

NOTE

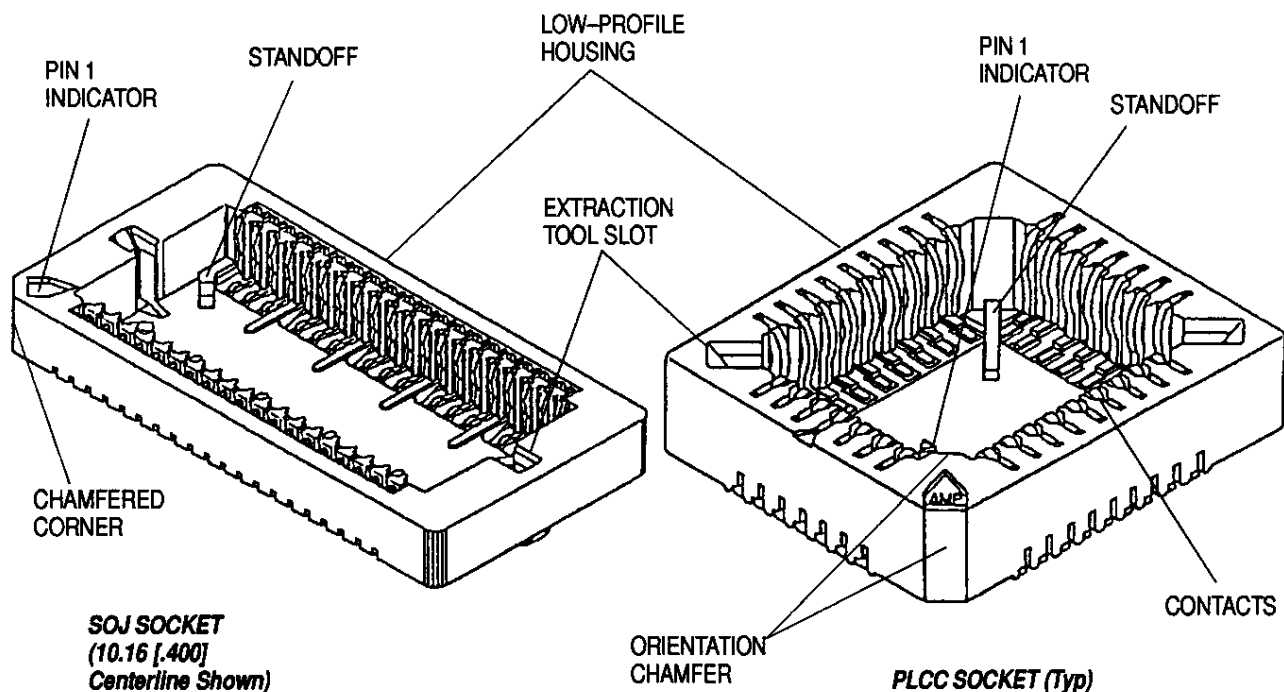
All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [.005] and angles have a tolerance of $\pm 2^\circ$.

1. INTRODUCTION

This specification covers the requirements for application of AMP* PLCC (Plastic Leaded Chip Carrier) and SOJ (Small Outline J-Leaded) sockets to a printed circuit (pc) board.

Square PLCC configurations include 20, 28, 44, 52, 68, and 84 positions. Rectangular configurations include a 32-position PLCC and a 32-position Ultra-Low PLCC. The SOJ configurations include 28-, 32-, and 40-positions on 10.16 [.400] centerlines and 28- and 32-positions on 7.62 [.300] centerlines. All sockets feature a pin number 1 indicator and/or a corner chamfer for device orientation.

Basic terms and features of components are provided in Figure 1.

