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SENSITIVE**

**MIL-PRF-63004D(TM)
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**SUPERSEDING
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PERFORMANCE SPECIFICATION

MANUALS, TECHNICAL: PREPARATION OF LUBRICATION ORDERS

This specification is approved for use by the Department of the Army and is available for use by all Departments and Agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification contains requirements for the preparation of lubrication orders (LOs).

1.2 Application. This specification is applicable to separate, card-form lubrication orders (LOs) only. Lubrication instructions to be incorporated into the maintenance manual should be prepared using MIL-STD-40051-1 or MIL-STD-40051-2.

Comments, suggestions, or questions on this document should be addressed to U.S. Army Logistics Support Activity, ATTN: AMXLS-AP, Redstone Arsenal, AL 35898-7466 or emailed to tmss@logsa.redstone.army.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at assist.daps.dla.mil/online/start/.

AMSC NO A7572

AREA TMSS

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

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this specification, whether or not they are listed.

2.2 Government documents.

2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

STANDARDS

MIL-STD-38784	Standard Practice for Manuals, Technical: General Style and Format Requirements
MIL-STD-40051-1	Department of Defense Standard Practice, Preparation of Digital Technical Information for Interactive Electronic Technical Manuals (IETMs)
MIL-STD-40051-2	Department of Defense Standard Practice, Preparation of Digital Technical Information for Page-Based Technical Manuals

HANDBOOKS

MIL-HDBK-113	Guide for the Selection of Lubricants, Functional Fluids, Preservatives and Specialty Products for Use in Ground Equipment Systems
MIL-HDBK-275	Guide for Selection of Lubricants, Fluids, and Compounds for Use in Flight Vehicles and Components

((Copies of these documents are available online at <http://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in the document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Incorporation of LOs into a technical manual. LOs shall be incorporated into the associated technical manual (TM) in accordance with MIL-STD-40051-1 or MIL-STD-40051-2 in the following instances:

- a. If the LOs are classified as confidential or higher (incorporate into TM of the same or higher security classification).
- b. If specified by the contracting activity.

3.2 Format.

3.2.1 LO card types. Lubrication order cards shall be either single-fold or flat.

- a. Single-fold card. LO(s) requiring no more than a single card shall be printed in a single-fold card style and shall be folded at the center. Single-fold LO(s) shall have no lettering, leader lines, or critical portions of illustrations closer than 1/4 inch from either side of the fold.
- b. Flat card. Flat cards shall be used for LOs with more than one card. Flat card LO(s) shall not be folded.

3.2.2 LO card sizes. Unless otherwise specified by the contracting activity, the sizes, in inches shall be as shown below:

TABLE I. LO Card Sizes.

LO Card	Size of LO (Flat)	LO Image Size	Size of LO (Single-Fold)
A	4 1/4 x 8 1/2	3 1/4 x 7 1/2	N/A
B	8 1/2 x 8 1/2	7 1/2 x 7 1/2	4 1/4 x 8 1/2
C ¹	6 1/2 x 9 1/2	5 5/16 x 8 3/4	N/A
D	8 1/2 x 11	7 1/4 x 9 3/4	N/A
E	17 x 11	14 x 9 1/2	8 1/2 x 11

Notes:

- 1. Use in conjunction with operators log book manual.

3.2.3 LO number. The LO number shall appear on the first card in accordance with paragraph 3.3.1. The LO number shall appear at the top of all other cards.

3.2.4 LO Card numbering. Unless otherwise specified by the contracting activity, the card number shall be centered at the bottom of the card. Each printed side of a card shall be numbered sequentially. Each side shall reflect the relationship of that side to the total number of printed sides. For example, 1 of 4; 2 of 4; 3 of 4; and 4 of 4. If only one side of a card is printed, it shall be numbered 1 of 1.

3.3 Title page (first card) contents. The title page shall contain the LO number, a heading, title, national stock number (NSN), part number, commercial and government entity code (CAGEC), the end item code, a reference line, reporting errors information, distribution statement/export control warning/destruction notice, and location of the LO statement. See FIGURE 1 for example of title page (first card).

