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MILITARY SPECIFICATION

COUPLINGS, QUICK DISCONNECT, AUTOMATIC SHUTOFF, GENERAL SPECIFICATION FOR

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

1. SCOPE

1.1 Scope. This specification covers requirements for automatic shutoff, quick-disconnect couplings for fuel and oil lines.

1.2 Classification. Quick-disconnect couplings shall be of the following types and classes, as specified (see 6.2):

| Type I - Fuel Line Coupling | Temperature Range |
|-----------------------------|--|
| Class A | -65° to +135° F fuel and +160° F ambient |
| Class B | -65° to +200° F fuel and +350° F ambient |
| Class C | -65° to +300° F fuel and +600° F ambient |

| Type II - Oil Line Coupling | Temperature Range |
|--|---|
| Class A - Petroleum Oil (MIL-L-6082) | -65° to +250° F oil and +160° F ambient |
| Class B - Synthetic Oil (MIL-L-7808) | -65° to +350° F oil and +350° F ambient |
| Class C - Synthetic Oil (MIL-L-23699) | -40° to +400° F oil and +400° F ambient |

Sizes: Types I and II couplings shall mate with hose and tubing of the following nominal sizes: 1/4, 3/8, 1/2, 5/8, 3/4, 1, 1-1/4, 1-1/2, and 2 inch.

2. APPLICABLE DOCUMENTS

2.1 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.

FSC 4730

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SPECIFICATIONSFederal

P-D-680 Dry Cleaning Solvent
 QQ-C-320 Chromium Plating (Electrodeposited)
 QQ-P-35 Passivation Treatments for Austenitic, Ferritic, and Martensitic
 Corrosion-Resisting Steel (Fastening Devices)

Military

MIL-P-5315 Packing, Preformed, Hydrocarbon Fuel Resistant
 MIL-L-6082 Lubricating Oil, Aircraft Reciprocating Engine (Piston)
 MIL-R-7362 Rubber, Synthetic, Solid, Sheet, Strip, and Fabricated Parts,
 Synthetic Oil Resistant
 MIL-L-7808 Lubricating Oil, Gas Turbine, Aircraft Engine, Synthetic Base
 MIL-F-8615 Fuel System Components: General Specification for
 MIL-A-8625 Anodic Coatings, For Aluminum and Aluminum Alloys
 MIL-H-8795 Hose Assemblies, Rubber, Hydraulic, Fuel and Oil Resistant
 MIL-S-8879 Screw Threads, Controlled Radius Root with Increased Minor
 Diameter; General Specification for
 MIL-L-23699 Lubricating Oil, Aircraft Turbine Engines, Synthetic Base
 MIL-H-25579 Hose Assembly, Tetrafluoroethylene, High Temperature, Medium
 Pressure
 MIL-R-25897 Rubber, High-Temperature, Fluid-Resistant
 MIL-R-25988 Rubber, Silicone, Oil and Fuel Resistant

STANDARDSMilitary

MIL-STD-130 Identification Marking of US Military Property
 MIL-STD-143 Specifications and Standards, Order of Precedence for the
 Selection of
 MIL-STD-810 Environmental Test Methods
 MIL-STD-889 Dissimilar Metals
 MIL-STD-1247 Markings, Functions and Hazard Designations of Hose, Pipe, and
 Tube Lines for Aircraft, Missile and Space Systems
 MS8000 Hose Assembly, Detachable Fittings, Tetrafluoroethylene, High
 Temperature, Medium Pressure, Flare to Flare
 MS8001 Hose Assembly, Detachable Fittings, Tetrafluoroethylene, High
 Temperature, Medium Pressure, Flareless to Flareless
 MS28741 Hose Assembly, Detachable End Fitting, Medium Pressure
 MS33656 Fitting End, Standard Dimensions for Flared Tube Connection
 and Gasket Seal
 MS33657 Fitting End, Standard Dimensions for Bulkhead Flared Tube
 Connection

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PUBLICATIONS**Air Force-Navy Aeronautical Bulletin****438 Age Controls of Age-Sensitive Elastomeric Items**

(Copies of specifications, standards, drawings, and publications required by suppliers 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 document forms 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.

Society of Automotive Engineers, Inc.

Aerospace Recommended Practice
ARP 868 (dated 6-25-66)

Pressure Drop Test for Fuel System
Components

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., Two Pennsylvania Plaza, New York, New York 10001.)

3. REQUIREMENTS

3.1 Preproduction. This specification makes provisions for preproduction testing.

3.2 General specification. The requirements of MIL-F-8615 apply as requirements of this specification for fuel couplings with the exceptions and additions as specified herein. When the two specifications conflict, this specification shall govern. Additional requirements may be added in the detail specification.

3.3 Components. The complete quick-disconnect coupling shall consist of two separate assemblies. A self-sealing shutoff device shall be incorporated in each assembly, and the locking device for the coupling shall be included in one assembly. The procuring activity shall have the option of procuring the complete quick-disconnect coupling or either of the two separate assemblies.

3.4 Selection of specifications and standards. Specifications and standards for necessary commodities and services not specified herein shall be selected in accordance with MIL-STD-143.

3.5 Materials. Materials used shall be of high quality, suitable for the environment expected for aircraft, and shall conform to applicable Government specifications or equivalent contractor specifications. The use of contractor specifications must be approved by the procuring activity. All materials shall be sufficiently resistant to the applicable fluids specified in MIL-F-8615 and this specification to assure satisfactory operation as defined herein.

