

INCH-POUND

MIL-DTL-8788D

6 April 2001

SUPERSEDING

MIL-H-8788C

14 July 1989

DETAIL SPECIFICATION

HOSE, RUBBER, HYDRAULIC, HIGH PRESSURE (3,000 PSI)

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

1. SCOPE

1.1 Scope. This specification covers the requirements for rubber hose for use in hydraulic systems with operating pressures of 3,000 psi maximum.

2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 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.

2.2 Government documents.

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

Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, Defense Supply Center, Columbus, Code DSCC-VAI, 3990 East Broad Street, Columbus, OH 43216-5000, by using the 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.

MIL-DTL-8788D

SPECIFICATIONS

DEPARTMENT OF DEFENSE

- MIL-H-5606 - Hydraulic Fluid, Petroleum Base, Aircraft, Missile and Ordnance Hydrocarbon Base, Aircraft and Missile
- MIL-DTL-8789 - Fitting End, Attachable, Hydraulic High Pressure (3,000 psi), General Specification for
- MIL-DTL-8790 - Hose Assemblies, Rubber, Hydraulic, High Pressure (3,000 psi)
- MIL-PRF-83282 - Hydraulic Fluid, Fire Resistant, Synthetic Hydrocarbon Base, Metric, NATO Code Number H-537

STANDARDS

FEDERAL

- FED-STD-595 - Colors Used in Government Procurement

DEPARTMENT OF DEFENSE

- MIL-STD-889 - Dissimilar Metals

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

2.3 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of the documents which are Department of Defense (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).

AEROSPACE INDUSTRIES ASSOCIATED OF AMERICA

- NAS847 - Caps and Plugs, Protective, Dust and Moisture Seal (DoD adopted)

(Application for copies should be addressed to the Aerospace Industries Associated of America, 1250 Eye Street, NW, Washington DC 20005-3922.)

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

- ASTM D380 - Standard Test Methods for Rubber Hose (DoD Adopted)

(Application for copies of ASTM publications should be addressed to the American Society of Testing and Materials, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959.)

MIL-DTL-8788D

NATIONAL CONFERENCE OF STANDARDS LABORATORIES (NCSL)

ANSI/NCSL Z540-1 - Calibration Laboratories and Measuring and Test Equipment,
General Requirements (DoD adopted)

(Application for copies should be addressed to the National Conference of Standards Laboratories,
1800 30th Street, Suite 305B, Boulder, CO 80301.)

SAE INTERNATIONAL

ARP603 - Impulse Testing of Hydraulic Hose, Tubing, and Fitting Assemblies
(DoD adopted)
AS1933 - Age Controls for Hose Containing Age-Sensitive Elastomeric
Material (DoD adopted)
J1966 - Lubricating Oil, Aircraft Piston Engine (Nondispersant Mineral Oil)
(DoD adopted)

(Application for copies should be addressed to SAE International, 400 Commonwealth Drive,
Warrendale, PA 15096-0001.)

2.4 Order of precedence. In the event of a conflict between the text of this document and the references cited herein (except for related associated specifications, specification sheets, or MS standards), 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 hose furnished under this specification shall be a product that is authorized by the qualifying activity for listing on the applicable qualified products list (QPL) before contract award (see 4.4 and 6.5).

3.2 Materials. Materials used shall be as specified herein. However, materials not specified herein shall be of a quality that will enable the hose to meet the requirements of this specification.

3.2.1 Metals. Metals selected for constructing the reinforcement of the hose shall be corrosion resistant or treated to resist corrosion caused by exposure to atmospheric and environmental conditions encountered during storage or normal service. Dissimilar metals, as defined by MIL-STD-889, shall not be used in intimate contact with each other unless protected against electrolytic corrosion.

3.2.2 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials shall be used to the maximum extent possible provided that the material meets operational and maintenance requirements, and promotes economically advantageous life cycle costs.

3.2.3 Hazardous substances. The use of hazardous substances, toxic chemicals, or Ozone Depleting Chemicals (ODCs) shall be avoided whenever feasible.

MIL-DTL-8788D

3.3 Design and construction. The hose shall be designed and constructed so that when assembled with fittings qualified to MIL-DTL-8789, the assembly shall meet all the requirements of MIL-DTL-8790. The physical and dimensional characteristics of the hose shall conform to table I and figure 1.

