REV	REASON
A	Product name change

AMP* HAZ PGA PRODUCTION AND BURN-IN SOCKETS

ENGINEERING RELEASE DATE
4-17-91

APPROVAL
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1. INTRODUCTION

This specification covers the requirements for application of AMP Handle Actuated Zero Insertion Force (HAZ) Pin Grid Array (PGA) Production and/or Burn-In Sockets.These sockets are designed to mate with high pin count PGA devices that have an interstitial (sometimes called "staggered" or .050 x .100) contact pattern. They consist of plastic housings and covers, die cast actuators, and copper alloy contacts. AMP HAZ PGA Sockets are available in a variety of contact patterns.

Refer to Figure 1 for socket features that will be referred to throughout this specification. Referencing these terms when communicating with AMP representatives about the sockets will allow them to better assist you.

NOTE

All dimensions in this specification are in inches and have a decimal tolerance of ±.005 and an angle tolerance of ±3° unless otherwise specified. Metric equivalents (millimeters) can be obtained by multiplying dimensions and tolerances by 25.4.

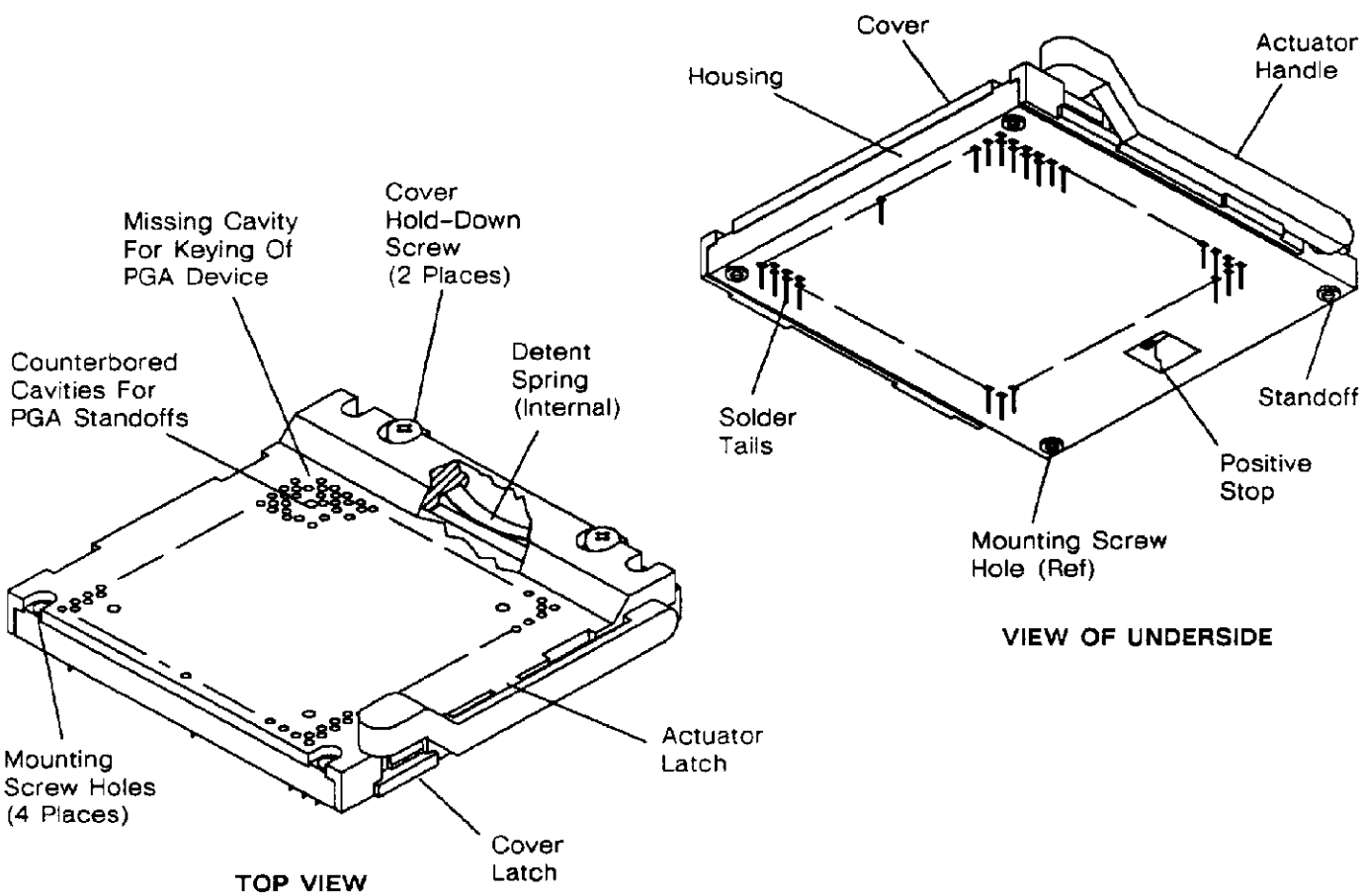

Fig. 1. Socket Features

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2. REFERENCE MATERIAL

2.1. Customer Assistance

A. Tooling and Application Information

Reference Part Number 382320 and Product Code 3409 are representative numbers that identify the AMP HAZ PGA Socket products. These numbers are used by a network of AMP customer service people to access tooling and product application information. This service is provided before the purchase by your local AMP representative (Field Sales Engineer, Field Applications Engineer, etc.) or, after the purchase, by calling the CUSTOMER HOTLINE number at the top of Page 1.

