

INCH-POUND

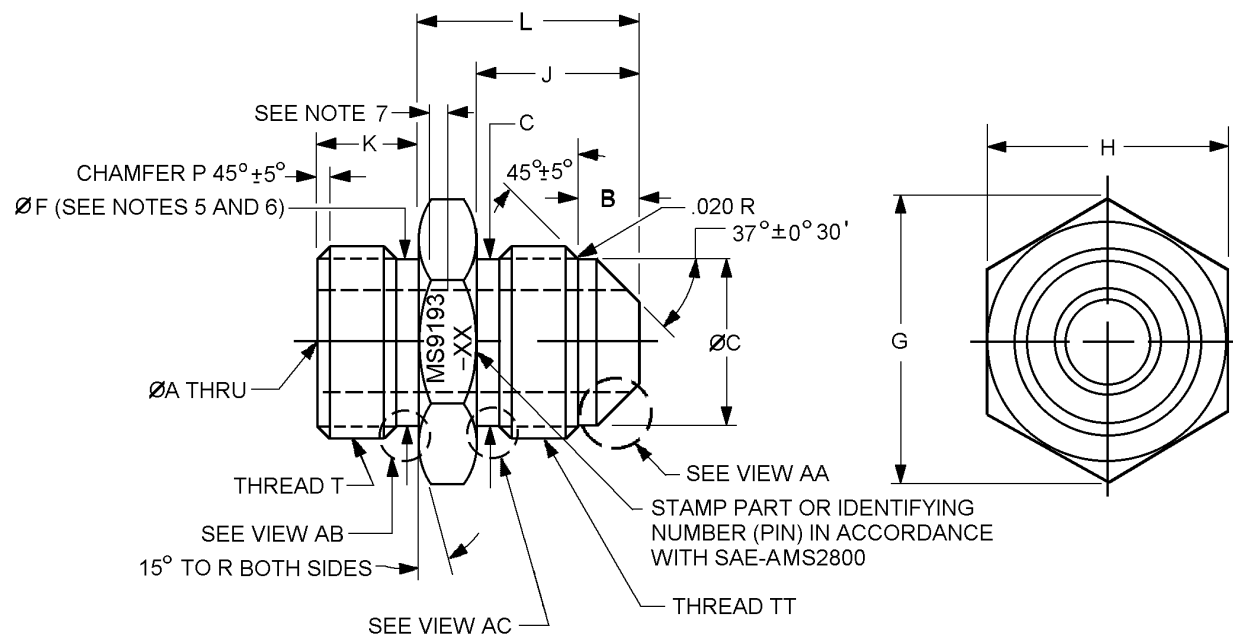
MS9193A
 16 February 2010
 SUPERSEDING
 MS9193 (ASG)
 11 April 1960