*Figure 1*

93-43A

2. REFERENCE MATERIAL**2.1. Revision Summary**

This paragraph is reserved for a revision summary covering the most recent additions and changes made to this specification which include the following:

Per EC 0160-3822-94:

- Add 32-position Ultra-Low PLCC and 28- and 32-position SOJ sockets
- Revised illustrations of sockets to show new solder tails
- Added solder volume information

Per EC 0990-7823-92:

- Updated format

2.2. Customer Assistance

Reference Part Number 822279-1 and Product Code 0590 are representative numbers that identify PLCC and SOJ sockets. Use of these numbers will identify the product line and expedite your inquiries through an AMP service network established to help you obtain product and tooling information. Such information can be obtained through a local AMP Representative (Field Sales Engineer, Field Applications Engineer, etc.) or, after purchase, by calling the TECHNICAL ASSISTANCE CENTER or the AMP FAX/PRODUCT INFORMATION number at the bottom of page 1.

2.3. Drawings

Customer Drawings for specific products are available from the responsible AMP Engineering department via the service network. The information contained in the Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by AMP Incorporated.

2.4. Specifications

AMP Product Specification 108-1267 provides test and performance requirements.

2.5. Instruction Material

AMP Instruction Sheets 408-9577 and 408-9695 provide extraction procedures for the AMP tools used to remove devices from sockets.

AMP Corporate Bulletin No. 52 is available upon request and can be used as a guide in soldering. This bulletin provides information on various flux types and characteristics along with the commercial designation and flux removal procedures. A checklist is attached to the bulletin as a guide for information on soldering problems.

3. REQUIREMENTS

3.1. Storage

Sockets should remain in the shipping containers until ready for use to prevent deformation to the solder tails and/or damage to the housings. When handling the sockets, pick them up by the housing only.

3.2. PC Boards

A. Tolerances

1. Maximum allowable bow of the pc board will be 0.13 [.005].
2. Coplanarity of plated pads on the pc board will be 0.03 [.001].
3. If a solder mask is used, it must allow full clearance around the pads as defined in Figure 2.

B. Material

1. Board material will be glass epoxy (FR-4, G-10). Consult AMP Engineering for suitability of other board materials.
2. Board thickness will be 1.57 [.062] nominal. For suitability of other board thicknesses contact AMP Engineering.

C. Recommended Board Layout

Pattern and pad dimensions and tolerances are recommended to conform to Figure 2.

3.3. Solder Paste

A. Alloy Type

1. 63 Sn/37 Pb
2. 60 Sn/40 Pb
3. 62 Sn/36 Pb/2 Ag

B. Flux

Flux incorporated in the paste will be a rosin, mildly active (RMA) type.

C. Paste

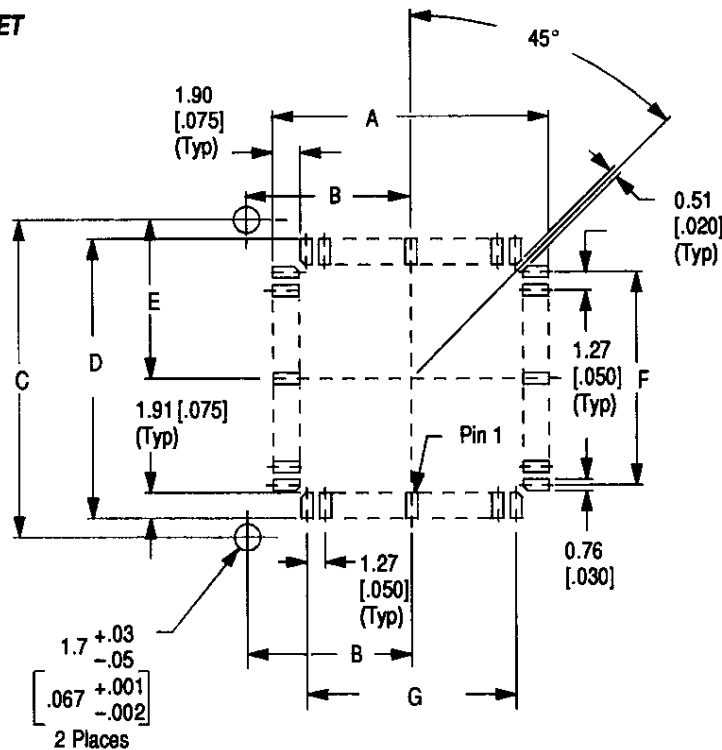
Paste will be at least 55% solids by volume.

