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AS39029/77

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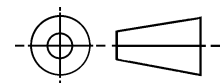
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THIRD ANGLE PROJECTION



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## AEROSPACE STANDARD

CONTACTS, ELECTRICAL CONNECTOR, SOCKET, CRIMP  
REMOVABLE, SHIELDED, SIZE 16 (FOR MIL-C-38999 SERIES  
I, III, AND AND IV CONNECTORS)

**AS39029/77**  
SHEET 1 OF 9

THE COMPLETE REQUIREMENTS FOR ACQUIRING THE CONTACTS DESCRIBED HEREIN SHALL CONSIST OF THIS SPECIFICATION AND THE LATEST ISSUE OF MIL-C-39029.

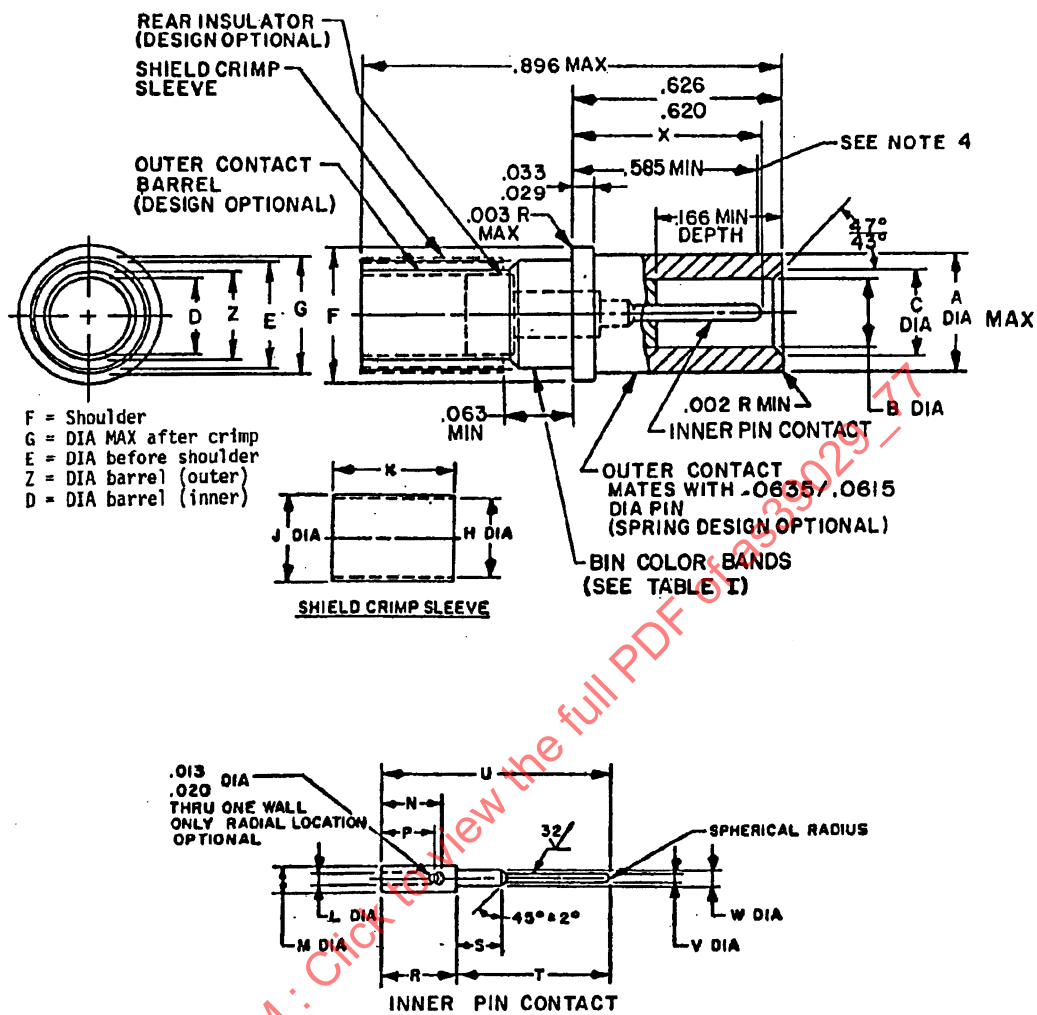


FIGURE 1. SOCKET CONTACTS.