B. Product and Part Number Information

Your local AMP representative will answer your product questions, or will contact the appropriate information source for you.

2.2. Engineering Drawings

Customer drawings for specific products are available from the responsible AMP Engineering Department via the appropriate service network source (See Paragraph 2.1). Information contained in Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by AMP Incorporated.

2.3. Specifications

AMP Product Specification 108-1246 provides performance tests for these sockets.

3. REQUIREMENTS

3.1. Storage

Sockets should remain in the protective packaging until ready for use to prevent deformation or overstressing of the contact solder tails, and to prevent damage to the plastic components or the actuator.

3.2. Special Features

The AMP HAZ PGA Sockets feature the following:

A. Positive Stop Actuator

The plated die cast actuator has an integral tab which stops, or interferes with, the plastic housing at each extreme of the normal handle throw. This feature prevents overstressing the plastic components. Figure 1, Page 1, shows the location of the positive stop.

B. Standoffs

The mounting holes located in the plastic housing are designed with .025-high standoffs to allow easy pc board cleaning after the soldering operation.

C. Acceptance Of Various PGA Devices

Many different PGA pin patterns can be used by changing the hole pattern in the plastic cover, and by only loading socket contacts in the plastic housing cavities where required. When the PGA pattern is significantly smaller than the maximum allowable in the plastic cover, rows and columns of holes may exist in the cover around the outside edges. These holes balance the cover during the molding process and serve no other function. Contacts will be loaded in the plastic housing under the functional hole pattern only. In all cases where nonfunctional holes exist in the cover, a solid plastic border will separate nonfunctional from functional contact positions on each of the four sides of the PGA pattern. See Customer Drawings for specific PGA pattern applications.

D. Counterbored Cavities

Many PGA devices are manufactured with standoffs on various corner pins. The AMP HAZ PGA Sockets accommodate these larger diameter standoffs by providing counterbored corresponding contact cavities in the plastic cover. These counterbores can and do occur at various positions in the many PGA patterns available. See Customer Drawings for specific PGA pattern applications.

E. Keying Of PGA Device To Socket

The ability to selectively position cavities and contacts in both the plastic cover and the plastic housing also allows the option of keying the pattern to a specific PGA device, providing positive orientation of the device to the socket. This is done in most cases by eliminating a cavity on the cover in a corner corresponding to a missing contact pin on the PGA device. See Customer Drawings for specific PGA pattern applications.

F. Actuator Latch

The actuator latch is an integral plastic protrusion on the handle side of the cover. The latch is a simple means by which the handle may be held in the down, or closed, position. It provides a margin of safety in applications where vibration or mechanical shock may occur.

3.3. Printed Circuit Board

The AMP HAZ PGA Sockets are available with solder tail lengths listed in the following table, to fit pc boards having the nominal thicknesses listed. For boards not listed, the tails must be long enough to receive a 360° solder fillet of integrity, holding each individual tail to the board. The Customer Drawing for a specific socket part number will show the tail length so that you may compare it to your board thickness.

SOLDER TAIL LENGTH	PC BOARD THICKNESS
.110	.062
.140	.093
.170	.125

Figure 2 shows the pc board layout dimensions required for placement of a socket. The dimensions given are common to all layouts. Refer to Customer Drawings for specific PGA pattern dimensions, including distances from the plated-thru hole pattern to the mounting holes and minimums from the mounting holes to the board edges or to mounting holes for adjacent sockets.

NOTE

Be sure to leave enough clearance space on the pc board for operation of the actuator handle, for PGA device placement and removal, device mounted heat-sinks, cover removal tool operation, and any other application specific space requirements.

