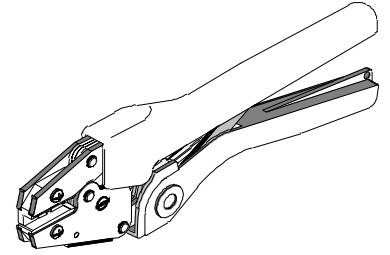




**Hand Crimp Tool Operating Instruction
And Specifications Sheet
Order No. 64001-0900
Eng. No. RHT 7050
(Replaces 19285-0053)**



FEATURES

- A full cycle ratcheting hand tool ensures complete crimps
- Long handles for comfortable crimping with reduced crimping force
- A precision user-friendly terminal locator wire stop holds terminals in the proper crimping position

SCOPE

Nylon closed end connectors 12–22 AWG

Testing

Mechanical

The tensile test, or pull test, is a means of evaluating the mechanical properties of the crimped connections. The following charts show the UL specifications for various wire sizes. The tensile strength is shown in pounds and indicates the minimum acceptable force to break or separate terminal from the conductor.

Wire Size (AWG)	UL – 486 C
22	8
20	10
18	10
16	15
14	25
12	35

* UL – 486 C – Closed end connectors and Wire Nuts.

The following is a partial list of the product part numbers and their specifications that this tool is designed to run. We will be adding to this list and an up to date copy is available on www.molex.com

Terminal No.	Terminal Eng No. (REF)	Wire Size		Wire Combinations
		AWG	mm ²	
19160-0009	NC-2212	12 - 22	(3.30-0.35)	See Chart 1
19160-0010	NC-2212-L	12 - 22	(3.30-0.35)	See Chart 1
19160-0011	NC-2212-BA	12 - 22	(3.30-0.35)	See Chart 1

OPERATION

Wire Preparation

Pre-twisted wire not required for OEM applications. For Solid Wire strip leads to 3/8 of an inch. Insert into connector and crimp (OEM only).

For stranded wire strip leads to approximately 3/4 of an inch. Twist the wire combination even and tight. Trim stripped pre-twisted area to 3/8 of an inch and insert into connector and crimp. For more information follow the Quality Crimping Handbook.

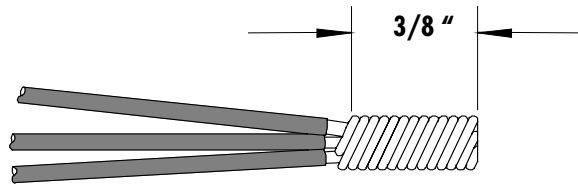


CHART 1

Wire Combinations for Nylon- Insulated Closed End Connectors Part No. 191600009 (NC-2212)						
Wire Type	Wire Gauge (AWG)					Rating
	14	16	18	20	22	
Stranded or Solid	1	1				UL & CSA
Stranded or Solid	1		1			UL & CSA
Stranded or Solid	1		2			UL & CSA
Stranded or Solid	1		1	1		UL & CSA
Stranded or Solid	1		1	2		UL & CSA
Stranded or Solid	1		1		1	UL & CSA
Stranded or Solid	1		1		2	UL & CSA
Stranded or Solid	1		1		3	UL & CSA
Stranded or Solid	1			1		UL & CSA
Stranded or Solid	1			2		UL & CSA
Stranded or Solid	1			3		UL & CSA
Stranded or Solid	1				1	UL & CSA
Stranded or Solid	1				2	CSA
Stranded or Solid	1				3	CSA
Stranded or Solid	1				4	CSA
Stranded or Solid	1		1	1	1	CSA
Stranded or Solid		3				UL & CSA
Stranded or Solid		2				UL & CSA
Stranded or Solid		2	1			UL & CSA
Stranded only		2	2			UL & CSA
Stranded or Solid		2		1		UL & CSA
Stranded or Solid		2		2		UL & CSA
Stranded or Solid		2			1	UL & CSA
Stranded or Solid		2			2	UL & CSA
Stranded or Solid		2			3	UL & CSA
Stranded or Solid		2	1	1		UL & CSA
Stranded or Solid		2	1		1	UL & CSA
Stranded or Solid		2		1	1	UL & CSA
Stranded or Solid		1		1	2	UL & CSA
Stranded or Solid		1	1			UL & CSA
Stranded or Solid		1	1			UL & CSA
Stranded or Solid		1	2			UL & CSA
Stranded or Solid		1	3			UL & CSA

