



SURFACE VEHICLE RECOMMENDED PRACTICE

J846™

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Superseding J846 NOV2015

Coding Systems for Identification of Fluid Conductors and Connectors

RATIONALE

SAE J846 has been reaffirmed to comply with the SAE Five-Year Review policy.

FOREWORD

It should be noted that the code numbers assigned to the applicable standards covered by the coding system could possibly change. Therefore, it is recommended that for the purpose of transmitting technical or engineering information relating to the various tube, pipe and hose fittings, the applicable code numbers, standard number and revision date be specified for proper identification.

Document is constantly under revision to include new codes/symbols.

1. SCOPE

This coding system is intended to provide a convenient means of identifying the various tube, pipe, hydraulic hose type and hose fittings, not intended for use in aircraft and of transmitting technical or engineering information relating to them wherever drawings or other pictorial media may not be readily available. The code has been kept flexible to permit expansion to cover new fitting categories or styles and, if the need develops, the inclusion of additional materials. The system is also compatible with automatic data processing equipment.

It is not intended that this code should supersede established systems or means of identification. Therefore, it should be the prerogative of the user to apply the code which best satisfies his requirements.

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Full document details: SAE J846_202009

For more information on this standard, visit
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Documents

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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 J246	Spherical and Flanged Sleeve (Compression) Tube Fittings
SAE J512	Automotive Tube Fittings
SAE J513	Refrigeration Tube Fittings - General Specifications
SAE J514	Hydraulic Tube Fittings
SAE J515	Specification for Hydraulic O-Ring Materials Used with Hydraulic Connections
SAE J516	Hydraulic Hose Fittings
SAE J517	Hydraulic Hose
SAE J518-1	Hydraulic Flanged Tube, Pipe, and Hose Connections, Four-Screw Flange Connection Part 1: 3.5 MPa to 35 MPa (Code 61)
SAE J518-2	Hydraulic Flanged Tube, Pipe, and Hose Connections, Four-Screw Flange Connection Part 1: 42 MPa (Code 62)
SAE J518-3	Hydraulic Flange Clamps, 2-Screw Connection to be used with J518-1 (Code 61) Connections where only low pressure is required
SAE J518-4	In-line, Elbow, and Tee Flanged Connectors for use with SAE J518-1/ISO6162-1 Components
SAE J518-5	In-line, Elbow, and Tee Flanged Connectors for use with SAE J518-2/ISO6162-2 Components
SAE J530	Automotive Pipe Fittings
SAE J531	Automotive Pipe, Filler, and Drain Plugs
SAE J532	Automotive Straight Thread Filler and Drain Plugs
SAE J534	Lubrication Fittings
SAE J1231	Formed Tube Ends for Hose Connections and Hose Fittings
SAE J1453-1	Specification for O-Ring Face Seal Connectors: Part 1 - Tube Connection Details and Common Requirements for Performance and Tests
SAE J1453-2	Specification for O-Ring Face Seal Connectors: Part 2 - Requirements, Dimensions, and Tests for Steel Unions, Bulkheads, Swivels, Braze Sleeves, Caps, and Connectors with ISO 6149-2 Metric Stud Ends
SAE J1453-3	Specification for O-Ring Face Seal Connectors: Part 3 - Requirements, Dimensions, and Tests for Steel Unions, Bulkheads, Swivels, Braze Sleeves, Caps, and Connectors with SAE J1926-2 Inch Stud Ends

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 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 J1926-3	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	Connections for General Use and Fluid Power - Ports and Stud Ends with ASME B1.1 Threads and O-Ring Sealing - Part 4: External Hex and Internal Hex Inch Port Plugs – Dimensions, Design, Test Methods and Requirements
SAE J2494-1	Dimensional Specifications for Metallic Body Push-to-Connect Fittings Used on a Vehicle Air Brake System
SAE J2494-2	Dimensional Specifications for Non-Metallic Body Push-to-Connect Fittings Used on a Vehicular Air Brake System
SAE J2552	Push-On Hose and Mating Hose Fittings
SAE AMS-C-81562	Coatings, Cadmium, Tin-Cadmium and Zinc (Mechanically Deposited)