| BIN<br>code | A<br>Dia.<br>Max. | B<br>Dia. | C<br>Dia. | D<br>Dia.<br>Min. | E<br>Dia. | F<br>Dia. | G<br>Dia.<br>Max. | H<br>Dia.<br>Min. | J<br>Dia.<br>Max. | K    | L<br>Dia.<br>Min. | M<br>Dia.<br>Max. |
|-------------|-------------------|-----------|-----------|-------------------|-----------|-----------|-------------------|-------------------|-------------------|------|-------------------|-------------------|
| 428         | .113              | .068      | .089      | .0670             | .103      | .130      | .108              | .105              | .120              | .105 | .0210             | .046              |
|             |                   | .065      | .084      |                   | .101      | .127      |                   |                   |                   | .095 |                   |                   |
| 429         | "                 | "         | "         | .0575             | "         | "         | "                 | .094              | "                 | "    | .0210             | .046              |
| 430         | "                 | "         | "         | .0670             | "         | "         | "                 | .105              | "                 | "    | .0355             | .052              |
| 431         | "                 | "         | "         | .0575             | "         | "         | "                 | .094              | "                 | "    | .0270             | .046              |

| BIN<br>code | N<br>Min. | P            | R            | S            | T            | U<br>REF. | V<br>Dia.      | W<br>Dia.    | X            | Z<br>Dia.<br>Max. |
|-------------|-----------|--------------|--------------|--------------|--------------|-----------|----------------|--------------|--------------|-------------------|
| 428         | .103      | .094<br>.087 | .125<br>.119 | .079<br>.073 | .269<br>.266 | .3895     | .0155<br>.0145 | .030<br>.028 | .611<br>.601 | .085              |
| 429         | "         | "            | "            | "            | "            | "         | "              | "            | "            | .076              |
| 430         | "         | "            | "            | "            | "            | "         | "              | "            | "            | .085              |
| 431         | "         | "            | "            | "            | "            | "         | "              | "            | "            | .076              |

| INCHES | MM    | INCHES | MM    | INCHES | MM    | INCHES | MM   | INCHES | MM    |
|--------|-------|--------|-------|--------|-------|--------|------|--------|-------|
| .002   | 0.05  | .030   | 0.76  | .0670  | 1.700 | .095   | 2.41 | .127   | 3.23  |
| .003   | 0.08  | .033   | 0.84  | .068   | 1.73  | .101   | 2.57 | .130   | 3.30  |
| .013   | 0.33  | .0355  | 9.002 | .073   | 1.85  | .103   | 2.62 | .166   | 4.22  |
| .0145  | 0.368 | .046   | 1.17  | .076   | 1.93  | .105   | 2.67 | .266   | 6.67  |
| .0155  | 0.394 | .052   | 1.32  | .079   | 2.01  | .108   | 2.74 | .269   | 6.83  |
| .020   | 0.51  | .0575  | 1.460 | .084   | 2.13  | .110   | 2.79 | .585   | 14.86 |
| .0210  | 0.530 | .0615  | 1.562 | .085   | 2.16  | .113   | 2.87 | .601   | 15.27 |
| .0270  | 0.690 | .063   | 1.60  | .087   | 2.21  | .119   | 3.02 | .611   | 15.52 |
| .028   | 0.71  | .0635  | 1.613 | .089   | 2.26  | .120   | 3.05 | .620   | 15.75 |
| .029   | 0.74  | .065   | 1.65  | .094   | 2.39  | .125   | 3.18 | .626   | 15.90 |
|        |       |        |       |        |       |        |      | .896   | 22.76 |

## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Dimensions shown apply after plating.
4. Point at which a square ended pin of the same basic diameter as the mating contact first engages the outer contact spring. Provision for clearance hole shall be provided.
5. Crimp deformation: The maximum diameter over the crimped portion of the shield crimp sleeve shall not exceed G diameter.