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3.5.1 Metals. Metals shall be corrosion resistant or suitably treated to resist corrosion due to fuels, oils, salt spray, atmospheric conditions, or wear likely to be encountered in transportation, storage, or during normal service life.

3.5.1.1 Dissimilar metals. Unless suitably protected against electrolytic corrosion, dissimilar metals as defined in MIL-STD-889 shall not be used in intimate contact with each other.

3.5.2 Magnesium, copper, and cadmium. Magnesium, copper, and cadmium plating shall not be used for parts that are normally in contact with fuel and synthetic oil.

3.5.3 Protective treatment. When materials are used in the construction of the couplings that are subject to deterioration when exposed to climatic or environmental conditions likely to occur during storage or service usage, they shall be protected against such deterioration in a manner that will in no way prevent compliance with the performance requirements of this specification. The use of any protective coating that will chip, crack, abrade, peel, or scale during service life or extreme environmental conditions shall be avoided.

3.6 Design and construction

3.6.1 Design. Coupling configurations shall not exceed the basic outline dimensions and weights shown on figure 1 and table I. One coupling half shall be primarily designed for, but not limited to bulkhead or firewall mounting. A means for quick separation of the coupling halves shall be incorporated with provisions for automatically sealing the contained fluid against flow during the disconnect cycle. When connected, the coupling shall permit fluid flow in either direction in accordance with the rated flows and pressure drops specified in table I and at the rated pressures specified in table II. Flow shall not be blocked under surge conditions.

3.6.1.1 Method of connecting and disconnecting coupling. The design of the couplings shall be such that they can be manually connected or disconnected throughout the applicable temperature range for coupling type and class and when subjected to the following line pressures:

a. 60 pounds per square inch (psi) for couplings applicable to 1/4- through 1-inch outside diameter (OD) tubing

b. 20 psi for couplings applicable to 1-1/4+ through 2-inch OD tubing except that these shall be capable of disconnection at 60 psi.

3.6.1.1.1 Locking. Devices shall be provided for positively locking connected couplings and means incorporated for visually and physically verifying the locked condition.

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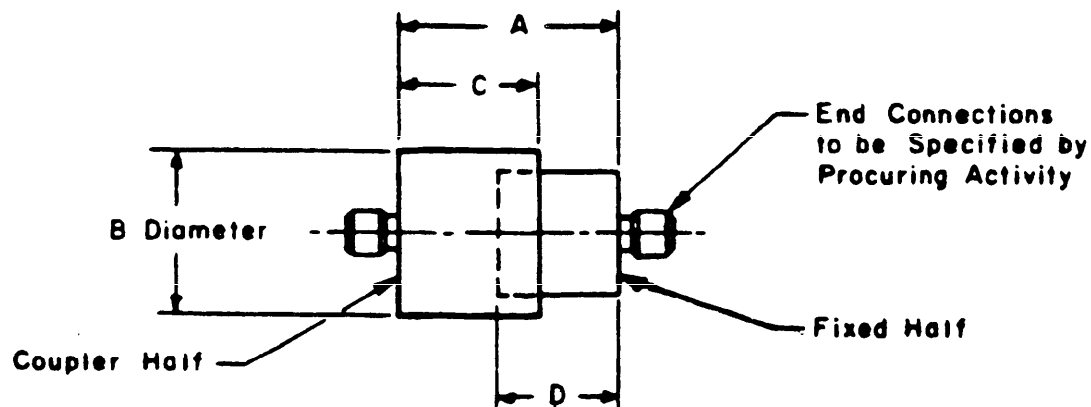


FIGURE 1. Maximum Envelope Dimensions (See Table I)

TABLE I. Maximum Envelope Dimensions, Weights, Spillage, Rated Flows, and Pressure Drops

| Tube Size (in.) | Max Envelope Dimensions | | | | Weight Coupled (lb) | Disconnect Spillage Cm^3 | Rated Flow GPM | Pressure Drop PSI |
|-----------------|-------------------------|---------|---------|---------|---------------------|-----------------------------------|----------------|-------------------|
| | A (in.) | B (in.) | C (in.) | D (in.) | | | | |
| 1/4 | 3.9 | 1.8 | 2.3 | 2.2 | 0.8 | 2.5 | 1.2 | 4.5 |
| 3/8 | 3.9 | 1.8 | 2.3 | 2.2 | 0.8 | 3.0 | 3.5 | 5.0 |
| 1/2 | 3.9 | 1.8 | 2.3 | 2.2 | 0.8 | 4.0 | 6.0 | 5.5 |
| 5/8 | 4.6 | 2.8 | 3.2 | 2.8 | 1.3 | 9.0 | 10.5 | 6.0 |
| 3/4 | 4.6 | 2.8 | 3.2 | 2.8 | 1.3 | 15.0 | 16.0 | 7.0 |
| 1 | 4.6 | 2.8 | 4.3 | 2.8 | 1.8 | 35.0 | 29.0 | 8.0 |
| 1-1/4 | 5.7 | 3.5 | 4.3 | 3.8 | 2.8 | 45.0 | 45.0 | 10.0 |
| 1-1/2 | 5.7 | 3.5 | 4.3 | 3.8 | 3.5 | 60.0 | 70.0 | 15.0 |
| 2 | 6.4 | 4.0 | 4.3 | 3.8 | 4.0 | 90.0 | 125.0 | 15.0 |

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TABLE II. Pressure Rating

| Type | Class | Fluid | Pressure - PSI | | |
|------|---------|-------|----------------|-------|-------|
| | | | Operating | Proof | Burst |
| I | A, B, C | Fuel | 60 | 120 | 240 |
| II | A | Oil | 120 | 240 | 360 |
| II | B | Oil | 120 | 240 | 360 |
| II | C | Oil | 120 | 240 | 360 |

3.6.2 Leakage. The average fluid loss or spillage during connection or disconnection cycles shall not exceed the quantities shown in table I. There shall be no visible leakage after connection or disconnection of the coupling when subjected to any pressure within the operating pressure range.

