CONTENTS

TECHNICAL ENQUIRIES

R.A.F.

Technical enquiries concerning these connectors should be directed to the Delegated Engineering Authority for Electrical Connectors, ESS, EEW, CSDE, RAF Swanton Morley. Telephone RAF Swanton Morley (894), extension 290 for urgent enquiries only.

Technical enquiries concerning tooling for these connectors should be directed to the Delegated Engineering Authority for Electrical Hand Tools, OC, GSS, RAF Swanton Morley. Telephone RAF Swanton Morley (894), extension 286 for urgent enquiries only.

R.N.

Technical enquiries concerning these connectors or tooling for these connectors should be directed to O.C. NATEC, HMS DAEDALUS, Lee-on-the-Solent, Hants.

Chapter 1

DESCRIPTION

CONTENTS

Introduction

1 The Cannon Type MS connectors are a range of general purpose and environmental resistant, threaded coupling, circular connectors manufactured by ITT Cannon Electric.

DESCRIPTION

Specification

2 Cannon Type MS connectors meet the requirements of specification MIL-C-5015.

Intermountability and intermateability

3 Cannon MS connectors are intermountable and intermateable with connectors complying with specification MIL-C-5015. In service connectors complying with specification MIL-C-5015 are as follows :-

3.1 Hellermann Deutsch HAN series.

3.2 Plessey UK-AN series.

3.3 Amphenol MS series.

3.4 Thorn MS series.

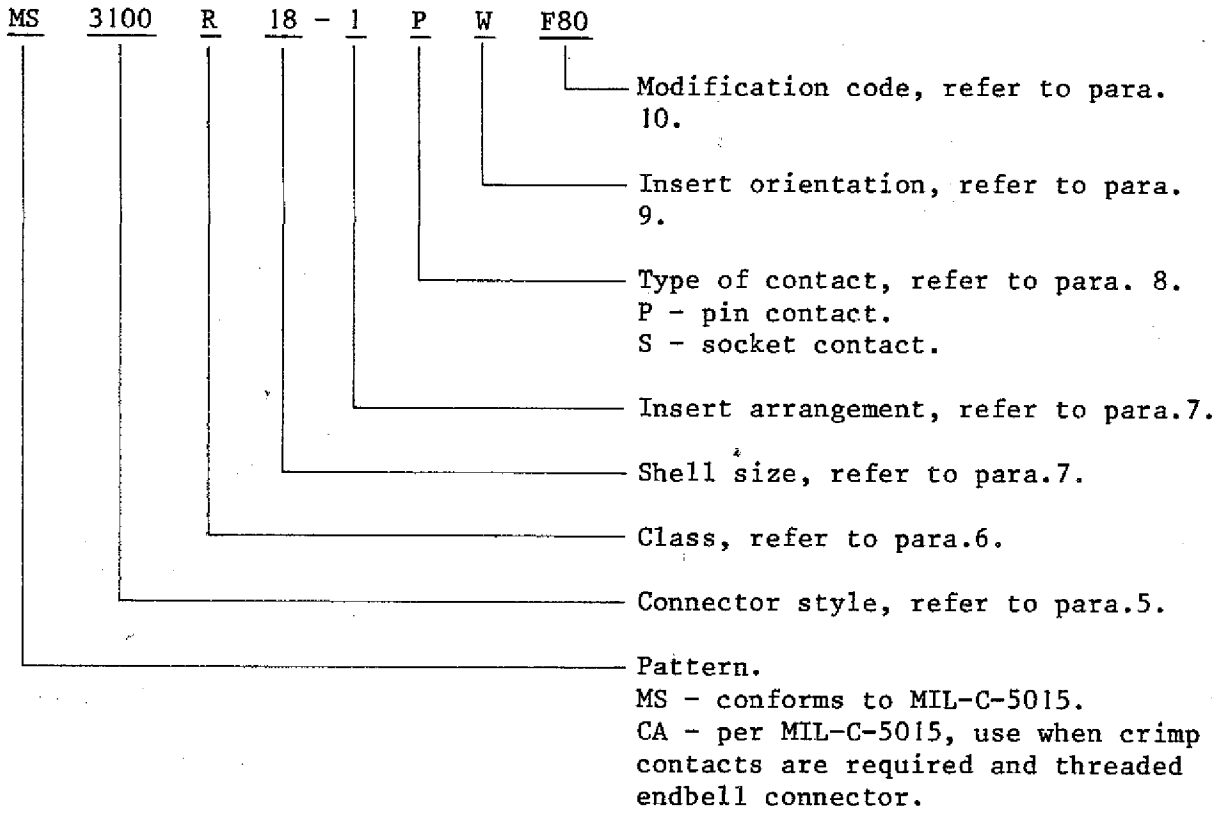
3.5 Cannon CA series.

Note ...

When Cannon MS connectors are fitted, they must not be substituted without reference to the relevant engineering authority for the equipment involved. To do so may denigrate the design standard of the equipment.

Connector identification

4 Cannon MS connectors are identified by the manufacturer's part number. A typical part number is as follows :-



Connector styles

5 The connectors are available in six styles. The styles are shown in figs. 1 to 6 and are as follows:-

5.1 3100 - wall mounting receptacle.

5.2 3101 - cable connecting receptacle.

5.3 3102 - box mounting receptacle.