Wire Combinations for Nylon- Insulated Closed End Connectors Part No. 191600009 (NC-2212)						
Wire Type	Wire Gauge (AWG)					Rating
	14	16	18	20	22	
Stranded or Solid		1		1		UL & CSA
Stranded or Solid		1		2		UL & CSA
Stranded or Solid		1		3		UL & CSA
Stranded or Solid		1		4		UL & CSA
Stranded or Solid		1			1	UL & CSA
Stranded or Solid		1			2	UL & CSA
Stranded or Solid		1			3	UL & CSA
Stranded or Solid		1			4	UL & CSA
Stranded or Solid		1			5	UL & CSA
Stranded or Solid		1	2	1		UL & CSA
Stranded or Solid		1	2		1	UL & CSA
Stranded or Solid		1	2		2	UL & CSA
Stranded or Solid			1	1	1	UL & CSA
Stranded or Solid			1	2	1	UL & CSA
Stranded or Solid			1	1	2	UL & CSA
Stranded Only			5			UL only
Stranded or Solid			4			UL & CSA
Stranded or Solid			4	1		UL & CSA
Stranded or Solid			4		1	UL & CSA
Stranded or Solid			3			UL & CSA
Stranded or Solid			3	1		UL & CSA
Stranded or Solid			3	2		UL & CSA
Stranded or Solid			3		1	UL & CSA
Stranded or Solid			3		2	UL & CSA
Stranded or Solid			3		3	UL & CSA
Stranded or Solid			3	1	1	UL & CSA
Stranded or Solid			2			UL & CSA
Stranded or Solid			2	1		UL & CSA
Stranded or Solid			2	2		UL & CSA
Stranded or Solid			2	3		UL & CSA
Stranded or Solid			2		1	UL & CSA
Stranded or Solid			2		2	UL & CSA
Stranded or Solid			2		3	UL & CSA
Stranded or Solid			2	1	1	UL & CSA
Stranded or Solid			2	2	1	UL & CSA
Stranded or Solid			2	3	1	UL & CSA
Stranded or Solid			2	1	2	UL & CSA
Stranded or Solid			2	1	3	UL & CSA
Stranded or Solid			1	1		UL & CSA
Stranded or Solid			1	2		UL & CSA
Stranded or Solid			1	3		UL & CSA
Stranded or Solid			1	4		UL & CSA
Stranded or Solid			1	5		UL & CSA
Stranded or Solid			1		1	UL & CSA
Stranded or Solid			1		2	UL & CSA
Stranded or Solid			1		3	UL & CSA
Stranded or Solid			1		4	UL & CSA
Stranded or Solid			1		5	UL & CSA
Stranded or Solid			1	1	1	UL & CSA
Stranded or Solid			1	2	1	UL & CSA
Stranded or Solid			1	3	1	UL & CSA
Stranded or Solid			1	4	1	UL & CSA
Stranded or Solid			1	1	2	UL & CSA
Stranded or Solid			1	1	3	UL & CSA
Stranded or Solid			1	1	4	UL & CSA
Stranded or Solid			1	2	2	UL & CSA
Stranded or Solid			1	2	3	UL & CSA
Stranded or Solid			1	3	2	UL & CSA
Stranded or Solid				6		UL & CSA
Stranded or Solid				5		UL & CSA

Wire Combinations for Nylon- Insulated Closed End Connectors Part No. 191600009 (NC-2212)						
Wire Type	Wire Gauge (AWG)					Rating
	14	16	18	20	22	
Stranded or Solid				5	1	UL & CSA
Stranded or Solid				4		UL & CSA
Stranded or Solid				4	1	UL & CSA
Stranded or Solid				4	2	UL & CSA
Stranded or Solid				3		UL & CSA
Stranded or Solid				3	1	UL & CSA
Stranded or Solid				3	2	UL & CSA
Stranded or Solid				3	3	UL & CSA
Stranded or Solid				2		UL & CSA
Stranded or Solid				2	1	UL & CSA
Stranded or Solid				2	2	UL & CSA
Stranded or Solid				2	3	UL & CSA

Wire Combinations for Nylon- Insulated Closed End Connectors Part No. 191600009 (NC-2212)						
Wire Type	Wire Gauge (AWG)					Rating
	14	16	18	20	22	
Stranded or Solid				2	4	UL & CSA
Stranded or Solid				1	1	UL & CSA
Stranded or Solid				1	2	UL & CSA
Stranded or Solid				1	3	UL & CSA
Stranded or Solid				1	4	UL & CSA
Stranded or Solid				1	5	UL & CSA
Stranded or Solid					6	UL & CSA
Stranded or Solid					5	UL & CSA
Stranded or Solid					4	UL & CSA
Stranded or Solid					3	UL & CSA
Stranded or Solid					2	UL & CSA

Crimping Terminals

Open the tool by first closing the jaws sufficiently for the ratchet mechanism to release.

1. Hold hand tool with the locator facing up. Insert the closed end connector in the correct slot (12-22). Make sure that the shoulder of the connector is resting on the locator plate (See Figure 1).
2. Close the hand tool jaws until the connector is held snug in place. Load the connector with the desired wire combination (See Figure 2 and 3). Complete the crimp by closing the hand tool handles until they release.

