

INCH-POUND

MIL-PRF-32104

28 July 2010

SUPERSEDING

A-A-59404

17-FEB-1999

## PERFORMANCE SPECIFICATION

### MOBILE HYDRAULIC OIL DISPENSER

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 portable self-contained unit (hereafter called “servicing unit”) that supplies clean filtered fluid to an aircraft reservoir and to related ground support equipment.

#### 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3, 4 and 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 the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3, 4 and 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.

#### FEDERAL STANDARDS

FED-STD-595/26173 Gray, Semigloss

Comments, suggestions, or questions on this document should be addressed to: WR-ALC/642 CBSG/GBEC, Robins AFB GA 31098-1813. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.daps.dla.mil/online>.

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## DEPARTMENT OF DEFENSE SPECIFICATIONS

MIL-DTL-0053030	Primer Coating, Epoxy, Water Reducible, Lead and Chromate Free
MIL-DTL-5541	Chemical Conversion Coatings on Aluminum and Aluminum Alloys
MIL-DTL-81706	Chemical Conversion Materials for Coating Aluminum and Aluminum Alloys
MIL-PRF-23377	Primer Coatings: Epoxy, High-Solids
MIL-PRF-26915	Primer Coating, for Steel Surfaces
MIL-PRF-5606	Hydraulic Fluid, Petroleum Base, Aircraft, Missile, and Ordnance
MIL-PRF-83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code H-537
MIL-PRF-85285	Coating: Polyurethane, Aircraft and Support Equipment
MIL-PRF-87257	Hydraulic Fluid, Fire Resistant; Low Temperature Synthetic Hydrocarbon Base, Aircraft and Missile

## DEPARTMENT OF DEFENSE STANDARDS

MIL-STD-810	Environmental Engineering Considerations and Laboratory Tests
MIL-STD-882	System Safety
MIL-STD-889	Dissimilar Metals

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 these documents are those cited in the solicitation or contract.

## SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE-AS8090	Equipment, Towed Aerospace Ground, Mobility
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(SAE documents may be obtained at <http://www.sae.org/servlets/index> or from SAE, Inc., 400 Commonwealth Drive, Warrendale PA 15096.)

## Eaton Corporation

145-S5-16D	Coupling Half, Quick Disconnect
155-S5-12D	Coupling Half, Quick Disconnect

(Application for additional information should be addressed to Eaton Corporation, 300 S East Ave, Jackson, MI 49203-1973, [www.eaton.com](http://www.eaton.com) (Aeroquip))

2.4 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence. Nothing in this document,

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however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

### 3. REQUIREMENTS

3.1 First article. When specified (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Servicing unit description. The servicing unit shall be portable, self-contained and designed for use with MIL-PRF-5606, MIL-PRF-87257 and MIL-PRF-83282 hydraulic fluids, capable of providing filtered flows to 7 gallons per minute (gpm) at pressures to 300 pounds per square inch gage (psig). The pump is driven and operated by nitrogen.

3.3 Performance. The nitrogen storage capacity, to drive the pump, shall be enough to provide complete draining of the servicing unit's 50 gallon oil dispenser reservoir. All components shall be housed within a weather-proof steel cabinet that shall be mounted on a pneumatic three-wheel type cart assembly. Operating controls and indicators shall be mounted on the control panel and inside the cabinet under the selector valve cover. The control panel shall display readings for the nitrogen bottles, regulator, pump drive, filter inlet, filter outlet, and pressure by-pass. A charging port for the nitrogen tanks shall also be provided. Flexible hoses are to be provided to fill the cart hydraulic oil reservoir and aircraft reservoir. Maneuverability shall be provided by a tow bar assembly for the front wheels. Hinge covers shall provide access to the reservoir fill and all components for maintenance and inspection. The unit's reservoir for the medium shall be capable of storing 50 gallons (+/- 2 gallons). The reservoir shall include two quick disconnect points (Eaton Corp, Commercial and Government Entity (CAGE) 00624, P/N 145-S5-16D or equivalent and P/N 155-S5-12D or equivalent) for attaching a hydraulic purifier. The capability of the filter unit shall be 3 microns absolute in a non-bypass filter housing and it shall have a disposable AN type element. The capacity of the two nitrogen tanks shall be 510 cubic inches (min) each at a maximum pressure of 2200 psig (storage) and 40 psig (driving). The pump shall be air (nitrogen) operated and shall be reciprocating with a 6.8:1 ratio. The hose supply (to aircraft) shall be 0.50 inch diameter x 20 ft long and the stand fill shall be 0.75 inch diameter x 8 ft long.