5.4 3106 - straight plug.

5.5 3108 - 90 deg angle plug.

5.6 TBF - through bulkhead, mates with 3106 and 3108 plugs.

Connector class

6 The method of shell and termination construction and the applications in which the connectors may be used are denoted by classification letters as follows:-

6.1 A - general duty, solid shell.

6.2 B - general duty, split shell.

6.3 C - general duty, pressurized.

6.4 E and F - environmental resistant with cable clamp.

6.5 R - environmental resistant with integrated endbell.

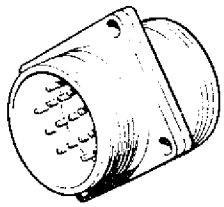


Fig.1 Style 3100, wall mounting receptacle

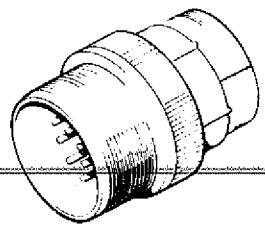


Fig.2 Style 3101, cable connecting receptacle

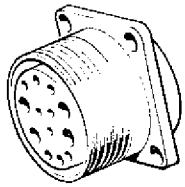


Fig.3 Style 3102, box mounting receptacle

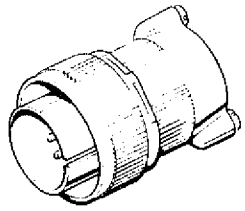


Fig.4 Style 3106, straight plug

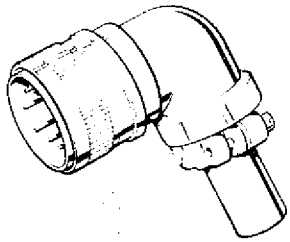


Fig.5 Style 3108, 90 deg angle plug

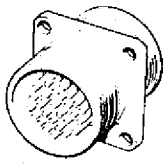


Fig.6 Style TBF, through bulkhead receptacle

SHELL SIZE 10

10SL-3
3 # 16

SHELL SIZE 12

12S-3
2 · # 16

12-5
1 · # 12

SHELL SIZE 14

14S-5
5 - # 16

14S-6
6-#16

14S-7
3 · # 16

SHELL SIZE 16

16S-1
7-#16

16S-8
5-#16

16-7
2 #16 (A,B)
1 · #8 (C)

16-9
2 · # 16 (B,D)
2 · # 12 (A,C)

16-10
3 · # 12

16-11
2 · # 12

Fig.7a Insert arrangements : shell sizes 10,12,14 and 16

SHELL SIZE 18

18-4
4 #16

18-5
1 · # 16 (A)
2 · # 12 (B, C)

18-6
1 · # 4

18-8
7-#16(A-G)
1-# 12 (H)

18-9
5-#16(B,C,E-G)
2-#12(A,D)

18-11
5-# 12

18-13
3 · # 12 (B, C)
1 · # 8 (A)

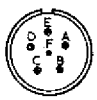
SHELL SIZE 20

20-2
1 · # 0

20-4
4 · # 12

20-7
8 · # 16

20-16
7 · # 16 (A-G)
2 · # 12 (H, I)



20-17
1-# 16 (F)
5-# 12 (A-E)

20-24
2 · # 16 (A, C)
2 · # 8 (B, D)

