INCH-POUND

MIL-STD-1669A
w/CHANGE 1
1 April 2011
SUPERSEDING
MIL-STD-1669A
29 October 2007

DEPARTMENT OF DEFENSE
INTERFACE STANDARD

**INSERT ARRANGEMENTS
FOR
MIL-DTL-26482**

**ENVIRONMENT RESISTING, CIRCULAR,
ELECTRICAL CONNECTORS**

AMSC N/A

FSC 5935

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FOREWORD

Insert Arrangements for MIL-DTL-26482 Environment Resisting, Circular, Electrical Connectors.

1. This military standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Comments, suggestions, or questions on this document should be addressed to: Commander, DLA Land and Maritime, ATTN: VAI, P.O. Box 3990, Columbus, Ohio, 43218-3990, or emailed to CircularConnector@dla.mil. Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at https://assist.daps.dla.mil.

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SUMMARY OF CHANGE 1 MODIFICATIONS

1. Editorial corrections to page "ii" to correct spelling and to change "Defense Supply Center Columbus" to its new name, "DLA Land and Maritime".

2. Table of Contents changes include the addition of "Summary of Change 1 Modifications", corrections to the numbering in section 6, "Notes", and the addition of "Tables".

3. Pages 3 and 4, minor editorial changes to Detailed Requirements, 5.1.a, 5.1.d and 5.1.g (added metric equivalents).

4. Page 20, Figure 5, corrections to contact positions "D" and "H" (corrected metric equivalents).

5. Page 27, Figure 6, corrections to contact positions "F", "L", "S" and "T" (corrected metric equivalents).

6. Page 28, Figure 6, editorial correction (changed word "test" to "rear").

7. Page 33, Figure 7, reinstate contact position "j" (previous revision incorrectly showed "i" in figure), and changed corresponding contact position in the table from "i" to "j".

8. Page 36, Figure 8, corrections to contact positions "N", "P", "R", and "S" (corrected metric equivalents).

9. Page 39, Figure 8, reinstate alternate insert position "W" angle from 83 to 63.

10. Page 42, Figure 8, corrections to contact positions "p" and "q" (corrected metric equivalents).

11. Page 49, Figure 9, reinstated contact position "l" in the table, which was incorrectly transcribed as "i" in previous revision.

12. Page 51, Figure 9, corrections to contact positions "F" and "T" (corrected metric equivalents).

13. Page 52, Figure 9, reinstate alternate insert positions "X", "Y" and "Z" (incorrectly referenced "W" for these three positions).

14. Pages 54 and 55, Figure 9, reinstate position "l" in figure and corresponding position in table, and reinstate alternate insert positions "X", "Y" and "Z" (incorrectly referenced "W" for these three positions).

15. Page 57, Figure 10, reinstate service rating "II" in table (incorrectly transcribed as "I" in previous revision).

16. Page 58, Figure 10, correct table to reinstate shell size 24, arrangement number 27, service rating "I" and the superseding document so that these apply to both contact size 20 and contact size 12.

17. Page 61, Figure 10, corrections to contact positions "j" and "m" (corrected metric equivalents).

18. Page 62, update "Concluding Material" to change "Air Force- 11" to new code "85", and update the project number.

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1. SCOPE

   1.1 Scope. This standard covers insert arrangements for use with MIL-DTL-26482 environment resisting, circular, electrical connectors.

2.   APPLICABLE DOCUMENTS

   2.1 General. The documents listed in this section are specified in sections 3, 4, or 5 of this standard. This section does not include documents cited in other sections of this standard or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements of documents cited in sections 3, 4, or 5 of this standard, whether or not they are listed.

   2.2 Government documents.

   2.2.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

   DEPARTMENT OF DEFENSE SPECIFICATION

      MIL-DTL-26482   - Connectors, Electrical, (Circular, Miniature, Quick Disconnect, Environment Resisting), Receptacles and Plugs, General Specification for

(Copies these documents are available online at https://assist.daps.dla.mil/quicksearch/ or from the Standardization Documents Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094.)

   2.2.2 Non-Government publications. The following documents form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those cited in the solicitation or contract.

   ASME INTERNATIONAL

      ASME Y14.5M   -   Dimensioning and Tolerancing

(Copies of these documents are available online at http://www.asme.org or from the ASME International, Three Park Avenue, New York, NY 10016-5990.)

   SAE INTERNATIONAL

      SAE-AS39029/4   Contacts, Electrical Connectors, Pin, Crimp Removable, (for MIL-C-26482 Series 2, MIL-C-81703 Series 3 and MIL-C-83723 Series I and III, and MIL-C-83733 Connectors)

      SAE-AS39029/5   Contacts, Electrical Connector, Socket, Crimp Removable (For MIL-C-26482 Series 2, AS81703 Series 3, MIL-C-83723 Series I and III, and MIL-C-83733 Connectors and MIL-S-12883/40 and /41 Relay Sockets)

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SAE-AS39029/7	Contacts, Electrical Connector, Pin, Crimp Removable, Shielded (for MIL-C-26482 Series 2 and MIL-C-81703 Series 3 Connectors)
SAE-AS39029/8	Contacts, Electrical Connector, Socket, Crimp Removable, Shielded, (for MIL-C-26482 Series 2 and MIL-C-81703 Series 3 Connectors
SAE-AS39029/9	Contacts, Electrical Connector, Pin, Crimp Removable, Thermocouple, (for MIL-C-26482 Series 2 and MIL-C-81703 Series 3, MIL-C-83723 Series 3, and MIL-C-83733 Connectors)
SAE-AS39029/10	Contacts, Electrical Connector, Socket, Crimp Removable, Thermocouple, (for MIL-C-26482 Series 2, MIL-C-81703 Series 3, MIL-C-83723 Series 3, and MIL-C-83733 Connectors
SAE-AS39029/22	Contacts, Electrical, Connector, Socket, Crimp Removable, (for MIL-T-81714 Terminal Junction System Series II and MIL-C-81511 Series 3 and 4 Class L Connectors)
SAE-AS39029/23	Contacts, Electrical Connector, Pin, Crimp Removable, Shielded, (for MIL-C-26482 Series 1 Connectors)
SAE-AS39029/24	Contacts, Electrical Connector, Socket, Crimp Removable, Shielded, (for MIL-C-26482 Series 1 Connectors)
SAE-AS39029/25	Contacts, Electrical Connectors, Pins, Crimp Removable, Shielded, (for MIL-C-26482 Series 1 Connectors)
SAE-AS39029/26	Contacts, Electrical Connector, Socket, Crimp Removable, Shielded, (for MIL-C-26482 Series 1 Connectors)
SAE-AS39029/31	Contacts, Electrical Connector, Pin, Crimp Removable, (for MIL-C-26482 Series 1, MIL-C-26500 and MIL-C-26518 Connectors)
SAE-AS39029/32	Contacts, Electrical Connector, Socket, Crimp Removable, (for MIL-C-26482 Series 1, MIL-C-26500 and MIL-C-26518 Connectors)

(Copies of these documents are available online at http://www.sae.org or from the SAE World Headquarters, 400 Commonwealth Drive, Warrendale, PA 15096-0001.)

2.3 Order of precedence. Unless otherwise noted herein or in the contract, the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Definitions. The terms used in this standard are generally accepted by the electrical and electronics industries and commonly used in electrical connector engineering practice.

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4. GENERAL REQUIREMENTS

   4.1 Recycled, recovered, or environmentally preferable materials. Recycled, recovered, or environmentally preferable materials should be used to the maximum extent possible, provided that the material meets or exceeds the operational and maintenance requirements, and promotes economical advantageous life cycle costs.

5. DETAILED REQUIREMENTS

   5.1 Dimensions. Dimensions shall be in accordance with the applicable section of this standard and the following dimensional data:

   a. Dimensioning and tolerancing in accordance with ASME Y14.5M. Dimensions are true position (TP) and are in inches.

   b. Metric equivalents (to the nearest 0.01 mm) are given for general information only and are based on 1 inch = 25.4 mm.

   c. Dimensions and markings shown are for engaging face of pin insert; socket insert is opposite.

   d. The following tolerances apply to an insert installed in the shell:

      1. Center of each hole in the insert shall be located at TP within .014 in (0.356 mm) diameter.

$$\boxed{\oplus \; | \; .014 \; dia}$$
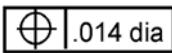
      2. Center of engaging end of each contact shall be located at TP within .024 in (0.610 mm) diameter.

$$\boxed{\oplus \; | \; .024 \; dia}$$
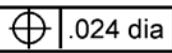
   e. Unless otherwise indicated, dimensions are symmetrical about centerline.

   f. ↓ indicates ℄ (centerline) of insert arrangement.

   5.2 Main key or keyway polarization.

   a. Each insert arrangement is shown in the "normal position" in the shell.

   b. The "master key or keyway" of the shell and the "indexing radius of the insert" are shown on figure 1.
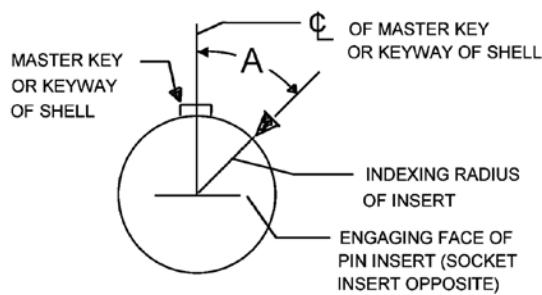
FIGURE 1. Insert position.

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    c. In the "normal position" the indexing radius coincides with the $\mathcal{C}$ of the "master key or keyway of the shell".

    d. In "alternate insert positions" the pin insert is rotated "A" degrees clockwise relative to $\mathcal{C}$ of "master key or keyway of shell" as indicated.

    e. In "alternate positions" the socket insert is rotated "A" degrees counter-clockwise relative to $\mathcal{C}$ of "master key or keyway of shell".

    f. See applicable section of this standard for insert positions.

    g. Four keys or keyways (maximum material condition) (MMC) and insert shall be located within .0035 inches (0.089 mm) either side of true position (TP) relative to master key or keyway (MMC) and shell outside diameter or inside diameter (MMC).

    5.3 Contacts. Solder contacts shall be in accordance with MIL-DTL-26482. Crimp contacts shall be in accordance with applicable document as specified in table I.

TABLE I. Crimp contacts.

Contact size	Applicable documents	
	Series 1	Series 2
20 Power	SAE-AS39029/31, SAE-AS39029/32	SAE-AS39029/4, SAE-AS39029/5
16 Power	SAE-AS39029/31, SAE-AS39029/32	SAE-AS39029/4, SAE-AS39029/5
12 Power	SAE-AS39029/31, SAE-AS39029/32	SAE-AS39029/4, SAE-AS39029/5
12 Shielded	SAE-AS39029/25, SAE-AS39029/26	SAE-AS39029/7, SAE-AS39029/8
8 Shielded	SAE-AS39029/23, SAE-AS39029/24	-------
20 Thermocouple	-------	SAE-AS39029/9, SAE-AS39029/10
20 Hermetic (class N)	-------	SAE-AS39029/22
16 Hermetic (class N)	-------	SAE-AS39029/22

    5.4 Marking. Marking shall be in accordance with MIL-DTL-26482 and as shown in the applicable section of this standard.

6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

    6.1 Intended use. This standard covers insert arrangements for use with MIL-DTL-26482 environment resisting, circular, electrical connectors. Information pertaining to the shell size, arrangement number, number of contacts, service rating, contact location and superseding information is contained in this document.

    6.2 Acquisition requirements. Acquisition documents should specify the following:

    a. Title, number, and date of this standard.

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6.3 International standardization agreement implementation. This standard implements NATO STANAG 7067 ED.2(2). When changes to, revision, or cancellation of this standard are proposed, the preparing activity must coordinate the action with the U.S National Point of Contact for the international standardization agreement, as identified in the ASSIST database at https://assist.daps.dla.mil.

6.4 Cross reference. See table II for cross reference of previous sections and current figures.

TABLE II. Cross reference of figures to sections of previous revisions.

Title	Current figure	Section of previous revisions
Shell size 8	2	10
Shell size 10	3	20
Shell size 12	4	30
Shell size 14	5	40
Shell size 16	6	50
Shell size 18	7	60
Shell size 20	8	70
Shell size 22	9	80
Shell size 24	10	90

6.5 Subject term (key word) listing.

    Shell size
    Contacts
    Socket
    Pin

6.6 Changes from previous issue. The margins of this standard 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 last previous issue.

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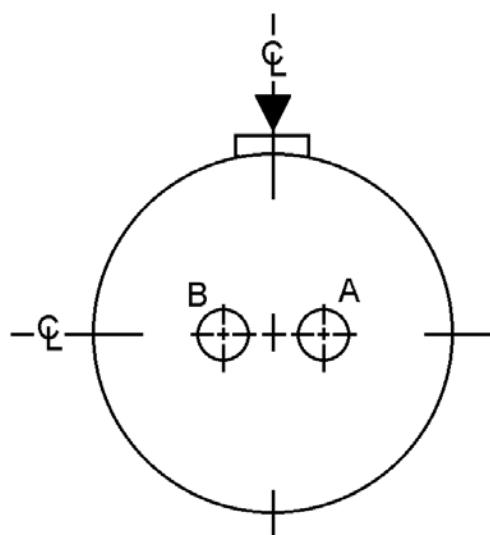
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.059 (1.50)	.000 (0.00)
B	-.059 (1.50)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
58	122	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
8	2	2	20	I	All	MS33708-2

NOTE: Inactive for new design after 11 August 1967.

FIGURE 2. Shell size 8.

