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PRELIMINARY MATERIAL Page

GENERAL AND TECHNICAL INFORMATION (-1)

Chapter

PREFACE

Amendments

1 Each page of this publication bears the date of issue. Subsequent amendments to the initial issue will bear the date and number of the amendment list with which they were issued.

2 New or amended technical matter will be indicated within the individual pages by black triangles thus (► ◄) at the beginning and end of the amendment. Triangles will not normally be used where a minor working alteration is made to clarify, rather than change, the requirement. When publications are produced on word processors the symbols > and < may be used in lieu of triangles, alternatively vertical marginal lines positioned 2 character spaces out, in both left and right hand margins shall be used to indicate the extent of amended text. However, where the word processor software dictates, a single line on the outer edge margin is permitted.

3 When a page is reissued without any changes whatsoever, but solely because it backs onto a changed page, the issue/amendment caption will remain unchanged from the previous issue.

4 When a chapter is completely rewritten the note '(Completely revised)' will appear below the chapter title. Triangles will not be used.

CHAPTER 1

DESCRIPTION

CONTENTS

Para

(continued)

CONTENTS (continued)

Table

Fig

(continued)

CONTENTS (continued)

LEADING PARTICULARS

Current rating ..... Size 20 contact 7.5 A
Size 16 contact 20 A

Voltage rating ..... 500 Vac rms
700 Vdc

Insulation resistance ..... Shall not be less than 5000 megohms when tested in accordance with MIL-STR-202C, method 302, condition B

Contact resistance

Environmental type ..... Size 20 contact – 65 mV (max) at 7.5 A
Size 16 contact – 60 mV (max) at 13 A

Hermetic type ..... Size 20 contact – 90 mV (max) at 5 A
Size 16 contact – 95 mV (max) at 13 A

Temperature range ..... -65 °C to +190 °C

Air leakage

Environmental type ..... Seal leakage rate at 30 lb/in^2 differential is less than 1 M^3/hr

Hermetic type ..... Seal leakage rate at 30 lb/in^2 differential is less than 3×10^{-7} cm^3/hr

Usable wire sizes. ..... Size 20 contact - 20 AWG
Size 16 contact - 16 AWG

INTRODUCTION

NOTE

All dimensions given in Tables and Figs are in inches, unless otherwise stated.

ENVIRONMENTAL TYPES

1 The main features of environmental connectors are as follows:

1.1 Environmental connectors in the Deutsch Ltd 460 series are bayonet locking fittings, with inserts that meet all requirements of MIL-C-26482 specification. A sectional view of a 460 series connector is shown in Fig 1.

1.2 The mating face on inserts of connectors fitted with socket type contacts is made of a rigid dielectric with closed entry sockets designed to resist test prod damage. The face of pin type inserts is of fluorinated silicone and provides complete interfacial sealing when connectors are mated.

1.3 The connectors have crimped contacts which are inserted and removed from the rear of the connector, using a plastic tool. The design and construction of the tool ensures that in the event of incorrect application, the tool will break before damage to the contact and/or insert occurs.

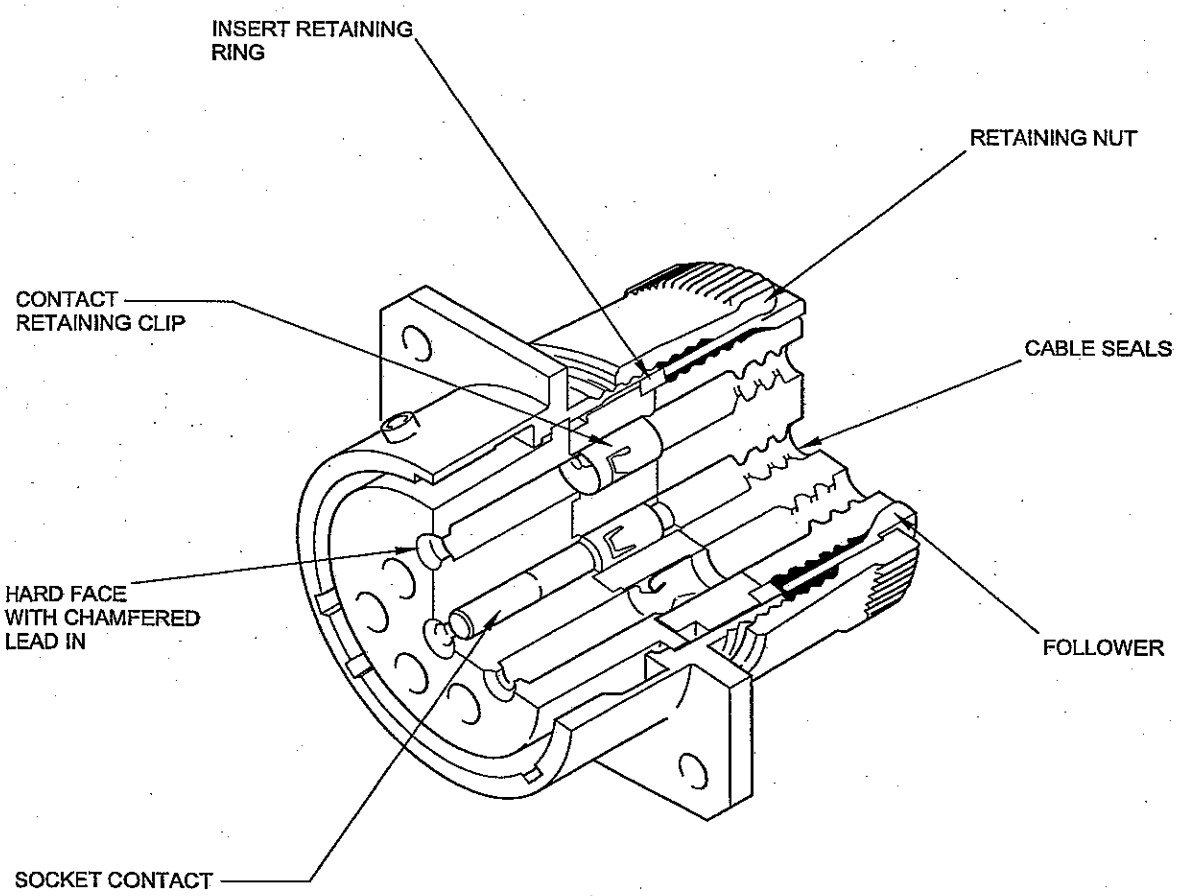


Fig 1 Connector, 460 series, sectional view

1.4 The 460 series connectors are intermateable with DEF 59-35 (Pattern 105), MIL-C-26482, PRL54130 and NAS 1599 types.

1.5 Environmental connector shells are cadmium plated and have an olive drab chromate finish.

HERMETIC TYPES

2 The main features of hermetic connectors are as follows:

2.1 Hermetic connectors are available in the 460 series to meet applications where pressure sealing properties are required.

2.2 The non-removable contacts of the hermetic connectors are sealed to a fired glass insert integrally mounted within the connector shell. Interfacial sealing between connectors is achieved in a manner similar to the environmental types.

2.3 Hermetic connector shells are made of electro-tin plated mild steel.

TABLE 1 MODIFICATIONS

Modification Suffix No. (1)	Details of variation from standard (2)
059	Connector supplied with straight cable clamp and bushing
081	Connector supplied with 90 degree cable clamp
090	Connector supplied without contacts
217	Combines modifications 059 and 090
9078	460 and 466 connectors: supplied with standard cable clamp and adapter part number 418492/** 467 connector: supplied with standard cable clamp and adapter part number 419411/**
9092	Connector supplied without retaining nut, follower and contacts
9088	460 connectors supplied with flange gasket of the same material as the connector insert grommet
9171	466 straight plug fitted with adapter to enable conduit to be secured.

NOTES

1 **- The shell size number of the connector is inserted to complete the part number.

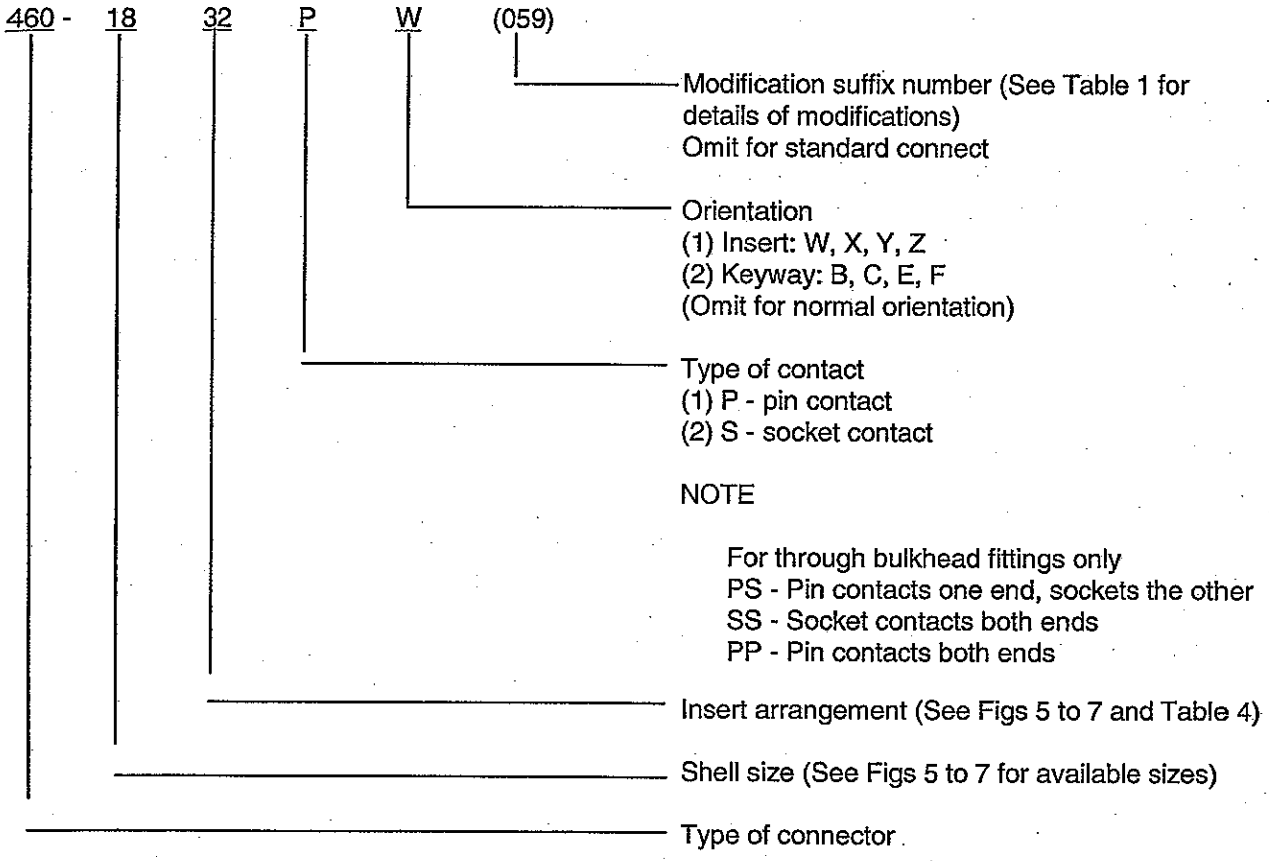
2 When a modified connector is required the standard connector and the appropriate accessory should be demanded.

3 Connectors without contacts should not be demanded.

DESCRIPTION

3 Each connector in the 460 series has a part number marked in black on the shell. A typical example is 460-18-32PW-059.

The significance of the composition of the part number is as follows:



Environmental types:

460 - Square flange receptacle

461 - Cable connecting receptacle

466 - Straight plug

467 - Jam nut receptacle

469 - Push-pull (quick disconnect) plug

Hermetic types

462H - Square flange receptacle

461H - Solder mount receptacle

467H - Jam nut receptacle

Through Bulkhead fitting:

460HTB - Square flange through bulkhead receptacle

467HTB - Jam nut through bulkhead receptacle

EQUIVALENT MS NUMBERS

4 MIL-C-26482 specification details the type of connectors by an MS number. Table 2 shows the MIL-C-26482 specification 'Type of connector number' with the equivalent Deutsch Ltd 460 series 'Type of connector number'.

TABLE 2 EQUIVALENT MS NUMBERS

Military standard connector No. (1)	Deutsch Ltd 460 series connector No. (2)
MS3120	460
MS3121	461
MS3124	467
MS3126	466
MS3113	461H
MS3114	467H
MS3119	460TB

ORIENTATION FEATURES

Insert orientations (W, X, Y and Z)

5 Insert orientations are as follows:

5.1 In the orientations shown in Fig 2, the pin-type insert is rotated clockwise relative to the main polarizing key or keyway, whilst the mating socket-type insert is rotated counter-clockwise the same number of degrees relative to the main polarizing key or keyway.

5.2 The degrees of insert orientation angle α varies for each orientation position and insert arrangement.

5.3 Connectors cannot be re-orientated as the insert is secured in the required orientation position during manufacture.

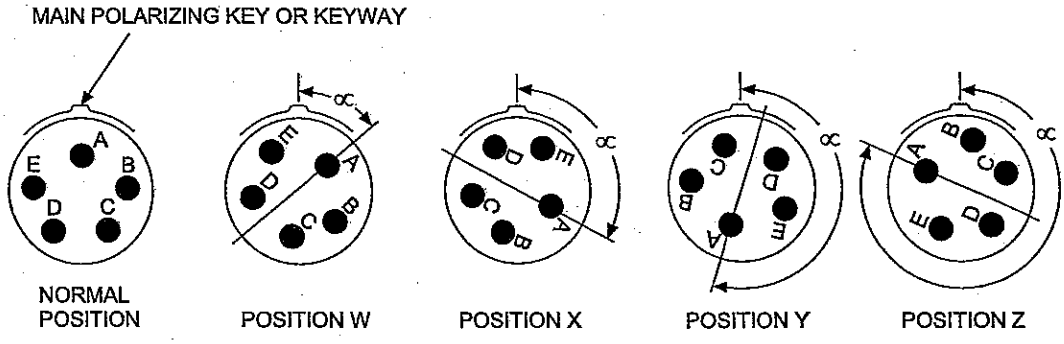


Fig 2 Insert orientations

Keyway orientations (B, C, E and F)

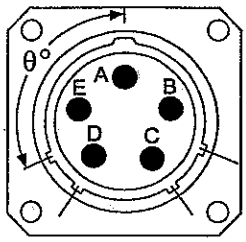
6 Keyway orientations are as follows:

6.1 Connectors provided with key/keyway orientations B, C, E and F have minor keys/keyways that are in different angular positions relative to the main polarising key/keyway. The angle θ Fig 3, varies for each orientation position and shell size, and is measured clockwise for plug shells and counter clockwise for receptacle shells.