D. Solder Volume

Recommended minimum solder paste volume before curing shall be .22 mm³ [(.35 X 10⁻⁵)³. Calculation of solder paste volume is done using the formula $V_s=(a)(b)(T_p)$, when

- V_s = Solder paste volume before curing
- a = aperture dimension corresponding to pad width
- b = aperture dimension corresponding to pad length
- T_p = stencil thickness

PLCC SOCKET



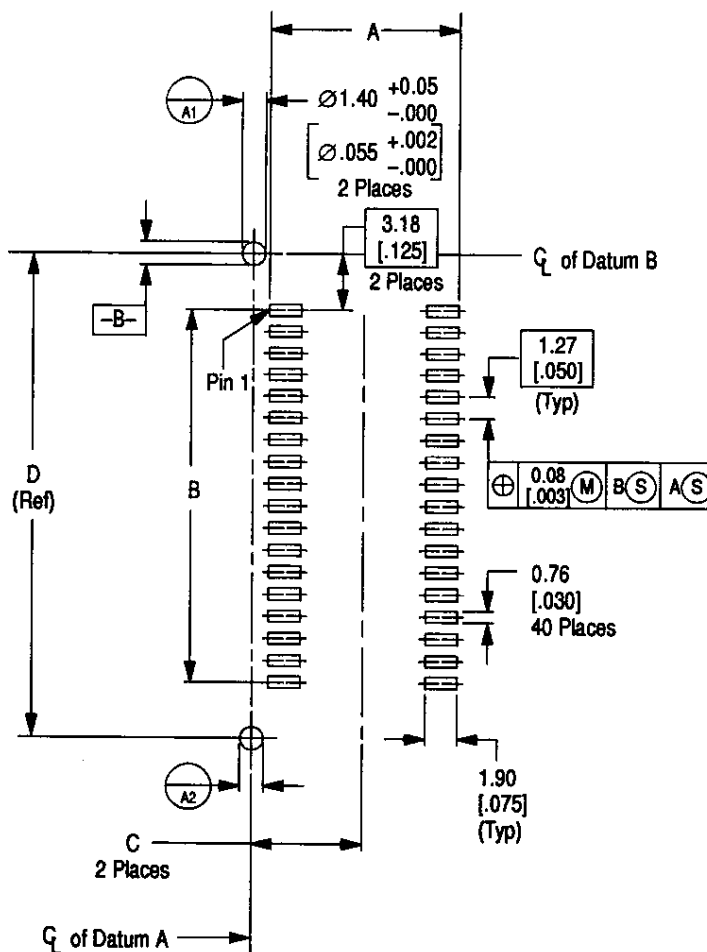
PLCC PC BOARD LAYOUT

NUMBER OF POSITIONS	DIMENSIONS						
	A	B +0.03 [.001]	C +0.05 [.002]	D	E +0.03 [.001]	F	G
20	10.03 [.395]	6.35 [.250]	12.70 [.500]	10.03 [.395]	6.35 [.250]	5.08 [.200]	5.08 [.200]
28	12.57 [.495]	7.62 [.300]	15.24 [.600]	12.57 [.495]	7.62 [.300]	7.62 [.300]	7.62 [.300]
32**	12.57 [.495]	7.62 [.300]	17.78 [.700]	15.11 [.595]	8.89 [.350]	10.16 [.400]	7.62 [.300]
44	17.65 [.695]	10.16 [.400]	20.32 [.800]	17.65 [.695]	10.16 [.400]	12.70 [.500]	12.70 [.500]
52	20.19 [.795]	11.43 [.450]	22.86 [.900]	20.19 [.795]	11.43 [.450]	15.24 [.600]	15.24 [.600]
68	25.27 [.995]	13.97 [.550]	27.94 [1.100]	25.27 [.995]	13.97 [.550]	20.32 [.800]	20.32 [.800]
84	30.35 [1.195]	16.51 [.650]	33.02 [1.300]	30.35 [1.195]	16.51 [.650]	25.40 [1.000]	25.40 [1.000]