3.6.3 Electrical resistance. The electrical resistance of a connected coupling shall be less than 1 ohm when dry.

3.6.4 Overhaul. The couplings shall be designed to permit overhaul or repair without the use of special tools or fixtures.

3.6.5 Construction. The couplings shall be constructed to withstand the normal strains, jars, vibrations, and other such conditions incident to shipping, storage, installation, and service. Manual connection and disconnection of the coupling shall have no adverse effect on its leakage characteristics, irrespective of the alignment of mating assemblies.

3.6.5.1 Packings, O-rings, or special seals. Packings, O-rings, or special seals shall be in accordance with MIL-P-5315, MIL-R-7362, MIL-R-25988, or MIL-R-25897, or other compatible material.

3.6.5.2 Lubrication. Lubricants which are compatible with system fluids and temperatures may be used on threads and O-ring packings at assembly. Bonded dry film lubricants compatible with system fluids are permissible. Lubricants compatible with system fluids and fluid temperature ranges may be applied to external parts subject to wear during coupling connection and disconnection cycles.

3.6.5.3 Fitting ends. Unless otherwise specified by the procuring activity, connector ends shall conform to MS33656 or MS33657 flared tubing ends.

3.7 Performance. The couplings shall successfully pass the tests of section 4.

3.8 Interchangeability. All coupling halves having the same manufacturer's part number shall be functionally and dimensionally interchangeable.

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3.9 Screw threads. All threads shall be in accordance with MIL-S-8879.

3.10 Finishes

3.10.1 Aluminum alloy. Aluminum alloy parts shall be anodized in accordance with MIL-A-8625.

3.10.2 Corrosion-resistant steel. Corrosion-resistant steel parts shall be passivated in accordance with QQ-P-35.

3.10.3 Chromium plating. Chromium plating shall conform to QQ-C-320, class 2.

3.11 Identification of product. Each coupling half shall be marked for identification in accordance with MIL-STD-130.

3.11.1 The following information shall be included on a securely attached nameplate or etched, engraved, embossed, or stamped in a suitable location on the primary housing of each coupling half.

Manufacturer's name or trademark, or both

Coupler half or fixed half (optional)

Manufacturer's part number and serial number, if used

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Type (I or II) Class (A, B, or C)

Usage: OIL-SYN, MIL-L-7808 (example)

or

Usage: FUEL, -65° to +200° F FUEL/+350° F

Assembly date

3.11.2 Age controls for synthetic rubber parts. Age controls shall be in accordance with ANA Bulletin No. 438.

3.11.2.1 Assemblies without age-sensitive elastomers. To identify assemblies which do not contain age-sensitive synthetic rubber materials from assemblies which do contain age-sensitive synthetic rubber materials, the letters NA (for not applicable) shall be stamped after the assembly date.

3.11.3 Connection and disconnection instructions. Connection and disconnection instructions shall appear on the coupling half containing the locking device.

3.11.4 Color identification. The couplings shall be color coded in accordance with MIL-STD-1247. Type I couplings shall also meet the color code requirements of MIL-F-8615.

3.12 Workmanship. Workmanship shall be of the highest quality. The couplings shall be uniform in quality and free from irregularities, defects, or foreign matter which could affect safety, performance, reliability, or durability.

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3.12.1 Cleaning. All parts shall be clean and free from dirt, sand, metal chips, and other foreign matter during and after assembly.

4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the supplier is responsible for the performance of all inspection requirements as specified herein. Except as otherwise specified in the contract or order, the supplier 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.

4.2 Classification of inspections. The examination and testing of the coupling assemblies shall be classified as follows:

- a. Preproduction inspection
- b. Quality conformance inspection.

4.3 Test conditions

4.3.1 Atmospheric conditions. Unless otherwise specified herein, all tests shall be performed at an atmospheric pressure within the range of 28 to 31 inches of mercury, a temperature between 65° and 85° F, and a relative humidity of not more than 90 percent. Actual atmospheric conditions shall be recorded during each test.

4.3.2 Test fluid. Unless otherwise specified, the fluid used for preproduction testing shall be the fluid for which the couplings are intended. For quality conformance testing of fuel couplings, solvent in accordance with P-D-680 may be used.

4.4 Preproduction inspection

4.4.1 The preproduction inspection shall consist of the following examination and tests and shall be conducted on complete production coupling assemblies:

- a. Each coupling to be tested shall successfully complete the examination and tests specified under the quality conformance inspection in 4.5.
- b. One complete coupling assembly of each line size for each type and class shall be subjected to the following tests in the order listed:
 - (1) Vacuum (see 4.6.5)
 - (2) Operation (see 4.6.6)

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- (3) Spillage (fluid loss) (see 4.6.7)
- (4) Temperature shock (see 4.6.8)
- (5) Pressure drop (see 4.6.9)
- (6) Surge flow (see 4.6.10)
- (7) Accelerated corrosion (see 4.6.11)
- (8) Salt fog (see 4.6.12)
- (9) Dust (see 4.6.13).

c. One complete coupling assembly of each line size for each type and class shall be subjected to the following tests in the order listed:

- (1) Endurance (see 4.6.14)
- (2) Vibration (see 4.6.15).

d. One complete coupling assembly of each line size for each type and class shall be subjected to the following tests in the order listed:

- (1) Compatibility (see 4.6.16)
- (2) Burst pressure (see 4.6.17).