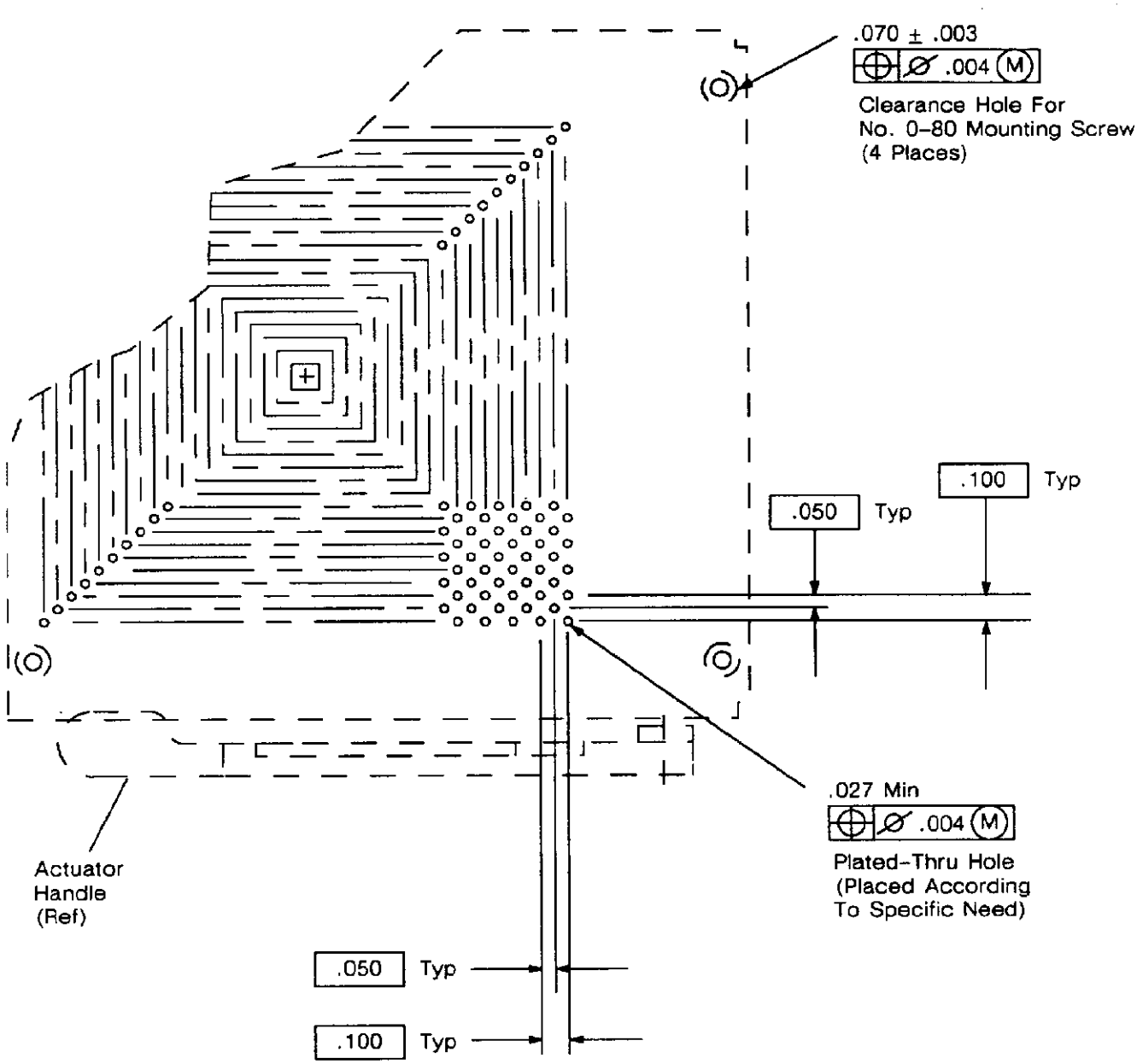

Fig. 2. PC Board Layout

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3.4. Special Handling

The following precautions for handling must be observed in order to ensure proper application of sockets. If you have questions concerning problems unique to specific applications, contact your AMP representative.

CAUTION *Each subparagraph describes special handling during some stage of assembly. In each handling consideration, care must be taken not to damage the socket or otherwise render it unusable.*

A. Positioning

Sockets should remain in their protective packaging until ready for use. Handle sockets by the housing and cover only, and not by the actuator or solder tails. Carefully align all of the socket solder tails with their respective pc board holes before inserting the tails into the holes. One misaligned tail creates little resistance, and can be bent easily. Bent solder tails can be straightened without damaging the contacts.

B. Mounting

Each socket has four recessed mounting holes to accommodate customer supplied No. 0–80 screws (mating hex nuts, or other securing method, must also be supplied). Mounting hardware must be tightened so that housing standoffs are seated on the pc board within the limits shown in Figure 3, Page 6. This will ensure that the socket remains in place during soldering.

C. Soldering

Solder only after checking to see that mounting hardware is secure. Prior to and during wave soldering, the actuator handle should be latched in the closed position. This prevents the handle from hooking on objects and dislodging the socket or damaging the pc board or socket.