3.3.1 Physical characteristics. The servicing unit shall be a maximum of 75 inches in length, 38 inches in width, and 54 inches in height. The unit shall weigh not more than 2000 pounds (empty)

3.3.2 Cart assembly. The servicing unit shall be built on a pneumatic three-wheel type cart assembly that shall be capable of being towed at 10 mph over improved surfaces. The cart shall meet the mobility requirements of SAE-AS8090, Type I, Class 2, Group C. Cart shall include a parking brake. Cart shall not include fenders, mud flaps and bumper.

3.4 Service life. The service life (out-of container) shall be no less than 15 years with regular maintenance as specified by the manual.

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3.5 Maintainability. The unit shall be capable of being maintained and operated with minimal special tools and with commonly sized wrenches and tools found in a typical mechanic's tool box. If special tools are required they shall be provided with each unit. The recommended preventive maintenance interval (PMI) shall be at least 750 operating hours. Preventive maintenance tasks shall not require more than 8 hours.

3.6 Environmental requirements.

3.6.1 Operating temperatures. The servicing unit shall be capable of performing as specified herein in ambient temperatures between -40° and +140°F.

3.6.2 Humidity. Operation or storage in any relative humidity up to and including 100% shall not damage the pump unit; including conditions where condensation takes place in the form of water and frost.

3.6.3 Sand and dust. The servicing unit shall not be damaged by operation or storage in atmospheres containing sand and dust particles as encountered in desert areas.

3.6.4 Salt fog. The pump unit shall not be damaged by operation or storage in atmospheres containing salt-laden moisture such as encountered near bodies of salt water and in transportation on shipboard.

3.6.5 Storage environment. The unit shall be capable of meeting the requirements of this specification (first article testing) after being subjected to each of the following environmental conditions: Air temperature -60° to +160°F; relative humidity 5% to 99%; atmospheric pressure 28 to 31.4 inches of mercury. Exposure to each of these conditions should be for a minimum of 48 hours. The contractor's test plan shall detail the specific parameters and methods for conducting the storage environment test.

3.7 Protective coatings. Materials that deteriorate when exposed to sunlight, weather, or operational conditions normally encountered during the service life of the item shall not be used or shall have means of protection against such deterioration that does not prevent compliance with the performance requirements specified herein. Protective coatings that chip, crack, or scale with age or extremes of climatic conditions or when exposed to heat shall not be used. Fasteners, handles, and fittings used in the assembly of the item shall also be primed and painted.

3.7.1 Surface preparation and pretreatment. Surface preparation and pretreatment shall be in accordance with the respective primer and topcoat specifications. Structures shall be cleaned and degreased and scuffed or blasted prior to priming; primer shall be applied before any oxidation or rusting occurs. Aluminum surfaces shall have MIL-DTL-81706, Type II, Class 1A, and MIL-DTL-5541, Type II, Class 1A, chemical conversion coating applied in accordance with the manufacturer's directions prior to priming.

3.7.2 Primer. Raw metal edges, to include fastener and drain holes, shall be coated with primer before applying topcoat.

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3.7.2.1 Ferrous surfaces. Ferrous structures and surfaces shall be primed with a water reducible zinc rich primer in accordance with MIL-PRF-26915, Type II, Class B; this shall be followed, within four hours, by a coat of MIL-DTL-0053030 intermediate primer in a wet-to-wet primer application. This two part primer system shall yield a dry-film thickness of 2.0-2.5 mils for the zinc primer and 0.9 to 1.1 mils for the intermediate primer. The two-primer system shall be allowed to dry and fully cure in accordance with the primer manufacturer's directions prior to top coating.

