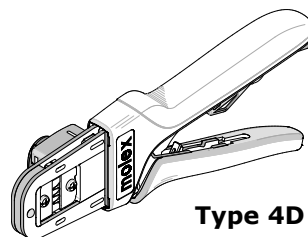


Order Number
223863-0900

molex®

Application Tooling Specification



Type 4D

FEATURES

- A full cycle ratcheting hand tool ensures complete crimps
- Ergonomic soft grip handles for comfortable crimping
- A precision terminal locator with wire stop holds terminals in the proper crimping position
- Dies and locator from this tool can be used in the Battery Powered Tool Order No. 63816-0270 (110 V) or 63816-0280 (220 V) with the use of the 63816-1920 Power Crimp Adapter
- Many tool kits can be used with a single Battery Powered Crimp Tool
- This tool is RoHS compliant; however, RoHS compliance is not required
- For 16-18 AWG Ultra-Fit terminals, use hand crimp tool 213309-6200

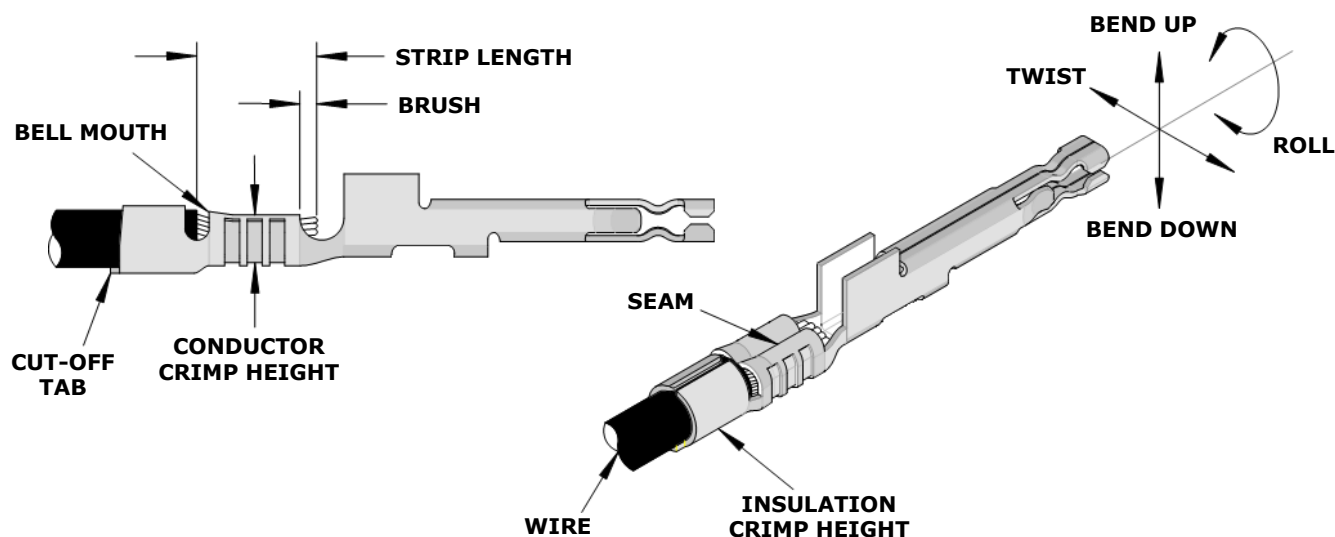
SCOPE

Products: Ultra-Fit Tang-less Crimp Terminals, Male and Female, 20 AWG and 22 AWG, (UL1061) Wires.

Terminal Series No.	Terminal Order No.		Wire Size		*Insulation Diameter UL1061 Wire is Recommended		Strip Length	
	Reel (1)		AWG	Type	mm	In.	mm	In.
172253	172253-6111	172253-6112	20-22	UL1061	1.22-1.50	.048-.059	3.50-4.00	.138-.158
	172253-7123							
216946	216946-5111	216946-5112	20-22	UL1061	1.22-1.50	.048-.059	3.50-4.00	.138-.158
	216946-5113							

(1) Customer to cut off terminal from reel: 0.20mm (.008") maximum cut-off tab.
* To achieve optimum IPC/WHMA-A-620 insulation crimps, use this insulation OD range.

