

## How to Order

TBF and BFR pressurized bulkhead receptacles mate with standard MS type plugs (3106, 3107 and 3108) if contact arrangements correspond. Both the BFR and TBF have resilient insulators. The TBF (thru-bulkhead fitting) version has a double-faced construction allowing mating from both ends. An O ring is supplied as standard on both the BFR and the TBF. Contacts are silver plated copper or brass alloy. Shells are aluminum alloy.

PREFIX \_\_\_\_\_  
 CLASS \_\_\_\_\_  
 SHELL SIZE \_\_\_\_\_  
 CONTACT ARRANGEMENT \_\_\_\_\_  
 CONTACT TYPE \_\_\_\_\_  
 ALTERNATE POSITION \_\_\_\_\_  
 MOUNTING (BFR ONLY) \_\_\_\_\_

PREFIX  
 BF – Bulkhead fittings  
 TBF – Thru bulkhead fittings

CLASS  
 \*R – Resilient insulators  
 H – Hermetic; see page 327  
 \*Letter designator "R" not required for TBF.

SHELL SIZE  
 Coupling thread diameter figured in sixteenths of an inch

CONTACT ARRANGEMENTS  
 See pages 171-174.

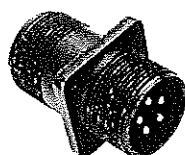
CONTACT TYPE  
 P for Pin; S for Socket; PS for Pin and Socket (TBF only)

ALTERNATE POSITION  
 (Consult factory for available alternate positions.)

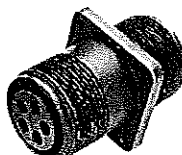
MOUNTING  
 BFR only; see chart on page 183

## Thru-Bulkhead Receptacle

TBF – Resilient Insulator

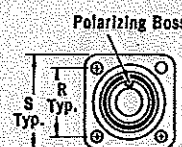
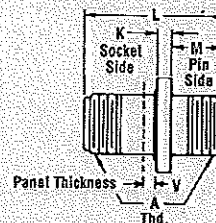
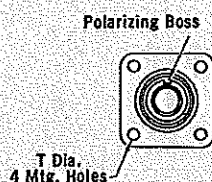


Pin Insert End



Socket Insert End

TBF thru-bulkhead fittings have pressurized resilient insulators. Special double-face pin and socket contact construction permits cable components to be wired and tested in the shop and then to be plugged into the mounted TBF plug to complete the installation. The TBF mates with 3106, 3107 and 3108 plugs.



| Shell Size | K Max.      | L Max.        | $\begin{matrix} +.031 (0.79) \\ -.000 (0.00) \end{matrix}$ | $\begin{matrix} \pm .005 (0.13) \\ \pm .005 (0.13) \end{matrix}$ | $\begin{matrix} \pm .031 (0.79) \\ \pm .031 (0.79) \end{matrix}$ | $\begin{matrix} +.010 (0.25) \\ -.005 (0.13) \end{matrix}$ | V Max.       | A Thread        |
|------------|-------------|---------------|------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------|--------------|-----------------|
| 8S         | .125 (3.18) | 1.482 (37.64) | .562 (14.27)                                               | .594 (15.09)                                                     | .875 (22.22)                                                     | .120 (3.05)                                                | .325 (8.26)  | 1/2-28UNEF-2A   |
| 10S        | .125 (3.18) | 1.482 (37.64) | .562 (14.27)                                               | .719 (18.26)                                                     | 1.000 (25.40)                                                    | .120 (3.05)                                                | .325 (8.26)  | 5/8-24UNEF-2A   |
| 10SL       | .125 (3.18) | 1.482 (37.64) | .562 (14.27)                                               | .719 (18.26)                                                     | 1.000 (25.40)                                                    | .120 (3.05)                                                | .325 (8.26)  | 5/8-24UNEF-2A   |
| 12S        | .140 (3.56) | 1.482 (37.64) | .562 (14.27)                                               | .812 (20.62)                                                     | 1.094 (27.79)                                                    | .120 (3.05)                                                | .325 (8.26)  | 3/4-20UNEF-2A   |
| 14S        | .140 (3.56) | 1.482 (37.64) | .562 (14.27)                                               | .906 (23.01)                                                     | 1.188 (30.18)                                                    | .120 (3.05)                                                | .325 (8.26)  | 7/8-20UNEF-2A   |
| 16S        | .140 (3.56) | 1.482 (37.64) | .562 (14.27)                                               | .968 (24.59)                                                     | 1.281 (32.54)                                                    | .120 (3.05)                                                | .325 (8.26)  | 1-20UNEF-2A     |
| 12         | .146 (3.71) | 2.030 (51.56) | .750 (19.05)                                               | .812 (20.62)                                                     | 1.094 (27.79)                                                    | .120 (3.05)                                                | .445 (11.30) | 3/4-20UNEF-2A   |
| 14         | .146 (3.71) | 2.030 (51.56) | .750 (19.05)                                               | .906 (23.01)                                                     | 1.188 (30.18)                                                    | .120 (3.05)                                                | .445 (11.30) | 7/8-20UNEF-2A   |
| 16         | .146 (3.71) | 2.030 (51.56) | .750 (19.05)                                               | .968 (24.59)                                                     | 1.281 (32.54)                                                    | .120 (3.05)                                                | .445 (11.30) | 1-20UNEF-2A     |
| 18         | .180 (4.57) | 2.030 (51.56) | .750 (19.05)                                               | 1.062 (26.97)                                                    | 1.375 (34.92)                                                    | .120 (3.05)                                                | .445 (11.30) | 1-1/8-18UNEF-2A |
| 20         | .180 (4.57) | 2.030 (51.56) | .750 (19.05)                                               | 1.156 (29.36)                                                    | 1.500 (38.10)                                                    | .120 (3.05)                                                | .445 (11.30) | 1-1/4-18UNEF-2A |
| 22         | .180 (4.57) | 2.030 (51.56) | .750 (19.05)                                               | 1.250 (31.75)                                                    | 1.625 (41.28)                                                    | .120 (3.05)                                                | .445 (11.30) | 1-3/8-18UNEF-2A |
| 24         | .203 (5.16) | 2.030 (51.56) | .812 (20.62)                                               | 1.375 (34.92)                                                    | 1.750 (44.45)                                                    | .147 (3.73)                                                | .383 (9.73)  | 1-1/2-18UNEF-2A |
| 28         | .203 (5.16) | 2.030 (51.56) | .812 (20.62)                                               | 1.562 (39.67)                                                    | 2.000 (50.80)                                                    | .147 (3.73)                                                | .383 (9.73)  | 1-3/4-18UNS-2A  |
| 32         | .203 (5.16) | 2.030 (51.56) | .875 (22.22)                                               | 1.750 (44.45)                                                    | 2.250 (57.15)                                                    | .173 (4.39)                                                | .320 (8.13)  | 2-18UNS-2A      |
| 36         | .203 (5.16) | 2.030 (51.56) | .812 (20.62)                                               | 1.938 (49.23)                                                    | 2.500 (63.50)                                                    | .173 (4.39)                                                | .383 (9.73)  | 2-1/4-16UN-2A   |
| 40         | .203 (5.16) | 2.030 (51.56) | .875 (22.22)                                               | 2.188 (55.58)                                                    | 2.750 (69.85)                                                    | .173 (4.39)                                                | .383 (9.73)  |                 |

