

COPALUM CRIMPING DIES USED IN ...					
CRIMPING HEAD 69082			CRIMPING HEAD 69099		
68034	68035	68036	68043	68044	68045
68037	68050		68046	68047	68048
			68048	68049	

Figure 1

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1. INTRODUCTION

This instruction sheet covers the use of the AMP Crimping Die Assemblies listed in Figure 1, which are used to crimp AMP COPALUM Terminals and Splices. The die assemblies are used in AMP Crimping Heads 69082 and 69099. Refer to instruction sheet packaged with the crimping head for information concerning die installation and general performance of the head. Read these instructions thoroughly before using the die assemblies.

See Section 7, REVISION SUMMARY, for revision information.

NOTE

All dimensions on this document are in metric units [with U.S. customary units in brackets].

2. DESCRIPTION

The die assemblies consist of stationary dies (nest) and moving dies (anvils). Refer to Figure 2 to ensure the compatibility of die assemblies, crimping heads, and terminals and splices. These dies are used to crimp COPALUM Terminals and Splices on No. 8 through 500 MCM stranded or solid, aluminum or copper wire.

Dies are coated with preservative to prevent rust and corrosion. Wipe this preservative away from dies, particular from crimping areas.

For further instructions on the hydraulic power unit and hydraulic crimping heads, refer to the instructions packaged with these tools.

2.1. Die Installation

DANGER

AVOID PERSONAL INJURY. Exercise extreme caution when using power unit. Avoid depressing foot switch or trigger control when installing or removing die assemblies. **DO NOT MIX DIE COMPONENTS FROM DIFFERENT DIE SETS.**

The radii of both dies must match the radii of the tool. See Figure 1.

Crimping head No. 69099 is illustrated throughout this publication; however, die insertion, die removal and crimping instructions are the same for 69099 and 69082 crimping heads.

Proceed as follows:

1. Loosen retaining screw in top section of crimping head. See Figure 1.
2. Insert shank of stationary die into top section of crimping head and tighten retaining screw.

NOTE

Ensure that the dies are inserted fully and that the "flats" on shanks are facing the operator.

3. Activate power unit to advance ram until setscrew is visible.

DANGER

AVOID PERSONAL INJURY. Exercise extreme caution when using power unit. Avoid depressing foot switch or trigger control when installing or removing die assemblies.

4. Loosen setscrew and insert shank of moving die into ram well. Tighten setscrew.
5. Activate power unit to complete cycle and allow ram to return to down position.

2.2. Die Removal

1. Loosen retaining screw in top section of crimping head and remove die.
2. Raise ram to full up position. Loosen setscrew in ram and remove die.

DANGER

AVOID PERSONAL INJURY. Exercise extreme caution when using power unit. Avoid depressing foot switch or trigger control when installing or removing die assemblies.

3. WIRE STRIPPING AND CRIMPING PROCEDURE

3.1. Wire Stripping Procedure

1. Select the proper size terminal or splice for the wire size being used. See Figure 2.
2. Strip wire to dimension indicated in Figure 2.

NOTE

Do NOT nick or cut conductor strands.

3.2. Crimping Terminals

DANGER

AVOID PERSONAL INJURY; when operating power unit, exercise caution while holding terminals or wire near crimping area. Never place anything within the crimping dies except COPALUM terminals and splices.

1. Ensure that the wire size stamped on the terminal corresponds with the size marked on the dies.
2. Center terminal wire barrel in stationary die. Terminals may be crimped with tongue facing either die. (AMP recommends the terminal positioning shown in Figure 3:) (tongue toward moving die.)

WIRE SIZE	mm ²	CMA• RANGE	WIRE STRIP LENGTH		CRIMPING DIE ASSEMBLY	CRIMPING HEAD
			MIN	MAX		
8	6.638 – 10.540	13,100 – 20,800	10.32 [.4062]	11.90 [.4687]	68043	69099
6	10.540 – 16.772	20,800 – 33,100			68044	
4	16.772 – 26.652	33,100 – 52,600	14.29 [.5625]	15.88 [.6250]	68045	
2	26.652 – 42.412	52,600 – 83,700	18.25 [.7187]	19.84 [.7812]	68046	
1/0	42.412 – 60.55	83,700 – 119,500			68047	
2/0	60.55 – 76.26	119,500 – 150,500			68048	
3/0	76.26 – 96.27	150,500 – 190,000			68049	
4/0	96.27 – 117.049	190,000 – 231,000	19.10 [.75]	20.64 [.8125]	68050	69082
250 MCM	117.049 – 152.01	231,000 – 300,000	28.58 [1.125]	31.75 1.250	68034	
300 MCM	152.01 – 192.55	300,000 – 380,000	31.75 [1.250]	34.93 [1.375]	68035	
400 MCM	192.55 – 242.20	380,000 – 478,000	34.93 [1.375]	38.1 [1.50]	68036	
500 MCM	242.20 – 304.02	478,000 – 600,000	38.1 [1.50]	41.28 [1.625]	68037	

