NOT MEASUREMENT SENSITIVE

MIL-PRF-3150D
6 February 1997
SUPERSEDING
MIL-L-3150C
25 July 1985

PERFORMANCE SPECIFICATION

Lubricating Oil, Preservative, Medium

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

1. SCOPE

1.1 Scope. This specification covers one grade of preservative lubricating oil, identified by Military Symbol PL-M and NATO Code Number 0-192.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 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 the completeness of this list, document users are cautioned that they must meet all specified requirements in documents cited in section 3 and 4 of this specification, whether or not they are listed.

Beneficial comments(recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-TR-E/BLUE, Warren, MI 48397-5000, by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at end of this document or by letter.

AMSC N/A FSC 9150

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

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 listed in the issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation (see 6.2).

SPECIFICATION

FEDERAL

P-D-680 - Dry Cleaning and Degreasing Solvent.

STANDARDS

FEDERAL

FED-STD-791 - Lubricants, Liquid Fuels, and Related Products; Methods of Testing.

(Unless otherwise indicated, copies of the above specifications, standards and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

2.2.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

U.S. DEPARTMENT OF LABOR (DOL)

OSHA 29 CFR 1910.1200 - Toxic and Hazardous Substances-Hazard Communication.

(Application of copies of the Code of Federal Regulations(CFR) should be addressed to the Superintendent of Documents, US Government Printing Office, Washington, DC 20402.)

NATIONAL TOXICOLOGY PROGRAM

Annual Report on Carcinogens

(Application for copies should be addressed to the Annual Report on Carcinogens, National Toxicology Program, PO Box 12233, Research Triangle Park, NC 27709)

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are DoD adopted are those listed in the issue of the DoDISS cited in the solicitation. Unless otherwise specified, the issues of documents not listed in the DoDISS are the issues of the documents cited in the solicitation (see 6.2).

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM B 117	- Salt Spray (Fog) Testing.(DoD adopted)
ASTM D 97	- Pour Point of Petroleum Oils.(DoD adopted)
ASTM D 130	- Detection of Copper Corrosion from Petroleum Products by the Copper Strip Tarnish Test.(DoD adopted)
ASTM D 445	- Kinematic Viscosity of Transparent and Opaque Liquids (and the Calculation of Dynamic Viscosity).(DoD adopted)
ASTM D 446	- Viscometers, Glass Capillary Kinematic.(DoD adopted)
ASTM D 972	- Evaporation Loss of Lubricating Greases and Oils.(DoD adopted)
ASTM D 1152	- Methanol (Methyl Alcohol).
ASTM D 1748	- Rust Protection by Metal Preservatives in the Humidity Cabinet. (DoD adopted)
ASTM D 4057	- Manual Sampling of Petroleum and Petroleum Products. (DoD adopted)
ASTM D 4177	- Automatic Sampling of Petroleum and Petroleum Products. (DoD adopted)

(Application for copies should be addressed to the American Society for Testing and Materials, 100 Bar Harbor Drive, West Conshohocken, PA 19428-2959.)

AMERICAN NATIONAL STANDARD INSTITUTE

ANSI Z1.4	- Sampling Procedures and Tables for Inspections by Attributes.

(Application for copies should be addressed to the American National Standard Institute, 11 West 42nd Street 13th Floor, New York NY 10036-8088, Tel (212) 642-4900).

AMERICAN SOCIETY FOR QUALITY CONTROL

ASQC-Z1.4 - Sampling procedures and Tables for Inspection by attributes

(Application for copies of ASQC-Z1.4 should be addressed to the American Society for Quality Control, PO Box 3005, 611 East Wisconsin Avenue, Milwaukee, WI 53201-4606)

2.4 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 shall take precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. REQUIREMENTS

3.1 Qualification. Lubricating oils furnished under this specification shall be products that are authorized by the qualifying activity for listing on the applicable qualified products list before contract award (see 4.1.1 and 6.3).

