

Figure 1

## 1. INTRODUCTION

This instruction sheet covers the application and maintenance procedures for Crimping Die Assembly 318106-1.

For additional information on COPALUM terminals and splices, refer to Catalog 82020.

Read these instructions thoroughly before crimping any terminals or splices.

### NOTE



All dimensions on this document are in metric units [with U.S. customary units in brackets]. Figures and illustrations are not drawn to scale and are for reference only.

## 2. DESCRIPTION

The die assembly consists of a stationary die (indenter) and a moving die (anvil).

The crimping die assembly is designed for use in Hydraulic Tool 69099 to crimp insulation piercing COPALUM terminals and splices on size 4/0 film-insulated solid aluminum or copper wire or stranded copper wire.

For further information concerning setup procedures, refer to instruction sheet 408-2458, which is packaged with the hydraulic tool.

### NOTE

Do not use stranded aluminum wire.



## 3. DIE INSTALLATION AND REMOVAL

### NOTE



Crimping dies are coated with a preservative to prevent rust and corrosion. Wipe this preservative from the dies, particularly from the crimping surfaces.

### 3.1. Installation

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

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.



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

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

**3.2. Die Removal**

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



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

**4. WIRE SELECTION AND LOADING**

Solid aluminum or copper (or a combination of both) and stranded copper conductors may be crimped in the same wire barrel under the conditions referenced in Application Specification 114-2121.

**5. WIRE STRIPPING AND CRIMPING PROCEDURES**

**5.1. Wire Stripping Procedure**



*Do not use stranded aluminum wire.*

- Select the proper size terminal or splice for the wire size being used. See Figure 2.

CRIMPING HEAD	DIE SET	WIRE SIZE	CMA RANGE	WIRE STRIP LENGTH●	
				Min.	Max.
69099	318106-1	4/0	190,000 to 231,000	19.05 [0.750]	20.65 [0.813]

●Stranded copper wire only.

Figure 2

- Determine correct terminal or splice wire loading and CMA range listed in Figure 2.
- Strip stranded copper wire to dimension indicated in Figure 2.



*It is not necessary to strip film-insulated aluminum or copper wires.*

**5.2. Terminal Crimping Procedure**



**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.

- Ensure that the wire size stamped on the terminal corresponds with the wire size stamped on the dies.
- Position terminal wire barrel between locators of stationary die as shown in Figure 3, Detail A. Back of terminal tongue must face moving die.
- Activate power unit so that moving die advances and holds terminal in place. Do not deform terminal wire barrel.
- 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.
- Activate power unit to complete crimp.
- Refer to Figure 4 and Section 6, CRIMP INSPECTION.

**5.3. Butt Splice Crimping Procedure**

- Position butt splice in stationary die so that end of splice butts against locator as shown in Figure 3, Detail B. View port in splice faces stationary die.
- Activate power unit so that moving die advances and holds splice in place. Do not deform splice wire barrel.
- Insert stripped wire all the way into splice wire barrel.
- Activate power unit to complete crimp.
- To crimp other half of butt splice, remove it and reposition uncrimped half in stationary die and follow same procedure used to crimp first half of splice. If splice cannot be turned, turn tool around.



*Butt splices may be slightly bent when crimped as instructed in Step 5. If this bending is objectionable, use the crimp procedure in Step 6.*

- To crimp other half of butt splice, remove and rotate splice 180° end over end. Reposition uncrimped half in stationary die as described in Step 1. If splice cannot be rotated, rotate tool. Insert wire and then crimp the splice.
- Refer to Figure 4 and Section 6, CRIMP INSPECTION.