• CIRCULAR MIL AREA

Figure 2

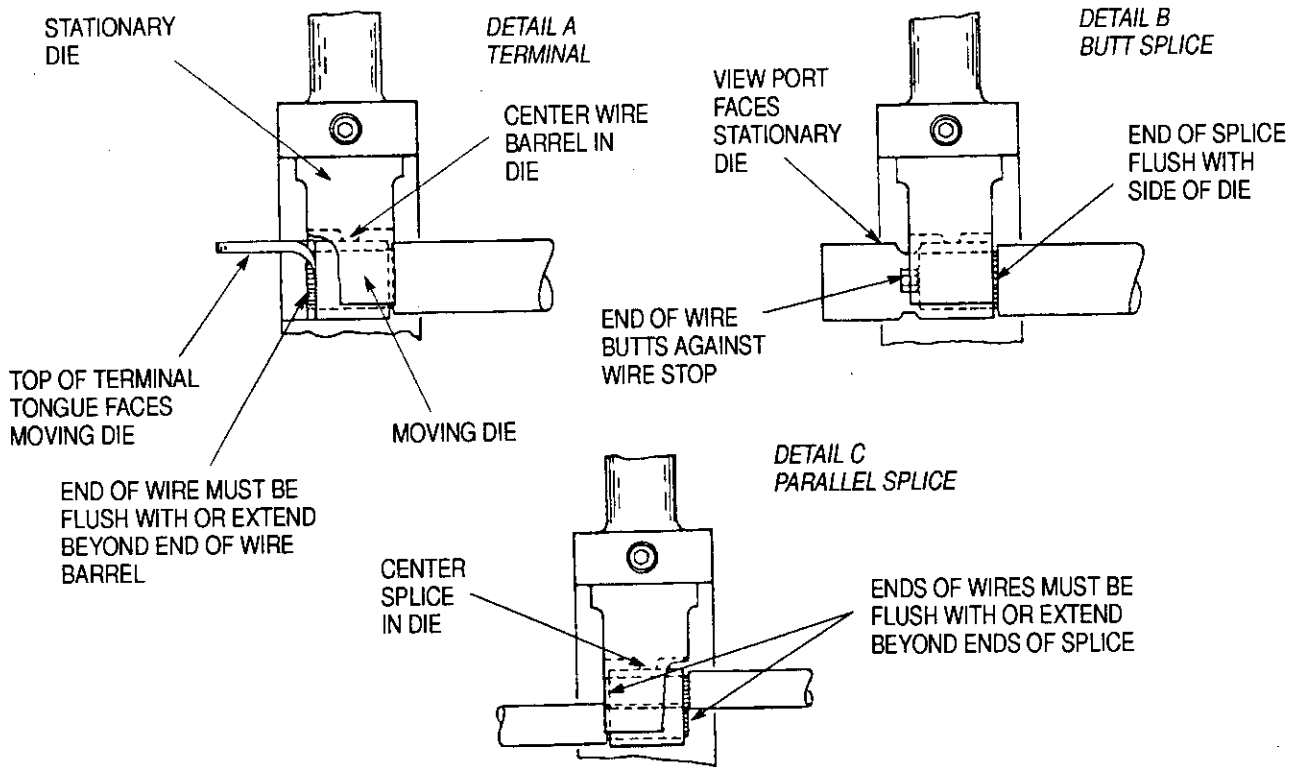


Figure 3

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NOTE

Depending on conductor hardness, and if near maximum conductor CMA limit is reached, some cracking may occur in crimp area when terminal is crimped with tongue toward stationary die.

