Centre Connector

Preliminary Installation Instructions

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Bendix Electrical Components Division

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DESCRIPTION

1-1. GENERAL

1-2. The Centre Connector is a hard dielectric connector manufactured by The Electrical Components Division of The Bendix Corporation, Sidney, New York, for printed circuit board applications. This unique connector is designed to mount at or near the center of printed circuit boards to permit shorter conductor runs and to provide a stacking capability for multiple board buildups. The connector presently allows up to 126 electrical connections between adjacent printed circuit boards, and makes interconnections between them by plugging into itself. See figure 1-1. A keyed slot in the center of the PCB (printed circuit board) connector permits the separation of the stacked boards with a simple tool. The mating chassis centre connector is designed to provide a simple, rugged method of mounting and interconnecting a stack of PCB connectors together as well as the exit/entry point for interconnections between similar connector stacks and external connectors in the system.

1-3. Centre connectors are made in a family of contact configurations containing 28, 30, 60, 80 and 126 contacts. The design of these connectors permits any smaller connector (except the 30 pin version) to mate with any larger connector, i.e. (a 28 pin connector will plug into the 60, 80, or 126 version as well as into another 28 pin connector). The 30 pin connectors are made in the minimum size possible for 30 contacts and will not be intermated with 28, 60, 80 or 126 pin connectors. The center hole of the 30 contact connector is 3/8 inch in diameter as compared to the 1/2 inch hole in the 28, 60, 80 and 126 pin connectors.

1-4. Contacts with PCB connectors are the insertable/removable pin-socket configuration and utilize a memory retention system, thus allowing the user to establish his own particular interconnection scheme before soldering to the printed board. The standard size contacts are 22M and are plated with 50-70 microinches gold over silver.

