PERFORMANCE and TEST METHODS for FASTON RECEPTACLES

1. SCOPE

1.1 SCOPE - This specification is applied to the FASTON receptacles shown in Table 1.

TABLE 1

No.	Discription	Wire size	Applicable tool
41969	.250 Series FASTON Receptacle	22-18	720590-1
41729	"	18-14	"
42806-2	"	"	46007-J
41829	"	14-10	90120
42599-2	.250 Series PIDG FASTON Recep.	22-18	90035
42332-9	"	16-14	90009
42844-1	"	14-12	59239
170038-2	.187 Series FASTON Recep.	20-16	720590-1

1.2 STYLE - The FASTON receptacles will accept a flat tab of specified thickness and width.

1.3 WIRE RANGE - The FASTON receptacles will accommodate the wire ranges indicated on the respective terminal drawings.

2. MATERIAL

2.1 TERMINAL MATERIAL

Copper Alloy No. 260 Brass, ASTM B36 Copper Alloy or equivalent.

2.2 INSULATION SLEEVE - Semi-rigid vinyle chloride with a high electric nonconductivity, distortion resistance and noncombustibility shall be employed for insulation.

LTR	REVISION RECORD	DR	CHK	DATE
B	Revised Para 3.1.1 Millivolt Drop			5/1/73
A	Revised 4.4.3			4/15/70
O	Released			

DR K Kitaba 3/16/67
CHK [illegible] 3/17/67
APP [illegible] 3/20/67

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3. PERFORMANCE

3.1 ELECTRIC PERFORMANCE

3.1.1 MILIVOLT DROP

When tested in accordance with 4.4.1, the millivolt drop in free air on "mating portion + crimped area of receptacle" shall not be greater than those shown in Table 2.

TABLE 2

Wire Size	Test Current (A)	Millivolt Drop (mV)	Temperature Rise (C)
AWG #22 (0.3mm^2)	2	6	20
20 (0.5mm^2)	4	12	20
18 (0.85mm^2)	7	21	20
16 (1.25mm^2)	10	30	30
14 (2.0mm^2)	15	45	30
12 (3.0mm^2)	20	60	30
10 (5.0mm^2)	25	75	30

3.1.2 CONTACT RESISTANCE OF MATING PORTION

When tested as specified in 4.4.1, the contact resistance across a mated pair of terminals shall not be greater than 2 milliohms.

3.1.3 TEMPERATURE RISE

When tested in accordance with 4.4.1, the temperature rise of receptacles shall not be greater than those values in Table 2.

3.1.4 DIELECTRIC STRENGTH

When tested as specified in 4.4.2, the crimped insulation shall withstand for 1 minute, without break down, 1,500 volts root mean square (Rms) at a frequency of 50 or 60 cycles per second (Cps).

3.2 MECHANICAL PERFORMANCE

3.2.1 TENSILE STRENGTH

When tested in accordance with 4.4.3, the tensile strength of crimped receptacle shall not be less than those values listed in Table 3.

TABLE 3

Wire Size	Tensile Strength (Kg)
AWG #22 ($0.3mm^2$)	5
20 ($0.5mm^2$)	8
18 ($0.85mm^2$)	12
16 ($1.25mm^2$)	18
14 ($2.0mm^2$)	22
12 ($3.0mm^2$)	30
10 ($5.0mm^2$)	40

4. TEST

4.1 TEST CONDITION - Tests shall be conducted under any combination of conditions within the following ranges.

Temperature:	20° to 30°C
Relative Humidity:	30 to 80%
Barometric Preasure:	610 to 790 mm Hg (24 to 31 inches of Mercury)

4.2 TEST SAMPLE - The specimens used for this test shall be the appropriate terminals crimped with applicable tools on the wires specified in Table 4.
The tab used for this test shall be CP-63-046J or CP-63-048J.

4.3 WIRE - The wire used for this test shall be as specified in Table 4.

TABLE 4

AWG Wire Size	Cross sectional Area (mm^2)	Composition of Conductor Dia meter (mm)	No. of Strand	CMA
#22	0.3	0.18	12	622
20	0.56	0.32	7	1111
18	0.88	0.32	11	1746
16	1.28	0.32	16	2540
14	2.09	0.32	26	4127
12	3.29	0.32	41	6509
10	5.23	0.32	65	10319

4.4 TEST METHOD

4.4.1 MILLIVOLT DROP METHOD (Re: Fig. 1)

The millivolt drop and contact resistance of crimped area shall be measured by Millivolt Drop Method.
As shown in Fig 1, connect D.C. source to Z-Z and supply the test current indicated in Table 2 to the wires in applicable wire size.
The lead wire shall be longer than 91.5 cm (3 feet) for heat dissipation.
After the temperature rise has stabilized, the millivolt drop $Y-X_2$ on "mating portion + crimped area of receptacle" shall be measured by means of D.C. voltmeter.
This measured value includes the millivolt drop of 3 inches of wire so that the millivolt drop of the wire must be deducted from the total measured value.
The contact resistance of mating portion shall be calculated by measuring the millivolt drop of mating portion X_1-X_2 with the test current of 4 Amps.
The temperature rise shall be measured by means of iron-constantan thermoconples set up on the position shown in Fig. 1 at the test current after the temperature becomes stabilized.