3.3.1 Heading. The heading shall consist of the words "LUBRICATION ORDER," date printed, the LO number, and a supersession notice (if applicable), formatted as shown in FIGURE 1.

3.3.2 Title. The title shall appear below the heading and read the same as the title on the related technical manual (TM). When more than one piece of equipment is covered by the LO, the title for each shall appear separately.

3.3.3 NSN, part number, CAGEC, and EIC. The applicable NSNs, part numbers, CAGECs, and EICs for each piece of equipment covered by the LO shall be entered beneath the title(s).

3.3.4 Reference line. A reference line consisting of the publication number(s) of the related TMs shall be placed below the title within the applicable area.

3.3.5 Reporting errors. LO cards shall contain a Reporting Errors and Recommending Improvements Statement.

3.3.6 Location of the LO statement. The following statement shall be included on the title page of the LO:

"Copy of this lubrication order will remain with the equipment at all times; instructions contained herein are mandatory."

3.3.7 Distribution statement, export control warning, and destruction notice. A distribution statement, export control warning, and destruction notice shall be placed on the first card in accordance with MIL-STD-40051-2.

3.4 Other statements/warnings. The following other statements shall be included in the LO, as applicable:

3.4.1 General statement(s)/Notes. General statement(s)/notes shall be placed on the first card of the LO that is applicable to the overall understanding of requirements of the LO procedures. The statement(s) shall include such information as adherence to lubrication intervals, explanation of interval symbols, maintenance levels, exceptional operational requirements, abbreviations, fittings and parts cleaning. A statement concerning corrosion control shall be used as applicable. The statement shall provide instructions or reference corrosion control requirements provided in the applicable narrative TM. See FIGURE 2 for example.

3.4.2 Oil filter statement. As applicable, a statement similar to the following shall be included:

"Oil filters shall be serviced/cleaned/changed as applicable, when:

- a. They are known to be contaminated, or clogged;
- b. Service is recommended by Army Oil Analysis Program (AOAP) laboratory analysis, or
- c. At prescribed hardtime intervals."

3.4.3 AOAP sampling interval statement. Statement similar to the following shall be included:

"Engine oil/transmission oil/hydraulic fluids must be sampled at (*insert applicable hour/mileage time frame*) as prescribed by (*insert DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual or DA PAM 738-751, Functional Users Manual for the Army Maintenance Management System - Aviation (TAMMS-A)*)."

3.4.4 AOAP not available/non-enrolled statement. When a component/equipment is not enrolled in the AOAP, or oil analysis support is not available, a statement similar to the following shall be used:

"This (*enter name of component/equipment*) is not enrolled in the Army Oil Analysis Program. HARDTIME INTERVALS APPLY."

3.4.5 Warranty hardtime statement. When applicable, the following statement shall be used:

"For equipment under manufacturer's warranty, hardtime oil service intervals shall be followed. Intervals shall be shortened if lubricants are known to be contaminated or if operation is under adverse conditions such as longer than usual operating hours, extended idling periods, extreme dust, etc."

3.5 Lubrication procedures. Lubrication procedures shall be prepared and shall include all applications, procedures, authorized lubricants, intervals, man-hour requirements, lubrication points, and AOAP requirements. Unless otherwise specified by the contracting activity, the lubrication procedures shall be presented in grouped sequence by interval so as to enable the user to receive, lubricate, and return to an acceptable performance standard all components of the equipment in a minimum of time with the skills, tools, test equipment, and spare parts authorized by the Logistics Management Information (LMI) or the Maintenance Allocation Chart (MAC). Unless otherwise specified by the contracting activity, lubrication procedures shall be based upon the principles of Reliability Centered Maintenance (RCM) logic.

3.5.1 Warnings, cautions, and notes. Warnings, cautions, and notes shall be applied in accordance with MIL-STD-40051-2.

3.5.2 Illustrations. Illustrations shall be used to show the location of grease fittings, and when applicable, shall indicate the number of grease points. A minimum number shall be used.