DEFINITION OF TERMS



CONDITIONS

After crimping to the wire, the crimped terminal should measure as follows:

Terminal Series No.	Wire Size	Conductor Crimp			
		Height		Width	
		mm	In.	mm	In.
172253 and 216946	20	0.82-0.92	.032-.036	1.60-1.70	.063-.067
	22	0.73-0.83	.029-.033	1.60-1.70	.063-.067

Terminal Series No.	Wire Size	Insulation Crimp				Pull Force Minimum		Profile	
		Height (Ref.)		Width (Ref.)				20	22
	AWG	mm	In.	mm	In.	N	Lb.		
172253 and 216946	20	1.70-1.80	.067-.071	1.70-1.95	.067-.077	57.9	13.0	X	
	22	1.55-1.65	.061-.065	1.70-1.80	.067-.071	35.6	8.0		X

Crimp attribute specifications are as follows:

Terminal Series No.	Wire Size	Bell Mouth		Brush		Bend Up	Bend Down	Twist	Roll
	AWG	mm	In.	mm	In.				
172253 and 216946	20	0.30-0.70	.012-.028	0.00-1.00	.00-.039	3°	3°	3°	5°
	22								

Tool Qualification Notes

1. (Ref) means that the dimension provided is approximate because of the wide range of wires, conductor stranding, insulation diameter and insulation hardness.
2. An occasional conductor crimp height measurement should be performed. It must lie between the minimum and maximum crimp height specification.
3. Pull force should be measured with no influence from the insulation crimp. To ensure this, strip the wire long enough so the terminal insulation grips do not contact the wire insulation.

Notes

1. To prevent crimped terminals from sticking in the crimp tooling and to maximize crimp tooling life, crimping punches should be lightly lubricated with a stamping fluid (such as Ashburn 7530 Vanishing Oil QD) before using this tool and every 50 crimps thereafter.
2. This tool should only be used for the terminals and wire gauges specified on this sheet.
3. Variations in tools, terminals, wire stranding and insulation types may affect crimp height.
4. This tool is intended for AWG conductor sizes. It may not give good insulation crimp support for insulation sizes outside of the specified range.
5. Molex does not repair hand tools. See warranty on page 6. The replacement parts listed are the only parts available for repair. If the handles or crimp tooling become damaged or worn, a new tool must be purchased.
6. Conductor crimp height should be used as the final criterion for an acceptable crimp. Refer to Molex Quality Crimping Handbook 63800-0029 for additional information on crimping and crimp testing.
7. Molex does not certify hand crimp tools.

OPERATION

CAUTION: Crimp only the Molex terminals listed in the scope for this tool. Do not crimp hardened objects because damage can occur to the tool frame or crimp dies.

Open the tool by squeezing the handles together. At the end of the closing stroke, the ratchet mechanism will release and the handle will spring open. See Figure 1.

Crimping Terminals

1. Select the desired terminal from the Scope table.
2. Load the terminal into the proper nest opening in the locator based on the wire gauge markings on the hand tool. See Figure 2.

Note: The terminal locator is stationary and does not “push thru” the tooling like other Type 4D tools.