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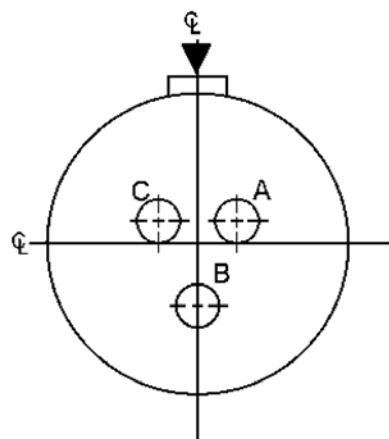
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.056 (1.42)	+.018 (0.46)
B	-.079 (2.01)	.000 (0.00)
C	-.056 (1.42)	+.018 (0.46)

Alternate insert positions			
A degrees			
W	X	Y	Z
60	210	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
8	3	3	20	I	All	MS33708-3

NOTE: Inactive for new design after 1 November 1965.

FIGURE 2. <u>Shell size 8</u> – Continued.

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Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	-.056 (1.42)	+.056 (1.42)
B	-.056 (1.42)	-.056 (1.42)
C	+.056 (1.42)	-.056 (1.42)
D	+.056 (1.42)	+.056 (1.42)

Alternate insert positions			
A degrees			
W	X	Y	Z
45	-----	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
8	4	4	20	I	All	MS33708-4

NOTE: Inactive for new design after 1 November 1965.

FIGURE 2. <u>Shell size 8</u> – Continued.

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Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.075 (1.90)
B	+.065 (1.65)	-.038 (0.97)
C	-.065 (1.65)	-.038 (0.97)

Alternate insert positions			
A degrees			
W	X	Y	Z
90	-----	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
8	33	3	20	I	All	MS33708-33

FIGURE 2. Shell size 8 – Continued.

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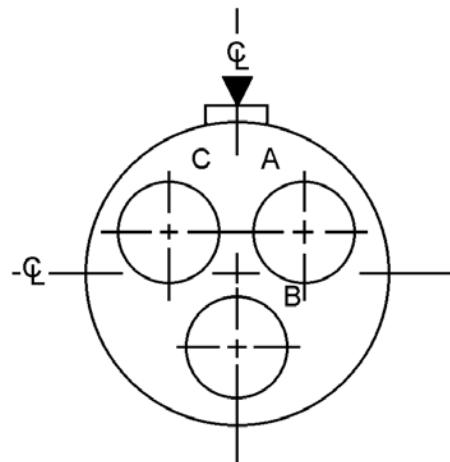
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.065 (1.65)	+.037 (0.94)
B	.000 (0.00)	-.075 (1.90)
C	-.065 (1.65)	+.037 (0.94)

Alternate insert positions			
A degrees			
W	X	Y	Z
-----	-----	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
8	98	3	20	I	All	MS33701-98

FIGURE 2. Shell size 8 – Continued.

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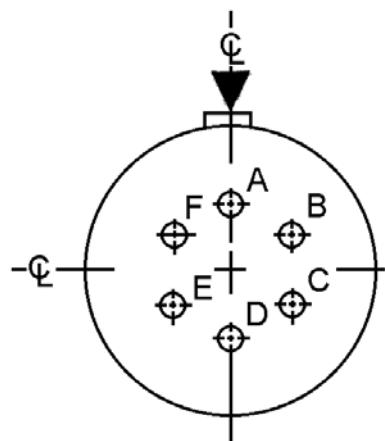
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.130 (3.30)
B	+.113 (2.87)	+.065 (1.65)
C	+.113 (2.87)	-.065 (1.65)
D	.000 (0.00)	-.130 (3.30)
E	-.113 (2.87)	-.065 (1.65)
F	-.113 (2.87)	+.065 (1.65)

Alternate insert positions			
A degrees			
W	X	Y	Z
90	-----	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
10	6	6	20	I	All	MS33709-6

FIGURE 3. Shell size 10.

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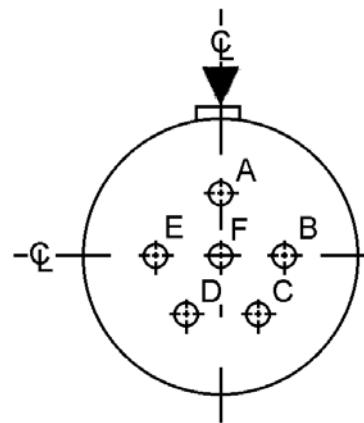
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.130 (3.30)
B	+.130 (3.30)	.000 (0.00)
C	+.065 (1.65)	-.113 (2.87)
D	-.065 (1.65)	-.113 (2.87)
E	-.130 (3.30)	.000 (0.00)
F	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
90	180	240	270

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
10	98	6	20	I	All	MS33709-98

FIGURE 3. <u>Shell size 10</u> - Continued.

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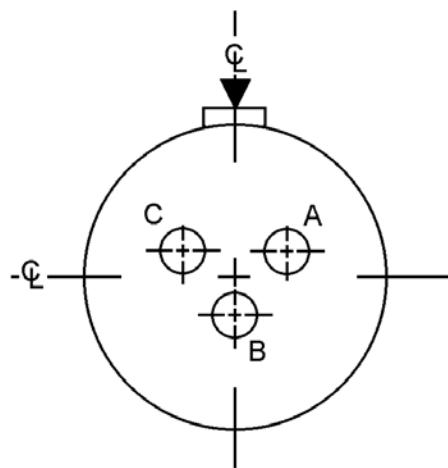
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.094 (2.39)	+.058 (1.47)
B	.000 (0.00)	-.111 (2.82)
C	-.094 (2.39)	+.058 (1.47)

Alternate insert positions			
A degrees			
W	X	Y	Z
-----	-----	180	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
12	3	3	16	II	All	MS33710-3

FIGURE 4. Shell size 12.

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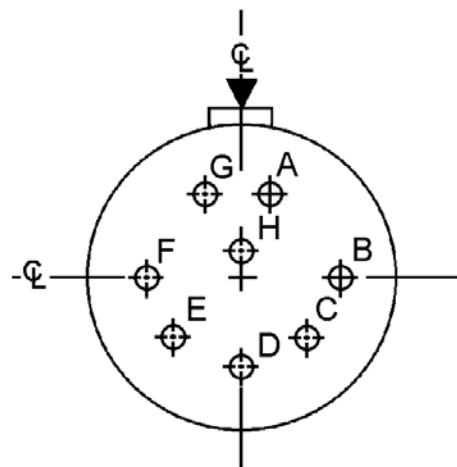
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.065 (1.65)	+.157 (3.99)
B	+.170 (4.32)	.000 (0.00)
C	+.120 (3.05)	-.120 (3.05)
D	.000 (0.00)	-.170 (4.32)
E	-.120 (3.05)	-.120 (3.05)
F	-.170 (4.32)	.000 (0.00)
G	-.065 (1.65)	+.157 (3.99)
H	.000 (0.00)	+.044 (1.12)

Alternate insert positions			
A degrees			
W	X	Y	Z
90	112	203	292

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
12	8	8	20	I	All	MS33710-8 MS27727-8

FIGURE 4. Shell size 12 – Continued.

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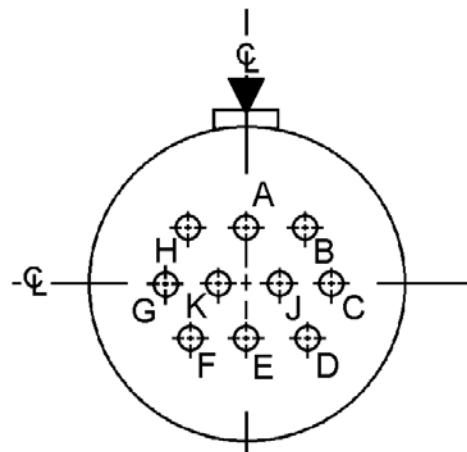
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.120 (3.05)
B	+.130 (3.30)	+.120 (3.05)
C	+.195 (4.95)	.000 (0.00)
D	+.130 (3.30)	-.120 (3.05)
E	.000 (0.00)	-.120 (3.05)
F	-.130 (3.30)	-.120 (3.05)
G	-.195 (4.95)	.000 (0.00)
H	-.130 (3.30)	+.120 (3.05)
J	+.065 (1.65)	.000 (0.00)
K	-.065 (1.65)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
60	155	270	295

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
12	10	10	20	I	All	MS33710-10

FIGURE 4. <u>Shell size 12</u> – Continued.

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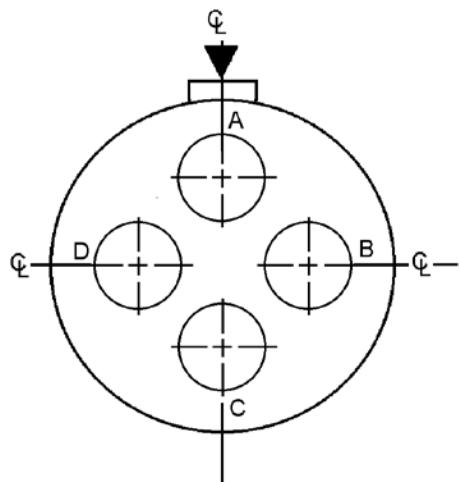
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.169 (4.29)
B	+.169 (4.29)	.000 (0.00)
C	.000 (0.00)	-.169 (4.29)
D	-.169 (4.29)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
45	-----	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	4	4	12 Power	I	All	MS33711-4

FIGURE 5. Shell size 14.

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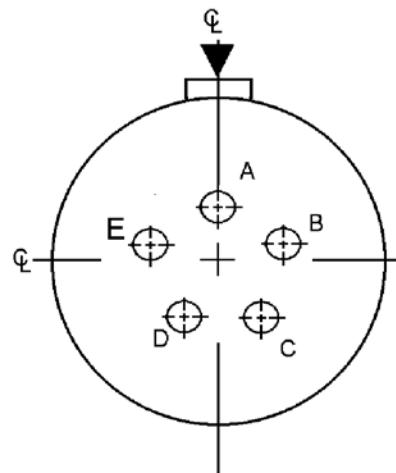
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.100 (2.54)
B	+.174 (4.42)	+.024 (0.61)
C	+.094 (2.39)	-.148 (3.76)
D	-.094 (2.39)	-.148 (3.76)
E	-.174 (4.42)	+.024 (0.61)

Alternate insert positions			
A degrees			
W	X	Y	Z
40	92	184	273

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	5	5	16	II	All	MS33711-5

FIGURE 5. Shell size 14 – Continued.

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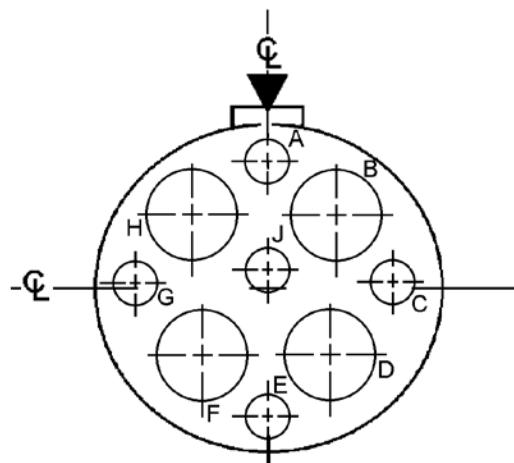
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.260 (6.60)
B	+.141 (3.58)	+.151 (3.83)
C	+.255 (6.48)	+.014 (0.36)
D	+.125 (3.18)	-.124 (3.15)
E	.000 (0.00)	-.253 (6.43)
F	-.125 (3.18)	-.124 (3.15)
G	-.255 (6.48)	+.014 (0.36)
H	-.141 (3.58)	+.151 (3.83)
J	.000 (0.00)	+.042 (1.07)

Alternate insert positions			
A degrees			
W	X	Y	Z
15	90	180	240

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	9	5	20	I	A, C, E, G, J	MS33711-9
		4	12 Power		B, D, F, H	

FIGURE 5. <u>Shell size 14</u> – Continued.

18

MIL-STD-1669A
w/CHANGE 1
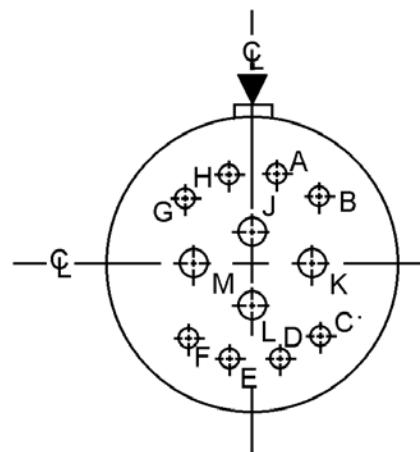
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.065 (1.65)	+.243 (6.17)
B	+.178 (4.52)	+.178 (4.52)
C	+.178 (4.52)	-.178 (4.52)
D	+.065 (1.65)	-.243 (6.17)
E	-.065 (1.65)	-.243 (6.17)
F	-.178 (4.52)	-.178 (4.52)
G	-.178 (4.52)	+.178 (4.52)
H	-.065 (1.65)	+.243 (6.17)
J	.000 (0.00)	+.094 (2.39)
K	+.162 (4.11)	.000 (0.00)
L	.000 (0.00)	-.094 (2.39)
M	-.162 (4.11)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
43	90	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	12	4	16	I	J, K, L, M	MS33711-12
		8	20		Remainder	

FIGURE 5. <u>Shell size 14</u> – Continued.