3.4 Components. The hose shall consist of the following, as depicted in figure 1:

- a. a seamless compounded inner tube (see 3.4.1)
- b. braided wire reinforcement (see 3.4.2)
- c. an abrasion resistant cover (see 3.4.3)

The hose shall meet the age limitation requirements specified in AS1933. Definitions for "cure date" and "quarter" can be found in AS1933. The cut hose ends shall be sealed with caps or plugs conforming to NAS847 to prevent the entrance of foreign contaminants.

3.4.1 Inner tube. The inner tube shall be a seamless fabrication of an oil-resistant elastomer and shall have a uniform thickness. The bore of the tube shall be smooth, free from pitting, cuttings, borings, or cements.

TABLE I. Physical and dimensional requirements.

Hose size no.	Hose ID, dimension A (inch)	Hose OD, dimension B (inch)	Inner tube diameter at bulge, dimension C 1/ (inch)	Nominal OD of tube (inch)	Wire braiding OD, dimension D (inch)	Braided wire layers
4	0.219 $\begin{matrix} + 0.031 \\ - 0.007 \end{matrix}$	0.625 \pm 0.031	0.146	0.250	0.484 \pm 0.016	2
5	0.281 $\begin{matrix} + 0.025 \\ - 0.007 \end{matrix}$	0.703 \pm 0.031	0.177	0.313	0.547 \pm 0.016	2
6	0.344 $\begin{matrix} + 0.025 \\ - 0.007 \end{matrix}$	0.766 \pm 0.031	0.271	0.375	0.640 \pm 0.023	2
8	0.438 $\begin{matrix} + 0.025 \\ - 0.007 \end{matrix}$	0.859 \pm 0.031	0.365	0.500	0.734 \pm 0.023	2
10	0.563 $\begin{matrix} + 0.025 \\ - 0.007 \end{matrix}$	1.031 \pm 0.031	0.455	0.625	0.859 \pm 0.031	2
12	0.688 $\begin{matrix} + 0.031 \\ - 0.010 \end{matrix}$	1.219 \pm 0.031	0.568	0.750	1.047 \pm 0.031	2
16	0.875 $\begin{matrix} + 0.031 \\ - 0.010 \end{matrix}$	1.500 $\begin{matrix} + 0.047 \\ - 0.031 \end{matrix}$	0.778	1.000	1.328 \pm 0.031	3

1/ Dimension C indicates both the minimum allowable inner tube diameter at the bulge and the minimum nipple ID of the fitting when assembled with the hose (see figure 1). When elbow fittings are used, the minimum ID through the elbow bend area may be 0.031 inch less than the values shown in this column.