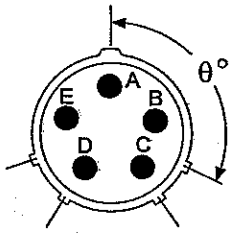
6.2 The position of the insert relative to the main polarizing key or keyway does not alter.

NOTE

Keyway orientation positions A and D are not recommended for new applications, due to mismating possibilities. Positions A and D will be available for replacement purposes only.



RECEPTACLE



PLUG

Shell Size	θ in Degrees						
	Normal	A	B	C	D	E	F
8	105	92	–	–	118	118	82
10	105	95	85	125	115	115	85
12	105	97	89	121	113	115	85
14	105	98	91	119	112	75	120
16	105	99	93	117	111	75	120
18	105	100	95	115	110	75	120
20	105	100	95	115	110	75	120
22	105	101	97	113	109	75	120
24	105	101	97	113	109	75	120

Fig 3 Keyway orientations

CONTACTS

7 Contact details are as follows:

7.1 Contacts are available in three sizes with the following current ratings:

Size 20 - 7.5 A, Size 16 - 13 A, Size 12 – 23 A.

7.2 The size 20 contact will accommodate the following cable insulation diameters:

Contact size	Insulation diameter
Standard contacts	0.040 - 0.083 in.
16	0.068 - 0.103 in.
12	0.106 - 0.158 in.

7.3 Contacts which have a longer crimping bucket than the standard contact should be used when the outside diameter of the cable insulation exceeds 0.083 in. and 0.103 in. respectively. Accommodation details of long bucket contacts are as follows:

Contact size	Insulation diameter
20	0.084 - 0.100 in.
16	0.104 - 0.130 in.

7.4 The contact is retained in the insert as shown in Fig 4.

7.5 Part and reference numbers of the contacts are given in Table 3.

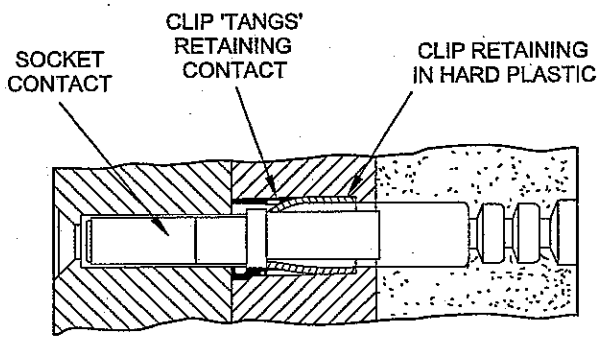


Fig 4 Contact retention

TABLE 3 CONTACTS, PARTS AND REFERENCE NUMBERS

Contact size (1)	Description (2)	Part No. (3)	Ref No. (4)
20	Pin Contact, Standard	0641-10-2056	5999-99-1990886
20	Socket Contact, Standard	0603-13-2056	5X/5935-99-1990887 5999-00-1720851
20	Pin Contact, Long Bucket	416588	5X/5999-99-4683244
20	Socket Contact, Long Bucket	417691	5X/5999-99-4683242
16	Pin Contact, Standard	0641-12-1656	5X/5935-99-1990888
16	Socket Contact, Standard	419743	5999-99-2214976
16	Pin Contact, Long Bucket	417688	5999-99-1125825
16	Socket Contact, Long Bucket	417690	5X/5999-99-468-3245
12	Pin Contact, Standard	0641-32-1256	
12	Socket Contact, Standard	0603-32-1256	

INSERT ARRANGEMENTS

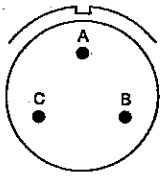
8 Insert arrangements are as follows:

8.1 Figs 5 to 7 show the available insert arrangements in ascending order of shell size and depict the mating face of the insert of a fixed connector in the normal position.

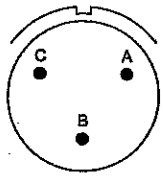
8.2 The number and size of contacts in each insert arrangement is given in Table 4.

SHELL SIZE

8



8-33



8-98

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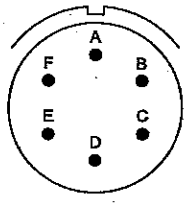

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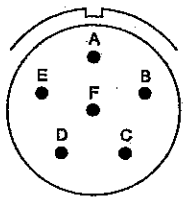
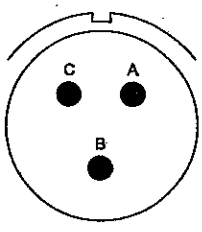
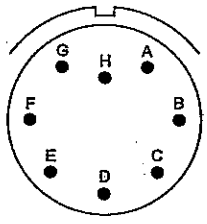


10-98

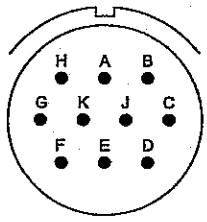
12



12-3

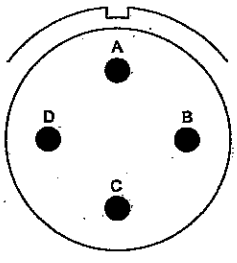


12-8

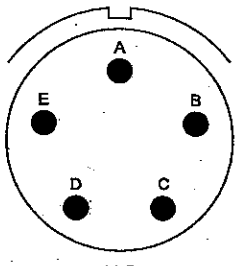


12-10

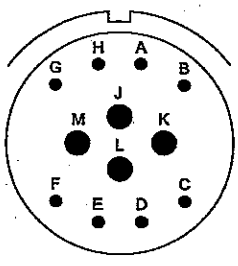
14



14-4

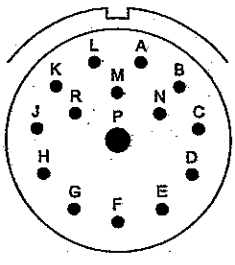


14-5



14-12

14



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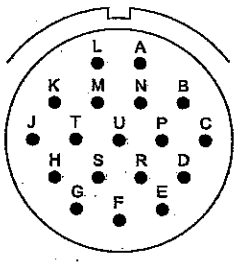

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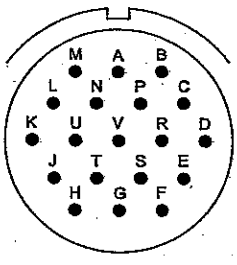
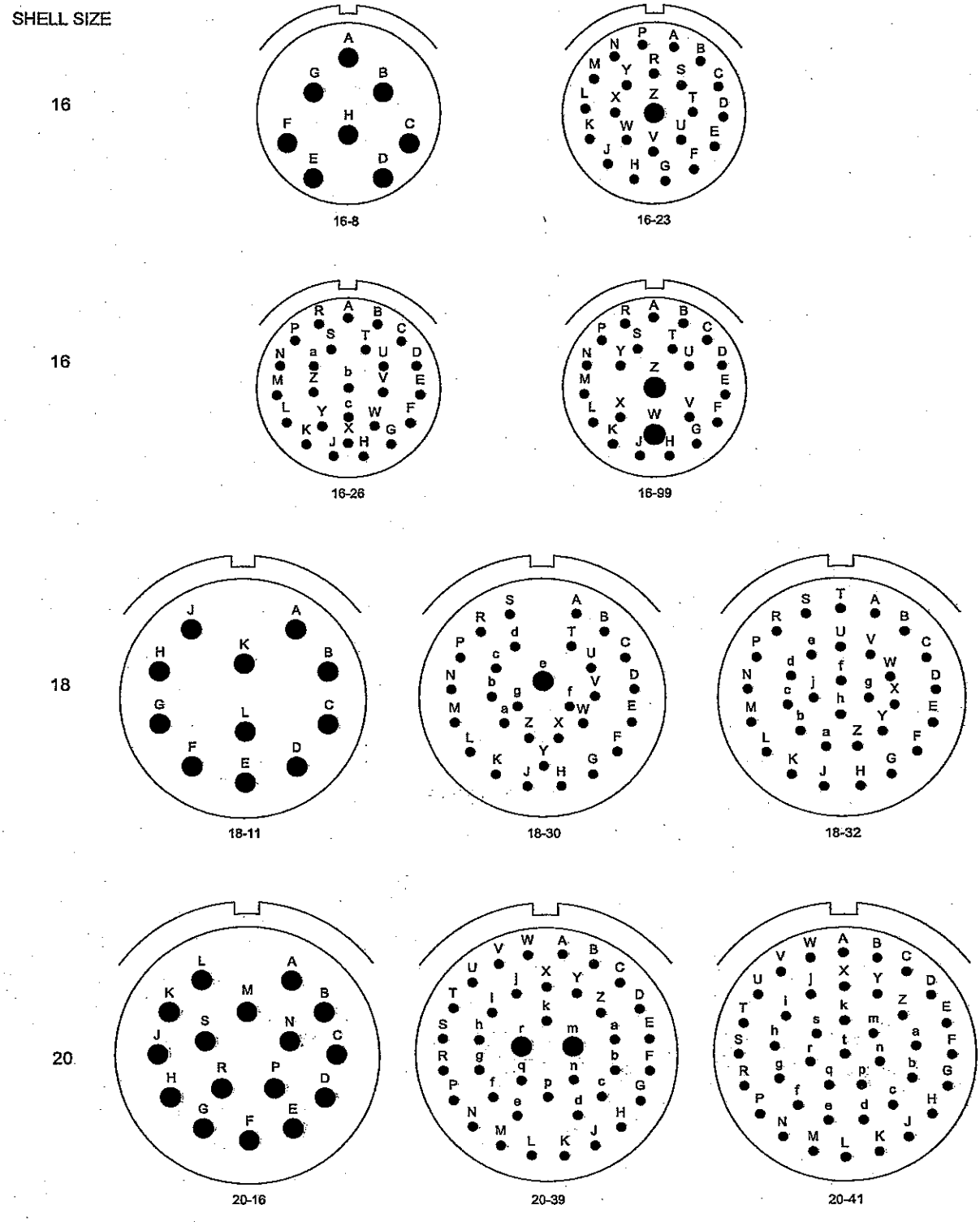


14-19

ALL VIEWS ARE LOOKING INTO THE FRONT FACE
OF A PIN INSERT IN THE NORMAL POSITION

Fig 5 Insert arrangements, shell size 8-14

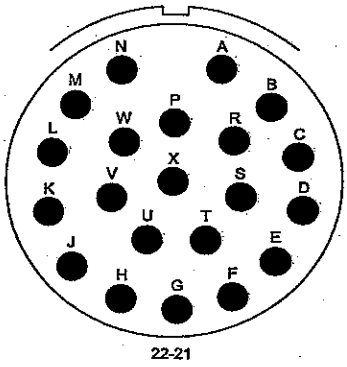


ALL VIEWS ARE LOOKING INTO THE FRONT FACE
OF A PIN INSERT IN THE NORMAL POSITION

Fig 6 Insert arrangements, shell size 16-20

SHELL SIZE

22



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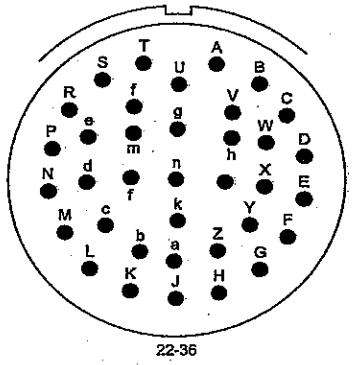
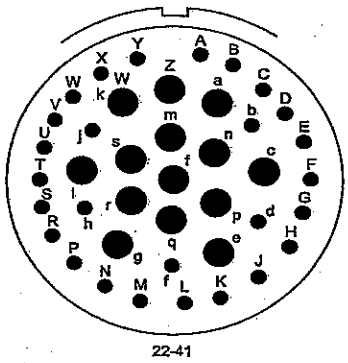
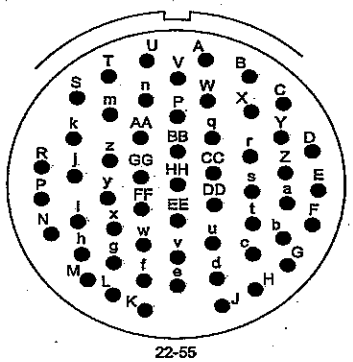


22-36

22

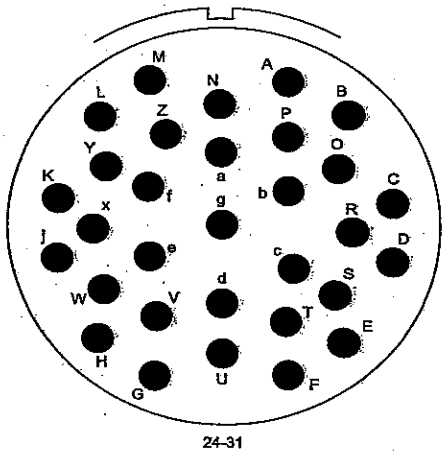


22-41



22-55

24



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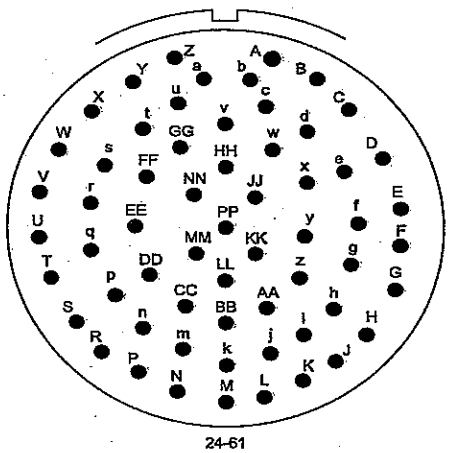


24-61

ALL VIEWS ARE LOOKING INTO THE FRONT FACE
OF A PIN INSERT IN THE NORMAL POSITION

Fig 7 Insert arrangements, shell size 22-24

TABLE 4 INSERT ARRANGEMENT, CONTACT DETAILS

Shell size and Insert arrangement (1)	Number of contacts		
	Size 20 (2)	Size 16 (3)	Size 12 (4)
8 - 33	3		
8 - 98	3		
10 - 6	6		
10 - 98	6		
12 - 3		3	
12 - 8	8		
12 - 10	10		
14 - 4			4
14 - 5		5	
14 - 12	8	4	
14 - 15	14	1	
14 - 18	18		
14 - 19	19		
16 - 8		8	
16 - 23	22	1	
16 - 26	26		
16 - 99	21	2	
18 - 11		11	
18 - 30	29	1	
18 - 32	32		
20 – 16		16	
20 - 39	37	2	
20 - 41	41		
22 - 21		21	
22 - 36	36		
22 - 41	27	14	
22 - 55	55		
24 - 31		31	
24 - 61	61		

CONNECTOR TYPES

ENVIRONMENTAL

460 Square flange receptacle

9 Details of the 460 square flange receptacle are as follows:

9.1 The 460 square flange wall mounting receptacle with crimped type contacts conforms to MS3120 specification and is suitable for panel mounting (Fig 8).

