

INCH-POUND

MIL-DTL-28748/17B

23 June 2016

SUPERSEDING

MIL-DTL-28748/17A

8 August 2014

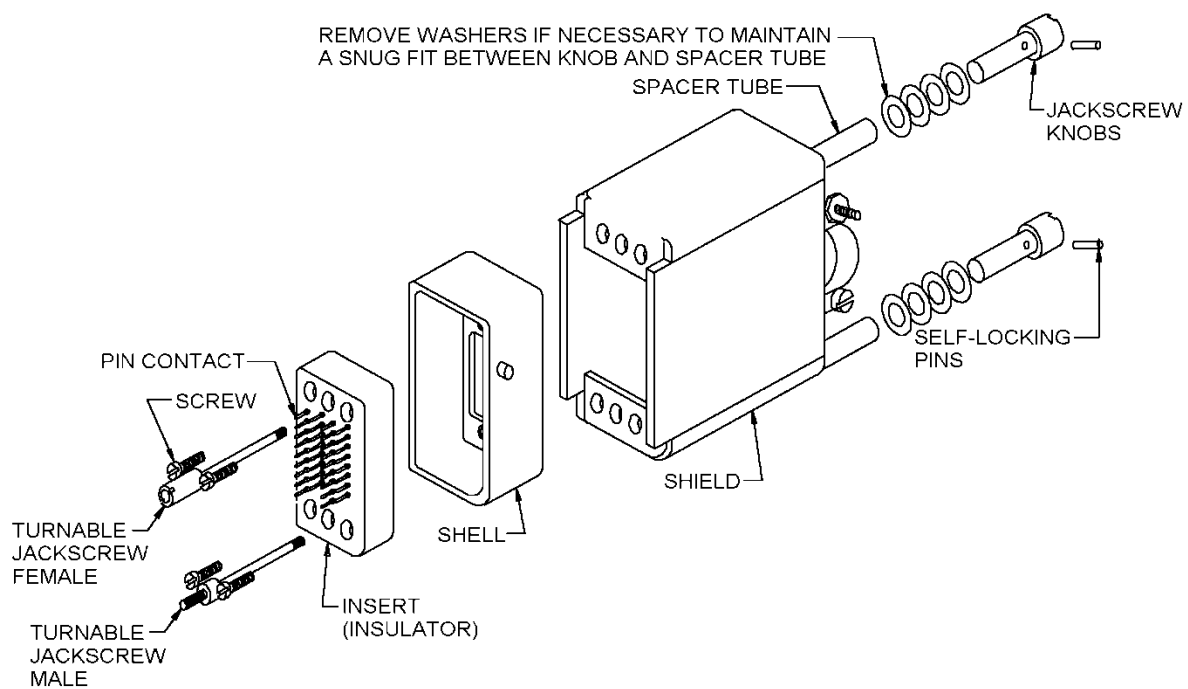
DETAIL SPECIFICATION SHEET

CONNECTORS, ELECTRICAL, RECTANGULAR, RACK AND PANEL, HARDWARE FOR

Inactive for new design after 8 August 2014. For new design,
use MIL-DTL-28748/1 through MIL-DTL-28748/6.

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 MIL-DTL-28748.



Connector assembly

FIGURE 1. Plug connector with shield, plug shell, and turnable jackscrews.



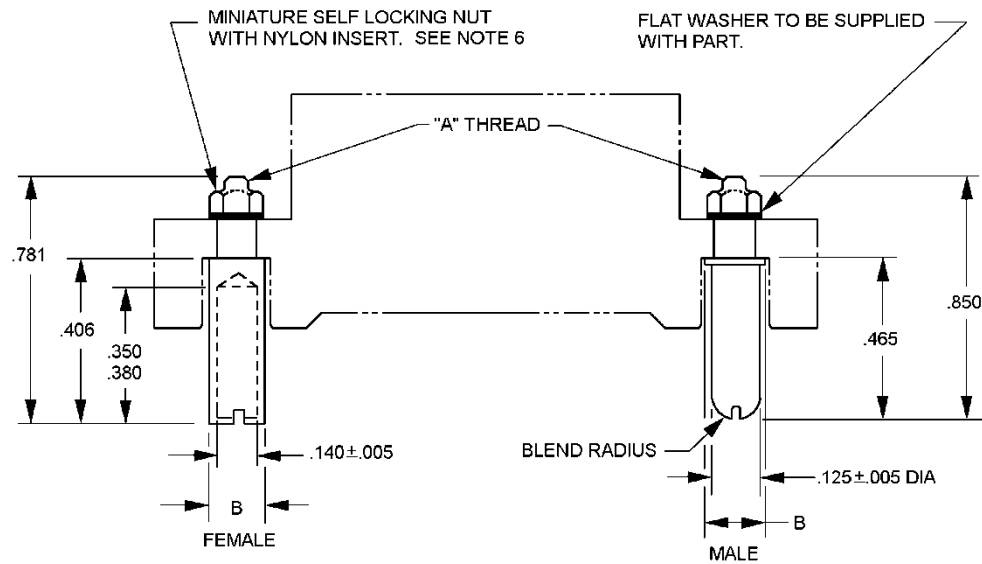


Figure 2. Guidepin male and female

Inches	mm
.005	0.13
.125	3.18
.140	3.56
.350	8.89
.380	9.65
.406	10.31
.465	11.81
.781	19.84
.850	21.59

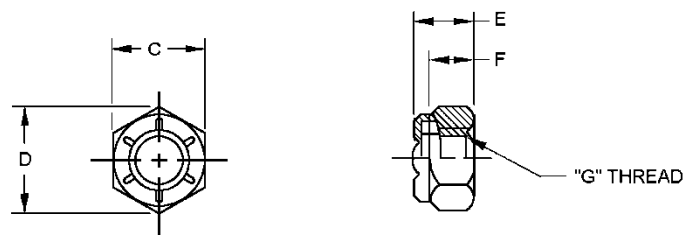


FIGURE 3. Self-locking nut.

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Guide pin or guide socket designator	Gender	Connector size (number of contacts)	A Thread class 2	B dia max	C		D ref	E		F ref	G Thread
					max	min		max	min		
MS18197-1	Male	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	4-40 UNC-2A .112-40 UNC	.190 (4.83)	.190 (4.83)	.181 (4.60)	.205 (5.21)	.125 (3.18)	.095 (2.41)	.070 (1.78)	4-40 UNC-3B
MS18197-2	Female	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	4-40 UNC-2A .112-40 UNC	.190 (4.83)	.190 (4.83)	.181 (4.60)	.205 (5.21)	.125 (3.18)	.095 (2.41)	.070 (1.78)	4-40 UNC-3B
MS18197-3	Male	104	6-32 UNC-2A .138-32 UNC	.190 (4.83)	.252 (6.40)	.240 (6.10)	.275 (6.99)	.153 (3.89)	.133 (3.38)	.081 (2.06)	6-32 UNC-3B
MS18197-4	Female	104	6-32 UNC-2A .138-32 UNC	.190 (4.83)	.252 (6.40)	.240 (6.10)	.275 (6.99)	.153 (3.89)	.133 (3.38)	.081 (2.06)	6-32 UNC-3B

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.016 inch (0.41 mm).
4. Material corrosion resistance steel in accordance with ASTM A276/A276M, ASTM A473, ASTM A581/A581M, A582/A582M, SAE AMS5636, SAE AMS5639, SAE AMS5648, classes 302, 303, 303Se, 304 or 316 except for aluminum alloy knob and .040 inch (1.02 mm) flat washer.
5. Finish passivated in accordance with ASTM A967/A967M or SAE AMS2700 except for anodized knob.
6. Miniature self-locking nut with nylon insert shall be in accordance with figure 3. Material and finish shall be in accordance with notes 4 and 5.

FIGURE 2. Guidepin male and female. Continued.

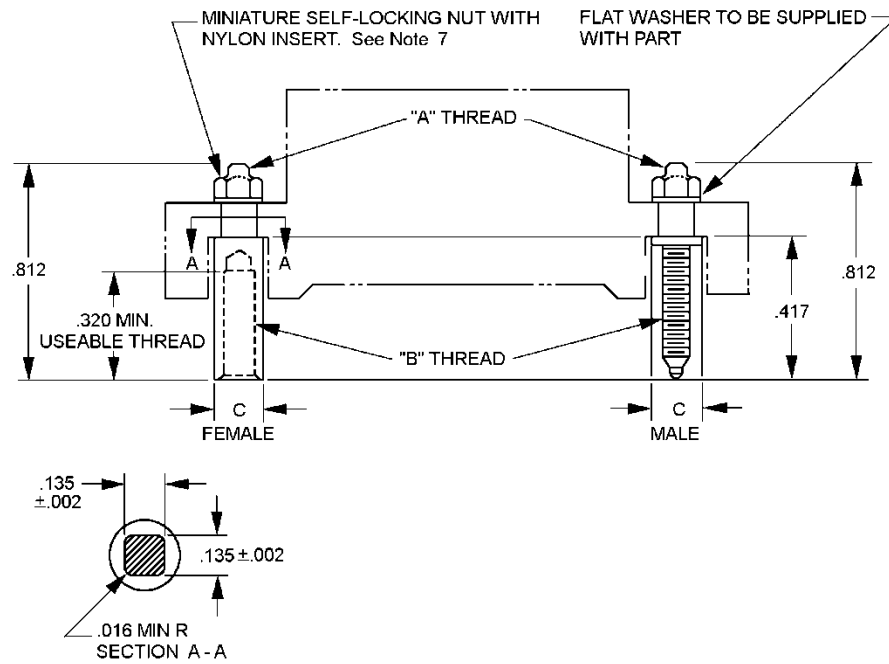


FIGURE 4. Fixed jackscrew male and female.

Inches	mm
.002	0.05
.016	0.41
.135	3.43
.320	8.13
.417	10.59
.812	20.62

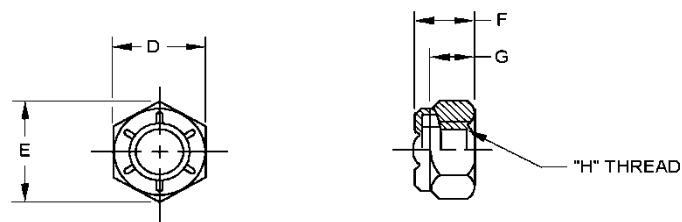


FIGURE 5. Self-locking nut.

