SURFACE VEHICLE STANDARD	J1926-2 MAR2010
	Issued 1988-08 Revised 2010-03 Superseding J1926-2 OCT2007

(R) Connections for General Use and Fluid Power—Ports and Stud Ends with ASME B1.1 Threads and O-Ring Sealing—Part 2: Heavy-Duty (S Series) Stud Ends

RATIONALE

General revision for harmonization with J1453-3 and ISO 11926-2, addition of sizes -32, -40 and-48 and converting the document to metric hex standard in accordance with FCCTC resolution on metric hex conversion. The resolution provides rationale for converting to metric hex and not using inch hex for new designs as follows:

"In an effort to standardize within a global market and ensuring that companies can remain competitive in an international market, it is the intent to convert to metric hex sizes which will:

- lead to one global standard

- guide users to a preferred system

- reduce complexity

- eliminate duplication

- reduce confusion"

FOREWORD

SAE J1926 consists of the following parts, under the general title:

Connections for general use and fluid power

Ports and stud ends with ASME B1.1 threads and O-ring sealing:

- Part 1: Port with O-Ring Seal in Truncated Housing

- Part 2: Heavy-Duty (S Series) Stud Ends

- Part 3: Light-Duty (L Series) Stud Ends

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2010 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/J1926/2_201003

These standards define performance requirements, dimensions, and designs for port and stud end connections for heavy-duty in Parts 1 and light-duty in Part 3. Significant testing through 25 years of use has confirmed the performance capabilities of these ports and studs and thoroughly established their interchangeability. The ports originally designed for high pressure connections of SAE J1453 (current SAE J1453-3), Ultra-37 was developed later with performance verification requirements being by ISO/TC 5/SC1 committee members.

In fluid power systems, power is transmitted and controlled through a fluid under pressure within an enclosed circuit. In general applications, it is necessary to convey fluid under pressure. Components are connected through their threaded ports by stud ends or fluid conductor fittings to tubes/pipes, or to hose fittings and hoses.

1. Scope

This part of SAE J1926 specifies dimensions, performance requirements, and test procedures for actuable and non-actuable heavy-duty (S series) stud ends with ASME B1.1 threads for use in fluid power and general applications. Flange ends with metric threads are currently not listed in SAE J515.

Stud ends in accordance with this part of SAE J1926 may be used for working pressures up to 63 MPa for named non-actuable stud ends and up to 41.5 MPa for actuable stud ends. The non-actuable end test pressure depends upon materials, design, working conditions, application, etc.

For threaded ports and stud ends specified in new designs for rod-end fluid power cylinder ports, only ISO 6149 shall be used. Threaded ports and stud ends in accordance with ISO 1179-1, ISO 6162, and ISO 6164 shall not be used for new design in hydraulic fluid power applications.

NOTE: This document specifies metric series threads. Inch series threaded ports, therefore, any product claiming conformance to stud ends in accordance with this document must exactly have metric threads to assure positive mechanical lock.

Stud ends in same envelope dimensions, January 1, 2010 using this document, shall be supplied with inch threads, unless otherwise specified.

Conformance to the dimensional information does not guarantee sealing performance. Each manufacturer shall certify sealing according to the specification contained in this document to ensure that compliance is made. This document is not to be used for design purposes unless it is used in conjunction with the performance ratings.

Appendix A of this document is informative.

2. REFERENCES

2.1 Applicable Documents

The following documents contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All documents are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the documents indicated as follows: members of ISO and IEC maintain registers of currently valid International Standards.

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.

SAE J515 Specification for O-ring Materials Used with Hydraulic Connectors

SAE J1926-1 Connections for General Use and Fluid Power – Ports and Stud Ends with ASME B 1.1 Threads and O-ring Sealing – Part 1: Port with O-ring Seal in Truncated Housing

SAE J2593 Information Report for the Installation of Fluid Conductors and Connectors

2.1.2 ISO Publications

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

ISO 4759-1 Tolerances for fasteners—Part 1: Bolts, screws and nuts with thread diameters between 1.6 (inclusive) and 150 mm (inclusive) and product grades A, B and C

ISO 5598 Fluid power systems and components vocabulary

ISO 19879 Metallic tube connections for fluid power and general use - Test methods for hydraulic fluid power connections

2.1.3 ASME Publications

Available from American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

ASME B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)

2.2 Related Publications

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

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 724-776-4970 (outside USA), www.sae.org.

SAE J1453-3 Specification for O-ring Face Seal Connectors: Part 3—Requirements, Dimensions, and Tests for Steel Unions, Bulkheads, Swivels, Braze Sleeves, Connectors, Caps and Connectors with SAE J1926-2 Inch Stud Ends

SAE J1926-3 Connections for General Use and Fluid Power—Ports and Stud Ends with ASME B1.1 Threads and O-ring Sealing—Part 3: Light Duty (L Series) Stud Ends

SAE J1926-4 Connector for Fluid Power and General Use—Ports and Stud Ends with ASME B1.1 Threads and O-ring Seal—Part 4: External Hex and Internal Hex Inch Port Plugs—Dimensions, Design, Test Methods and Requirements

2.2.2 ISO Publications

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

ISO 48 Rubber, Vulcanized or thermoplastic—Determination of hardness (Hardness between 10 IRHD and 100 IRHD)

ISO 1101 Technical drawings—Tolerancing of form, orientation, location and run-out—Generalities, definitions, symbols, indications on drawings

ISO 1302 Technical drawings—Method of indicating surface texture on drawings

ISO 1179-1[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 1: Threaded port

ISO 1179-2[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 2: Heavy duty (S series) and light duty (L series) stud ends with elastomeric sealing (type E)