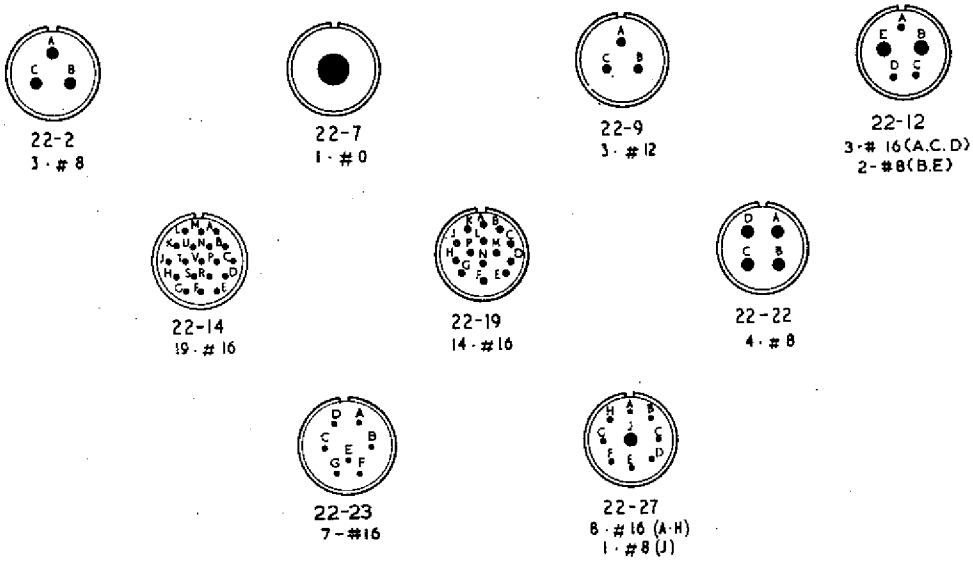
20-27
14 · # 16

20-29
17 · # 16

20-33
11 · # 16

Fig.7b Insert arrangements : shell sizes 18 and 20

SHELL SIZE 22



SHELL SIZE 24

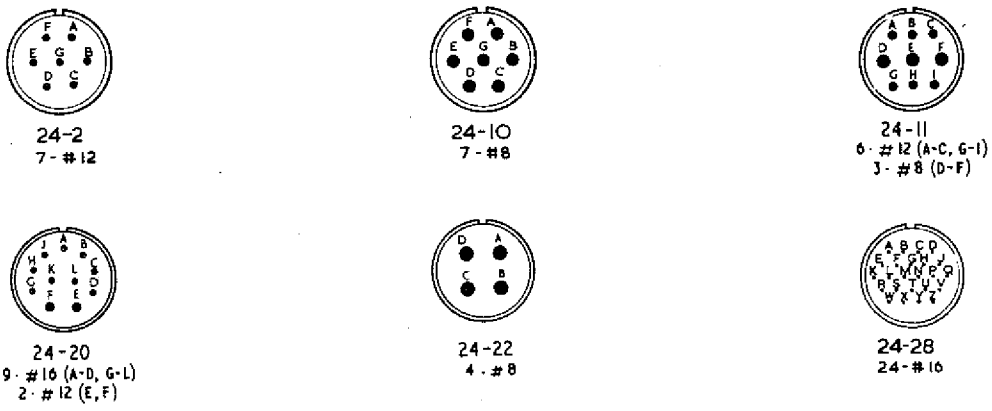
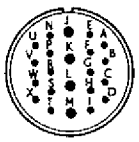
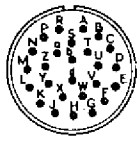


Fig.7c Insert arrangements : shell sizes 22 and 24

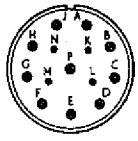
SHELL SIZE 28



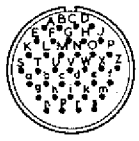
28-11
18 - # 16 (A-L, N-X)
4 - # 12 (J-M)



28-12
26 - # 16

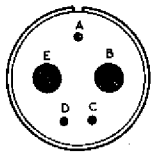


28-20
4 - # 16 (K-N)
10 - # 12 (A-J, P)

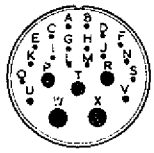


28-21
37 - # 16

SHELL SIZE 32

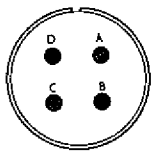


32-1
3 - # 12 (A,C,D)
2 - #0 (B,E)



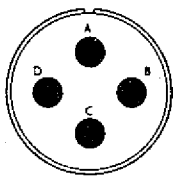
32-6
16 - # 16 (A-O,S)
2 - # 12 (U,V)
3 - # 8 P.T. 2 # 4 (W,X)

32-7
28 - # 16 (A-N,W-Z,a-k)
7 - # 12 (O-V)

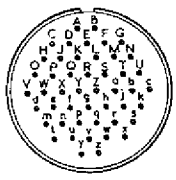


32-17
4 - # 4

SHELL SIZE 36



36-5
4 - # 0



36-10
48 - # 16

Fig.7d Insert arrangements : shell sizes 28,32 and 36

Shell size and insert arrangement (fig.7)

7 The available insert arrangements in ascending order of shell size are shown in fig.7. The number and sizes of the contacts are detailed in Table 1.

TABLE 1 SHELL SIZE AND INSERT ARRANGEMENTS

Shell size/insert arrangement	No. of contacts				
	Size 16	Size 12	Size 8	Size 4	Size 0
10SL-3	3	-	-	-	-
12S-3	2	-	-	-	-
12-5	-	1	-	-	-
14S-5	5	-	-	-	-
14S-6	6	-	-	-	-
14S-7	3	-	-	-	-
16S-1	7	-	-	-	-
16S-8	5	-	-	-	-
16-7	2	-	1	-	-
16-9	2	2	-	-	-
16-10	-	3	-	-	-
16-11	-	2	-	-	-
18-4	4	-	-	-	-
18-5	1	2	-	-	-
18-6	-	-	-	1	-
18-8	7	1	-	-	-
18-9	5	2	-	-	-
18-11	-	5	-	-	-
18-13	-	3	1	-	-
20-2	-	-	-	-	1
20-4	-	4	-	-	-
20-7	8	-	-	-	-
20-16	7	2	-	-	-
20-17	1	5	-	-	-
20-24	2	-	2	-	-
20-27	14	-	-	-	-
20-29	17	-	-	-	-
20-33	11	-	-	-	-
22-2	-	-	3	-	-
22-7	-	-	-	-	1
22-9	-	3	-	-	-
22-12	3	-	2	-	-
22-14	19	-	-	-	-
22-19	14	-	-	-	-
22-22	-	-	4	-	-
22-23	-	8	-	-	-
22-27	8	-	1	-	-
24-2	-	7	-	-	-
24-10	-	-	7	-	-
24-11	-	6	3	-	-
24-20	9	2	-	-	-
24-22	-	-	4	-	-
24-28	24	-	-	-	-

(continued)

TABLE 1 SHELL SIZE AND INSERT ARRANGEMENTS (continued)

Shell size/insert arrangement	No. of contacts				
	Size 16	Size 12	Size 8	Size 4	Size 0
28-11	18	4	-	-	-
28-12	26	-	-	-	-
28-20	4	10	-	-	-
28-21	37	-	-	-	-
32-1	-	3	-	-	2
32-6	16	2	3	2	-
32-7	28	7	-	-	-
32-17	-	-	-	4	-
36-5	-	-	-	-	4
36-10	48	-	-	-	-

Contacts

Standard range

8 Contact pins or contact sockets can be specified for all connector styles. Standard contacts are supplied with the connector. Table 2 details the contact data by contact size. Short pin contacts and short socket contacts are only to be used in shell sizes 10SL, 12S, 14S and 16S. Contacts are normally of the solder pot type. Crimp pot contacts can be specified in sizes 12 and 16 only, see para.10. and Table 3.

