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PROPER USE GUIDELINES

Cumulative Trauma Disorders can result from the prolonged use of manually powered hand tools. AMP hand tools are intended for occasional use and low volume applications. AMP offers a wide selection of powered application equipment for extended-use, production operations.

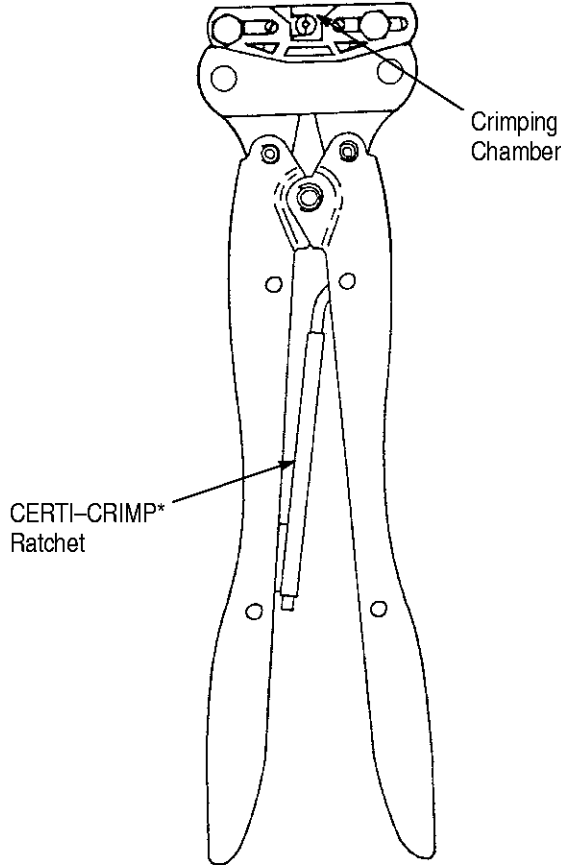


Figure 1

1. INTRODUCTION

This instruction sheet covers the use of AMP* Hand Crimping Tools 69656, 69656-1, -2, -3, -7, -8, and -9 (Figure 1 shows typical tool). The tools crimp COAXICON Subminiature pin and socket contacts to various types of cable and twisted-pair wires. Typical pin and socket contacts are shown in Figure 2. Read these instructions thoroughly before using the tool.

NOTE For contact part numbers and corresponding cable and wire sizes, refer to AMP Catalog 82003 or 82074.

NOTE Dimensions on this sheet are in millimeters [with inches in brackets].

Reasons for reissue are provided in Section 6, REVISION SUMMARY.

2. DESCRIPTION

Each tool features two sets of dies which, when mated, form a crimping chamber with three sections. One section crimps the inner wire barrel to the center conductor; another section crimps the ferrule to the braid; and the other section crimps the ferrule to the insulation. Crimping is accomplished simultaneously with one crimping cycle of the tool.

The CERTI-CRIMP ratchet assures full crimping of the contact. Once engaged, the ratchet will not release until the handles have FULLY closed.

CAUTION The crimping jaws bottom before the CERTI-CRIMP ratchet releases. This design feature ensures maximum electrical and tensile performance of the crimp. Do NOT re-adjust the ratchet.

3. CRIMPING PROCEDURE

NOTE Each hand tool is coated with a preservative to prevent rust or corrosion. Wipe this preservative from the tool, particularly from the crimping sections, before using the tool.

The crimping procedure requires two separate operations. First, the cable or wires must be prepared and assembled with the contact; then the contact assembly is crimped in the tool.

Typical COAXICON Subminiature Contacts

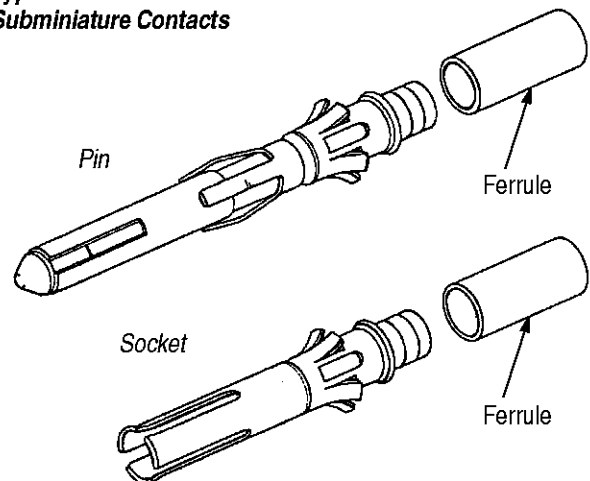


Figure 2

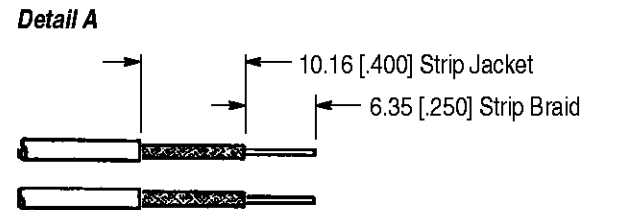
3.1. Cable and Wire Preparation

Make certain that the contact is compatible with the cable or wire (refer to AMP Catalog 82003 or 82074). Proceed as follows with the applicable instruction:

A. Dual Coaxial Cable Sizes RG-178 and RG-196

1. Strip both cable to the dimension shown in Figure 3, Detail A.
2. Twist conductor of both cable tightly together. Figure 3, Detail B.
3. Slide ferrule over braid, then flare braid to approximately 3.18 [.125]. See Figure 3, Detail C.

