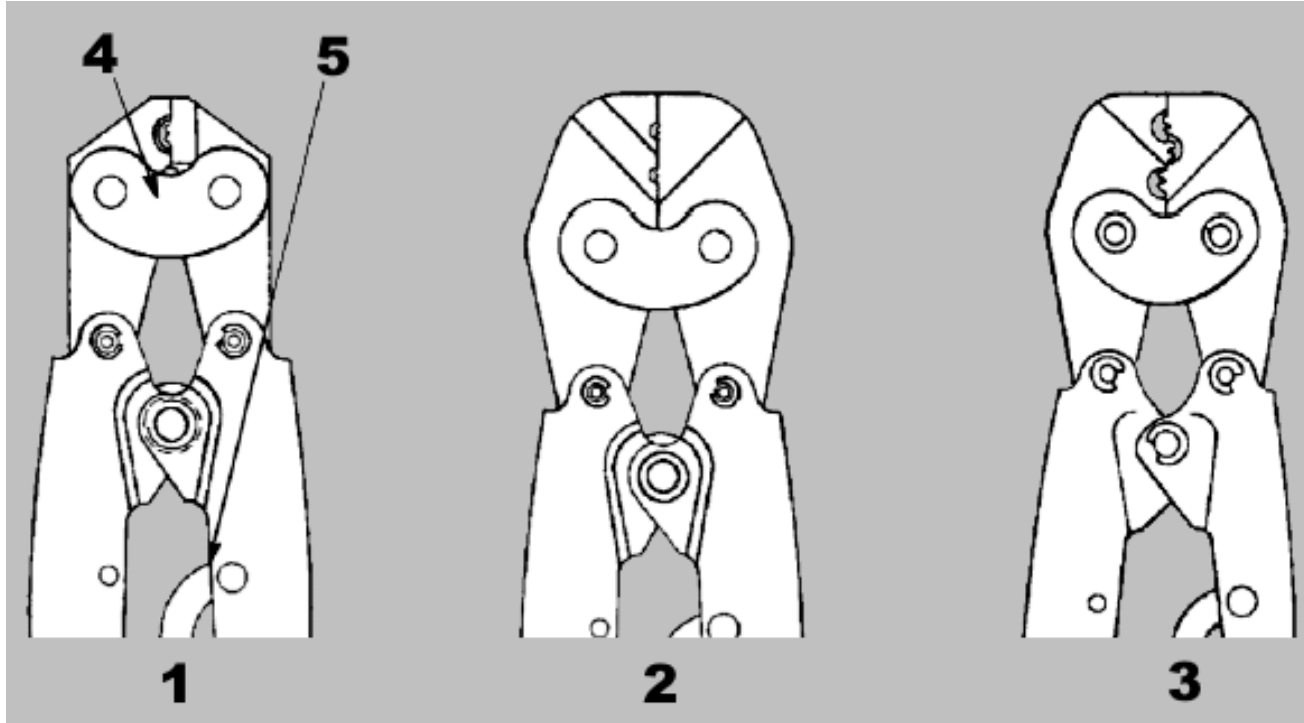


### PROPER USE GUIDELINES

Cumulative trauma disorders can result from the prolonged use of manually powered hand tools. Hand tools are intended for occasional use and low-volume applications. A wide selection of powered application equipment is available for extended-use production operations.

Figure 1: Hand crimping tools



- 1 One crimping chamber (typical)
- 2 Two crimping chambers (typical)
- 3 Three crimping chambers (typical)
- 4 Wire size marking
- 5 CERTI-CRIMP™ tool ratchet

## 1. INTRODUCTION

Hand Crimping Tools 46447, 2326374-1, 47410 (crimps 12-10 AWG terminals on a 45° angle), 49592, 49935, 69363, 525693, 574573, 1490046-1, and 1490047-1 (shown in Figure 1) are used to crimp SOLISTRAND™ and STRATO-THERM™ terminals and splices (listed in Table 1) onto stranded wire sizes 26 through 10 AWG.