** Rectangular Socket and Ultra-Low Socket

Figure 2 (cont'd)

SOJ SOCKET



SOJ PC BOARD LAYOUT

CENTERLINE	NUMBER OF POSITIONS	DIMENSIONS			
		A	B	C $\pm .08$ [0.003]	D $\pm .08$ [0.003]
10.16 [400]	40	11.30 [445]	24.13 [950]	6.60 [260]	30.48 [1.200]
10.16 [400]	32	11.30 [445]	19.05 [750]	6.60 [260]	25.40 [1.00]
10.16 [400]	28	11.30 [445]	16.51 [650]	6.60 [260]	22.86 [900]
7.62 [300]	32	8.76 [345]	19.05 [750]	5.33 [210]	25.40 [1.000]
7.62 [300]	28	8.76 [345]	16.51 [650]	5.33 [210]	22.86 [900]

Figure 2 (end)

3.4. Socket Placement

A. Registration

1. Sockets may be placed on the pc board by hand. After placement, no leads shall overhang solder pads. Leads may be flush with the pad edge. For manual placement, sockets with orientation posts are recommended.
2. Requirements for lead positioning on the pads for automatic application tooling is the same as for hand application. In addition, clearances around the socket may be required depending on the type of gripper equipment employed (external grippers or vacuum). For reliable placement, total equipment accuracy (i.e. gripper head, centering fingers, fixtures, repeatability) must be within ± 0.089 [0.0035].

B. Seating Forces

The force required to seat the socket into the paste will be 0.24 Newton [.88 oz.] multiplied by the number of contact positions.

3.5. Soldering**A. Temperature and Time**

The reflow temperature to which the socket body is subjected shall not exceed 215°C [419°F] for more than 3 minutes.

CAUTION Excessive temperatures may cause housing degradation.

B. Process

Socket design is compatible with vapor phase and infrared reflow solder processing. For suitability with other reflow methods, contact AMP Engineering. Additional information on soldering and soldering variables can be found in AMP Corporate Bulletin 52.

Sockets are qualified using a Corpanet Batch Vapor Phase (Model VVP 10BU) and Vitronics†† Infrared (IR) (Model SMD 718) equipment. The following reflow parameters are provided as baseline information only. Due to the many variables involved with reflow processes (i.e. component density, location, orientation, etc.), we recommend that the user conduct trial runs under actual manufacturing conditions to insure product/process compatibility.

Vapor Phase Reflow:

Primary vapor temperature – 215°C [419°F]
 Preheat (secondary VPR) – 30 sec
 Dwell (Primary VPR) – 60 sec
 Cool (Secondary VPR) – 30 sec

Infrared (Non-focused) Reflow:

Conveyor Speed – 635mm [25 in.] per second

Heater Settings: TOP AND BOTTOM

Preheat –	325°C [617°F]
Zone 1 –	240°C [464°F]
Zone 2 –	260°C [500°F]
Zone 3 –	275°C [527°F]

† A product of Corpane Industries, Louisville, KY

†† A product of Vitronics Corporation, Newberryport, MA

C. Cleaning

After soldering, removal of fluxes, residues, and activators may be necessary. Consult the supplier of the solder and flux for recommended cleaning solvents. The following common cleaning solvents can be used on these sockets for a period of up to 10 minutes at room temperature with no harmful affects. If you have a particular solvent that is not listed, consult an AMP Representative before using it on these sockets.

1,1,1 – Trichloroethane
 Freon TA▲

Freon TMS▲
 Freon TMC▲

Freon TF▲
 Genesolv■

Prelete●
 Freon TE▲

▲ Trademark of E.I. DuPont de Nemours & Co., Inc.

● Trademark of London Chemical Co., Inc.

■ Trademark of Allied-Signal Inc.

DANGER

Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the Material Safety Data Sheet (MSDS) supplied by the manufacturer for characteristics and handling of cleaners.