ISO 1179-3[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 3: Light duty (L series) stud end with sealing by O-ring with retaining ring (types G and H)

ISO 1179-4[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 4: Stud end for general use only with metal-to-metal sealing (type B)

ISO 6149-1 Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 1: Port with O-ring seal in truncated housing

ISO 6149-2 Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 2: Heavy duty (S series) stud ends—Dimensions, design, test methods and requirements

ISO 6149-3 Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 3: Light duty (L series) stud ends—Dimensions, design, test methods and requirements

ISO 6410-1 Technical Drawings – Screw threads and threaded parts – Part 1: General conventions

ISO 9974-1 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads with elastomeric and metal-to-metal sealing—Part 1: Threaded port

ISO 9974-2 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads with elastomeric and metal-to-metal sealing—Part 2: Stud end with elastomeric sealing (type E)

ISO 9974-3 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads with elastomeric and metal-to-metal sealing—Part 3: Stud end with metal-to-metal sealing (type B)

ISO 11926-2 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 2: Heavy duty (S series) stud ends

[1] To be published

3. DEFINITIONS

For the purpose of this part of SAE J1926, the definitions given in ISO 5598 and the following shall apply.

3.1 ADJUSTABLE STUD END

A stud end connector that allows for fitting calculation before final tightening of the lock nut to complete the connection. This type of end is typically used on shaped fittings (e.g., tees, crosses, and elbows).

3.2 NON-ADJUSTABLE STUD END

A stud end connector that does not require specific orientation before final tightening of the connector because it is only used on straight fittings.

4. STUD END

4.1 Size Designation

The stud ends shall be designated by SAE J1926-2 and the manufacturer, supplier, or agent (e.g., for example, SAE J1926-2/12-8). Products shall have a positive identification and shall have the type of test (nut or sleeve) listed.

4.2 Hardhead 9/16 Stud Ends for Jump Size Connections

For jump size connections where the hex size of the valve end, e.g., adapter end, is larger than the stud hex "A" in Table 1, a shoulder may have to be ground to appropriate diameter and length to avoid interference with the next size hex. For details, see appropriate component standard, e.g. SAE J1453-2/Table 6B.

4.3 Assembly

For stud end assembly, follow instructions in SAE J2593.

5. REQUIREMENTS

5.1 Dimensions

Heavy-duty (S-series) SAE J1926-2 stud ends shall conform to the dimensions in Figures 1 and 1B and Table 1. Male connections across flats shall be according to ISO 4399-1 product grade C.

5.2 Working Pressure

Heavy-duty (S-series) stud ends made of low carbon steel shall be designed for use at the working pressures given in Table 2.

CAUTION: The pressures for 3/8-12 UN and -10 (1 1/4-12) are based on calculations for guidance only.

