

Bendix® B³ Low Mating Force Connector Installation Instructions

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L-1220-1

This publication provides general information for assembling connector accessories and offers some suggestions for connector installation that will help to maintain connector straightness after equipment assembly.

Bendix® Low Mating Force Connectors are covered in depth in Bendix® Catalog 12-035.

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If more information is needed concerning the connectors covered in this publication, or if there are special application needs, please contact:

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B³ connector bodies are intentionally designed to be nonrigid to facilitate application variables (e.g., compliance to printed wiring boards, fixtures and card cages; vibration and shock exposure; thermal excursions; contact repairability; differential expansion characteristics). Users must employ installation procedures that will provide mating surface straightness of these nonrigid bodies within 0.010 inch to ensure maximum connector performance.

GENERAL

Generally, no external board support structures are required with B³ connectors as long as the mounting surface offers sufficient rigidity. However, longer installations should consider external support to prevent excessive flexing of the connector/printed wiring board assembly.

MOTHERBOARD (MB) CONNECTORS

1. MB connectors that are mounted on printed wiring boards should be installed on the board and held somewhat loosely, yet assuring all connector molding standoff pads contact the surface of the board, prior to any soldering. There are several methods for attaching the MB connector to the board.

- a. Locking/mounting accessories, Bendix® 10-411196-3 or 10-411196-5, may be used (two per connector). These bushings may be inserted into any MB connector body from the front into the 0.185 inch diameter countersink holes at each end. The knurled section of the bushing must be pressed firmly into the lower 0.122 inch diameter hole until the front of the bushing is flush with, or slightly below, the front surface of the MB connector. (Ref. figure 1) A light arbor press or similar device may be used for this procedure. Carefully align the axes of the bushing and hole and avoid excessive pressure that could crack the back surface of the connector body.

The back of the locking/mounting bushing has a 4-40 UNC-2A thread for connector mounting. Fasten with a suitable washer and nut and tor-

que to 5.5 pound-inch maximum. The front of the locking/mounting bushing has a 4-40 UNC-2B thread which will mate with the locking screw accessory of an I/O connector.

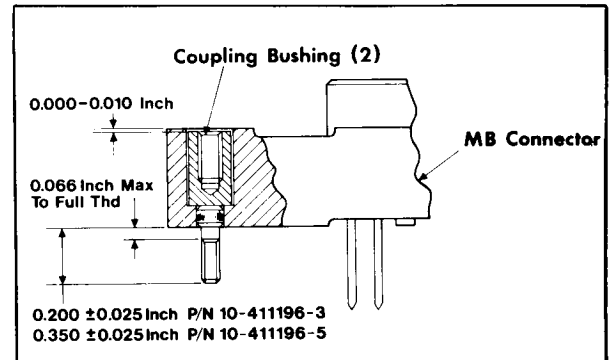


Figure 1. MB locking/mounting bushing assy.

- *b. A clinch nut (such as Abbott or Esna #79NCFMA2-26) (Bendix® P/N 10-285461-256) may be pressed from the front, knurled end first, through the 0.185 inch diameter countersink into the 0.122 inch diameter hole at each end of the connector. (Ref. figure 2) An appropriate length 2-56 UNC-3A screw and washer may be used to mount the connector. Mounting forces should be applied to the nut toward the rear of the connector.

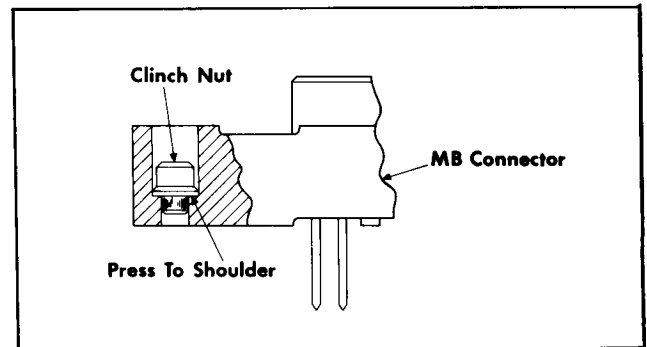


Figure 2. MB connector with clinch nut assy.