19

MIL-STD-1669A
w/CHANGE 1
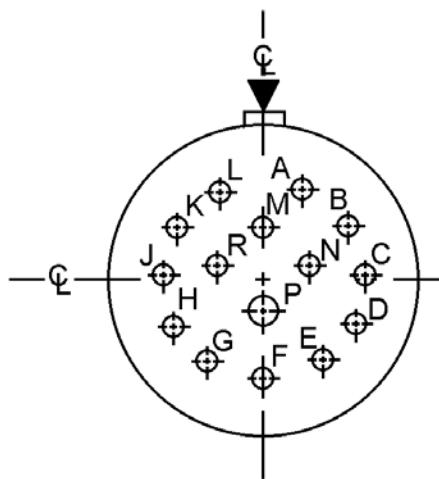
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.100 (2.54)	+.225 (5.71)
B	+.202 (5.13)	+.140 (3.56)
C	+.244 (6.20)	+.014 (0.36)
D	+.218 (5.54)	-.113 (2.87)
E	+.126 (3.20)	-.209 (5.31)
F	.000 (0.00)	-.245 (6.22)
G	-.126 (3.20)	-.209 (5.31)
H	-.218 (5.54)	-.113 (2.87)
J	-.244 (6.20)	+.014 (0.36)
K	-.202 (5.13)	+.140 (3.56)
L	-.100 (2.54)	+.225 (5.71)
M	.000 (0.00)	+.140 (3.56)
N	+.110 (2.79)	+.040 (1.02)
P	.000 (0.00)	-.077 (1.96)
R	-.110 (2.79)	+.040 (1.02)

Alternate insert positions			
A degrees			
W	X	Y	Z
17	110	155	234

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	15	1	16	I	P	MS33711-15
		14	20		Remainder	

FIGURE 5. <u>Shell size 14</u> – Continued.

20

MIL-STD-1669A
w/CHANGE 1
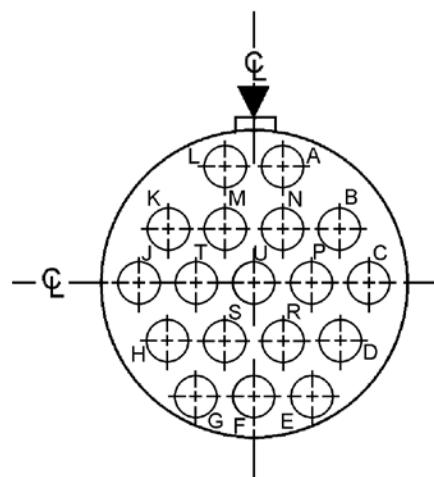
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.065 (1.65)	+.252 (6.40)
B	+.195 (4.95)	+.113 (2.87)
C	+.260 (6.60)	.000 (0.00)
D	+.195 (4.95)	-.113 (2.87)
E	+.130 (3.30)	-.225 (5.71)
F	.000 (0.00)	-.225 (5.71)
G	-.130 (3.30)	-.225 (5.71)
H	-.195 (4.95)	-.113 (2.87)
J	-.260 (6.60)	.000 (0.00)
K	-.195 (4.95)	+.113 (2.87)
L	-.065 (1.65)	+.252 (6.40)
M	-.065 (1.65)	+.113 (2.87)
N	+.065 (1.65)	+.113 (2.87)
P	+.130 (3.30)	.000 (0.00)
R	+.065 (1.65)	-.113 (2.87)
S	-.065 (1.65)	-.113 (2.87)
T	-.130 (3.30)	.000 (0.00)
U	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
15	90	180	270

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	18	18	20	I	All	MS33711-18 MS27728-18

FIGURE 5. <u>Shell size 14</u> – Continued.

21

MIL-STD-1669A
w/CHANGE 1
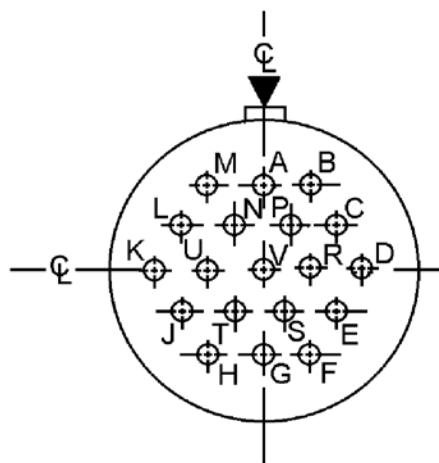
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.225 (5.71)
B	+.130 (3.30)	+.225 (5.71)
C	+.195 (4.95)	+.113 (2.87)
D	+.260 (6.60)	.000 (0.00)
E	+.195 (4.95)	-.113 (2.87)
F	+.130 (3.30)	-.225 (5.71)
G	.000 (0.00)	-.225 (5.71)
H	-.130 (3.30)	-.225 (5.71)
J	-.195 (4.95)	-.113 (2.87)
K	-.260 (6.60)	.000 (0.00)
L	-.195 (4.95)	+.113 (2.87)
M	-.130 (3.30)	+.225 (5.71)
N	-.065 (1.65)	+.113 (2.87)
P	+.065 (1.65)	+.113 (2.87)
R	+.130 (3.30)	.000 (0.00)
S	+.065 (1.65)	-.113 (2.87)
T	-.065 (1.65)	-.113 (2.87)
U	-.130 (3.30)	.000 (0.00)
V	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
30	165	315	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	19	19	20	I	All	MS33711-19

FIGURE 5. Shell size 14 – Continued.

22

MIL-STD-1669A
w/CHANGE 1
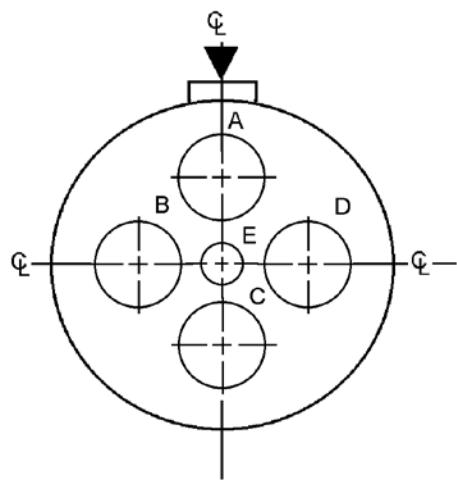
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.191 (4.85)
B	-.191 (4.85)	.000 (0.00)
C	.000 (0.00)	-.191 (4.85)
D	+.191 (4.85)	.000 (0.00)
E	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
45	-----	-----	-----

Shell size	Arrangement number.	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
14	22	4	12	I	A, B, C, D	M33711-22
		1	20		E	

FIGURE 5. Shell size 14 – Continued.

23

MIL-STD-1669A
w/CHANGE 1
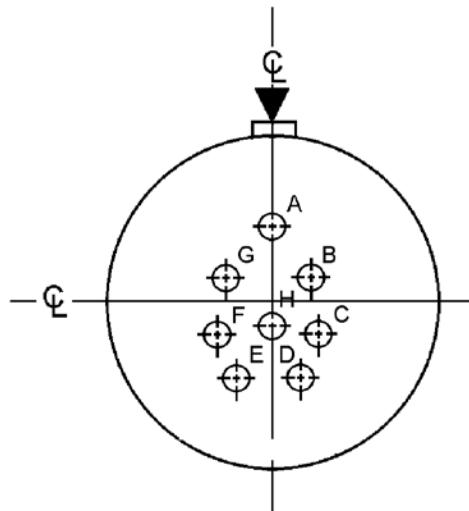
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.236 (5.99)
B	+.128 (3.25)	+.086 (2.18)
C	+.230 (5.60)	-.078 (1.98)
D	+.094 (2.39)	-.216 (5.49)
E	-.094 (2.39)	-.216 (5.49)
F	-.230 (5.60)	-.078 (1.98)
G	-.128 (3.25)	+.086 (2.18)
H	.000 (0.00)	-.052 (1.32)

Alternate insert positions			
A degrees			
W	X	Y	Z
54	152	180	331

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
16	8	8	16	II	All	MS33712-8

FIGURE 6. <u>Shell size 16</u>.

24
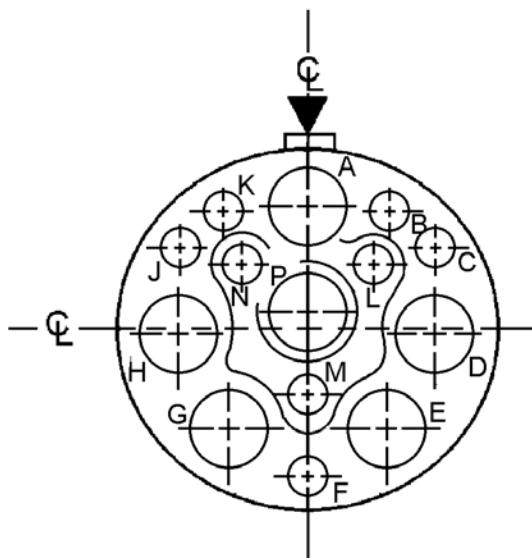
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.268 (6.81)
B	+.178 (4.52)	+.266 (6.76)
C	+.268 (6.81)	+.173 (4.39)
D	+.268 (6.81)	-.005 (.130)
E	+.165 (4.19)	-.212 (5.38)
F	.000 (0.00)	-.320 (8.13)
G	-.165 (4.19)	-.212 (5.38)
H	-.268 (6.81)	-.005 (.130)
J	-.268 (6.81)	+.173 (4.39)
K	-.178 (4.52)	+.266 (6.76)
L	+.142 (3.61)	+.139 (3.53)
M	.000 (0.00)	-.146 (3.71)
N	-.142 (3.61)	+.139 (3.53)
P	.000 (0.00)	+.032 (0.81)

Alternate insert positions			
A degrees			
W	X	Y	Z
25	78	180	240

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
16	14	8	20	I	B, C, F, J, K, L, M, N	MS33712-14
		6	12		A, D, E, G, H, P	

FIGURE 6. <u>Shell size 16</u> – Continued.

MIL-STD-1669A
w/CHANGE 1
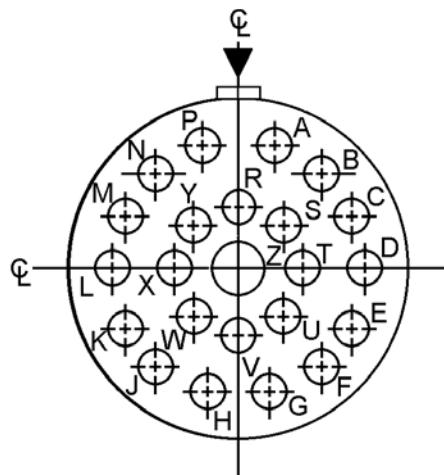
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.070 (1.79)	+.300 (7.62)
B	+.193 (4.90)	+.240 (6.10)
C	+.278 (7.06)	+.134 (3.40)
D	+.308 (7.82)	.000 (0.00)
E	+.278 (7.06)	-.134 (3.40)
F	+.193 (4.90)	-.240 (6.10)
G	+.070 (1.79)	-.300 (7.62)
H	-.070 (1.79)	-.300 (7.62)
J	-.193 (4.90)	-.240 (6.10)
K	-.278 (7.06)	-.134 (3.40)
L	-.308 (7.82)	.000 (0.00)
M	-.278 (7.06)	+.134 (3.40)
N	-.193 (4.90)	+.240 (6.10)
P	-.070 (1.79)	+.300 (7.62)
R	.000 (0.00)	+.178 (4.52)
S	+.126 (3.20)	+.126 (3.20)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
T	+.178 (4.52)	.000 (0.00)
U	+.126 (3.20)	-.126 (3.20)
V	.000 (0.00)	-.178 (4.52)
W	-.126 (3.20)	-.126 (3.20)
X	-.178 (4.52)	.000 (0.00)
Y	-.126 (3.20)	+.126 (3.20)
Z	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
158	270	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
16	23	1	16	I	Z	MS33712-23
		22	20		Remainder	MS33729-23

FIGURE 6. Shell size 16 – Continued.

26

MIL-STD-1669A
w/CHANGE 1

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.321 (8.15)
B	+.131 (3.33)	+.293 (7.44)
C	+.239 (6.07)	+.214 (5.44)
D	+.305 (7.75)	+.099 (2.51)
E	+.319 (8.10)	-.034 (0.86)
F	+.278 (7.06)	-.161 (4.09)
G	+.189 (4.80)	-.260 (6.60)
H	+.067 (1.70)	-.314 (7.98)
J	-.067 (1.70)	-.314 (7.98)
K	-.189 (4.80)	-.260 (6.60)
L	-.278 (7.06)	-.161 (4.09)
M	-.319 (8.10)	-.034 (0.86)
N	-.305 (7.75)	+.099 (2.51)
P	-.239 (6.07)	+.214 (5.44)
R	-.131 (3.33)	+.293 (7.44)
S	-.070 (1.79)	+.177 (4.50)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
T	+.070 (1.79)	+.177 (4.50)
U	+.175 (4.44)	+.094 (2.39)
V	+.178 (4.52)	-.036 (0.91)
W	+.119 (3.02)	-.151 (3.83)
X	.000 (0.00)	-.203 (5.16)
Y	-.119 (3.02)	-.151 (3.83)
Z	-.178 (4.52)	-.036 (0.91)
a	-.175 (4.44)	+.094 (2.39)
b	.000 (0.00)	+.065 (1.65)
c	.000 (0.00)	-.065 (1.65)

Alternate insert positions			
A degrees			
W	X	Y	Z
60	-----	275	338

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
16	26	26	20	I	All	MS33712-26

FIGURE 6. Shell size 16 – Continued.

27

MIL-STD-1669A
w/CHANGE 1

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.162 (4.11)
B	+.115 (2.92)	+.261 (6.83)
C	+.200 (5.08)	.000 (0.00)
D	+.143 (3.63)	-.250 (6.35)
E	.000 (0.00)	-.162 (.411)
F	-.143 (3.63)	-.250 (6.35)
G	-.200 (5.08)	.000 (0.00)
H	-.115 (2.92)	+.261 (6.83)

Alternate insert positions			
A degrees			
W	X	Y	Z
25	90	153	----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
16	95	6	20	I	A, B, D, E, F, H	MS33712-95
		2	8 shielded. Not applicable to series 2 (rear release connectors)		C, G	

FIGURE 6. Shell size 16 – Continued.