NOTE Make sure that all braid strands are removed from between the conductors.



Note: Not to Scale

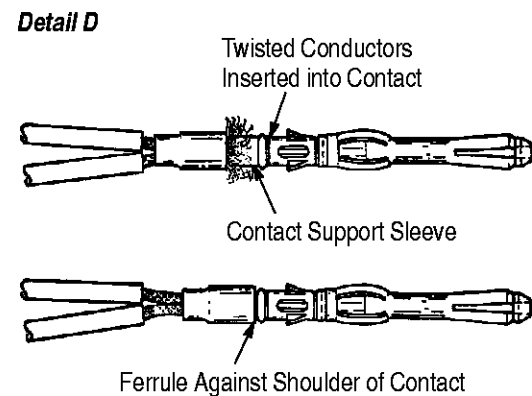
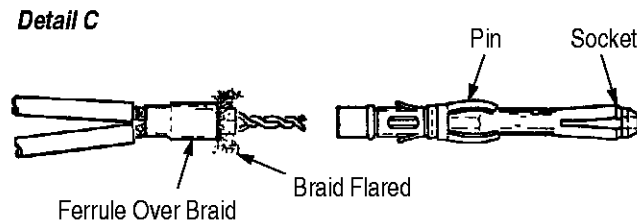
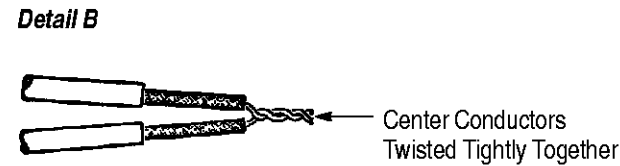


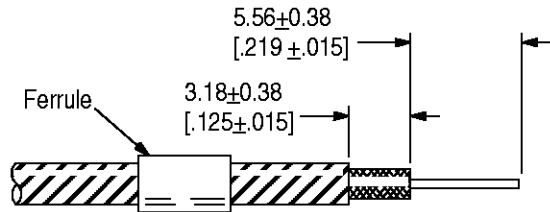
Figure 3

4. Insert twisted conductors into contact. Make certain that braid is on the outside of the contact support sleeve. Bottom cable in contact, then slide ferrule forward to the shoulder of the contact. See Figure 3, Detail D.

B. Coaxial and Shielded Single Braid Cable and Double Braid Cable Size RG-196

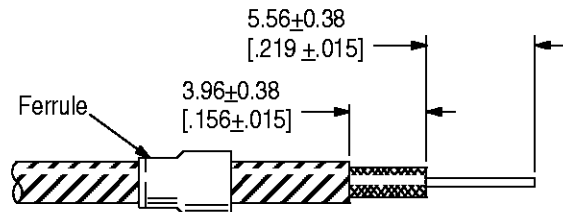
1. Slide ferrule onto cable, then strip cable to the appropriate dimensions shown in Figure 4. Do NOT cut or nick braid or center conductor.

Single Braid Cable



Note: Not to Scale

Double Braid Cable



Note: Both braids are terminated.

Figure 4

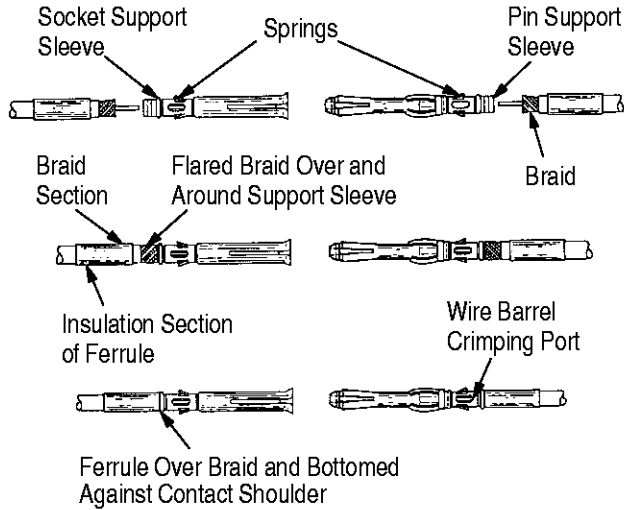
2. Flare cable braid, then insert conductor into contact as far as it will go. Braid must pass over and around support sleeve on contact. See Figure 5, Detail A.
3. Slide ferrule forward and over braid until ferrule bottoms against shoulder on contact.