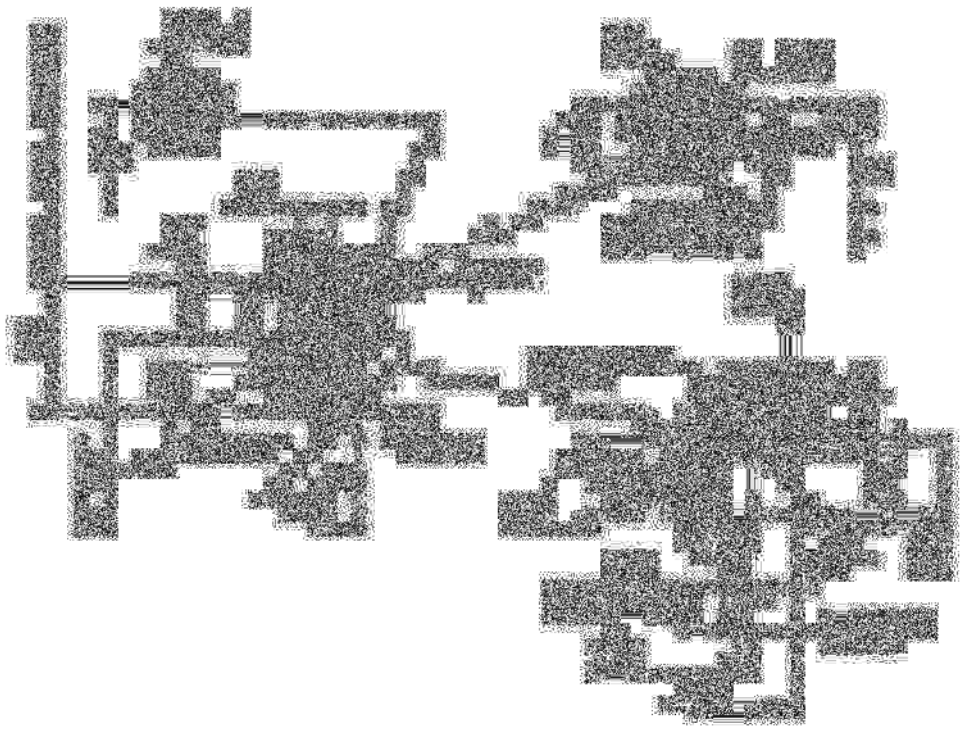


FIGURE 1A—ADJUSTABLE SAE J1926/2 HEAVY-DUTY (S SERIES) STUD END DETAIL

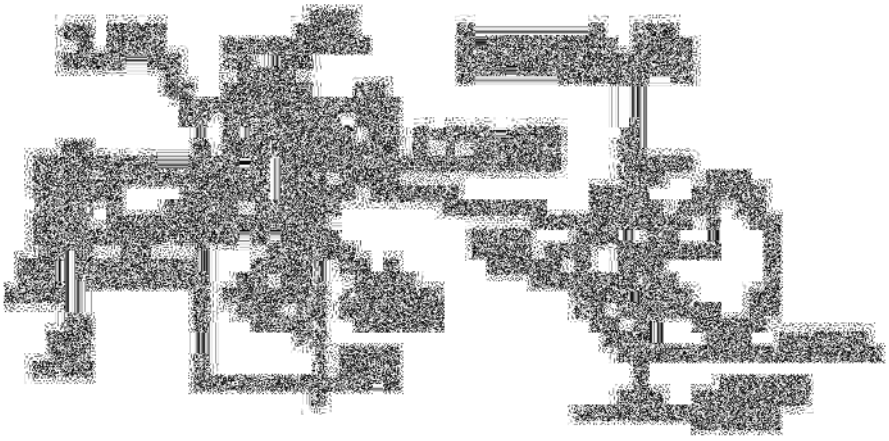


FIGURE 1B—NONADJUSTABLE SAE J1926/2 HEAVY-DUTY (S SERIES) STUD END DETAIL

Downloaded from www.sae.org by Technical Data Services

TABLE 1 - SAE J1926-2 HEAVY-DUTY (S SERIES) STUB END DIMENSIONS

Dimensions in millimeters

Nominal Tube OD	Nominal Tube OD	Nominal Tube OD	Nominal Tube OD										
Dash Tubing Size	Inch Tubing mm	Inch Tubing in	Metric Tubing mm	Thread Size in									
-2	3.76	0.125	6	5/8-24	13.5	12.5	9	15.9	16.4	20.3	20	13.5	13.5
-4	6.35	0.250	8	7/16-20	14.3	13.1	10.5	18.3	19.5	23.1	22	15.5	15.5
-5	7.94	0.312	10	M18	16.5	15.3	12.5	21.5	22.5	26.2	25	17.5	17.5
-6	9.52	0.375	10	9/16-18	15.9	14.3	12.5	21.5	22.5	26.2	25	17.5	17.5
-8	12.70	0.500	12	3/4-16	20.6	20	15.5	25.2	26.2	30.2	29	20.5	20.5
-10	15.88	0.625	16	7/8-14	22.3	20.7	17.5	28.3	29.3	33.2	32	23.7	23.5
-12	19.05	0.750	20	1-1/16-12	31.8	30.2	24.5	34.7	35.7	39.3	38	26.4	26.4
-14	22.22	0.875	22	1-3/16-12	33.3	31.7	26.5	40.4	41.4	45.2	44	29.4	29.4
-16	25.40	1.000	25	1-5/16-12	40.2	38.6	30.5	46.1	47.1	51.0	50	32.4	32.4
-20	31.75	1.250	30	1-5/8-12	47.8	47.4	37.5	58.0	59.0	63.5	62	38.5	40.0
-24	38.10	1.500	38	1-7/8-12	54.0	53.6	43.5	67.5	68.5	73.2	72	44.5	54.0
-32	50.80	2.000	50	2-1/2-12	69.2	68.8	56.5	86.5	87.5	92.5	91	57.5	69.0
-40	63.5	2.500	-	3-12	85.1	84.4	70	107.5	108.5	113.5	112	71.5	84.0
-48	76.2	3.000	-	3-1/2-12	98.8	98.1	83	127.5	128.5	133.5	132	84.5	98.0

TABLE 1 - SAE J1926/3 HEAVY-DUTY S SERIES TUBE END DIMENSIONS (CONTINUED)

Dimensions in millimeters

Nominal Tube OD (Inch Tubing Dash Size)	Nominal Tube OD (Inch Tubing mm)	Nominal Tube ID (Inch Tubing in)	Nominal Tube OD (Metric Tubing mm)	Min Hex Flat Size (Ref)	L1 ±0.8	L2 ±0.5	L3 min	L4 ±0.8	L5 ±0.8	L6 ±0.4	L7 ±0.4	L8 ±0.4
-4	6.35	0.250	6	14.3	9	8.5	14.3	6.5	1.78	9.1	4.8	9.5
-5	7.94	0.312	8	15.7	10	8.5	15.5	7.1	2.03	9.1	4.83	11
-6	9.52	0.375	10	17.5	13	8.5	16.5	7.1	2.03	9.1	4.8	11
-8	12.7	0.500	12	20.6	16	8.5	18.3	7.1	2.03	9.1	4.8	11
-10	15.88	0.625	16	23.8	18	10.5	20.1	8.9	2.54	9.1	4.8	13.5
-12	19.05	0.750	20	28.6	21.5	11.5	22.1	10.3	3.05	9.1	4.8	13.5
-16	25.4	1.000	25	34.7	27.5	13.5	25.6	12.5	3.05	9.1	4.8	13.5
-20	31.75	1.250	30	41.6	34.5	15.5	29.6	14.5	3.05	9.1	4.8	13.5
-24	38.1	1.500	38	50.8	41.5	17.5	34.6	16.5	3.05	9.1	4.8	13.5
-32	50.80	2.000	50	66.6	53.5	19.5	42.6	18.5	3.05	9.1	4.8	13.5
-40	63.5	2.500	-	82.4	70	19	49.4	24	3.5	9.5	4.8	21
-48	76.2	3.000	-	98.1	80	22	62.9	28	3.5	9.5	4.8	25

TABLE 1 - SAE J1926/2 HEAVY DUTY S SERIES STUDDED DIMENSIONS (CONTINUED)