FIGURE 1. SOCKET CONTACTS - CONTINUED.

## REQUIREMENTS:

Contacts shall comply with the reliability assurance provisions of MIL-STD-790 as specified in MIL-C-38999.

Dimensions, design characteristics, and configuration: See figure 1 and table I.

Mating contacts: MIL-C-39029/76.

Tools: See table II.

TABLE I. DESIGN CHARACTERISTICS.

| BIN code | Color bands |        |       | Cable accommodated                                                                                                                                                 | Contact cavity size              | Type                            | Class                           |
|----------|-------------|--------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------------|---------------------------------|
|          | 1st         | 2nd    | 3rd   |                                                                                                                                                                    |                                  |                                 |                                 |
| 428      | Yellow      | Red    | Gray  | 3/ { M17/119-RG174<br>M17/113-RG316<br>M17/094-RG179<br>Times AA3248<br>Teledyne 11299<br>1/2 { Thermax 75-738-BCCWYE<br>Tensolite 30888/L707YX-1<br>Haveg 8100207 | 16<br>"<br>"<br>"<br>"<br>"<br>" | D<br>"<br>"<br>"<br>"<br>"<br>" | B<br>"<br>"<br>"<br>"<br>"<br>" |
| 429      | Yellow      | Red    | White | M17/093-RG178                                                                                                                                                      | "                                | "                               | "                               |
| 430      | Yellow      | Orange | Black | 1/ { Haveg 61-02051<br>Revere WH95623 (red shielded)                                                                                                               | "<br>"                           | "<br>"                          | "<br>"                          |
| 431      | Yellow      | Orange | Brown | 1/ { Haveg 30-02024<br>Haveg 30-02033<br>Tensolite 24713/A955KK1<br>Tensolite 26723/A955KK1                                                                        | "<br>"<br>"<br>"                 | "<br>"<br>"<br>"                | "<br>"<br>"<br>"                |

1/ Or equivalent.

2/ High tensile strength copper alloy wire.

3/ M17/119-RG174 PVC not for Air Force use.

TABLE II. TOOLS.

| BIN code           | Inner contact       |             | Outer contact       |             | Installing tool                   | Removal tool                      |
|--------------------|---------------------|-------------|---------------------|-------------|-----------------------------------|-----------------------------------|
|                    | Basic crimping tool | Positioner  | Basic crimping tool | Positioner  |                                   |                                   |
| 428, 429, 430, 431 | M22520/2-01         | M22520/2-35 | M22520/4-01         | M22520/4-02 | M81969/8-07<br>or<br>M81969/14-03 | M81969/8-08<br>or<br>M81969/14-03 |

Cable to contact information: See table III.

TABLE III. CABLE TO CONTACT INFORMATION.

| BIN code | Cable accommodated                                                                                                                                                                    | Inner contact tool selector setting no. |
|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| 428      | <u>3/</u> { M17/119-RG174<br>M17/113-RG316<br>M17/094-RG179<br>Times AA3248<br>Teledyne 11299<br>Thermax 75-738-BCCWXE<br>Tensolite 30888/L707YX-1<br>Haveg 8100207<br><u>1/ 2/</u> { | 3<br>5<br>3<br>"<br>"<br>"<br>"<br>"    |
| 429      | M17/093-RG178                                                                                                                                                                         | 3                                       |
| 430      | <u>1/</u> { Haveg 61-02051<br>Revere WH95623 (red shielded)                                                                                                                           | 4<br>4                                  |
| 431      | <u>1/</u> { Haveg 30-02024<br>Haveg 30-02033<br>Tensolite 24713/A955KK1<br>Tensolite 26723/A955KK1                                                                                    | 4<br>3<br>3<br>3                        |

1/ Or equivalent.

2/ High tensile strength copper alloy wire.

3/ M17/119-RG174 PVC not for Air Force use.

Contact resistance: See table IV.

Test current:

Inner contact - 1 ampere.