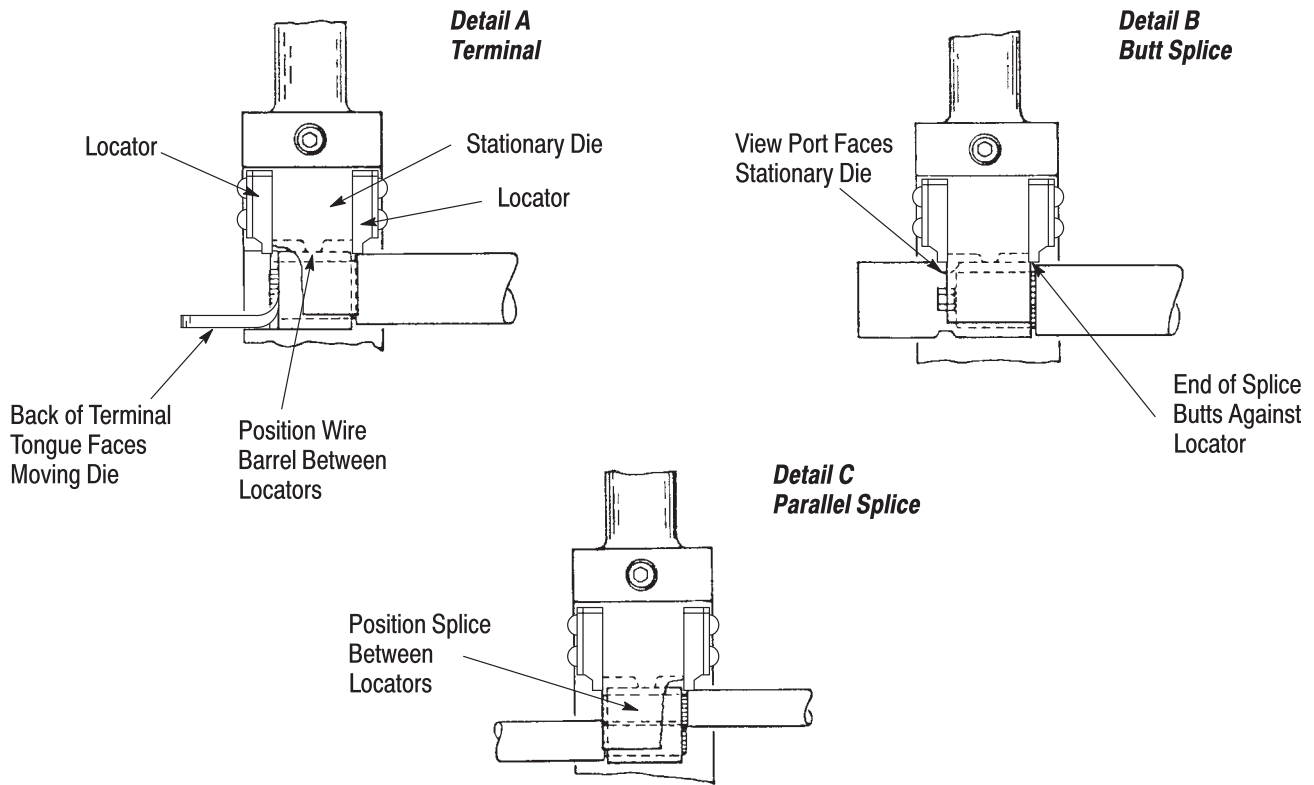


Figure 3

**5.4. Parallel Crimping Procedure**

1. Position parallel splice between locators 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 COPALUM terminal or splice sticks in die after crimping, apply a rocking action to remove from die.*

5. Refer to Figure 4 and Section 6, CRIMP INSPECTION.

**6. 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 instruction in

Section 5, and by performing regular die maintenance as described in Section 7.

**7. MAINTENANCE AND INSPECTION**

Tyco Electronics recommends that a maintenance and inspection program be performed periodically to ensure dependable and uniform terminations. The crimping die assembly should be inspected once a month. Frequency of inspection should be adjusted to suit your requirements through experience. Frequency of inspection depends on:

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

Each die assembly is thoroughly inspected before packaging. Since there is the possibility of damage during shipment, new die assemblies should be inspected immediately upon arrival at your facility.