MIL-DTL-8788D

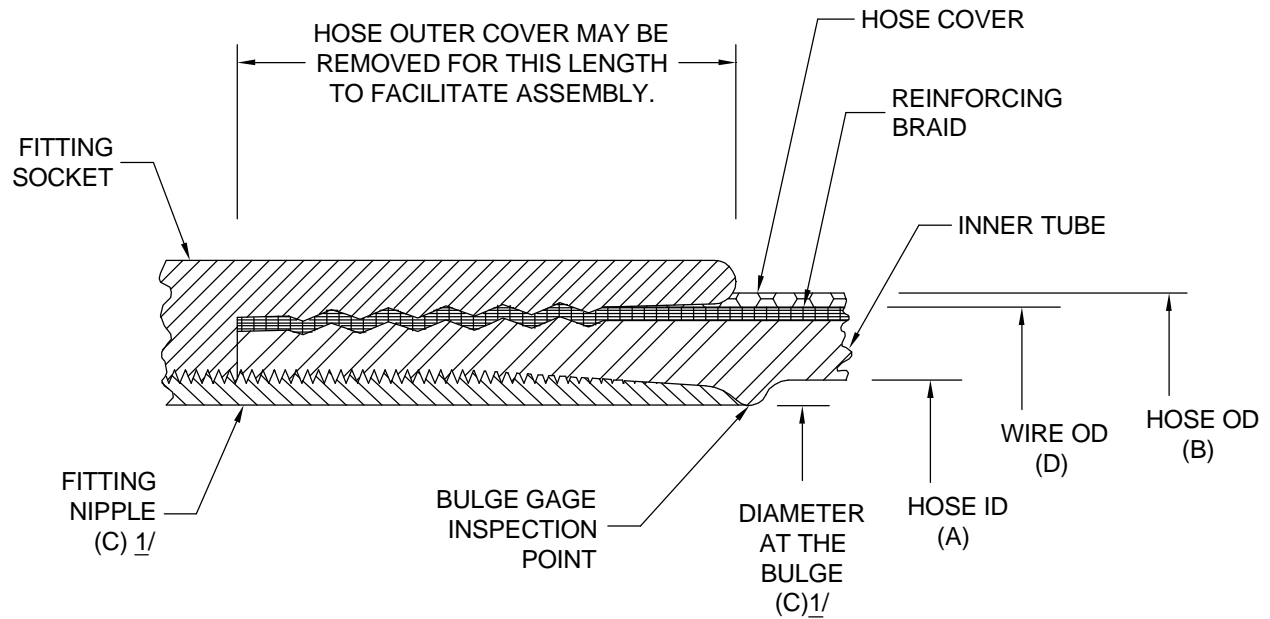


FIGURE 1. Construction of hose.

3.4.2 Reinforcement. The hose shall be reinforced with uniformly braided wires in order to meet the requirements specified herein. The reinforcement shall be concentric, with the inside bore of the tube, to within 0.030 inch Full Indicator Movement (FIM) for sizes 8 and smaller. Sizes larger than 8 shall be within 0.035 inch FIM. The outer surface shall be concentric, with the inside bore of the tube, to within 0.035 inch FIM for sizes 6 and smaller, 0.040 inch FIM for sizes 8 and 10, and 0.050 inch FIM for sizes 12 and 16.

3.4.3 Cover. The cover shall be of a compounded polymerized chloroprene that is both abrasion and oil resistant. A friction ply or a braided layer may be used over the wire reinforcement.

3.5 Examination of product. The hose shall conform to the design and construction (see 3.3), identification markings (see 3.7), interchangeability (see 3.9), and workmanship (see 3.11) specified herein and in the applicable specification sheets, when examined as specified in 4.7.1.

3.6 Performance. The hose shall meet the following performance requirements. When necessary for testing, the hose shall be assembled with end fittings qualified to MIL-DTL-8789.

3.6.1 Bulge resistance. The ball gage, used to determine the inner tube diameter at the bulge of the hose, shall fall freely under its own weight through the section of the end-fitting insert in the hose, when tested as specified in 4.7.2.

3.6.2 Proof pressure. The hose shall not leak or fail during or at the completion of the test, when tested as specified in 4.7.3, with the applicable proof pressure specified in table II. There shall be no visual evidence of damage or permanent deformation.

MIL-DTL-8788D

3.6.3 Diameter reduction. The ID of the hose shall not be less than 90% of the applicable diameter specified in table I, when tested as specified in 4.7.4.

3.6.4 Elongation and contraction. The length change for hose sizes 4 and 5 shall not be more than +0.50 or -2.50%, when tested as specified in 4.7.5. Length change for hose sizes 6 and larger shall not be more than $\pm 2.00\%$.

3.6.5 Leakage. The hose and end fittings shall not show any evidence of leakage during or at the completion of the test, when tested as specified in 4.7.6.

3.6.6 Burst resistance. There shall be no leakage in the hose or at the end fittings, when tested as specified in 4.7.7, below and including the minimum burst pressure specified in table II. The hose shall not burst or develop a permanent blister. The fittings shall not loosen or disconnect from the hose.

3.6.7 Impulse. The hose and end fittings shall not show any evidence of leakage, burst, or fitting loosening or blow-off, when tested as specified in 4.7.8.

3.6.8 Low temperature flexibility. The hose shall not leak or fail during or at the completion of the test, when tested as specified in 4.7.9. There shall be no visual evidence of damage or permanent deformation.

TABLE II. Performance characteristics.

Hose size no.	Operating pressure (psi)	Operating pressure for impulse testing (psi)	Proof pressure, min (psi)	Burst pressure, min (psi)	Bend radius inside, min (inch)	Assembly length of test samples (inch) 1/
4	3,000	3,000	8,000	16,000	3.00	16
5	3,000	3,000	7,000	14,000	3.38	18
6	3,000	3,000	7,000	14,000	5.00	21
8	3,000	3,000	7,000	14,000	5.75	24
10	3,000	3,000	6,000	12,000	6.50	30
12	3,000	3,000	6,000	12,000	7.75	33
16	3,000	3,000	5,000	10,000	9.63	24

1/ Length specified includes fittings at both ends (see 3.6).