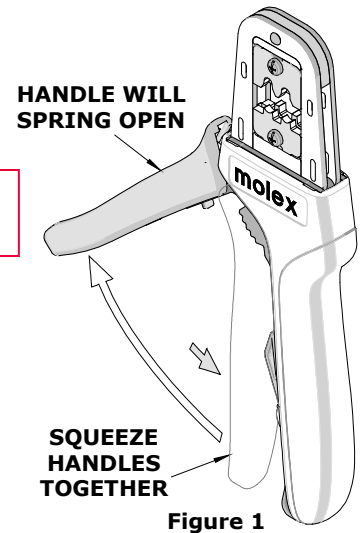


Figure 1

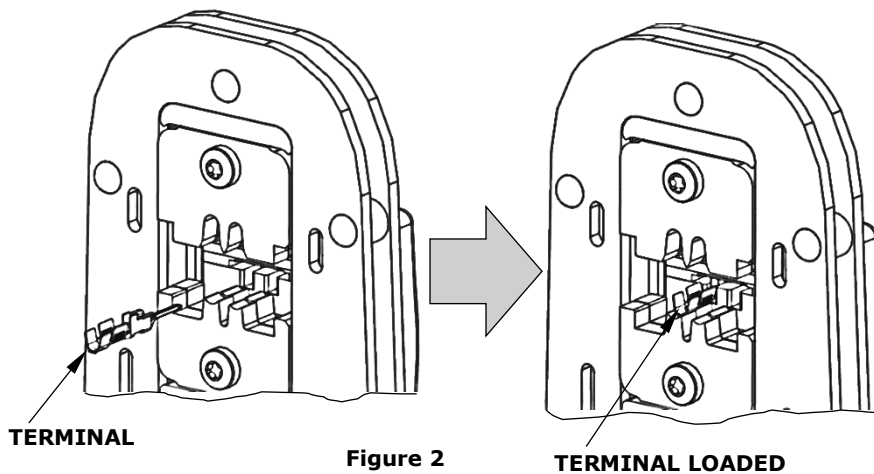


Figure 2

TERMINAL LOADED

3. Close the tool handle until the first ratchet position engages. See Figure 3.
4. Insert the properly stripped wire through the punches and against the wire stop. See Figure 4.
5. Crimp the terminal by squeezing the tool handles until the ratchet mechanism cycle has been completed. Release the handles to open the jaws.

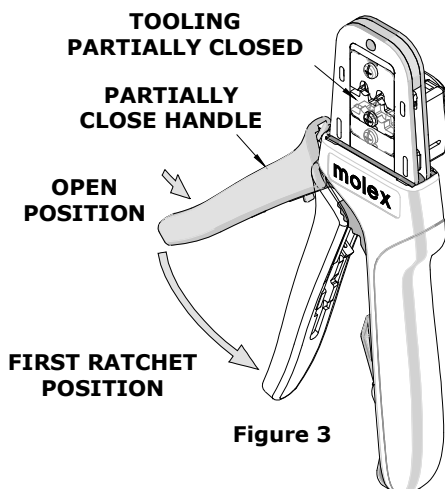


Figure 3

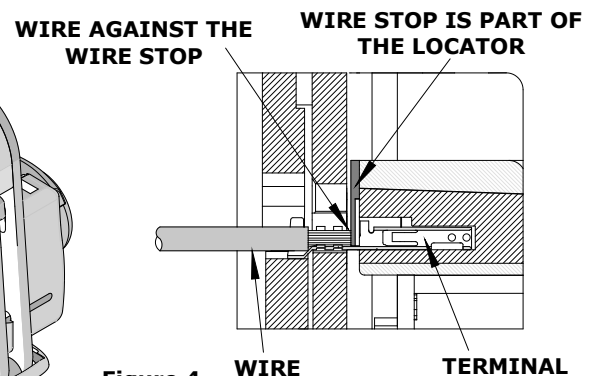
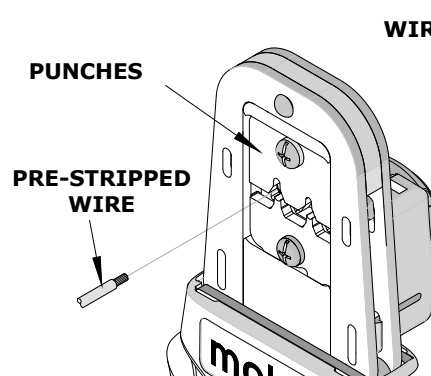


Figure 4

Note: The tamper-proof ratchet action will not release the tool until it has been fully closed.

6. Remove the crimped terminal from the terminal locator by pulling on the wire.
7. Visually inspect the crimped terminal for proper crimp location.
8. On some wires, it may not be possible to insert the wire with the tool partially closed. Those wires should be inserted with the hand tool in the open position. Insert the wire above the terminal and against the wire stop, then close the tool. See Figure 5.

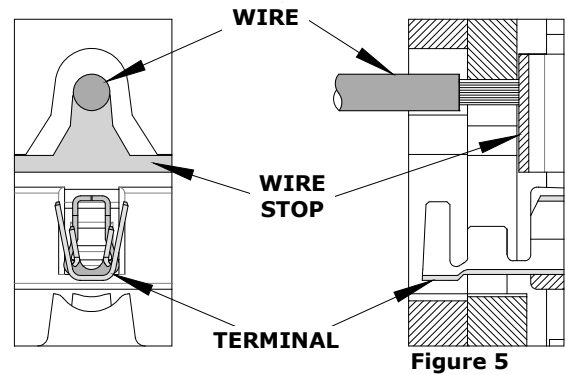


Figure 5

Right- or Left-Handed Operation

This hand tool can be converted from right-handed operation to left-handed operation. It is necessary to reverse the terminal locator along with the tooling. Follow the steps below:

1. The terminal locator must be removed before reversing the tooling.
2. Close the tool halfway and remove the M3 hex nut holding the terminal locator. See Figure 6.
3. Squeeze the sides of the locator frame and pivot the locator away from the tool. See Figure 7. Set the locator aside.
4. Close the tool fully and let it spring open. Remove the M3 screws holding the upper and lower tooling. See Figure 8.

