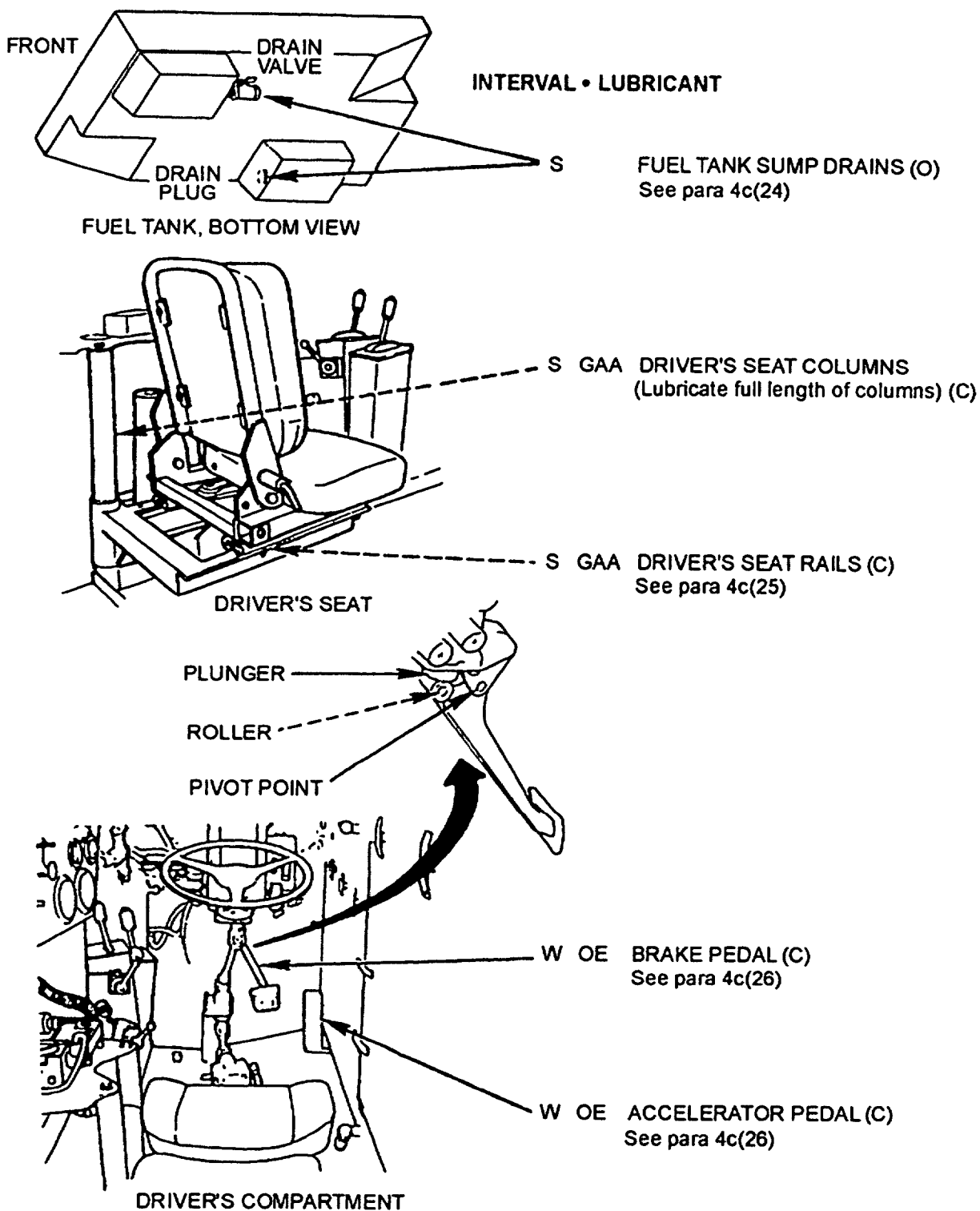


FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

INTERVAL • LUBRICANT

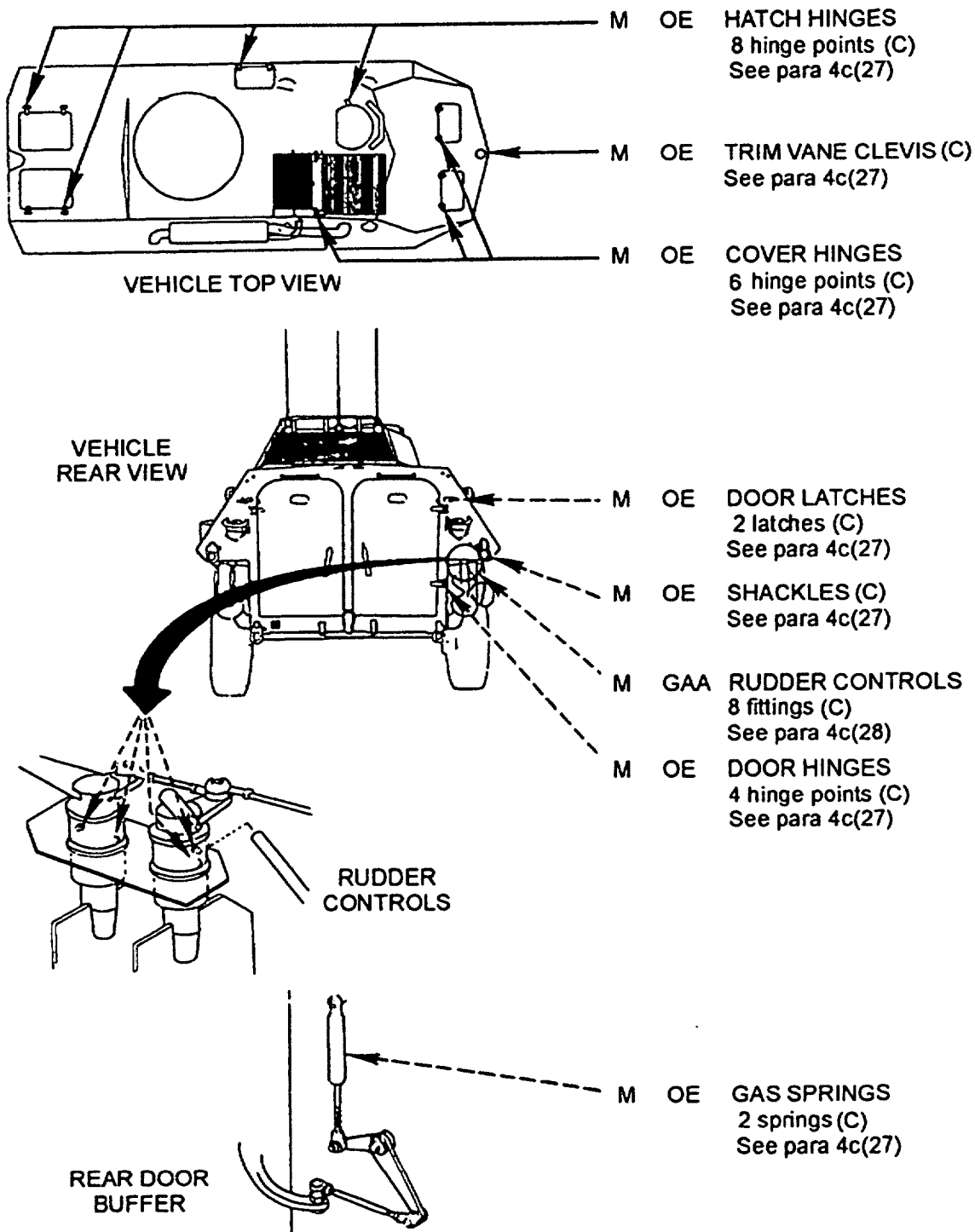


FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

- KEY -

SYMBOL	LUBRICANT AND APPLICATIONS	CAPACITIES	EXPECTED TEMPERATURES			INTERVALS
			ABOVE +32 F	+40 F to -10 F	+10 F to -25 F	SYMBOL- INTERVAL
GAA	GREASE, Automotive and Artillery Multipurpose		MIL-G 10924			D - Daily W - Weekly M - Monthly S - Semiannually A - Annually B - Biannually
	Steering shock absorber	25 oz				
	Drive Shafts	25 oz				
	Winch fairlead	25 oz				
	Driver's seat columns	25 oz				
	Driver's seat rails	25 oz				
	Rudder controls	25 oz				
OE	OIL, Lubrication, Engine		OE/HDO-15/40 MIL-L-2104	OE/HDO-10 OE/HDO-15/40 MIL-L-2104	OEA MIL-L-46167	
	Oil Can Points	25 oz				
	Winch Cable	25 oz				
	Transmission	23.2 qt (22 liters)	OE/HDO-10 MIL-L-2104			
	Engine	6.5 gal (24.6 liters)	OE/HDO-15/40 MIL-L-2104			
GO	OIL, Lubricating, Gear, Multipurpose		GO-80/90 MIL-L-2105			GO-75 MIL-L-2105
	Wheel drives	1.9 pints (0.9 liters)				
	Winch gear box	1.7 pints (0.8 liters)				
	Transfer case	6.4 pints (3 liters)				
	Differential	5.5 pints (2.6 liters)				
	Main drive transfer case	3.2 pints (1.5 liters)				
	Propeller drive, upper	0.4 pints (0.2 liters)				
	Propeller drive, lower	0.8 pints (0.4 liters)				

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

- KEY (cont'd) -				
FRH	HYDRAULIC FLUID, Fire Resistant, Rust Inhibiting		MIL-H-46170	