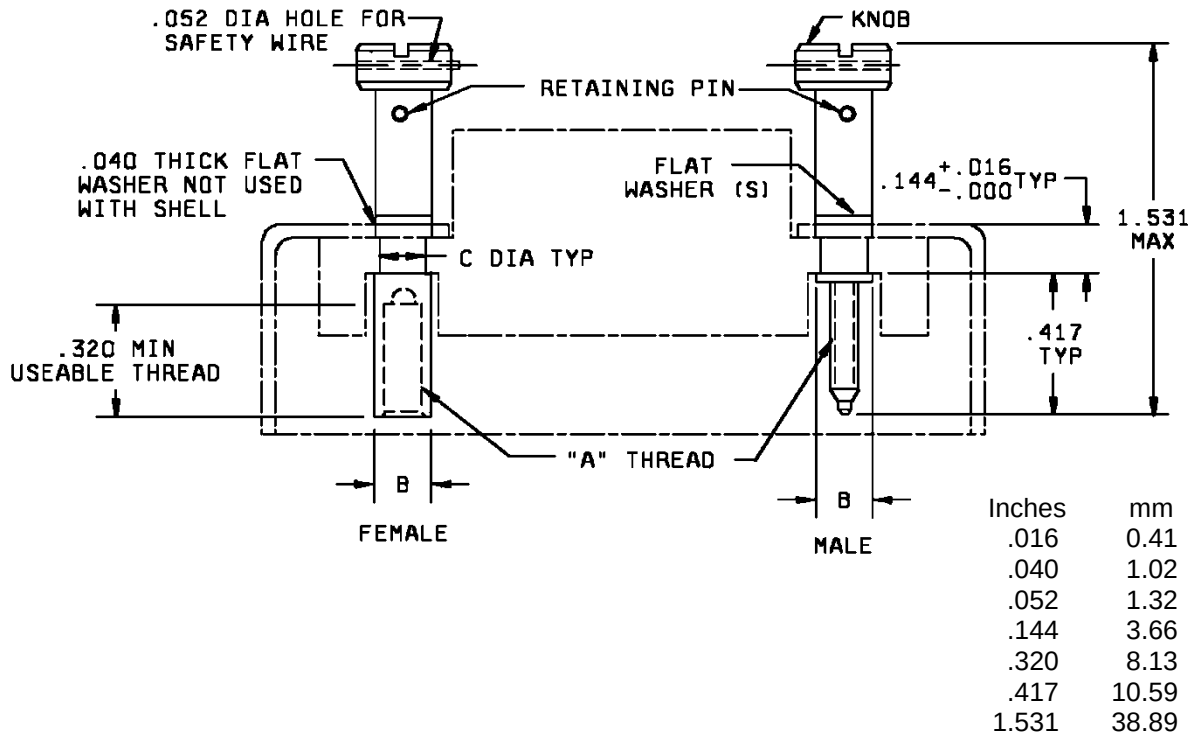
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Fixed jackscrew designator	Gender	Connector size (number of contacts)	A Thread class 2	B Thread class 2	C dia max	D		E ref	F		G ref	H Thread
						max	min		max	min		
MS18196-1	Male	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	4-40 UNC-2A .112-40 UNC	6-32 UNC-2A .138-32 UNC	.190 (4.83)	.190 (4.83)	.181 (4.60)	.205 (5.21)	.125 (3.18)	.095 (2.41)	.070 (1.78)	4-40 UNC-3B
MS18196-2	Female	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	4-40 UNC-2A .112-40 UNC	6-32 UNC-2B .138-32 UNC	.190 (4.83)	.190 (4.83)	.181 (4.60)	.205 (5.21)	.125 (3.18)	.095 (2.41)	.070 (1.78)	4-40 UNC-3B
MS18196-3	Male	104	6-32 UNC-2A .138-32 UNC	8-32 UNC-2A .164-32 UNC	.225 (5.72)	.252 (6.40)	.240 (6.10)	.275 (6.99)	.153 (3.89)	.133 (3.38)	.081 (2.06)	6-32 UNC-3B
MS18196-4	Female	104	6-32 UNC-2A .138-32 UNC	8-32 UNC-2B .164-32 UNC	.225 (5.72)	.252 (6.40)	.240 (6.10)	.275 (6.99)	.153 (3.89)	.133 (3.38)	.081 (2.06)	6-32 UNC-3B

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.016 inch (0.41 mm).
4. Material corrosion resistance steel in accordance with ASTM A276/A276M, ASTM A473, ASTM A581/A581M, ASTM A582/A582M, SAE AMS5636, SAE AMS5639, SAE AMS5648, classes 302, 303, 303Se, 304 or 316 except for aluminum alloy knob and .040 inch (1.02 mm) flat washer.
5. Finish passivated in accordance with ASTM A967/A967M or SAE AMS2700 except for anodized knob.
6. Jackscrew may have .005 inch (0.13 mm) minimum vertical float.
7. Miniature self-locking nut with nylon insert shall be in accordance with figure 5. Material and finish shall be in accordance with notes 4 and 5.

FIGURE 4. Fixed jackscrews male and female. Continued.

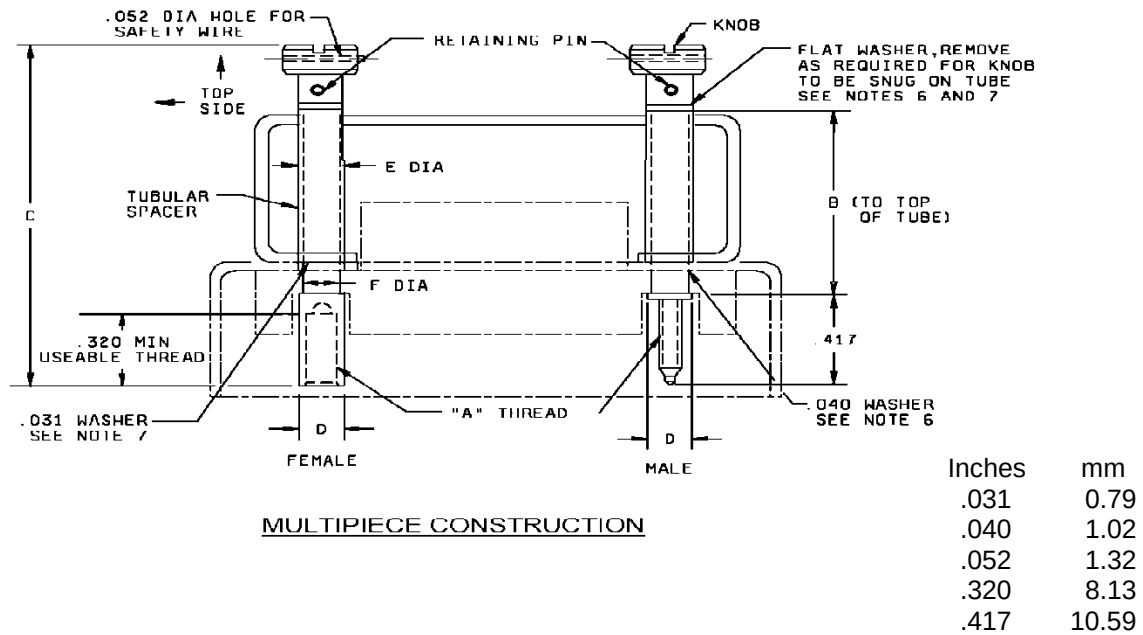


Short turnable jackscrew designator	Gender	Connector size (number of contacts)	"A" thread class 2	"B" dia max	C dia ±.003 (0.08 mm)
MS18195-1	Male	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	6-32 UNC-2A .138-32 UNC	.190 (4.83)	.115 (2.92)
MS18195-2	Female	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	6-32 UNC-2B .138-32 UNC	.190 (4.83)	.115 (2.92)
MS18195-3	Male	104	8-32 UNC-2A .164-32 UNC	.225 (5.72)	.137 (3.48)
MS18195-4	Female	104	8-32 UNC-2B .164-32 UNC	.225 (5.72)	.137 (3.48)

NOTES:

- 6 Dimensions are in inches.
- 7 Metric equivalents are given for information only.
- 8 Unless otherwise specified, tolerances are ± 0.016 inch (0.41 mm).
- 9 ASTM A581/A581M, ASTM A582/A582M, SAE AMS5636, SAE AMS5639, SAE AMS5648, classes 302, 303, 303Se, 304 or 316 except for aluminum alloy knob and .040 inch (1.02 mm) flat washer.
- 10 Finish passivated in accordance with ASTM A967/A967M or SAE AMS2700 except for anodized knob.
- 11 Parts bagged disassembled.

FIGURE 6. Short turnable jackscrews.



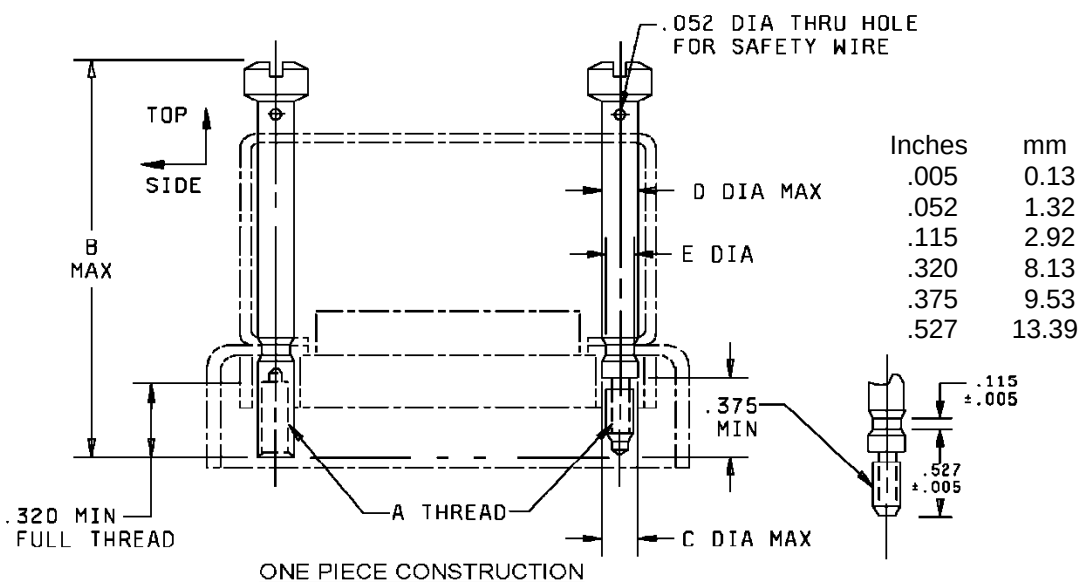
Multipiece turnable jackscrew designator	Gender	Connector size (Number of contacts)	A Thread class 2	B $\pm .016$ (0.41 mm)	C max	D dia max	E dia $\pm .004$ (0.10 mm)	F dia $\pm .003$
MS18194-1	Male	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	6-32 UNC-2A .138-32 UNC	1.500 (38.10)	2.467 (62.66)	.190 (4.83)	.188 (4.78)	.115 (2.92)
MS18194-2	Female	7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75	6-32-UNC-2B .138-32 UNC	1.500 (38.10)	2.467 (62.66)	.190 (4.83)	.188 (4.78)	.115 (2.92)
MS18194-3	Male	104	8-32-UNC-2A .164-32 UNC	2.495 (63.37)	3.438 (87.33)	.225 (5.72)	.219 (5.56)	.137 (3.48)
MS18194-4	Female	104	8-32-UNC-2B .164-32 UNC	2.495 (63.37)	3.438 (87.33)	.225 (5.72)	.219 (5.56)	.137 (3.48)

For use with MS18192-1 through -9, MS18193-1 and -2 and MS24133-1 through -4 shields and MS18203-1 through -10 and MS18204-1 through -10 shells.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are $\pm .016$ inch (0.41 mm).
4. Material corrosion resistance steel in accordance with ASTM A276/A276M, ASTM A473, ASTM A581/A581M, ASTM A582/A582M, SAE AMS5636, SAE AMS5639, SAE AMS5648, classes 302, 303, 303Se, 304 or 316 except for aluminum alloy knob and tubular spacer.
5. Finish passivated in accordance with ASTM A967/A967M or SAE AMS2700 except for anodized knob and tubular spacer on multipiece construction.
6. Washer .040 inch thick (1.02 mm) supplied with all sizes, not used with shell.
7. Washer .031 inch thick (0.79 mm) supplied with -1 and -2 is not used with shield sizes 20 and smaller.

FIGURE 7. Multipiece turnable jackscrews.



Long turnable jackscrew designator	Gender	Connector size (number of contacts)	"A" Thread class 2	"B" max	C dia max	D dia max	E dia ±.002 (0.05 mm)
MS18194-5	Male	34, 42, 50, 66, 75	6-32-UNC-2A .138-32 UNC	2.438 (61.93)	.192 (4.88)	.192 (4.88)	.111 (2.82)
MS18194-6	Female	34, 42, 50, 66, 75	6-32-UNC-2B .138-32 UNC	2.438 (61.93)	.192 (4.88)	.192 (4.88)	.111 (2.82)
MS18194-7	Male	104	8-32-UNC-2A .164-32 UNC	3.282 (83.36)	.225 (5.72)	.225 (5.72)	.140 (3.56)
MS18194-8	Female	104	8-32-UNC-2B .164-32 UNC	3.282 (83.36)	.225 (5.72)	.225 (5.72)	.140 (3.56)

For use with MS18192-10 through -13, MS18193-3 and -4, and MS24133-9 through -12 shields or MS18203-11 through -16 and MS18204-11 through -16 shells.

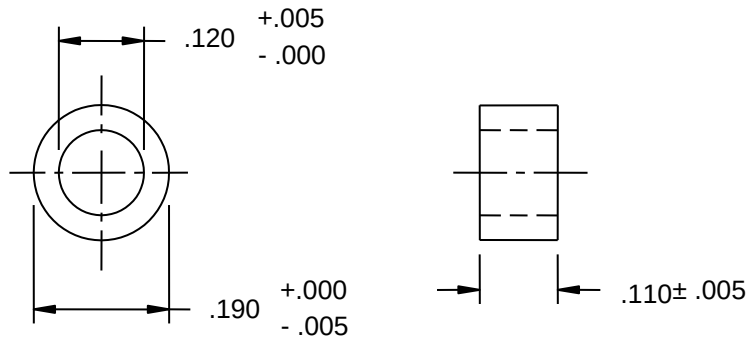
When MS18203-11 through -16 or MS18204-11 through -16 shells are required to be used with a shield, use MS18192-1 through -9 or MS18193-1 or -2 shield.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.016 inch (0.41 mm).
4. Material corrosion resistance steel in accordance with ASTM A276/A276M, ASTM A473, ASTM A581/A581M, ASTM A582/A582M, SAE AMS5636, SAE AMS5639, SAE AMS5648, classes 302, 303, 303Se, 304 or 316 except for aluminum alloy knob and tubular, spacer.
5. Finish passivated in accordance with ASTM A967/A967M or SAE AMS2700 except for anodized knob.