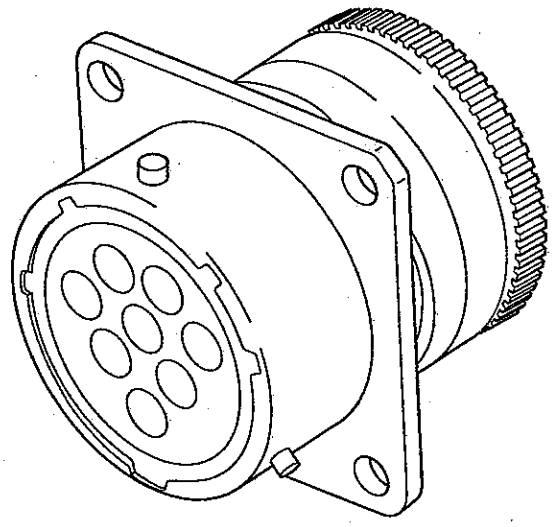


Fig 8 460 Square flange receptacle, general view

9.2 The 460 receptacle may be used to replace a MS3122 box mounting receptacle providing sufficient space is available. The MS3120 connector has a longer length at the rear of the flange when compared with the MS3122 connector.

9.2 Details of the 460 receptacle are given in Fig 9 and Table 5. Panel cut-out details for mounting the connector are given in Fig 10 and Table 6.

461 Cable connecting receptacle

10 Details of the cable connecting receptacle are as follows:

10.1 The 461 cable connecting receptacle with crimped type contacts conforms to MS3121 specification and mates with the MS3124 straight plug.

10.2 The cable connecting receptacle is used when in-line coupling is required and there are no convenient connector mounting positions adjacent to the joint.

10.3 The dimensions of the 461 cable connecting receptacle are the same as those of the 460 square flange receptacle. The only difference being that the corners of the flange are rounded off thus removing the mounting holes.

10.4 Dimensions of the receptacle are given in Fig 11 and details in Table 7.

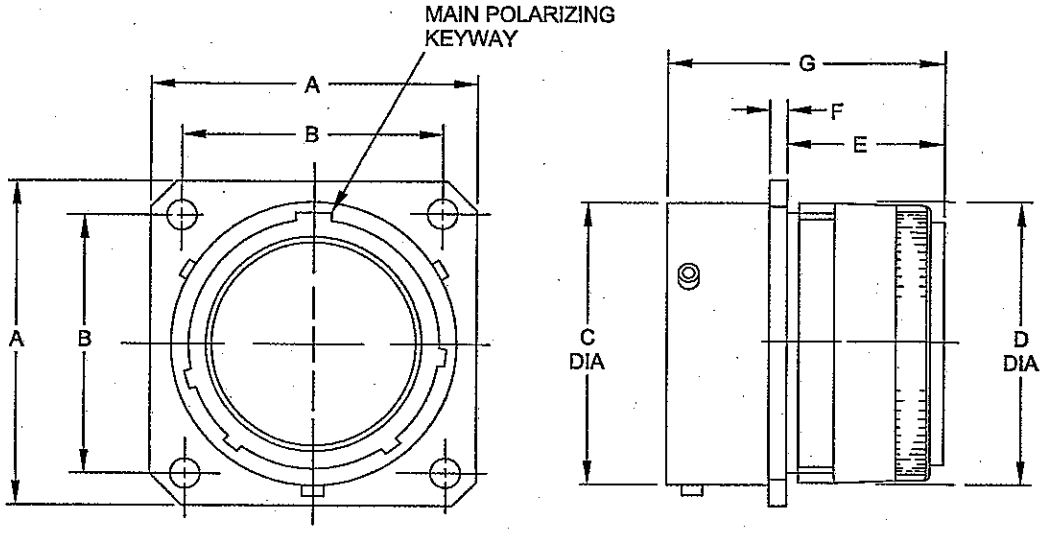


Fig 9 460 Square flange receptacle, dimensions

TABLE 5 460 SQUARE FLANGE RECEPTACLE, DETAILS

Part No. (1)	A Max (2)	B (3)	C +0.001 -0.005 (4)	D Max (5)	E (6)	F ±0.015 (7)	G Max (8)
460-8-*PS*	0.828	0.594	0.473	0.560	0.924	0.062	1.417
460-10-*PS*	0.954	0.719	0.590	0.685	0.924	0.062	1.417
460-12-*PS*	1.047	0.812	0.750	0.813	0.924	0.062	1.417
460-14-*PS*	1.141	0.906	0.875	0.930	0.924	0.062	1.417
460-16-*PS*	1.234	0.969	1.000	1.057	0.924	0.062	1.417
460-18-*PS*	1.326	1.062	1.125	1.175	0.924	0.062	1.417
460-20-*PS*	1.453	1.156	1.250	1.301	0.822	0.094	1.472
460-22-*PS*	1.578	1.250	1.375	1.428	0.822	0.094	1.472
460-24-*PS*	1.703	1.375	1.500	1.560	0.850	0.094	1.532

NOTE

PS (insert arrangement, type of contact, orientation feature) is inserted to complete the part number. Refer to Para 3.

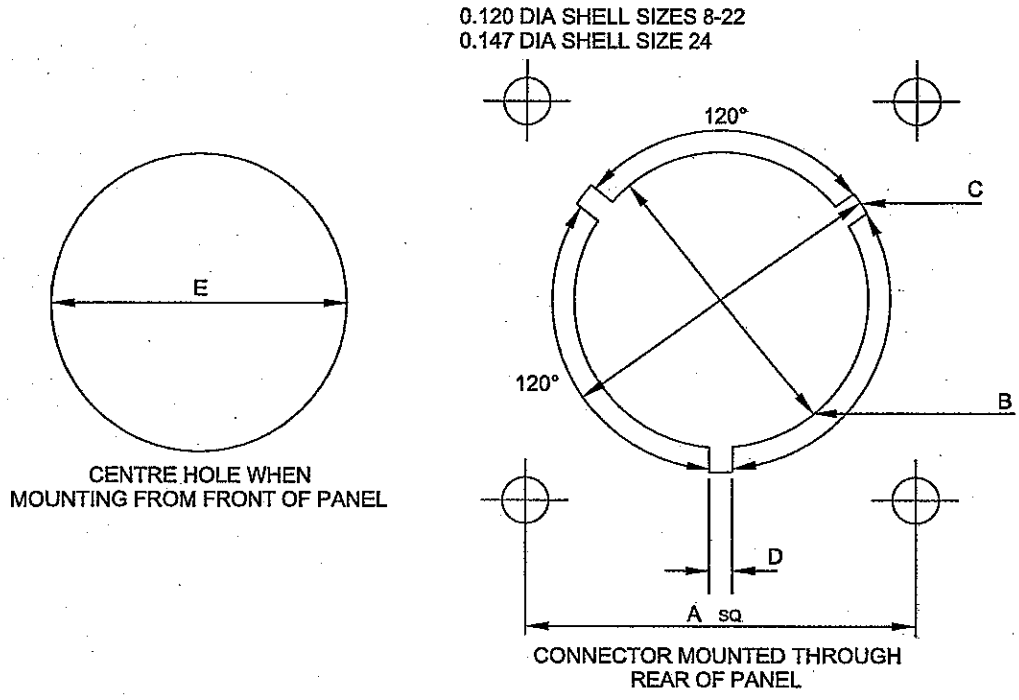


Fig 10 460 Square flange receptacle, panel cut-out dimensions

TABLE 6 460 SQUARE FLANGE RECEPTACLE, PANEL CUT-OUT DETAILS

Shell size (1)	Fixing centres A ±0.005 (2)	B (3)	C +0.150 -0.005 (4)	D +0.150 -0.005 (5)	E ±0.015 (6)
8	0.594	0.480	0.593	0.090	0.580
10	0.719	0.597	0.710	0.090	0.705
12	0.812	0.757	0.889	0.090	0.833
14	0.906	0.882	1.014	0.090	0.950
16	0.969	1.007	1.138	0.090	1.077
18	1.062	1.132	1.263	0.090	1.195
20	1.156	1.257	1.388	0.090	1.321
22	1.250	1.382	1.513	0.090	1.448
24	1.375	1.507	1.640	0.137	1.583

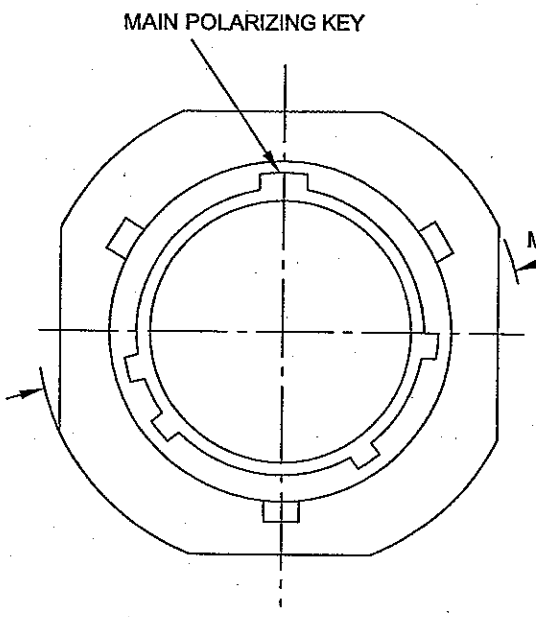


Fig 11 461 Cab

TABLE 7 461 CABL

Part No. (1)	A Max (2)	B ±0.006 (3)	C +0.001 -0.005 (4)	D (5)
461-8-*PS*	0.958	0.821	0.473	0.56
461-10-*PS*	1.082	0.947	0.590	0.68
461-12-*PS*	1.176	1.040	0.750	0.81
461-14-*PS*	1.270	1.134	0.875	0.93
461-16-*PS*	1.364	1.227	1.000	1.05
461-18-*PS*	1.458	1.316	1.125	1.17
461-20-*PS*	1.582	1.446	1.250	1.30
461-22-*PS*	1.708	1.571	1.375	1.42
461-24-*PS*	1.832	1.690	1.500	1.56

NOTE

PS (insert arrangement, type of contact, orientation featu

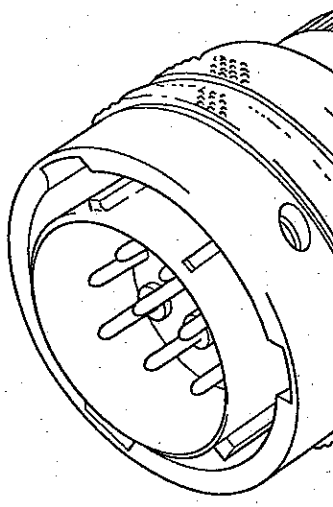


Fig 12 466 Straight plug

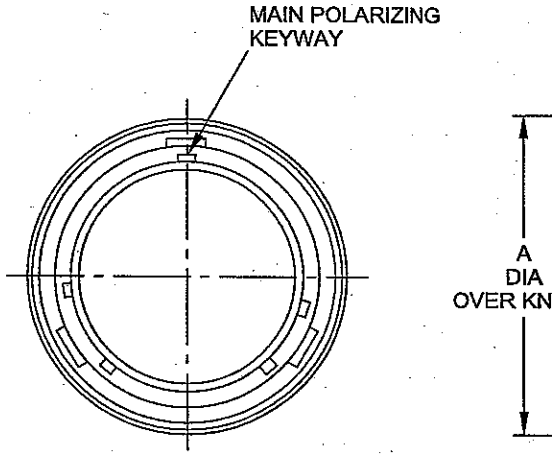


Fig 13 466 Straight plug

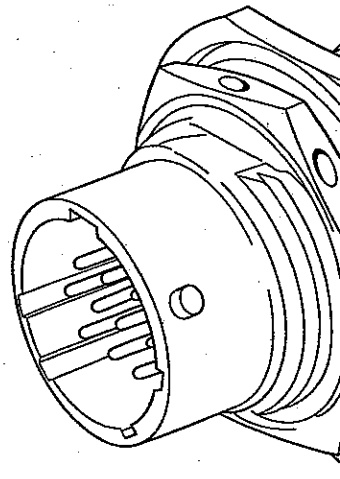


Fig 14 467 Jam nut recepta

466 Straight plug

11 Details of the 446 straight plug are as follows:

11.1 The 466 straight plug (Fig 12) is a free unit with crimped type contacts and conforms to MS3126 specification.

11.2 With the exception of the 469 push-pull plug, the 466 straight plug will mate with all other types of connectors in the series.