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Contacts, Sealing Plugs, Assembly Tools – Page 187

Contact Arrangements – Page 171-174

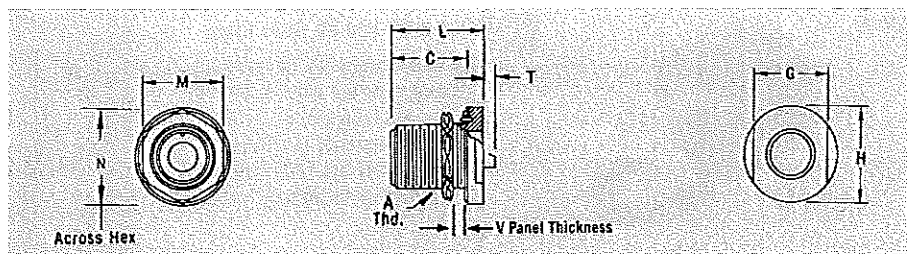
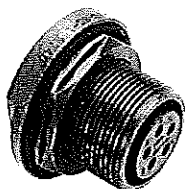
**ITT Cannon**

For technical assistance, price or delivery information, call your local technical sales office or distributor.

Dimensions are shown in inches (millimeters).  
Dimensions subject to change.

## Pressurized Bulkhead Receptacle

BFR



Standard Position  
Pin is 3/32" Dia.

BFR pressurized bulkhead receptacles withstand the air leakage requirements of MIL-C-5015 not to exceed 1 cu. in. of air per hour when subjected to a pressure differential of 30 psi at -55°C. Insulators are resilient material bonded to aluminum shell. Both pin and socket assemblies are available. The BFR will mate with standard MS type 3106, 3107, 3108 plugs.

Type 1

Shell Standard  
Insulator Polychloroprene  
Lock Nut Hex with 6 wire holes  
O Ring Neoprene  
Position Pin Standard  
Mounting Figure 1 or 2  
Part No. Example: BFR14S-5P-1

| Shell Size | C Max.        | G Max.        | H Max.        | L Max.        | M Max.        | N Max.        | T Max. Solder Pot Ext. |             |             |             |             | V Max.      |
|------------|---------------|---------------|---------------|---------------|---------------|---------------|------------------------|-------------|-------------|-------------|-------------|-------------|
|            |               |               |               |               |               |               | #16                    | #12         | #8          | #4          | #0          |             |
| 8S         | .853 (21.67)  | .895 (22.73)  | 1.077 (27.36) | 1.087 (27.61) | .702 (17.83)  | .820 (20.83)  | .140 (3.56)            | —           | —           | —           | —           | .250 (6.35) |
| 10S        | .853 (21.67)  | 1.015 (25.78) | 1.203 (30.56) | 1.087 (27.61) | .822 (20.88)  | .960 (24.38)  | .140 (3.56)            | —           | —           | —           | —           | .250 (6.35) |
| 10SL       | .853 (21.67)  | 1.015 (25.78) | 1.203 (30.56) | 1.087 (27.61) | .822 (20.88)  | .960 (24.38)  | .140 (3.56)            | —           | —           | —           | —           | .250 (6.35) |
| 12S        | .853 (21.67)  | 1.077 (27.36) | 1.327 (33.71) | 1.087 (27.61) | .955 (24.26)  | 1.110 (28.19) | .140 (3.56)            | —           | —           | —           | —           | .250 (6.35) |
| 14S        | .853 (21.67)  | 1.203 (30.56) | 1.453 (36.91) | 1.087 (27.61) | 1.072 (27.23) | 1.250 (31.75) | .140 (3.56)            | —           | —           | —           | —           | .375 (9.52) |
| 16S        | .853 (21.67)  | 1.327 (33.71) | 1.577 (40.06) | 1.087 (27.61) | 1.265 (32.13) | 1.460 (37.08) | .140 (3.56)            | —           | —           | —           | —           | .375 (9.52) |
| 12         | 1.244 (31.60) | 1.077 (27.36) | 1.327 (33.71) | 1.525 (38.74) | .955 (24.26)  | 1.110 (28.19) | .062 (1.57)            | .062 (1.57) | —           | —           | —           | .375 (9.52) |
| 14         | 1.244 (31.60) | 1.203 (30.56) | 1.453 (36.91) | 1.525 (38.74) | 1.072 (27.23) | 1.250 (31.75) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | —           | —           | .375 (9.52) |
| 16         | 1.244 (31.60) | 1.327 (33.71) | 1.577 (40.06) | 1.525 (38.74) | 1.265 (32.13) | 1.460 (37.08) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | —           | .375 (9.52) |
| 18         | 1.244 (31.60) | 1.453 (36.91) | 1.703 (43.26) | 1.525 (38.74) | 1.395 (35.43) | 1.610 (40.89) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | —           | .375 (9.52) |
| 20         | 1.244 (31.60) | 1.577 (40.06) | 1.827 (46.41) | 1.525 (38.74) | 1.515 (38.48) | 1.750 (44.45) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | .359 (9.12) | .375 (9.52) |
| 22         | 1.244 (31.60) | 1.577 (40.06) | 1.953 (49.61) | 1.525 (38.74) | 1.635 (41.53) | 1.900 (48.26) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | .359 (9.12) | .375 (9.52) |
| 24         | 1.244 (31.60) | 1.827 (46.41) | 2.077 (52.76) | 1.525 (38.74) | 1.765 (44.83) | 2.030 (51.56) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | .359 (9.12) | .375 (9.52) |
| 28         | 1.244 (31.60) | 1.953 (49.61) | 2.327 (59.11) | 1.525 (38.74) | 2.015 (51.18) | 2.330 (59.18) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | .359 (9.12) | .375 (9.52) |
| 32         | 1.244 (31.60) | 2.203 (55.96) | 2.577 (65.46) | 1.525 (38.74) | 2.205 (56.01) | 2.550 (64.77) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | .359 (9.12) | .375 (9.52) |
| 36         | 1.244 (31.60) | 2.577 (65.46) | 2.827 (71.81) | 1.525 (38.74) | 2.455 (62.36) | 2.840 (72.14) | .062 (1.57)            | .062 (1.57) | .125 (3.18) | .125 (3.18) | .359 (9.12) | .312 (7.92) |