DETAIL SPECIFICATION SHEET

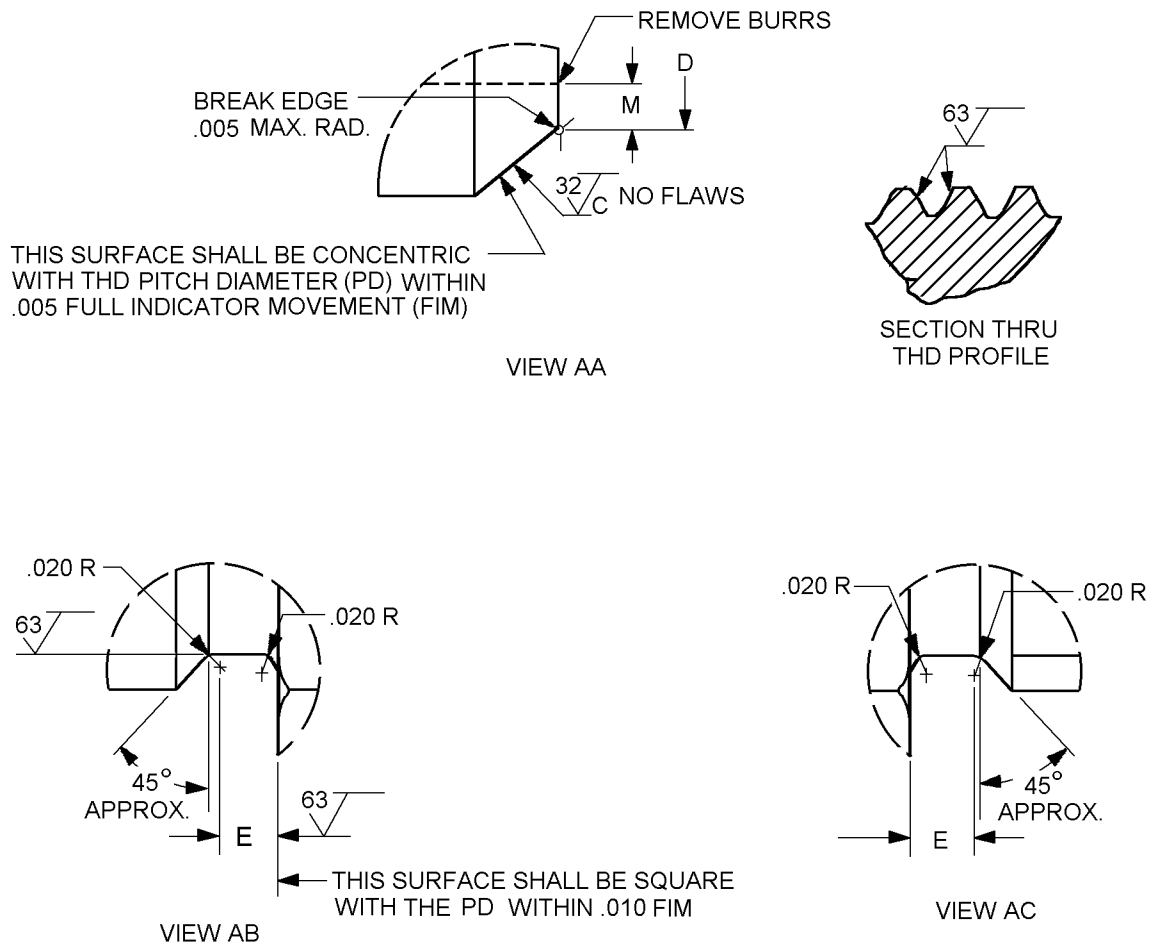
NIPPLE, TUBE - SAE-AMS5639, BOSS

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 and
 SAE-AS4841.

FIGURE 1. Nipple, tube, boss.

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Inches	mm
.005	0.13
.010	0.25
.020	0.51

FIGURE 1. Nipple, tube, boss - Continued.