Read these instructions thoroughly before using the tool.



### NOTE

Dimensions in this instruction sheet are in millimeters with [inches in brackets]. Figures are for reference only and are not drawn to scale.

Reasons for reissue of this instruction sheet are provided in Section 7, REVISION SUMMARY.

Table 1: Specifications

Product	Hand tool	Wire size (AWG) range and terminal size	Crimping chamber marking	Wire strip length			
				Terminal (standard)	Terminal (long barrel)	Butt splice	Parallel splice
STRATO-THERM	46447 2326374-1	22-16	22-16	4.37-5.16 [.172-.203]	---	6.35-7.14 [.250-.281]	7.94-8.73 [.313-.344]
		16-14	16-14	6.35-7.14 [.250-.281]			
		12-10	12-10	6.35-7.14 [.250-.281]			
SOLISTRAND	49592	14-12	14-12	4.37-5.16 [.172-.203]	---	7.94-8.73 [.313-.344]	---
	49935 525693 574573	22-16	22-16	4.37-5.16 [.172-.203]	6.35-7.14 [.250-.281]	6.35-7.14 [.250-.281]	7.94-8.73 [.313-.344]
	49935 525693 574573 1490046-1	16-14	16-14	4.37-5.16 [.172-.203]	6.35-7.14 [.250-.281]	6.35-7.14 [.250-.281]	7.94-8.73 [.313-.344]
	47410 49935 525693 574573 1490047-1	12-10 & 16-14 HD	12-10	6.35-7.14 [.250-.281]	---	6.35-7.14 [.250-.281]	---
	69363	26-24	26-24	3.17-3.97 [.125-.156]	---	3.57-4.37 [.141-.172]	---
		22-20	22-20	4.37-5.16 [.172-.203]	---	5.16-5.95 [.203-.234]	---
		24-20	22-20	---	---	4.37-5.16 [.172-.203]	---
		26-22	26-24	3.17-3.97 [.125-.156]	---	3.57-4.37 [.141-.172]	---

## 2. DESCRIPTION

Each tool consists of a CERTI-CRIMP tool ratchet and two crimping jaws (indenter and anvil) containing one, two, or three crimping chambers. Each tool is marked with the wire size range for each crimping chamber (Figure 1). Full crimping of the terminal or splice is assured by the CERTI-CRIMP tool ratchet. When engaged, the ratchet does not release until the tool handles have been **fully** closed.



### CAUTION

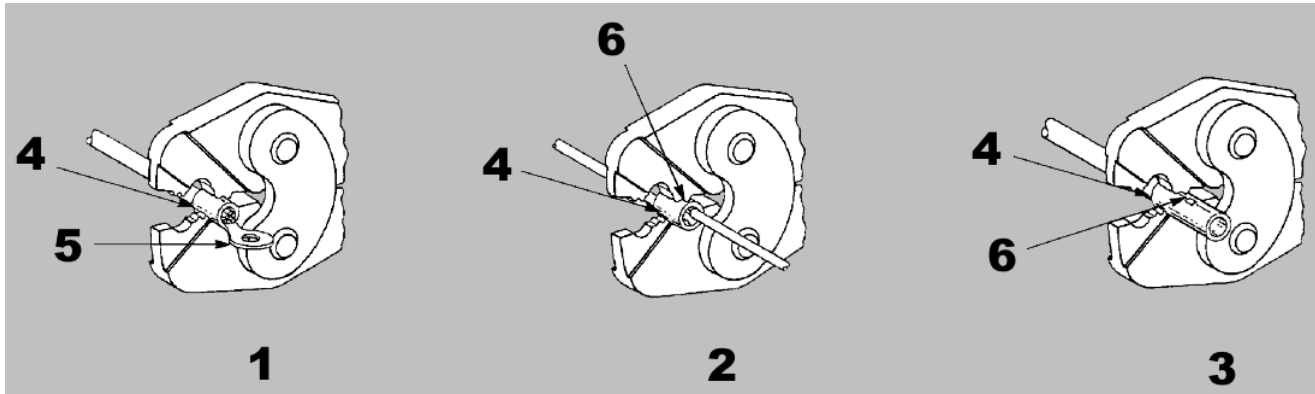
The crimping jaws bottom before the ratchet releases. This feature ensures maximum electrical and tensile performance of the crimp. **Do not** re-adjust the ratchet.