| Shell Size | A Thread      |
|------------|---------------|
| 8S         | 1/2-28UNEF-2A |
| 10S        | 5/8-24UNEF-2A |
| 10SL       | 5/8-24UNEF-2A |
| 12S        | 3/4-20UNEF-2A |
| 14S        | 7/8-20UNEF-2A |
| 16S        | 1-20UNEF-2A   |
| 12         | 3/4-20UNEF-2A |
| 14         | 7/8-20UNEF-2A |

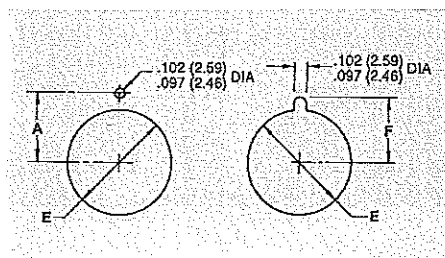
| Shell Size | A Thread        |
|------------|-----------------|
| 16         | 1-20UNEF-2A     |
| 18         | 1-1/8-18UNEF-2A |
| 20         | 1-1/4-18UNEF-2A |
| 22         | 1-3/8-18UNEF-2A |
| 24         | 1-1/2-18UNEF-2A |
| 28         | 1-3/4-18UNS-2A  |
| 32         | 2-18UNS-2A      |
| 36         | 2-1/4-16UN-2A   |

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## Mounting Dimensions



| Shell Size | A ±.005 (0.13) | E +.015 (0.38) - .000 (0.00) | F ±.005 (0.13) |
|------------|----------------|------------------------------|----------------|
| 8S         | .323 (8.20)    | .500 (12.70)                 | .373 (9.47)    |
| 10S, 10SL  | .385 (9.78)    | .625 (15.88)                 | .435 (11.05)   |
| 12S, 12    | .448 (11.38)   | .750 (19.05)                 | .498 (12.65)   |
| 14S, 14    | .510 (12.95)   | .875 (22.22)                 | .560 (14.22)   |
| 16S, 16    | .573 (14.55)   | 1.000 (25.40)                | .623 (15.82)   |
| 18         | .635 (16.13)   | 1.125 (28.58)                | .685 (17.40)   |

| Shell Size | A ±.005 (0.13) | E +.015 (0.38) - .000 (0.00) | F ±.005 (0.13) |
|------------|----------------|------------------------------|----------------|
| 20         | .698 (17.73)   | 1.250 (31.75)                | .748 (19.00)   |
| 22         | .760 (19.30)   | 1.375 (34.92)                | .810 (20.57)   |
| 24         | .823 (20.90)   | 1.500 (38.10)                | .873 (22.17)   |
| 28         | .948 (24.08)   | 1.750 (44.45)                | .998 (25.35)   |
| 32         | 1.073 (27.25)  | 2.000 (50.80)                | 1.123 (28.52)  |
| 36         | 1.198 (30.43)  | 2.250 (57.15)                | 1.248 (31.70)  |

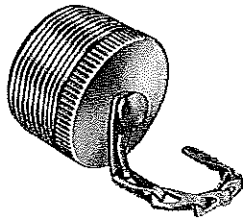
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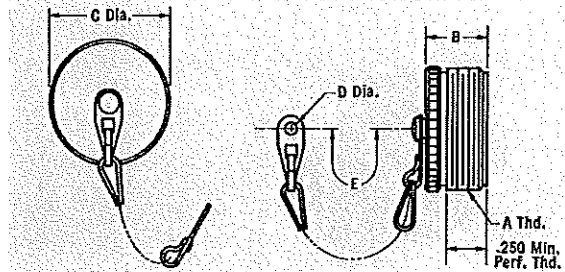
## Protective Metal Cap

MS25042

CA17530  
CA19741

## For 06 and 08 Style Plugs

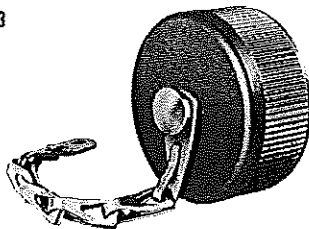
These externally threaded metal dust caps are used to protect the MS3106 and MS3108 plugs. Material is aluminum alloy. They are furnished with sash chain or less sash chain.



