

INCH-POUND

MS20756E
 17 November 2009
 SUPERSEDING
 MS27056D
 7 October 2008

DETAIL SPECIFICATION SHEET

FLANGE, SWIVEL, RETAINING

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-AS4875.

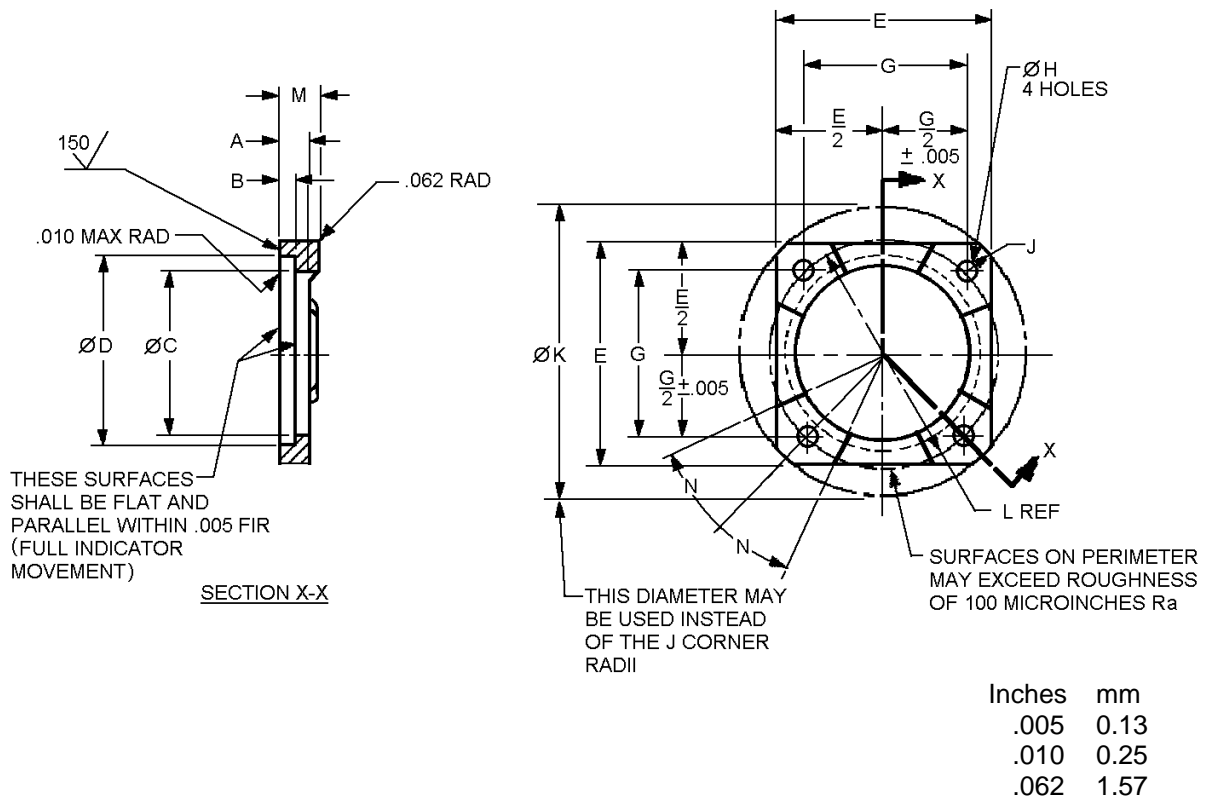


FIGURE 1. Swivel fitting flange type I rectangle size 8 through 32.

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Size designator	Tubing OD and hose ID inches (mm)	A +.015 -.005 (+0.38 -0.13) inches (mm)	B +.005/- .000 (+0.13 -0.000) inches (mm)	C dia (see note 4) +.010/- .000 (+0.25 -0.000) inches (mm)	D dia (see note 4) +.005 (+0.13 -0.000) inches (mm)	E inches (mm)	
8	.500 (12.70)	.234 (5.94)	.136 (3.45)	.750 (19.05)	.885 (22.48)	1.390 (35.31)	±.016 (0.41)
10	.625 (15.88)			.880 (22.35)	1.010 (25.65)	1.468 (37.29)	
12	.750 (19.05)			1.125 (28.58)	1.260 (32.00)	1.594 (40.49)	
16	1.000 (25.40)			1.375 (34.93)	1.510 (38.35)	1.750 (44.45)	
20	1.250 (31.75)			1.688 (42.88)	1.854 (47.09)	2.188 (55.58)	
24	1.500 (38.10)	.297 (7.54)	.168 (4.27)	1.938 (49.23)	2.135 (54.23)	2.375 (60.33)	±.020 (0.51)
32	2.000 (50.80)			2.562 (65.07)	2.760 (70.10)	3.000 (76.20)	

FIGURE 1. Swivel fitting flange type I rectangle size 8 through 32 – Continued.

