

Inch Pound

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MILITARY SPECIFICATION

HOSE, RUBBER, LIGHTWEIGHT, MEDIUM PRESSURE, GENERAL SPECIFICATION FOR

This specification is approved for use by all departments and agencies of the Department of Defense.

1. SCOPE

1.1 Coverage. This specification covers the general requirements for light weight, medium pressure, rubber hose suitable for aircraft fuel and oil systems within the limits specified herein.

2. APPLICABLE DOCUMENTS

2.1 Government Documents.

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: SA-ALC/TIRDM, Kelly AFB, TX 78241-5000 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

FSC 4720

Distribution Statement A. Approved for public release;
Distribution is unlimited.

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2.1.1 Specifications, Standards, and Handbooks. The following specifications, standards, and handbooks, form a part of this specification 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

Military

MIL-H-5606	Hydraulic Fluid, Petroleum Base; Aircraft, Missile, and Ordnance
MIL-T-5624	Turbine Fuel, Aviation Grades JP-4 and JP-5 MIL-L-7808 Lubrication Oil, Aircraft Turbine Engine, Synthetic Base
MIL-H-83282	Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Aircraft, Metric, Nato Code Number H-537
MIL-H-83796/1	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flare
MIL-H-83796/2	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flare, with Lockwire Hole
MIL-H-83796/3	Hose Assembly, Rubber, Lightweight, Medium Attachable End Fittings, Flareless to Flareless
MIL-H-83796/4	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flareless, with Lockwire Hole
MIL-H-83796/5	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flange
MIL-H-83796/6	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flare to Flange, with Lockwire Hole
MIL-H-83796/7	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flange

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MIL-H-83796/8	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flareless to Flange, with Lockwire Hole
MIL-H-83796/9	Hose Assembly, Rubber, Lightweight, Medium Pressure, Field Attachable End Fittings, Flange to Flange
MIL-F-83798	Fittings, Rubber Hose, Lightweight, Medium Pressure, General Specification For

STANDARDS

Military

MIL-STD-105	Sampling Procedures and Tables For Inspection By Attributes
MIL-STD-130	Identification Marking of US Military Property
MIL-STD-970	Standards and Specifications, Order of Precedence For The Selection of Test Reports, Preparation of
MIL-STD-831	Age Controls of Age-Sensitive
MIL-STD-1523	Elastomeric Materiel (For Aerospace Applications)
MS20756	Flange, Swivel Retaining

HANDBOOKS

Defense Supply Agency Cataloging Handbook

H4-1 (SB 708-41)	Federal Supply Code For Manufacturers-Name To Code
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(Unless otherwise indicated copies of Federal and Military specifications, standards, and handbooks, are available from the Defense Printing Service Detachment Office, Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.1.2 Other Government documents, drawings, and publications. The following other government documents, drawings, and publications form a part of this document to the extent specified herein. Unless otherwise specified, the issues are those cited in the solicitation.

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PUBLICATIONS

Federal Aviation Administration Technical Standard Order
 TSO-C53a Fuel And Oil System Hose Assemblies

(Copies of Federal Aviation Administration Technical Standard Orders may be obtained by writing to Department of Transportation, Personal Property Operations Branch, Utilization and Storage Section, M-443.2, Washington, DC 20590.)

2.2 Non-Government Publications. The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, 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 the issues of the documents cited in the solicitation (see 6.2)

Society of Automotive Engineers (SAE)

AS611	Tetrafluoroethylene Hose Assembly Cleaning Methods
AS1055	Fire Resistance And Fire Test Requirements For Fluid System Components
AS1933	Age Controls for Hose Containing Age-Sensitive Elastomeric Material

(Application for copies should be addressed to the Society of Automotive Engineers, Inc., 400 Commonwealth Dr., Warrendale, PA 15096-0001.)

(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.)

2.3 Order of Precedence. In the event of 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 Qualification. The hoses furnished under this specification shall be products which are authorized by the qualifying activity

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for listing on the applicable qualified products list at the time of award or contract (see 4.2 and 6.3). To qualify, a product shall have been tested and shall have passed the qualification tests specified herein.

3.2 Material. Materials shall be limited to those specified within this specification.

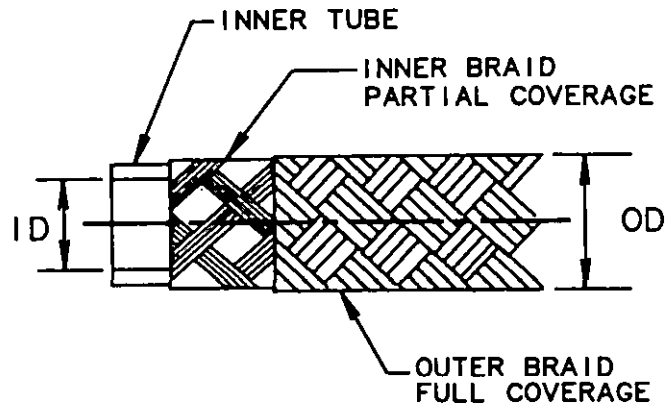
3.3 Recycled and reclaimed materials. The use of recycled or reclaimed materials shall be encouraged to the maximum extent possible. For the purpose of this requirement, recycled and reclaimed materials are those materials collected from solid waste and reprocessed to become a source of raw materials as distinguished from virgin raw materials. Used, rebuilt or remanufactured components, pieces and parts shall not be incorporated in the hoses or hose assemblies.

3.4 Design and construction. The design and construction of the hose, including braid details, shall conform to Figure 1.

3.4.1 Hose. Hose shall consist of seamless compounded inner tube of oil resistant synthetic rubber, reinforced with 18-8 corrosion-resistant steel in a manner to meet the requirements of this specification and retain the specified end fittings without leakage or other malfunction when tested as specified herein.

3.4.1.1 Lengths. Unless otherwise specified, hose shall be furnished in minimum lengths of 20 feet; however, 10 percent of such orders may be furnished in random lengths over 10 feet, and an additional 10 percent in random lengths over 3 feet. When hose is ordered in specified lengths, a tolerance of ± 1 percent of the lengths shall be allowed.