28

MIL-STD-1669A
w/CHANGE 1

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.321 (8.15)
B	+.131 (3.33)	+.293 (7.44)
C	+.239 (6.07)	+.214 (5.44)
D	+.305 (7.75)	+.099 (2.51)
E	+.319 (8.10)	-.034 (0.86)
F	+.278 (7.06)	-.161 (4.09)
G	+.189 (4.80)	-.260 (6.60)
H	+.067 (1.70)	-.314 (7.98)
J	-.067 (1.70)	-.314 (7.98)
K	-.189 (4.80)	-.260 (6.60)
L	-.278 (7.06)	-.161 (4.09)
M	-.319 (8.10)	-.034 (0.86)
N	-.305 (7.75)	+.099 (2.51)
P	-.239 (6.07)	+.214 (5.44)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
R	-.131 (3.33)	+.293 (7.44)
S	-.070 (1.78)	+.177 (4.50)
T	+.070 (1.78)	+.177 (4.50)
U	+.175 (4.44)	+.094 (2.39)
V	+.150 (3.81)	-.075 (1.90)
W	.000 (0.00)	-.161 (4.09)
X	-.150 (3.81)	-.075 (1.90)
Y	-.175 (4.44)	+.094 (2.39)
Z	.000 (0.00)	+.025 (0.63)

Alternate insert positions			
A degrees			
W	X	Y	Z
66	156	223	340

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
16	99	2	16	I	W, Z	MS33712-99
		21	20		Remainder	

FIGURE 6. <u>Shell size 16</u> – Continued.

29

MIL-STD-1669A
w/CHANGE 1
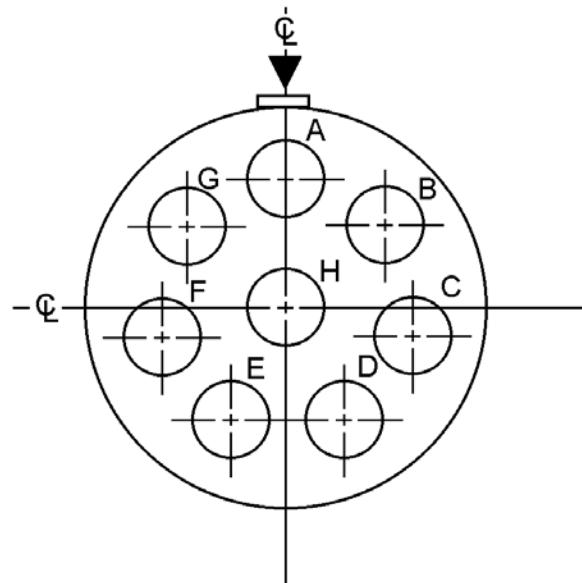
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.280 (7.11)
B	+.219 (5.56)	+.175 (4.45)
C	+.273 (6.93)	-.062 (1.57)
D	+.121 (3.07)	-.252 (6.40)
E	-.121 (3.07)	-.252 (6.40)
F	-.273 (6.93)	-.062 (1.57)
G	-.219 (5.56)	+.175 (4.45)
H	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
180	-----	-----	-----

Shell size	Arrangement No.	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
18	8	8	12	I	All	MS33713-8 MS27730-8

FIGURE 7. Shell size 18.

30

MIL-STD-1669A
w/CHANGE 1
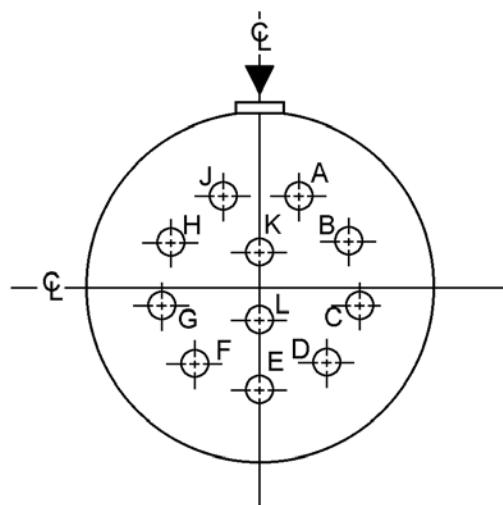
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.105 (2.67)	+.260 (6.60)
B	+.250 (6.35)	+.132 (3.35)
C	+.275 (6.99)	-.053 (1.35)
D	+.179 (4.55)	-.215 (5.46)
E	.000 (.000)	-.281 (7.14)
F	-.179 (4.55)	-.215 (5.46)
G	-.275 (6.99)	-.053 (1.35)
H	-.250 (6.35)	+.132 (3.35)
J	-.105 (2.67)	+.260 (6.60)
K	.000 (.000)	+.105 (2.67)
L	.000 (.000)	-.092 (2.34)

Alternate insert positions			
A degrees			
W	X	Y	Z
62	119	241	340

Shell size	Arrangement No.	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
18	11	11	16	II	All	MS33713-11

FIGURE 7. <u>Shell size 18</u> – Continued.

31

MIL-STD-1669A
w/CHANGE 1
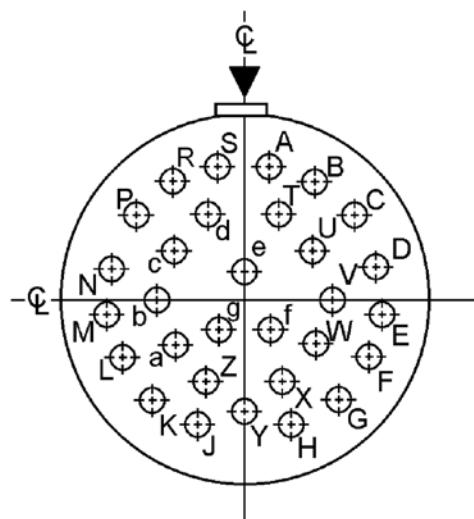
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.065 (1.65)	+.346 (8.79)
B	+.186 (4.72)	+.299 (7.59)
C	+.282 (7.16)	+.210 (5.33)
D	+.340 (8.67)	+.093 (2.36)
E	+.351 (8.91)	-.033 (0.84)
F	+.315 (8.00)	-.158 (4.01)
G	+.236 (5.99)	-.261 (6.63)
H	+.124 (3.15)	-.330 (8.38)
J	-.124 (3.15)	-.330 (8.38)
K	-.236 (5.99)	-.261 (6.63)
L	-.315 (8.00)	-.158 (4.01)
M	-.351 (8.91)	-.033 (0.84)
N	-.340 (8.67)	+.093 (2.36)
P	-.282 (7.16)	+.210 (5.33)
R	-.186 (4.72)	+.299 (7.59)
S	-.065 (1.65)	+.346 (8.79)
T	+.084 (2.13)	+.217 (5.51)
U	+.181 (4.60)	+.129 (3.28)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
V	+.228 (5.79)	+.008 (0.20)
W	+.193 (4.90)	-.117 (2.97)
X	+.096 (2.44)	-.203 (5.16)
Y	.000 (0.00)	-.290 (7.37)
Z	-.096 (2.44)	-.203 (5.16)
a	-.193 (4.90)	-.117 (2.97)
b	-.228 (5.79)	+.008 (0.20)
c	-.181 (4.60)	+.129 (3.28)
d	-.084 (2.13)	+.217 (5.51)
e	.000 (0.00)	+.072 (1.83)
f	+.069 (1.75)	-.076 (1.93)
g	-.069 (1.75)	-.076 (1.93)

Alternate insert positions			
A degrees			
W	X	Y	Z
180	193	285	350

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
18	30	1	16	I	e	MS33713-30
		29	20		Remainder	MS27730-30

FIGURE 7. Shell size 18 – Continued.

32

MIL-STD-1669A
w/CHANGE 1
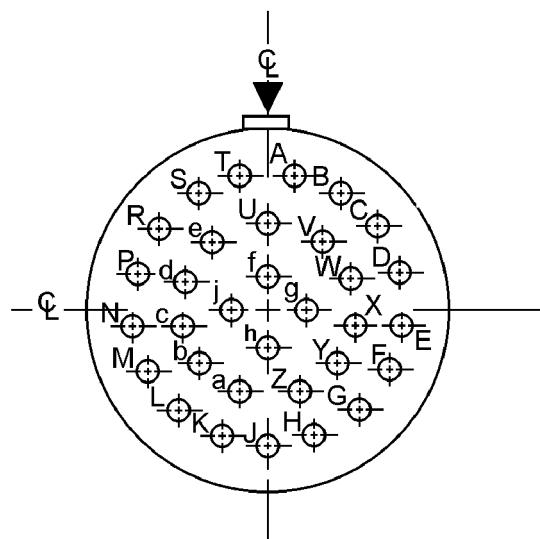
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.066 (1.68)	+.353 (8.97)
B	+.189 (4.80)	+.305 (7.75)
C	+.286 (7.26)	+.217 (5.51)
D	+.345 (8.76)	+.098 (2.49)
E	+.357 (9.07)	-.033 (0.84)
F	+.321 (8.15)	-.160 (4.06)
G	+.242 (6.15)	-.265 (6.73)
H	+.130 (3.30)	-.335 (8.51)
J	.000 (0.00)	-.359 (9.12)
K	-.130 (3.30)	-.335 (8.51)
L	-.242 (6.15)	-.265 (6.73)
M	-.321 (8.15)	-.160 (4.06)
N	-.357 (9.07)	-.033 (0.84)
P	-.345 (8.76)	+.098 (2.49)
R	-.286 (7.26)	+.217 (5.51)
S	-.189 (4.80)	+.305 (7.75)
T	-.066 (1.68)	+.353 (8.97)
U	.000 (0.00)	+.230 (5.84)
V	+.124 (3.15)	+.193 (4.90)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
W	+.209 (5.31)	+.095 (2.41)
X	+.228 (5.79)	-.033 (0.84)
Y	+.174 (4.42)	-.151 (3.83)
Z	+.065 (1.65)	-.221 (5.61)
a	-.065 (1.65)	-.221 (5.61)
b	-.174 (4.42)	-.151 (3.83)
c	-.228 (5.79)	-.033 (0.84)
d	-.209 (5.31)	+.095 (2.41)
e	-.124 (3.15)	+.193 (4.90)
f	.000 (0.00)	+.096 (2.44)
g	+.096 (2.44)	.000 (0.00)
h	.000 (0.00)	-.096 (2.44)
j	-.096 (2.44)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
85	138	222	265

Shell size	Arrangement Number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
18	32	32	20	I	All	MS33713-32

FIGURE 7. Shell size 18 – Continued.

33

MIL-STD-1669A
w/CHANGE 1
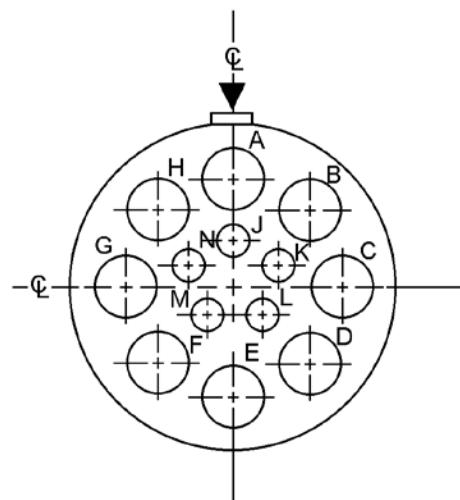
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.305 (7.75)
B	+.215 (5.46)	+.215 (5.46)
C	+.305 (7.75)	.000 (.000)
D	+.215 (5.46)	-.214 (5.44)
E	.000 (.000)	-.300 (7.62)
F	-.215 (5.46)	-.214 (5.44)
G	-.305 (7.75)	.000 (.000)
H	-.215 (5.46)	+.215 (5.46)
J	.000 (.000)	+.122 (3.10)
K	+.126 (3.20)	+.059 (1.50)
L	+.078 (1.98)	-.079 (2.01)
M	-.078 (1.98)	-.079 (2.01)
N	-.126 (3.20)	+.059 (1.50)

Alternate insert positions			
A degrees			
W	X	Y	Z
45	90	180	240

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
18	85	5	20	I	J, K, L, M, N	MS33713-85
		8	12		Remainder	

FIGURE 7. <u>Shell size 18</u> – Continued.

34

MIL-STD-1669A
w/CHANGE 1
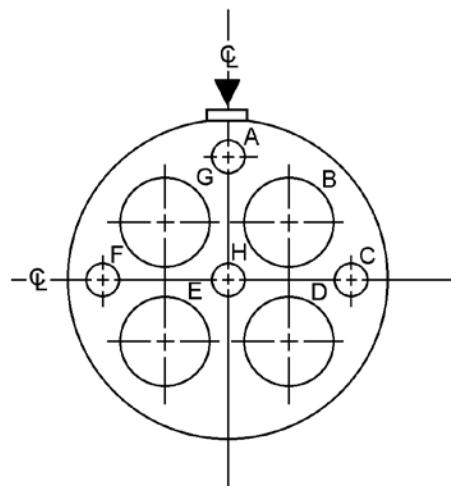
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.350 (8.89)
B	+.175 (4.44)	+.175 (4.44)
C	+.350 (8.89)	.000 (.000)
D	+.175 (4.44)	-.175 (4.44)
E	-.175 (4.44)	-.175 (4.44)
F	-.350 (8.89)	.000 (.000)
G	-.175 (4.44)	+.175 (4.44)
H	.000 (.000)	.000 (.000)

Alternate insert positions			
A degrees			
W	X	Y	Z
12	45	168	202

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
18	88	4	20	I	A, C, F, H	MS33713-88
		4	8 Shielded. Not applicable to series 2 (rear release connectors).		B, D, E, G	

FIGURE 7. Shell size 18 – Continued.

