

INCH-POUND

MS33786B  
12 February 2013  
SUPERSEDING  
MS33786A  
1 February 1985

DETAIL SPECIFICATION SHEET  
FITTING, INSTALLATION, FLARED TUBE  
AND HOSE, SWIVEL

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet.

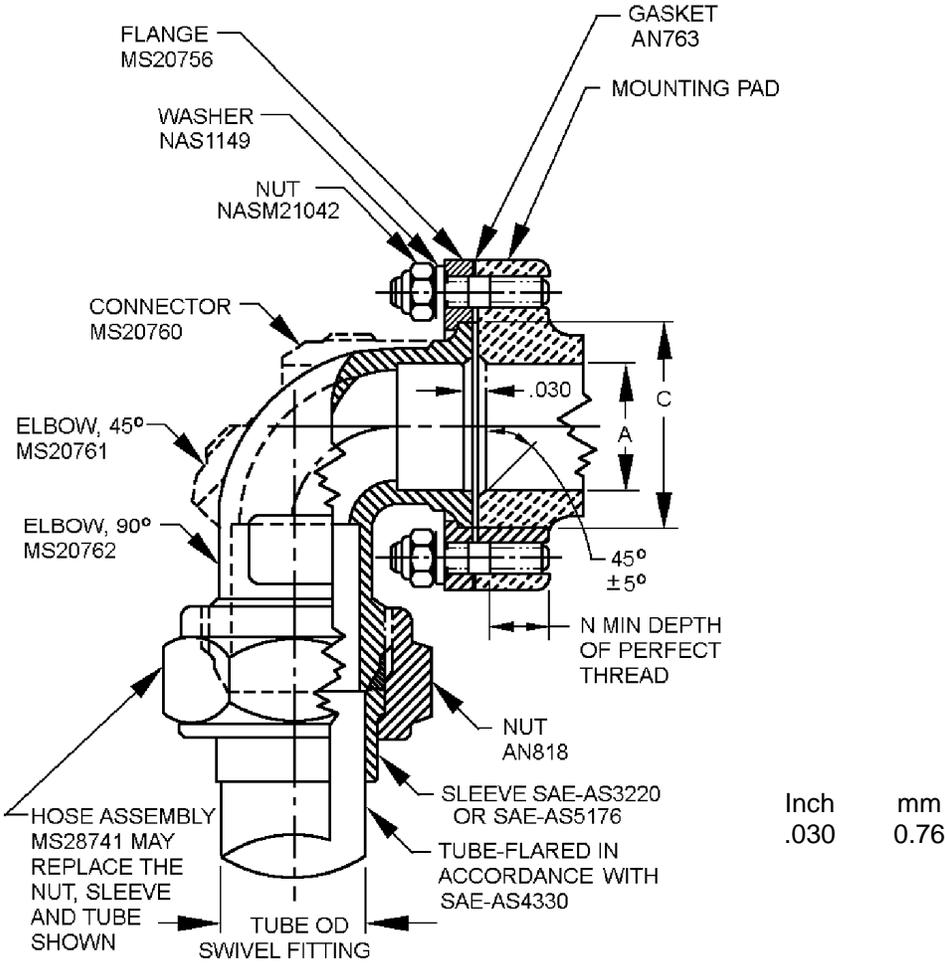


FIGURE 1. Installation swivel fitting, flared tube, dimensions and configurations.

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Size code number	Nominal tube and hose size (ref) inch (mm)	A dia. $\pm 0.003$ (0.08)	C dia. $+0.000$ $-0.005$ (0.13) inch (mm)	N (see note 5) inch (mm)	E inch (mm)	
-8	.500 (12.70)	.383 (9.73)	.875 (22.23)	.281 (7.14)	1.390 (35.31)	$\pm 0.016$ (0.41)
-10	.625 (15.88)	.469 (11.91)	1.000 (25.40)		1.468 (37.29)	
-12	.750 (19.05)	.609 (15.47)	1.250 (31.75)		1.594 (40.49)	
-12-16			1.500 (38.10)		1.750 (44.45)	
-16	1.000 (25.40)	.844 (21.44)	1.844 (46.84)		.375 (9.53)	
-20	1.250 (31.75)	1.078 (27.38)	2.125 (53.98)	2.375 (60.33)		
-20-24			1.500 (38.10)	1.312 (33.32)		3.000 (76.20)
-24	1.500 (38.10)	1.312 (33.32)	2.750 (69.85)	.469 (11.91)	4.000 (101.60)	
-32	2.000 (50.80)	1.781 (45.24)	3.281 (83.34)		4.500 (114.30)	
-40	2.500 (63.50)	2.281 (57.94)	3.781 (96.04)			
-48	3.000 (76.20)	2.781 (70.64)				

