

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 for extended-use, production operations is available.

1. INTRODUCTION

AMP* Modular Plug (Premium Grade) Hand Tool 231652-[], which includes Die Set 853400-[] (shown in Figure 1), terminates modular plug connectors onto stranded or solid, shielded or unshielded—flat oval cable or round cable. The tool also cuts and strips unshielded flat oval cable; other cable must be prepared by separate tools.

NOTE

All dimensions are in millimeters [followed by inches in brackets].

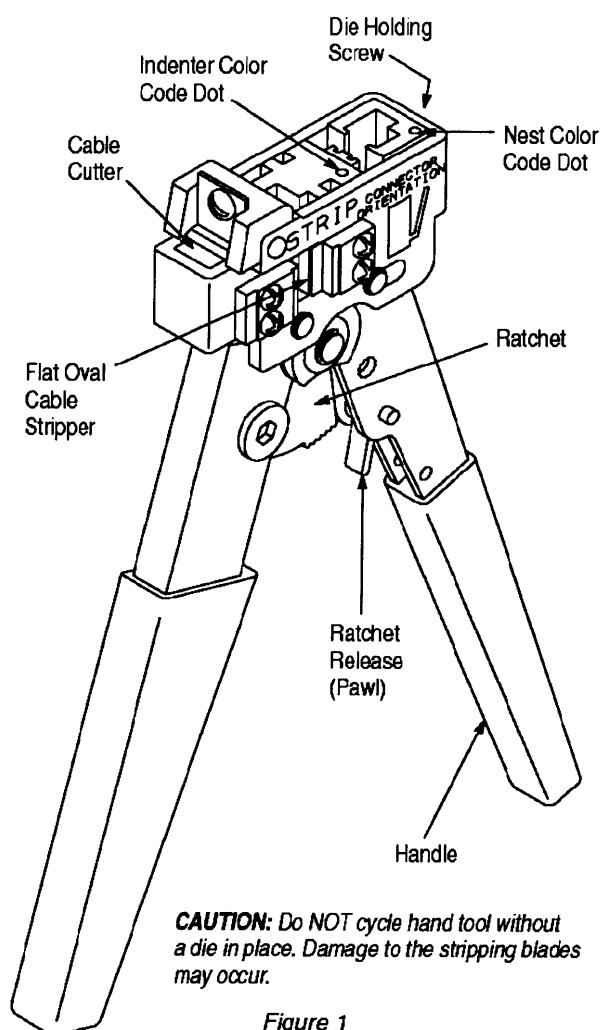


Figure 1

Read and understand this instruction sheet before using the hand tool. For further information on the modular interconnection system, see Catalog 82066.

Reasons for reissue of this instruction sheet are provided in Section 8, REVISION SUMMARY.

2. DESCRIPTION (Figure 1)

Each die set is unique to its purpose, but die sets can be interchanged to accommodate any modular plug. The die set consists of a nest and an indenter, each marked with a color code dot. Refer to Figure 2. The dies are held in the tool by a single die holding screw. The tool also includes a wire cutter and flat oval cable stripper to prepare unshielded flat oval cable.

NOTE

Die sets are available separately.

The tool handle ensures full crimping. Once engaged, the ratchet will not release until the handles have been FULLY closed, unless the ratchet release (pawl) is depressed to manually release the ratchet. When depressed, the pawl prevents crimping of an improperly positioned connector.

CAUTION

The dies bottom before the ratchet releases. This feature ensures maximum electrical and tensile performance of the crimp. Do NOT re-adjust the ratchet.

HAND TOOL	CORRESPONDING DIE SET		
	PART NUMBER	COLOR CODE DOT	DESCRIPTION (Modular Plug Type)
2-231652-1 2-231652-2■	853400-1	Black	8-Position Line
2-231652-3	853400-3	Green	4-Position Handset
2-231652-6	853400-6	Orange	6-Position Offset Latch
2-231652-7	853400-7	Violet	6-Position Long Body
2-231652-8 2-231652-4■	853400-8	Blue	4- and 6-Position Line
3-231652-0 3-231652-1■	1-853400-0	White	8-Position High Performance

■ Same as preceding tool, except packaged in "clamshell" for retail display.