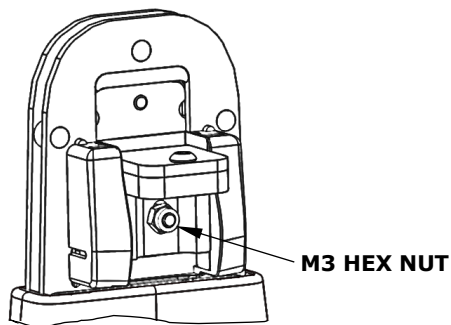


Figure 6

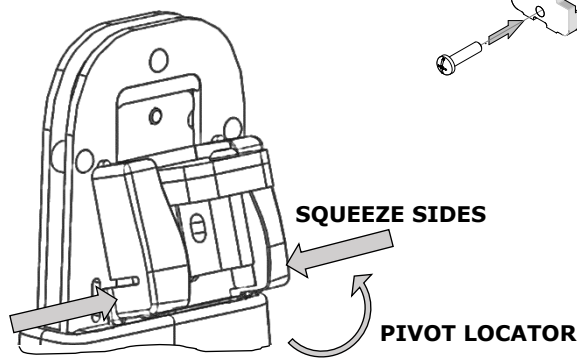


Figure 7

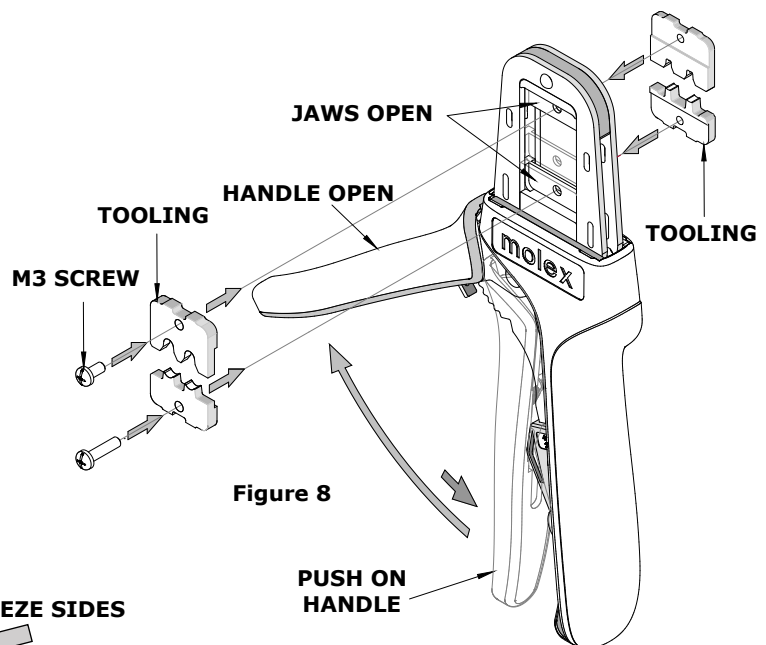
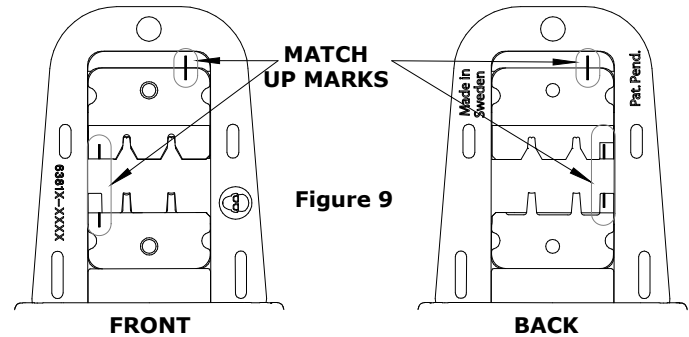


Figure 8

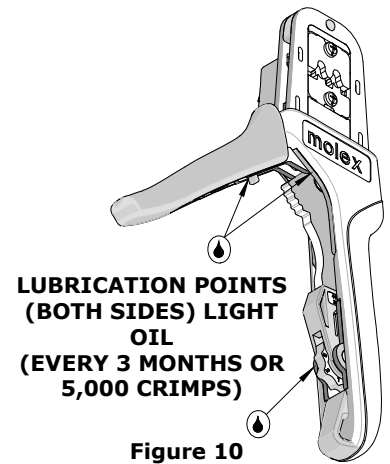
- Reverse the upper tooling to the opposite side of the tool and replace the M3 screw. Make sure the small markings on the front and back of the hand tool frame match up and are on the outside of the hand tool frame. See Figure 9.
- Repeat the process with the lower tooling, close the tool, and tighten the M3 screws. Be sure the small markings line up.
- Reinstall the terminal locator and the M3 hex nut.



