

MIL-P-3306E
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SUPERSEDING
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MILITARY SPECIFICATION

PUMP, ENGINE PRIMING, HAND-DRIVEN, (NONAIRCRAFT) ENGINE

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

1. SCOPE

1.1 Scope. This specification covers a hand-operated, displacement type pump for engine priming. It is capable of delivering 5 to 20 cubic centimeters (cc) of fuel per stroke in 5 cc increments determined by the number of sleeves installed (see 6.1 and MS51084).

2. APPLICABLE DOCUMENTS

2.1 Government documents.

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

SPECIFICATIONS FEDERAL

P-D-680	- Dry Cleaning Solvent.
TT-S-735	- Standard Test Fluids; Hydrocarbon.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: US Army Tank-Automotive Command, ATTN: AMSTA-GDS, Warren, MI 48397-5000, 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

FSC 2910

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MILITARY

MIL-G-3056
MIL-L-21260

- Gasoline, Automotive, Combat.
- Lubricating Oil, Internal Combustion Engine, Preservative and Break-In.

STANDARDS
MILITARY

MIL-STD-105
MIL-STD-193
MIL-STD-810
MIL-STD-45662
MS51084

- Sampling Procedures and Tables for Inspection by Attributes.
- Painting Procedures and Marking for Vehicles, Construction Equipment and Material Handling Equipment.
- Environmental Test Methods, and Engineering Guidelines.
- Calibration Systems Requirements.
- Pump, Manual, Engine Priming.

2.1.2 Other Government drawing. The following Government drawing forms a part of this specification to the extent specified herein. Unless otherwise specified, the issue shall be that in effect on the date of the solicitation.

DRAWING
ARMY

5702557

- Kit, Primer Pump Replacement.

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

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

3. REQUIREMENTS

3.1 First article. Unless otherwise specified (see 6.2), the contractor shall furnish sample units for first article inspection and approval (see 4.4). First article samples shall be inspected by the contractor under the surveillance of the Government to determine conformance to quality

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assurance provisions of this specification. First article samples shall be fully representative of priming pumps to be supplied from production tooling and facilities. Any change or deviation of production units from first article sample shall be subject to the approval of the Government.

3.2 Materials. Materials shall be as specified herein, and in applicable specifications or drawings. Materials not specifically designated shall be suitable for use in priming pumps operated over specified ranges, without any change in physical or dimensional properties that would result in operation of the units falling outside of specified limits (see 6.3).

3.2.1 Ozone resistance. When rubber components are required to be ozone resistant, the degree of resistance shall be as specified in applicable specifications or drawings.

3.3 Design and construction. Construction and assembly of pumps conforming to this specification shall be in accordance with the following military standard or drawing, as specified (see 6.2). Replacement kit 5702557 contains the basic primer pump with sleeves (MS51084-3), connecting hardware and installation instructions. The number of installed sleeves determines the capacity of the pump.

<u>Pump</u>	<u>Part No.</u>
20 cc capacity	MS51084-1
15 cc capacity	MS51084-4
10 cc capacity	MS51084-2
5 cc capacity	MS51084-3
Replacement kit for any of above:	5702557 (package contents drawing)

3.3.1 Lubrication. The plunger shall be coated with lubricant conforming to grade 30 of MIL-L-21260.

3.3.2 Spare and supplementary parts. When specified (see 6.2), spare or supplementary parts shall be furnished with each pump.

3.4 Performance.

3.4.1 Pumping resistance. The force against the knob or handle to start and to maintain plunger movement in either direction at any point in the normal stroke (not including that required to disengage from the retainer or holding device) shall not exceed 20 pounds (see 4.8.3.1).

3.4.2 Pump delivery. Pump delivery shall be not less than 95 percent (%) of the nominal capacity shown on the applicable military standard, when pumping liquid with free flow to inlet and from discharge ports, as specified in 4.8.3.2.

3.4.3 Leakage. The pump shall evidence no air leakage when subjected to 20 pounds per square inch (psi) air pressure applied to either inlet or outlet port under water (see 4.8.3.3).

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3.4.4 Low temperature operation. The pump shall meet requirements specified in 3.4.2 when operated at minus 65 degrees Fahrenheit (°F) (see 4.8.3.4).

3.4.5 Fuel effects. The pump shall operate properly, without impairment of subsequent functioning, after 16 hours exposure to effects of test fuel conforming to TT-S-735. Plunger cap and packings shall subsequently evidence no swelling, shrinking, cracking or discoloration (see 4.8.3.5).

