



SURFACE VEHICLE STANDARD

J517™

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Superseding J517 OCT2017

Hydraulic Hose

RATIONALE

Replaced Tables 36, 37, and 38 with Appendices A, B, and C as they were in previous editions, to correct improper references. Changed the word “hose” for “hoses” in multiple locations, to agree with the use of the plural instead of the singular to describe more than one hose. Added the word “metric” in multiple locations, to describe the hose sizes. Deleted SAE J1401 from the references since the use of the color yarn was not updated since 1998 and is no longer mandatory. Replaced the Rubber Manufacturers Association with the ARPM (Association for Rubber Products Manufacturers). Changed the temperature requirements for spiral hoses from 121 to 120 °C.

1. SCOPE

This SAE Standard provides general, dimensional, and performance specifications for the most common hoses used in hydraulic systems on mobile and stationary equipment.

The general specifications contained in Sections 1 through 12 are applicable to all hydraulic hoses and supplement the detailed specifications for the 100R-series hoses contained in the later sections of this document (see Tables 1 and 2).

This document shall be utilized as a procurement document only to the extent as agreed upon by the manufacturer and user.

The maximum working pressure of a hose assembly comprising SAE J517 hose and hose connectors per SAE J516, SAE J518, SAE J1453, etc., shall not exceed the lower of the respective SAE maximum working pressure values.

When using SAE J517 hose for marine applications, refer to SAE J1475, SAE J1942, and SAE J1942-1.

The SAE J517 100R9, 100R10, and 100R11 hoses were discontinued due to lack of demand. For DOD orders, see Appendix C.

The SAE J517 100R1A, 100R2A, 100R2B, and 100R 2BT were discontinued due to lack of demand. For DOD orders, replace 100R1A with 100R1AT, and replace 100R2A, 100R2B, and 100R2BT with 100R2AT.

The SAE J517 100R1AT maximum working pressures were replaced by the type S maximum working pressures beginning with the year 2009, eliminating the need to label 100R1 as type S.

The SAE J517 100R2AT maximum working pressures were replaced by the type S maximum working pressures beginning with the year 2009, eliminating the need to label 100R2 as type S.

The SAE J517 100R16 maximum working pressures were replaced by the type S maximum working pressures beginning with the year 2009, eliminating the need to label 100R16 as type S.

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SAE WEB ADDRESS:

Full document details: SAE J517_202007

For more information on this standard, visit
https://www.sae.org/standards/content/J517_202007

Documents

Document Sharing Hub

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J343	Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies
SAE J516	Hydraulic Hose Fittings
SAE J518-1	Hydraulic Flanged Tube, Pipe, and Hose Connections, 4-Screw Flange Connection Part 1: 3.5 MPa to 35 MPa (Code 61)
SAE J518-2	Hydraulic Flanged Tube, Pipe, and Hose Connections, 4-Screw Flange Connection Part 2: 42 MPa (Code 62)
SAE J846	Coding Systems for Identification of Fluid Conductors and Connectors
SAE J1273	Recommended Practices for Hydraulic Hose Assemblies
SAE J1475	Hydraulic Hose Fitting for Marine Applications
SAE J1942	Hose and Hose Assemblies for Marine Applications
SAE J1942-1	Qualified Hoses for Marine Applications

2.1.2 ASTM Publications

Available from ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428-2959, Tel: 610-832-9585, www.astm.org.

ASTM D380	Standard Test Methods for Rubber Hose
ASTM D471	Standard Test Method for Rubber Property - Effects on Liquids
ASTM D792	Test Method for Specific Gravity (Relative Density) and Density of Plastics by Displacement

2.1.3 Federal Standard Publications

Available from the Document Automation and Production Service (DAPS), Building 4/D, 700 Robbins Avenue, Philadelphia, PA 19111-5094, Tel: 215-697-6257, <http://assist.daps.dla.mil/quicksearch/>.

