

customer manual

ORIGINAL INSTRUCTIONS

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SAFETY PRECAUTIONS — AVOID INJURY — READ THIS FIRST!

Safeguards are designed into this application equipment to protect operators and maintenance personnel from most hazards during equipment operation. However, certain safety precautions must be taken by the operator and repair personnel to avoid personal injury, as well as damage to the equipment. For best results, application equipment must be operated in a dry, dust-free environment. Do not operate equipment in a gaseous or hazardous environment.

Carefully observe the following safety precautions before and during operation of the equipment:



Always wear approved eye protection while operating equipment.



*Never insert hands into installed equipment.
Never wear loose clothing or jewelry that can catch in moving parts of the equipment.*



Always wear appropriate ear protection while using equipment.



Never alter, modify, or misuse the equipment.



Moving parts can crush and cut. Always keep guards in place during normal operation.

SUPPORT CENTER

CALL TOLL FREE 1-800-522-6752 (CONTINENTAL UNITED STATES AND PUERTO RICO ONLY)

The **Support Center** offers a means of providing technical assistance when required.

In addition, Field Service Specialists are available to provide assistance in the adjustment or repair of the application equipment when problems arise which your maintenance personnel are unable to correct.

INFORMATION REQUIRED WHEN CONTACTING THE SUPPORT CENTER

When calling the Support Center regarding service to equipment, it is suggested that a person familiar with the device be present with a copy of the manual (and drawings) to receive instructions. Many difficulties can be avoided in this manner.

When calling the Support Center, be ready with the following information:

- Customer name
- Customer address
- Person to contact (name, title, telephone number, and extension)
- Person calling
- Equipment number (and serial number if applicable)
- Product part number (and serial number if applicable)
- Urgency of request
- Nature of problem
- Description of inoperative components
- Additional information/comments that might be helpful

When reading this manual, pay particular attention to DANGER, CAUTION, and NOTE statements.

**DANGER**

Denotes an imminent hazard that can result in moderate or severe injury.

**CAUTION**

Denotes a condition that can result in product or equipment damage.

**NOTE**

Highlights special or important information.

Also, pay particular attention to the following safety precautions:



Always wear approved eye protection while operating equipment.



Always wear appropriate ear protection while using equipment.



Always disconnect the air and lock out the tool when not in use or when head or tool holder is detached.

Reasons for reissue of this document are provided in section 10, REVISION SUMMARY.

**NOTE**

Dimensions in this customer manual are in metric units [with U.S. customary units in brackets]. Figures are not drawn to scale.

**DANGER**

This power unit should only be operated by trained personnel.

**DANGER**

If not using quick-disconnect fittings to connect the tool to the air supply, other means must be provided to easily disconnect the tool from the air supply.