NOTE If using double braid cable, allow approximately 1.59 [.0625] of space between the ferrule and the contact shoulder. See Figure 5, Detail B.

C. Double Braid Cable Sizes RG-174 and RG-187

1. Strip cable to the dimensions shown in Figure 6.
2. Flare outermost braid and trim off as close to insulation as possible.
3. Slide ferrule, large-diameter end first, over remaining braid and insulation. A sufficient amount of braid should protrude from ferrule to permit flaring.

Detail A



Note: Not to Scale

Detail B—Double Braid Cable

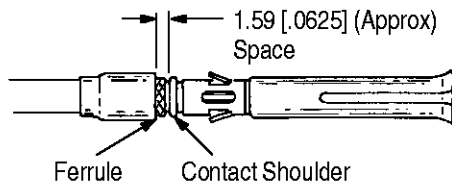
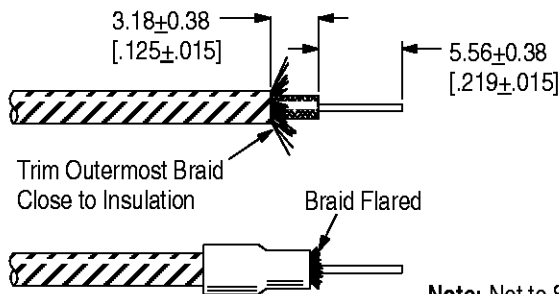


Figure 5

4. Insert conductor into contact. Make certain that braid is on the outside of the contact support sleeve. Bottom cable in contact, then slide ferrule forward to the shoulder of the contact.



Note: Not to Scale

Figure 6

D. Twisted Pair Cable

1. Separate the insulated leads and cut one lead to the dimension shown in Figure 7.
2. Strip insulation from both leads to the dimensions shown in Figure 7.
3. Slide ferrule on wire, then insert longer lead into center contact as far as it will go (refer to Figure 8).

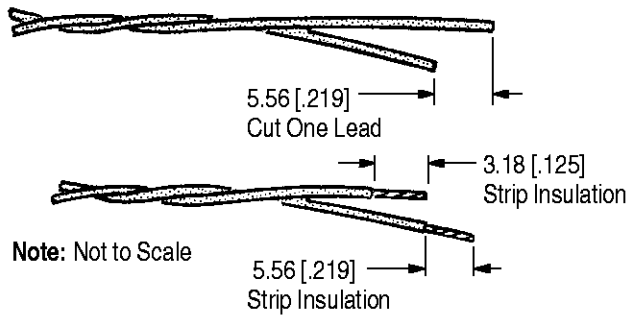


Figure 7

4. Lay shorter (outside) lead on support sleeve of contact in line with wire barrel port. See Figure 8.
5. Slide ferrule forward and over outside wire until ferrule bottoms against contact.

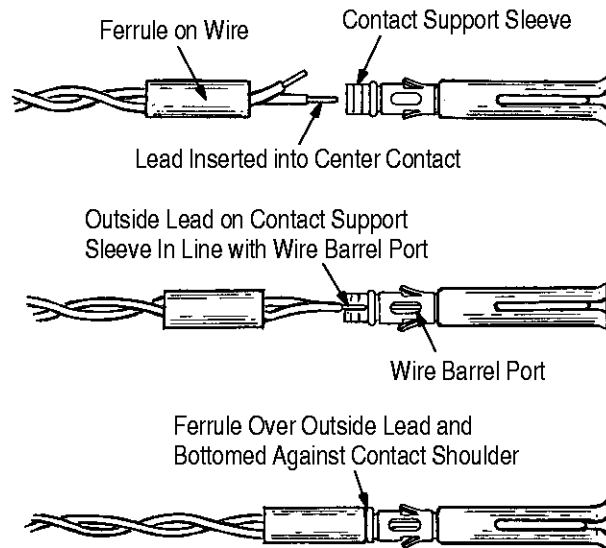


Figure 8

3.2. Crimping Contact Assembly

1. Open the tool by squeezing the handles until the ratchet releases and then allow the handles to open FULLY.

NOTE

A convenient way of holding the tool is to rest the ends of its handles on a bench. Then hold contact and cable between thumbs and forefingers and steady tool head with other fingers, as shown in Figure 9, Detail A.

2. Position the cable assembly in the crimping chamber as shown in Figure 9, Detail B. The crimping ports of the contact must align with the upper barrel crimping die so that the die enters the upper crimping port. Once located, push the contact upward so that the upper barrel crimping die enters the wire barrel port.

