

INCH-POUND

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MILITARY SPECIFICATION

COUPLING ASSEMBLY, SEMI-DRY-BREAK  
QUICK-DISCONNECT, FUEL  
WITH OR WITHOUT CONTINUITY SWITCH

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

1. SCOPE.

1.1 Scope. This specification covers the requirements for acquisition of light weight semi-dry-break, quick-disconnect assemblies used in connecting nozzles to hose in aircraft fuel systems. The dry-break feature will be included in the female half (hose side) of the unit only.

1.2 Classification. Quick-disconnect coupling assemblies are of the following classes, as specified (see 6.2):

- Class 1 - Quick Disconnect without Continuity Switch.
- Class 2 - Quick Disconnect with Continuity Switch.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, SEA 03Q42, Naval Sea Systems Command, 2531 Jefferson Davis Highway Arlington, VA 22242-5160 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

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## 2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.2).

## SPECIFICATIONS

## FEDERAL

P-D-680 - Dry Cleaning and Degreasing Solvent.  
 TT-S-735 - Standard Test Fluids, Hydrocarbon.

## MILITARY

MIL-P-116 - Preservation, Methods of.  
 MIL-T-5624 - Turbine Fuel, Aviation, Grades JP-4, JP-5 and JP-5-  
 /JP-8 ST.  
 MIL-S-8512 - Support Equipment, Aeronautical, Special General  
 Specification for the Design of.  
 MIL-F-8615 - Fuel System Components: General Specification for.  
 MIL-H-17902 - Hose End Fittings and Hose Assemblies, Synthetic  
 Rubber, Aircraft Fuels.  
 MIL-L-19140 - Lumber and Plywood, Fire-Retardant Treated  
 MS29520 - Envelope Dimensions Nozzle, Pressure Fuel Servicing  
 Locking Aircraft, Type D-1 and D-2.

## STANDARDS

## FEDERAL

FED-STD-H28 - Screw-Thread Standards for Federal Services.

## MILITARY

MIL-STD-130 - Identification Marking of U.S. Military Property.  
 MIL-STD 2073-1 - DOD Material Procedures for Development and Appli-  
 cation of Packaging Requirements.

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

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

(Non-Government standards and other publications are normally available from the organizations that prepare or distribute the documents. These documents also may be available in or through libraries or other informational services)

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2.3 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, 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 (see 6.4) in accordance with 4.3.

3.2 Components. A complete quick disconnect assembly shall consist of male and female halves. The dry break feature shall be included within the female (hose) half only. The male half shall mate with the standard MS29520 aircraft pressure fuel nozzle. A separate male half shall be provided, when required, to mate with an overwing refueling nozzle (1.5 NPT). The female dry-break half shall mate with either the underwing or overwing nozzle adapters to facilitate fueling interchange on the same hose.

3.2.1 Strainers. Strainers shall be 60 mesh screen.

3.3 Materials. Materials and processes used by the manufacturer of the dry-break quick disconnect assemblies shall be suitable for the intended purpose and shall conform to the applicable material specifications listed (see 2.1.1).

3.3.1 Metals. Metals used in the manufacturing of the assemblies shall be light weight aluminum alloys suitable for use in a marine environment. All metals used shall be protected to resist corrosion. The use of dissimilar metals in contact with each other which may set up galvanic couplings is prohibited. The use of magnesium or any alloy thereof is prohibited.

3.3.1.1 Component examination. Castings shall be clean, sound, and free from blowholes, porosity, cracks, and any other defects that would interfere with components working as specified (see 4.5).

3.3.2 Test fluids. Where tests are conducted requiring the use of test fluids, the test fluids shall be in accordance with P-D-680, MIL-T-5624 or TT-S-735.

3.4 Design. The quick-disconnect coupling components and assembly shall not exceed the envelope dimensions, or the weight limitations shown on figure 1. The coupling shall connect or disconnect a hose and nozzle easily by a single person wearing winter gloves without using tools. The coupling shall consist of a male and a female halve of which the female half shall incorporate and automatically operated mechanism to prevent spillage of liquid from the hose when the units are disconnected. A strainer of specified mesh opening shall be provided between the two halves of the units. The strainer shall be removable from the male half, for checking, cleaning, or replacing without the use of tools. The pressure loss through the connected unit shall be kept to a minimum. All normal replacement parts shall be the same regardless of the thread or inlet size of the unit.

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3.4.1 Control switch. The female half of the quick disconnect coupling, Class 2, shall contain an explosion proof single pole, single throw control switch. The handle or lever which activates the switch must be shielded by a protective guard. The top of the handle or lever shall not extend above the switch guard so as to prevent abrasion of the handle or lever, and to prevent inadvertent actuation. The handle or lever must be sealed by a rubber boot or cover, or be designed to resist deterioration in its performance when subjected to a severe marine salt environment without a rubber boot or cover. One side of the continuity switch shall be electrically connected to the body of the female half of the coupling and the other side of the switch shall be isolated from the body and shall make electrical contact with the spider assembly protruding from the end of the mating fuel supply hose, as shown in Figure 1.

3.4.1.1 Protective boot. Unless otherwise required by the design of the control switch, the switch toggle shall be protected by a rubber boot to prevent abrading of the toggle and to keep moisture out of the switch body.

3.4.2 Commercial standard tools. Disassembly, reassembly, and service maintenance shall be accomplished by means of commercially standard tools. Commercial standard tools are defined in MIL-S-8512.

3.5 Construction. Quick-disconnect assemblies shall withstand the strains, jars, vibrations, and other conditions incident to shipping, storage, and service usage. The assembly shall withstand a drop of 6 feet onto a steel plate without any damage affecting operation.

3.5.1 Strainer. The strainer in a clogged condition shall withstand 20 pounds per square inch (PSI) differential pressure in the fueling direction and a 10 PSI differential pressure in the defueling direction without collapse, tearing, or other damage to the screen.

3.6 Screw threads. Screw threads shall be in accordance with FED-STD-H28.

3.6.1 Screw-thread locking devices. Threaded fasteners that if loosened or disengaged could fall into the fuel system, shall be locked by self-locking nuts, lock wires, or cotter pins.

3.7 Synthetic rubber parts.

3.7.1 Elastomeric compatibility. O-rings, seals, and other elastomeric parts shall be compatible with aviation fuels as specified in 3.3.2.

3.7.2 Elastomeric serviceability. Elastomeric parts shall be readily replaceable with a minimum teardown of attaching parts.