2.1.2 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

ASTM B 633 Specification for Electrodeposited Coatings of Zinc on Iron and Steel

2.1.3 ISO Publications

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

ISO 6149-1	Connections for fluid power and general use - Ports and stud ends with ISO 261 threads and O-ring sealing - Part 1: Ports 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 6162-1	Hydraulic fluid power - Flange connectors with split or one-piece flange and metric or inch screws - Part 1: Flange connectors for use at pressures of 3,5 MPa (35 bar) to 35 MPa (350 bar), DN 13 to DN 127
ISO 6162-2	Hydraulic fluid power - Flange connectors with split or one-piece flange and metric or inch screws - Part 2: Flange connectors for use at pressures of 35 MPa (350 bar) to 40 MPa (400 bar), DN 13 to DN 51
ISO 8434-1	Metallic tube connections for fluid power and general use - Part 1: 24° compression fittings
ISO 8434-2	Metallic tube connections for fluid power and general use - Part 2: 37° flare fittings
ISO 8434-3	Metallic tube connections for fluid power and general use - Part 3: O-ring face seal fittings
ISO 11926-1	Connections for general use and fluid power - Ports and stud ends with ISO 725 threads and O-ring sealing - Part 1: Ports with O-ring seal in truncated housing
ISO 11926-2	Connections for general use and fluid power - Ports and stud ends with ISO 725 threads and O-ring sealing - Part 2: Heavy-duty (S series) stud ends

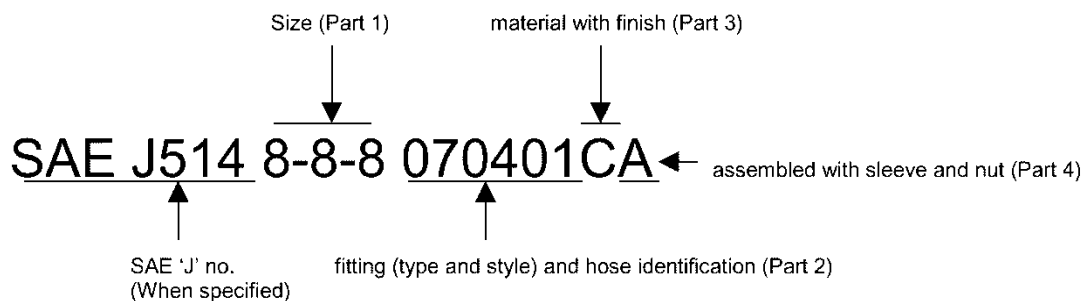
ISO 11926-3	Connections for general use and fluid power - Ports and stud ends with ISO 725 threads and O-ring sealing - Part 3: Light-duty (L series) stud ends
ISO 12151-1	Connections for hydraulic fluid power and general use - Hose fittings - Part 1: Hose fittings with ISO 8434 - 3 O-ring face seal ends
ISO 12151-2	Connections for hydraulic fluid power and general use - Hose fittings - Part 2: Hose fittings with ISO 8434-1 24° cone ends
ISO 12151-3	Connections for hydraulic fluid power and general use - Hose fittings - Part 3: Hose fittings with ISO 6162 flange ends
ISO 12151-4	Connections for hydraulic fluid power and general use - Hose fittings - Part 3: Hose fittings with ISO 6149 metric stud ends
ISO 12151-5	Connections for hydraulic fluid power and general use - Hose fittings - Part 5: Hose fittings with ISO 8434-2 37° flare ends
ISO 12151-6	Connections for hydraulic fluid power and general use - Hose fittings - Part 6: Hose fittings with ISO 8434-6 60° cone ends

3. GENERAL SPECIFICATIONS

3.1 Part Identification Number (PIN) or Code

The PIN shall consist of the SAE 'J' standard number (when specified) followed by four-part code of numbers and/or letter(s): the first part, a group of numbers symbolizing the size identification; the second part, a group of numbers, sometimes combined with letters, symbolizing the fitting and hose identification; the third part, a letter symbolizing the material with finish, where applicable; and the fourth part, another letter symbolizing assembly, if applicable, as shown in Figure 1A. When ordering metric base fittings or components for metric tubing, see 3.1.1.6 and/or 3.1.2 for details.