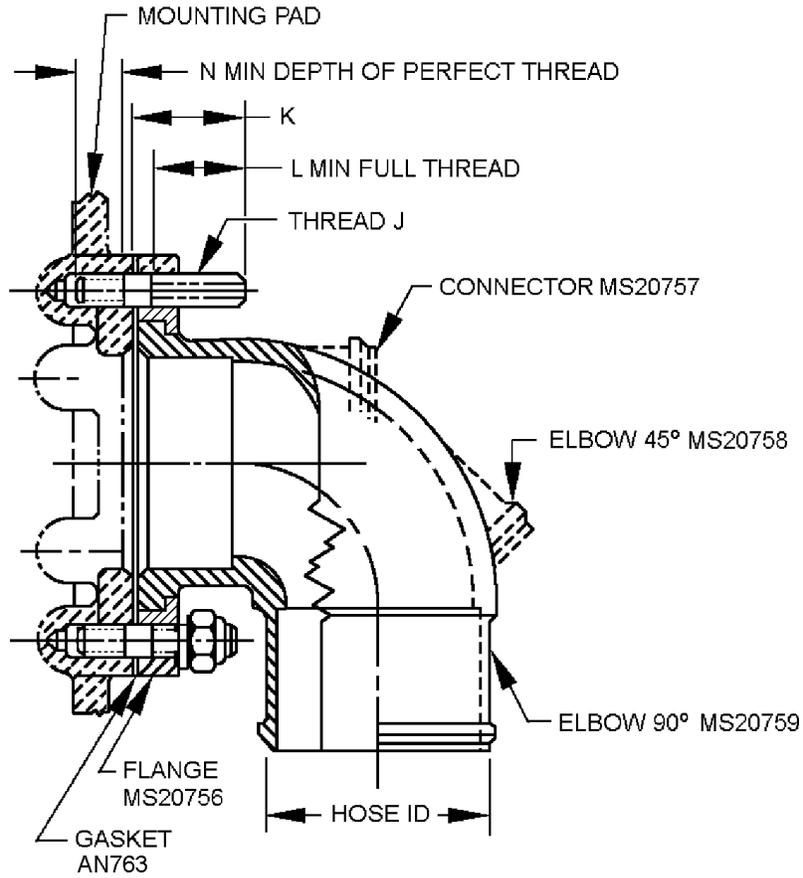
Size code number	Wrench torque (see note 6) inch-lbs (Nm)
-8	40 (4.5)
-10	
-12	
-12-16	
-16	
-20	100 (11.3)
-20-24	
-24	
-32	225 (25.4)
-40	
-48	

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise noted tolerances are  $\pm 0.005$  (0.76 mm), angles  $\pm 5^\circ$ .
4. Detail design and construction of swivel fitting mounting pad optional except that gasket sealing surfaces, as noted, shall be finished smooth with a surface roughness not to exceed  $150\mu$ -in Ra. Surface finish shall be in accordance with ASME B46.1.
5. Dimension "N" for studs and cap screws only.
6. Tabulated torque values indicate limits for proper sealing of fitting to pad.

FIGURE 1. Installation swivel fitting, flared tube, dimensions and configurations - Continued.

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SWIVEL FITTING  
HOSE CONNECTION INSTALLATION

Size code number	Thread J in accordance with MIL-S-7742 (see note 5)	K inch (mm)	L inch (mm)	N inch (mm)
-8	10-32NF-3A	.625 (15.88)	.500 (12.70)	.281 (7.14)
-10				
-12				
-12-16				
-16				
-20	.2500-28UNF-3A	.688 (17.48)	.562 (14.27)	.375 (9.53)
-20-24		.750 (19.05)	.625 (15.88)	
-24				
-32	.3125-24UNF-3A	.812 (20.62)	.688 (17.48)	.469 (11.91)
-40				
-48				

FIGURE 2. Installation swivel fitting, hose connection, dimensions and configurations.