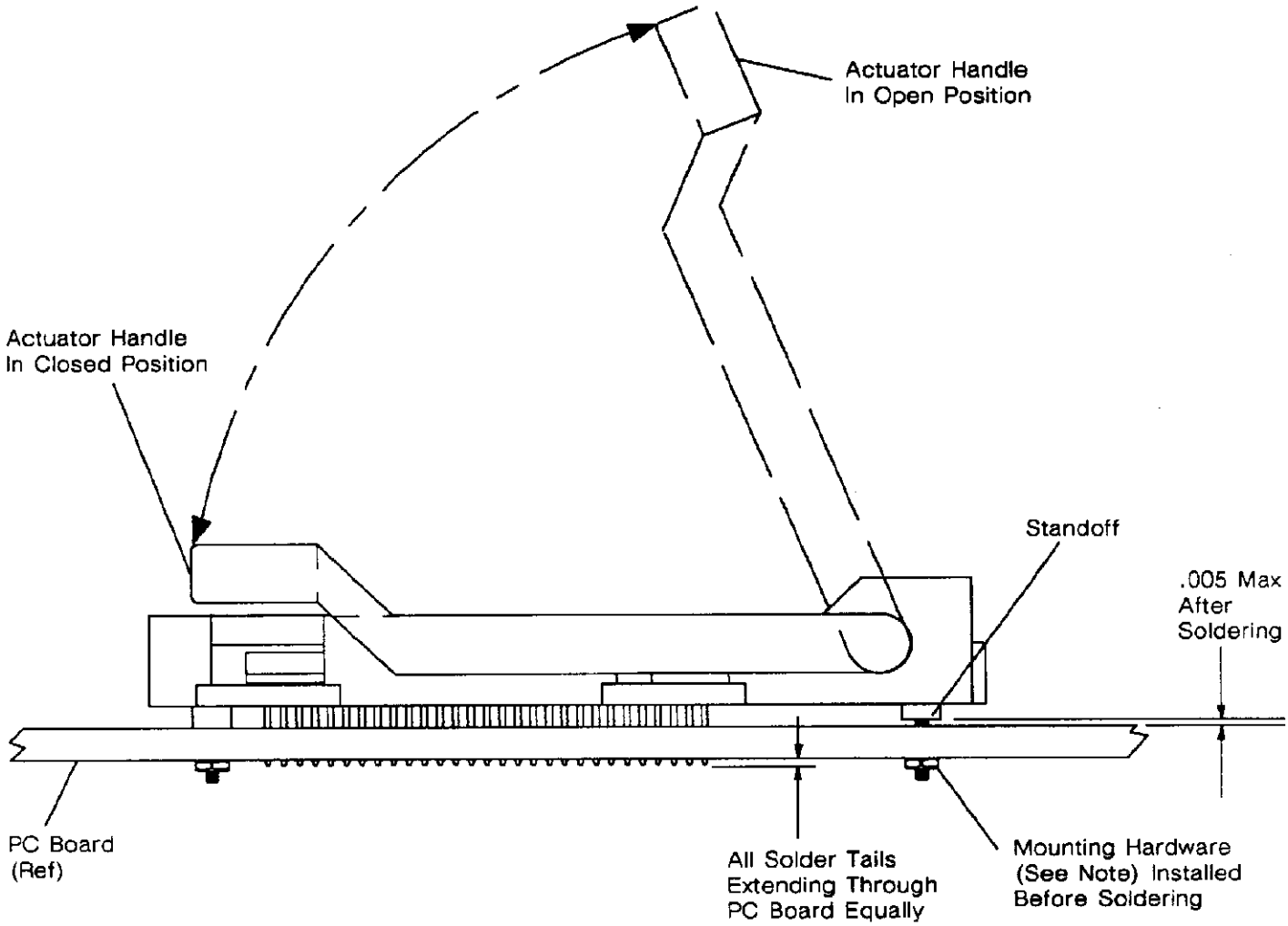
Prior to hand soldering, mate a PGA device (preferably a dummy device) to the socket, and make sure that the actuator handle is closed. This stabilizes the socket spring contacts so that they will not be displaced from their normal operating positions. During hand soldering, be careful not to push on the ends of solder tails, thereby dislodging contacts from the socket housing. Rather, lay the soldering iron tip against the sides of the tails to heat them.

After soldering, inspect to ensure that no solder balls, bridges, or other visible shorting exists between adjacent solder tails. Each solder fillet must adhere 360° to the tail and pc board thru-hole.

NOTE *Due to the tight pattern associated with interstitial contact placement, inspection techniques must provide an extremely clear picture of possible areas of shorting.*

D. Alignment

In order to function properly, the completed soldered socket and contact solder tails must conform to the dimensions and callouts shown in Figure 3 on Page 6.



NOTE: Mounting hardware not supplied by AMP Incorporated. Use four No. 0-80 screws with .120 Max Dia head, .080 Max head height, and Min screw length equal to the total thicknesses of the socket mounting flange and housing standoff, pc board, and mating hardware (hex nut or other method).

Fig. 3. Installed Socket Requirements cad

3.5. Intermateability

A. PGA Device Pin Cross-Section

These sockets are designed to mate with PGA devices having pins with a diameter of .018 +.002. Sockets to mate with devices with pin diameters .015 -.021 are available upon request. No special pin tip lead-ins are required, but some amount of chamfer on the pin tip will inevitably aid insertion.

B. PGA Device Pin Length

The AMP HAZ PGA Sockets accept pins .150 -.210 long.

C. PGA Device Pin True Position

The true position of the PGA package pins should be within .008 MMC (Maximum Material Condition).

D. PGA Device Pin Plating

The socket contacts are plated with gold to mate with gold plated pins. Other platings are available upon request from your AMP representative.

3.6. Repair

The AMP HAZ PGA Sockets are designed to be repairable. The cover, actuator, detent spring, and contacts are replaceable. Replacement of the entire socket would be recommended only if the housing or a large number of contacts needs replacement.

CAUTION *The considerations listed below must be carefully followed to prevent damage to the socket, PGA device, or their individual parts.*

1. Mate a dummy PGA device to the socket and make sure the actuator handle is closed before soldering repaired contacts, before retouching solder joints, or before adding wires to the solder side of the pc board.
2. Do not push on solder tail tips of contacts being replaced with the desoldering unit or soldering iron. Rather, lay the soldering tool tips against the sides of the tails to perform repair operations.
3. Any possibility of a contact being contaminated by flux requires thorough cleaning of the entire contact area using a safe, appropriate solvent or other approved cleaning procedure.

A. Cover Removal and Replacement

To remove and/or replace contacts, actuators, or detent springs, the socket cover must first be removed. Tools required are AMP Cover Removal Tool 2336-SK-026 and a No. 1 Phillips screwdriver.

Procedure:

1. Using Phillips screwdriver, unscrew cover hold-down screws.
2. Position cover removal tool as shown in Figure 4, and apply force in the direction indicated.