EXAMPLE: A 37 degree flare tee for 1/2 in OD tubing made from corrosion protected carbon steel and assembled with sleeves and nuts is designated as shown in Figure 1A.



Note: All combinations of these codes may not be feasible or covered by an SAE standard. User needs to contact the manufacturer for availability.

Figure 1A - Part identification number (PIN) example

3.1.1 Size Identification

The fitting size shall be identified by a series of dash numbers, each representing the size of the respective fitting ends. The size of the tube end shall precede the size of the pipe, hose, or other ends of the fitting. The dash shall be given in the sequence defined in Figure 1B:

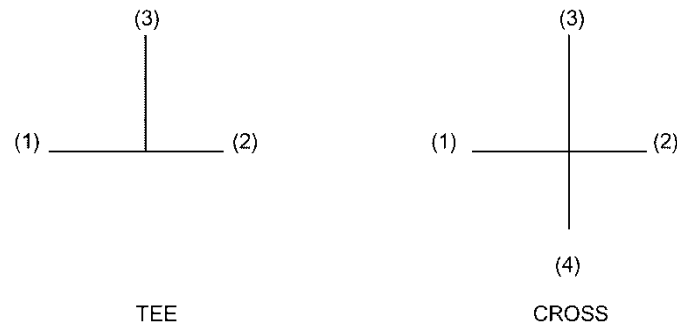


Figure 1B - Dash sequence

When special size combinations of tube-to-tube fitting ends are specified, the largest tube size shall precede the smaller tube size for unions and union elbows. For tees, the (1) shall be the larger tube size of (1) and (2). For crosses, the (1) shall be the largest tube size of (1) and (2), and (3) shall be equal to or larger than (4). Male tube end shall precede female (swivel) tube end.

For stud fittings (tube to port connectors) the tube end shall precede the stud end.

For adapter unions shown in SAE J514, the order of thread designation shall be male pipe NPTF, female pipe NPTF, male O-ring and swivel female NPSM.

3.1.1.1 Tube and Straight Thread O-Ring Port Ends

The dash size code, applicable to all tube ends and straight thread O-ring port ends, shall consist of the number of sixteenth-inch increments contained in the outside diameter of the tubing (nominal tube OD) they are designed to be used with, as listed in Table 1.

Table 1 - Dash numbers for tube and straight thread o-ring port ends

Nominal Tube OD, in	Dash Size Code	Nominal Tube OD, in	Dash Size Code	Nominal Tube OD, in	Dash Size Code
1/8	-2	3/8	-6	7/8	-14
5/32	-2.5 ⁽¹⁾	7/16	-7 ⁽¹⁾	1	-16
3/16	-3	1/2	-8	1-1/4	-20
1/4	-4	5/8	-10	1-1/2	-24
5/16	-5	3/4	-12	2	-32

1. For tube only, -2.5 and -7 Straight Thread O-ring Ports do not exist.

3.1.1.2 Pipe Thread Ends

The dash size code for pipe thread ends shall be the number of sixteenth-inch increments contained in the nominal pipe thread size as listed in Table 2.

Table 2 - Dash numbers for pipe thread ends

Nominal Pipe Thread Size, in	Dash Size Symbol	Nominal Pipe Thread Size, in	Dash Size Symbol	Nominal Pipe Thread Size, in	Dash Size Symbol
1/16	-1	3/8	-6	1	-16
1/8	-2	1/2	-8	1-1/4	-20
1/4	-4	3/4	-12	1-1/2	-24
				2	-32



A suffix "K" shall be added to the dash size code if the end has the optional 30 degree (60 degree included) seat, for sealing with an NPSM swivel end (Figures 47 to 49, SAE J514), as shown in Figure 1A of SAE J516.

EXAMPLE: A 37 degree flare male connector, with -8 tube end and -6 male pipe end with the optional 30 degree (60 degree included) seat, made from low carbon steel is called out as:

8 - 6K 070102C

└─ 30° seat on -6 pipe end

The suffix is not required for hose fittings with male pipe ends where the 30 degree seat is mandatory (Figure 1, SAE J516).