FIGURE 8. Long turnable jackscrew one piece construction.

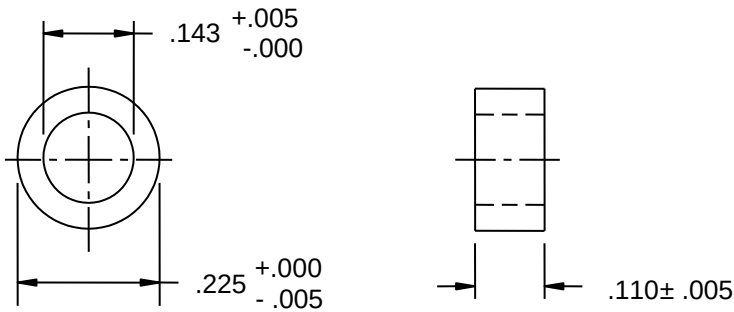
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For use with inserts sizes 34, 42, 50, 66, and 75

Inches	mm
.005	0.13
.110	2.79
.120	3.05
.143	3.63
.190	4.83
.225	5.72

Designator MS18173-1



For use with insert size 104

Designator MS18173-2

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.015 inch (0.38 mm).
4. Washer: Corrosion resistant steel, in accordance with ASTM A276/A276M, ASTM A473, SAE AMS5639, SAE AMS5648, classes 304, 305, or 316, UNS S30400, S30500, S30403, S31600, or S31603.
5. Washer finish: Passivated in accordance with SAE AMS2700 and self-locking nut. Passivation treatment, method 1, type 6 or method 1, type 7.

FIGURE 9. Flat washer.

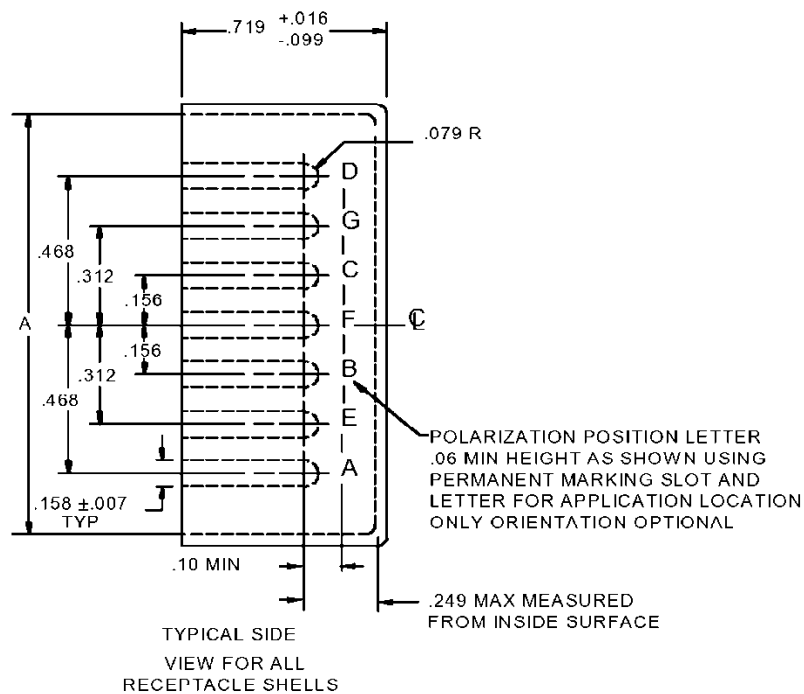
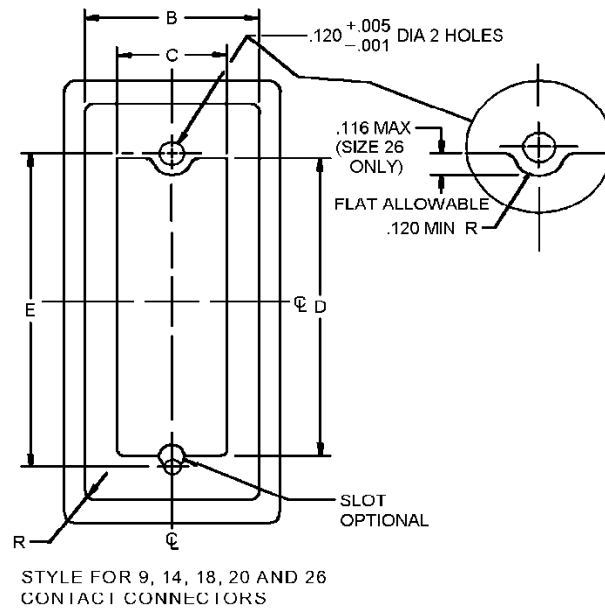
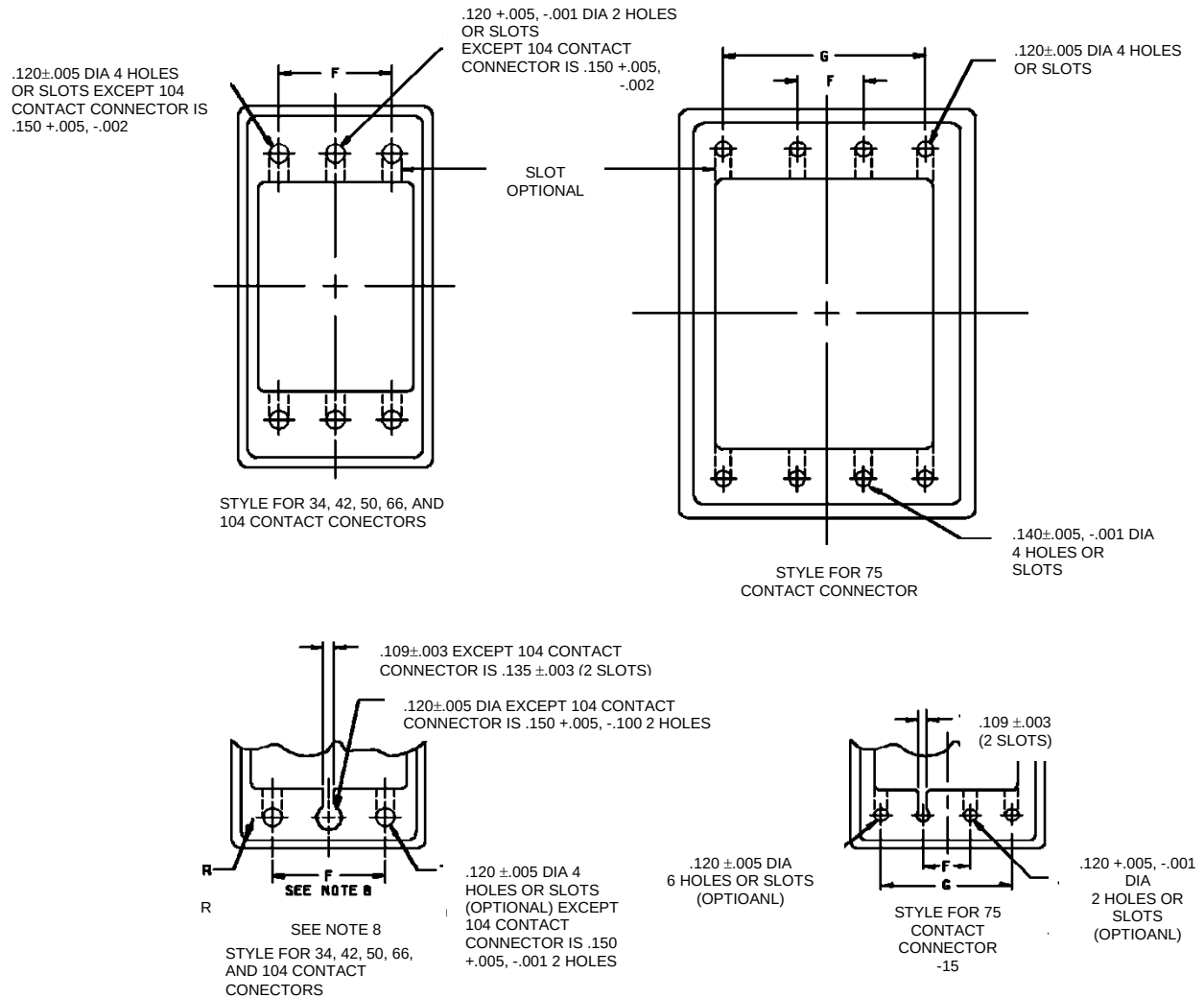


FIGURE 10. Receptacle shell, polarizing.

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Inches	mm	Inches	mm
.001	0.03	.116	2.95
.002	0.05	.120	3.05
.003	0.08	.135	3.43
.005	0.13	.140	3.56
.007	0.18	.150	3.81
.016	0.41	.156	3.96
.06	1.5	.158	4.01
.079	2.01	.249	6.32
.099	2.51	.312	7.92
.10	2.5	.468	11.89
.109	2.77	.719	18.26

Receptacle shell MS18204, polarizing

FIGURE 10. Receptacle shell, polarizing - Continued.

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Receptacle shell with polarization designator	Connector size (number of contacts)	A min	B min	C min	D min	E ±.005 (0.13 mm)	F ±.005 (0.13 mm)	G ±.005 (0.13 mm)	R
MS18204-9()	9	1.448 (36.78)	.512 (13.00)	.375 (9.53)	.864 (21.95)	1.000 (25.40)	---	---	.141 (3.58)
MS18204-1()	14	1.388 (35.26)	.575 (14.61)	.440 (11.18)	.800 (20.32)	.938 (23.83)	---	---	.141 (3.58)
MS18204-17()	18	1.450 (36.83)	.696 (17.68)	.565 (14.35)	.880 (22.35)	1.00 (25.40)	---	---	.141 (3.58)
MS18204-2()	20	1.702 (43.23)	.575 (14.61)	.440 (11.18)	1.097 (27.86)	1.250 (31.75)	---	---	.141 (3.58)
MS18204-10()	26	1.763 (44.78)	.696 (17.68)	.565 (14.35)	1.182 (30.02)	1.312 (33.32)	---	---	.141 (3.58)
MS18204-3()	34	2.138 (54.31)	.888 (22.56)	.745 (18.92)	1.400 (35.56)	1.688 (42.88)	.468 (11.89)	---	.141 (3.58)
MS18204-4()	42	2.450 (62.23)	.888 (22.56)	.745 (18.92)	1.700 (43.18)	2.000 (50.80)	.468 (11.89)	---	.141 (3.58)
MS18204-5()	50	2.856 (72.54)	1.015 (25.78)	.745 (18.92)	2.026 (51.46)	2.281 (57.94)	.468 (11.89)	---	.188 (4.78) (see note 4)
MS18204-6()	66	2.420 (61.47)	1.264 (32.11)	1.115 (28.32)	1.696 (43.08)	1.969 (50.01)	.500 (12.70)	---	.375 (9.53)
MS18204-7()	75	2.855 (72.52)	1.370 (34.80)	1.104 (28.04)	2.026 (51.46)	2.281 (57.94)	.234 (5.94)	.766 (19.46)	.203 (5.16)
MS18204-8()	104	2.900 (73.66)	1.680 (42.67)	1.476 (37.49)	2.073 (52.65)	2.375 (60.33)	.875 (22.23)	---	.422 (10.72)
MS18204-11() see note 9	34	2.138 (54.31)	.888 (22.56)	.745 (18.92)	1.400 (35.56)	1.688 (42.88)	.468 (11.89)	---	.141 (3.58)
MS18204-12() see note 9	42	2.450 (62.23)	.888 (22.56)	.745 (18.92)	1.700 (43.18)	2.000 (50.80)	.468 (11.89)	---	.141 (3.58)
MS18204-13() see note 9	50	2.856 (72.54)	1.015 (25.78)	.745 (18.92)	2.026 (51.46)	2.281 (57.94)	.468 (11.89)	---	.188 (4.78) (see note 4)
MS18204-14() see note 9	66	2.420 (61.47)	1.264 (32.11)	1.115 (28.32)	1.696 (43.08)	1.969 (50.01)	.500 (12.70)	---	.375 (9.53)
MS18204-15() see note 9	75	2.855 (72.52)	1.370 (34.80)	1.104 (28.04)	2.026 (51.46)	2.281 (57.94)	.234 (5.94)	.766 (19.46)	.203 (5.16)
MS18204-16() see note 9	104	2.900 (73.66)	1.680 (42.67)	1.476 (37.49)	2.073 (52.65)	2.375 (60.33)	.875 (22.23)	---	.422 (10.72)

