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MILITARY SPECIFICATION

RECEPTACLE, FLYING BOOM, AERIAL REFUELING

1. SCOPE

1.1 This specification covers the requirements for aerial refueling flying boom receptacles.

1.2 Classification. Receptacles shall be of the classes specified in 3.5.3.1.

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.

SPECIFICATIONS

Federal

QQ-C-320	Chromium Plating (Electrodeposited)
TT-S-735	Standard Test Fluids, Hydrocarbon

Military

MIL-P-116	Preservation, Methods of
MIL-W-5086	Wire, Electric, Hook-up and Interconnecting, Polyvinyl Chloride-Insulated, Copper or Copper Alloy Conductor
MIL-B-5087	Bonding, Electrical, and Lighting Protection, for Aerospace Systems
MIL-W-5088	Wiring, Aircraft, Selection and Installation of
MIL-P-5315	Packing, Preformed, Hydrocarbon Fuel Resistant
MIL-H-5440	Hydraulic Systems, Aircraft Types I and II, Design, Installation, and Data Requirements for
MIL-C-5503	Cylinders, Aeronautical, Hydraulic Actuating, General Requirements for
MIL-G-5572	Gasoline, Aviation, Grades 80/87, 100/130, 115/145
MIL-T-5624	Turbine Fuel, Aviation, Grades JP-4 and JP-5
MIL-C-6021	Casting, Classification and Inspection of
MIL-P-7105	Pipe Threads, Taper, Aeronautical National Form, Symbol ANPT, General Requirements for

MIL-F-7179	Finishes and Coatings, General Specification for Protection of Aerospace Weapons Systems, Structures and Parts
MIL-S-7742	Screw Threads, Standard, Optimum Selected Series: General Specification for
MIL-H-8446	Hydraulic Fluid, Nonpetroleum Base, Aircraft
MIL-I-8500	Interchangeability and Replaceability of Component Parts for Aircraft and Missiles
MIL-P-8585	Primer Coating, Zinc Chromate, Low-Moisture-Density
MIL-F-8615	Fuel System Components, General Specification for
MIL-A-8625	Anodic Coatings, for Aluminum and Aluminum Alloys
MIL-S-8805	Switches and Switch Assemblies, Sensitive and Push, Snap Action, General Specification for
MIL-A-8865	Airplane Strength and Rigidity Miscellaneous Loads
MIL-H-8891	Hydraulic Systems, Manned Flight Vehicles, Type III, Design, Installation, and Data Requirements for
MIL-N-25027	Nut, Self-locking, 250°F, 450°F, and 800°F, 125 Ksi Ftu, 60 Ksi Ftu, and 30 Ksi Ftu
MIL-W-25038	Wire, Electrical, High Temperature and Fire Resistant, Aircraft
MIL-F-25558	Fuel, Ramjet Engine, Grade RJ-1
MIL-J-25656	Jet Fuel, Grade JP-6
MIL-P-25732	Packing, Preformed, Petroleum Hydraulic Fluid Resistant, 275°F
MIL-F-38363	Fuel System, Aircraft, Design, Performance, Installation, Testing, and Data Requirements, General Specification for
MIL-S-38449	Signal Amplifier, Universal, Flying Boom Aerial Refueling
MIL-C-81511	Connector, Electric, Circular, High Density, Quick Disconnect, Environment Resisting
MIL-C-83286	Coating, Urethane, Aliphatic Isocyanate, for Aerospace Applications

STANDARDS

Federal

FED-STD-151	Metal, Test Methods
FED-STD-595	Colors

Military

MIL-STD-100	Engineering Drawing Practices
MIL-STD-129	Marking for Shipment and Storage
MIL-STD-130	Identification Marking of U.S. Military Property
MIL-STD-143	Standards and Specifications, Order of Precedence for the Selection of
MIL-STD-461	Electromagnetic Interference Characteristics Requirements for Equipment

MIL-STD-462	Electromagnetic Interference Characteristics, Measurement of
MIL-STD-704	Electric Power, Aircraft, Characteristics and Utilization of
MIL-STD-794	Parts and Equipment, Procedures for Packaging and Packing of
MIL-STD-810	Environmental Test Methods
MIL-STD-831	Test Reports, Preparation of
MIL-STD-889	Dissimilar Metals
MS20995	Wire, Safety or Lock
MS27604	Nozzle-Universal Aerial Refueling Tanker Boom
MS28775	Packing, Preformed, Hydraulic, +275°F ("O" Ring)
MS33588	Nut, Self-Locking, Aircraft Design and Usage, Limitations of

PUBLICATIONS

Air Force-Navy Aeronautical Bulletin

438	Age Controls of Age-Sensitive Elastomeric Items

Air Force Systems Command Handbooks

2-1	Airframe
2-4	Electronic Warfare

(Copies of documents 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

868	Pressure Drop Test for Fuel System Components

(Application for copies should be addressed to the Society of Automotive Engineers, 2 Pennsylvania Plaza, New York, New York 10001.)

3. REQUIREMENTS

3.1 Preproduction. This specification makes provisions for preproduction testing.

3.2 Components. The receptacle shall consist of the following components:

a. Receptacle body (casting)

b. Sliding valve assembly

c. Pedestal assembly

d. Toggle latch mechanism assembly

e. Guide rollers

f. Scuff plate (face)

g. Induction coil

h. Latch actuator (hydraulic actuated integral relief)

i. Nozzle contact and latch switches

j. Wiring harness assembly and connector.

3.2.1 Mounting components. All components mounting the receptacle body to the airframe shall be designed to loads in accordance with MIL-A-8865.

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

3.4 Materials. Materials and processes used by the manufacturer of the receptacle shall be of high quality, suitable for the purpose, and shall conform to applicable Government documents. All materials used in the receptacle shall be sufficiently resistant to fuel conforming to MIL-G-5572, MIL-T-5624, MIL-P-25558, and MIL-J-25656 (JP-6), or to fluid conforming to TT-S-735 (types I and III) of aromatic content from 0 to 30 percent.

3.4.1 Fungusproof materials. Materials that are nutrients for fungi shall not be used where it is practicable to avoid them. Where used and not hermetically sealed, they shall be treated with a fungicidal agent acceptable to the procuring activity, however, if they are to be used in a hermetically sealed inclosure, fungicidal treatment is not necessary.

3.4.2 Metals. Metals shall be of the corrosion-resistant type or be suitably treated to resist corrosion due to fuels, salt spray, or atmospheric conditions likely to be met in storage or normal service. The use of any protective coating

that will crack or scale with age or extremes of climatic and environmental conditions shall be avoided. Metals shall be inspected in accordance with FED-STD-151. Magnesium and copper or alloys of either one shall not be used.

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

3.4.3 Castings. All castings used in the manufacturing of the receptacle shall be classified 1A and be inspected in accordance with MIL-C-6021.

3.4.4 Fuel O-ring packing. Fuel O-ring packing shall conform dimensionally to MS28775 and physically to MIL-P-5315.

3.4.5 Hydraulic O-ring packing. Hydraulic O-ring packing shall conform dimensionally to MS28775 and physically to MIL-P-25732.

3.4.6 Teflon seals. Teflon shall not be used for gaskets, seals, and packings in any location where an impact load is encountered.

3.5 Design. The receptacle, when installed on the receiver aircraft, shall be designed to be compatible with the boom nozzle, described in MS27604, AFSC DH 2-1, DN5A3, of the flying-boom type tanker. Upon engagement, the tanker boom nozzle shall be held in place by a hydraulic pressure actuated mechanism; however, disconnects may occur if prescribed airplane formating envelopes are exceeded or if the tanker or airplane being refueled initiates electrical disconnect signals. The receptacle design shall also permit tension disconnects with the toggles in the locked position. The receptacle shall be designed to withstand the structural loads incident to boom insertion and retraction.

3.5.1 Reliability. The receptacle shall withstand the cyclic operating conditions throughout the testing specified in section 4.

