

MIL-P-13218C  
9 March 1976  
SUPERSEDING  
MIL-P-13218B  
9 November 1964

## MILITARY SPECIFICATION

### PUMP, BUCKET, LUBRICATION, HAND-OPERATED

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

#### 1. SCOPE

1.1 Scope. This specification covers hand-operated, self-contained portable bucket pumps which dispense grease and oil from bulk or standard bucket containers.

1.2 Classification. Bucket pumps covered by this specification shall be of the following types, as specified (see 6.2):

Type I - Grease  
Type II - Oil

#### 2. APPLICABLE DOCUMENTS

2.1 Issues of documents. The following documents of the issue in effect on date of invitation for bids or request for proposal form a part of this specification to the extent specified herein.

#### SPECIFICATIONS

##### FEDERAL

QQ-S-781	- Strapping, Steel, and Seals.
PPP-B-601	- Boxes, Wood, Cleated-Plywood.
PPP-B-621	- Boxes, Wood, Nailed and Lock-Corner.
PPP-B-636	- Boxes, Shipping, Fiberboard.
PPP-T-60	- Tape: Packaging, Waterproof.

##### MILITARY

MIL-P-116	- Preservation-Packaging, Methods of.
MIL-B-121	- Barrier Material, Greaseproofed, Waterproofed, Flexible.

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MIL-L-2105	- Lubricating Oil, Gear, Multipurpose.
MIL-H-3868	- Hose Assemblies, Grease Gun, High and Low Pressure.
MIL-L-4387	- Lubrication Dispensing Equipment Accessories.
MIL-G-10924	- Grease, Automotive and Artillery.
MIL-H-13444	- Hose, Rubber: Fuel and Oil.

## STANDARDS

### FEDERAL

FED. STD. No. 356	- Commercial Packaging of Supplies and Equipment.
FED. STD. No. 595	- Colors.

### MILITARY

MIL-STD-105	- Sampling Procedures and Tables for Inspection by Attributes.
MIL-STD-129	- Marking for Shipment and Storage.
MIL-STD-130	- Identification Marking of US Military Property.

(Copies of specifications and standards required by contractors in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or request for proposal shall apply.

#### AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

B46.1 - Surface Roughness, Waviness and Lay.

(Application for copies should be addressed to the American National Standards Institute, 1430 Broadway, New York, NY 10018.)

#### NATIONAL BUREAU OF STANDARDS (NBS)

Handbook H28 - Screw-Thread Standards for Federal Services.

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

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(Technical society and technical association specifications and standards are generally available for reference from libraries. They are also distributed among technical groups and using Federal agencies.)

### 3. REQUIREMENTS

3.1 Description. The two types of self-contained, hand-operated bucket pumps shall consist of a pressure pump, lubricant container, and hose assembly, and other components such as nozzle, follower plate, foot step, and casters as specified herein for dispensing grease or oil, as applicable.

3.2 First article (preproduction model). The contractor shall furnish one or more bucket pumps as specified (see 6.2) for examination and testing within the time frame specified (see 6.2) to prove prior to starting production that his production methods and choice of design detail will produce bucket pumps that comply with the requirements of this specification. Examination and tests shall be as specified in Section 4 and shall be subject to surveillance and approval by the Government (see 6.3).

3.3 Material. Material shall be as specified herein. Materials not specified shall be selected by the contractor and shall be subject to all provisions of this specification.

#### 3.4 Environmental conditions.

3.4.1 Storage temperature. The bucket pumps shall be capable of withstanding storage, without damage, in a temperature of minus 30° F for a minimum period of 72 hours and in a temperature of plus 160° F for a period of 8 hours. Following these extreme temperature conditions, the bucket pumps shall perform in accordance with Table I for discharge capacity at 70° F when tested in accordance with 4.5.2.1 and 4.5.2.2.

3.4.2 Humidity conditions. The bucket pumps shall withstand exposure, without damage, to 20 hours of relative humidity between 93 and 97 percent at air temperatures from plus 80° F to plus 85° F, followed by 4 hours of 100 percent relative humidity with condensation at plus 75° F to plus 80° F. Following the humidity test, the bucket pumps shall perform in accordance with Table I when tested in accordance with 4.5.2.3.

3.4.3 Operating temperature. The bucket pumps shall operate effectively while being subjected to an operating temperature of minus 25° F to plus 110° F when tested in accordance with 4.5.2.4, 4.5.2.5, and 4.5.2.6.

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3.5 Construction. The bucket pumps shall be constructed to withstand operation and service without malfunction or permanent deformation and shall meet the discharge capacity requirements specified in Table I. All components subject to wear, breakage, or distortion shall be accessible for adjustment and repair.

TABLE I. Discharge capacity requirements.

Function	Requirements		Test Paragraph
	Type I	Type II	
Min. rate of discharge at 70° F.	8 oz. per minute with max. of 50 strokes.	2-1/2 lb. per minute with max. of 50 strokes.	4.5.2.4
Min. rate of discharge at 0° F.	7 oz. per minute with max. of 50 strokes.	1-3/4 lb. per minute with max. of 50 strokes.	4.5.2.5
Min. rate of discharge at minus 25° F.	4 oz. per minute with max. of 50 strokes.	1 lb. per minute with max. of 50 strokes.	4.5.2.6
Min. rate of discharge at back pressure of 5000 psig and temperature of 70° F.	1 oz. in not more than 30 seconds with continuous pumping.	No requirement.	4.5.2.7
Max. static pressure developed by pressure pump at all specified temperatures.	7000 psig	500 psig	4.5.2.8

3.5.1 Fastening devices. All screws, pins, bolts, and similar parts shall be installed with positive means of locking to prevent loosening due to operation. All such parts that are subject to removal or adjustment shall not be swaged, peened, staked, or otherwise permanently fastened.

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3.5.1.1 Threaded parts. Threads shall conform to NBS Handbook H28 except as specified herein.

3.5.2 Seals. All sealing members, gaskets, and packings shall be grease resistant and shall withstand prolonged storage. Seals shall not be damaged or deteriorate when the bucket pumps are tested as specified in 4.5.2.1, 4.5.2.2, and 4.5.2.3.

3.5.3 Pressure pump. The pressure pump shall be a hand-operated type with a priming device and shall be capable of continuous lubricant delivery in accordance with Table I. The head shall be of sufficient size and strength to withstand maximum pumping pressures. The pump shall have an NPTF internally threaded connection of the size specified herein. When packings are provided, they shall be of a type that will insure maximum life and retain grease at the high pressure and temperature range to which they will be subjected. All moving surfaces contacting the packings shall be finished to a surface roughness not exceeding 32 microinches. The piston and cylinder contacting each other within the pump chamber shall be constructed of surface-hardened metal with a surface roughness not exceeding 16 microinches. Surface roughness shall be determined in accordance with ANSI B46.1.

3.5.4 Containers. The containers shall be made of not less than 16 gage steel (0.0598 nominal thickness). The containers shall be grease-tight or oiltight, as applicable.

3.5.4.1 Container cover. A removable leakproof metal cover with means to fasten the cover to the container shall be provided. The cover shall not loosen during operation. The cover shall support the pump, and the pump head shall fasten securely to the cover and shall not work loose during operation.

3.5.4.2 Container seal. A synthetic rubber seal shall be provided between the container and cover.

3.5.5 Linkages and gears. All linkages shall be steel. All gears, when furnished, shall be steel. The gears shall be covered to prevent injury to the operator and to protect gears from the elements.

3.5.6 Handles. When specified (see 6.2), the bucket pump shall be provided with steel handles. The handles shall be properly spaced to permit two men to carry the bucket pump.

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3.5.7 Casters. When specified (see 6.2), four antifriction bearing-type steel casters shall be mounted to the bottom of the bucket pump containers. The casters shall be 1-1/2 to 3 inches in diameter, with a tread width of 1/2 to 1-1/2 inches. A suitable locking device shall be provided to secure two of the casters.

3.5.8 Foot step. A foot step of adequate size and strength shall be secured to the bottom of the container or caster mounting to enable holding the unit to the floor by foot pressure while operating the pump or when removing the cover and pump assembly.