Dimensions in millimeters

Nominal Tube OD Inch Tubing Size	Nominal Tube OD Tubing mm	Nominal Tube OD Tubing in	Nominal Tube OD Tubing Dash Size	Wall Thickness Tubing mm	Wall Thickness Tubing in	Wall Thickness Tubing mm	Wall Thickness Tubing in
5	4.76	0.188	-3	1.4	1.4	12.70	11.20
6	6.35	0.250	-4	1.5	1.7	14.22	13.03
8	7.94	0.312	-5	1.7	1.7	15.75	17.45
10	9.52	0.375	-6	1.9	1.9	17.30	19.07
12	12.70	0.500	-8	2.4	2.4	22.22	23.81
14	15.88	0.625	-10	2.8	2.7	23.40	26.95
16	19.05	0.750	-12	3.2	3.2	28.70	32.03
18	22.23	0.875	-14	3.5	3.5	31.00	35.07
20	25.40	1.000	-16	3.8	3.8	34.10	41.24
24	31.75	1.250	-20	4.8	4.8	47.63	47.63
32	38.10	1.500	-24	5.5	5.5	53.98	53.98
40	50.80	2.000	-32	7.0	7.0	69.85	69.85
48	63.5	2.500	-40	8.5	8.5	82.55	82.55
56	76.2	3.000	-48	9.5	9.5	95.25	95.25

TABLE 1 NOTES:

1. Minimum burst pressure is 4 times the working pressure rating for the tube size.
2. Tube diameter tolerance is ±0.13 mm (±0.005 in).
3. Minimum bend radius is 3 times the nominal tube OD for all tube sizes.
4. Minimum clamping length is 3 times the nominal tube OD for all tube sizes.
5. Minimum straight length is 1 times the nominal tube OD for all tube sizes. Minimum straight length is measured from the end of the tube to the start of the bend radius. Minimum straight length is required for proper installation of tube clamps. See SAE J1926/1.
6. Tube shall be cut square, deburred, and free of any foreign material and shall be capped with hose, when not hose specified.
7. Hose ends will be crimped to a tolerance of ±2 mm (±0.08 in) over or under the specified hose length with the use of a calibrated crimper.
8. Hose ends will be swivel type with 37° flare seat and shall be capable of swiveling 360° in the plane of the bend.
9. Hose ends shall be manufactured from corrosion resistant material and shall withstand the salt corrosion test.

6.3 Performance

Hydraulic impulse testing shall be conducted on hose assemblies at the maximum operating pressure specified in Table 2 and in accordance with SAE J343.

TABLE 3 - SAE J1926/2 HEAVY DUTY 4S SERIES STUB END PRESSURES

Units: Engineering (SI)

Trade Size	Stub End Body Nominal Working Pressure	Stub End Body Test Pressure	Stub End Body Proof Pressure	Stub End Body Minimum Burst Pressure	Stub End Collar Test Pressure	Stub End Collar Proof Pressure
-4	35	263	53	140	105	35
-5	29	263	53	140	105	35
-6	29	263	53	140	105	35
-8	29	263	53	140	105	35
-10	29	263	53	140	105	35
-12	29	263	53	140	105	35
-16	29	263	53	140	105	35
-20	29	263	53	140	105	35
-24	29	263	53	140	105	35
-32	29	263	53	140	105	35

1- Pressures are based on steel stub ends. Pressures for other materials may be lower.

2- Proof pressure is 2 times the maximum operating pressure.

3.3 Adjustable Stud End Washer Fit and Flatness

The washer shall be alignable by the stud end with a clearance not to exceed that specified in Table 3. The washer shall not "cock" so that the washer cannot be used to compensate for angularity between the stud and nut. The force required to move the washer at the maximum washer thickness shall not exceed the force given in Table 3.

Any washer surface that is in contact with the nut or flat face shall be within the flatness tolerance specified in Table 3.

TABLE 3—ADJUSTABLE STUD END WASHER FIT TORQUE AND FLATNESS ALLOWANCE

Thread Size (1)	Maximum Fit Torque Allowance (Inch-Pounds)	Maximum Washer Flatness Allowance (Inch)
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

1. [illegible]

8.3 Test Methods

Stud ends shall be tested for torque qualification per ISO 6149-2 with reference torque values shown in Table 4.

TABLE 4 - SAE J1926-2 STUD END QUALIFICATION TORQUE

Thread Size in	Torque +10% -0 N·m[1]
3/8-24 UNF-2A	[illegible]
7/16-20 UNF-2A	30[3]
1/2-20 UNF-2A	40
9/16-18 UNF-2A	58
3/4-16 UNF-2A	95
7/8-14 UNF-2A	115
1-1/16-12 UN-2A	172
1-3/16-12 UN-2A	230
1-5/16-12 UN-2A	270
1-5/8-12 UN-2A	285
1-7/8-12 UN-2A	334
2-1/2-12 UN-2A	520
3-12 UN-2A	550[2]
3-1/4-12 UN-2A	590[2]

1 [illegible]

2 [illegible]

3 [illegible]

NOTE: These torque values are for testing only. Assembly torque depends on many factors, such as lubrication, coating, surface finish, etc. The manufacturer of the component shall be consulted.

9. O-RING

O-rings used with heavy-duty (S series) SAE J1926-2 stud ends shall conform to the dimensions given in SAE J515, except for sizes -40 and -48 which are specified in Table 5.