3.5.2 Sliding valve and pedestal operations. The sliding valve shall be opened by the inserting force of the nozzle. An external seal with the nozzle shall occur before the poppet permits the fuel to flow. After the external seal is made, the remaining insertion of the nozzle shall open both the receptacle sliding valve and nozzle poppet. The sliding valve shall be spring loaded to close and closure shall be simulataneous with nozzle extraction when the nozzle extraction is 10 fps or less. The sliding-valve assembly and pedestal shall be removable from the front portion of the receptacle. The main seal shall be a part of the sliding valve assembly and shall be easily removable after the sliding valve has been removed. The pedestal which opens the boom nozzle poppet on engagement shall be easily removable and installed without receptacle disassembly. A positive means of retention shall be provided for the stem. Torsional and compression loading in static and all operating positions of the sliding valve shall not

cause loosening, breakage, or cause malfunction of receptacle operation. The sliding valve and pedestal shall be of such design as to be compatible with MS27604. The receptacle sliding valve assembly shall be bottomed out when the plane of the contact surface (the plane formed by the nozzle striker plates and the locked toggle latch rollers) is normal to the nozzle centerline (figure 1). This condition shall exist when a nozzle having the maximum allowable tolerance from striker plate to nozzle tip (4.4125 inches) is inserted and locked into the receptacle. The total sliding-valve travel shall be not less than 1 inch or greater than 1.17 inches.

3.5.3 Nonoperating and operating conditions

3.5.3.1 Nonoperating. The receptacle shall withstand the following conditions without adverse effect or malfunction:

a. Nonoperating temperatures

Temperature Range (°F)

	Fuel		Ambient		Hydraulic	
	Min	Max	Min	Max	Min	Max
Class A:	-67	+135	-67	+160	-67	+275
Class B:	-67	+200	-67	+350	-67	+350
Class C:	-67	+300	-67	+600	-67	+450

b. Nonoperating altitude - all classes: 75,000 feet

3.5.3.2 Operating. During refueling, the receptacle shall operate under the following conditions:

a. Operating temperatures: Class A for all operating temperature environment

b. Operating altitude: All classes 45,000 feet.

3.5.4 Drain. The receptacle shall incorporate provisions for draining all residual fluids from that part of the receptacle body which is not pressurized during the refueling, including the volume from just forward of the sliding valve assembly to a point just forward of the bottomed position of the aft edge of the sliding valve at the 6 o'clock position. The drain shall remove all residual fuel when the receptacle is in any position from horizontal through a 30° inclined position. Receptacles which are sealed shall contain drainage for all low points including the guide roller pockets.

3.5.4.1 Traps and voids. The receptacle shall be so constructed that freezing of condensate will not cause it to malfunction.

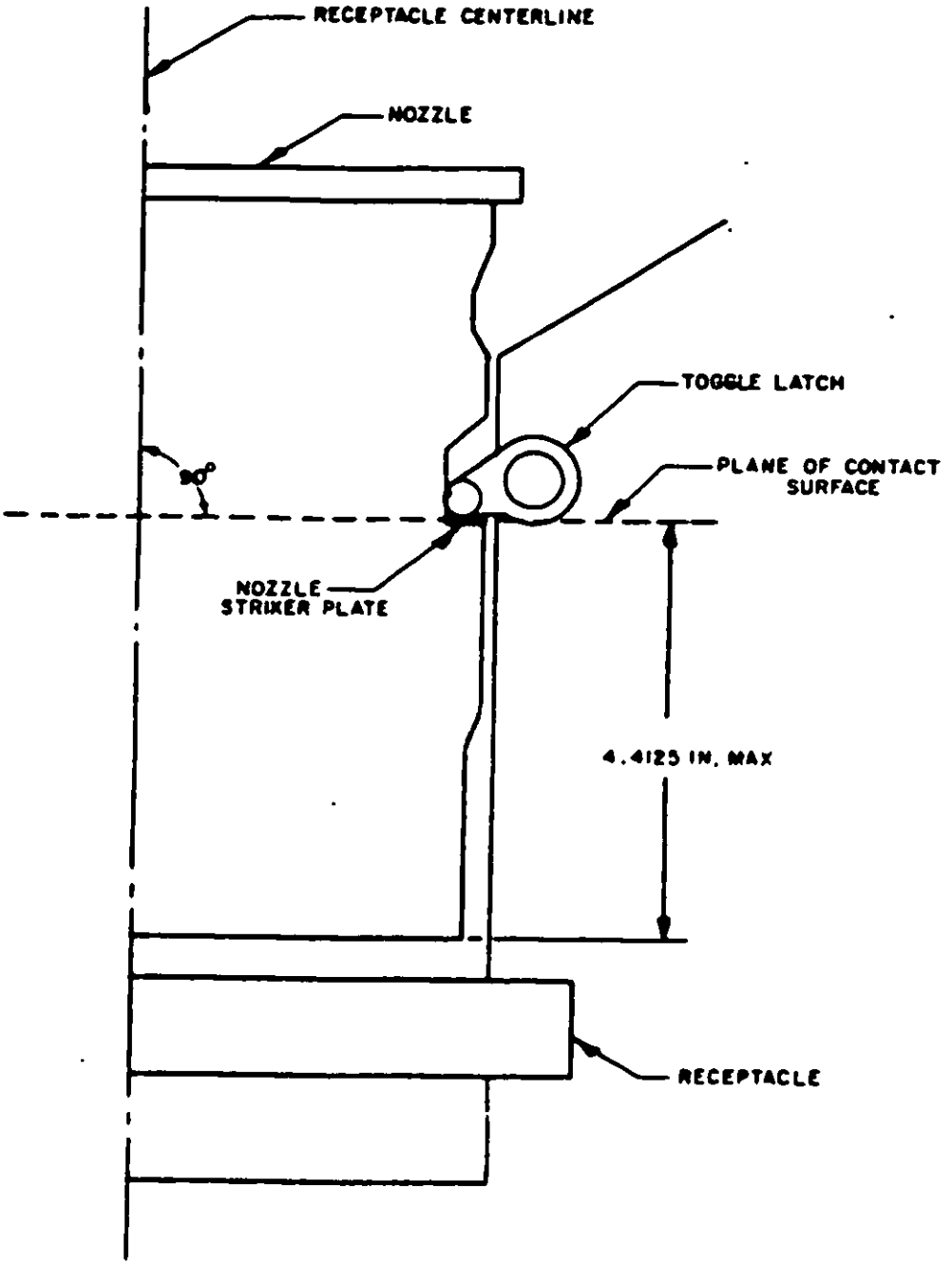

Figure 1. Maximum Nozzle Locked Configuration

3.5.5 Structure. The receptacle shall withstand the following design loads:

a. Ultimate design tension load: A load of $\frac{14,000}{\cos A}$ pounds applied to the boom nozzle ball joint where angle "A" may vary from 0° to 30°

b. Ultimate compression load: A 20,000-pound compression load applied at the boom-nozzle ball joint anywhere within a 34° cone

c. Limit load (tension and compression working load): A load of $\frac{9,000}{\cos C}$ pounds applied at the boom nozzle ball joint where angle "C" may vary from 0° to 17°.

3.5.5.1 Impact. The receptacle, including all parts such as sliding valve, main seal, pedestal assemblies, et cetera, shall withstand the impacts received from a weighted boom nozzle of 100 pounds dropped 9.2 inches directly onto the sliding valve assembly as installed in a completed receptacle.

3.5.6 Electrical requirements. The receptacle shall perform electrically on 18 to 30V d-c power in accordance with MIL-STD-704. All electrical components, materials, and wiring practices shall meet the requirements of MIL-W-5088. Connectors shall be in accordance with MIL-C-81511.

3.5.6.1 Bonding and lightning protection. The metal parts of the receptacle, with the exception of the induction coil core, shall be designed to meet the electrical bonding and lightning protection requirements of MIL-B-5087. The lightning waveform shall also be in accordance with MIL-B-5087.