*MB mounting methods for use when mated with DB connectors only

- *c. A number four fillister head machine screw of appropriate length, with suitable washer under the head, may be inserted from the front of the connector through the 0.185 inch diameter countersink into the 0.122 inch diameter hole at each end of the connector and fastened with a suitable washer and nut. (Ref. figure 3) Torque to 5.5 pound-inch maximum after soldering operation has been completed.

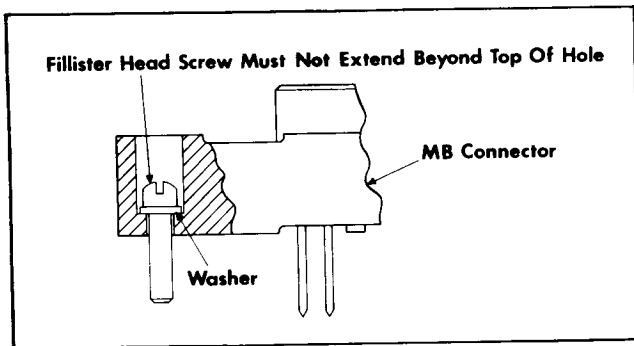


Figure 3. MB connector, screw mounted

- Printed wiring boards that are to be wave soldered to the MB connectors should be fixtured to maintain assembly straightness prior to and during the wave soldering process. (Ref. figure 4)

DAUGHTERBOARD (DB) CONNECTORS

- DB connectors should be loosely held on the printed wiring board prior to and during wave soldering. Care must be taken to ensure that the board does not bow away from the center of the connector during the soldering process. (Ref. figure 5) After soldering, mounting screws should be properly torqued.
- For cosmetic purposes, the board side of the DB connector can be masked prior to wave soldering to protect it from heat exposure and solder wash. Acceptable masking may be accomplished with split tubing, stainless steel, or Mystik Tape #7010 or #7367. (Ref. figure 6)
- Printed wiring boards with DB connectors attached should be inserted into the housing until firmly seated. If possible, visual observation of the MB/DB mated condition is recommended. The fully mated condition occurs when the DB connector skirt bottoms on the MB or PC connector shoulder along the full length. (Ref. figure

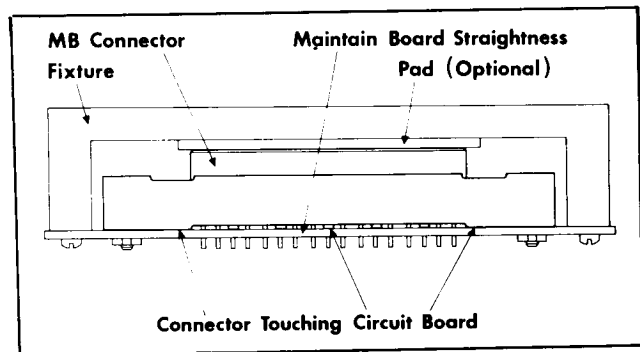


Figure 4. Typical fixture for soldering MB connectors

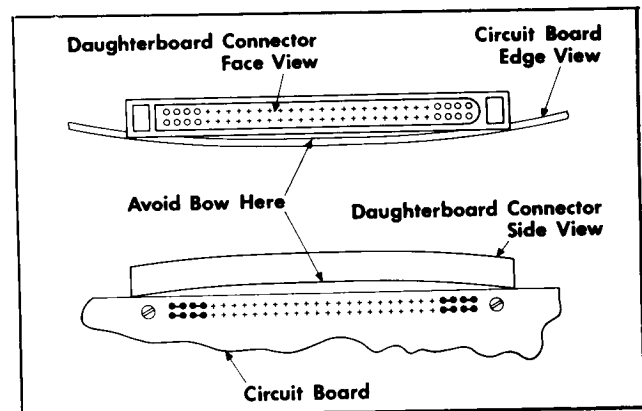


Figure 5. DB connector/circuit board assembly

- Printed wiring boards should be supported in card guides and locked in position when connectors are fully mated.

PRINTED CIRCUIT (PC) CONNECTORS

- The PC connector should be loosely attached to the printed wiring board prior to any soldering of contacts.