Federal Standard 595 Colors Used in Government Procurement

2.1.4 Military Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-H-8446	Hydraulic Fluid, Nonpetroleum Base, Aircraft
MIL-PRF-7808	Lubricating Oil, Aircraft Turbine Engine, Synthetic Base
MIL-PRF-83282	Hydraulic Fluid, Fire Resistant Synthetic Hydrocarbon Base, NATO Code Number H-537

2.1.5 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 1436	Rubber Hoses and Hose Assemblies - Wire-Braid-Reinforced Hydraulic Types for Oil-Based or Water-Based Fluids - Specification
ISO 3862	Rubber Hoses and Hose Assemblies - Rubber-Covered Spiral-Wire-Reinforced Hydraulic Types for Oil-Based or Water-Based Fluids - Specification
ISO 3949	Plastics Hoses and Hose Assemblies - Textile-Reinforced Types for Hydraulic Applications - Specification
ISO 4079	Rubber Hoses and Hose Assemblies - Textile-Reinforced Hydraulic Types for Oil-Based or Water-Based Fluids - Specification
ISO 4397	Fluid Power Systems and Components - Connectors and Associated Components - Nominal Outside Diameters of Tubes and Nominal Inside Diameters of Hoses
ISO 11237	Rubber Hoses and Hose Assemblies - Compact Wire-Braid-Reinforced Hydraulic Types for Oil-Based or Water-Based Fluids - Specification

2.2 Related Publications

The following publications are provided for information purposes only and are not a required part of this SAE Technical Report.

2.2.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

SAE J1176	External Leakage Classifications for Hydraulic Systems
SAE J1927	Cumulative Damage Analysis for Hydraulic Hose Assemblies

2.2.2 ISO Publications

Copies of these documents are available online at <http://webstore.ansi.org/>.

ISO 1402	Rubber and Plastics Hoses and Hose Assemblies - Hydrostatic Testing
ISO 1817	Rubber Vulcanized - Determination of the Effect of Liquids
ISO 4671	Rubber and Plastics Hoses and Hose Assemblies - Methods of Measurement of Dimensions
ISO 6803	Rubber or Plastics Hoses and Hose Assemblies - Hydraulic Pressure Impulse Test without Flexing

3. DEFINITIONS

3.1 COMPACT HOSE

Hose with an outside diameter smaller than comparable construction hoses.

3.2 MAXIMUM WORKING PRESSURE

Maximum pressure which the hose is designed to withstand during service, including any momentary pressure surges.

3.3 MINIMUM BURST PRESSURE

Minimum pressure at which failure of the hose or hose assembly occurs. This failure can be a hose burst, leakage, or separation of the hose from the hose fitting. This is a destructive test and pressure shall be increased until failure occurs.

4. AGE CONTROL

Age control of rubber hose is a method for designating a period of time, following manufacture, during which it is reasonable to expect that this product retains full capabilities for rendering the intended service, provided it has been stored as prescribed in SAE J1273.

Hose and hose assemblies are affected by exposure to ozone, oxygen, heat, sunlight, rain, and other similar environmental factors. Storage of bulk hose and hose assemblies should be in such a manner that exposure to these environmental factors is controlled as much as possible. Refer to SAE J1273 for selection, installation, and maintenance of hose and hose assemblies.

Hose and hose assemblies should be stored, handled, shipped, and used in such a manner as to facilitate first-in first-out usage, based on manufacturing date marked on the hose or hose assembly.

For the shelf life of hoses and hose assemblies, refer to SAE J1273.

**Table 1 - Summary of SAE J517 100R-series hose maximum working pressures (MPa)⁽¹⁾
metric hose size⁽²⁾ (SAE dash size)**

Hose Type	3.2 (-2)	5 (-3)	6.3 (-4)	8 (-5)	10 (-6)	12.5 (-8)	16 (-10)	19 (-12)	25 (-16)	31.5 (-20)	38 (-24)	51 (-32)	63 (-40)	78 (-48)	89 (-56)	102 (-64)
100R1AT ⁽³⁾	25	22.5	21.5	18	16	13	10.5	8.8	6.3	5	4					
100R2AT ⁽³⁾	41.5	40	35	33	27.5	25	21.5	16.5	12.5	9	8	7				
100R3	10.5	8.7	8.4	7.8	7	6.1	5.2	3.9	2.6							
100R4							2.1	1.7	1.4	1.05	0.7	0.4	0.4	0.3	0.25	
100R6		3.5	2.8	2.8	2.8	2.8	2.4	2.1								
100R7	21	21	19.2	17.5	15.7	14	10.5	8.7	7							
100R8	42	35	35		28	24.5	19.2	15.7	14							
100R12					28	28	28	28	28	21	17.5	17.5				
100R13								35	35	35	35	35				
100R15					42	42		42	42	42	42					
100R16 ⁽⁴⁾			40	35	33	27.5	25	21.5	16.5	12.5						
100R17		21	21	21	21	21	21	21	21							
100R18	21	21	21	21	21	21	21	21	21							
100R19		28	28	28	28	28	28	28	28							

NOTE: Minimum burst pressure of 100R hoses is at least four times maximum working pressure.