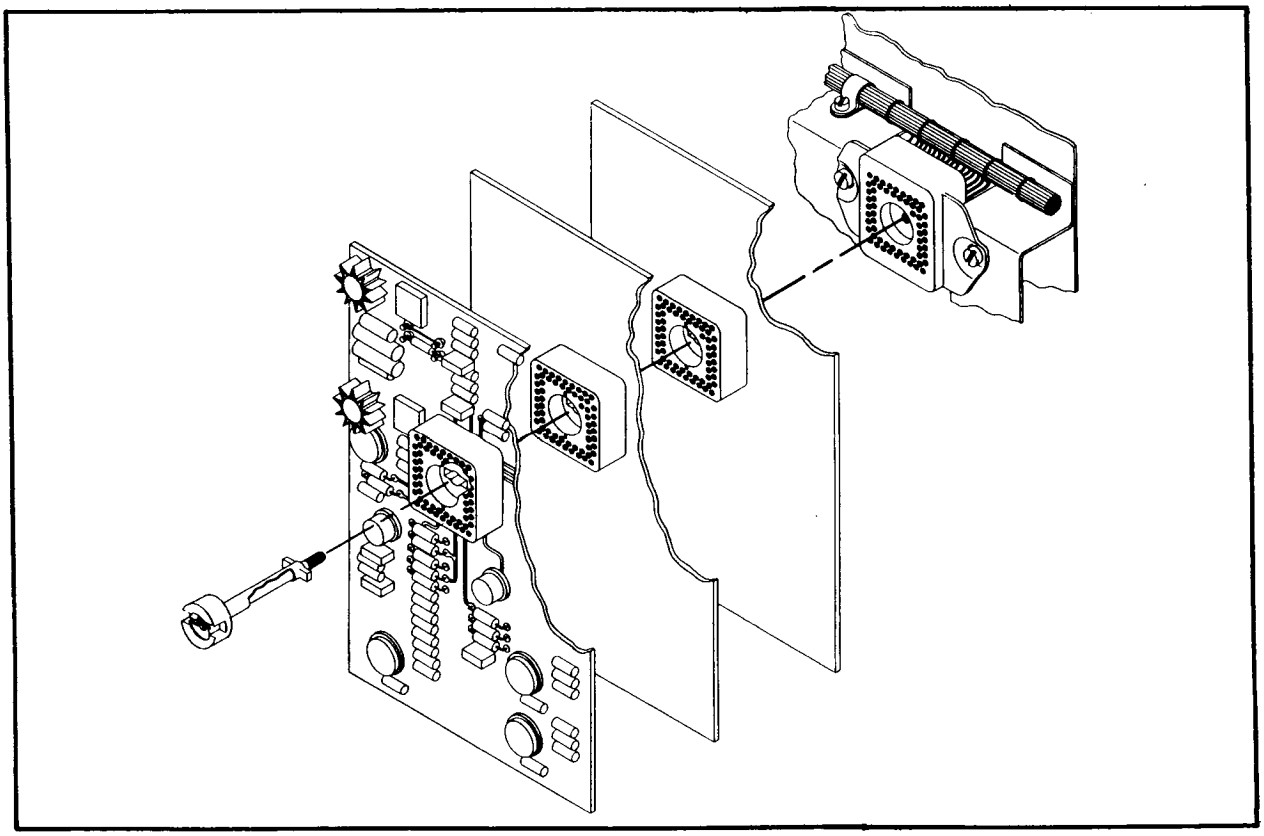


Figure 1-1. Application of Centre Connector

A non-feed through contact is also available for use in place of the standard pin-socket contact. This contact is terminated to the printed circuit board in the same manner as the pin-socket contact, but due to its shorter length, allows flexibility in interconnections where feed-through is not desired but a connection to the board is still required.

1-5. The chassis connectors utilize standard JT-RE insertable/removable size 22M socket contacts that are retained by a metallic locking bushing within the hard dielectric body. Contact plating is 50-70 microinches gold over silver. A crimp type contact terminates single wires, while a solder type contact with a special adapter can be used to selectively terminate two wires.

SECTION II

INSTALLATION

2-1. PRINTED CIRCUIT BOARD (PCB) CONNECTORS.

2-2. Installing Contacts in PCB Connectors.

2-3. Determine the type, quantity and layout of the contacts to be used with the connector. Figure 2-1 shows the contacts used with PCB connectors.

NOTE

Before installing contacts in the connector, the contacts must be thoroughly cleaned. To clean, immerse contacts in trichlorethylene for 10 minutes. Remove contacts from cleaning solvent and thoroughly dry.

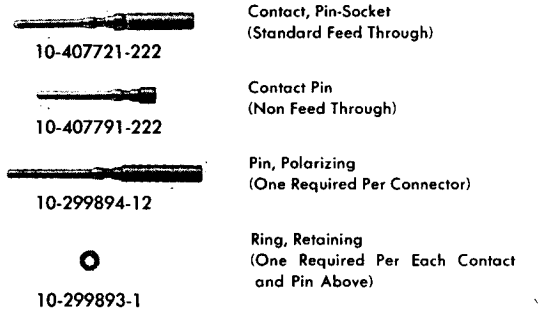


Figure 2-1. PCB Connector Contacts

2-4. To install the standard (feed through) pin-socket contacts, P/N 10-407721-22 or the polarizing pin, P/N 10-299894-12 in the connector, proceed as follows:

1. Insert contact (pin end first) into side of connector having round center hole.

2. Position connector, with pin end of contacts up, on applicable 11-8875-28, -30, -60 or -80 Backup Plate. Dash number of Backup Plate corresponds with connector dash number.

3. Place the 10-299877-1A contact retaining matrix down over pin end of contacts of the 30, 60 or 80 contact connector.

NOTE

The 28 contact and the balance of contacts above 80 in the 126 contact connectors may be prepared by using a pair of tweezers to drop a retaining ring P/N 10-299893-1 down over pin end of each contact.

4. Slide tip of 11-8790-1 Insertion Tool down contact until it butts against retaining ring in matrix. Seat retaining ring by pushing down with the Insertion Tool until ring snaps out of matrix and in place within connector shell. Use of the 11-8875 Backup Plate will assure that retaining ring is fully seated.

2-5. To install non-feed through contacts, P/N 10-407791-222, proceed as follows:

1. Insert contacts (pin end first)into side of connector having round center hole.

2. Position a 0.035 ± 0.001 inch diameter rod against rear of contact to hold contact firmly in place when seating retaining ring.

3. Install nylon retaining ring over pin end of contact.

4. Using the 11-8790-1 Insertion Tool, seat retaining ring in connector shell.

2-6. To remove a contact from a PCB connector, use the 11-8791-1 Removal Tool. Place Removal Tool over pin end of contact and push down on contact. This will unseat retaining ring from connector shell. Remove retaining ring from contact and push contact out of connector, socket end first.

2-7. Installing PCB Connectors to Boards.

2-8. Prior to installing connector to board, the board must be prepared as follows:

1. Drill a 1/2 inch hole through board at center of connector mounting area. Connectors with 30 pins require only a 3/8 inch diameter hole.

2. Following the layout from the respective drawing in figure 2-2, drill applicable contact holes that are required, in printed circuit board. The recommended hole size is 0.032+ 0.003 - 0.000 inch diameter, located within 0.004 inch diameter True Position of locating hole.

2-9. SOLDER RING HANDLING TECHNIQUE.