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Size number	G ± 0.005 (± 0.13) inches (mm)	H dia $+0.010/-0.000$ ($+0.25/-0.000$) inches (mm)	J radius ± 0.016 (± 0.41) inches (mm)	K dia ± 0.015 (± 0.38) inches (mm)	L dia inches (mm)	M ± 0.016 (± 0.41) inches (mm)	N
8	.950 (24.13)	.205 (5.21)	.219 (5.56)	1.782 (45.26)	1.344 (34.14)	.296 (7.52)	20°
10	1.038 (26.37)			1.906 (48.41)	1.468 (37.29)		
12	1.156 (29.36)			2.094 (53.19)	1.635 (41.53)		
16	1.312 (33.32)			2.312 (58.72)	1.855 (47.12)		18°
20	1.656 (42.06)	.266 (6.76)	.266 (6.76)	2.875 (73.03)	2.342 (59.49)	.359 (9.12)	16°
24	1.812 (46.02)		.281 (7.14)	3.094 (78.59)	2.562 (65.07)		
32	2.375 (60.33)	.328 (8.33)	.312 (7.92)	3.953 (100.41)	3.359 (85.32)		12°

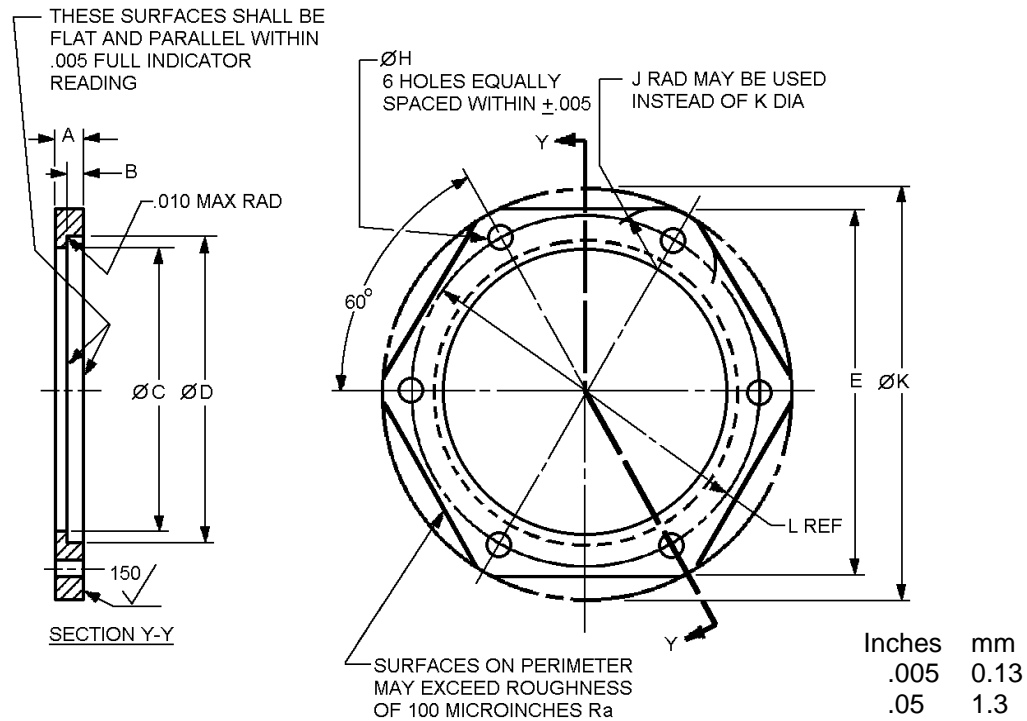
Size number	Weight max (estimated) lbs (gram)		
	Steel	Al alloy	Titanium
8	.03 (14)	.01 (5)	.02 (9)
10	.05 (23)	.02 (9)	.03 (14)
12	.08 (36)	.03 (14)	.04 (18)
16			
20	.14 (64)	.05 (23)	.07 (32)
24	.17 (77)	.06 (27)	.09 (41)
32	.25 (113)	.09 (41)	.13 (59)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise, tolerances, ± 0.005 inch (0.13 mm) angles $\pm 5^\circ$.
4. Diameters C and D shall be concentric within .010 inch (0.25 mm) full indicator reading.
5. Unless otherwise specified, the surface roughness shall not exceed 100 microinches (25.4 μm) Ra in accordance with ASME B46.1.
6. Break all sharp edges; remove all loose or hanging burrs and slivers that may become dislodged.
7. For tube sizes -8 through -16, maximum operating temperature 275°F (135°C), maximum pressure 1500 psi (10 MPa).
8. For tube sizes -20 through -48, maximum operating temperature 275°F (135°C), maximum pressure 500 psi (3.4 MPa).

