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SAE J2244/1 (ISO 6149-1)

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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

This document is technically equivalent to ISO 6149-1 except as noted in the Foreword.

Foreword—SAE J2244/ISO 6149 Parts 1 and 2 were prepared by SAE FCCTC-SC1, Automotive and Hydraulic Tube and Fitting Subcommittee and ISO/TC 131 Fluid Power Systems. SAE J2244/ISO 6149 consists of the following parts under the general title: 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

Part 2: Heavy-duty (S Series) Stud Ends—Dimensions, Design, Test Methods, and Requirements

The two parts of SAE J2244 constitute a revision of ISO 6149:1980. This revision defines performance requirements, dimensions, and designs for port and heavy-duty (S series) stud ends. Significant testing was conducted to confirm the performance requirements of stud ends made from carbon steel. ISO 6149-2 applies to fittings detailed in ISO 8434 parts 1, 3, and 4.

SAE J2244 Parts 1 and 2 are technically equivalent to ISO 6149 parts 1 and 2, respectively. Parts produced to either standard will interchange with parts produced to the other standard. **Two main differences exist between the SAE standards and the ISO standards: size M30 x 2 is included in SAE standard but not in the ISO standard and the tube ODs have been shown in the SAE standard for the port sizes.** The SAE subcommittee chose not to include ISO 6149-3, a light-duty stud end, within SAE J2244 to minimize part proliferation.

In fluid power systems, power is transmitted and controlled through a fluid (liquid or gas) under pressure within an enclosed circuit. In general applications, a fluid may be conveyed under pressure. Components are connected through their threaded ports by fluid conductor fittings to tubes and pipes, or to hose fittings and hoses.

Ports are an integral part of fluid power components, such as pumps, motors, valves, cylinders, etc.

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1. Scope—This part of SAE J2244 specifies dimensions for fluid power metric ports for use with adjustable and nonadjustable stud ends shown in SAE J2244/2.

Ports in accordance with this part of SAE J2244 may be used at working pressures up to 63 MPa for nonadjustable stud ends and 40 MPa for adjustable stud ends. The permissible working pressure depends upon materials, design, working conditions, application, etc.

For threaded ports and stud ends specified in new designs in hydraulic fluid power applications, only SAE J2244 shall be used. Threaded ports and stud ends in accordance with ISO 1179, ISO 9974, and SAE J1926 (ISO 11926) shall not be used for new designs in hydraulic fluid power applications.

1.1 Rationale—All parts of SAE J2244 are being cancelled. SAE J2244 was published to provide users and manufacturers access to metric port and stud end dimensions. ISO 6149 is more recognized in the industry as the preferred metric port and stud end standard, thus the SAE FCCTC SC1 committee has approved cancelling SAE J2244-1 and superseding it with ISO 6149-1.

2. References

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

2.1.1 ISO PUBLICATIONS—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ISO 261:1973—ISO general purpose metric screw threads—General plan
ISO 1179-1:-[1]—Connections for fluid power and general use—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 fluid power and general use—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 fluid power and general use—Ports and stud ends with ISO 228-1 threads with elastomeric and metal-to-metal sealing—Part 3: Light duty (L series) stud ends with sealing by O-ring with retaining ring (types G and H)
ISO 1179-4:-[1]—Connections for fluid power and general use—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 1302:1978—Technical drawings—Method of indicating surface texture on drawings
ISO 2306:1972—Drills for use prior to tapping screw threads
ISO 5598:1985—Fluid power systems and components—Vocabulary
ISO 6149-1:-[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:-[1]—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:-[1]—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 7789:-[1]—Hydraulic fluid power—Two, three- and four-port screw-in cartridge valve cavities
ISO 9974-1:-[1]—Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and elastomeric sealing ring and metal-to-metal sealing—Part 1: Threaded port