TABLE 5 - O-RING SIZES FOR -40 AND -48 SIZES

Dash Size	Thread Size	O-ring Size	Tolerance	O-ring Cross Section	Tolerance
-40	2-12 UN-2A	[illegible]	±0.5	[illegible]	±0.08
-48	3/2-12 UN-2A	[illegible]	±0.5	[illegible]	±0.08

SURFACE VEHICLE STANDARD	J1926-3 MAR2010
	Issued 1988-08 Revised 2010-03 Superseding J1926-3 OCT2006

(R) Connections for General Use and Fluid Power—Ports and Stud Ends with ASME B1.1 Threads and O-Ring Sealing—Part 3: Light-Duty (L-Series) Stud Ends

RATIONALE

General revision for harmonizationwith SAE J514 and ISO 11926-3 and addition of sizes -40, -48 and -64 and converting the document to metric hex standard in accordance with FCCTC resolution on metric hex conversion. The resolution provides rationale for converting to metric hex and not using inch hex for new designs as follows:

"In an effort to standardize within a global market and ensuring that companies can remain competitive in an international market, it is the intent to convert to metric hex sizes which will:

- lead to one global standard

- guide users to a preferred system

- reduce complexity

- eliminate duplication

- reduce confusion"

FOREWORD

SAE J1926 consists of the following parts, under the general title:

Connections for general use and fluid power Ports and stud ends with ASME B1.1 threads and O-ring sealing:

- Part 1: Port with O-ring Seal in Truncated Housing

- Part 2: Heavy-Duty (S Series) Stud Ends

- Part 3: Light-Duty (L Series) Stud Ends

SAE Technical Standards Board Rules provide that: "This report is published by SAE to advance the state of technical and engineering sciences. The use of this report is entirely voluntary, and its applicability and suitability for any particular use, including any patent infringement arising therefrom, is the sole responsibility of the user."

SAE reviews each technical report at least every five years at which time it may be reaffirmed, revised, or cancelled. SAE invites your written comments and suggestions.

Copyright © 2010 SAE International

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of SAE.

TO PLACE A DOCUMENT ORDER: **Tel: 877-606-7323 (inside USA and Canada)**
Tel: 724-776-4970 (outside USA)
Fax: 724-776-0790
Email: CustomerService@sae.org
SAE WEB ADDRESS: http://www.sae.org

SAE values your input. To provide feedback on this Technical Report, please visit
http://www.sae.org/technical/standards/J1926/3_201003

These standards define performance requirements, dimensions, and designs for port and stud end connections for heavy-duty (series S and light-duty (series L) Parts 2, 3 (flanges), using hydraulic fluids of petroleum base. Test requirements of mated parts and assemblies are also established. SAE J1926/3 and J1926/4 are aligned with the connections shown in SAE J518.

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. In general application, a fluid may be conveyed, compressed, or controlled when connected through their threaded ports by studs or screws in fluid conductor fittings or tube adapters, or to base fittings and valves.

1. SCOPE

This part of SAE J1926 specifies dimensions, performance requirements, and test procedures for ports and stud ends conforming to light-duty (L series) stud ends with ISO 6149-1 threads for use in fluid power and general applications and those designed with them.

Stud ends in accordance with this part of SAE J1926 may be used in existing provisions up to 35 MPa for new equipment and other stud ends. The permissible working pressure depends upon materials, design, working conditions, application, etc.

For threaded ports and stud end connections in new designs for use with hydraulic power applications, only ISO 6149 applies. Threaded ports and stud ends in accordance with ISO 1179, ISO 6162, and ISO 12151-5 shall not be used for new designs in hydraulic fluid power applications.

Conformance to the dimensional information does not guarantee interchangeability. Each manufacturer shall perform testing according to the specifications contained in this document to ensure that components made to this document comply with the performance rating.

Appendix A of this document is informative.

NOTE: This document specifies both overall and metric boxes in the end ports. Therefore, any product showing conformity to this standard in accordance with this document must specify one type, inch or metric, to assure getting intended fit.

Ports and stud ends specified to meet January 1, 2010 using this standard, shall be supported with technical data, unless otherwise specified.

2. REFERENCES

(NOTE: Documents in this section have been rearranged to better identify from an other applicable or related)

2.1 Applicable Documents

The following standards contain provisions which, through reference in this text, constitute provisions of this document. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this document are encouraged to investigate the possibility of applying the most recent editions of the standards indicated as follows. Members of IEC and ISO maintain registers of currently valid International Standards.

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.

SAE J515 Specification for O-ring Materials Used with Hydraulic Connectors

SAE J1926-1 Connections for General Use and Fluid Power—Ports and Stud Ends with ASME B1.1 Threads and O-ring Sealing—Part 1: Threaded Port with O-ring Seal in Truncated Housing

SAE J2593 Information Report for the Installation of Fluid Conductors and Connectors

2.1.2 ISO Publications

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

ISO 4759 -1 Tolerances for fasteners – General plan and selection for screws, bolts and nuts – Product grades A, B and C

ISO 5598 Fluid power systems and components – Vocabulary

ISO 19879 Metallic tube connections for fluid power and general use – Test methods for hydraulic fluidpower connections

2.1.3 ASME Publications

Available from American Society of Mechanical Engineers, 22 Law Drive, P.O. Box 2900, Fairfield, NJ 07007-2900, Tel: 973-882-1170, www.asme.org.