MAINTENANCE

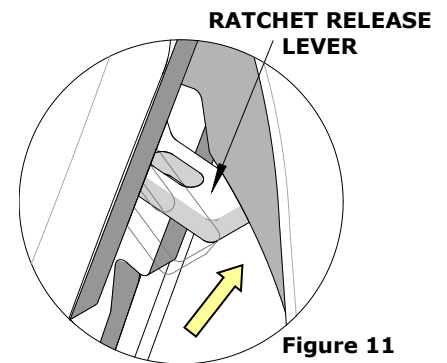
It is recommended that each operator of the tool be made aware of and responsible for the following maintenance steps:

- Remove dust, moisture and other contaminants with a clean brush or a soft, lint-free cloth.
- Do not use any abrasive materials that could damage the tool.
- Make certain all pins, pivot points and bearing surfaces are protected with a thin coat of high-quality machine oil. Do not oil excessively. The tool was engineered for durability, but like any other equipment, it needs cleaning and lubrication for a maximum service life of trouble-free crimping. Light oil (such as 30W automotive oil) used at the oil points every 5,000 crimps or 3 months will significantly enhance the tool life. See Figure 10.
- Wipe excess oil from hand tool, particularly from crimping area. Oil transferred from the crimping area onto certain terminations may affect the electrical characteristics of an application.
- When the tool is not in use, keep the handles closed to prevent objects from becoming lodged in the crimping dies, and store the tool in a clean, dry area.



Miscrimps or Jams

Should this tool ever become stuck or jammed in a partially closed position, **do not force the handles open or closed**. The tool will open easily by pressing up on the ratchet release lever in the movable handle. See Figure 11.



How to Adjust Tool Preload (See Figure 12)

Hand tool frame preload is factory preset to ensure crimp quality. It may be necessary over the life of the tool to adjust tool handle preload force. Listed below are the steps required to adjust the crimping force of the hand tool to obtain proper crimp conditions:

1. Open the hand tool.
2. Close the handle 2 ratchet clicks.
3. Hold the hand tool in the palm of your hand as shown in Figure 12. Using your index finger, squeeze the link toward the top of the hand tool frame. This will release the preload adjustment wheel.
4. Rotate the setting wheel counterclockwise (CCW) to increase handle force. The numbers will display higher. To decrease handle force, rotate the setting wheel clockwise (CW).
5. Release the link to lock the setting wheel in place.
6. Check the crimp specifications or conduct a pull test after tool handle preload force is adjusted.

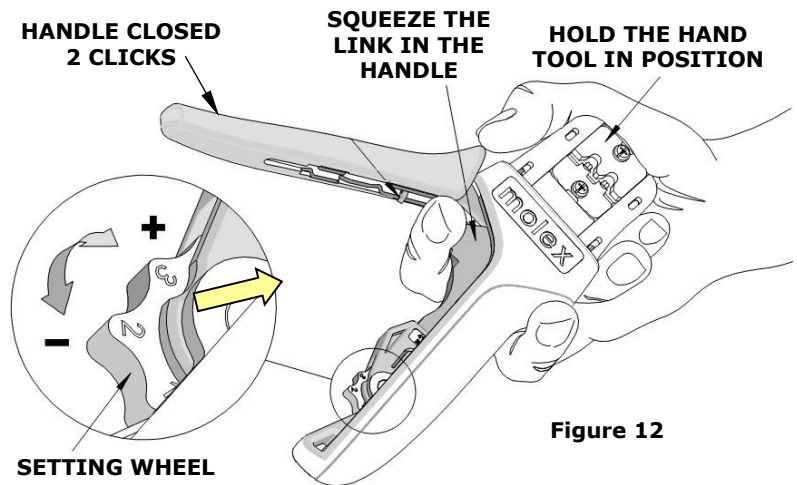


Figure 12

WARRANTY

This tool is for electrical terminal crimping purposes only. This tool is made of the best quality materials. All vital components are long-life tested. All tools are warranted to be free of manufacturing defects for a period of 30 days. Should such a defect occur, Molex will repair or exchange the tool free of charge. This repair or exchange will not be applicable to altered, misused, or damaged tools. This tool is designed for hand use only. Any clamping, fixturing or use of handle extensions voids this warranty.