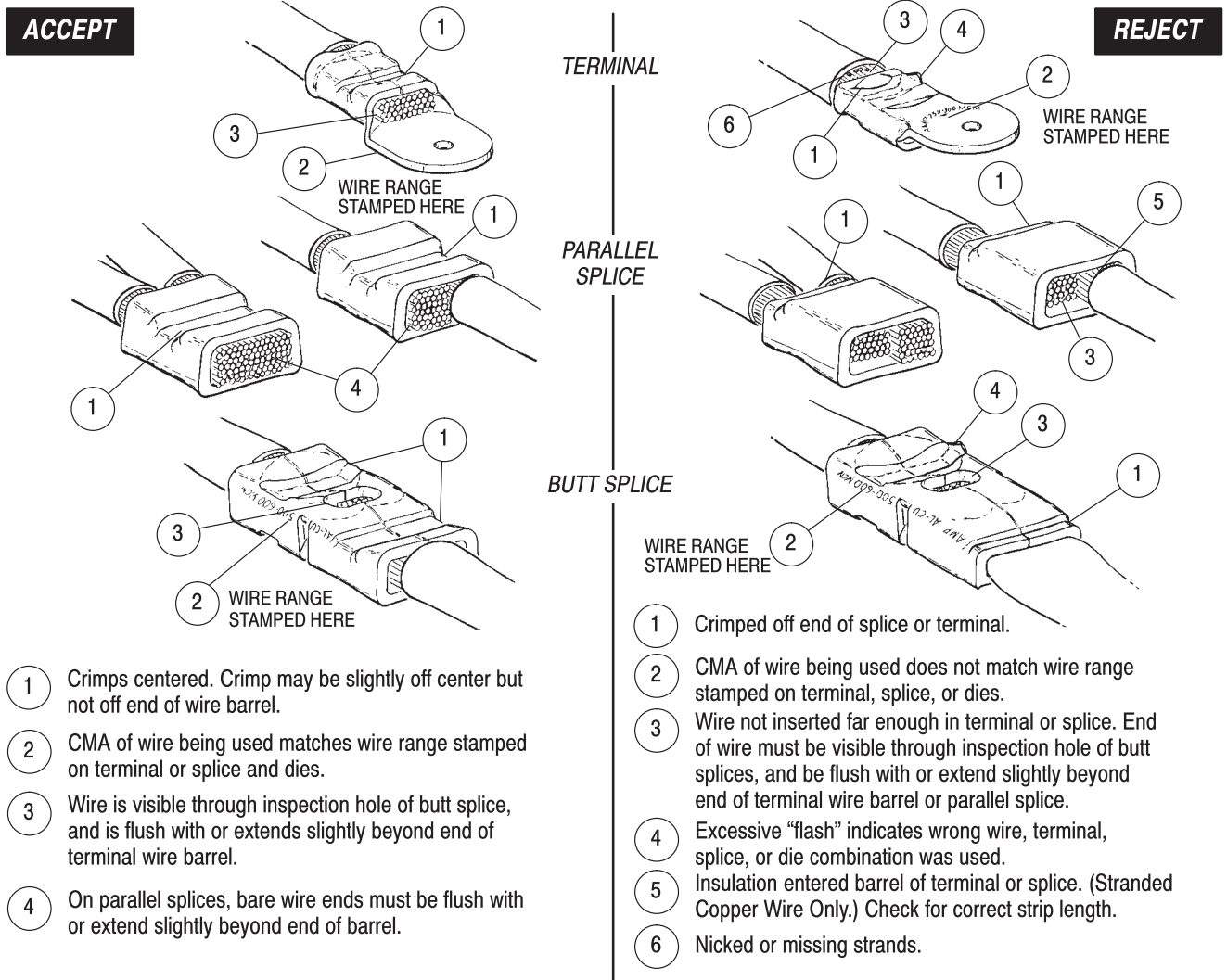


Figure 4

**7.1. Daily Maintenance**

Tyco Electronics recommends that each operator be responsible for the following steps of daily maintenance:

1. Remove dust, moisture, and other contaminants with a clean, soft brush, or a 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 in a clean, dry area.

**7.2. Periodic Inspection**

Regular inspections should be performed by quality control personnel. A record of scheduled inspections should remain with the die assembly or be supplied to supervisory personnel responsible for the die assembly. Though recommendations call for at least one inspection a month, the frequency should be based on amount of use, working conditions, operator training and skill, and your established company policies. These inspections should include a visual inspection (Paragraph 7.3) and a crimping chamber inspection (Paragraph 7.4).

**7.3. 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.
2. Inspect crimp area for flattened, chipped, or broken areas. See Figure 5. Replace worn or damaged parts.