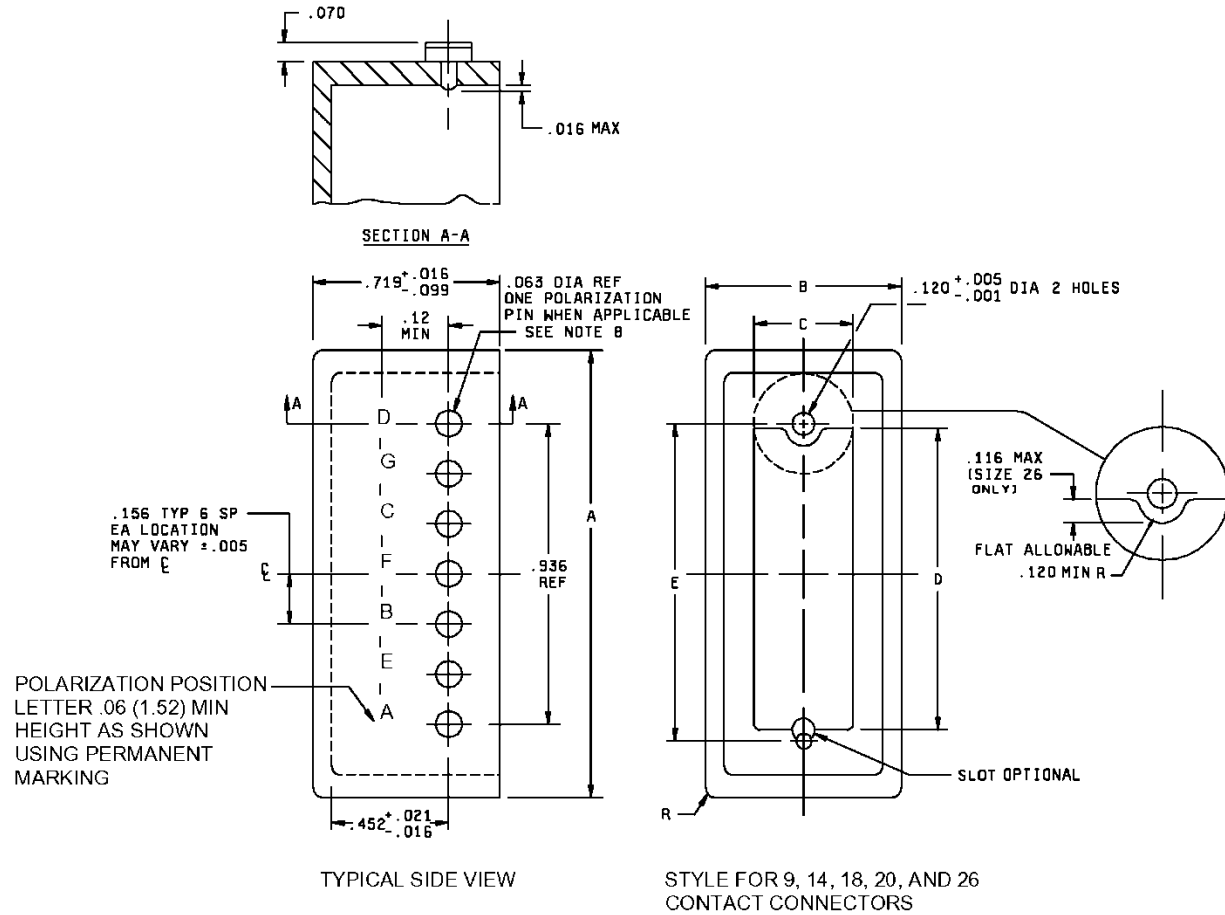
Polarization designators () indicate location of polarization slot designator A through G (see note 8).

FIGURE 10. Receptacle shell polarizing - Continued.

NOTES:

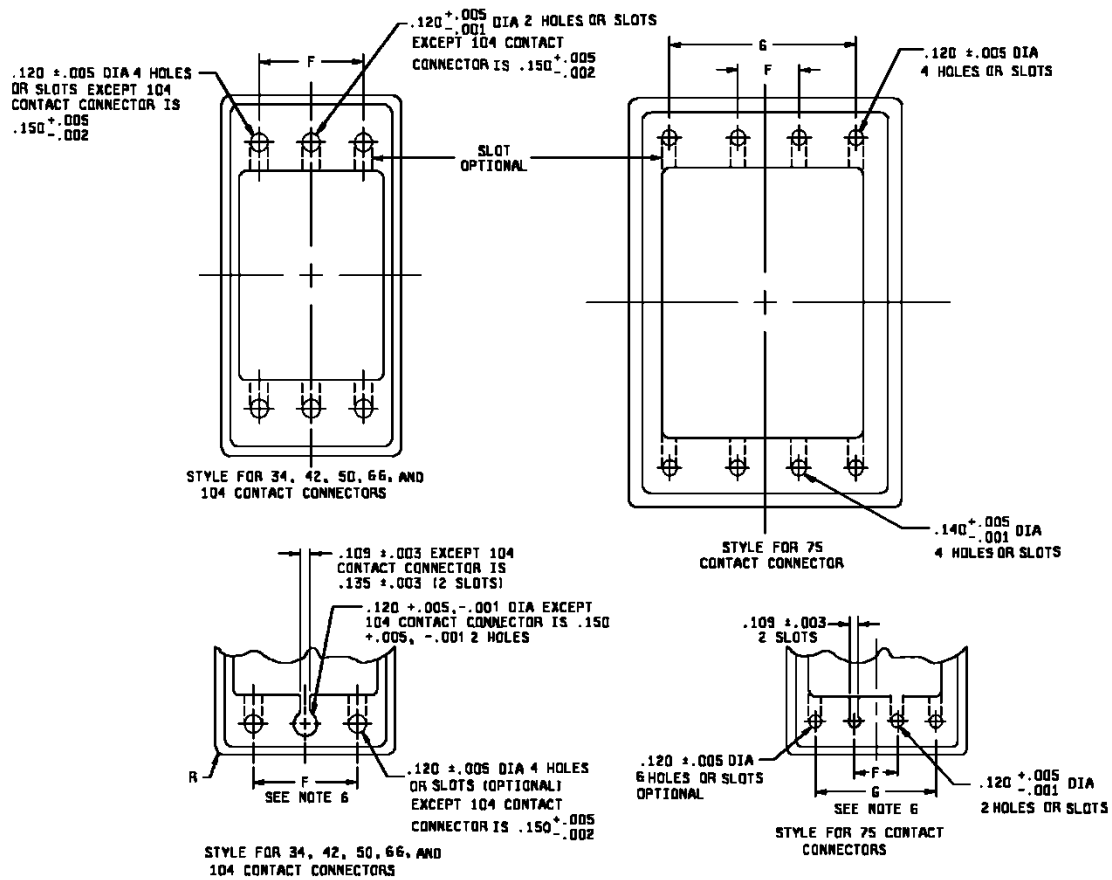
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are $\pm .016$ inch (0.41 mm).
4. Tolerance $+.020$ inch (0.51 mm) $-.016$ inch (0.41 mm).
5. Material aluminum alloy in accordance with SAE AMS4015, temper O, or ASTM B209, temper H12, .040 inch (1.02 mm) thick.
6. Finish anodize in accordance with MIL-A-8625, type I or type II.
7. Each slot may vary $\pm .005$ inch (0.13 mm) from centerline.
8. PIN examples:
 - a. Polarization required, specify as MS18204-# (A through G). Example: MS18204-5D.
 - b. Polarization not required, specify as MS18204-#. Example: MS18204-5.
9. Receptacle shell designators MS18204-11, -12, -13, -14, -15, and -16 are not used with one-piece jackscrew shields of MS24133.

FIGURE 10. Receptacle shell polarizing - Continued.



Plug shell polarizing

FIGURE 11. Plug shell, configurations.



Inches	mm	Inches	mm
.001	0.03	.116	2.95
.002	0.05	.12	3.0
.003	0.08	.120	3.05
.005	0.13	.135	3.43
.016	0.41	.140	3.56
.021	0.53	.150	3.81
.063	1.60	.156	3.96
.070	1.78	.234	5.94
.099	2.51	.452	11.48
.109	2.77	.719	18.26
		.936	23.77

Plug shell MS18203, polarizing

FIGURE 11. Plug shell configurations - Continued.

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Designator see note 6	Connector size (number of contacts)	A max	B max	C min	D min	E ±.005 (0.13 mm)	F ±.005 (0.13 mm)	G ±.005 (0.13 mm)	R
MS18203-9()	9	1.440 (36.58)	.500 (12.70)	.375 (9.53)	.864 (21.95)	1.000 (25.40)	---		.141 (3.58)
MS18203-1()	14	1.380 (35.05)	.567 (14.40)	.440 (11.18)	.800 (20.32)	.938 (23.83)	---		.141 (3.58)
MS18203-17()	18	1.440 (36.58)	.680 (17.27)	.580 (14.73)	.880 (22.35)	1.000 (25.40)	---	---	.141 (3.58)
MS18203-2()	20	1.700 (43.18)	.567 (14.40)	.440 (11.18)	1.097 (27.86)	1.250 (31.75)	---		.141 (3.58)
MS18203-10()	26	1.755 (44.58)	.688 (17.48)	.565 (14.35)	1.182 (30.02)	1.312 (33.32)	---		.141 (3.58)
MS18203-3()	34	2.130 (54.10)	.880 (22.35)	.745 (18.92)	1.400 (35.56)	1.688 (42.88)	.468 (11.89)		.141 (3.58)
MS18203-4()	42	2.442 (62.03)	.880 (22.35)	.745 (18.92)	1.700 (43.18)	2.000 (50.80)	.468 (11.89)		.141 (3.58)
MS18203-5()	50	2.846 (72.29)	1.005 (25.53)	.745 (18.92)	2.026 (51.46)	2.281 (57.94)	.468 (11.89)		.188 (4.78)
MS18203-6()	66	2.410 (61.21)	1.254 (31.85)	1.115 (28.32)	1.696 (43.08)	1.969 (50.01)	.500 (12.70)		.375 (9.53)
MS18203-7()	75	2.850 (72.39)	1.365 (34.67)	1.104 (28.04)	2.026 (51.46)	2.281 (57.94)	.234 (5.94)	.766 (19.46)	.187 (4.75)
MS18203-8()	104	2.890 (73.41)	1.670 (42.42)	1.476 (37.49)	2.073 (52.65)	2.375 (60.33)	.875 (22.23)		.422 (10.72)
MS18203-11() see note 8	34	2.130 (54.10)	.880 (22.35)	.745 (18.92)	1.400 (35.56)	1.688 (42.88)	.468 (11.89)		.141 (3.58)
MS18203-12() see note 8	42	2.442 (62.03)	.880 (22.35)	.745 (18.92)	1.700 (43.18)	2.000 (50.80)	.468 (11.89)		.141 (3.58)
MS18203-13() see note 8	50	2.846 (72.29)	1.005 (25.53)	.745 (18.92)	2.026 (51.46)	2.281 (57.94)	.468 (11.89)		.188 (4.78)
MS18203-14() see note 8	66	2.410 (61.21)	1.254 (31.85)	1.115 (28.32)	1.696 (43.08)	1.969 (50.01)	.500 (12.70)		.375 (9.53)
MS18203-15() see note 8	75	2.850 (72.39)	1.365 (34.67)	1.104 (28.04)	2.026 (51.46)	2.281 (57.94)	.234 (5.94)	.766 (19.46)	.187 (4.75)
MS18203-16() see note 8	104	2.890 (73.41)	1.670 (42.42)	1.476 (37.49)	2.073 (52.65)	2.375 (60.35)	.875 (22.23)		.422 (10.72)

Polarization designators () indicate location of polarization plug A through G (see note 6).