3.6 Interchangeability. All parts having the same part number shall be functionally and dimensionally interchangeable. Interchangeable parts are defined as two or more like parts possessing such functional and physical characteristics as to be equivalent in performance and durability, and capable of being exchanged one for the other without alteration of the parts themselves or of adjoining parts, except for adjustment, and without selection for fit or performance.

3.7 Identification marking. The bucket pumps shall be marked in accordance with MIL-STD-130.

3.8 Treatment and painting. The bucket pumps shall be finished in accordance with the manufacturer's commercial practice. When painted, the color shall be gray in accordance with FED. STD. No. 595, Color No. 16187. Exposed bare metal and working surfaces for which painting is not suitable, and where parts involved are not made of corrosion-resisting materials, shall be properly coated or covered with a chemical or electrochemical finish or with other suitable finishes.

3.9 Type I - Grease.

3.9.1 Container. The container for Type I bucket pumps shall be capable of holding 35-pound standard grease pails.

3.9.2 Follower plate. A metal follower plate shall be furnished to fit over the pump tube and shall be provided with a seal around the pump tube that shall act as a guide or shall be provided with a guide bushing having a sliding fit on the pump tube. The follower plate shall aid pump priming and pump suction, and shall remove the lubricant from the container walls as it descends.

3.9.3 Pump outlet. The Type I pump outlet shall be a 1/4-18 NPTF internally threaded connection.

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3.9.4 Hose assembly. The hose assembly shall conform to MIL-H-3868, Type I, Style 3, Grade B. The hose shall be 10 feet long, 3/8 inch inside diameter, with a 1/2-27 NPTF externally threaded fitting on one end and a 1/2-27 NPTF internally threaded fitting on the other end.

3.9.5 Swivels. Two universal Z-type swivels shall be attached to the hose. One swivel shall have a 1/4-18 NPTF external thread on one end and a 1/2-27 NPTF internal thread on the other end. The other swivel shall have a 1/8-27 NPTF internal thread on one end and a 1/2-27 NPTF external thread on the other end.

3.9.6 Nozzle. The nozzle shall be of the T-handle type, conforming to MIL-L-4387, Type III, Class 1, having a minimum extension of 6 inches and a hydraulic coupler.

### 3.10 Type II - Oil.

3.10.1 Foot valve. The pump shall be furnished with a foot valve attached to the inlet end of the pump tube. The foot valve shall aid pump priming and assure free lubricant flow.

3.10.2 Container. The container for Type II bucket pumps shall be capable of holding 35 pounds of oil, bulk packing.

3.10.3 Pump outlet. The Type II pump outlet shall be a 1/4-18 NPTF internally threaded connection.

3.10.4 Hose assembly. The hose assembly shall conform to MIL-H-13444, Type I or Type II. The hose shall be 5 feet long, 1/2 inch inside diameter, with a 1/4-18 NPTF brass or bronze internally threaded fitting on one end and a 1/4-18 NPTF brass or bronze externally threaded fitting on the other end.

3.10.5 Nozzle. The nozzle shall be of the gooseneck type. The nozzle outlet shall be provided with either a cap or an automatic antidrip tip, as specified (see 6.2). The cap shall prevent entrance of dirt and other foreign matter and shall be secured to the nozzle by a chain. The nozzle inlet shall have a 1/4-18 NPTF externally threaded fitting.

3.10.6 Swivel. A straight swivel shall be attached to the inlet side of the nozzle. The swivel shall have a 1/4-18 NPTF internally threaded fitting on one end and a 1/4-18 NPTF externally threaded fitting on the other end.

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3.11 Workmanship. The bucket pumps and all component parts shall be fabricated free from any defects which could affect reliability, strength, or serviceability.

3.11.1 Castings and forgings. All parts and components of the bucket pumps which include castings and forgings shall be clean of harmful extraneous material such as sand, dirt, sprues, scale, and flux. Rework shall be limited to procedures which do not reduce mechanical properties or affect function. Processes which include peening or plugging on castings or forgings for reclaiming parts shall not be permitted without the permission of the contracting officer.