2-10. A transfer plate, developed by the Electrical Components Division, expedites installing solder rings on Bendix Centre Connectors. The arrangement of recesses in this transfer plate matches identically with the configuration of contacts on the centre connector. The chosen depth of a single recess allows only one solder ring to lodge within it. The technique for installing solder rings using the transfer plate is described in steps 1 through 8. See figure 2-3, views (A) through (G) and proceed as follows:

1. Pile solder rings on surface of transfer plate. (A)

2. Push solder rings into individual recesses by brushing solder rings over surface of plate until all recesses are filled. (B)

3. Brush excess solder rings off plate into a catch tray or equivalent arrangement. (C)

4. Hold transfer plate alongside vertically oriented PCB/connector assembly with polarizing pin hole in proper mating position with polarizing pin of connector. A-line bottom row of contacts, projecting through the PCB, with bottom row of holes in loaded transfer plate. (D)

5. Tip PCB/connector assembly down toward transfer plate until all contacts of centre connector are fully mated in holes in loaded transfer plate.

NOTE

Solder rings are now captivated between solder side of PCB and transfer plate.

6. Invert PCB/connector assembly and transfer plate combination. (E)

7. Tap bottom of transfer plate while slowly lifting and removing it from PCB/connector. This action causes the solder rings to fall out of their recesses and to slide down connector contacts against the PCB. (F)

8. Examine PCB/connector to insure each solder ring is fully down against land area of PCB. (G)

NOTE

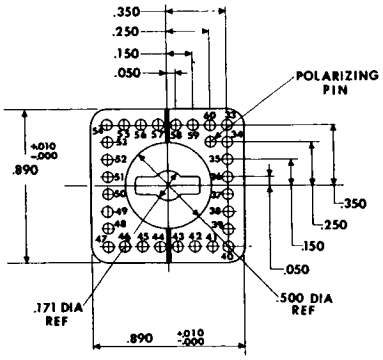
Transfer plate must be kept free of all contaminents.

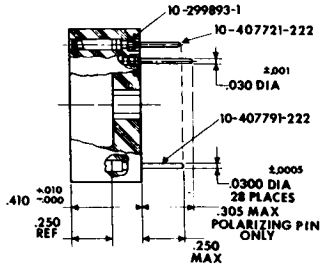
2-11. Transfer Plate Fabrication and Use Data.

2-12. Drilling and counterbore dimensioning shown in figure 2-4 and listed in table 2-1, when used in conjunction with connector layout and diagrams (see figure 2-2) provides data for manufacturing transfer plates at the using facility. Material recommended for a transfer plate is aluminum AMS 4150; with black anodize or equivalent dark finish to provide sharp contrast with solder rings.

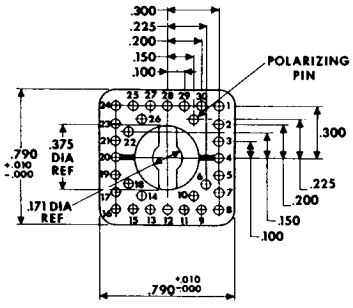
2-13. Organizations fabricating PCB assemblies can adapt the same methods used for drilling comparable holes in the PCB. Whenever PCB/connector assembly