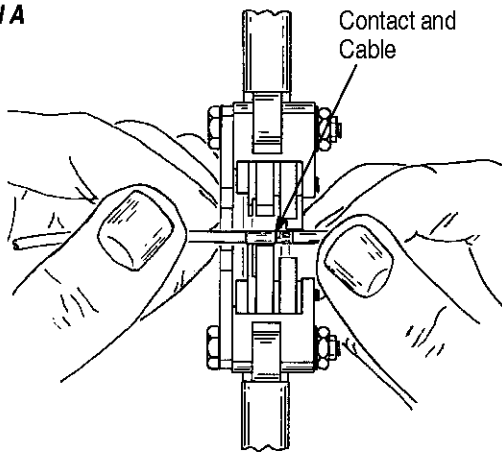
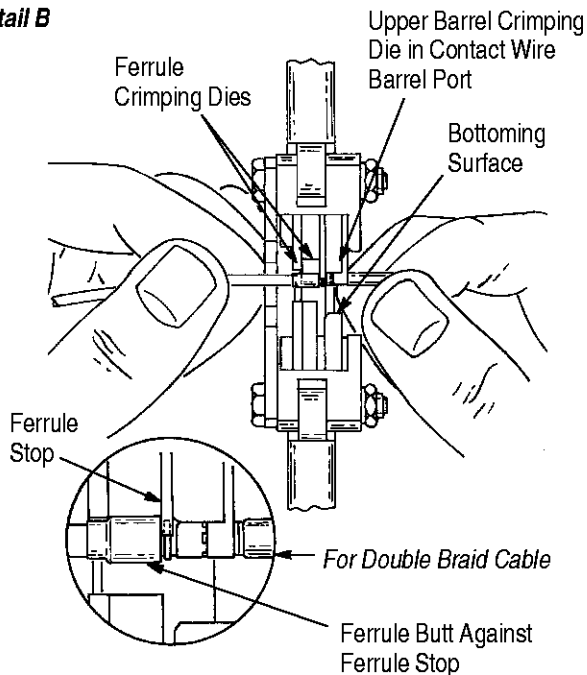
Detail A**Detail B**

Figure 9

3. Ensure that the braid section of ferrule is bottomed firmly on the braid ferrule crimping die.

NOTE

For double braid cable, push ferrule forward over braid until it butts against ferrule stop.

4. While holding the cable assembly in place, close tool handles until ratchet releases. Allow handles to open fully and remove and inspect crimped contact.

3.3. Contact Insertion and Extraction

Most of these contacts can be inserted by hand into multiple-contact connectors. Proceed as follows:

1. Insert contact into connector until it is evident that it has contacted the shoulder of the connector cavity.

2. Using light inward force, rotate the contact 45°. At this point, the contact should pass through the shoulder of the connector cavity.

3. Continue to insert contact until it is bottomed in connector cavity.

To extract contacts from connector cavity, use AMP Extraction Tool 305183. For information on using the tool, refer to instruction sheet 408-1216 packaged with the tool.

4. MAINTENANCE AND INSPECTION

AMP recommends that a maintenance and inspection program be performed periodically to ensure dependable and uniform terminations. Frequency of inspection depends on:

1. The care, amount of use, and handling of the hand tool.
2. The type and size of the products crimped.
3. The presence of abnormal amounts of dust and dirt.
4. The degree of operator skill.
5. Your own established standards.

The hand tool is inspected before being shipped; however, AMP recommends that the tool be inspected immediately upon its arrival at your facility to ensure that the tool has not been damaged during shipment. Due to the precision design, it is important that no parts of these tools be interchanged except those replacement parts listed in Figure 16.

4.1. Daily Maintenance

1. Remove dust, moisture, and other contaminants with a clean brush, or a soft, lint-free cloth. Do NOT use objects that could damage the tool.
2. Make certain that the retaining pins are in place and that they are secured with retaining rings.
3. All pins, pivot points, and bearing surfaces should be protected with a thin coat of any good SAE 20 motor oil. Do not oil excessively.
4. When the tool is not in use, keep handles closed to prevent objects from becoming lodged in the crimping dies. Store the tool in a clean, dry area.

4.2. Lubrication

Lubricate all pins, pivot points, and bearing surfaces with SAE 20 motor oil as follows:

- Tools used in daily production—lubricate daily
- Tools used daily (occasional)—lubricate weekly
- Tools used weekly—lubricate monthly

Wipe excess oil from tool, particularly from crimping area. Oil transferred from the crimping area onto certain terminations may affect the electrical characteristics of an application.

4.3. Periodic Inspection

1. Hand tool should be immersed (handles partially closed) in a reliable commercial degreasing compound to remove accumulated dirt, grease, and foreign matter.
2. Close tool handles until ratchet releases and then allow them to open freely. If they do not open quickly and fully, the spring is defective and must be replaced. See Section 5, REPLACEMENT AND REPAIR.
3. Inspect head assembly for worn, cracked, or broken dies. If damage is evident, return the tool to AMP for evaluation and repair. See Section 5, REPLACEMENT AND REPAIR.