FIGURE 1. Swivel fitting flange type I rectangle size 8 through 32 – Continued.

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Size designator	Tubing OD and hose ID inches (mm)	A +.015 -.005 (+0.38 -0.13) inches (mm)	B +.005/- .000 (+0.13 -0.000) inches (mm)	C dia (see note 4) +.010/- .000 (+0.25 -0.000) inches (mm)	D dia (see note 4) +.005 (+0.13 - .000) inches (mm)	E inches (mm)	
8	.500 (12.70)	.234 (5.94)	.136 (3.45)	.750 (19.05)	.885 (22.48)	1.390 (35.31)	±.016 (0.41)
10	.625 (15.88)			.880 (22.35)	1.010 (25.65)	1.468 (37.29)	
12	.750 (19.05)			1.125 (28.58)	1.260 (32.00)	1.594 (40.49)	
16	1.000 (25.40)			1.375 (34.93)	1.510 (38.35)	1.750 (44.45)	
20	1.250 (31.75)			1.688 (42.88)	1.854 (47.09)	2.188 (55.58)	
24	1.500 (38.10)	.297 (7.54)	.168 (4.27)	1.938 (49.23)	2.135 (54.23)	2.375 (60.33)	±.020 (0.51)
32	2.000 (50.80)			2.562 (65.07)	2.760 (70.10)	3.000 (76.20)	
40	2.500 (63.50)			3.062 (77.77)	3.291 (83.59)	4.000 (101.60)	
48	3.000 (76.20)			3.562 (90.47)	3.791 (96.29)	4.500 (114.30)	

FIGURE 2. Swivel fitting flange type II hexagon size 8 through 48.

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Size number	G ± 0.005 (± 0.13) inches (mm)	H dia $+0.010/-0.000$ ($+0.25/-0.000$) inches (mm)	J radius ± 0.016 (± 0.41) inches (mm)	K dia ± 0.015 (± 0.38) inches (mm)	L dia inches (mm)	M ± 0.016 (± 0.41) inches (mm)	N
8	.950 (24.13)	.205 (5.21)	.219 (5.56)	1.782 (45.26)	1.344 (34.14)	.296 (7.52)	20°
10	1.038 (26.37)			1.906 (48.41)	1.468 (37.29)		
12	1.156 (29.36)			2.094 (53.19)	1.635 (41.53)		
16	1.312 (33.32)			2.312 (58.72)	1.855 (47.12)		18°
20	1.656 (42.06)	.266 (6.76)	.266 (6.76)	2.875 (73.03)	2.342 (59.49)	.359 (9.12)	16°
24	1.812 (46.02)		.281 (7.14)	3.094 (78.59)	2.562 (65.07)		
32	2.375 (60.33)	.328 (8.33)	.312 (7.92)	3.953 (100.41)	3.359 (85.32)		12°
40	-		.375 (9.53)	4.500 (114.30)	3.812 (96.82)	-	-
48	-		.625 (15.88)	5.000 (127.00)	4.312 (109.52)	-	-