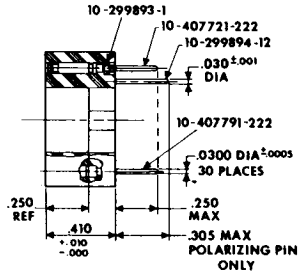
*10-299810-28 PCB CONNECTOR





*10-299812-30 PCB CONNECTOR

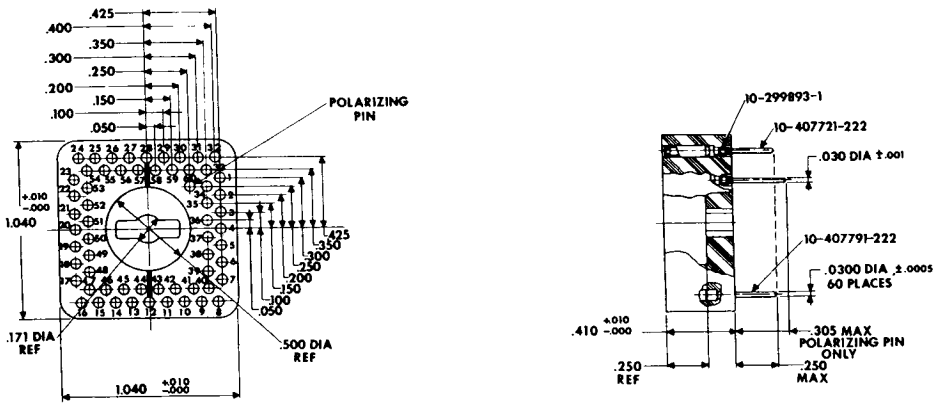




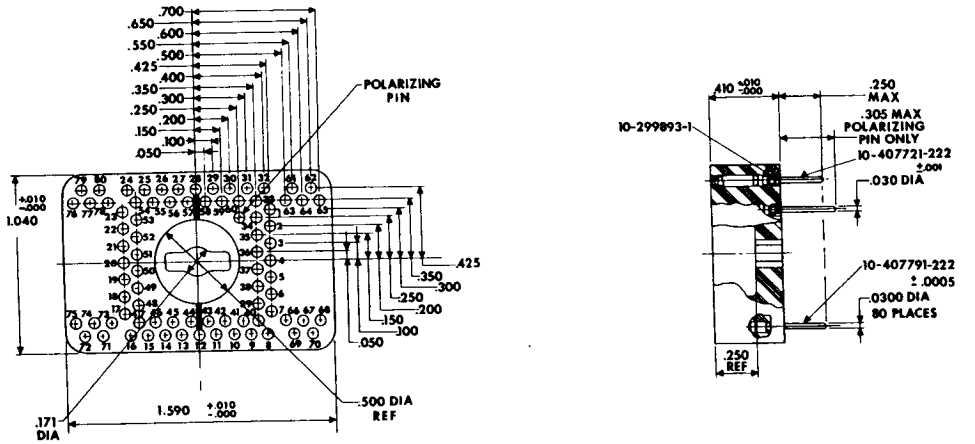
*This part number applies to shell only.

Figure 2-2. Layout of Contact Holes

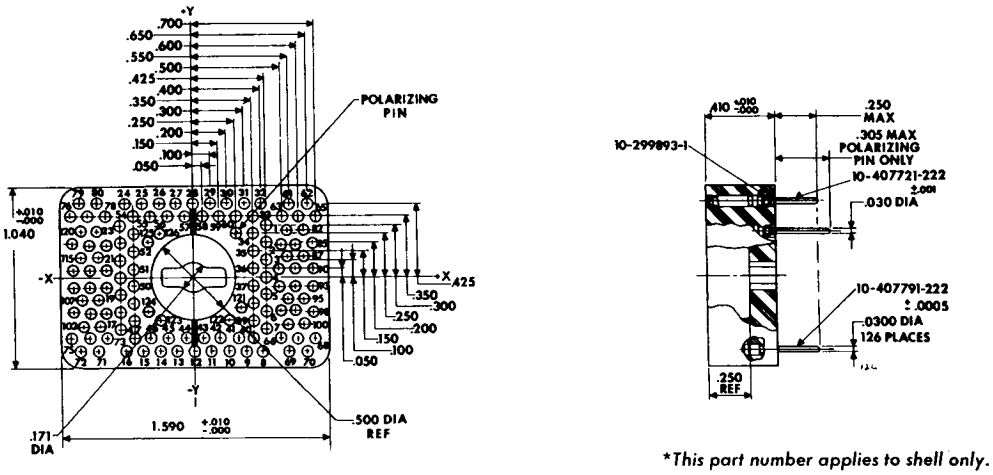
*10-299810-60 PCB CONNECTOR



*10-299810-80 PCB CONNECTOR



*10-299810-1 PCB CONNECTOR



*This part number applies to shell only.

Figure 2-2. Layout of Contact Holes (continued)