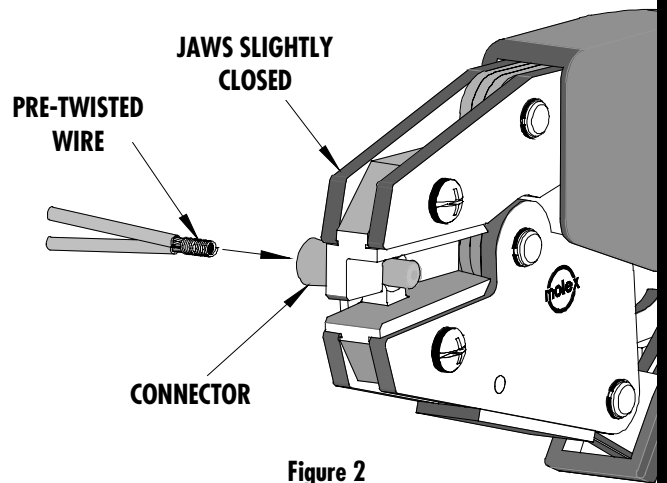


Figure 2

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

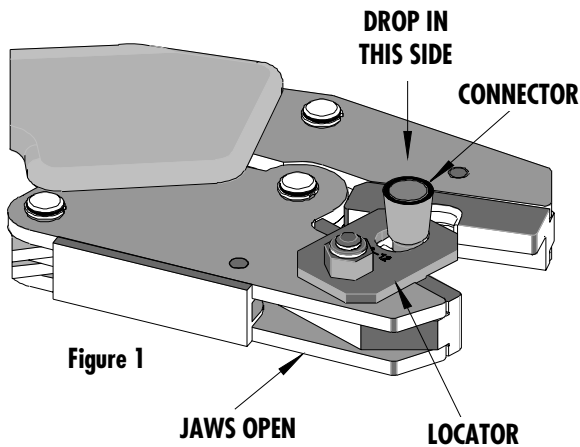


Figure 1

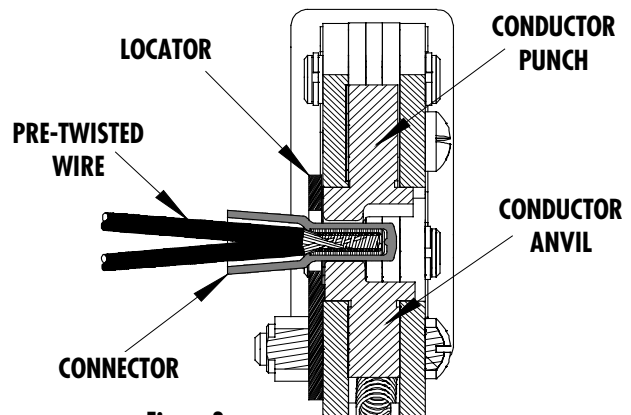


Figure 3

3. Remove the crimp and inspect for proper crimp location, and check for insulation closure. Molex offers a Crimp Inspection Handbook for closed barrel industrial product. See our website or contact your sales engineer.

Note: Whenever crimping without the locator, make sure the seam of the terminal is oriented up or down in the tool if using unbrazed product, as this will provide higher pull force values.

Maintenance

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

1. Remove dust, moisture and other contaminants with a clean brush, or soft, lint-free cloth.
2. Do not use any abrasive materials that could damage the tool.
3. 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 64001-0900 (RHT-7050) was engineered for durability, but like any fine piece of equipment it needs cleaning and lubrication for a maximum service life of trouble-free crimping. A light oil, such as 30 weight automotive oil used at the oil points shown in Figure 4, every 5,000 crimps or 3 months will significantly enhance the tool life and ensure a stable calibration.
4. When 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.

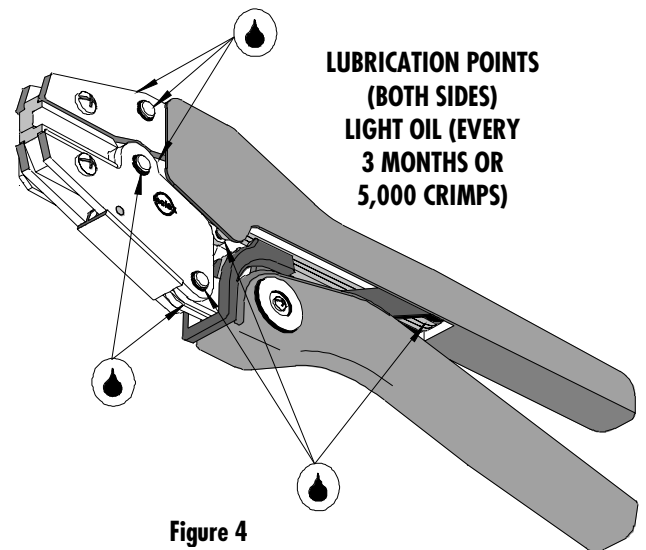


Figure 4

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 the ratchet release lever (See Figure 5).

How To Adjust Tool Preload (See Figure 5)

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. Remove the screw and plastic cover washer. Note the setting wheel position.
2. Lift the setting wheel off the axle. Turn the eccentric axle with a screwdriver.
3. Turning the eccentric axle counter-clockwise (CCW) will increase handle force.
4. Replace the setting wheel to the axle, aligning the nearest notch in the setting wheel to the dowel pin.
5. Replace the plastic cover washer and screw.
6. Check the crimp specifications after tool handle preload force is adjusted.

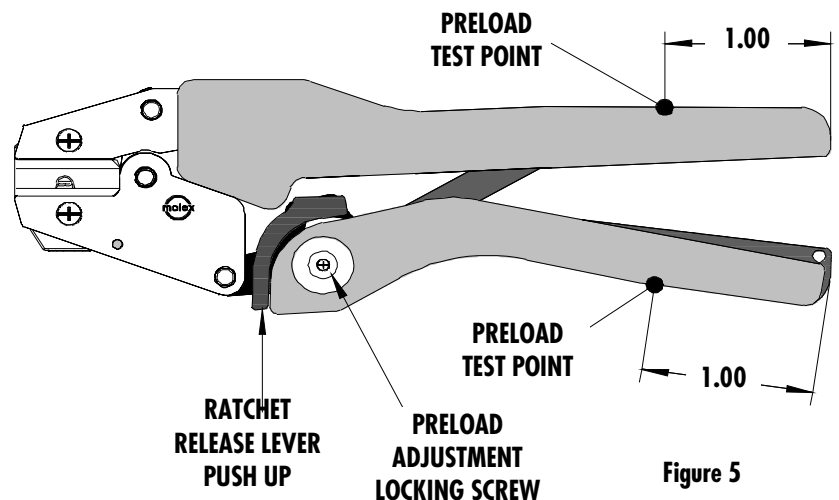
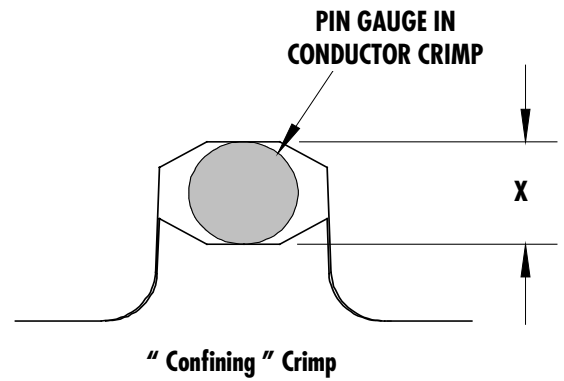


Figure 5

Tool Calibration

A Certificate of Calibration (see last page) was supplied with the tool. To recalibrate this tool, pin gauge measurements should be taken in each conductor nest and compared to this chart. The tool should be lubricated prior to recalibration to ensure consistent measurements. Handle preload is factory set to 25-45 LBS. See How to Adjust Tool Preload (See Figure 5) to recalibrate.