Outer contact - 12 amperes.

Low signal level contact resistance (inner contact only): See table V.

Contact engagement and separation forces (socket contact only): The engagement depth shall be as encountered in normal service. The test pins shall be in accordance with MS3197 except the diameters shall be as specified in the following, and surface roughness shall not exceed 3 microinches. Provision for clearance hole shall be provided.

| Test pin diameter (inch)    | Minimum separation force (ounces) |                    | Maximum engagement force (ounces) |                    | Maximum average engagement force |
|-----------------------------|-----------------------------------|--------------------|-----------------------------------|--------------------|----------------------------------|
|                             | Initial                           | After conditioning | Initial                           | After conditioning |                                  |
| .0635 $\pm .0002$<br>-.0000 | NA                                | NA                 | 30.0                              | 36.0               | NA                               |
| .0615 $\pm .0000$<br>-.0002 | 2.0                               | 1.5                | NA                                | NA                 | NA                               |

Dielectric withstanding voltage (applied between inner and outer contact):

Test voltage:

At sea level - 800 V ac rms.

At 50,000 feet - 250 V ac rms.

Tensile strength (inner and outer contact crimp joint): See table V.

TABLE IV. CONTACT RESISTANCE.

| BIN code | Cable accommodated                                                                                            | Maximum voltage drop (millivolts) |               |                     |               |                   |               | Maximum average voltage drop |
|----------|---------------------------------------------------------------------------------------------------------------|-----------------------------------|---------------|---------------------|---------------|-------------------|---------------|------------------------------|
|          |                                                                                                               | 25° +3°C<br>-0°C                  |               | 2/ 25° +3°C<br>-0°C |               | 200° +3°C<br>-0°C |               |                              |
|          |                                                                                                               | Inner contact                     | Outer contact | Inner contact       | Outer contact | Inner contact     | Outer contact |                              |
| 428      | 5/ { M17/119-RG174                                                                                            | 55                                | 85            | 66                  | 102           | 94 4/             | 145 4/        | NA                           |
|          | M17/113-RG316                                                                                                 | 55                                | 75            | 66                  | 90            | 94                | 128           | "                            |
|          | M17/094-RG179                                                                                                 | 120                               | 70            | 144                 | 84            | 204               | 119           | "                            |
|          | Times AA3248                                                                                                  | 170                               | 150           | 204                 | 180           | 290               | 255           | "                            |
|          | Teledyne 11299                                                                                                | "                                 | "             | "                   | "             | "                 | "             | "                            |
|          | 1/ 3/ { Thermax 75-738-BCCWKE                                                                                 | "                                 | "             | "                   | "             | "                 | "             | "                            |
|          | Tensolite 30888/L707YX-1                                                                                      | "                                 | "             | "                   | "             | "                 | "             | "                            |
|          | Haveg 8100207                                                                                                 | "                                 | "             | "                   | "             | "                 | "             | "                            |
| 429      | M17/093-RG178                                                                                                 | 120                               | 110           | 144                 | 132           | 204               | 187           | "                            |
| 430      | 1/ { Haveg 61-02051<br>Revere WH95623 (red shielded)                                                          | 65                                | 100           | 78                  | 120           | 111               | 170           | "                            |
|          |                                                                                                               | 65                                | 100           | 78                  | 120           | 111               | 170           | "                            |
| 431      | 1/ { Haveg 30-00761<br>Haveg 30-02024<br>Haveg 30-02033<br>Tensolite 24713/A955KK1<br>Tensolite 26723/A955KK1 | 120                               | 110           | 144                 | 132           | 204               | 187           | "                            |
|          |                                                                                                               | "                                 | "             | "                   | "             | "                 | "             | "                            |
|          |                                                                                                               | "                                 | "             | "                   | "             | "                 | "             | "                            |
|          |                                                                                                               | 55                                | 100           | 66                  | 120           | 94                | 170           | "                            |
|          |                                                                                                               | 65                                | 100           | 78                  | 120           | 111               | 170           | "                            |

1/ Or equivalent.

2/ After conditioning.

