

FIGURE 11 - LONG NUT (070111)

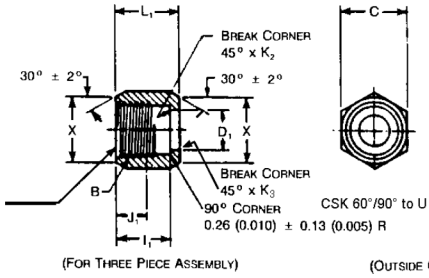


FIGURE 12 - SHORT NUT (070110)

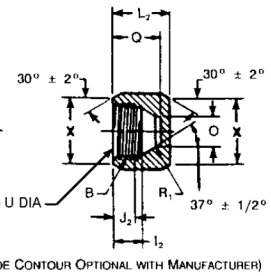


FIGURE 13 - CAP (070112)

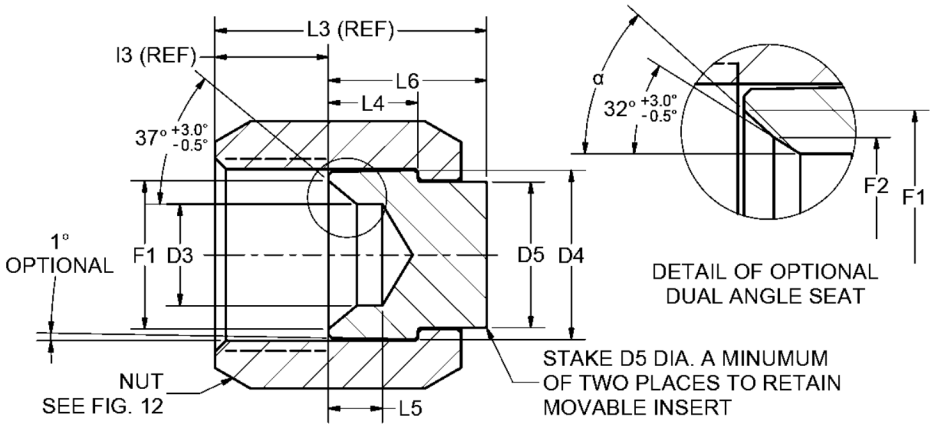


FIGURE 13 - CAP ASSEMBLY (MOVEABLE INSERT) (070112A)

TABLE 5 - DIMENSIONS OF STYLE A AND B NUTS AND CAPS (FIGURES 11 TO 13A)