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HOSE DIMENSIONS					BRAID DETAIL		WT. MAX LBS/I
HOSE SIZE	EQUIV. OD TUBE	ID INNER TUBE	OD OVER BRAID	CONC. OD TO ID FIM	INNER BRAID	OUTER BRAID	
					WIRE OD	WIRE OD	
-03	.188	.156±.015	.376±.022	.020	.008	.008	.008
-04	.250	.219±.015	.440±.022	.020	.008	.008	.010
-05	.313	.281±.015	.486±.022	.020	.008	.008	.012
-06	.375	.344±.015	.549±.022	.020	.008	.008	.013
-08	.500	.438±.023	.651±.022	.020	.008	.008	.017
-10	.625	.562±.023	.797±.023	.020	.008	.008	.022
-12	.750	.688±.023	.938±.023	.030	.008	.008	.026
-16	1.000	.875±.031	1.156±.031	.030	.010	.008	.037
-20	1.250	1.125±.031	1.437±.031	.030	.010	.010	.051
-24	1.500	1.375±.031	1.703±.031	.030	.016	.010	.069
-32	2.000	1.773±.023	2.101±.039	.030	.016	.012	.085

NOTES

1. HOSE IS FOR USE WITH MIL-F-83798 FITTINGS IN MIL-H-83796/1 THROUGH MIL-H-83796/9 ASSEMBLIES.
2. HOSE SHOULD BE REQUISITIONED IN BULK QUANTITIES, AND FIELD MAINTENANCE UNITS FABRICATE TO SPECIFIC LENGTHS. PART NUMBERS FOR SPECIFIC LENGTHS SHALL BE USED IN ORDERING ONLY WHEN THE NEED FOR SPECIFIC LENGTHS EXCEEDS THE FIELD MAINTENANCE ELEMENT'S CAPABILITY.
3. IDENTIFICATION: SEE PARAGRAPHS 3.7 and 6.4.
4. DIMENSIONS IN INCHES. UNLESS OTHERWISE SPECIFIED, TOLERANCES: DECIMALS, ± .010 EXCEPT FOR WIRE BRAID WHICH WILL BE IN ACCORDANCE WITH CURRENT INDUSTRY STANDARDS.

Figure 1. Hose construction

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3.5 Selection of specification and standards. Specifications and standards for parts, materials, procedures, and processes not specified herein shall be selected in accordance with MIL-STD-970.

3.6 Performance of product. The product shall meet all of the requirements listed below and in Table I when subjected to the applicable tests in Section 4:

3.6.1 Examination of product. The hose shall be visually examined for conformance with the requirements of 3.2, 3.7, 3.9, and Figure 1, (see 4.4.3.1).

3.6.2 Reduction in diameter. When tested in accordance with 4.4.3.2, the inside diameter (ID) of the hose shall not decrease to less than 90 percent of the minimum ID specified in Figure 1 for all sizes except size 3, for which the ID of the hose shall not decrease to less than 75 percent, (see 4.4.3.2).

3.6.3 Field attachability. When assembled and tested in accordance with 4.4.3.3, the assemblies shall meet all the requirements of this specification, (see 4.4.3.3).

3.6.4 Coupling. When assembled and tested in accordance with 4.4.3.4, the gage shall fall through the bulge under its own weight, (see 4.4.3.4).

3.6.5 Proof pressure. When tested in accordance with 4.4.3.5, the hose shall show no evidence of leakage or deterioration, (see 4.4.3.5).

3.6.6 Elongation or contraction. When tested in accordance with 4.4.3.6, the hose specimen shall not increase more than 2 percent or decrease more than 4 percent, (see 4.4.3.6).

3.6.7 Bending and vacuum. When tested in accordance with 4.4.3.7, a steel ball of the applicable diameter shall be passed through the entire length of the specimen. It shall roll freely through the specimen, (see 4.4.3.7).

3.6.8 Fuel immersion. When tested in accordance with 4.4.3.8, the hose specimen shall show no evidence of disintegration, solubility of component parts, porosity, blistering or collapse, (see 4.4.3.8).

3.6.9 Oil immersion. When tested in accordance with

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4.4.3.9, the hose specimen shall show no evidence of disintegration, solubility of component parts, porosity, blistering or collapse, (see 4.4.3.9).

3.6.10 Cold temperature deflection. Assemblies shall be tested in accordance with 4.4.3.10. The specimens shall then be subjected to the proof pressure test of 4.4.3.5. There shall be no evidence of leakage or deterioration, (see 4.4.3.10).

3.6.11 Oil circulation. Hoses subjected to the tests of 4.4.3.11 shall show no evidence of leakage or deterioration, (see 4.4.3.11).

3.6.12 Leakage. When subjected to the tests of 4.4.3.12, the specimen shall show no evidence of leakage from the fitting, seepage through the hose, or other malfunction, (see 4.4.3.12).

3.6.13 Corrosion. When subjected to the tests of 4.4.3.13, the specimen shall show no evidence of leakage, (see 4.4.3.13).

3.6.14 Burst pressure. There shall be no leakage, burst, or fitting blow-off below the minimum burst pressure specified in Table II, (see 4.4.3.14).

3.6.15 Fire resistance. When required, the specimen shall meet the requirements of AS1055, Type 1a, Class A. Hose assemblies approved to the requirements of TSO-C53a prior to the date of this specification are considered in compliance with this requirement. A protective sleeve over the hose or fitting may be required to facilitate compliance to this requirement, (see 4.4.3.15)

3.6.16 Ozone resistance. When tested in accordance with 4.4.3.16, the specimens shall display no evidence of cracking when examined under seven power magnification, (see 4.4.3.16).