## Part Number

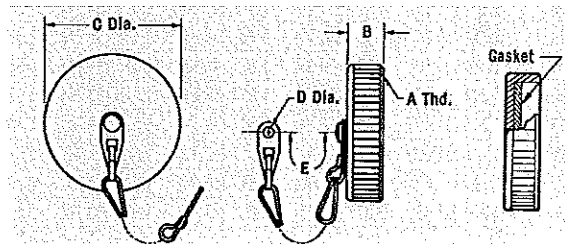
| Black Anodized Finish With Sash Chain |              | Olive Drab Chromate Over Cadmium Finish With Sash Chain |                                            | Olive Drab Chromate Over Cadmium Finish, Without Sash Chain |           | Fits Shell Size | B Max.        | C Dia. Max.    | E Max.      | D Dia. Max.     | A Thread |
|---------------------------------------|--------------|---------------------------------------------------------|--------------------------------------------|-------------------------------------------------------------|-----------|-----------------|---------------|----------------|-------------|-----------------|----------|
| MS                                    | ITT Cannon   | Superseded MS Number (Ref)                              | May Still be Purchased by ITTC Part Number | ITTC Part Number                                            |           |                 |               |                |             |                 |          |
| MS25042-80A                           | CA17530-8000 | MS25042-80                                              | CA17530-5100                               | CA19741-8                                                   | 8S        | .656 (16.66)    | .562 (14.27)  | 4.500 (114.30) | .166 (4.22) | 1/2-28UNEF-2A   |          |
| MS25042-100A                          | CA17530-8001 | MS25042-100                                             | CA17530-5101                               | CA19741-10                                                  | 10S, 10SL | .656 (16.66)    | .687 (17.45)  | 4.500 (114.30) | .166 (4.22) | 5/8-24UNEF-2A   |          |
| MS25042-120A                          | CA17530-8002 | MS25042-120                                             | CA17530-5102                               | CA19741-12                                                  | 12, 12S   | .844 (21.44)    | .812 (20.62)  | 5.000 (127.00) | .166 (4.22) | 3/4-20UNEF-2A   |          |
| MS25042-140A                          | CA17530-8003 | MS25042-140                                             | CA17530-5103                               | CA19741-14                                                  | 14, 14S   | .844 (21.44)    | .937 (23.80)  | 5.000 (127.00) | .166 (4.22) | 7/8-20UNEF-2A   |          |
| MS25042-160A                          | CA17530-8004 | MS25042-160                                             | CA17530-5104                               | CA19741-16                                                  | 16, 16S   | .844 (21.44)    | 1.062 (26.97) | 5.000 (127.00) | .166 (4.22) | 1-20UNEF-2A     |          |
| MS25042-180A                          | CA17530-8005 | MS25042-180                                             | CA17530-5105                               | CA19741-18                                                  | 18        | .844 (21.44)    | 1.187 (30.15) | 5.000 (127.00) | .166 (4.22) | 1-1/8-18UNEF-2A |          |
| MS25042-200A                          | CA17530-8006 | MS25042-200                                             | CA17530-5106                               | CA19741-20                                                  | 20        | .844 (21.44)    | 1.312 (33.32) | 5.500 (139.70) | .197 (5.00) | 1-1/4-18UNEF-2A |          |
| MS25042-220A                          | CA17530-8007 | MS25042-220                                             | CA17530-5107                               | CA19741-22                                                  | 22        | .844 (21.44)    | 1.437 (36.50) | 5.500 (139.70) | .197 (5.00) | 1-3/8-18UNEF-2A |          |
| MS25042-240A                          | CA17530-8008 | MS25042-240                                             | CA17530-5108                               | CA19741-24                                                  | 24        | .844 (21.44)    | 1.562 (39.67) | 6.000 (152.40) | .197 (5.00) | 1-1/2-18UNEF-2A |          |
| MS25042-280A                          | CA17530-8009 | MS25042-280                                             | CA17530-5109                               | CA19741-28                                                  | 28        | .844 (21.44)    | 1.812 (46.02) | 8.250 (209.55) | .197 (5.00) | 1-3/4-18UNEF-2A |          |
| MS25042-320A                          | CA17530-8010 | MS25042-320                                             | CA17530-5110                               | CA19741-32                                                  | 32        | .844 (21.44)    | 2.062 (52.37) | 8.250 (209.55) | .228 (5.79) | 2-18UNEF-2A     |          |
| MS25042-360A                          | CA17530-8011 | MS25042-360                                             | CA17530-5111                               | CA19741-36                                                  | 36        | .844 (21.44)    | 2.312 (58.72) | 8.250 (209.55) | .228 (5.79) | 2-1/4-16UN-2A   |          |
| MS25042-400A                          | CA17530-8012 | MS25042-400                                             | CA17530-5112                               | CA19741-40                                                  | 40        | .844 (21.44)    | 2.562 (65.07) | 8.250 (209.55) | .228 (5.79) | 2-1/2-16UN-2A   |          |
| MS25042-440A                          | CA17530-8013 | MS25042-440                                             | CA17530-5113                               | CA19741-44                                                  | 44        | .844 (21.44)    | 2.812 (71.42) | 8.250 (209.55) | .228 (5.79) | 2-3/4-16UN-2A   |          |
| MS25042-480A                          | CA17530-8014 | MS25042-480                                             | CA17530-5114                               | CA19741-48                                                  | 48        | .844 (21.44)    | 3.062 (77.77) | 8.250 (209.55) | .228 (5.79) | 3-16UN-2A       |          |

MS25043

CA2209  
CA2322

## For 00, 01 and 02 Style Receptacles

These internally threaded metal dust caps are used to protect MS3100, MS3101 and MS3102 receptacles. Material is aluminum alloy. They are furnished with sash chain or less sash chain.



