

## 1. INTRODUCTION

Crimp height comparators and plug gages are instruments recommended for verifying the correctness of application tooling (see Figure 1). The most appropriate instrument will be specified on the instruction material supplied with the crimp tooling being used.



**NOTE**

Refer to Customer Manual 409-5253 concerning 4/8 indent crimps.

Crimp Height Comparator



Plug Gage

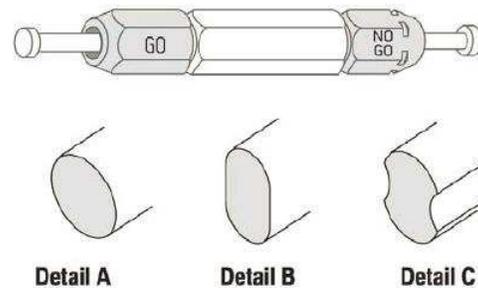


Figure 1

Reasons for reissue are provided in Section 7, REVISION SUMMARY.

## 2. TERMINAL FORMS AND CRIMP TOOLING

There are three basic forms of TE Connectivity (TE) contacts, each associated with a given type of crimp tooling: (1) strip contacts crimped in machine applicators, (2) tape-mounted contacts crimped in tape-supplied machines and tools, and (3) loose-piece contacts crimped in hand crimping tools.

To ensure the quality and reliability of crimped terminations, the application tooling should be checked periodically.



**NOTE**

Due to the wide range of insulation thicknesses, a measurement relating to the insulation barrel crimp is NOT specified-unless it is critical to the applications.

Always check the instruction material packaged with the crimp tooling. The crimp height of a loose-piece contact may vary from the comparable strip-form contact. The prescribed crimp height for a strip contact appears on the appropriate Applicator Parts List, while the crimp height for a loose-piece contact is provided on the 408 Series Instruction Sheet or Customer Drawing for the applicable hand tool.

### 3. WIRE STRIPPING

Care in stripping is required to ensure an effective crimp. If wire strands are cut, the result will be the same as using a smaller wire size. Further, a nicked wire strand reduces resistance to corrosion, and causes weakness which could lead to a break. Also, proper strip length is necessary if the wire is to be properly inserted into the contact (refer to the applicable 114 Series Application Specification).

### 4. CRIMP HEIGHT COMPARATOR

#### 4.1. Description (Figure 1)

Crimp height comparators are micrometers which have been modified to measure contact crimp height in the area where maximum crimping height force has been applied. TE does not manufacture or market crimp height comparators. However, the comparator most commonly recommended by TE has a modified anvil and spindle (see Figure 1).

The comparator has an adjustment knob (see Figure 2).



Figure 2

The comparator also contains a digital readout (refer to Figure 3).



Figure3



**NOTE**

The comparator shown is a Mitutoyo Digimatic Digital Crimp Height Comparator; Part Number 342-371. An internet search of Part Number 342-371 will provide several sources for the purchase of this crimp height comparator.



**NOTE**

TE CONNECTIVITY recommends the use of this digital crimp height comparator with the TE Crimp Quality Monitor.

## 4.2. Using the Crimp Height Comparator

The comparator is used when the contact crimp height is specified. When checking an uninsulated contact, crimp the contact to the wire and measure the crimp height.

A pre-insulated contact can NOT be accurately measured (due to insulation “spring back”). The application specifications for pre-insulated terminals and certain other terminals may specify the use of proxy materials which are crimped and measured in place of a contact or terminal. Be sure to use the specific material and size referenced in the application specification for the contacts or terminals you are crimping.



**CAUTION**

Do NOT use crimp proxy materials in tools that crimp uninsulated contacts, unless specified by TE Engineering (metal particles could jam tooling locators, wire stops, ejectors, etc).

The crimp height dimension is obtained from the calibrations on the handles of the comparator (see Figure 4).



**NOTE**

Each line on the stationary handle indicates .025 in., and is numerically marked every .100 in. Each line on the movable handle indicates .001 in. and is so marked. Each line on the Vernier scale indicates .0001 in. and is so marked.