4.4. Gaging the Crimping Chamber

This inspection requires the use of plug gages conforming to the dimensions shown in Figures 10 through 13. AMP does not manufacture or market these gages. To gage crimping chamber, proceed as follows:

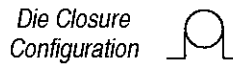
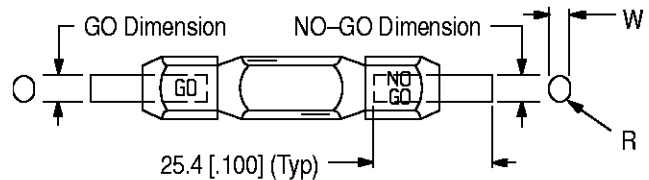
1. Remove traces of oil or dirt from the crimping chamber and plug gage.
2. Close the tool handles until it is evident that the dies have bottomed; then hold in this position. Do NOT force the dies beyond initial contact.
3. Align the center contact gage GO element with the center contact crimping section (refer to Figure 14). Push element straight into the crimping section without using force. The GO element must pass completely through the crimping section.
4. Check the center contact crimping section with the NO-GO element in the same manner. The NO-GO element may start entry, but must not pass completely through the crimping section.
5. Check the insulation crimping section by repeating Steps 3 and 4 using the insulation crimp plug gage (refer to Figure 15, Detail A).

NOTE *Inspect tools containing braid dies with a smaller diameter than the insulation dies as shown in Figure 15, Detail A (proceed to Step 6). Inspect tools containing braid dies with a larger diameter than the insulation dies as shown in Figure 15, Detail B; see Figure 11 for gage configuration (proceed to Step 7).*

6. Check the braid crimping section by repeating Steps 3 and 4 using the appropriate braid plug gage.
7. Open the crimping dies by squeezing the handles until the ratchet releases and then allow the handles to open fully.

8. Carefully insert the proper braid crimp gage GO element between the center contact and braid crimping sections. Slowly close the tool handles until the dies bottom while making certain that the GO element does not become lodged in the crimping dies.
9. Align the GO element with the braid crimping section and pull element straight into the section without using force. The GO element must pass completely through the crimping section.
10. Check the NO-GO conditions of the braid crimping section by repeating Steps 7, 8, and 9 using the braid crimp gage NO-GO element.

**Suggested Plug Gage Design
Insulation Crimping Section**

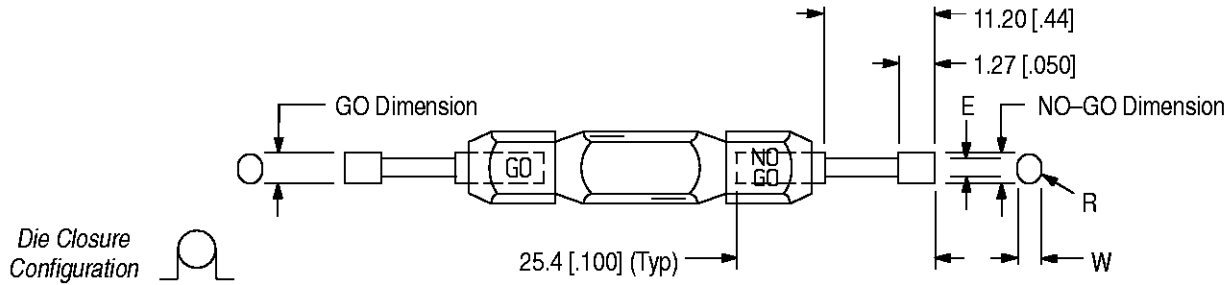


TOOL	GAGE ELEMENT DIMENSION			
	GO	NO-GO	WIDTH DIM. "W" (Max)	RADIUS DIM. "R" (Max)
69656	2.794-2.802 [.1100-.1103]	2.918-2.921 [.1149-.1150]	2.54 [.100]	1.27 [.050]
69656-1	2.794-2.802 [.1100-.1103]	2.918-2.921 [.1149-.1150]	2.54 [.100]	1.27 [.050]
69656-2	2.184-2.192 [.0860-.0863]	2.309-2.311 [.0909-.0910]	1.63 [.064]	0.81 [.032]
69656-3	2.184-2.192 [.0860-.0863]	2.309-2.311 [.0909-.0910]	1.63 [.064]	0.81 [.032]
69656-7	3.124-3.132 [.1230-.1233]	3.249-3.251 [.1279-.1280]	2.95 [.116]	1.47 [.058]
69656-8	3.124-3.132 [.1230-.1233]	3.249-3.251 [.1279-.1280]	2.95 [.116]	1.47 [.058]
69656-9	2.642-2.649 [.1040-.1043]	2.766-2.769 [.1089-.1090]	2.44 [.096]	1.22 [.048]

⌘ Tools 69656 and 69656-1 have single dies for braid and insulation crimps. Additional plug gages are not required for the braid section.