Where designs are such that the basic difference between two or more coupling assemblies is the size of the end fitting, only the couplings with the largest end fittings shall be subjected to all of the applicable tests. Pressure drop and vibration tests shall be performed on all sizes.

4.5 Quality conformance inspection. Each coupling shall be subjected to the following examination and tests before shipment to the procuring activity:

- a. Examination of product (see 4.6.1)
- b. Functional test (see 4.6.2)
- c. Proof pressure (see 4.6.3)
- d. Low pressure (see 4.6.4).

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4.6 Inspection methods

4.6.1 Examination of product. Each coupling half shall be carefully examined to determine conformance to the requirements of this specification with respect to design, workmanship, and identification.

4.6.2 Functional test. Each coupling half shall be manually connected and disconnected five times with a mating coupling half or adapter and with a pressure as specified in the detail specification. There shall be no binding, sticking or any other evidence of faulty operation.

4.6.3 Proof pressure. Each coupling, connected and disconnected, shall be subjected to the proof pressure listed in table II. There shall be no visible signs of leakage after 2 minutes minimum of pressurization.

4.6.4 Low pressure. Each coupling, connected or disconnected, shall be subjected to a pressure of 1 to 5 psi. There shall be no visible signs of leakage after 2 minutes minimum of pressurization.

4.6.5 Vacuum. A vacuum of -6 psi (12.2 inches mercury gage) shall be applied to the connected couplings and -3 psi (6.1 inches mercury gage) to the disconnected coupling halves. There shall be no visible signs of leakage as indicated by a loss of vacuum, shown by the vacuum gage used, in 5 minutes at these negative pressures. See figure 2 for a typical test setup.

4.6.6 Operation. The couplings shall be connected and disconnected 200 times consecutively by hand and without any special means to keep the coupling halves in perfect alignment with an internal pressure as specified in the detail specification. The coupling shall then be subjected to and pass the tests specified in 4.6.3 and 4.6.4.

4.6.7 Spillage. The average spillage (fluid loss) during five consecutive disconnect cycles at each of the pressures specified in 3.6.1.1 shall not exceed the amounts shown in table I. This test shall be performed immediately following the test specified in 4.6.6.

4.6.8 Temperature shock. Mating couplings shall be connected and tested in accordance with the temperature shock test specified in method 503 of MIL-STD-810. After this test the couplings shall respond freely to connecting and disconnecting operations and shall be subjected to and pass the tests specified in 4.6.3 and 4.6.4. There shall be no evidence of failure.

4.6.9 Pressure drop. The pressure drop through the connected couplings shall not exceed the values shown in table I when using water as the test fluid. The tests shall be conducted as recommended in ARP 868. Also, tests shall be conducted over a range of flows and temperatures completely covering the design capacity of the coupling using the fluid for which the coupling is intended as a test fluid. The data shall be presented in the form of curves. Pressure drops shall be conducted in both directions.

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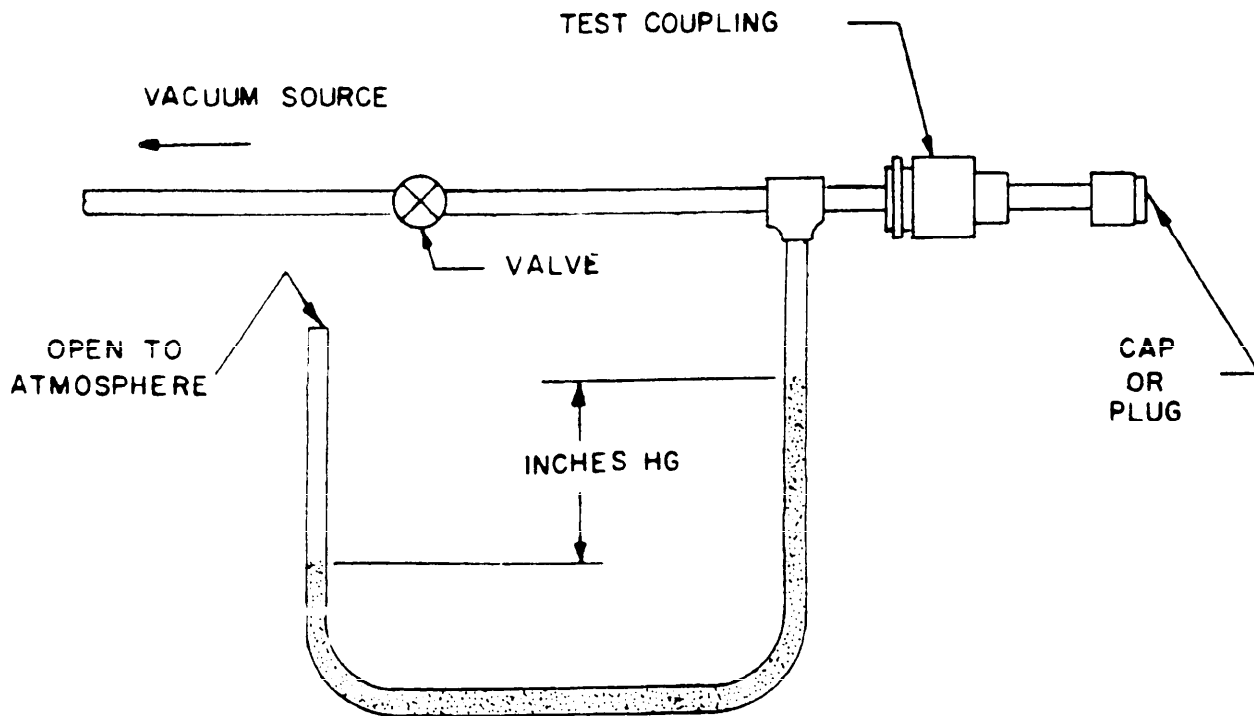