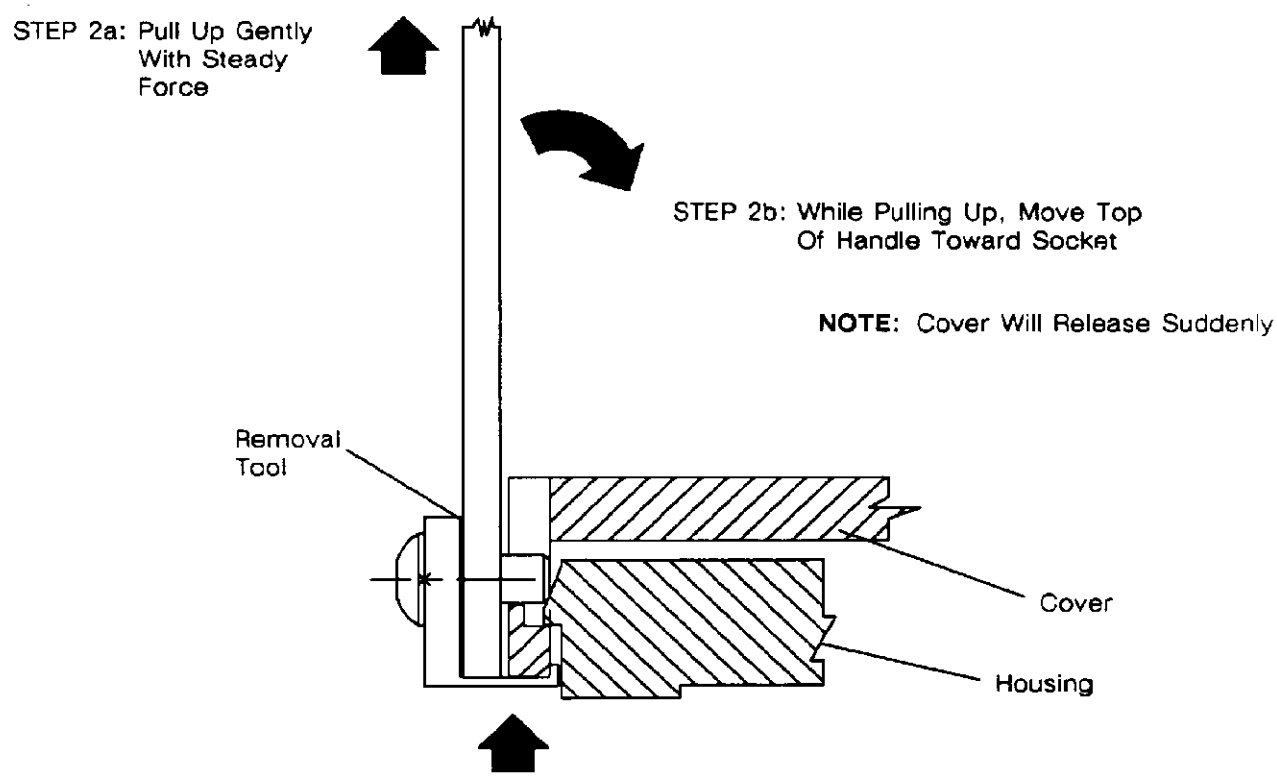


Fig. 4. Cover Removal

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3. Cover Replacement

(1) Position actuator in housing slot with actuator handle in the open position.

(2) Make sure detent spring is located properly in slot on underside of cover.

(3) Position cover over socket and push down until latches on cover snap over bosses on housing.

(4) Re-install cover hold-down screws: The screws should be seated on the housing bosses leaving a very small gap between the bottom of the screw heads and the cover.

CAUTION

Do not overly tighten the cover hold-down screws, as this will likely break the screw heads off. If an automatic screwdriver is used adjust the torque on a practice housing before using on a valid socket. Final torquing may have to be done by hand, using a Phillips screwdriver.

(5) After assembly, install a dummy device in the socket and close the actuator handle. Handle should be able to be secured under the actuator latch of the cover. Cover should move to same position relative to the housing as it does when the empty socket is closed.

B. Contact Removal and Replacement

With the socket cover removed inspect contacts for any that are touching the bottom wall of the housing contact cavity (See Figure 6). Also inspect for any which will not move freely when engaged by a .020 dia gage pin as shown in Figure 8, Page 11. Replace any contacts that fit into either of the above-mentioned categories. The following tools will be required:

- Desoldering unit with a No. 113 tiplet†
- AMP Contact Hand Insertion Tool 1120-SK-539
- .020 dia steel gage pin
- Tweezers
- No. 13 or No. 14 crochet hook

† Operator should be skilled in the use of desoldering unit.