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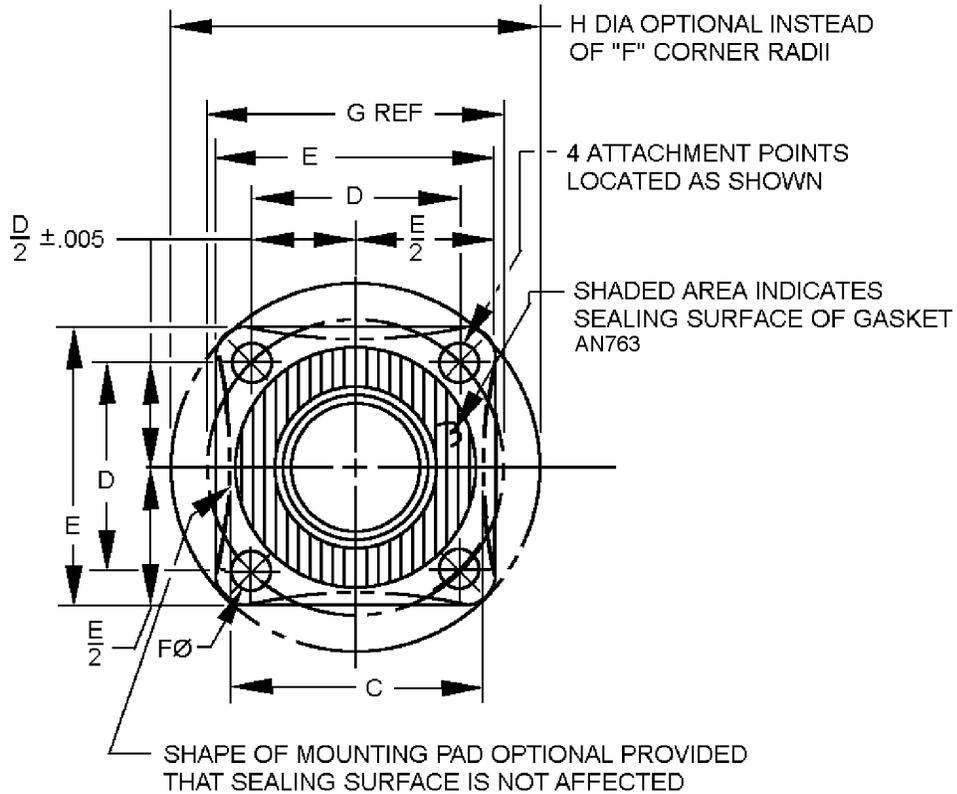
Size code number	Wrench torque (see note 6) inch-lbs (Nm)
-8	40 (4.5)
-10	
-12	
-12-16	
-16	
-20	100 (11.3)
-20-24	
-24	
-32	225 (25.4)
-40	
-48	

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise noted tolerances are  $\pm 0.005$  (0.13 mm), angles  $\pm 5^\circ$ .
4. Detail design and construction of swivel fitting mounting pad optional except that gasket sealing surfaces, as noted, shall be finished smooth with a surface roughness not to exceed  $150\mu\text{-in Ra}$ . Surface finish shall be in accordance with ASME B46.1.
5. Thread J applies to external portion of studs and internal tapped thread for cap screws.
6. Tabulated torque values indicate limits for proper sealing of fitting to pad.

FIGURE 2. Installation swivel fitting, hose connection, dimensions and configurations - Continued.

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SQUARE MOUNTING FOR  
FITTINGS -8 THRU -32

Inch     mm  
.005     0.13

Size code number	Nominal tube and hose size (ref) inch (mm)	C dia. +.000 (0.13) inch (mm)	D ±.005 (0.13) inch (mm)	E inch (mm)	
-8	.500 (12.70)	.875 (22.23)	.950 (24.13)	1.390 (35.31)	±.016 (0.41)
-10	.625 (15.88)	1.000 (25.40)	1.308 (33.22)	1.468 (37.29)	
-12	.750 (19.05)	1.125 (28.58)	1.156 (29.36)	1.594 (40.49)	
-12-16		1.500 (38.10)	1.312 (33.32)	1.750 (44.45)	
-16	1.000 (25.40)	1.844 (46.84)	1.656 (42.06)	2.188 (55.58)	±.020 (0.51)
-20	1.250 (31.75)	2.125 (53.98)	1.812 (46.02)	2.375 (60.33)	
-20-24	1.500 (38.10)				
-24	1.500 (38.10)	2.750 (69.85)	2.375 (60.33)	3.000 (76.20)	
-32	2.000 (50.80)				