Locking bushing accessory, 10-411196-4 (two per connector), may be inserted into any PC connector body from the back into the large mounting holes at each end. (Ref. figure 8) The 0.126 inch diameter cross holes in the locking bushing must be aligned with the 0.126 inch diameter cross hole in the connector body. These holes accept a 4-40 UNC-2A screw, for mounting the connector to the printed wiring board. The screw should be used with a suitable washer under the head and a suitable washer and nut for fastening. The front of the locking bushing has a 4-40 UNC-2B thread which will mate with the locking screw accessory of an I/O connector.

*MB mounting methods for use when mated with DB connectors only

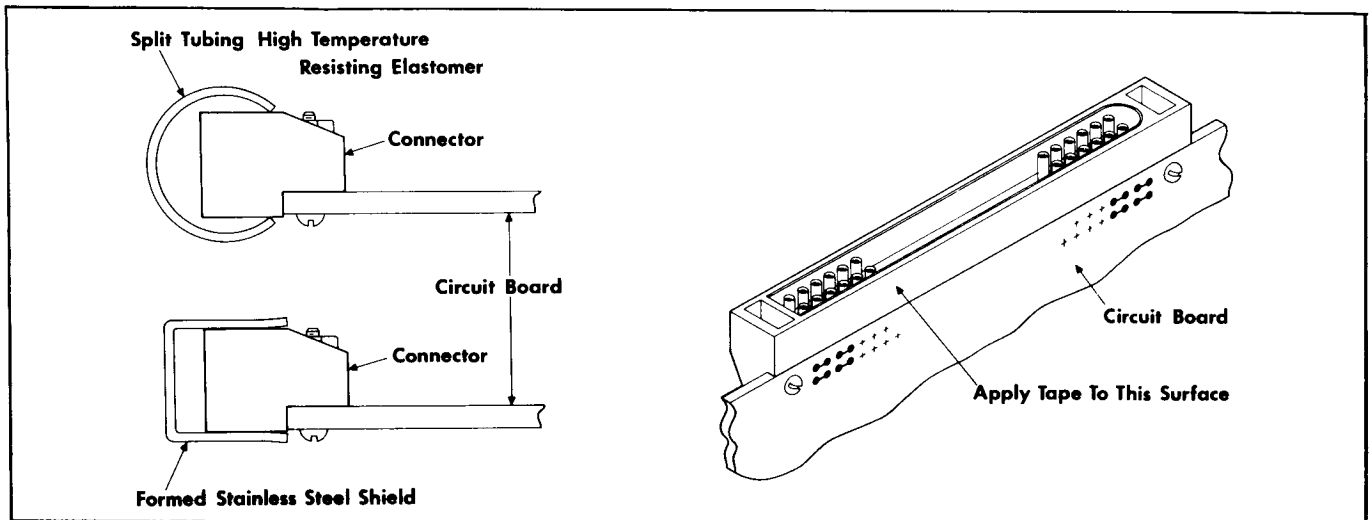


Figure 6. Typical masking applications for soldering DB connectors

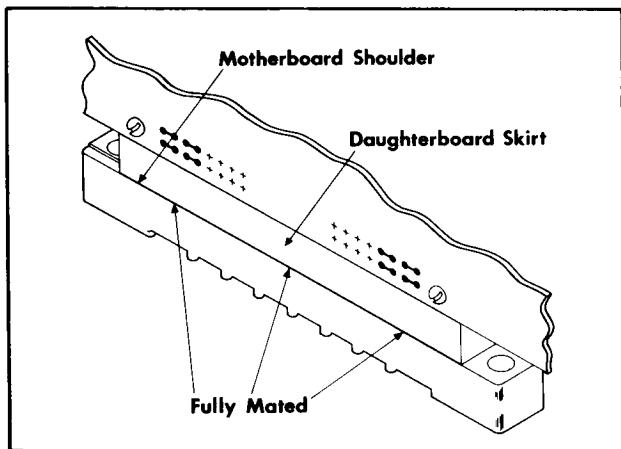


Figure 7. MB/DB fully mated condition

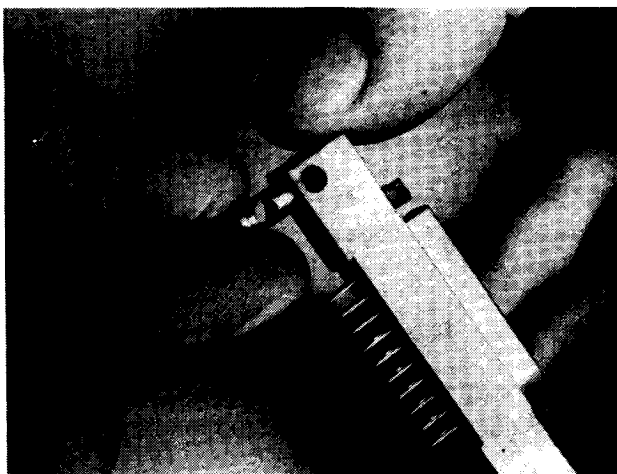


Figure 8. Locking bushing accessory inserted into PC connector

The mounting surface to which the connector is applied should not extend forward of the shoulder of the PC connector. If the mounting surface does extend beyond the shoulder, a shim (minimum 0.005 inch thick) must be inserted between the connector body and the mounting surface. (Ref. figure 9) After soldering, mounting screws should be properly torqued.