3.8 Interchangeability. Parts having the same manufacturer's part number shall be directly and completely interchangeable with each other with respect to installation and performance.

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3.9 Identification of product. Assemblies and parts shall be marked for identification in accordance with MIL-STD-130.

3.9.1 Identification. The quick disconnect female half shall be identified in accordance with MIL-STD-130. The information shall contain the following:

- (a) Manufacturer's name or logo.
- (b) The number of this specification.
- (c) Contract or order number.
- (d) Manufacturer's part number.
- (e) Manufacturer's serial number.
- (f) Date of manufacture number.

3.10 Performance requirements.

3.10.1 Proof pressure. When tested as specified in 4.6.1, there shall be no evidence of leakage, distortion, or failure of any part or component.

3.10.2 Operating force. When tested as specified in 4.6.2, the force to engage the male and female coupling halves shall not exceed 60 pounds and the force to disengage shall not exceed 20 pounds.

3.10.3 Leakage. When tested as specified in 4.6.3, there shall be no evidence of leakage from the quick-disconnect assembly under positive pressure or leakage of air into the assembly shall be not greater than 50 cubic centimeters (cc) of free air per minute when under negative pressure.

3.10.3.1 Check valve leakage. When tested as specified in 4.6.3.1 there shall be no leakage through the unit.

3.10.4 Fuel resistance and extreme temperature. When tested as specified in 4.6.4, there shall be no signs of leakage, cracking, or other evidence of failure to the unit.

3.10.5 Total pressure loss. When tested as specified in 4.6.5, the pressure drop across the entire assembly shall be not greater than 9 psi at 300 gallons per minute (gal/min).

3.10.6 Explosion proof. When tested as specified in 4.6.6, there shall be no explosion within the quick-disconnect assembly that ignites the surrounding explosive mixture or causes any damage to the quick-disconnect unit.

3.10.7 Strength. When tested as specified in 4.6.7, there shall be no damage which causes malfunctioning of the quick-disconnect unit, nor there be any leakage that one drop per minute.

3.10.8 Angular movement. When tested as specified in 4.6.8, there shall be no damage which causes malfunctioning of the quick-disconnect coupling assembly nor any leakage which exceeds one drop per minute.

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3.10.9 Endurance, wet and dry. When tested as specified in 4.6.9.1 and 4.6.9.2, the quick-disconnect coupling assembly shall pass the operating force test and leakage tests, as specified in 4.6.9.1 and 4.6.9.2.

3.10.10 Electrical resistance. When tested as specified in 4.6.10, the electrical resistance of the quick-disconnect coupling unit shall be not greater than 0.10 ohm for hose contact to the female disconnect half and female disconnect half to male disconnect half.

3.10.11 Insulation breakdown. When tested as specified in 4.6.11, there shall be no insulation breakdown either during or as a result of the test.

3.10.12 Accelerated corrosion. When tested as specified in 4.6.12, there shall be no evidence of corrosion which might adversely affect subsequent operation of the coupling. The coupling shall also pass the specified operating force, leakage, electrical resistance, and insulation breakdown tests.

3.10.13 Rough handling. When tested as specified in 4.6.13, the quick-disconnect coupling shall show no leakage or physical damage that causes malfunction of the coupling components.

3.10.14 Burst pressure. When tested as specified in 4.6.14, there shall be no evidence of leakage, distortion, or failure of any component as a result of this test.

3.10.15 Disassembly and inspection. After the requisite testing the quick-disconnect coupling assemblies shall be disassembled for inspection. There shall be no evidence of corrosion, wear, or distortion which would adversely affect the performance of the coupling (see 4.6.15).

3.11 Cleanliness. When prepared for shipment, couplings and components shall be free of dirt, manufacturing oils, and debris. There shall be no exposed sharp edges on machined surfaces. Castings shall be free of blow holes. Mold parting seams shall be smooth.

#### 4. QUALITY ASSURANCE PROVISIONS

4.1 Responsibility for inspection. Unless otherwise specified in the contract or purchase order, the contractor is responsible for the performance of all inspection requirements (examinations and tests) 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 any of the inspections set forth in this specification where such inspections are deemed necessary to ensure supplies and services conform to prescribed requirements.

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4.1.1 Responsibility for compliance. All items shall 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 ensuring that all products or supplies submitted to the Government for acceptance comply with all requirements of the contract. Sampling inspection, as part of the manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize submission of known defective material, either indicated or actual, nor does it commit the Government to accept defective material.

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

- (a) First article inspection (see 4.3).
- (b) Quality conformance inspection (see 4.4).

4.2.1 Inspection lot. For the purpose of quality conformance inspection and test sampling, a lot is defined as all the quick-disconnect couplings and components of the same class, produced in one facility, using the same production processes and materials, and being offered for delivery at one time.

4.3 First article inspection. Unless otherwise specified (see 6.2), first article inspection shall be performed on three complete quick-disconnect coupling units, each consisting of a male half, female half, and any necessary adapters required to conduct the first article tests. The inspection shall include the examination and the tests specified in table I. The first article may be a standard production item from the contractor's current inventory provided that the unit meets the requirements of this specification and is representative of the design, construction and manufacturing techniques applicable to the remaining units to be furnished under the contract.

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TABLE I. First article test schedule.

No. 1 Assembly		No. 2 Assembly		No. 3 Assembly	
Test	Test method	Test	Test method	Test	Test method
Examination	4.5	Examination	4.5	Examination	4.5
Proof pressure	4.6.1	Proof pressure	4.6.1	Proof pressure	4.6.1
Operating force	4.6.2	Operating force	4.6.2	Operating force	4.6.2
Leakage	4.6.3	Leakage	4.6.3	Leakage	4.6.3
				Endurance	4.6.9
Fuel resistance and extreme temperature	4.6.4	Total pressure loss	4.6.5	Electrical resistance	4.6.10
		Explosion proof Strength	4.6.6 4.6.7		
Disassembly and inspection	4.6.15	Angular movement	4.6.8	Insulation breakdown	4.6.11
		Disassembly and inspection	4.6.15	Accelerated corrosion	4.6.12
				Rough handling	4.6.13
				Burst pressure	4.6.14
				Disassembly and inspection	4.6.15

4.4 Quality conformance inspection. Quality conformance inspection shall consist of the inspections and tests as listed in table II.

Table II. Quality conformance inspections and tests.