11.3 Details of the 466 straight plug are given in Fig 13 and Table 8.

TABLE 8 466 STRAIGHT PLUG, DETAILS

Part No.	A Max (2)	C Max (3)
466-8-CPS*	0.782	1.404
466-10-*PS*	0.926	1.404
466-12-*PS*	1.043	1.404
466-14-*PS*	1.183	1.404
466-16-*PS*	1.305	1.404
466-18-*PS*	1.391	1.404
466-20-*PS*	1.531	1.404
466-22-*PS*	1.656	1.404
466-24-*PS*	1.777	1.459

NOTE

PS (insert arrangement, type of contact, orientation feature) is inserted to complete the part number. Refer to Para 3.

467 Jam nut receptacle

12 Details of the jam nut receptacle are as follows:

12.1 The 467 jam nut receptacle (Fig 14) with crimped type contacts conforms to MS3124 specification and is single hole panel mounted.

12.2 Details of the 567 jam nut receptacle including panel mounting hole dimensions are given in Fig 15 and Table 9.

12.3 Details of silicone O-ring seal are given in Table 14.

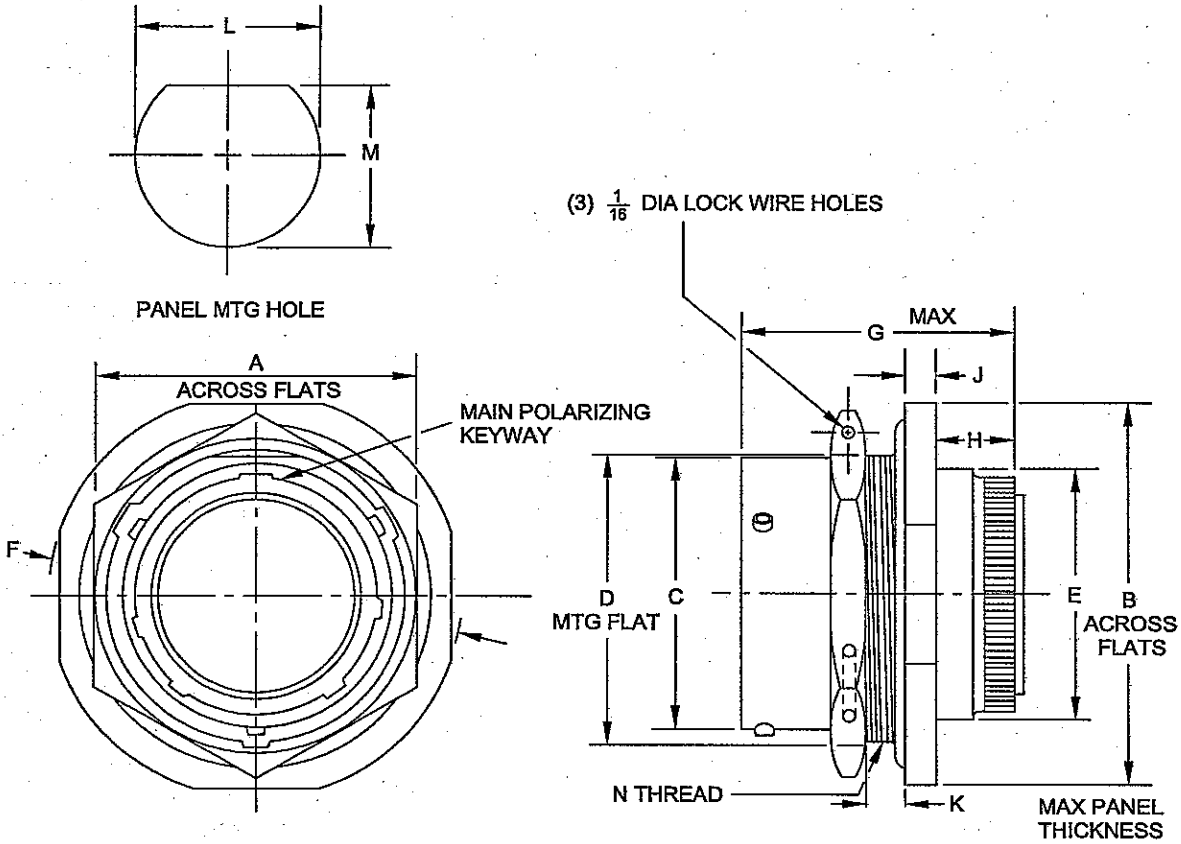


Fig 15 467 Jam nut receptacle, dimensions

TABLE 9 467 JAM

Part No. (1)	A Max (2)	B Max (3)	C +0.000 -0.005 (4)	D +0.000 -0.010 Flat (5)	E Max (6)
467-8-*PS*	0.767	0.954	0.473	0.530	0.750
467-10-*PS*	0.892	1.078	0.590	0.655	0.880
467-12-*PS*	1.079	1.266	0.750	0.818	1.010
467-14-*PS*	1.205	1.391	0.875	0.942	1.130
467-16-*PS*	1.329	1.516	1.000	1.066	1.260
467-18-*PS*	1.455	1.641	1.125	1.191	1.380
467-20-*PS*	1.579	1.828	1.250	1.316	1.530
467-22-*PS*	1.705	1.954	1.375	1.441	1.650
467-24-*PS*	1.829	2.078	1.500	1.566	1.780

NOTE

PS (insert arrangement, type of contact, orientation feature) is inserted to

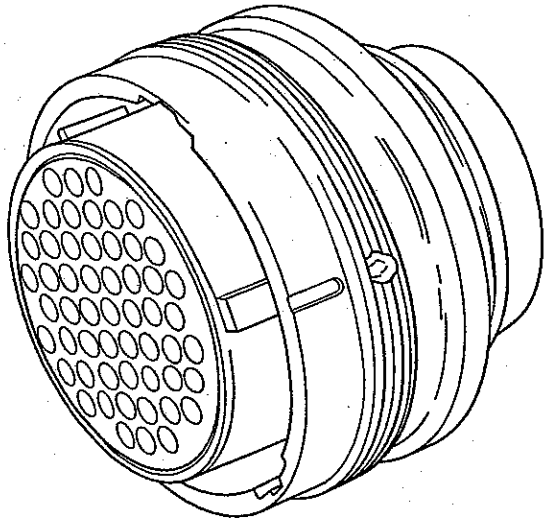


Fig 16 469 Push-pull plug, general view

469 Push-pull plug

13 Details of the 469 push-pull plug are as follows:

13.1 The 469 push-pull plug (Fig 16) with crimped type contacts permits relatively rapid locking and unlocking of plug to receptacle. The 469 push-pull plug will mate with all connectors in the 460 series with the exception of the 466 straight plug.

13.2 Details of the 469 push-pull plug are given in Fig 17 and Table 10. Locking of the 469 plug on a receptacle is achieved by pushing the outer shell of the plug over the bayonet studs on the shell of the receptacle.

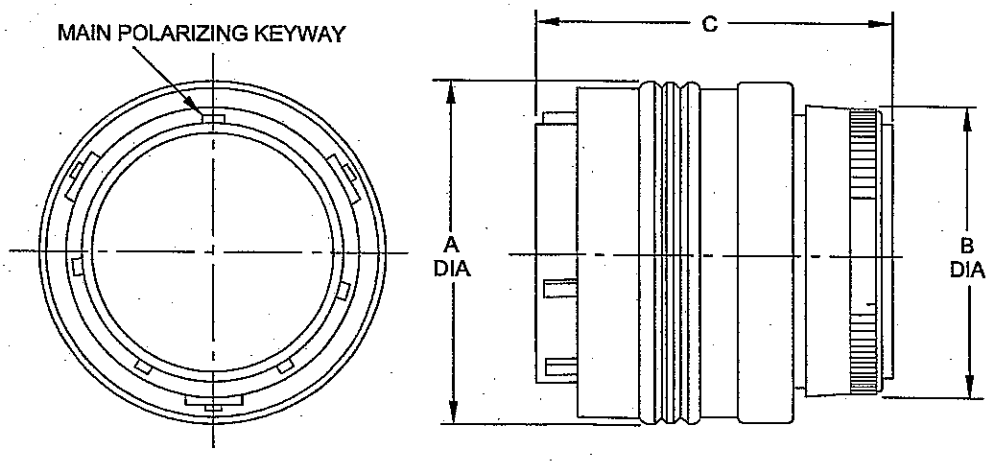


Fig 17 469 Push-pull plug, dimensions

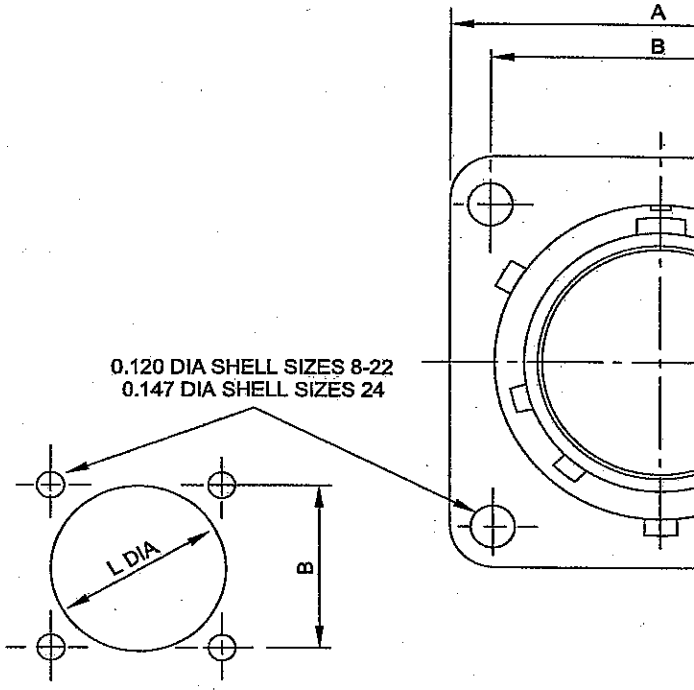


Fig 19 462H Squar

TABLE 11 462H SQUAR

Shell size (1)	Part No. (2)	A Max (3)	B ±0.005 (4)	D ±0.015 (5)
8	460H-8-*PS*	0.828	0.594	0.062
10	460H-10-*PS*	0.954	0.719	0.062
12	460H-12-*PS*	1.047	0.812	0.062
14	460H-14-*PS*	1.141	0.906	0.062
16	460H-16-*PS*	1.234	0.969	0.062
18	460H-18-*PS*	1.326	1.062	0.062
20	460H-20-*PS*	1.453	1.156	0.093
22	460H-22-*PS*	1.578	1.250	0.093
24	460H-24-*PS*	1.703	1.375	0.093

NOTE

PS (insert arrangement, type of contact, orientation feature) is inse

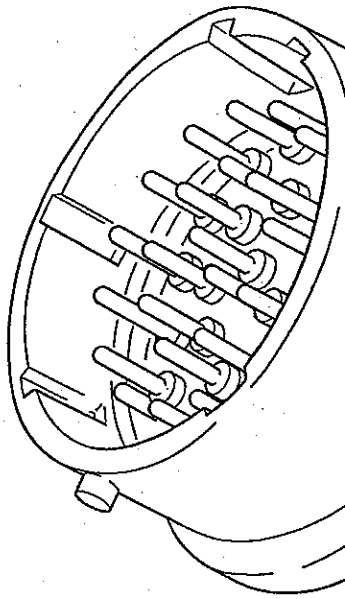


Fig 20 416H Solder mount rece

TABLE 12 416H SOLDER MOUNT F

Shell size (1)	Part No. (2)	A +0.000 −0.020 (3)	B +0.001 -0.005 (4)	D Max (5)
8	460H-8-*PS*	0.635	0.473	0.801
10	460H-10-*PS*	0.760	0.590	0.801
12	460H-12-*PS*	0.854	0.750	0.801
14	460H-14-*PS*	0.979	0.875	0.801
16	460H-16-*PS*	1.104	1.000	0.801
18	460H-18-*PS*	1.228	1.125	0.801
20	460H-20-*PS*	1.322	1.250	0.863
22	460H-22-*PS*	1.447	1.375	0.895
24	460H-24-*PS*	1.573	1.500	1.895

NOTE

PS (insert arrangement, type of contact, orientation feature) is ins

461H Solder mount receptacle

15 Details of the 461H solder mount receptacle are as follows:

15.1 The 461H solder mount receptacle (Fig 20) conforms to MS3113 specification. Details are given in Fig 21 and Table 12. The dimension of the panel mounting hole is diameter F, plus 0.010 in.