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TABLE I

Hose test schedule - qualification and quality conformance

QUALIFICATION									
Hose assy sample No.	1,2	3,4	5,6	7,8	9,10	11,12	13,14	15,16	
Length of hose assy.	3 inches (hose only)	18 inches	18 inches	18 inches	*See column 1	*See column 1	18 inches	Ozone Resistance 4.4.3.16	
*Column 1	Exam. 4.4.3.1	→	→	→	→	→	→	Ozone Resistance 4.4.3.16	
Dash assy. size lg.	Rdcn in dia. 4.4.3.2	Field Atch 4.4.3.3	→	→	→	→	→		
-3 10"		Proof 4.4.3.5	→	→	→	→	→		
-4 10" -5 12"		Coupling 4.4.3.4	→	Elong contr 4.4.3.6	Bend-vac 4.4.3.7	Cold defl 4.4.3.10	Oil circ ltn 4.4.3.11		
-6 12" -8 15"		Fuel imrs 4.4.3.8	Oil imrs 4.4.3.9	Leakage 4.4.3.12					
-10 18" -12 20"				Corrosion 4.4.3.13					
-16 24" -20 28"				Burst 4.4.3.14					
-24 30" -32 43"									
QUALITY CONFORMANCE									
Sampling (lot size 20,000 ft. or less) (See 4.5.2)									
				As above except omit corrosion	As above				
Periodic control (lot size 100,000 ft. or less) (See 4.5.2)									
	As above	As above	As above			As above	As above	As above	

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3.7 Identification of products. Products shall be identified in accordance with MIL-STD-130. In addition, a band shall be attached near the end of each hose length, and for hose more than 10 feet long, an additional band shall be attached near the center, with the following information:

a. Manufacturer's Commercial and Government Entity (CAGE) code in accordance with Handbook H4-1.

b. Part number of the hose, including size (see 6.4).

c. Date of manufacture in quarter of year and year.

Example: 12345 M83797-32 3/92 or 12345 M83797-32 3Q92

3.8 Age control. Bulk hose shall not exceed age limits established in AS1933 and MIL-STD-1523.

3.9 Workmanship. Workmanship shall be of the quality necessary to produce hose and hose assemblies free from all defects which affect proper functioning in service. All products shall be free from oil, grease, dirt, or other foreign material both internally and externally. Cleaning shall be in accordance with class 0 of AS 611.

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 the specification where such inspections are deemed necessary to assure supplies and services conform to prescribed requirements.

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 be 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 manufacturing operations, is an acceptable practice to ascertain conformance to requirements, however, this does not authorize

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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. Qualification inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).

4.3 Test conditions. Unless otherwise specified, all inspections shall be performed in accordance with the test conditions as specified in paragraphs 4.3.2 and 4.4.

4.3.1 Test fluids. Test fluids for each test shall be as specified in 4.4.3.5.

4.3.2 Oil aging. When a test specifies an oil-aged sample, it shall be produced by immersing in oil conforming to MIL-L-7808 at 250°F (Fahrenheit) $\pm 2^\circ\text{F}$ for 168 hours. All air shall be excluded from the bore of the hose during this aging. For qualification tests, a new batch of oil shall be used for each group of test samples. For quality conformance tests, a new batch of oil shall be used for each 10 or fewer tests.

4.4 Tests. Qualification tests shall be in accordance with the following (also see 6.3):

4.4.1 Samples. The length of test samples, the minimum quantity of test samples, and the schedule for conducting the tests, shall be as shown in Table I.

4.4.1.1 Hose. Each size of hose shall meet the tests in Table I. The fittings for the test samples shall be obtained from all the fitting manufacturers listed or approved for listing on the applicable QPL. Each end of the test samples may have a fitting from a different manufacturer. When there are more than four approved fitting manufacturers, the quantity of test samples shall be increased accordingly. Unless otherwise specified, fittings for the test samples may be straight, 45 degrees, 90 degrees, flared, flareless, or flanged.

4.4.2 Test report. For qualification tests, one copy of the test report in accordance with MIL-STD-831 shall be submitted to the qualifying activity for approval, prior to shipment of the product.

4.4.3 Test method. The qualification tests required by 3.1 shall consist of all the tests in Table I, and as specified below. At the option of the preparing activity, the qualification tests may

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be supplemented by tests under actual service conditions (see 6.2c).

4.4.3.1 Examination of product. All hose shall be examined to determine conformance with this specification in regard to the following as applicable:

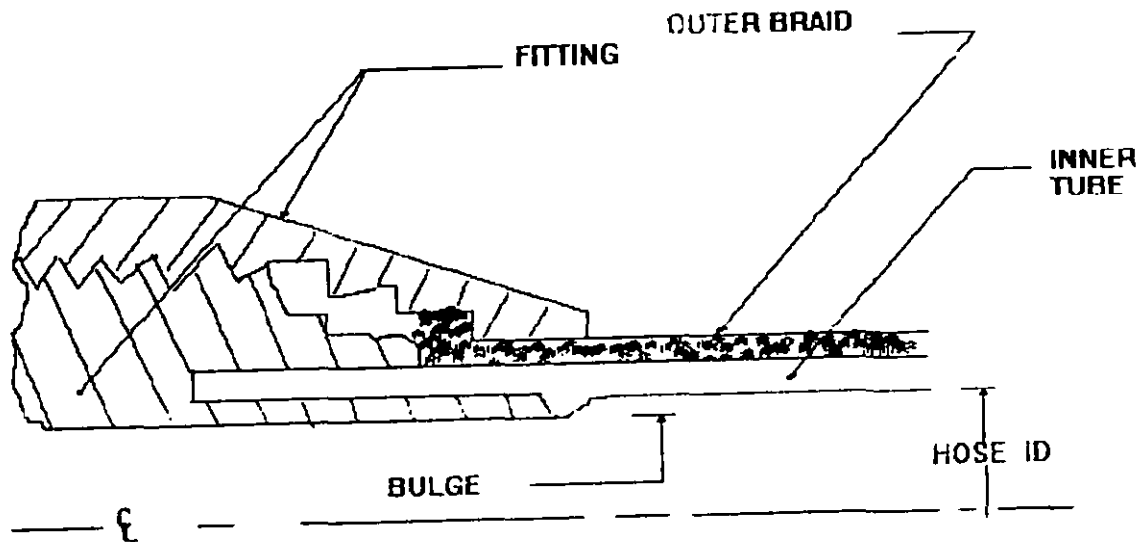
- a. Size (Figure 1)
- b. Materials (3.2)
- c. Finish (Figure 1)
- d. Dimensions (Figure 1)
- e. Identification (3.7)
- f. Workmanship (3.9)
- g. Cleaning (3.9)

4.4.3.2 Reduction in diameter. The lengths of hose in Table I under samples number 1 and 2 shall be oil-aged in accordance with 4.3.2, and measured at least .5 inches inside the hose from the end. The inside diameter (ID) of the hose shall not decrease to less than 90 percent of the minimum ID specified in Figure 1 for all sizes except size 3, for which the ID of the hose shall not decrease to less than 75 percent.