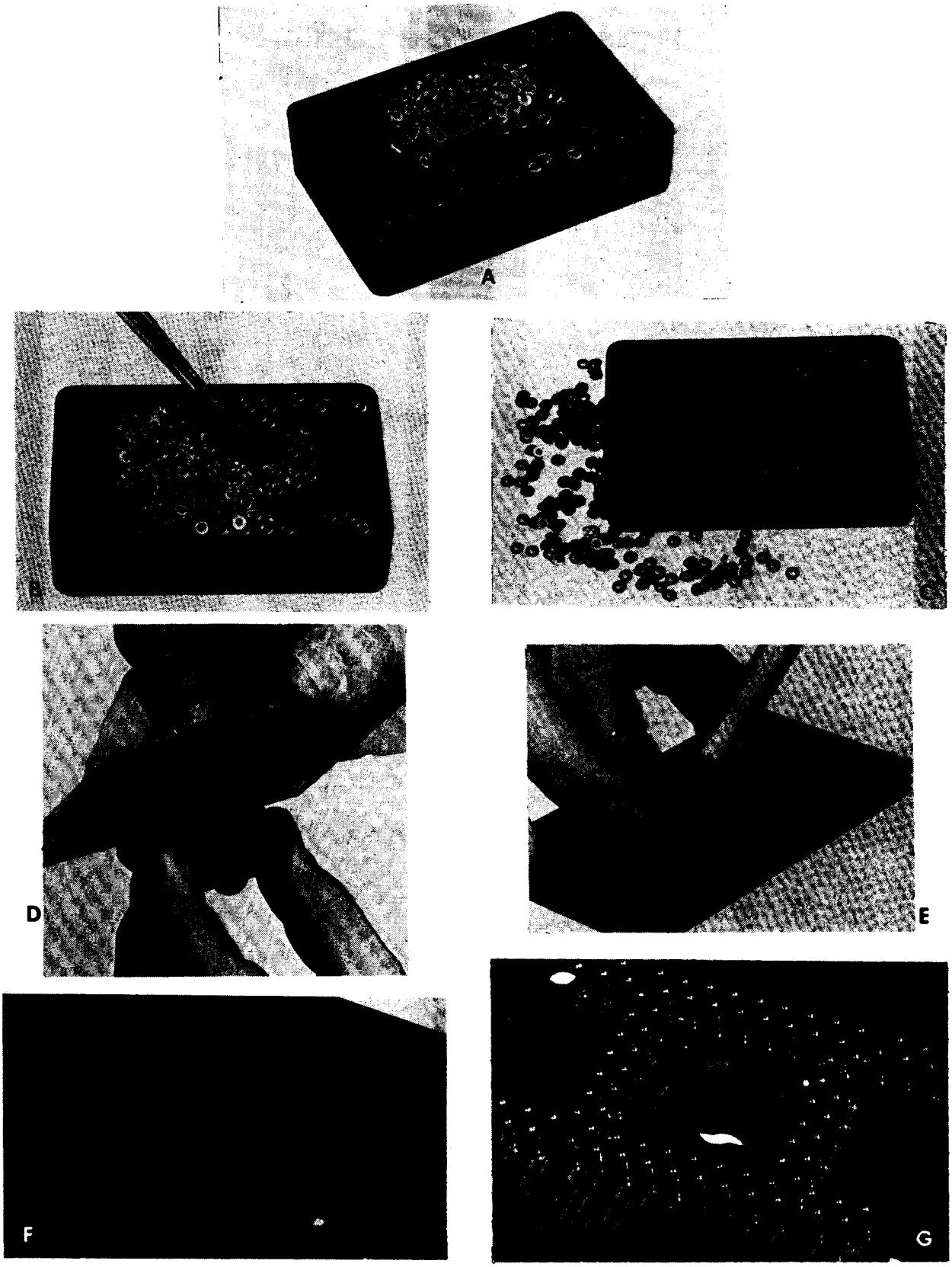


Figure 2-3. Solder Ring Handling Techniques

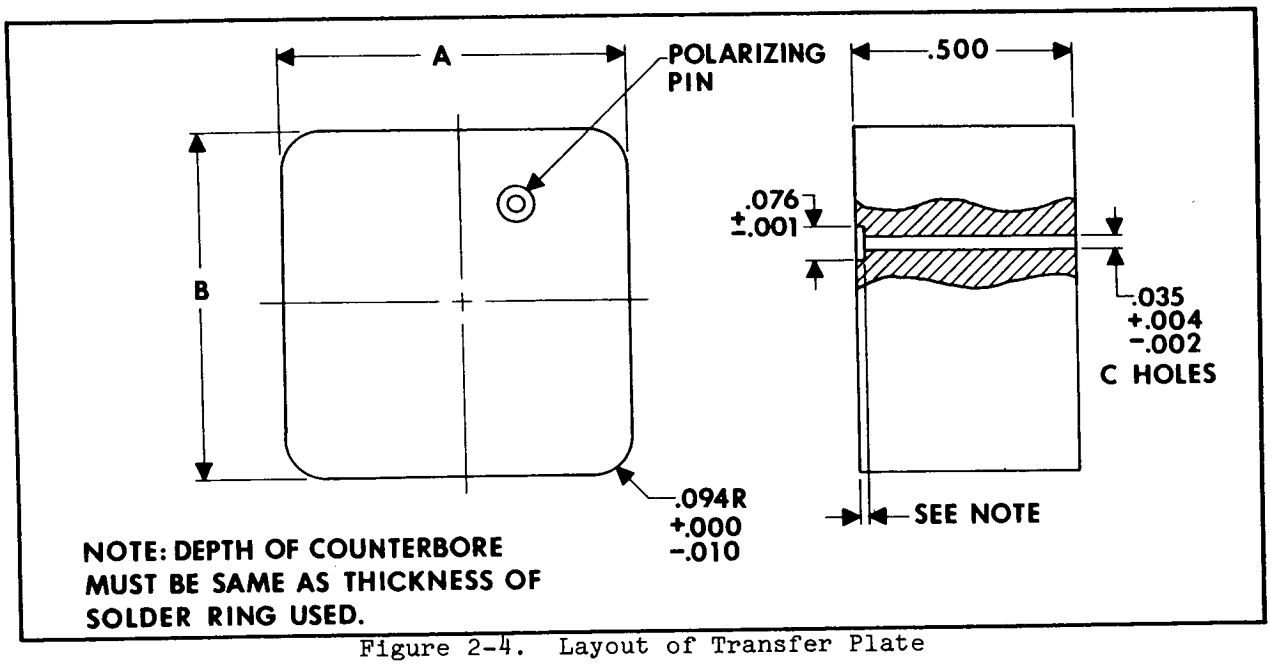


Figure 2-4. Layout of Transfer Plate

spacing permits an 80 contact transfer plate can be used for solder ring transfer to a 60 or a 28 contact connector assembly by masking off the extra counterbored holes with cellophane tape. A 30 pin connector requires a separate transfer plate. Organizations using the Bendix Centre Connector for relatively high production can further expedite handling solder rings by adapting a vibrating mechanism (such as Syntron hopper) for loading the transfer plates.

Table 2-1 Transfer Plate Dimensions

	A	B	C	Figure Ref.
-126	1.040	1.590	127	2-3 E
- 80	1.040	1.590	81	2-3 D
- 60	1.040	1.040	61	2-3 C
- 30	0.790	0.790	31	2-3 B
- 28	0.890	0.890	29	2-3 A

NOTE

The solder "pad" dimension on boards is 0.078 - 0.005 inch maximum diameter on the inside holes. The outside holes use a basic "pad" dimension of 0.078 with two sides of the pad trimmed to 0.062 to allow clearance for the conductor runs. See figure 2-5.

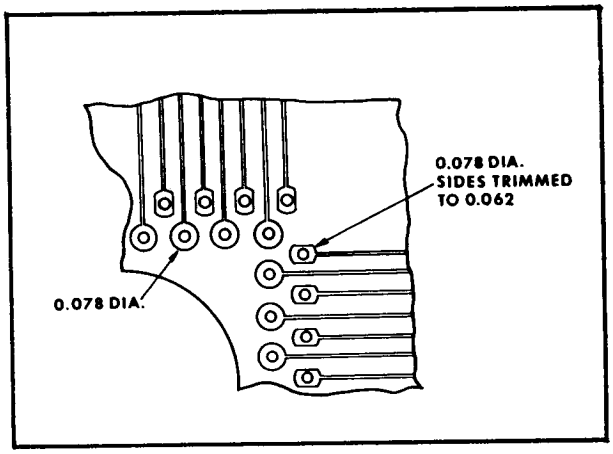


Figure 2-5. Recommended Board Pad Dimensions

2-14. Mate the connector.with the printed circuit board and solder. The recommended method of soldering contacts to the board is the Infra-red Soldering process. The infra-red method accomplishes soldering of all the connector contacts in