D. Drying

Sockets can withstand a temperature of 105°C [221°F] for a period of five minutes with no degradation to the connector components. Values may vary with different types of automatic cleaning equipment (see equipment manufacturer's recommendation).

E. Soldering Guidelines

Refer to Paragraph 2.5. for instructional material that is available for establishing soldering guidelines.

3.6. Inspection

1. All solder joints should comply with AMP Workmanship Standard 201-21.
2. Sockets shall be firmly attached to the pc board; there should be no evidence of looseness or rocking.
3. There shall be no evidence of any damage to the socket as a result of application tooling.

3.7. Repair

If the socket is not properly seated, the solder can be removed and the socket reseated and resoldered. However, if there is any damage to the contacts or the housing, the socket must be removed and replaced with a new one.

A soldered connector may be removed by use of small-tip irons with vacuum, or benchtop or free standing styles of convection or infrared rework stations.

CAUTION

Excessive temperatures may cause housing degradation. Use of temperature indicating tape/paste is recommended for convection rework.

4. INSTALLATION OF INTEGRATED CIRCUIT (IC) DEVICES

Insert device onto socket as follows:

1. Place socket/pc board on a flat surface. See Figure 3.
2. Align pin number 1 on device with pin number 1 indicator on socket.
3. Push straight down on device with four fingers positioned as shown until device is completely seated.

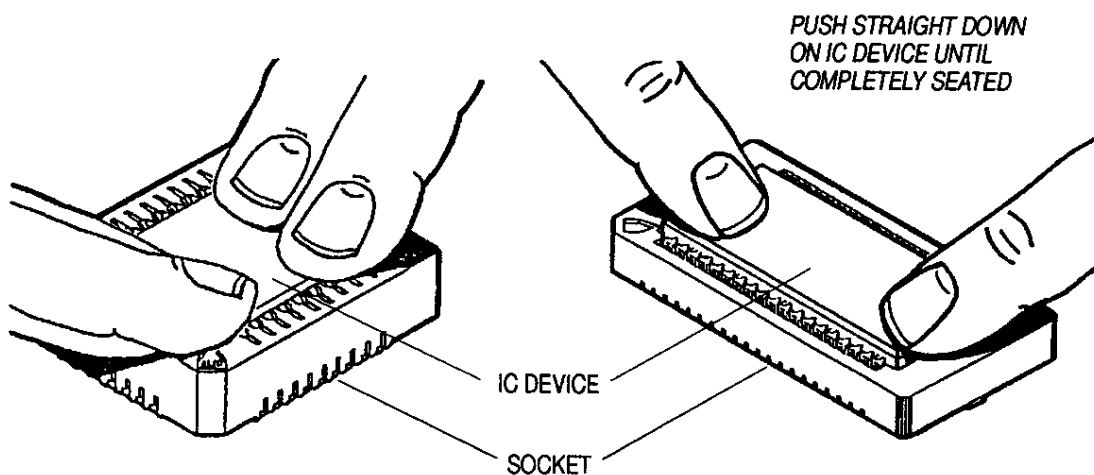


Figure 3

93-44A

NOTE

A maximum of 4.2 Newton [15 oz] force per contact is required to seat device in a standard socket. A maximum of 2.8 Newton [10 oz] force per contact is required to seat device in a low insertion force socket.

CAUTION

If excessive force is encountered, do NOT continue to seat the device. Instead, realign the device and seat normally.

4. Visually check to be sure device is bottomed in socket.

5. QUALIFICATIONS

PLCC and SOJ sockets are designed in accordance with JEDEC (Joint Electronic Device Engineering Council) Specifications for both inch-standard and metric-standard PLCC devices.

The sockets are UL (Underwriters' Laboratories, Inc.) recognized and CSA (Canadian Standards Association) certified.

6. TOOLING

AMP Extraction Tools are used to remove IC devices from PLCC or SOJ sockets. Refer to Figure 4 for available tooling according to socket size (number of positions). For extraction procedures, refer to the instruction sheet packaged with the tool.