Figure 2

3. CABLE PREPARATION

Refer to Figure 3 and select the appropriate cable and die set for the modular plug connector being used. Then proceed as follows:

3.1. Unshielded Flat Oval Cable (Figure 4)

1. Insert cable squarely into CUT slot in tool cable cutter. Squeeze handles until ratchet releases.
2. Insert trimmed cable into STRIP slot in tool flat oval cable stripper until cable butts against die cable stop.
3. Close handles to last ratchet stop, but DO NOT release them. Pull cable straight out of tool. Then release tool handles.
4. Check cable strip length as shown in Figure 4.

NOTE

DO NOT squeeze handles together while pulling cable out. Rather, with handles closed (and not released) grip head of tool in one hand and cable in other; then pull cable straight out of tool.

3.2. Shielded Flat Oval Cable and Round Cable

Prepare the cable according to Application Specification 114-6016.

3.3. High Performance Cable

Prepare the cable according to Application Specification 114-6053.

CAUTION

DO NOT cut or remove insulation from individual conductors. This may result in shorted or open terminations within the finished modular plug cable assembly.

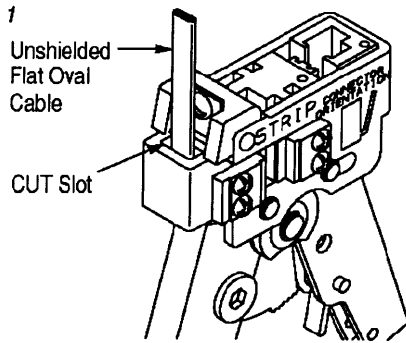
MODULAR PLUG CONNECTOR			CABLE		DIE SET COLOR CODE DOT
POSITION	TYPE	PART NUMBER	TYPE	STYLE	
2	Line	5-641333-2	Stranded	Flat Oval	Blue
4	Handset	5-556200-2	Solid	Flat Oval	Green
	Handset	5-641334-2	Stranded	Flat Oval	
	Line	5-641335-2	Stranded	Flat Oval	Blue
	Blue—Small Conductor	5-557965-2	Solid	Flat Oval	
6	Line	5-569032-2	Solid	Round	Blue
	Line	5-641337-2	Stranded	Flat Oval	
	Blue—Small Conductor	5-557970-2	Solid	Flat Oval	
	Offset	5-555236-2	Solid	Flat Oval	Orange
	Long	5-555426-2	Solid	Flat Oval	Violet
	Long	5-555177-2	Stranded	Round	
	Shielded—Long Body	5-555174-2	Stranded	Flat Oval	
8	Line	5-554169-2	Stranded	Round	Black
	Line	5-554720-2	Solid	Flat Oval	
	Line	5-554739-2	Stranded	Flat Oval	
	Line	5-557315-2	Solid	Round	
	Blue—Small Conductor	5-557972-2	Solid	Flat Oval	
	Keyed	5-554743-2	Stranded	Flat Oval	
	Keyed	5-555417-2	Solid	Flat Oval	
	Shielded	5-569532-2	Stranded	Round	
8 (High Performance)	Line	5-558530-2	Stranded	Round	White
	Line	5-569278-2	Solid	Round	
	Shielded	5-569550-2	Solid	Round	
	Shielded	5-569552-2	Stranded	Round	

Note: Standard modular plugs are designed to be used with cable having an outside diameter of 0.89 to 0.99 [.035 to .039].
Use small conductor modular plugs with cable having an outside diameter of 0.74 to .086 [.029 to .034].