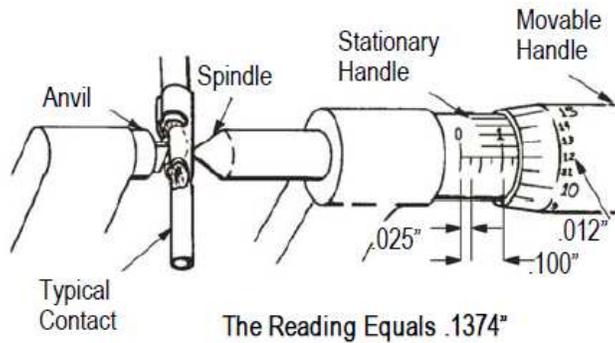


Figure 4

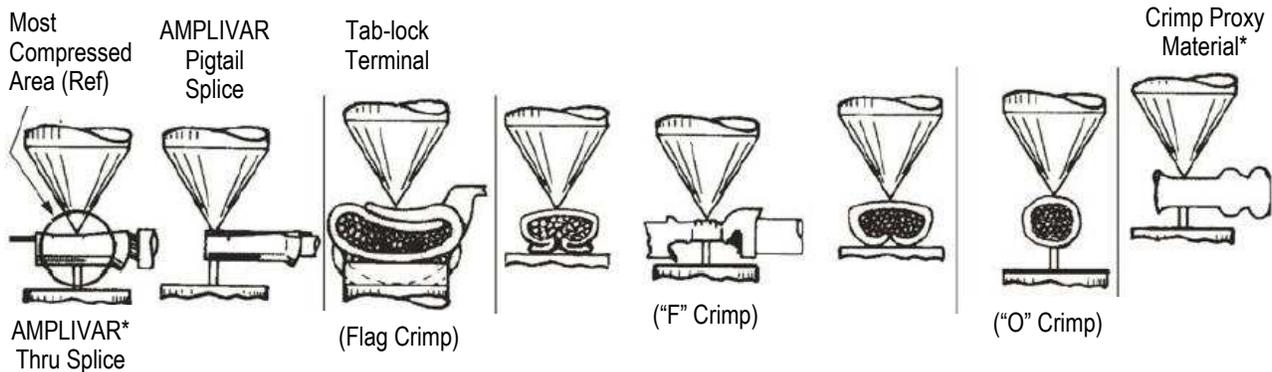
When using a comparator, center the most compressed area (see Figure 5) of the contact or crimp proxy material on the anvil and rotate the movable handle until the spindle tip touches the contact or crimp proxy. Do NOT go beyond initial contact as this could cause a depression (especially when checking a crimp proxy) and result in an inaccurate reading. Obtain reading from calibrations on the handles.



**NOTE**

Mitutoyo Digimatic digital crimp height comparator part number 342-371 also has a dial (Figure 4) which can be used when the screen is blank (dead battery).

Refer to Figure 5 for typical examples of measuring crimps with a crimp height comparator.



\* Only for Pre-Insulated Contacts or when specifically allowed for, or required by, the terminal Application Specification.

Figure 5

### 4.3. Using the Plug Gage (Figure 6)

Close the dies until bottomed. Align the GO element with the applicable crimp area and insert it straight into the crimping chamber without using force. **The GO element should pass all the way through the crimping chamber.**

Next, align the NO-GO element with the same crimping chamber and insert it straight into the chamber. **It may start entry, but should NOT pass through.**

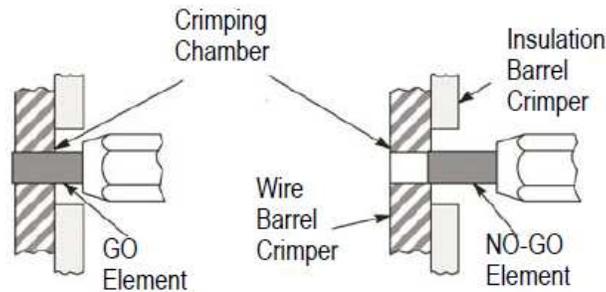


Figure 6

## 5. PLUG GAGE

The plug gage consists of a tool handle and precision GO and NO-GO gaging elements (see Figure 7).

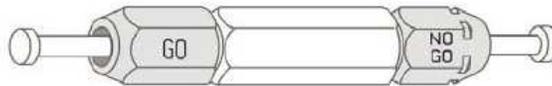


Figure 7

Certain plug gage dimensions are unique or specific to the terminations. The gages may be round Figure 1, (Detail A), oblong Figure 1, (Detail B), or specially configured in some other way (Figure 1, Detail C). Specified dimensions are provided on the tool 408 Series Instruction Sheet or the Customer Drawing.



#### NOTE

*TE does not manufacture these gages. They can be obtained from: Pennoyer-Dodge Co. 6634 San Fernando Road Glendale, CA 91201 or any manufacturer of comparable quality gages.*

If the GO element does NOT pass through, or the NO-GO element does pass through, the tool must be repaired by TE before returning it to service. **Call the Tooling Assistance Center number at the bottom of Page 1.**

## 6. ADDITIONAL INFORMATION

Refer to the instruction material packaged with each crimping tool for more specific information concerning crimp height measurement or die closure gaging, tool inspection, and tool repair.

## 7. REVISION SUMMARY

- Updated locations of some figures.
- Changed all usage of 'solder slugs' to 'crimp proxy material' in paragraph 4.2.
- Deleted Figure 4 and renumbered subsequent Figures.
- Revised Figure 5 to remove reference to Solder Slug and changed it to Crimp Proxy Material.