Wire Range		"X" Dimension Conductor Crimp		
Awg	mm ²	Mean	Go	No Go
12 - 22	0.35 – 3.30	.102	.099	.106

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, we 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.

Hand held crimping tools are intended for low volume, prototyping, or repair requirements only.

Caution: Repetitive use of this tool should be avoided.

PARTS LIST

Item	Order No	Description	Quantity
	64001-0900	Hand Crimp Tool	(Fig. 6)
1	64000-0076	Repair Kit (Springs, Pins and E-Rings)	1
2	63810-0000	Handle	1
3	64001-0975	Locator Assembly	1
4	64001-0970	Tooling Kit	1
Tooling Kit Only			
5	64001-0901	Conductor Punch	1
6	64001-0902	Conductor Anvil	1

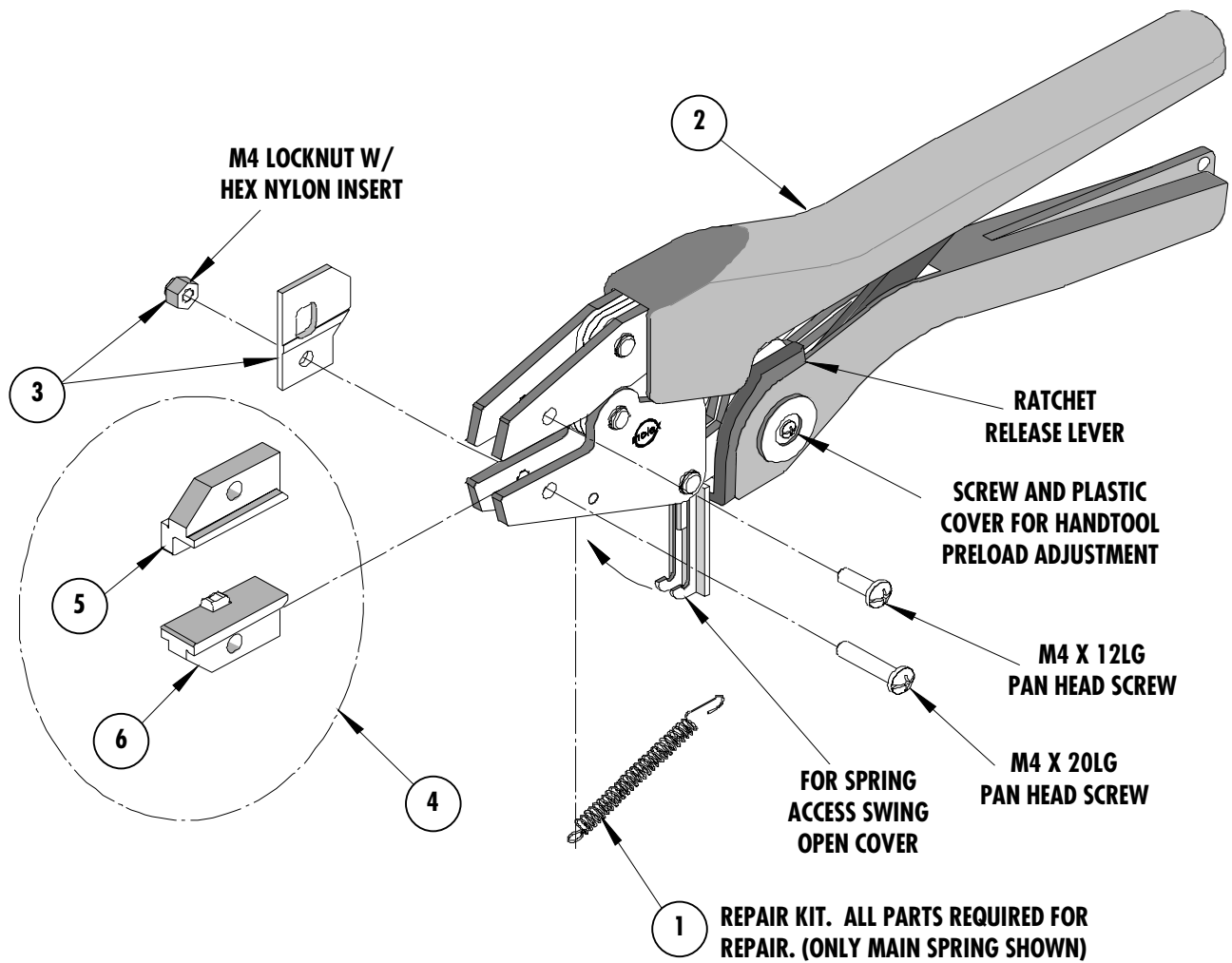
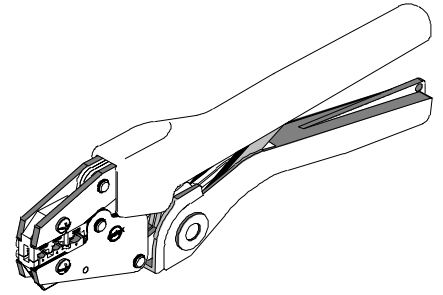


Figure 6



Certificate of Calibration

Tool Order Number _____

Tool Eng. Number _____

Tool Revision _____

Serial Number _____

Date of Manufacture _____

Handle Load Range at 1 inch from the Tips = _____

Actual = _____

Pin Gage of Conductor Nest/Nests or Slug height if the nest is the "F" Crimp style.