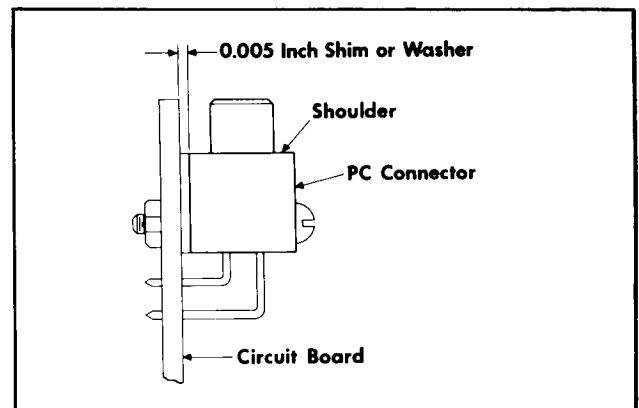


Figure 9. PC connector mounting.

2. Fixturing of the PC connector and mounting surface may be desirable to assure straightness after wave soldering.

INPUT/OUTPUT (I/O) CONNECTORS

1. Use of mating hardware, such as locking screws, is recommended with I/O connectors.
 - a. Locking screw accessory, Bendix® Part Number 10-502599, (two per connec-

tor), may be inserted into any I/O connector body from the back into the large holes at each end. Press the locking screw firmly down into the cavity by hand until it reaches a positive stop. The locking screw is then captivated* in the retention system of the cavity. The front of the locking screw has a 4-40 UNC-2A thread which will mate with the locking bushing accessories of MB or PC connectors. (Ref. figures 10 & 11)

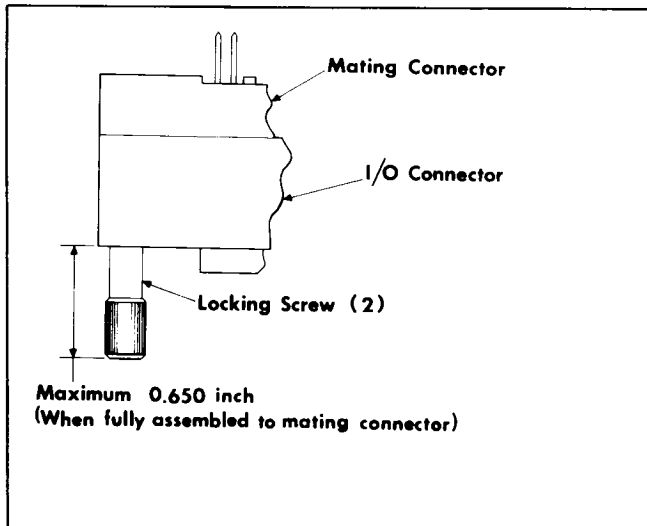


Figure 10. I/O locking screw dimensions

***Note**

If it should be necessary to remove the captivated locking screw accessory, it should be pushed as far forward as possible. Using vise grip pliers to grasp the threaded end, and pliers to hold the knurled end, apply torque until the locking screw breaks in two. Each half will then drop out.