4.4.3.3 Field attachability. The hose lengths shall be cut, using the groove on the socket to establish the cutoff factor. The hose shall be inserted into the socket to the depth of the groove on the socket. The fitting shall be attached to the hose with standard tools. The nipple shall be tightened to meet the gap specified in the requirements paragraph titled "Field attachability" of MIL-F-83798. The hose lengths shall then meet the tolerance specified in MIL-H-83796/1 through MIL-H-83796/9. If assemblies fabricated as specified herein fail in any of the tests required by Table I, then the assembly shall be considered to have also failed this field attachability test.

4.4.3.4 Coupling. The measurement of the bulging of hose inner tubes caused by attachment of the fitting shall be made with a ball-end type gage. The diameter of the ball shall be within .001 inch of the minimum bulge diameter specified on Figure 2. The weight of each gage in ounces shall be equal to the dash number of the fitting being tested. In taking the measurement, the gage shall be placed inside the end of the assembly without lubrication, and without pushing through. The gage shall fall through the bulge under its own weight. This test shall be made only on straight fittings.

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HOSE SIZE	MINIMUM BULGE DIAMETER
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-03	.094
-04	.141
-05	.203
-06	.266
-08	.344

HOSE SIZE	MINIMUM BULGE DIAMETER
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-10	.496
-12	.563
-16	.750
-20	1.000
-24	1.250
-32	1.625

FIGURE 2. Coupling bulge

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4.4.3.5 Proof pressure. The hose assemblies, lengths of hose, with mechanically attached fittings, as applicable, shall be subjected to the proof pressure of Table II for not less than 30 seconds and not more than three minutes, using oil conforming to MIL-L-7808, hydraulic fluid conforming to MIL-H-5606, MIL-H-83282, or water. There shall be no evidence of leakage.

4.4.3.6 Elongation or contraction. The hose assemblies shall be placed in a straight unpressurized position and a standard 10-inch length marked off on the hose. The hose assemblies shall then be pressurized to the applicable operating pressure specified in Table II, using MIL-L-7808 oil, MIL-H-5606 or MIL-H-83282 hydraulic fluid, or water. While still pressurized, the standard length shall be remeasured and the change in length computed as a percent of the original length. The standard length shall not increase more than 2 percent or decrease more than 4 percent.

4.4.3.7 Bending and vacuum. The bending and vacuum test shall be performed at room temperature. A steel ball of the applicable diameter, as specified in Table III, shall be installed within the hose assemblies. The assemblies shall then be bent over to form the applicable minimum bend radius specified in Table II. All size assemblies shall not flatten or otherwise deform at any section more than 10 percent of the outside diameter (OD). While bent in this radius, a vacuum of 27 inches Hg shall be applied to sizes -03 through -12, and 22 inches Hg to sizes -16 through -32, and held for 5 minutes. Application of vacuum shall not flatten or otherwise deform the hose an additional 10 percent of the OD for sizes -03 through -24, and an additional 25 percent of the OD for size -32. With the vacuum still applied, the assemblies shall be straightened and held in a horizontal position, then gradually tilted 30 degrees in each direction. Failure of the ball to roll through the assemblies shall be cause for rejection. After release of the vacuum, one assembly shall be dissected longitudinally and visually examined. Evidence of ply separation, blistering, collapse, or other deformation shall be cause for rejection.

4.4.3.8 Fuel immersion. The uncapped hose assemblies shall be immersed in fuel conforming to type JP-4, MIL-T-5624 (JP-8 may be used as an alternate) for 48 hours at a temperature of 250°F. After immersion, the assemblies shall be removed and, at room temperature, shall pass the proof pressure test of 4.4.3.5 for three minutes, with oil conforming to MIL-L-7808. The assemblies shall then pass the coupling test of 4.4.3.4. The hose shall then be dissected longitudinally, and visually inspected. Any indication of disintegration, solubility of component parts, porosity, blistering or collapse shall be considered failure to meet the test requirement.

"CAUTION: Use safety precautions, fuel and oil under pressure and at high temperature may self ignite or explode."

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4.4.3.9 Oil immersion. The uncapped hose assemblies shall be immersed in oil conforming to MIL-L-7808 at a temperature of 250°F for a period of 168 hours. After 24 hours, 96 hours, and 168 hours, the assemblies shall be removed, cooled to room temperature, and shall pass the proof pressure test of 4.4.3.5 for three minutes, using MIL-L-7808 oil. The assemblies shall then pass the coupling test of 4.4.3.4. The hose shall then be dissected longitudinally and visually inspected. Any indication of disintegration, solubility of component parts, porosity, blistering or collapse shall be considered failure to meet the test requirement.

"CAUTION: Use safety precautions, fuel and oil under pressure and at high temperature may self ignite or explode."

TABLE II

Physical requirements of hose, fittings, and hose assemblies

Hose Size	Operating Pressure psi (MAX)	Proof Pressure psi	Burst Pressure psi (MIN)	Bend Radius Inches (MIN)	Operating Temperature (fluid or ambient)
-03	1,000	3,000	6,000	1.75	-65°F to +250°F
-04	1,000	3,000	6,000	2.00	-65°F to +250°F
-05	1,000	3,000	6,000	2.25	-65°F to +250°F
-06	1,000	3,000	6,000	2.50	-65°F to +250°F
-08	1,000	2,500	5,000	3.50	-65°F to +250°F
-10	1,000	2,500	5,000	4.00	-65°F to +250°F
-12	1,000	2,000	4,000	4.50	-65°F to +250°F
-16	750	1,500	3,000	5.50	-65°F to +250°F
-20	500	1,300	2,000	8.00	-65°F to +250°F
-24	250	800	1,750	9.00	-65°F to +250°F
-32	200	600	1,200	12.50	-65°F to +250°F

1/ Assemblies having aluminum flange fittings shall be pressure tested at the rated proof pressure or 1,500 psi, whichever is less (see MS20756).