3.1.2 Qualification period. All lubricating oils which satisfy the requirements of this specification shall be qualified for a period not exceeding five years from the date of its original qualification. When the qualification period has expired, or whenever there is any change in the formulation of a qualified product, retesting for its requalification will be required if the contractor wishes to maintain the formulation as a qualified product and be eligible to bid on government solicitations for this material.

3.1.3 Tolerances. The lubricating oil supplied under contract shall have the same formulation as when qualified. The finished oil properties shall fall within permissible tolerances assigned by the qualifying activity to the product receiving qualification.

3.2 Materials. The lubricating oil shall be derived from petroleum fractions. These may be re-refined, virgin, or synthetically prepared compounds or a combination thereof. Re-refined stocks shall be as defined in ASTM D 4175. It shall contain whatever additive materials are necessary to meet all of the operational and environmental requirements specified herein. The lubricating oil shall not contain known or suspected human carcinogens(as defined by the National Toxicology Program's Annual Report on Carcinogens) nor toxic pollutants (as defined in 40 CFR 401, "Effluent Guidelines and Standards-General Provisions"). When required(see 6.2), the manufacturer shall certify or provide proof of compliance to this formulary restriction.

3.2.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirements and promotes economically advantageous life cycle costs.

3.3 Physical and chemical requirements. The lubricating oil shall conform to the respective requirements specified in table I and in 3.4 through 3.9.

Table I. Requirements

PROPERTIES	VALUES
Viscosity at 40°C, Kinematic, centistokes	95 to 125
Pour Point, °C	-8 to -4
Evaporation loss at 100°C, percent	6.0 to 4.0
Copper strip corrosion at 100°C for 3 hour ASTM D 130 classification, max	2e

3.4 Corrosion-protection.

3.4.1 Humidity cabinet. After testing as specified in table II (30 days exposure in a humidity cabinet), not more than three corrosion dots, none of which exceeds one millimeter in length, width, or diameter, shall be evident on the test panels. The total of such corrosion dots on all three test panels shall not exceed three. Corrosion on the outer 6 mm of the panels shall not be cause for rejection.

3.4.2 Salt-spray resistance. After testing as specified in 4.5.1 (48 hours exposure to a spray of 5-percent salt solution), not more than three corrosion dots, none of which exceeds one millimeter in length, width, or diameter, shall be evident on any one of the test panels. The total of such corrosion dots on all three test panels shall not exceed nine. Corrosion on the outer 6 mm of the panels shall not be cause for rejection.

3.5 Removal. After testing as specified in 4.5.2, there shall be no visual evidence of oil or residue on the panels. The presence of a stain or of discoloration shall be cause for rejection.

3.6 Stability.

3.6.1 Accelerated. After testing as specified in 4.5.3.1, the oil shall flow freely to its new level within a period of five seconds, and the viscosity shall not have changed more than $\pm$ 5 percent from the original viscosity.

3.6.2 Low temperature. After testing as specified in 4.5.3.2, the oil shall flow freely to its new level within a period of five seconds, and the viscosity shall not have changed more than ± 5 percent from the original viscosity.

3.7 Storage stability. After completion of the 6-month storage stability test specified in 4.5.4, the oil shall meet all of the requirements specified in table I (viscosity at 40 °C, pour point, evaporation loss, and copper-strip corrosion), 3.4.1, 3.4.2, 3.5, 3.6.1, 3.6.2 and 3.9.

3.8 Toxicity. The lubricating oil shall have no adverse effects on human health when it is used as intended (see 6.1).

3.8.1 Toxicity warning label. Marking shall be in accordance with the requirements as specified herein. However each unit, intermediate and exterior container, shall be marked as follows:

MIL-PRF-3150

LUBRICATING OIL, GENERAL PURPOSE, PRESERVATIVE

WARNING!

Do not use this oil in food-processing or food-handling equipment on surfaces that may contact food. Do not allow the oil to contaminate foodstuffs.

3.9 Workmanship. The oil shall be free from suspended matter, grit, or other foreign matter and shall be uniform in appearance when examined visually through transmitted light.