Test	Test Method	Sampling Plan
Visual and dimensional examination	4.5	Table III
Proof test	4.6.1	Table IV
Electrical resistance <u>1/</u>	4.6.10	Table IV
Insulation breakdown <u>2/</u>	4.6.11	Table IV

- 1/ Nipples and couplings with switches  
2/ Couplings with switches

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4.4.1 Sampling for quality conformance inspection.

4.4.1.1 Sampling for visual and dimensional examination. As a minimum, the contractor shall randomly select a sample quantity of completed quick-disconnect coupling units, male and female halves, in accordance with table III and examine them in accordance with table II. If one or more defects are found in any sample, the entire lot is rejected. The contractor has the option of screening 100% of the lot for the defective characteristic (s) or providing a new lot which shall be examined in accordance with the sampling plan contained herein. The contractor shall maintain for a period of three years after contract completion all records of inspections, tests, or any resulting rejections.

Table III. Sampling for visual and dimensional examination.

Lot size	Sample size
2 to 8	All
9 to 150	13
151 to 280	20
281 to 500	29
501 to 1200	34
1201 to 3200	42

4.4.1.2 Sampling for acceptance tests. As a minimum, the contractor shall randomly select a sample quantity of completed quick-disconnect coupling units, male and female halves, in accordance with table IV and test them in accordance the table II. If one or more defects are found in any sample, the entire lot represented by the sample shall be rejected. If a lot is rejected, the contractor has the option of screening 100% of the lot for the defective characteristic (s) or providing a new lot which shall be tested in accordance with the sampling plan contained herein. The contractor shall maintain for a period of three years after contract completion all records of inspections, tests or any resulting rejections.

Table IV. Sampling for acceptance tests.

Lot size	Sample size
2 to 25	3
26 to 50	5
51 to 90	6
91 to 150	7
151 to 280	10
281 to 500	11
501 to 1200	15
1201 to 3200	18

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4.5 Visual and dimensional examination. Each quick-disconnect assembly, nipple, and strainer shall be thoroughly examined for rough edges and castings, sharp edges where machining has been performed, and for compliance to 3.3.1.1 and the manufacturer's drawings.

4.6 Test methods. CAUTION: Tests requiring the use of a flammable test fluid should be conducted in an area where hot work (welding), smoking, and other activities that could produce sparks are prohibited.

4.6.1 Proof pressure. The connected quick-disconnect coupling and nipple shall be subjected to an internal test pressure of not less than 120 PSI for not less than 1 minute using test fluids specified in 3.3.2. Failure to meet the requirements of 3.10.1 shall be cause for rejection.

4.6.2 Operating force. With the nipple mounted on a solid support, the coupling shall be engaged and locked. The coupling shall be unlocked and disengaged. Failure to meet the requirements of 3.10.2 shall be cause for rejection.

4.6.3 Leakage. The connected assembly shall be subjected to internal fluid pressures of minus 4 PSI to plus 4 PSI in 2-PSI increments and from 10 PSI to 60 PSI in 10-PSI increments using test fluids specified in 3.3.2 for positive pressures and air for the negative pressures. The pressures shall be maintained at each increment for not less than 1 minute. Failure to meet the requirements of 3.10.3 shall be cause for rejection.

4.6.3.1 Check valve leakage. The female half, hose end, of the coupling shall be connected to a fuel pressure source. Five and 60 PSI fuel pressure shall be applied to the inlet and observed for leakage through the outlet end for not less than 1 minute. Failure to meet the requirements of 3.10.3.1 shall be cause for rejection.

4.6.4 Fuel resistance and extreme temperature. Quick-disconnect coupling components which contain nonmetallic parts exposed to the fuel shall be subjected to the appropriate fuel resistance test in accordance with MIL-F-8615. Coupling components which are all metal need only be subjected to the extreme temperature test. Failure to meet the requirements of 3.10.4 shall be cause for rejection.

4.6.5 Total pressure loss. The quick-disconnect coupling assembly, with a 60 mesh strainer installed, shall be installed in a test set up similar to figure 2. The test shall be conducted at flow rates from 0 to 350 gal/min using test fluids specified in 3.3.2. Sufficient data shall be taken to plot a "Total Pressure Loss vs Flow" curve. Failure to meet the requirements of 3.10.5 shall be cause for rejection.

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4.6.6 Explosion proof. The explosion-proof test shall be conducted in a test chamber having a transparent window on one side and the opposite side closed by thin nonporous paper to permit instant pressure relief during explosion. The chamber shall be equipped with a means for vaporizing fuel and maintaining a predetermined gasoline vapor-air mixture throughout the test chamber. Three drilled holes in the quick disconnect housing shall be tapped for insertion of a spark plug, a vapor line, and a vent line. A pressure gauge shall be connected in the vapor line to indicate when explosions occur in the unit housing. The quick-disconnect coupling assembly and surrounding chamber shall be filled with the explosive mixture and the valves in the vapor and vent lines shall be closed. The temperature of the explosive mixture shall be not greater than 135 degrees Fahrenheit (°F). The explosive mixture in the quick-disconnect coupling assembly shall be exploded and replaced for three explosions. After the three explosions, the mixture in the chamber shall be exploded to determine that an explosive mixture existed in the chamber. A total of four tests as described above shall be conducted at each of the following air-fuel ratios (by weight): 12.5:1, 13.5:1, 14.5:1, and 15.5:1. The quick-disconnect coupling assembly shall confine all sparks and flame. Failure to meet the requirements of 3.10.6 shall be cause for rejection.

4.6.7 Strength. With the test setup as shown on figure 3, the 90-pound force shall be applied and removed 1,000 times while a pressure of 60 PSI is maintained internally on the quick-disconnect coupling assembly. The test fluid shall be as specified in 3.3.2. Failure to meet the requirements of 3.10.7 shall be cause for rejection.

4.6.8 Angular movement. With the test setup as shown on figure 4, the nipple-coupling assembly shall be rotated alternately 180 degrees in each direction for 2,500 complete cycles while an internal test fuel (see 3.3.2) pressure of 60 PSI is applied to the assembly. At the conclusion of the test, the assembly shall be subjected to the operating force and leakage test as specified in 4.6.2 and 4.6.3, respectively. Failure to meet the requirements of 3.10.8 shall be cause for rejection.

4.6.9 Endurance. Failure to meet the requirements of 3.10.9 after either of the following two tests shall be cause for rejection.