Nom Tube, OD in	B Thread Size, in SAE J475 (ISO R725) Class 2B Int	Thread[b] Minor Dia mm +0.13 –0.00	Thread[b] Minor Dia in +0.005 –0.000	C[a] Hex Min in	D Dia mm +0.8 –0.00	D Dia in +0.003 –0.000	D_1 Dia mm	D_1 Dia tol –0.00	D_1 Dia in	D_1 Dia tol –0.000	D_3 Dia mm	D_3 Dia in	D_4 Dia mm +0.08 –0.00	D_4 Dia in +0.003 –0.000	D_5 Dia mm +0.13 –0.00	D_5 Dia in +0.005 –0.000	E Dia mm +0.13 –0.00	E Dia in +0.005 –0.000
1/8	5/16-24	6.91	0.272	3/8	3.30	0.130	4.55	+0.10	0.179	+0.004	2.39	0.094	6.71	0.264	4.24	0.167	4.65	0.183
3/16	3/8-24	8.48	0.334	7/16	4.90	0.193	6.12	+0.10	0.241	+0.004	3.96	0.156	8.28	0.326	5.82	0.229	6.25	0.246
1/4	7/16-20	9.86	0.388	9/16	6.48	0.255	7.72	+0.10	0.304	+0.004	4.37	0.172	9.65	0.380	7.42	0.292	7.82	0.308
5/16	1/2-20	11.46	0.451	5/8	8.08	0.318	9.47	+0.10	0.373	+0.004	5.94	0.234	11.23	0.442	9.17	0.361	9.42	0.371
3/8	9/16-18	12.90	0.508	11/16	9.65	0.380	11.15	+0.10	0.439	+0.004	7.54	0.297	12.68	0.499	10.85	0.427	11.00	0.433
1/2	3/4-16	17.48	0.688	7/8	12.83	0.505	14.43	+0.13	0.568	+0.005	9.93	0.391	17.25	0.679	14.15	0.557	14.17	0.558
5/8	7/8-14	20.42	0.804	1	16.03	0.631	17.68	+0.13	0.696	+0.005	12.29	0.484	20.17	0.794	17.40	0.685	17.63	0.694
3/4	1-1/16-12	24.87	0.979	1-1/4	19.20	0.756	21.13	+0.13	0.832	+0.005	14.27	0.562	24.61	0.969	20.85	0.821	21.06	0.829
3/4[c] SPL	1-1/16-12	24.87	0.979	1-1/4	—	—	21.84	+0.13	0.860	+0.005	—	—	—	—	—	—	—	—
7/8	1-3/16-12	28.04	1.104	1-3/8	22.38	0.881	24.36	+0.13	0.959	+0.005	18.26	0.719	27.78	1.094	24.08	0.948	24.49	0.964
1	1-5/16-12	31.22	1.229	1-1/2	25.55	1.006	27.61	+0.13	1.087	+0.005	21.44	0.844	30.96	1.219	27.33	1.076	27.91	1.099
1-1/4	1- 5/8-12	39.14	1.541	2	32.00	1.260	34.14	+0.15	1.344	+0.006	27.38	1.078	38.88	1.531	33.88	1.334	34.37	1.353
1-1/2	1- 7/8-12	45.49	1.791	2-1/4	38.35	1.510	41.00	+0.15	1.614	+0.006	33.32	1.312	45.24	1.781	40.73	1.604	40.72	1.603
2	2- 1/2-12	61.37	2.416	2-7/8	51.16	2.014	54.97	+0.15	2.164	+0.006	45.23	1.781	61.11	2.406	54.71	2.154	54.03	2.127

Continued on next page.

TABLE 5 - DIMENSIONS OF STYLE A AND B NUTS AND CAPS (FIGURES 11 TO 13A) (CONTINUED)