15.2 Pin and socket type inserts are available.

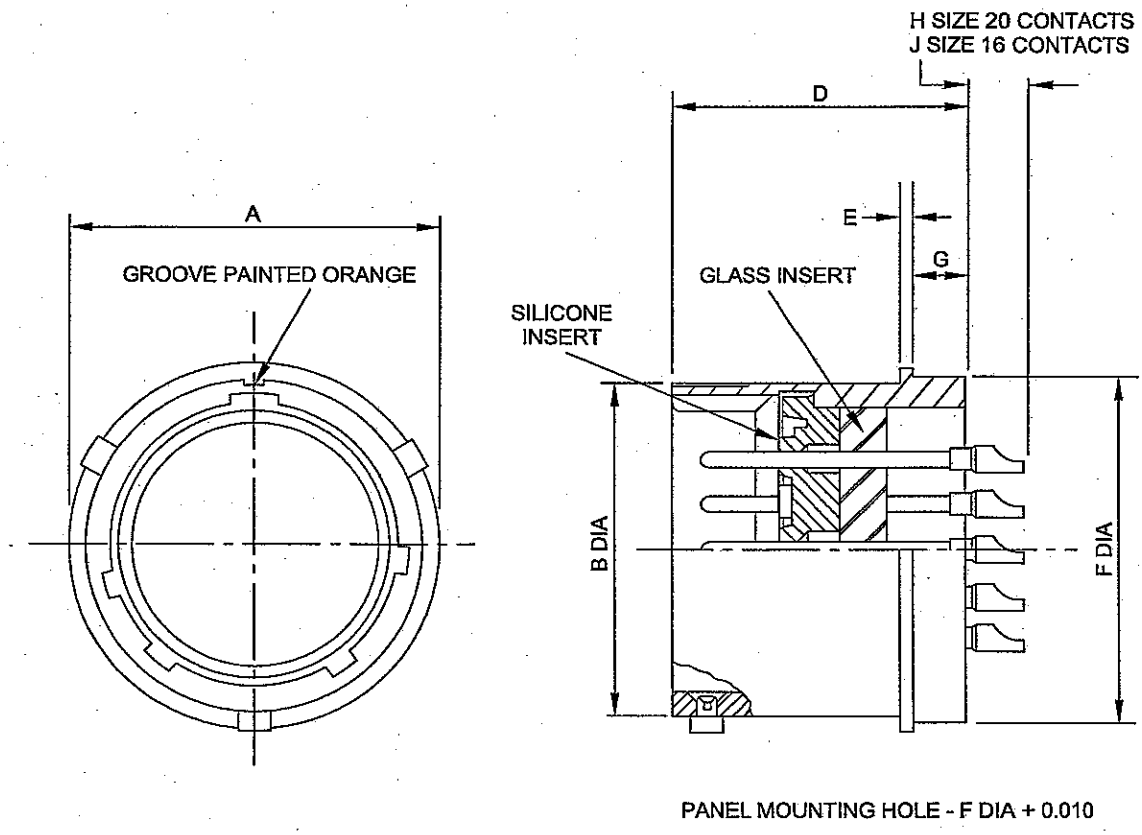


Fig 21 461H Solder mount receptacle, dimensions

467H Jam nut receptacle

16 Details of the jam nut receptacle are as follows:

16.1 The 467H jam nut receptacle details are given in Fig 22 and Table 13. It conforms to MS3114 specification (Fig 23).

16.2 Pin and socket type inserts are available.

16.3 Details of silicone O-ring seal are given in Table 14.

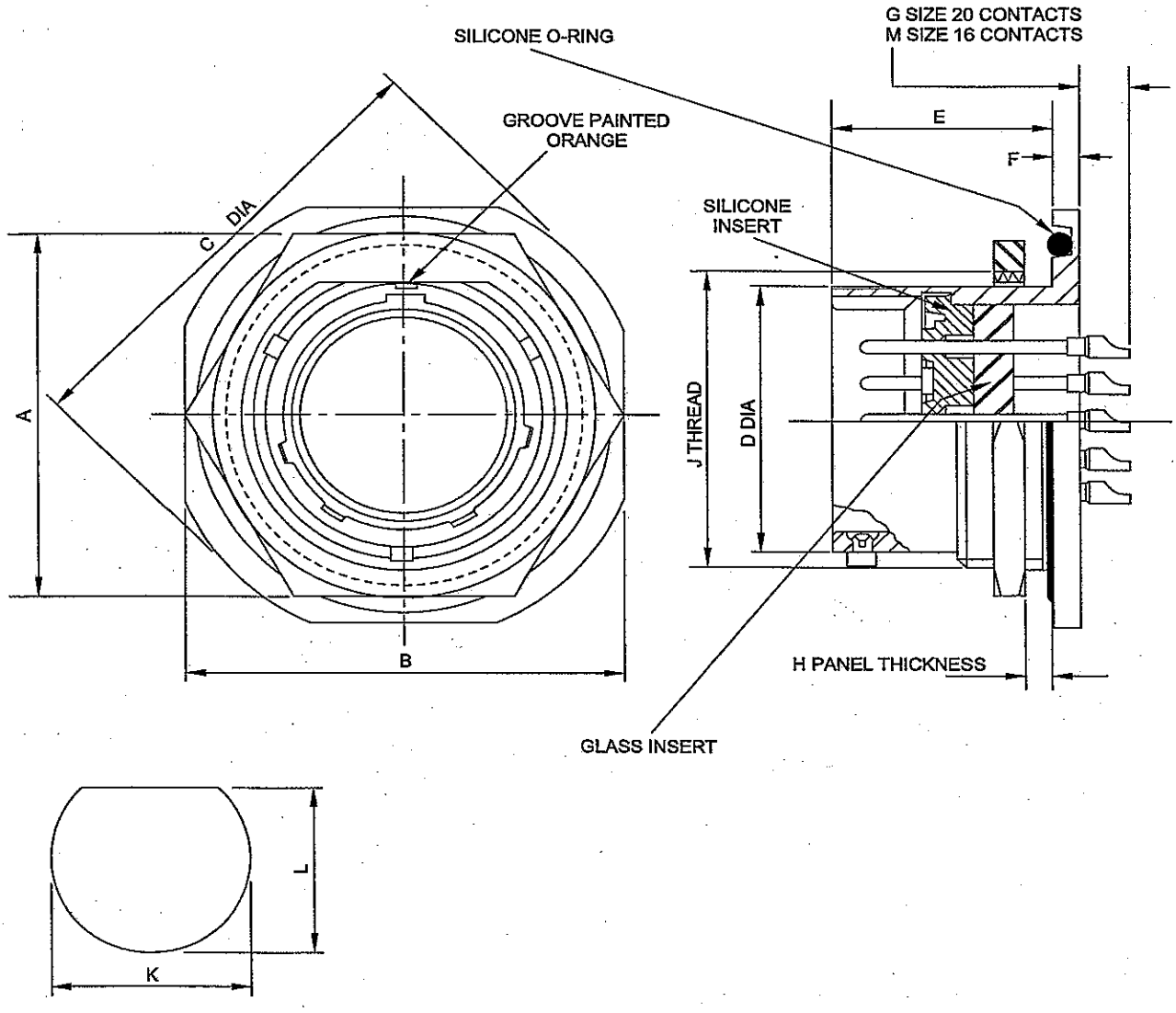


Fig 22 467 Jam nut receptacle, dimensions

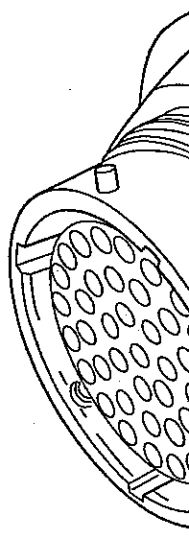


Fig 23 467 Jam

TABLE 13 467H JA

Shell size (1)	Part No. (2)	A Max (3)	B Max (4)	C Dia (5)	D Dia +0.001 −0.005 (6)	E (7)
8	467H-8-*PS*	0.767	0.954	1 1/16	0.473	0.699
10	467H-10-*PS*	0.892	1.078	1 3/16	0.590	0.699
12	467H-12-*PS*	1.079	1.266	1 3/8	0.750	0.699
14	467H-14-*PS*	1.205	1.391	1 1/2	0.875	0.699
16	467H-16-*PS*	1.329	1.516	1 5/8	1.000	0.699
18	467H-18-*PS*	1.455	1.641	1 3/4	1.125	0.699
20	467H-20-*PS*	1.579	1.828	1 15/16	1.250	0.763
22	467H-22-*PS*	1.705	1.954	2 1/16	1.375	0.763
24	467H-24-*PS*	1.829	2.078	2 3/16	1.500	0.794

NOTE

PS* (insert arrangement, type of contact, orientation feature) is inserted to complete the

TABLE 14 SILICONE O-RING SEAL, DETAILS

Shell size (1)	Part No. (2)	RAF Ref No. (3)	RN Ref No. (4)	Joint services Ref No. (4)
	467 O-ring			
8	420417-17	-		
10	420417-19	-		
12	420417-22	5330-99-2535846		
14	420417-24	-		
16	420417-26	-		
18	420417-28	5330-99-6629204		
20	420417-29	-		
22	420417-30	5330-99-6351249		
24	420417-31	5330-99-6439624		
	467H O-ring			
8	420417-16	5933-99-6037788		
10	420417-18	5935-99-6584118		
12	420417-21	5330-99-6537785		
14	420417-23	5330-99-6537784		
16	420417-25	-		
18	420417-27	5330-99-6537786		
20	420417-29	5935-99-6537787		
22	420417-30	-		
24	420417-31	-		

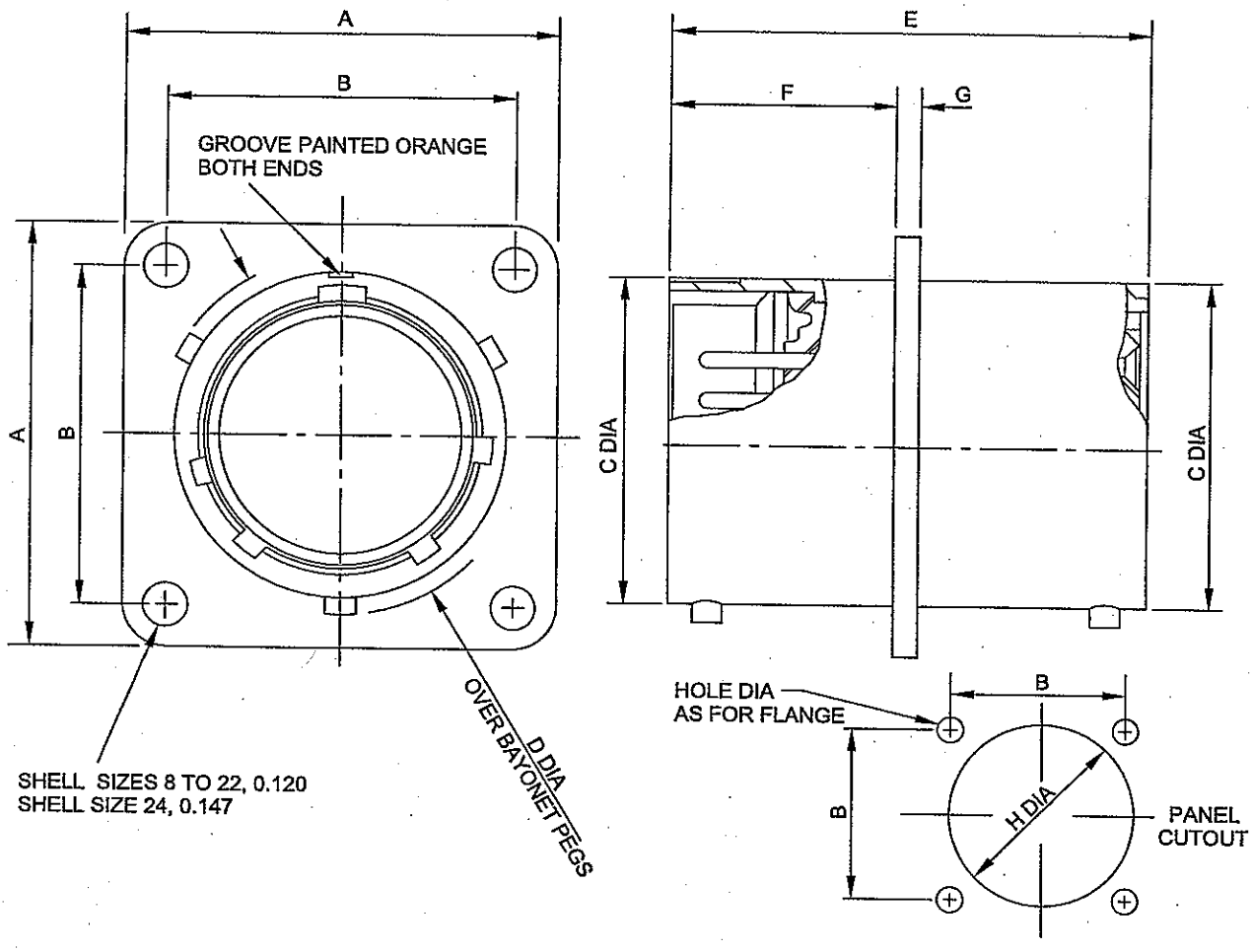


Fig 25 460HTB through bulkhead receptacle, dimensions

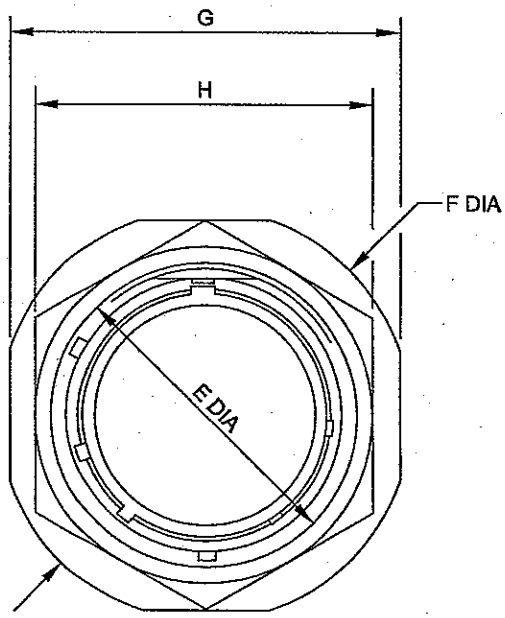


Fig 26 467HTB through bulkhead

TABLE 16 467HTB THROUGH BULKHE

Shell size (1)	Part No. (2)	A (3)	B (4)	C (5)
8	467HTB-8-*PS*	1.238	0.804	0.699
10	467HTB-10*PS*	1.238	0.804	0.699
12	467HTB-12-*PS*	1.238	0.804	0.699
14	467HTB-14-*PS*	1.238	0.804	0.699
16	467HTB-16-*PS*	1.238	0.804	0.699
18	467HTB-18-*PS*	1.238	0.804	0.699
20	467HTB-20-*PS*	1.393	0.901	0.763
22	467HTB-22-*PS*	1.393	0.901	0.763
24	467HTB-24-*PS*	1.393	0.932	0.794

NOTE

PS* (insert arrangement, type of contact, orientation feature) is inser

ACCESSORIES

DUMMY RECEPTACLES

18 Details of dummy receptacles are as follows:

18.1 Dummy receptacles (Fig 27) are used as a stowage for 466 straight plugs when they are temporarily disconnected from receptacles. They are available in normal and keyway oriented configurations.