	Hydraulic Reservoir	12 gal (45.4 liters)		
BFS	BRAKE FLUID, Silicone		MIL-H-46176	
	Hydraulic brake reservoirs	as req		

(1) Trim Vane. Monthly, raise trim vane, wipe off old grease and apply coating to guide rails. Lower trim vane and wipe off excess grease. Regrease as necessary after amphibious operation. If guide rails are extremely dirty, organizational maintenance may have to completely remove trim vane to clean.

(2) Shock Absorbers. Monthly, grease fitting at bottom of each shock absorber (12 total). Regrease after amphibious operation.

(3) Towing Pintle. Monthly, grease towing pintle at three fittings. Regrease after amphibious operation.

CAUTION

DO NOT overfill wheel drives.

(4) Wheel Drive. Operator/crew will check oil level daily. Oil level must be at middle of sight glass. Add oil as required through upper fill/drain plug. Add slowly to allow oil to drain down to prevent overfilling. Annually, operator/ crew will drain and refill. Oil should be at operating temperature before draining. Rotate wheel until either fill/drain plug is at bottom. Drain by removing both plugs and sealing rings. Inspect for metal particles. Clean plugs and replace sealing rings. Install lower plug and tighten. Add oil until level is at middle of sight glass. Reinstall top plug. After amphibious operation check for water in wheel drive. Check sight glass for white or discolored oil. If present, oil must be changed immediately. Oil seals will have to be replaced.

(5) Drive Shafts. Monthly, grease all 16 drive shafts. Each drive shaft has two universal joint fittings. In addition, drive shafts from marine transfer case to propeller drives and input, shafts to four differentials have third grease fitting on slip joints. Transfer case input drive shaft is in engine compartment and must be reached through driver's compartment access panel. Regrease all 15 external drive shafts after amphibious operation.

CAUTION

DO NOT overfill gear housings.

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

(6) Transfer Case. Monthly, check oil level. Remove inspection cover on back of transfer case compartment to gain access to level check plug. Remove plug and check that oil is level with bottom of hole. Add oil as required. Oil may be added through level check plug hole or through filler plug on top surface of transfer case if compartment cover is removed. Clean plugs before installing. Annually, drain and refill transfer case. Oil should be at operating temperature before draining. Remove level check plug, lint! drain plug under transfer case, and drain plug on bottom of transfer case. Inspect magnetic drain plug for metal particles. Clean and reinstall (drain plug). Fill through level check plug hole or filler plug hole until oil is level with bottom of plug hole (about 6.4 pints). Clean and reinstall level check plug and filler plug if removed. Check to see that drain plug is not leaking; then reinstall hull drain plug. See paragraph 4c(7) for checks after amphibious operation.