3.4.6 Endurance. Subsequent to 20 hours of operation, the pump shall satisfy performance requirements specified in 3.4.2 (see 4.8.3.6).

3.4.7 Fungus resistance. The priming pump assembly, including accessories, shall meet the fungus resistance requirements of method 508 of MIL-STD-810 (see 4.8.3.7).

3.5 Exterior surface treatment. All exposed surfaces of the pump and its components shall be cleaned, painted or treated for corrosion resistance as specified on applicable standards or drawing or, if not so specified, in accordance with applicable provisions of MIL-STD-193.

3.6 Marking. Identification marking shall be in accordance with the applicable drawing or military standard (see 6.2).

3.7 Workmanship. Workmanship shall be of such quality that will assure a product free of burrs, rust, scratches, chips, sharp edges, loose or defective connectors or other defects which may adversely affect the serviceability or appearance of the pump.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order (see 6.2), the contractor is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or 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. The Government reserves the right to perform or witness any of the inspections set forth in the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

4.1.1 Responsibility for compliance. All items must meet all requirements of sections 3 and 5. The inspection set forth in this specification shall become a part of the contractor's overall inspection system or quality program. The absence of any inspection requirements in the specification shall not relieve the contractor of the responsibility 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.

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4.1.2 Inspection equipment. Unless otherwise specified in the contract (see 6.2), the contractor is responsible for the provision and maintenance of all inspection equipment necessary to assure that supplies and services conform to contract requirements. Inspection equipment must be capable of repetitive measurements to an accuracy of 10% of the measurement tolerance. Calibration of inspection equipment shall be in accordance with MIL-STD-45662.

4.1.2.1 Low temperature test equipment. The contractor is responsible for the provision and maintenance of temperature controlled cells and equipment for attaining and maintaining specified temperatures (see 4.8.3).

4.2 Classification of inspections:

- a. First article inspection (see 4.4).
- b. Quality conformance inspections (see 4.5).
 - 1. Examination (see 4.5.2).
 - 2. Tests (see 4.5.3).
- c. Control tests (see 4.6).

4.3 Inspection conditions. Unless otherwise specified (see 6.2), all inspections shall be conducted under the following conditions:

- a. Air temperature $77 \pm 15^{\circ}\text{F}$
- b. Barometric pressure 725 ± 50 millimeter (mm) mercury (Hg)
- 75
- c. Relative humidity $50 \pm 30\%$

4.4 First article inspection. Unless otherwise specified (see 6.2), the Government shall randomly select 3 priming pumps properly marked with identifying information from the first 20 pumps produced under the production contract (see 6.2) for first article inspection. First article samples shall be inspected as specified in table I, in the order listed in table II. Approval of the first article sample by the Government shall not relieve the contractor of his obligation to supply priming pumps that are fully representative of those inspected as a first article sample. Any changes or deviation of the production units from the first article sample shall be subject to the approval of the contracting officer.

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TABLE I. Classification of inspections.

Title	Requirement	Inspection	First article	Quality conformance		Control
				Examination	Tests	
Materials and construction	3.2 thru 3.3.2	4.8.1	X			
Defects (see table III)	3.2, 3.6 and 3.7	4.8.2	X	X		
Pumping resistance	3.4.1	4.8.3.1	X			
Pump delivery	3.4.2	4.8.3.2	X		X	X
Leakage	3.4.3	4.8.3.3	X		X	X
Low temperature	3.4.4	4.8.3.4	X			X
Fuel effects	3.4.5	4.8.3.5	X			
Endurance	3.4.6	4.8.3.6	X			X
Fungus resistance	3.4.7	4.8.3.7	X			

TABLE II. First article test schedule.

Sample	Test	
1	4.8.3.1	Pumping resistance
	4.8.3.3	Leakage
	4.8.3.2	Pump delivery
	4.8.3.4	Low temperature
	4.8.3.2	Pump delivery
	4.8.3.5	Fuel effects
	4.8.3.2	Pump delivery
2	4.8.3.2	Pump delivery
	4.8.3.6	Endurance
	4.8.3.2	Pump delivery
3	4.8.3.7	Fungus resistance

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4.4.1 First article inspection failure. Test item deficiencies found during, or as a result of, the first article test, shall be cause for rejection of the items until evidence has been provided by the contractor that corrective action has been taken to eliminate the deficiency. Any deficiency found during, or as a result of the first article test, shall be evidence that all items already produced prior to completion of the first article test are similarly deficient unless contrary evidence satisfactory to the contracting officer is furnished by the contractor. Such deficiencies on all items shall be corrected by the contractor. The Government shall not accept products until first article testing is completed to the satisfaction of the Government.