18.2 Details of the normal oriented dummy receptacles which conform to MS3115 are given in Fig 28 and Table 17.

18.3 Part and reference numbers details are given in Table 18.

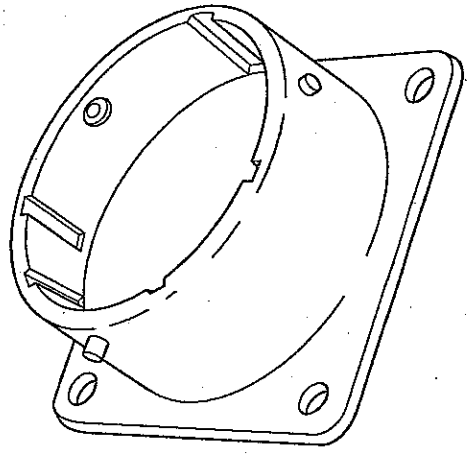


Fig 27 Dummy stowage receptacle, general view

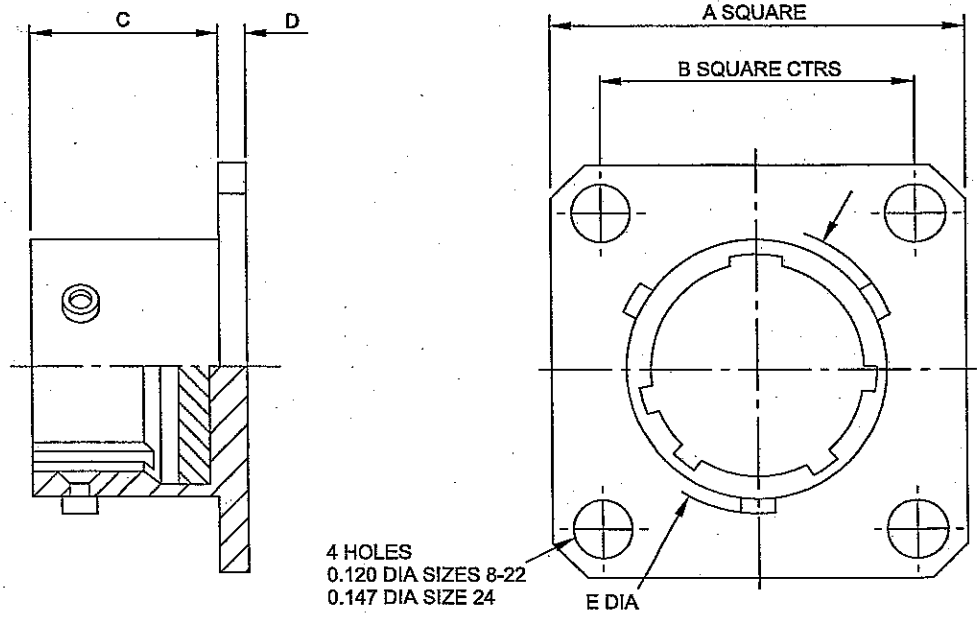


Fig 28 Dummy stowage receptacle, dimensions

TABLE 17 DUMMY STOWAGE RECEPTACLE, DETAILS

Shell size (1)	Part No. (2)	A Max (3)	B ±0.005 (4)	C ±0.010 (5)	D ±0.015 (6)	E +0.000 -0.012 (7)
8	418618-8*	0.828	0.594	0.477	0.062	0.561
10	418618-10*	0.954	0.719	0.477	0.062	0.678
12	418618-12*	1.047	0.812	0.477	0.062	0.858
14	418618-14*	1.141	0.906	0.477	0.062	0.983
16	418618-16*	1.234	0.969	0.477	0.062	1.108
18	418618-18*	1.336	1.062	0.477	0.062	1.233
20	418618-20*	1.453	1.156	0.571	0.094	1.358
22	418618-22*	1.578	1.250	0.571	0.094	1.483
24	418618-24*	1.697	1.375	0.604	0.094	1.608

NOTE

*Orientation feature is inserted to complete part number.

TABLE 18 DUMMY STOWAGE RECEPTACLE, PART AND REFERENCE NUMBERS

Shell size (1)	Part No. (2)	RAF Ref No. (3)	RN Ref No. (4)	Joint services Ref No. (5)
8	418618-8	5935-99-6406327		
10	418618-10	5935-99-6370242		
12	418618-12	5935-99-2224276 5935-99-6386543		
14	418618-14	5935-99-6471674		
16	418618-16	5935-99-2221821		
18	418618-18	5935-99-4504064		
20	418618-20	5935-99-4504065 5935-99-4681702		
22	418618-22	5935-99-6370238		
24	418618-24	-		

POTTING CUPS

19 Details of potting cups are as follows:

19.1 Nylon potting cups are available for installations where requirements necessitate the cable entry at the rear of the connectors to be potted.

19.2 The potting cups are a push fit over the rear retaining nut of the connector.

19.3 Part and reference number details are given in Table 19.

TABLE 19 POTTING CUPS, PART AND REFERENCE NUMBERS

Shell size (1)	Part No. (2)	RAF Ref No. (3)	RN Ref No. (4)	Joint services Ref No. (5)
8	9018-1-0108	5935-99-1117071		
10	9018-1-0110	-		
12	9018-1-0112	-		
14	9018-1-0114	-		
16	9018-1-0116	-		
18	9018-1-0118	-		
20	9018-1-0120	-		
22	9018-1-0122	-		
24	9018-1-0124	-		

PROTECTIVE CAPS

Plastic types

20 Details of plastic type protective caps are as follows:

20.1 Two types of plastic caps are available.

20.2 A light duty plastic cap (Fig 29) is fitted to each connector by the manufacturer prior to despatch. The cap provides protection against damage during transit only and is incapable of providing protection against ingress of moisture, oil or dust.

20.3 Plastic caps of this type are not provisioned by Service supply sources as accessories.

20.4 Plastic caps (Fig 30) provide protection against ingress of moisture, oil or dust when fitted to receptacle type connectors.

20.5 Part number details are given in Table 20.

NOTE

Orientated versions are not required.

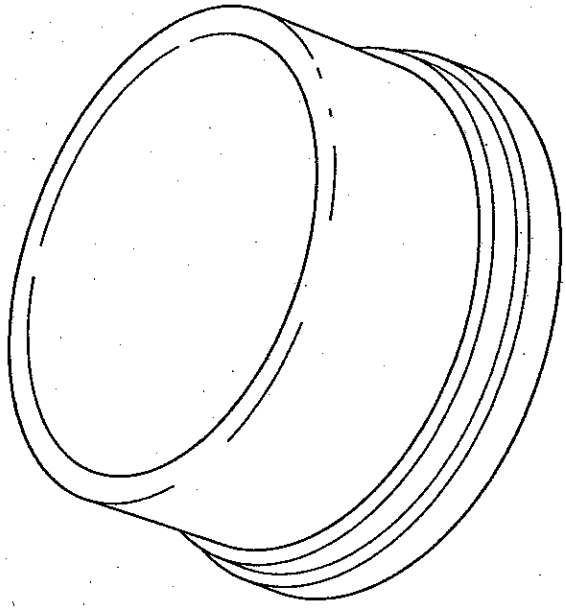


Fig 29 Light duty plastic cap, general view

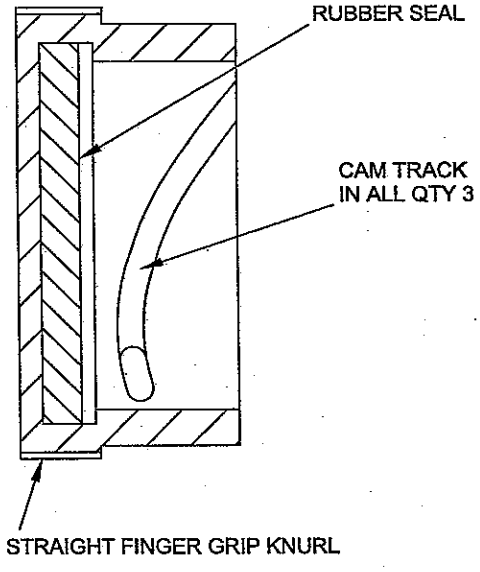


Fig 30 Receptacle plastic protective cap, sectional view

TABLE 20 PLASTIC PROTECTIVE CAPS, PART AND REFERENCE NUMBERS

Shell size (1)	Part No. (2)	RAF Ref No. (3)	RN Ref No. (4)	Joint services Ref No. (5)
8	419934-8	-		
10	419934-10	5935-99-4678056		
12	419934-12	5935-99-4678055		
14	419934-14	5935-99-4278058		
16	419934-16	5935-99-4278057		
18	419934-18	5935-99-4278060		
20	419934-20	5935-99-4278059		
22	419934-22	5935-99-4278062		
24	419934-24	5935-99-4278061		

Metal types

21 Details of metal type protective caps are as follows:

21.1 MIL-C-26482 connector specification requires metal protective caps to be manufactured to MS3180 and MS3181 specifications for plugs and receptacles respectively.

21.2 The MS3180 and MS3181 protective caps provide the connectors with protection against damage to the mating parts of the shells and insert faces whilst providing a seal against ingress of moisture, oil and dust.

21.3 The metal caps are located on connectors in a manner similar to that used when mating connectors.

MS3180 Type C plug protective cap

22 The MS3180 Type C protective cap is shown in Fig 31 and details are given in Fig 32 and Table 21. The caps are available in normal and keyway orientated configurations. Table 22 gives part number and reference number details.

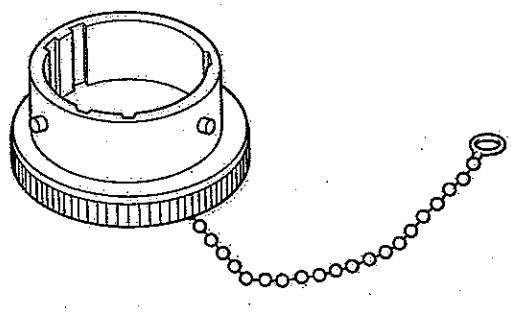


Fig 31 MS3180 Type C plug protective cap, general view

TABLE 22 MS3180 TYPE C PLUG PROTECTIVE C

Shell size (1)		Normal (2)	B (3)
8	Part No. Ref No.	420353 5935-99-7205029 5935-99-7434405	420353-B -
10	Part No. Ref No.	0003-041-000 5935-99-2214919	0003-041-000B
12	Part No. Ref No.	0003-042-000 5935-99-2214926	0003-042-000B
14	Part No. Ref No.	0003-043-000 5935-99-2214933	0003-043-000B 5935-99-2214935
16	Part No. Ref No.	0003-044-000 5935-99-2214940	0003-044-000B
18	Part No. Ref No.	0003-045-000 5935-99-2214947	0003-045-000B
20	Part No. Ref No.	0003-046-000 5935-99-2214954	0003-046-000B
22	Part No. Ref No.	0003-047-000 5935-99-2214961	0003-047-000B
24	Part No. Ref No.	0003-048-000 5935-99-2214968	0003-048-000B

MS3181 Type C and N receptacle protective caps

23 Details of the MS3181 type C and N receptacle protective caps are as follows:

23.1 Two types of MS3181 protective caps are available

23.1.1 MS3181 Type C - for flange mounted receptacles (Fig 33).

23.1.2 MS3181 Type N - for jam nut (single hold mounted) receptacles (Fig 34).

23.2 Details of the MS3181 Type C protective cap are given in Fig 35 and Table 23. The type N cap is of similar dimensions except that a flat washer is attached to the chain.

23.3 Orientated versions are not required as the cap fits over the outside of the receptacle shell.

23.4 Part numbers and reference numbers of the MS3181 Types C and N protective caps are given in Table 24.

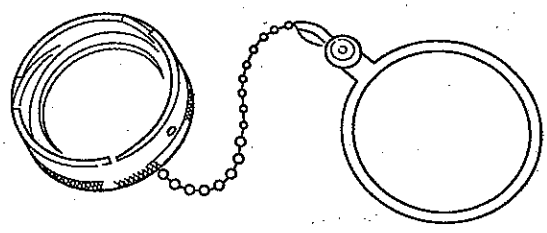


Fig 33 MS3181 Type N receptacle protective cap, general view

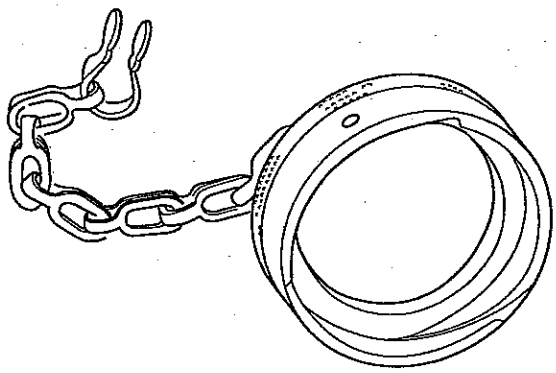


Fig 34 MS3131 Type C receptacle protective cap, general view

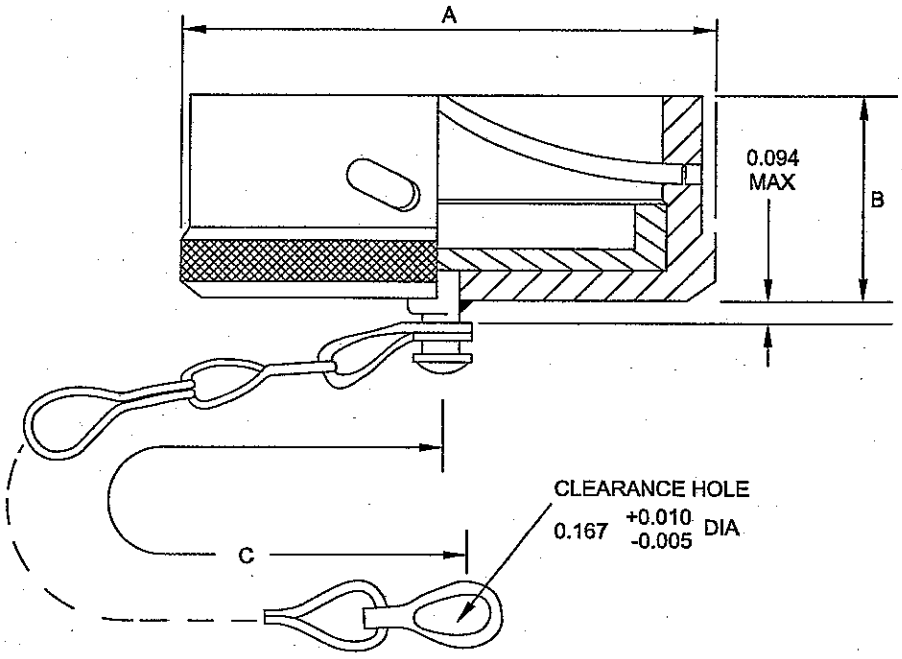


Fig 35 MS3181 Type C receptacle protective cap, general view

TABLE 23 MS3181 TYPE C RECEPTACLE PROTECTIVE CAP, DETAILS

Shell size (1)	Part No. (2)	A Max (3)	B Max (4)	C +0.500 –0.250 (5)
8	420352	0.734	0.562	3.000
10	0003-033-000	0.859	0.562	3.000
12	0003-034-000	1.000	0.562	3.500
14	0003-035-000	1.125	0.562	3.500
16	0003-036-000	1.250	0.562	3.500
18	0003-037-000	1.375	0.562	3.500
20	0003-038-000	1.500	0.562	4.000
22	0003-039-000	1.625	0.562	4.000
24	0003-040-000	1.750	0.602	4.000