4.6.9.1 Wet. The wet endurance test shall consist of connecting and disconnecting the quick disconnect coupling assembly in the normal manner 2000 times (complete cycles). The assembly shall be pressurized to 60 PSI with test fluid (see 3.3.2) each time the connection is made. The operating force test, (see 4.6.2), shall be conducted after each 200 cycles. At the completion of this test, the leakage test (see 4.6.3) shall be conducted.

4.6.9.2 Dry. The dry endurance test shall be conducted in a manner similar to the wet endurance test, except that the duration of the test shall be 500 cycles, the nipple and coupling shall remain dry throughout the test, and no pressure shall be applied to the connected units. The operating force test, (see 4.6.2), shall be conducted at the completion of the dry endurance test followed by the leakage test (see 4.6.3).

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4.6.10 Electrical resistance. This test is applicable to all class 2 quick-disconnect couplings containing an electrical control switch. The electrical resistance shall be measured from an aluminum plate bolted to the nipple flange through the nipple and coupled coupling to a special fitting screwed into the coupling. The test setup shall be as specified on figure 5. For couplings containing electrical contacts, the electrical resistance shall meet the requirements of 3.10.10. Failure to meet these requirements shall be cause for rejection.

4.6.11 Insulation breakdown. This test is applicable only to those quick-disconnect couplings which incorporate the control switch. One thousand volts root mean square (rms), 60-hertz, shall be applied as indicated on figure 5, with the switch in the open position. Failure to meet the requirements of 3.10.11 shall be cause for rejection.

4.6.12 Accelerated corrosion. The assembled strainer, nipple, and quick-disconnect coupling shall be immersed in a 2.5 percent solution by weight of sodium chloride and water. The assembly shall then be dried for a period of 1 hour at a temperature of  $130 \pm 5^{\circ}\text{F}$ . The procedure shall be repeated for a total of 50 cycles. Immediately after this test, the assembly shall be washed with warm water to remove all salt accumulations and then dried. The assembly shall then be subjected to the operating force and leakage tests of 4.6.2 and 4.6.3, respectively. When the assembly includes an electrical control switch, the electrical resistance and insulation breakdown tests of 4.6.10 and 4.6.11, respectively, shall also be conducted. Failure to meet the requirements of 3.10.12 shall be cause for rejection.

4.6.13 Rough handling. The coupling shall be attached to a length (12 feet minimum) of 2.5 inch collapsible hose in accordance with MIL-H-17902. With the coupling axis horizontal, the hose shall then be dropped a total of nine times from a height of 6 feet to a .625-inch thick steel plate, striking the plate three times with the electrical control switch in each of the following positions:

- (a) Top.
- (b) Side.
- (c) Bottom.

The coupling shall then be connected to a nipple and subjected to the operating force and leakage tests of 4.6.2 and 4.6.3, respectively. Failure to meet the requirements of 3.10.13 shall be cause for rejection.

4.6.14 Burst pressure. The nipple and quick-disconnect coupling assembly shall be subjected to an internal test pressure of 180 PSI using the test fluids specified in 3.3.2. The pressure shall be held for 1 minute then reduced to 60 PSI and held for an additional 1 minute. Failure to meet the requirements of 3.10.14 shall be cause for rejection.

4.6.15 Disassembly and inspection. Failure to meet the requirements of 3.10.15 shall be cause for rejection.

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4.7. Inspection of packaging. Sample packs and the inspection of packaging (preservation packing and marking) for shipment, stowage, and storage shall be in accordance with the requirements of section 5 and the documents specified therein.

## 5. PACKAGING

(The packaging requirements specified herein apply only for direct Government acquisition. For the extent of applicability of the packaging or preparation for delivery requirements of referenced documents listed in Section 2, see 6.7)

5.1 General.5.1.1 Navy fire retardant requirements.

- a. Lumber and plywood. When specified (see 6.2), all lumber and plywood including laminated veneer materials used in shipping container and pallet construction, members, blocking, bracing and reinforcing shall be fire-retardant treated materials conforming to MIL-L-19140 as follows:

Level A and B-	Type II-weather resistant Category I-general use.
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Level C-	Type I-non-weather resistant Category I-general use.
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- b. Fiberboard. Fiberboard used in the construction of interior (unit and intermediate) and exterior fiberboard boxes including interior packaging forms shall conform to the class-domestic/fire retardant or class-weather resistant/fire retardant material requirements as specified (see 6.2), of ASTM D 4727.

5.2 Preservation. Preservation shall be level A,C or commercial as specified (see 6.2).

5.2.1 Level a.

5.2.1.1 Cleaning, drying and preservatives. The assembly components (see 3.2) shall be individually cleaned, dried and preserved by a process, a procedure, and protected by a preservative material application in accordance with MIL-P-116. Selection of the cleaning process, drying procedure and preservative material shall be at the contractor's option.

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5.2.1.2 Unit protection. The assembly components shall be unit protected in accordance with the preservation methods or sub-method in accordance with MIL-P-116. Unless otherwise specified (see 6.2), selection of the method or sub-method shall be a contractor's option. Methods or sub-methods shall be supplemented with a water resistant folding, set-up or metal edged paperboard or a class weather resistant/fire retardant fiberboard (see 5.1.1b) box meeting the unit and intermediate container requirements of MIL-STD-2072-1. The container selection shall be at the option of the contractor.

5.2.2 Level c. The assembly components shall be preserved as specified under level A except that the interior (unit and intermediate) boxes shall be as follows:

- a. Paperboard containers shall be of the domestic or non-weather resistant type, class or variety as applicable and,
- b. Fiberboard containers shall be of the class-domestic/fire retardant material (see 5.1.1b). Box closure shall be in accordance with Method I using pressure sensitive adhesive tape.

5.3 Packing. Packing shall be level A, B, C or commercial as specified (see 6.2).

5.3.1 General requirements for levels A, B and C. Containers selected (see 5.3.2), shall be of minimum weight and cube consistent with the protection required and of uniform size.

5.3.2 Levels A, B and C containers. Couplings preserved as specified (see 5.2), shall be packed in exterior shipping containers for the level of packing specified (see 5.3), in accordance with MIL-STD 2073-1, and herein. Unless otherwise specified (see 6.2), container selection shall be at the contractor's option.

5.3.2.1 Caseliners, closure and gross weight.

5.3.2.1.1 Caseliners. Unless otherwise specified (see 6.2), level A shipping containers containing couplings preserved level C or commercial shall be provided with waterproof caseliners in accordance with MIL-STD 2073-1.