FIGURE 2. Typical Setup for Vacuum Test

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4.6.10 Surge flow. The coupling shall be subjected to flow at five times the rated flow for 5 seconds minimum duration in each direction. This surge flow pattern shall be repeated 100 times. There shall be no evidence of flow blocking or internal damage, and the disconnected halves shall be subjected to and pass the tests specified in 4.6.3 and 4.6.4. See figure 3 for a typical test setup.

4.6.11 Accelerated corrosion. With the ports open, the connected couplings shall be immersed in a saturated salt solution. The couplings shall then be drained for 30 seconds and operated to remove entrapped salt solution. The connected couplings shall be placed immediately in a test chamber maintained at a temperature of $86^{\circ} \pm 3^{\circ}$ F with a relative humidity of 100 percent for a period of 20 minutes. Upon completion of the humidity exposure period, the couplings shall be placed in an air oven maintained at a temperature of 130° F for a period of 20 minutes. The couplings shall be washed with warm water to remove all exposed salt accumulations, after which the couplings shall be dried, wetted with fluid, and actuated as in normal service. Any corrosion that affects the operation of the couplings or is detectable without special visual aids shall be cause for rejection. Photographs of any corrosion shall be included in the test report.

4.6.12 Salt fog. The connected couplings shall be subjected to a salt fog test in accordance with method 509 of MIL-STD-810. Any corrosion that affects the operation of the couplings or is detectable without special visual aids shall be cause for rejection. Photographs of any corrosion shall be included in the test report.

4.6.13 Dust. The connected couplings shall be subjected to a sand and dust test in accordance with method 510 of MIL-STD-810. It shall be possible to manually disconnect the couplings after this test.

4.6.14 Endurance

4.6.14.1 Endurance test installation. A complete MS8000 style A or MS8001 style A hose assembly and coupling assembly of the type and class applicable shall be installed in a cyclic test setup. The apparatus shall essentially consist of two manifolds, one fixed and the other reciprocating axially. The coupling shall be attached to the fixed manifold and a vibration imposed on it by means of the hose assembly which shall connect the coupling and vibrating manifold. Fluid shall circulate from one manifold through the coupling to the second manifold. The free length of hose between hose end fittings shall be 9 inches for all sizes through the 1-1/2 inch size. The 2-inch size hose assembly shall conform to MS28741, and the free length of hose between hose end fittings shall be 12 inches. The hose assemblies shall be installed in the minimum bend radius required in MIL-H-25579 for MS8000 and MS8001 assemblies and MIL-H-8795 for MS28741 assemblies.

4.6.14.2 Endurance test fluid. The endurance test shall be conducted using the fluid which is applicable to the type and class of coupling that is being tested.

