AMP INCORPORATED
Harrisburg, Pa 17105

AMP* 750, 751, 1000, AND 1001 SERIES IN-LINE BOX CONNECTORS

Instruction Sheet
IS 7328
RELEASED 7-7-87

CUSTOMER HOTLINE 1 800 722-1111

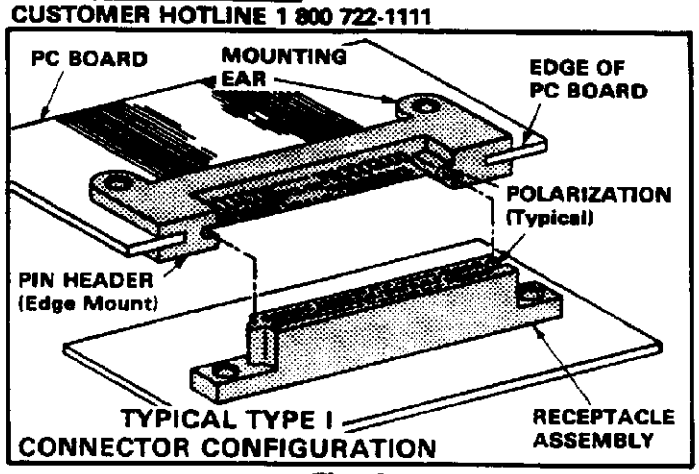


Fig. 1

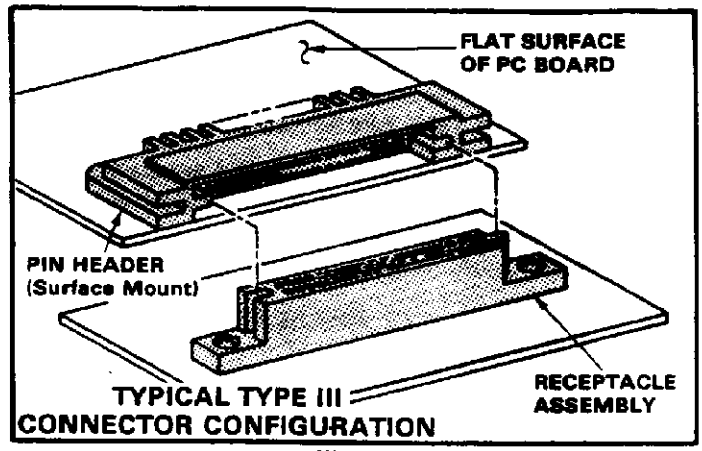


Fig. 2

1. INTRODUCTION

This instruction sheet (IS) covers the installation, keying, and repair of AMP 750, 751, 1000, and 1001 Series In-Line Box Connectors. The basic connector configurations are shown in Figures 1 and 2.

Read this sheet and all referenced material before starting.

NOTE *All dimensions presented on this instruction sheet are in inches.*

2. DESCRIPTION

The connectors are designed for printed circuit (pc) board and individual wire applications. They have been assigned a series indicator which relates to the contact centerline spacing in the housing: 750 and 751 Series connectors have in-row contact cavities on .075-in. centerlines, and row-to-row contact cavities on .125-in. centerlines; 1000 and 1001 Series connectors have in-row contact cavities on .100-in. centerlines, and row-to-row contact cavities on .100-in. centerlines.

Each connector consists of a polarized housing with mounting ears and preloaded contacts. A connector pair consists of a pin header and a receptacle assembly. Connectors can be keyed to ensure that only two properly keyed connectors can be mated. Series 750 and Series 1000 connectors that feature a standard housing (housing without external key cavities) can be keyed by using a keying sleeve or a keying pin. A key can be installed onto each connector that has an external key housing.

NOTE *Keys must be installed onto pin header connectors that have an external key housing BEFORE the connector is mountd on the pc board.*

Pin headers are available in three configurations:

Type I — a male connector with pre-tinned, preformed contacts for mounting on the edge of a pc board. This type, shown in Figure 1, is available in the 750 and 1000 Series.

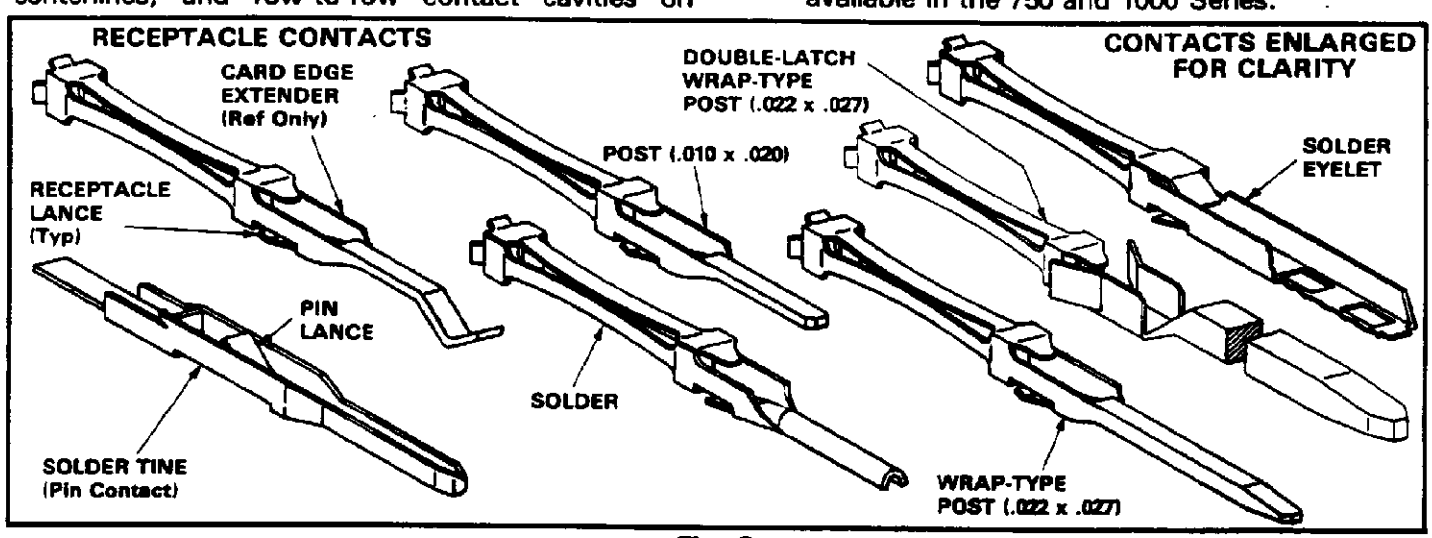


Fig. 3

Type II — a male connector that is identical to the Type I connector except that it has an anodized aluminum pin protector. This connector is available in the 750 and 1000 Series.

Type III — a male connector that has contact tails at a right angle to the contact pins. This type connector is available in the 751, 1000, and 1001 Series. See Figure 2.

Receptacle assemblies are female connectors designed to be mated with pin headers. These assemblies can be provided with a variety of contact tail configurations, such as those shown in Figure 3.

3. INSTALLING PIN HEADERS

A. Type I and Type II Pin Headers

The Type I and Type II box contact pin headers are designed to be mounted on the edge of a 1/16-in.-thk pc board. They have two mounting ears by which they are secured to the board with suitable hardware. The contact tines (tails) are pre-tinned for wave solder applications. See Figure 4.

