



SURFACE VEHICLE STANDARD

J246™**JAN2022**

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Reaffirmed 2022-01

Superseding J246 NOV2017

Spherical and Flanged Sleeve (Compression) Tube Fittings

RATIONALE

SAE J246 has been reaffirmed to comply with the SAE Five-Year Review policy.

1. SCOPE

This SAE Standard covers complete general and dimensional specifications for tube fittings of the spherical and flanged sleeve compression types for use in the piping of air brake systems on automotive vehicles. The spherical sleeve compression type Figures 1A to 5 and Tables 1 to 3 is intended for use with annealed copper alloy tubing per SAE J1149, Type 1. The flanged sleeve compression type Figures 6A to 11 and Tables 4 to 6 is intended for use with nylon tubing per SAE J844. It is not intended to restrict or preclude other designs of a tube fitting for use with SAE J844, air brake tubing. Performance requirements for SAE J844 are covered in SAE J1131. See SAE J1131 for the Performance Requirements of Reusable (Push to Connect) Fittings Intended for Use in Automotive Air Brake Systems.

CAUTION: To assure satisfactory performance, tapered sleeve compression type fitting components (SAE J512) should not be intermixed with the spherical or flanged sleeve components, nor should the spherical sleeve compression type components be intermixed with the flanged sleeve compression type components when assembling connection in areas where the three types are available.

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Full document details: SAE J246_202201

For more information on this standard, visit
https://www.sae.org/standards/content/J246_202201/

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

SAE J476 Dryseal Pipe Threads

SAE J512 Automotive Tube Fittings

SAE J844 Nonmetallic Air Brake System Tubing

SAE J846 Coding Systems for Identification of Fluid Conductors and Connectors

SAE J1131 Performance Requirements for SAE J844 Nonmetallic Tubing and Fitting Assemblies Used in Automotive Air Brake Systems

SAE J1149 Metallic Air Brake System Tubing and Pipe

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.

ANSI/ASME B1.1-1989 Unified Inch Screw Thread (UN and UNR)

2.1.3 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 B 117 Method of Salt Spray (Fog) Testing

FMVSS 106 Brake Hoses

TABLE 1A - DIMENSIONS OF CONNECTORS, UNIONS, ELBOWS, AND TEES (FIGURES 1A TO 3E)

Nom Tube OD, in	Aa Dryseal Taper Thread in	B, Nom Thread Size, in Class 2A Ext.	C Nom, in	C ₁ Nom, in	C ₂ Nom, in	Df Dia Drill mm	Df Dia Drill in	D ₁ f Dia Max mm	D ₁ f Dia Max in	E Dia mm +0.10 -0.00	E Dia in +0.004 -0.000	F Dia mm +0.10 -0.00	F Dia in +0.004 -0.000	Gb Dia mm +0.00 -0.25	Gb Dia in +0.000 -0.010
1/4	1/8	7/16-24	7/16	7/16	9/16	4.78	0.188	5.66	0.223	6.45	0.254	7.90	0.311	9.96	0.392
5/16	1/8	1/2 -24	1/2	1/2	9/16	6.35	0.250	5.66	0.223	8.08	0.318	9.60	0.378	9.96	0.454
3/8	1/4	17/32-24	9/16	9/16	11/16	7.92	0.312	8.07	0.318	9.70	0.382	11.38	0.448	12.34	0.486
1/2	3/8	11/16-20	11/16	11/16	7/8	10.31	0.406	11.28	0.444	12.88	0.507	14.66	0.577	16.08	0.633
5/8	1/2	13/16-18	7/8	13/16	1- 1/16	13.49	0.531	14.42	0.568	16.05	0.632	18.01	0.709	19.10	0.752
3/4	1/2	1 -18	1	1	1- 1/16	16.66	0.656	14.42	0.568	19.25	0.758	21.59	0.850	23.85	0.939
3/4	3/4	1 -18	1- 1/16	1- 1/4	1- 1/4	16.66	0.656	19.20	0.756	19.25	0.758	21.59	0.850	23.85	0.939
1	1	1- 1/4 -16	1- 3/8	1- 1/4	1- 5/8	22.22	0.875	24.00	0.945	25.60	1.008	28.50	1.122	30.02	1.182