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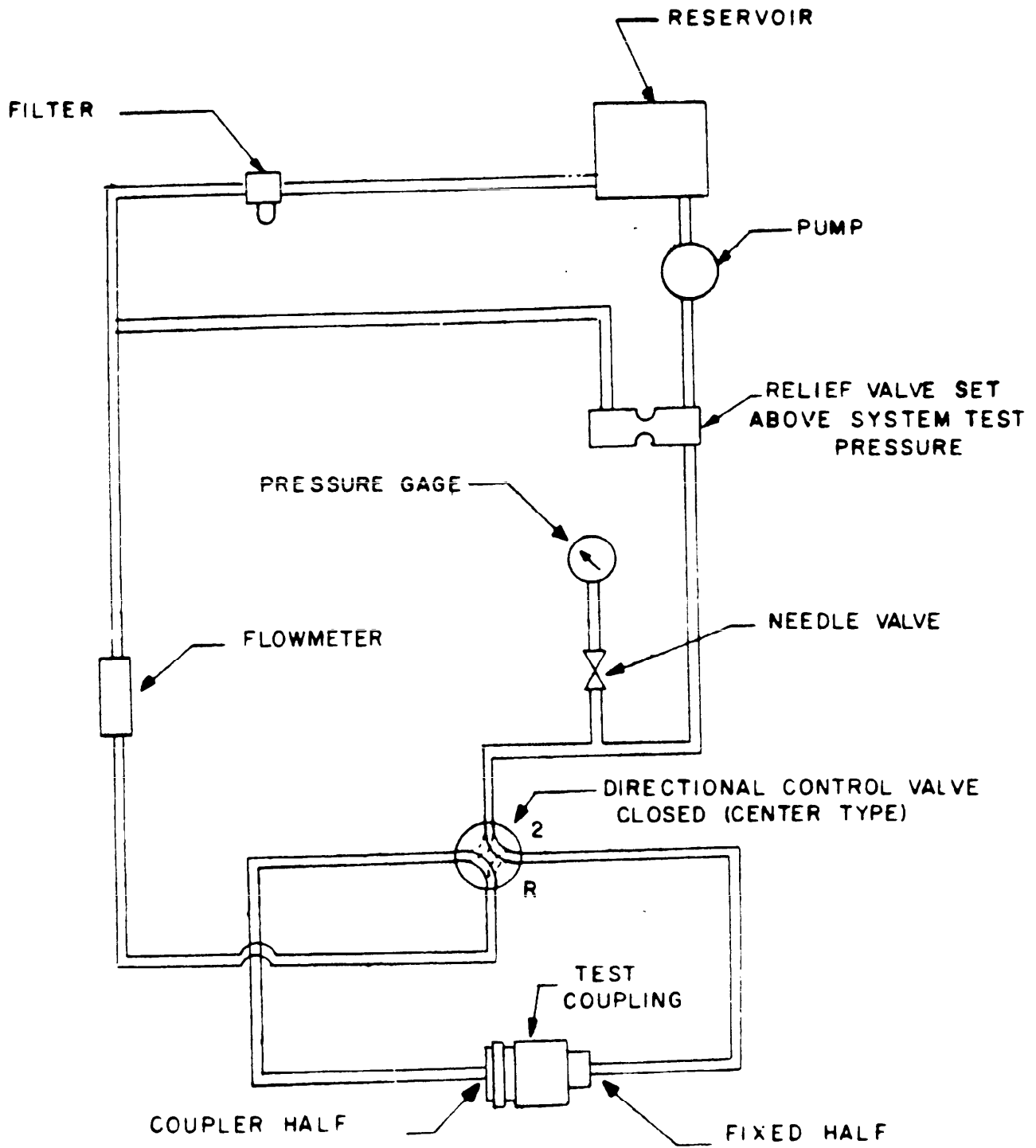


FIGURE 3. Typical Setup for Surge Flow Test

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4.6.14.3 Endurance test procedure. The hose and coupling assemblies shall be subjected to a minimum of 200 hours of fluid circulation and vibration with a minimum of 10 cycles of temperature and pressure; each cycle shall consist of at least 20 hours duration. The total amplitude of the vibration shall be 0.060 inch, and the frequency of vibration shall be 55 ± 2 hertz. The temperature and pressure readings shall be recorded at least once every hour.

4.6.14.4 Cyclic. The test shall be started with the fluid in the coupling at 1 to 5 psig static pressure, and the ambient temperature shall be the low temperature specified in 1.2 $\pm 5^\circ$ F. This temperature shall be maintained for a minimum of 4 hours (shutdown period). Fluid circulation and vibration shall be started and maintained for 20 hours. Fluid circulation shall be at a sufficient rate to maintain uniform pressures and temperatures. The operating pressure shall be maintained during the fluid circulation. The ambient temperature around the coupling shall be increased to the applicable ambient temperature $\pm 5^\circ$ F as specified in 1.2 within 1 hour after circulation is started. When circulation is started, the temperature of the internal fluid shall be increased to the applicable operating temperature $\pm 5^\circ$ F, as specified in 1.2, within 30 seconds of fluid circulation. This 24-hour test procedure shall be repeated until the 200 hours of fluid circulation and vibration on the coupling have been accomplished.

4.6.14.5 Disconnection. At least once during each shutdown period, the coupling shall be disconnected for 30 minutes and then reconnected.

4.6.14.6 Pressure tests after cyclic testing. After completion of cyclic testing, the couplings shall be subjected to and pass the proof and low pressure tests of 4.6.3 and 4.6.4, and the coupling shall not exhibit any undue looseness due to wear from the vibration.

4.6.15 Vibration

4.6.15.1 Vibration test installation. A complete hose assembly as used in 4.6.14.1 and coupling assembly shall be installed as shown on figure 4. The coupler half shall be connected to the hose assembly and pressure source. The other coupling half shall be connected to a rigid bulkhead mounted on the vibration table.

4.6.15.2 Vibration test fluid. The test fluid shall be the fluid for which the couplings were designed except that fuel couplings shall use solvent in accordance with P-D-680. The couplings shall be pressurized to the applicable operating pressure for the first vibration test and 10 psi for the second vibration test (see 4.6.15.3).

4.6.15.3 Vibration test procedure. Unless otherwise specified by the procuring activity, the assemblies shall be vibrated in each of two mutually perpendicular axes according to method 514 of MIL-STD-810, procedure I, curves L and M. Two consecutive tests shall be run, one at operating pressure and one at low pressure, on each coupling (see 4.6.15.2).