3.11.2 Welding. The surface of parts to be welded shall be free from rust, scale, paint, grease, mill scale that can be removed by chipping and wire brushing, and other foreign matter. Parent materials, weld filler metals, and fabrication techniques shall be as required to enable the bucket pump to conform to the examination and test requirements specified in Section 4. Unless otherwise specified (see 6.2), the welding process used in fabrication of the bucket pump shall be at the option of the contractor.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract, the contractor is responsible for the performance of all inspection requirements specified herein. Except as otherwise specified in the contract, 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 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 Component and material inspection. The contractor is responsible for insuring that components and materials used are manufactured, examined, and tested in accordance with referenced specifications and standards, as applicable.

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

- (a) Preproduction inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).
- (c) Inspection of packaging (see 4.6).



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#### 4.3 Preproduction inspection.

4.3.1 Examination. The preproduction bucket pump shall be examined as specified in 4.5.1. Presence of one or more defects shall be cause for rejection.

4.3.2 Tests. The preproduction bucket pump shall be tested as specified in 4.5.2.1 through 4.5.2.8, except that 4.5.2.7 shall not be performed for Type II bucket pumps. Failure of any test shall be cause for rejection.

#### 4.4 Quality conformance inspection.

4.4.1 Sampling. Sampling for examination and tests shall be in accordance with MIL-STD-105.

##### 4.4.2 Examination.

4.4.2.1 Samples. Samples selected in accordance with 4.4.1 shall be examined for the major and minor defects specified in 4.5.1. AQL shall be 2.5 percent defective for major defects and 4.0 percent defective for minor defects.

##### 4.4.3 Tests.

4.4.3.1 Samples. Samples selected in accordance with 4.4.1 shall be tested as specified in 4.5.2.4, 4.5.2.7, and 4.5.2.8 for Type I, and 4.5.2.4 and 4.5.2.8 for Type II bucket pumps. AQL shall be 4.0 percent defective.

#### 4.5 Inspection procedure.

4.5.1 Examination. The bucket pump shall be examined as specified herein for the following defects:

##### Major

101. Material not as specified.
102. Components missing, fractured, split, cut, punctured, dented, deteriorated, malformed, or otherwise impaired.
103. Parts missing or not as specified.
104. Parts subject to removal or adjustment not accessible, or swaged, peened, staked, or otherwise permanently deformed.

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- 105. Threads not as specified.
- 106. Linkages and gears, when furnished, not covered or not as specified.
- 107. Handles, when specified, not as required.
- 108. Casters, when specified, missing or not as required.
- 109. Foot step missing or not as specified.
- 110. Workmanship not as specified.

Minor

- 201. Treatment and painting not as specified.
- 202. Marking not as specified.

4.5.2 Tests.

4.5.2.1 Cold storage. The bucket pump shall be conditioned at a temperature of minus 30° F, plus or minus 5° F, for a period of 72 hours. At the end of this time, the unit shall be removed and allowed to stabilize at a temperature of plus 70° F, plus or minus 5° F, and then inspected for evidence of damage and tested for performance in accordance with 4.5.2.4. Nonconformance to 3.4.1 shall constitute failure of the test.

4.5.2.2 Hot storage. The bucket pump shall be conditioned at a temperature of plus 160° F, plus or minus 5° F, for a period of 8 hours. The bucket pump shall then be removed and allowed to stabilize at a temperature of 70° F, plus or minus 5° F. It shall then be inspected for evidence of damage and tested for performance in accordance with 4.5.2.4. Nonconformance to 3.4.1 shall constitute failure of the test.

4.5.2.3 Humidity exposure. The bucket pump shall be subjected to a relative humidity test of 93 to 97 percent at air temperatures of plus 80° F to 85° F for 20 hours, followed by four hours of 100 percent relative humidity with condensation at plus 75° F to plus 80° F. At the conclusion of the humidity test, the bucket pumps shall be inspected for evidence of damage and tested for performance in accordance with 4.5.2.4. Nonconformance to 3.4.2 shall constitute failure of the test.