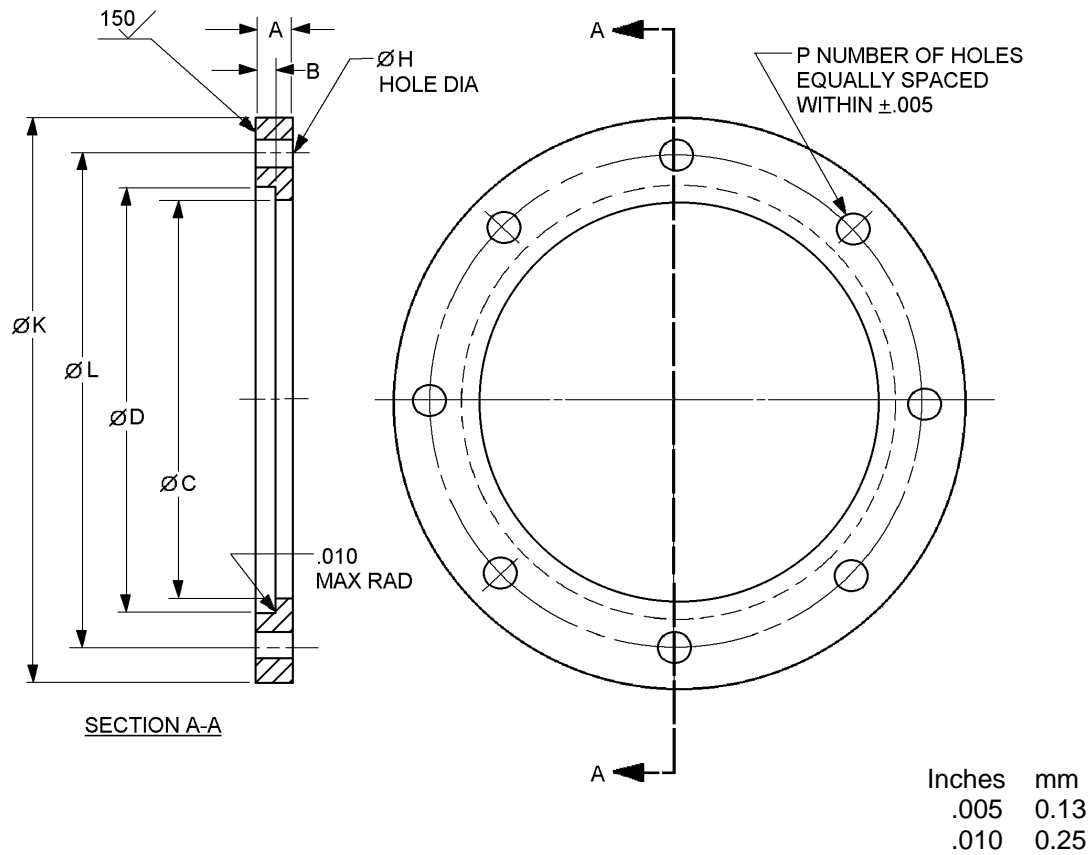
Size number	Weight max (estimated) lbs (gram)		
	Steel	Al alloy	Titanium
8	.03 (14)	.01 (5)	.02 (9)
10	.05 (23)	.02 (9)	.03 (14)
12	.08 (36)	.03 (14)	.04 (18)
16			
20	.14 (64)	.05 (23)	.07 (32)
24	.17 (77)	.06 (27)	.09 (41)
32	.25 (113)	.09 (41)	.13 (59)
40	.45 (204)	.16 (73)	.21 (95)
48	.53 (240)	.19 (86)	.24 (109)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise, tolerances, ± 0.005 inch (0.13 mm) angles $\pm 5^\circ$.
4. Diameters C and D shall be concentric within .010 inch (0.25 mm) full indicator reading.
5. Unless otherwise specified, the surface roughness shall not exceed 100 microinches (25.4 μm) Ra in accordance with ASME B46.1.
6. Break all sharp edges; remove all loose or hanging burrs and slivers that may become dislodged.
7. For tube sizes -8 through -16, maximum operating temperature 275°F (135°C), maximum pressure 1500 psi (10 MPa).
8. For tube sizes -20 through -48, maximum operating temperature 275°F (135°C), maximum pressure 500 psi (3.4 MPa).

FIGURE 2. Swivel fitting flange type II hexagon size 8 through 48 - Continued.