4. VERIFICATION

4.1 Classification of inspections. The inspection requirements specified herein are classified as follows:

a. Qualification inspection (see 4.2)
b. Conformance Inspection (see 4.3)

4.2 Qualification inspections. Qualification inspection consist of tests for all of the requirements specified in section 3 and may be conducted in any plant or laboratory approved by the qualifying activity.

4.3 Conformance inspection. Conformance inspection consist of tests for the following requirements only (see table I and 3.4.2 and 3.6):

Viscosity (D 445)
Pour point (D 97)
Evaporation loss at 100 °C (D 972)
Copper strip corrosion at 100 °C (D 130)
Salt-spray resistance (see 4.6.1)
Stability (see 4.6.3)

4.4 Sampling.

4.4.1 Sampling for examination of filled containers. Sampling for examination of filled containers shall be in accordance with ANSI/ASQC Z1.4.

4.4.2 Sampling for tests. Take samples for tests in accordance with ASTM D 4057 or D 4177.

4.5 Inspection.

4.5.1 Inspection of material. Perform inspection of material in accordance with method 9601 of FED-STD-791.

4.5.2 Examination of filled containers. Examine samples taken in accordance with 4.3.1 with regard to fill, closure, sealing, leakage, packaging, packing and marking requirements. If the number of defective or underfilled containers exceeds the acceptance number for the appropriate sampling plan of ANSI Z1.4, reject the lot represented by the sample.

4.6 Test methods. Perform tests in accordance with the applicable methods listed in table II and in 4.6.1 through 4.6.5.

Table II. Test methods.

TEST	METHOD NO. ASTM
Viscosity, Kinematic1/	D445
Pour Point	D97
Evaporation Loss	D972
Copper Strip Corrosion	D130
Humidity Cabinet	D17482/

1/ Allow the sample for viscosity determination to stand for one hour at 40 °C + 1/2 °C before performing the test.
2/ After completing the humidity cabinet test, use the same panels for the removal test (4.5.2).

4.6.1 Salt-spray resistance.

4.6.1.1 Test panels. This test will require three test panels, measuring 76mm by 51mm by 1.6mm, and made from steel of the type specified in ASTM D1748. Clean and sand-blast the panels as specified in ASTM D1748.

4.6.1.2 Test procedure. Immerse the panels in the test oil for one minute with mild agitation and drain them for 2 hours ± 10 minutes at 24 ± 3 °C. Expose the panels for 48 hours to a spray of 5 percent salt (NaCl) solution as specified in ASTM B 117. The panels shall be supported 15 degrees from vertical and parallel to the principal direction of horizontal flow. Adjust the fog-collection rate to 0.75 to 2.0 ml per hour. At the completion of the exposure period, rinse the panels first in water, then in methanol specified by D 1152, and clean them by immersion in aliphatic naphtha specified by D 3735. Finally, rinse the panels in methanol and examine them for conformance to 3.4.2.

4.6.2 Removal. Wash the test panels used in the humidity cabinet test (see table II) first in cold P-D-680 Type II, then in warm P-D-680 Type II, and finally in warm methanol specified by D 1152. During each rinse, agitate the panel continuously with an easy forward and backward motion for 30 ± 3 seconds.

4.6.3 Stability.

4.6.3.1 Accelerated. Fill a pour-point jar conforming to ASTM D 97 to the mark with test oil, stopper it, and subject the oil to the following test sequence:

Table III. Stability Test Sequence

TEMPERATURE	TIME(hours ± 10 minutes)
54 ± 3°C	2
4 ± 3°C	2
54 ± 3°C	2
4 ± 3°C	2
25 ± 3°C	16
54 ± 3°C	8
4 ± 3°C	64
25 ± 3°C	4

At the completion of the test sequence, turn the pour-point jar to a horizontal position and observe the rate of flow. Then pour the oil into a standard viscosity tube conforming to ASTM D 446, figure A 2.4 and allow it to stand for one hour at 40 °C. Make consecutive viscosity determinations in accordance with ASTM D 445 until three such determinations yield values that agree within 0.2 centistokes. Report the average value of these determinations as the viscosity of the oil (for the purpose of determining stability only and compare to the viscosity determined prior to stability testing.