⁽¹⁾ See Appendix A for conversion table from MPa to psi.

⁽²⁾ Metric hose size number is not a dimension, it is a label used to identify the product size (refer to ISO 4397).

⁽³⁾ Maximum working pressures match ISO 1436 for types 1SN and 2SN.

⁽⁴⁾ Maximum working pressures match ISO 11237 for type 2SC.

**Table 2 - Summary of SAE J517 100R-series hose maximum working pressure (MPa)⁽¹⁾
metric hose size⁽²⁾ (SAE dash size)**

Hose Type	3.2 (-3)	5 (-4)	6.3 (-5)	8 (-6)	10 (-7)	11 (-8)	12.5 (-10)	16 (-12)	19 (-14)	22 (-16)	25 (-18)	29 (-20)	35 (-24)	46 (-32)	60 (-40)	76 (-48)
100R5		21	21	15.7		14	12.2	10.5		5.6		4.3	3.5	2.4	2.4	1.4
100R14	10.5	10.5	10.5	10.5	10.5	7	5.6	5.6	5.6	5.6	5.6	4.2				

NOTE: Minimum burst pressure of 100R hoses shall be four times maximum working pressure, except 100R14; see Table 23.

(1) See Appendix A for conversion table from MPa to psi.

(2) Metric hose size number is not a dimension; it is a label used to identify the product size (refer to ISO 4397).

5. HOSE CONNECTORS

Hydraulic hoses are rarely used without connectors. Hoses with connectors attached are commonly referred to as hose assemblies. The general and dimensional standards for hydraulic hose connectors are contained in SAE J516. SAE J516 connectors are identified by a code system as specified in SAE J846. The hose code, in accordance with SAE J846, for use with their respective connectors, is shown in Appendix B.

SAE J1475 covers general and performance specifications for hydraulic hose connectors when used in marine applications.

6. HOSE ASSEMBLIES

Hose assemblies may be fabricated by the manufacturer, an agent for or customer of the manufacturer, or by the user. Fabrication of permanently attached connectors to hydraulic hose requires specialized assembly equipment. Field attachable connectors (screw style and segment clamp style) can usually be assembled without specialized equipment although many manufacturers provide equipment to assist in this operation.

SAE J517 hose from one manufacturer is usually not compatible with SAE J516 connectors supplied by another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written assembly instructions or the manufacturers directly before intermixing hose and connectors from two manufacturers. Similarly, assembly equipment from one manufacturer is usually not interchangeable with that of another manufacturer. It is the responsibility of the fabricator to consult the manufacturer's written instructions or the manufacturer directly for proper assembly equipment. Always follow the manufacturer's instructions for proper preparation and fabrication of hose assemblies.

7. HOSE CUT END ANGLE DIMENSION

The length of the hose shall be considered the longest portion of the hose when measuring for overall length. On each cut end, the profile of the cut should be within 5 degrees. Shown in Figure 1.

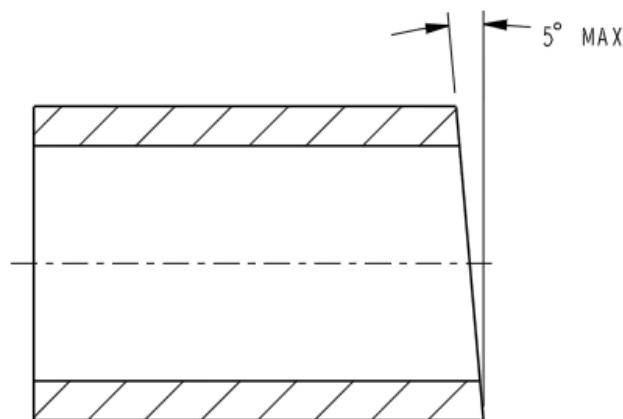


Figure 1 - Hose cut end angle dimension

8. APPLICATION FACTORS

Hydraulic hose assemblies have a finite life and factors which will reduce life include:

- Flexing the hose to less than the specified minimum bend radius.
- Twisting, pulling, kinking, crushing, or abrading the hose.
- Operating above maximum and below minimum temperature.
- Exposing the hose to surge pressures above the maximum working pressure.
- Intermixing hose, connectors, or assembly equipment not recommended by the manufacturer or not following the manufacturer's instructions for fabricating hose assemblies.