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TABLE III

Ball size for bending and vacuum test

Dash No.	Dia. plus .001-inch	Dash No.	Dia. plus .001-inch
-03	.070	-10	.406
-04	.125	-12	.500
-05	.188	-16	.656
-06	.250	-20	.875
-08	.313	-24	1.125
		-32	1.594

4.4.3.10 Cold temperature deflection test. One of two hose assembly samples (see Table I) shall be oil-aged in accordance with 4.3.2, and the other not aged. The hose assemblies shall then be installed in the apparatus shown on Figure 3 and subjected to the cold temperature deflection test. The oil-aged assembly shall be filled with MIL-L-7808 oil, and the non-aged assembly with type JP-4, MIL-T-5624 fuel (JP-8 may be used as an alternate). These assemblies shall be placed in a cold chamber, the temperature of which shall be controlled at -67°F , $\pm 2^{\circ}\text{F}$, and maintained at this temperature for 2 hours. After this time, and while at the specified temperature, the assemblies shall be subjected to the operating pressure specified in Table II. The hose assemblies shall also be subjected to a deflection of plus or minus .5 inches at a rate of 15 cycles a minute for a 15 minute period. Then the hose assemblies shall be allowed to return to room temperature, and shall pass the proof pressure test of 4.4.3.5.

4.4.3.11 Oil circulation test. The hose assemblies shall be installed in a test set-up similar to that shown on Figure 4. The test fluid shall be oil conforming to MIL-L-7808. The sequence of the test procedure, as shown on Figure 5 follows:

a. Soak the assemblies with no pressure in a cold chamber, the temperature of which shall be controlled at -65°F , $\pm 2^{\circ}\text{F}$, and maintained at this temperature for 1 hour.

b. Pressure-test the assemblies to the operating pressure specified in Table II for 30 seconds. There shall be no evidence of leakage.

c. Circulate the test fluid at a pressure of 70 pounds per square inch (psi) and at a flow rate not to exceed 15 feet a second. While circulating the fluid, increase the temperature of the test fluid to $250^{\circ}\text{F} \pm 10^{\circ}\text{F}$, and increase the ambient temperature to $200^{\circ}\text{F} \pm 10^{\circ}\text{F}$.

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d. Continue circulation for 20 hours. During the last hour of the 20-hour period, increase the test fluid temperature to 375°F ±10°F. Maintain this fluid temperature a minimum of 15 minutes.

"CAUTION: Use safety precautions, fuel and oil under pressure and at high temperature may self ignite or explode."

e. Upon completion of above-mentioned tests, reduce the fluid and ambient temperature to room temperature, and test the assembly to the applicable operating pressure a minimum of 30 seconds. There shall be no evidence of leakage.

f. The tests described in (a) through (e) above constitute one cycle. Complete 10 such cycles. Upon completion of the 10 cycles, pressure-test the hose assemblies at the applicable operating pressure for a minimum of three minutes. There shall be no evidence of leakage or other malfunction.

4.4.3.12 Leakage. The hose assemblies shall be subjected to 70 percent of the minimum burst pressure specified in Table II for three minutes, using oil conforming to MIL-L-7808. The pressure shall then be released to 0 psi and then reapplied to 70 percent of minimum burst pressure and held for an additional three minutes. There shall be no leakage from the fitting, no seepage through the hose, or other malfunction.

4.4.3.13 Corrosion. The hose assemblies shall be immersed, in a vertical position with the ends capped, into a 2.5 percent solution of sodium chloride for a five minute period. The samples shall then be air dried for 25 minutes at a temperature of 140°F. This immersion and drying cycle shall be repeated for a total of 168 hours. Upon completion of this test the hose assemblies shall be subjected to and meet the burst requirements of 4.4.3.14.

4.4.3.14 Burst pressure. Within 24 hours after assembly, the hose assemblies shall be pressurized until destruction occurs, using MIL-L-7808 oil, MIL-H-5606 hydraulic fluid, or water. The rate of pressure rise shall be 25,000 psi, +0 psi/-10,000 psi per minute. There shall be no leakage, burst, or fitting blow-off below minimum burst pressure specified in Table II. The mode of destruction and pressure of occurrence shall be recorded in the test report (see 4.4.2).

4.4.3.15 Fire resistance. When fire-resistance supplemental tests are required (see 6.2b), the hose assemblies shall be tested and shall meet the requirements of AS1055, Type 1a, class A (Note: Dimensions are in inches). Hose assemblies approved to the fire test requirements of TSO-C53a prior to the date of this specification will be considered in compliance with this requirement. A protective sleeve over the hose or fitting may be required to facilitate compliance with this requirement.