3.5.6.2 Limit switches. The receptacle shall incorporate two latch limit switches and one contact limit switch which shall function as specified herein. The switches shall operate on 18 to 30V dc, normally 28V dc, and shall have an induction rating of not less than 3 amps. They shall be of a hermetically sealed type conforming to MIL-S-8805 and to the requirements specified herein. The switch terminals shall be physically separated by a barrier of sufficient dielectric strength to meet the requirements of this specification. The switches shall be identified by NOZZLE CONTACT SWITCH and NOZZLE LATCH SWITCH and shall be so marked. Electrical limit switch operation shall be compatible with the tanker system and MS27604. The contact switch shall be actuated between 0.50 to 0.75 inch of sliding valve travel as measured from the fully closed position of the sliding valve assembly. The contact switch shall have a minimum overtravel of 0.250 inch. After the contact switch has been closed by the sliding-valve assembly, the operating limits of the latch switch shall be equivalent to those of the contact switch. The use of holding relays in lieu of contact/latch switches shall not be permissible for maintaining the contact-made condition when inadvertant nozzle movement occurs.

3.5.6.3 Nozzle contact switch. This double-throw limit switch shall complete the electrical circuits as specified on figure 2.

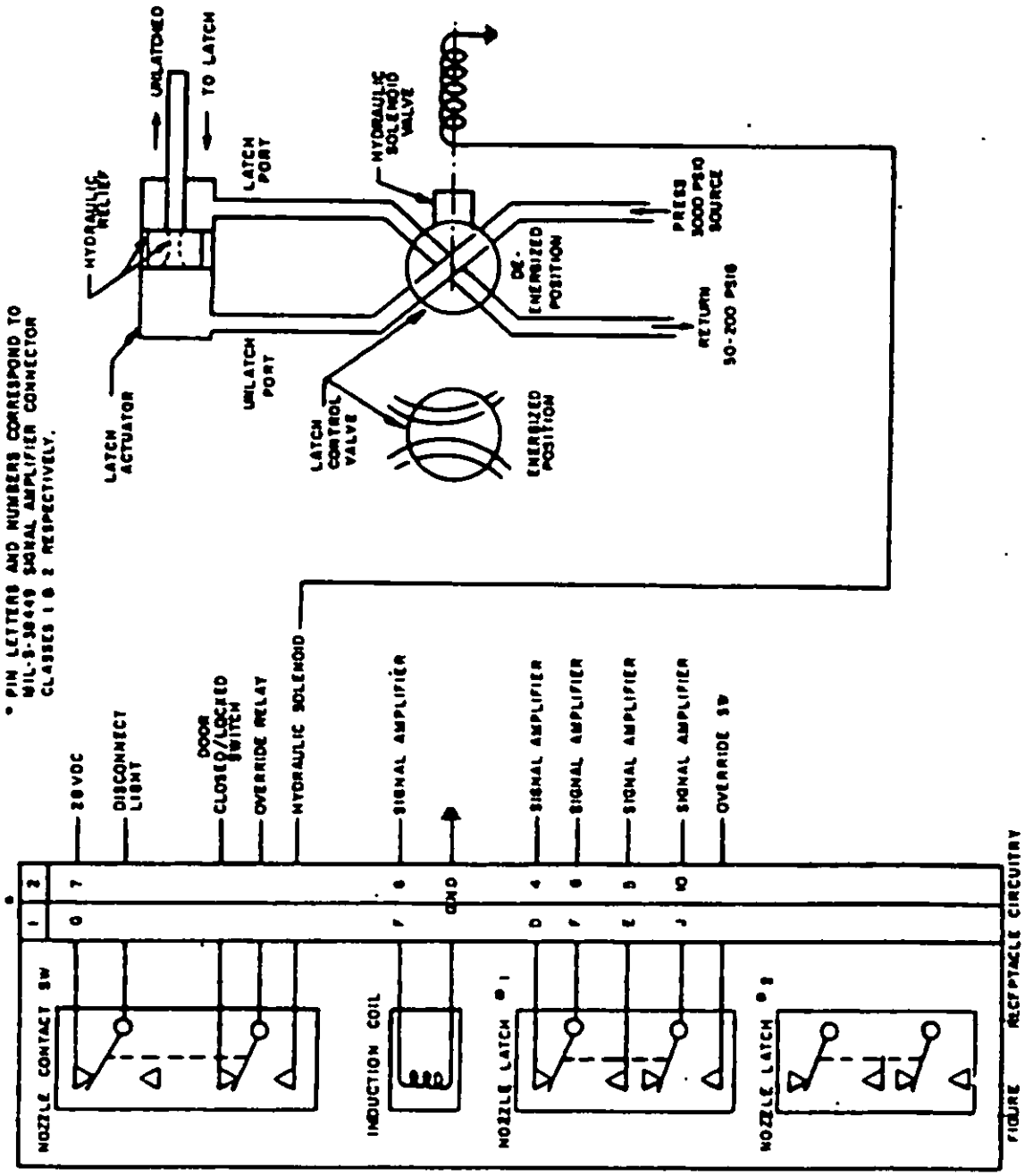

FIGURE 2. Functional Test Schematic

3.5.6.4 Nozzle latch switches. These double-pole, double-throw limit switches shall be as specified on figure 2 and shall complete the circuits when the toggles are in the locked position.

3.5.6.5 Induction coil. The induction coil shall be compatible with the coil located in the boom nozzle of the tanker aircraft. The receptacle coil shall transmit or receive signals when the boom is inserted and tanker coil and receptacle coil are rotated 15° clockwise or counterclockwise with a maximum air gap of 0.060 inch. Coil installation or replacement shall not require potting or special tools, and shall be accomplished with a minimum of time. The use of shims is considered permissible with each coil installation for obtaining the correct air gap specified in 3.5.6.5.1. The coil shall be installed through the bore of the receptacle and shall be easily removable and replaceable. All electrical connections or leads shall be shielded. This coil shall be compatible with MS27604. The pole faces shall be protected from corrosion with one coat of clear urethane in accordance with MIL-C-83286.

3.5.6.5.1 Coil design. The minimum lamination cross-sectional area shall be 0.204 inch^2 with the pole face dimensions as shown on figure 3. Laminations shall be 0.01 thick commercial quality transformer steel with core loss not exceeding 0.72 watt per pound. When the positive terminal of a 28 volt d-c power source is applied to the signal input lead, the north needle of a compass shall point as shown on figure 3. The pole faces shall be positioned from flush with the inside surface of the receptacle to 0.01 inch greater than the radius of the receptacle. The coil shall be centered to ±.03 inch relative to the receptacle vertical axis.

3.5.6.5.2 Signal receiving. The receptacle induction coil shall produce a positive transient voltage pulse of not less than 7.5V nor more than 30V when the nozzle is in the seated position and the nozzle induction coil receives an 18 to 30V pulse. The coil shall be compatible with MS27604.

3.5.6.5.3 Signal sending. The receptacle induction coil shall transmit a positive transient voltage pulse of not less than 10V nor more than 30V to the nozzle induction coil when the nozzle is in the seated position and when the receptacle coil receives an 18 to 30V pulse. The coil shall be compatible with MS27604.

3.5.6.5.4 Terminal identification. The induction coil terminals shall be clearly and permanently identified by stamping or preferably by engraving or with a securely attached nameplate.

3.5.6.5.5 Environmental conditions. The induction coil shall be designed for continuous duty under all the environmental conditions listed herein.