3.5.3 Multiple illustrations. When it is necessary to provide a multiple number of illustrations to show separate component parts, each illustration shall have an individual title.

3.5.4 Maintenance level. The lowest level of maintenance authorized to perform the task shown shall be identified. The applicable maintenance level symbol shall be shown in parentheses after the task. Maintenance levels to be used, as applicable, are the following:

TABLE II. Maintenance Levels.

Symbol	Maintenance Level
C	Crew
O	Service or Aviation Maintenance Company (AMC)
F	Field or Aviation Support Battalion (ASB)
H	Below Depot
L	Specialized Repair Activity or Theater Aviation Support Maintenance Group (TASMG)
D	Depot

3.5.5 Grouped lubrication points. When grouped lubrication points require the same lubricant at the same interval, the type and number of points shall be identified and described by one of the following methods:

a. Multi-headed arrows. Multi-headed, solid-shafted arrows shall point to each of the lubrication points (see FIGURE 3).

b. Lubrication point notes. Lubrication point notes shall provide instructions for applying lubricants, taking into account the following factors:

- (1) Type, grade, availability, and properties of prescribed lubricant.
- (2) Expected temperature.
- (3) Lubrication gun and tools available to authorized maintenance level.
- (4) Types of lubrication fittings.
- (5) Possible ill effects of excessive or insufficient lubrication.

Caution shall be stressed where over or under lubrication of a part will damage that part or closely associated parts. Such cautionary notes shall be included either as a portion of the point note, or as a special note (see para 3.8).

3.5.6 Disassembling/and hand packing. If applicable, disassembling and hand packing instructions shall be provided for medium and high speed antifriction bearings which are sensitive to the amount of lubrication applied and do not have bleed holes or relief valves.

3.5.7 Cleaning, disassembling, and reassembling. Cleaning, disassembling, and reassembling instructions required before or after lubrication shall be provided. If instructions are extensive and contained in a technical manual, the TM shall be referenced.

3.5.8 Washing and natural drying. If applicable, instructions shall be given for washing and natural drying of finely machined and dirt-sensitive parts before relubricating. Use of compressed air jets or temperatures above 212 degrees Fahrenheit shall not be prescribed.

3.5.9 Preservative material. Instructions shall not specify a coating of preservative material, either before or after packing parts that are lubricated with grease; nor shall they specify an application of oil, solvent, or additional grease to a "sealed-for-life" or prepacked antifriction bearing.

3.6 Lubricants and military symbols. Unless otherwise specified by the contracting activity, lubricants shall be identified by standard military symbols, in accordance with MIL-HDBK-113 and MIL-HDBK-275 (see FIGURE 3). The lubricant symbols and interval symbols shall be printed in separate vertical columns on the inner side of the point names. These columns shall be headed by the words "LUBRICANT" AND "INTERVAL". Those lubrication points which are serviced or lubricated by checking level, replenishing lubricant, or draining and refilling shall be indicated by the lubricant's symbol at the point on the illustration which is designated for replenishing or refilling. The amount of lubricant required shall be given either in the point note or in the "Capacity" column of the table, if applicable.

3.6.1 Lubrication interval symbols. Unless otherwise specified by the contracting activity, the following lubrication interval symbols shall be used:

TABLE III. Lubrication Intervals.

Symbol	Definition
D	Daily
W	Weekly
M	Monthly
Q	Quarterly
S	Semiannually
A	Annually
B	Biannually
H	Hours (operated)
MI	Miles (operated)
KM	Kilometers (operated)
RDS	Rounds (fired)
OC	On Condition
MRA	Maintenance Repair Action

3.7 Measurements. Unless otherwise specified by the contracting activity, all measurements expressed in the text, in tables, or in illustrations shall be expressed in both U.S. standard units and metric units. The order shall be in accordance with equipment markings.