Nom Tube OD, in	Ic mm	Ic in	J Full Thread Min mm	J Full Thread Min in	K mm	K in	L mm ±0.8	L in ±0.03	L ₁ mm ±0.8	L ₁ in ±0.03	L ₂ mm ±0.8	L ₂ in ±0.03	M mm ±0.8	M in ±0.03	M ₁ mm ±0.8	M ₁ in ±0.03
1/4	8.4	0.33	6.9	0.27	6.4	0.25	22.9	0.90	21.6	0.85	21.6	0.85	16.0	0.63	17.8	0.70
5/16	8.6	0.34	7.1	0.28	7.1	0.28	23.9	0.94	22.9	0.90	21.8	0.86	17.0	0.67	17.8	0.70
3/8	11.2	0.44	9.7	0.38	7.9	0.31	31.0	1.22	27.9	1.10	30.2	1.19	20.3	0.80	22.9	0.90
1/2	13.5	0.53	11.2	0.44	11.2	0.44	34.0	1.34	33.3	1.31	32.5	1.28	23.9	0.94	26.4	1.04
5/8	15.0	0.59	12.7	0.50	11.2	0.44	40.4	1.59	36.3	1.43	38.4	1.51	27.9	1.10	30.5	1.20
3/4	16.8	0.66	13.5	0.53	14.2	0.56	42.9	1.69	40.6	1.60	40.1	1.58	30.5	1.20	31.2	1.23
3/4	16.8	0.66	13.5	0.53	14.2	0.56	43.7	1.72	—	—	41.4	1.63	32.5	1.28	34.5	1.36
1	18.3	0.72	15.0	0.59	19.8	0.78	50.8	2.00	45.2	1.78	48.5	1.91	36.6	1.44	40.4	1.59

Nom Tube OD, in	M ₂ mm ±0.8	M ₂ in ±0.03	M ₃ mm ±0.8	M ₃ in ±0.03	N mm ±0.8	N in ±0.03	N ₁ mm ±0.8	N ₁ in ±0.03	N ₂ mm ±0.8	N ₂ in ±0.03	P ref mm	P ref in	P ₁ ref mm	P ₁ ref in	S Max mm	S Max in	S ₁ Max mm	S ₁ Max in
1/4	12.7	0.50	16.0	0.63	17.0	0.67	13.7	0.54	16.3	0.64	9.7	0.38	9.7	0.38	—	—	10.9	0.43
5/16	13.7	0.54	17.0	0.67	17.8	0.70	14.5	0.57	16.3	0.64	9.7	0.38	9.7	0.38	11.4	0.45	-	-
3/8	18.3	0.72	20.3	0.80	23.6	0.93	19.8	0.78	21.8	0.86	14.2	0.56	14.2	0.56	—	—	17.0	0.67
1/2	21.6	0.85	23.9	0.94	25.4	1.00	21.1	0.83	24.1	0.95	14.2	0.56	14.2	0.56	-	—	17.0	0.67
5/8	23.9	0.94	27.9	1.10	31.8	1.25	27.4	1.08	29.7	1.17	19.1	0.75	19.1	0.75	—	—	21.8	0.86
3/4	28.4	1.12	31.8	1.25	34.0	1.34	29.0	1.14	30.5	1.20	19.1	0.75	19.1	0.75	20.3	0.80	-	-
3/4	30.5	1.20			34.0	1.34	29.0	1.14	30.5	1.20	19.1	0.75	19.1	0.75	-	-	21.8	0.86
1	32.3	1.27	36.6	1.44	42.2	1.66	36.6	1.44	37.6	1.48	23.9	0.94	23.9	0.94	—	—	26.9	1.06

Continued on next page.

TABLE 1A - DIMENSIONS OF CONNECTORS, UNIONS, ELBOWS, AND TEES
(FIGURES 1A TO 3E) (CONTINUED)

Nom Tube OD, in	S2 Min mm	S2 Min in	S3 Min mm	S3 Min in	T ^d Ref mm	T ^d Ref in	T ₁ Min mm	T ₁ Min in	V Dia Max mm	V Dia Max in	V Dia Min mm	V Dia Min in	W ^e Forged or Bar Min mm +0.0 -0.5	W ^e Forged or Bar Min in +0.00 -0.02
1/4	—	—	10.9	0.43	4.6	0.18	4.6	0.18	9.7	0.38	9.1	0.36	14.2	0.56
5/16	19.8	0.78	-	-	5.3	0.21	5.3	0.21	11.2	0.44	10.7	0.42	14.2	0.56
3/8	—	—	17.0	0.67	5.3	0.21	5.3	0.21	12.2	0.48	11.7	0.46	17.5	0.69
1/2	—	—	17.0	0.67	6.1	0.24	6.1	0.24	15.7	0.62	15.5	0.61	20.6	0.81
5/8	—	—	21.8	0.86	6.1	0.24	6.1	0.24	18.5	0.73	18.3	0.72	25.4	1.00
3/4	38.1	1.50	-	-	6.9	0.27	6.9	0.27	23.4	0.92	22.9	0.90	25.4	1.00
3/4	-	-	21.8	0.86	7.6	0.30	7.6	0.30	23.4	0.92	22.9	0.90	31.8	1.25
1	—	—	26.9	1.06	8.4	0.33	8.4	0.33	29.5	1.16	29.0	1.14	38.1	1.50

