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High Temperature Electrical Connectors

Installation
Instructions

10-201XXX
BT Series

10-204XXX
BG Series

10-306XXX
Special

Form L-795-1
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Bendix Electrical Components Division

Sidney, N.Y. 13838

Installation Instructions for Bendix High Temperature Connectors

10-201XXX (BT Series)

10-204XXX(BT-G Series)

10-306XXX(Special)

DESCRIPTION

I. The Bendix high temperature BT type connectors withstand extreme ambient temperature and radiation conditions while maintaining electrical continuity. The BT series are sealed connectors utilizing Hastaloy shells, high grade Alumina dielectrics and nickel alloy contacts. The BT-G series sealed connectors utilize stainless steel shells, high grade Alumina dielectrics and nickel alloy contacts. The BT and BT-G connector series will maintain hermetic seals to 1000°F. Contacts are 0.000100 gold plated in the standard series. All threads are silver plated and modified with an undercut trailing edge to prevent seizing. Standard MIL-C-5015 insert arrangements and shell sizes are utilized. Shell styles include cable connecting plug, box mounting receptacle, weld mounting receptacle and straight plug.

II. CABLE AND WIRE PREPARATION

1. When working with multi-conductor cable remove the armor sheath (braid) from the end of the cable according to the rear accessory being used on the connector. Strip armor (braid) a sufficient distance to prevent the armor (braid) from entering any resilient sealing glands. Strip cable insulation from conductor bundle ahead of stripped armor (braid) end enough to provide a sufficient sealing area for sealing surfaces of rear accessory.

NOTE

When using cable with a rear elbow assembly, bend the cable to the elbow contour and cut off straight. This custom fits the cable to the assembly, positioning the longest conductor at the top of the elbow and reducing strain on the conductor termination.

2. Strip insulation 5/16 ± 1/32 inch from end of individual conductors; do not damage the conductor strands. Use hot wire stripping whenever applicable.

NOTE

Very high temperature applications may demand wire with refractory type insulation (usually protected with a light metal braid). After cutting the shield used by this wire, bind the exposed portion of insulation to prevent fraying. Binding may be accomplished by using a glass thread and "whip-tie".

3. Fan each conductor and mechanically clean each strand of all impregnated sealant compound. Brushing with a clean fine wire brush is recommended. When strands are clean, rewind the conductor to its natural lay for ease of insertion through the applicable conductor adapter (See Table I).

NOTE

At temperatures (500° to 700°F) where wire insulation may be durable but small, the use of a conductor terminating sleeve with insulation support is recommended.

TABLE I

CONDUCTOR ADAPTERS

Contact Size	Wire Size	Nickel Part Number	Alumel Part Number	Chromel Part Number	* Type
12	12	10-166203-120	10-306298-120	10-306299-120	I
12	12	10-166203-121	10-306298-121	10-306299-121	II
12	14	10-166203-140	10-306298-140	10-306299-140	I
12	14	10-166203-141	10-306298-141	10-306299-141	II
16	16	10-166203-160	10-306298-160	10-306299-160	I
16	16	10-166203-161	10-306298-161	10-306299-161	II
16	18	10-166203-180	10-306298-180	10-306299-180	I
16	18	10-166203-181	10-306298-181	10-306299-181	II
16	20	10-166203-200	10-306298-200	10-306299-200	I
16	20	10-166203-201	10-306298-201	10-306299-201	II
**16	20	10-166203-202			II
16	22	10-166203-220	10-306298-220	10-306299-220	I
16	22	10-166203-221	10-306298-221	10-306229-211	II
**16	22	10-166203-222	10-306298-222	10-306299-222	II
16	24	10-166203-240			I

*Type I is without insulation support

Type II is with insulation support

**Adapters were set up for special application. Consult factory for further details.

4. Clean the adapter sleeve to be used by degreasing to remove any foreign material. Insert bare stranded conductor wire into appropriate conductor terminating adapter sleeve (depending upon wire and contact size) until wire extends through sleeve (approximately 1/16 inch). See Table I for appropriate adapter sleeve.

III. TERMINATION OF SIZE 12 CONTACTS

1. Insert the sleeve and conductor into a chill block fixture, as shown in Figure 1, and weld as follows:

A. Equipment

1. Miller Electric AC/DC Tungsten Inert Gas Arc Welder or equivalent capable of producing 20-30 amps of consistent D.C.S.P. welding current.

2. H. W. 20-8 Heliarc Torch (Linde Co.) or equivalent using a #6 gas cup, 1/16 inch diameter 2% thoriated tungsten electrode sharpened to a 20 tapered point.

3. Copper chill fixture equivalent to Figure 1.

B. Settings

1. Gas Flow - 8-10 cu. ft./hr. welding grade argon gas.

2. 30% of low range direct current straight polarity using high frequency starting current (actual welding current 30 amps ±5 amps).