Plug shell MS18203, polarizing

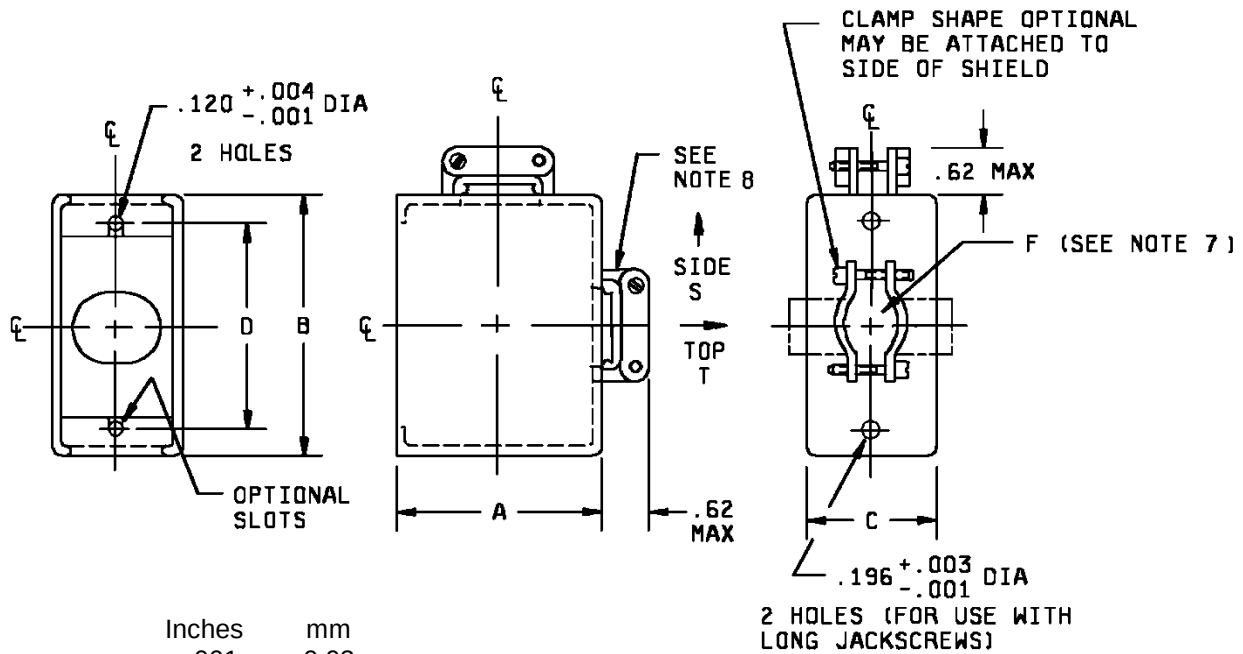
FIGURE 11. Plug shell configurations - Continued.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.016 inch (0.41 mm).
4. Material aluminum alloy in accordance with SAE AMS4015, temper O, or ASTM B209, temper H12, .040 inch (1.02mm) thick.
5. Finish anodize in accordance with MIL-A-8625, type I or type II.
6. PIN examples:
 - a. Polarization required, specify as MS18203- # (A through G): Example: MS18203-14D (see note 7).
 - b. Polarization not required, specify as MS18203- #: Example: MS18203-5.
7. One polarization pin is used when applicable. Polarization pin will be packaged loose. If a polarization pin only is required order separately as MS18205.
8. MS18203-11, -12, -13, -14, -15, and -16 are not used with one-piece jackscrew shields of MS24133.

Plug shell polarizing

FIGURE 11. Plug shell configurations - Continued.



<u>1/</u> Shield designator	Shield and shield clamp location	Connector size (number of contacts)	A min max	B ± .016 (0.41 mm)	C ± .016 (0.41 mm)	D ±.005 (0.13 mm)	F Minimum cable opening square inch
MS18192-T7 MS18192-S7	top opening side opening	7	1.18 (29.97) 1.35 (34.29)	1.220 (30.99)	.437 (11.10)	.906 (23.01)	.18 (4.57)
MS18192-T8 MS18192-S8	top opening side opening	9	1.18 (29.97) 1.35 (34.29)	1.312 (33.32)	.437 (11.10)	1.000 (25.40)	.10 (2.54)
MS18192-T1 MS18192-S1	top opening side opening	14	1.18 (29.97) 1.35 (34.29)	1.250 (31.75)	.500 (12.70)	.938 (23.83)	.19 (4.83)
MS18192-T14 MS18192-S14	top opening side opening	18	1.18 (29.97) 1.35 (34.29)	1.190 (30.23)	.630 (16.00)	1.000 (25.40)	.22 (5.59)
MS18192-T2 MS18192-S2	top opening side opening	20	1.18 (29.97) 1.35 (34.29)	1.562 (39.67)	.500 (12.70)	1.250 (31.75)	.22 (5.59)
MS18192-T9 MS18192-S9	top opening side opening	26	1.18 (29.97) 1.35 (34.29)	1.625 (41.28)	.640 (16.26)	1.312 (33.32)	.22 (5.59)

1/ When used with MIL-DTL-28748/5 and 6 slash sheets, the shield is only used when shell MS18203 or MS18204 is specified.

FIGURE 12. Shield 7, 9, 14, 20, 26, 34, 42, 50, and 75 contact positions.

MIL-DTL-28748/17B

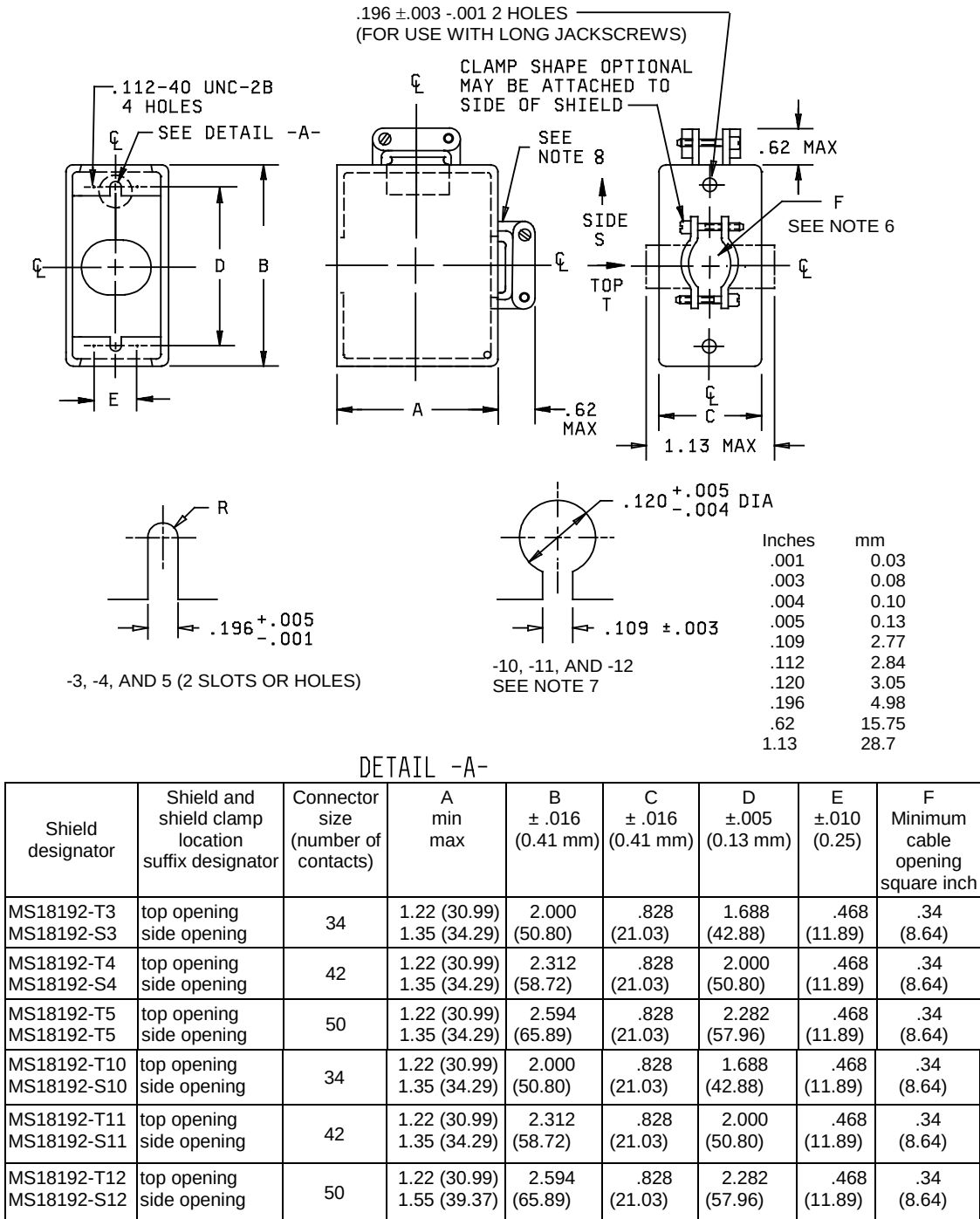
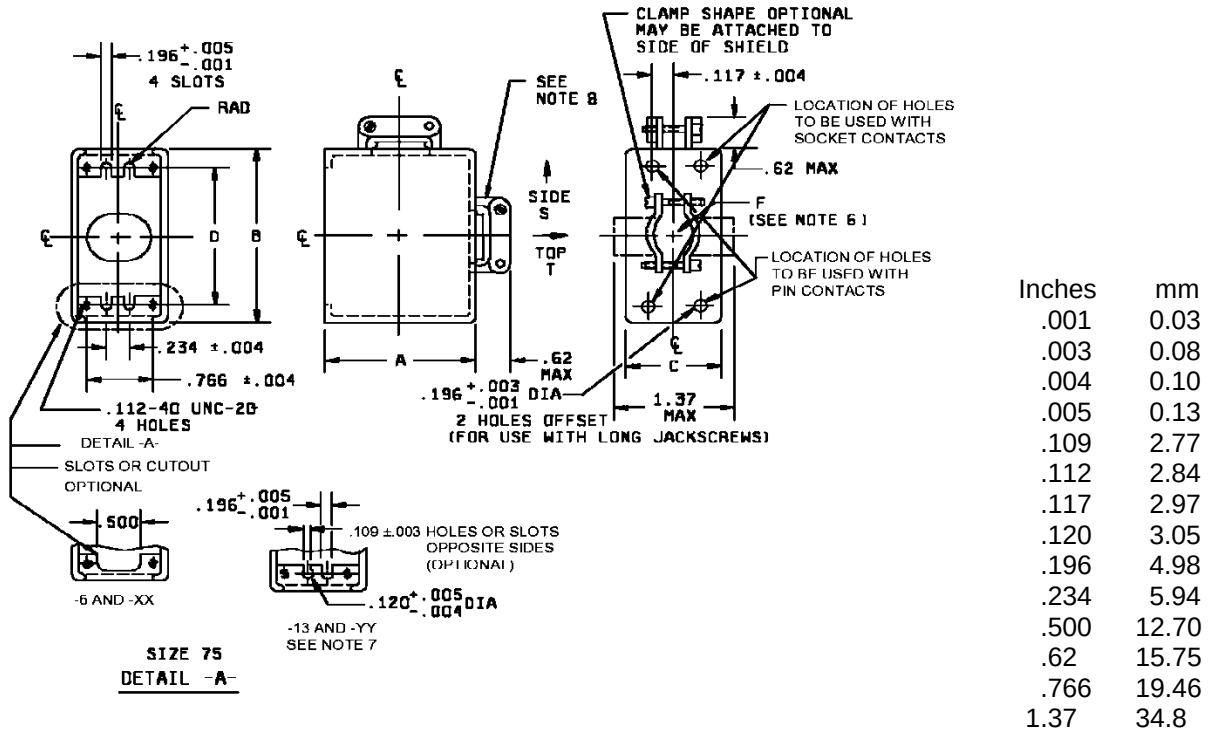


FIGURE 12. Shields for 7, 9, 14, 20, 26, 34, 42, 50, and 75 contact positions - Continued.