3.7.1 Lubricant table. As applicable, a table(s) shall be prepared to provide information needed to select the proper lubricant for various temperature ranges and uses. The size and location of the table(s) shall be tailored to meet layout requirements and shall include as applicable, information on temperature range, lubricant, military symbol, NATO code, specification, national stock number, capacity, interval between service, and man-hours required to complete all service by type stated to the nearest tenth for all lubricants prescribed by the lubrication order. See FIGURE 4 for example.

3.7.2 Notes to tables. As necessary, when specific restrictions, preferred grades, and other conditions exist, notes shall be annotated on table(s) in accordance with MIL-STD-38784. For example: 1/"When MIL-PRF-2104 lubricant is authorized, use 15W-40 (OE/HDO-15/40) when available and applicable temperature range exists," or 2/"15W-40 oil is not authorized in this particular (*enter component name*)." Where applicable, the statement "For Arctic Operation, refer to FM 9-207" shall be included as a note.

3.8 Special notes.

3.8.1 Pertinent lubrication point information. As applicable, additional pertinent lubrication point information shall be incorporated into the lubrication order. When applicable, the lubrication order shall contain a special note referencing, but not repeating, instructions in technical manuals.

3.8.2 Effect of extreme conditions. If applicable, pertinent instructions relevant to the effect of extreme conditions such as temperature, humidity, or altitude on lubrication requirements for the equipment shall be included as a special note.

3.9 Authentication block. An authentication block provided by the contracting activity, shall be included in the LO. Distribution information, as applicable, shall be placed below the authentication block.

4. VERIFICATION

4.1 Verification. The validation and/or verification requirements shall be in accordance with the statement of work and as specified by the contracting activity (see para 6.2g).

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see para 6.2h). When packaging of materiel is to be performed by DOD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activities within the Military Service or Defense Agency, or within the military service's system commands. 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.

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. Lubrication orders provide information used by operator/crew and service maintenance personnel to perform lubrication services on equipment. This specification provides the requirements for preparation of these lubrication orders.

6.2 Acquisition requirements.

- a. Title, number and date of the specification.
- b. Title, number, and date of the lubrication order.
- c. Reference line (see para 3.3.4).
- d. Lubrication interval symbols to be used (see para 3.6.1).
- e. Whether LO card(s) are to be used or instructions are to be include in the manual.
- f. Type of reproducible copy desired.

g. Verification requirements (see para 4.1).

h. Packaging requirements (see para 5.1).

6.3 Technical manuals. The requirement for technical manuals should be considered when this specification is applied on a contract. If technical manuals are required, specifications and standards that have been authorized and assigned an Acquisition Management System Control (AMSC) number must be listed on a separate Contract Data Requirements List (DD Form 1423), which is included as an exhibit to the contract. The technical manuals must be acquired under separate contract line item in the contract.

6.4 Definitions.

6.4.1 Caution. A caution is used to identify risk of damage to the equipment.

6.4.2 Hardtime scheduled maintenance. Hardtime maintenance is scheduled maintenance conducted at predetermined, fixed intervals because of age, calendar, or usage such as operating time, flying hours, miles driven, or rounds fired.

6.4.3 Note. A note is used to highlight essential procedures, conditions, or statements, or to convey important instructional data to the user.

6.4.4 On-condition scheduled maintenance. On-condition scheduled maintenance is maintenance or item replacement action performed based upon condition of the item as determined by an evaluation of each item on scheduled basis.

6.4.5 Warning. A warning is used to identify danger of injury or death to the person performing the task.

6.5 Subject term (key word) listing.

AOAP
Card LO
Hardtime
Lubricant table
Lubricants
Military lubrication symbols
On-condition

6.6 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

LUBRICATION ORDER
31 JULY 1987

LO X-XXXX-XXX-XX
(Superseding LO X-XXXX-XXX-XX, 25 March 1982)

**TITLE
NSN
PART NUMBER
CAGEC
EIC**

References: TM X-XXXX-XXX-10, TM X-XXXX-XXX-20, LO X-XXXX-XXX-XX, and FM X-XXX

REPORTING OF ERRORS

You can help improve this LO. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter, DA Form 2028 (Recommended Changes to Publications and Blank Forms) directly to: *(Insert name and address of proponent)*. You may also send your recommended changes via electronic mail or by fax. Our fax number is *(insert DSN and commercial number of proponent)*. Our e-mail address is *(insert e-mail address of proponent)*. A reply will be furnished to you.