a Dryseal American Standard Taper Pipe Thread, except as noted in General Specifications.

b Where thread relief undercut is used, last thread shall be chamfered 1/2 to 1 pitch long from G diameter. Thread marks on surface of undercut shall be permissible.

c For elbows and tees, the L dimensions shown shall apply to turned or finished length. Where body is relieved beyond thread, length of turned boss L may be reduced to the minimum full thread length J.

d Minimum design thickness, not subject to inspection.

e Basic dimensions shown shall apply as min dia or across flats for bosses. The -0.5 mm (-0.02 in) tolerance shall apply only to chamfer on full hexagon version in Figure 1C.

f At manufacturer's option, through passages in fittings may conform with smaller diameter specified or the appropriate end may be counter bored to the larger diameter for depths defined by S, S1, S2 or S3 respectively. If counter bored to larger diameter minimum wall thickness requirements as specified by table 10 must be maintained.

TABLE 1B - DIMENSIONS OF SPECIAL SIZE FITTINGS, B
CONNECTORS, ELBOWS, AND TEES (FIGURES 1A, 1C, 2A, 2C, 2D, 3B, 3C, 3D, AND 3E)

Nom Tube OD, In	A ^a Dryseal Taper Thread, in	A ₁ ^a Dryseal Taper Thread, in	B, Nom Thread Size, in Class 2A Ext.	C Nom, in	C ₂ Nom, in	L mm ±0.8	L in ±0.03	L ₂ mm ±0.8	L ₂ in ±0.03	M mm ±0.8	M in ±0.03	M ₁ mm ±0.8	M ₁ in ±0.03
1/4	1/4		7/16-24	9/16	11/16	28.2	1.11	27.4	1.08	17.5	0.69	20.1	0.79
1/4	3/8	1/8	7/16-24	11/16	7/8	29.0	1.14	27.4	1.08	18.8	0.74	21.3	0.84
1/4	1/2		7/16-24	7/8	1- 1/16	33.8	1.33	31.8	1.25	21.3	0.84	23.9	0.94
5/16	1/4		1/2 -24	9/16	11/16	28.4	1.12	27.7	1.09	17.8	0.70	20.3	0.80
5/16	3/8	1/8	1/2 -24	11/16	7/8	29.2	1.15	27.7	1.09	19.0	0.75	26.6	0.85
5/16	1/2		1/2 -24	7/8	1- 1/16	34.0	1.34	32.0	1.26	21.6	0.85	24.1	0.95
3/8	1/8		17/32-24	9/16	9/16	26.4	1.04	25.7	1.01	18.5	0.73	21.3	0.84
3/8	3/8	1/4	17/32-24	11/16	7/8	31.8	1.22	30.2	1.19	21.6	0.85	24.1	0.95
3/8	1/4	1/4	17/32-24	9/16	9/16	31.0	1.22	30.2	1.19	20.3	0.80	22.9	0.90
3/8	1/2		17/32-24	7/8	1- 1/16	36.6	1.44	34.5	1.36	24.1	0.95	26.7	1.05
1/2	1/8		11/16-20	11/16	11/16	29.5	1.16	27.9	1.10	20.3	0.80	23.1	0.91
1/2	1/4		11/16-20	11/16	11/16	34.0	1.34	32.5	1.28	22.1	0.87	24.6	0.97
1/2	3/8	1/4	11/16-20	11/16	7/8	34.0	1.34	32.5	1.28	23.9	0.94	26.4	1.04
1/2	1/2	3/8	11/16-20	7/8	1- 1/16	38.9	1.53	36.8	1.45	26.4	1.04	29.0	1.14
1/2	3/4		11/16-20	1- 1/16	1- 1/4	40.4	1.59	38.1	1.50	29.2	1.15	31.2	1.23
1/2	1		11/16-20	1- 3/8	1- 5/8	46.0	1.81	43.7	1.72	31.8	1.25	35.6	1.40
5/8	1/4		13/16-18	13/16	13/16	35.6	1.40	33.5	1.32	24.1	0.95	26.4	1.04
5/8	3/8	1/2	13/16-18	13/16	7/8	35.6	1.40	33.5	1.32	25.7	1.01	27.9	1.10
5/8	3/4		13/16-18	1- 1/16	1- 1/4	41.9	1.65	39.6	1.56	30.7	1.21	32.8	1.29
5/8	1		13/16-18	1- 3/8	1- 5/8	47.5	1.87	45.2	1.78	33.3	1.31	37.1	1.46
3/4	1/4		1 -18	1	1	38.1	1.50	35.3	1.39	26.7	1.05	27.2	1.07
3/4	3/8		1 -18	1	1	38.1	1.50	35.3	1.39	27.9	1.10	28.7	1.13
3/4	1		1 -18	1- 3/8	1- 5/8	49.3	1.94	47.0	1.85	35.1	1.38	38.9	1.53
1	1/2	3/4	1- 1/4 -16	1- 1/4	1- 1/4	46.0	1.81	43.7	1.72	30.5	1.20	34.0	1.34
1	3/4		1- 1/4 -16	1- 1/4	1- 1/4	46.0	1.81	43.7	1.72	33.3	1.31	37.1	1.46