5.3.2.1.2 Closure. Container closure, reinforcing, or banding shall be in accordance with the applicable container specification or appendix thereto except that class-weather-resistant/fire retardant fiberboard boxes shall be closed in accordance with Method V and reinforced with non-metallic or tape banding and class domestic or class-domestic/fire retardant fiberboard boxes shall be closed in accordance with Method I using pressure sensitive tape.

5.3.2.1.3 Weight. Wood, plywood, and cleated type containers exceeding 200 pounds gross weight shall be modified by the addition of skids in accordance with MIL-STD 2073-1 and the applicable container specification or appendix thereto.

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5.3.3 Commercial. Couplings preserved as specified (see 5.2) shall be packed for shipment in accordance with ASTM D 3952 and herein.

5.3.3.1 Container modification. Shipping containers exceeding 200 pounds gross weight shall have a minimum of two, 3-inch by 4-inch nominal wood skids laid flat, or a skid or sill type base which will support the material and facilitate handling by mechanical handling equipment during shipment, stowage and storage.

5.4 Marking, levels A, B, C and commercial. In addition to any special marking required (see 6.2), interior packs and shipping containers shall be marked for shipment, stowage and storage in accordance with MIL-STD 2073-1. Commercial marking shall be in accordance with ASTM D 4727.

## 6. NOTES

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

6.1 Intended use. The quick-disconnect coupling assemblies covered by this specification are intended for use in connecting fuel nozzles to aviation fuel hose.

6.2 Acquisition requirements. Acquisition documents must specify the following:

- (a) Title, number, and date of this specification.
- (b) Class and part number of each component to be furnished (see 1.2).
- (c) Issue of DoDISS to be cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1.1 and 2.2).
- (d) Whether first article inspection is required (see 3.1).
- (e) When fire retardant treatment is required (see 5.1.1a).
- (f) Class of fire-retardant fiberboard required (see 5.1.1b).
- (g) Level of preservation and level of packing required (see 5.2 and 5.3)
- (h) Unit protection selection is other than contractor's option (see 5.2.1.2).
- (i) Container selection if other than contractor's option (see 5.3.2).
- (j) When caseliners are not required (see 5.3.2.1.1).
- (k) Special marking required (see 5.4).

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6.4 First article. When a first article inspection is required, the unit should be a first production item or it may be a standard production item from the contractor's current inventory as specified in 4.3. The first article should consist of one complete quick disconnect assembly. The contracting officer should include specific instruction in acquisition documents regarding arrangements for examinations, approval of first article test results and disposition of first articles. Invitations for bids should provide that the Government reserves the right to waive the requirement for samples for first article inspection to those bidders offering a product which has been previously acquired or tested by the Government, and that bidders offering such products, who wish to rely on such production or test, must furnish evidence with the bid that prior Government approval is presently appropriate for the pending contract.

6.5 Requirement and test cross reference. For information, the requirements paragraphs and test paragraphs are cross referenced below in table V.

TABLE V. Requirement and test cross reference.

Test	Requirement	Test method
Examination	3.3.1.1	4.5
Proof pressure	3.10.1	4.6.1
Operating force	3.10.2	4.6.2
Leakage	3.10.3	4.6.3
Leakage, check valve	3.10.3.1	4.6.3.1
Fuel resistance and extreme temperature	3.10.4	4.6.4
Total pressure loss	3.10.5	4.6.5
Explosion proof	3.10.6	4.6.6
Strength	3.10.7	4.6.7
Angular movement	3.10.8	4.6.8
Endurance	3.10.9	4.6.9
Electrical resistance	3.10.10	4.6.10
Insulation breakdown	3.10.11	4.6.11
Accelerated corrosion	3.10.12	4.6.12
Rough handling	3.10.13	4.6.13
Burst pressure	3.10.14	4.6.14
Disassembly and inspection	3.10.15	4.6.15

6.6 Sub-contracted material and parts. The packaging or preparation for delivery requirements of referenced documents listed in section 2 do not apply when material and parts are acquired by the contractor for incorporation into the equipment and lose their separate identity when the equipment is shipped.

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6.7 Subject term (key word) listing.

Aircraft fuel system  
Fuel hose  
Fuel nozzle  
Refueling nozzle

6. Issue of DODISS. When this specification is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see 2.2).

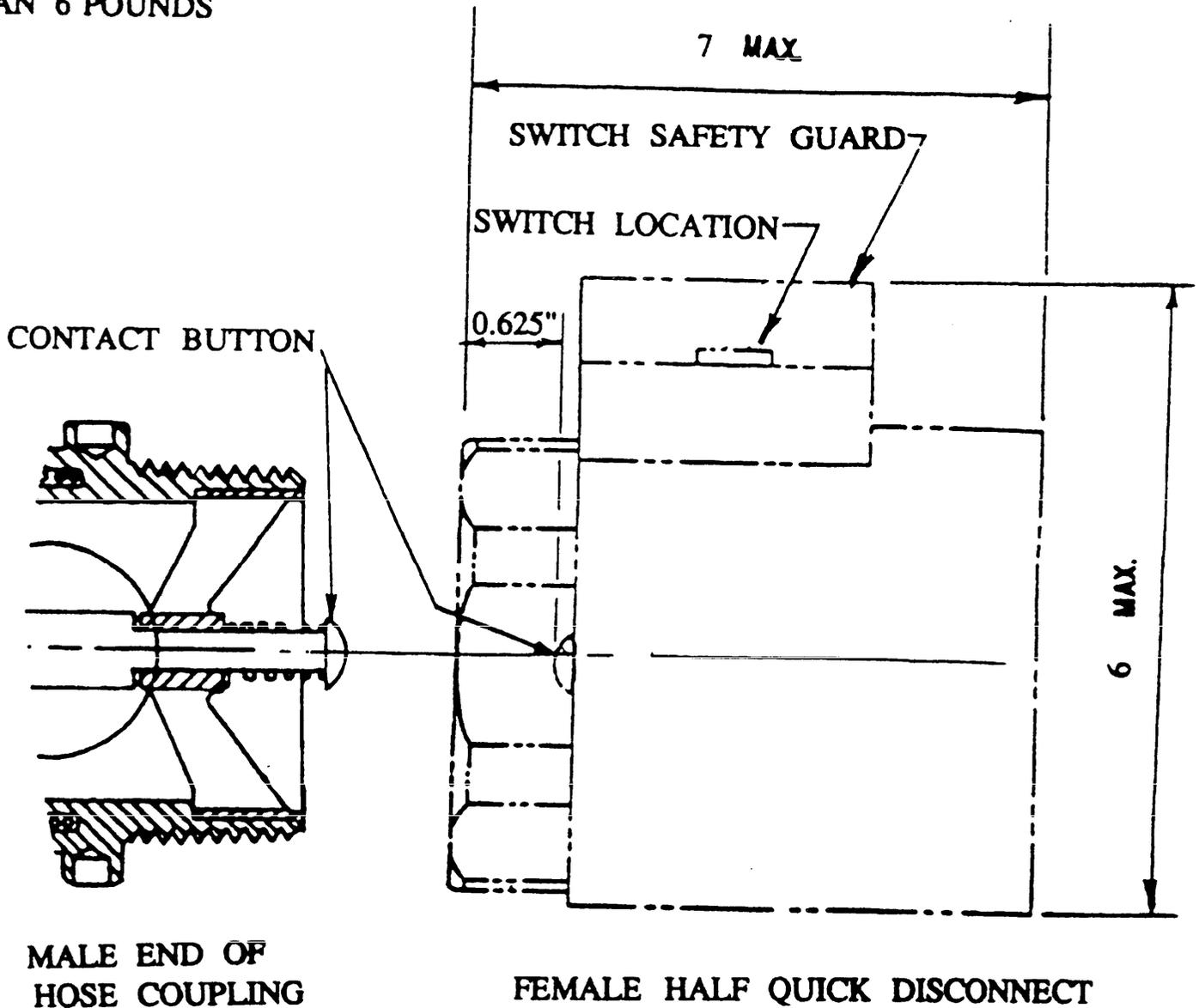
Preparing activity:  
Navy - SH  
(Project 4730-0193)