C. Establish arc on copper chill and transfer arc to copper conductor, melting and fusing conductor to end of adapter.

D. Extinguish arc on copper chill and maintain inert gas coverage until weld has cooled.

NOTE

Weld bead and adapter must be free from oxides for the next weld. The copper chill is required to control weld size (must fit contact well), oxidation, and protect conductor insulation.

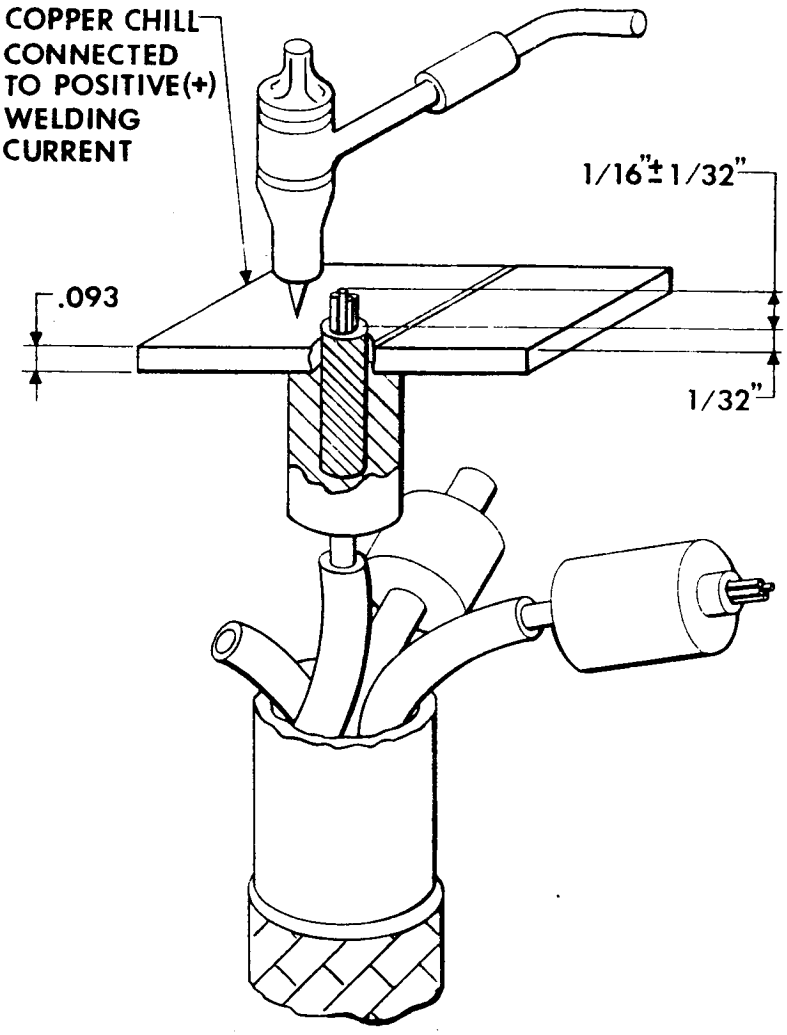

Figure 1

2. Hold connector in a suitable holding device insulated from all welding current as shown in Figure 2. Starting at center of connector arrangement, insert conductor assembly into contact wire well using chill/ground tool equivalent to Figure 2 and weld as follows:

A. Equipment

1. Miller Electric A.C./D.C. Tungsten A.C./D.C. Inert Gas Arc Welder or equivalent capable of producing 20-30 amps of consistent D.C.S.P. welding current.

2. H.W. 20-8 Heliarc Torch (Linde Co.) or equivalent using a #4 gas cup, 1/16 inch diameter 2% thoriated tungsten electrode sharpened to a 2D tapered point.

3. Copper chill fixture equivalent to Figure 2.

B. Settings

1. Gas Flow - 8-10 cu. ft./hr. welding grade argon gas.

2. 30% of low range direct current straight polarity using high frequency starting current (actual welding current 30 amps ± 5 amps).

C. Establish arc on chill/ground tool, transfer arc to joint, weld approximately 2/3 the diameter of joint, and extinguish the arc allowing inert gas coverage to remain until weld joint is cooled.

NOTE

Chill/ground should not touch adjacent contacts to avoid arcing to other contacts.
Chill is required to protect connector insulation.