NOTE

For aluminum-to-aluminum applications, butt splices will accept the same wire size at either end. For aluminum-to-copper applications, however, the size of the copper wire must be "stepped down" to the next smaller wire size to compensate for differences in the physical properties of copper and aluminum. Determine correct splice wire loading by referring to CMA range listed in Figure 2. If "stepping down" to a smaller wire size is not desirable, i.e., if aluminum-to-copper applications are to be made using the same size wire at each end of the butt splice, AMP recommends that the perforated sleeve be removed from inside that particular end of splice that is to be crimped on copper wire.

When two or more wires are used in either end of butt splice, combined cross-sectional area must be within the CMA range listed for the splice in Figure 2.

3. Activate power unit so that moving die advances and holds terminal in place. Do NOT deform terminal wire barrel.
4. Insert stripped wire all the way into terminal wire barrel. End of wire must be flush with or extend beyond end of wire barrel as shown in Figure 3, Detail A.
5. Activate power unit to complete crimp.
6. Refer to Figure 4 and Section 4, CRIMP INSPECTION.

3.3. Crimping Procedure (Butt Splice)

1. Position butt splice in stationary die so that end of splice is flush with sides of dies and view port in splice is facing stationary die. See Figure 3, Detail B.
2. Activate power unit so that moving die advances and holds splice in place. Do NOT deform splice wire barrel.

3. Insert stripped wire into splice wire barrel until end of wire butts against wire stop as shown in Figure 3, Detail B.
4. Activate power unit to complete crimp.
5. To crimp other half of butt splice, remove and rotate splice 180° end-over-end. If splice cannot be rotated, rotate crimping head. Reposition uncrimped half in stationary die as described in Step 1. Insert wire and then crimp the splice.
6. Refer to Figure 4 and Section 4, CRIMP INSPECTION.

3.4. Crimping Procedure (Parallel Splices)

1. Center parallel splice in stationary die as shown in Figure 3, Detail C.
2. Activate power unit so that moving die advances and holds splice in place. Do NOT deform the splice.
3. Insert stripped wires all the way into splice. Ends of wires must be flush with or extend beyond ends of splice.
4. Activate power unit to complete the crimp.

NOTE

If terminal or splice sticks in die after crimping, apply rocking action to remove from die.

5. Refer to Figure 4 and Section 4, CRIMP INSPECTION.

4. CRIMP INSPECTION

Inspect crimped terminals and splices by checking the features described in Figure 4. Use only the terminals and splices that meet the conditions shown in the "ACCEPT" column. "REJECT" terminals and splices can be avoided through careful use of the tabular information in Figure 2 and the instructions Section 3, and by performing regular die maintenance as instructed in Section 5.