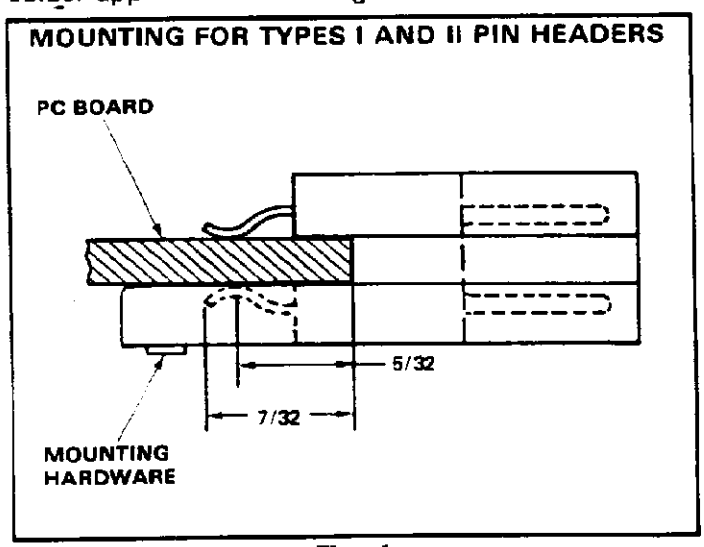


Fig. 4

Install these pin headers as follows:

1. Determine whether a 750 or 1000 Series pin header is to be installed.
2. Make a layout on the pc board for the pin header. Use the dimensions shown in Figure 6, Layout "A" or "B," for 750 Series pin headers, or refer to Figure 7, Layout "A" or "B," for 1000 Series pin headers.
3. Clean surface films from the pc board. This is necessary to ensure a good solder joint.
4. Align the connector with the edge of the pc board. Check polarization, and make sure the pin header is oriented so that it will mate with the mating receptacle assembly. Then position and secure pin header on pc board with suitable hardware.
5. Apply a mildly active flux over the solder tines of the contacts, and solder the contacts to the pc board using standard wave-soldering technique.

B. Type III Pin Headers

The Type III box contact pin headers (90° contact tails) are designed to be mounted to the flat surface of a pc board (3/32 in. maximum thickness). They have two mounting ears by which they are secured to the pc board with bolts. See Figure 5.

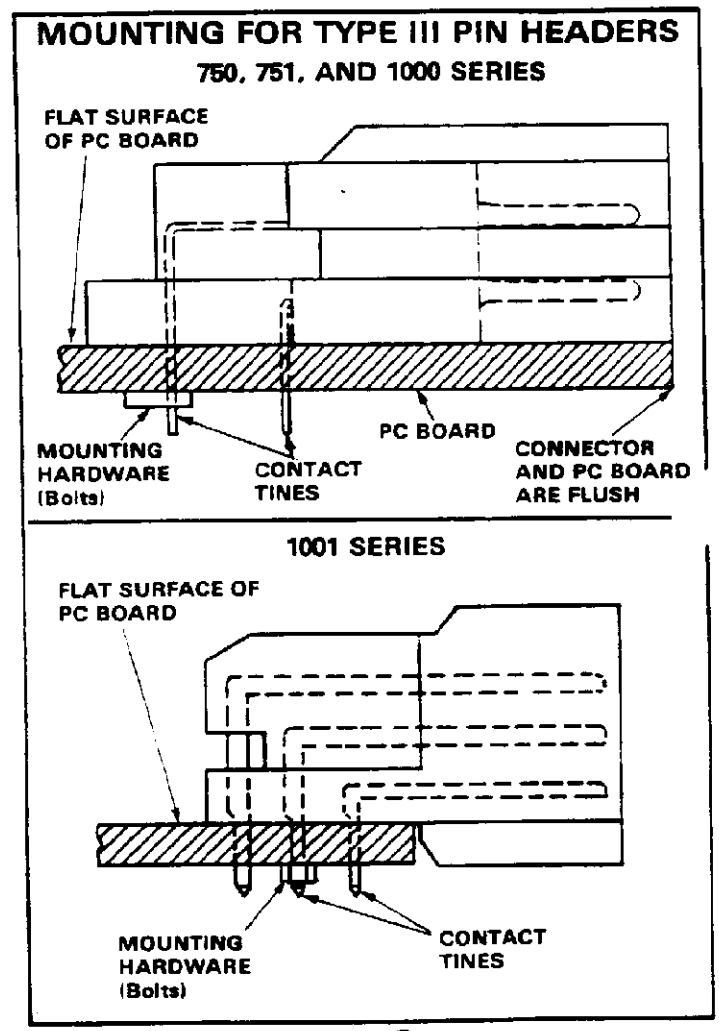


Fig. 5

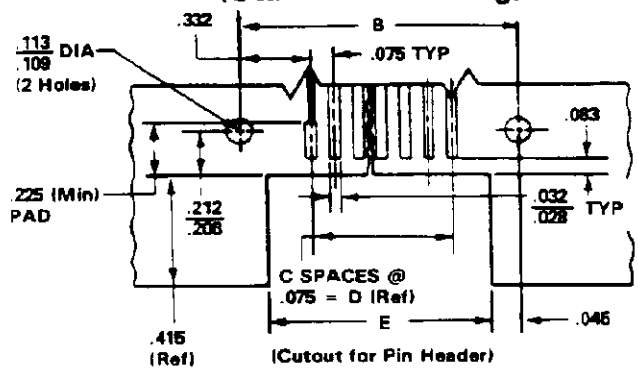
Install the connector as follows:

1. Determine whether a 751, 1000, or 1001 Series pin header is to be installed.
2. Make a layout on the pc board for the pin header. Use the dimensions shown in Figure 6, Layout "C" or "D," for 751 Series pin headers. Refer to Figure 7, Layout "C," for 1000 and 10 Series two-row pin headers, or see Figure . Layout "D," for 1001 Series three-row pin headers.
3. Position the connector on the board as shown in Figure 5.

750 AND 751 SERIES PIN HEADER PC BOARD LAYOUTS

LAYOUT FOR TYPES I AND II PIN HEADERS

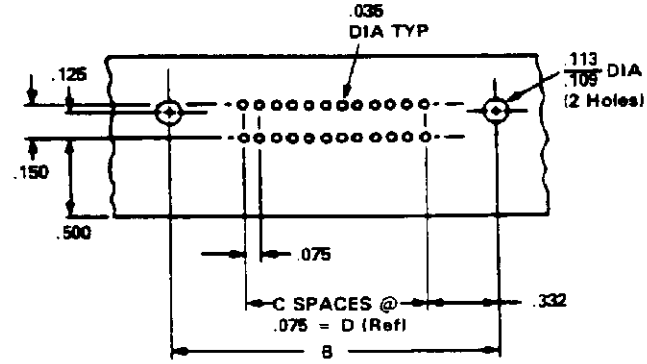
750 SERIES (Standard Housing)



LAYOUT "A"