3.1.1.3 Hose

The dash size code for hose shall be the number of sixteenth-inch increments contained in the inside diameter of the hose (nominal hose size), except in the case of SAE 100R5 and 100R14 hose where it is equivalent to the number of sixteenth-inch increments in the outside diameter of tubing having approximately the same inside diameter as the hose. Table 3 for respective hose types.

Table 3 - Dash size numbers for 100R series hoses

Metric Hose Size	Nominal Hose Size (inch)	Hose Type 100R1	Hose Type 100R2	Hose Type 100R3	Hose Type 100R4	Hose Type 100R5	Hose Type 100R6	Hose Type 100R7	Hose Type 100R8	Hose Type 100R9 ⁽¹⁾	Hose Type 100R10 ⁽¹⁾	Hose Type 100R11 ⁽¹⁾
3.2	1/8	—	—	—	—	—	—	-2	-2	—	—	—
5	3/16	-3	-3	-3	—	-4	-3	-3	-3	—	-3	-3
6.3	1/4	-4	-4	-4	—	-5	-4	-4	-4	—	-4	-4
8	5/16	-5	-5	-5	—	-6	-5	-5	—	—	—	—
10	3/8	-6	-6	-6	—	—	-6	-6	-6	-6	-6	-6
12	13/32	—	—	—	—	-8	—	—	—	—	—	—
12.5	1/2	-8	-8	-8	—	-10	-8	-8	-8	-8	-8	-8
16	5/8	-10	-10	-10	—	-12	-10	-10	-10	—	—	—
19	3/4	-12	-12	-12	-12	—	-12	-12	-12	-12	-12	-12
22	7/8	—	—	—	—	-16	—	—	—	—	—	—
25	1	-16	-16	-16	-16	—	—	-16	-16	-16	-16	-16
29	1-1/8	—	—	—	—	-20	—	—	—	—	—	—
31.5	1-1/4	-20	-20	-20	-20	—	—	—	—	-20	-20	-20
35	1-3/8	—	—	—	—	-24	—	—	—	—	—	—
38	1-1/2	-24	-24	—	-24	—	—	—	—	-24	-24	-24
46	1-13/16	—	—	—	—	-32	—	—	—	—	—	—
51	2	-32	-32	—	-32	—	—	—	—	-32	-32	-32
60	2-3/8	—	—	—	—	-40	—	—	—	—	—	—
63	2-1/2	—	-40	—	-40	—	—	—	—	—	—	-40
76	3	—	—	—	-48	-48	—	—	—	—	—	—
89	3-1/2	—	—	—	-56	—	—	—	—	—	—	—
102	4	—	—	—	-64	—	—	—	—	—	—	—

1. SAE 100R9, R10 and R11 have been deleted from SAE J517, but are shown here for record retention purposes.

Table 3 - Dash size numbers for 100R series hoses (continued)

Metric Hose Size	Nominal Hose Size (inch)	Hose Type 100R12	Hose Type 100R13	Hose Type 100R14	Hose Type 100R15	Hose Type 100R16	Hose Type 100R17	Hose Type 100R18	Hose Type 100R19
3.2	1/8	—	—	–3	—	—	—	–2	—
5	3/16	—	—	–4	—	—	–3	–3	–3
6.3	1/4	—	—	–5	—	–4	–4	–4	–4
8	5/16	—	—	–6	—	–5	–5	–5	–5
10	3/8	–6	—	–7	–6	–6	–6	–6	–6
12	13/32	—	—	–8	—	—	—	—	—
12.5	1/2	–8	—	–10	–8	–8	–8	–8	–8
16	5/8	–10	—	–12	—	–10	–10	–10	–10
19	3/4	–12	–12	–14	–12	–12	–12	–12	–12
22	7/8	—	—	–16	—	—	—	—	—
25	1	–16	–16	–18	–16	–16	–16	–16	–16
29	1-1/8	—	—	–20	—	—	—	—	—
31.5	1-1/4	–20	–20	—	–20	–20	—	—	—
35	1-3/8	—	—	—	—	—	—	—	—
38	1-1/2	–24	–24	—	–24	—	—	—	—
46	1-13/16	—	—	—	—	—	—	—	—
51	2	–32	–32	—	—	—	—	—	—
60	2-3/8	—	—	—	—	—	—	—	—
63	2-1/2	—	—	—	—	—	—	—	—
76	3	—	—	—	—	—	—	—	—
89	3-1/2	—	—	—	—	—	—	—	—
102	4	—	—	—	—	—	—	—	—

3.1.1.4 Four Bolt Split Flange Connections

The dash size code for 4-bolt split flange O-ring connections shall be the number of sixteenth-inch increments contained in the nominal flange size as listed in Table 4.