WARNING - This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C., Sec 2751, et. seq.) or the Export Administration Act of 1979, as amended, Title 50A, U.S.C, App. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of DOD Directive 5230.25.

DISTRUBITION STATEMENT C. Distribution authorized to U.S. government agencies and their contractors. This publication is Administrative-Operational Use required for administrative and operational purposes, as determined on *(insert date)*. Other requests for this document must be referred to *(insert name and address of proponent)*.

DESTRUCTION NOTICE - Destroy by any method that will prevent disclosure of the contents or reconstruction of the document.

NOTICE - Copy of this lubrication order will remain with the equipment at all times; instructions contained herein are mandatory.

Card 1 of 16

FIGURE 1. Example of first card.

NOTES:

This LO is for crew (C) or service (O) maintenance. Lube intervals (on-condition or hardtime) are based on normal operation. Lube more during constant use, and less during inactive periods. Use correct grade of lubricant for seasonal temperature expected.

On the picture a dash line (—) means lube points on both sides.

Clean parts with dry solvent (SD), type II, or equivalent. Use cleaning compound solvent (RBC) on powder-fouled parts. Dry before lubricating. DO NOT use fluid or semi-fluid lubricant on SFD lubricated surface. Wipe surfaces dry.

Before you start your lube service.

ALWAYS

- a. Clean grease fittings before lubrication.
- b. Use the lubrication order as your guide.

NEVER

- a. Use wrong type/grade grease.
- b. Use too much lubricant.

FIGURE 2. Example of general statements/notes.

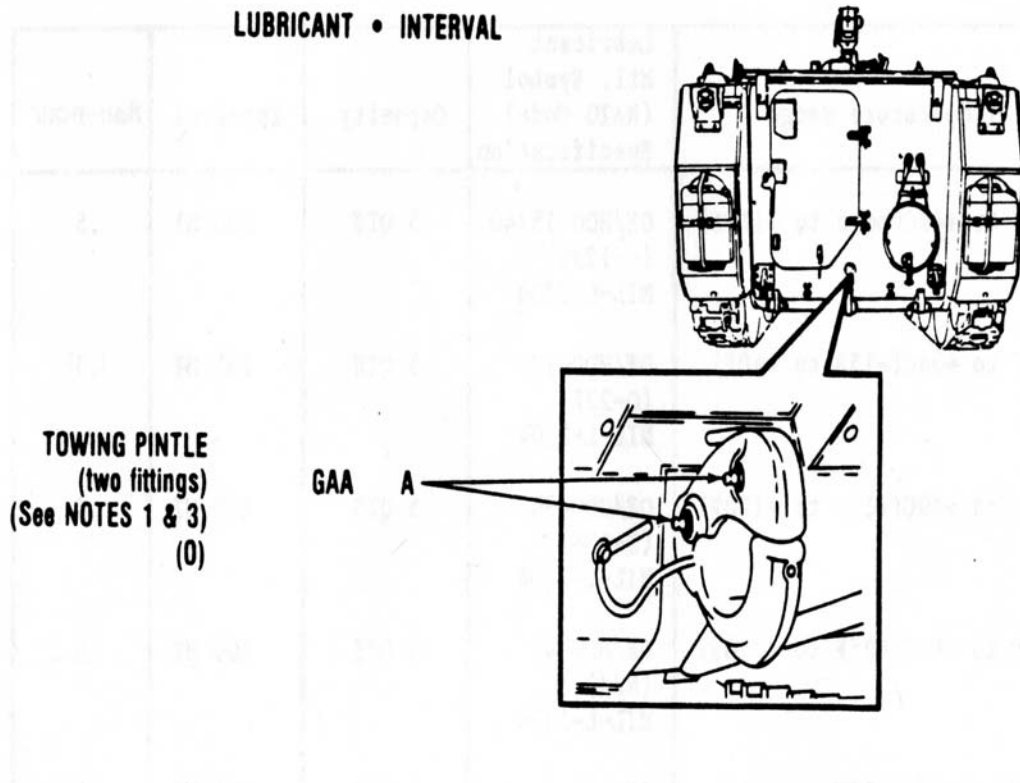


FIGURE 3. Example - identification of lubricant symbol, and lubrication points, interval and note.