F_1 Dia mm 0.25	F_1 Dia in 0.01	F_2 Dia mm 0.13	F_2 Dia in 0.005	I mm ±0.13	I in ±0.005	I_1 mm ±0.3	I_1 in ±0.010	I_2 mm ±0.13	I_2 in ±0.005	I_3 mm Ref	I_3 in Ref	J Full Thread Min mm	J Full Thread Min in	J_1 Full Thread Min mm	J_1 Full Thread Min in	J_2 Full Thread Min mm	J_2 Full Thread Min in	K mm ±0.5	K in ±0.02	K_1 mm ±0.13	K_1 in ±0.005
4.85	0.190	2.67	0.105	7.16	0.282	11.7	0.460	5.94	0.234	5.74	0.226	5.5	0.215	6.2	0.246	4.2	0.167	2.3	0.09	0.25	0.010
6.20	0.245	4.32	0.170	7.95	0.313	12.9	0.506	6.76	0.266	7.29	0.287	6.2	0.246	7.0	0.277	5.0	0.198	2.3	0.09	0.25	0.010
7.35	0.290	6.35	0.250	9.52	0.375	13.5	0.532	8.33	0.328	8.36	0.329	7.5	0.295	7.5	0.295	6.2	0.245	2.3	0.09	0.25	0.010
8.90	0.350	7.93	0.312	9.52	0.375	14.7	0.579	8.74	0.344	9.14	0.360	7.5	0.295	8.3	0.326	6.6	0.261	2.3	0.09	0.25	0.010
10.90	0.430	8.89	0.350	9.78	0.385	15.3	0.603	8.74	0.344	8.56	0.337	7.5	0.297	8.3	0.328	6.6	0.261	2.3	0.09	0.25	0.010
14.35	0.565	12.70	0.500	11.13	0.438	18.4	0.723	9.52	0.375	10.41	0.410	8.6	0.339	9.4	0.370	7.0	0.276	3.0	0.12	0.25	0.010
17.15	0.675	15.88	0.625	13.23	0.521	20.8	0.817	11.91	0.469	13.61	0.536	10.4	0.409	11.6	0.456	9.0	0.354	4.8	0.19	0.25	0.010
21.45	0.845	17.65	0.695	15.09	0.594	22.0	0.868	12.70	0.500	14.91	0.587	11.8	0.464	11.8	0.464	9.4	0.370	4.8	0.19	0.25	0.010
—	—	—	—	—	—	22.0	0.868	—	—	—	—	11.8	0.464	—	—	—	—	—	—	—	—
24.65	0.970	20.83	0.820	15.09	0.594	23.2	0.914	13.49	0.531	16.08	0.633	11.8	0.464	13.0	0.511	10.2	0.401	4.8	0.19	0.25	0.010
27.80	1.095	24.00	0.945	15.88	0.625	24.4	0.962	14.30	0.563	16.89	0.665	12.6	0.495	14.2	0.558	11.0	0.433	4.8	0.19	0.25	0.010
35.70	1.405	29.85	1.175	15.88	0.625	25.8	1.017	14.30	0.563	16.31	0.642	12.6	0.495	14.2	0.558	11.0	0.433	6.4	0.25	0.25	0.010
41.15	1.620	35.81	1.410	17.98	0.708	29.7	1.170	16.66	0.656	19.41	0.764	14.7	0.578	16.7	0.656	13.4	0.526	6.4	0.25	0.25	0.010
56.75	2.235	48.51	1.910	22.22	0.875	37.1	1.462	21.03	0.828	22.45	0.884	18.9	0.745	21.3	0.839	17.7	0.698	7.9	0.31	0.38	0.015

K_2 mm ±0.13	K_2 in ±0.005	K_3 mm Max	K_3 in Max	L mm ±0.5	L in ±0.02	L_1 mm ±0.5	L_1 in ±0.020	L_2 mm ±0.3	L_2 in ±0.01	L_3 mm Ref	L_3 in Ref	L_4 mm ±0.4	L_4 in ±0.016	L_5 mm ±0.4	L_5 in ±0.016	L_6 mm ±0.4	L_6 in ±0.016	O Dia mm ±0.13	O Dia in ±0.005
0.13	0.005	0.5	0.020	21.3	0.84	14.0	0.550	12.7	0.500	15.27	0.601	5.9	0.234	3.2	0.125	9.5	0.375	1.57	0.062
0.13	0.005	0.5	0.020	23.9	0.94	15.5	0.610	14.3	0.562	16.81	0.662	5.6	0.219	3.2	0.125	9.5	0.375	3.18	0.125
0.13	0.005	0.5	0.020	25.4	1.00	15.8	0.620	15.1	0.594	17.09	0.673	5.2	0.203	3.2	0.125	8.7	0.344	4.37	0.172
0.13	0.005	0.5	0.020	26.9	1.06	17.3	0.680	15.5	0.609	19.46	0.766	5.6	0.219	3.6	0.141	10.3	0.406	5.94	0.234
0.25	0.010	0.5	0.020	27.7	1.09	18.5	0.730	15.9	0.625	20.47	0.806	6.8	0.266	4.0	0.156	11.9	0.469	7.54	0.297
0.25	0.010	0.5	0.020	32.5	1.28	21.6	0.850	19.0	0.750	23.93	0.942	8.0	0.313	4.4	0.172	13.5	0.531	9.93	0.391
0.25	0.010	1.0	0.040	37.6	1.48	24.9	0.980	21.4	0.844	27.10	1.067	7.1	0.281	4.8	0.188	13.5	0.531	12.29	0.484
0.25	0.010	1.0	0.040	42.2	1.66	26.2	1.030	23.0	0.906	31.57	1.243	7.1	0.281	8.0	0.313	16.7	0.656	15.47	0.609
—	—	1.0	0.040	—	—	26.2	1.030	—	—	—	—	—	—	—	—	—	—	—	—
0.25	0.010	1.0	0.040	46.0	1.81	27.7	1.090	24.6	0.969	31.95	1.258	7.1	0.281	6.4	0.250	15.9	0.625	18.26	0.719
0.25	0.010	1.0	0.40	49.3	1.94	28.7	1.130	25.8	1.016	32.76	1.290	7.6	0.297	5.6	0.219	15.9	0.625	21.44	0.844
0.25	0.010	1.0	0.40	55.6	2.19	31.2	1.230	27.0	1.062	35.35	1.392	9.5	0.375	7.1	0.281	19.1	0.750	27.38	1.078
0.25	0.010	1.0	0.40	58.7	2.31	36.1	1.420	30.2	1.188	43.20	1.701	10.3	0.406	9.5	0.375	23.8	0.938	33.32	1.312
0.38	0.015	1.0	0.40	69.8	2.75	44.5	1.750	36.5	1.438	52.60	2.071	14.7	0.578	10.3	0.406	30.1	1.188	45.24	1.781