## Part Number

| Black Anodize Finish With Sash Chain |             | Olive Drab Chromate Over Cadmium Finish With Sash Chain |                                            | Olive Drab Chromate Over Cadmium Finish Without Sash Chain |           | Fits Shell Size | B Max.        | C Dia. Max.    | E Max.      | D Dia. Max.     | A Thread |
|--------------------------------------|-------------|---------------------------------------------------------|--------------------------------------------|------------------------------------------------------------|-----------|-----------------|---------------|----------------|-------------|-----------------|----------|
| MS                                   | ITT Cannon  | Superseded MS Number (Ref)                              | May Still be Purchased by ITTC Part Number | ITTC Part Number                                           |           |                 |               |                |             |                 |          |
| MS25043-80A                          | CA2209-8000 | MS25043-80                                              | CA2209-5100                                | CA2322-1                                                   | 8S        | .469 (11.91)    | .688 (17.48)  | 4.500 (114.30) | .150 (3.81) | 1/2-28UNEF-2B   |          |
| MS25043-100A                         | CA2209-8001 | MS25043-100                                             | CA2209-5101                                | CA2322-2                                                   | 10S, 10SL | .469 (11.91)    | .815 (20.70)  | 4.500 (114.30) | .150 (3.81) | 5/8-24UNEF-2B   |          |
| MS25043-120A                         | CA2209-8002 | MS25043-120                                             | CA2209-5102                                | CA2322-3                                                   | 12, 12S   | .469 (11.91)    | 1.000 (25.40) | 5.000 (127.00) | .150 (3.81) | 3/4-20UNEF-2B   |          |
| MS25043-140A                         | CA2209-8003 | MS25043-140                                             | CA2209-5103                                | CA2322-4                                                   | 14, 14S   | .469 (11.91)    | 1.125 (28.58) | 5.000 (127.00) | .150 (3.81) | 7/8-20UNEF-2B   |          |
| MS25043-160A                         | CA2209-8004 | MS25043-160                                             | CA2209-5104                                | CA2322-5                                                   | 16, 16S   | .469 (11.91)    | 1.188 (30.18) | 5.000 (127.00) | .150 (3.81) | 1-20UNEF-2B     |          |
| MS25043-180A                         | CA2209-8005 | MS25043-180                                             | CA2209-5105                                | CA2322-6                                                   | 18        | .469 (11.91)    | 1.344 (34.14) | 5.000 (127.00) | .150 (3.81) | 1-1/8-18UNEF-2B |          |
| MS25043-200A                         | CA2209-8006 | MS25043-200                                             | CA2209-5106                                | CA2322-7                                                   | 20        | .469 (11.91)    | 1.469 (37.31) | 5.500 (139.70) | .150 (3.81) | 1-1/4-18UNEF-2B |          |
| MS25043-220A                         | CA2209-8007 | MS25043-220                                             | CA2209-5107                                | CA2322-8                                                   | 22        | .469 (11.91)    | 1.594 (40.49) | 5.500 (139.70) | .150 (3.81) | 1-3/8-18UNEF-2B |          |
| MS25043-240A                         | CA2209-8008 | MS25043-240                                             | CA2209-5108                                | CA2322-9                                                   | 24        | .469 (11.91)    | 1.719 (43.66) | 6.000 (152.40) | .181 (4.60) | 1-1/2-18UNEF-2B |          |
| MS25043-280A                         | CA2209-8009 | MS25043-280                                             | CA2209-5109                                | CA2322-10                                                  | 28        | .531 (13.49)    | 1.969 (50.01) | 8.250 (209.55) | .181 (4.60) | 1-3/4-18UNS-2B  |          |
| MS25043-320A                         | CA2209-8010 | MS25043-320                                             | CA2209-5110                                | CA2322-11                                                  | 32        | .531 (13.49)    | 2.219 (56.36) | 8.250 (209.55) | .197 (5.00) | 2-18UNS-2B      |          |
| MS25043-360A                         | CA2209-8011 | MS25043-360                                             | CA2209-5111                                | CA2322-12                                                  | 36        | .531 (13.49)    | 2.469 (62.71) | 8.250 (209.55) | .197 (5.00) | 2-1/4-16UN-2B   |          |
| MS25043-400A                         | CA2209-8012 | MS25043-400                                             | CA2209-5112                                | CA2322-13                                                  | 40        | .531 (13.49)    | 2.719 (69.06) | 8.250 (209.55) | .197 (5.00) | 2-1/2-16UN-2B   |          |
| MS25043-440A                         | CA2209-8013 | MS25043-440                                             | CA2209-5113                                | CA2322-14                                                  | 44        | .531 (13.49)    | 2.969 (75.41) | 8.250 (209.55) | .197 (5.00) | 2-3/4-16UN-2B   |          |
| MS25043-480A                         | CA2209-8014 | MS25043-480                                             | CA2209-5114                                | CA2322-15                                                  | 48        | .531 (13.49)    | 3.188 (80.98) | 8.250 (209.55) | .197 (5.00) | 3-16UN-2B       |          |

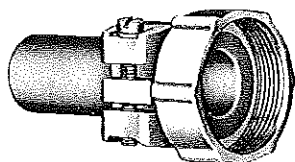
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Dimensions are shown in inches (millimeters).  
Dimensions subject to change.

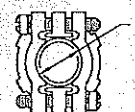
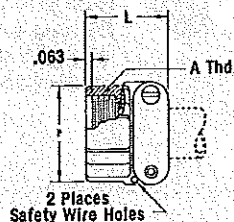
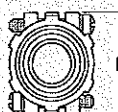
For technical assistance, price or delivery information, call your local technical sales office or distributor.

## Cable Clamp

M85049/41  
With or Without Bushing



The M85049/41 cable clamp is made for plugs and receptacles that have an endbell with external conduit threads. The double clamping action provides a balanced, positive hold on the wires and greatly reduces moisture transmission. Provision is made for safety wiring. This clamp is supplied without bushing; to order bushing, add "with bushing" after part number.



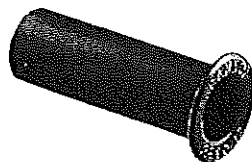
| Part Number*  | Superseded Part Number* | Fits Shell Size | Accommodates MS Bushings | E Min.       | E Max.        | ± L (0.79)    | ± P (0.79)    | ± R (0.79)    | A Thread         |
|---------------|-------------------------|-----------------|--------------------------|--------------|---------------|---------------|---------------|---------------|------------------|
| M85049/41-3A  | MS3057-3A               | 8S-10S          | MS3420-3                 | .102 (2.59)  | .250 (6.35)   | .812 (20.62)  | .688 (17.48)  | .812 (20.62)  | 1/2-28UNEF-2B    |
| M85049/41-4A  | MS3057-4A               | 10SL, 12S, 12   | MS3420-4                 | .140 (3.56)  | .312 (7.92)   | .812 (20.62)  | .812 (20.62)  | .875 (22.22)  | 5/8-24UNEF-2B    |
| M85049/41-6A  | MS3057-6A               | 14S, 14         | MS3420-6                 | .195 (4.95)  | .438 (11.13)  | .875 (22.22)  | .969 (24.61)  | 1.062 (26.97) | 3/4-20UNEF-2B    |
| M85049/41-8A  | MS3057-8A               | 16S, 16         | MS3420-8                 | .255 (6.48)  | .562 (14.27)  | .938 (23.83)  | 1.094 (27.79) | 1.156 (29.36) | 7/8-20UNEF-2B    |
| M85049/41-10A | MS3057-10A              | 18              | MS3420-10                | .285 (7.24)  | .625 (15.88)  | .938 (23.83)  | 1.188 (30.18) | 1.250 (31.75) | 1-20UNEF-2B      |
| M85049/41-12A | MS3057-12A              | 20, 22          | MS3420-12                | .350 (8.89)  | .750 (19.05)  | .938 (23.83)  | 1.375 (34.92) | 1.469 (37.31) | 1-3/16-18UNEF-2B |
| M85049/41-16A | MS3057-16A              | 24, 28          | MS3420-16, 12            | .468 (11.89) | .938 (23.83)  | 1.031 (26.19) | 1.656 (42.06) | 1.688 (42.88) | 1-7/16-18UNEF-2B |
| M85049/41-20A | MS3057-20A              | 32              | MS3420-20, 16            | .664 (16.87) | 1.250 (31.75) | 1.094 (27.79) | 2.031 (51.59) | 2.031 (51.59) | 1-3/4-18UNS-2B   |
| M85049/41-24A | MS3057-24A              | 36              | MS3420-24, 20            | .694 (17.63) | 1.375 (34.92) | 1.156 (29.36) | 2.219 (56.36) | 2.281 (57.94) | 2-18UNS-2B       |
| M85049/41-28A | MS3057-28A              | 40              | MS3420-24, 20            | .911 (23.14) | 1.625 (41.28) | 1.688 (42.88) | 2.500 (63.50) | 2.688 (68.28) | 2-1/4-16UN-2B    |
| M85049/41-32A | MS3057-32A              | 44              | MS3420-32, 28, 24        | —            | 1.875 (47.62) | 1.750 (44.45) | 2.781 (70.64) | 2.938 (74.63) | 2-1/2-16UN-2B    |
| M85049/41-40A | MS3057-40A              | 48              | MS3420-40, 32, 28        | —            | 2.375 (60.32) | 1.750 (44.45) | 3.281 (83.34) | 3.500 (88.90) | 3-16UN-2B        |

\*To order cable clamp with bushing, add "with bushing" after part number.