## 3. CRIMPING

1. Strip the wire according to the dimensions listed in Table 1. The strip length is determined by the type of terminal or splice and by the wire size. Do not nick or cut the wire strands.
2. Close the tool handles until the ratchet releases.
3. Allow the tool handles to open fully.

4. Center the terminal or splice wire barrel in the appropriate crimping chamber (Figure 2).
  - For terminals, make sure that the flat side of the tongue faces the anvil or the nest.
  - For splices, make sure that the brazed seam (when visible) is toward the indenter or the nest.

Figure 2: Centering the wire barrel in the crimping chamber



- |   |                 |   |   |
|---|-----------------|---|---|
| 1 | Terminal        | 4 | Wire barrel centered in crimping chamber  |
| 2 | Parallel splice | 5 | Flat side of terminal tongue facing anvil |
| 3 | Butt splice     | 6 | Brazed seam on splice toward indenter     |

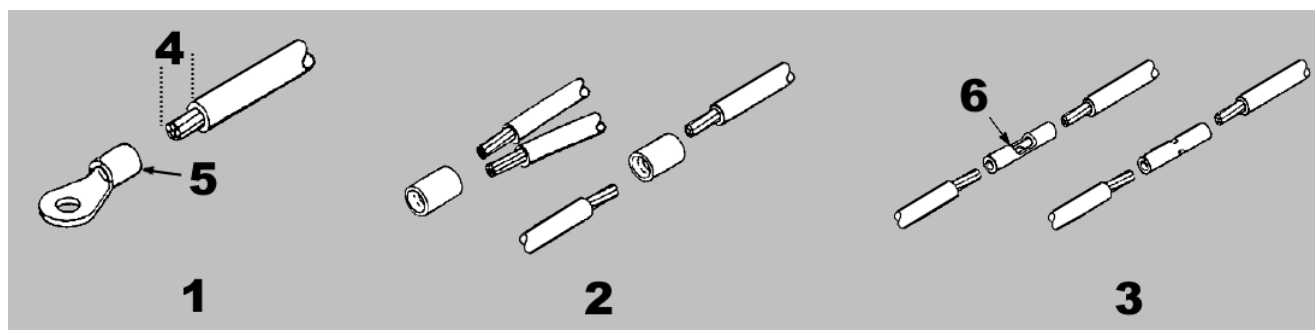


**NOTE**

Terminals and splices can also be rotated 180 degrees with the seam toward the nest.

5. While holding the terminal or splice in place, squeeze the tool handles together just until the jaws begin to close on the wire barrel. Do **not** deform the wire barrel.
6. Insert the stripped wire into the wire barrel, making sure that the wire insulation does not enter the wire barrel (Figure 3).

Figure 3: Inserting stripped wire in wire barrel (not to scale)



- |   |                 |   |                   |
|---|-----------------|---|-------------------|
| 1 | Terminal        | 4 | Wire strip length |
| 2 | Parallel splice | 5 | Wire barrel       |
| 3 | Butt splice     | 6 | Strap type        |

7. While holding the wire in place, squeeze the tool handles together until the ratchet releases, then allow the tool handles to open fully.
8. To crimp the other half of a butt splice, position the uncrimped wire barrel in the crimping chamber and repeat the crimping procedure.