TABLE 24 MS3181 TYPE C AND N RECEPTACLE PROTECTIVE CAPS, PART AND REFERENCE NUMBERS

Shell Size (1)		MS3181 Type C (2)	MS3181 Type N (3)
8	Part No. Ref No.	420352 5935-99-1115708 5935-99-7258193	420099 5935-99-6220856
10	Part No. Ref No.	0003-033-000 5935-99-4683253	0003-049-000B 5935-99-1113409
12	Part No. Ref No.	0003-034-000 5935-99-6387801	0003-050-000 5935-99-6305120
14	Part No. Ref No.	0003-035-000 5935-99-1115706	0003-051-000 5935-99-4683248
16	Part No. Ref No.	0003-036-000 5935-99-1116374	0003-052-000 5935-99-4683247
18	Part No. Ref No.	0003-037-000 5935-99-4683246	0003-053-000 -
20	Part No. Ref No.	0003-038-000 5935-99-1116375	0003-054-000 5935-99-6301706
22	Part No. Ref No.	0003-039-000 5935-99-1115707	0003-055-000 5935-99-4683249
24	Part No. Ref No.	0003-040-000 5935-99-1962618	0003-056-000 5935-99-6256706

CABLE CLAMPS

Straight cable clamp

24 Details of the straight cable clamp are as follows:

24.1 Details of the straight cable clamp are given in Fig 36 and Table 25.

24.2 Clamps are supplied with a cable bushing sleeve made of fluorinated silicone under part number 416750-**. Clamps, part numbered 416750 ** are provisioned by Service supply sources.

NOTE

Shell size number is inserted to complete the part number.

24.3 The straight cable lamp is screwed to the rear of the connector body after the connector grommet retaining nut is removed.

NOTE

Cable clamps cannot be hermetic connectors.

24.4 Part number and reference number details are given in Table 26.

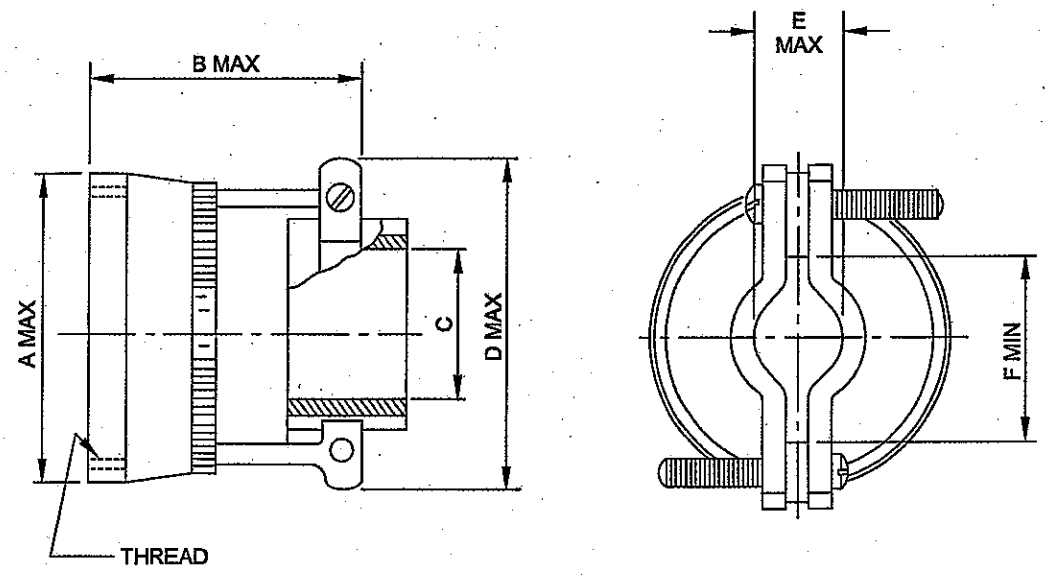


Fig 36 Straight cable clamp, dimensions

TABLE 25 STRAIGHT CABLE CLAMP, DETAILS

Shell size (1)	A Max (2)	B Max (3)	C Dia Free (4)	D Max (5)	E Max (6)	F Min (7)	J (8)
8	0.560	1.197	0.130	0.812	0.187	0.240	7/16 - 28 UNEF
10	0.685	1.197	0.190	0.891	0.187	0.297	9/16 - 24 UNEF
12	0.813	1.197	0.312	1.016	0.281	0.422	11/16 - 24 UNEF
14	0.930	1.197	0.375	1.141	0.325	0.547	13/16 - 20 UNEF
16	1.057	1.270	0.500	1.203	0.356	0.609	15/16 - 20 UNEF
18	1.175	1.270	0.625	1.469	0.456	0.734	1 1/16 - 18 UNEF
20	1.301	1.327	0.625	1.469	0.519	0.734	1 3/16 - 18 UNEF
22	1.428	1.330	0.750	1.656	0.519	0.922	1 5/16 - 18 UNEF
24	1.560	1.330	0.812	1.750	0.657	0.984	1 7/16 - 18 UNEF

TABLE 26 STRAIGHT CABLE CLAMP, PART AND REFERENCE NUMBERS

Shell size (1)	Straight cable clamp complete with bushes		Bushes	
	Part No. (2)	Ref No. (3)	Part No. (4)	Ref No. (5)
8	416750-08	5935-99-2213951	418620-08	-
10	416750-10	5935-99-1956334	418620-10	-
12	416750-12	5935-99-1956335	418620-12	-
14	416750-14	5935-99-1956336	418620-14	-
16	416750-16	5935-99-1956337	418620-16	-
18	416750-18	5935-99-1957398	418620-18	-
20	416750-20	5935-99-1956338	418620-20	-
22	416750-22	5935-99-1956339	418620-22	-
24	416750-24	5935-99-4504058	418620-24	-

90 degree outlet cable clamp

25 The 90 degree outlet clamp can be fitted to the 460 square flange receptacle, 467 jam nut receptacle and the 466 straight plug. Details of the clamp are given in Fig 37 and Table 27.

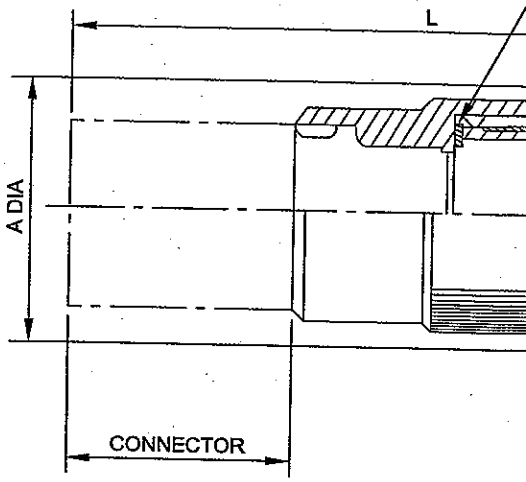


Fig 37 90 degree outlet cla

TABLE 27 90 DEGREE CABL

Shell size (1)	Part No. (2)	Ref No. (3)	A (4)	V (5)	
8	-	-	-	-	
10	416751-10	5935-99-1956340	0.812	0.671	0.3
12	416751-12	5935-99-1957399	0.922	0.734	0.4
14	416751-14	5935-99-1956341	1.109	0.843	0.5
16	416751-16	5935-99-1956342	1.187	0.859	0.6
18	416751-18	5935-99-1956343	1.359	0.953	0.7
20	416751-20	5935-99-1956772	1.359	0.953	0.7
22	416751-22	5935-99-1956773	1.656	1.109	0.9
24	416751-24	5935-99-4504052	1.656	1.109	0.9

NOTE

Gasket (item 8) is listed for reference only.

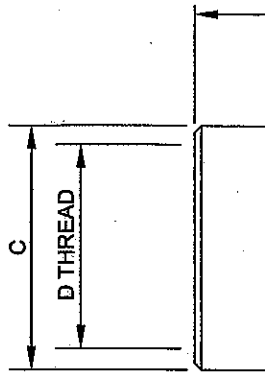


Fig 39 MS3057 C

TABLE 29 MS3057 CA

Shell size (1)	Part No. (2)	A ±0.010 (3)	B ±1/64 (4)	C ±1/64 (5)
8	417037-8	0.960	11/32	9/16
10	417037-10	0.960	11/32	11/16
12	417037-12	0.960	11/32	13/16
14	417037-14	0.960	11/32	29/32
16	417037-16	0.960	11/32	1 1/32
18	417037-18	0.960	11/32	1 5/32
20	417037-20	0.990	11/32	1 9/32
22	417037-22	0.870	11/32	1 13/32
24	417037-24	1.050	11/32	1 9/16

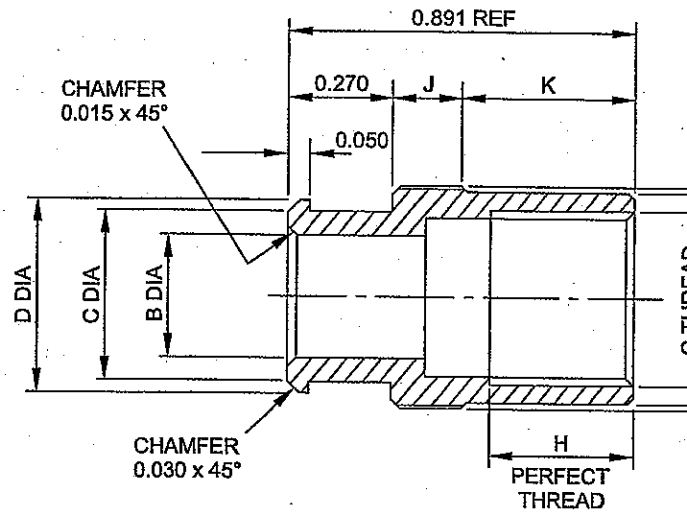


Fig 40 Sleeving adapter, 46(

TABLE 30 SLEEVING ADAPTE

Shell size (1)	Part No. (2)	A Dia ±0.005 (3)	B Dia +0.005 −0.000 (4)	C ±0.003 (5)	D Dia +0.005 -0.000 (6)	E Dia (7)
8	420982-8	-	0.324	0.440	0.500	0.575
10	420982-10	-	0.479	0.565	0.625	0.702
12	420982-12	-	0.599	0.690	0.750	0.819
14	420982-14	-	0.729	0.815	0.875	0.955
16	420982-16	-	0.849	0.940	1.000	1.073
18	420982-18	-	0.951	1.127	1.187	1.201
20	420982-20	1.027	1.076	1.127	1.187	1.317
22	420982-22	-	1.201	1.377	1.437	1.445
24	420982-24	1.277	1.324	1.377	1.437	1.572

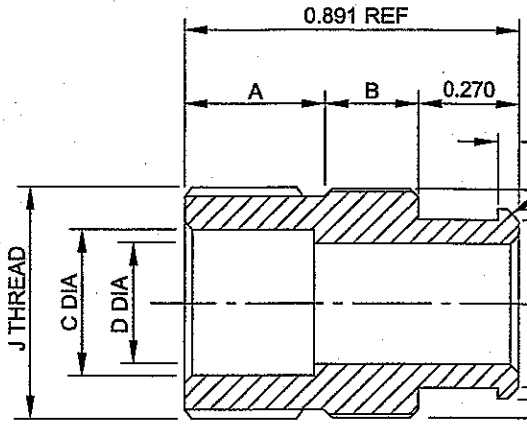


Fig 41 Sleevi

TABLE 31 SLEEV

Shell size (1)	Part No. (2)	A (3)	B (4)	C +0.005 -0.000 (5)
8	420978-8	0.384	0.237	0.403
10	420978-10	0.384	0.237	0.521
12	420978-12	0.384	0.237	0.646
14	420978-14	0.384	0.237	0.774
16	420978-16	0.384	0.237	0.899
18	420978-18	0.384	0.237	1.006
20	420978-20	0.283	0.338	1.131
22	420978-22	0.283	0.338	1.256
24	420978-24	0.274	0.347	1.380