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Size number	A +.015/ -.005 (+0.38/ -(0.13) inches (mm)	B +.005/ -.000 (+0.13/ -.000) inches (mm)	C dia (see note 4) .031 (0.79) inches (mm)	D dia (see note 4) inches (mm)		H dia +.010/ -.000 (+0.25/ -0.00) inches (mm)	K dia ±.015 (±0.38) inches (mm)
56	.312 (7.92)	.168 (4.27)	3.968 (100.79)	4.234 (107.54)	+.010/ -.000 (+0.25/ -0.000)	.328 (8.33)	5.562 (141.27)
64			4.531 (115.09)	4.797 (121.84)			6.125 (155.58)
80	.375 (9.53)	.188 (4.78)	5.531 (140.49)	5.797 (147.24)			7.125 (180.98)
96			6.531 (165.89)	6.797 (172.64)	+.020/ -.000 (0.51/ -.000)		8.125 (206.38)
112	.437 (11.10)	.200 (5.08)	7.594 (192.89)	7.860 (199.64)			9.188 (233.38)

FIGURE 3. Swivel fitting flange type II hexagon size 56 through 112.

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Size number	L dia Ref inches (mm)	P number of holes
56	4.875 (123.83)	8
64	5.438 (138.13)	
80	6.438 (163.53)	10
96	7.438 (188.93)	12
112	8.500 (215.90)	14

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise, tolerances, ± 0.005 inch (0.13 mm), angles $\pm 5^\circ$.
4. Diameters C and D shall be concentric within .010 inch (0.25 mm) full indicator reading.
5. Unless otherwise specified, the surface roughness shall not exceed 100 microinches (2.54 μm) Ra in accordance with ASME B46.1.
6. Break all sharp edges; remove all loose or hanging burrs and slivers that may become dislodged.
7. Maximum operating temperature 275°F (135°C), maximum pressure 500 psi (3.4 MPa).

FIGURE 3. Swivel fitting flange type II hexagon size 56 through 112 – Continued.

REQUIREMENTS:

Design and construction:

Dimensions and configuration: See figures 1, 2, and 3.

Reduction by forging draft angle of 7° maximum is permissible.

Materials. Materials shall be in accordance with MIL-DTL-83798.

Finishes. Finishes for the flange shall be in accordance with MIL-DTL-83798.

Finish designators shall be as specified in table I.

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TABLE I. Flange finish code. 1/

PIN code dash letter	Material	Plating Finish
Blank	Steel	Cadmium plating in accordance with SAE-AMS-C-81562, type II, class 3 or SAE-AMS-QQ-P-416, type II, class 2.
	Aluminum	Anodize in accordance with MIL-A-8625, type II. <u>2/</u>
-A	Steel	Aluminum-nickel in accordance with ASTM F1136, grade 3, NC
-D	Aluminum	Anodize above with NAVAIR trivalent chromium pretreatment (TCP) in accordance with MIL-DTL-81706, type 2, class A. <u>2/</u>
-CN	Steel	Cadmium plating in accordance with SAE-AMS-C-81562, type II, class 3 or SAE-AMS-QQ-P-416, type II, class 2 with NAVAIR TCP in accordance with MIL-DTL-81706, type 2, class A.
F	Steel	TCP in accordance with MIL-DTL-81706, type 2, class A. <u>2/</u>
G	Steel	Zinc plating with colorless passivate in accordance with ASTM B633, type V, Fe/Zn 25.
-H	Steel	Zinc phosphate finish in accordance MIL-DTL-16232 type Z, class1. <u>3/</u>
-J	Steel	Zinc plating in accordance with ASTM B633; type II or III, Fe/Zn 5, or ASTM B695, type II, class 5.
N	Steel	NAVAIR TCP in accordance with MIL-DTL-81706, type 2, class A.
-R	Steel	Zinc plating in accordance with ASTM B633; type VI, Fe/Zn 5.
-S	Corrosion resistant steel	No additional finish. Passivation in accordance with SAE-AMS2700, type 6 or 7.
-T	Titanium <u>4/</u>	Annealed
-V	Steel	Zinc-nickel in accordance with SAE-AMS2417, type 1.
-Z	Zinc any type above	PIN code H, J, R, V.
-ZN	Zinc any type above	PIN code H, J, R, V with NAVAIR TCP in accordance with MIL-DTL-81706, type 2, class A.

1/ Shall be capable of withstanding minimum of 96 hours salt spray.