4.6.3.2 Low temperature. Fill a pour-point jar conforming to ASTM D 97 to the mark with test oil, stopper it, and subject the oil to the following sequence:

Table IV. Low Temperature Test Sequence

TEMPERATURE	TIME (hours ± 10 minutes)
-40 ± 3°C	24
25 ± 3°C	24
-18 ± 3°C	24
25 ± 3°C	24

At the completion of the test sequence, turn the pour-point jar to a horizontal position and observe the rate of flow. Then pour the oil into a standard viscosity tube conforming to ASTM D 446, figure A 2.4 and allow it to stand for one hour at 40 °C. Make consecutive viscosity determinations in accordance with ASTM D 445 until three such determinations yield values that agree within 0.2 centistokes. Report the average values as the viscosity of the oil (for the purpose of determining stability only) and compare to the viscosity determined prior to stability testing.

4.6.4 Storage stability. Fill three 1-quart containers with the test oil to within approximately 6 mm of the top of the container. Seal all three containers tightly. Store each of the three sample containers at the temperatures and for the time periods indicated below:

Table V. Storage Stability Sequence

SAMPLE NO.	TEMPERATURE	STORAGE PERIOD (MONTHS)
1st	-40 ± 3°C	3
1st	-18 ± 3°C	3
2nd	-18 ± 3°C	3
2nd	25 ± 3°C	3
3rd	25 ± 3°C	3
3rd	54 ± 3°C	3

At the end of the 6-month storage period, examine and test the samples for conformance with the requirements of 3.7.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of material 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 or 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. Oil covered by this specification is intended for the preservation of ferrous and non-ferrous metals and as a general purpose and ordinance lubricant where light loads are anticipated. This oil is not intended for the protection of interior surfaces of internal combustion engines.

6.2 Acquisition requirements. Acquisition documents must specify the following:

a. Title, number, and date of this specification.
b. Issue of DODISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.2.1).
c. Quantity (for bulk deliveries, specify the quantity in U.S. gallons.
d. Size of container (see 6.4).

e. Marking requirements (see 3.9)
f. If a certification is required for formulary content (see 3.2)

6.3 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion in Qualified Products List QPL No. 3150 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from U.S. Army Mobility Technology Center-Belvoir, ATTN: AMSTA-RBF, 10115 Gridley Rd. Suite 128, Fort Belvoir, VA 22060-5843.

6.4 Definitions.

6.4.1 Bulk lot. An indefinite quantity of a homogeneous mixture of oil offered for acceptance in a single, isolated container, or manufactured in a single plant run (not exceeding 24 hours), through the same processing equipment, with no change in the ingredient materials.

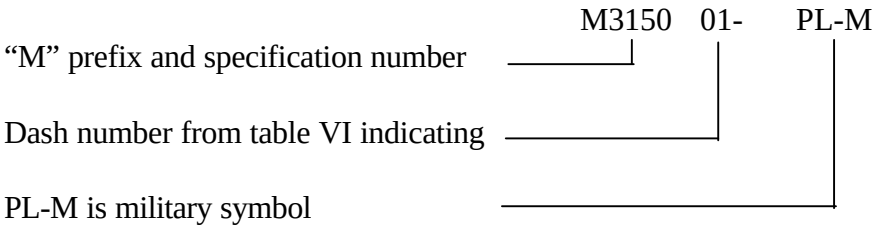
6.4.2 Packaged lot. An indefinite number of 55-gallon drums or smaller unit containers of identical size and type, offered for acceptance, and filled with a homogeneous mixture of oil manufactured in a single plant run (not exceeding 24 hours), through the same processing equipment, with no change in the ingredient materials.

6.5 National Stock Numbers (NSNs). The following is a list NSNs which correspond to the lubricating oil container sizes:

Table VI. NSN and corresponding minimum container size.