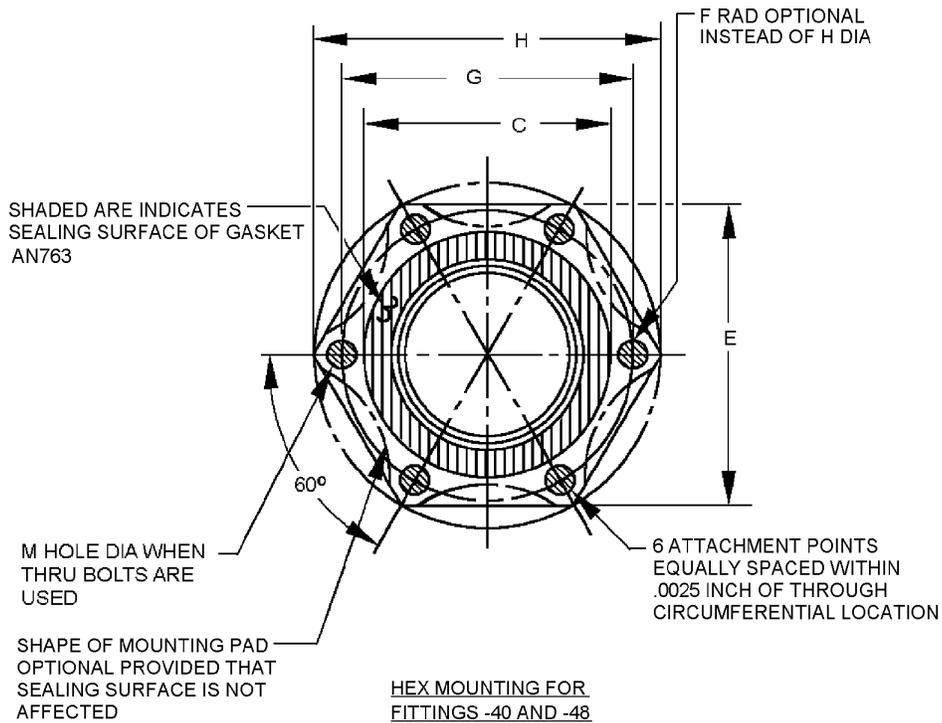
FIGURE 3. Square mounting for fittings -8 through -32, dimensions and configuration.

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Size code number	F rad. inch (mm)	G dia. ±.005 (0.13) inch (mm)
-8	.219 (5.56)	1.344 (34.14)
-10		1.468 (37.29)
-12		1.635 (41.53)
-12-16		1.855 (47.12)
-16		
-20	.266 (6.76)	2.342 (59.49)
-20-24	.281 (7.14)	2.562 (65.07)
-24		
-32	.312 (7.92)	3.359 (85.32)

FIGURE 3. Square mounting for fittings -8 through -32, dimensions and configuration - Continued.

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Inch .0025  
mm 0.064

Size code number	Nominal tube and hose size (ref) inch (mm)	C dia. +.000 -.005 (0.13) inch (mm)	E inch (mm)	F rad. inch (mm)
-40	2.500 (63.50)	3.281 (83.34)	4.000 (101.60)	.375 (9.53)
-48	3.000 (76.20)	3.781 (96.04)	4.500 (114.30)	.625 (15.88)

Size code number	G dia. ±.005 (0.13) inch (mm)	H dia. inch (mm)	Thread J in accordance with MIL-S-7742 (see note 5)	M bolt hole +.010 (0.25) -.000 inch (mm)
-40	3.812 (96.82)	4.500 (114.30)	.3125-24UNF-3A	.328 (8.33)
-48	4.312 (109.52)	5.000 (127.00)		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise noted tolerances are ±.005 (0.76 mm), angles ±.5°.
4. Detail design and construction of swivel fitting mounting pad optional except that gasket sealing surfaces, as noted, shall be finished smooth with a surface roughness not to exceed 150µ-in Ra. Surface finish shall be in accordance with ASME B46.1.
5. Thread J applies to external portion of studs and internal tapped thread for cap screws.