CAUTION: Molex crimp specifications are valid only when used with Molex terminals and tooling.

CAUTIONS:

1. Manually powered hand tools are intended for low-volume use or field repair. This tool is **NOT** intended for production use. Repetitive use of this tool should be avoided.
2. Insulated rubber handles are not protection against electrical shock.
3. Wear eye protection at all times.
4. Use only the Molex terminals specified for crimping with this tool.

Certification

Molex does not certify or re-certify hand tools but rather supplies the following guidelines for customers to re-certify hand tools:

- This tool is qualified to pull force only. See the Molex website for the Quality Crimp Handbook for more information on pull testing.
- If the tool does not meet minimum pull force values, handle preload should be increased and the pull test rerun. (See How to Adjust Preload).
- When the hand tool is no longer capable of achieving minimum pull force, it should be taken out of service and replaced.

PARTS LIST

Item Number	Order Number	Description	Quantity
REF	223863-0900	Hand Crimp Tool	Figure 13
1	63810-0104	Spring, Return	1
2	63810-0105	Spring, Ratchet	1

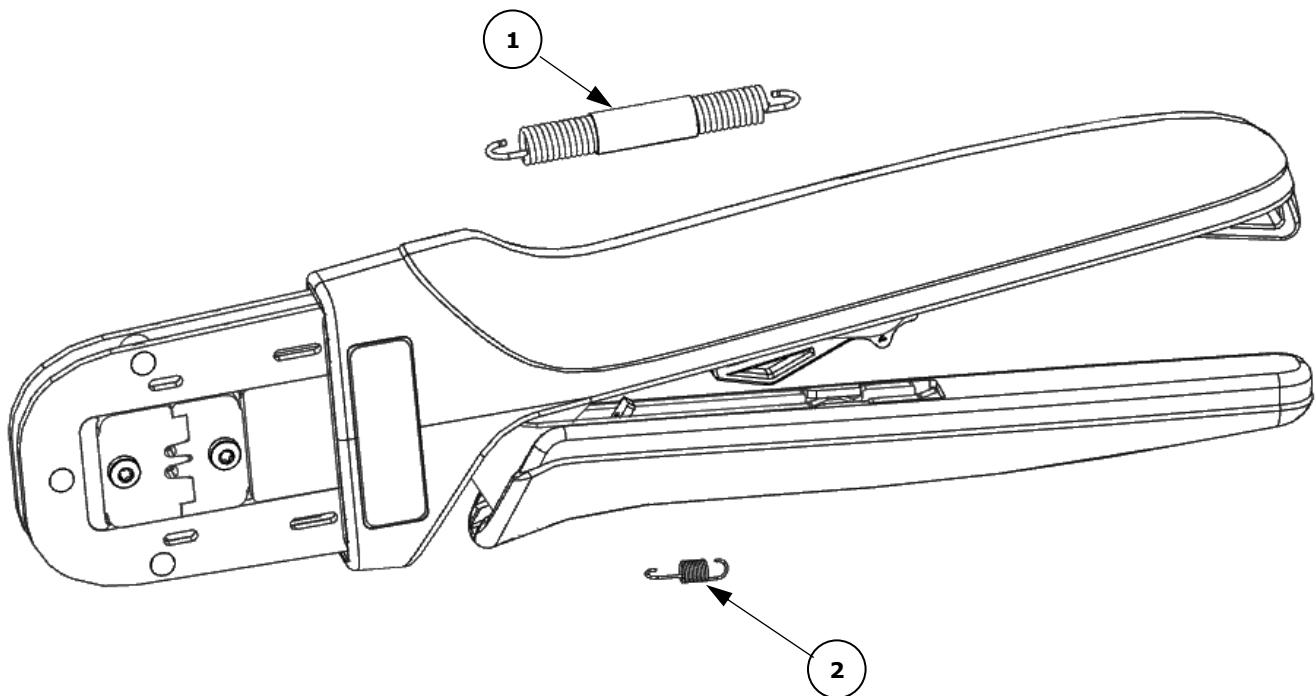


Figure 13

Application Tooling Support

Phone: (402) 458-TOOL (8665)

E-Mail: toolingsupport@molex.com

Website: www.molex.com/applicationtooling

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