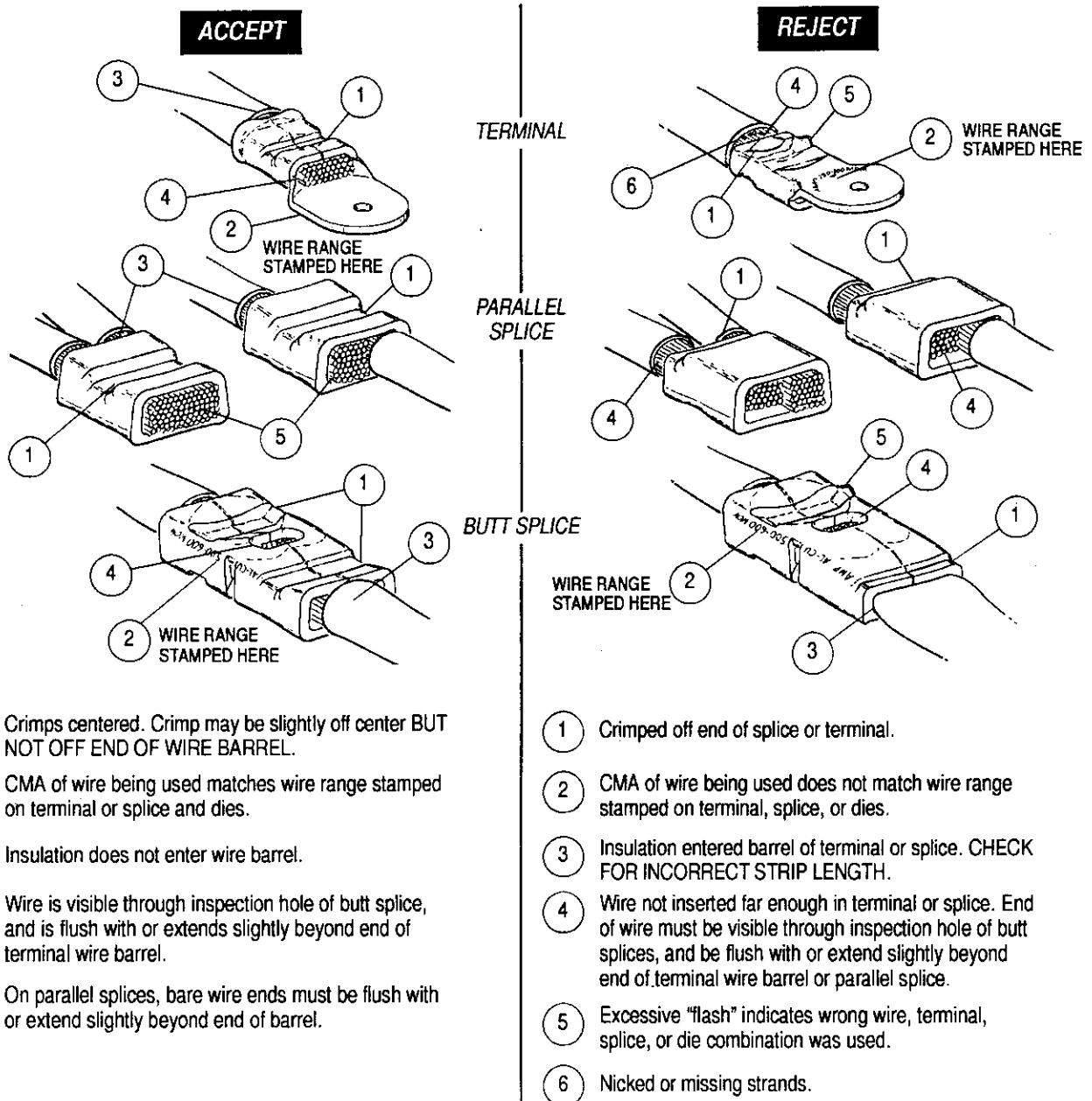


Figure 4

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5. MAINTENANCE/INSPECTION

DANGER

AVOID PERSONAL INJURY; exercise extreme caution when using power unit. Avoid depressing foot switch or trigger control when installing or removing die assemblies.

Customer-replaceable parts are listed in Figure 9. A complete inventory should be stocked and controlled to prevent lost time when replacement of parts is necessary.

AMP Crimping Die Assemblies are inspected before shipment. AMP recommends that the die assembly be inspected immediately upon arrival at your facility to ensure that it has not been damaged during shipment.

5.1. Daily Maintenance

It is recommended that each operator of the tool be made aware of – and responsible for – the following three steps of 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 dies.
2. Make certain the dies are protected with a THIN coat of any good SAE 20 motor oil. DO NOT OIL EXCESSIVELY.

NOTE

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.

3. When the dies are not in use, mate them and store the tool in a clean, dry area.

5.2. Periodic Inspection

AMP recommends that a maintenance and inspection program be performed periodically to ensure dependable and uniform terminations. Though recommendations call for at least one inspection a month, frequency of inspection depends on:

1. The care, amount of use, and handling of the dies.
2. The presence of abnormal amounts of dust and dirt.
3. The degree of operator skill.
4. Your own established standards.

A. Visual Inspection

1. Remove all lubrication and accumulated film by immersing the die assembly in a suitable commercial degreaser that will not affect paint or plastic material.

2. Inspect the crimp area for flattened, chipped, cracked, worn, or broken areas. If damage is evident, the dies must be replaced or repaired. Examples of possible damaged die closure surfaces are shown in Figure 5. If desired, you may return them to AMP for evaluation and repair (see Section 6, REPAIR).