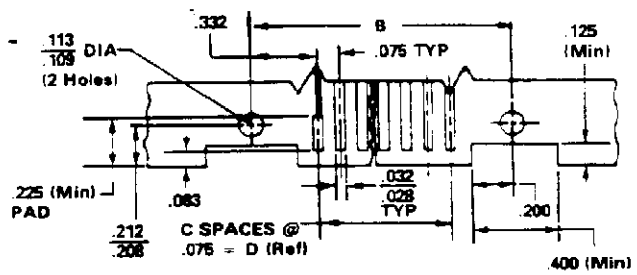
LAYOUT FOR TYPE III PIN HEADERS

751 SERIES (In-Line Tails)



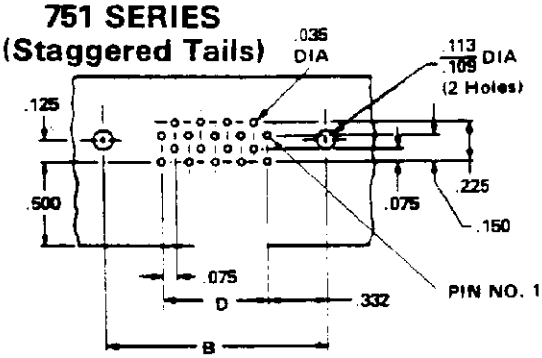
LAYOUT "C"

750 SERIES (External Key Housing)



LAYOUT "B"

751 SERIES (Staggered Tails)



LAYOUT "D"

DIMENSIONS

NO. OF POSITIONS	A*	B	C	D	E	NO. OF POSITIONS	A*	B	C	D	E
180	7.645	7.340	89	6.675	7.250	70	3.520	3.215	34	2.550	3.120
160	6.895	6.590	79	5.925	6.500	60	3.145	2.840	29	2.175	2.745
150	6.520	6.215	74	5.550	6.125	50	2.770	2.465	24	1.800	2.370
120	5.395	5.090	59	4.425	4.995	40	2.395	2.090	19	1.425	1.995
110	5.020	4.715	54	4.050	4.620	30	2.020	1.715	14	1.050	1.620
100	4.645	4.340	49	3.675	4.245	20	1.645	1.340	9	.675	1.245
90	4.270	3.965	44	3.300	3.870	10	1.270	.965	4	.300	.870
80	3.895	3.590	39	2.925	3.495						

* OVERALL LENGTH OF CONNECTOR

Fig. 6

4. Secure the connector to the pc board with bolts.

5. Using standard flux cleaning procedures, clean the contact area.

6. Using standard wave-soldering technique, solder the contacts to the pc board.

4. INSTALLING RECEPTACLES

A. Box Contact Receptacle Assemblies with Wave Solder Contacts

These assemblies can be mounted vertically on a pc board and wave soldered on the opposite side. They are designed to be mounted to a pc board that is .125 in. thick (max).

Proceed as follows:

1. Determine whether a 750, 1000, or 1001 Series receptacle is to be installed, and then make a layout on the pc board. Use the dimensions shown in Figure 9 for 750 and 1000 Series receptacles, or refer to Figure 10, Layout "A" for the 1001 Series receptacle layout dimensions.

2. Insert the contact tines (tails) through the holes in the pc board.

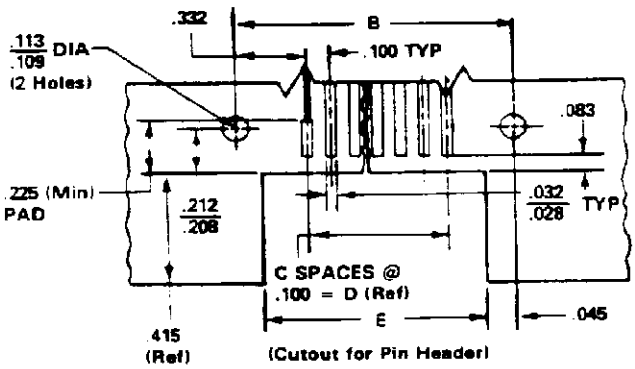
3. Mount the assembly to the pc board using bolts.

4. Solder the receptacle assembly contacts to the pc board using standard wave-solder technique.

1000 AND 1001 SERIES PIN HEADER PC BOARD LAYOUTS

LAYOUT FOR TYPES I AND II PIN HEADERS

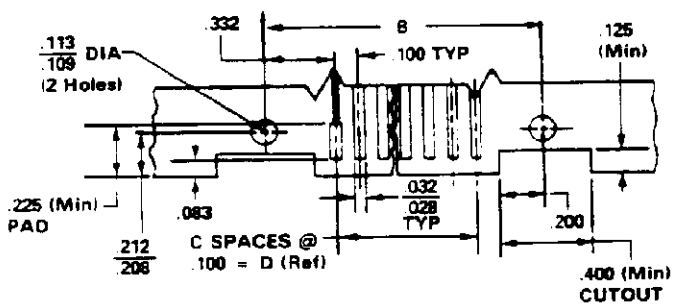
1000 SERIES (Standard Housing)



LAYOUT "A"

LAYOUT FOR TYPES I AND II PIN HEADERS

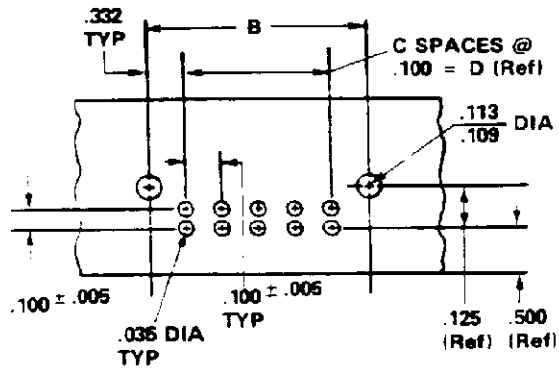
1000 SERIES (External Key Housing)



LAYOUT "B"

LAYOUT FOR TYPE III (Right Angle Mount) PIN HEADERS

1000 AND 1001 SERIES (Two-Row)

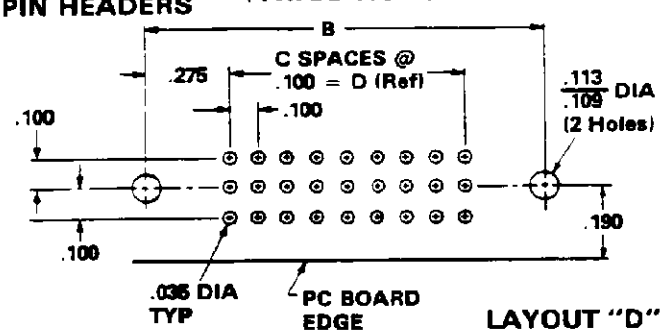


LAYOUT "C"

DIMENSIONS					
NO. OF POSITIONS	A*	B	C	D	E
140	7.855	7.565	69	6.900	7.470
134	7.555	7.265	66	6.600	7.170
130	7.355	7.065	64	6.400	6.970
120	6.855	6.565	59	5.900	6.470
110	6.355	6.065	54	5.400	5.970
100	5.855	5.565	49	4.900	5.470
90	5.355	5.065	44	4.400	4.970
80	4.855	4.565	39	3.900	4.470
70	4.355	4.065	34	3.400	3.970
60	3.855	3.565	29	2.900	3.470
50	3.355	3.065	24	2.400	2.970
40	2.855	2.565	19	1.900	2.470
30	2.355	2.065	14	1.400	1.970