3.7 Identification of product. The hose shall be legibly marked with the information listed below. This information shall be repeated every 12 inches along the entire length of the hose. The marking color shall be yellow conforming to FED-STD-595, color number 13538.

- a. Part or Identifying Number (PIN) as depicted in 6.3.
- b. Cure date in quarter and year such as 4Q01 for fourth quarter, 2001.
- c. CAGE code.
- d. Manufacturer's name or trademark.

MIL-DTL-8788D

3.8 Length of bulk hose. Bulk hose shall be furnished in lengths greater than 20 feet. However, up to 10% of the order may be furnished in random lengths between 10 and 20 feet. No more than 10% of the order shall be furnished in random lengths between 3 and 10 feet. When the order is for a specific length, a tolerance of $\pm 1\%$ of the required length shall be used.

3.9 Interchangeability. Hoses bearing the same manufacturer's part number shall be both functionally and dimensionally interchangeable.

3.10 Anti-counterfeiting protection. All qualified manufacturers shall establish proprietary measures to authenticate their products when necessary. If required, this proprietary information shall be released only to the quality assurance department of the final procuring activity.

3.11 Workmanship. Hose shall be uniform in quality and shall be free from defects, irregularities, or foreign matter that may adversely affect its service performance.

3.11.1 Cleanliness. The ends of each hose length shall be capped or plugged to prevent entrance of moisture and foreign matter. The caps or plugs shall be securely attached and shall withstand normal strains, jarring and vibrations encountered during shipping, storage and handling. Hose lengths with uncovered ends shall be rejected and considered as failure. The interior surface of the hose shall be free from oil, grease, dirt, moisture, cleaning solvents and foreign materials when examined in accordance with 4.6.2.1.

4. VERIFICATION

4.1 Test equipment and inspection facilities. Test and measuring equipment and inspection facilities of sufficient accuracy, quality and quantity to permit performance of the required inspection shall be used. The establishment and the maintenance of a calibration system to control the accuracy of all test and measuring equipment shall be in accordance with ANSI/NCSL Z540-1 or equivalent.

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

- a. Qualification inspection (see 4.4).
- b. Quality conformance inspection (see 4.5).
 1. Individual tests (see 4.5.1).
 2. Sampling tests (see 4.5.2).
 3. Periodic control tests (see 4.5.3).

4.3 Inspection conditions. Unless otherwise specified, all required inspection shall be performed in accordance with the test conditions specified in 4.6.

MIL-DTL-8788D

4.4 Qualification inspection. Qualification inspection shall be performed at a laboratory acceptable to the Government qualifying activity (see 6.5) on sample units produced with equipment and procedures used in production.

4.4.1 Samples for qualification. Qualification samples shall be representative of the products proposed to be furnished to this specification. Samples, consisting of 10 hose assemblies of each size and of the lengths specified in table II, shall be subjected to qualification testing. Each assembly shall consist of a hose, as specified herein, assembled with fittings from two different manufacturers qualified to MIL-DTL-8789, one at each end.

4.4.2 Qualification inspection routine. Samples shall be subjected to qualification testing in accordance with table III in the sequence specified in table IV.

TABLE III. Inspection requirements.

Requirement	Requirement paragraph	Test Method paragraph	Qualification inspection	Conformance inspection		
				Individual	Sampling	Periodic
Examination of product	3.5	4.7.1	X	X		
Bulge resistance	3.6.1	4.7.2	X			
Proof pressure	3.6.2	4.7.3	X	X		
Diameter reduction	3.6.3	4.7.4	X			
Elongation & contraction	3.6.4	4.7.5	X		X	
Leakage	3.6.5	4.7.6	X		X	
Burst resistance	3.6.6	4.7.7	X		X	
Impulse <u>1/</u>	3.6.7	4.7.8	X			X
Low temperature flexibility	3.6.8	4.7.9	X			

1/ Aging is not required for periodic inspection

4.4.3 Acceptance of qualification data. For identical requirements and test procedures, using an identical fitting, qualification test data from the manufacturer of MIL-DTL-8788 hose may be accepted as qualification data for MIL-DTL-8789 and for MIL-DTL-8790 providing that documented approval has been obtained from the qualifying activity. Unless otherwise approved by the qualifying activity, qualification test data from one manufacturer shall not be accepted for another.