Orientation

9 To prevent the cross-mating of identical connectors in the vicinity of each other, the connector insert can be orientated to give one of five positions as follows:

9.1 Insert orientation - W, X, Y, Z or N (normal).

Modifications

10 The modification codes detailed in Table 5 list the variations in finish and contacts.

TABLE 2 STANDARD CONTACTS - SOLDER POT TYPE

Size	Contact type	Current rating (max)	Contact accommodation (a.w.g.)	Contact ident.	Service Ref No./ NATO Stock No.	Part No
16	Pin, short	22A	16			
16	Pin, long	22A	16			
16	Socket, short	22A	16			
16	Socket,long	22A	16			
12	Pin	41A	12			
12	Socket	41A	12			
8	Pin	73A	8			
8	Socket	73A	8			
4	Pin	135A	4			
4	Socket	135A	4			
0	Pin	245A	0			
0	Socket	245A	0			

TABLE 3 STANDARD CONTACTS - CRIMP POT TYPE

Size	Contact type	Current rating (max)	Contact accommodation (a.w.g.)	Contact ident.	Service Ref No./ NATO Stock No.	Part No
16	Pin, short	22A	16		5935-99-972-3256	330-0345-016
16	Pin, long	22A	16		5X/9723255	330-0351-016
16	Socket, short	22A	16		5X/9723262	031-0554-161
16	Socket, long	22A	16		5X/9723260	031-0560-161
12	Pin	41A	12		5X/9723257	330-0351-012
12	Socket	41A	12		5X/9723261	031-0560-121

TABLE 4 THERMOCOUPLE CONTACTS

Size	Contact type	Contact accommodation (a.w.g.)	Contact ident.	Service Ref No./ NATO Stock No.	Part No
16	Pin, short, chromal	20-16		5999-99-625-9756	330-0347-016
16	Pin, short, alumel	20-16		5999-99-625-9755	330-0346-016
16	Socket, short, chromal	20-16		5999-99-625-9783	031-0556-161
16	Socket, short, alumel	20-16		5999-99-625-9782	031-0555-161
12	Pin, long, chromal	14-12			330-0353-016
12	Pin. long, alumel	14-12			330-0352-016
12	Socket, long, chromal	14-12		5X/14158	031-0562-161
12	Socket, long, alumel	14-12		5X/14157	031-0561-161

TABLE 5 MODIFICATION CODE

Mod.No.	Description of variation from standard
*A29	Anodize natural finish
*A30	Anodize black finish
*A95	Contacts, gold plate finish over silver plate
*A101	Yellow chromate coating over cadmium finish
*A105	Clear chromate coating over cadmium finish
*A115	Contacts, heavy gold plate finish over silver plate
*C32	Insert made from diallyl phthalate
*B1	Contacts for welded terminations
*F0	Without contacts
*F1	Box mount receptacle with small flange
*F2	Box mount receptacle with small flange and plastic insert
*F3	Box mount receptacle with intermediate flange
*F4	Box mount receptacle with intermediate flange and plastic insert
*F16	Connector supplied with plastic dust cap
*F30	Short solder pot on contacts
*F110	Crimp, snap-in contacts supplied with, but not installed in, two piece plastic insulator. Connectors with size 12 and 16 contact only.
*F80	Crimped contacts supplied, but not installed. Sizes 12 and 16 contacts only.

Note ...

* Class A, B and C connectors.

** Class E and R connectors.

Environmental sealing (fig.8)

11 Rear sealing, in the E, F and R connectors, is provided by a grommet. The grommet is designed to seal on wires having the overall diameters detailed in Table 6. The grommet has internal restrictions within the wire cavities which act as '0' rings around each wire. This allows the wires to slide easily when assembling the connector, yet when the ferrule is sealed and the endbell is tightened provides a perfect seal over a wide variety of wire diameters.

TABLE 6 WIRE SEALING RANGE

Contact size	Wire size (a.w.g.)	Insulation o.d. (in)	
		Min	Max
16	22 - 16	0.064	0.130
12	14 - 12	0.114	0.170
8	10 - 8	0.159	0.255
4	6 - 4	0.280	0.370
0	2 - 0	0.400	0.550