one short operation. The solder joints achieved are uniform, of the desired shape and quality, and obtained at a lower temperature than is possible with ordinary soldering techniques. For further information on infra-red soldering, refer to form L-754.

2-15. If the equipment required for infra-red soldering is not available,

the connector contacts can be soldered to the board as follows:

1. Apply a good grade of rosin-alcohol flux to junction of contact and board.

2. Using a pencil type soldering iron of approximately 37-1/2 watts with a small chisel shaped tip, heat contact and board at junction.

3. Apply 60/40 solder to heated area so that a 0.020 maximum solder fillet is formed around contact. Remove iron and let solder joint cool before moving board.

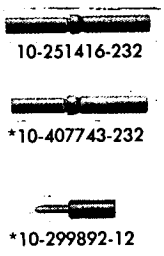
NOTE

Movement of board before solder joint has cooled and solidified may result in crystallation of joint.

4. Remove excess flux from joint using a small brush and Neosol or proprietary ethyl alcohol.

2-16. CHASSIS CONNECTORS

2-17. There are two different types of sockets used with the chassis connector. When one wire is to be terminated to a contact, the 10-251416-232 socket should be used. If two wires are to be terminated to a contact, the 10-407743-232 socket and the 10-299892-12 adapter must be used. Figure 2-6 shows the sockets and the adpater used with chassis connectors.