- b. For fixed mounting, a 6-32 thread forming screw, type AB (MS51861), may be inserted through the mounting member and into the holes at each end of the connector body from the back. The screws must be used with suitable washers and must be of sufficient length to penetrate the connector body 0.350 inch. Care must be taken not to over-tighten the screws.

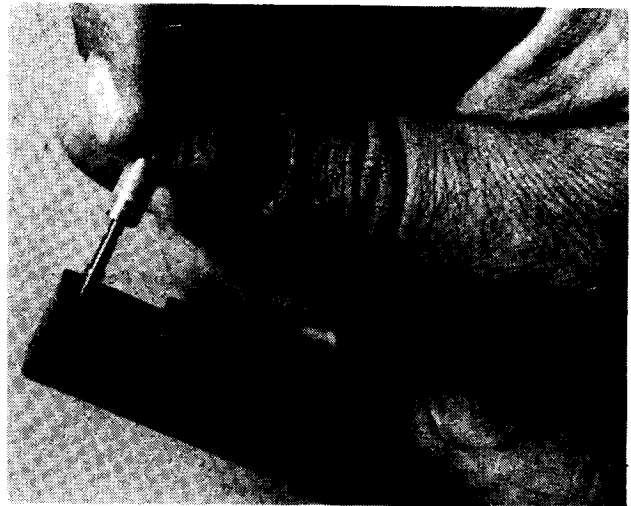


Figure 11. Locking screw accessory inserted into I/O connector body

2. Visual observation of the mating of the MB connector to the I/O connector or the PC connector to the I/O connector is recommended. The fully mated condition occurs when the I/O connector skirt bottoms on the MB or PC shoulder along the full length. (Ref. figure 12)
3. Printed wiring boards containing PC connectors that are mating with I/O connectors should utilize a holding device that is capable of locking the board in place to prevent backoff during use.

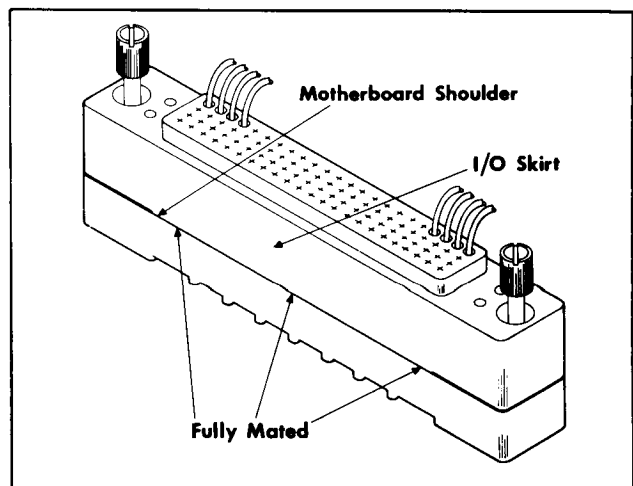
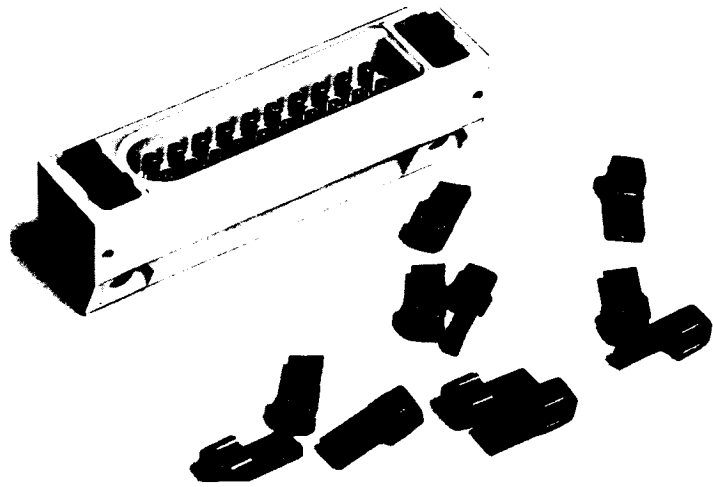


Figure 12. MB/IO fully mated condition

**LOW MATING FORCE-ACCESSORIES
POLARIZATION KEYS**

Polarization Keys, 10-285422-2 are accessory items, ordered separately for MB, DB, I/O and PC Series Low Mating Force Connectors. If used, 4 keys are required per connector half.