4.5 Quality conformance inspections.

4.5.1 Sampling.

4.5.1.1 Lot formation. Unless otherwise specified (see 6.2), an inspection lot shall consist of all priming pumps of one type and part number, from an identifiable production period, from one manufacturer, submitted at one time for acceptance.

4.5.1.2 Sampling for examination. Samples for quality conformance examination shall be selected in accordance with general inspection level II of MIL-STD-105.

4.5.1.3 Tests (100%). Each pump shall be subjected to tests specified in table I.

4.5.2 Examination.

4.5.2.1 Acceptable quality level. Each sample selected in accordance with 4.5.1.2 shall be examined to determine conformance to the following acceptable quality levels (AQL).

<u>Classification</u>	<u>AQL</u>
Major	1.0
Minor	2.5

4.5.2.2 Classification of defects. For examination purposes, defects shall be classified as listed in table III.

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TABLE III. Classification of defects.

Category	Defect	Method of examination
Critical	None	
Major	AQL 1.0% Defective	
101	Assembly, incomplete (see 3.3).	Visual
102	Dimensions affecting interchangeability, out of tolerance (see 3.3).	SIE <u>1</u> /
103	Cup deformed; edges irregular (see 3.3).	Visual
104	Cup not properly attached to plunger (see 3.3).	Visual
105	Burrs or roughness inside pumping chamber (see 3.3).	Visual
106	Identification marking, improper (see 3.6).	Visual
107	Faulty workmanship affecting performance (see 3.7).	Visual
Minor	AQL 2.5% Defective	
201	Dimensions not affecting interchangeability, out of tolerance (see 3.3).	SIE <u>1</u> /
202	Improper marking (see 3.6).	Visual
203	Faulty workmanship affecting appearance (see 3.7).	Visual

1/ SIE = Standard Inspection Equipment.

4.5.3 Tests.

4.5.3.1 Leakage test. All production pumps shall be subjected to, and pass, the leakage test specified in 4.8.3.3.

4.5.3.2 Pump delivery. Each sample selected in accordance with 4.5.1.3 shall be subjected to the pump delivery test as specified in 4.8.3.2, using an AQL of 1.0 on the basis of percent defective.

4.6 Control tests.

4.6.1 Sampling. Pumps shall be selected at a rate of 2 per month or 2 of every 1000 units produced, but not more than 4, nor less than 2, in any 30 day period. Each control test sample shall be identified as to production period, examined for defects specified in table III, and subjected to the following tests in the order given:

- a. Low temperature (see 4.8.3.4).
- b. Pump delivery (see 4.8.3.2).
- c. Endurance (see 4.8.3.6).
- d. Pump delivery (see 4.8.3.2).
- e. Leakage (see 4.8.3.3).

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4.7 Failure. Failure of any pump to pass any of the specified quality conformance or control tests may be cause for the Government to refuse acceptance of the production quantity represented, until action taken by the contractor to correct defects and prevent recurrence has been approved by the Government.

4.8 Methods of inspection.

4.8.1 Materials and construction. Conformance to 3.2 through 3.3.2 shall be determined by inspection of contractor records providing proof or certification that design, construction, processing and materials conform to requirements. Applicable records shall include drawings, specifications, design data, receiving inspection records, processing and quality control standards, vendor catalogs and certifications, industry standards, test reports and rating data.

4.8.2 Defects. Conformance to 3.2 through 3.3.2 shall be determined by examination for the defects listed in table III. Examination shall be visual, tactile, or by measurement with standard inspection equipment.

4.8.3 Performance. Unless otherwise specified herein, tests shall be performed with gasoline conforming to MIL-G-3056. Fuel, equipment and air shall be maintained at $77 \pm 15^{\circ}\text{F}$ for all tests except low temperature (see 4.8.3.4).

4.8.3.1 Pumping resistance. The pump shall be operated for 55 strokes, during which time the force necessary to start and maintain uniform piston movement during the suction and discharge strokes shall be measured to determine conformance to 3.4.1.