Range Conductor Nest # 1 = _____ Actual = _____

Range Conductor Nest # 2 = _____ Actual = _____

Range Conductor Nest # 3 = _____ Actual = _____

Technician _____

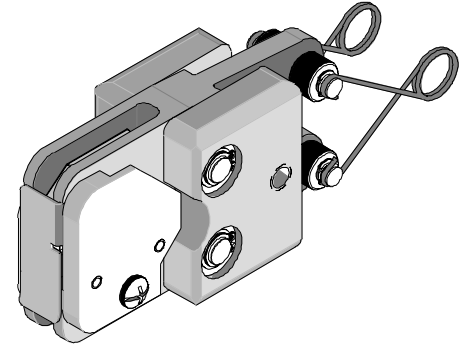
Date of Calibration _____

Calibration should be done every 5,000 cycles or 3 months.
Tools should be lubricated during this operation.

Molex Application Tooling Group
1150 E. Diehl Road
Naperville, IL 60563
Tel: (630) 969-4550
Fax: (630) 505-0049



**Air Powered Crimp Tool Head
Operating Instruction Sheet
And Specifications
Part No. 64005-0600
Eng. No. AT 7000
(Replaces 19283-0046)**



FEATURES

- Quick-change tool head for the 19279-0001 (AT-200)
- Tooling kit is interchangeable with other kits in the 64001 and 64003 Series
- A precision user-friendly terminal locator holds terminals in the proper crimping position for each of the nests
- 2-nested tool eliminates the need for additional tools

SCOPE

Nylon closed end connectors 10 - 22 AWG (2 nests 14 - 22 and 10 - 16). This tool head is intended for use in the 19279-0001 (AT-200) either hand held or with optional bench adapter 19078-0307 (ATBA) and foot switch.

Testing

Mechanical

The tensile test, or pull test, is a means of evaluating the mechanical properties of the crimped connections. The following charts show the UL specifications for various wire sizes. The tensile strength is shown in pounds and indicates the minimum acceptable force to break or separate terminal from the conductor.

Wire Size (AWG)	*UL - 486 C
22	8
20	10
18	10
16	15
14	25
12	35
10	40

* UL - 486 C - Closed end connectors and Wire Nuts.

The following is a partial list of the product part numbers and their specifications that this tool is designed to run. We will be adding to this list and an up to date copy is available on www.molex.com

Terminal No.	Terminal Eng No. (REF)	Wire Size		Wire Combinations
		AWG	mm ²	
19160-0002	NC-1610	10 - 16	(5.00-1.30)	See Chart 1
19160-0003	NC-1610-BA	10 - 16	(5.00-1.30)	See Chart 1
19160-0004	NC-1610-L	10 - 16	(5.00-1.30)	See Chart 1
19160-0006	NC-1610-Y	10 - 16	(5.00-1.30)	See Chart 1
19160-0030	NC-S1610	10 - 16	(5.00-1.30)	See Chart 1
19160-0012	NC-2214	14 - 22	(2.00-0.35)	See Chart 2
19160-0013	NC-2214-BA	14 - 22	(2.00-0.35)	See Chart 2
19160-0015	NC-2214-L	14 - 22	(2.00-0.35)	See Chart 2
19160-0016	NC-2214-R	14 - 22	(2.00-0.35)	See Chart 2

OPERATION

Refer to the instruction manual for the 19279-0001 (AT200) for mounting this crimp tool head.

Wire Preparation

Pre-twisted wire not required for OEM applications. For Solid Wire strip leads to 3/8 of an inch. Insert into connector and crimp (OEM only).

For stranded wire strip leads to approximately 3/4 of an inch. Twist the wire combination even and tight. Trim stripped pre-twisted area to 3/8 of an inch and insert into connector and crimp. For more information follow the Quality Crimping Handbook.

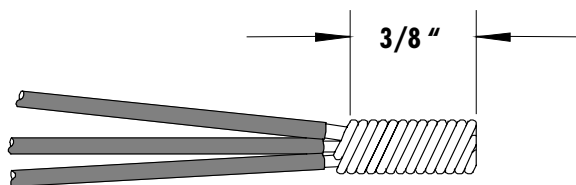


CHART 1

Wire Type	Wire Gauge (AWG)						Rating
	12	14	16	17	18	20	
Stranded or Solid	1		1				UL & CSA
Stranded or Solid	1				1		UL & CSA
Stranded or Solid	1				2		UL & CSA
Stranded or Solid		2					UL & CSA
Stranded or Solid		1	2				UL & CSA
Stranded or Solid		1	1				UL & CSA
Stranded or Solid		1	1		1		UL & CSA
Stranded or Solid		1			3		UL & CSA
Stranded or Solid		1			2		UL & CSA
Stranded or Solid		1			1		UL & CSA
Stranded or Solid			3		1		UL & CSA
Stranded or Solid			3				UL & CSA
Stranded or Solid			2		3		UL & CSA
Stranded or Solid			2		2		UL & CSA
Stranded or Solid			2		1		UL & CSA
Stranded or Solid			2				UL & CSA
Stranded or Solid			1		4		UL & CSA
Stranded or Solid			1		3		UL & CSA
Stranded or Solid			1		2		UL & CSA
Stranded or Solid					1		UL & CSA
Stranded or Solid					6		UL & CSA

Crimping Terminals

1. Hold Air Head crimp tool with the locator facing up. Insert the closed end connector in the correct slot (14 - 22 or 10 - 16). Make sure that the shoulder of the connector is resting on the locator plate (See Figure 1).
2. Place pre-twisted wire into closed-end connector. Then press lever on air tool (See Figure 2 and 3). Release after jaws have closed.