Table 4 - Dash size codes for 4-bolt split flange connections

Nominal Flange Size, in	Dash Size Code	Nominal Flange Size, in	Dash Size Code	Nominal Flange Size, in	Dash Size Code
1/2	–8	1-1/2	–24	3-1/2	–56
3/4	–12	2	–32	4	–64
1	–16	2-1/2	–40	5	–80
1-1/4	–20	3	–48		

3.1.1.5 Straight Thread Filler and Drain Plug Ends

The dash code for straight thread filler and drain plugs shall be the number of sixteenth-inch increments contained in the nominal straight thread size except in the case of metric sizes where the thread size shall be designated as the metric size code listed in Table 5A.

Table 5A - Dash size codes for straight thread filler and drain plugs

Nominal Straight Thread Size, in	Dash Size Code	Nominal Metric Thread Size, in	Metric Size Code
5/16	-5	M10 x 1	M10
3/8	-6	M14 x 1.25 ⁽¹⁾	M14
1/2	-8	M18 x 1.5	M18
5/8	-10		
3/4	-12		
7/8	-14		
1	-16		
1-1/4	-20		
1-1/2	-24		
1-3/4	-28		
2	-32		

1. For all fittings other than drain plugs, code M14 signifies M14X1.5 thread size.

3.1.1.6 Tube and Port Ends for Metric Base Fittings

When ordering metric base fittings (those for use with metric tube and/or with hard metric hex and forging flat sizes), use metric tube sizes equivalent to the inch dash sizes as shown in Table 5B for size code, and replace the “-” (dash) with an “X” between the size codes, as shown in examples 1 and 3. When designating metric stud end size, the thread pitch is omitted as shown in Table 5B.

Table 5B - Metric tube end codes

Inch Tube Dash Size	Equivalent Metric Size Code
-2	4
-3	5
-4	6
-5	8
-6	10
-8	12
-10	16
-12	20
-14	22
-16	25
-20	30
-24	38
-32	50

Table 5C - Metric port/stud end codes

Nominal Metric Thread Size	Port / Stud Size Codes
M8X1	M8
M10X1	M10
M12X1.5	M12
M14X1.5	M14
M16X1.5	M16
M18X1.5	M18
M20X1.5	M20
M22X1.5	M22
M27X2	M27
M30X2	M30
M33X2	M33
M42X2	M42
M48X2	M48
M60X2	M60

EXAMPLE 1: Metric O-ring Face Seal stud elbow with 20 mm (–12) face seal and M27X2 stud end per ISO 6149-2 made from low carbon steel is called out as:

SAE J1453-2* 20XM27 52M0287C

NOTE: 'M' after the fitting type code '52' indicates metric forging flats per 3.1.2.

EXAMPLE 2: Style 'A' braze sleeve made from carbon steel for –8 or 12 mm size inch or metric base O-ring face seal fitting to mate with 1/2 in OD tube is called out as:

SAE J1453-3* 8-8 520115ACX (in inch base document)

SAE J1453-2* 8-8 520115ACX (in metric base document)

NOTE: "CX" indicates carbon steel with oil dip per 3.1.4.

EXAMPLE 3: Style 'B' braze sleeve for –8 or 12 mm size inch or metric base ORFS fitting to mate with 12 mm OD tube is called out as:

SAE J1453-3* 12X12 5201M15BCX (in inch base document)

SAE J1453-2* 12X12 5201M15BCX (in metric base document)

NOTE: Part number for a given sleeve in either document, in previous examples, is the same because the part is physically the same. Also, there is no 'M' after 52 because the sleeve has no hex, eliminating the need for 'Metric' hex designator. 'M' before 15 in example 3 indicates the sleeve is for metric tube.