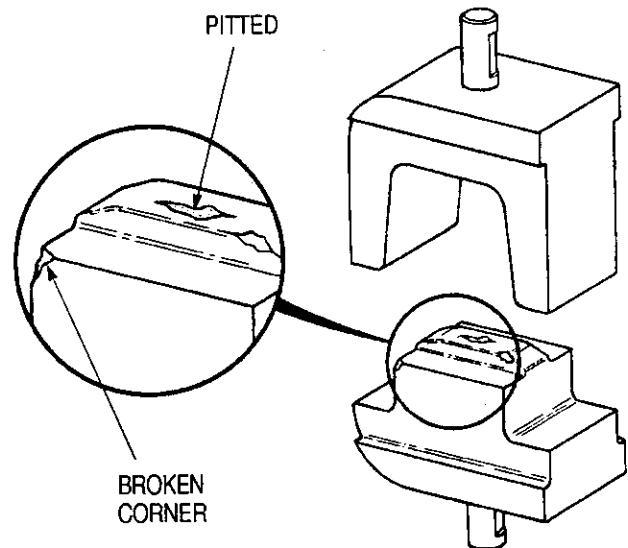


Figure 5

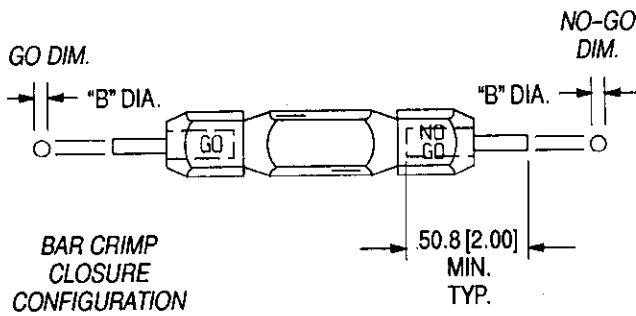
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B. Gaging the Crimping Chamber

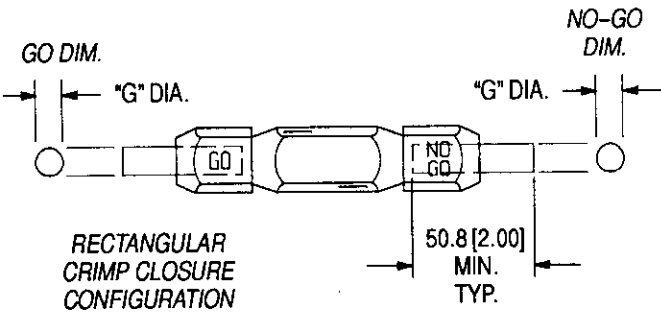
This inspection requires the use of a plug gage conforming to the diameters provided in Figure 6 or 7. AMP does not manufacture or market these gages. The following procedure is recommended for inspecting the die closures.

1. Clean oil or dirt from the die closure areas, and plug gage elements.
2. Assemble and adjust dies to meet the "gage dimension" indicated in Figure 8, Detail A.
3. With dies positioned at the "gage dimension," inspect the bar crimp closure using the proper plug gage. Align the GO element of the gage with the crimping chamber. Push the element straight into the chamber without using force. The GO element must pass completely through the crimping chamber without using force, as shown in Figure 8, Detail A.
4. Align the NO-GO element with the crimping chamber and try to insert it straight into the chamber. The NO-GO element may start entry, but must not pass through, as shown in Figure 8A, Detail A.

SUGGESTED PLUG GAGE DESIGN - BAR CRIMP



SUGGESTED PLUG GAGE DESIGN - RECTANGULAR CRIMP



DIE SET NUMBER	GAGE ELEMENT DIMENSIONS ("B" DIA)	
	GO	NO-GO
68034	5.512 - 5.519 [.2170 - .2173]	5.763 - 5.766 [.2269 - .2270]
68035	6.172 - 6.180 [.2430 - .2433]	6.424 - 6.426 [.2529 - .2530]
68036	6.960 - 6.967 [.2740 - .2743]	7.211 - 7.214 [.2839 - .2840]
68037	7.874 - 7.882 [.3100 - .3103]	8.125 - 8.128 [.3199 - .3200]
68043	1.702 - 1.709 [.0670 - .0673]	1.953 - 1.956 [.0769 - .0770]
68044	2.007 - 2.014 [.0790 - .0793]	2.258 - 2.260 [.0889 - .0890]
68045	2.464 - 2.471 [.0970 - .0973]	2.715 - 2.718 [.1069 - .1070]
68046	2.718 - 2.725 [.1070 - 1073]	2.969 - 2.972 [.1169 - 1170]
68047	3.404 - 3.411 [.1340 - .1343]	3.655 - 3.658 [.1439 - .1440]
68048	3.835 - 3.843 [.1510 - .1513]	4.087 - 4.089 [.1609 - .1610]
60049	4.343 - 4.351 [.1710 - .1713]	4.595 - 4.597 [.1809 - .1810]
68050	4.851 - 4.859 [.1910 - 1913]	5.103 - 5.105 [.2009 - .2010]