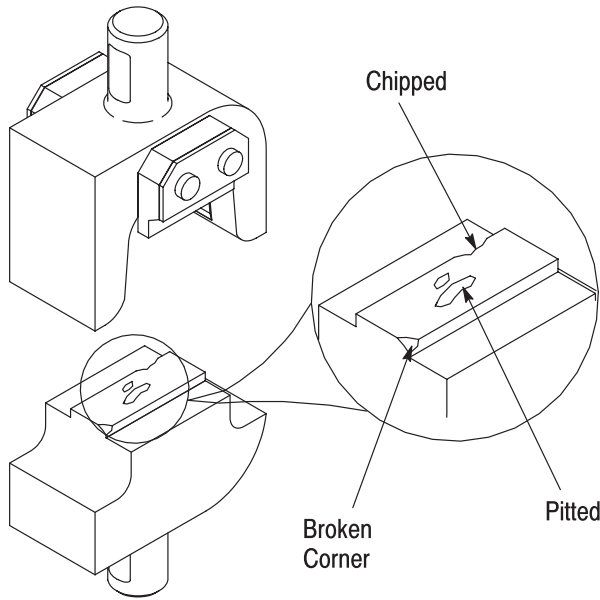


Figure 5

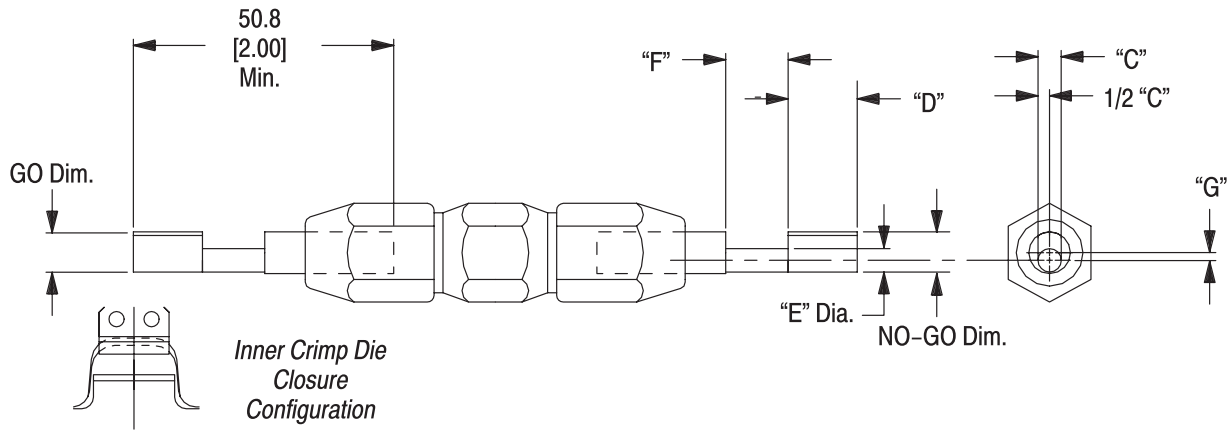
**7.4. Gaging the Crimping Chamber**

This inspection requires the use of a plug gage conforming to the diameters provided in Figure 6 or 7.

Tyco Electronics 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. Select the proper GO gage. Position gage element in inner crimp closure of stationary die so that locator is in notch of gage element. See Figure 8, Detail A.
3. Assemble and adjust dies to meet the “gage dimension” indicated in Figure 8, Detail A.
4. To meet the GO gage conditions, the plug gage must be able to rotate freely in either direction as shown in Figure 8, Detail A.
5. Select the proper NO-GO gage. Position gage element in inner crimp closure of stationary die so that locator is in notch of gage element. See Figure 8, Detail B.
6. Mate the stationary and moving dies so that inner crimp surfaces are seated on the NO-GO gage element.
7. To meet the NO-GO gage conditions, NO-GO gage element will be held stationary (will not rotate) by the dies. See Figure 8, Detail B.