Figure 10

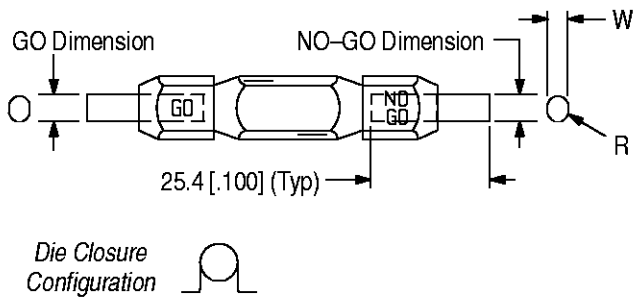
Suggested Plug Gage Design—Braid Crimping Section



TOOL	GAGE ELEMENT DIMENSION				
	GO	NO-GO	DIAMETER DIM. "E" (Max)	WIDTH DIM. "W" (Max)	RADIUS DIM. "R" (Max)
69656-2 69656-3	2.794-2.802 [.1100-.1103]	2.918-2.921 [.1149-.1150]	1.63 [.064]	2.54 [.100]	1.27 [.050]
69656-9	2.896-2.903 [.1140-.1143]	3.020-3.023 [.1189-.1190]	2.39 [.094]	2.69 [.106]	1.35 [.053]

Figure 11

**Suggested Plug Gage Design
Braid Crimping Section**



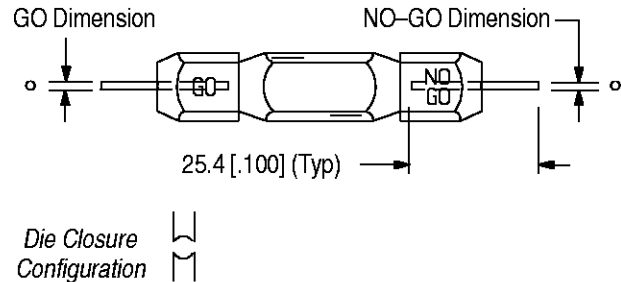
TOOL	GAGE ELEMENT DIMENSION			
	GO	NO-GO	WIDTH DIM. "W" (Max)	RADIUS DIM. "R" (Max)
69656-7 69656-8	2.718-2.725 [.1070-.1073]	2.842-2.845 [.1119-.1120]	2.49 [.098]	1.24 [.049]

Figure 12

If die closures conform to the gage inspections, the crimping chamber is considered dimensionally correct. If correct, the tool should be lubricated with a thin coat of any good SAE 20 motor oil and returned to service. If not correct, the tool must be returned to AMP for further evaluation and repair. Refer to Section 5, REPLACEMENT AND REPAIR.

For additional information regarding the use of plug gages, refer to instruction sheet 408-7424.

**Suggested Plug Gage Design
Wire Barrel Crimping Section**



TOOL	GAGE ELEMENT DIMENSION	
	GO	NO-GO
69656	0.483-0.490 [.0190-.0193]	0.556-0.559 [.0219-.0220]
69656-1 69656-2	0.356-0.363 [.0140-.0143]	0.429-0.432 [.0169-.0170]
69656-3	0.483-0.490 [.0190-.0193]	0.556-0.559 [.0219-.0220]
69656-7	0.483-0.490 [.0190-.0193]	0.556-0.559 [.0219-.0220]
69656-8 69656-9	0.356-0.363 [.0140-.0143]	0.429-0.432 [.0169-.0170]

Figure 13

Inspection of Wire Barrel Dies (Center Contact Crimping Section)

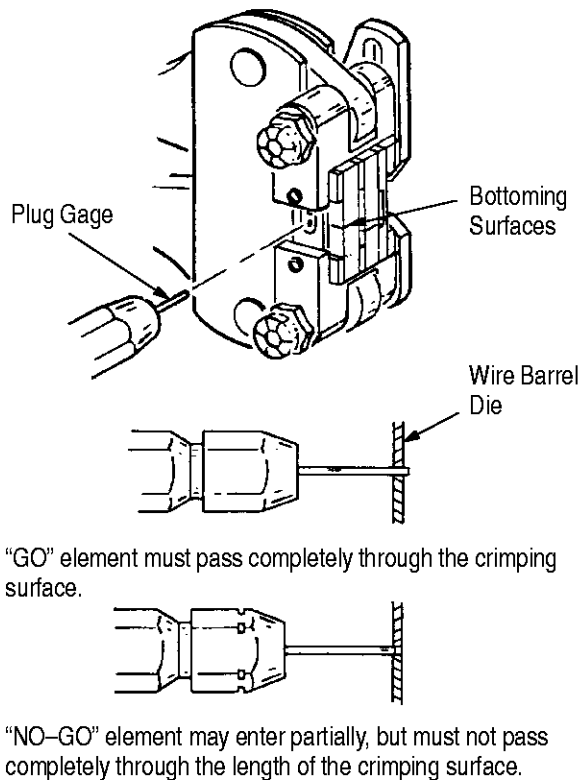


Figure 14

4.5. CERTI-CRIMP Ratchet Inspection

The CERTI-CRIMP ratchet feature on AMP hand tools should be checked to ensure that the ratchet does not release prematurely, allowing the crimping dies to open before they have fully bottomed. Obtain a 0.025 [.001] shim that is suitable for checking the clearance between the bottoming surfaces of the crimping dies. Proceed as follows:

1. Position the contact between the crimping dies, as described in Section 3, CRIMPING PROCEDURE.

2. Hold the contact in place and squeeze the handles until the CERTI-CRIMP ratchet releases. Hold the handles in this position, maintaining just enough tension to keep the dies closed.

3. Check the clearance between the bottoming surfaces of the crimping dies. If the clearance is 0.025 [.001] or less, the ratchet is satisfactory. If clearance exceeds 0.025 [.001], the ratchet is out of adjustment and must be repaired. See Section 5, REPLACEMENT AND REPAIR.

5. REPLACEMENT AND REPAIR

Replacement parts are listed in Figure 16. Parts other than those listed should be replaced by AMP to ensure quality and reliability of the tool. Order replacement parts through your AMP representative, or call 1-800-526-5142, or send a facsimile of your purchase order to 717-986-7605, or write to:

CUSTOMER SERVICE (38-35)
AMP INCORPORATED
P.O. BOX 3608
HARRISBURG, PA 17105-3608

Tools may also be returned to AMP for evaluation and repair. For tool repair service, contact an AMP representative at: 1-800-526-5136.

6. REVISION SUMMARY

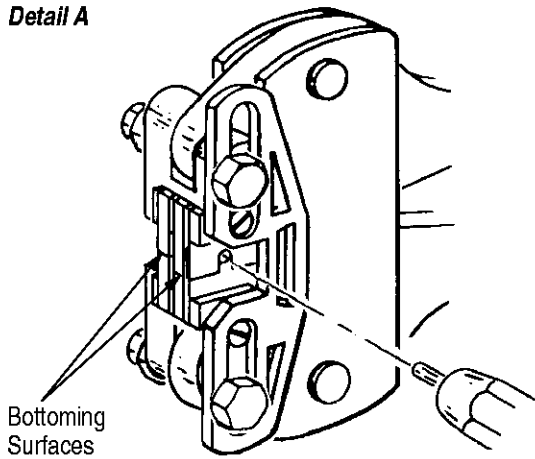
The following changes were made since the previous release of this sheet:

Per EC 0990-0725-99

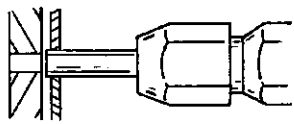
- Changed tool repair service information in Section 5, REPLACEMENT AND REPAIR
- Updated document format

Inspection of Insulation Dies and Braid Dies

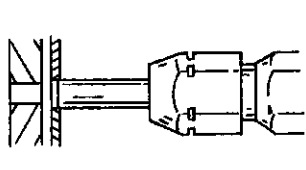
Detail A



Insulation Dies



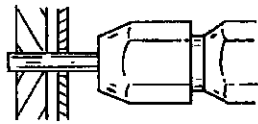
"GO" element must pass completely through the crimping surface.



"NO-GO" element may enter partially, but must not pass completely through the length of the crimping surface.

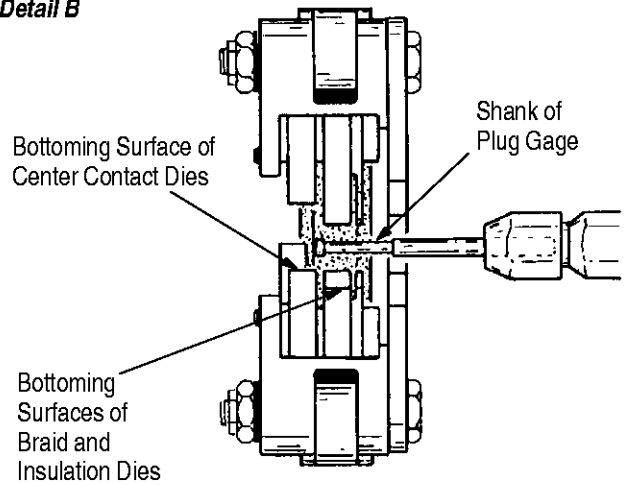
■ Where braid dies have a smaller diameter than insulation dies.