Examples below show key locations for mating connector halves. The number or letter designations on all mating connectors are arranged so that the projecting keys on one relate to the same numbers or letters on the other. With the numbers or letters matching, the connector will mate. (Ref. figures 13 & 14)



TYPICAL CODE SEQUENCE

B, H-1, 5
4 Different possibilities
at each position = .256

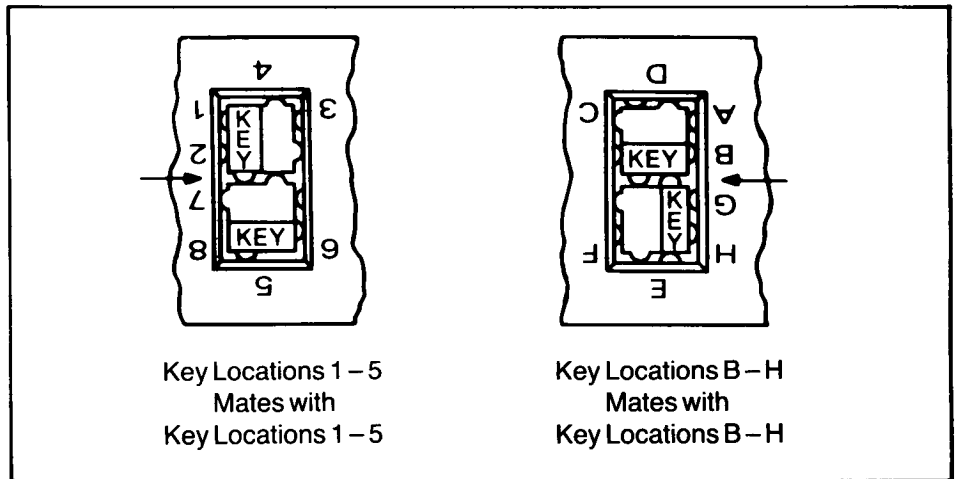


Figure 13. Key Locations - Mother Board or PC Connectors

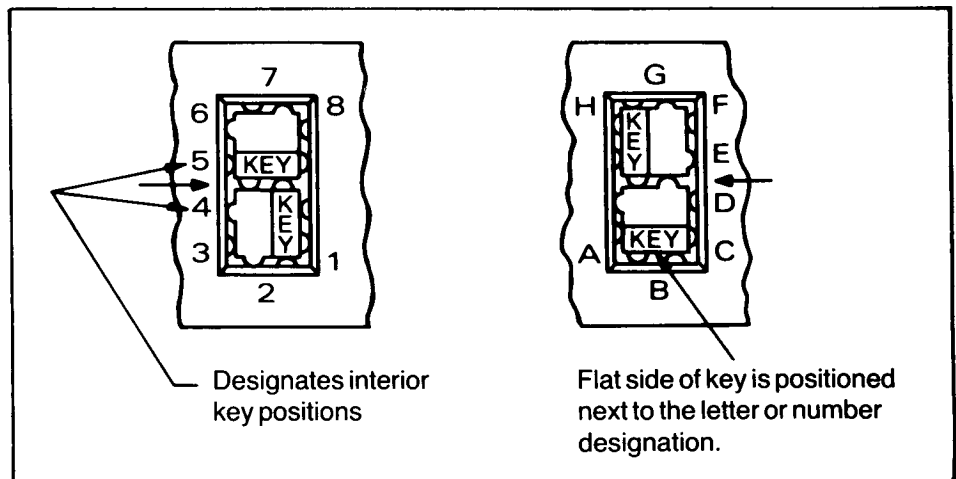


Figure 14. Key Locations - Daughter Board or Input/Output Connectors

**LOW MATING FORCE-ACCESSORIES
TEST PROBE KIT**

In order to insure that contacts are properly wired within a connector, a Test Probe Kit (11-10400-22)* is needed. This kit is especially designed to prevent damage to brush contacts during probing. It consists of a plastic holder, insert, and two contacts, usable for either the Mother Board or Daughter Board applications. It is recommended that the user buy two kits, if using connectors of two genders. The kits are not convertible after assembly.