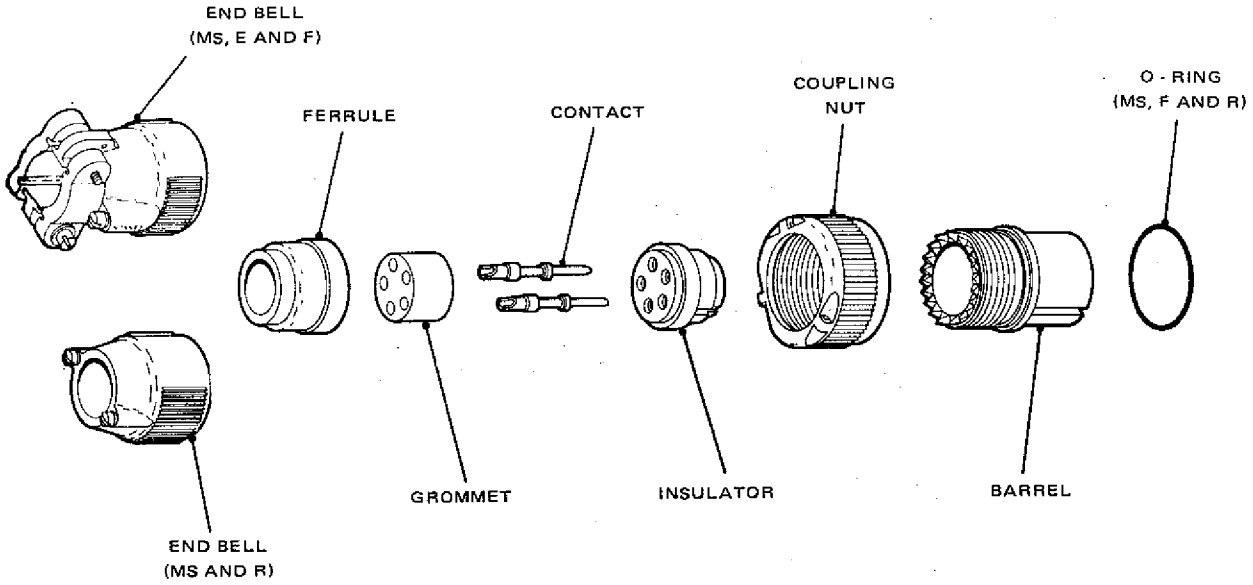


Fig 8 Environmental straight plugs : exploded view

12 In cavities which are not wired, filler plugs must be fitted behind unwired contacts. Table 7 details the filler plugs available.

TABLE 7 FILLER PLUGS

Contact size	Wire size (a.w.g.)	Colour code	Service Ref No/ NATO stock No.	Part No.
16S/16	16	Blue		225-0017-000
12	12	Yellow	5X/1126885	225-0018-000
8	8	White		225-0019-000
4	4	Green		225-8502-000
0	0	Black		225-8503-000

Temperature range

13 The operating temperature range of these connectors is - 55 deg C to + 150 deg C. The upper limit quoted is the maximum internal hot spot temperature resulting from any combination of ambient temperature and heating due to current.

Lubrication and cleaning

14 ZX-36 may be used for light lubrication of contacts and guide pins when inserting contacts. Connectors can be cleaned using, sparingly, Arklone P (33D/2204018) or safecleane aerosol (33D/511).

Tooling

15 When crimp pot contacts are used, select the correct tooling from the appropriate contact work sheet detailed in Chap.2, or connector assembly

instructions detailed in Chap.3. No tooling is supplied with the connectors.

ACCESSORIES

16 These connectors are supplied with back end accessories as required, refer to para. 5. Other accessories may be ordered separately and these are detailed Tables 8 to 12 (figs 9 to 11).

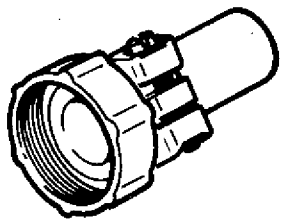


Fig 9 Cable clamp : bushing fitted

TABLE 8 CABLE CLAMPS

Shell size	Bushing * accommodation	Service Ref.No/ NATO Stock No.	Part No
10SL, 12S, 12	MS 3420-4	5X/1933511	MS 3057-4A
14S, 14	MS 3420-6	5X/5193787	MS 3057-6A
16S, 16	MS 3420-8	5X/1987419	MS 3057-8A
18	MS 3420-10	5X/9153509	MS 3057-10A
20, 22	MS 3420-12	5X/5195806	MS 3057-12A
24, 28	MS 3420-16	5X/4501410	MS 3057-16A
32	MS 3420-20		MS 3057-20A
36	MS 3420-24	105X/2802192	MS 3057-24A

* Bushing detailed in Table 9

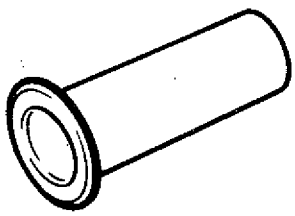


Fig 10 Telescopic bushing

TABLE 9 TELESCOPIC BUSHINGS

Shell size	Service Ref No./ NATO Stock No.	Part No.
8S, 10S		MS 3420-3
10SL, 12S, 12		MS 3420-4
14S, 14		MS 3420-6
16S, 16	5340-99-914-9901	MS 3420-8
18		MS 3420-10
20, 22		MS 3420-12
24, 28		MS 3420-16
32		MS 3420-20
36		MS 3420-24

Dummy receptacle

17 The dummy receptacle holds style 3106 or 3108 connectors when not in use.

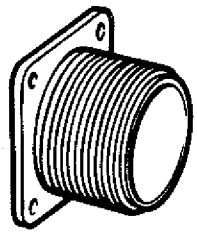


Fig 11 Dummy receptacle

TABLE 10 DUMMY RECEPTACLES

Shell size	Service Ref No./ NATO Stock No.	Part No.
10S, 10SL		MS 3105-10S
12S		MS 3105-12S
14S	5935-99-109-5348	MS 3105-14S
16S		MS 3105-16S
12		MS 3105-12
14		MS 3105-14
16		MS 3105-16
18		MS 3105-18
20	5X/6424841	MS 3105-20
22		MS 3105-22
24		MS 3105-24
28	5X/6287547	MS 3105-28
32		MS 3105-32
36		MS 3105-36

Protective caps, plastic

18 Light duty plastic caps are designed to cover the coupling and conduit ends of connectors. These caps, of red polyethylene provide protection against damage or ingress of foreign matter during storage and transit. The caps may be re-used, but are not to be used in lieu of metal caps (see modification code, Table 5).