LAYOUT FOR TYPE III (Right Angle Mount) PIN HEADERS

1001 SERIES (Three-Row)



LAYOUT "D"

DIMENSIONS				
NO. OF POSITIONS	A*	B	C	D
300	10.750	10.450	99	9.900
270	9.750	9.450	86	8.900
240	8.750	8.450	79	7.900
210	7.750	7.450	69	6.900
195	7.250	6.950	64	6.400
180	6.750	6.450	59	5.900
165	6.250	5.950	54	5.400
150	5.750	5.450	49	4.900
135	5.250	4.950	44	4.400
126	4.950	4.650	41	4.100
123	4.850	4.550	40	4.000
120	4.750	4.450	39	3.900
111	4.450	4.150	38	3.600
105	4.250	3.950	34	3.400
90	3.750	3.450	29	2.900

* OVERALL LENGTH OF CONNECTOR

Fig. 7

B. Box Contact Receptacle Assemblies with Solder Eyelet Contacts

These assemblies are designed to be rack- or panel-mounted and will accommodate either a single- or multiple-wire termination. For single terminations, each wire is individually placed in the contact channel and soldered. For multiple terminations, each wire is placed in an eyelet and the wire is soldered to the contact. See Figure 8.

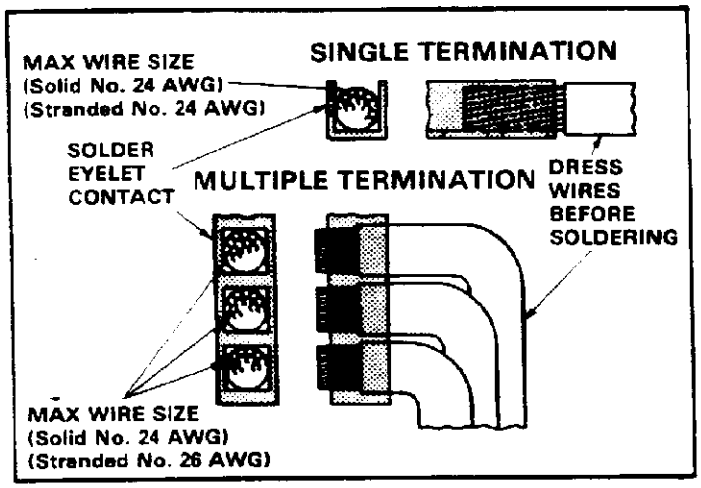


Fig. 8

CAUTION *Do NOT clinch or wrap wires to the contact eyelet tail.*

Proceed as follows:

1. Determine whether a 750, 1000, or 1001 Series receptacle is to be installed.
2. Make a layout on the rack for the receptacle. Refer to Figure 9 for rack-mounting dimensions for 750 and 1000 Series receptacles. Refer to Figure 10, Layout "C" for rack-mounting dimensions for 1001 Series receptacles.
3. Dress the wires in the proper direction. This will prevent bending of the contacts after they are soldered. See Figure 8.
4. Position the conductor in the contact channel (or eyelet) and solder it. See Figure 8.

C. Box Contact Receptacle Assemblies with Card Extender Contacts

These assemblies are designed to be mounted to the edge of a 1/16-in.-thk pc board.

Proceed as follows:

1. Determine whether a 750 Series or 1000 Series receptacle is to be installed. Then, using the dimensions shown in Figure 9, make a layout on the pc board.
2. Clean surface films from the pc board. This is necessary to ensure a good solder joint.
3. Align the receptacle with the edge of the pc board. Check to be sure that the polarized receptacle will mate with the polarized pin header; then install the receptacle on the edge of the pc board.
4. Remove contaminants and surface oxides, then apply a mildly active flux to the soldering surface.
5. Using standard wave-soldering technique, solder the pre-soldered contact tines to the pc board.

D. Box Contact Receptacle Assemblies with .010 x .020 Posted Contacts

These assemblies are designed to be mounted on the flat surface of a pc board in the same manner as the wave solder contacts.

NOTE *The .010 x .020 posted contacts may be used to accommodate one wrap-type termination, using either 30 or 32 AWG wire.*

Proceed as follows:

1. Determine whether a 750 Series or 1000 Series receptacle is to be installed; then refer to Figure 9 and make a layout on the pc board, using the dimensions for wave-solder contacts.
2. Insert the posted contacts into the pc board.
3. Secure the receptacle to the pc board with bolts.
4. Solder the posted contacts to the pc board using standard wave-soldering technique.
5. If applicable, apply one wrap-type termination to the posted contact.

E. Box Contact Receptacle Assemblies with .022 x .027 Wrap-Type Posted Contacts.

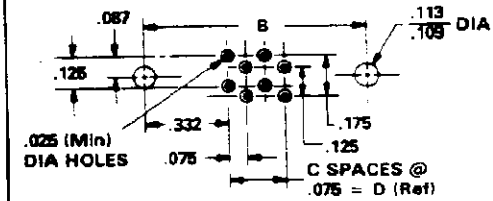
These assemblies are available for rack or panel mounting, and for pc board applications. Note that these assemblies are available in 1000 and 1001 Series only.

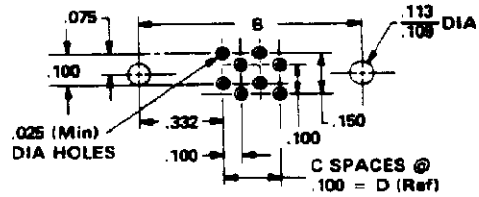
CAUTION *Do NOT use wrap-type posted contacts designed for pc board solder-mount applications (base part number 531839 or military equivalent) in a rack-mount application, because you could damage the contact tines. Use an AMP receptacle with base part number of 531836, 531837, or 531838, or a military equivalent, for rack-mount applications.*

1. Determine whether a rack- or panel-mount application, or a pc board application is to be made, and whether a 1000 or 1001 Series receptacle is to be installed, and then make a layout on the rack, panel, or pc board. Refer to Figure 9

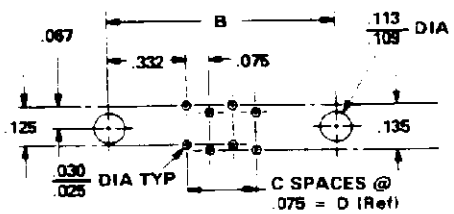
750 AND 1000 SERIES RECEPTACLE ASSEMBLY PC BOARD LAYOUTS

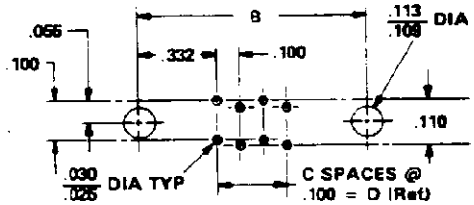
WAVE SOLDER CONTACT (Connector Side Shown)