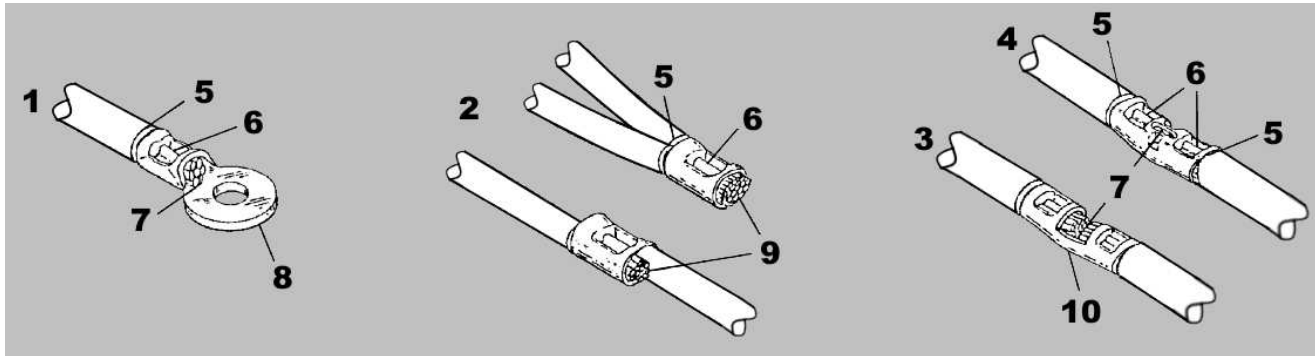
**NOTE**

If the splice cannot be turned for crimping the other half, turn the tool around.

#### 4. INSPECTING THE CRIMP

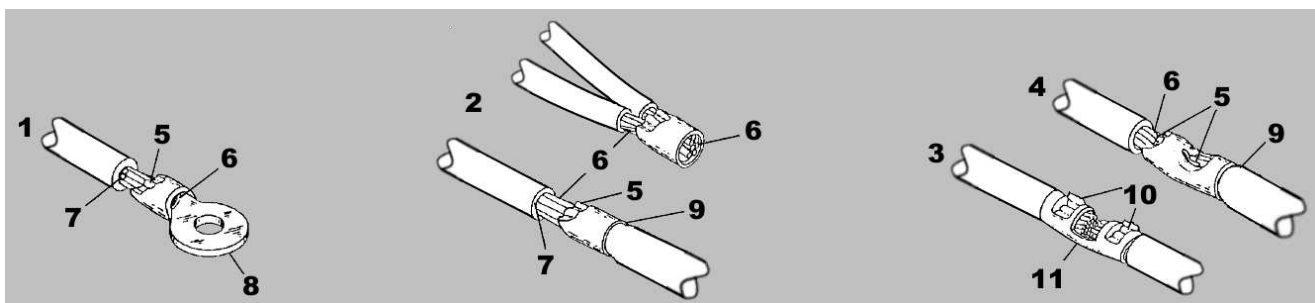
Inspect crimped terminals and splices by checking the features shown in Figure 4. Poor crimps (Figure 5) can be avoided by carefully following the procedures provided in Section 3, and by following the tool maintenance procedures provided in Section 5.

Figure 4: Features of a good crimp



- 1 Terminal
- 2 Parallel splice
- 3 Butt splice (strap type)
- 4 Butt splice (sight hole or stranded type)
- 5 Wire insulation does not enter wire barrel
- 6 Crimp is centered. Crimp can be off center, but not off end of wire barrel.
- 7 Wire is visible through inspection hole. Wire is flush with or extends slightly beyond end of wire barrel.
- 8 Wire size matches wire range or size stamped under tongue.
- 9 Bare wire ends are flush with or extend slightly beyond end of wire barrel.
- 10 Wire size matches wire range or size stamped on splice.

Figure 5: Features of a poor crimp



- 1 Terminal
- 2 Parallel splice
- 3 Butt splice (strap type)
- 4 Butt splice (sight hole or stranded type)
- 5 Crimped off end of wire barrel
- 6 Wire not inserted far enough. End of wire must be visible through inspection hole, and be flush with (or extend slightly beyond) end of wire barrel.
- 7 Nicked or missing strands
- 8 Wire size does not match wire range or size stamped under tongue.
- 9 Wire insulation enters wire barrel. Check for incorrect strip length.
- 10 Excess "flash" on terminal or splice indicates damaged jaws or use of wrong wire, splice, or tooling combination.
- 11 Wire size does not match wire range or size stamped on splice.