1. Remove solder from pc board hole with desoldering unit from solder tail side of board.

2. Break any remaining solder bridges to contacts using a pair of tweezers (See Figure 5).

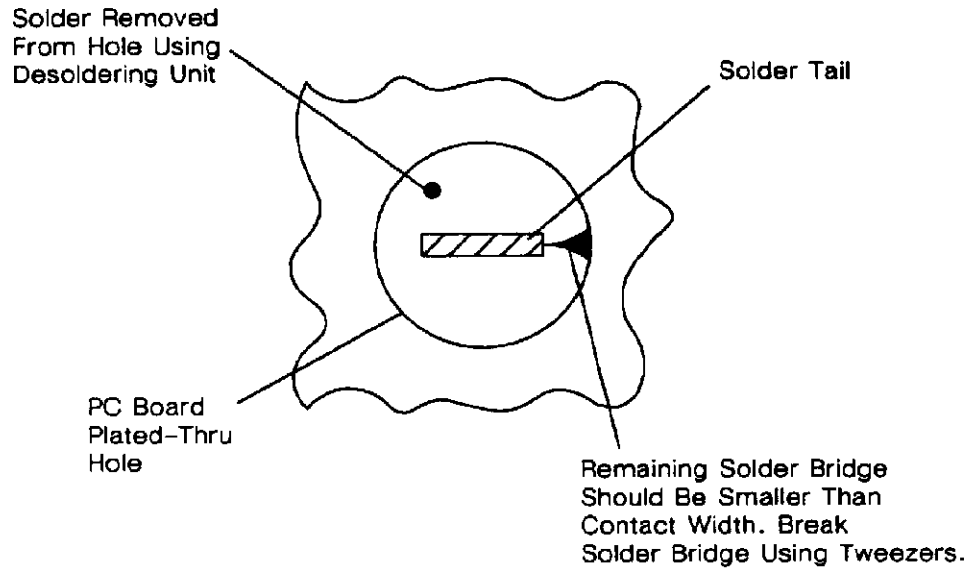

Fig. 5. Removal Of Solder Bridges After Desoldering Tail And Hole cad

3. Contacts which have been desoldered for removal can now be displaced from the socket by pushing against the solder tail tip with tweezers or similar tool. Push gently in a straight motion until the tail tip is flush with the bottom of the pc board. Then remove the contact from its housing cavity as shown in Figure 6, using a No. 13 or No. 14 crochet hook. Lift the contact gently so as not to break the top of the spring.

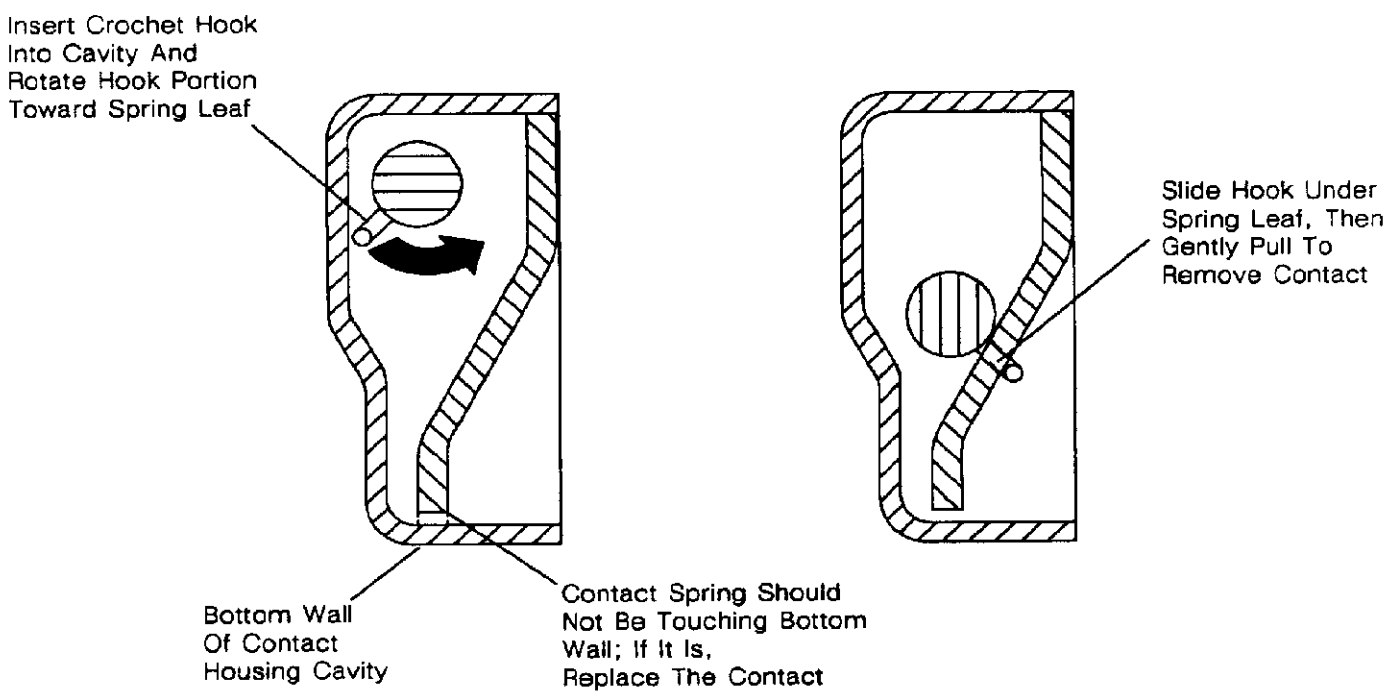

Fig. 6. Contact Removal cad

4. Insert a replacement contact into the cavity using insertion tool as shown in Figure 7. The top of the contact must be inserted below the top surface of the housing.

NOTE *Make sure the contact flag is pointed in the right direction before insertion by comparing it to adjacent flags.*