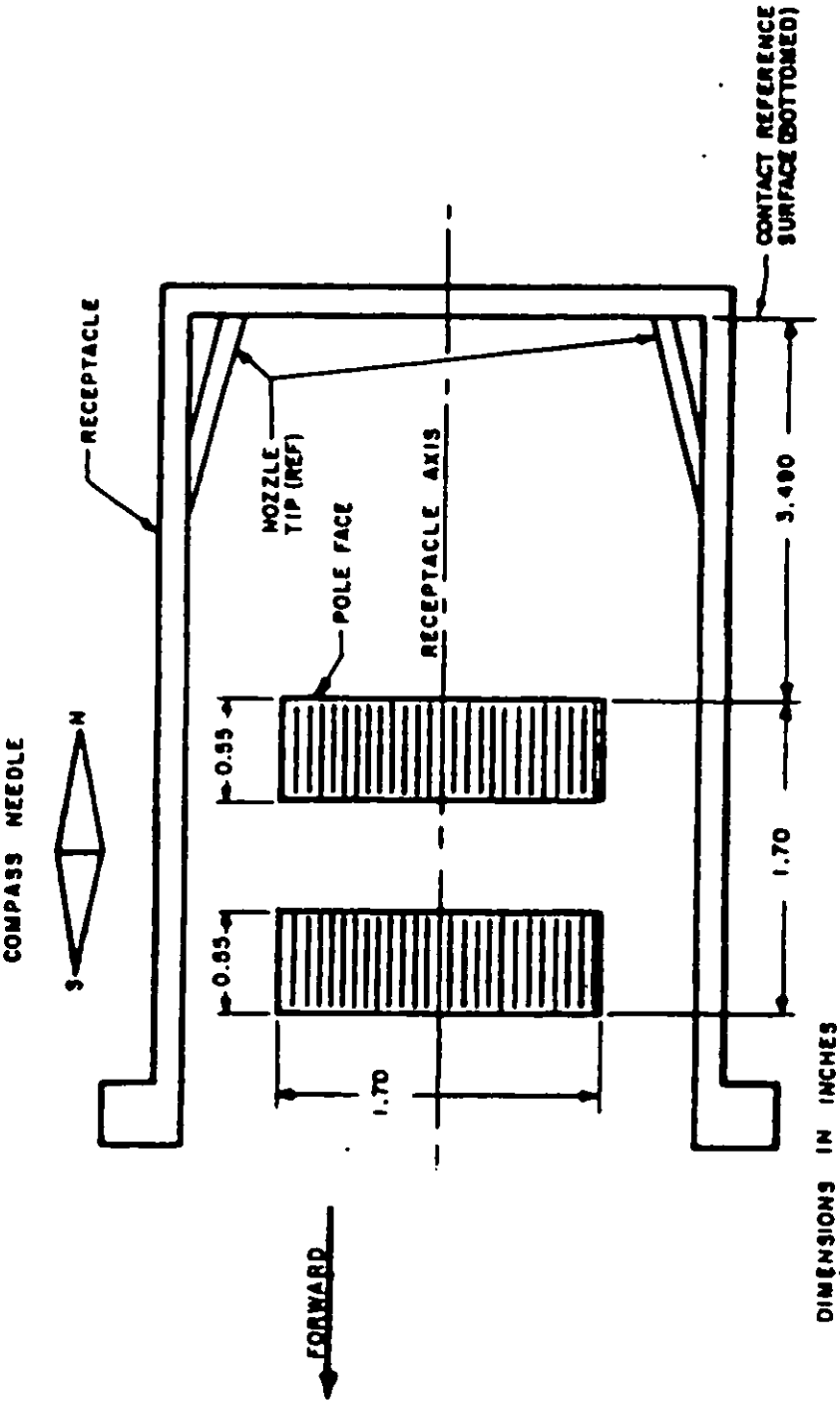

FIGURE 3. Coil Design

3.5.6.5.5.1 Potting. The coil and core shall be potted with fuel-resistant, dielectric material suitable for the conditions specified in 3.5.3.

3.5.6.6 Wiring. All wiring shall be of a fuel-resistant type conforming to MIL-W-5086 or MIL-W-25038. The signal input and test leads shall be shielded wire in accordance with MIL-W-5086, or equivalent. The contact and latch switches shall be easily disconnected from the wiring harness.

3.5.6.7 Magnetism. The component shall not have parts with residual or induced magnetism so arranged as to attract particles or debris internally or externally that may result in malfunction.

3.6 Construction. The receptacle shall be built to withstand the loads, strains, jars, vibrations, and other conditions incident to shipping, storage, installation, and service.

3.7 Performance. The receptacle shall meet the following performance requirements:

3.7.1 Dielectric strength. The induction coil shall be capable of withstanding a surge of 100V dc between test points for 1 minute. For the individual tests, this time may be reduced to 10 seconds.

3.7.2 Fuel pressures

3.7.2.1 Operating pressure. The operating pressure shall be 120 psig.

3.7.2.2 Proof pressure. With the nozzle installed in the receptacle, the receptacle shall withstand 240 psig pressure without permanent deformation or impairment of life or operation.

3.7.2.3 Burst pressure. With nozzle not installed in the receptacle, the receptacle shall withstand 360 psig applied at the outlet port without permanent deformation or evidence of rupture.

3.7.2.4 Fuel pressure drop. The pressure drop through the receptacle and boom nozzle when engaged with the receptacle shall not exceed 20 psi at 1,200 gpm.

3.7.3 Fuel leakage. The main fuel seal of the receptacle shall be made with the boom nozzle sealing lip shown on MS27604 dimensioned as 1.345 to 1.330 inches from nozzle tip.

3.7.3.1 Contact. There shall be no external loss of fuel during the process of engagement with the nozzle.

3.7.3.2 Engaged. During the fuel transfer with the boom in the locked-in position, there shall be no external leakage with fuel pressures from 0 to 240 psig.

3.7.3.3 Back pressure. Without the nozzle inserted, external leakage shall not be allowed with internal fuel pressure from 0 to 240 psig applied at the outlet.

3.7.3.4 Aerodynamic forces. The receptacle internal valve passage shall not be opened by aerodynamic forces.

3.7.3.5 Disconnect spillage. With nozzle retraction rates up to but no greater than 10 feet per second, the disconnect leakage shall not exceed 75 cc.

3.7.4 Fuel resistance and extreme temperature. The receptacle shall withstand the fuel resistance and extreme temperature test as described in section 4 with no fuel leakage.

3.7.5 Contaminated fuel resistance. The receptacle shall withstand the contaminated fuel resistance test as described herein with no leakage or malfunction.

3.7.6 Environmental conditions. The receptacle shall withstand the environmental conditions described herein with no deterioration, deformation, leakage, corrosion, or malfunction.

3.7.7 Function. The receptacle shall be capable of functioning as specified in section 4.

3.7.8 Endurance. The receptacle shall be capable of withstanding the endurance test conditions specified in section 4 without deterioration, deformation, leakage, corrosion, or malfunction.

3.7.9 Electromagnetic interference. The receptacle shall meet the electromagnetic interference requirements of MIL-STD-461 for class A1 equipment. Design Handbook DH 1-4 shall be used for design guidance.

3.8 Hydraulic components. All hydraulic components shall meet the applicable requirements of MIL-H-5440, MIL-C-5503, MIL-H-8446, and MIL-H-8891 except when the requirements of those specifications and this specification conflict, this specification shall govern.

3.8.1 Hydraulic latch actuator. The receptacle shall incorporate a hydraulically actuated mechanism which shall hold the boom nozzle in a locked-in position during refueling operations. The mating dimensions shall be compatible with MS27604. The latch mechanism shall operate on a nominal 3,000 psig hydraulic

pressure system applied to the latch mechanism actuator. A pressure relief valve shall be provided across the pressure and return sides of the hydraulic actuator with the cracking pressure set at 3,700 ±100 psig and reset at not less than 3,400 psig. The controls for the hydraulic system shall be included in the receptacle/slipway installation as specified on figure 2 and in MIL-F-38363. The latch mechanism shall hold the boom nozzle in the locked-in position against a minimum tension design load of 4,800 pounds applied along the boom nozzle centerline when the hydraulic actuator is subjected to a nominal pressure of 3,000 psig. The maximum disconnect load shall not exceed the limit load specified in 3.5.5. The hydraulic actuator rod shall have a adjustable end fitting to facilitate maximum/minimum toggle adjustment and tolerances. The hydraulic actuator shall have a minimum total available stroke of 0.125 inch greater than the working stroke to prevert bottoming of the actuator piston. Aircraft system hydraulic surges or component actuation shall not cause the relief valve to malfunction or chatter.