Braid Dies

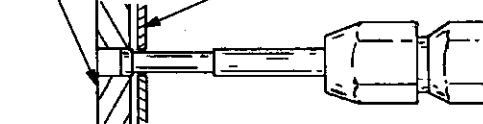


Inspection of Braid Dies

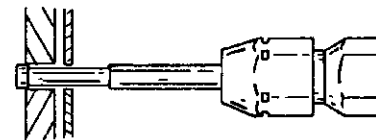
Detail B



Braid Die *Insulation Die*



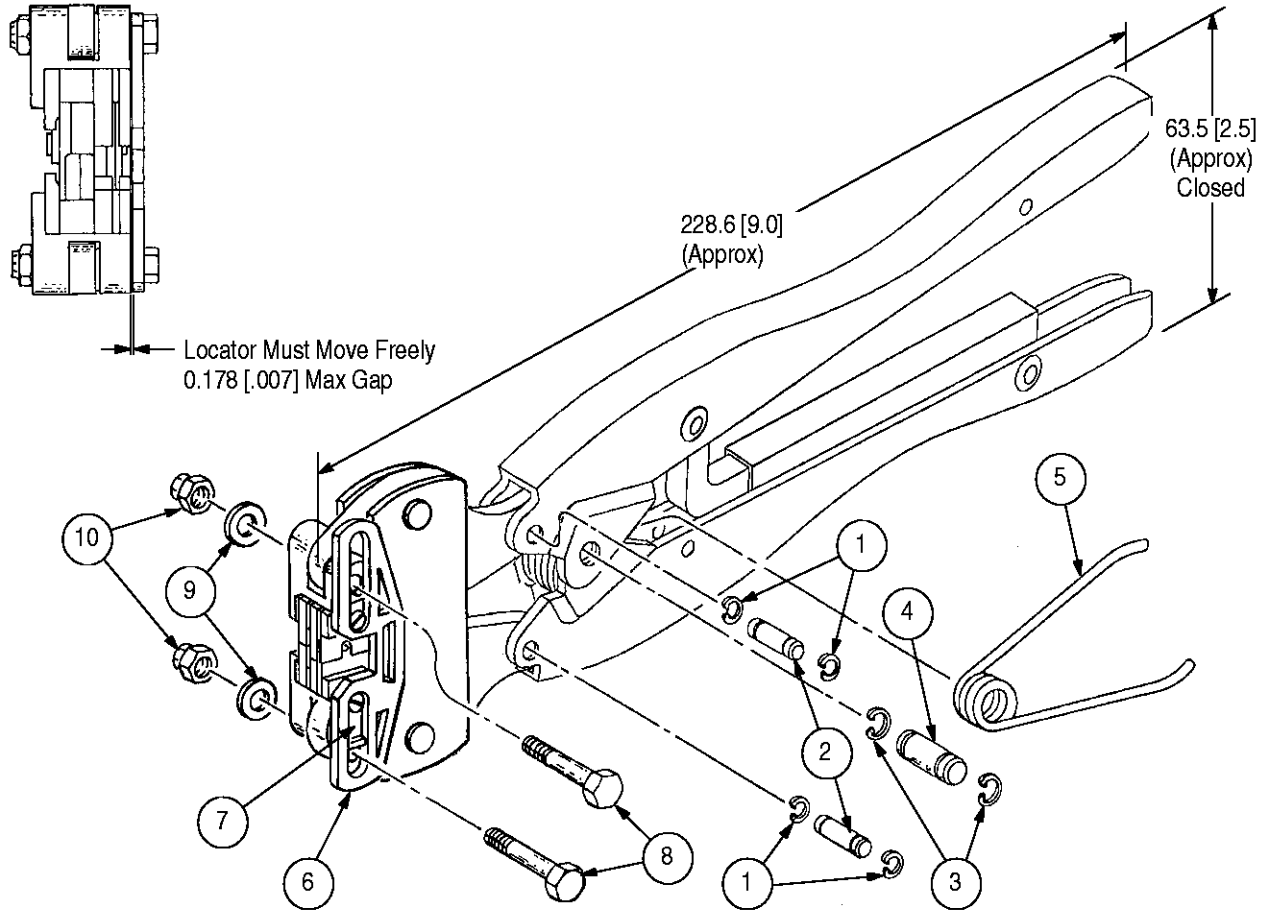
"GO" element must pass completely through the crimping surface.



"NO-GO" element may enter partially, but must not pass completely through the length of the crimping surface.

† Where braid dies have a larger diameter than insulation dies.

Figure 15



REPLACEMENT PARTS

ITEM	PART NUMBER	DESCRIPTION	QTY PER TOOL
1	21045-3	RING, Retaining	4
2	1-23619-6	PIN, Straight, Grooved	2
3	21045-6	RING, Retaining	2
4	2-23620-9	PIN, Straight, Grooved	1
5	39364	SPRING	1
6	307089-1	LOCATOR	1
7	307339-1	SPACER	2
8	307087-5	SCREW, Shoulder	2
9	23911-7	WASHER, Spring	2
10	21022-2	NUT, Self-Locking	2

Figure 16