(7) Amphibious Operation. As soon as possible after amphibious operation, have organizational maintenance check for water in gear housings. Check by momentarily removing drain plug. If water comes out first, oil will be changed immediately. Oil must also be changed if white or discolored. Oil seals in units which have water contamination will have to be replaced.

(8) Differentials, Marine Transfer Case, and Propeller Drives. Monthly, check level in all four differentials, marine transfer case, and upper and lower housings of both propeller drives. Each housing has level check/fill plug in middle of back or side. Drain plugs are at bottom of each housing. Remove level check/fill plug and check that oil is level with bottom of plug hole. Add oil as required. Clean and reinstall plug. Annually, drain and refill all units. Oil should be at operating temperature before draining. Inspect magnetic drain plugs for metal particles. Clean and install drain plugs. Fill each unit until oil is level with bottom of level check/fill plug hole. Clean and install level check/fill plugs. See paragraph 4c(7) for checks after amphibious operation.

CAUTION

DO NOT overfill crankcase.

(9) Engine Oil Level. Daily, before starting engine, check oil level. Level should fall between F and L marks on gage rod. Add oil as required to bring level between F and L marks.

(10) Engine Oil Drain and Breather Caps. Drain in accordance with warranty/Joint Oil Analysis Program. Service engine oil filter per paragraph 4c(11).

(11) Engine Oil Filter. Filter will be replaced every time oil is changed.

(12) Fuel Filter/Separator. Daily, operator drains water. Semiannually organizational maintenance will remove and replace filter element. Preformed packings on filter bowl and housing will also be replaced. Start engine and check for leaks.

(13) Transmission Oil Level. Daily, operator checks transmission oil level per instructions in Operator's Manual TM 08594A-1012. Both cold and hot checks will be made. Add oil as necessary to bring oil level to within COLD RUN or HOT RUN band on gage rod as required.

(14) Secondary Fuel Filter. Semiannually, remove and replace filter element. Lightly coat gasket of new filter with clean fuel. Screw filter on until gasket touches; then tighten additional 1/2 turn. Start engine and check for leaks.

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

(15) Transmission Governor Filter. Filter will be changed every time transmission oil is changed. Remove plug at bottom rear of transmission. Remove filter and preformed packing. Install new filter and preformed packing. Install plug and tighten.

(16) Transmission Oil Filter. Filter will be changed every time transmission oil is changed. Remove and discard oil filter and gasket. Lubricate gasket on new filter with clean engine oil and install filter. Screw oil filter until gasket contacts filter mount; then tighten another 2/3 turn.

(17) Transmission Oil Drain. Annually, drain transmission oil. Oil will be at operating temperatures before draining. Remove hull drain plug under transmission oil pan. Remove (drain plug from oil pan. Service transmission oil filters per paragraphs 4c(15) and 4c(16). Fill transmission through gage rod tube (23 quart). Bring oil up to operating temperature per instructions in Operator's Manual. Check level and add oil as necessary to bring level within HOT RUN band on gage rod. Check fitters and drain plugs for leaks. Install hull drain plug.

(18) Transmission Internal Oil Filter. Filter will be replaced upon transmission overhaul or at depot maintenance.

(19) Starter. Whenever power pack is removed from vehicle, but not more than annually, remove starter from engine. Refer to TM 08594A-20/4. Remove pipe plug at each end of starter motor, and add 3 to 5 drops of oil. Additionally, reverse, replace, or clean contact plate as necessary. Inspect jumper connections for corrosion. Remove corrosion as necessary.

WARNING

FIRE RESISTANT HYDRAULIC OIL, MIL-H-46 170, CAN BE HAZARDOUS TO YOUR HEALTH. THE OIL CAN BE ABSORBED THROUGH THE SKIN, AND CAN PRODUCE PARALYSIS. WEAR PROTECTIVE CLOTHING, GLOVES, GOGGLES, AND A RESPIRATOR.

(20) Hydraulic Reservoir. Daily, operator/crew check level and add as needed. Annually, organizational maintenance will drain and refill hydraulic reservoir. Remove filter screen and clean with cleaning solvent before refilling. Allow to dry before reinstalling, then refill reservoir. Fill reservoir until fluid is at middle of sight gage.