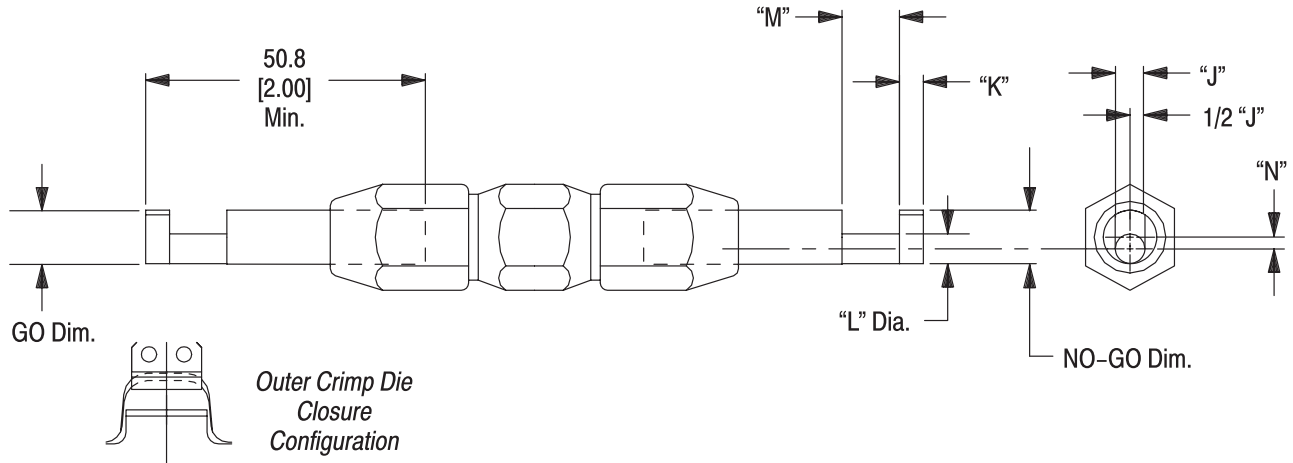
**Suggested Plug Gage Design - Inner Crimp**



DIE SET NUMBER	GAGE ELEMENT DIMENSIONS ("A" Dia.)						
	GO	NO-GO	"C"	"D"	"E" Dia.	"F"	"G"
318106-1	7.874 - 7.882 [.3100 - .3103]	8.125 - 8.128 [.3199 - .3200]	4.57 [.180]	13.46 [.530]	4.57 [.180]	12.19 [.480]	1.47 [.058]

Figure 6

**Suggested Plug Gage Design - Outer Crimp**



DIE SET NUMBER	GAGE ELEMENT DIMENSIONS ("A" Dia.)						
	GO	NO-GO	"J"	"K"	"L" Dia.	"M"	"N"
318106-1	11.430 - 11.438 [.4500 - .4503]	11.783 - 11.786 [.4639 - .4640]	6.35 [.250]	5.08 [.200]	6.35 [.250]	12.19 [.480]	2.46 [.097]

Figure 7

8. Inspect the right and left outer crimp closures in the same manner as Steps 2 through 7. See Figure 8, Details C and D.

If both the inner crimp and the outer crimp closures meet the plug gage conditions, the die closures may be considered dimensionally correct and 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 8, REPLACEMENT AND REPAIR.

For additional information concerning the use of the plug gage, refer to Instruction Sheet 408-7424.

**8. REPLACEMENT AND REPAIR** (Figure 9)

Order replacements through your representative, or call 1-800-526-5142, or send a facsimile of your purchase order to 717-986-7605, or write to:

CUSTOMER SERVICE (038-035)  
 TYCO ELECTRONICS CORPORATION  
 P.O. BOX 3608  
 HARRISBURG, PA 17105-3608

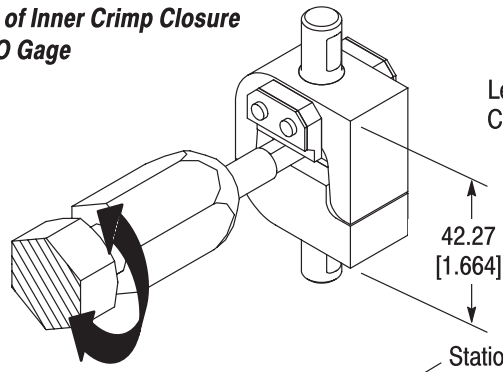
**9. REVISION SUMMARY**

- Updated document to corporate requirements
- Changed dimension lines in Figures 6 and 7