Wire Type	Wire Gauge (AWG)						Rating
	12	14	16	17	18	20	
Stranded or Solid					5		UL & CSA
Stranded or Solid					4		UL & CSA
Stranded or Solid					3		UL & CSA
Stranded only				2	1		UL
Stranded only				3	2		UL
Solid only	1		3				CSA

CHART 2

Wire Type	Wire Gauge (AWG)					Rating
	14	16	18	20	22	
Stranded only		1	1			UL only
Stranded only		1	1	1	1	UL only
Stranded only		1		2		UL only
Stranded only		1		1		UL only
Stranded only		1			3	UL only
Stranded only		1			2	UL only
Stranded only		1			1	UL only
Stranded only			3			UL only
Stranded only			2	1		UL only
Stranded only			2		2	UL only
Stranded only			2		1	UL only
Stranded only			1	3		UL only
Stranded only			1	2		UL only
Stranded only			1	2	1	UL only
Stranded only			1	1	3	UL only
Stranded only			1	1	2	UL only
Stranded only			2			UL only
Stranded only			1	1	1	UL only
Stranded only			1		5	UL only
Stranded only			1		4	UL only
Stranded only			1		3	UL only
Stranded only				4	1	UL only
Stranded only				4		UL only
Stranded only				3	2	UL only
Stranded only				3	1	UL only
Stranded only				2	4	UL only
Stranded only				2	3	UL only
Stranded only				2	2	UL only
Stranded only				1	6	UL only
Stranded only				1	5	UL only
Stranded only				1	4	UL only
Stranded only					7	UL only
Stranded only					6	UL only
Solid only			3			UL only
Solid only			2			UL only
Stranded only					7	CSA only
Stranded only				2	4	CSA only
Stranded only		1		2		CSA only
Stranded only			2	1		CSA only
Copper Stranded only			3			CSA only

Caution: Never operate this tool without the supplied safety shield in place. Never place fingers in the tool nests.

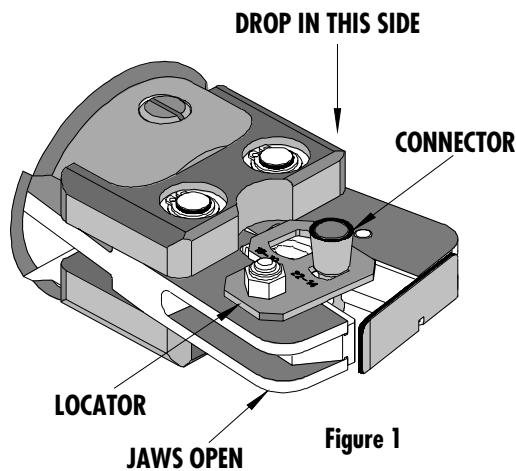


Figure 1

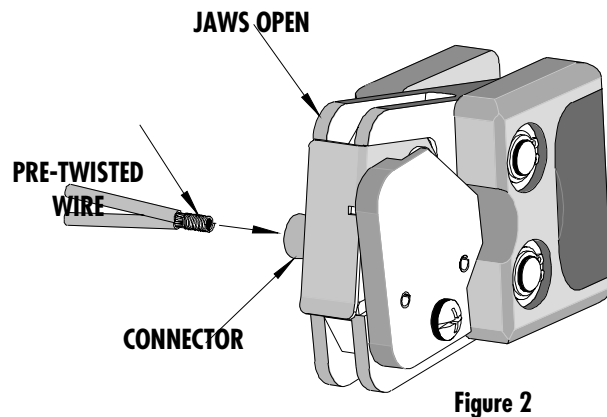


Figure 2

3. Remove the crimp and inspect for proper crimp location, and check for insulation closure. Molex offers a Crimp Inspection Handbook for closed barrel industrial product. See our website or contact you sales engineer.

Note: Whenever crimping without the locator, make sure the seam of the terminal is oriented up or down in the tool if using unbrazed product, as this will provide higher pull force values.

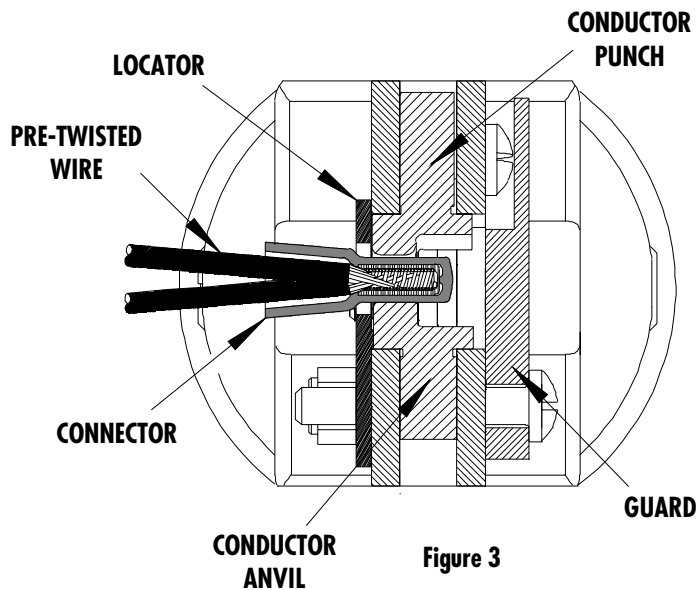


Figure 3

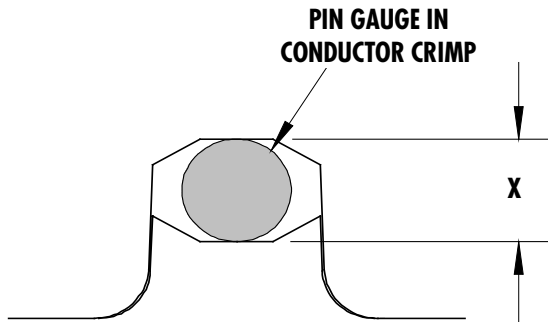
Maintenance

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

1. Remove dust, moisture and other contaminants with a clean brush, or soft, lint-free cloth.
2. Do not use any abrasive materials that could damage the tool.
3. 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 64005-0600 (AT-7000) was engineered for durability, but like any fine piece of equipment it needs cleaning and lubrication for a maximum service life of trouble-free crimping. A light oil, such as 30 weight automotive oil used at the oil points shown in Figure 4, every 5,000 crimps or monthly will significantly enhance the tool life and ensure a stable calibration.
4. When tool is not in use store the tool in a clean, dry area.