(21) Hydraulic Fluid Filter Indicator. If filter indicator is tripped, press in to reset. Start engine and check for indicator tripping and leaks. If indicator trips replace filter.

WARNING

WEAR GLOVES WHILE CLEANING WINCH CABLE.

NOTE

Oil should be heated to increase penetration into cable strands, especially in cold weather.

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

(22) Winch Cable. Operator/crew will clean cable after use by hosing off dirt and mud if required. After cleaning, allow cable to dry; then oil cable with clean oil. Semiannually, unwind all the cable and clean off cable drum. Coat drum with light coat of clean oil. Oil cable using brush to bet between stands. Wipe off excess oil and rewind cable.

(23) Winch Gear Box. Semiannually, check oil level. Release cable from retaining hook. With winch in free spool mode, rotate drum until either fill/drain plug is horizontal and other is at top. Remove plug which is horizontal and check that oil is level with bottom of hole. If oil needs to be added, remove top plug and slowly add oil as required. Annually, drain and refill gear box. Both plugs must be removed and drum rotated until either plug hole is at bottom. Use small pail or container to catch old oil. Inspect oil for metal particles. Rotate drum until either hole is at top and fill until level with bottom of other hole. After checking or refilling, reinstall plugs; then hook cable on retaining hook and rotate drum by hand until cable is tight. Take winch out of free spool mode.

(24) Fuel Tank Sump Drain. Semiannually, organizational maintenance will drain fuel tank sumps. Remove hull drain plugs next to each sump. Open fuel tank drain valve and drain until fuel appears. Close drain valve. Remove fuel tank drain plug and drain until fuel appears. Install tank drain plug. Wash fuel from hull. Install hull drain plugs.

(25) Driver's Seat Rails. Semiannually, grease rails. Slide seat all the way forward and wipe off exposed part of slide rails with clean rag and cleaning solvent. Slide seat all the way back and lean front part of slide rails. Slide seat all the way forward and grease rear part of slide rails. Slide seat back and forth several times; then wipe excess grease off ends of rails. Apply grease to two locking slots on left of seat rail, then move seat through nine locking positions.

(26) Accelerator and Brake Pedals Oil Can Point Weekly, apply several drops of oil to accelerator pedal hinge points. Apply several drops of oil to pivot point and rollers at top of brake pedal. Using small brush, apply light coat of oil around plunger where it enters brake valve body. Plunger is part which sits on top of pedal rollers.

(27) Oil Can Points. Monthly, apply several drops of oil to hinges, trim van clevis pin and rear door latch pivot points. Apply several drops of oil to gas spring and bell crank pivot points. Clean gas spring pistons and light coat with oil. Unscrew pins for shackles. Lubricate threads and then reinstall pins. To prevent the fire extinguisher pull handles and cables from sticking due to corrosion, coat each cable with a light film of oil. Refer to TM 08594A-20/4 for fire extinguisher control valve assembly removal and installation instructions. Other control linkage pins and shafts, clevis pins, pivot points, and exposed adjusting threading which are not illustrated should also be lightly oiled.

(28) Rudder Controls. Monthly, grease fittings (4 interior, 4 exterior). Grease also after amphibious operations.

NOTE

Refer to paragraphs 4c(10) and 4c(11) and comply with manufacturer's warranty provisions until warranty expires. When warranty has expired, comply with paragraph 4c(29). (Refer to TI-4731-14/1 of January 1986.)

(29) Engine Oil Sampling Valve. Semiannually, take engine oil sample from engine oil sampling valve. Bring engine up to operating temperature and take sample with engine idling. Submit sample for analysis.

FIGURE 13. Sample of Typical LI Continued

MIL-DTL-28999C(MC)

LI 08594A-12/2B

(30) Air Box Drain Access. Weekly, or after 8 hours of operation, drain fluid from air box. For instructions on how to carry out this procedure, refer to TM 08594A-20/4, Service Air Box Trap.

BY DIRECTION OF THE COMMANDANT OF THE MARINE CORPS

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FIGURE 13. Sample of Typical LI Continued

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