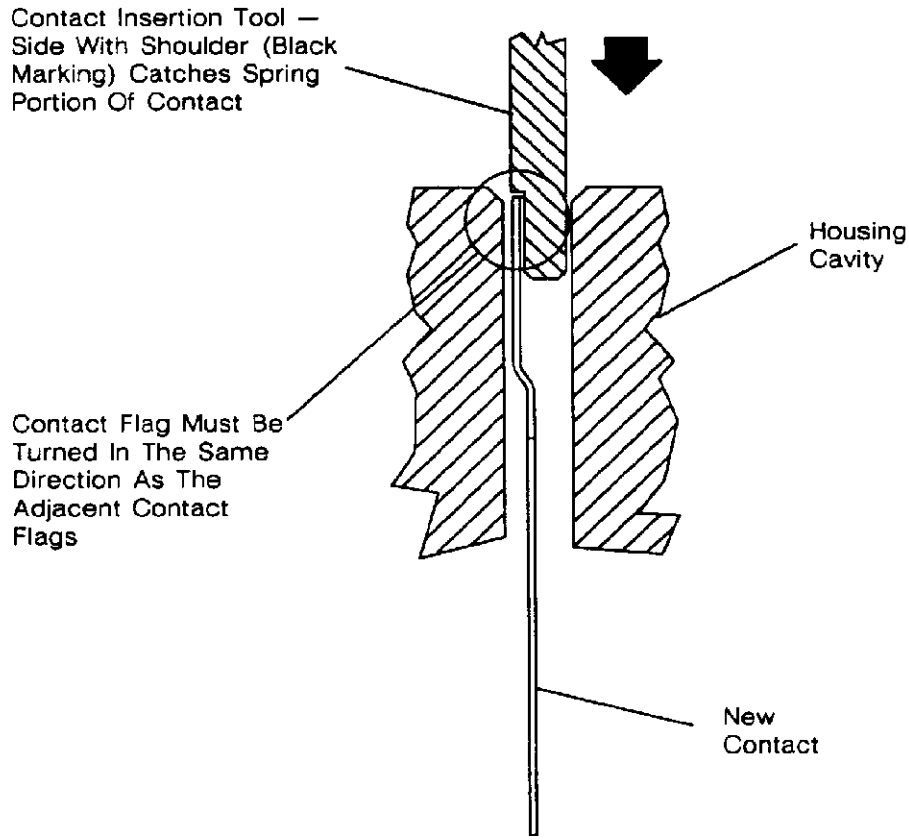

Fig. 7. Inserting A Replacement Contact cad

5. The top view of the contact in its cavity should look like the open position illustration in Figure 8:
   (1) Contact must be touching the side wall.
   (2) Contact should be touching the top wall but a small gap is permissible.
   (3) Contact should not be touching the bottom wall. A gap of.001 minimum must exist.

6. Solder contact in place heeding the cautionary statements on Page 7.

7. After soldering, engage the contact with a .020 dia gage pin as shown in Figure 8. The spring should move freely and have the same feel (exerting approximately the same tension against the pin) as the adjacent springs.

CAUTION *The .020 dia gage pin can be broken easily. If the spring does not move freely, replace the contact as described in Paragraph 3.6.B, beginning on Page 8.*

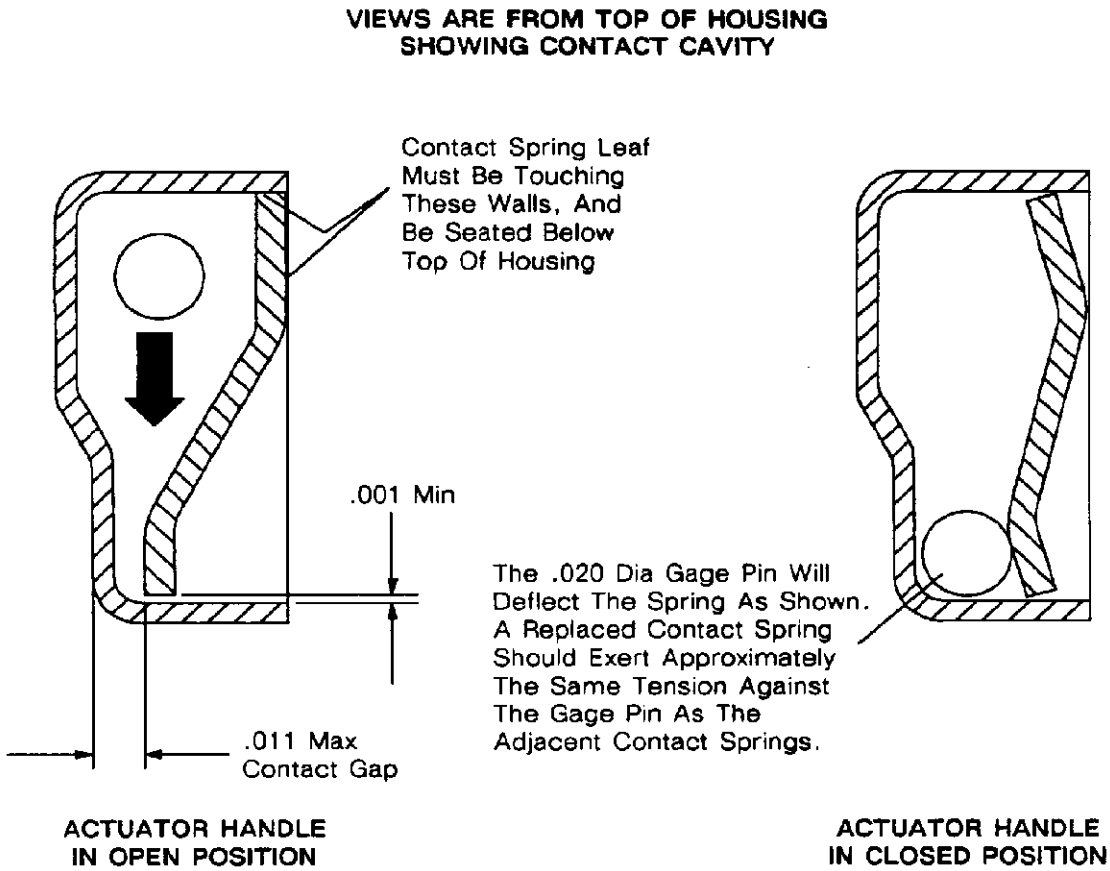

Fig. 8. Gaging Contact Spring Tension cad

3.7. Additional Precautions

CAUTION *The considerations listed below must be carefully followed to prevent damage to the socket, PGA device, or their individual parts.*

A. Positive Actuator Stops

The actuator and housing have been designed with a positive stop to limit the actuator handle to traveling from horizontal (closed) to 65° (open). Because the actuator is die cast and the housing and cover are plastic, forcing the handle past the extremes of normal travel will cause permanent damage to the socket.