Continued on next page.

TABLE 1B - DIMENSIONS OF SPECIAL SIZE FITTINGS, B
CONNECTORS, ELBOWS, AND TEES (FIGURES 1A, 1C, 2A, 2C, 2D, 3B, 3C, 3D, AND 3E) (CONTINUED)

Nom Tube OD, in	M ₂ mm ±0.8	M ₂ in ±0.03	N mm ±0.8	N in ±0.03	N ₁ mm ±0.8	N ₁ in ±0.03	N ₂ mm ±0.8	N ₂ in ±0.03	N ₃ mm ±0.8	N ₃ in ±0.03	W ^e mm +0.0 -0.5	W ^e in +0.00 -0.02
1/4	15.5	0.61	22.4	0.88	18.3	0.72	21.8	0.86			17.5	0.69
1/4	16.5	0.65	22.1	0.87	18.3	0.72	24.1	0.95	23.9	0.94	20.6	0.81
1/4	17.3	0.68	26.9	1.06	23.1	0.91	29.7	1.17			25.4	1.00
5/16	15.7	0.62	23.1	0.91	19.0	0.75	21.8	0.86			17.5	0.69
5/16	16.8	0.66	23.1	0.91	19.0	0.75	24.1	0.95	23.9	0.94	20.6	0.81
5/16	17.5	0.69	27.7	1.09	23.9	0.94	29.7	1.17			25.4	1.00
3/8	18.3	0.72	19.0	0.75	15.2	0.60	17.3	0.68			14.2	0.56
3/8	19.3	0.76	23.4	0.92	19.8	0.78	24.1	0.95	25.4	1.00	20.6	0.81
3/8	18.3	0.72	23.6	0.93	19.8	0.78	21.8	0.86	23.6	0.93	17.5	0.69
3/8	20.1	0.79	28.2	1.11	24.6	0.97	29.7	1.17			25.4	1.00
1/2	21.6	0.85	20.8	0.82	16.5	0.65	19.6	0.77			14.2	0.56
1/2	21.6	0.85	25.4	1.00	21.1	0.83	24.1	0.95			17.5	0.69
1/2	21.6	0.85	25.4	1.00	21.1	0.83	24.1	0.95	25.4	1.00	20.6	0.81
1/2	22.4	0.88	30.2	1.19	25.9	1.02	29.7	1.17	31.8	1.25	25.4	1.00
1/2	27.2	1.07	30.0	1.18	25.7	1.01	30.5	1.20			31.8	1.25
1/2	27.4	1.08	35.1	1.38	30.7	1.21	37.6	1.48			38.1	1.50
5/8	23.9	0.94	26.9	1.06	22.6	0.89	24.8	0.98			17.5	0.69
5/8	23.9	0.94	26.9	1.06	22.6	0.89	24.8	0.98	34.0	1.34	20.6	0.81
5/8	28.7	1.13	31.8	1.25	27.4	1.08	30.5	1.20			31.8	1.25
5/8	29.0	1.14	36.6	1.44	32.3	1.27	37.6	1.48			38.1	1.50
3/4	28.4	1.12	29.2	1.15	24.1	0.95	25.7	1.01			17.5	0.69
3/4	28.4	1.12	29.2	1.15	24.1	0.95	25.7	1.01			20.6	0.81
3/4	30.7	1.21	38.9	1.53	33.8	1.33	37.6	1.48			38.1	1.50
1	32.3	1.27	37.3	1.47	31.8	1.25	32.8	1.29	37.3	1.47	25.4	1.00
1	32.3	1.27	37.3	1.47	31.8	1.25	32.8	1.29			31.8	1.25