Custodians:  
Army - ME  
Navy - SH  
Air Force - 99

Review activities:  
Air Force - 82

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THE FEMALE HALF OF THE  
 DRYBREAK COUPLING SHALL  
 WEIGH NOT GREATER  
 THAN 6 POUNDS



NOT TO SCALE

FIGURE 1. Envelope and weight limitations, and contact assembly location.

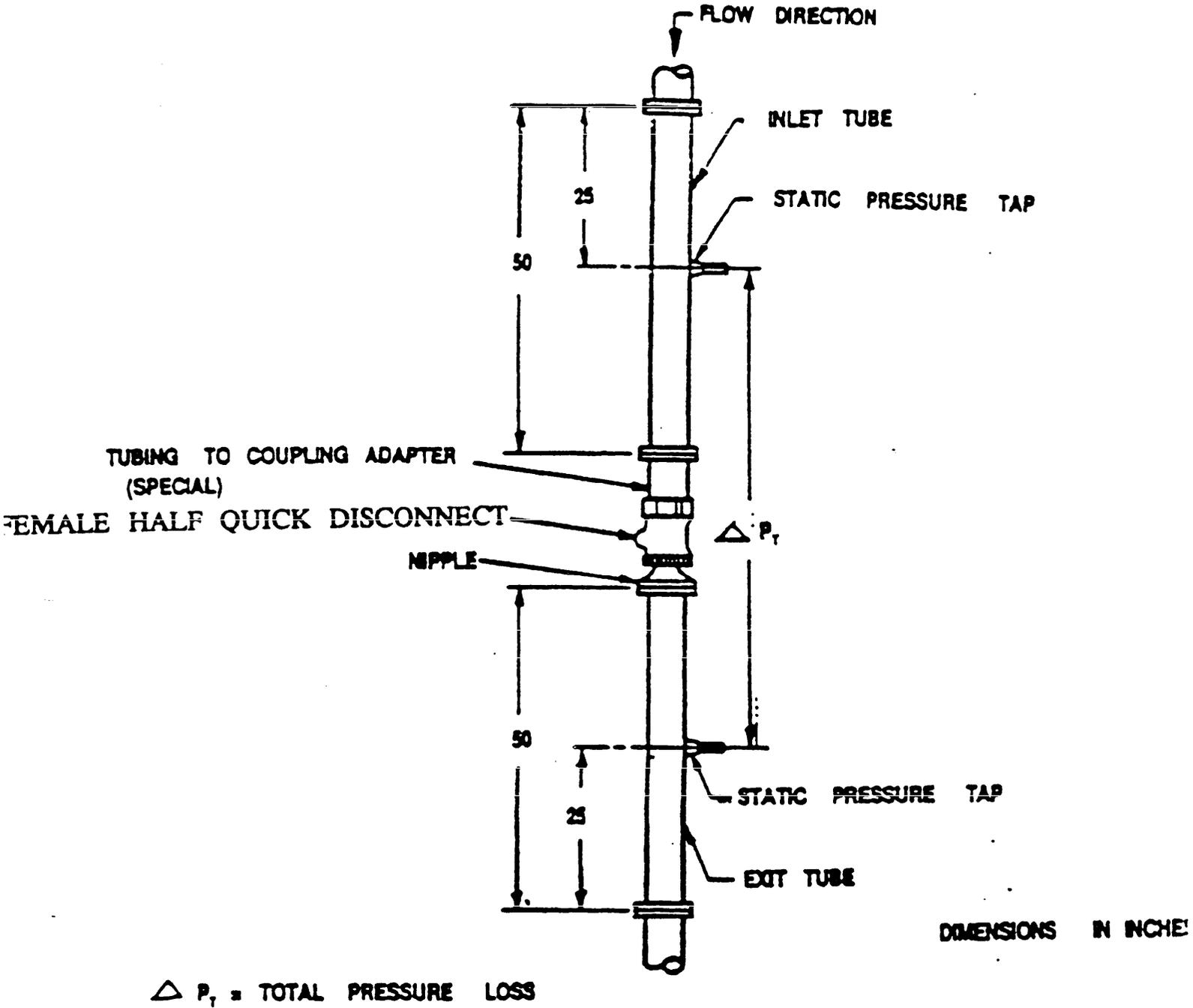
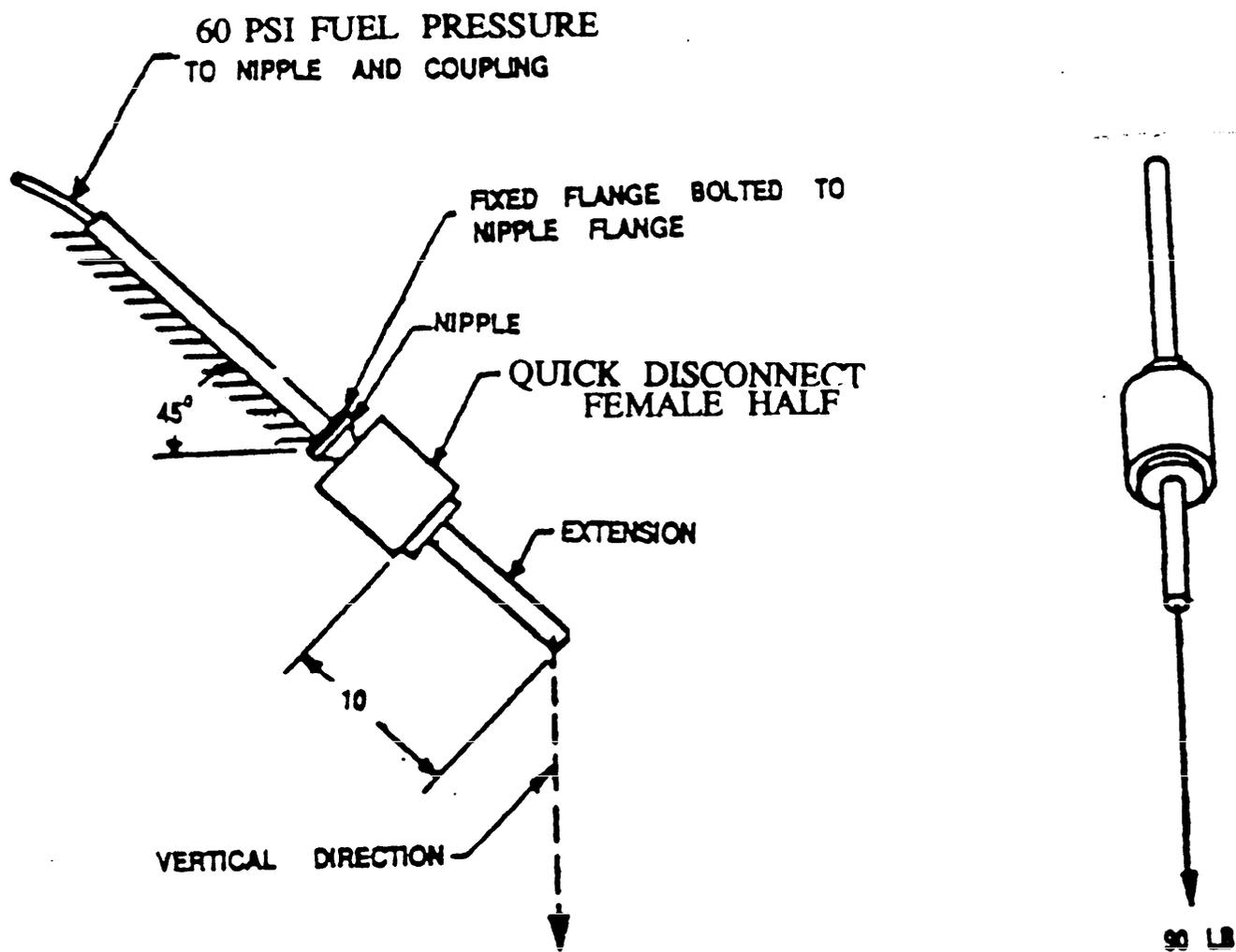
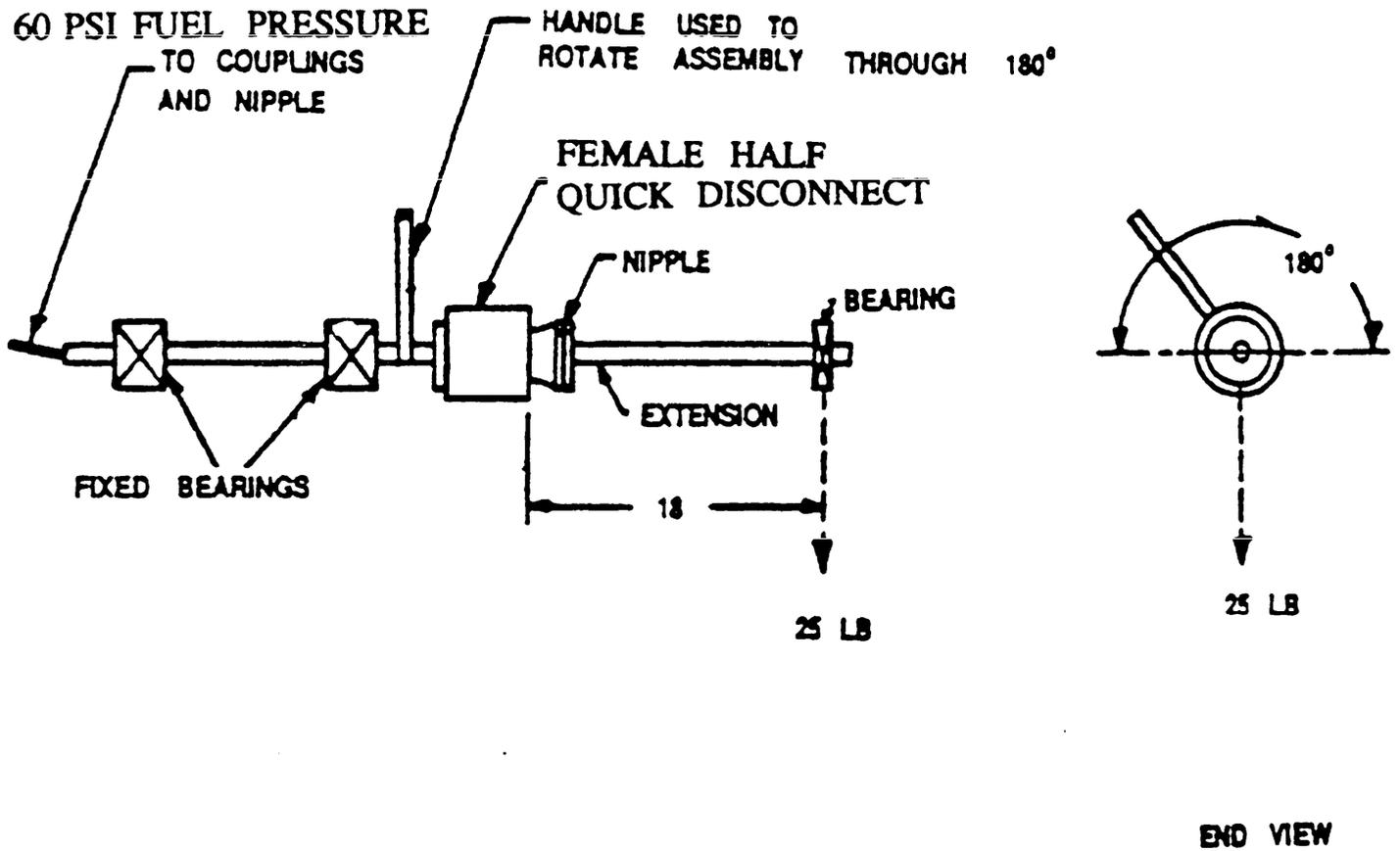


FIGURE 2. Pressure loss test set-up.