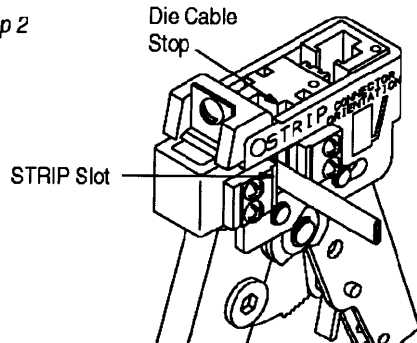
Figure 3

Cutting and Stripping Unshielded Flat Oval Cable

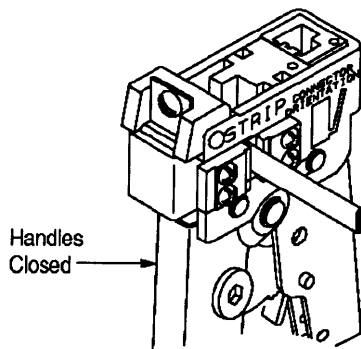
Step 1



Step 2



Step 3



Step 4

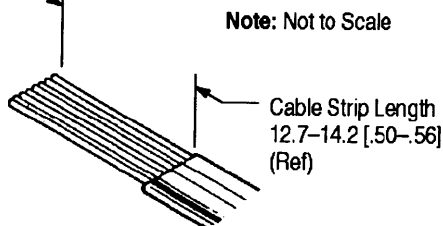


Figure 4

4. TERMINATION PROCEDURE

Before proceeding, double-check to be sure that the cable and plug are compatible, and that cable polarity is correctly maintained for your specific application. Refer to Figure 5 and proceed as follows:

NOTE

Before proceeding with the termination procedure for high-performance modular plugs, refer to 114-6053 for preparation techniques to ensure high performance levels.

NOTE

Illustrations for termination procedure show line modular plugs. Illustrations for other types of modular plugs would be similar.

1. Hold plug as shown (locking latch facing UP). Insert cable into plug until fully bottomed.
2. Open tool handles. Insert plug assembly *fully* into die cavity. When using die set color coded with green, orange, or blue, make sure that the plug locking latch snaps into position. When using die set color coded with black, violet, or white, make sure that the plug bottoms in the die cavity (but does not snap into position).

CAUTION

Failure to fully seat the plug assembly in the cavity will cause the indenter to mis-align with the plug internal strain reliefs, which may result in die set damage.

3. Squeeze handles until ratchet releases. Depress locking latch (if necessary) and remove terminated plug assembly.
4. After releasing the terminated plug assembly, inspect for proper crimp height using a dial indicator or digital indicator with needle-point probes, or Crimp Height Gage 904170-1 according to 408-4389. Figure 6 shows a cross-section of a typical terminated plug—proper crimp height dimension and required location of the conductors. A visual inspection through the plastic housing of the plug should reveal whether the conductors are within acceptable range.

NOTE

Refer to 114-6016 (standard and small conductor modular plugs) and 114-6053 (high performance modular plugs) for specific information concerning inspection requirements.

5. TOOL ADJUSTMENTS

5.1. Adjusting Flat Oval Cable Stripper (Figure 7)

If cable jacket is cut too shallow and does not strip properly from the conductor bundle, or if it is cut too deeply and conductor insulation is also cut, adjust the flat oval cable stripper on the hand tool as follows.

NOTE

The die set must be in the tool when adjusting the flat oval cable stripper.

1. Close tool handles until the dies bottom, but DO NOT release the handles.
2. Loosen the two screws that hold the movable blade assembly.