Surge pressures are rapid and transient rises in pressure. Surge pressures are not indicated on many common pressure gauges and can best be identified on electronic measuring instruments with a high-frequency response.

Refer to SAE J1273 for additional information on application factors.

The test requirements for each 100R-series hose are detailed in this document. Specific procedures for conducting each test are contained in SAE J343. The specified tests provide a baseline for performance capability of a hose assembly under controlled laboratory conditions. Hydraulic systems seldom duplicate these test parameters precisely. The hydraulic designer shall consider the system demands on the hose assembly and correlate those demands with the specified requirements, with particular concern for the frequency and amplitude of pressure fluctuations. Rapid pressure cycling with a return to zero accelerates fatigue failures.

9. SIZE DESIGNATIONS

Hose sizes are normally designated by the metric hose size number or by the SAE dash size which, except for SAE 100R5 and 100R14, represents the number of 16th inch increments in the hose inside diameter. For these exceptions, the SAE dash size represents the number of 16th inch increments in the outside diameter of tubing having approximately the same inside diameter as that of the hose. See dimensional tables for the respective hoses.

10. HOSE IDENTIFICATION

Except for hoses with a wire braided exterior, the entire length of hose shall be legibly marked longitudinally with one or more laylines parallel to the longitudinal axis. Marking shall include, but is not limited to, the hose manufacturer name or other identification (MMM), the SAE hose specification number, including type designation where applicable and dash size, the metric hose size number (optional, the fractional inch nominal hose inside diameter), the maximum working pressure of the hose (XXXX), and the date of manufacture, repeated with the first letter of each repeat not more than 760 mm from the first letter of that preceding.

In the case of a private labeled hose, where the company specifying the hose is different than the company manufacturing the hose, the specifying company name shall be marked on the hose. The specifying company is then responsible for compliance to the SAE Standards and shall maintain traceability records as to the specific hose manufacturer.

No mention of the burst pressure or the design factor is allowed on the hose. This information could be misinterpreted and result in a hose being used above its maximum working pressure.

Working pressures may be shown on a hose in numerous ways and is not limited to the following examples:

EXAMPLES: XXXX MAX. W.P.
XXXX Maximum W.P.
XXXX Max. Working Pressure

Electrically nonconductive 100R7, 100R8, and 100R18 thermoplastic hoses shall have an orange-colored cover. (Refer to color chip #22510 Federal Standard 595.) Also, in addition to the information required previously, the words "Electrically Nonconductive" or electrically nonconductive shall appear in each marking repeat.

The date of manufacture shall be expressed, as a minimum, with the quarter and year of manufacture (2Q17). Other markings may be used to denote the actual day of manufacture, manufacturing shift, production lot, etc.

SAE J517 hoses are referenced by listing, in sequence, the 100R number (100R1, 100R7, etc.), the hose type letters (AT for 100R1 and 100R2) and (A or B for 100R14) where applicable, and the hose dash size number (-4, -16, -24, etc.).

EXAMPLES: MMM 100R2AT-8 12.5 27.5 MPa MAX W.P. 2Q17
MMM 100R4-32 51 0.7 MPa MAX W.P. 2Q17
MMM 100R14B-16 22 5.6 MPa MAX W.P. 2Q17 Electrically Conductive

For hoses with a wire braided exterior, information shall be incorporated on a tag or tape applied to each coil or length of bulk hose. Additionally, except for 100R14, a colored yarn shall be incorporated into the wall of the hose, identifying the manufacturer. The color shall be as designated by the ARPM (Association for Rubber Products Manufacturers).

Hose assemblies shall be marked, as a minimum, with name or other identification of the manufacturer of the hose assembly (YYY) and the year and month of manufacture (1704). Other markings may be added, such as the maximum working pressure of the hose assembly, part number, etc.