3.8.1.1 Normal disconnect force. With the receptacle latch mechanism disengaged, it shall be possible for the boom nozzle to be retracted with a force not exceeding 500 pounds. This force shall not exceed 500 pounds when applied through a 60° cone using the centerline of the receptacle as a reference.

3.8.1.2 Hydraulic pressure. The hydraulic system and components that operate the latch mechanism shall be designed to the following pressure requirements:

	Pressure
Rated	3,000 psig
Proof	6,000 psig
Burst	10,000 psig

3.8.1.3 Structural loads. The actuator shall withstand design limit tension and compression loads, applied in axial opposition at the barrel and rod end terminal, which result from proof pressure differential between the extend and retract ports. Loads are the forces the actuator develops with a 6,000 psig differential applied to the ports. Ultimate loads shall be the loads developed by burst pressure differential between extend and retract ports.

3.8 Part numbering of interchangeable parts. All parts having the same manufacturer's part number shall be functionally and dimensionally interchangeable in accordance with MIL-I-8500. The item identification and part number requirements of MIL-STD-100 shall govern the manufacturer's part numbers and changes thereto.

3.10 Threaded connections

3.10.1 Pipe threads. Pipe threads shall not be used on fuel system components except for permanent closures, in which case the pipe threads shall conform to MIL-P-7105.

3.10.2 Screw threads. Machine screw threads shall conform to MIL-S-7742 except the thread inserts shall be as specified in 3.10.4.

3.10.3 Locking of parts. All threaded parts shall be positively locked by safety wiring, self-locking nuts in accordance with MIL-N-25027 and MS33588 or other approved methods. Safety wire shall have a minimum diameter of 0.032 inch and shall conform to MS20995. Staking, cotter pins, and lockwashers shall not be permitted. Rivets shall not be used across the support for the pedestal assembly for locking any parts that may be subject to impact loads or highly stressed parts.

3.10.4 Thread inserts. Threaded inserts shall be in accordance with MIL-I-8846.

3.11 Weight. The total weight of the receptacle including the components listed in 3.2 shall not exceed 30 pounds.

3.12 Finishes

3.12.1 Anodizing. All aluminum-alloy parts and the main casting shall be anodized in accordance with type I of MIL-A-8625. The receptacle bore which mates with the MS27604 boom nozzle shall be hard-coat anodized in accordance with MIL-A-8625, type III thickness.

3.12.2 Protective treatment. Steel parts, other than corrosion resisting steel, shall be chromium plated in accordance with QQ-C-320 or shall be adequately treated in some other acceptable manner for corrosion prevention. Corrosion-resistant steel parts shall be passivated and shall be used for all wearing surfaces. Unless otherwise specified, finish shall be in accordance with MIL-F-7179.

3.12.3 Paint. The external portion of the receptacle casting shall be painted with two coats of zinc chromate primer in accordance with MIL-P-8585, color No. 34151 of FED-STD-595. The marking shall be in accordance with MIL-F-8615. No paint shall be permitted in areas where it might get into the fuel passage.

3.13 Identification of product. Equipment, assemblies, and parts shall be marked for identification in accordance with MIL-STD-130.

3.13.1 Synthetic rubber parts. Equipment and assemblies containing synthetic rubber parts used in aircraft fuel systems shall be marked in accordance with ANA Bulletin 438.

3.14 Workmanship. All details of workmanship shall be of sufficiently high grade to insure satisfactory operation and service life. Parts shall not contain sharp edges, burrs, loose chips, dirt or other foreign matter.

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 tests. The inspection and testing of receptacles shall be classified as follows:

a. Preproduction tests

b. Quality conformance tests.

4.3 Test conditions

4.3.1 Atmospheric conditions. Unless otherwise specified, all tests shall be conducted at a room and fuel temperature between 60° and 90°F, at a barometric pressure of 28 to 32 inches Hg, and at a relative humidity of 80 percent or less. Where tests are substantially different from the above values, proper allowance shall be made for the change in instrument reading.

4.3.2 Cleaning. Before testing the receptacle, all oil and grease or other corrosion-resistant compounds shall be removed from the interior and exterior parts of the unit.

4.3.3 Fuel. Unless otherwise specified, all receptacle classes shall be tested with MIL-T-5624, JP-4 fuel.

4.3.4 Attitude. Unless otherwise specified, the receptacle shall be tested at 30° with the horizontal.

4.3.5 Temperatures. Unless otherwise noted, all specified temperatures shall be verified by thermocouple at a suitable location on the test sample or the sample shall be soaked at the specified temperature for 48 hours prior to testing and maintained at that temperature for the test duration.

4.4 Preproduction tests

4.4.1 Test samples. The test samples shall consist of four receptacles. The samples shall be identified with the manufacturer's part number and such other information as required by the procuring activity.

4.4.2 Test report and test sample. When the tests are conducted at a location other than the laboratory of the procuring activity, the following shall be furnished to that activity (see 6.2.1):

a. Test report - Three copies of a test report in accordance with MIL-STD-831

b. Test samples - The samples that were tested

c. Drawings - Two complete sets of detail and assembly drawings.
The drawings submitted with the preproduction test samples shall show a cut-away section of all parts in their normal assembled position and shall specify part numbers of all parts and subassemblies.

4.4.3 Preproduction tests. The contractor shall submit a preproduction test outline, procedures, and test setups (see 6.2.1) to the procuring activity, for the receptacle being tested. Upon receipt of written approval from the procuring activity the contractor may then proceed with preproduction testing. The preproduction tests shall consist of all tests described under 4.6 and shall be conducted in the order listed unless otherwise specified in the test procedure:

Sample No. 1	Paragraph
a. Examination of product	4.6.1
b. Dielectric strength	4.6.2
c. Fuel leakage	4.6.4
d. Functional	4.6.5
e. Fuel resistance and extreme-temperature	4.6.6
f. Contaminated fuel endurance	4.6.7
g. Humidity	4.6.10.1
h. Temperature shock	4.6.10.3
i. High ambient air temperature	4.6.10.8
j. Low ambient air temperature	4.6.10.9
k. Disassembly and inspection	4.6.16

	Sample No. 2	Paragraph
a.	Examination of product	4.6.1
b.	Dielectric strength	4.6.2
c.	Fuel leakage	4.6.4
d.	Functional	4.6.5
e.	Fuel flow and pressure drop	4.6.9
f.	Vibration	4.6.10.2
g.	Salt fog	4.6.10.4
h.	Structure (except destructive tests which shall be accomplished on separate castings)	4.6.11
i.	Disassembly and inspection	4.6.16

	Sample No. 3	Paragraph
a.	Examination of product	4.6.1
b.	Dielectric strength	4.6.2
c.	Fuel leakage	4.6.4
d.	Functional	4.6.5
e.	Proof pressure	4.6.3
f.	Burst pressure	4.6.8
g.	Dust	4.6.10.7
h.	Fungus	4.6.10.5
i.	Explosive atmosphere	4.6.10.6
j.	Disassembly and inspection	4.6.16

Sample No. 4	Paragraph
a. Examination of product	4.6.1
b. Dielectric strength	4.6.2
c. Fuel leakage	4.6.4
d. Functional	4.6.5
e. Aerodynamic forces	4.6.4.5
f. Endurance	4.6.12
g. Electromagnetic interference	4.6.13
h. Bonding and lightning protection	4.6.14
i. Disassembly and inspection	4.6.16

4.5 Quality conformance tests. The quality conformance tests shall consist of the individual tests.

4.5.1 Individual tests. Each receptacle shall be subjected to the following tests as described under 4.6:

a. Examination of product	4.6.1
b. Dielectric strength	4.6.2
c. Proof pressure	4.6.3
d. Fuel leakage	4.6.4
e. Functional test	4.6.5.