4.4.2 DIELECTRIC STRENGTH TEST METHOD

The test will be conducted with the test voltage applied between the insulation and wire assembled to the terminal for 1 minute. The voltage must be increased gradually until the specified voltage of 1,500 volts root mean square is reached. The exposed portion of the receptacle shall be sealed with beeswax to keep off a leakage.

When the beeswax is hardened, the sample shall be immersed in 5 per cent salt water solution to a depth sufficient to cover the crimped areas of the wire and insulation barrels.

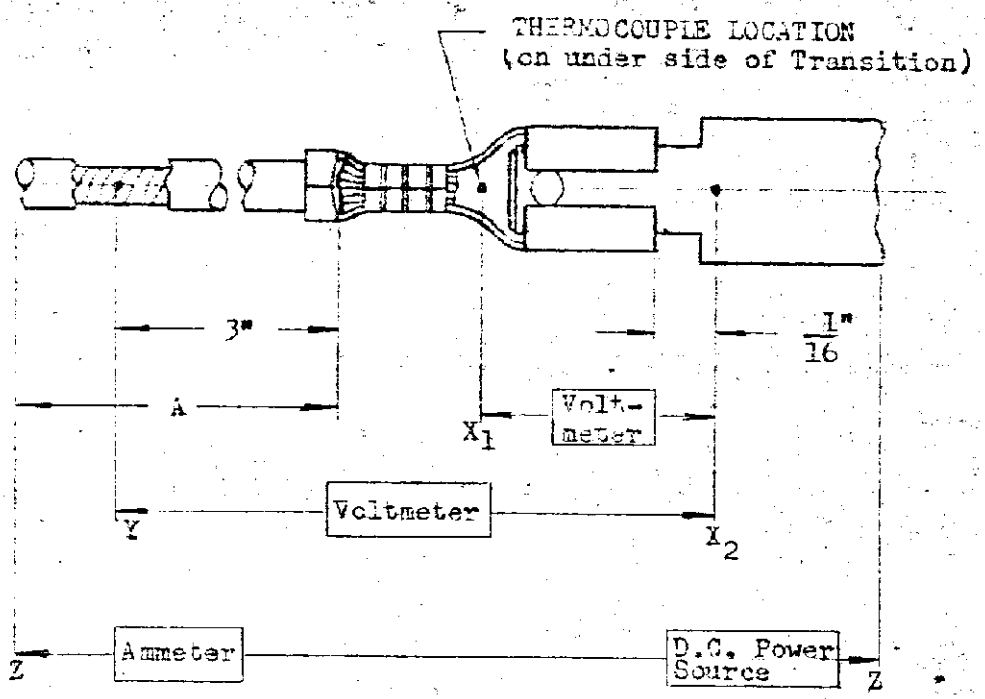
4.4.3 TENSILE STRENGTH TEST

Place the specimens crimped to wires of 6 inches (152.4 mm) in length in a standard tensile-testing machine and operate the machine at a speed of 1 inch per minute. The value of tensile strength is determined when the wire breaks or the wire is pulled out of the terminal crimp.

5. TEST EQUIPMENT

The following equipments are used for the determination of the test values.

	Name of Equipement	Manufacturer
(1)	300 kg Tension Tester	Tokyo Koki
(2)	D.C. Ammeter	YEW
(3)	D.C. Voltmeter	YEW
(4)	Draft Free Chamber	AMP-J
(5)	D.C. Source	AMP-J
(6)	Thermoelectric Thermometer	YEW
(7)	Dielectric Strength Tester	AMP-HBG



A: 3 feet (91.5 cm) minimum length of continuous lead. (for heat dissipation)

X_1: In the center of the transition area between wire barrel and receptacle.

X_2: On the mating tab $\frac{1}{16}$ inch (1.59 mm) from the front edge of the receptacle.

Y: Measure across the contact wire crimp. Insulation may be cut back for marking this measurement. The probe area on the wire shall be soldered so as to eliminate variables in contact resistance.

FIGURE 1