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TABLE 5 - DIMENSIONS OF STYLE A AND B NUTS AND CAPS (FIGURES 11 TO 13A) (CONTINUED)

Q mm ±0.3	Q in ±0.010	R Rad mm ±0.3	R Rad in ±0.01	R_1 Rad mm ±0.3	R_1 Rad in ±0.01	T mm ±0.5	T in ±0.02	U Dia mm +0.4 –0.0	U Dia in +0.016 –0.000	X mm ±0.3	X in ±0.01	α ° +3.0° -0.5°
11.1	0.438	0.8	0.03	0.8	0.03	6.4	0.25	8.05	0.317	9.1	0.36	47
12.7	0.500	0.8	0.03	0.8	0.03	6.9	0.27	9.65	0.380	10.7	0.42	47
13.5	0.531	0.8	0.03	0.8	0.03	8.4	0.33	11.25	0.443	13.7	0.54	47
13.9	0.547	0.8	0.03	0.8	0.03	8.4	0.33	12.83	0.505	15.2	0.60	47
14.3	0.562	1.3	0.05	1.5	0.06	8.6	0.34	14.40	0.567	17.0	0.67	47
15.9	0.625	1.5	0.06	1.5	0.06	11.4	0.45	19.18	0.755	21.8	0.86	47
18.3	0.719	1.5	0.06	1.5	0.06	13.2	0.52	22.35	0.880	24.9	0.98	47
19.8	0.781	2.0	0.08	1.5	0.06	16.3	0.64	27.10	1.067	31.5	1.24	42
—	—	2.3	0.09	1.5	0.06	17.5	0.69	30.30	1.193	34.5	1.36	—
21.4	0.844	—	—	—	—	—	—	30.30	1.193	34.5	1.36	42
21.8	0.859	2.3	0.09	1.5	0.06	18.5	0.73	33.45	1.317	37.6	1.48	42
23.0	0.906	2.3	0.09	1.5	0.06	18.5	0.73	41.40	1.630	50.3	1.98	42
26.2	1.031	2.8	0.11	1.5	0.06	21.1	0.83	47.75	1.880	56.9	2.24	42
32.5	1.281	2.8	0.11	1.5	0.06	23.4	0.92	63.63	2.505	72.6	2.86	42

(a) Across flat widths must fit standard wrench openings.
(b) Modified minor diameter.
(c) For use with 20 mm sleeve specified in Table 6A.

