INCH POUND

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SUPERSEDING
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PERFORMANCE SPECIFICATION

ADAPTER, PRESSURE LUBRICATING OIL SERVICING, AIRCRAFT

This specification is approved for use by the Department of the Air Force and is available for use by all Departments and agencies of the Department of Defense.

1. SCOPE

1.1 Scope. This specification covers an adapter installed in an aircraft turbine engine lubricating oil system as a connection for ground servicing with pressure lubricating oil servicing equipment, using synthetic lubricating and preservative oil.

1.2 Classification. Pressure lubricating oil servicing adapters will be in the sizes specified in MS24476 (see 6.2).

1.2.1 Types. The types of adapters are as follows:

Type I	MS24476-1,	½ inch size.
Type 2	MS24476-2,	¾ inch size.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are cited in section 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: the Resources and Logistics Services Division, SA-ALC/TILDD, 485 Quentin Roosevelt Rd., Bldg 171, Kelly AFB, TX 78241-6524 by using the Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

AMSC N/A FSC 4730

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2.2 Government documents.

2.2.1 Specifications and standards. The following specifications and standards form part of this specification to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in this issue of the Department of Defense Index of Specifications and Standards (DoDISS) and supplement thereto, cited in the solicitation.

SPECIFICATIONS

DEPARTMENT OF DEFENSE

MIL-S-8879	Screw Threads, Controlled Radius Root With Increased Minor Diameter, General Specification For

STANDARDS

DEPARTMENT OF DEFENSE

MS24476	Adapter, pressure Lubricating Oil Servicing, Aircraft
MS24480	Cap and Lubrication Fitting, Protective, Pressure Servicing Adapter.
MS29561	Packing Preformed, "O"Ring, Synthetic Lubricant Resistant.

(Unless otherwise indicated, copies of the above specifications, standards and handbooks are available from the Standardization Document Order Desk, 700 Robbins Avenue Building 4/D, Philadelphia, PA 19111-5094.)

2..3 Non-Government Publications. The following documents forms 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 the documents not listed in the DoDISS are issues of the documents cited in the solicitation (see 6.2).

SOCIETY OF AUTOMOTIVE ENGINEERS, INC. (SAE-AS)

AS4396	Fitting End - Bulkhead Flared Tube Connection Design Standard

2.4 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 in (see 6.2), a sample shall be subjected to first article inspection in accordance with 4.2.

3.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible provided that the material meets or exceeds the operational and maintenance requirement, and promotes economically advantageous life cycle.

3.3 Materials. All materials shall be suitably treated to resist corrosion due to electrolytic decomposition, salt spray, and any other atmospheric conditions that may be encountered during operational use or storage.

3.4 Design. The complete adapter assembly shall consist of an adapter incorporating a self-sealing shutoff device and a protective cap in accordance with MS24476 and MS24480, respectively. The adapter shall be designed to mount on a section of aircraft or engine structure and to mate with a pressure servicing lubricating oil nozzle to provide quick separation from the nozzle. The adapter when disconnected from the nozzle, shall automatically seal itself to avoid spillage. In addition, the adapter shall be provided with a protective, dust and moisture and salt spray seal cap. The cap must be able to remain securely fastened and mounted to the adapter during vibration testing. The cap shall have a means of attachment, such as a chain, for connection to the adapter or the aircraft.

3.5 Interface. The adapter end styles shall be manufactured in accordance with AS4396.

3.5.1 Method of connecting and disconnecting. Connecting and disconnecting of the adapter to the nozzle shall be accomplished Manually throughout the operating temperature range. While connected, a positive flow of fluid has been assured with no possibility of fluid shutoff. A positive means of locking shall be provided when the adapter is connected to the nozzle. The force required to engage the adapter shall not exceed 20 pounds.