*10-407743-232 Socket and 10-299892-12 Adapter used to terminate two 24 gage wires.

Figure 2-6. Chassis Connector Contacts

NOTE

Wiring for connector should be laid out so that contacts using two wires are not inserted in adjacent contact holes.

2-18. 10-251416-232 Sockets.

2-19. The following procedures should be used to install 10-251416-232 Sockets on wire.

1. Cut wire to length and strip 3/32 + 1/16 - 0 inch of insulation from end of wire. Hot wire stripping methods are recommended where applicable. When other methods are employed, use extreme care to avoid nicking or cutting wire strands.

2. Check to be sure strands of conductors are not separated. Whenever necessary, reform by lightly twisting the strands together.

3. The MH-750 Hand Crimping Tool (Daniels Mfg. Co., Pontiac, Michigan) should be used to crimp contacts. Select proper location to be used with tool from table 2-2. To change locator, unscrew and remove previous locator. Thread desired locator in place. Seat locator firmly with finger pressure only. Set tool for wire size being crimped by turning dial to proper setting listed in table 2-1. Dial setting must aline with index on the tool handle.

4. Insert stripped end of wire into contact wire well until wire insulation butts against end of contact wire well. Make certain wire strands are visible in inspection hole.

5. With wire in place, insert contact into crimping tool. Handles of tool must be fully open. Make sure contact and wire are inserted into crimping tool as far as possible. Then compress handles of crimping tool to fully closed position. Tool handles will not release until a complete, uniform, and reliable crimp is obtained.

2-20. To install the sockets in connector, the 11-8674-24 (Angle Type) or the 11-8794-24 (Straight Type) Tweezer Insertion Tool should be used. These tools are distinguished from the removal tools by a black stripe and a notch in handles. Open insertion tool tips by squeezing handles together. Slip tips of tool around wire insulation. Slide tool along wire until tip ends butt against the shoulder of contact. Carefully push the contact for-

Table 2-2. Locator Selection

Socket or Adapter Part No.	Locator Part No.	Size	Wire MIL Spec	MH-750 Crimping Tool Dial Setting
10-251416-232	11-867307	24	MIL-W-16878 Type E tin or silver plated only	2
		26 & 28	MIL-W-16878 Type E tin or silver plated only	1
10-299892-12	11-8673-11	2 size 24	MIL-W-16878 Type E tin or silver plated only	6

ward and directly in line with the hole in the dielectric until the contact is felt to snap into position. Slide the tool back along the wire insulation until it clears the dielectric and remove from the wire. Hold forward on wire during the time insertion tool is being removed from connector. This action prevents contact from being dragged back by tool tips.

CAUTION

Do not spread the insertion tool tips while they are within the dielectric. The tool must be kept in perfect alinement during insertion of the contact to prevent damage to tool tip.

2-21. Visually check the mating end of connector to be sure contacts are installed to the same depth. A gentle pull on each wire is a positive check to insure contact is properly seated.

2-22. To remove 10-251416-232 sockets from chassis connector, use the 11-8675-24 Removal Tool (color coded black/white) and proceed as follows:

1. Open tool tips sufficiently to be placed around wire.

2. Slide tool down wire until tool tips enter connector shell and come to a positive stop.

NOTE

A slight increase in resistance will be felt just before the tips bottom. Design of the tool is such that this action will spread the internal contact retention member and release its hold on the socket.

3. Holding the tool tips firmly against the socket, grip wire and simultaneously remove tool, socket and wire.

CAUTION

Do not spread or rotate Removal Tool tips while they are within connector shell. Such movements may result in damage to tool tips.

2-23. 10-407743-232 Socket and 10-299892-12 Adapter.

2-24. To terminate two wires to one contact, proceed as follows:

1. Strip wires and crimp in the 10-299892-12 Adapter in accordance with procedures given in paragraph 2-19.

NOTE

When inserting two size 24 wires in adapter, stripped wire ends should be laid side by side, rather than twisted together. This method provides a higher tensile strength value.

2. Apply a good grade of rosin-alcohol flux to the small diameter end of the 11-299892-12 Adapter. Apply by dipping small end in flux. Shake off excess flux. Avoid using excessive flux as it tends to creep up conductor during tinning.

3. Immediately after fluxing, pre-tin the small diameter end of the adapter. Use of a solder pot and a good grade of 60/40 tin-lead solder from 500 to 550 degrees is recommended. Dip fluxed

adapter end into the solder so that a thin even coat of solder is obtained. Shake off any excess solder immediately after removing adapter from bath.

4. Using a small pencil soldering iron or approximately 37-1/2 watts, tin wire well of 10-407743-232 socket with 60/40 solder and a good grade of rosin alcohol flux. After tinning, insert small diameter end of adapter in wire well of socket and solder two pieces together.