## 5. MAINTENANCE AND INSPECTION

The tool is inspected before being shipped. Inspect it immediately upon arrival at your facility to ensure that the tool has not been damaged during shipment.

Frequency of inspection depends on:

- The care, amount of use, and handling of the hand tool
- The presence of abnormal amounts of dust and dirt
- The degree of operator skill
- Your own established standards

### 5.1. Daily maintenance

- Remove dust, moisture, and other contaminants with a clean soft brush or soft lint-free cloth. **Do not** use objects that could damage the dies or tool.
- Make certain that the retaining pins are in place and that they are secured with retaining rings.
- 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.
- When the tool is not in use, keep the handles closed to prevent objects from becoming lodged in the dies. Store the tool in a clean, dry area.

### 5.2. Lubrication

Lubricate all pins, pivot points, and bearing surfaces with SAE 20 motor oil as indicated in Table 2.

*Table 2: Lubrication schedule*

When tool is used	When to lubricate
In daily production	Daily
Daily (occasional)	Weekly
Weekly	Monthly



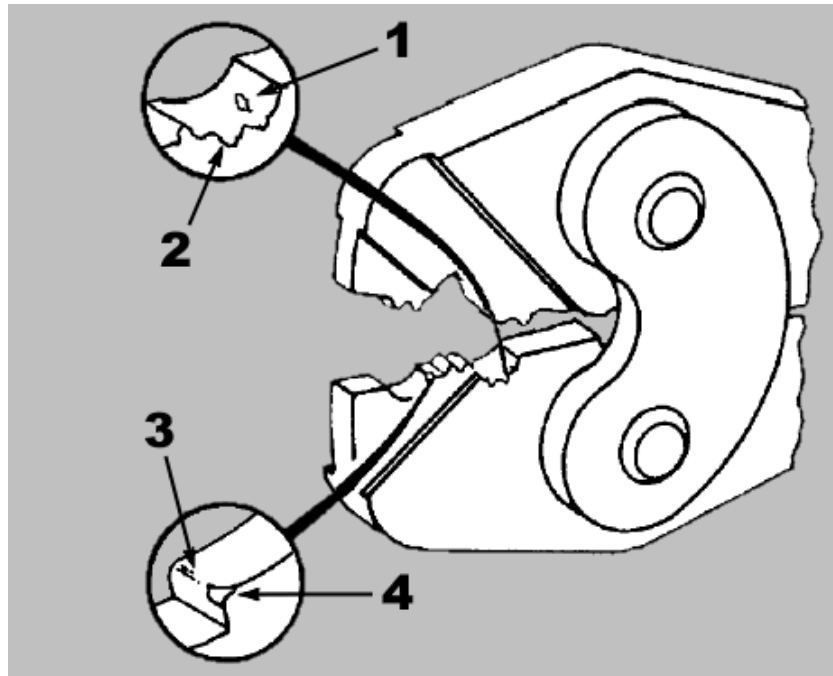
**NOTE**

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

### 5.3. Periodic inspection

- Remove accumulated dirt, grease, and foreign matter by immersing the tool (with handles partially closed) in a reliable commercial degreasing compound.
- Close the tool handles until the 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 6, REPLACEMENT AND REPAIR.
- Inspect the head assembly for worn, cracked, or broken jaws (Figure 6). If damage is evident, return the tool to TE for evaluation and repair. See Section 6, REPLACEMENT AND REPAIR.