IV TERMINATION OF SIZE 16 CONTACTS

1. Termination of size 16 contacts is accomplished using the same method except for setting and equipment changes. When welding the wire to the adapter and conductor assembly to the contact wire well the following setting should be used: 15% of low range direct current straight polarity using high frequency starting current. (Actual welding current 20 amps ± 5 amps). When welding the conductor assembly into the size 16 contact wire well a copper chill such as shown in Figure 2 should be used(See Next page)

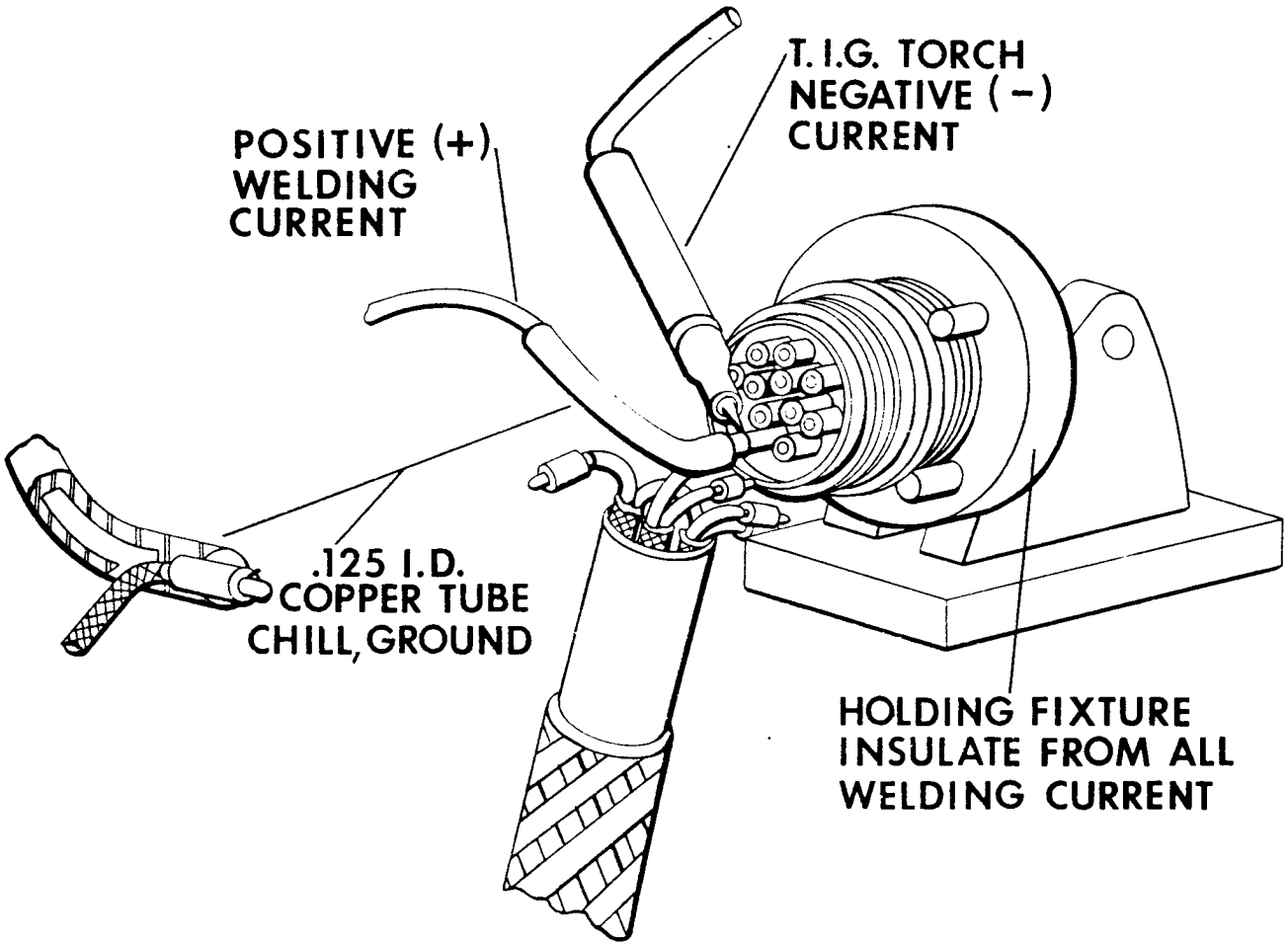

Figure 2

2. A refractory type wool packing between and around contact wire well area may give additional support to prevent possible bending and shorting out of contacts.

V. MOUNTING

During weld mounting of the receptacle, use care to prevent thermal shock to the inserts, or leakage occurring due to excessive weld penetration. For a sealed weld joint (complete periphery) a maximum of 12 amps - 45 volts shall be used. Welding arc duration shall be limited to 15 seconds. For an intermittent weld joint, a maximum of 14 amps - 45 volts shall be used. When additional

arc time is required to complete the weld, allow the part to cool or provide an efficient method for relieving the heat to prevent excessive thermal shock.

NOTE

Brazing of conductors to contacts, or retaining bushing to connector is not recommended. However, if brazing is used, a resistance heat source should be used on the contacts and induction heat source on the connector body with proper heat "sinks" to prevent thermal shock. Neutralize flux and clean from the unit.

VI TORQUE VALUES

Torque coupling nuts as shown in Table II. Anti-seize thread lubricant is not required because receptacle threads have special plating to prevent seizing.

TABLE II

Coupling Nut Torque Values

Shell Size	Torque (lb. ft.)
12	12
14	15
16	18
18	21
20	24
22	27