2-25. To install the socket/adapter in the connector shell, start socket in appropriate hole of shell. Grasp the adapter with fingers and push downward in a straight vertical line until socket snaps in place.

2-26. To remove the 10-407743-232 Socket and 10-299892-12 Adapter from connector shell, proceed as follows:

1. Unsolder 10-299892-12 Adapter from 10-407743-12 Socket and remove adapter.

2. Insert tips of the 11-8675-24 (color coded - black/white) Removal Tool into back of connector shell. Carefully work tool tips over socket wire well until it bottoms and releases socket from internal contact retention member.

3. Using a 0.020 ± 0.001 inch diameter rod and working from connector front face, push socket and removal tool out the rear of connector.

2-27. MATING PCB AND CHASSIS CONNECTORS

2-28. To mate the PC connector/board combinations together, aline the polarizing pin with the mating polarizing pin and push the connectors together. The polarizing pins are 1/16 inch longer than the other contacts, and are stainless steel. The boards must not be tipped during the mating operation.

2-29. To mate the stack with the chassis connector, aline polarizing pin of PCB connector with polarizing pin hole in chassis connector. To secure the PC connector/board stack, use the 10-299822-1, -2, -3 or -4 Hold Down and Removal Accessory. See figure 2-7 and table 2-3. This accessory provides a simple method of securing the PC connector/boards in a stack to the chassis connector. Install the proper 10-299822 Accessory (see table 2-3) through the PC connector/board stack by alining tip of accessory with the keyed slot of PCB connectors. Using a screw driver, tighten center portion of 10-299822 Accessory thereby pulling the PCB stack and the chassis connector together. The torque applied to the accessory should not exceed 5 in. lb.

2-30. To un-mate the PC connector/board stack from the chassis connector, aline the slot in the head of outer sleeve of the 10-299822 Accessory with the alinement bar on the top PCB connector. Then unscrew the center portion of the accessory. This operation unlocks and unmates the PCB stack from the chassis connector. To remove the accessory from PCB stack, turn outer sleeve of accessory 90 degrees until its end alines with keyed slot in PCB connectors. Then remove accessory from stack.

2-31. The 11-8832 Separator, figure 2-8, is used to separate individual PC Centre connector/boards within a stack. The tool can also be used to separate PCB stacks from chassis connectors in applications where the 10-299822 Hold Down and Removal Accessory is not/or can not be used (stacks where more than four boards are used). To use the separator, position next to the stack. Aline bottom of separator with bottom of the PC connector/board which is to be separated from stacks. With the thumb and index finger, grip on to shaft of separator at top of PCB stack. This

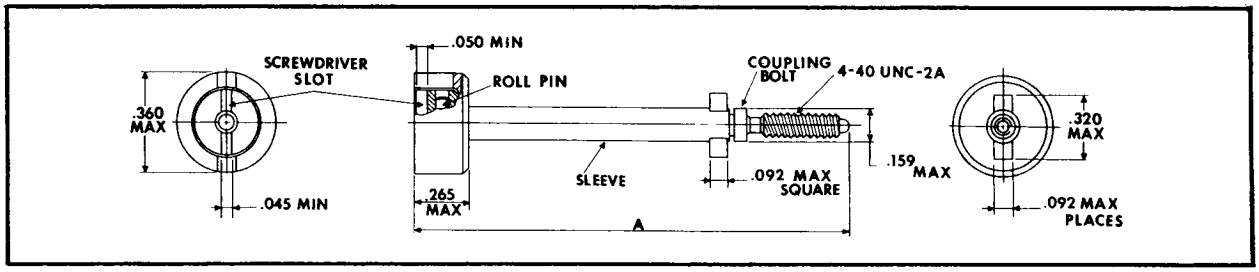


Figure 2-7. 10-299822 Hold Down and Removal Accessory

marks the depth to which the separator must be inserted. Aline the 11-8832 Separator with keyed slot in center of PCB connectors. Insert the separator to the desired depth and turn the complete tool 90 degrees or 1/4 turn, then squeeze separator handles together. This action will separate the connector/board combination at the desired point. Turn separator 90 degrees and remove from connectors.

Figure 2-8. 11-8832 Separator

Table 2-3. Accessory/Module Data

Part No.	Modules * Per Stack	Dimension "A" (Refer to Fig. 2-7)
10-299822-1	1	1.127
10-299822-2	2	1.616
10-299822-3	3	2.105
10-299822-4	4	2.594

*Module consists of one connector and a 0.062 inch thick circuit board.