4.4.3 Failures. One or more failures shall be cause for refusal to grant qualification approval.

4.4.4 Retention of qualification. To retain qualification, the manufacturer shall submit a report at 12-month intervals to the qualifying activity. The qualifying activity shall establish the initial reporting date. Each report shall contain a summary of the results obtained from both the sampling tests and the periodic control tests performed during the 12-month interval. The number of lots and the quantities of hose that have passed and failed shall be included. All reworked lots shall also be accounted for and identified.

If the summary of test results indicates nonconformance with the requirements specified herein but the corrective measures acceptable to the qualifying activity has not been taken, action may be taken to remove the failing product from the QPL.

MIL-DTL-8788D

Failure to submit the report within 30 days after the end of each 12-month period may result in loss of qualification for the product. In addition to the periodic submission of inspection data, the manufacturer shall immediately notify the qualifying activity at any time during the 12-month period that the inspection data indicates failure of the qualified product to meet the requirement specified herein. If there has been no production during the reporting period, a report shall be submitted certifying that the manufacturer still has the capabilities and the facilities necessary to produce the qualified product. If there has been no production during two consecutive reporting periods, the manufacturer may be required, at the discretion of the qualifying activity, to submit his qualified product for testing in accordance with the qualification inspection requirements.

TABLE IV. Qualification inspection sequence.

Required qualification test	Required test paragraph	Sample number										
		1	2	3	4	5	6	7	8	9	10	
Examination of product	4.7.1	X	X	X	X	X	X	X	X	X	X	X
Bulge resistance	4.7.2	X	X	X	X							
Proof pressure	4.7.3	X	X	X	X	X	X	X	X	X	X	X
Diameter reduction	4.7.4					X	X					
Elongation & contraction	4.7.5							X	X			
Leakage	4.7.6									X	X	
Burst resistance	4.7.7								X	X		
Impulse	4.7.8	X	X	X	X							
Low temperature flexibility	4.7.9						X	X				
Proof Pressure	4.7.3						X	X				

4.5 Quality conformance inspection.

4.5.1 Individual tests. Inspection of the product, for delivery, shall consist of subjecting each hose length to the individual tests specified in table III. Any item failing to meet the requirements of the individual tests shall be immediately removed from the lot.

4.5.2 Sampling tests. Hose lengths, randomly selected from a production lot (see 4.5.2.1) to form an inspection sample (see 4.5.2.2), shall be subjected to the sampling tests and in the sequence specified in table III.

4.5.2.1 Production lot. A production lot shall consist of all hose of one size manufactured on the same production line(s) by means of the same production techniques, materials, controls and design during the same continuous production run.

MIL-DTL-8788D

4.5.2.2 Inspection sample. An inspection sample shall consist of one hose length, randomly selected without regard to quality, from each full or partial increment of 750 feet of bulk hose produced. For a continuous production lot of greater than 7,500 feet, 10 samples shall be randomly selected for testing.

4.5.2.3 Nonconformance of sampling tests. If one or more defects are found in the inspection sample, both the qualifying and inspection activities shall be immediately notified and the production lot shall be rejected and not be supplied to this specification. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity, has been taken. The corrective measures shall be performed on the materials or processes, or both, as warranted, and on all products considered subjected to the same failure. Once the corrective action has been completed, either the specific sampling test in which the original sample failed or all sampling tests may be required to be repeated on additional samples, at the option of the qualifying activity. However, final acceptance shall be withheld until testing has shown that the corrective action was successful. In the event of a failure after re-inspection, information concerning the failure and the corrective action taken shall be furnished to both the qualifying and inspection activities.

4.5.3 Periodic control tests. For each size manufactured under essentially the same conditions, periodic control testing shall be performed on either four samples from every 20,000 feet of bulk hose produced or one sample from every 5,000 feet. Samples shall be subjected to testing in accordance with table III. If there has been some production but the total number of footage produced has not reached 5,000 feet for a specific size within three years, the manufacturer shall perform periodic control tests on one sample of that size unless documented approval has been obtained from the qualifying activity.