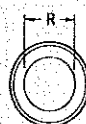
## Telescoping Bushing

MS3420/  
MS39056(REF.)

CA18220



Telescoping bushing with  
M85049/41 cable clamp



Telescoping gland bushings (used with M85049/41 cable clamp) keep dirt, oil and moisture out of endbell. Taping or wrapping wires is eliminated since bushing protects wires going thru clamp. Combinations of bushings may be used to decrease cable entry diameter to improve sealing.

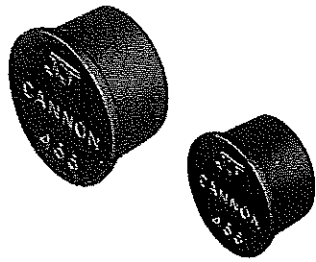
| MS Part Number | Superseded MS Part Number | ITT Cannon Part Number | Fits Shell Size | ± C (0.41)    | ± L (0.79)    | ± R (0.41)    |
|----------------|---------------------------|------------------------|-----------------|---------------|---------------|---------------|
| MS3420-3       | MS39056-1                 | CA18220-3              | 8S, 10S         | .379 (9.63)   | 2.875 (73.02) | .130 (3.30)   |
| MS3420-4       | MS39056-2                 | CA18220-4              | 10SL, 12, 12S   | .505 (12.83)  | 2.750 (69.85) | .220 (5.59)   |
| MS3420-6       | MS39056-3                 | CA18220-6              | 14, 14S         | .619 (15.72)  | 2.625 (66.68) | .312 (7.92)   |
| MS3420-8       | MS39056-4                 | CA18220-8              | 16, 16S         | .744 (18.90)  | 2.500 (63.50) | .437 (11.10)  |
| MS3420-10      | MS39056-5                 | CA18220-10             | 18              | .869 (22.07)  | 2.375 (60.32) | .562 (14.27)  |
| MS3420-12      | MS39056-6                 | CA18220-12             | 20, 22          | 1.064 (27.03) | 2.250 (57.15) | .625 (15.88)  |
| MS3420-16      | MS39056-7                 | CA18220-16             | 24, 28          | 1.314 (33.38) | 2.125 (53.98) | .750 (19.05)  |
| MS3420-20      | MS39056-8                 | CA18220-20             | 32              | 1.596 (40.54) | 2.000 (50.80) | .937 (23.80)  |
| MS3420-24      | MS39056-9                 | CA18220-24             | 36              | 1.847 (46.91) | 1.875 (47.62) | 1.250 (31.75) |
| MS3420-28      | MS39056-10                | CA18220-28             | 40              | 2.085 (52.96) | 1.750 (44.45) | 1.375 (34.92) |
| MS3420-32      | MS39056-11                | CA18220-32             | 44              | 2.335 (59.31) | 1.625 (41.28) | 1.624 (41.25) |
| MS3420-40      | MS39056-12                | CA18220-40             | 48              | 2.835 (72.01) | 1.500 (38.10) | 1.874 (47.60) |

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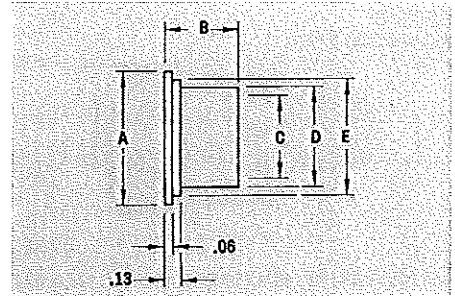
Dimensions are shown in inches (millimeters).  
Dimensions subject to change.

## Plastic Protective Caps



025-XXXX-000

Protective dust caps are designed to cover the coupling and conduit ends of MS connectors where there is a possibility of foreign matter accumulating on the interior of the connector or of damage to the threaded parts. Material is red polyethylene. Plastic dust caps can be reused, but are not intended to replace the standard aluminum dust caps shown on preceding pages.