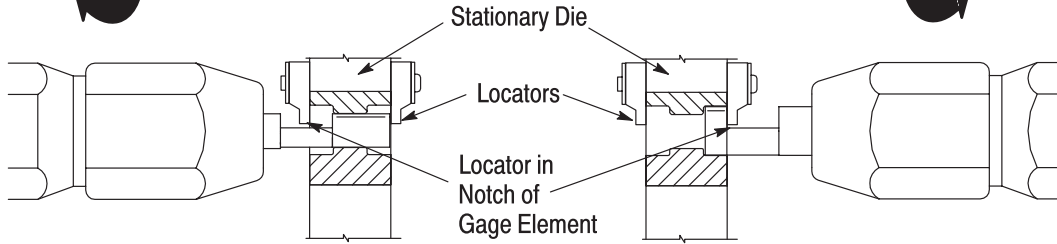
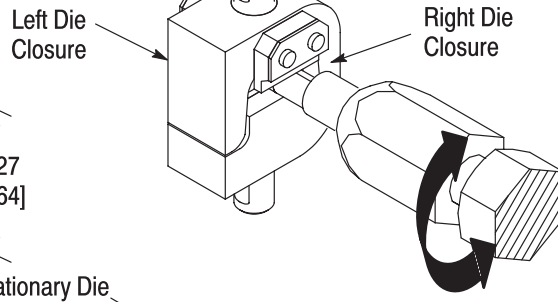
**Inspection of Inner Crimp Closure  
Detail A GO Gage**

GO Gage  
Rotates  
Freely in  
Either  
Direction



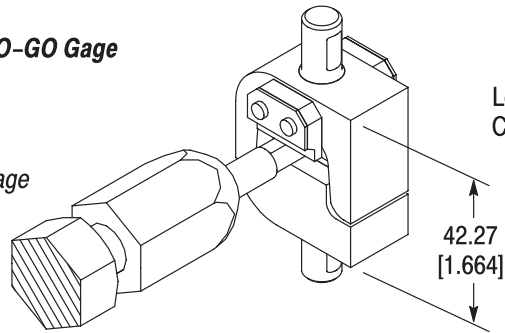
**Inspection of Outer Crimp Closure  
Detail C GO Gage**

GO Gage  
Rotates  
Freely in  
Either  
Direction



**Detail B NO-GO Gage**

NO-GO Gage  
Will Not  
Rotate



**Detail D NO-GO Gage**

NO-GO Gage  
Will Not  
Rotate

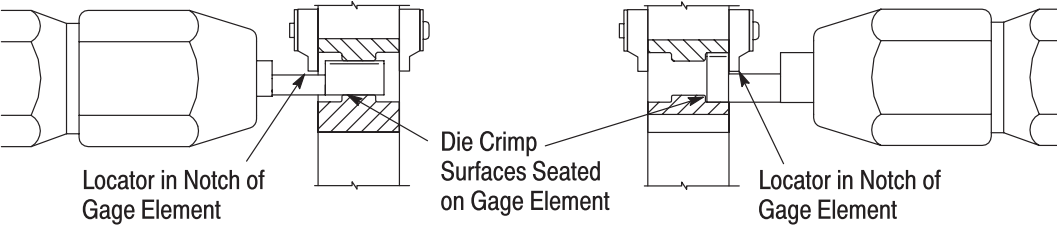
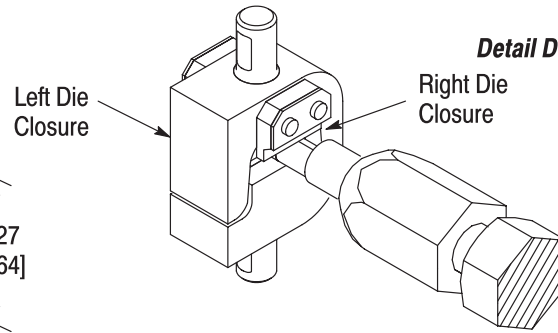
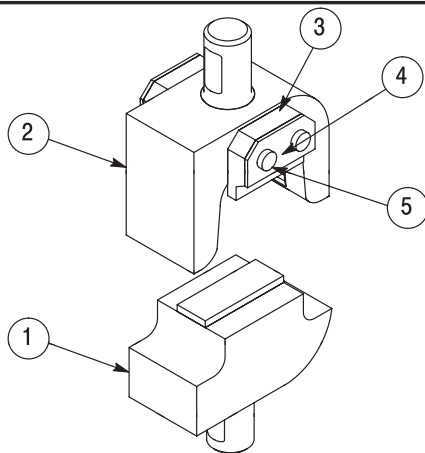


Figure 8



ITEM	PART NUMBER	DESCRIPTION	QTY PER ASSY.
1	314993-1	MOVING DIE, (Anvil)	1
2	314992-1	STATIONARY DIE (Indenter)	1
3	308131-1	LOCATOR	2
4	308133-1	PLATE	2
5	1-59573-7	RIVET	2

Figure 9