4.8.3.2 Pump delivery. The pump shall be connected to the test fuel supply and to a reservoir or receiver, with intake and discharge lines and fittings of sizes specified on the applicable military standard or drawing. The pump shall be operated at a uniform rate of 20 full strokes per minute for 5 minutes, pumping test fuel against a 20 inch suction head and a 54 inch discharge head. The next 10 strokes shall be counted and delivery volume measured for average delivery per stroke to determine conformance to 3.4.2.

4.8.3.3 Leakage. The pump, while submerged in water, shall be subjected to air pressure of 20 psi applied at the inlet port, with the outlet port plugged or blocked off. The plunger shall be drawn back to the end of the suction stroke, at which time the plunger shall be subjected to a side pressure of 5 pounds in several directions. Rising air bubbles shall indicate leakage. This test shall be repeated, except air pressure shall be applied to the outlet port, with the inlet port plugged or blocked off, and shall determine conformance to 3.4.3.

4.8.3.4 Low temperature. The pump shall be filled with test fluid conforming to P-D-680 or type II of MIL-G-3056 and shall be conditioned for 48 hours at a temperature of $\text{minus } 65 \pm 7^{\circ}\text{F}$. While at that temperature, the pump shall be tested as specified in 4.8.3.2, to determine conformance to 3.4.4.

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4.8.3.5 Fuel effects. The pump shall be tested as specified in 4.8.3.2, except the unit shall be operated for one minute using hydrocarbon test fuel conforming to type III of TT-S-735. This pumping shall be repeated at 50 minute intervals using 8 cycles. A rest period of 16 hours shall follow, during which time the test fuel shall remain in the pump. The pumping shall then be resumed until an additional 8 cycles have been completed. At this time, the pump shall be disassembled and inspected for conformance to 3.4.5.

4.8.3.6 Endurance. The pump shall be operated as specified in 4.8.3.2, except that operation shall be maintained for periods totaling 5 hours each day until 20 hours of operation have been reached. During periods of nonoperation, the pump shall remain filled with the test fuel. At the conclusion of the test, the pump capacity shall be measured as specified in 4.8.3.2, to determine conformance to 3.4.6.

4.8.3.7 Fungus resistance. To determine conformance to 3.4.7, the pump shall be tested in accordance with method 508 of MIL-STD-810. Incubation shall be for a single period of 90 days. At the conclusion of the test, the pump shall operate properly without impairment of subsequent functioning. Plunger cup and packings shall evidence no swelling, shrinkage, cracking or discoloration. Pump shall also evidence no air leakage when tested as specified in 4.8.3.3.

5. PACKAGING

5.1 Preservation, packaging, packing, and marking. Preservation, packaging, packing and marking for the desired level shall be in accordance with the applicable packaging standard or packaging data sheet specified by the contracting authority (see 6.2).

6. NOTES

6.1 Intended use. Pumps covered by this specification are intended for installation in, or as auxiliaries to, the fuel systems of vehicles, and other military equipment powered by internal-combustion engines, either during production, or in the field as part of winterization or other kits. Fuel for priming may be tank-installed to hold more volatile fuel.

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification.
- b. If first article samples are not required(see 3.1).
- c. Military standard or Army drawing number, as applicable (see 3.3).
- d. Whether and what spare parts, or fittings, if any, are to be furnished (see 3.3.2).
- e. If identification marking shall be in accordance with the drawing or military standard (see 3.6).
- f. If responsibility for inspection shall be other than as specified (see 4.1).
- g. If responsibility for inspection equipment shall be other than as specified (see 4.1.2).
- h. If inspection conditions shall be other than as specified (see 4.3).

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- i. If the number of first article samples shall be other than as specified (see 4.4).
- j. If the number of lot samples shall be other than as specified (see 4.5.1.1).
- k. Selection of applicable level and packaging standard or packaging data sheet (see 5.1).

6.3 Recycled materials. The use of recycled materials which meet the requirements of the applicable material specifications without jeopardizing the intended use of the item shall be encouraged (see 3.2).

6.4 Subject term (key word) listing.

Engine Priming Pump, Hand-Driven, (Nonaircraft) Engine
 Hand-Driven Engine Priming Pump, (Nonaircraft) Engine
 Priming Pump, Engine, Hand-Driven, (Nonaircraft) Engine

6.5 Changes from previous issue. Asterisks (or vertical lines) are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:

Army - AT
 Air Force - 99

Preparing activity:

Army - AT

(Project 2910-0185)

Review activities:

Navy - MC
 Air Force - 82
 DLA - CS

User activity:

Army - ME

(See Instructions – Reverse Side)

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)