B. Actuator Detent Spring

The detent spring has been designed into the socket to prevent the actuator from stopping in mid-throw. This means that the socket is either open or closed, preventing damage to a PGA device or the socket contacts that would occur when trying to insert the device into a partially open socket. Also, because of the detent spring, you will need to overcome some force in closing and latching the actuator handle when the socket is empty.

C. Latching The Actuator Handle

Be careful to ensure that the actuator handle is latched in the closed position unless a specific procedure or operation requires that it be open. Latching prevents the handle from hooking on objects and dislodging the socket or damaging the pc board, socket, or PGA device.

4. VISUAL AID

Figure 9 is to be used by production personnel to ensure a properly applied product. Applications which are NOT visually correct should be inspected using the information in the main body of this specification.

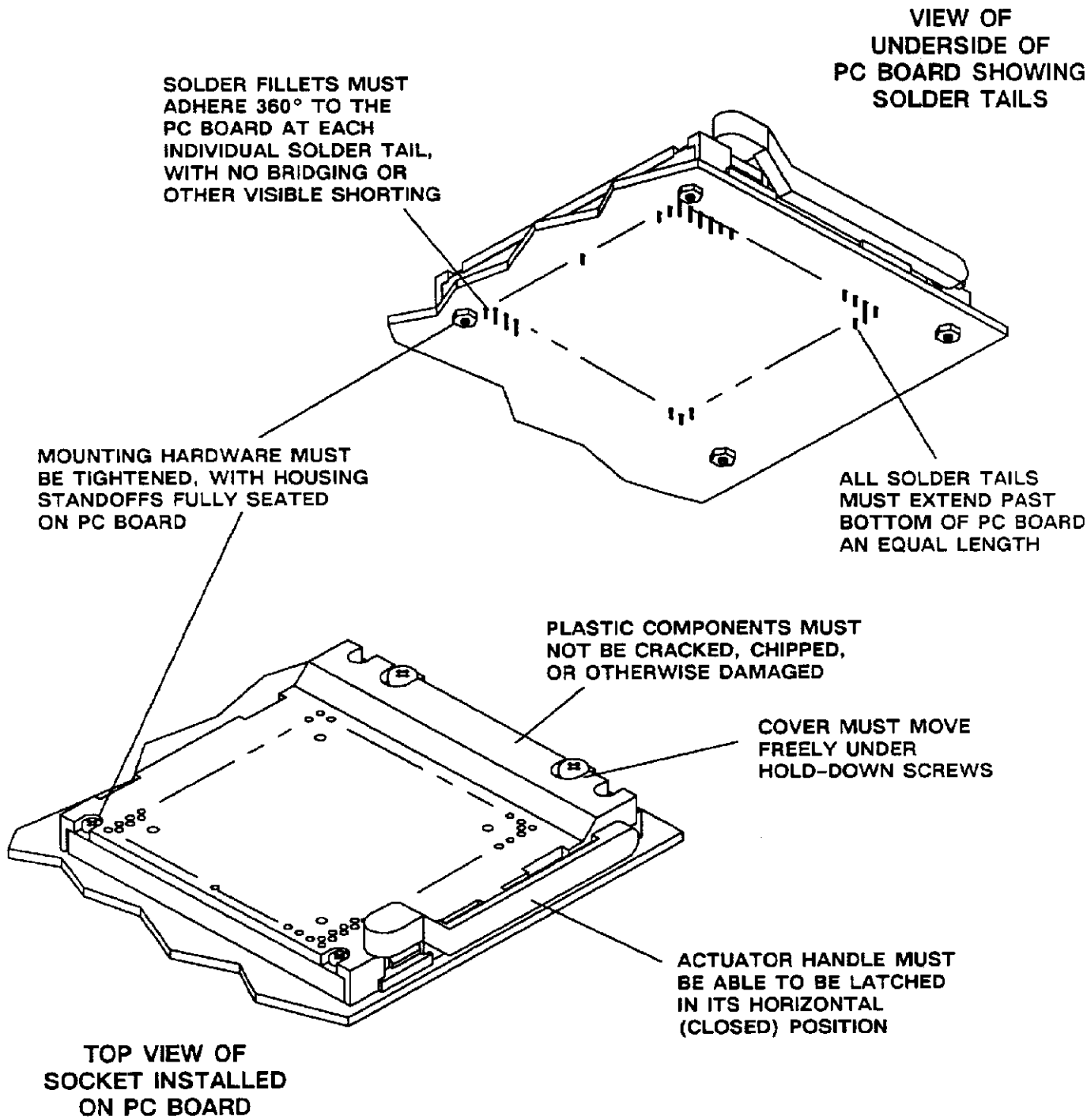

FIG. 9. VISUAL AID