4.6 Test methods

4.6.1 Examination of product. The receptacle shall be examined to determine compliance with the requirements specified herein with respect to materials, weight, marking, finish, workmanship, and the following. Photographs shall be taken of the assembled and disassembled (exploded view) receptacles.

a. Use of the specified connections

b. Applicable requirements of 3.5, 3.5.2, 3.5.4, 3.5.4.1, and 3.5.6.5

c. Requirements not covered by specific tests.

4.6.2 Dielectric strength (see figure 2). A voltage of 1,000V dc shall be applied for 1 minute between circuits and between each circuit and the metal frame of the component. Current flow in excess of 2 milliamperes or breakdown of insulation shall constitute failure.

4.6.3 Proof pressure test. With the valve closed in the receptacle and the outlet blocked off, the receptacle shall be subjected to a hydrostatic proof pressure of 240 psig for a period of 1 minute. There shall be no evidence of distortion or damage to any part of the receptacle. The receptacle shall then be subjected to and shall meet the functional and fuel leakage tests specified in 4.6.5 and 4.6.4 respectively.

4.6.4 Fuel leakage

4.6.4.1 Contact. With a 120-psig fuel pressure in the boom nozzle, and zero psig on the back side of the receptacle poppet, engage the nozzle in the receptacle at a rate of 4 feet per second. There shall be no leakage.

4.6.4.2 Engaged. With the boom nozzle in the locked-in position, increase fuel pressure in 20 psig increments until 240 psig is reached. Each pressure increment shall be maintained until it stabilizes except for the 240 psig reading which will be held for 10 minutes. There shall be no leakage.

4.6.4.3 Back pressure. With the boom nozzle removed, increase internal fuel back pressure in 20 psig increments until 240 psig is reached. Each pressure shall be maintained until it stabilizes except for the 240-psig reading which will be held for 10 minutes. There shall be no leakage.

4.6.4.4 Disconnect spillage. During the disconnect operation, the fuel spillage shall be an absolute minimum and shall not exceed 75 cc at disconnect rates up to 10 feet per second.

4.6.4.5 Aerodynamic forces. The receptacle shall be tested for leakage due to aerodynamic forces by applying a 5 psi vacuum aft of the receptacle for 10 minutes. A 0.50 psi maximum increase in pressure is permitted.

4.6.5 Functional test. A functional test shall be conducted in accordance with figure 3 to ascertain and record the following:

a. Check all switches in all positions for continuity. Lights shall be used for demonstration purposes.

b. Decay transients across the coil shall be limited to 3V (maximum).

c. A permanent record, oscillograph, or oscilloscope picture shall be made under the following conditions:

(1) Normal alignment: Connections per figure 4, test 4B using 18 and 30V dc. Connections per figure 4, test 4A using 18 and 30V dc.

(2) Clockwise misalignment of centerline of boom coil to receiver coil, maximum air gap: Connections per figure 4, test 4B using 18 and 30V dc. Connections per figure 4, test 4A using 18 and 30V dc.

(3) Counterclockwise misalignment of centerline of boom coil to receiver coil, maximum air gap: Connections per figure 4, test 4B, using 18 and 30V dc. Connections per figure 4, test 4A, using 18 and 30V dc.

(4) Opening the actuator test setup switch shall allow removal of boom. The receptacle shall then meet the voltage requirements of 3.5.6.5.2 and 3.5.6.5.3.

d. Two tension disconnects shall be performed and shall meet the requirements of 3.8.1.

4.6.6 Fuel resistance and extreme temperature. The fuel resistance and extreme temperature tests shall be conducted in accordance with table I. Temperatures shall be in accordance with 3.5.3.1 as applicable for the class of receptacle being tested.

4.6.7 Contaminated fuel endurance. The receptacle shall be tested for contaminated fuel endurance in accordance with the test in MIL-F-8615 and as follows:

a. Fuel flow shall be at least 50 percent rated flow for the 5 hours.

b. Boom retraction and insertion shall be once each 10 minutes. Upon completion of the fuel flow and flushing, the receptacle shall be subjected to and shall meet the fuel leakage and functional tests. The gum test shall not be conducted.

4.6.8 Burst pressure test. With the valve closed in the receptacle and the outlet blocked off, the receptacle shall be subjected to a hydrostatic burst pressure of 360 psig. No failure or permanent distortion shall be allowed. Upon completion of the test, the receptacle shall be subjected to the functional test specified in 4.6.5 and leakage tests specified under 4.6.4.

4.6.9 Fuel flow and pressure drop test. The boom-nozzle shall be engaged with the receptacle. The fuel flow shall be increased in 200 gpm increments until 1,200 gpm is reached. A curve of pressure drop versus flow shall be plotted on logograph paper. The pressure drop shall not exceed 20 psi. The pressure drop test shall be conducted in accordance with ARP [redacted] and corrected in accordance with MIL-P-8615.