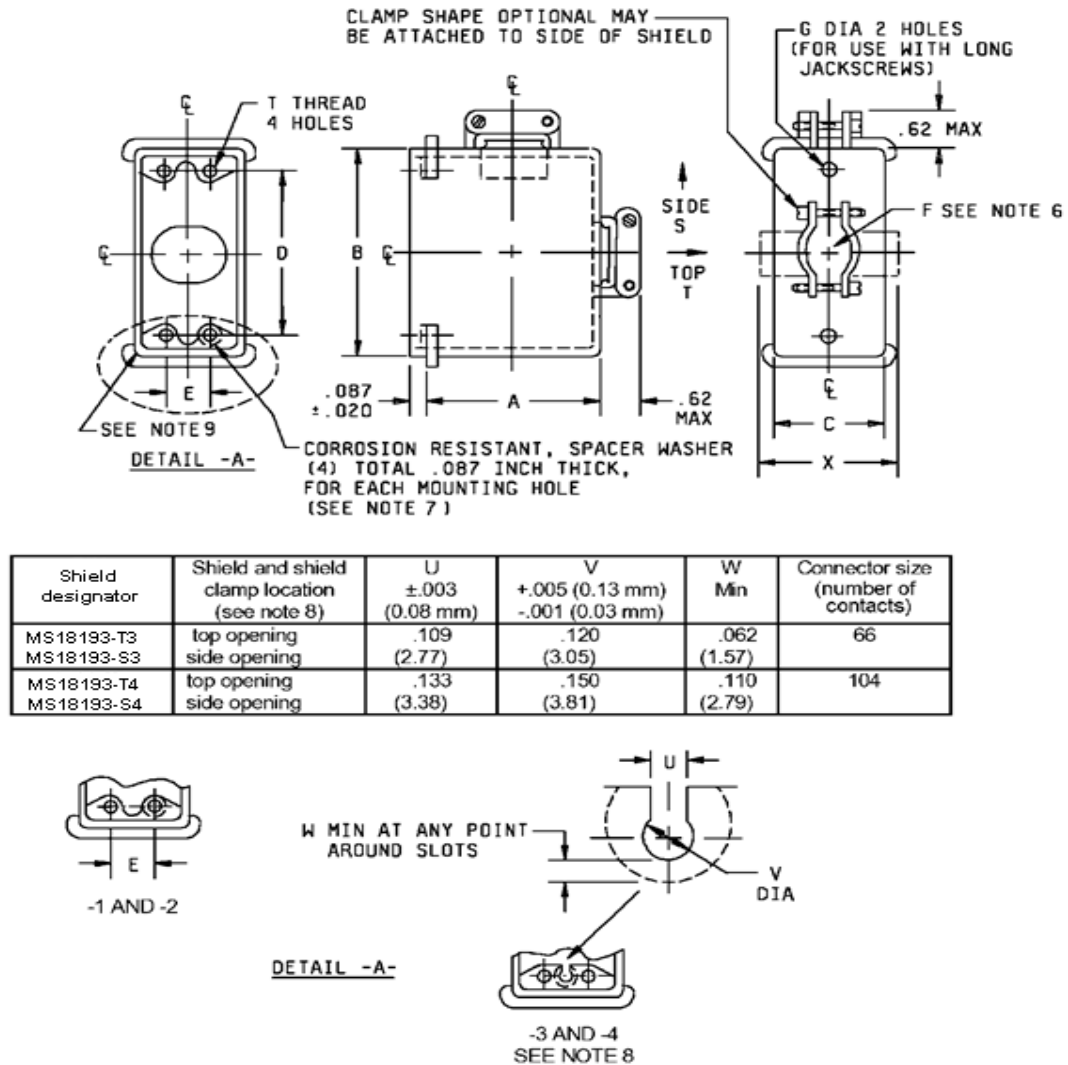


Designator	Shield and shield clamp location suffix designator	Connector size (number of contacts)	A min max	B ± .016 (0.41 mm)	C ± .016 (0.41 mm)	D ± .005 (0.13 mm)	F Minimum cable opening square inch
MS18192-T6	top opening	75	1.22 (30.99)	2.594	1.188	2.282	.55
MS18192-S6	side opening	Pin only	1.35 (34.29)	(65.89)	(30.18)	(57.96)	(13.97)
MS18192-T13	top opening	75	1.22 (30.99)	2.594	1.188	2.282	.55
MS18192-S13	side opening	Pin only	1.35 (34.29)	(65.89)	(30.18)	(57.96)	(13.97)
MS18192-TXX	top opening	75	1.22 (30.99)	2.594	1.188	2.282	.55
MS18192-SXX	side opening	Socket only	1.35 (34.29)	(65.89)	(30.18)	(57.96)	(13.97)
MS18192-TYY	top opening	75	1.22 (30.99)	2.594	1.188	2.282	.55
MS18192-SYY	side opening	Socket only	1.35 (34.29)	(65.89)	(30.18)	(57.96)	(13.97)

NOTES:

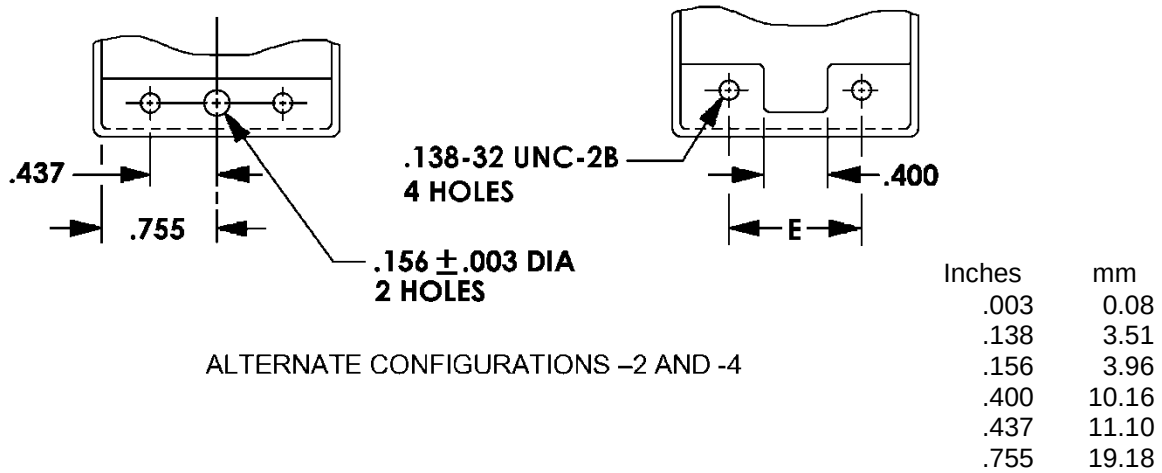
- Dimensions are in inches.
- Metric equivalents are given for information only.
- Unless otherwise specified, tolerances are ±.016 inch (0.41 mm).
- Material aluminum alloy in accordance with SAE-AMS4016 temper H32 .040 inch (1.02 mm) thick.
- Finish anodized in accordance with MIL-A-8625, type I or type II.
- Edges of cable entry hole to be rounded to prevent insulation chafing.
- MS18192-T10, S10, T11, S12, T13, S13, TYY, and SYY are for use with one-piece jackscrews.
- Clamp hinge may attach to side of shield.

FIGURE 12. Shields for 7, 9, 14, 20, 26, 34, 42, 50, and 75 contact positions - Continued.



Inches	mm
.020	0.51
.087	2.21
.62	15.75

FIGURE 13. Shields for 66 and 104 contact connector.



Shield designator	Shield and shield clamp location	Connector size (number of contacts)	A ±.03 (0.76 mm)	B ±.016 (0.41 mm)	C ±.016 (0.41 mm)	D ±.005 (0.13 mm)	E ±.005 (0.13 mm)	F Minimum cable opening sq. inch	G +.003 (0.08 mm) -.001 (0.03 mm)	T thread	X max
MS18193-T1 MS18193-S1	top opening side opening	66	1.17 (29.72)	2.366 (60.10)	1.211 (30.76)	1.969 (50.01)	.500 (12.70)	.55 (13.97)	.196 (4.98)	.112-40 UNC-2B	1.37 (34.80)
MS18193-T2 MS18193-S2	top opening side opening	104	2.23 (56.64)	2.835 (72.01)	1.625 (41.28)	2.375 (60.33)	.875 (22.23)	1.10 (27.94)	.229 (5.82)	.138-32 UNC-2B	1.88 (47.75)
MS18193-T3 MS18193-S3	top opening side opening	66	1.17 (29.72)	2.366 (60.10)	1.211 (30.76)	1.969 (50.01)	.500 (12.70)	.55 (13.97)	.196 (4.98)	.112-40 UNC-2B	1.37 (34.80)
MS18193-T4 MS18193-S4	top opening side opening	104	2.23 (56.64)	2.835 (72.01)	1.625 (41.28)	2.375 (60.33)	.875 (22.23)	1.10 (27.94)	.229 (5.82)	.138-32 UNC-2B	1.88 (47.75)

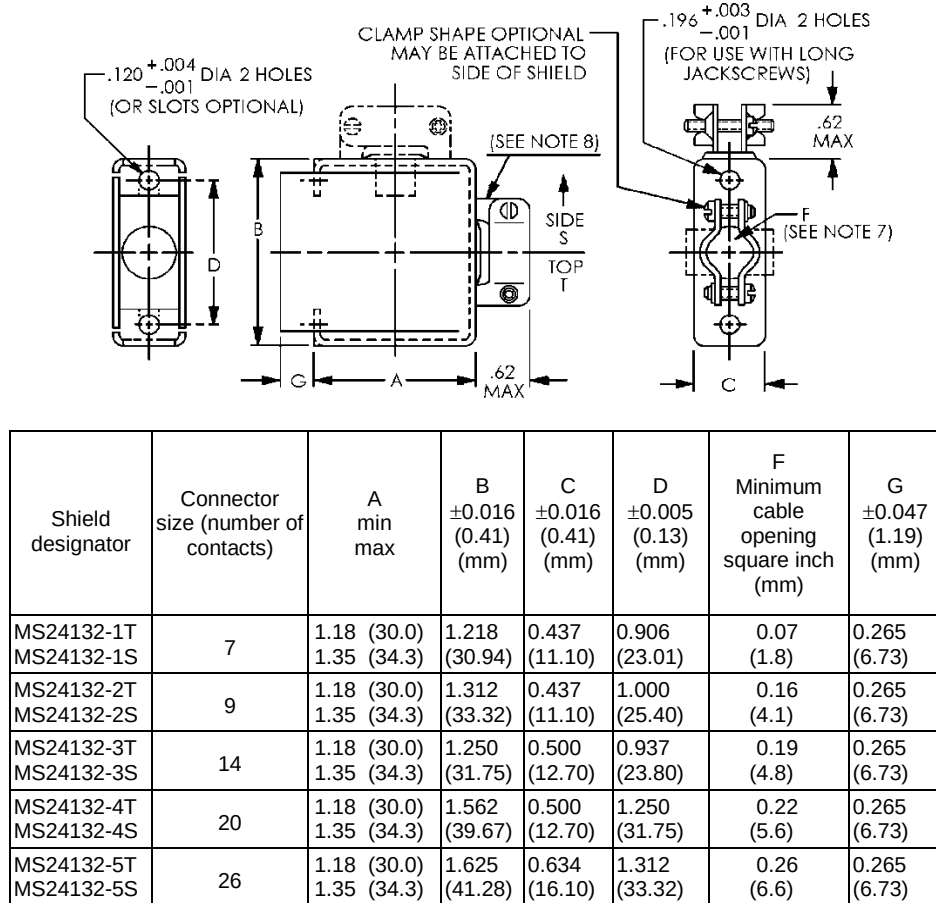
MS18193-T3, S3, T4, and S4 are used with one-piece jackscrews.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ± 0.016 inch (0.41 mm).
4. Material aluminum alloy in accordance with SAE-AMS4016 temper H32 .040 inch (1.02 mm) thick.
5. Finish anodized in accordance with MIL-A-8625, type I or type II.
6. Edges of cable entry hole to be rounded to prevent insulation chafing.
7. Spacer washers (4) used only with shell. Discard otherwise. Aluminum shall be in accordance with SAE AMS4027, T6, anodized in accordance with MIL-A-8625, type I or II.
8. MS18193-T3, S3, T4, S4 are for use with one-piece jackscrews.
9. No crack, chips, or sharp edges on all 4 edges of flange.

FIGURE 13. Shields for 66 and 104 contact connector - Continued.