4.5.3.1 Nonconformance of periodic control tests. If a sample fails a periodic control test, both the qualifying and inspection activities shall be immediately notified of such failure. Acceptance and shipment of the product shall be discontinued until corrective action, acceptable to the qualifying activity, has been taken. The corrective measures shall be performed on the materials or processes, or both, as warranted, and on all products considered subjected to the same failure. Once the corrective action has been completed, either the specific periodic control test in which the original sample failed or all periodic control tests may be required to be repeated on additional samples, at the option of the qualifying activity. Furthermore, the sampling tests may be reinstated in addition to the periodic control tests if deemed applicable by the qualifying activity. However, final acceptance shall be withheld until testing has shown that the corrective action was successful. In the event of a failure after re-inspection, information concerning the failure and the corrective action taken shall be furnished to both the qualifying and inspection activities.

4.5.4 Disposition of test specimens. Samples that have been subjected to any sampling or periodic control tests are considered damaged and shall not be delivered as part of a contract or purchase order.

4.5.5 Discontinuation and resumption of production. If there has been no production of a specific size for a period of three years or more, 12 samples shall be randomly selected from the first lot produced when production of that size has been resumed. Eight of the samples shall be subjected to the sampling tests while the remaining four shall be subjected to the periodic control tests (see table III).

4.5.6 Acceptance of conformance inspection data. For identical requirements and test procedures, using an identical fitting, conformance inspection data from MIL-DTL-8789 or MIL-DTL-8790 may be accepted as conformance inspection data for MIL-DTL-8788 providing that documented approval has

MIL-DTL-8788D

been obtained from the qualifying activity. When conformance inspection data from MIL-DTL-8790 is to be accepted as conformance inspection data for MIL-DTL-8788, one hose assembly shall be considered to be the equivalent of two feet of bulk hose.

4.6 Test conditions.

4.6.1 Preparation of specimens. Test samples shall be assembled with samples of fittings of applicable size conforming to MIL-DTL-8789. Assembly lengths shall be as shown in table II.

4.6.2 Temperature. Unless otherwise specified, room temperature shall be defined as 60 to 90°F.

4.6.3 Test fluids. Unless otherwise specified, the test fluid shall be lubricating oil conforming to grade 50 of SAE J1966 or hydraulic fluid conforming to MIL-H-5606, MIL-PRF-83282, or water.

4.6.4 Aging of samples. When specified, specimens shall be either air aged (see 4.6.4.1) or oil aged (see 4.6.4.2) prior to testing.

4.6.4.1 Air aging. Samples shall be exposed to air at a temperature of $158 \pm 2^\circ\text{F}$ for a minimum of 168 continuous hours.

4.6.4.2 Oil aging. Samples shall be completely immersed in fluid conforming to either MIL-PRF-5606 or MIL-PRF-83282 at a temperature of $158 \pm 2^\circ\text{F}$ for a minimum of 168 continuous hours. Air shall not be trapped in the bore of the tube during this aging period. The volume of fluid used shall be sufficient to completely fill and cover the samples. Both the samples and the fluid shall be placed in a non-pressurized closed type container or in a reflux type condenser to prevent distillation of the volatile matter in the fluid. 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.

4.7 Test methods.

4.7.1 Examination of product. Each hose length shall be visually and physically examined for conformance to the following requirements:

- a. Design and construction (see 3.3).
- b. Identification marking (see 3.7).
- c. Interchangeability (see 3.9).
- d. Workmanship (see 3.11).

4.7.1.1 Cleanliness inspection. Both ends of the hose length shall be visually inspected to determine if caps or plugs are installed. The caps or plugs shall then be removed and a light source shall be placed at one end. The interior of the hose shall be visually examined, without magnification, from the opposite end of the light source. Conformance shall be as specified in 3.11.1.

4.7.2 Bulge resistance test. The four samples prepared for the impulse test (see 4.7.8) shall be checked for bulging of the inner tube and reduction of fitting nipple inner diameter caused by the attachment of end fittings. Measurements shall be taken on the samples using a ball-end type gage. The

MIL-DTL-8788D

diameter of the ball shall not be less than -0.002 but no greater than -0.001 inch smaller than the bulge diameter specified in table I. The weight of the ball, in ounces, shall not be more than the hose size tested. Without using force or lubrication, the ball shall be placed inside the samples at the bulge gage inspection point shown in figure 1. Conformance shall be as specified in 3.6.1.

