
	<b>SURFACE VEHICLE STANDARD</b>		<b>J514 JAN2012</b>
		Issued 1950-05 Revised 2012-01	
		Superseding J514 SEP2004	
Hydraulic Tube Fittings			

#### RATIONALE

Optional dual angle seat for 37 degree flare swivel connection is expanded to all sizes to provide consistent performance. Drill tolerance is changed according to ISO 2768-1, tolerance class m.

#### 1. SCOPE

This SAE Standard covers complete general and dimensional specifications for 37 degree flared and flareless types of hydraulic tube fittings and O-ring plugs. Also included are pipe fittings and adapter unions for use in conjunction with these tube fittings. These fittings are intended for general application in hydraulic systems on industrial equipment and commercial products.

These fittings are capable of providing leakproof, full flow connections in hydraulic systems operating at working pressures as specified in Table 1 for respective sections.

Since many factors influence the pressure at which a hydraulic system will or will not perform satisfactorily, the values shown in SAE J1065 should not be construed as a guaranteed minimum.

For any application, it is recommended that sufficient testing be conducted and reviewed by both the user and fitting manufacturer to assure that performance levels will be safe and satisfactory.

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TABLE 1 - WORKING PRESSURE RATINGS<sup>(d)</sup> CAPABLE OF 4 TO 1 MINIMUM BURST

Nom SAE Dash Size	Nom Tube OD mm	Nom Tube OD in	Straight Thread Size	Nom Pipe Size	Rigid <sup>(a)</sup> SAE St. Threads Unions and Bulkheads MPa	Rigid <sup>(a)</sup> SAE St. Threads Unions and Bulkheads psi	Adjustable <sup>(b)</sup> SAE St. Threads and Female Swivels MPa	Adjustable <sup>(b)</sup> SAE St. Threads and Female Swivels psi	Fittings <sup>(c)</sup> With Pipe Threads MPa	Fittings <sup>(c)</sup> With Pipe Threads psi
2	3.18	0.125	5/16-24	1/8	34.5	5000	34.5	5000	34.5	5000
3	4.76	0.188	3/8 -24	1/8	34.5	5000	34.5	5000	34.5	5000
4	6.35	0.250	7/16-20	1/8	34.5	5000	31	4500	34.5	5000
5	7.94	0.313	1/2 -20	1/8	34.5	5000	27.5	4000	34.5	5000
6	9.52	0.375	9/16-18	1/4	34.5	5000	27.5	4000	27.5	4000
8	12.70	0.500	3/4 -16	3/8	31	4500	27.5	4000	21	3000
10	15.88	0.625	7/8 -14	1/2	24	3500	21	3000	21	3000
12	19.05	0.750	1-1/16-12	3/4	24	3500	21	3000	17	2500
14	22.22	0.875	1-3/16-12	3/4	21	3000	17	2500	17	2500
16	25.40	1.000	1-5/16-12	1	21	3000	17	2500	14	2000
20	31.75	1.250	1-5/8 -12	1-1/4	17	2500	14	2000	8	1150
24	38.10	1.500	1-7/8 -12	1-1/2	14	2000	10.5	1500	7	1000
32	50.80	2.000	2-1/2 -12	2	10.5	1500	8	1125	7	1000

(a) For fittings in Sections 1, 2, and 3.

(b) For fittings in Sections 1 and 2.

(c) For fittings in Sections 1, 2, and 4.

(d) Working pressures given are for low carbon steel fittings only. Consult the manufacturer for values for other materials.

The standard is divided into six sections as follows:

Section 1—37 Degree Flare Tube Fittings

Section 2—Flareless Tube Fittings

Section 3—O-ring Plugs (for O-ring Ports see SAE J1926)

Section 4—Hydraulic Pipe Fittings (formerly SAE J926)

Section 5—Adapter Unions (formerly in SAE J516)

Section 6—Tables for Calculating Dimensions on Special Sizes

## 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 724-776-4970 (outside USA), [www.sae.org](http://www.sae.org).

SAE J343 Test and Test Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies

SAE J405 Chemical Compositions of SAE Wrought Stainless Steels

SAE J476 Dryseal Pipe Threads

SAE J533 Flares for Tubing

SAE J1065 Nominal Reference Working Pressures for Steel Hydraulic Tubing

## 2.1.2 ANSI Publication

Available from American National Standards Institute, 25 West 43rd Street, New York, NY 10036-8002, Tel: 212-642-4900, [www.ansi.org](http://www.ansi.org).

ANSI B1.20.1 American Standard Straight Pipe Thread for Mechanical Joints

ANSI B1.20.3 Dryseal Pipe Threads (Inch)

## 2.1.3 ASTM Publication

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

ASTM B 117 Method of Salt Spray (Fog) Testing

## 3. GENERAL SPECIFICATIONS

The following general specifications supplement the dimensional data contained in Tables 3 to 21 with respect to all unspecified detail.

## 3.1 Size Designations

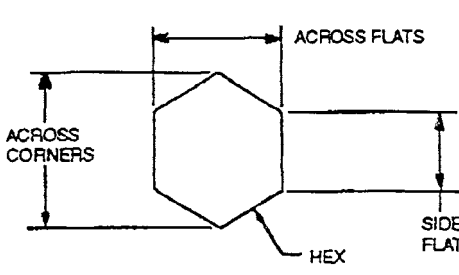
Fitting sizes are designated by the corresponding outside diameter of the tubing for the various types of tube ends and by the corresponding standard nominal pipe size for pipe thread ends.

See SAE J846 for proper coding and call-out.

## 3.2 Dimensions and Tolerances

Except for nominal sizes and thread specifications, dimensions and tolerances are given in both SI Units and U.S. Customary as designated. Tabulated dimensions shall apply to the finished parts, plated or otherwise processed, as specified by the purchasers. Hex tolerances across flats are listed in Table 1A. The minimum across-corners dimensions of hexagons shall be 1.092 times the nominal width across flats, but shall not result in a side-flat width less than 0.43 times the nominal width across flats. The minimum across-corners dimensions of external squares shall be 1.25 times the nominal width across flats, but shall not result in a side-flat width less than 0.75 times the nominal width across the flats.

TABLE 1A - HEX TOLERANCES

	Nominal Hex Size Across Flats mm Over	Nominal Hex Size Across Flats mm Include	Nominal Hex Size Across Flats in Over	Nominal Hex Size Across Flats in Include	Tolerance (Minus Only) mm	Tolerance (Minus Only) in
	—	19.05	25.40	—	0.750	0.3
19.05	25.40	34.92	0.750	1.000	0.4	0.016
25.40	34.92	AND UP	1.000	1.375	0.5	0.020
34.92	AND UP		1.375	AND UP	0.8	0.031

Tolerance on all dimensions not otherwise limited shall be  $\pm 0.4$  mm ( $\pm 0.016$  in). Fitting seats shall be concentric with straight thread pitch diameters within 0.25 mm (0.010 in) full indicator movement (FIM).

Unless otherwise specified, tolerance on hole diameters designated drill in the dimensional tables shall be as tabulated in Table 1B: