

**MIL-DTL-38999**  
**Part Number Development**  
**Series III**



Military and Aero-Electric Part Number Development

Mil. Prefix	D38999/	20	W	C	35	P	N	
Aero Prefix	AE3	20	W	C	35	P	N	-340
<b>Shell Type (Specification Sheet Number)</b>								
20 = Wall mount receptacle								
24 = Jam nut receptacle								
26 = Self-locking, RFI grounding plug								
<b>Class (Material &amp; Finish)</b>								
F = Aluminum shell, electroless nickel finish								
W = Aluminum shell, olive drab cadmium over electroless nickel base								
K = Stainless steel shell, passivated, with firewall insert								
S = Stainless steel shell, electrodeposited nickel, with firewall insert								
BZ* = Aluminum nickel bronze shell with standard insert (Aero p/n only)								
ZC* = Aluminum shell, zinc cobalt plating (Aero p/n only)								
<b>Shell Size</b>								
A, B, C, D, E, F, G, H or J								
<b>Insert Arrangement</b>								
See pages 15 thru 19								
<b>Contact Style</b>								
P = Pin								
S = Socket								
A = Pin connector less pins (with intent to use non-std pin contacts)								
B = Socket connector less sockets (with intent to use non-std socket contacts)								
<b>Polarization (Keying)</b>								
N = Normal (Included in part number)								
A, B, C, D, or E								
<b>Modification (applies to Aero part numbers only)</b>								
01 = Less contacts (is not marked on the part)								
340 = Connector kitted with M85049/15-XXX								
341 = Connector kitted with M85049/38-XXX straight clamp								
342 = Connector kitted with M85049/39-XXX right angle clamp								
Consult factory for other modifications								

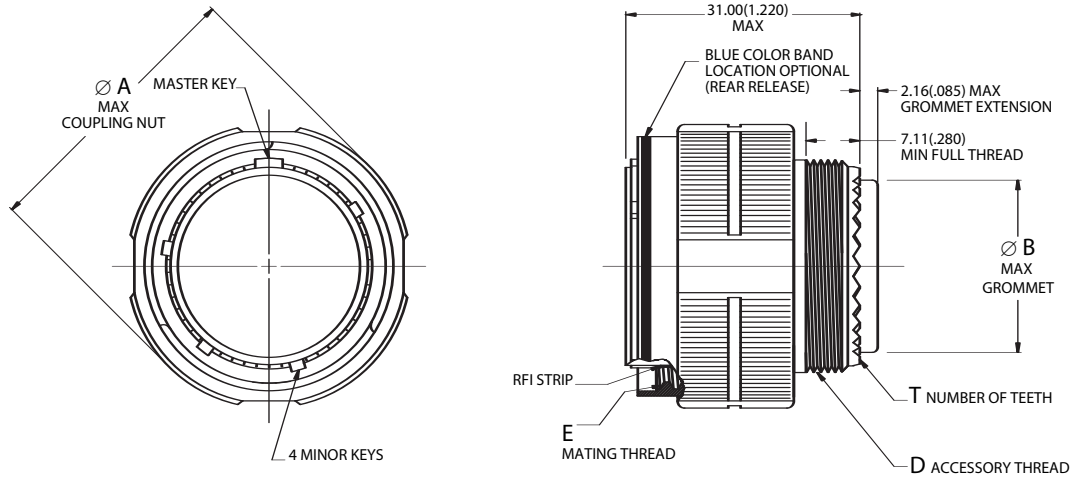
\* Not on QPL, can be supplied to Aero-Electric part number only.

**Note 1:** Each connector is furnished with contacts unless ordered less contacts (L/C) as follows: One spare contact for inserts requiring 2 through 26 of each contact and two spares for inserts with 27 or more contacts, and a minimum of one sealing plug up to 10% of the number contacts. Spare Coax and Twinax contacts are not supplied. One insertion/extraction tool for each contact size is also included.

**Note 2:** Proper part number marking has no “0” in front of single digit layout. Example: J D38999/20WB5SN. “N” for normal is included. In addition, J or JAN must be marked immediately in front of MIL part number.



Triple Start Threaded Coupling, Crimp Removable, Rear Release, Scoop-Proof



MIL-DTL-38999 S III

Page 38	Completed Part Number
Page 44	Contacts, Sealing Plugs and Tools
Pages 17–19	Insert Arrangements
Page 37	Performance Specifications
Pages 15, 16	Insert Availability and Contact Information
Page 42	Polarization

**Note :** Maximum Grommet Extension for insert layouts incorporating size 8 and 10 contacts = **5.95(.234)**.

Shell Size	Ø A		Ø B		D	E	T
	Maximum		Maximum		Accessory Thread Metric	Mating Thread Class 2B	No. of Teeth
	inch	mm	inch	mm			
A	.858	21.80	.299	7.59	M12x1.0-6g 0.100R	.6250-0.1P-0.3L	12
B	.984	25.00	.427	10.85	M15x1.0-6g 0.100R	.7500-0.1P-0.3L	16
C	1.157	29.40	.541	13.74	M18x1.0-6g 0.100R	.8750-0.1P-0.3L	20
D	1.280	32.50	.666	16.92	M22x1.0-6g 0.100R	1.0000-0.1P-0.3L	24
E	1.406	35.70	.791	20.09	M25x1.0-6g 0.100R	1.1875-0.1P-0.3L	28
F	1.516	38.50	.897	22.78	M28x1.0-6g 0.100R	1.2500-0.1P-0.3L	32
G	1.642	41.70	1.022	25.96	M31x1.0-6g 0.100R	1.3750-0.1P-0.3L	36
H	1.768	44.90	1.147	29.13	M34x1.0-6g 0.100R	1.5000-0.1P-0.3L	40
J	1.890	48.00	1.272	32.31	M37x1.0-6g 0.100R	1.6250-0.1P-0.3L	44

# MIL-DTL-38999

## Contacts, Tools and Seal Plugs

### Series III



#### Contacts, Plastic Insertion/Removal Tools and Seal Plugs

Contact Size	Application	Pin Contacts	Socket Contacts	Seal Plugs	Insertion/Removal Tools
	Type	Military No.	Military No.	Military No.	Military No.
22D	Power/Signal	M39029/58-360	M39029/56-348	MS27488-22-1	M81969/14-01
20	Power/Signal	M39029/58-363	M39029/56-351	MS27488-20-1	M81969/14-10
16	Power/Signal	M39029/58-364	M39029/56-352	MS27488-16-1	M81969/14-03
12	Power/Signal	M39029/58-365	M39029/56-353	MS27488-12-1	M81969/14-04
12 Coax	Coax	M39029/28-211	M39029/75-416		
12 Coax	Coax	M39029/102-558	M39029/103-559		
10 (Power)	Power	M39029/58-528	M39029/56-527	M85049/81-10***	M81969/14-05
8 Coax	Coax	M39029/60-367	M39029/59-366	MS27488-8-1	M81969/14-06
8 Twinax	Twinax	M39029/90-529	M39029/91-530	MS27488-8-1	M81969/14-12

#### Crimping and Metal Insertion/Extraction Tools

Contact Size/Type	Crimp Tool	Positioner	Positioner	Insertion Tool	Extraction Tool
	Military No.	For Pin Contacts Military No.	For Socket Contacts Military No.	Metal Military No.	Metal Military No.
22D	M22520/2-01	M22520/2-09	M22520/2-07	M81969/8-01	M81969/8-02
20	M22520/1-01	M22520/1-04	M22520/1-04	M81969/8-05	M81969/8-06
	M22520/2-01	M22520/2-10	M22520/2-10		
16	M22520/1-01	M22520/1-04	M22520/1-04	M81969/8-07	M81969/8-08
12	M22520/1-01	M22520/1-04	M22520/1-04	M81969/8-09	M81969/8-10
12 Coax Inner	M22520/2-01	M22520/2-34	M22520/2-34		
12 Coax Outer	M22520/31-01	M22520/31-02	M22520/31-02		
10 ( Power)	—	—	—	M81969/8-11	M81969/8-12
8 Coax Inner	M22520/2-01	M22520/2-31	M22520/2-31	M81969/8-13**	M81969/8-14
8 Coax Outer	M22520/5-01	M22520/5-05 Die Closure B	M22520/5-05 Die Closure B		
8 Twinax Center	M22520/2-01	M22520/2-37	M22520/2-37	—	—
8 Twinax Outer & Intermediate	M22520/5-01	M22520/5-200	M22520/5-200		

#### Contact and Wire Data

Contact Size	Test Current*	Voltage*	Crimp Well Data			Wire Range		Finished Wire Ø Range			
	DC Test	Max. Drop	Well Dia.	Minimum Well Dept		AWG	mm <sup>2</sup>	Minimum		Maximum	
	Amps	Millivolts	inch	inch	mm			inch	mm	inch	mm
22D	5.0	73	.0345 ±.0010	.141	3.58	28-22	.08-.33	.030	.76	.054	1.37
20	7.5	55	.047 ±.001	.209	5.31	24-20	.20-.52	.040	1.02	.083	2.11
16	13.0	49	.067 ±.001	.209	5.31	20-16	.52-1.31	.065	1.65	.109	2.77
12	23.0	42	.100 ±.002	.209	5.31	14-12	2.08-3.31	.097	2.46	.142	3.61
10	33.0	33	.137 ±.003	.355	9.02	12-10†	3.31-5.26	.135	3.42	.162	4.12

† MS3348 bushing required with 12 gauge wire.

\* When tested with silver-plated wire.

\*\* Insertion tool is not required.

\*\*\* Dummy contact, used in lieu of unwired contact and seal plug.

**Note:** Size 8 coax contacts are used with M17/095-RG180 cable, while size 8 Twinax contacts are used with M17/176-00002 cable.



# MIL-DTL-38999 Series I, II and III Insert Availability and Contact Information per MIL-STD-1560

## Insert Availability and Contact Information

Insert Arrangement			Aero-Electric		Service	Total	Quantity of Contacts							
			Status			No. of	(by Size)							
Series I	Series II	Series III	QPL'd	Tooled	Rating	Contacts	22D	22M	22	20	16	12	10	8
9-6*	8-6*	—	Yes	Yes	M	6		6						
9-35	8-35	A35	Yes	Yes	M	6	6							
9-98	8-98	A98	Yes	Yes	I	3				3				
11-2	—	B2	Yes	Yes	I	2					2			
11-4	—	B4	Yes	Yes	I	4				4				
11-5	10-5	B5	Yes	Yes	I	5				5				
11-13*	10-13*	—	Yes	Yes	M	13		13						
11-35	10-35	B35	Yes	Yes	M	13	13							
11-98	10-98	B98	Yes	Yes	I	6				6				
11-99	10-99	B99	Yes	Yes	I	7				7				
—	12-3	—	Yes	Yes	II	3					3			
13-4	12-4	C4	Yes	Yes	I	4					4			
13-8	12-8	C8	Yes	Yes	I	8				8				
13-22*	12-22*	—	Yes	Yes	M	22		22						
13-35	12-35	C35	Yes	Yes	M	22	22							
13-98	12-98	C98	Yes	Yes	I	10				10				
15-5	14-5	D5	Yes	Yes	II	5					5			
15-15	14-15	D15	Yes	Yes	I	15				14	1			
15-18	14-18	D18	Yes	Yes	I	18				18				
15-19	—	D19	Yes	Yes	I	19				19				
15-35	14-35	D35	Yes	Yes	M	37	37							
15-37*	14-37*	—	Yes	Yes	M	37		37						
15-97	14-97	D97	Yes	Yes	I	12				8	4			
17-6	16-6	E6	Yes	Yes	I	6						6		
17-8	16-8	E8	Yes	Yes	II	8					8			
17-26	16-26	E26	Yes	Yes	I	26				26				
17-35	16-35	E35	Yes	Yes	M	55	55							
17-55*	16-55*	—	Yes	Yes	M	55		55						
17-99	16-99	E99	Yes	Yes	I	23				21	2			
19-11	18-11	F11	Yes	Yes	II	11					11			
19-28	18-28	F28	Yes	Yes	I	28				26	2			
19-30	18-30	F30	Yes	Yes	I	30				29	1			
19-32	18-32	F32	Yes	Yes	I	32				32				
19-35	18-35	F35	Yes	Yes	M	66	66							
—	18-53**	—	Yes	Yes	M	53			53					
19-66*	18-66*	—	Yes	Yes	M	66		66						

Please see next page for Shell Sizes 21/20/G thru 25/24/J layouts.

\* Not approved for new design. Toolled and qualified but their separate pictorials are not shown on pages 17 thru 19, as they are the same as corresponding (-35) layouts that take same qty of 22D instead of 22M contacts.

\*\* Not approved for new design. Pictorial is shown on page 18.

— above means "not available" for that series.

# MIL-DTL-38999 Series I, II and III

## Insert Availability and Contact Information

### per MIL-STD-1560



### Insert Availability and Contact Information (continued)

Insert Arrangement			Aero-Electric		Service	Total	Quantity of Contacts							
			Status			No. of	(by Size)							
Series I	Series II	Series III	QPL'd	Tooled	Rating	Contacts	22D	22M	22	20	16	12	10	8
21-1*	20-1*	—	Yes	Yes	M	79		79						
21-11	—	G11	Yes	Yes	I	11						11		
21-16	20-16	G16	Yes	Yes	II	16					16			
21-35	20-35	G35	Yes	Yes	M	79	79							
21-39	20-39	G39	Yes	Yes	I	39				37	2			
21-41	20-41	G41	Yes	Yes	I	41				41				
21-48**	—	G48**	N/A	Yes	I	4								4 (Power)
21-75	—	G75	Yes	Yes	Twinax	4								4 (Twinax)
23-1*	22-1*	—	Yes	Yes	M	100		100						
23-2***	22-2***	—	Yes	Yes	M	85			85					
23-21	22-21	H21	Yes	Yes	II	21					21			
23-32	22-32	H32	Yes	Yes	I	32					32			
23-35	22-35	H35	Yes	Yes	M	100	100							
23-53	22-53	H53	Yes	Yes	I	53					53			
23-55	22-55	H55	Yes	Yes	I	55					55			
25-1*	24-1*	—	Yes	Yes	M	128		128						
25-4	24-4	J4	Yes	Yes	I	56				48	8			
—	—	J8	Yes	Yes	Twinax	8								8 (Twinax)
—	—	J11	Yes	Yes	N	11				2			9	
25-19	24-19	J19	Yes	Yes	I	19						19		
—	—	J20	Yes	Yes	N, Coax, Twinax	30				10	13	4 (Coax)		3 (Twinax)
25-24	24-24	J24	Yes	Yes	I	24					12	12		
25-29	24-29	J29	Yes	Yes	I	29					29			
25-35	24-35	J35	Yes	Yes	M	128	128							
25-43	—	J43	Yes	Yes	I	43				23	20			
25-46	—	J46****	Yes	Yes	I, Coax	46				40	4			2 (Coax)
25-61	24-61	J61	Yes	Yes	I	61				61				
—	—	J90	Yes	Yes	I, Twinax	46				40	4			2 (Twinax)

\* Not approved for new design. Toolled and qualified but their separate pictorials are not shown on pages 17 thru 19, as they are same as corresponding (-35) layouts that take same quantity of 22D instead of 22M contacts.

\*\* 21-48/G48 layout is not to MIL-STD-1560. It is toolled and intended for comm'l use only.

\*\*\* Not approved for new design. Pictorial is shown on page 18.

\*\*\*\* J46 in Series III is not QPL'd but can be purchased to comm'l number (Size 8 Coax contact must be used).

— above means "not available" for that series

**Note 1:** J20P uses 4 size 12 coax contacts as follows: 2 ea M39029/28-211 and 2 ea of M39029/102-558; J20S uses 4 size 12 coax contacts as follows: 2 ea M39029/75-416 and 2 ea of M39029/103-559.

**Note 2:** Layouts (G75, J8, J20, J46 and J90) that take twinax or coax contacts should not be used for firewall applications (Classes K & S) in Series III.

**Note 3:** H and J contact styles (in lieu of P & S) are meant for Composite (classes J & M) Series III only. Aluminum (classes A, B, F & W) and Firewall (classes K & S) are rated for 500 cycles regardless what contacts are used.



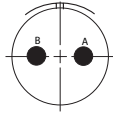
Insert Arrangements Views



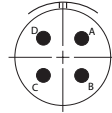
9-35/8-35  
A35,  
6 # 22D, M



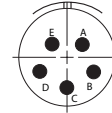
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A98,  
3 # 20, I



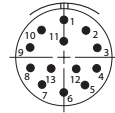
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B2,  
2 # 16, I



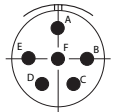
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B4,  
4 # 20, I



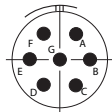
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B5,  
5 # 20, I



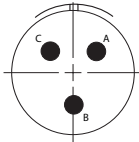
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13 # 22D, M



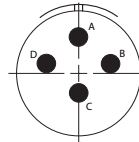
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6 # 20, I



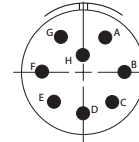
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7 # 20, I



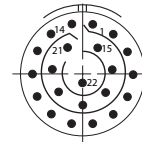
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3 # 16, II



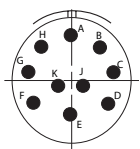
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C4,  
4 # 16, I



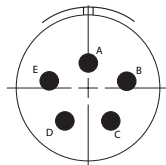
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C8,  
8 # 20, I



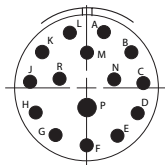
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22 # 22D, M



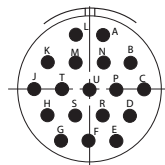
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10 # 20, I



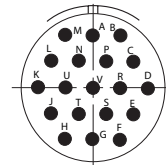
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5 # 16, II



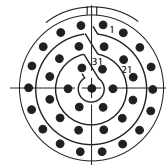
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1 # 16, 14 # 20, I



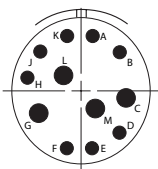
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D18,  
18 # 20, I



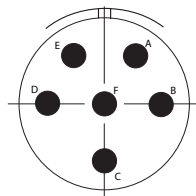
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19 # 20, I



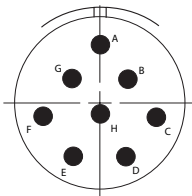
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D35,  
37 # 22D, M



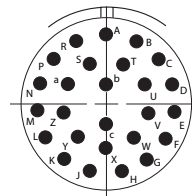
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D97,  
4 # 16, 8 # 20, I



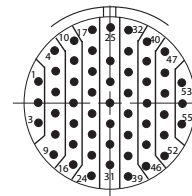
17-6/16-6  
E6,  
6 # 12, I



17-8/16-8  
E8,  
8 # 16, II



17-26/16-26  
E26,  
26 # 20, I



17-35/16-35  
E35,  
55 # 22D, M

# MIL-STD-1560

## Insert Arrangements (Pin Front View)

### for MIL-DTL-38999 Series I, II and III Connectors

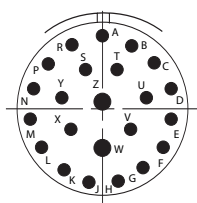


MIL-DTL-38999 S I

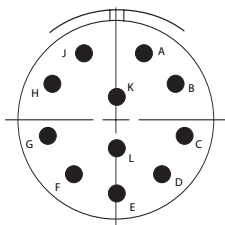
38999 S II

38999 S III

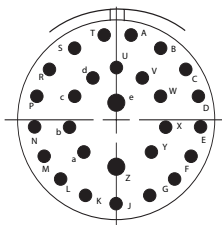
#### Insert Arrangements Views



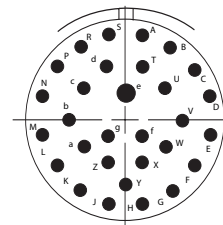
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2 # 16, 21 # 20, I



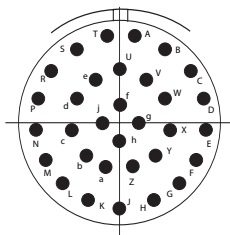
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F11,  
11 # 16, II



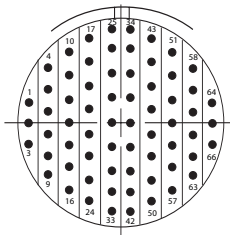
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F28,  
2 # 16, 26 # 20, I



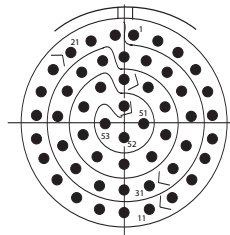
19-30/18-30  
F30,  
1 # 16, 29 # 20, I



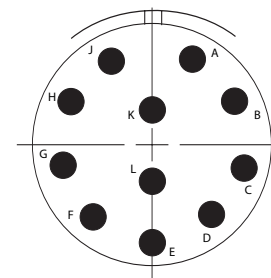
19-32/18-32  
F32,  
32 # 20, I



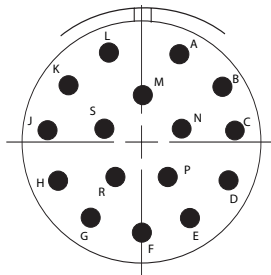
19-35/18-35  
F35,  
66 # 22D, M



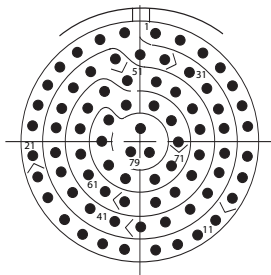
18-53\*  
53 # 22, M



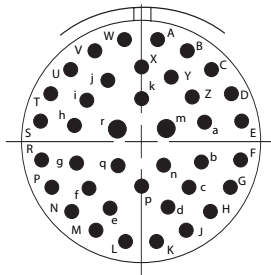
21-11  
G11,  
11 # 12, I



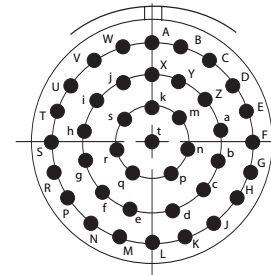
21-16/20-16  
G16,  
16 # 16, II



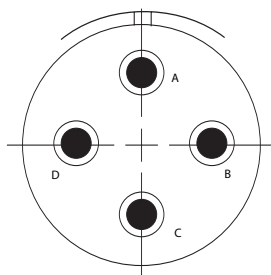
21-35/20-35  
G35,  
79 # 22D, M



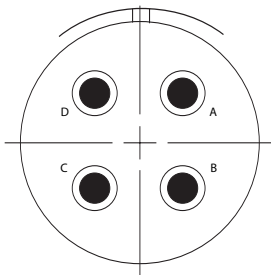
21-39/20-39  
G39,  
2 # 16, 37 # 20, I



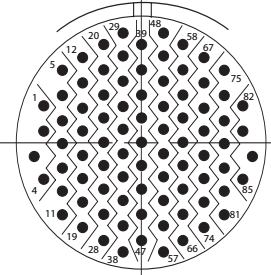
21-41/20-41  
G41,  
41 # 20, I



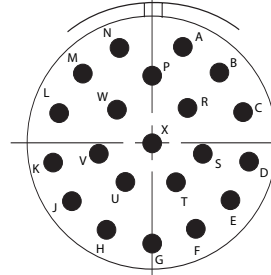
21-48\*\*  
G48\*\*,  
4 # 8 Power, I



21-75  
G75,  
4 # 8 Twinax, Twinax



23-2\*/22-2\*  
85 # 22, M

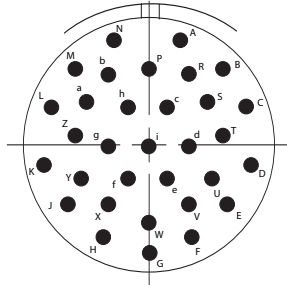


23-21/22-21  
H21,  
21 # 16, II

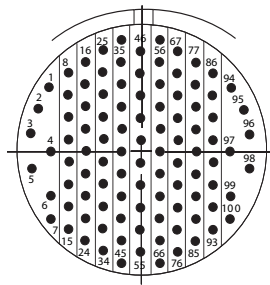
\* Inactive for new design.  
\*\* Not MIL-STD-1560 layout (not QPL'd).