4.7.3 Proof pressure test. Samples shall be tested as specified in ASTM D380 when subjected to the applicable proof pressure listed in table II. Test fluid shall be water or fluid conforming to MIL-PRF-5606 or MIL-PRF-83282. Conformance shall be as specified in 3.6.2.

4.7.4 Diameter reduction. Prior to testing, two hose lengths shall be oil aged as specified in 4.6.4.2. Following the aging process, the ID of the hose shall be measured at a distance of at least 0.500 inch from each end of the hose. Conformance shall be as specified in 3.6.3.

4.7.5 Elongation and contraction. Testing shall be in accordance with ASTM D380. Two unaged samples shall be held in a straight, unpressurized position while 10-inch gage length shall be marked on each hose. The hose shall then be subjected to a minimum pressure of 3,000 psi and held for at least 5 minutes. While still pressurized, the gage length on each hose shall be measured. Change in length shall be calculated in percentage of the original length. Conformance shall be as specified in 3.6.4.

4.7.6 Leakage test. Two unaged samples shall be tested as specified in ASTM D380. The samples shall be a minimum of 12 inches in length. Test fluid shall be water or hydraulic fluid conforming to MIL-PRF-5606 or MIL-PRF-83282. Samples shall be subjected to 70% of the burst pressure specified in table II and held for 5 minutes. After 5 minutes, the pressure shall be released and reduced to zero. Then the pressure shall be raised again to 70% of the burst pressure and held for another 5 minutes. The adjacent outer cover shall be carefully inspected during this period for any wicking or leakage of the test fluid. Conformance shall be as specified in 3.6.5.

4.7.7 Burst resistance test. Two unaged samples shall be subjected to the burst pressure specified in table II. The assemblies shall be a minimum of 12 inches in length. Test fluid shall be water or fluid conforming to MIL-PRF-5606 or MIL-PRF-83282. The rate of pressure rise shall be 25,000 +0/-10,000 psi per minute. Pressure shall be applied until failure occurs. During this test, the hose shall be fastened at one end fitting to the pressure source while the other end shall be extended straight, and the free end shall not be restrained or fastened in anyway. The actual pressure at which the samples burst or otherwise fail shall be recorded. Conformance shall be as specified in 3.6.6.

4.7.8 Impulse test. Four samples of the length specified in table II, shall be subjected to the proof pressure test (see 4.7.3), prior to impulsing. Two of the four samples shall be air aged and the other two shall be oil aged. The samples shall be tested in accordance with ARP603, table II, and table VI. Only size 16 hose shall be tested without surge peaks and in a straight position with one end free. Test fluid shall conform to either MIL-PRF-5606 or MIL-PRF-83282 except that up to 25% of the total volume may be fluid conforming to SAE J1966, grade 50. The fluid temperature, measured at the manifold, shall be held at $120 \pm 20^{\circ}\text{F}$. Conformance shall be as specified in 3.6.7.

MIL-DTL-8788D

TABLE VI. Impulse cycles.

Hose size no.	Minimum impulse cycles	Minimum average impulse cycles 1/	Maximum impulse cycles that can be used to compute average 2/
4	100,000	—	—
5	100,000	—	—
6	100,000	—	—
8	75,000	100,000	150,000
10	50,000	75,000	100,000
12	35,000	50,000	70,000
16	45,000	55,000	75,000

1/ The average of the test samples shall not be below the values listed in this column.

2 When test samples impulse cycles are averaged, the maximum cycles that may be used to compute the average shall not exceed the figures given in this column.

4.7.9 Low temperature flexibility test. Testing shall consist of two samples of the lengths specified in table II. One sample shall be unaged while the other shall be oil aged prior to testing. Samples shall be filled with fluid conforming to MIL-PRF-5606 or MIL-PRF-83282 and then exposed for 24 hours in a chamber at a temperature of $-65 \pm 2^\circ\text{F}$. Size 16 hose may be exposed to a temperature of $-40^\circ \pm 2^\circ\text{F}$. After the 24 hour exposure and while still at the specified temperature, the samples shall be flexed through 180° at each extreme travel, considered as one cycle, to the applicable inside bend radius specified in table II. Each sample shall be subjected to one cycle only, the duration of which shall be no greater than four seconds. After the flexing cycle (see figure 2), samples shall be removed from the cold chamber and subjected to the proof pressure test (see 4.7.3). Conformance shall be as specified in 3.6.8.