Protective caps, metal

19 Two types of protective caps, metal are available. Type MS25042 is for use with style 3106 and 3108 connectors. Type MS24043 is for use with style 3100, 3101 and 3102 connectors. Table 11 details MS24042 caps and Table 12 details MS25043 caps.

TABLE 11 PROTECTIVE CAPS, METAL, MS25042

Shell size	Service Ref No./ NATO Stock No.	Part No.
10SL		MS 25042-10D
12S, 12	5X/14079	MS 25042-12D
14S, 14	5X/4501454	MS 25042-14D
16S, 16		MS 25042-16D
18	5935-99-633-0828	MS 25042-18D
20	5935-99-633-0827	MS 25042-20D
22		MS 25042-22D
24	5935-99-633-0831	MS 25042-24D
28	5X/6400398	MS 25042-28D
32		MS 25042-32D
36		MS 25042-36D

TABLE 12 PROTECTIVE CAPS, METAL, MS25043

Shell size	Service Ref No./ NATO Stock No.	Part No.
10SL	5X/13716	MS 25043-10D
12S, 12		MS 25043-12D
14S, 14	5X/9997864	MS 25043-14D
16S, 16	5935-99-640-2634	MS 25043-16D
18	5935-99-450-0442	MS 25043-18D
20	5935-99-519-2400	MS 25043-20D
22	5935-99-622-5763	MS 25043-22D
24	5935-99-631-2737	MS 25043-24D
28	5935-99-999-7860	MS 25043-28D
32		MS 25043-32D
36		MS 25043-36D

Conductor size measurement

20 The contact which sheets in Chapter 2 detail each contact size and the standard a.w.g. wire size that contact size will accomodate.

Note ...

Where either it is suspected that the cable conductor (wire) is not standard a.w.g. or the integrity of the crimp is in doubt, then either DEA 92, CSDE, RAF Swanton Morley, extension 290 (RAF) or OC NATEC, HMS DAEDALUS (RN) should be contacted for cable (wire) identification.

Chapter 2

CONTACT ASSEMBLY INSTRUCTIONS

CONTENTS

Introduction

1 This chapter comprises a number of work sheets detailing the procedure for crimping each size and type of crimp pot contact to the range of wire sizes they are designed to accommodate.

Procedure

2 Proceed as follows :

2.1 Identify the size and type of contact to be crimped.

2.2 Select the appropriate contact work sheet.

2.3 Identify the size of cable conductor (wire size) being used.

2.4 Carry out the stripping and crimping procedures detailed in the contact work sheet.

Contact Work Sheet 1

STANDARD CONTACT SIZE 16

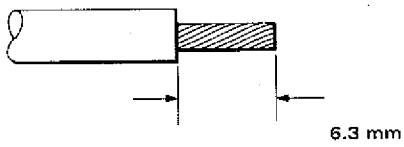


Fig. 1 Stripping dimensions

Wire insulation range

0.130 in max.

Wire conductor range

Wire size 16 a.w.g.

Procedure

1 Check that the wire, to which the contact is to be crimped, is within the insulation and conductor ranges given in this work sheet.

2 Strip the wire to the dimensions given in fig. 1. Ensure that the insulation is completely removed and that the conductor is undamaged.

Note ...

Information on wire stripping is detailed in AP 113D-1700-1 (RAF) and AP 120M-0600-1 (RN).

3 Select the appropriate crimping tool from Tables 1, 2 or 3.

TABLE 1 RAF CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	IM/1653912	M22520/1-02	IM/6278075	Blue

Note ...

The tool and turret detailed in Table 1 are available as part of Crimping tool kit Ref. No. IM/949. Units are to demand the tool kit rather than individual tools and turrets.

TABLE 2 RAF ALTERNATIVE CRIMPING TOOL

Crimping tool		Locator		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
MS 3191	1M/4658819	M3191-16A (Part No. 602520/3)	1M/1300394	Blue

TABLE 3 RN CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	0273-1380390	M22520/1-02	0273-1380391	Blue

4 Where the crimping tool detailed in Tables 1 and 3 is to be used, select the appropriate tool setting from Table 4.

TABLE 4 CRIMPING TOOL MS22520/1-01 TOOL SETTING

Wire size	Tool setting
16	6

5 Crimp the contact to the wire.

Note ...

Information on the use of crimping tools is detailed in AP 120M-0602-1 (RAF) and AP 120M-0600-1 (RN).