Size designation	National Stock number NSN	Container size
01	9150-00-271-8427	4-ounces
02	9150-00-231-2361	1 quart
03	9150-00-231-2356	5 gallons
04	9150-00-231-2357	55 gallons

6.6 Part identifying number (PIN). The PIN to be used for lubricating oil acquired to this specification are created as follow:



6.7 Storage conditions. Before use, the lubricating oil may be stored under conditions of covered or uncovered storage at temperatures ranging from -40 to 54 °C.

6.8 International standardization. Certain provisions of this specification are the subject of international standardization agreements (NATO STANAGS 1135, and 7094). When amendment, revision, or cancellation of this specification is proposed which would affect or violate the international agreement concerned, the preparing activity will take appropriate reconciliation action through international standardization channels, including departmental standardization offices, if required.

6.9 Waste disposal instructions.

6.9.1 Recovery (RC). The very first step in disposal is to coordinate with Defense Property Disposal Office (DPDO) for turn-in for disposal of any excess items of supply. Defense Disposal Manual DOD 4160.21-M (with pertinent supplements/messages) describes the requirements for such turn-ins. Variations exist as to whether the DPDO accepts physical custody of the disposal turn-in. The potential for DPDO acceptance and disposal processing is enhanced by comprehensive identification. If the DPDO does not accept the item for disposal (accountability) or returns the item to the generator for disposal, the manufacturer/supplier should be contacted for chemical recovery before proceeding with ultimate disposal management procedures.

DISCLAIMER

THE RECOMMENDED DISPOSAL INSTRUCTION IS FORMULATED FOR USE BY ELEMENTS OF THE DEPARTMENT OF DEFENSE. THE UNITED STATES OF AMERICA IN NO MANNER WHATSOEVER EXPRESSLY OR IMPLIEDLY WARRANTS, STATES, OR INTENDS SAID INSTRUCTION TO HAVE ANY APPLICATION, USE, OR VIABILITY BY OR TO ANY PERSON OR PERSONS OUTSIDE THE DEPARTMENT OF DEFENSE NOR ANY PERSON OR PERSONS CONTRACTING WITH ANY INSTRUMENTALITY OF THE UNITED STATES OF AMERICA AND DISCLAIMS ALL LIABILITY FOR SUCH USE. ANY PERSON UTILIZING THIS INSTRUCTION WHO IS NOT A MILITARY OR CIVILIAN EMPLOYEE OF THE UNITED STATES OF AMERICA SHOULD SEEK COMPETENT PROFESSIONAL ADVICE TO VERIFY AND ASSUME

RESPONSIBILITY FOR THE SUITABILITY OF THIS INSTRUCTION TO THEIR PARTICULAR SITUATION REGARDLESS OF SIMILARITY TO A CORRESPONDING DEPARTMENT OF DEFENSE OR OTHER GOVERNMENT SITUATION.

6.10 Material safety data sheets. The contracting officers will identify those activities requiring copies of completed Material Safety Data Sheets prepared in accordance with FED-STD-313. The pertinent Government mailing addresses for submission of data are listed in appendix B of FED-STD-313.

6.11 Subject term (key word) listing.

Lubricating Oil
Preservative
Petroleum

6.12 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.

Custodians:
Army - AT
Navy - AS
Air Force - 11

Preparing activity:
Army - AT

Project 9l50-1165

Review activities:
Army - AL, AR, AV, MD, MI
Navy - OS, MC, SA, SH
Air Force - 68
DLA - GS, PS

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, and 7.
3. The preparing activity must provide a reply within 30 days from receipt of the form.

NOTE: This form may not be used to request copies of documents, nor to request waivers, or clarification of requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-PRF-3150D	2. DOCUMENT DATE *(YYMMDD)* 970206

3. DOCUMENT TITLE
LUBRICATING OIL, PRESERVATIVE, MEDIUM

4. NATURE OF CHANGE ***(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)***

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(If applicable)*	7. DATE SUBMITTED *(YYMMDD)*

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *(Include Area Code)* (1) Commercial (810) 574-8745 (2) AUTOVON 786-8745
c. ADDRESS *(Include Zip Code)* Commander U.S. Army Tank-automotive and Armaments Command ATTN: AMSTA-TR-E/BLUE Warren, MI 48397-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403 Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340