FIGURE 4. Installation hex mounting -40 and -48, dimensions and configurations.

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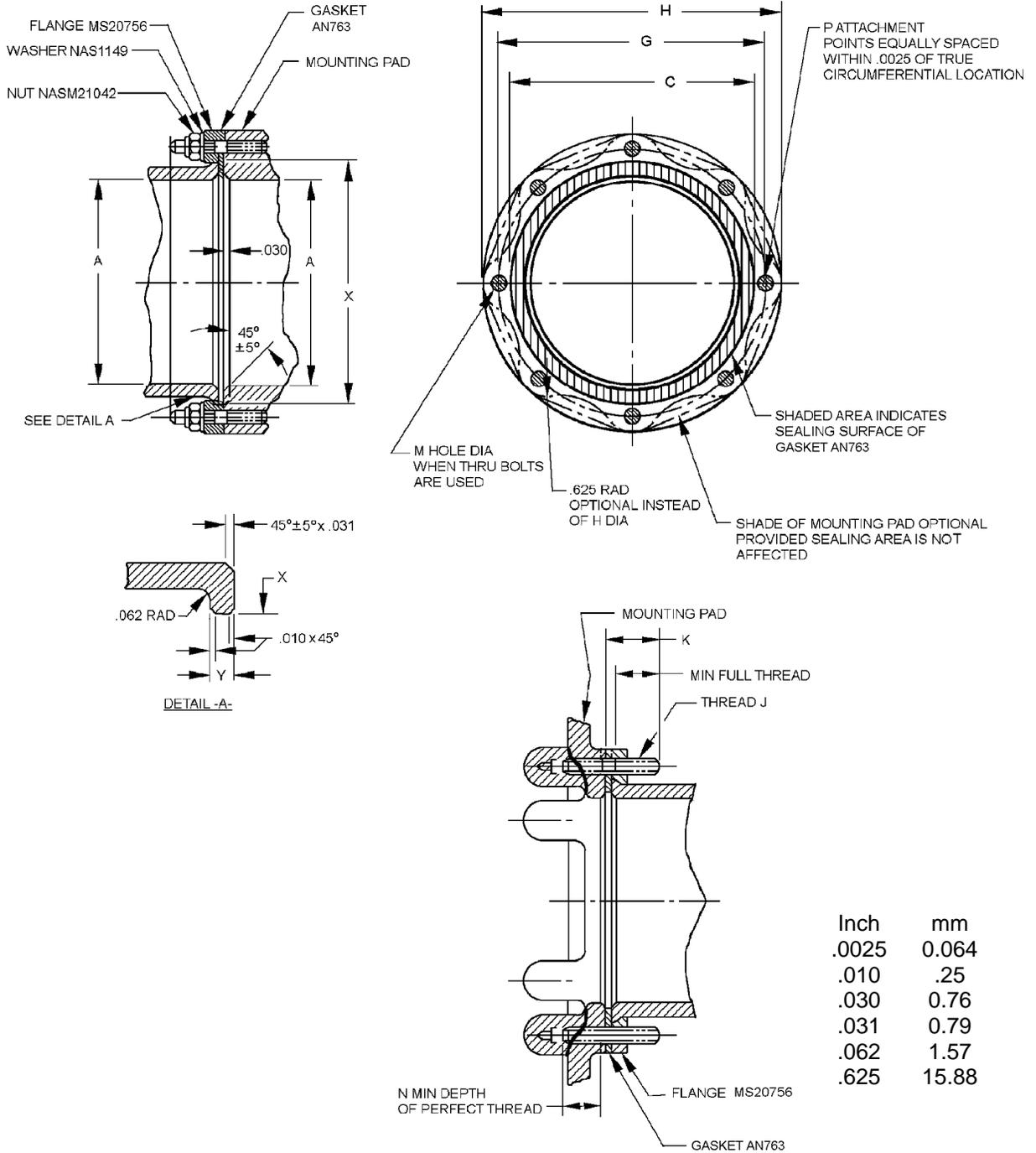


FIGURE 5. Installation (56 through 112) dimensions and configurations.