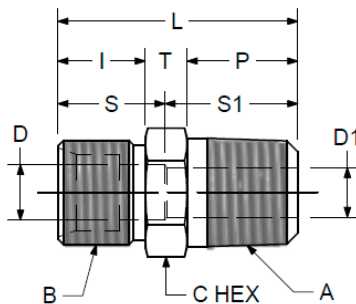
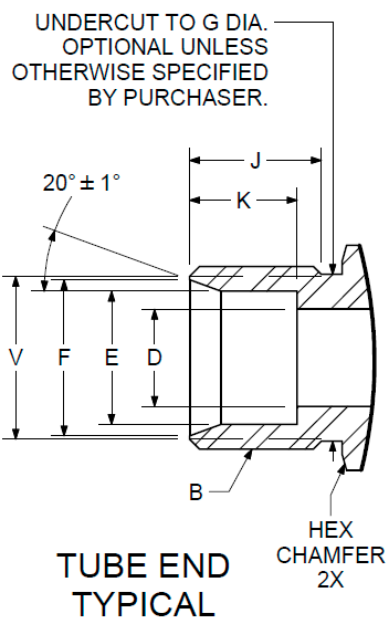


FIGURE 1A (120102)

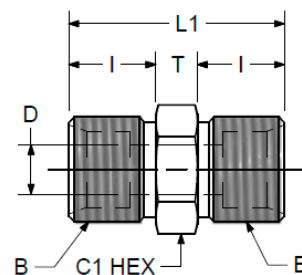


FIGURE 1B (120101)

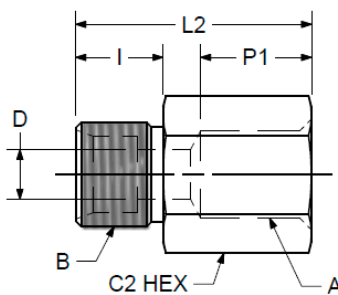


FIGURE 1C (120103)

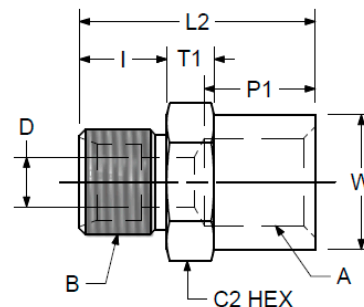
FIGURE 1C (120103)
OPTIONAL CONSTRUCTION

FIGURE 1 - CONNECTORS AND UNIONS

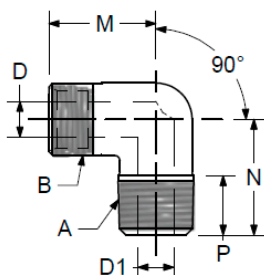
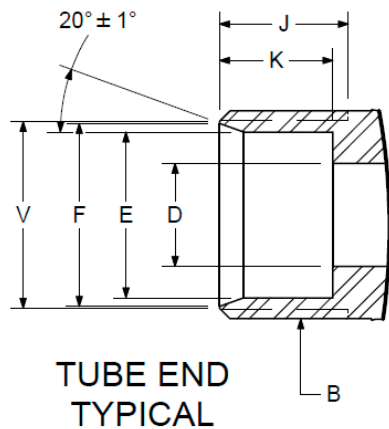


FIGURE 2A (120202)

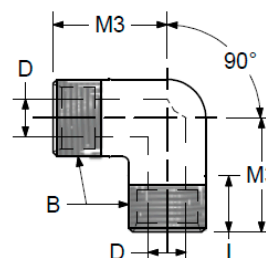


FIGURE 2B (120201)

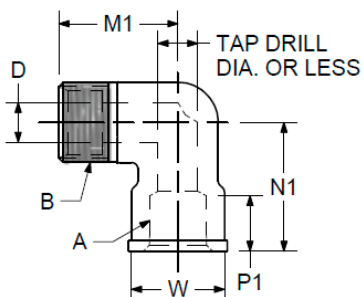


FIGURE 2C (120203)

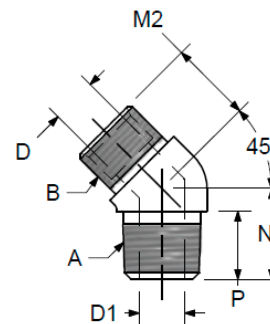


FIGURE 2D (120302)

FIGURE 2 - ELBOWS

NOTE: Unspecified detail with respect to dimensions, tolerances, contours, material, workmanship, etc., must conform to general specifications for spherical and flanged sleeve (compression) tube fittings. The dimensional designations on the tube end typical shall apply to all figures except as shown otherwise. Codes shown in brackets adjacent to figure numbers represent respective fitting identification in accordance with SAE J846.