ASME B1.1 Unified Inch Screw Threads (UN and UNR Thread Form)

2.2 Related Publications

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

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 724-776-4970 (outside USA), www.sae.org

SAE J514 Hydraulic Tube Fittings

SAE J1926-2 Connections for General Use and Fluid Power—Ports and Stud Ends with ASME B1.1 Threads and O-ring Sealing—Part 2: Heavy-Duty (S Series) Stud Ends

SAE J1926-4 Connector for Fluid Power and General Use—Ports and Stud End with ASME B1.1 Threads and O-ring Seal—Part 4: External Hex and Internal Hex Inch Port Plugs—Dimensions, Design, Test Methods and Requirements

2.2.2 ISO Publications

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

ISO 48 Rubber, Vulcanized or thermoplastic—Determination of hardness (Hardness between 10 IRHD and 100 IRHD)

ISO 1101 Technical drawings—Tolerancing of form, orientation, location and run-out—Generalities, definitions, symbols, indications on drawings

ISO 1179-1[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 1: Threaded port

ISO 1179-2[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 2: Heavy duty (S series) and light duty (L series) stud ends with elastomeric sealing (type E)

ISO 1179-3[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 3: Light duty (L series) stud end with sealing by O-ring with retaining ring (types G and H)

ISO 1179-4[1] Connections for general use and fluid power—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 4: Stud end for general use only with metal-to-metal sealing (type B)

ISO 1302 Technical drawings—Method of indicating surface texture on drawings

ISO 6149-1 Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 1: Port with O-ring seal in truncated housing

ISO 6149-2 Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 2: Heavy duty (S series) stud ends—Dimensions, design, test methods and requirements

ISO 6149-3 Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 3: Light duty (L series) stud ends—Dimensions, design, test methods and requirements

ISO 6410-1 Technical Drawings – Screw threads and threaded parts – Part 1: General conventions

ISO 8434-2 Metallic tube connections for fluid power and general use – Part 2: 37º flared connectors

ISO 9974-1 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads with elastomeric and metal-to-metal sealing—Part 1: Threaded port

ISO 9974-2 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads with elastomeric and metal-to-metal sealing—Part 2: Stud end with elastomeric sealing (type E)

ISO 9974-3 Connections for general use and fluid power Ports and stud ends with ISO 261 threads with elastomeric and metal-to-metal sealing—Part 3: Stud end with metal-to-metal sealing (type B)

ISO 11926-3 Connections for general use and fluid power—Ports and stud ends with ISO 261 threads and O-ring sealing—Part 3: Light duty (L series) stud ends

[1] To be published

3. DEFINITIONS

For the purpose of this SAE J1926, the definitions given in ISO 5598 and the following shall apply.

3.1 ADJUSTABLE STUD END

A stud end provided for final alignment before final tightening of the tube to the complete connection. This type of stud end is typically used on shaped fittings (e.g., nuts, sleeves, and elbows).

3.2 NONADJUSTABLE STUD END

A stud end provided for final alignment before final tightening of the connection because it is only used on straight fittings.

4. STUD ENDS

4.1 Size Designation

The stud ends shall be designated by SAE J1926-3 and the thread size, separated by a colon, for example, SAE J1926/3-1/2:20. Products dimensions specifying this stud end shall have the type of fitting, inch or metric, listed.

4.2 Reduced Size Stud Ends for Jump Size Connections

For jump size connections where the hole size of the other end, e.g., tube nut end, is larger than the stud, see "C" in Table 1, a shoulder is to be formed to accommodate gasket and length to avoid interference with the port seat face. For details, see appropriate connector standard, e.g., SAE J514 (Hydraulic Tube Fittings).

4.3 Assembly

For proper stud end assembly, follow instructions in SAE J1453.

5. REQUIREMENTS

5.1 Dimensions

Light-duty (L series) SAE J1926-3 stud ends shall conform to the dimensions in Figures 1A and B and Table 1. Port connection access hole shall be according to ISO 6149-1 product grade G.

5.2 Working Pressure

Light-duty (L series) stud ends made of low-carbon steel shall be designed for use at the working pressures given in Table 2.

CAUTION: The pressures for sizes -02 (-1/8 UN), -03 (-3/8), and -04 (-1/4) are based on limited number of burst test results. See notes 1 under table 2.

5.3 Performance

Light-duty (L series) stud ends made of low-carbon steel shall meet or exceed the burst and impulse pressures given in Table 2 when tested according to 6.3.