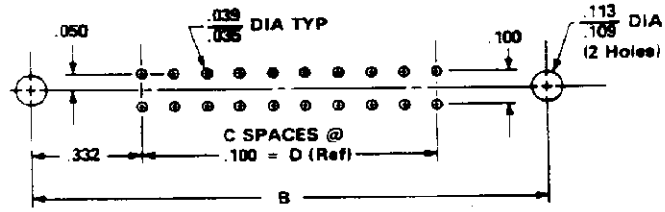
.010 x .020 POSTED CONTACTS (Connector Side Shown)



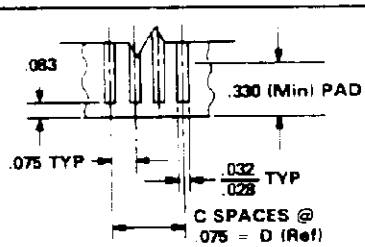


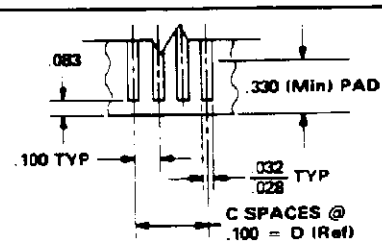
WRAP-TYPE .022 x .027 POSTED CONTACTS (Connector Side Shown)

NOT AVAILABLE IN 750 SERIES

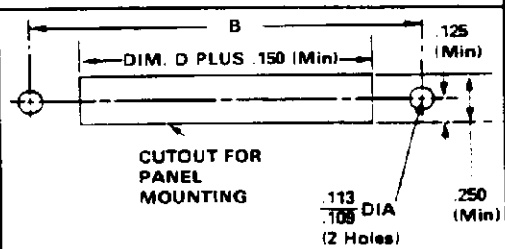


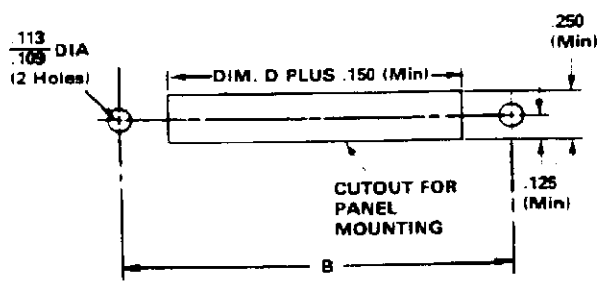
CARD EXTENDER CONTACTS





RACK- OR PANEL-MOUNT CONNECTORS





DIMENSIONS				
NO. OF POSITIONS	A*	B	C	D
180	7.630	7.340	89	6.675
160	6.880	6.590	79	5.925
150	6.505	6.215	74	5.550
120	5.380	5.090	59	4.425
110	5.005	4.715	54	4.050
100	4.630	4.340	49	3.675
90	4.255	3.965	44	3.300
80	3.880	3.590	39	2.925
70	3.505	3.215	34	2.550
60	3.130	2.840	29	2.175
50	2.755	2.465	24	1.800
40	2.380	2.090	19	1.425
30	2.005	1.715	14	1.050
20	1.630	1.340	9	.675
10	1.225	.965	4	.300

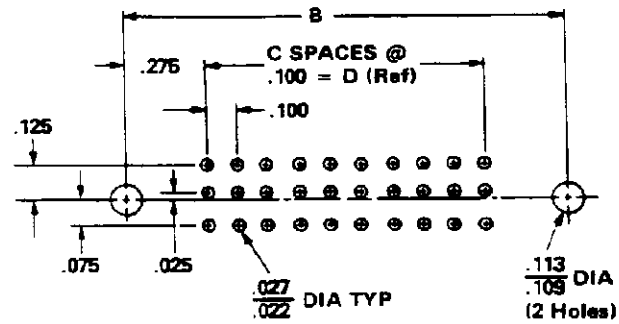
DIMENSIONS				
NO. OF POSITIONS	A*	B	C	D
140	7.855	7.565	69	6.900
134	7.555	7.265	66	6.600
130	7.355	7.065	64	6.400
120	6.855	6.565	59	5.900
110	6.355	6.065	54	5.400
100	5.855	5.565	49	4.900
90	5.355	5.065	44	4.40
80	4.855	4.565	39	3.90
70	4.355	4.065	34	3.400
60	3.855	3.565	29	2.900
50	3.355	3.065	24	2.400
40	2.855	2.565	19	1.900
30	2.355	2.065	14	1.400

* OVERALL LENGTH OF CONNECTOR.

Fig. 9

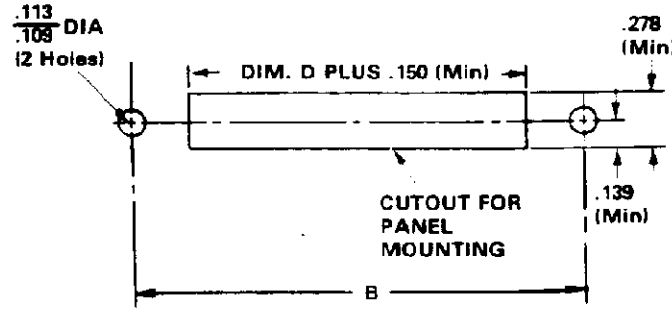
1001 SERIES THREE-ROW RECEPTACLE ASSEMBLY PC BOARD LAYOUTS (Connector Side Shown)

LAYOUT FOR WAVE SOLDER CONTACTS



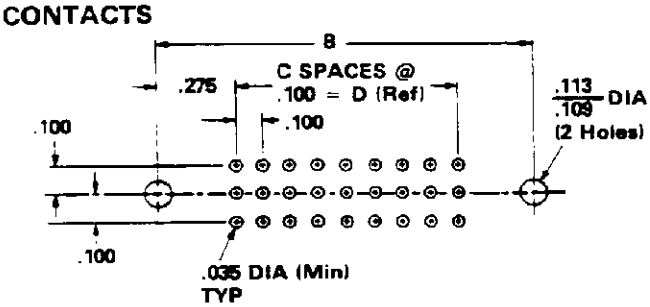
LAYOUT "A"

LAYOUT FOR RACK- OR PANEL-MOUNT CONNECTORS



LAYOUT "C"

LAYOUT FOR .022 x .027 WRAP-TYPE CONTACTS



LAYOUT "B"

DIMENSIONS				
NO. OF POSITIONS	A*	B	C	D
300	10.750	10.450	99	9.900
270	9.750	9.450	89	8.900
240	8.750	8.450	79	7.900
210	7.750	7.450	69	6.900
195	7.250	6.950	64	6.400
180	6.750	6.450	59	5.900
165	6.250	5.950	54	5.400
150	5.750	5.450	49	4.900
135	5.250	4.950	44	4.400
126	4.950	4.650	41	4.100
123	4.850	4.550	40	4.000
120	4.750	4.450	39	3.900
111	4.450	4.150	36	3.600
105	4.250	3.950	34	3.400
90	3.750	3.450	29	2.900

* OVERALL LENGTH OF CONNECTOR

Fig. 10

for 1000 Series layout dimensions, or see Figure 10 for 1001 Series layout dimensions. (Use rack- or panel-mounting connector layout for rack or panel-mounting, and .022 x .027 wrap-type posted contact layout for pc board applications.)

2. If a rack- or panel-mount application is made, install the receptacle on the rack or panel and secure receptacle with bolts. If a pc board application is made, insert the contacts into the pc board, secure the assembly with bolts, and solder the contacts to the pc board, using standard wave-soldering technique.