Figure 6

DIE SET NUMBER	GAGE ELEMENT DIMENSIONS ("G" DIA)	
	GO	NO-GO
68034	12.624 - 12.631 [.4970 - .4973]	12.977 - 12.979 [.5109 - .5110]
68035	13.945 - 13.952 [.5490 - .5493]	14.298 - 14.300 [.5629 - .5630]
68036	15.596 - 15.603 [.6140 - .6143]	15.949 - 15.951 [.6279 - .6280]
68037	17.526 - 17.534 [.6900 - .6903]	17.879 - 17.882 [.7039 - .7040]
68043	4.191 - 4.199 [.1650 - .1653]	4.544 - 4.547 [.1789 - .1790]
68044	5.258 - 5.265 [.2070 - .2073]	5.611 - 5.613 [.2209 - .2210]
68045	5.715 - 5.723 [.2250 - .2253]	6.068 - 6.071 [.2389 - .2390]
68046	6.629 - 6.637 [.2610 - .2613]	6.982 - 6.985 [.2749 - 2750]
68047	7.925 - 7.932 [.3120 - .3123]	8.278 - 8.280 [.3259 - .3260]
68048	8.865 - 8.872 [.3490 - .3493]	8.357 - 9.220 [.3629 - .3630]
68049	9.881 - 9.888 [.3890 - .3893]	10.233 - 10.236 [.4029 - .4030]
68050	11.201 - 11.209 [.4410 - .4413]	11.554 - 11.557 [.4549 - .4550]

Figure 7

5. With dies positioned at "gage dimension," check the right and left rectangular crimp closures using the proper plug gage in the same manner as Steps 4 and 5; see Figure 8, Detail B.

If both the bar crimp and the rectangular crimp closures meet the plug gage conditions, the closures may be considered dimensionally correct and should

be lubricated with a thin coat of any good SAE 20 motor oil. If the dies do NOT conform, the dies must be replaced or repaired before returning them to service. See Section 6, REPAIR.

For additional information concerning the use of the plug gage, refer to AMP instruction sheet 408-7424.