3.7.2.2 Aluminum and mixed aluminum and ferrous surfaces. Aluminum and mixed aluminum and ferrous structures and surfaces shall be primed with an epoxy primer, Type II, Class N of MIL-PRF-23377. This single part primer system shall yield a dry-film thickness of 0.6 to 0.8 mils.

3.7.3 Topcoat. Topcoat shall be polyurethane in accordance with Type I, Class H of MIL-PRF-85285. Neither Chemical Agent Resistant Coating (CARC) nor powder coating shall be used. Topcoat shall be applied to a dry film thickness of 1.6 to 2.4 mils in all instances, regardless of the primer system utilized. The coating shall be free from runs, sags, orange peel, or other defects.

3.7.4 Dissimilar metals. Dissimilar metals, as defined in MIL-STD-889, shall not be in contact with each other. Metal plating or metal spraying of dissimilar base metals to provide electromotively compatible abutting surfaces is acceptable. The use of dissimilar metals only when separated by suitable insulating material is permitted, except in systems where bridging of insulation materials by an electrically conductive fluid can occur. Sealants or gel type gasket materials shall be used between faying surfaces and butt joints.

3.7.5 Finish. The exterior finish color of the servicing unit shall be gray, semigloss, Color Number 26173 of FED-STD-595.

3.8 Safety. The design of the servicing unit shall not contain any system safety mishap risk categories greater than low as defined in Table A-IV of MIL-STD-882. The units shall comply with the Federal OSHA requirements in effect as of the date the proposal is issued. In the event that state and local OSHA regulations are also in effect, the Federal OSHA regulation shall take precedence. A safety report shall be submitted on the units' operational safety.

3.9 Workmanship. The servicing unit, including all parts and accessories, shall be constructed and finished in a thoroughly workmanlike manner. Workmanship objectives shall include freedom from blemishes, defects, burrs and sharp corners and edges; accuracy of dimensions, surface finish, and radii of fillets; thoroughness of welding, painting, and riveting; marking of parts and assemblies; and proper alignment of parts and tightness of assembly fasteners.

3.9.1 Bolted connections. Bolt holes shall be accurately punched or drilled and shall be deburred. Threaded fasteners shall be tight and shall not work loose during testing or service usage.

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3.9.2 Riveted connections. Rivet holes shall be accurately punched or drilled and shall be deburred. Rivets shall be driven with pressure tools and shall completely fill the holes. Rivet heads shall be full, neatly made, concentric with the rivet holes and in full contact with the surface of the component.

3.9.3 Cleaning. The servicing unit shall be thoroughly cleaned. Loose, spattered, or excess solder; welding slag; stray bolts, nuts, and washers; rust; metal particles; pipe compound; and other foreign matter shall be removed during and after final assembly.

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

#### 4. VERIFICATION

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

- a. First article inspection (see 4.2).
- b. Conformance inspection (see 4.3).

4.2 First article inspection. The first article servicing unit shall be subjected to the examinations, tests, and analyses described in 4.5.1 through 4.5.5.5.

4.3 Conformance inspection. Each production servicing unit shall be subjected to the examination described in 4.5.1.

4.4 Inspection requirements.

4.4.1 General inspection requirements. Apparatus used in conjunction with the inspections specified herein shall be laboratory precision type, calibrated at proper intervals to ensure laboratory accuracy.

4.4.2 Data. During all testing herein, at least the following data, unless not applicable, shall be recorded at intervals not to exceed 30 minutes. Additional data and/or shorter intervals shall be provided as appropriate for any specific test.

- a. Date.
- b. Time started.
- c. Time finished.
- d. Ambient temperature.

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4.4.3 Test rejection criteria. Throughout all tests specified herein, the servicing unit shall be closely observed for the following conditions, which shall be cause for rejection:

- a. Failure to conform to design or performance requirements specified herein or in the contractor's technical proposal.
- b. Any spillage or leakage of any liquid, including lubricant or hydraulic fluid, under any condition, except as allowed herein.
- c. Structural failure of any component, including permanent deformation, or evidence of impending failure.
- d. Evidence of excessive wear.
- e. Interference between servicing unit components or between the servicing unit the ground, and all required obstacles, while traversing all required terrain.
- f. Conditions that present a safety hazard to personnel during operation, servicing, or maintenance.
- g. Evidence of corrosion or deterioration.

