

INCH-POUND

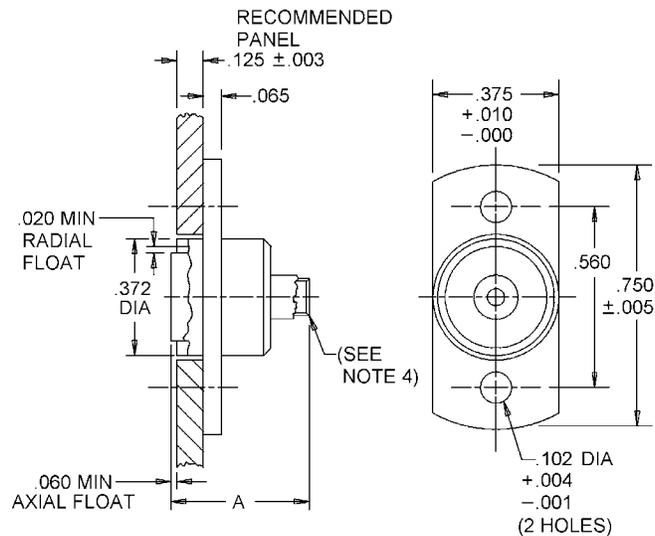
MIL-PRF-31031/11B
12 April 2004
SUPERSEDING
MIL-PRF-31031/11A
3 November 1998

PERFORMANCE SPECIFICATION

CONNECTOR, RECEPTACLE, ELECTRICAL, RADIO FREQUENCY, SERIES BMA, FLANGE MOUNT, FOR SEMIRIGID CABLE, SOCKET CONTACT, HIGH RELIABILITY

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification sheet and MIL-PRF-31031.

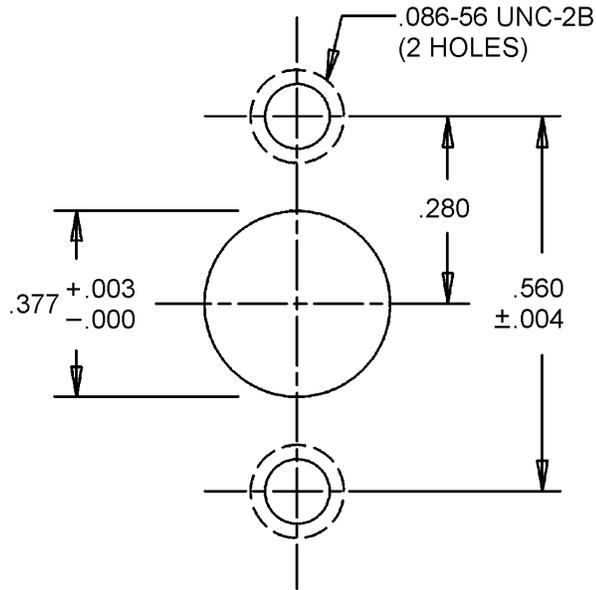


Inches	mm	Inches	mm	Inches	mm
.000	0.00	.010	0.25	.125	3.18
.001	0.03	.020	0.51	.372	9.45
.003	0.08	.060	1.52	.375	9.53
.004	0.10	.065	1.65	.560	14.22
.005	0.13	.102	2.59	.750	19.05

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, all tolerances are ±.005 inch.
4. See table I for cable accommodation.
5. For dimension A see table I.
6. Dimension A defines the overall length of the connector when assembled to the cable.

FIGURE 1. General configuration.



RECOMMENDED MOUNTING HOLE

Inches	mm
.000	0.00
.003	0.08
.004	0.10
.086	2.18
.280	7.11
.377	9.58
.560	14.22

Spring compression force and travel: The face of the push-on interface shall have a total travel capability of .060 Inch toward the connector retainer clip. Force versus displacement shall be as follows:

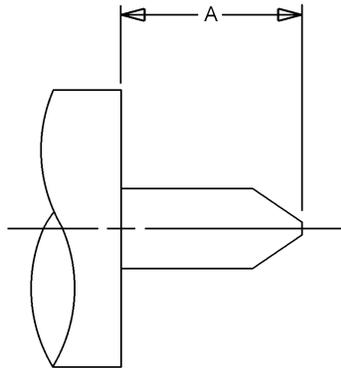
Displacement Inches/mm	Force pounds
.010 (0.25)	3.0 ± .5
.050 (1.27)	3.7 ± .5
.060 (1.52)	3.8 ± .5

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.