Figure 6: Inspecting the head assembly

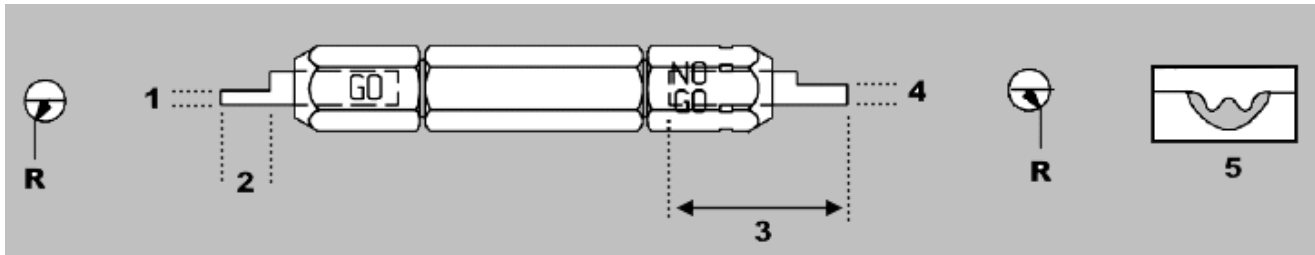


- 1** Pitted
- 2** Chipped edge
- 3** Flattened area
- 4** Broken corner

#### 5.4. Gaging the crimping chambers

This inspection requires the use of a plug gage (Figure 7) conforming to the dimensions listed in Table 3.

Figure 7: Recommended plug gage design



- 1 GO dimension
- 2 12.7 [.50] minimum (typical)
- 3 50.8 [2.00] minimum (typical)
- 4 NO-GO dimension
- 5 Jaw closure configuration

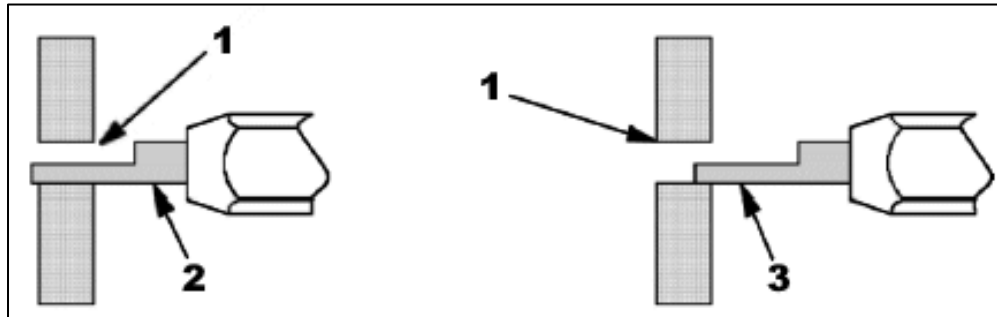
Table 3: Plug gage dimensions

Hand tool	Crimping chamber marking	Gage element dimensions mm [in.]		
		GO	NO-GO	R
46447 2326374-1	22-16	1.295-1.303 [.0510-.0513]	1.445-1.447 [.0569-.0570]	1.57 [.062]
	16-14	1.498-1.506 [.0590-.0593]	1.648-1.651 [.0649-.0650]	1.57 [.062]
	12-10	2.108-2.116 [.0830-.0833]	2.258-2.260 [.0889-.0890]	2.36 [.093]
49592	14-12	1.752-1.760 [.0690-.0693]	1.902-1.905 [.0749-.0750]	1.57 [.062]
49935 525693 574573	22-16	1.168-1.176 [.0460-.0463]	1.318-1.320 [.0519-.0520]	1.57 [.062]
49935 525693 574573 1490046-1	16-14	1.371-1.379 [.0540-.0543]	1.521-1.524 [.0599-.060]	1.98 [.078]
47410 49935 525693 574573 1490047-1	12-10	1.930-1.938 [.0760-.0763]	2.080-2.082 [.0819-.082]	2.76 [.109]
69363	26-24	0.660-0.668 [.026-.0263]	.0810-0.812 [.0319-.032]	1.003 [.0395]
	22-20	0.939-0.947 [.037-.0373]	1.089-1.092 [.0429-.043]	1.19 [.047]