Terminating Modular Plug

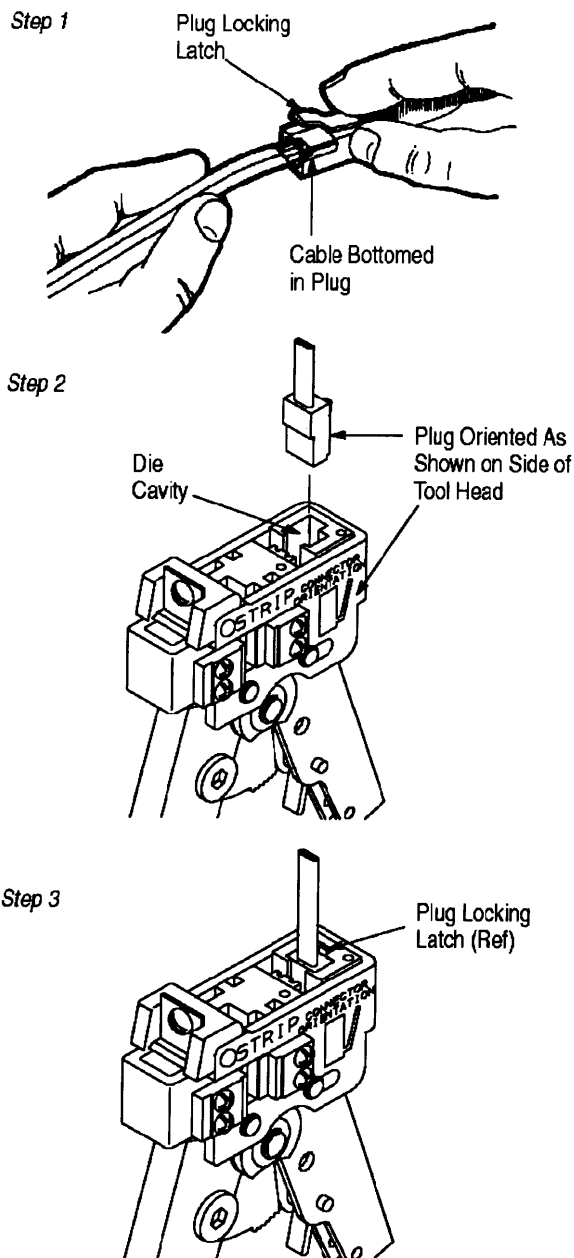


Figure 5

3. Insert the blade set-up gage (part of the blade replacement kit included with the tool) or a 1.02 [.040] shim between the stationary and movable blades. Slide the movable blade against the gage (or shim) and tighten the screws.

NOTE

The recommended shim thickness does not account for larger than normal conductor insulation. Adjust the blade gap according to your specific needs.

Terminated Modular Plug Inspection

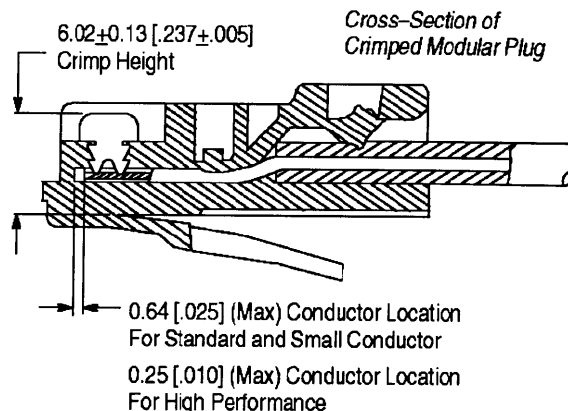


Figure 6

5.2. Replacing Flat Oval Cable Stripper Blades (Figure 7)

If the flat oval cable stripper blades are worn or damaged, replace the fixed blade assembly and movable blade assembly as follows:

1. Remove the four screws holding both blades in place. Remove fixed blade assembly and movable blade assembly from tool.
2. Position new blades onto tool with beveled edges facing inward.
3. Install and tighten screws. Adjust flat oval cable stripper according to Paragraph 5.1.

CAUTION

Do NOT cycle hand tool without a die in place. Damage to the stripping blades may occur.

6. MAINTENANCE AND INSPECTION

Inspect the hand tool and die set immediately upon arrival at your facility and at regularly-scheduled intervals thereafter to ensure that they have not been damaged. When not in use, store with tool handles closed in a clean, dry area.

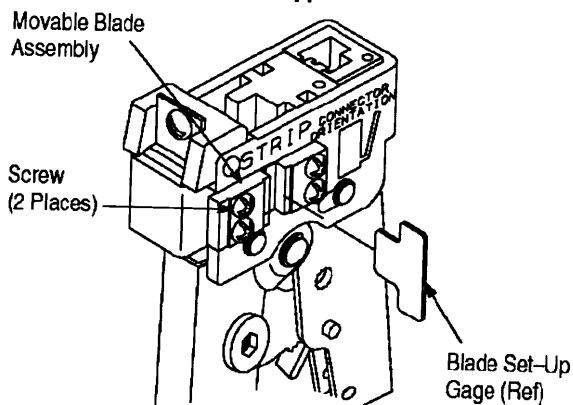
CAUTION

Failure to perform daily maintenance and periodic inspection can cause defective modular plug terminations, leading to discontinuities on individual wire circuits.