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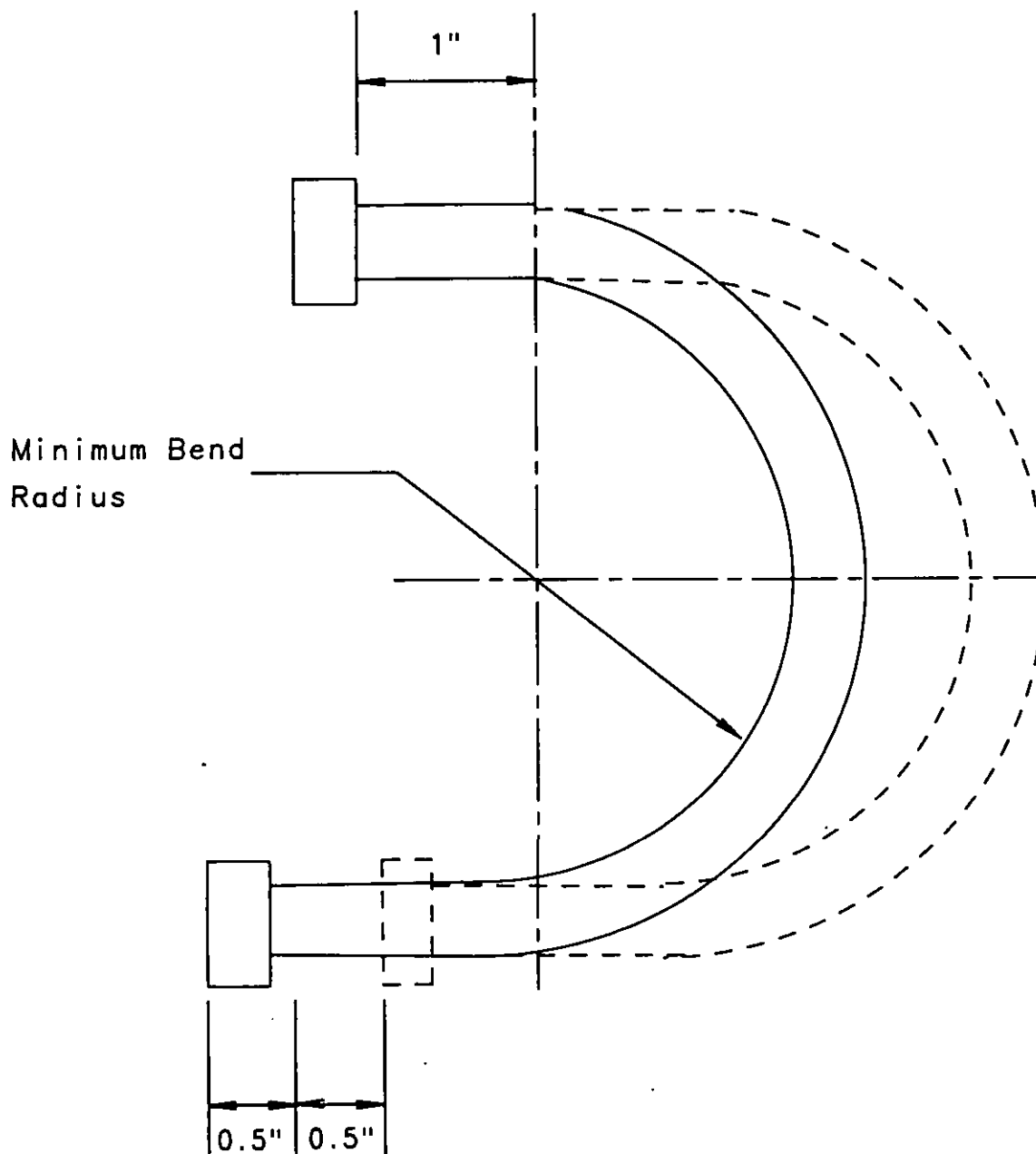


FIGURE 3. Cold temperature deflection test diagram

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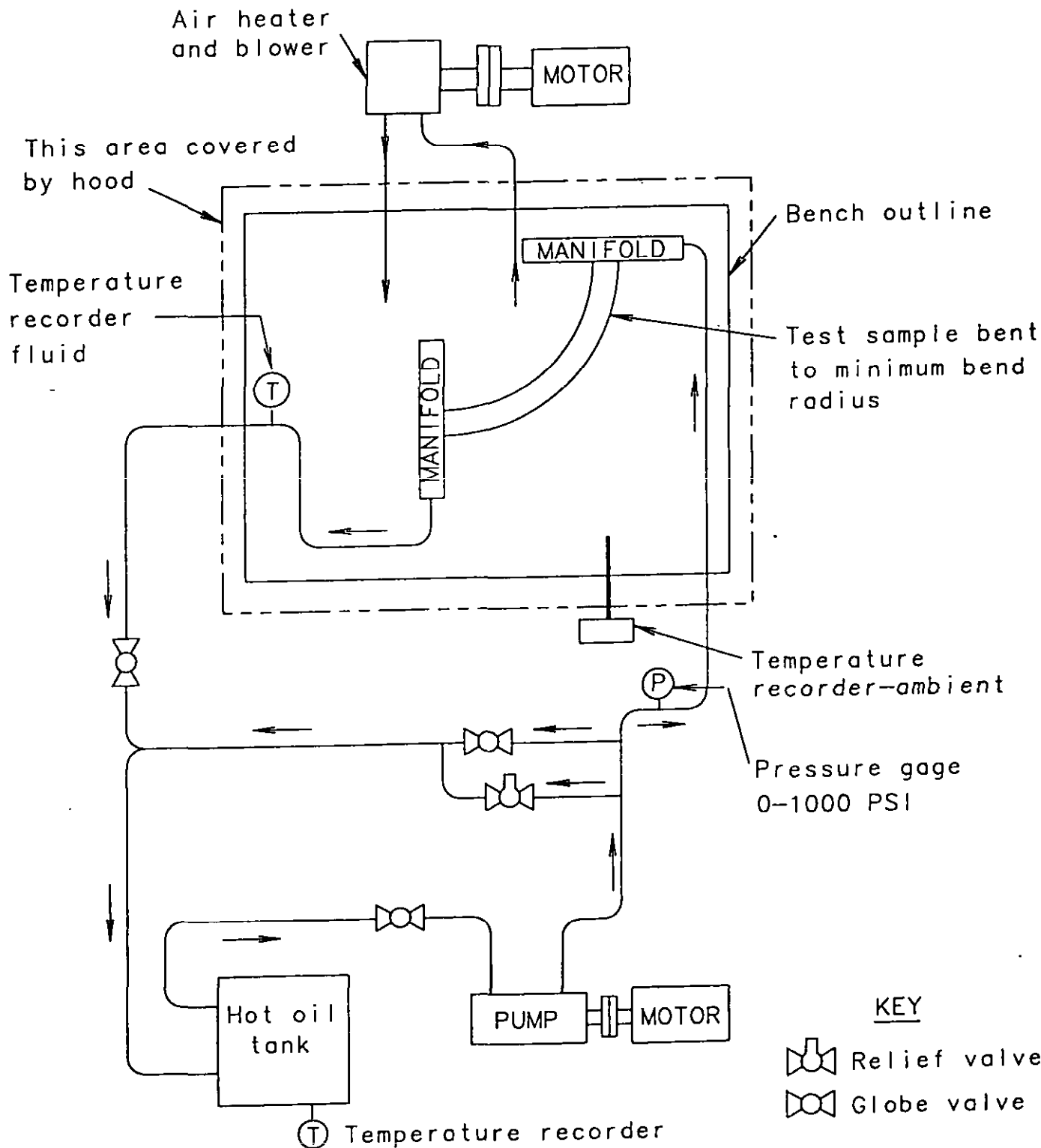