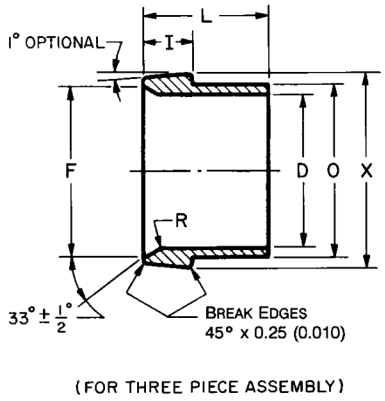


FIGURE 14 - SLEEVE (070115)

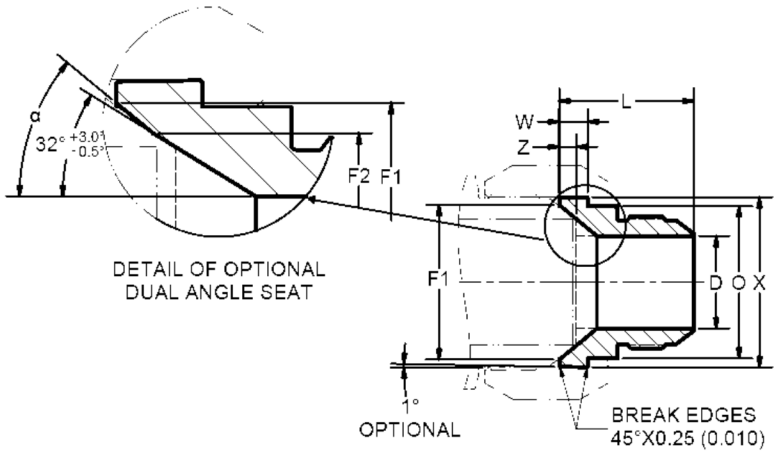


FIGURE 15 - REDUCING ADAPTER WITHOUT LARGE NUT (070123)

TABLE 6 - DIMENSIONS FOR SLEEVES (FIGURE 14) FOR INCH TUBING

Nom Tube OD, in	D Dia mm +0.08 –0.00	D Dia in +0.003 –0.000	F Dia mm ±0.13	F Dia in ±0.005	I mm ±0.5	I in ±0.02	L mm ±0.5	L in ±0.02	O Dia mm +0.00 –0.08	O Dia in +0.000 –0.003	R Rad mm ±0.3	R Rad in ±0.01	X Dia mm +0.00 –0.08	X Dia in +0.000 –0.003
1/8	3.30	0.130	5.21	0.205	3.0	0.12	8.6	0.34	4.37	0.172	0.8	0.031	6.78	0.267
3/16	4.90	0.193	6.78	0.267	3.6	0.14	8.6	0.34	5.94	0.234	0.8	0.031	8.36	0.329
1/4	6.48	0.255	8.00	0.315	3.6	0.14	10.4	0.41	7.54	0.297	0.8	0.031	9.73	0.383
5/16	8.08	0.318	9.52	0.375	4.1	0.16	11.2	0.44	9.30	0.366	0.8	0.031	11.30	0.445
3/8	9.65	0.380	11.20	0.441	4.3	0.17	12.7	0.50	10.97	0.432	1.2	0.047	12.75	0.502
1/2	12.83	0.505	14.96	0.589	5.6	0.22	14.2	0.56	14.27	0.562	1.6	0.062	17.32	0.682
5/8	16.03	0.631	17.91	0.705	6.1	0.24	16.8	0.66	17.53	0.690	1.6	0.062	20.24	0.797
3/4	19.20	0.756	22.35	0.880	6.6	0.26	17.3	0.68	20.98	0.826	2.0	0.078	24.69	0.972
7/8	22.38	0.881	25.53	1.005	6.6	0.26	19.3	0.76	24.21	0.953	2.4	0.094	27.86	1.097
1	25.55	1.006	28.70	1.130	7.1	0.28	19.8	0.78	27.46	1.081	2.4	0.094	31.04	1.222
1-1/4	32.00	1.260	35.86	1.412	7.9	0.31	23.1	0.91	34.01	1.339	2.4	0.094	38.96	1.534
1-1/2	38.35	1.510	41.40	1.630	8.6	0.34	28.4	1.12	40.87	1.609	2.8	0.109	45.31	1.784
2	51.16	2.014	55.75	2.195	10.4	0.41	30.2	1.19	54.84	2.159	2.8	0.109	61.19	2.409