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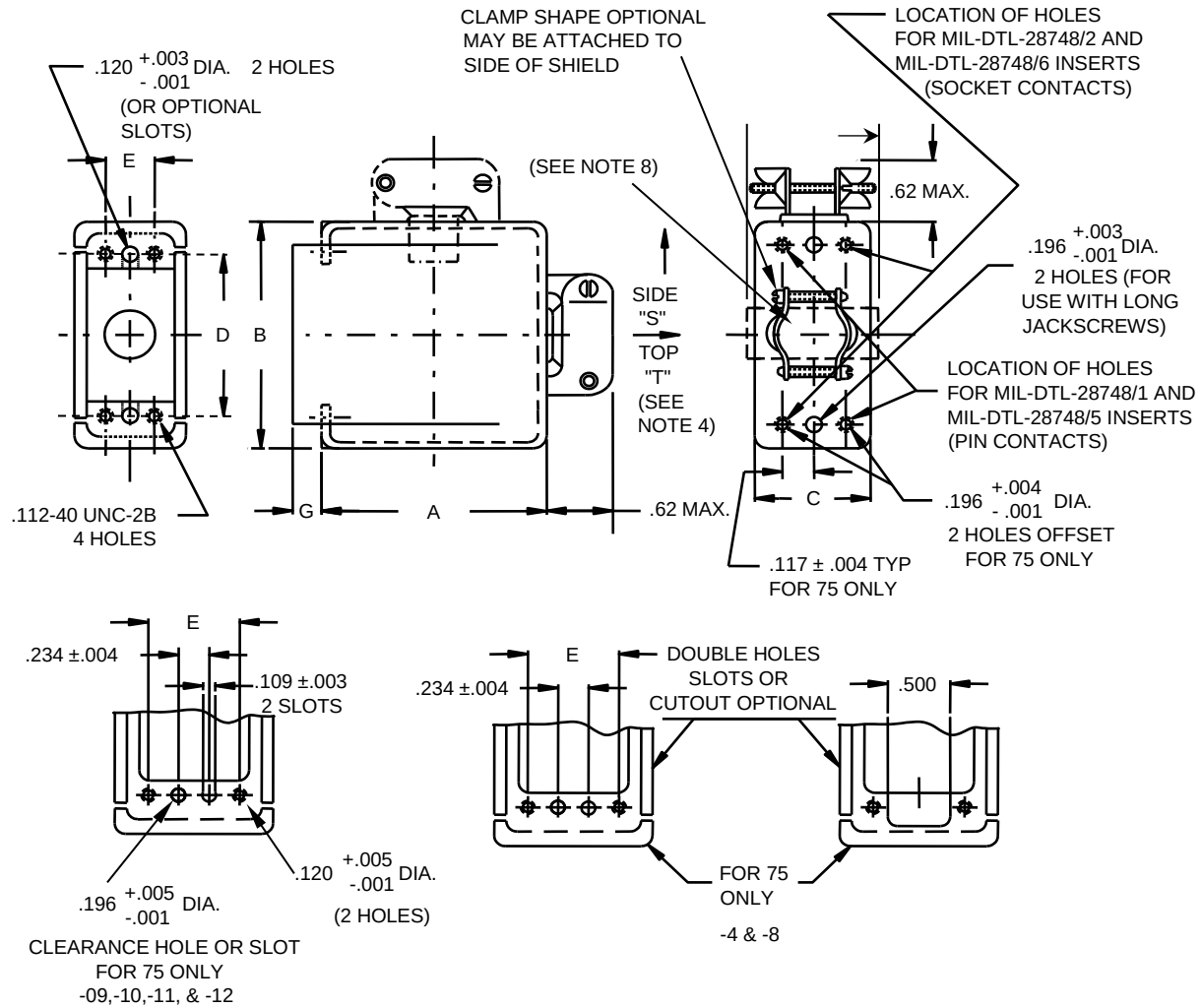


The following designators are the same as those listed above, except the two .120 inch (3.05 mm) diameter thru holes for mounting are threaded and the two .196 inch (4.98 mm) diameter holes are omitted. NOT RECOMMENDED FOR NEW DESIGN.

Shield designator	Connector size (number of contacts)	Thread size
MS24132-1T MS24132-1S	7	4-40 UNC-2B .112-40 UNC-2B
MS24132-2T MS24132-2S	9	4-40 UNC-2B .112-40 UNC-2B
MS24132-3T MS24132-3S	14	4-40 UNC-2B .112-40 UNC-2B
MS24132-4T MS24132-4S	20	4-40 UNC-2B .112-40 UNC-2B
MS24132-5T MS24132-5S	26	4-40 UNC-2B .112-40 UNC-2B

FIGURE 14. Shields for 7, 9, 14, 20, 26, 34, 42, 50, and 75.

MIL-DTL-28748/17B



Shield designator	Connector size (number of contacts)	A min max	B ± 0.016 (0.41) (mm)	C ± 0.016 (0.41) (mm)	D ± 0.005 (0.13) (mm)	E ± 0.005 (0.13) (mm)	F Minimum cable opening square inch (mm)	G ± 0.047 (1.19) (mm)
MS24133-T1 MS24133-S1	34	1.22 (31.0) 1.35 (34.3)	2.000 (50.80)	0.828 (21.03)	1.688 (42.88)	.468 (11.89)	.34 (8.6)	0.265 (6.73)
MS24133-T2 MS24133-S2	42	1.22 (31.0) 1.35 (34.3)	2.312 (58.72)	0.828 (21.03)	2.000 (50.80)	.468 (11.89)	.34 (8.6)	0.093 (2.36)
MS24133-T3 MS24133-S3	50	1.22 (31.0) 1.35 (34.3)	2.594 (65.89)	0.828 (21.03)	2.282 (57.96)	.468 (11.89)	.34 (8.6)	0.093 (2.36)
MS24133-T4 MS24133-S4	75	1.22 (31.0) 1.35 (34.3)	2.594 (65.89)	1.188 (30.18)	2.282 (57.96)	.766 (19.46)	.55 (14.0)	0.093 (2.36)

The following designators are the same as those listed above, except the two .196 inch (4.98 mm) diameter thru holes for mounting are threaded and the two .196 inch (4.98 mm) diameter holes are omitted. NOT RECOMMENDED FOR NEW DESIGN.

FIGURE 14. Shields for 7, 9, 14, 20, 26, 34, 42, 50, and 75 - Continued.

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Shield designator	Connector size (number of contacts)	Thread size
MS24133-T5 MS24133-S5	34	4-40 UNC-2B .112-40 UNC-2B
MS24133-T6 MS24133-S6	42	4-40 UNC-2B .112-40 UNC-2B
MS24133-T7 MS24133-S7	50	4-40 UNC-2B .112-40 UNC-2B
MS24133-T8 MS24133-S8	75	4-40 UNC-2B .112-40 UNC-2B

The following shields are for use with one piece jackscrews are and not used with shells.

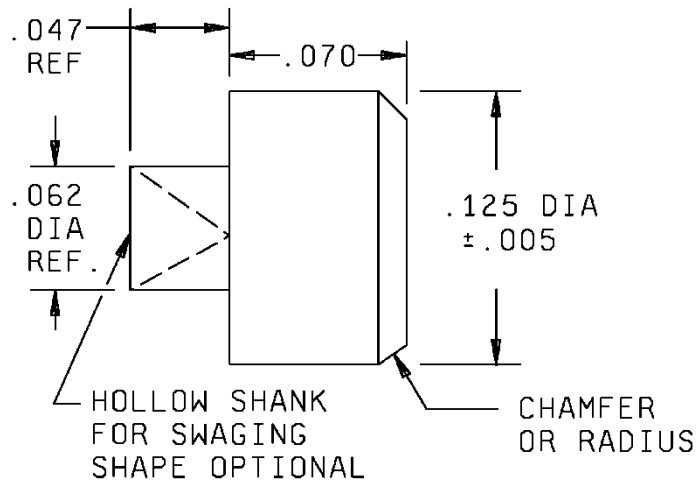
Shield designator	Connector size (number of contacts)	A min max	B ±0.016 (0.41) (mm)	C ±0.016 (0.41) (mm)	D ±0.005 (0.13) (mm)	E ±.005 (0.13) (mm)	F Minimum cable opening square inch (mm)	G ±0.047 (1.19) (mm)	H max
MS24133-T9 MS24133-S9	34	1.22 (31.0) 1.35 (34.3)	2.000 (50.80)	0.828 (21.03)	1.688 (42.88)	.468 (11.89)	.34 (8.6)	.265 (6.73)	1.13 (28.7)
MS24133-T10 MS24133-S10	42	1.22 (31.0) 1.35 (34.3)	2.312 (58.72)	0.828 (21.03)	2.000 (50.80)	.468 (11.89)	.34 (8.6)	.093 (2.36)	1.13 (28.7)
MS24133-T11 MS24133-S11	50	1.22 (31.0) 1.35 (34.3)	2.594 (65.88)	0.828 (21.03)	2.282 (57.96)	.468 (11.89)	.34 (8.6)	.093 (2.36)	1.13 (28.7)
MS24133-T12 MS24133-S4	75	1.22 (31.0) 1.35 (34.3)	2.594 (65.88)	1.188 (30.18)	2.282 (57.96)	.766 (19.46)	.55 14.0	.093 (2.36)	1.37 (34.8)

Inches	mm	Inches	mm	Inches	mm
.001	0.03	.109	2.77	.196	4.98
.003	0.08	.112	2.84	.234	5.94
.004	0.10	.117	2.97	.500	12.70
.005	0.13	.120	3.05	.62	15.75

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ±.016 inch (0.41 mm).
4. Material aluminum alloy in accordance with SAE AMS4016, temper H32 .040 inch (1.02 mm) thick.
5. Finish anodize in accordance with MIL-A-8625, type I or type II.
6. Spacer washers (4) used only with shell: Discard otherwise.
7. Edges of cable entry hole to be rounded to prevent insulation chafing.
8. No cracks, chips, or sharp edges on all 4 edges of flange.

FIGURE 14. Shields for 7, 9, 14, 20, 26, 34, 42, 50, and 75 - Continued.



Pin polarizing, straight headed.

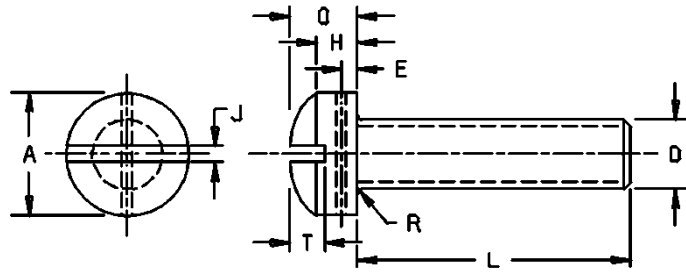
Inches	mm
.005	0.13
.047	1.19
.062	1.57
.070	1.78
.125	3.18

Designator MS18205

NOTES:

1. Dimensions are in inches.
2. Unless otherwise specified, tolerance is ± 0.016 inch (0.41 mm).
3. Metric equivalents are given for information only.
4. Material: Corrosion resistant steel in accordance with ASTM A484/A484M and ASTM A582/A582M, classes 302, 303, 303Se, 304, 316.
5. Passivated in accordance with SAE AMS2700.
6. Design standard for use with MS18203.

FIGURE 15. Pin polarizing configuration.



These are machined drilled fillister head screws. Screws furnished with shields when required, crossed drilled hole is optional.

NASM35275 PIN 1/	Nominal size	Threads per inch, UNC-2A (Pitch)	D Body diameter		A Head diameter		H Head side height		O Total head height	
			min	max	min	max	min	max	min	max
MS35275-215	.112 (#4) (2.84)	40 (.64)	.0925 (2.350)	.1120 (2.84)	.166 (4.22)	.183 (4.65)	.072 (1.83)	.079 (2.01)	.094 (2.39)	.107 (2.72)
MS35255-229	.138 (#6) (3.51)	32 (.79)	.1141 (2.898)	.1380 (3.505)	.208 (5.28)	.226 (5.74)	.089 (2.26)	.096 (2.44)	.118 (3.00)	.132 (3.35)

NASM35275 PIN 1/	J Slot width		T Slot depth		E drill location nom	Drilled hole size nom	R radius max	Tensile strength LB-min (KN-min)
	min	max	min	max				
MS35275-215	.031 (.79)	.039 (.99)	.030 (.76)	.038 (.97)	.035 (.89)	.037 (.94)	.017 (.43)	.480 (.22)
MS35275-229	.039 (.99)	.048 (1.22)	.035 (.89)	.045 (1.14)	.043 (1.09)	.046 (1.17)	.021 (.53)	.730 (.33)

1/ National Aerospace Standard NASM35275. Not to be ordered with this slash sheet (see note 1).