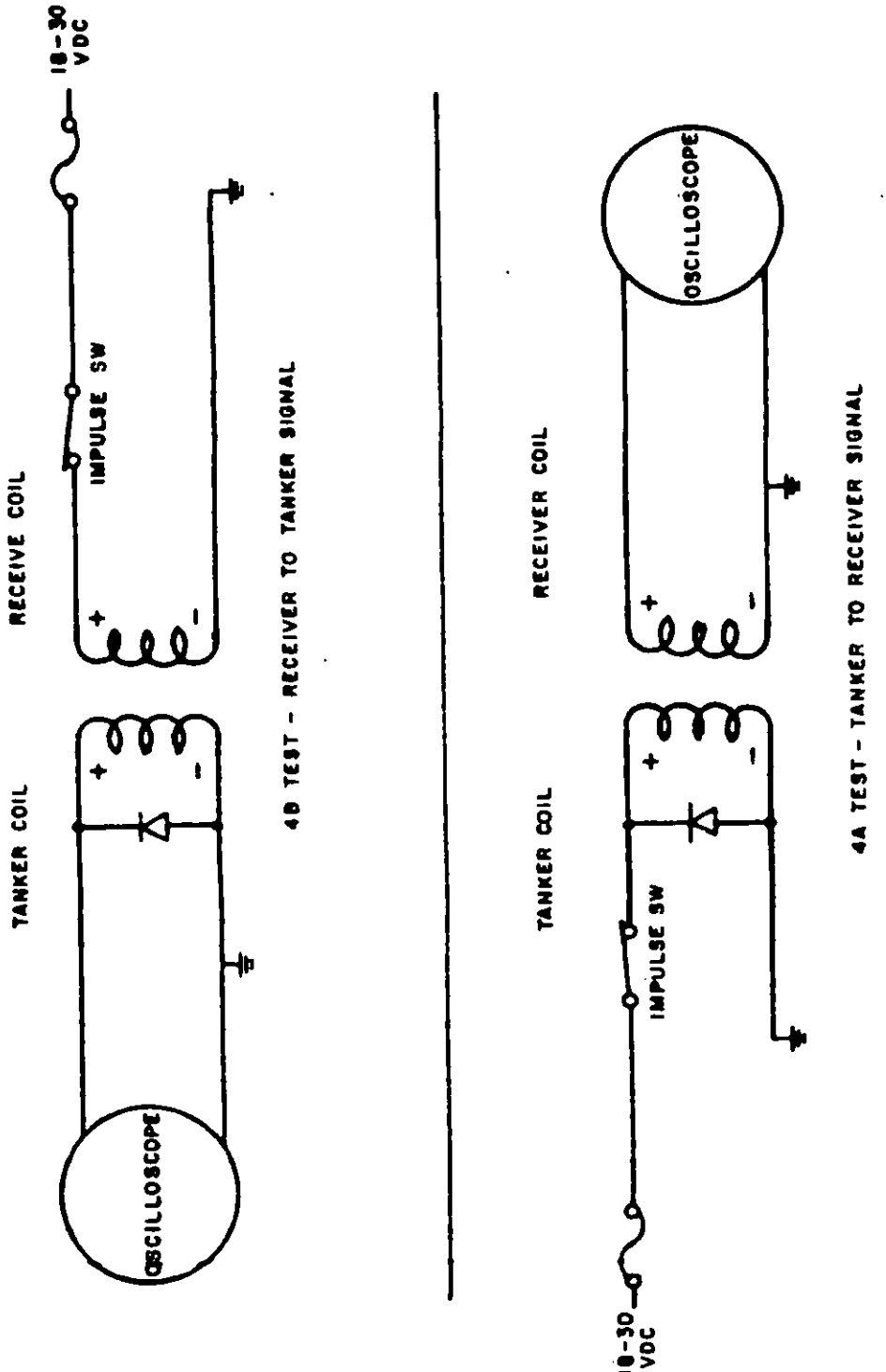

FIGURE 4. Test Setup for Coil

TABLE I. FUEL RESISTANCE AND EXTREME TEMPERATURE TEST SCHEDULE

Test	Fuel Resistance				Low Temperature
Period 1/	Phase I soak	Phase I dry	Phase II soak	Phase II dry	
Component configuration	2/	Drained and blown dry, normal condition as would be expected under service conditions, ports open.	2/	Drained and blown dry, normal condition as would be expected under service condition, ports open.	Mounted as would be expected under normal service condition. 2/
Test fluid	TT-S-735, Type III	None	TT-S-735, Type III	None	TT-S-735, Type I
Period duration	96 hours (4 days)	24 hours	18 hours	30 hours	18 hours
Ambient and test fluid temperature.	Class A, B, or C or the normal operating temperature of the system in which the component is used, whichever is higher.	Circulating air for class, A, B, or C or the normal operating temperature of the system in which the component is used, whichever is higher.	Class A, B, or C or the normal operating temperature of the system in which the component is used, whichever is higher.	Circulating air for class A, B, or C or the normal operating temperature of the system in which the component is used whichever is higher.	Lower the fluid temperature to -67° ±2°F, then temperature at -67° ±2°F for a minimum of 18 hours. 3/
Operating or test during period.	Actuate component 4 cycles/day. 5/	None	Actuate component 4 cycles. 5/	None	None

TABLE I. FUEL RESISTANCE AND EXTREME TEMPERATURE TEST SCHEDULE (Cont)

Test	Fuel Resistance				Low Temperature
Period 1/	Phase I soak	Phase I dry	Phase II soak	Phase II dry	
Operation or tests immediately after period	Conduct leakage test, using TT-S-735, type III fluid	(a) Conduct functional test 6/ (b) Actuate for five times or for 1 min, as applicable (c) Conduct leakage test using TT-S-735, type I fluid 4/	Conduct leakage test, using TT-S-735, type III fluid 4/	(a) Conduct functional test (b) Actuate for five times or for 1 min, as applicable. (c) Conduct leakage test, using TT-S-735, type I fluid. 4/	With temperature not higher than -65°F, conduct functional and leakage tests using TT-S-735, type I fluid 4/ 7/

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.

4/ Conduct fuel leakage tests per 4.6.4

5/ Cycle is defined in 6.3.1.

6/ Conduct functional test per 4.6.5.

7/ Test nozzle shall be cold soaked and held at a temperature not higher than -65°F during functional and leakage tests. Fuel shall also be held at a temperature not higher than -65°F.

4.6.10 Environmental tests

4.6.10.1 Humidity test. A humidity test shall be conducted in accordance with MIL-STD-810, method 507, procedure I. The outlet port shall be open. Immediately after exposure, stabilize at 0°F. The receptacle shall meet functional test 4.6.5. Evidence of corrosion, indicating improper selection of materials, or inadequate protective finishes shall be reason for rejection.

4.6.10.2 Vibration. The vibration test shall be conducted in accordance with MIL-STD-810, method 514, table 514.1-II, figure 514.1-2, curve G. Each resonant and cycling period shall be divided into the following four equal parts: The first part shall be conducted at -65°F, the second part at -65°F but with the boom nozzle inserted as specified herein, the third part at class A operating temperature, and the fourth part at maximum nonoperating temperature as applicble to the class. The test specimen shall be in a dry condition. One-quarter of the resonant and cycling period shall be conducted with the MS27604 boom nozzle inserted and locked into position by the receptacle toggle latch mechanism using 3,000 psig hydraulic power. The signal amplifier and indicator lights shall be included in a simulated receiver electrical system. During this period of testing, the receptacle's contact and latch switches shall be monitored for momentary opening. Opening of the switches causing either a disconnect light to illuminate or actual disconnect of the boom nozzle shall constitute failure of the unit. The receptacle shall be subjected to the functional test specified in 4.6.5 just after starting and just before completion of the one-quarter resonant and cycling period and upon completion of the vibration test.

4.6.10.3 Temperature shock. A temperature shock test shall be conducted in accordance with method 503 of MIL-STD-810, except the temperature range shall be from -65° to +160°F (class A) -65° to +350°F (class B), and -65° to +600°F (class C). At the conclusion of the third cycle, the receptacle shall be removed from the test chamber, returned to standard temperature, and shall be subjected to the leakage test specified in 4.6.4 and the functional test specified in 4.6.5.

4.6.10.4 Salt fog. A salt fog test shall be conducted in accordance with method 509 of MIL-STD-810. Any evidence of corrosion indicating improper selection of materials as inadequate protective finishes shall be cause for rejection. At the conclusion of this test, the receptacle shall meet the tests specified in 4.6.4 and 4.6.5.

4.6.10.5 Fungus test. A fungus test shall be conducted in accordance with method 508 of MIL-STD-810. After the exposure, the receptacle shall be washed in warm water, dried at 160°F for 1 hour, and then shall meet the tests specified in 4.6.4 and 4.6.5.

4.6.10.6 Explosive atmosphere. The receptacle shall be subjected to an explosive atmosphere test in accordance with MIL-STD-810, method 511, procedure I. JP-4 fuel shall be used in addition to that specified.

4.6.10.7 Dust. The receptacle shall be subjected to a dust test in accordance with MIL-STD-810, method 510, with the receptacle unmated. Upon completion of this test, the loose dust may be blown or brushed off. The receptacle shall then meet the tests specified in 4.6.4 and 4.6.5.

4.6.10.8 High ambient air temperature test. The receptacle shall be subjected to a high ambient air temperature test in accordance with MIL-F-8615.

4.6.10.9 Low ambient air temperature test. The receptacle shall be tested for low ambient air temperature in accordance with MIL-F-8615.

4.6.10.10 Altitude. The receptacle shall be subjected to an altitude test in accordance with MIL-STD-810, method 500, procedure II, at a pressure equivalent to 45,000 feet, operating, and 75,000 feet, nonoperating. Upon completion of this test, the functional test shall be conducted at the 45,000-foot pressure altitude.

4.6.11 Structure. The MS27604 boom nozzle shall be used for load applications. For tests conducted with the nozzle locked in the receptacle, load application shall be applied through a point equivalent to the location of the universal nozzle ball joint which is 11 inches from the nozzle forward tip.

4.6.11.1 Static structural test. Guide rollers and latches shall be installed and the latches shall be secured in a locked position by a solid link in lieu of the latch actuating hydraulic cylinder. The receptacle casting shall also be equipped with the pedestal and sliding-valve assembly.

4.6.11.1.1 An ultimate tension load in accordance with 3.5.5a shall be applied. No fracture or rupture shall occur. The receptacle shall be subejcted to and meet the tests specified in 4.6.4 and 4.6.5. After completion of the remaining structural tests, the tension load shall then be increased until casting failure occurs.

4.6.11.1.2 An ultimate compression load (20,000 pounds) shall be applied in accordance with 3.5.5b by a boom nozzle locked in the receptacle. The same compression load shall also be applied perpendicular to the forward flange of the receptacle at a minimum of two locations considered most conducive to breakage. A compression load of 10,000 pounds shall be applied to each edge of the receptacle face at points 6.5 inches from and in a direction parallel to the receptacle centerline at locations considered most conducive to breakage. Permanent distortion or cracking shall constitute failure. The receptacle shall then be subjected to and meet the tests specified in 4.6.4 and 4.6.5.