EXAMPLE: YYY 1704

11. ORIENTATION OF OFFSET ELBOW ENDS IN A HOSE ASSEMBLY

For double elbow assemblies, it is imperative that the method of description and measurement provide the desired displacement rather than its mirror image. To achieve this, either end may be selected as the reference point, provided angle displacement is determined appropriately (clockwise or counterclockwise) for the reference selected.

As shown in Figure 2, with the centerline of the near end as a base reference, angular displacement is measured counterclockwise to the centerline of the far end.

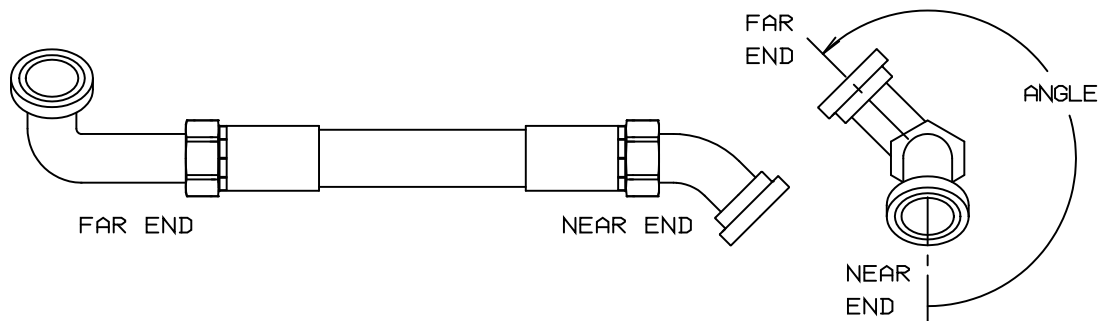


Figure 2 - Near end reference - measured counter-clockwise

As shown in Figure 3, with the centerline of the far end as a base reference, angular displacement is measured clockwise to the centerline of the near end.

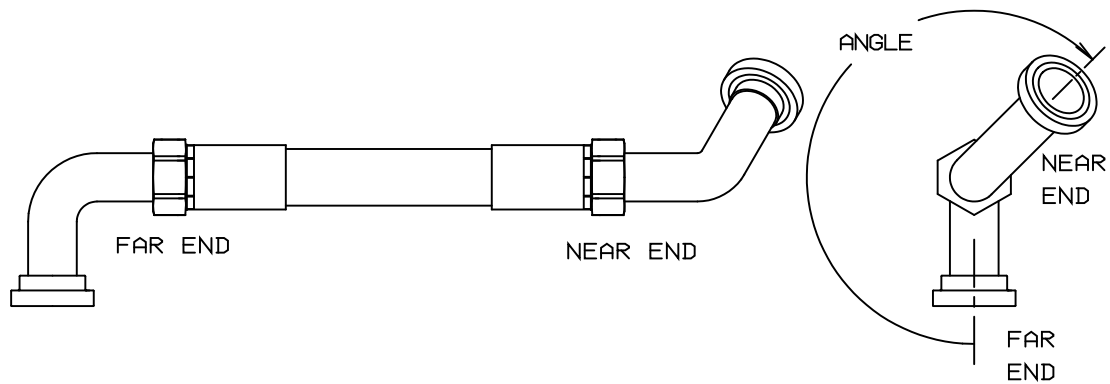


Figure 3 - Far end reference - measured clockwise

Displacement angle can have any value up to 360 degrees. Making the angle determination in the wrong direction results in an unacceptable part.

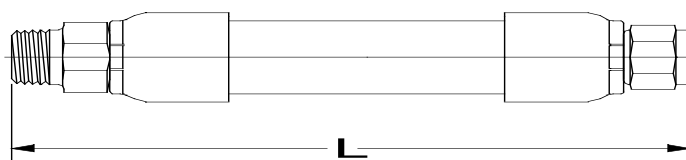
Unless otherwise specified, a tolerance of ± 3 degrees is acceptable for assembly lengths up to 610 mm inclusive, and ± 5 degrees for assembly lengths over 610 mm.

Try to avoid use of double elbow hose assemblies. Twisting of the hose during installation can occur. The relative location of the natural curvature in the hose can induce a twist during pressure cycling. Twisted hose reduces the life of the hose assembly.

12. ASSEMBLY LENGTH

Unless otherwise specified, assembly length shall be the overall length measured from the extreme end of one connector to the extreme end of the other, except for O-ring face seal type connectors which shall be measured from the sealing face. Where elbow connectors are used, measurement shall be to the centerline of the sealing surface of the elbow end (the sealing surface of female flared elbow connectors shall be the centerline of the outer end of the cone seat). See Figure 4.