Circular Connectors

| Part Number  | MS3100FR     |                | MS3102FR     |                | MS-F (only)<br>Solder Pot End | MS3106/MS3108<br>FR |                | Dimensions |        |        |        |        | Wt. Lb. |
|--------------|--------------|----------------|--------------|----------------|-------------------------------|---------------------|----------------|------------|--------|--------|--------|--------|---------|
|              | Coupling End | Solder Pot End | Coupling End | Solder Pot End |                               | Coupling End        | Solder Pot End | A Max.     | B Max. | C Max. | D Max. | E Max. |         |
| 025-0458-000 |              |                |              | 8S             |                               | 8S                  |                | .673       | .440   | .430   | .486   | .583   | .0012   |
| 025-0459-000 | 8S           | 8S, 10S        | 8S           | 8S, 10S        | 10S                           |                     | 8S, 10S        | .734       | .440   | .490   | .546   | .644   | .0014   |
| 025-0460-000 | 10S, 10SL    | 10SL, 12S, 12  | 10S, 10SL    | 10SL, 12S, 12  |                               | 10SL, 12S, 12       | 10SL, 12S, 12  | .848       | .700   | .600   | .656   | .758   | .0022   |
| 025-0462-000 | 12S, 12      | 14S, 14        | 12S, 12      | 14S, 14        |                               |                     | 14S, 14        | .973       | .700   | .730   | .786   | .883   | .0028   |
| 025-0463-000 | 14S, 14      | 16S, 16        | 14S, 14      | 16S, 16        |                               |                     | 16S, 16        | 1.098      | .700   | .850   | .908   | 1.008  | .0033   |
| 025-0466-000 |              |                |              | 18             | 18                            |                     |                | 1.209      | .700   | .950   | 1.016  | 1.119  | .0042   |
| 025-0467-000 |              |                |              | 20             |                               | 20                  |                | 1.396      | .700   | 1.150  | 1.216  | 1.308  | .0054   |
| 025-0468-000 | 20           |                | 20           | 22             | 22                            |                     |                | 1.500      | .700   | 1.240  | 1.306  | 1.405  | .0060   |
| 025-0469-000 | 22           |                | 22           | 24             | 24                            |                     |                | 1.625      | .700   | 1.360  | 1.426  | 1.530  | .0067   |
| 025-0470-000 |              |                |              | 28             |                               |                     |                | 1.870      | .700   | 1.610  | 1.676  | 1.775  | .0087   |
| 025-0471-000 |              |                |              | 32             |                               |                     |                | 2.120      | .700   | 1.860  | 1.926  | 2.025  | .0103   |
| 025-0472-000 |              |                |              | 36             |                               |                     |                | 2.370      | .700   | 2.110  | 2.176  | 2.275  | .0141   |
| 025-0473-000 |              |                |              | 40             |                               |                     |                | 2.501      | .700   | 2.310  | 2.380  | 2.491  | .0164   |
| 025-0474-000 |              |                |              | 44             |                               |                     |                | 2.872      | .700   | 2.590  | 2.660  | 2.772  | .0186   |
| 025-0475-000 |              |                |              | 48             |                               |                     |                | 3.122      | .700   | 2.840  | 2.910  | 3.022  | .0222   |
| 025-0477-000 |              |                |              |                |                               | 10S, 10SL           |                | .802       | .491   | .550   | .616   | .712   | .0017   |
| 025-0478-000 |              |                |              |                |                               | 12S, 12             |                | .911       | .571   | .669   | .725   | .821   | .0022   |
| 025-0479-000 |              |                |              |                |                               | 14S, 14             |                | 1.036      | .571   | .794   | .850   | .946   | .0027   |
| 025-0480-000 |              |                |              |                |                               | 16S, 16             |                | 1.161      | .571   | .919   | .975   | 1.071  | .0033   |
| 025-0484-000 |              |                |              |                |                               | 18                  |                | 1.290      | .576   | 1.028  | 1.094  | 1.195  | .0044   |
| 025-0486-000 |              |                |              |                |                               | 22                  |                | 1.540      | .576   | 1.278  | 1.344  | 1.445  | .0058   |
| 025-0487-000 |              |                |              |                |                               | 24                  |                | 1.665      | .576   | 1.403  | 1.469  | 1.570  | .0066   |
| 025-0488-000 |              |                |              |                |                               | 28                  |                | 1.907      | .576   | 1.645  | 1.711  | 1.812  | .0084   |
| 025-0489-000 |              |                |              |                |                               | 32                  |                | 2.157      | .576   | 1.895  | 1.961  | 2.062  | .0102   |
| 025-0490-000 |              |                |              |                |                               | 36                  |                | 2.412      | .576   | 2.140  | 2.216  | 2.317  | .0132   |
| 025-0491-000 |              |                |              |                |                               | 40                  |                | 2.672      | .576   | 2.390  | 2.466  | 2.572  | .0163   |
| 025-0492-000 |              |                |              |                |                               | 44                  |                | 2.922      | .576   | 2.640  | 2.716  | 2.822  | .0186   |
| 025-0493-000 |              |                |              |                |                               | 48                  |                | 3.172      | .576   | 2.890  | 2.966  | 3.072  | .0213   |
| 025-0498-000 | 16S, 16      | 18             | 16S, 16      | 48             |                               |                     | 18             | 1.240      | .700   | .990   | 1.056  | 1.150  | .0044   |
| 025-0499-000 |              | 20, 22         |              | 36             |                               | 22                  | 20, 22         | 1.427      | .700   | 1.117  | 1.183  | 1.337  | .0055   |
| 025-0500-000 |              | 24, 28         |              | 40             |                               |                     | 24, 28         | 1.677      | .700   | 1.420  | 1.486  | 1.587  | .0072   |
| 025-0501-000 | 28           | 32             | 28           | 44             |                               |                     | 32             | 1.985      | .700   | 1.730  | 1.796  | 1.895  | .0095   |
| 025-0502-000 | 32           | 36             | 32           | 32             |                               |                     | 36             | 2.245      | .700   | 1.980  | 2.046  | 2.155  | .0114   |
| 025-0503-000 | 36           | 40             | 36           | 24, 28         |                               |                     | 40             | 2.495      | .700   | 2.230  | 2.296  | 2.400  | .0134   |
| 025-0504-000 | 40           | 44             | 40           | 20, 22         |                               |                     | 44             | 2.742      | .700   | 2.480  | 2.546  | 2.652  | .0186   |
| 025-0505-000 | 48           |                | 48           | 18             |                               |                     | 48             | 3.257      | .700   | 2.980  | 3.046  | 3.157  | .0233   |
| 025-0507-000 | 18           |                | 18           |                | 20                            |                     |                | 1.365      | .700   | 1.110  | 1.176  | 1.275  | .0050   |
| 025-0510-000 | 24           |                | 24           |                |                               |                     |                | 1.740      | .700   | 1.490  | 1.556  | 1.650  | .0077   |
| 025-0511-000 | 44           | 48             | 44           |                |                               |                     |                | 3.007      | .700   | 2.730  | 2.796  | 2.907  | .0220   |
| 025-0608-000 |              |                |              |                | 8S                            |                     |                | .643       | .440   | .400   | .456   | .553   | .0011   |
| 025-0609-000 |              |                |              |                | 10SL, 12S, 12                 |                     |                | .829       | .700   | .580   | .636   | .739   | .0021   |
| 025-0610-000 |              |                |              |                | 14S, 14                       |                     |                | .954       | .700   | .710   | .766   | .864   | .0028   |
| 025-0611-000 |              |                |              |                | 16S, 16                       |                     |                | 1.079      | .700   | .830   | .886   | .989   | .0032   |
| 025-0612-000 |              |                |              |                | 28                            |                     |                | 1.839      | .700   | 1.570  | 1.626  | 1.744  | .0083   |
| 025-0613-000 |              |                |              |                | 32                            |                     |                | 2.089      | .700   | 1.820  | 1.876  | 1.994  | .0100   |
| 025-0614-000 |              |                |              |                | 36                            |                     |                | 2.376      | .700   | 2.010  | 2.066  | 2.231  | .0132   |

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For technical assistance, price or delivery information, call your local technical sales office or distributor.

 Dimensions are shown in inches.  
 Dimensions subject to change.