4.5.2.4 Rate of discharge at 70° F. The bucket pump shall be loaded with Grade 80 gear lubricant conforming to the requirements of MIL-L-2105 and stabilized at a temperature of 70° F, plus or minus 5° F. A clean receptacle shall be weighed and the weight recorded. The receptacle shall then be placed at the coupler end of the hose and

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the bucket pump shall be operated for 3 minutes under the conditions specified in Table I for the particular type or class. Receptacles and discharge grease shall then be weighed. Nonconformance to Table I or 3.4.3 shall constitute failure of the test.

4.5.2.5 Rate of discharge at 0° F. The procedure shall be as specified in 4.5.2.1, except that the bucket pump and lubricant shall be chilled to a temperature of 0° F, plus or minus 5° F, in a cold chamber until stabilized.

4.5.2.6 Rate of discharge at minus 25° F. The procedure shall be as specified in 4.5.2.1, except that the bucket pump and lubricant shall be chilled to a temperature of minus 25° F, plus or minus 5° F, in a cold chamber until equilibrium is established.

4.5.2.7 Back pressure for Type I bucket pumps. The coupler at the end of the hose shall be attached to a lubricating fitting mounted on a pressure gage of not less than 10,000 psi in dial reading, with adjustable pressure valve. The pressure valve shall be adjusted to a back pressure of 5000 psig at the coupler end of the hose. The bucket pump shall be loaded with grease conforming to the requirements of MIL-G-10924, and the pressure pump shall be operated in a continuous pumping period of not more than 30 seconds. Receptacles and discharge grease shall then be weighed. The back pressure test shall be conducted at a temperature of 70° F, plus or minus 5° F. Nonconformance to Table I shall constitute failure of the test.

4.5.2.8 Static pressure. The coupler at the end of the hose of the Type I bucket pump shall be attached to a lubricating fitting mounted on a pressure gage of not less than 10,000 psi in dial reading. The gooseneck nozzle of the Type II bucket pump shall be removed and the swivel on the end of the hose shall be attached to the pressure gage mentioned above. The pressure pump shall be operated until pressure indicated in Table I is registered on gage dial, at which time the coupler and hose joints shall be inspected for evidence of leakage. Nonconformance to Table I shall constitute failure of the test.

4.6 Inspection of packaging.

4.6.1 Quality conformance inspection of pack.

4.6.1.1 Unit of product. For the purpose of inspection, a completed pack prepared for shipment shall be considered a unit of product.

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4.6.1.2 Sampling. Sampling for examination shall be in accordance with MIL-STD-105.

4.6.1.3 Examination. Samples selected in accordance with 4.6.1.2 shall be examined for the following major defects. AQL shall be 2.5 percent defective.

- 111. Materials, methods, or containers not as specified. Each incorrect material, method, or container shall constitute one defect.
- 112. Disassembly not as specified for Level A.
- 113. Unprotected metal surfaces not preserved as specified for Level A.
- 114. Pump not preserved as specified for Level A.
- 115. Technical publications not preserved as specified for Level A.
- 116. Consolidation not as specified.
- 117. Fiberboard boxes not closed as specified for Level A or B.
- 118. Strapping not as specified for Level A or B.
- 119. Marking illegible, incorrect, or incomplete.

## 5. PACKAGING

5.1 Preservation-packaging. Preservation shall be Level A or Commercial, as specified (see 6.2).

### 5.1.1 Level A.

5.1.1.1 Disassembly. The casters, when provided (see 3.5.7 and 6.2), the pump, hoses, and any other parts that can be removed to effect a reduction in cube or which are vulnerable to damage and which can be reinstalled without special tools shall be disassembled from the basic unit. Removed nuts, bolts, washers, and screws shall be reinstalled in one of the mating parts and secured to prevent their loss, or they shall be preserved in accordance with MIL-P-116, Method IC-1.

5.1.1.2 Unprotected metal surfaces. All unprotected exterior metal surfaces of bolts, nuts, brackets, fittings, gears, linkages, and any other exterior surfaces requiring application of a contact preservative in accordance with MIL-P-116 shall be coated with Type P-1 preservative.