TABLE 6A - DIMENSIONS FOR SLEEVES (FIGURE 14) FOR METRIC TUBING[(c)]

Nom Tube OD, mm	D Dia mm 0.08 –0.00	D Dia in +0.003 –0.000	F Dia mm ±0.13	F Dia in ±0.005	I mm ±0.5	I in ±0.02	L mm ±0.5	L in ±0.02	O Dia mm +0.00 –0.08	O Dia in +0.000 –0.003	R Rad in ±0.30	R Rad in ±0.010	X Dia mm +0.00 –0.08	X Dia in +0.000 –0.003	In Size Body[(a)] and Nut
6	6.13	0.241	8.00	0.315	3.6	0.14	10.4	0.41	7.54	0.297	0.80	0.031	9.73	0.383	1/4
8	8.13	0.320	9.52	0.375	4.1	0.16	11.2	0.44	9.30	0.366	0.80	0.031	11.30	0.445	5/16
10	10.13	0.399	11.20	0.441	4.3	0.17	12.7	0.50	10.97	0.432	1.20	0.047	12.75	0.502	3/8
12	12.13	0.478	14.96	0.589	5.6	0.22	14.2	0.56	14.27	0.562	1.60	0.062	17.32	0.682	1/2
16	16.15	0.636	17.91	0.705	6.1	0.24	16.8	0.66	17.53	0.690	1.60	0.062	20.24	0.797	5/8
19[(b)]	19.20	0.756	22.35	0.880	6.6	0.26	17.3	0.68	20.98	0.826	2.00	0.078	24.69	0.972	3/4
20[(d)(e)]	20.15	0.793	22.6	0.886	6.6	0.26	17.3	0.68	21.64	0.852	2.00	0.078	24.69	0.972	3/4 SPL
20	20.15	0.793	25.53	1.005	6.6	0.26	19.3	0.76	24.21	0.953	2.40	0.094	27.86	1.097	7/8
25	25.15	0.990	28.70	1.130	7.1	0.28	19.8	0.78	27.46	1.081	2.40	0.094	31.04	1.222	1
32	32.25	1.270	35.86	1.412	7.9	0.31	23.1	0.91	34.01	1.339	2.40	0.094	38.96	1.534	1-1/4
38[(b)]	38.35	1.510	41.40	1.630	8.6	0.34	28.4	1.12	40.87	1.609	2.80	0.109	45.31	1.784	1-1/2
50	50.36	1.983	55.75	2.195	10.4	0.41	30.2	1.19	54.84	2.159	2.80	0.109	61.19	2.409	2

(a) With the exception of the 20 mm tube sleeve which requires use of the 3/4 SPL nut (footnote d), metric sleeves are used with standard Figure 12 (070110) tube nuts and standard fitting bodies shown in Figures 2a to 10c (Table 4) and Figure 15 (Table 7).
(b) 19 mm and 38 mm are shown only because they use the standard 3/4 and 1-1/2 size Figure 14 sleeve and there is apparent usage.
(c) In addition to plating, sleeves for metric tubing will be dyed blue for identification.
(d) Designed for use with a 3/4 SPL nut which is equivalent to the –12 nut shown in Figure 12, Table 5 with the D_1 diameter modified to 0.860 + 0.005/–0.000.
(e) Technically equivalent to the 20 mm tube sleeve specified in ISO 8434-2.