TE does not manufacture or market these gages. To gage the crimping chambers, proceed as follows:

1. Remove traces of oil or dirt from the crimping chambers and plug gage.
2. Close the tool handles until it is evident that the jaws have bottomed; then hold in this position. Do **not** force the jaws beyond initial contact.
3. Align the GO element with the crimping chamber. Push element straight into the crimping chamber without using force. The GO element must pass completely through the crimping chamber (Figure 8).
4. Align the NO-GO element and try to insert it straight into the same crimping chamber. The NO-GO element can enter partially, but must not pass completely through the crimping chamber (Figure 8).

Figure 8: Gaging with GO and NO-GO elements



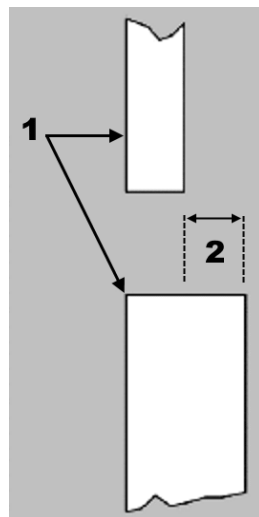
- 1 Crimping chamber
- 2 GO element
- 3 NO-GO element



**NOTE**

The jaws in Tools 49935 and 574573 are not symmetrically located. Make sure that the tool conforms to the symmetry requirements shown in Figure 9.

Figure 9: Symmetry requirements for tools 49935, 574573, 1490046-1, and 1490047-1



- 1 Jaws
- 2 0.254 mm [0.010 in.] minimum (typical)

- If the crimping chambers conform to the gage inspection, the tool is considered dimensionally correct. Lubricate it with a **thin** coat of any good SAE 20 motor oil.
- If not, the tool must be returned for further evaluation and repair. Refer to Section 6, REPLACEMENT AND REPAIR.

For additional information regarding the use of a plug gage, refer to Instruction Sheet [408-7424](#).



## 5.5. Inspecting the ratchet

1. Check the CERTI-CRIMP tool ratchet to verify that the ratchet does not release prematurely, allowing the jaws to open before they have fully bottomed.
2. Obtain a 0.025 mm [.001 in.] shim suitable for checking the clearance between the bottoming surfaces of the crimping jaws.
3. Select a terminal or splice, and properly stripped wire with maximum wire load (such as wire size 16 AWG and size 22-16 terminal).
4. Position the terminal or splice and wire between the crimping jaws, as described in Section 3, CRIMPING.
5. Hold the wire in place and squeeze the handles until the CERTI-CRIMP tool ratchet releases. Hold the handles in this position, maintaining just enough tension to keep the jaws closed.
6. Use the shim to check the clearance between the bottoming surfaces of the crimping jaws.
  - If the clearance is 0.025 mm [.001 in.] or less, the ratchet is satisfactory.
  - If clearance exceeds 0.025 mm [.001 in.], the ratchet is out of adjustment and must be repaired. See Section 6, REPLACEMENT AND REPAIR.

## 6. REPLACEMENT AND REPAIR

Customer-replaceable parts are listed in Table 4. Stock and control a complete inventory to prevent lost time when replacement of parts is necessary. Parts other than those listed should be replaced by TE to ensure quality and reliability. Order replacement parts through your TE representative. You can also order parts by any of the following methods:

- Go to [TE.com](http://TE.com) and click the **Shop TE** link at the top of the page.
- Call 800-522-6752.
- Write to:

CUSTOMER SERVICE (038-035)  
 TE CONNECTIVITY CORPORATION  
 PO BOX 3608  
 HARRISBURG PA 17105-3608

Tools can also be returned to TE for evaluation and repair. For customer repair services, call 800-522-6752.