5.1.1.3 Pump. The interior surfaces of the pump shall be coated with Type P-10, Type I, Grade 10 preservative. The pump shall be operated

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to insure complete coverage of all interior surfaces. The excess preservative shall be allowed to drain. All openings shall be closed with tape conforming to PPP-T-60, Type IV.

5.1.1.4 Technical publications. Technical publications shall be preserved in accordance with MIL-P-116, Method IC-1.

5.1.1.5 Consolidation. The removed pump, casters, and all other removed parts shall be placed inside the container. Cushioning shall be provided to prevent movement or damage of the items inside the container. The cover shall be installed on the container and any openings shall be covered with tape conforming to PPP-T-60, Type IV, or barrier material conforming to MIL-B-121, Type I, Grade A, Class 2. The barrier material shall be secured to the container with tape as specified herein. Each complete unit shall be placed in a close-fitting box conforming to PPP-B-636, Class Weather Resistant, grade as applicable to the weight of the items. The box shall be closed in accordance with Method V of the appendix to the box specification.

5.1.2 Commercial. The pumps shall be preserved in accordance with FED. STD. No. 356.

5.2 Packing. Packing shall be Level A, B, or Commercial, as specified (see 6.2).

5.2.1 Level A. Preserved pumps of like description shall be packed in wood boxes conforming to PPP-B-601, Overseas Type, style optional, Grade B, or PPP-B-621, Class 2, style optional. Strapping shall conform to QQ-S-781, Class 1, Type I or IV, size as applicable. Unless otherwise specified (see 6.2), strapping shall be Finish B. When specified (see 6.2), strapping shall be Finish A.

5.2.2 Level B. Preserved pumps of like description shall be packed in boxes as specified in 5.2.1 for Level A, except that the boxes shall be Domestic Type. Strapping shall be either Finish A or B. As an alternative, boxes shall conform to PPP-B-636, V3c or equivalent. Fiber-board boxes shall be closed in accordance with Method V of the appendix to the box specification.

5.2.3 Commercial. Preserved pumps of like description shall be packed in accordance with FED. STD. No. 356.

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### 5.3 Marking.

5.3.1 Levels A and B. Levels A and B marking shall be in accordance with MIL-STD-129.

5.3.2 Commercial. Commercial marking shall be in accordance with FED. STD. No. 356.

## 6. NOTES

6.1 Intended use. The bucket pumps covered by this specification are intended to be used for the lubrication of vehicles and other equipment as follows:

- (a) Type I bucket pump is a high-pressure unit to be used where high pressure is required to lubricate, and to load hand-operated grease guns.
- (b) Type II bucket pump is a low-pressure unit to be used for the lubrication of transmission and gear differentials.

6.2 Ordering data. Procurement documents should specify the following:

- (a) Title, number, and date of this specification.
- (b) Type of bucket pump required (see 1.2).
- (c) Time frame required for submission of preproduction model, and number of bucket pumps required (see 3.2).
- (d) When steel handles are required (see 3.5.6).
- (e) When casters are required (see 3.5.7).
- (f) Whether nozzle outlet shall be provided with a cap or an automatic antidrip tip (see 3.10.5).
- (g) When welding process is not at the option of the contractor (see 3.11.2).
- (h) Degree of preservation and packing required (see 5.1 and 5.2).
- (i) When strapping shall be other than specified (see 5.2.1).

6.3 Preproduction model. Any changes or deviations of production bucket pumps from the approved preproduction model during production will be subject to the approval of the contracting officer. Approval of the preproduction model will not relieve the contractor of his obligation to furnish bucket pumps conforming to this specification.

6.4 Data requirements. The contracting officer should include requirements for such data as technical publications to be furnished with each bucket pump.

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6.5 Classification change. Type I, Class 2, bucket pump has been discontinued since it is no longer required. Type I, Class 1, bucket pump has been redesignated as Type I.

Custodians:

Army - ME

Navy - YD

Air Force - 82

Preparing activity:

Army - ME

Review activity:

DSA - CS

User activity:

Navy - MC

Project No. 4930-0265

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