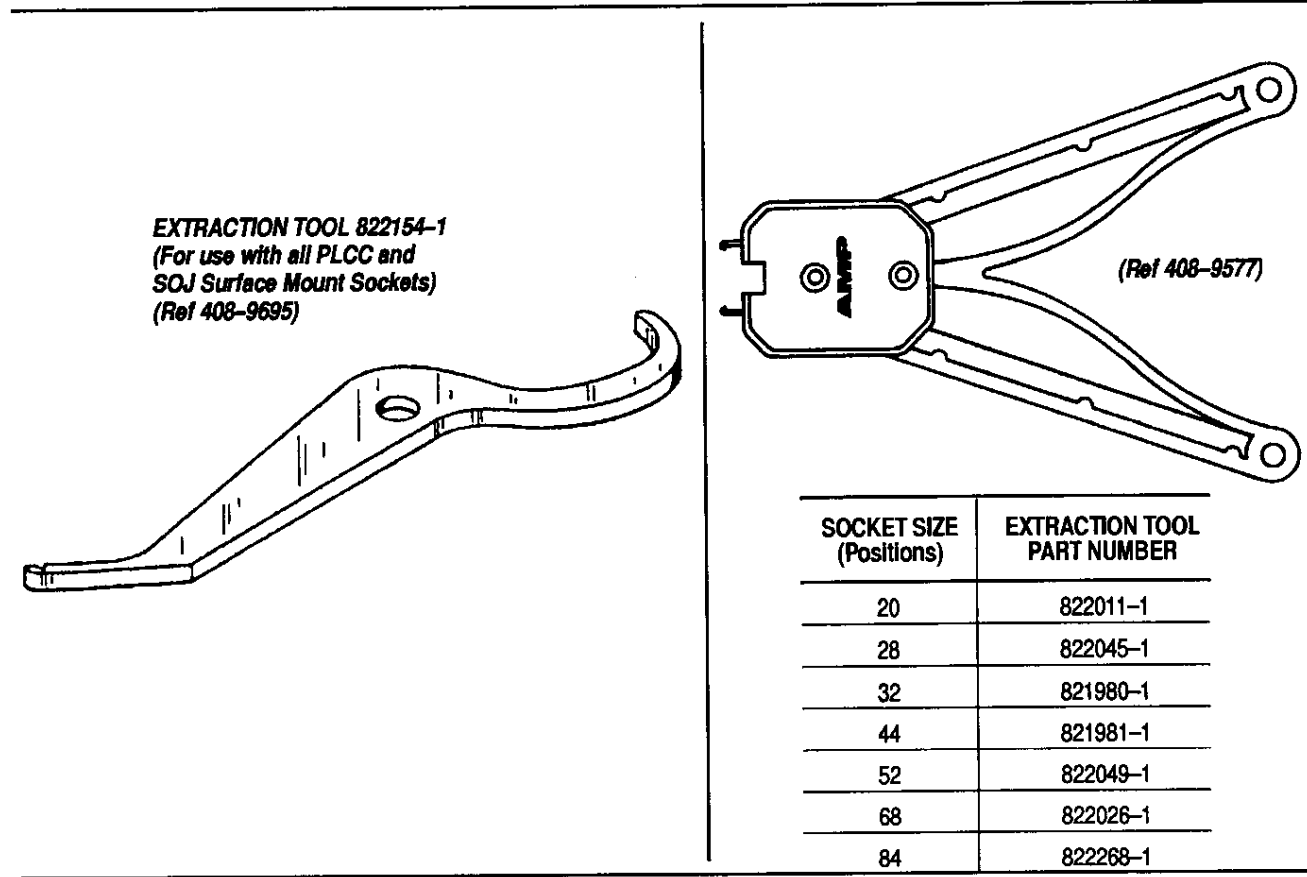
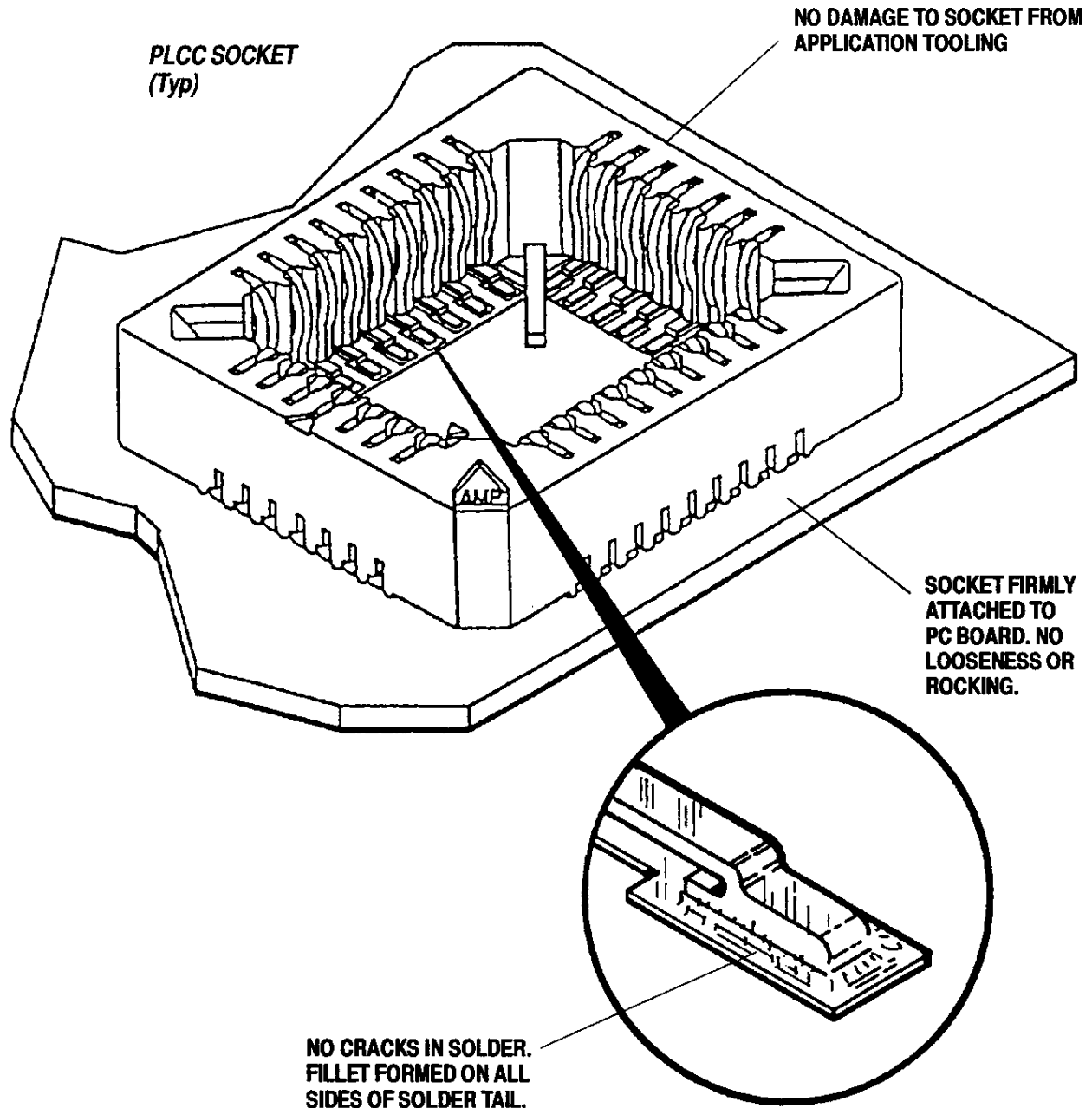


Figure 4

91-111A, 90-185

7. VISUAL AID

The following illustration shows a typical application of a PLCC socket and call out the conditions that production personnel should check to ensure a good installation. For dimensional inspection, refer to the details in preceding pages of this specification and the appropriate customer drawing.

**FIGURE 5. VISUAL AID**

93-45A