Method of measurement should be specified. Tolerances on assembly length shall be as in Table 3.



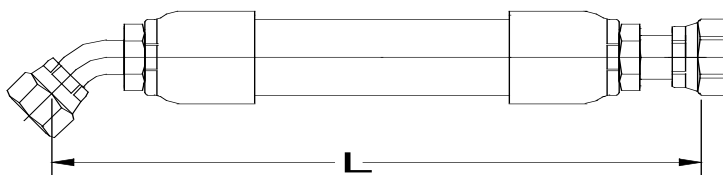
Straight connectors (except O-ring face seal)



Female swivel elbow connectors



Flange connectors



O-ring face seal connectors

Figure 4 - Assembly length measurement**Table 3 - Tolerances on assembly length**

Length	Tolerance (Plus or Minus) mm
Up to 300 mm, included	3
Over 300 mm through 450 mm, included	5
Over 450 mm through 900 mm, included	7
Over 900 mm	1% ⁽¹⁾

⁽¹⁾ Measured to nearest whole millimeter.

13. TESTS

Unless otherwise agreed upon between the manufacturer and purchaser, tests for evaluating conformance of product with specifications shall be on the basis of qualification tests and inspection tests set forth in this document. Tests may be conducted by the manufacturer, the purchaser, or both, as decreed by the purchaser. The tests, sampling, and criteria applicable to both test classifications are given in Table 4 and the detailed specifications and tables for each hose. All tests shall be conducted in accordance with the procedures in SAE J343.

13.1 Qualification Tests

The following are tests required for qualification of various 100R-series hoses specified in SAE J517. Some of these tests do not apply to certain 100R-series hose types. See Table 4 to determine which of these qualification tests are specified for each 100R-series hose type. Table 4 also provides specific requirements for each hose type where temperatures, percent length change, and impulse requirements vary by hose type. Some hose types like 100R1, R5, and R14 have added special impulse requirements which are specified in SAE J517 immediately after the hose construction for these hose types. For such hose types, Table 4 states "see 100R1" or "see 100R5," etc., for impulse requirements. Some other hose types, like 100R7, R8, R14, and R18, have specialized conductivity tests and Table 4 again states "see 100R7" or "see 100R8," etc., for the specific test requirements.

13.1.1 Dimensional Check Test (All Samples)

Shall conform to the dimensions in the respective table for that 100R-series hose type and these detailed specifications.

13.1.2 Proof Test (All Samples)

Shall not leak at a proof pressure equal to 2X the maximum working pressure for that type and size of hose. The exception is 100R14, use the proof pressure listed for the hose type and size.

13.1.3 Change in Length Test (One 600 mm Minimum Free Hose Length Assembly)

When pressurized to the maximum working pressure, shall not exceed the percentage change listed in Table 4 for that 100R-series type of hose.

13.1.4 Burst Test (One 300 mm Minimum Free Hose Length Assembly)

Shall not leak or fail below the minimum burst pressure equal to 4X the maximum working pressure for that type and size of hose. The exception is 100R14; use the minimum burst pressure listed for the hose type and size.

13.1.5 Leakage Test (Two 300 mm Minimum Free Hose Length Assemblies)

Shall not leak or fail at the leakage pressure stipulated in SAE J343 for that type and size of hose.

13.1.6 Cold Bend Test (One Assembly)

Shall exhibit no cover cracks or leakage. Exposure shall be at the temperature listed in Table 4 for that 100R-series type of hose.

13.1.7 Oil Resistance Test (One Sample Each of Hose Inner Tube and Cover)

Tube and cover samples shall be prepared in accordance with ASTM D380 and tested in accordance with ASTM D471. After 70 hour immersion in IRM 903 oil at the temperature specified in Table 4 for that type of hose, the volume change of the inner tube and cover shall be between the limits listed for that type of hose in Table 4.

13.1.8 Ozone Resistance Test (Two Samples)

Specimens shall be subjected to an atmosphere comprised of air and ozone with an ozone partial pressure of 50 MPa (50 parts of ozone per 100 million parts of air) at standard atmospheric conditions at an ambient temperature of 40 °C. After 70-hour exposure, specimens shall not show evidence of cracking or deterioration when viewed with 2X magnification while still in a stressed condition.