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Dash number	Tube OD (reference) inches (mm)	A inches (mm)		B inches (mm) +.015 (0.38) -.000	C diameter inches (mm) +.000 -.010 (0.25)
-02	.125 (3.18)	.058 (1.47)	- .065 (1.65)	.144 (3.66)	.245 (6.22)
-03	.188 (4.78)	.121 (3.07)	- .128 (3.25)	.144 (3.66)	.307 (7.80)
-04	.250 (6.35)	.168 (4.27)	- .175 (4.45)	.160 (4.06)	.359 (9.12)
-05	.313 (7.95)	.230 (5.84)	- .237 (6.02)	.160 (4.06)	.421 (10.69)
-06	.375 (9.53)	.293 (7.44)	- .301 (7.65)	.165 (4.19)	.476 (12.09)
-07	.438 (11.13)	.355 (9.02)	- .363 (9.22)	.165 (4.19)	.539 (13.69)
-08	.500 (12.70)	.387 (9.83)	- .395 (10.03)	.229 (5.82)	.654 (16.61)
-09	.562 (14.27)	.434 (11.02)	- .442 (11.23)	.229 (5.82)	.716 (18.19)
-10	.625 (15.88)	.480 (12.19)	- .488 (12.40)	.255 (6.48)	.767 (19.48)
-11	.688 (17.48)	.542 (13.77)	- .552 (14.02)	.304 (7.72)	.875 (22.23)
-12	.750 (19.05)	.604 (15.34)	- .614 (15.60)	.304 (7.72)	.938 (23.83)
-14	.875 (22.23)	.729 (18.52)	- .739 (18.77)	.304 (7.72)	1.062 (26.97)
-16	1.000 (25.40)	.839 (21.31)	- .851 (21.62)	.312 (7.92)	1.188 (30.18)
-18	1.125 (28.58)	.948 (24.08)	- .960 (24.38)	.312 (7.92)	1.375 (34.93)
-20	1.250 (31.75)	1.073 (27.25)	- 1.086 (27.58)	.363 (9.22)	1.500 (38.10)
-24	1.500 (38.10)	1.307 (33.20)	- 1.320 (33.53)	.374 (9.50)	1.750 (44.45)
-28	1.750 (44.45)	1.542 (39.17)	- 1.557 (39.55)	.447 (11.35)	2.125 (53.98)
-32	2.000 (50.80)	1.776 (45.11)	- 1.791 (45.49)	.457 (11.61)	2.375 (60.33)

FIGURE 1. Nipple, tube, boss - Continued.

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Dash number	D diameter inches (mm) ±.003 (0.08)	E inches (mm)	F diameter inches (mm) +.002 (0.05) -.003 (0.08) (see notes 4 and 5)	G minimum inches (mm)	H inches (mm)
-02	.132 (3.35)	.063 (1.60)	.250 (6.35)	.631 (16.03)	.553 (14.05) - .564 (14.33)
-03	.195 (4.95)	.063 (1.60)	.312 (7.92)	.703 (17.86)	.616 (15.65) - .627 (15.93)
-04	.242 (6.15)	.075 (1.91)	.364 (9.25)	.775 (19.69)	.679 (17.25) - .690 (17.53)
-05	.304 (7.72)	.075 (1.91)	.426 (10.82)	.846 (21.49)	.741 (18.82) - .752 (19.10)
-06	.368 (9.35)	.083 (2.11)	.481 (12.22)	.916 (23.27)	.803 (20.40) - .814 (20.68)
-07	.430 (10.92)	.083 (2.11)	.544 (13.82)	.987 (25.07)	.865 (21.97) - .877 (22.28)
-08	.462 (11.73)	.094 (2.39)	.660 (16.76)	1.130 (28.70)	.990 (25.15) - 1.062 (26.97)
-09	.509 (12.93)	.094 (2.39)	.722 (18.34)	1.200 (30.48)	1.052 (26.72) - 1.064 (27.03)
-10	.555 (14.10)	.107 (2.72)	.773 (19.63)	1.270 (32.26)	1.114 (28.30) - 1.127 (28.63)
-11	.619 (15.72)	.125 (3.18)	.882 (22.40)	1.484 (37.69)	1.301 (33.05) - 1.314 (33.38)
-12	.681 (17.30)	.125 (3.18)	.945 (24.00)	1.556 (39.52)	1.364 (34.65) - 1.377 (34.98)
-14	.806 (20.47)	.125 (3.18)	1.070 (27.18)	1.699 (43.15)	1.489 (37.82) - 1.502 (38.15)
-16	.918 (23.32)	.125 (3.18)	1.195 (30.35)	1.842 (46.79)	1.614 (41.00) - 1.627 (41.33)
-18	1.027 (26.09)	.125 (3.18)	1.382 (35.10)	1.983 (50.37)	1.738 (44.15) - 1.752 (44.50)
-20	1.153 (29.29)	.125 (3.18)	1.507 (38.28)	2.126 (54.00)	1.863 (47.32) - 1.877 (47.68)
-24	1.387 (35.23)	.125 (3.18)	1.756 (44.60)	2.411 (61.24)	2.113 (53.67) - 2.127 (54.03)
-28	1.652 (41.96)	.125 (3.18)	2.131 (54.13)	2.839 (72.11)	2.488 (63.20) - 2.502 (63.55)
-32	1.886 (47.90)	.125 (3.18)	2.381 (60.48)	3.124 (79.35)	2.738 (69.55) - 2.752 (69.90)