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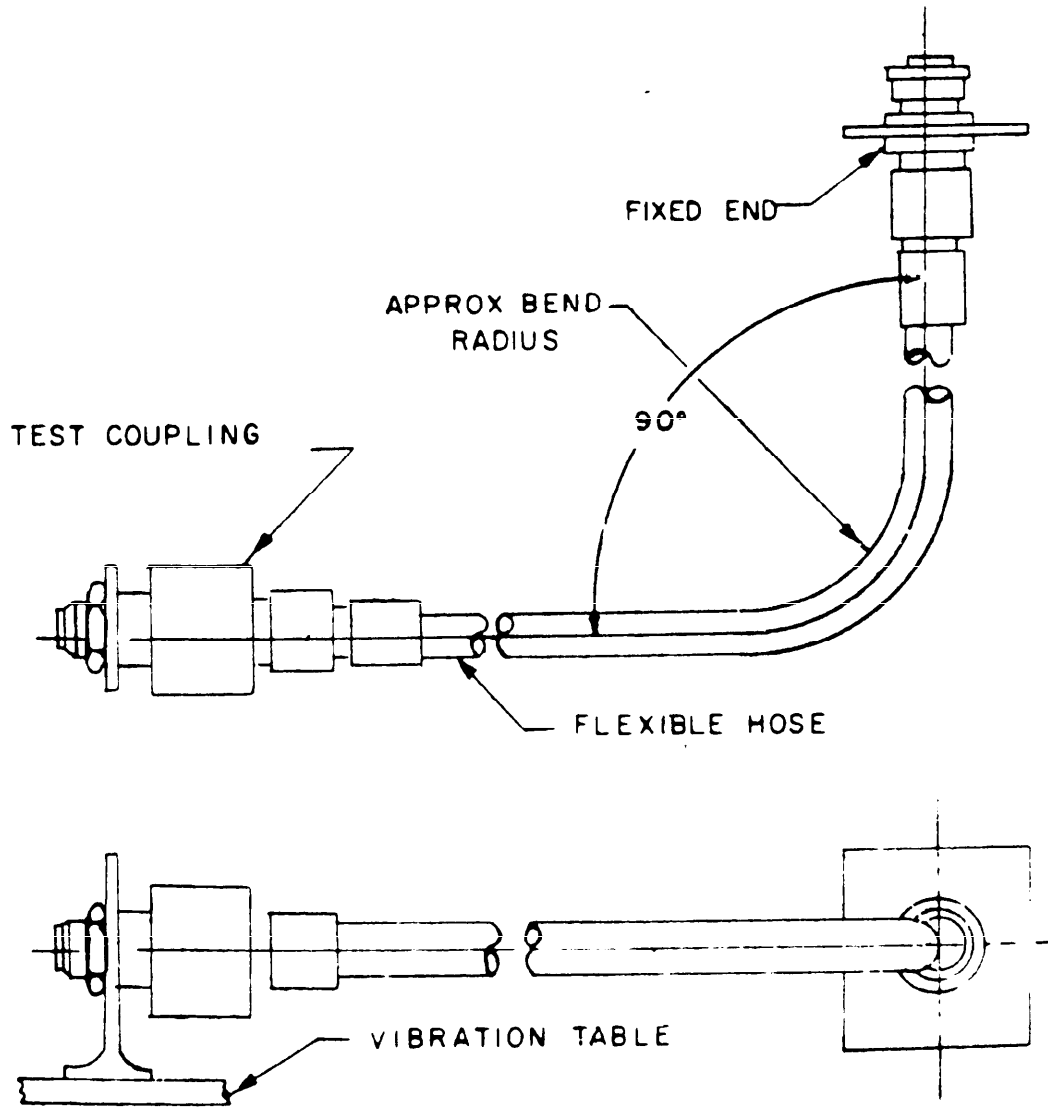


FIGURE 4. Typical Setup for Vibration Test

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4.6.15.4 Pressure tests after vibration. The couplings shall be subjected to and pass the test specified in 4.6.3 and 4.6.4 after completion of the vibration tests, and the coupling shall not exhibit any undue looseness due to wear from the vibration.

4.6.15.5 The burst pressure (see table II) shall be applied for 1 minute to the connected couplings. There shall be no leakage.

4.6.16 Compatibility

4.6.16.1 Fuel couplings

4.6.16.1.1 Fuel resistance and low temperature. The connected couplings shall satisfactorily complete the fuel resistance and low temperature tests of MIL-F-8615. The high temperatures shall be the operating temperatures specified in 1.2. The test fluid shall be as specified in MIL-F-8615.

4.6.16.1.2 Contaminated fluid endurance. Test fluid containing each type of contaminant and at the concentration specified in table III shall be circulated through connected couplings as follows:

- a. With rated flow for 2-1/2 hours
- b. With 10 percent rated flow for 2-1/2 hours.

The procedures shall be repeated one time. After this test, the couplings shall be flushed out with clear fluid and drained, and the functional and leakage tests specified in 4.6.2, 4.6.3, and 4.6.4 shall be conducted. The couplings shall perform satisfactorily.

4.6.16.2 Oil couplings

4.6.16.2.1 Oil resistance and low temperature. The connected couplings shall satisfactorily complete the oil resistance and low temperature tests shown in table IV. The high temperatures shall be the operating temperatures specified in 1.2.

4.6.17 Burst pressure. The burst pressure listed in table II shall be applied for 1 minute to the connected coupling at the maximum temperature conditions specified in 1.2. There shall be no leakage.

4.6.18 Electrical resistance. The electrical resistance across the interface of the two coupling halves shall be measured with the couplings in the dry condition. The resistance shall not exceed 1 ohm.