Figure 10: Tool dimensions (with handles closed) and replacement parts

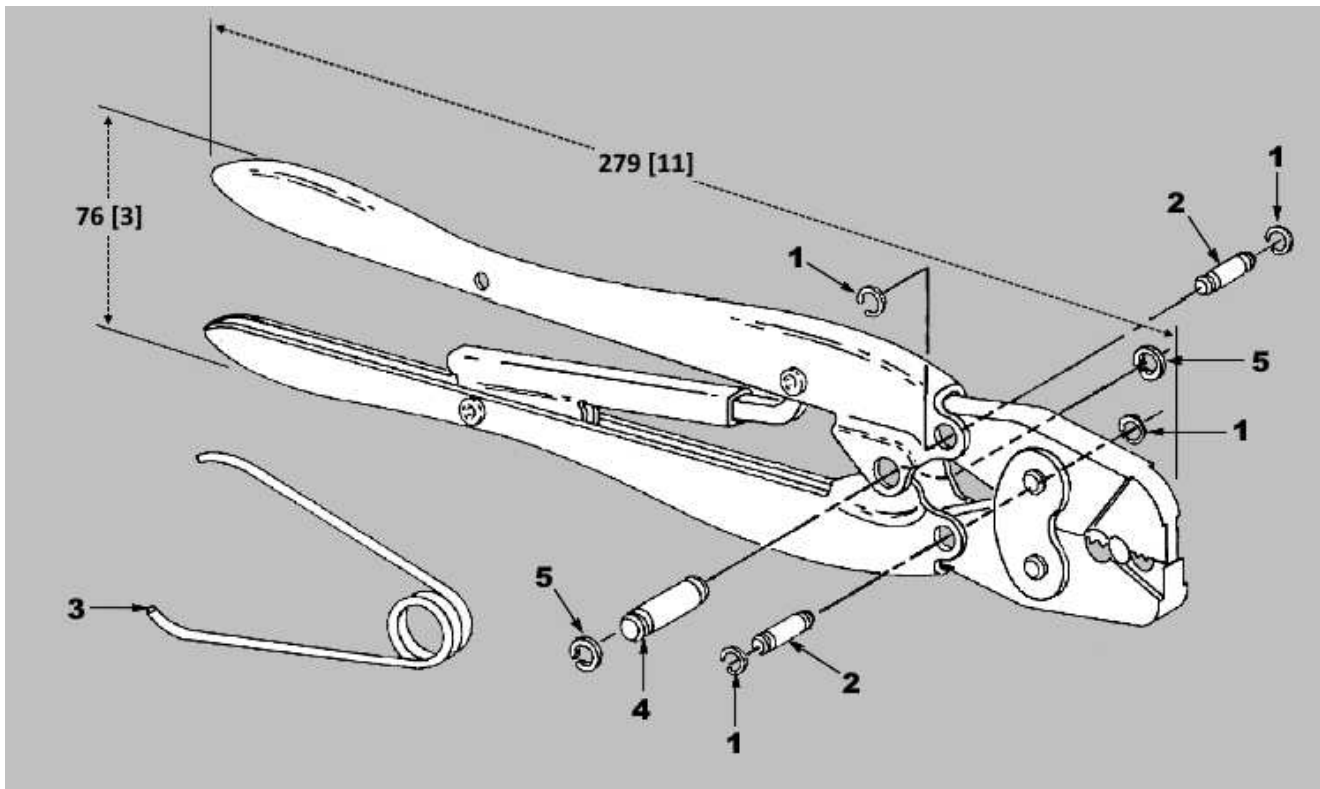


Table 4: Replacement parts

Item	Part number	Description	Quantity per tool	525693 tool only
1	21045-3	Ring, retaining	4	---
2	1-23619-6	Ring, retaining	2	2
3	39364	Spring, hold down	1	---
4	2-23620-9	Pin, straight, grooved	1	1
5	21045-6	Ring, retaining	2	2
6	525108	Ring, retaining, beryl copper	---	4

## 7. REVISION SUMMARY

Revisions to this instruction sheet include:

- Added a row to the bottom of Table 1.
- Reworked figures in section 4.
- Numerous formatting corrections and enhancements.

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