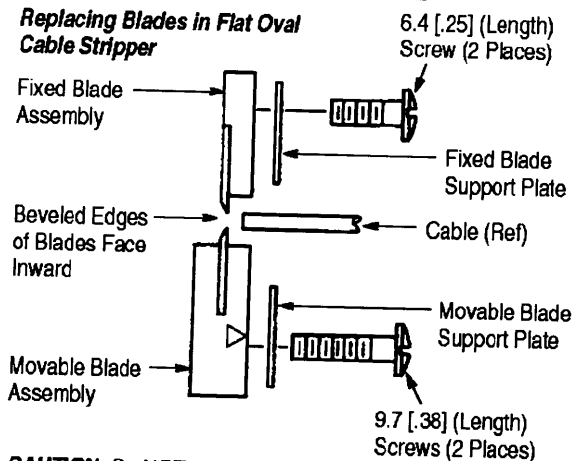
6.1. Daily Maintenance

At the dose of each shift, the responsible operator should clean foreign particles from the tool using a soft, clean, lint-free cloth or brush. Make sure all pins, rings and other retaining hardware is in place, and that the die set is undamaged. Lightly lubricate all pins, pivot points and bearing surfaces using a good grade SAE 20 motor oil. Do not lubricate excessively.

Adjusting Flat Oval Cable Stripper



Replacing Blades in Flat Oval Cable Stripper



CAUTION: Do NOT cycle hand tool without a die in place. Damage to the stripping blades may occur.

Figure 7

CAUTION

DO NOT lubricate surfaces of the die set that contact the product. These areas must be kept clean to ensure a usable modular plug cable assembly.

6.2. Periodic Inspection

It is recommended that the following inspections be conducted at least once a month by quality control personnel. More frequent inspections should be conducted if your work environment, company standards, or amount of tool use indicates the need.

A. Visual Inspection

Remove die set from the tool; then, remove all lubrication and accumulated film and debris by immersing the dies and tool head in a mild commercial degreaser.

1. Check for missing or defective pins, rings, or other retaining hardware. Replace parts as necessary.

2. Closely inspect dies for damage, giving special attention to bearing surfaces and surfaces that contact the product. Worn, cracked, pitted, or chipped indenter or nest surfaces, or other obvious wear or damage to the die set or tool head requires removal of the affected part from service.

B. Die Closure Inspection

The hand tool and die set is inspected for correct operation before shipment. To ensure uniform performance over the life of the tool, periodically inspect as follows:

1. Insert a properly stripped cable of appropriate type and size into a sample modular plug. Then insert the unterminated cable and plug into the die cavity.
2. Squeeze tool handles together slowly, while watching to ensure indenter bottoms against nest.
3. Release handles to open die set and remove terminated cable assembly.
4. Test for proper crimp height according to Section 4, Step 4. If plug crimp height is within acceptable limits, lightly lubricate the tool and die set, and place it back into service. If the crimp height is not within acceptable limits, return the tool (with die set) to Tyco Electronics for evaluation (refer to Section 7).