4.6.11.2 Tension. The boom nozzle shall be locked in place with the hydraulic latch mechanism. The hydraulic latch mechanism will incorporate the pressure relief valve across the pressure and relief sides of the hydraulic cylinder. A nominal 3,000 psig pressure shall be maintained on the actuator piston of the hydraulic actuator.

4.6.11.2.1 Slow pull out. With an MS27604 nozzle installed and locked in the receptacle, a load shall be applied to the nozzle until the axial component of the load reaches 4,800 pounds. The nozzle with this load applied shall not be released from the receptacle. The load shall be gradually increased until disconnect occurs. The load at disconnect shall be recorded and shall not exceed the limit load specified in 3.5.5c. A minimum of four such disconnects shall be performed at a 30° angle with the receptacle axis at equally spaced radial locations and one disconnect shall be performed at 0°. Permanent distortion or cracking shall constitute failure.

4.6.11.2.2 Emergency pull out. The nozzle shall be retracted and disconnected from the receptacle at average velocities from 0 to 10 fps in increments of 2 fps with the receptacle and attached components and nozzle maintained at -65° ±2°F temperature. The receptacle loads produced by this test shall not exceed the limit load specified in 3.5.5c. A graph will be plotted with disconnect load vs disconnect velocity. The sliding valve travel of 1.00 ±0.17 -0.00 inch shall constitute the distance used for a complete disconnect. Upon conclusion of this test, the tests specified in 4.6.4 and 4.6.5 shall be conducted.

4.6.11.2.3 Normal disonnnect force. Disconnects to determine conformance with 3.8.1.1 shall be performed. At least four disconnects shall be performed at a 30° angle with the receptacle axis at equally spaced radial locations, and one disconnect at zero°.

4.6.11.3 Impact test of main poppet seal. The sliding sleeve and poppet valve shall be inspected, and replaced if evidence of wear has occurred due to previous testing. The main poppet seal that directly contacts the MS27604 boom nozzle shall be replaced. The receptacle shall be mounted vertically on a rigid base. The receptacle shall be inclosed in a cold chamber and a thermocouple placed as close as possible to the poppet seal. The thermocouple must indicate a temperature of -65°F (+10°, -2°) at the beginning of the impact test. The impact test shall be conducted with a weighted nozzle (total weight including nozzle 100 pounds) dropped 9.2 inches into the receptacle. Measure the 9.2 inches from the initial point of contact between the nozzle and the receptacle. The nozzle shall be aligned to make a direct hit with the well of the receptacle. The boom nozzle shall be locked in with the receptacle toggles after each impact. Impacts may be conducted at a practical rate until 200 impacts have been completed. After every 200 impacts, the receptacle shall be subjected to the tests specified in 4.6.4 and 4.6.5, except item d. The receptacle shall be subjected to 1,000 impacts with no evidence of distortion, wear, or leakage in excess of the value specified in 4.6.4. The receptacle shall also meet the test specified in 4.6.5, except item d.

4.6.12 Endurance test. An endurance test shall be conducted as outlined in table II.

4.6.13 Electromagnetic interference. The receptacle shall be tested in accordance with MIL-STD-462, methods CE03, C501, C506, and RS02. Upon completion of this test, the receptacle shall meet the test specified in 4.6.5.

4.6.14 Bonding and lighting protection. The bonding and lighting protection test shall be conducted in accordance with MIL-B-5087 and as specified herein and approved by the procuring activity. The receptacle shall be lightning tested in a simulated installation approved by the procuring activity. It shall not spark in areas where fuel vapors are present.

4.6.15 Induction coil. The test sample shall consist of one additional induction coil supplied with the four complete receptacle assemblies of the same preproduction lot. The tests specified in 4.6.15.1 shall be in addition to the preproduction tests conducted on the induction coils in the four assembled receptacles.

4.6.15.1 Fuel soak. The entire coil shall be immersed and allowed to stand for 100 hours in type I fluid conforming to TT-S-735 and then 100 hours in type III fluid. At the conclusion of the immersion, there shall be no disintegration or deterioration and the coil shall pass the test specified in 4.6.2.

4.6.16 Disassembly and inspection. The receptacle shall be disassembled and visually inspected. Evidence of excessive wear or deterioration shall be cause for rejection. Photograph all parts and include in the preproduction report.

4.6.17 Reliability. Satisfactory completion of all tests specified herein will demonstrate the reliability of the receptacle.

5. PREPARATION FOR DELIVERY

5.1 Packaging. Packaging shall be level A or C as specified in the contract or order (see 6.2).

5.1.1 Level A or C. The receptacle shall be packaged in accordance with MIL-STD-794, level A or C (see 6.2). The preservation method, shall be selected from appendix D of MIL-STD-794 and applied in accordance with MIL-P-116.

5.2 Packing. Packing shall be in accordance with MIL-STD-794, level A, B, or C as specified (see 6.2). Insofar as practicable, containers shall be of minimum cube and tare consistent with the protection required.

5.3 Marking. Interior and exterior containers shall be marked in accordance with MIL-STD-129.

TABLE II. ENDURANCE TEST

PHASE NO.	1	2	3	4
TEST PERIOD	ALTITUDE	ROOM TEMPERATURE	LOW TEMPERATURE	HIGH TEMPERATURE
Test	45,000 ft operating & 75,000 ft nonoperating	Atmos Press.	Atmos Press.	Atmos Press.
Test Fluid	MIL-T-5624 JP-4	MIL-T-5624 JP-4	TT-S-735, Type I	TT-S-735, Type III
Ambient & Test Fluid Temperature	Room	Room	-65°F	Amb 160°F (Class A) Amb 350°F (Class B) Amb 600°F (Class C)
No. of Cycles	500	6,000	2,500	1,000
Cycling Procedure	Per Note 1/ and Per Note 2/	Per Note 1/	Per Note 1/	Per Note 1/
Tests After Completion of Cycling	4.6.4 4.6.5	4.6.4 4.6.5	(at -65°F) 4.6.4 4.6.5	(above 135°F) 4.6.4 4.6.5

1/ A cycle shall consist of inserting an MS27604 flying boom nozzle, actuating the latch actuators, assuring that the microswitches make contact, and assuring a signal from the boom can be transmitted through the induction coil. The number of cycles of each phase shall be divided in 2 equal halves. The first half shall be cycled with the unit wetted by passing 50 to 100 gpm through the receptacle assembly for 10 seconds. The second half of each phase cycling shall be conducted with 240 psig fuel pressure for a period of 10 seconds between each engagement and disengagement.

2/ No flow conditions for altitude with the receptacle nonoperating.

6. NOTES

6.1 Intended use. The receptacle covered by this specification is intended to be mounted in the forward upper section of the receiving aircraft for engaging with the MS27604 flying-boom-type nozzle of the tanker aircraft to accomplish aerial refueling.

6.2 Ordering data. Procurement documents should specify the following:

a. Title, number, and date of this specification

b. Class of receptacle required (see 3.5.3.1)

c. Levels of packaging and packing required (see section 5).

6.2.1 Data. Data required by this specification should be specified on DD form 1423.

6.3 Definition

6.3.1 Cycle. A cycle of operation consists of inserting and latching the nozzle, transferring the fuel, and unlatching and extracting the nozzle.

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

Custodian:
Air Force - 11

Review activity:
Air Force - 82

Preparing activity:
Air Force - 11

Project No. 1680-F245

SPECIFICATION ANALYSIS SHEET

Form Approved
Budget Bureau No. 22-R255

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.

SPECIFICATION

ORGANIZATION

CITY AND STATE

CONTRACT NUMBER

MATERIAL PROCURED UNDER A

☐ DIRECT GOVERNMENT CONTRACT ☐ 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?

☐ YES ☐ 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 1 JAN 68 1426

REPLACES EDITION OF 1 OCT 64 WHICH MAY BE USED.

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