6 Inspect the crimp joint for the following:-

6.1 All conductor strands enter the crimping barrel and the conductor is visible through the inspection hole.

6.2 The contact is not distorted and the crimp barrel is free from fractures.

Contact Work Sheet 2

STANDARD CONTACT SIZE 12

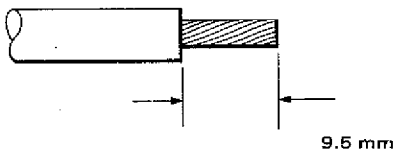


Fig. 1 Stripping dimensions

Wire insulation range	Wire conductor range
0.70 in max.	Wire size 12 a.w.g.

Procedure

1 Check that the wire, to which the contact is to be crimped, is within the insulation and conductor ranges given in this work sheet.

2 Strip the wire to the dimensions given in fig. 1. Ensure that the insulation is completely removed and that the conductor is undamaged.

Note ...

Information on wire stripping is detailed in AP 113D-1700-1 (RAF) and AP 120M-0600-1 (RN).

3 Select the appropriate crimping tool from Tables 1, 2 or 3.

TABLE 1 RAF CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	IM/1653912	M22520/1-02	IM/6278075	Yellow

Note ...

The tool and turret detailed in Table 1 are available as part of Crimping tool kit Ref. No. IM/949. Units are to demand the tool kit rather than individual tools and turrets.

TABLE 2 RAF ALTERNATIVE CRIMPING TOOL

Crimping tool		Locator		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
MS 3191	1M/4658819	M3191-12A (Part No. 602520/4)	1M/1300395	Yellow

TABLE 3 RN CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	0273-1380390	M22520/1-02	0273-1380391	Yellow

4 Where the crimping tool detailed in Tables 1 and 3 is to be used, select the appropriate tool setting from Table 4.

TABLE 4 CRIMPING TOOL MS22520/1-01 TOOL SETTING

Wire size	Tool setting
12	8

5 Crimp the contact to the wire.

Note ...

Information on the use of crimping tools is detailed in AP 120M-0602-1 (RAF) and AP 120M-0600-1 (RN).

6 Inspect the crimp joint for the following:-

6.1 All conductor strands enter the crimping barrel and the conductor is visible through the inspection hole.

6.2 The contact is not distorted and the crimp barrel is free from fractures.

Contact Work Sheet 3

THERMOCOUPLE CONTACT, SIZE 16

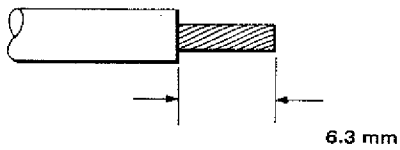


Fig. 1 Stripping dimensions

Wire insulation range	Wire conductor range
0.130 in max.	Wire size 20-16 a.w.g.

Procedure

1 Check that the wire, to which the contact is to be crimped, is within the insulation and conductor ranges given in this work sheet.

2 Strip the wire to the dimensions given in fig. 1. Ensure that the insulation is completely removed and that the conductor is undamaged.

Note ...

Information on wire stripping is detailed in AP 113D-1700-1 (RAF) and AP 120M-0600-1 (RN).

3 Select the appropriate crimping tool from Tables 1, 2 or 3.

TABLE 1 RAF CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	1M/1653912	M22520/1-02	1M/6278075	Blue

Note ...

The tool and turret detailed in Table 1 are available as part of Crimping tool kit ref. No. 1M/949. Units are to demand the tool kit rather than individual tools and turrets.

TABLE 2 RAF ALTERNATIVE CRIMPING TOOL

Crimping tool		Locator		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
MS 3191	1M/4658819	M3191-16A (Part No. 602520/3)	1M/1300394	Blue

TABLE 3 RN CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	0273-1380390	M22520/1-02	0273-1380391	Blue

4 Where the crimping tool detailed in Tables 1 and 3 is to be used, select the appropriate tool setting from Table 4.

TABLE 4 CRIMPING TOOL MS22520/1-01 TOOL SETTING

Wire size	Tool setting
20	4
18	5
16	6

5 Crimp the contact to the wire.

Note ...

Information on the use of crimping tools is detailed in AP 120M-0602-1 (RAF) and AP 120M-0600-1 (RN).

6 Inspect the crimp joint for the following:-

6.1 All conductor strands enter the crimping barrel and the conductor is visible through the inspection hole.

6.2 The contact is not distorted and the crimp barrel is free from fractures.

Contact Work Sheet 4

THERMOCOUPLE CONTACT SIZE 12

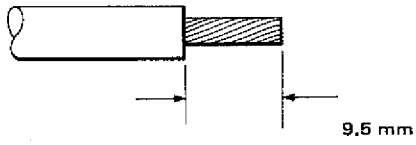


Fig. 1 Stripping dimensions

Wire insulation range	Wire conductor range
0.70 in max.	Wire size 14-12 a.w.g.

Procedure

1 Check that the wire, to which the contact is to be crimped, is within the insulation and conductor ranges given in this work sheet.

2 Strip the wire to the dimensions given in fig. 1. Ensure that the insulation is completely removed and that the conductor is undamaged.

Note ...

Information on wire stripping is detailed in AP 113D-1700-1 (RAF) and AP 120M-0600-1 (RN).

3 Select the appropriate crimping tool from Tables 1, 2 or 3.

TABLE 1 RAF CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	1M/1653912	M22520/1-02	1M/6278075	Yellow

Note ...