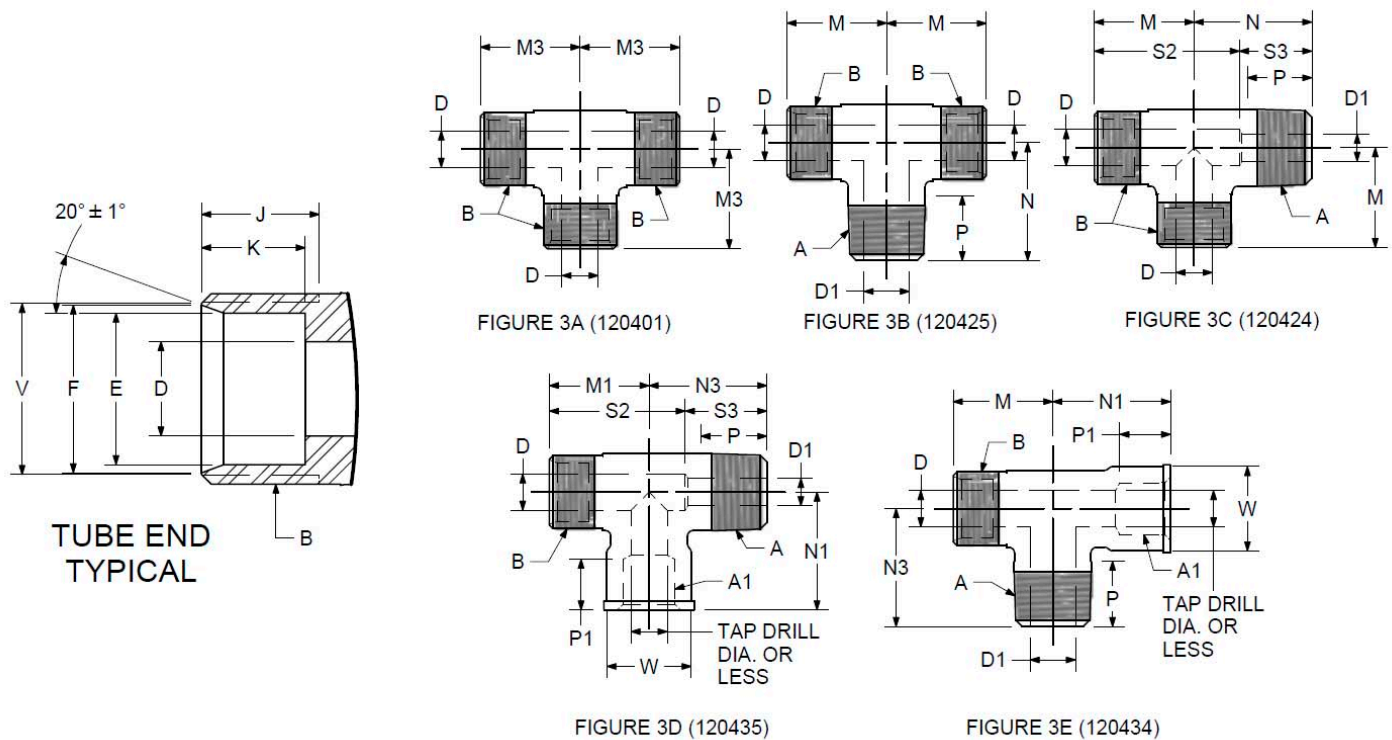


FIGURE 3 - TEES

NOTE: Unspecified detail with respect to dimensions, tolerances, contours, material, workmanship, etc., must conform to general specifications for spherical and flanged sleeve (compression) tube fittings. The dimensional designations on the tube end typical shall apply to all except as shown otherwise. Codes shown in brackets adjacent to figure numbers represent respective fitting identification in accordance with SAE J846.

FIGURES 1A THRU 3E