1. To be published.

ISO 9974-2:-[2]—Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and elastomeric sealing ring and metal-to-metal sealing—Part 2: Stud end with elastomeric sealing (type E)
ISO 9974-3:-[2]—Connections for fluid power and general use—Ports and stud ends with ISO 261 threads and elastomeric sealing ring and metal-to-metal sealing—Part 3: Stud end with metal-to-metal sealing (type S)
ISO 11926-1:-[2]—Connections for fluid power and general use—Ports and stud ends with ISO 725 threads and O-ring sealing—Part 1: Threaded port
ISO 11926-2:-[2]—Connections for fluid power and general use—Ports and stud ends with ISO 725 threads and O-ring sealing—Part 2: Heavy duty (S series) stud end
ISO 11926-3:-[2]—Connections for fluid power and general use—Ports and stud ends with ISO 725 threads and O-ring sealing—Part 3: Light duty (L series) stud end

2.2 Other Publications—U.S. References Identical to ISO References

2.2.1 ANSI PUBLICATIONS—Available from ANSI, 11 West 42nd Street, New York, NY 10036-8002.

ANSI/ASME B1.13M—83—Metric Screw Threads—M Profile

2.2.2 SAE PUBLICATIONS—Available from SAE, 400 Commonwealth Drive, Warrendale, PA 15096-0001.

SAE J343 APR91—Test and Procedures for SAE 100R Series Hydraulic Hose and Hose Assemblies
SAE J1926 AUG88—Specifications for Straight Thread O-ring Boss Port
SAE J2244/2 DEC91—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

3. Definitions—For the purposes of this part of SAE J2244, the definitions given in ISO 5598 shall apply.

4. Port Size—The ports shall be specified by ISO 6149-1 and the thread size, separated by a colon, for example, SAE J2244/1: M18 x 1.5.

5. Requirements

5.1 Dimensions—Ports shall conform to the dimensions given in Figure 1 and Table 1.

5.2 Identification—Each port in accordance with this part of SAE J2244 shall be identified by a raised ring, per Figure 2 and Table 2, or by permanently marking "metric" next to the port, or by a permanent identification label on the component to read "ISO 6149 metric."

6. Test Methods—Ports shall be tested along with stud ends per the test methods and requirements in SAE J2244/2.

7. Identification Statement—Use the following statement, except for M30 x 2,[3] in test reports, catalogues, and sales literature when electing to comply with this part of SAE J2244 (ISO 6149-2): Ports conform to SAE J2244/1 (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.

2. To be published.
3. Not included in ISO 6149.

TABLE 1—SAE J2244/1 PORT DIMENSIONS

Dimensions in Millimeters

Tube OD	Inch Nominal Tube Dash Size	Inch Nominal Tube OD min	Inch Nominal Tube OD in	Thread Size d_1[1]	d_2 Large[2] min	d_2 Small[3] min	d_3[4] Ref	d_4	d_5 +0.1 0	L_1 +0.4 0	L_2[5] Min	L_3 Max	L_4 Min Full Thread	Z° ±1°
4	–2	3.18	0.125	M8 x 1	17	14	3	12.5	9.1	1.6	11.5	1	10	12°
5	–3	4.76	0.188	M10 x 1	20	16	4.5	14.5	11.1	1.6	11.5	1	10	12°
6	–4	6.35	0.250	M12 x 1.5	23	19	6	17.5	13.8	2.4	14	1.5	11.5	15°
8	–5	7.94	0.312	M14 x 1.5[6]	25	21	7.5	19.5	15.8	2.4	14	1.5	11.5	15°
10	–6	9.52	0.375	M16 x 1.5	28	24	9	22.5	17.8	2.4	15.5	1.5	13	15°
12	–8	12.7	0.500	M18 x 1.5	30	26	11	24.5	19.8	2.4	17	2	14.5	15°
16	–10	15.88	0.625	M22 x 1.5	34	29	14	27.5	23.8	2.4	18	2	15.5	15°
20	–12	19.05	0.750	M27 x 2	40	34	18	32.5	29.4	3.1	22	2	19	15°
22	–14	22.22	0.875	M30 x 2[7]	43	38	18	36.5	32.4	3.1	22	2	19	15°
25	–16	25.4	1.000	M33 x 2	49	43	23	41.5	35.4	3.1	22	2.5	19	15°
30	–20	31.75	1.250	M42 x 2	60	52	30	50.5	44.4	3.1	22.5	2.5	19.5	15°
38	–24	38.10	1.500	M48 x 2	66	57	36	55.5	50.4	3.1	25	2.5	22	15°
50	–32	50.80	2.000	M60 x 2	76	67	44	65.5	62.4	3.1	27.5	2.5	24.5	15°
				M20 x 1.5[8]	32	27		25.5	21.8	2.4		2	14.5	15°