Tool Calibration

A Certificate of Calibration (See last page) was supplied with the tool. To recalibrate this tool, pin gauge measurements should be taken in each conductor nest and compared to this chart. The tool should be lubricated prior to recalibration to ensure consistent measurements.



“ Confining ” Crimp

Wire Range		“X” Dimension Conductor Crimp		
Awg	mm ²	Mean	Go	No Go
14 - 22	0.35 – 2.00	.100	.096	.104
10 - 16	1.30 - 5.00	.120	.116	.128

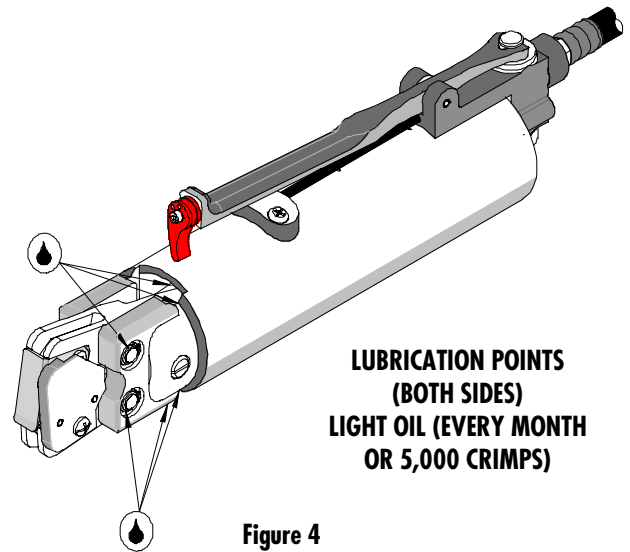


Figure 4

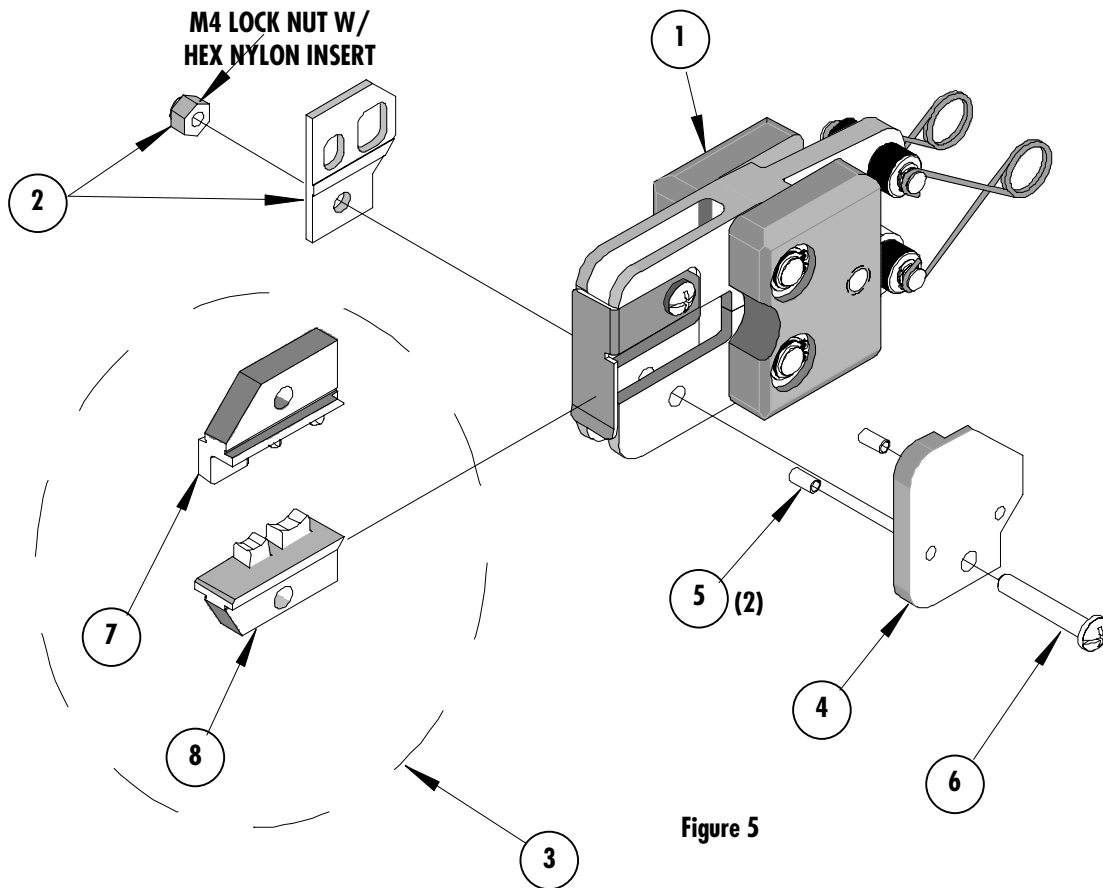
Warranty

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, we would repair or exchange the tool free of charge. This repair or exchange will not be applicable to alter, misused or damaged tools.