3. Apply wrap-type termination(s) to each posted contact, using the specifications provided in Figure 11.

5. KEYING

Keying ensures that only two properly keyed connectors can be mated. There are three methods by which connectors can be keyed: (1) by using external keys on connectors that have an external key housing, (2) by using a keying sleeve (for 750 and 1000 Series connectors only), or (3) by using a solid keying pin (750 and 1000 Series connectors only).

POST LENGTH	.406	.565	.725
Wires Per Post	1 High	2 High	3 High

Maximum wire size for wrapping the posted box terminal is No. 30 AWG (max. insulated wire diameter, .019).

The following data can be used to determine bit and sleeve size for the wire-wrap tool*.

Maximum Terminal Diagonal: .034
Minimum Terminal Diagonal: .031
Maximum Effective Radius: .067

Recommended Sleeve: No. 507100*

Recommended Bits: No. 511206*
No. 507063*

* Available from Gardner-Denver Co., Grand Haven, Michigan

Fig. 11

NOTE

The keying sleeve and keying pin keying methods are intermateable, with one exception: receptacles with a contact removed (but not drilled to .062) will mate with pin headers having a keying pin, but will not mate with pin headers that are equipped with the keying sleeve.

A. Installing External Keys

Eight different positions can be achieved with keys in one end of a connector assembly, and 64 different positions can be achieved with keys in both ends of a connector assembly. See Figure 12. If more than 64 keying positions are required, keying pin 530328 can be used in conjunction with the external keys (on 750 and 1000 Series only). The connectors have number and letter coding on the outside of the key cavity to aid in key location. Keys are secured in receptacle assemblies by a screw. A rivet is used to secure keys in pin header assemblies. AMP Clinching Tool 91117 is required for installing the rivets.

Proceed as follows:

NOTE

Keys must be installed BEFORE mounting the connector to a pc board.

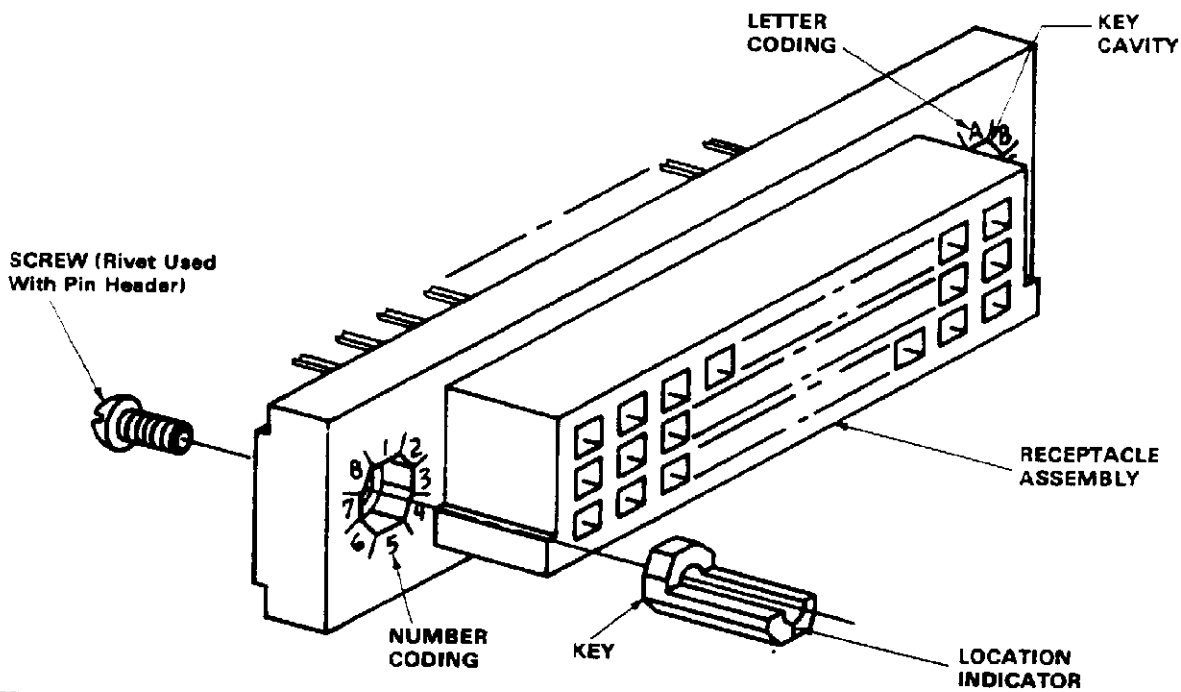
1. Refer to Figure 12 and select the proper keying parts needed for the application. installing keys in a pin header assembly, obt the required clinching tool.
2. Determine the keying position required on the connector. To key mating connectors, place the location indicator at the same number or letter position on both connectors.
3. Insert the key into the key cavity. See Figure 12.
4. If installing keys in a receptacle assembly, secure each key with a screw. If installing keys in a 750, 751, or 1000 Series pin header, secure keys in connector according to procedures given in IS 7803. If installing keys in a 1001 Series 3-row connector, secure keys in connector according to procedures given in IS 6626.

B. Internal Keying Sleeve 583254

This keying sleeve is to be used on the pin header contacts only. Proceed as follows:

NOTE

The contact positions in the last three vertical rows of contact cavities at either end of a connector should not be used for keying.



CONN SIZE	RECEPTACLE KEYS			PIN HEADER KEYS			CLINCHING† TOOL NO.
	KEY NO.	SCREW	KIT NO.*	KEY NO.	RIVET NO.	KIT NO.**	
750	530341-1	2-56 x 1/4	530341-3	530341-1	530347-1	530341-4	91117-1
751	↓	↓	↓	↓	-3	-5	-1
1000	↓	↓	↓	↓	-1	-4	-1
1001	↓	↓	↓	↓	-3	-5	-3

* KIT INCLUDES TWO KEYS AND TWO SCREWS.
** KITS INCLUDE TWO KEYS AND TWO RIVETS.
† REQUIRED FOR INSTALLING KEYS IN PIN HEADERS.

Fig. 12

1. Place a small amount of glue on the contact to be keyed.

2. Slide the sleeve over the contact until it bottoms on the contact. A small fillet of glue should form at the base of the keying sleeve, as shown in Figure 13.