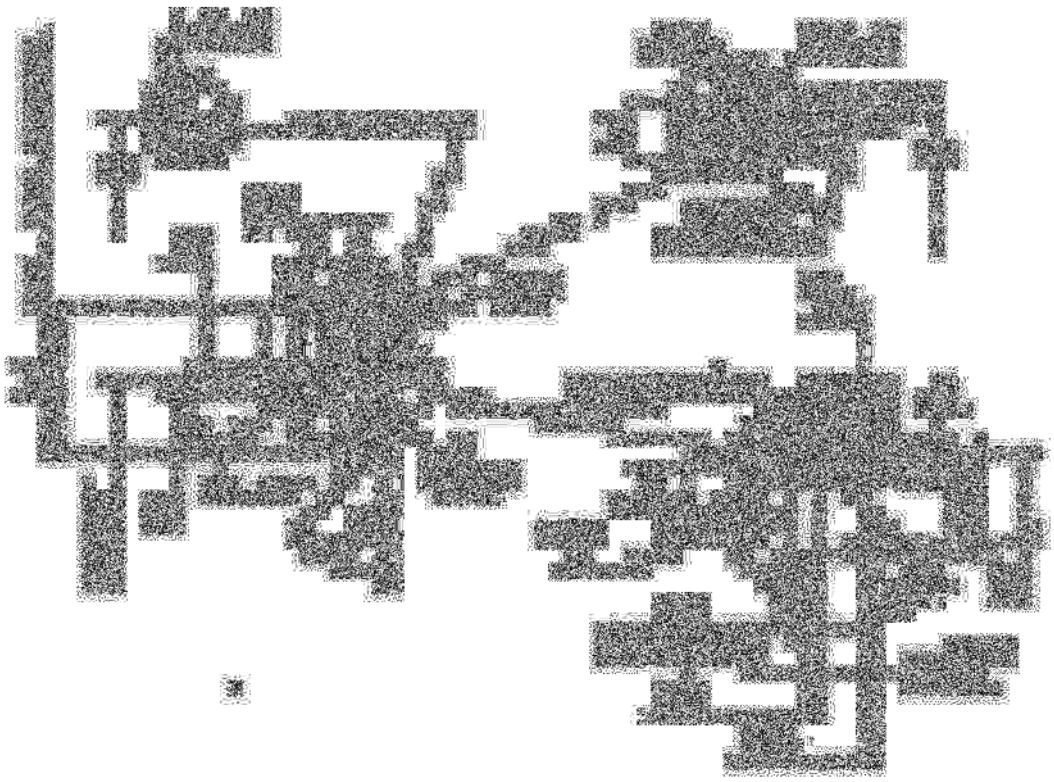


FIGURE 6A - ADJUSTABLE SAE J1626-1 LIGHT-DUTY L-SERIES STUD END DETAIL

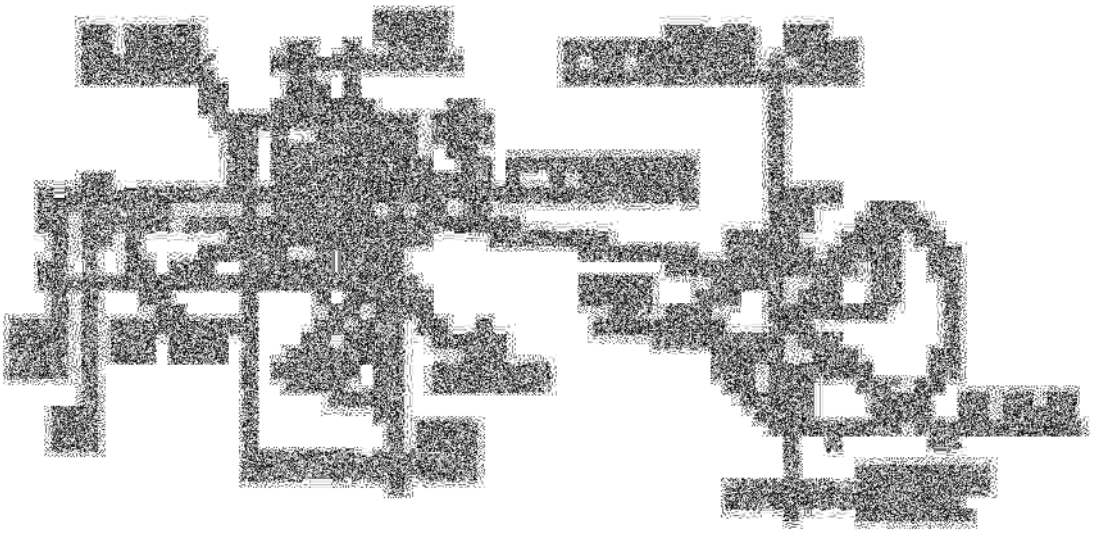


FIGURE 7B - NON-ADJUSTABLE SAE J1626-1 LIGHT-DUTY L-SERIES STUD END DETAIL

Copyright © 2015 SAE International

TABLE 1 - SAE J1926/3 LIGHT-DUTY (L SERIES) STUD END DIMENSIONS

Dimensions in millimeters

Nominal Tube OD	Nominal Tube OD	Nominal Tube OD	Nominal Tube OD								
Inch Tubing Dash Size	Inch Tubing mm	Inch Tubing in	Metric Tubing mm	Thread Size in	Hex Size for Metric Hex	Hex Size for Inch Hex					
-3	3/16	0.188	-	5/16-24	10	9/16	1.02-0.51	12.5	9.53	9.5	9.4
-4	4.76	0.188	4	M8 x 1	10	9/16	1.02-0.51	12.5	7.90	9.5	9.4
-5	5/16	0.250	5	7/16-24	12	11/16	1.02-0.51	13.5	9.53	11.5	11.4
-6	3/8	0.375	6	9/16-18	14	3/4	1.52-0.51	13.5	12.70	12	11.9
-8	1/2	0.500	8	M14 x 1.5	17	7/8	2.54-0.51	20.5	15.24	14.2	14.1
-10	5/8	0.625	10	M16 x 1.5	19	1	2.54-0.51	20.5	15.24	16.2	16.1
-12	12.70	0.750	12	M18 x 1.5	22	1 1/16	3.05-0.51	20.7	15.75	18.4	18.3
-14	15.87	0.875	14	1 1/16-12	24	1 1/4	3.05-0.51	20.7	15.88	20.4	20.3
-16	19.05	1.000	16	M22 x 1.5	27	1 5/16	3.05-0.51	20.7	25.4	22.3	22.2
-18	22.22	1.125	18	1 3/16-12	30.5	1 7/16	3.05-0.51	20.7	27.18	25.5	25.4
-20	25.40	1.250	20	1 5/16-12	32.5	1 1/2	3.05-0.51	21	28.58	28.4	28.4
-24	31.75	1.500	24	1 7/8-12	41.5	1 7/8	3.05-0.51	23	34.93	34.5	34.5
-28	38.10	1.750	28	2 1/16-12	50.8	2 3/8	3.05-0.51	23.5	44.6	40	34.5
-32	50.8	2.000	32	2 1/2-12	54.6	2 1/2	3.81	±0.13	31.8	50.8	50.8
-40	63.5	2.500	-	3-12	63.5	3 1/8	3.81	±0.13	35	63.5	63.5
-48	76.2	3.000	=	3 5/8-12	69.8	3 5/8	3.81	±0.13	45.5	69.8	69.8
-64	101.6	4.000	=	4 1/2-12	108.0	4 1/2	3.81	±0.13	57	101.6	101.6