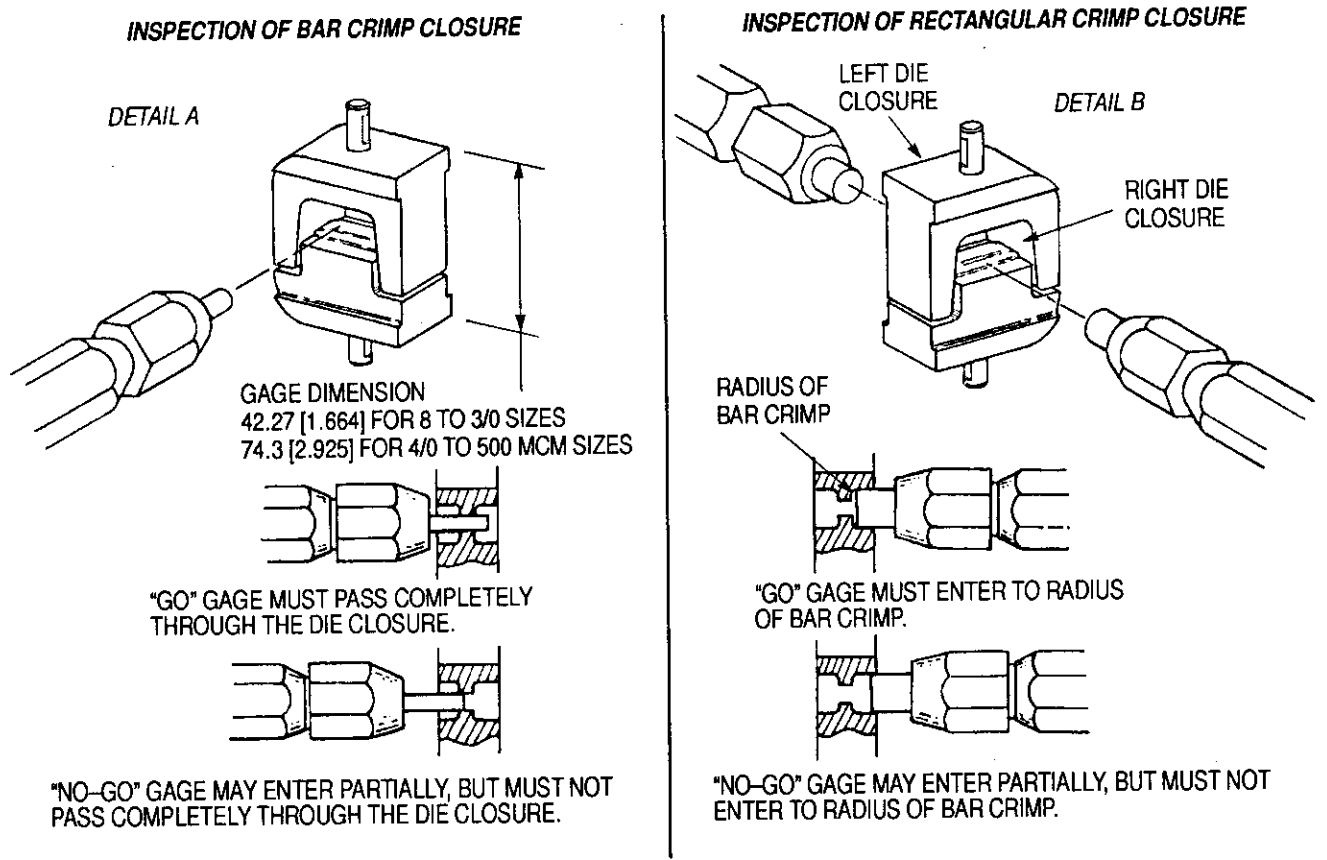


Figure 8

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6. REPAIR

When repair is necessary, return the die assembly with a written description of the problem to:

CUSTOMER REPAIR (001-012)
 AMP INCORPORATED
 1523 NORTH 4TH STREET
 HARRISBURG, PA 17102-1604

Customer-replaceable parts, listed in Figure 9, can be ordered from:

CUSTOMER SERVICE (038-035)
 AMP INCORPORATED
 P.O. BOX 3608
 HARRISBURG, PA 17105-3608

7. REVISION SUMMARY

Revisions to this document include:

Per EC 0150-3328-94

- Remove "Mod" from assembly part numbers
- Remove "Lockscrew" from Figure 1
- Reposition terminal in Figure 3, Detail A

Per EC 0990-0252-93

- Updated format
- Added "REVISION SUMMARY"
- Added metric units

ASSEMBLY	ITEM 1 MOVING DIE	ITEM 2 STATIONARY DIE
68034	1-307586-3	1-307585-3
68035	1-307586-4	1-307585-4
68036	1-307586-5	1-307585-5
68037	1-307586-6	1-307585-6
68043	307586-1	307585-1
68044	307586-2	307585-2
68045	307586-3	307585-3
68046	307586-4	307585-4
68047	307586-5	307585-5
68048	307586-6	307585-6
68049	307586-7	307585-7
68050	307586-8	307585-8

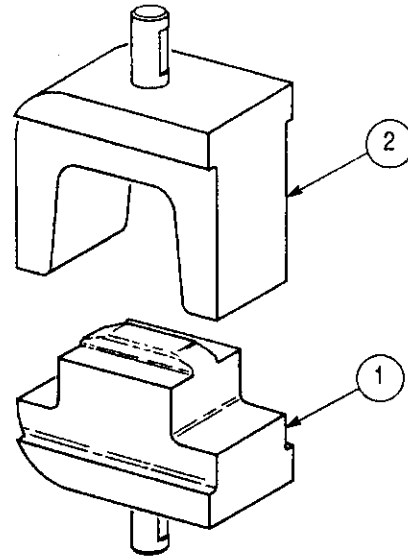


Figure 9

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161-079 26 408015 1
 LINDA J LUTZ
 CATCOM -- C/73
 Replace Prepackaged & Shelf Stock
 See REVISION SUMMARY SECTION