TABLE 7 - DIMENSIONS[(a)] OF REDUCING ADAPTER (FIGURE 15)

Tube Reduction, in	D Dia Ref mm	D Dia Ref in	F1 Dia mm +0.13 –0.40	F1 Dia in +0.005 –0.016	L mm ±0.5	L in ±0.02	O Dia mm +0.00 –0.08	O Dia in +0.000 –0.003	W mm ±0.5	W in ±0.02	X Dia mm +0.00 –0.08	X Dia in +0.00 –0.003	Z mm ±0.5	Z in ±0.02
3/8 x 1/4	4.4	0.172	11.20	0.441	24.6	0.97	10.97	0.432	4.3	0.17	12.75	0.502	—	—
1/2 x 1/4	4.4	0.172	14.96	0.589	25.4	1.00	14.27	0.562	5.6	0.22	17.32	0.682	—	—
1/2 x 3/8	7.5	0.297	14.96	0.589	25.4	1.00	14.27	0.562	5.6	0.22	17.32	0.682	—	—
5/8 x 1/4	4.4	0.172	17.91	0.705	26.2	1.03	17.53	0.690	5.8	0.23	20.24	0.797	—	—
5/8 x 3/8	7.5	0.297	17.91	0.705	26.2	1.03	17.53	0.690	5.8	0.23	20.24	0.797	—	—
3/4 x 1/4	4.4	0.172	22.35	0.880	27.7	1.09	20.98	0.826	6.9	0.27	24.69	0.972	10.4	0.41
3/4 x 3/8	7.5	0.297	22.35	0.880	27.7	1.09	20.98	0.826	6.9	0.27	24.69	0.972	—	—
3/4 x 1/2	9.9	0.391	22.35	0.880	30.2	1.19	20.98	0.826	6.9	0.27	24.69	0.972	—	—
1 x 3/4	15.5	0.609	28.70	1.130	37.3	1.47	27.46	1.081	7.1	0.28	31.04	1.222	—	—

(a) For dimensions in Figure 15 not specified in above table, see corresponding dimensions for the specified outside diameter in Table 4.

6. SECTION 2—FLARELESS TUBE FITTINGS

The flareless tube fittings shall be as shown in Figures 16 to 32 and Tables 8 to 12. The basic design of these fittings is derived from existing military standards.

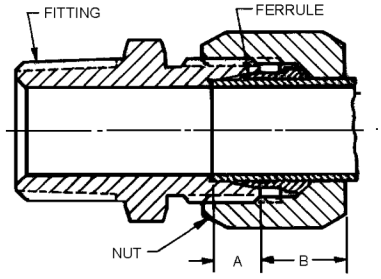


FIGURE 16A - ASSEMBLY WITH STYLE A FERRULE (FIGURE 28)

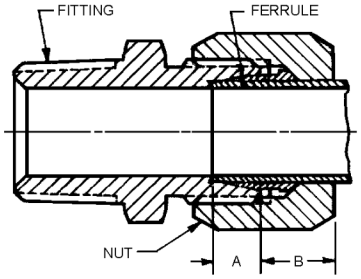


FIGURE 16B - ASSEMBLY WITH STYLE B FERRULE (FIGURE 29)

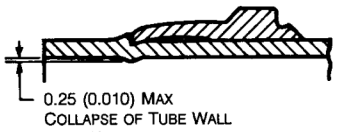


FIGURE 17 - ENLARGED VIEW OF STYLE A FERRULE BITE

FIGURE 16 - DETAILS OF FLARELESS HYDRAULIC TUBE FITTING ASSEMBLIES

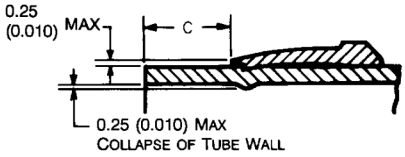


FIGURE 18 - ENLARGED VIEW OF STYLE B FERRULE BITE