To order screws individually use the following NASM PINs:

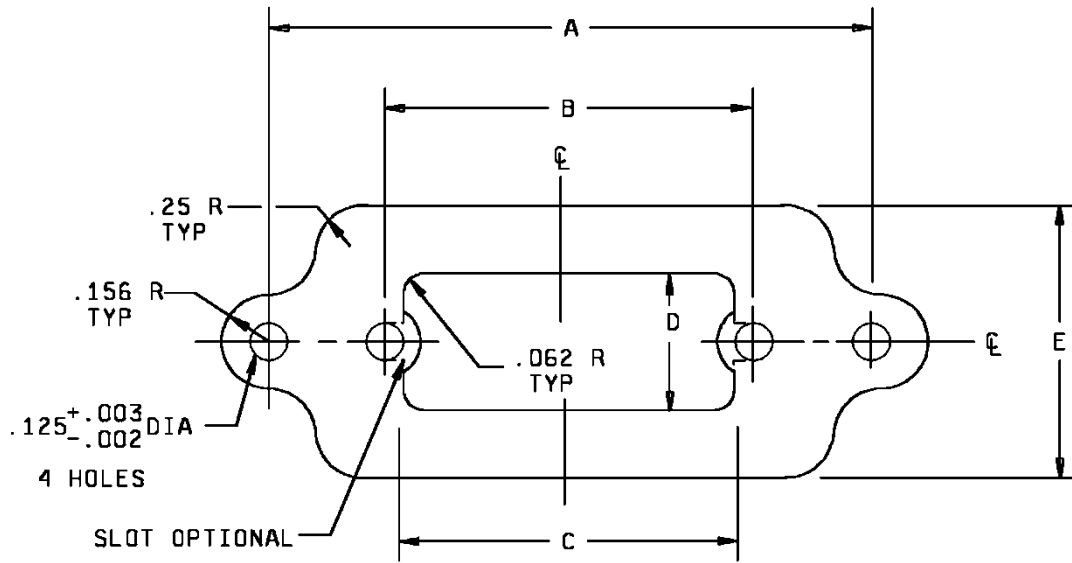
- a. #4 screw MS35275-215
- b. #6 screw MS35275-229

NOTES:

1. Screws are shown for reference purposes only.
2. Material corrosion resisting, in accordance with SAE AIR4127, UNS S3xxx (developed for cold heading) or type UNS S30430 in accordance with the chemical requirements of ASTM A493.
3. Treatment: Passivation shall be in accordance with SAE AMS2700.
4. Magnetic permeability: These screws shall have a magnetic permeability of 2.0 μ maximum (air = 1.0 μ) for a field strength of H = 200 oersteds, using a magnetic indicator in accordance with ASTM A342/A342M.
5. Threads: Threads shall be in accordance with FED-STD-H28.
6. Threads: Screws shall have complete threads extending to within two threads of the head, or closer if practicable.
7. Drilled hole is to be approximately at right angles to the slot and may be permitted to break through the bottom of the slot. All sharp edges shall be removed.
8. Copies of NASM35275 are available online at <http://www.aia-aerospace.org/>

FIGURE 16. Slotted screw.

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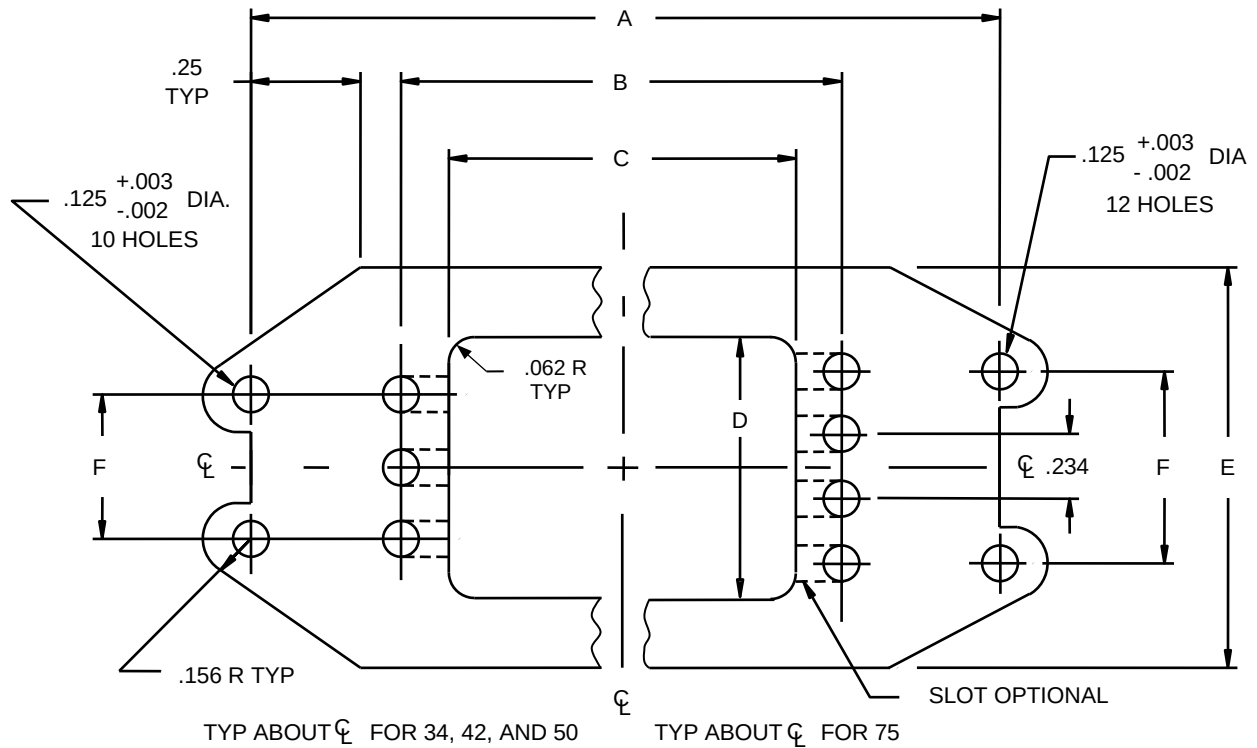
Inches	mm
.002	0.05
.003	0.08
.062	1.57
.125	3.18
.156	3.96
.25	6.4

Retaining plate designator	Connector size (number of contacts)	A $\pm .005$ (0.13 mm)	B $\pm .005$ (0.13 mm)	C (mm)	D (mm)	E (mm)
MS18198-1	14	1.953 (49.61)	.937 (23.80)	.812 (20.62)	.469 (11.91)	1.016 (25.81)
MS18198-2	20	2.266 (57.56)	1.250 (31.75)	1.125 (28.58)	.469 (11.91)	1.016 (25.81)
MS18198-3	9	2.016 (51.21)	1.000 (25.4)	.875 (22.23)	.406 (10.31)	.953 (24.21)
MS18198-4	26	2.328 (59.13)	1.312 (33.32)	1.187 (30.15)	.593 (15.06)	1.141 (28.98)

See notes at end of figure.

FIGURE 17. Retaining plate.

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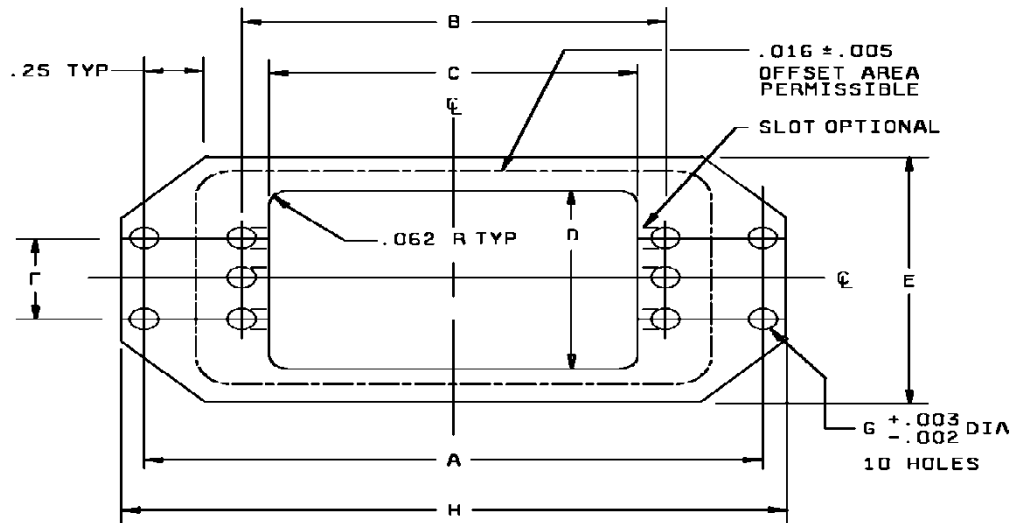
Inches	mm
.002	0.05
.003	0.08
.062	1.57
.125	3.18
.156	3.96
.234	5.94
.25	6.4

Retaining plate designator	Connector size (number of contacts)	A $\pm .005$ (0.13 mm)	B $\pm .005$ (0.13 mm)	C (mm)	D (mm)	E $\pm .005$ (0.13 mm)	F (mm)
MS18199-1	34	2.703 (68.66)	1.687 (42.85)	1.438 (36.53)	.750 (19.05)	.468 (11.89)	1.328 (33.73)
MS18199-2	42	3.016 (78.61)	2.000 (50.80)	1.750 (44.45)	.750 (19.05)	.468 (11.89)	1.328 (33.73)
MS18199-3	50	3.422 (86.92)	2.281 (57.94)	2.031 (51.59)	.750 (19.05)	.468 (11.89)	1.453 (36.91)
MS18199-4	75	3.422 (86.92)	2.281 (57.94)	2.031 (51.59)	1.109 (28.17)	.766 (19.46)	1.797 (45.64)

See notes at end of figure.

FIGURE 17. Retaining plate - Continued.

MIL-DTL-28748/17B



Inches	mm
.002	0.05
.003	0.08
.005	0.13
.016	0.41
.062	1.57
.25	6.4

Retaining plate designator	Connector size (number of contacts)	A ±.005 (0.13 mm)	B ±.005 (0.13 mm)	C (mm)	D (mm)	E (mm)	F ±.005 (0.13 mm)	G (mm)	H (mm)
MS18200-1	66	2.984 (75.79)	1.969 (50.01)	1.718 (43.64)	1.125 (28.58)	1.688 (42.88)	.500 (12.70)	.125 (3.18)	3.296 (83.72)
MS18200-2	104	3.500 (83.90)	2.375 (60.33)	2.125 (53.98)	1.486 (37.74)	2.000 (50.80)	.875 (22.23)	.150 (3.81)	3.875 (98.43)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are ±.016 inch (0.41 mm).
4. Material aluminum alloy in accordance with SAE AMS4016, temper H32, .040 inch (1.02 mm) thick.
5. Finish anodize in accordance with MIL-A-8625, type I or type II.

FIGURE 17. Retaining plate - Continued.

REQUIREMENTS:

Dimensions and configuration: See figures 1 through 17.

Connector parts described herein are intended for use with MIL-DTL-28748/1 through MIL-DTL-28748/6.

NASM screws and nuts are not ordered on this slash sheet, they are shown for reference only.

PIN: As shown in the following example.

MS18204-1F
designator
from figures

Qualification: Qualified sources for MIL-DTL-28748/1 through MIL-DTL-28748/6 that meet the qualification testing requirements in MIL-DTL-28748 require no further testing for the hardware.

Qualification of hardware only: the hardware shall be installed in a qualified connector and shall be subjected to the tests below in accordance with MIL-DTL-28748. Sample size, if qualifying all hardware configurations, shall be two connector pairs.

Visual and mechanical inspection

Vibration

Shock

Salt spray

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the previous issue.

MIL-DTL-28748/17A

Reference documents. In addition to MIL-DTL-28748, this document references the following:

MIL-A-8625
MIL-DTL-28748/1
MIL-DTL-28748/2
MIL-DTL-28748/3
MIL-DTL-28748/4
MIL-DTL-28748/5
MIL-DTL-28748/6
MS18203
MS18204
MS18205
MS24133
FED-STD-H28
ASTM A276/A276M
ASTM A342/A342M
ASTM A473
ASTM A484/A484M
ASTM A493
ASTM A581/A581M
ASTM A582/A582M
ASTM A967/A967M
ASTM B209
NASM35275
SAE AIR4127
SAE AMS4015
SAE AMS4027
SAE AMS5636
SAE AMS5639
SAE AMS5648
SAE AMS2700
SAE AMS4016

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - EC
Air Force - 85
DLA - CC

Preparing activity:
DLA - CC

(Project 5935-2016-092)

Review activities:
Army - AT, MI
Navy - AS, SH
Air Force - 99

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>.