3. Key the receptacle assembly by drilling a .062-dia hole completely through the corresponding receptacle cavity.

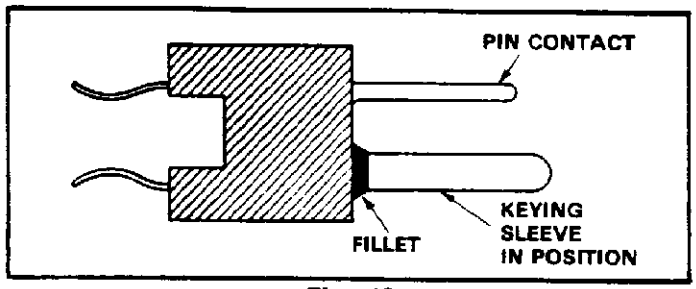


Fig. 13

C. Internal Keying Pin 530328

The keying pins are to be used in the pin headers only. Proceed as follows:

NOTE *The contact positions in the last three vertical rows of contact cavities at either end of a connector should not be used for keying.*

1. Remove the pin contact from the desired keying position.

2. Insert the keying pin into the cavity.

3. Bend the tail of the keying pin over the edge of the housing and trim off excessive material. See Figure 14.

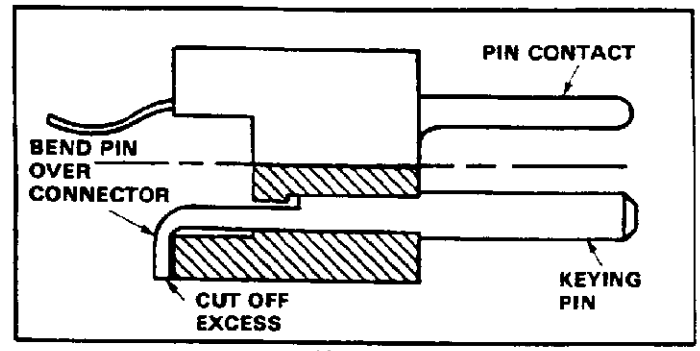


Fig. 14

4. Remove the corresponding receptacle contact from the receptacle assembly. No drilling is necessary.

6. REPLACING A DAMAGED CONTACT

Contacts can be removed and replaced in both soldered and unsoldered connectors.

A. Extracting Contacts from Pin Headers (Figure 15)

To remove contacts from connectors with AMP Extraction Tool 91156-1, proceed as follows:

1. If contact is soldered to a pc board, remove ALL solder from the contact to be removed before attempting to extract it.

2. Insert the tool tip into the channel of the pin until the tool bottoms. This depresses the locking lance (Figure 3) and releases the contact.

3. Remove the extraction tool and push on the pin contact to remove it from the connector. It should back out easily.

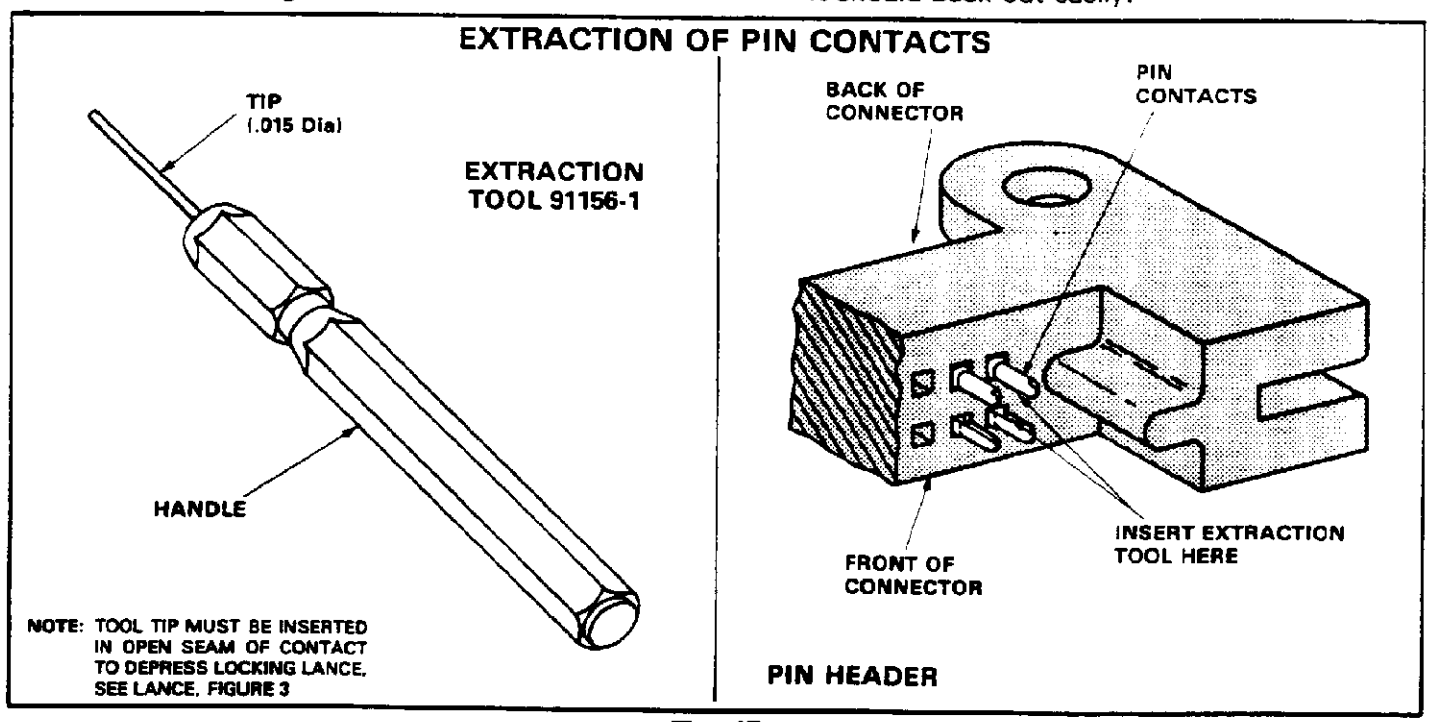


Fig. 15

B. Inserting Contacts into Pin Headers

1. Check to be sure the contact lance is sprung approximately 15° inward.
2. Orient the contact with those already in the connector.
3. Insert the contact, pin portion first, into the back of the contact cavity until the contact bottoms in the connector.
4. Pull back lightly on the contact to be sure it is locked in the cavity.

C. Extracting Contacts (excluding .022 x .027 double-latch posts) from Receptacle Assemblies (Figure 16)

To remove contacts from unsoldered connectors with AMP Extraction Tool 91035-1, proceed as follows:

1. If the contact is soldered to a pc board, and/or wires are attached to the contact, remove ALL solder and/or wires before attempting to extract contact.
2. Slide the tool tip into the contact cavity as indicated in Figure 16. This will depress the contact lance and allow easy removal of the contact through the front of the connector.
3. Push on the back of the contact. It should pass easily out the front of the connector. If NOT, repeat Steps 1 and 2.

NOTE

An extraction tool is not needed to remove a wrap-type posted contact from the pc board application. Remove ALL solder (or keep solder in a melted state) and push the contact through the hole and out of the receptacle cavity. This contact has a latch design that makes extraction possible without depressing the locking latch.

D. Inserting Contacts into Receptacle Assemblies

1. Check to be sure the contact lance sprung outward approximately 15°.
2. Orient the contacts with those already in the connector.
3. Push the contact, tail end first, through the front of the cavity until it bottoms in the connector.
4. Using a small, blunt object (.044 diameter), seat the contact in the connector.
5. Push lightly on the protruding end (solder or wire end) to be sure the contact is locked in the connector.

E. Extracting .022 x .027 Double-Latch Posted Contacts from Receptacle Assemblies (Figure 17)

To remove double-latch posted contacts from unsoldered connectors with AMP Contact Replacement Tool 1-265871-7, proceed as follows:

1. Assemble contact replacement tool by screwing threaded end of contact removal tip into plunger.
2. Slide contact removal tip over the contact post.
3. Push damaged contact until it snaps fr.
4. Remove contact from front of connector.