35

MIL-STD-1669A
w/CHANGE 1
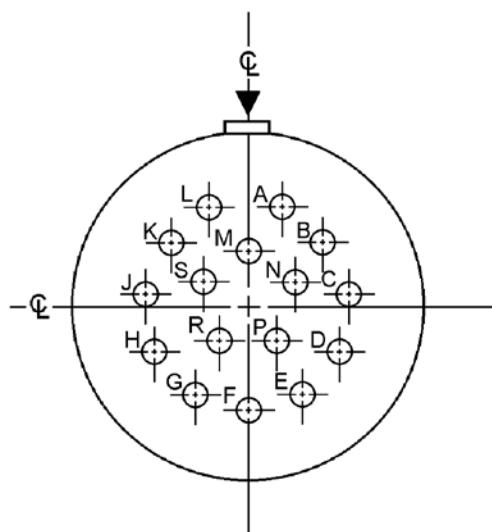
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.118 (3.00)	+.322 (8.18)
B	+.271 (6.88)	+.211 (5.36)
C	+.341 (8.66)	+.036 (0.91)
D	+.308 (7.82)	-.150 (3.81)
E	+.182 (4.62)	-.290 (7.37)
F	.000 (.000)	-.343 (8.71)
G	-.182 (4.62)	-.290 (7.37)
H	-.308 (7.82)	-.150 (3.81)
J	-.341 (8.66)	+.036 (0.91)
K	-.271 (6.88)	+.211 (5.36)
L	-.118 (3.00)	+.322 (8.18)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
M	.000 (.000)	+.175 (4.44)
N	+.154 (3.91)	+.062 (1.57)
P	+.094 (2.39)	-.122 (3.10)
R	-.094 (2.39)	-.122 (3.10)
S	-.154 (3.91)	+.062 (1.57)

Alternate insert positions			
A degrees			
W	X	Y	Z
238	318	333	347

Shell size	Arrangement Number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
20	16	16	16	II	All	MS33714-16

FIGURE 8. Shell size 20.

36

MIL-STD-1669A
w/CHANGE 1
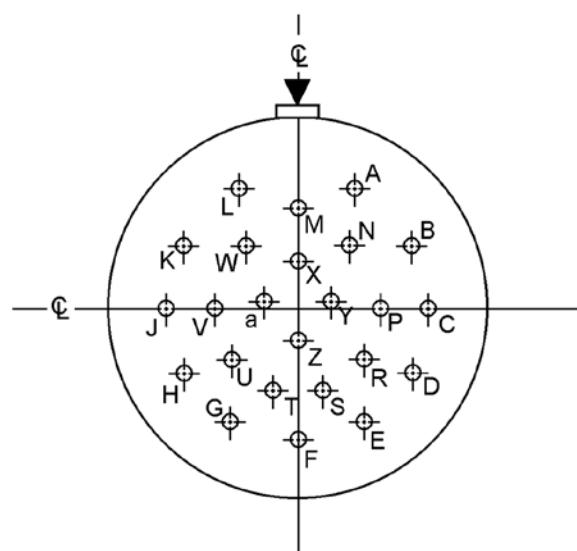
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.175 (4.44)	+.375 (9.52)
B	+.350 (8.89)	+.200 (5.08)
C	+.400 (10.18)	.000 (.000)
D	+.350 (8.89)	-.200 (5.08)
E	+.200 (5.08)	-.350 (8.89)
F	.000 (.000)	-.400 (10.16)
G	-.200 (5.08)	-.350 (8.89)
H	-.350 (8.89)	-.200 (5.08)
J	-.400 (10.18)	.000 (.000)
K	-.350 (8.89)	+.200 (5.08)
L	-.175 (4.44)	+.375 (9.52)
M	.000 (.000)	+.300 (7.62)
N	+.150 (3.81)	+.200 (5.08)
P	+.250 (6.35)	.000 (.000)
R	+.200 (5.08)	-.150 (3.81)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
S	+.075 (1.90)	-.250 (6.35)
T	-.075 (1.90)	-.250 (6.35)
U	-.200 (5.08)	-.150 (3.81)
V	-.250 (6.35)	.000 (.000)
W	-.150 (3.81)	+.200 (5.08)
X	.000 (.000)	+.150 (3.81)
Y	+.100 (2.54)	+.025 (0.63)
Z	.000 (.000)	-.100 (2.54)
a	-.100 (2.54)	+.025 (0.63)

Alternate insert positions			
A degrees			
W	X	Y	Z
70	145	215	290

Shell size	Arrangement No.	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
20	24	24	20	I	All	MS33714-24 MS27731-24

FIGURE 8. Shell size 20 – Continued.

37

MIL-STD-1669A
w/CHANGE 1
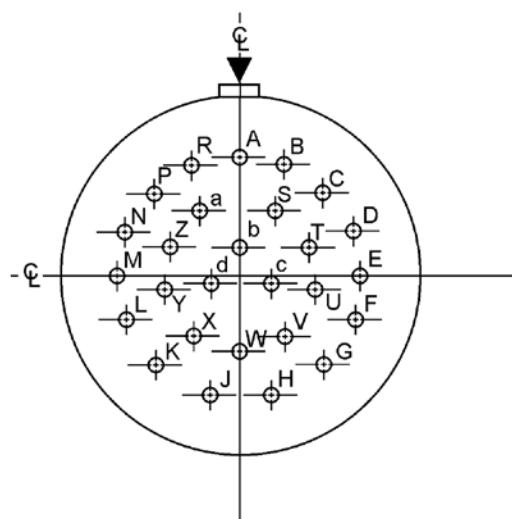
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.400 (10.16)
B	+.150 (3.81)	+.375 (9.53)
C	+.275 (6.99)	+.275 (6.99)
D	+.375 (9.53)	+.150 (3.81)
E	+.400 (10.16)	.000 (.000)
F	+.375 (9.53)	-.150 (3.81)
G	+.275 (6.99)	-.300 (7.62)
H	+.100 (2.54)	-.400 (10.16)
J	-.100 (2.54)	-.400 (10.16)
K	-.275 (6.99)	-.300 (7.62)
L	-.375 (9.53)	-.150 (3.81)
M	-.400 (10.16)	.000 (.000)
N	-.375 (9.53)	+.150 (3.81)
P	-.275 (6.99)	+.275 (6.99)
R	-.150 (3.81)	+.375 (9.53)
S	+.125 (3.18)	+.225 (5.71)
T	+.225 (5.71)	-.100 (2.54)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
U	+.250 (6.35)	-.050 (1.27)
V	+.150 (3.81)	-.200 (5.08)
W	.000 (.000)	-.250 (6.35)
X	-.150 (3.81)	-.200 (5.08)
Y	-.250 (6.35)	-.050 (1.27)
Z	-.225 (5.71)	-.100 (2.54)
a	-.125 (3.18)	+.225 (5.71)
b	.000 (.000)	+.100 (2.54)
c	+.100 (2.54)	-.025 (0.63)
d	-.100 (2.54)	-.025 (0.63)

Alternate insert positions			
A degrees			
W	X	Y	Z
72	144	216	288

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
20	27	27	20	I	All	MS33714-27 MS27731-27

FIGURE 8. Shell size 20 – Continued.

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MIL-STD-1669A
w/CHANGE 1
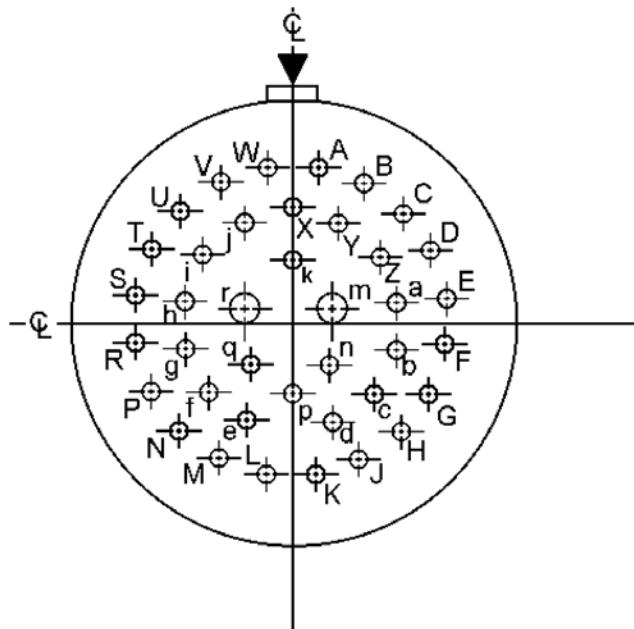
Alternate insert positions			
A degrees			
W	X	Y	Z
63	144	252	333

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
20	39	2	16	I	m, r	MS33714-39
		37	20		Remainder	MS27731-39

FIGURE 8. Shell size 20 – Continued.

MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 39)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.065 (1.65)	+.411 (10.44)
B	+.189 (4.80)	+.371 (9.42)
C	+.294 (7.47)	+.294 (7.47)
D	+.371 (9.42)	+.189 (4.80)
E	+.411 (10.44)	+.065 (1.65)
F	+.411 (10.44)	-.065 (1.65)
G	+.371 (9.42)	-.189 (4.80)
H	+.294 (7.47)	-.294 (7.47)
J	+.189 (4.80)	-.371 (9.42)
K	+.065 (1.65)	-.411 (10.44)
L	-.065 (1.65)	-.411 (10.44)
M	-.189 (4.80)	-.371 (9.42)
N	-.294 (7.47)	-.294 (7.47)
P	-.371 (9.42)	-.189 (4.80)
R	-.411 (10.44)	-.065 (1.65)
S	-.411 (10.44)	+.065 (1.65)
T	-.371 (9.42)	+.189 (4.80)
U	-.294 (7.47)	+.294 (7.47)
V	-.189 (4.80)	+.371 (9.42)
W	-.065 (1.65)	+.411 (10.44)

Contacts (arrangement 39)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
X	.000 (.000)	+.295 (7.49)
Y	+.126 (3.20)	+.256 (6.50)
Z	+.232 (5.89)	+.179 (4.55)
a	+.280 (7.11)	+.057 (1.45)
b	+.280 (7.11)	-.074 (1.88)
c	+.217 (5.51)	-.189 (4.80)
d	+.112 (2.84)	-.265 (6.73)
e	-.112 (2.84)	-.265 (6.73)
f	-.217 (5.51)	-.189 (4.80)
g	-.280 (7.11)	-.074 (1.88)
h	-.280 (7.11)	+.057 (1.45)
i	-.232 (5.89)	+.179 (4.55)
j	-.126 (3.20)	+.256 (6.50)
k	.000 (.000)	+.164 (4.17)
m	+.114 (2.90)	+.048 (1.22)
n	+.106 (2.69)	-.107 (2.72)
p	.000 (.000)	+.189 (4.80)
q	-.106 (2.69)	-.107 (2.72)
r	-.114 (2.90)	+.048 (1.22)

FIGURE 8. Shell size 20 – Continued.

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MIL-STD-1669A
w/CHANGE 1
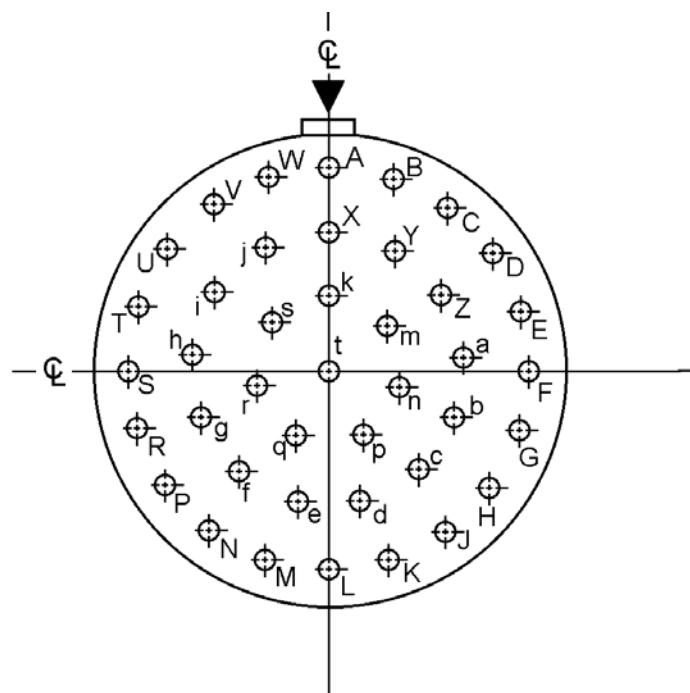
Alternate insert positions			
A degrees			
W	X	Y	Z
45	126	225	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
20	41	41	20	I	All	MS33714-41

FIGURE 8. Shell size 20 – Continued.

MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 41)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.418 (10.62)
B	+.129 (3.28)	+.397 (10.08)
C	+.245 (6.22)	+.338 (8.59)
D	+.338 (8.59)	+.245 (6.22)
E	+.397 (10.08)	+.129 (3.28)
F	+.418 (10.62)	.000 (.000)
G	+.397 (10.08)	-.129 (3.28)
H	+.338 (8.59)	-.245 (6.22)
J	+.245 (6.22)	-.338 (8.59)
K	+.129 (3.28)	-.397 (10.08)
L	.000 (.000)	-.418 (10.62)
M	-.129 (3.28)	-.397 (10.08)
N	-.245 (6.22)	-.338 (8.59)
P	-.338 (8.59)	-.245 (6.22)
R	-.397 (10.08)	-.129 (3.28)
S	-.418 (10.62)	.000 (.000)
T	-.397 (10.08)	+.129 (3.28)
U	-.338 (8.59)	+.245 (6.22)
V	-.245 (6.22)	+.338 (8.59)
W	-.129 (3.28)	+.397 (10.08)
X	.000 (.000)	+.284 (7.20)

Contacts (arrangement 41)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
Y	+.132 (3.35)	+.251 (6.38)
Z	+.233 (5.92)	+.161 (4.09)
a	+.281 (7.14)	+.034 (.867)
b	+.265 (6.73)	-.101 (2.57)
c	+.188 (4.78)	-.212 (5.38)
d	+.068 (1.73)	-.275 (6.99)
e	-.068 (1.73)	-.275 (6.99)
f	-.188 (4.78)	-.212 (5.38)
g	-.265 (6.73)	-.101 (2.57)
h	-.281 (7.14)	+.034 (.867)
i	-.233 (5.92)	+.161 (4.09)
j	-.132 (3.35)	+.251 (6.38)
k	.000 (.000)	+.150 (3.81)
m	+.117 (2.97)	+.094 (2.39)
n	+.146 (3.71)	-.033 (0.84)
p	+.065 (1.65)	-.135 (3.43)
q	-.065 (1.65)	-.135 (3.43)
r	-.146 (3.71)	-.033 (0.84)
s	-.117 (2.97)	+.094 (2.39)
t	.000 (.000)	.000 (.000)

FIGURE 8. Shell size 20 – Continued.

MIL-STD-1669A
w/CHANGE 1
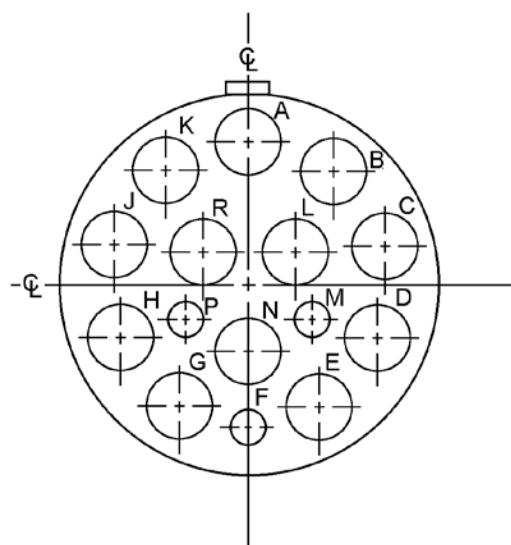
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.368 (9.35)
B	+.224 (5.69)	+.292 (7.42)
C	+.356 (9.04)	+.095 (2.41)
D	+.341 (8.66)	-.142 (3.61)
E	+.182 (4.62)	-.319 (8.10)
F	.000 (.000)	-.368 (9.35)
G	-.182 (4.62)	-.319 (8.10)
H	-.341 (8.66)	-.142 (3.61)
J	-.356 (9.04)	+.095 (2.41)
K	-.224 (5.69)	+.292 (7.42)
L	+.120 (3.05)	+.079 (2.01)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
M	+.166 (4.22)	-.098 (2.49)
N	.000 (.000)	-.170 (4.32)
P	-.166 (4.22)	-.098 (2.49)
R	-.120 (3.05)	+.079 (2.01)

Alternate insert positions			
A degrees			
W	X	Y	Z
18	60	240	270

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
20	90	3	20	I	F, M, P	MS33714-90
		12	12		Remainder	

FIGURE 8. <u>Shell size 20</u> – Continued.

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MIL-STD-1669A
w/CHANGE 1
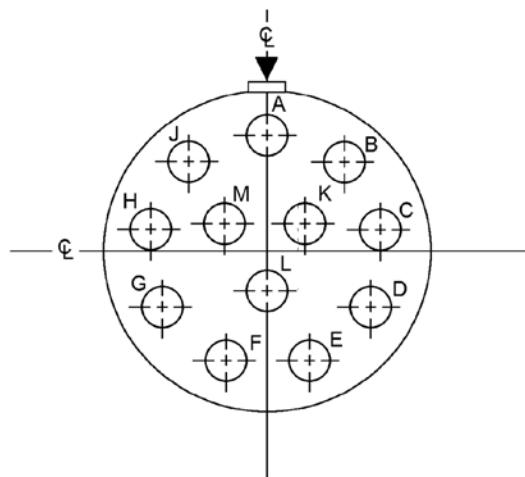
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.398 (10.11)
B	+.256 (6.50)	+.305 (7.75)
C	+.392 (9.97)	+.069 (1.73)
D	+.345 (8.76)	-.199 (5.06)
E	+.136 (3.45)	-.374 (9.50)
F	-.136 (3.45)	-.374 (9.50)
G	-.345 (8.76)	-.199 (5.06)
H	-.392 (9.97)	+.069 (1.73)
J	-.256 (6.50)	+.305 (7.75)
K	+.131 (3.33)	+.075 (1.90)
L	.000 (0.00)	-.151 (3.83)
M	-.131 (3.33)	+.075 (1.90)

Alternate insert positions			
A degrees			
W	X	Y	Z
-----	-----	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	12	12	12	I	All	MS33715-12

FIGURE 9. Shell size 22.

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MIL-STD-1669A
w/CHANGE 1
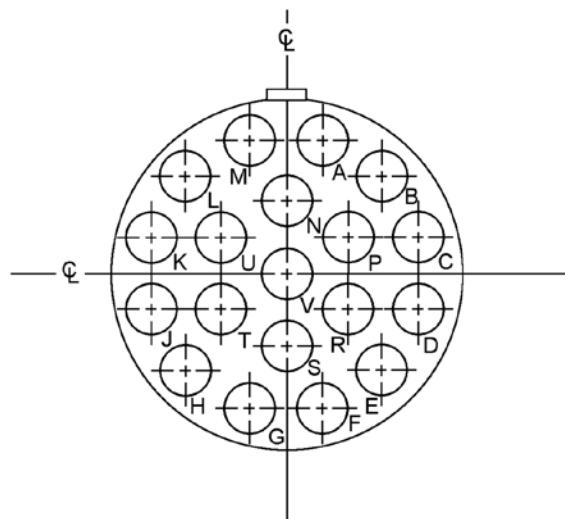
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.114 (2.90)	+.425 (10.80)
B	+.311 (7.90)	+.311 (7.90)
C	+.425 (10.80)	+.114 (2.90)
D	+.425 (10.80)	-.114 (2.90)
E	+.311 (7.90)	-.311 (7.90)
F	+.114 (2.90)	-.425 (10.80)
G	-.114 (2.90)	-.425 (10.80)
H	-.311 (7.90)	-.311 (7.90)
J	-.425 (10.80)	-.114 (2.90)
K	-.425 (10.80)	+.114 (2.90)
L	-.311 (7.90)	+.311 (7.90)
M	-.114 (2.90)	+.425 (10.80)
N	.000 (.000)	+.228 (5.79)
P	+.197 (5.00)	+.114 (2.90)
R	+.197 (5.00)	-.114 (2.90)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
S	.000 (.000)	-.228 (5.79)
T	-.197 (5.00)	-.114 (2.90)
U	-.197 (5.00)	+.114 (2.90)
V	.000 (.000)	.000 (.000)

Alternate insert positions			
A degrees			
W	X	Y	Z
15	90	225	308

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	19	19	12	I	All	MS33715-19

FIGURE 9. Shell size 22 – Continued.

45

MIL-STD-1669A
w/CHANGE 1
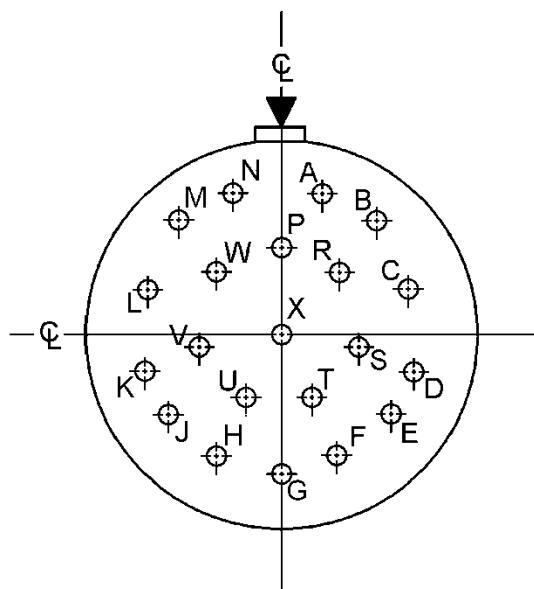
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.128 (3.25)	+.385 (9.78)
B	+.289 (7.34)	+.285 (7.24)
C	+.386 (9.80)	+.123 (3.12)
D	+.400 (10.16)	-.065 (1.65)
E	+.328 (8.33)	-.239 (6.07)
F	+.183 (4.65)	-.362 (9.19)
G	.000 (.000)	-.406 (10.31)
H	-.183 (4.65)	-.362 (9.19)
J	-.328 (8.33)	-.239 (6.07)
K	-.400 (10.16)	-.065 (1.65)
L	-.386 (9808)	+.123 (3.12)
M	-.289 (7.34)	+.285 (7.24)
N	-.128 (3.25)	+.385 (9.78)
P	.000 (.000)	+.245 (6.22)
R	+.160 (4.06)	+.146 (3.71)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
S	+.214 (5.44)	-.035 (0.89)
T	+.094 (2.39)	-.194 (4.93)
U	-.094 (2.39)	-.194 (4.93)
V	-.214 (5.44)	-.035 (0.89)
W	-.160 (4.06)	+.146 (3.71)
X	.000 (.000)	.000 (.000)

Alternate insert positions			
A degrees			
W	X	Y	Z
16	135	175	349

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	21	21	16	II	All	MS33715-21

FIGURE 9. Shell size 22 – Continued.

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MIL-STD-1669A
w/CHANGE 1
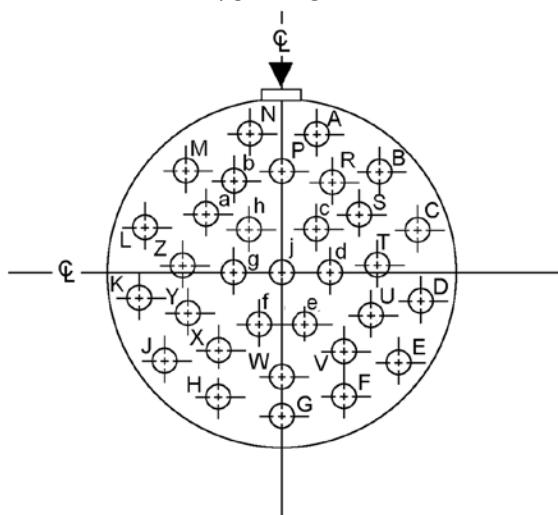
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.100 (2.54)	+.450 (11.43)
B	+.325 (8.25)	+.325 (8.25)
C	+.425 (10.80)	+.150 (3.81)
D	+.450 (11.43)	-.075 (1.90)
E	+.375 (9.52)	-.275 (6.99)
F	+.200 (5.08)	-.400 (10.16)
G	.000 (.000)	-.450 (11.43)
H	-.200 (5.08)	-.400 (10.16)
J	-.375 (9.52)	-.275 (6.99)
K	-.450 (11.43)	-.075 (1.90)
L	-.425 (10.80)	+.150 (3.81)
M	-.325 (8.25)	+.325 (8.25)
N	-.100 (2.54)	+.450 (11.43)
P	.000 (.000)	+.325 (8.25)
R	+.150 (3.81)	+.300 (7.62)
S	+.250 (6.35)	+.175 (4.44)
T	+.325 (8.25)	+.025 (0.63)
U	+.300 (7.62)	-.125 (3.18)
V	+.200 (5.08)	-.250 (6.35)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
W	.000 (.000)	-.300 (7.62)
X	-.200 (5.08)	-.250 (6.35)
Y	-.300 (7.62)	-.125 (3.18)
Z	-.325 (8.25)	+.025 (0.63)
a	-.250 (6.35)	+.175 (4.44)
b	-.150 (3.81)	+.300 (7.62)
c	+.100 (2.54)	+.150 (3.81)
d	+.150 (3.81)	.000 (.000)
e	+.075 (1.90)	-.150 (3.81)
f	-.075 (1.90)	-.150 (3.81)
g	-.150 (3.81)	.000 (.000)
h	-.100 (2.54)	+.150 (3.81)
j	.000 (.000)	.000 (.000)

Alternate insert positions			
A degrees			
W	X	Y	Z
72	145	215	288

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	32	32	20	I	All	MS33715-32 MS27732-32 MS33715-18

FIGURE 9. Shell size 22 – Continued.

47

MIL-STD-1669A
w/CHANGE 1
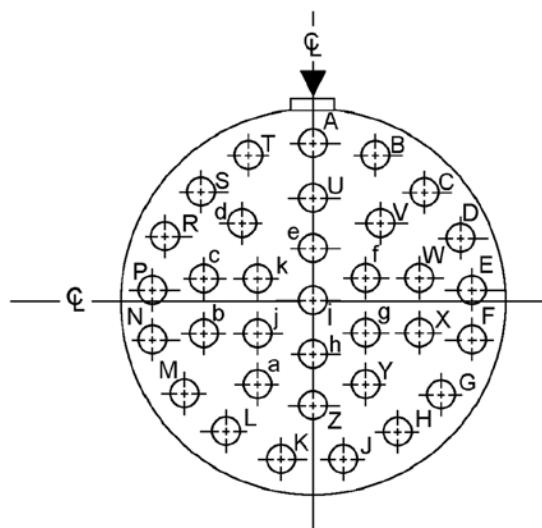
Alternate insert positions			
A degrees			
W	X	Y	Z
62	142	218	298

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	34	34	20	I	All	MS33715-34 MS27732-34

FIGURE 9. Shell size 22 – Continued.

MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 34)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.450 (11.43)
B	+.175 (4.44)	+.425 (10.80)
C	+.325 (8.25)	+.325 (8.25)
D	+.425 (10.80)	+.175 (4.44)
E	+.450 (11.43)	+.025 (0.63)
F	+.450 (11.43)	-.125 (3.18)
G	+.375 (9.52)	-.275 (6.99)
H	+.250 (6.35)	-.375 (9.52)
J	+.100 (2.54)	-.450 (11.43)
K	-.100 (2.54)	-.450 (11.43)
L	-.250 (6.35)	-.375 (9.52)
M	-.375 (9.52)	-.275 (6.99)
N	-.450 (11.43)	-.125 (3.18)
P	-.450 (11.43)	+.025 (0.63)
R	-.425 (10.80)	+.175 (4.44)
S	-.325 (8.25)	+.325 (8.25)
T	-.175 (4.44)	+.425 (10.80)

Contacts (arrangement 34)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
U	.000 (.000)	+.300 (7.62)
V	+.200 (5.08)	+.225 (5.71)
W	+.300 (7.62)	+.050 (1.27)
X	+.300 (7.62)	-.100 (2.54)
Y	+.150 (3.81)	-.250 (6.35)
Z	.000 (.000)	-.300 (7.62)
a	-.150 (3.81)	-.250 (6.35)
b	-.300 (7.62)	-.100 (2.54)
c	-.300 (7.62)	+.050 (1.27)
d	-.200 (5.08)	+.225 (5.71)
e	.000 (.000)	+.150 (3.81)
f	+.150 (3.81)	+.050 (1.27)
g	+.150 (3.81)	-.100 (2.54)
h	.000 (.000)	-.150 (3.81)
j	-.150 (3.81)	-.100 (2.54)
k	-.150 (3.81)	+.050 (1.27)
l	.000 (.000)	.000 (.000)

FIGURE 9. Shell size 22 – Continued.

49

MIL-STD-1669A
w/CHANGE 1
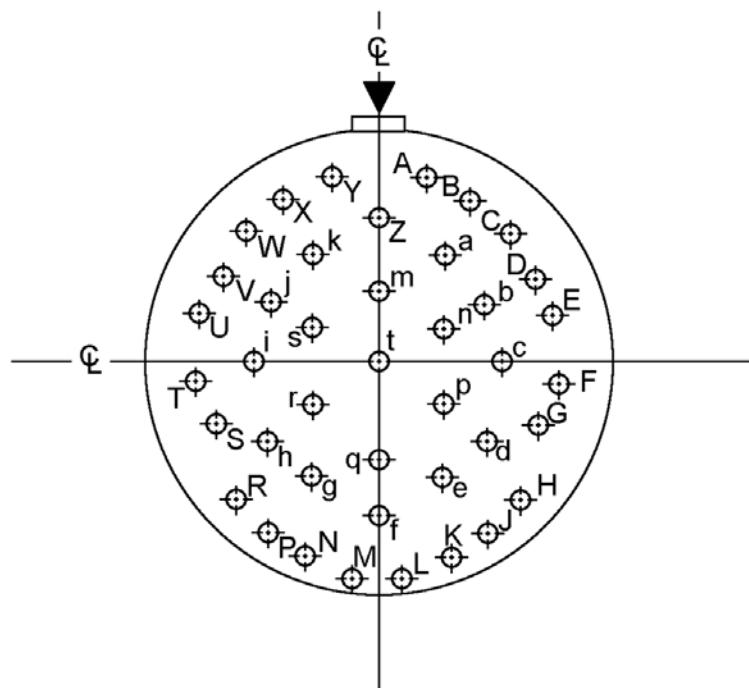
Alternate insert positions			
A degrees			
W	X	Y	Z
39	135	264	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	41	14	16	I	Z, a, c, e, g, i, k, m, n, p, q, r, s, t	MS33715-41
		27	20		Remainder	

FIGURE 9. Shell size 22 – Continued.

MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 41)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.132 (3.35)	+.472 (11.99)
B	+.255 (6.48)	+.418 (10.62)
C	+.358 (9.09)	+.334 (8.48)
D	+.435 (11.04)	+.225 (5.71)
E	+.480 (12.19)	+.099 (2.51)
F	+.489 (12.42)	-.034 (0.86)
G	+.462 (11.73)	-.165 (4.19)
H	+.400 (10.16)	-.283 (7.19)
J	+.308 (7.82)	-.381 (9.68)
K	+.194 (4.93)	-.450 (11.43)
L	+.067 (1.70)	-.486 (12.34)
M	-.067 (1.70)	-.486 (12.34)
N	-.194 (4.93)	-.450 (11.43)
P	-.308 (7.82)	-.381 (9.68)
R	-.400 (10.16)	-.283 (7.19)
S	-.462 (11.73)	-.165 (4.19)
T	-.489 (12.42)	-.034 (0.86)
U	-.480 (12.19)	+.099 (2.51)
V	-.435 (11.04)	+.225 (5.71)
W	-.358 (9.09)	+.334 (8.48)
X	-.255 (6.48)	+.418 (10.62)

Contacts (arrangement 41)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
Y	-.132 (3.35)	+.472 (11.99)
Z	.000 (.000)	+.376 (9.55)
a	+.163 (4.14)	+.282 (7.16)
b	+.299 (7.59)	+.173 (4.39)
c	+.326 (8.28)	.000 (.000)
d	+.308 (7.82)	-.173 (4.39)
e	+.163 (4.14)	-.282 (7.16)
f	.000 (.000)	-.344 (8.74)
g	-.163 (4.14)	-.282 (7.16)
h	-.308 (7.82)	-.173 (4.39)
i	-.326 (8.28)	.000 (.000)
j	-.299 (7.59)	+.173 (4.39)
k	-.163 (4.14)	+.282 (7.16)
m	.000 (.000)	+.188 (4.77)
n	+.163 (4.14)	+.094 (2.39)
p	+.163 (4.14)	-.094 (2.39)
q	.000 (.000)	-.188 (4.77)
r	-.163 (4.14)	-.094 (2.39)
s	-.163 (4.14)	+.094 (2.39)
t	.000 (.000)	.000 (.000)

FIGURE 9. <u>Shell size 22</u> – Continued.
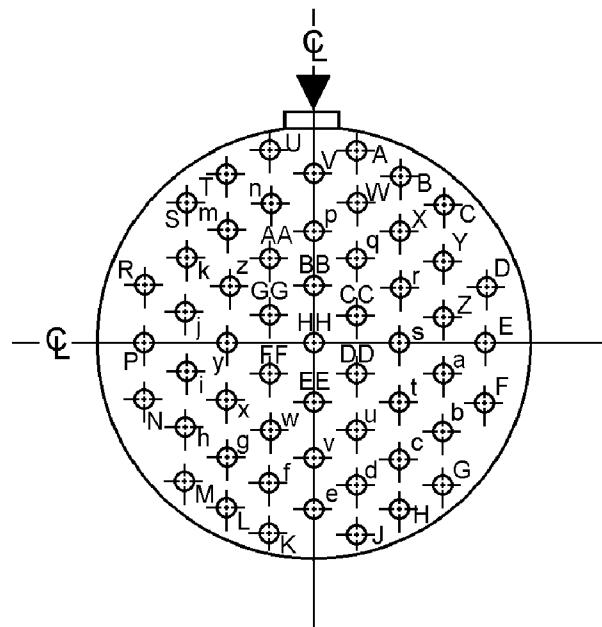
Alternate insert positions			
A degrees			
W	X	Y	Z
30	142	226	314

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	55	55	20	I	All	MS33715-55

FIGURE 9. Shell size 22 – Continued.

MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 55)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.112 (2.84)	+.455 (11.56)
B	+.225 (5.71)	+.390 (9.91)
C	+.336 (8.53)	+.325 (8.25)
D	+.450 (11.43)	+.130 (3.30)
E	+.450 (11.43)	.000 (.000)
F	+.450 (11.43)	-.130 (3.30)
G	+.336 (8.53)	-.325 (8.25)
H	+.225 (5.71)	-.390 (9.91)
J	+.112 (2.84)	-.455 (11.56)
K	-.112 (2.84)	-.455 (11.56)
L	-.225 (5.71)	-.390 (9.91)
M	-.336 (8.53)	-.325 (8.25)
N	-.450 (11.43)	-.130 (3.30)
P	-.450 (11.43)	.000 (.000)
R	-.450 (11.43)	+.130 (3.30)
S	-.336 (8.53)	+.325 (8.25)
T	-.225 (5.71)	+.390 (9.91)
U	-.112 (2.84)	+.455 (11.56)
V	.000 (.000)	+.390 (9.91)
W	+.112 (2.84)	+.325 (8.25)
X	+.225 (5.71)	+.260 (6.60)
Y	+.336 (8.53)	+.195 (4.95)
Z	+.336 (8.53)	+.065 (1.65)
a	+.336 (8.53)	-.065 (1.65)
b	+.336 (8.53)	-.195 (4.95)
c	+.225 (5.71)	-.260 (6.60)
d	+.112 (2.84)	-.325 (8.25)
e	.000 (.000)	-.390 (9.91)

Contacts (arrangement 55)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
f	-.112 (2.84)	-.325 (8.25)
g	-.225 (5.71)	-.260 (6.60)
h	-.336 (8.53)	-.195 (4.95)
i	-.336 (8.53)	-.065 (1.65)
j	-.336 (8.53)	+.065 (1.65)
k	-.336 (8.53)	+.195 (4.95)
m	-.225 (5.71)	+.260 (6.60)
n	-.112 (2.84)	+.325 (8.25)
p	.000 (.000)	+.260 (6.60)
q	+.112 (2.84)	+.195 (4.95)
r	+.225 (5.71)	+.130 (3.30)
s	+.225 (5.71)	.000 (.000)
t	+.225 (5.71)	-.130 (3.30)
u	+.112 (2.84)	-.195 (4.95)
v	.000 (.000)	-.260 (6.60)
w	-.112 (2.84)	-.195 (4.95)
x	-.225 (5.71)	-.130 (3.30)
y	-.225 (5.71)	.000 (.000)
z	-.225 (5.71)	+.130 (3.30)
AA	-.112 (2.84)	+.195 (4.95)
BB	.000 (.000)	+.130 (3.30)
CC	+.112 (2.84)	+.065 (1.65)
DD	+.112 (2.84)	-.065 (1.65)
EE	.000 (.000)	-.130 (3.30)
FF	-.112 (2.84)	-.065 (1.65)
GG	-.112 (2.84)	+.065 (1.65)
HH	.000 (.000)	.000 (.000)

FIGURE 9. Shell size 22 – Continued.

MIL-STD-1669A
w/CHANGE 1
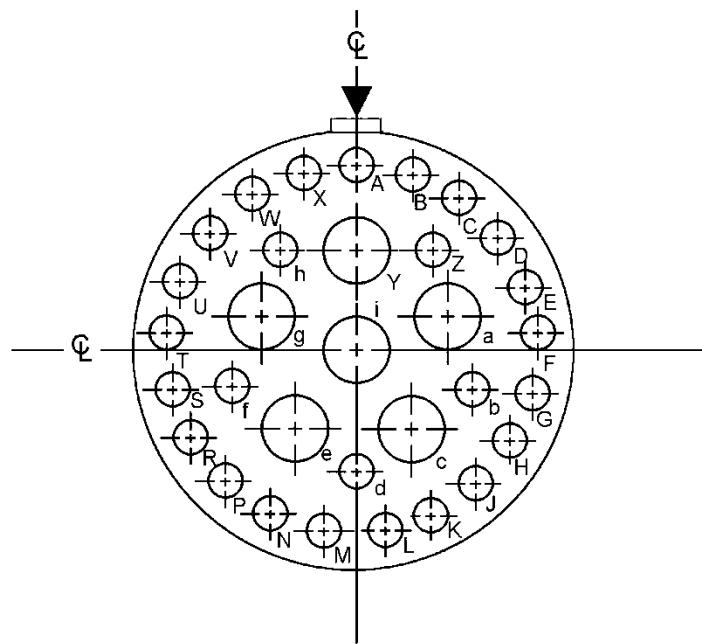
Alternate insert positions			
A degrees			
W	X	Y	Z
26	180	266	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	95	6	12	I	Y, a, c, e, g, i	MS33715-95
		26	20		Remainder	

FIGURE 9. Shell size 22 – Continued.

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MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 95)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.470 (11.94)
B	+.138 (3.50)	+.449 (11.40)
C	+.265 (6.73)	+.388 (9.86)
D	+.367 (9.32)	+.293 (7.44)
E	+.437 (11.10)	+.172 (4.37)
F	+.469 (11.91)	+.035 (0.89)
G	+.458 (11.63)	-.104 (2.64)
H	+.407 (10.34)	-.234 (5.94)
J	+.320 (8.13)	-.344 (8.74)
K	+.205 (5.21)	-.423 (10.74)
L	+.070 (1.78)	-.465 (11.81)
M	-.070 (1.78)	-.465 (11.81)
N	-.205 (5.21)	-.423 (10.74)
P	-.320 (8.13)	-.344 (8.74)
R	-.407 (10.34)	-.234 (5.94)
S	-.458 (11.63)	-.104 (2.64)

Contacts (arrangement 95)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
T	-.469 (11.91)	+.035 (0.89)
U	-.437 (11.10)	+.172 (4.37)
V	-.367 (9.32)	+.293 (7.44)
W	-.265 (6.73)	+.388 (9.86)
X	-.138 (3.50)	+.449 (11.40)
Y	.000 (.000)	+.250 (6.35)
Z	+.191 (4.85)	+.283 (7.19)
a	+.238 (6.04)	+.077 (1.98)
b	+.309 (7.85)	-.100 (2.54)
c	+.147 (3.73)	-.202 (5.13)
d	.000 (.000)	-.325 (8.25)
e	-.147 (3.73)	-.202 (5.13)
f	-.309 (7.85)	-.100 (2.54)
g	-.238 (6.04)	+.077 (1.98)
h	-.191 (4.85)	+.283 (7.19)
i	.000 (.000)	.000 (.000)

FIGURE 9. Shell size 22 – Continued.