FIGURE 1. Nipple, tube, boss - Continued.

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Dash number	J inches (mm)	K inches (mm)	L inches (mm)	M min inches (mm)
-02	.415 (10.54)	.360 (9.14)	.605 (15.37)	.030 (0.76)
-03	.446 (11.33)	.360 (9.14)	.636 (16.15)	.030 (0.76)
-04	.517 (13.13)	.400 (10.16)	.737 (18.72)	.030 (0.76)
-05	.517 (13.13)	.400 (10.16)	.737 (18.72)	.030 (0.76)
-06	.523 (13.28)	.400 (10.16)	.773 (19.63)	.030 (0.76)
-07	.523 (13.28)	.440 (11.18)	.773 (19.63)	.030 (0.76)
-08	.633 (16.08)	.440 (11.18)	.883 (22.43)	.030 (0.76)
-09	.633 (16.08)	.440 (11.18)	.883 (22.43)	.030 (0.76)
-10	.747 (18.97)	.440 (11.18)	1.057 (26.85)	.030 (0.76)
-11	.853 (21.67)	.440 (11.18)	1.163 (29.54)	.030 (0.76)
-12	.853 (21.67)	.480 (12.19)	1.163 (29.54)	.030 (0.76)
-14	.898 (22.81)	.480 (12.19)	1.208 (30.68)	.030 (0.76)
-16	.908 (23.06)	.480 (12.19)	1.268 (32.21)	.030 (0.76)
-18	.954 (24.23)	.480 (12.19)	1.314 (33.38)	.030 (0.76)
-20	.954 (24.23)	.480 (12.19)	1.314 (33.38)	.030 (0.76)
-24	1.079 (27.41)	.480 (12.19)	1.439 (36.55)	.030 (0.76)
-28	1.204 (30.58)	.480 (12.19)	1.594 (40.49)	.044 (1.12)
-32	1.329 (33.76)	.480 (12.19)	1.719 (43.66)	.044 (1.12)

FIGURE 1. Nipple, tube, boss - Continued.

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Dash number	P inches (mm)	R radius	Thread T (see note 11)
-02	.020 (0.51) - .050 (1.27)	.562 (14.27)	.3125 - 24UNF-3A
-03	.020 (0.51) - .050 (1.27)	.625 (15.88)	.375 - 24UNF-3A
-04	.030 (0.76) - .060 (1.52)	.688 (17.48)	.4375 - 20UNF-3A
-05	.030 (0.76) - .070 (1.78)	.750 (19.05)	.500 - 20UNF-3A
-06	.040 (1.02) - .070 (1.78)	.812 (20.62)	.5625 - 18UNF-3A
-07	.040 (1.02) - .070 (1.78)	.875 (22.23)	.625 - 18UNF-3A
-08	.040 (1.02) - .070 (1.78)	1.000 (25.40)	.7500 - 16UNF-3A
-09	.040 (1.02) - .070 (1.78)	1.062 (26.97)	.8125 - 16UN-3A
-10	.050 (1.27) - .080 (2.03)	1.125 (28.58)	.8750 - 14UNF-3A
-11	.050 (1.27) - .080 (2.03)	1.312 (33.32)	1.000 - 12UNF-3A
-12	.050 (1.27) - .080 (2.03)	1.375 (34.93)	1.0625 - 12UN-3A
-14	.050 (1.27) - .080 (2.03)	1.500 (38.10)	1.1875 - 12UN-3A
-16	.050 (1.27) - .080 (2.03)	1.625 (41.28)	1.3125 - 12UN-3A
-18	.050 (1.27) - .080 (2.03)	1.750 (44.45)	1.500 - 12UNF-3A
-20	.050 (1.27) - .080 (2.03)	1.875 (47.63)	1.625 - 12UN-3A
-24	.050 (1.27) - .080 (2.03)	2.125 (53.98)	1.8750 - 12UN-3A
-28	.050 (1.27) - .080 (2.03)	2.500 (63.50)	2.2500 - 12UN-3A
-32	.050 (1.27) - .080 (2.03)	2.750 (69.85)	2.500 - 12UN-3A