TABLE I. Lubricant Table for Engine XXC

Temperature Range	Lubricant Mil. Symbol (NATO Code) Specification	Capacity	Interval	Man-hour
-18°C to +49°C (zero to +120°F)	OE/HDO 14/40 (0-1236) MIL-PRF-2104	5 QTS	200 MI	.5
-25°C to +40°C (-15°F to +40°F)	OE/HDO 10 (0-237) MIL-PRF-2104	5 QTS	200 MI	.5
-10°C to +49°C (+15°F to +120°F)	OE/HDO 30 (0-238) MIL-PRF-2104	5 QTS	200 MI	.5
-05°C to +49°C (+25°F to +120°F)	OE/HDO 40 (N/A) MIL-PRF-2104	5 QTS	200 MI	.5
-57°C to +04°C (-70°F to +40°F)	OEA (D-183) MIL-PRF-46167	5 QTS	100 MI	.5

FIGURE 4. Example of lubricant table.

APPENDIX A

**CONTENT/FORMAT SELECTION SUMMARY
FOR LUBRICATION ORDER (LO)**

A.1 SCOPE.

A.1.1 Scope. This appendix is to be used by the contracting activity to specify which optional requirements of this specification are to be contractually imposed in the acquisition of the LO(s). This appendix is a mandatory part of this specification. The information contained herein is intended for compliance.

A.1.2 Application. This appendix is intended to be copied/reproduced, completed, and become part of the Technical Manual Contract Document Summary List for solicitation/contract application.

A.2 EXPLANATION OF COLUMNS

A.2.1 Explanation of columns - Content/Format Selection Summary:

- a. Column 1, Item No. - Self Explanatory.
- b. Column 2, Optional requirements - Identifies the optional requirements in this specification.
- c. Column 3, Applicable paragraph - Identifies the applicable paragraph(s) in this specification.
- d. Column 4, Option Selected, Subcolumn a (yes) - This column should be marked with an "X" if the requirement is applicable to the solicitation/acquisition.
- e. Column 4, Option Selected, Subcolumn b (No) - This column should be marked with an "X" if the requirement is not applicable to the solicitation/acquisition.
- f. Column 4, Option Selected, Subcolumn c (Remarks) - This column is used when further explanation of requirements is needed.

APPENDIX A

CONTENT/FORMAT SELECTION SUMMARY - LO

Equipment name/nomenclature _____

(1)	(2)	(3)	(4)		
			(a)	(b)	(c)
Item No.	Requirement (Options)	Applicable Paragraph No.	Options Selected		Explanation/Remarks
			(Yes)	(No)	
1	Reliability Centered Maintenance (RCM)	3.5			
2	Single-fold lubrication card	3.2.1a			
	Flat lubrication card	3.2.1b			
3	Card numbering	3.2.4			
4	Grouped sequence	3.5			
5	LO card size:	3.2.2			
	A				
	B				
	C				
	D				
6	Lubrication interval symbols	3.6.1			
7	Measurements	3.7			

NOTE: The above selected requirements tailoring options identified by an "X" in the Options Selected Column 4, subcolumn 4(a) or 4(b), or the explanations provided in the Remarks subcolumn 4(c) are a mandatory part of this contract.

Completed by: _____
 (authorized signature)

Publications Activity _____ Date _____

CONCLUDING MATERIAL

Custodian:

Army - TM

Preparing Activity:

Army - TM

Review Activities:

Army - AR, AT, AV, CR, EA, MI

Project TMSS 2006 006

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online data base at <http://assist.daps.dla.mil/online/start/>.