4.5 Test methods.

4.5.1 Examination of product. Each servicing unit shall be examined to verify compliance with the requirements herein. A contractor-generated, Government-approved checklist that identifies each relevant requirement not verified by a test or analysis and the inspection results shall be used. Particular attention shall be given to materials, workmanship, dimensions, surface finishes, protective coatings and sealants and their application, welding, fastening, and markings. Proper operation of each servicing unit function shall be verified. Each production servicing unit shall be inspected to a Government-approved reduced version of the checklist.

4.5.2 Pressure and flow test. The unit shall be tested to demonstrate compliance with a maximum 300 psig pressure requirement and a maximum 7 gpm flow rate (Para 3.2). The pressure requirement shall be measured at three intervals of five minutes each and the flow rate shall be measured at three intervals of five minutes each. The test shall be conducted using certified calibrated gages and flow meters. The calibration certifications for the gages and meters shall be available for Government viewing.

4.5.3 Filter test. The filter capability may be demonstrated by certification for the filter, or by actually running the unit for 3 cycles of 30 minutes each and evaluation of the fluid after each cycle. The fluid shall not exhibit contaminants larger than 3 microns.

4.5.4 Mobility test. With the unit at capacity, the horizontal breakaway force required to manually move the unit forward from rest on a smooth, dry level paved surface shall not exceed 120 pounds. The force required to redirect (move) the unit tow bar steering mechanism-front wheel assemblies shall not exceed 65 pounds. The unit shall be capable of attaining the speed of

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10 mph over improved surfaces without damage to the unit and without working loose of the components. The mobility tests include the unit being towed for two sequences of 30 minutes each. The unit shall be inspected for damage and loose components after each test.

#### 4.5.5 Environmental testing.

4.5.5.1 High temperature storage and operation test. A first article servicing unit shall be tested in accordance with MIL-STD-810, Method 501.5, Procedures I and II, to demonstrate compliance with the high temperature storage and operating requirements of 3.6.1 and 3.6.5. Test duration shall be one 24-hour cycle for each procedure.

4.5.5.2 Low temperature storage and operation test. A first article servicing unit shall be tested in accordance with MIL-STD-810, Method 502.5, Procedures I and II, to demonstrate compliance with the low temperature storage and operating requirements of 3.6.1 and 3.6.5. Test duration shall be one 24-hour cycle for each procedure.

4.5.5.3 Rain test. A first article servicing unit shall be tested in accordance with MIL-STD-810, Method 506.5, Procedure I, to demonstrate compliance with 3.6.2.

4.5.5.4 Salt fog test. A first article servicing unit shall be tested in accordance with MIL-STD-810, Method 509.5, to demonstrate compliance with 3.6.4. Test duration shall be alternating 24-hour periods of salt fog exposure and drying conditions (two wet and two dry).

4.5.5.5 Sand and dust test. A first article servicing unit shall be tested in accordance with MIL-STD-810, Method 510.5, Procedure I (12 hours) and II (90 minutes per side), to demonstrate compliance with 3.6.3.

## 5. PACKAGING

5.1 For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department 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

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



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6.1 Intended use. The unit supplies hydraulic filtered fluid for aircraft hydraulic systems. Two separate and independent systems provide the required pressures to supply up to 7 gpm of hydraulic fluid.

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6.2 Acquisition requirements. Acquisition documents must specify the following:

- a. Title, number, and date of the specification.
- b. If first article inspection is required (see 3.1).

6.3 Subject term (key words) listing.

Dispensing unit  
Fluid  
Portable  
Pressure  
Self-contained

Custodians:  
Air Force – 84  
Army – AT

Preparing Activity:  
Air Force – 84

Reviewers:  
Air Force – 99  
DLA – CC

Agent:  
Air Force – 99

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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 database at <https://assist.daps.dla.mil/online> .