7. REPLACEMENT AND REPAIR

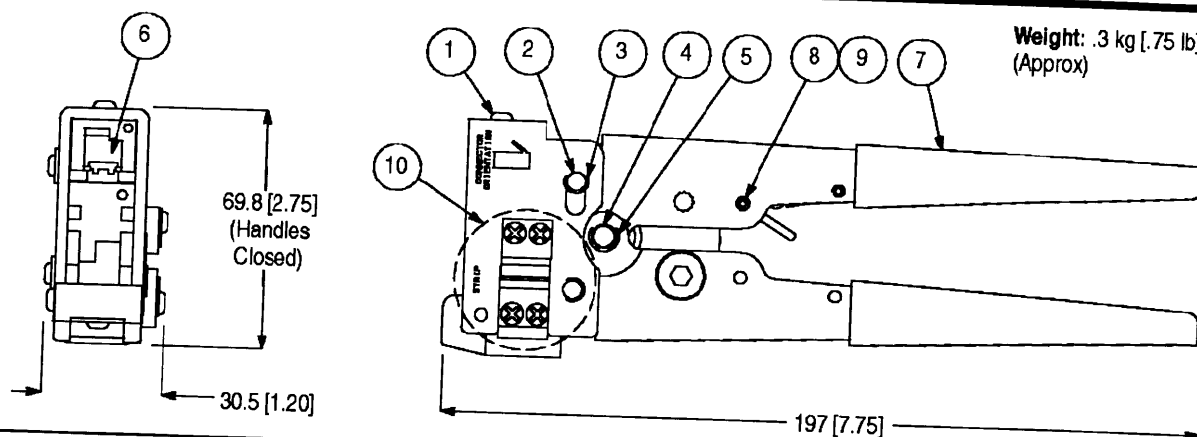
Customer-replaceable parts are provided in Figure 8. A complete inventory should be stocked and controlled to prevent lost time when replacement of parts is necessary. Order replacement parts through your representative, or call 1-800-526-5142, or send a facsimile of your purchase order to 717-986-7605 or write to:

CUSTOMER SERVICE (038-035)
TYCO ELECTRONICS CORPORATION
PO BOX 3608
HARRISBURG PA 17105-3608

8. REVISION SUMMARY

Revisions to this instruction sheet per EC: 0990-1519-00 include:

- Updated document to corporate requirements
- Added a new caution to Figures 1 and 7, and Paragraph 5.2.3



REPLACEMENT PARTS

ITEM	PART NUMBER	DESCRIPTION	QTY PER TOOL
1	993314-1	SCREW, Pan Head 4-40 x .250 L (Die Holding)	1
2	4-23619-8	PIN, Grooved	2
3	21045-3	RING, Crescent Retaining	4
4	2-23620-5	PIN, Center	1
5	21045-6	RING, Crescent Retaining	2
6	853400-[]▲	DIE SET	1
7	2-231652-0	TOOLING ASSEMBLY (Without Die Set)	1
8	21045-1	RING, Crescent Retaining	2
9	768522-1	PIN, Handle (Pawl)	2
10	231662-4	KIT, Blade Replacement (Consists of a blade set-up gage, 5 sets of strip blades, 5 cutoff blades, 2 support plates, and 5 pan head screws)	Not Included

▲ Refer to Figure 1 for specific die set suffix part numbers.

HAND TOOL KITS

PART NUMBER	DESCRIPTION
231666-9	Carrying Case, Screwdriver, Set of Strip Blades, Cutoff Blade, 2 Support Plates, and 4 Pan Head Screws
1-231666-0	Carrying Case, Screwdriver, Set of Strip Blades, Cutoff Blade, 2 Support Plates, 4 Pan Head Screws, Modular Plug Hand Tool, 4- and 6-Position Line Die Set, and 8-Position Die Set
1-231666-1	Carrying Case, Screwdriver, Set of Strip Blades, Cutoff Blade, 2 Support Plates, 4 Pan Head Screws, Modular Plug Hand Tool, 4- and 6-Position Line Die Set, 8-Position Die Set, and 4-Position Handset Die Set
1-231666-2	Carrying Case, Screwdriver, Set of Strip Blades, Cutoff Blade, 2 Support Plates, 4 Pan Head Screws, Modular Plug Hand Tool, 4- and 6-Position Line Die Set, 8-Position Die Set, and 6-Position Long Body Die Set
1-231666-3	Carrying Case, Screwdriver, Set of Strip Blades, Cutoff Blade, 2 Support Plates, 4 Pan Head Screws, Modular Plug Hand Tool, 4- and 6-Position Line Die Set, 8-Position Die Set, 6-Position Long Body Die Set, and 4-Position Handset Die Set
1-231666-4	Carrying Case, Screwdriver, Set of Strip Blades, Cutoff Blade, 2 Support Plates, 4 Pan Head Screws, Modular Plug Hand Tool, 4- and 6-Position Line Die Set, 8-Position Die Set, 6-Position Long Body Die Set, and 8-Position High-Performance Die Set

Figure 8