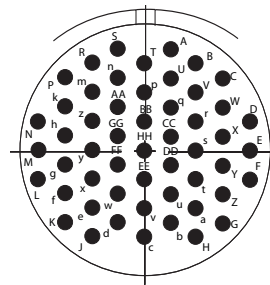
Insert Arrangements Views



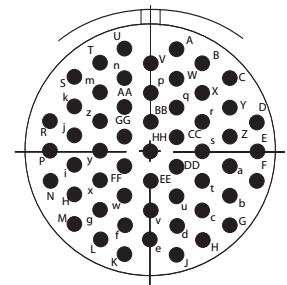
23-32/22-32  
H32,  
32 # 20, I



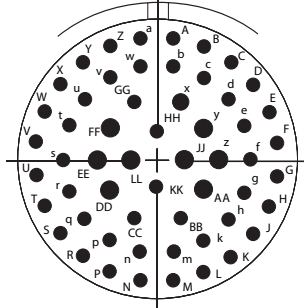
23-35/22-35  
H35,  
100 # 22D, M



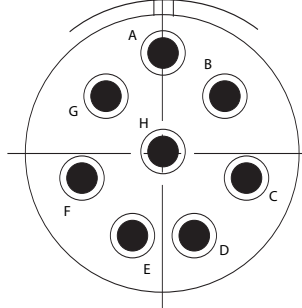
23-53/22-53  
H53,  
53 # 20, I



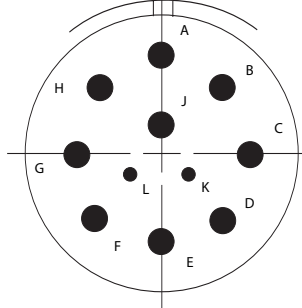
23-55/22-55  
H55,  
55 # 20, I



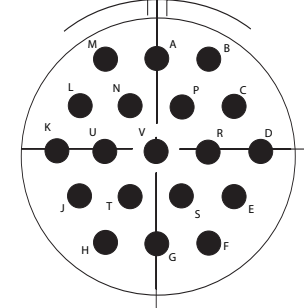
25-4/24-4  
J4,  
8 # 16, 48 # 20, I



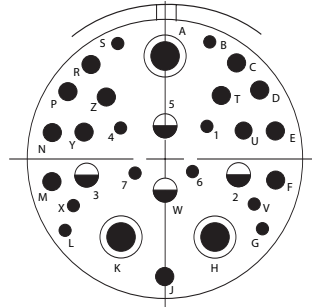
J8  
8 # 8 Twinax,  
Twinax



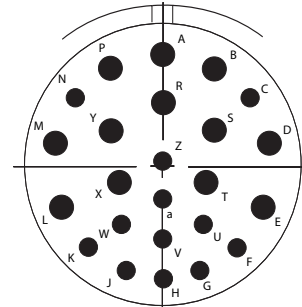
J11  
9 # 10, 2 # 20,  
N



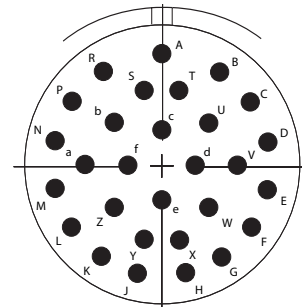
25-19/24-19  
J19,  
19 # 12, I



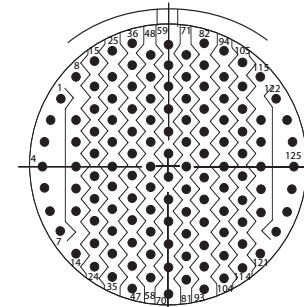
J20  
10 # 20, 13 # 16, 4 # 12, 3 # 8 Twinax,  
N / Coax / Twinax



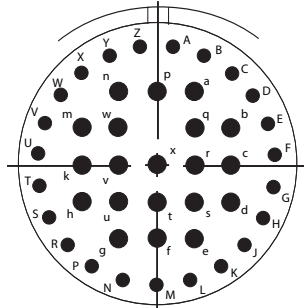
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J24,  
12 # 12, 12 # 16, I



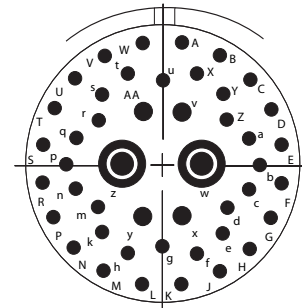
25-29/24-29  
J29,  
29 # 16, I



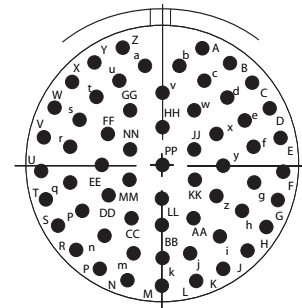
25-35/24-35  
J35,  
128 # 22D, M



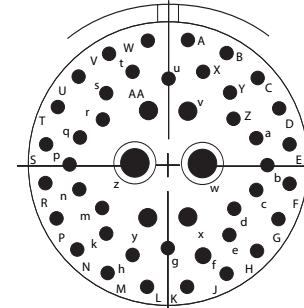
25-43  
J43,  
20 # 16, 23 # 20, I



25-46  
J46,  
40 # 20, 4 # 16, 2 # 8 Coax, I / Coax



25-61/24-61  
J61,  
61 # 20, I



J90,  
40 # 20, 4 # 16, 2 # 8 Twinax,  
I / Twinax