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TABLE III. Fuel Endurance Test Contaminant

| Contaminant | Particle size | Quantity |
|--|--|-----------------|
| Iron oxide | 0-5 microns | 28.5 gm/400 gal |
| | 5-10 microns | 1.5 gm/400 gal |
| Sharp silica sand | 150-300 microns | 1.0 gm/400 gal |
| | 300-420 microns | 1.0 gm/400 gal |
| Prepared dirt conforming to AC Spark Plug Co. Part No. 1543637 (Coarse Arizona dust) | Mixture as follows | 8.0 gm/400 gal |
| | 0-5 microns (12%) | |
| | 5-10 microns (12%) | |
| | 10-20 microns (14%) | |
| | 20-40 microns (23%) | |
| | 40-80 microns (30%) | |
| Cotton linters | 80-200 microns (9%) | |
| | Grade 6, staple below 7, second cut linters (U. S. Department of Agriculture Grading Standards). | 0.1 gm/400 gal |
| Crude naphthenic acid | | 0.03% by volume |
| Salt water solution shall contain 4 parts NaCl to 96 parts H ₂ O by wt. | | 0.01% entrained |

5. PREPARATION FOR DELIVERY

5.1 Preservation, packaging, and packing. The preservation, packaging, and packing shall be in accordance with the applicable levels specified in MIL-F-8615 or as required by the procuring activity (see 6.2).

5.2 Marking of shipments. The information required in 3.11.1 shall also be included in the shipment marking information.

6. NOTES

6.1 Intended use. The fluid line quick-disconnect, automatic shutoff couplings covered by this specification are primarily intended for use in aircraft fuel systems and in aircraft reciprocating and turbine engine oil systems and in helicopter transmission oil systems.

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TABLE IV. Oil Resistance and Low Temperature Test Schedule

| Test Period <u>1/</u> | Oil Resistance Phase I soak | Low Temperature |
|---|---|---|
| Component configuration | <u>2/</u> | Mounted as would be expected under normal service conditions. <u>2/</u> |
| Test fluid | MIL-L-6082, MIL-L-7808, or MIL-L-23699, as applicable (see 1.2) | See 1.2 |
| Period duration | 96 hours (4 days) | 18 hours <u>3/</u> |
| Ambient and test fluid temperature | High temperature as specified in 1.2 | Low temperature as specified in 1.2 |
| Operation or tests during period | Operate couplings at least 4 cycles per day in a normal manner. | Operate the coupling at least 4 cycles uniformly during the test period. |
| Operation or tests immediately after period | Conduct leakage test 4.6.3, 4.6.4 with fluid specified in 1.2. | With temperature not higher than the low temperature of 1.2, conduct operation and leakage tests 4.6.2, 4.6.5, 4.6.4. |

1/ Each period shall follow immediately after the preceding one in the order noted.

2/ The component shall be maintained in such a manner as to insure complete contact of all nonmetallic parts with the test fluid as would be expected under normal service conditions.

3/ Unless an increased test period is specified by the procuring activity.

MII-C-7413B

6.2 Ordering data. Procurement documents should specify the following:

- a. Title, number, and date of this specification
- b. Type, class, and size
- c. End fitting style
- d. (1) Complete coupling assembly (2) coupler half or (3) fixed half. (Except where both halves are identical.)
- e. Manufacturer and manufacturer's part number
- f. Manufacturer's mating coupling half part number
- g. Selection of applicable levels of preservation, packaging, and packing (see 5.1).

6.3 Definitions. The following definitions are applicable to this specification:

- a. Coupler half - The coupling half that contains the locking device which holds the coupling halves together in the coupled position. This half is generally connected to a hose assembly and is also known as the hose attaching half, socket half, or female half.
- b. Fixed half - The coupling half which, normally, is rigidly mounted to a bulkhead firewall, or tube assembly. This half is also known as the bulkhead mounting half, nipple, or male half.

6.4 Asterisks are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodians:
Air Force - 11
Army - ME

Preparing activity:
Air Force - 11

Review activities:
Air Force - 82
Army - ME, AV

Project No. 4730-0422

| SPECIFICATION ANALYSIS SHEET | | Form Approved Budget Bureau No. 22-R255 |
|--|--|--|
| <p>INSTRUCTIONS: This sheet is to be filled out by personnel, either Government or contractor, involved in the use of the specification in procurement of products for ultimate use by the Department of Defense. This sheet is provided for obtaining information on the use of this specification which will insure that suitable products can be procured with a minimum amount of delay and at the least cost. Comments and the return of this form will be appreciated. Fold on lines on reverse side, staple in corner, and send to preparing activity. Comments and suggestions submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or serve to amend contractual requirements.</p> | | |
| SPECIFICATION | | |
| ORGANIZATION | | |
| CITY AND STATE | | CONTRACT NUMBER |
| MATERIAL PROCURED UNDER A <input type="checkbox"/> DIRECT GOVERNMENT CONTRACT <input type="checkbox"/> SUBCONTRACT | | |
| 1. HAS ANY PART OF THE SPECIFICATION CREATED PROBLEMS OR REQUIRED INTERPRETATION IN PROCUREMENT USE? A. GIVE PARAGRAPH NUMBER AND WORDING. | | |
| B. RECOMMENDATIONS FOR CORRECTING THE DEFICIENCIES | | |
| 2. COMMENTS ON ANY SPECIFICATION REQUIREMENT CONSIDERED TOO RIGID | | |
| 3. IS THE SPECIFICATION RESTRICTIVE? <input type="checkbox"/> YES <input type="checkbox"/> NO (If "yes", in what way?) | | |
| 4. REMARKS (Attach any pertinent data which may be of use in improving this specification. If there are additional papers, attach to form and place both in an envelope addressed to preparing activity) | | |
| SUBMITTED BY (Printed or typed name and activity - Optional) | | DATE |

DD FORM 1426
1 JAN 66

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.

AFLC-WPAFB-OCT 67 2M

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Wright-Patterson AFB, O 45433

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