3/ High tensile strength copper alloy wire.

4/ 85° +3°, -0°C is maximum operating temperature of cable.

5/ M17/119-RG174 PVC not for Air Force use.

TABLE V. LOW SIGNAL LEVEL CONTACT RESISTANCE (INNER CONTACT ONLY) AND TENSILE STRENGTH.

| BIN code | Cable accommodated                                                                                                                                                                 | Maximum contact resistance (milliohms) |                    | Tensile load (pounds) (minimum) |               |
|----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|--------------------|---------------------------------|---------------|
|          |                                                                                                                                                                                    | Initial                                | After conditioning | Inner contact                   | Outer contact |
| 428      | <u>3/</u> { M17/119-RG174<br>M17/113-RG316<br>M17/094-RG179<br>Times AA3248<br>Teledyne 11299<br><u>1/ 2/</u> { Thermax 75-738-BCCWXE<br>Tensolite 30888/L707YX-1<br>Haveg 8100207 | 55                                     | 66                 | 15.0                            | 15.0          |
|          |                                                                                                                                                                                    | 55                                     | 66                 | 10.0                            | "             |
|          |                                                                                                                                                                                    | 120                                    | 144                | 3.5                             | "             |
|          |                                                                                                                                                                                    | 170                                    | 204                | 7.0                             | 35.0          |
|          |                                                                                                                                                                                    | "                                      | "                  | "                               | "             |
|          |                                                                                                                                                                                    | "                                      | "                  | "                               | "             |
|          |                                                                                                                                                                                    | "                                      | "                  | "                               | "             |
|          |                                                                                                                                                                                    | "                                      | "                  | "                               | "             |
| 429      | M17/093-RG178                                                                                                                                                                      | 120                                    | 144                | 3.5                             | 10.0          |
| 430      | <u>1/</u> { Haveg 61-02051<br>Revere WH95623 (red shielded)                                                                                                                        | 65                                     | 78                 | 15.0                            | 15.0          |
|          |                                                                                                                                                                                    | 65                                     | 78                 | 15.0                            | 15.0          |
| 431      | <u>1/</u> { Haveg 30-00761<br>Haveg 30-02024<br>Haveg 30-02033<br>Tensolite 24713/A955KK1<br>Tensolite 26723/A955KK1                                                               | 120                                    | 144                | 4.0                             | 10.0          |
|          |                                                                                                                                                                                    | "                                      | "                  | "                               | "             |
|          |                                                                                                                                                                                    | "                                      | "                  | "                               | "             |
|          |                                                                                                                                                                                    | 55                                     | 66                 | "                               | "             |
|          |                                                                                                                                                                                    | 65                                     | 78                 | "                               | "             |

1/ Or equivalent.2/ High tensile strength copper alloy wire.3/ M17/119-RG174 PVC not for Air Force use.

Vibration (random): Connectors shall be subjected to the test specified in method 2005 of MIL-STD-1344. The following details shall apply:

- Test condition V. Using the vibration envelope shown on figure 2. (Derived from zone 2 outlined in Aerospace Information Report AIR 1557.)
- Vibration to be conducted at standard test conditions.
- Duration shall be 8 hours in the longitudinal direction and 8 hours in a perpendicular direction for a total of 16 hours.

Shock (high-impact): Wired and mated connectors shall be subjected to the test specified in MIL-S-901, grade A with the following modifications and additions:

- Connectors shall be coupled together by normal coupling means. All contacts shall be wired in a series circuit with 100 milliamperes maximum current flow through the series circuit during high-impact shock. Connectors shall be monitored for any discontinuities. A detector capable of detecting all discontinuities in excess of 1 microsecond shall be used.
- Mounting fixture shall be in accordance with MIL-S-901, light weight.
- The cable or wire bundle shall be supported on a stationary frame in such a manner to provide a free flexing cable length between frame and fixture of not less than 36 inches (914.4 mm).
- Test condition A. The plug shall be terminated with at least 80 percent of wired contacts. The wire bundle shall be provided with straight, open frame, strain relief accessory hardware.