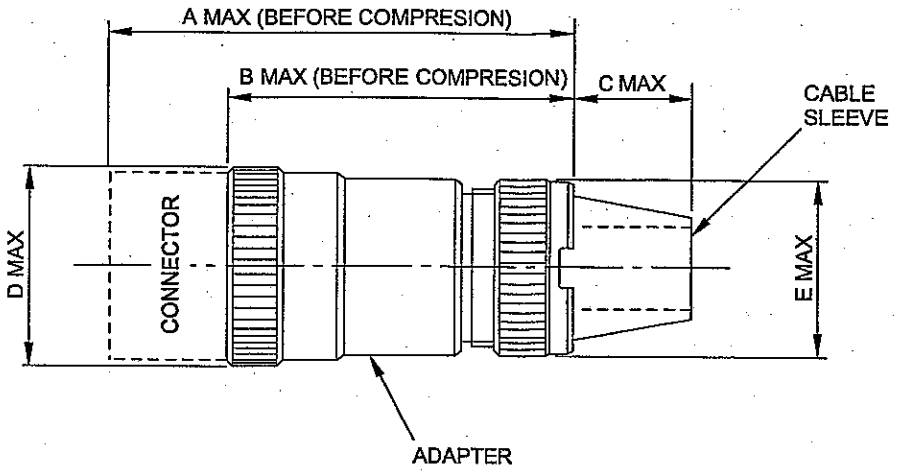


Fig 42 Screened cable adapter, dimensions

TABLE 32 SCREENED CABLE ADAPTER, DETAILS

Shell size (1)	Adapter size (2)	A Max 460 & 461 (3)	A Max 466 (4)	B Max (5)	C Max (6)	D Max (7)	E Max (8)
8	Small	2.432	2.432	1.747	0.650	0.550	0.783
10	Small	2.432	2.432	1.747	0.650	0.700	0.783
	Medium	2.526	2.526	1.841	0.650	0.700	0.942
12	Small	2.432	2.432	1.747	0.650	0.795	0.783
	Medium	2.526	2.526	1.841	0.650	0.795	0.942
14	Small	2.432	2.432	1.747	0.650	0.905	0.783
	Medium	2.526	2.526	1.841	0.650	0.905	0.942
	Large	2.577	2.577	1.892	0.775	0.905	1.220
16	Medium	2.526	2.526	1.841	0.650	1.035	0.942
	Large	2.577	2.577	1.892	0.775	1.035	1.220
18	Medium	2.526	2.526	1.841	0.650	1.155	0.942
	Large	2.577	2.577	1.892	0.775	1.155	1.220
20	Medium	2.671	2.616	1.841	0.650	1.280	0.942
	Large	2.722	2.667	1.892	0.775	1.280	1.220
22	Medium	2.671	2.616	1.841	0.650	1.405	0.942
	Large	2.722	2.667	1.892	0.775	1.405	1.220
24	Medium	2.736	2.671	1.841	0.650	1.540	0.942
	Large	2.787	2.722	1.892	0.775	1.540	1.220

CHAPTER 2

INSTRUCTIONS FOR USE

CONTENTS

TOOLING

Crimping tool

1 Details of crimping tools and turret head/positioners are as follows:

1.1	Recommended Crimping Tool	M22520/1-01	1M/1653912
	Turret Head	M22520/1-02	1M/0166382
1.2	Alternative Crimping Tool	MS3191-A	1M/4658819
	Positioners:		
	Size 20 Contacts	MS3191-20A	1M/1300396
	Size 16 Contacts	MS3191-16A	1M/1300394
	Size 12 Contacts	MS3191-12A	

NOTE

The positioners are used for the standard contacts and the long bucket contacts.

Insertion/removal tools

2 Details of insertion/removal tools are as follows:

2.1 The expendable plastic insertion/removal tools are supplied with each connector.

2.2 The tool is designed so that with the incorrect usage the tool will break before damage occurs to the connector insert, contact retention clip or the contact.

2.3

Tool Part No.	Colour Insertion	Colour Removal	Contact Size	Contact Ref No.
M15570-20	Red	White	20	5120-00-9154587 5120-99-7537676
M15570-16	Blue	White	16	5120-99-1243477 5120-99-7537677
M15570-12	Yellow	White	12	5120-99-1278993 5120-99-7537678

Unwired contact removal tool

3 Details of contact removal tools are as follows:

3.1 The tool (Fig 1) consists of a body/plunger assembly and three removable plastic probes.

3.2 The probe details are as follows:

Contact size	Part No.	Colour code
20	105910	Red
16	11059111	Blue
12	105912	Yellow

3.3 The plastic probe secures into the body on a screw thread.

3.4 To remove a contact using the tool proceed as follows:

3.4.1 Unscrew the rear retaining nut and follower, or other accessory, on the rear of the connector, and thread it back along the cable form. Remove the sealing plug.

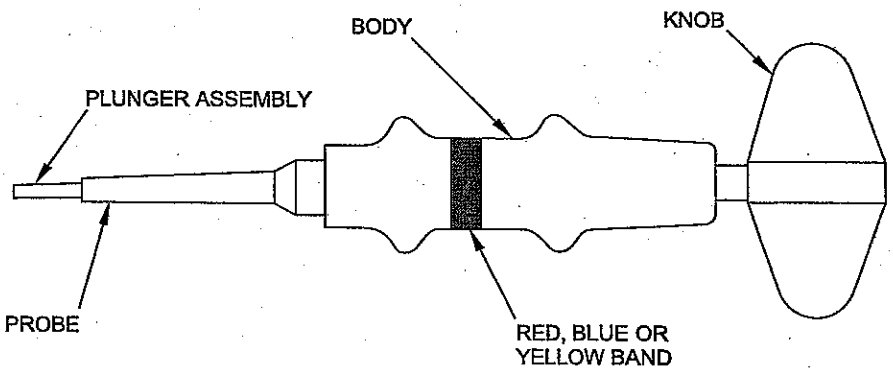


Fig 1 Unwired contact removal tool

3.4.2 Fit the appropriate plastic probe to the tool.

3.4.3 With the inner plunger tip protruding forward of the coloured probe, hold the body between the thumb and forefinger and place the knob against the palm of the hand.

3.4.4 Align the tool with the appropriate cavity in the rear of the connector and push it slowly into the cavity until a stop is felt.

3.4.5 At this point the inner plunger has met the rear of the contact, thus aligning the coloured probe with the crimp barrel of the contact. The outer probe is now ready to seat around the crimp barrel of the contact.

3.4.6 Continue by pushing the body only of the tool into the cavity until a positive stop is felt. Since the coloured probe goes over the crimp barrel with an interference fit this will require slightly more pressure than with the standard removal tool.

3.4.7 When the coloured probe is fully seated the contact is unlocked, firmly held in the probe by the interference fit, and ready for extraction.

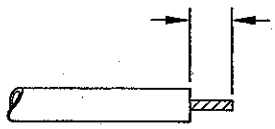
3.4.8 Withdraw by pulling the body of the tool away from the cavity. The contact will be securely held in the tool tip.

3.4.9 To remove the contact from the tool, push the knob on the inner plunger forward thereby causing it to eject the contact.

INSTRUCTIONS

Cable preparation

4 Strip the wire to the dimensions as shown in Fig 2.



1/8" TO 3/16" FOR SIZE 20 SHORT BUCKET
3/8" TO 7/16" FOR SIZE 20 LONG BUCKET
7/32" TO 9/32" FOR SIZE 16 SHORT BUCKET
3/8" TO 7/16" FOR SIZE 16 LONG BUCKET

Fig 2 Cable stripping instructions

Contact crimping

5 To carry out contact crimping proceed as follows:

5.1 Ensure that the correct positioner for the size of contact being crimped is fitted in the crimping tool.

5.2 Insert prepared cable end into the contact.

5.3 Insert the prepared wire and contact through indentor opening and into the positioner.

5.4 Squeeze handles together until a positive stop is reached. The tool will then release and return to the fully open position.

5.5 Remove crimped contact and wire.

5.6 Inspect contact for correct crimping (Fig 3).

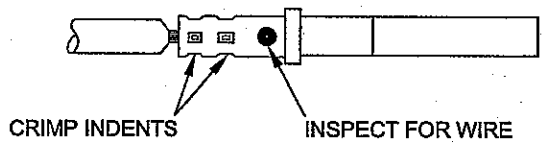


Fig 3 Inspection of contact after crimp

Contact insertion

6 To insert contacts proceed as follows:

6.1 If applicable, thread cable/wires through clamps or accessories.

6.2 Load the wire into the appropriate insertion tool (see Para 2) as shown in Fig 4. Place the wire into the slot and apply pressure with the thumb.

NOTE

Care must be taken to prevent damage to the wire insulation.

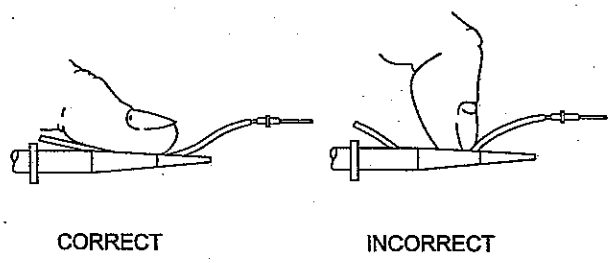


Fig 4 Loading contact insertion tool

6.3 Draw the tool along the wire until it locates on the shoulder of the contact.

6.4 Slowly push the contact into the rear insert ensuring that the contact and insertion tool are correctly aligned as shown in Fig 5.

6.5 When the contact is fully inserted a positive stop will be encountered and the tool should then be withdrawn.

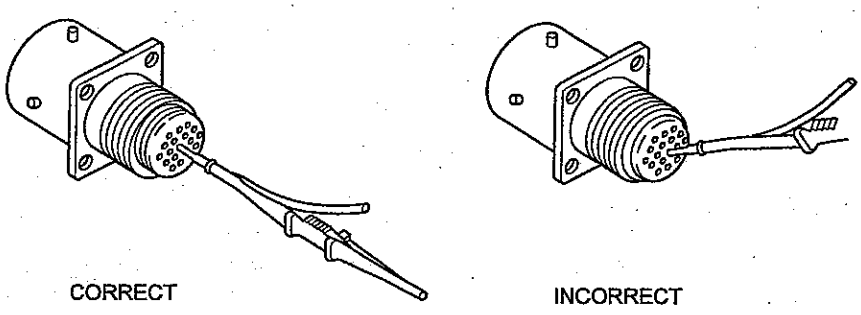


Fig 5 Contact insertion into rear insert

6.6 After all the wired contacts have been inserted, unwired contact should then be inserted into the remaining cavities in the insert.

6.7 Filler plugs (see Chap 1 Para 26) should be fitted into the rear insert to seal cavities fitted with unwired contacts.

6.8 Tighten cable clamps 0 appropriate.

NOTE

No undue pressure should be applied to the tool otherwise damage to the tool and contact will result.

Contact removal

7 To remove contacts proceed as follows:

7.1 Contacts are removed from the rear (cable entry) of the connector. Load the white end of the appropriate tool (see Para 2) onto the wire using the same procedure as given in Para 6.

7.2 Push the tool along the wire into the insert cavity until it engages in the contact retaining clip when a positive stop will be encountered. The contact retention clip will now be in the unlocked position.

7.3 Whilst maintaining pressure on the wire against the serrations of the tool, withdraw the tool together with the wire and contact assembly.

Unwired contact removal

8 To remove unwired contacts proceed as follows:

8.1 Remove filler plug from rear insert cavity.

8.2 The insertion/removal tool is inserted (Para 7) to open the contact retaining clip. The probe tool is then inserted down inside the removal tool to engage in the open end of the contact. Whilst maintaining pressure on the probe tool against the serrations of the removal tool, the contact is withdrawn with the probe and removal tool.

Screened cable adapter

9 To fit the screened cable adapter proceed as follows:

9.1 Remove retaining nut from rear of connector and replace with screen adapter body.

9.2 Cut screen and outer sheath as shown in Fig 6.

9.3 Insert contacts and place cable sleeve into conical seat in adapter body.

9.4 Place washer behind sleeve and tighten compression nut.

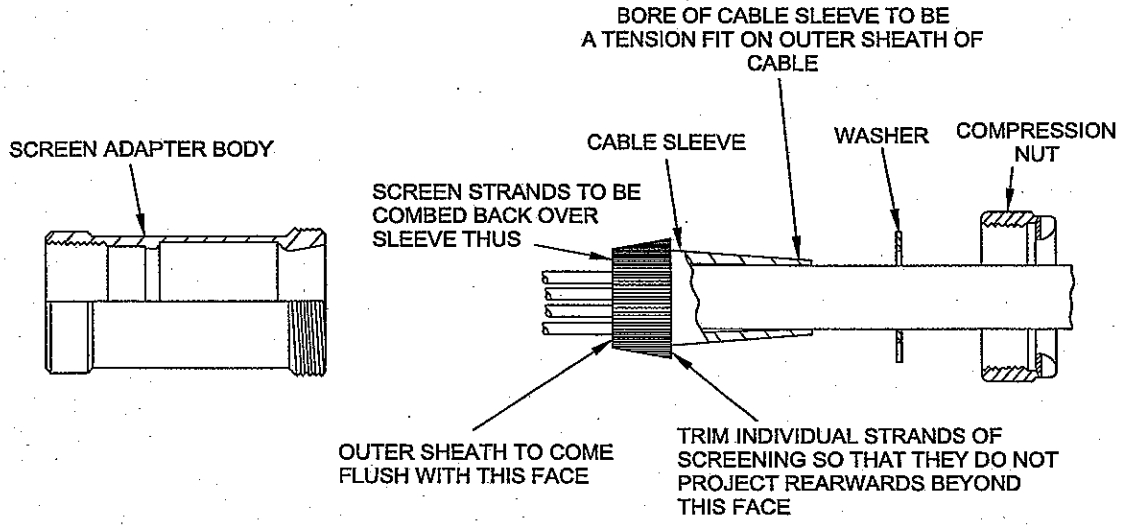


Fig 6 Screened cable adapter, fitting instructions