TABLE 1 - SAE J1926-3 LIGHT-DUTY XL SERIES STUD END PROJECTIONS (CONTINUED)

Dimensions in millimeters

Nominal Tube OD	Nominal Tube OD	Nominal Tube OD	Nominal Tube OD										
Inch Tubing Dash Size	Inch Tubing mm	Inch Tubing in	Metric Tubing mm	L1 ±0.38	L2 ±0.5	L3 max	L4 ±0.5	L5 ±0.13	L6 ±0.5	L7 ±0.25	L8 ±0.1	Thread Length min	Thread Length in
-2	3.18	0.125	-	5.6	5.6	16	9.5	6.35	5.2	5.6	5.1	6	11.11
-3	4.76	0.188	-3	5.6	5.6	16	9.5	6.35	5.2	5.6	5.1	6	11.11
-4	6.35	0.250	-4	7.1	7.1	18.5	9.5	7.9	6.7	7.1	6.3	7	12.70
-5	7.94	0.312	-5	7.1	7.1	18.5	9.5	7.9	6.7	7.1	6.3	7	12.70
-6	9.52	0.375	-6	7.1	7.1	18.5	9.5	7.9	6.7	7.1	6.3	7	12.70
-8	12.70	0.500	-8	8.9	7.9	20.6	11.1	9.53	8.3	7	7.9	8	12.70
-10	15.87	0.625	-10	10	8.4	22.5	12.7	9.53	8.7	7.85	11.4	27	25.40
-12	19.05	0.750	-12	12	10.3	25.0	15.3	9.53	9	7.85	11.9	28	27.78
-14	22.22	0.875	-14	12	10.4	25.0	15.4	9.53	9	7.85	12.7	28	27.78
-16	25.40	1.000	-16	12	10.3	25.0	15.1	9.53	9	7.85	13.0	27	25.40
-20	31.75	1.250	-20	12	10.3	25.0	15.1	9.53	9	7.85	13.0	27	25.40
-24	38.10	1.500	-24	12	10.3	25.0	15.1	9.53	9	7.85	13.0	27	25.40
-32	50.80	2.000	-32	12	10.4	25.0	15.1	9.53	9	7.85	13.0	27	25.40
-40	63.5	2.500	-	12.7	11.5	28	17.5	9.5	9.5	1.5	14.5	28	27.00
-48	76.2	3.000	-	12.7	11.5	28	17.5	9.5	9.5	1.5	14.5	28	27.00
-64	101.6	4.000	-	12.7	11.5	28	17.5	9.5	9.5	1.5	14.5	28	27.00

Table 1 NOTES:

1. Threads per inch for SAE J1926-3 dash sizes -2 through -64 are the same as for SAE J1926-1 dash sizes.
2. Optional shoulder and shoulder diameter for metric tube sizes per ISO 8434-3.
3. Straight thread per ISO 6149-3 for metric tube sizes per type C boss.
4. Straight thread per ISO 6149-3 for metric tube sizes per type D boss.
5. Straight thread per ISO 6149-3 for metric tube sizes per type E boss.
6. Straight thread per ISO 6149-3 for metric tube sizes per type F boss.
7. Chamfer or radius optional, but shall not violate minimum thread length. Chamfer or radius shall not exceed the nominal major thread diameter. The chamfer angle shall be 45 ± 15 degrees. Radius shall be tangent to the major thread diameter and the face of the boss.
8. Undercut optional, but shall not violate minimum thread length. Undercut shall be smooth and free of burrs.
9. Recommended thread length for reference only. Actual thread length shall be sufficient to meet performance requirements.

TABLE 2—SIZE /1/2-2 LIGHT-DUTY L SERIES STUD END PRESSURES

Units in [redacted]

Thread Size in	Stud End Style Nonadjustable Working Pressure	Stud End Style Nonadjustable Test Pressure Bars	Stud End Style Nonadjustable Test Pressure PSIG	Stud End Style Adjustable Working Pressure	Stud End Style Adjustable Test Pressure Bars	Stud End Style Adjustable Test Pressure PSIG
5/16-24 UNF-2A	35	140	47	35	140	47
3/8-24 UNF-2A	35	140	47	35	140	47
7/16-20 UNF-2A	35	140	47	27.5	125	42
1/2-20 UNF-2A	35	140	47	27.5	125	42
9/16-18 UNF-2A	35	140	47	25	110	37
5/8-18 UNF-2A	31.5	125	42	25	110	37
3/4-16 UNF-2A	29	105	39	21	95	32
7/8-14 UN-2A	25	105	35	21	95	32
1 1/16-12 UN-2A	23	84	28	12.5	55	25
1 3/16-12 UN-2A	23	84	25	12.5	55	25
1 5/16-12 UN-2A	23	84	25	12.5	55	25
1 5/8-12 UN-2A	23	84	25	12.5	55	25
1 7/8-12 UN-2A	19	56	19	11.5	42	15
2 1/2-12 UN-2A	9	28	9.5	7	28	9.5
3 1/2-12 UN-2A	7	28	9.5	7	28	9.5
4 1/2-12 UN-2A	3.5	14	4.5	3.5	14	4.5

1. The working pressure for any type of end connection with a material other than steel is determined by multiplying the working pressure shown in Table 2 for the connection with the appropriate material temperature factor from Table 3. Working pressures for intermediate temperatures may be determined by interpolation.
2. Test pressure = working pressure × 1.33. For 3/4 and smaller sizes, test pressure = working pressure × 1.5.
3. Stud end dimensions are in SAE J1926-3.