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Size code number	Nominal tube and hose size (ref) inch (mm)	A dia. +.050 (1.27) - .005 (0.13)	C dia. inch (mm)		G dia, ±.005 (0.13) inch (mm)
56	3.500 (88.90)	3.281 (88.34)	4.281 (108.74)	+.020 (0.51) -.000	4.875 (123.83)
64	4.000 (101.60)	3.781 (96.04)	4.781 (121.44)		5.438 (138.13)
80	5.000 (127.00)	4.781 (121.44)	5.781 (146.84)	+.030 (0.76) -.000	6.438 (163.53)
96	6.000 (152.40)	5.781 (146.84)	6.781 (172.24)		7.438 (188.93)
112	7.000 (177.80)	6.781 (172.24)	7.781 (197.64)		8.500 (215.90)

Size code number	H dia. min inch (mm)	Thread J in accordance with MIL-S-7742 (see note 5)	K ±.020 (0.51) inch (mm)	L	M Bolt hole +.010 (0.25) - .000 inch (mm)
56	5.562 (141.27)	.3125-24UNF-3A	.812 (20.62)	.688 (17.48)	.328 (8.33)
64	6.125 (155.58)				
80	7.125 (180.98)				
96	8.125 (206.38)				
112	9.188 (233.38)				

Size code number	N (see note 6) inch (mm)	P Attachment points	X inch (mm)		Y +.005 (0.13) - .000 inch (mm)
56	.469 (11.91)	8	4.214 (107.04)	+.000 -.010 (0.25)	.188 (4.78)
64			4.777 (121.34)		
80		10	5.777 (146.74)	+.000 -.020 (0.51)	.208 (5.28)
96		12	6.777 (172.14)		
112		14	7.840 (199.14)		

Size code number	Wrench torque (see note 7) inch-pounds (Nm)
56	225 (25.4)
64	
80	
96	
112	

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise noted tolerances are ±.005 (0.76 mm), angles ±.5°.
4. Detail design and construction of swivel fitting mounting pad optional except that gasket sealing surfaces, as noted, shall be finished smooth with a surface roughness not to exceed 150µ-in Ra. Surface finish shall be in accordance with ASME B46.1.
5. Thread J applies to external portion of studs and internal tapped thread for cap screws.
6. For studs and cap screws only.
7. Tabulated torque values indicate limits for proper sealing of fitting to pad.

FIGURE 5. Installation (56 through 112) dimensions and configurations - Continued.

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REQUIREMENTS:

This is a design standard and not to be used as a Part or Identifying Number (PIN).

Dimensions and configuration shall be in accordance with figures 1, 2, 3, 4, and 5.

For design features purposes, this standard takes precedence over documents referenced herein.

Connectors have fixed or integral mounting flanges, but all fittings provided for a given tube size are fully interchangeable in mounting dimensions.

Mounting with studs, standard thru-bolts with self-locking nuts or cap screws with heads lockwired and threaded into helical coil or threaded inserts for soft metals.

This part is designed for use in fuel and oil systems with maximum operating pressures in accordance with table I.

TABLE I. Maximum operating pressure.

Size code number	Material	PSI	MPa
-8 thru -16	Aluminum alloy	1500	10.3
-20 thru -48	Aluminum alloy	500	3.4
-56 thru -112	Aluminum alloy	200	1.4

Maximum operating temperature 275°F (135°C).

Referenced documents shall be of the issue in effect on date of invitation for bid. For design feature purposes, this standard takes precedence over procurement documents referenced herein.

Changes from previous issues. Marginal notations are not used in this revision to identify changes with respect to the previous issue due to the extent of the changes.

Referenced documents. This document references the following:

AN763	MS20759	NASM21042
AN818	MS20760	NAS1149
MIL-S-7742	MS20761	SAE-AS3220
MS20756	MS20762	SAE-AS4330
MS20757	MS28741	SAE-AS5176
MS20758	ASME B46.1	

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CONCLUDING MATERIAL

Custodians:

Army - AV  
Navy - AS  
Air Force - 99  
DLA - CC

Preparing activity:  
DLA - CC

(Project 4730-2012-081)

Review activities:

Army - MI  
Navy - MC, SA  
Air Force - 71

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.