FIGURE 2. Recommended mounting hole.

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Stripping dimensions

Cable	Dimension A	
	Minimum	Maximum
M17/130-RG402 group XVI	.080 (2.03 mm)	.090 (2.29 mm)
M17/133-RG405 group XVII	.065 (1.65 mm)	.075 (1.91 mm)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Tapering of the center conductor is required see manufacturers instructions.
4. All undimensioned pictorial configurations are for reference purposes only.

FIGURE 3. Cable stripping dimensions.

TABLE I. PIN's cross-reference and dimensions.

PIN <u>1/</u> M31031/11	Applicable cable and group <u>2/ 3/</u> M17/	Dimensions	Inches (millimeters) maximum
Category E - Field serviceable (no special tools required) <u>4/</u>			
E**01	130-RG402 group XVI	A	.715 (18.03 mm)
E**02	133-RG405 group XVII	A	.715 (18.03 mm)

- 1/ These connectors have captivated center contacts.
- 2/ The cables are to be used when performing tests, however, all the cables in the specification sheet must accommodate the connectors.
- 3/ The latest version of the cable is applicable.
- 4/ Kit number - Omni Spectra T-200, Amphenol 901-2500, or equivalent.

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TABLE II. Cable retention force.

Cable	Pounds (minimum)	Torque (minimum)
MIL-C-17/130 group XVI	60	55
MIL-C-17/133 group XVII	30	16

1/ Torque to be applied 4 inches maximum from the end of the connector reverse bend not applicable.

TABLE III. Group qualification. 1/ 2/ 3/ 4/

Group	Submission and qualification of any of the following connectors	Qualifies the following connectors
1	M31031/11E**02	M31031/11E**01 M31031/11E**02

* Options as defined in the PIN construction.

1/ Individual connectors other than those listed are self-qualifying.

2/ Qualification of connectors qualifies connectors of the same body materials only.

3/ Qualification of connectors qualifies connectors of the same environmental construction only.

4/ Changes in plating (body or center contact) shall require the corrosion and contact resistance tests be performed.

ENGINEERING DATA

Nominal impedance: 50 ohms \pm 1 ohm.

Frequency range: 0 to 18 GHz (frequency limit is dependent on cable used).

Voltage rating:

MIL-C-17/130 and group XVI: 500 V rms at sea level: 125 V rms at 70,000 feet.

MIL-C-17/133 and group XVII: 335 V rms at sea level: 85 V rms at 70,000 feet.

Temperature rating: -65°C to +125°C.

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REQUIREMENTS: The following tests assure connector integrity within typical operating conditions and applications. Alternate methods shall be made known to the qualifying authority prior to performance of the test. The test methods described in the general specification and herein are proven methods and shall be the referee method in case of dispute.

Dimensions and configurations: See figures 1 and 2 and MIL-STD-348.

Force to engage and disengage:

- Longitudinal force: 3 pounds maximum.
- Torque: Not applicable.
- Radial misalignment: ± 0.020 inch (0.050 mm) minimum.
- Axial misalignment: .060 inch (1.52 mm) minimum.
- Coupling proof torque: Not applicable.

Mating characteristics:

Reference: MIL-STD-348 for dimensions.

Hermetic seal: Not applicable.

Permeability: Applicable.

Leakage (pressurized connectors): Not applicable.

Insulation resistance: Test procedure 021 of EIA 364 5,000 megohms minimum.

Center contact retention: 6 pounds minimum axial force.

Radial torque: Not applicable.

Corrosion (salt spray): Test procedure 026 of EIA 364 condition B.