PARTS LIST

Item	Order No	Description	Quantity
	64005-0600	Crimp Tool Head	(Fig. 5)
1	64005-0000	Basic Air Tool Head	1
2	64001-0675	Locator Assembly	1
3	64001-0670	Tooling Kit	1
4	64005-0605	Guard	1
5	N/A	3MM by 6 Long Roll Pin	2**
6	N/A	M4 by 25 Long Freedrive Pan Head Screw	1**
Tooling Kit Only			
7	64001-0601	Conductor Punch	1
8	64001-0602	Conductor Anvil	1

** The following purchased parts are available from an Industrial supply company such as MSC (1-800-645-7270).



Parts List (Continued)

Item	Order No.	Description	Quantity
	64005-0000	Basic Air Tool Head	(Fig. 6)
1	64005-0103	Nose Guard	1
2	64000-0077	Repair Kit (Springs, Rods, Pivots, Rings, and Washers)	1
3	N/A	M4 by 12LG. Freedrive Pan Head Screw	1**
4	N/A	M4 by 30LG. Freedrive Pan Head Screw	1**
5	N/A	3/16" by 3/8" Long Dowel Pin	1**

** The following purchased parts are available from an Industrial supply company such as MSC (1-800-645-7270).

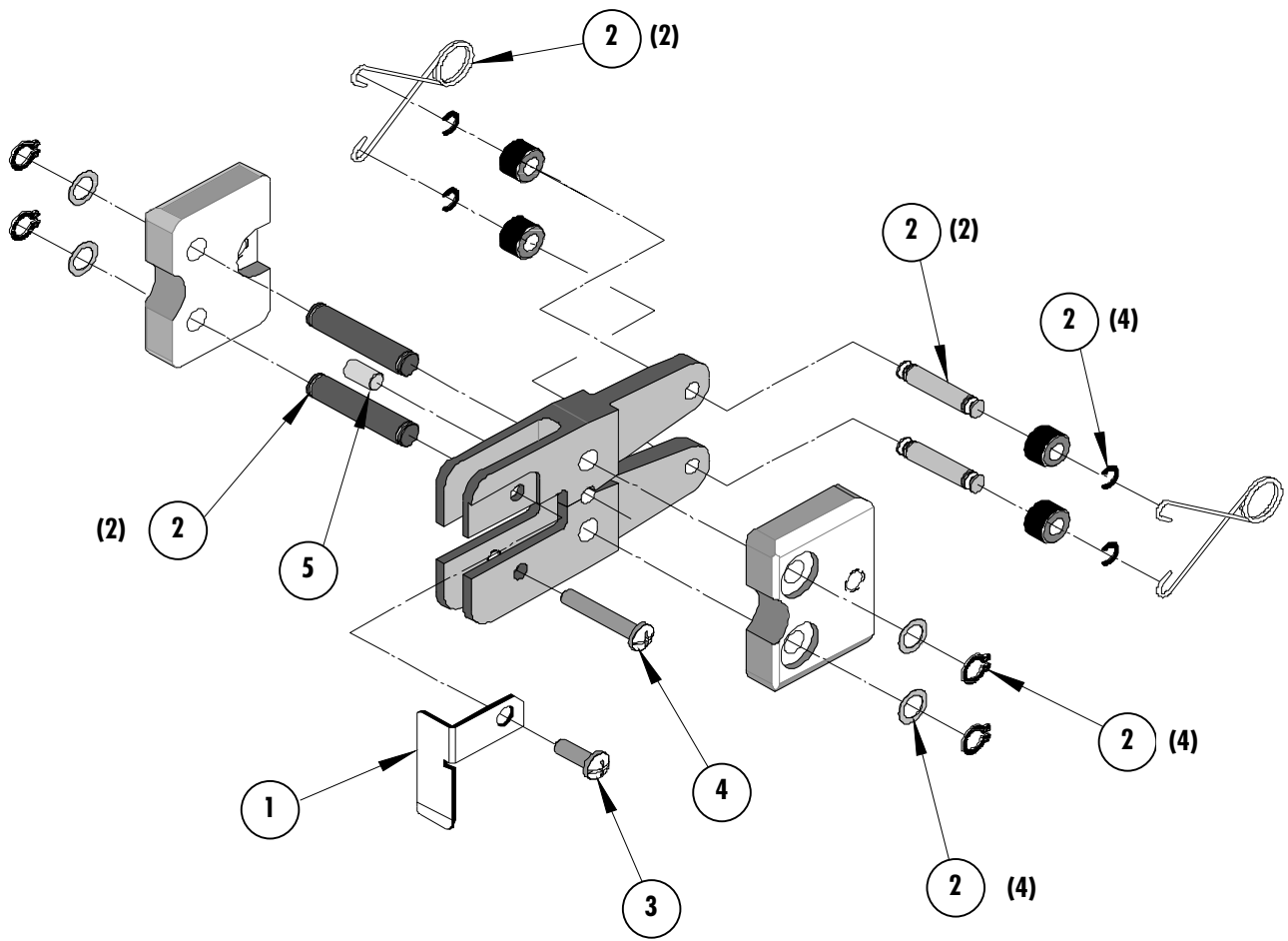
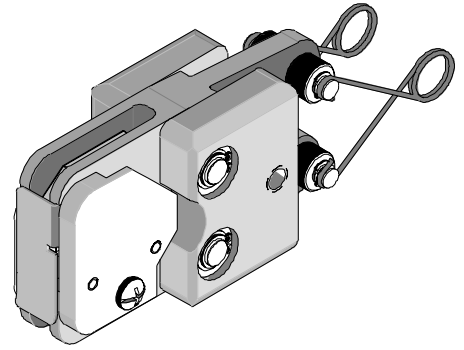


Figure 6



Certificate of Calibration

Tool Order Number _____

Tool Eng. Number _____

Tool Revision _____

Serial Number _____

Date of Manufacture _____

Pin Gauge of Conductor Nest/Nests or Slug height if the nest is the "F" Crimp style.

Range Conductor Nest # 1 = _____ -- Actual = _____

Range Conductor Nest # 2 = _____ -- Actual = _____

Range Conductor Nest # 3 = _____ -- Actual = _____

Technician _____

Date of Calibration _____

Calibration should be done every 5,000 cycles or 3 months.
Tools should be lubricated during this operation.

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