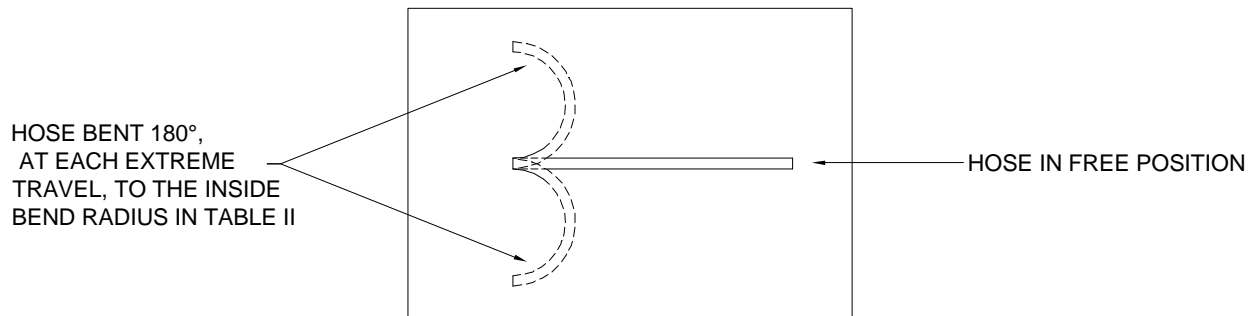


FIGURE 2. Flexibility test set up.

5. PACKAGING

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When actual packaging of materiel 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.

MIL-DTL-8788D

Packaging data retrieval is available from the managing Military Department's or the 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.)

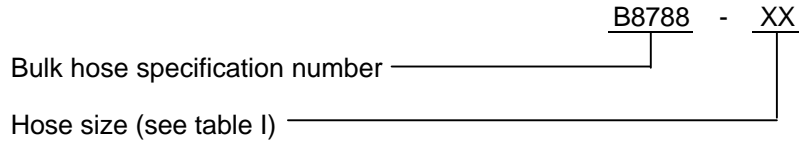
6.1 Intended use. The hose covered by this specification is military unique hose that mates with fittings conforming to MIL-DTL-8789, to form hose assemblies, conforming to MIL-DTL-8790. The military unique hose assemblies are intended to be used in high pressure hydraulic systems requiring interoperability and compatibility with associated components and equipment. The hose assemblies are required to withstand an operating pressure of 3000 psi. The interoperability and compatibility has been assured through strict adherence to the military detail specification requirements. Manufacturers of these items and users place great reliance on the detailed technical requirements to ensure the products meet the interoperability and compatibility requirements while encountering rapid ambient temperature fluctuations.

6.2 Acquisition requirements. Acquisition documents should specify the following:

- a. Title, number, and date of this specification, including any amendments.
- b. Issue of DoDISS to be cited in the solicitation and, if required, the specific issue of individual documents referenced (see 2.2 and 2.3).
- c. Required PIN (6.3).
- d. Quantity or lengths of bulk hose required (see 3.8).
- e. Packaging (see 5.1).

MIL-DTL-8788D

6.3 PIN for bulk hose. The PIN used to acquire bulk hose should be as depicted below. For requirements on bulk hose length, see 3.8.



6.4 Qualification. With respect to products requiring qualification, awards will be made only for products which are, at the time of award of contract, qualified for inclusion on the QPL-8788 whether or not such products have actually been so listed by that date. The attention of the contractors is called to these requirements, and manufacturers are urged to arrange to have the products that they propose to offer to the Government tested for qualification in order that they may be eligible to be awarded contracts or purchase orders for the products covered by this specification. Information pertaining to qualification of products may be obtained from Commander, Defense Supply Center, Columbus, Code DSCC-VQP, 3990 East Broad Street, Columbus, OH 43216-5000.

6.5 Subject term (key word) listing.

Abrasion resistant
 Bulge resistance
 Wire reinforcement

6.6 Changes from previous issue. Marginal notations are not used to identify changes with respect to the previous issue due to the extent of the changes.

Custodians:
 Air Force - 99
 Army - AT
 Navy - AS
 DLA - CC

Preparing activity:
 DLA - CC

(Project 4720-0160)

Review activities:
 Air Force - 71
 Army - AV, MI
 Navy - SA