1. Per ISO 261 tolerance class 6H. Tap drill per ISO 2306 class 6H.
2. Spotface diameter with identification ridge.
3. Spotface diameter without identification ridge.
4. Reference only, connecting hole application may require a different size.
5. Tap drill depths given require use of a bottoming tap to produce the specified full thread lengths. Where standard taps are used increase tap drill depths accordingly.
6. Preferred for diagnostic port applications.
7. Not included in ISO 6149.
8. For plug for cartridge cavity only. (See ISO 7789.)

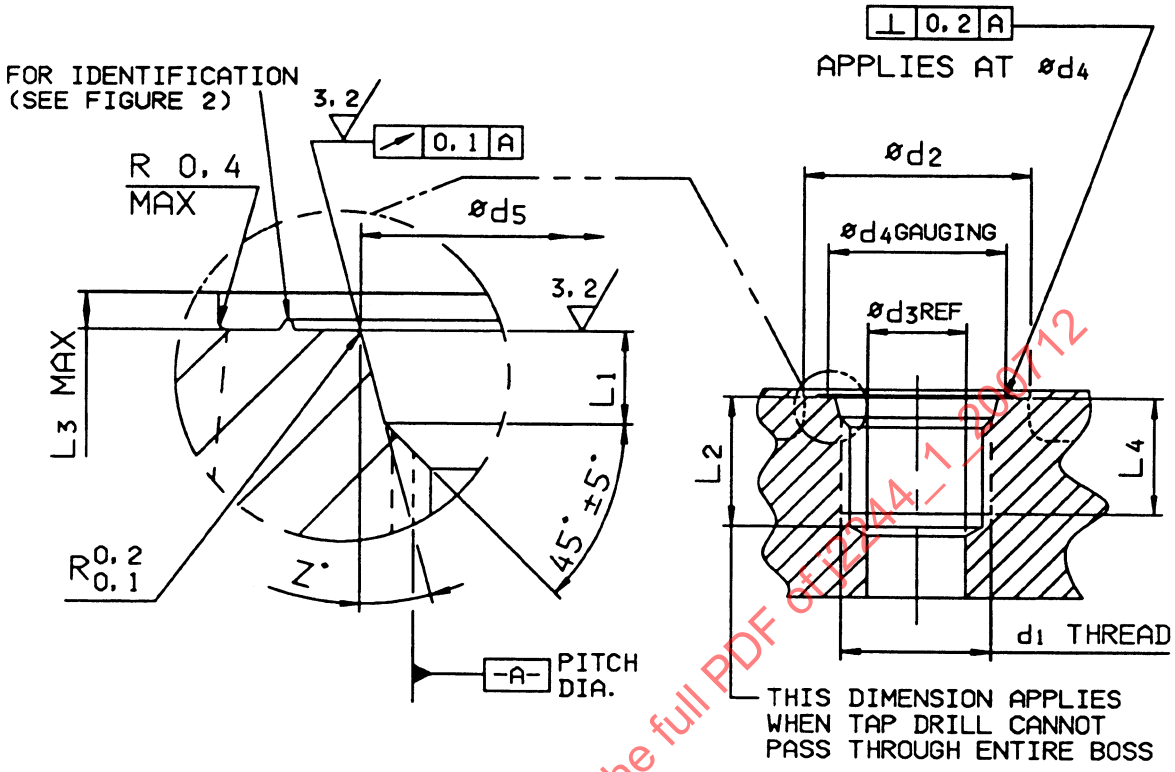

FIGURE 1—SAE J2244/1 PORT DETAIL