F. Inserting .022 x .027 Double-Latch Posted Contacts into Receptacle Assemblies

1. Insert a straight dental pick (.028 maximum diameter) from the mating face of the connector through the contact cavity and stabilizer of the

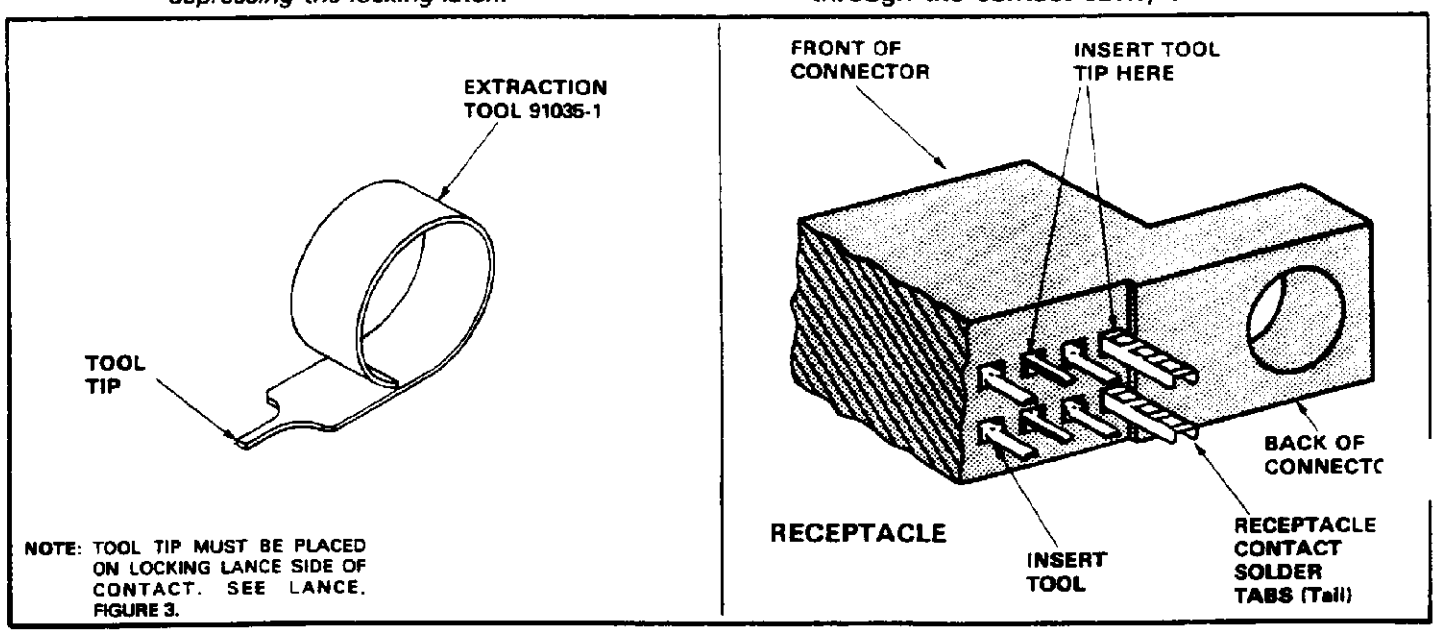


Fig. 16

removed contact until the pick extends beyond the stabilizer. See Figure 18.

5. Rotate the contact 90° from those already in the connector.

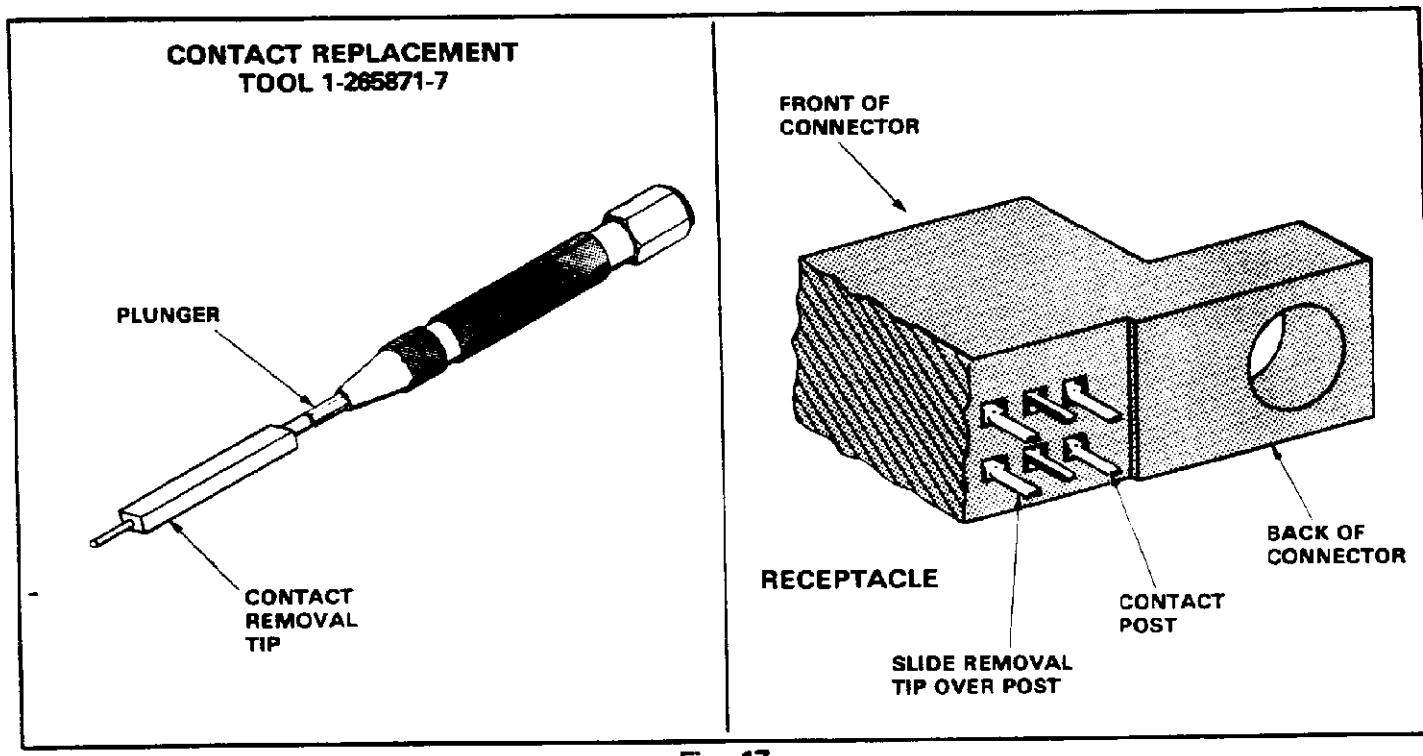


Fig. 17

2. Rotate the pick 360° to open the bead of epoxy on the stabilizer.

3. Remove the pick from the cavity.

4. Check to be sure that the replacement contact lances are sprung outward approximately 15°.

6. Push the contact, tail end first, into the front of the cavity until it bottoms.

7. Using a blunt probe (.044 maximum diameter), seat the contact in the connector.

8. Push lightly on the protruding end of the contact to make certain that it is latched in the connector.