DIMENSIONS IN INCHES

FIGURE 3. Strength test set-up.



DIMENSIONS IN INCHES

FIGURE 4. Angular test set-up.

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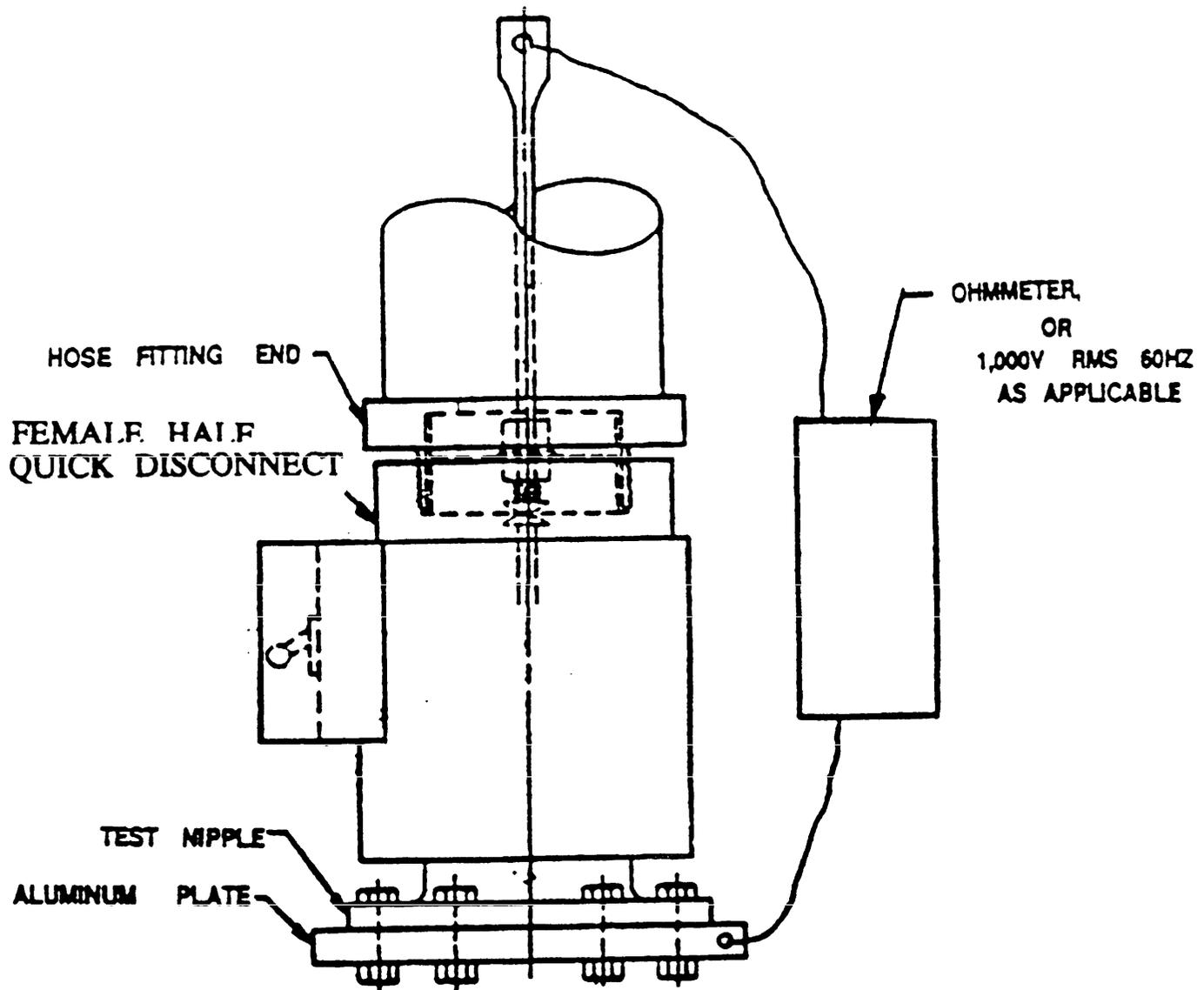


FIGURE 5. Electrical resistance test set-up.

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

## INSTRUCTIONS

The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.

2. The submitter of this form must complete blocks 4, 5, 6, and 7.

3. The preparing activity must provide a reply within 30 days from receipt of the form.

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

### 1 RECOMMEND A CHANGE:

1. DOCUMENT NUMBER  
MIL-C-24788

2. DOCUMENT DATE (YYMMDD)  
9 SEPTEMBER 1993

### 3. DOCUMENT TITLE

**COUPLING ASSEMBLY, SEMI-DRY-BREAK QUICK-DISCONNECT, FUEL WITH OR WITHOUT CONTINUITY SWITCH**

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

### 5. REASON FOR RECOMMENDATION

### 6. SUBMITTER

a. NAME (Last, First, Middle Initial)

b. ORGANIZATION

c. ADDRESS (Include Zip Code)

d. TELEPHONE (include Area Code)  
(1) Commercial  
(2) AUTOVON  
(if applicable)

7. DATE SUBMITTED  
(YYMMDD)

### B. PREPARING ACTIVITY

a. NAME **COMMANDER  
SEA 03Q42  
NAVAL SEA SYSTEMS COMMAND**

b. TELEPHONE (include Area Code)  
(1) Commercial  
(703) 602-6020  
(2) AUTOVON  
(AV) 332-6020

c. ADDRESS (Include Zip Code)  
**2531 JEFFERSON DAVIS HWY  
ARLINGTON, VA 22242-5160**

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5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466  
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