2/ Die light blue.

3/ Hexavalent chromium free.

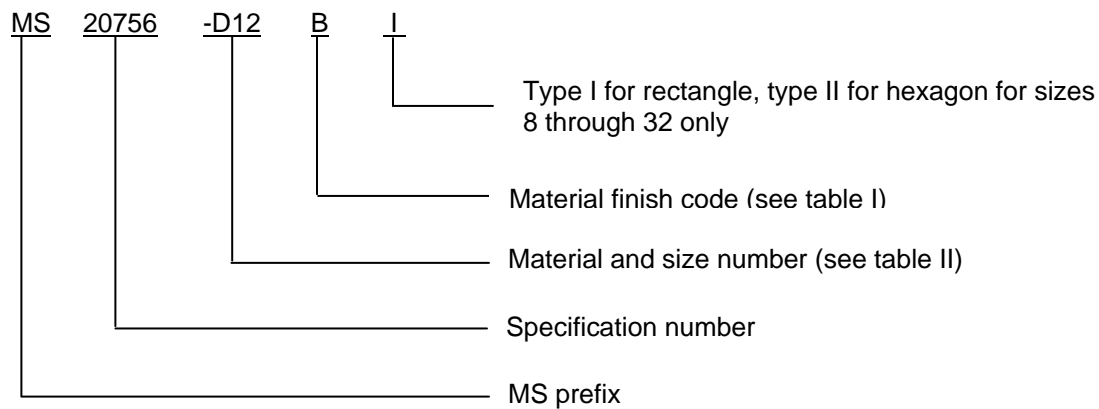
4/ Titanium shall not be used in oxygen or potable water systems.

Trivalent wrenchability. When the finish has been damaged due to poor wrenchability, the surface of the connector shall be touched up using the brush plating process below. The term "trivalent wrenchability" is used to evaluate the ability of the finish to withstand abrasion from an excessive amount of wrenching

- a. Brush plating of hard chromium by electrodeposition shall be in accordance with SAE-AMS-2451/5.
- b. Brush plating of medium-hardness, low stress nickel by electrodeposition shall be in accordance with SAE-AMS-2451/9.
- c. Brush plating of NAVAIR TCP shall be in accordance with MIL-DTL-81706, type 2, class A, material form 1 through 6, application method B. Example of a PIN: M817062A6B.

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Part or Identifying Number (PIN) example:



MS20756-D12B indicates: Flange, .750 inch tube ID, aluminum anodized with NAVAIR TCP.

Material and size designators. Material and size designators shall be as specified in table II.

TABLE II. Material and size designators.

Size dash number with letter material designator			
Steel	Aluminum alloy	CRES <u>1/</u>	Titanium <u>2/</u>
-8	-D8	-J8	-T8
-10	-D10	-J10	-T10
-12	-D12	-J12	-T12
-16	-D16	-J16	-T16
-20	-D20	-J20	-T20
-24	-D24	-J24	-T24
-32	-D32	-J32	-T32
-40	-D40	-J40	-T40
-48	-D48	-J48	-T48
-56	-D56	-J56	-T56
-64	-D64	-J64	-T64
-80	-D80	-J80	-T80
-96	-D96	-J96	-T96
-112	-D112	-J112	-T112

1/ Corrosion resistant steel (CRES).

2/ Titanium shall not be used in potable water or oxygen systems.

Marking. The complete PIN shall be permanently marked.

Guidance on use of alternative parts with less hazardous or nonhazardous materials. This specification provides for a number of alternative plating materials via the PIN. Users should select the PIN with the least hazardous material that meets the form, fit and function requirements of their application.

For nominal use on fuel and oil systems.

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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-AS4875, this document references the following:

MIL-A-8625	ASTM F1136
MIL-DTL-16232	SAE-AMS-C-81562
MIL-DTL-81706	SAE-AMS-QQ-P-416
MIL-DTL-83798	SAE-AMS2700
ASME B46.1	SAE-AMS2417
ASTM B633	SAE-AMS-2451/5
ASTM B695	SAE-AMS-2451/9

CONCLUDING MATERIAL

Custodians:

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

Preparing activity:

DLA - CC

(Project 4730-2009-108)

Review activities:

Army - AT
Navy - SA
Air Force - 85

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>.