INSTRUCTIONS

DB-I/O Test Probe:

Slide the insert back over the wire and crimp contact on. Follow crimping procedure below. Then snap the insert and contact assembly into the holder. (Ref. figure 15)

MB-PC Test Probe:

Slide holder over wire and then crimp contact. Follow crimping procedure below. Slide the insert on the contact and seat it against the shoulder. Slide the holder forward and snap it onto the insert. (Ref. figure 16)

Crimping Procedure:

Using accepted industry procedures, strip wire end to be terminated $\frac{1}{8}$ to $\frac{5}{32}$ inch. Care should be taken not to nick wire strands. Assemble the M22520/2-01 crimp tool and the M22520/2-27 positioner, and place tool selector on correct setting for wire size. Selected wire size must not have an insulation diameter more than .062 for MB-PC and not more than .038 for DB-I/O.

AWG	22	24	26	28
SEL	5	4	3	2

Insert stripped wire end into contact wire well. Strands should be visible in wire well inspection hole. Bottom contact, and wire assembly in positioner. Close handles of crimp tool to complete crimp. Handles will not open unless full crimping cycle has been completed.

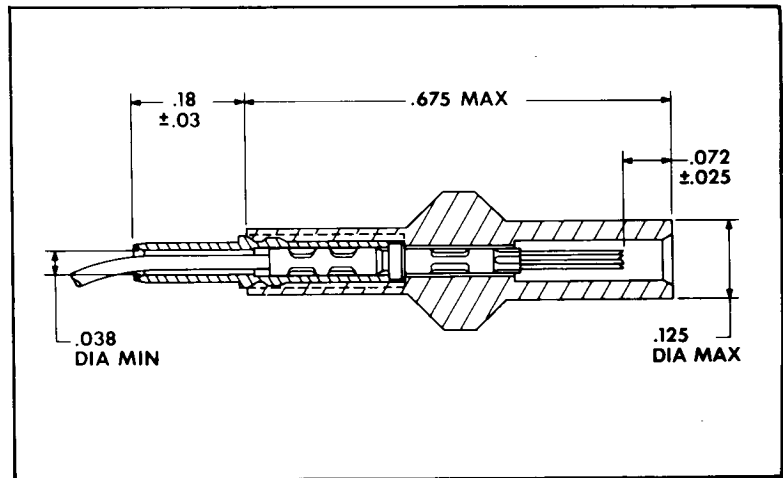


Figure 15. Daughter Board - Input/Output Test Probe

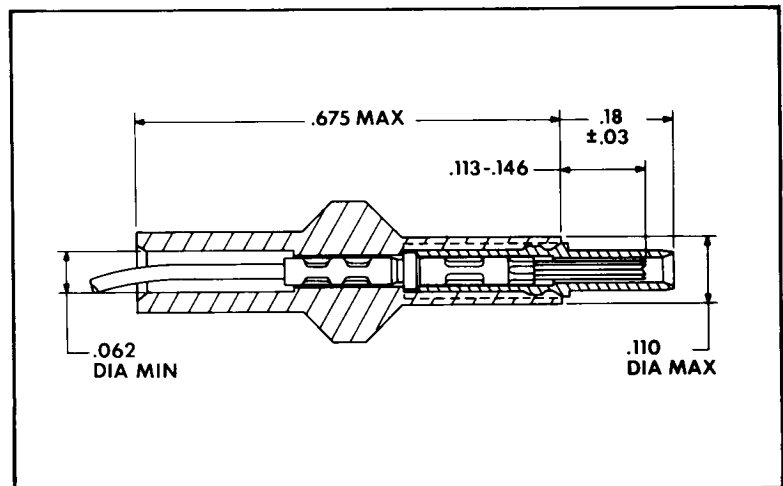


Figure 16. Mother Board - PC Test Probe

*For ordering information consult Sidney, New York 13838.