3.6 Performance. The adapter shall operate without failure, with no leakage, when subjected to the operating pressures encountered in turbine engine oil systems. The only exception would be the entrapped fluid within the adapter at the time of disconnection

3.6.1 Temperature range. The adapter shall have the ability to function in a temperature range from -65° F to +275° F.

3.6.2 Low temperature and leakage. The adapter shall not crack nor show other imperfections when subjected to an ambient temperature of -65°F for 24 hours. Following this cold exposure, connection and disconnection of the adapter and nozzle shall be accomplished with relative ease and rapidity. There shall be no leakage during leakage tests in 4.5.5.

3.6.3 High temperature and leakage. The adapter shall show no imperfections as a result of the high temperature test specified in 4.5.6. There shall be no visible signs of leakage during this test.

3.6.4 Poppet Spring. The poppet spring force of the adapter shall be such as to permit relatively easy coupling and uncoupling of the nozzle and to provide adequate pressure on the poppet while uncoupled.

3.7 Screw threads.

3.7.1 Straight screw threads. All screw threads shall be in accordance with MIL-S-8879.

3.7.2 Anti-seize compound. An anti-seize compound shall be used on all threaded aluminum and aluminum alloy parts.

3.8 Packing. Packing shall be in accordance with MS29561 and shall be compatible with lubricating oils, (see 6.3).

4. VERIFICATION

4.1 Classification of Inspection. The inspection requirements for the adapter are as follows:

a. First article inspection (see 4.2).

b. Conformance inspection (see 4.3).

4.2 First article Inspection. First article inspection shall be performed on one complete adapter assembly when a first article sample is required (see 3.1). This inspection shall include the examination of product (see 4.5.1) and the tests of (4.5.2 thru 4.5.6).

4.3 Conformance inspection. Conformance inspection shall include the examination of 4.4 and the tests of section 4.5.

4.4 Examination. Each adapter shall be examined for compliance with the requirements specified in 3.3 through 3.8. Any redesign or modification of the contractor's standard product to comply with specified requirements, or any necessary redesign or modification following failure to meet the specified requirements shall receive particular attention for adequacy and suitability. Non compliance with any specified requirement or presence of one or more defects preventing or lessening maximum efficiency shall constitute cause for rejection.

4.5 Methods of Inspection.

4.5.1 Examination of product. Each adapter and cap shall be visually inspected for defects of material, workmanship, finish, and for conformance to MS24476 and MS24480, respectively and all requirements of this specification for which there are no specific tests.

4.5.2 Connect and disconnect test. Each sample adapter shall be connected and disconnected from a nozzle a minimum of 10 times while dry. Each connection and disconnection shall be accomplished with relative ease and rapidity and without use of tools. There shall be no binding, sticking, or scoring of parts, (see 3.5.1).

4.5.3 Pressure test. Each sample adapter shall be connected to a nozzle and shall be hydrostatically tested at the pressure specified in 4.5.4. The adapter shall withstand the applied pressure for one minute without any visible signs of leakage.

4.5.4 Operation and leakage test. This test shall be conducted on the adapter while connected to a test nozzle, as follows:

a. An adapter and nozzle shall be connected and disconnected 2,000 times consecutively while dry. The assembly shall then be pressure checked at a hydrostatic pressure of 500 psi with a Lubricating oil for one minute. There shall be no visible signs of leakage from the adapter portion. The adapter and nozzle shall be disconnected and the following pressure tests shall be conducted on the adapter.

b. Using a lubricating oil, a hydraulic pressure of 500 psi shall be applied to the outlet end of the adapter for five minutes. There shall be no visible signs of leakage.

c. A hydraulic back pressure of a 2-foot head of hydraulic lubricating oil shall be applied to the adapter for 30 minutes. There shall be no visible signs of leakage.

d. A hydraulic back pressure of 5 psi shall be applied to the adapter for 30 minutes. There shall be no visible signs of leakage.

e. The adapter shall be drained and an air back pressure of 4.5 psi shall be applied to the adapter for 30 minutes. There shall be no visible signs of leakage.