## F80 Assembly Instructions

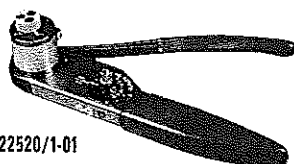
ITT Cannon provides a complete line of crimp insertion and extraction tooling to be used with CA-F80 contacts as follows:

| Contact Size | Hand Crimp Tool* | Locator | Power Crimp Tool** | Crimp Head | Locator   | Gauge   |
|--------------|------------------|---------|--------------------|------------|-----------|---------|
| 16           | M-22520/1-01     | TH-70-1 | CBT-530            |            |           |         |
| 12           | M-22520/1-01     | TP567   | CBT-600/600B       | CCH-12-7   | CCHP-12-2 | ---     |
| 8            | ---              | ---     | CBT-600/600B       | CCH-8-1    | CCHP-8-1  | CCH-8-1 |
| 4            | ---              | ---     | CBT-600/600B       | CCH-4-1    | CCHP-4-1  | CCH-4-1 |
| 0            | ---              | ---     | CBT-600B           | CCH-0-1    | CCHP-0-9  | CCH-0   |

\*The M-22520/1-01 is the MIL standard crimp tool for #12 thru #20 contacts and when used with crimp #12, 16 and 20 contacts for the CA-F80.

\*\*The CBT-600 is recommended for crimping of #4 thru #12 contacts. The CBT-600B for #0 thru #8. The appropriate locators and crimp heads are available as shown above.

## Crimp Tool



M22520/1-01

## Crimping Contacts

1. Check the crimp tool to be sure that the proper crimp head locator is used.
2. Cycle the tool to be sure the indentors are open.
3. Place the contact, mating end first, into the tool.
4. Insert the stripped wire into the hollow end of the contact. Be sure the wire is inserted as far as it will go.
5. Close the tool completely to crimp. Unless the tool is closed completely, the tool will not release the contact.
6. Remove the crimped contact from the tool. Check the inspection hole to verify that the wire is fully inserted.

## Insertion/Extraction Tools



CIT

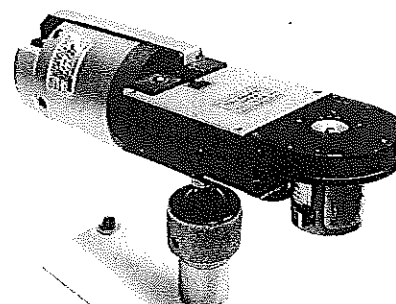
CET

Insertion and extraction tools used for these connectors are available for contact sizes 16 thru 0 as shown.

| Contact Size | Insertion Tools         | Extraction Tools          | Handle Color |
|--------------|-------------------------|---------------------------|--------------|
| 16           | CIT-16<br>(038895-0000) | CET-16-4<br>(038888-0004) | Blue         |
| 12           | CIT-12<br>(038896-0000) | CET-12-2<br>(038890-0002) | Yellow       |
| 8            | CIT-8                   | CET-8                     | Red          |
| 4            | CIT-4                   | CET-4                     | Blue         |
| 0            | CIT-0                   | CET-0                     | Yellow       |



CBT-600



CBT-520/530

## Insertion of Contacts

1. Before inserting the contacts, remove the endbell, grommets, and ferrule from the receptacle. Remove the endbell, grommet, ferrule, and coupling nut from the plug. Slide the hardware over the wire bundle in the proper order for reassembly after all the contacts are inserted.
2. To assist insertion of contacts, lubricate insert cavities with isopropyl alcohol. Alcohol will evaporate and will not leave a conductive film. **Caution: Never use any lubricant other than isopropyl alcohol.** Hold the plug or receptacle body firmly and insert the wired contacts as far as possible by hand. Starting at one side of the insulator, work progressively from contact to contact across the layout. When inserting socket contacts, be sure to provide fixture space below the front face to permit length of guide pins for #16 and #12 contacts to clear insulator face.
3. Place the correct insertion tool on the contact so that the wire runs along the groove in the tool. (Tool tip will butt against the shoulder.)
4. Beginning with a cavity on the outer edge of the plug, apply a slow, even pressure perpendicular to the insulator face until the contact snaps into position. If contacts are not inserted all the way prior to removing insertion tool, do not try to reinsert the insertion tool. Instead, using the extraction tool, push the contact back to position it was in when the insertion tool was originally placed over the contact for push-in; other wise the inside of contact cavity may be damaged by reinserting the insertion tool.
5. Inspect the front end of the insulator to assure that the contacts are inserted to the proper depth.

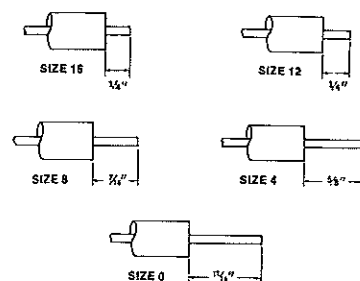
## Completion

After all the cavities have been filled, slide the hardware back into position on the barrel. Tighten the endbell until the ferrule and endbell are flush. Compression of the grommet in this manner results in maximum sealing characteristics of the plug.

## Extraction of Contacts

1. Select the appropriate tool. (Tool tips are reversible for either pin or socket.) Place the extraction tool over the pin or into the socket.
2. Apply a slow, even pressure to push the contact out of the rear of the insulator.

## Recommended Wire Stripping



## Contacts

| Contact Size | Contact Part Numbers |              |
|--------------|----------------------|--------------|
|              | F80                  |              |
|              | Pin                  | Socket       |
| 16S          | 330-0345-016         | 031-0554-161 |
| 16           | 330-0351-016         | 031-0560-161 |
| 12           | 330-0351-012         | 031-0560-121 |
| 8            | 330-0351-008         | 031-0560-081 |
| 4            | 330-0351-004         | 031-0560-041 |
| 0            | 330-0351-000         | 031-0560-001 |

## Guide Pins

Guide pins are used to assist insertion of socket contact Sizes #16 and #12. Larger sizes do not require guide pins.

| Contact | Guide Pin    |
|---------|--------------|
| #16     | 226-1017-000 |
| #12     | 226-1018-000 |

## Wire Hole Fillers

| Size | ITT Cannon Part Number | MS Number  |
|------|------------------------|------------|
| 16   | 225-0017-000           | MS25251-16 |
| 12   | 225-0018-000           | MS25251-12 |
| 8    | 225-0019-000           | MS25251-8  |

# ITT Cannon

For technical assistance, price or delivery information, call your local technical sales office or distributor.

Dimensions are shown in inches.  
Dimensions subject to change.

Circular  
Connectors