FIGURE 4. Oil circulation test schematic

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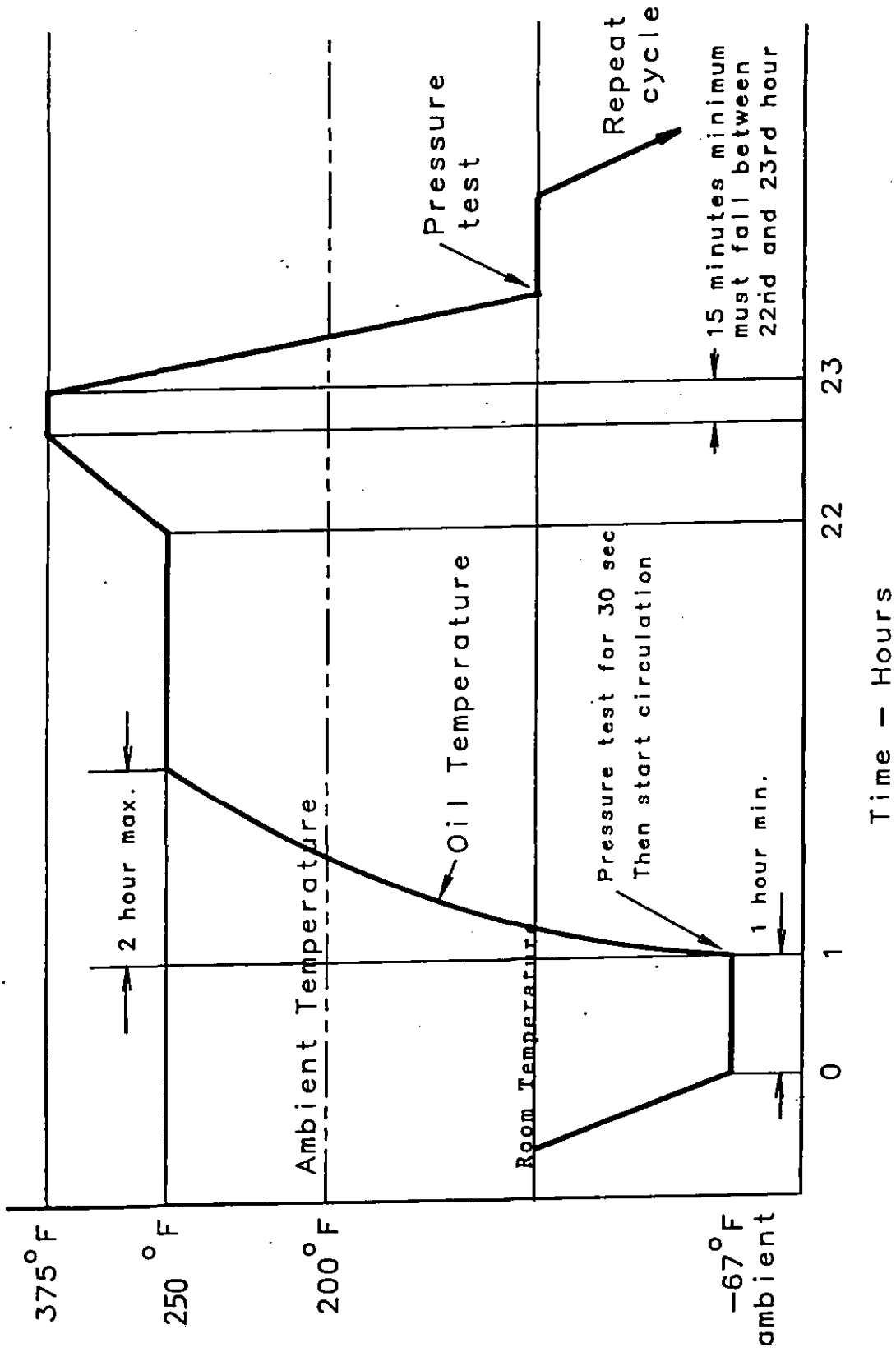


FIGURE 5. Oil circulation temperature cycle

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4.4.3.16 Ozone resistance. Two hose specimens of each size shall be tested for ozone resistance. The specimens shall be approximately ten inches longer than the circumference of the required mandrel. The specimens shall be bent around the mandrel and bound with tape or twine where the ends cross. If collapse of the hose occurs where bent around the mandrel, provision shall be made to support the hose internally. The specimens shall be conditioned for 45 minutes in air at room temperature, and then while still on the mandrel, shall be placed in an exposure chamber for 168 hours. The test temperature shall be 104°F ±2°F and the ozone concentration shall be 100 mPa [100 mPa = .99 ppm (Parts per One Hundred Million)]. Following exposure, there shall be no evidence of cracking when the specimens are examined under seven power magnification.

4.5 Quality conformance tests. Quality conformance tests shall consist of the following:

- a. Individual (see 4.5.1)
- b. Sampling and periodic control (see 4.5.2)

4.5.1 Individual. Individual tests shall consist of the following:

4.5.1.1 Examination of product (see 4.4.3.1). All hose shall be examined to determine conformance with this specification with respect to size and workmanship.

4.5.1.2 Proof pressure (see 4.4.3.5). Proof-pressure tests shall be performed on each piece of hose.

4.5.2 Sampling and periodic control. The tests to be performed for sampling and periodic control are identified in Table I. The samples shall meet all the tests.

4.5.2.1 Quantity. The quantity of samples for each test shall be the same as for qualification tests shown in Table I.

4.5.2.2. Schedule. The test schedules shall be the same as for qualification tests shown in Table I.

4.5.2.3 Lot size. Samples shall be selected at random from the lot size shown in Table I. A lot is defined as products of the same dash size, manufactured under essentially the same conditions, and at essentially the same time.

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4.5.3 Rejection and retest. When an item selected from a production run fails to meet the specification, no items still on hand or later produced shall be accepted until the extent and cause of failure have been determined and corrected. The contractor shall explain to the Government representative the cause of failure and the action taken to preclude recurrence. After correction, all of the quality conformance tests shall be repeated.