The tool and turret detailed in Table 1 are available as part of Crimping tool kit Ref. No. 1M/949. Units are to demand the tool kit rather than individual tools and turrets.

TABLE 2 RAF ALTERNATIVE CRIMPING TOOL

Crimping tool		Locator		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
MS 3191	1M/4658819	M3191-12A (Part No. 602520/4)	1M/1300395	Yellow

TABLE 3 RN CRIMPING TOOL

Crimping tool		Turret		
Specification	Sect. Ref.	Specification	Sect. Ref.	Colour code
M22520/1-01	0273-1380390	M22520/1-02	0273-1380391	Yellow

4 Where the crimping tool detailed in Tables 1 and 3 is to be used, select the appropriate tool setting from Table 4.

TABLE 4 CRIMPING TOOL MS22520/1-01 TOOL SETTING

Wire size	Tool setting
14	7
12	8

5 Crimp the contact to the wire.

Note ...

Information on the use of crimping tools is detailed in AP 120M-0602-1 (RAF) and AP 120M-0600-1 (RN).

6 Inspect the crimp joint for the following:-

6.1 All conductor strands enter the crimping barrel and the conductor is visible through the inspection hole.

6.2 The contact is not distorted and the crimp barrel is free from fractures.

Chapter 3

CONNECTOR ASSEMBLY INSTRUCTIONS

SOLDER POT CONTACTS

1 No special tools are required for dismantling standard connectors. When making wiring connections it is only necessary to remove the connector endbell and accessories to gain access to the contact solder cups. The contacts are soldered in situ.

Wiring connectors

2 When wiring multi-cored cables to a plan careful trimming of each conductor wire is necessary to allow the contacts to be evenly seated in their correct positions in the insert. To prepare the cable :-

2.1 Trim the outer sheath of the cableform back sufficiently to allow the conductors to spread out to the peripheral contacts, but ensure the end of the sheath will be housed within the cable clamp or endbell.

2.2 Apply a whipping to the end of the sheath to prevent the possibility of the sheath being split when the conductors are spread.

2.3 Cut the individual conductor to the length required to reach the appropriate contact.

2.4 Trim back the insulation of each conductor to the length shown in Table 1.

2.5 Tin the bared ends of the conductors ensuring that all strands of the conductor wires are laid evenly along the conductor.

2.6 Fit insulating sleeves on to each conductor and slide each sleeve along the conductor and clear of the tinned wire.

2.7 Remove the endbell and accessories from the connector to be wired.

2.8 Pass the cableform through the appropriate solid cable fittings e.g. the endbell of the MSA types, assembly ring of the MSB types and the bushing endbell and ferrules of the MSB and R types.

2.9 For E and R types only fit each conductor through its appropriate hole in the grommet and ensure that the grommet is pushed up clear of the bared ends of the wires.

Note ...

The conductors should be connected one at a time, starting with the most central contact and working outwards towards the perimeter of the insert.

2.10 Insert the tinned end of each conductor into its appropriate contact solder cup in turn. Apply the heat to the closed side of the cup so that the solder flow may be observed.

2.11 Slide the sealing grommet down on to the joints for E and R types, and the insulating sleeves over the joints for all other types.

2.12 Position and tighten the endbells and accessories as required, on to the connectors.

TABLE 1 CABLE STRIPPING LENGTHS - SOLDER POT CONTACTS

Contact size	Stripping length maximum (in)
16	0.250
12	0.375
8	0.500
4	0.625
0	0.625

CRIMP POT CONTACTS

Contact insertion

Note ...

Contacts are to be inserted into the connector, starting from the centre and working to the outside.

3 Proceed as follows :-

3.1 Slide the endbell, ferrule and grommet over the wire bundle.

3.2 Select the correct insertion tool from Table 2.

Note ...

The insertion tool must be maintained parallel to the contact during the following operation.

3.3 Insert the contact into the rear of the insulator, position the insertion tool behind the contact and apply firm steady pressure until the contact locates into position.

3.4 Withdraw the insertion tool from the rear of the insulator.

3.5 Fill all unused cavities with unwired contacts and fit filler plugs.

3.6 Inspect the front face of the insulator, ensuring that there are no bent contacts and that all contacts are even.

3.7 Slide the rear accessories over the wire bundle and fit the accessories to the connector.

Extraction of contacts

4 Proceed as follows :-

4.1 Disconnect all accessories fitted to the rear of the connector and slide the accessories over the wire bundle.

4.2 Select the correct extract tool from Table 3.

4.3 Working at the front face of the connector, carefully locate the extraction tool on the contact to be removed.

Notes ...

(1) The extract tool is double-ended, the tip being reversible in the handle, to provide a socket tip or pin tip.

(2) The extract tool must be maintained parallel to the contact during the contact removal.

(3) During the removal process care must be taken to ensure that the extract tool does not damage the insulator.

4.4 Exert pressure until the contact is pushed clear of its location. Remove the contact by hand and withdraw the extract tool.

TABLE 2 CONTACT INSERTION TOOLS

Contact size	Part No.	Service Ref No./ NATO Stock No.
16	CIT-F80-16	
12	CIT-F80-12	

TABLE 3 CONTACT EXTRACTION TOOLS

Contact size	Part No.	Service Ref No./. NATO Stock No.
16	CET16-4	
12	CET12-2