FIGURE 1. Nipple, tube, boss - Continued.

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Dash number	Thread TT (see note 11)					
	Size	Major diameter inches (mm)		Pitch diameter inches (mm)		Minor diameter max inches (mm)
-02	.3125 – 24UNS-3A	.3023 (7.678)	.3095 (7.861)	.2797 (7.104)	.2824 (7.173)	.2584 (6.563)
-03	.375 – 24UNS-3A	.3648 (9.266)	.3720 (9.449)	.3420 (8.687)	.3449 (8.760)	.3209 (8.151)
-04	.4375 – 20UNS-3A	.4264 (10.831)	.4345 (11.036)	.3989 (10.132)	.4020 (10.211)	.3732 (9.479)
-05	.500 – 20UNS-3A	.4889 (12.418)	.4970 (12.623)	.4613 (11.717)	.4645 (11.80)	.4357 (11.067)
-06	.5625 – 18UNS-3A	.5508 (13.990)	.5595 (14.211)	.5200 (13.208)	.5234 (13.294)	.4913 (12.479)
-07	.625 – 18UNS-3A	.6133 (15.578)	.6220 (15.799)	.5824 (14.793)	.5859 (14.881)	.5538 (14.067)
-08	.750 – 16UNS-3A	.7376 (18.735)	.7470 (18.974)	.7026 (17.846)	.7064 (17.942)	.6703 (17.026)
-09	.8125 – 16UNS-3A	.8001 (20.323)	.8095 (20.561)	.7653 (19.44)	.7689 (19.530)	.7328 (18.613)
-10	.875 – 14UNS-3A	.8617 (21.887)	.8720 (22.149)	.8215 (20.866)	.8256 (20.970)	.7844 (19.924)
-11	1.000 – 12UNS-3A	.9856 (25.034)	.9970 (25.324)	.9385 (23.838)	.9429 (23.950)	.8948 (22.728)
-12	1.0625 – 12UNS-3A	1.0481 (26.622)	1.0595 (26.911)	1.0012 (25.430)	1.0054 (25.537)	.9573 (24.315)
-14	1.1875 – 12UNS-3A	1.1731 (29.797)	1.1845 (30.086)	1.1261 (28.603)	1.1304 (28.712)	1.0823 (27.490)
-16	1.3125 – 12UNS-3A	1.2981 (32.972)	1.3095 (33.261)	1.2511 (31.778)	1.2554 (31.887)	1.2073 (30.665)
-18	1.500 – 12UNS-3A	1.4856 (37.734)	1.4970 (38.024)	1.4381 (36.528)	1.4429 (36.650)	1.3948 (35.428)
-20	1.625 – 12UNS-3A	1.6106 (40.909)	1.6220 (41.199)	1.5635 (39.713)	1.5679 (39.825)	1.5198 (38.603)
-24	1.875 – 12UNS-3A	1.8606 (47.259)	1.8720 (47.549)	1.8134 (46.060)	1.8179 (46.175)	1.7698 (44.953)
-28	2.250 – 12UNS-3A	2.2356 (56.784)	2.2470 (57.074)	2.1884 (55.585)	2.1929 (55.700)	2.1448 (54.478)
-32	2.500 – 12UNS-3A	2.4856 (63.134)	2.4970 (63.424)	2.4429 (62.050)	2.4383 (61.933)	2.3948 (60.828)

FIGURE 1. Nipple, tube, boss - Continued.