4.5.5 Low temperature and leakage test. An adapter and nozzle, while disconnected, shall be filled with oil and cold soaked at a temperature of -65° F for 24 hours. The following tests shall then be conducted at an ambient temperature of -65° F:

a. The adapter and nozzle shall be connected and disconnected. This shall be accomplished with relative ease and rapidity. Any binding, locking, or scoring of parts shall be cause for rejection.

b. The adapter and nozzle shall then be connected, and a hydrostatic pressure of 500 psi using a lubrication oil be applied at the adapter inlet for 1 minute. There shall be no visible signs of leakage.

c. The adapter shall again be subjected to the pressure tests of 4.5.4 (b), (c), (d) and (e).

4.5.6 High temperature and leakage test. A high temperature test shall be made at a temperature of 275° F. The adapter shall be heat soaked for 2 hours while maintaining this temperature. The pressure tests of 4.5.4 (b), (c) , (d) and (e) shall again be applied. There shall be no visible signs of leakage.

4.5.7 Vibration and leakage test. The adapter shall be mounted to a representative section of aircraft structure and subjected to a vibration test. A hydraulic back pressure equivalent to a 2 foot head of oil shall be maintained in the adapter during the test period. The protective cap shall be installed on the adapter during one-half of the total test period. Following the vibration period, the leakage tests of 4.5.4 shall be repeated. At no time during the test shall the protective cap become loosened or unattached, nor shall there be any visible signs of leakage.

4.5.8 Pressure drop test. With the adapter connected to a nozzle, the assembly shall be filled with oil and cold soaked at -65° F ambient air temperature for 24 hours. While maintained at this temperature, the following procedure shall be conducted:

a. Lubricating Oil at -65° shall be flowed through the assembly at a rate of 1 gpm. The maximum pressure drop across the assembly required to establish rated flow shall be determined.

b. The pressure drop shall then be with the oil entering the assembly at -45° F and at a flow rate of 1 gpm. The pressure drop with -45° F oil shall not exceed that shown on MS24476.

4. 5. 9 Measurements. Pressure measurements shall be taken at least 10 diameters upstream and 10 diameters downstream from the assembly. Temperature measurements shall be taken 10 diameters upstream of the assembly.

4. 5. 10 Accelerated corrosion test. The adapter shall be immersed in a solution consisting of 2.5 percent, by weight, of sodium chloride in distilled water. After immersion, the solution shall be drained and the adapter heated in an oven to a temperature of 130° $\pm$5° for a period of not less than 1 hour. The immersion and heating cycle shall be repeated 50 times. The adapter shall not be operated at any time during these cycles. Immediately after completing the immersion and heating cycles, the adapter shall be thoroughly washed with warm water to remove all salt accumulations. The adapter shall then be dried, wetted with oil, and connected for three complete cycles. There shall be no corrosion of any part to a degree which might adversely affect the performance of the adapter.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be specified in the contract or order (see 6.2). When actual packaging of materials is to be performed by DoD personnel, these personnel need to contact the responsible packaging activity to ascertain requisite packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Department or Defense Agency, or within the Military Department's System Command. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity .

6. NOTES

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

6.1 Intended use. The adapters covered by this specification are intended for use in aircraft turbine lubricating oil systems.

6.2 Acquisition requirements.

a. Title, number, and date of this specification.

b. Item identification (see 1.2.1).

c. Size of adapter required. (see 1.2.1).

d. Issue of DoDISS to be cited in the cited in the solicitation, and if required, the specific issue of individual documents referenced (see 2.1).

e. When first article is required (see 3.1).

f. Data required (see section 4).

g. Packaging requirements (see section 5).

6.3 Lubrication selections. For a guide to lubrication selections see MIL-HDBK-275.

6.4 Subject term (key word) listing.

Connecting/disconnecting	Test nozzle
Leakage	Turbine Engine
High/Low temperature	Self-Sealing Shutoff

6.5 International Standardization Agreements. Certain provisions of this specification are subject of the international standardization agreement provisions per ASCC standards and NATO STANAG 3595. When amendment, revision, or cancellation of this specification is proposed which will modify the appropriate action through international standardization channels, including departmental standardization offices, to change the agreement or make other appropriate accommodations.

Custodians:
Navy -AS
Air Force -99

Review Activity:
DLA -CS

Preparing Activity:
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Agent Activity:
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