Voltage standing wave ratio (VSWR): From 500 to 18 GHz or approximately 80 percent of upper cutoff frequency of the cable, whichever is lower:

- MIL-C-17/130 and group XVI: 1.02 ± 0.005 F (GHz).
- MIL-C-17/133 and group XVII: 1.05 ± 0.005 F (GHz).

Connector durability: 500 cycles minimum at 12 cycles per minute maximum. The connector shall meet the mating characteristics and force to engage and disengage requirements.

Contact resistance: In milliohms maximum:

	<u>Initial</u>	<u>After environment</u>
Center contact	3.0	4.0
Outer contact	2.0	Not applicable
Outer cable conductor to body	0.5	Not applicable

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Dielectric withstanding voltage: Test procedure 020 of EIA 364 condition I.

MIL-C-17/130 and group XVI: 1,500 volts rms at 60 Hz at sea level.

MIL-C-17/133 and group XVII: 1,000 volts rms at 60 Hz at sea level.

Vibration high frequency: Test procedure 028 of EIA 364 condition III. No discontinuity permitted. This test needs to be performed only during initial qualification, so long as the qualifying design does not change.

Shock: Test procedure 027 of EIA 364 condition F. No discontinuity permitted. This test needs to be performed only during initial qualification, so long as the qualifying design does not change.

Temperature cycling: Test procedure 032 of EIA 364 condition I, 5 cycles, except test high temperature shall be +125°C. Low-test temperature shall be -65°C.

Moisture resistance: Test procedure 031 of EIA 364 condition B no measurements at high humidity. Insulation resistance shall be at least 200 megohms within 5 minutes after removal from humidity.

Corona level (at 70,000 feet): This test needs to be performed only during initial qualification, so long as the qualifying design does not change.

Cable group XVI: 375 volts rms minimum.

Cable group XVII: 250 volts rms minimum.

RF high potential withstanding voltage: This test needs to be performed only during initial qualification, so long as the qualifying design does not change.

Voltage and frequency (at a frequency from 5 to 7.5 MHz):

Leakage current: Not applicable.

Cable group XVI: 1,000 volts rms minimum.

Cable group XVII: 670 volts rms minimum.

Cable retention force: See table II.

Coupling mechanism retention force: Not applicable.

Shielding effectiveness: Test procedure 066 of EIA 364 -85 dB minimum. This test needs to be performed only during initial qualification, so long as the qualifying design does not change.

RF transmission loss (dB maximum): This test needs to be performed only during initial qualification, so long as the qualifying design does not change: $.03\sqrt{\text{frequency GHz}}$ Test at a frequency between 9 and 12.4 GHz.

Porosity: Applicable.

Thermal vacuum outgassing: Applicable to space grade connectors only.

Flammability: Applicable to space grade connectors only.

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Odor: Applicable to space grade connectors only.

Toxicity (offgassing): Applicable to space grade connectors only.

Safety wire hole pullout: Not applicable.

Part or Identifying Number (PIN): M31031/11 (see table I).

Group qualification: See table III.

NOTES:

1. If a connector manufacturer produces a connector that meets all the requirements for two or more connector PIN's (within the same series and of the same environmental grade), the manufacturer may receive qualification approval for two or more connector PIN's qualifying the one connector. It is not necessary that such connectors be in the same group. Each connector, however, must be marked with its own PIN. For group qualification, the connectors must be of the similar design.
2. For qualification retention, where more than one part is listed in a group in this column, data may be supplied on any of those parts in order to retain qualification for those parts in the corresponding right hand column. The part does not necessarily have to be the part initially qualified.

Supersession: This specification supersedes DSCC drawing 85071 when a QPL source becomes available.

In addition to MIL-PRF-31031, this specification sheet references the following documents:

MIL-STD-348
MIL-C-17/130
MIL-C-17/133
EIA 364

CONCLUDING MATERIAL

Custodians:
Army - CR
Navy - EC
Air Force - 11
DLA - CC

Preparing activity:
DLA - CC

(Project 5935-4619-003)

Review activities:
Army - AT, AV, EA, MI
Navy - AS, MC, OS, SH
Air Force - 19, 99

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <http://www.dodssp.daps.mil>.