55

MIL-STD-1669A
w/CHANGE 1
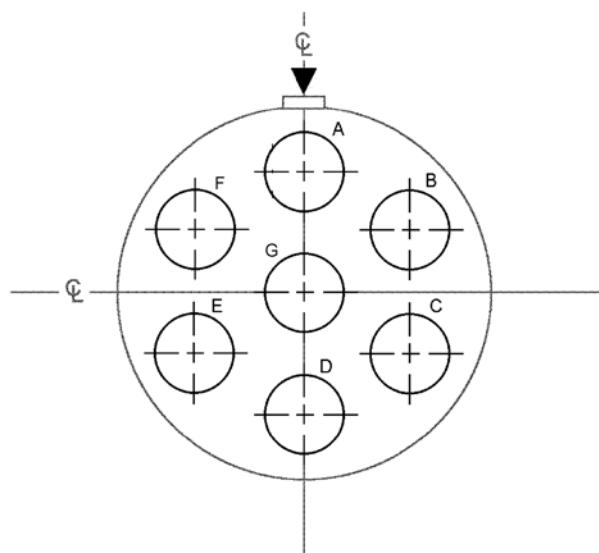
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (0.00)	+.360 (9.44)
B	+.312 (7.92)	+.180 (4.57)
C	+.312 (7.92)	-.180 (4.57)
D	.000 (0.00)	-.360 (9.44)
E	-.312 (7.92)	-.180 (4.57)
F	-.312 (7.92)	+.180 (4.57)
G	.000 (0.00)	.000 (0.00)

Alternate insert positions			
A degrees			
W	X	Y	Z
19	41	-----	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
22	96	7	8 Shielded. Not applicable to series 2 (rear release connectors)	I	All	MS33715-96

FIGURE 9. <u>Shell size 22</u> – Continued.

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MIL-STD-1669A
w/CHANGE 1
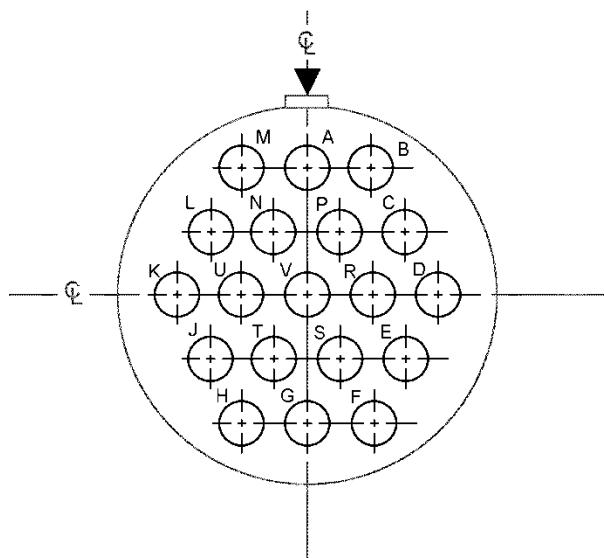
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.412 (10.46)
B	+.238 (6.04)	+.412 (10.46)
C	+.357 (9.07)	+.206 (5.23)
D	+.476 (12.09)	.000 (.000)
E	+.357 (9.07)	-.206 (5.23)
F	+.238 (6.04)	-.412 (10.46)
G	.000 (.000)	-.412 (10.46)
H	-.238 (6.04)	-.412 (10.46)
J	-.357 (9.07)	-.206 (5.23)
K	-.476 (12.09)	.000 (.000)
L	-.357 (9.07)	+.206 (5.23)
M	-.238 (6.04)	+.412 (10.46)
N	-.119 (3.02)	+.206 (5.23)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
P	+.119 (3.02)	+.206 (5.23)
R	+.238 (6.04)	.000 (.000)
S	+.119 (3.02)	-.206 (5.23)
T	-.119 (3.02)	-.206 (5.23)
U	-.238 (6.04)	.000 (.000)
V	.000 (.000)	.000 (.000)

Alternate insert positions			
A degrees			
W	X	Y	Z
30	165	315	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
24	19	19	12	II	All	MS33716-19 MS27733-19

FIGURE 10. Shell size 24.

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MIL-STD-1669A
w/CHANGE 1
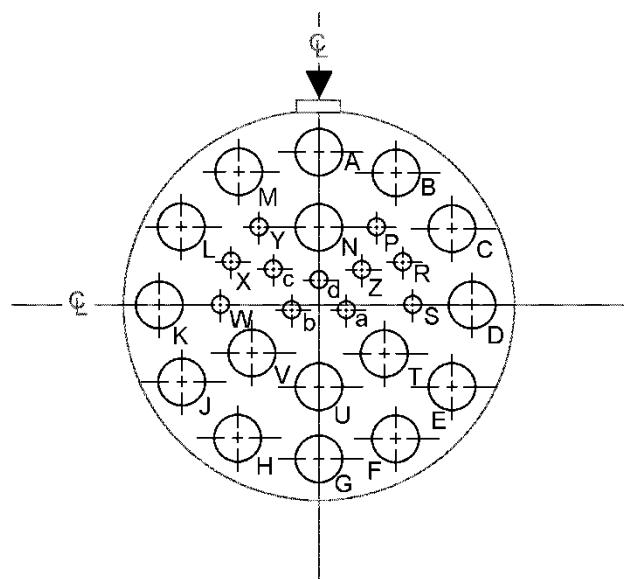
Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	.000 (.000)	+.491 (12.47)
B	+.246 (6.25)	+.425 (10.80)
C	+.425 (10.80)	+.246 (6.25)
D	+.491 (12.47)	.000 (.000)
E	+.425 (10.80)	-.246 (6.25)
F	+.246 (6.25)	-.425 (10.80)
G	.000 (.000)	-.491 (12.47)
H	-.246 (6.25)	-.425 (10.80)
J	-.425 (10.80)	-.246 (6.25)
K	-.491 (12.47)	.000 (.000)
L	-.425 (10.80)	+.246 (6.25)
M	-.246 (6.25)	+.425 (10.80)
N	.000 (.000)	+.255 (6.48)
P	+.184 (4.67)	+.239 (6.07)
R	+.270 (6.86)	+.130 (3.30)
S	+.301 (7.64)	.000 (.000)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
T	+.210 (5.33)	-.156 (3.97)
U	.000 (.000)	-.255 (6.48)
V	-.210 (5.33)	-.156 (3.97)
W	-.301 (7.64)	.000 (.000)
X	-.270 (6.86)	+.130 (3.30)
Y	-.184 (4.67)	+.239 (6.07)
Z	+.137 (3.48)	+.103 (2.62)
a	+.088 (2.23)	-.022 (0.56)
b	-.088 (2.23)	-.022 (0.56)
c	-.137 (3.48)	+.103 (2.62)
d	.000 (.000)	+.075 (1.90)

Alternate insert positions			
A degrees			
W	X	Y	Z
45	110	140	225

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
24	27	11	20	I	P, R, S, W, X, Y, Z, a, b, c, d	MS33716-27
		16	12		Remainder	

FIGURE 10. Shell size 24 – Continued.

58

MIL-STD-1669A
w/CHANGE 1

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.158 (4.01)	+.455 (11.56)
B	+.316 (8.03)	+.364 (9.25)
C	+.474 (12.04)	+.091 (2.31)
D	+.474 (12.04)	-.091 (2.31)
E	+.316 (8.03)	-.364 (9.25)
F	+.158 (4.01)	-.455 (11.56)
G	-.158 (4.01)	-.455 (11.56)
H	-.316 (8.03)	-.364 (9.25)
J	-.474 (12.04)	-.091 (2.31)
K	-.474 (12.04)	+.091 (2.31)
L	-.316 (8.03)	+.364 (9.25)
M	-.158 (4.01)	-.455 (11.56)
N	.000 (.000)	+.364 (9.25)
P	+.158 (4.01)	+.273 (6.93)
Q	+.316 (8.03)	+.182 (4.62)
R	+.316 (8.03)	.000 (.000)
S	+.316 (8.03)	-.182 (4.62)
T	+.158 (4.01)	-.273 (6.93)

Contacts		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
U	.000 (.000)	-.364 (9.25)
V	-.158 (4.01)	-.273 (6.93)
W	-.316 (8.03)	-.182 (4.62)
X	-.316 (8.03)	.000 (.000)
Y	-.316 (8.03)	+.182 (4.62)
Z	-.158 (4.01)	+.273 (6.93)
a	.000 (.000)	+.182 (4.62)
b	+.158 (4.01)	+.091 (2.31)
c	+.158 (4.01)	-.091 (2.31)
d	.000 (.000)	-.182 (4.62)
e	-.158 (4.01)	-.091 (2.31)
f	-.158 (4.01)	+.091 (2.31)
g	.000 (.000)	.000 (.000)

Alternate insert positions			
A degrees			
W	X	Y	Z
90	225	255	-----

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
24	31	31	16	I	All	MS33716-31 MS27737-31

FIGURE 10. Shell size 24 – Continued.

59

MIL-STD-1669A
w/CHANGE 1

Alternate insert positions			
A degrees			
W	X	Y	Z
90	180	270	324

Shell size	Arrangement number	Number of contacts	Size contacts	Service rating	Contact location	Supersedes document
24	61	61	20	I	All	MS33716-61

FIGURE 10. Shell size 24 – Continued.

MIL-STD-1669A
w/CHANGE 1

Contacts (arrangement 61)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
A	+.196 (4.98)	+.500 (12.70)
B	+.314 (7.98)	+.435 (11.05)
C	+.413 (10.49)	+.343 (8.71)
D	+.485 (12.32)	+.230 (5.84)
E	+.527 (13.39)	+.101 (2.57)
F	+.536 (13.61)	-.030 (0.76)
G	+.511 (12.98)	-.164 (4.17)
H	+.454 (11.53)	-.287 (7.29)
J	+.368 (9.35)	-.391 (9.93)
K	+.259 (6.58)	-.470 (11.94)
L	+.134 (3.40)	-.519 (13.18)
M	.000 (.000)	-.537 (13.64)
N	-.134 (3.40)	-.519 (13.18)
P	-.259 (6.58)	-.470 (11.94)
R	-.368 (9.35)	-.391 (9.93)
S	-.454 (11.53)	-.287 (7.29)
T	-.511 (12.98)	-.164 (4.17)
U	-.536 (13.61)	-.030 (0.76)
V	-.527 (13.39)	+.101 (2.57)
W	-.485 (12.32)	+.230 (5.84)
X	-.413 (10.49)	+.343 (8.71)
Y	-.314 (7.98)	+.435 (11.05)
Z	-.196 (4.98)	+.500 (12.70)
a	-.068 (1.73)	+.454 (11.53)
b	+.068 (1.73)	+.454 (11.53)
c	+.173 (4.39)	+.363 (9.22)
d	+.285 (7.24)	+.283 (7.19)
e	+.362 (9.19)	+.175 (4.44)
f	+.399 (10.13)	+.046 (1.17)
g	+.392 (9.97)	-.088 (2.23)
h	+.341 (8.68)	-.213 (5.41)

Contacts (arrangement 61)		
Contact position	Contact location	
	X-axis (mm)	Y-axis (mm)
i	+.251 (6.37)	-.314 (7.98)
j	+.133 (3.38)	-.379 (9.627)
k	.000 (.000)	-.402 (10.21)
m	-.133 (3.38)	-.379 (9.627)
n	-.251 (6.37)	-.314 (7.98)
p	-.341 (8.68)	-.213 (5.41)
q	-.392 (9.97)	-.088 (2.23)
r	-.399 (10.13)	+.046 (1.17)
s	-.362 (9.19)	+.175 (4.44)
t	-.285 (7.24)	+.283 (7.19)
u	-.173 (4.39)	+.363 (9.22)
v	.000 (.000)	+.338 (8.58)
w	+.147 (3.73)	+.223 (5.66)
x	+.237 (6.02)	+.122 (3.10)
y	+.267 (6.78)	-.010 (0.25)
z	+.228 (5.79)	-.139 (3.53)
AA	+.131 (3.33)	-.233 (5.92)
BB	.000 (.000)	-.267 (6.78)
CC	-.131 (3.33)	-.233 (5.92)
DD	-.228 (5.79)	-.139 (3.53)
EE	-.267 (6.78)	-.010 (0.25)
FF	-.237 (6.02)	+.122 (3.10)
GG	-.147 (3.73)	+.223 (5.66)
HH	.000 (.000)	+.200 (5.08)
JJ	+.105 (2.67)	+.094 (2.39)
KK	+.135 (3.43)	-.041 (1.04)
LL	.000 (.000)	-.132 (3.35)
MM	-.135 (3.43)	-.041 (1.04)
NN	-.105 (2.67)	+.094 (2.39)
PP	.000 (.000)	.000 (.000)

FIGURE 10. Shell size 24 – Continued.

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w/CHANGE 1

CONCLUDING MATERIAL

Custodians: Preparing activity:
  Army – CR   DLA - CC
  Navy – AS
  Air Force – 85   (Project 5935–2010-044)
  DLA - CC

Review activities:
  Army – AR, AV, MI
  Navy – EC, SH

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.daps.dla.mil.