4.5.3.1 Individual tests may continue. For production reasons, individual tests or other quality conformance tests may be continued pending the investigation of the test which failed. Final acceptance of items on hand or produced later shall not be made until it is determined that all items meet all the requirements of this specification.

4.5.4. Defects in items already accepted. If the investigation of quality conformance test failure indicates that defects may exist in items already accepted, the contractor shall fully advise the procuring activity of all defects likely to be found and the method of correcting them.

4.6 Inspection of preparation for delivery. The preservation, packaging, packing, and marking of hose, fittings, and hose assemblies shall be examined to determine conformance with Section 5 of this specification.

5. PACKAGING

5.1 Preservation, packaging. Preservation and packaging shall be A or C as specified (see 6.2), in accordance with MIL-H-775.

5.2 Packing. Packing shall be A, B or C as specified (see 6.2), in accordance with MIL-H-775.

5.3 Marking. Marking shall be in accordance with MIL-STD-129.

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 hose is intended for use in aircraft fuel and oil systems at the pressures and temperatures specified in Table II herein. The products are not recommended for vacuum or hydraulic impulse applications.

6.2 Acquisition requirements. Procurement documents should specify the following:

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a. Title, number, and date of this specification and applicable Part Identifying Number (PIN) (See 6.4).

b. Issue of DoDISS to be cited in the solicitation, and if required the specific issue of individual documents referenced (see 2.0).

c. Whether supplemental tests are required (see 4.4.3).

d. Levels of preservation, packaging, and packing (see 5.1 and 5.2).

e. Items of data requirements (see 6.3).

6.3 Consideration of data requirements. The following data requirements should be considered when this specification is applied on a contract. The applicable Data Item Description (DID's) should be reviewed in conjunction with the specific acquisition to ensure that only essential data are requested/provided and that the DID's are tailored to reflect the requirements of the specification acquisition. To ensure correct contractual application of the data requirements, a Contract Data Requirements List (DD Form 1423) must be prepared to obtain the data, except where DoD FAR Supplement 27.475-1 exempts the requirement for a DD Form 1423.

<u>Reference Paragraph</u>	<u>DID Number</u>	<u>DID Title</u>	<u>Suggested Tailoring</u>
4.1.1	DI-NDTI-80809	Test Report	2.2.7
4.4.2	DI-NDTI-80809	Test Reports	Use Contractor Format
4.4.3.1	DI-R-5299C	Failure Analysis and Correcting Action Report	Use Contractor Format
4.5.3	DI-RELI-80322	Quality Conformance Inspection and Test Procedures	Use Contractor Format

The above DID's were those cleared as of the date of this specification. The current issue of DoD 5010.12-L, Acquisition Management Systems and Data Requirements Control List (AMSDL), must be researched to ensure that only current, cleared DID's are cited on the DD Form 1423.

6.4 Qualification. With respect to products requiring qualification, awards will be made only for such products as have, prior to the time set for opening of bids, been tested and approved for inclusion in the applicable qualified products list, whether or not such products have actually been so listed by that date.

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The attention of the suppliers is called to this requirement, and manufacturers are urged to arrange to have the products that they may offer to the Federal Government tested for qualification in order that they may be eligible to be awarded contracts or orders for the products covered by this specification. The activity responsible for the qualified products list is the San Antonio Air Logistics Center, ATTN: SA-ALC/TIRDM, Kelly AFB, Texas 78241-5000, and information pertaining to qualification of products may be obtained from that activity.

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6.5 Part Identifying Number (PIN). The PIN shall be constructed as follows:

EXAMPLES OF PART IDENTIFYING NUMBERS (PINs):

M83797 -03-R

RANDOM LENGTHS AS SPECIFIED IN MIL-H-83797
(See 3.4.1.1)

HOSE SIZE	DASH NO.	-03	-04	-05	-06	-08	-10	-12	-16	-20	-24	-32
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M83797 -32-012 4

-EIGHTHS OF AN INCH

-INCHES

HOSE SIZE	DASH NO.	-03	-04	-05	-06	-08	-10	-12	-16	-20	-24	-32
-----------	----------	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

**NOTE: The above PINs have been changed to remove size codes and to reflect the inclusion of MIL-H-83797/1 specification sheet within this document (See old PIN below). The parts remain interchangeable.

The following PIN has been revised and should no longer be used:

M83797/1- X R

-RANDOM LENGTHS AS SPECIFIED IN MIL-H-83797

HOSE SIZE	DASH NO.	-3	-4	-5	-6	-8	-10	-12	-16	-20	-24	-32
	SIZE CODE	B	E	F	G	H	J	K	M	N	P	R

M83797/1-H 012 4

-EIGHTHS OF AN INCH

-INCHES

HOSE SIZE	DASH NO.	-3	-4	-5	-6	-8	-10	-12	-16	-20	-24	-32
	SIZE CODE	B	E	F	G	H	J	K	M	N	P	R

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6.6 Subject term (Key Word) listing.

Inner tube
Inner braid
Outer braid
End fitting

6.7 Changes from previous issue. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extensiveness of the changes.

Custodian:

Army - AV
Air Force - 99
Navy - AS

Review Activities:

Army - AT,MI
DLA - CS

User Activities:

Air Force - 11

Preparing Activity:

Air Force - 82

Agent Activity

DLA - CS

Project Number:

4720-0022

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. 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.

I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER	2. DOCUMENT DATE (YYMMDD)
3. DOCUMENT TITLE		
4. NATURE OF CHANGE <i>(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)</i>		
5. REASON FOR RECOMMENDATION		
6. SUBMITTER		
a. NAME <i>(Last, First, Middle Initial)</i>	b. ORGANIZATION	
c. ADDRESS <i>(Include Zip Code)</i>	d. TELEPHONE <i>(Include Area Code)</i> (1) Commercial (2) AUTOVON <i>(if applicable)</i>	7. DATE SUBMITTED (YYMMDD)
8. PREPARING ACTIVITY		
a. NAME	b. TELEPHONE <i>(Include Area Code)</i> (1) Commercial (2) AUTOVON	
c. ADDRESS <i>(Include Zip Code)</i>	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340 AUTOVON 289-2340	