13.1.9 Impulse Test (Four Unaged Assemblies)

When tested with circulating petroleum-based hydraulic fluid at the percentage of maximum working pressure and temperature listed in Table 4, hose assemblies shall withstand the minimum number of cycles specified in Table 4 for that type of hose, without leakage or other malfunction.

13.1.10 Resistance to Vacuum Test (One Sample)

After 5 minutes at the absolute pressure specified in Table 4 for that type of hose, there shall be no evidence of hose blistering or collapse.

13.1.11 Visual Examination (All Samples)

Table 4 - SAE J517 qualification test requirements

Type of Test	100R1	100R2	100R3	100R4	100R5	100R6	100R7	100R8
Dimensional Check	X	X	X	X	X	X	X	X
Proof	X	X	X	X	X	X	X	X
Change in Length (%)	+2/-4	+2/-4	+2/-4	NA	+2/-4	+2/-4	+3/-3	+3/-3
Burst	X	X	X	X	X	X	X	X
Leakage	X	X	X	X	X	X	X	X
Cold Bend (°C)	-40	-40	-40	-40	-40	-40	-40	-40
Volume Change @ +100 °C Tube & Cover 0/100%	X	X	X	X	X	X		
Volume Change @ +100 °C Tube & Cover -15/35%							X	X
Ozone Resistance 70 hours @ +40 °C	X	X	X	X		X	X	X
Impulse Test Temperature (°C)	+100	+100	+100		+100		+93	+93
Impulse Test % of Working Pressure	See 100R1	133	133		See 100R5		125	133
Impulse Test Minimum Cycles (X1000)	See 100R1	200	200		See 100R5		150	200
Vacuum Resistance @ Absolute Pressure (kPa)				17				
Electrical Conductivity in accordance with SAE J343 (For Thermoplastic Only)							See 100R7	See 100R8
Visual Examination	X	X	X	X	X	X	X	X

Table 4 - SAE J517 qualification test requirements (continued)

Type of Test	100R12	100R13	100R14	100R15	100R16	100R17	100R18	100R19
Dimensional Check	X	X	X	X	X	X	X	X
Proof	X	X	X	X	X	X	X	X
Change in Length (%)	+2/-2	+2/-2	+2/-4	+2/-2	+2/-4	+2/-4	+3/-3	+2/-4
Burst	X	X	X	X	X	X	X	X
Leakage	X	X	X	X	X	X	X	X
Cold Bend (°C)	-40	-40	-40	-40	-40	-40	-40	-40
Volume Change @ +100 °C Tube & Cover 0/100%					X	X		X
Volume Change @ +100 °C Tube & Cover -15/35%							X	
Volume Change @ +121 °C Tube 0/100%	X	X		X				
Volume Change @ +121 °C Cover 0/125%	X	X		X				
Ozone Resistance 70 hours @ +40 °C	X	X		X	X	X	X	X
Impulse Test Temperature (°C)	+120	+120	+204	+120	+100	+100	+93	+100
Impulse Test % of Working Pressure	133	120	See 100R14	120	133	133	133	133
Impulse Test Minimum Cycles (X1,000)	500	500	150	500	200	200	200	200
Vacuum Resistance @ Absolute Pressure (kPa)								
Electrical Conductivity in accordance with SAE J343 (For Thermoplastic Only)							See 100R18	
Electrical Conductivity in accordance with SAE J343 (For PTFE Only)			See 100R14					
Specific Gravity (PTFE Tube)			See 100R14					
Visual Examination	X	X	X	X	X	X	X	X

13.2 Inspection Tests

Inspection tests listed as follows shall be performed on two samples representing each lot of 150 to 3000 m of bulk hose. Lots of less than 150 m of hose need not be subjected to these tests if a lot has been tested and met the requirements within the previous 12-month period. Requirements shall be same as for corresponding qualification tests (13.1):

- Dimensional check test
- Proof test
- Change in length test
- Burst test

Visual examination is required for all hoses and hose assemblies.

Hose manufacturing facilities that are ISO 9000 or ISO/TS 16949 certified with a quality management system, which undergoes routine assessments by an accredited third-party registrar may use their documented inspection test procedures in lieu of the inspection test requirements listed above.