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NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified tolerances for linear dimensions are $\pm .010$ inch (0.25 mm) and angular dimensions are $\pm 5^\circ$, all dimensions concentric within .010 inch (0.25 mm) FIM.
4. Unless otherwise specified surfaces to be 125μ inches (3.18 μ m) in accordance with AMSE B46.1.
5. Diameter F shall be free of thread marks.
6. Diameter F shall be concentric with PD of thread within .0025 inch (1.134 mm) FIM.
7. Lettering height:
 - a. For size -02 through -04: .020 - .040 inch (0.51 - 1.02 mm).
 - b. For size -05 through -16: .040 - .060 inch (1.02 - 1.52 mm).
 - c. For size -18 and larger: .090 - .150 inch (2.29 - 3.81 mm)
8. All diameters shall be concentric within .010 inch (0.25 mm) FIM unless otherwise specified.
9. Parting line mismatch .015 inch (0.38 mm) max.
10. Unless otherwise specified break sharp edges .003 - .015 inches (0.08 - 0.38 mm).
11. Threads shall be in accordance with FED-STD-H28/2.

FIGURE 1. Nipple, tube, boss - Continued.

REQUIREMENTS:

Dimensions and configurations: See figure 1.

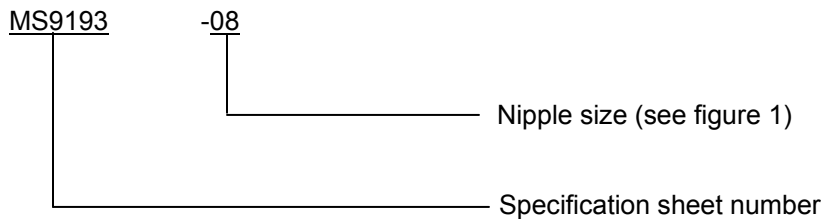
Material: Steel, corrosion and heat-resistant in accordance with SAE-AMS5639.

Max operating temperature: Oxidation resistance up to 1500°F (816°C).

Max operating pressure: 1500 psi (10 MPa).

Finish: Passivate in accordance with SAE-AMS2700, method 1.

PIN:



PIN Example:

MS9193-08 identifies a nipple .500 inch (tube), CRES.

Do not use unassigned PIN's.

The approximate weight for each fitting is shown in table I.

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TABLE I. Approximate weight.

Dash number	Approximate weight lbs/ea (grams/ea)		Dash number	Approximate weight lbs/ea (grams/ea)
-02	.026 (12)		-11	.255 (116)
-03	.034 (15)		-12	.282 (128)
-04	.048 (22)		-14	.331 (150)
-05	.057 (26)		-16	.407 (185)
-06	.069 (31)		-18	.522 (237)
-07	.080 (36)		-20	.573 (260)
-08	.125 (57)		-24	.739 (335)
-09	.141 (64)		-28	1.176 (533)
-10	.182 (83)		-32	1.433 (650)

Intended usage: Jet engine, miscellaneous parts, oil, fuel, and de-icing kits.

Not to be used on hydraulic, oxygen or applications requiring pressures of 3000 psi (21 MPa).

Changes from previous issue. 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. In addition to SAE-AS4841, this document references the following:

FED-STD-H28/2
AMSE B46.1
SAE-AMS2700
SAE-AMS2800
SAE-AMS5639

CONCLUDING MATERIAL

Custodians:

Army - MI
Navy - AS
DLA - CC

Preparing activity:

DLA - CC

(Project 4730-2009-079)

Review activity:

Navy - SA

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 <http://assist.daps.dla.mil>.