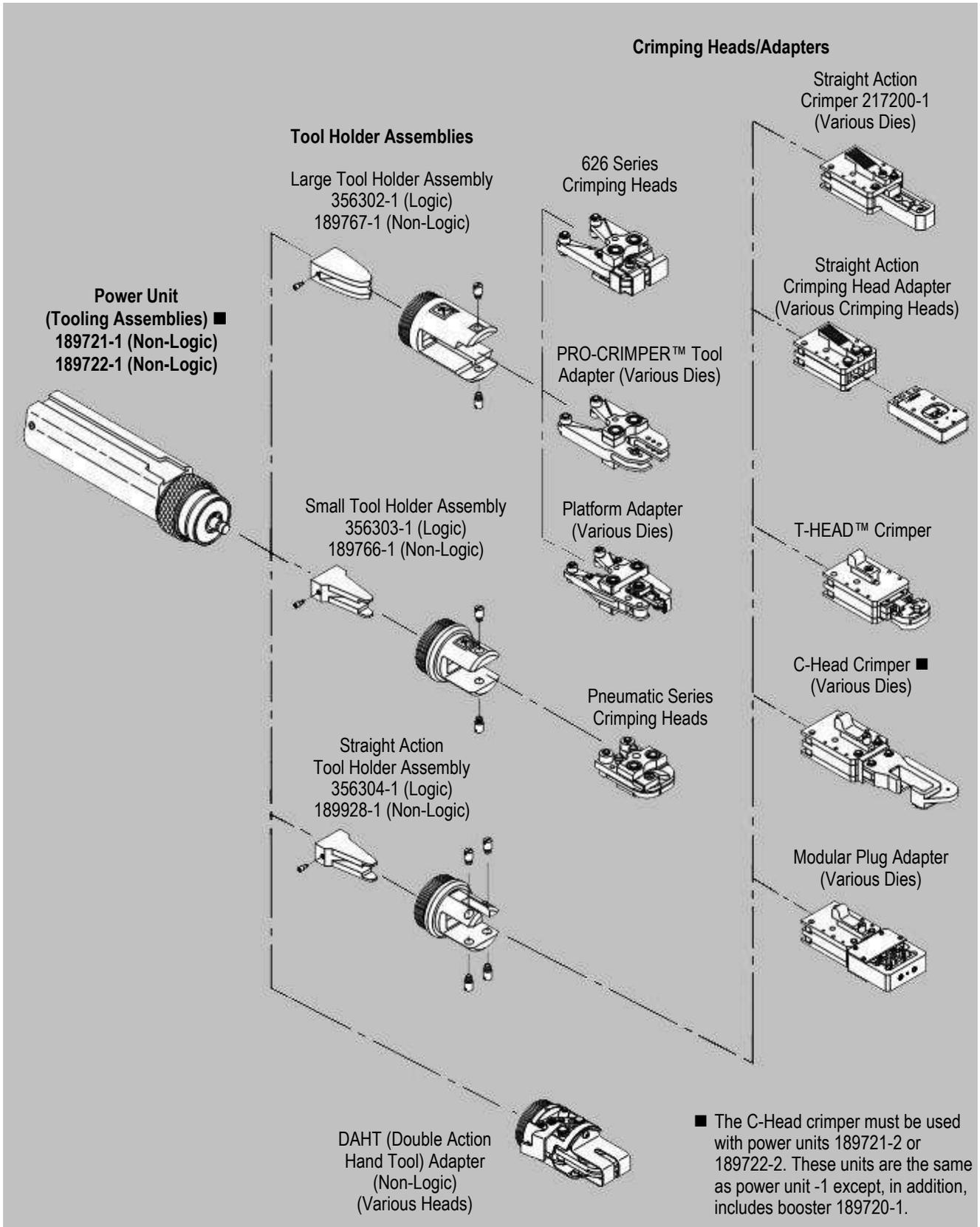
1. INTRODUCTION

This manual provides information on the various configurations of the tooling assemblies, available options, accessories, and upgrade capabilities for 626 pneumatic tooling systems (Figure 1). The manual also includes complete operation and maintenance information for both systems. Since there is a wide variety of crimping heads that can be used with the various tooling assemblies, specific information concerning the individual crimping heads, such as wire preparation and crimping head installation and maintenance, is provided with the instructions packaged with the individual crimping heads.

**NOTE**

The basic 626 pneumatic tooling system consists of a power unit, a tool holder assembly or adapter, a crimping head or adapter, and if required, crimping dies.

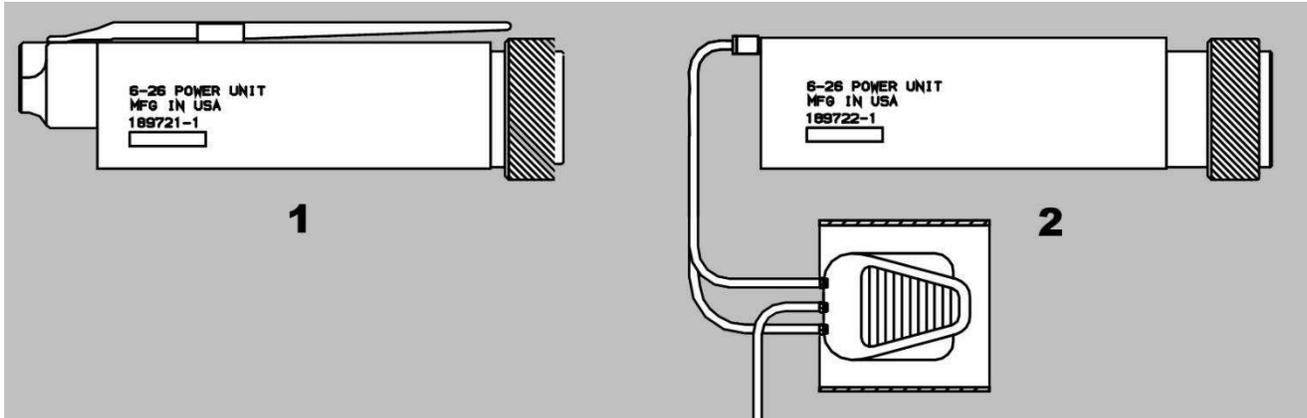
Figure 1: 626 Pneumatic Tooling Assemblies



2. DESCRIPTION

The 626 pneumatic tooling systems are designed to accept a wide variety of crimping heads for crimping various types of terminals and splices onto wires ranging in size from 6 through 26 AWG. Two system configurations are available (Figure 2).

Figure 2: System configurations



- 1 Hand-actuated (non-logic)
- 2 Foot-actuated (non-logic)

The systems employ a modular design concept, wherein each system configuration contains the (same) identical power unit. System variations are then achieved by expansion of the power unit to obtain the desired system functions. This system modularity permits the user to change from one system to another and retain the capabilities of the others without the expense of additional power units. It is feasible for the user to have the capabilities of both systems with only a single power unit.

The differences between the systems involve the method of actuation of the power unit (hand or foot actuated) and the type of crimp cycle control (operator controlled or CERTI-CRIMP™ tool ratchet logic controlled). The hand-actuated system has a hand switch assembly mounted directly on the power unit so that the operator can actuate the unit while holding it. The foot actuated system has a foot pedal assembly that permits foot actuation of the power unit, freeing the operator's hands for other uses. With either of these systems, the operator has complete control over the crimp cycle time. However, when actuating either the hand switch or the foot switch, the operator must momentarily keep the switch closed to ensure that the crimping head jaws or dies bottom. Also, the operator must time the release of the switch so as not to overstress the crimping head.

All of the six types of tool holder assemblies shown in Figure 1 are compatible with either power unit. Thus, both systems have the capability of using any of the associated crimping heads or adapters—both systems can therefore be used to crimp terminals and splices onto the full range of wire sizes. The tool holder assemblies are interchangeable with both systems, providing flexibility of choice and future add-on capabilities for the user.

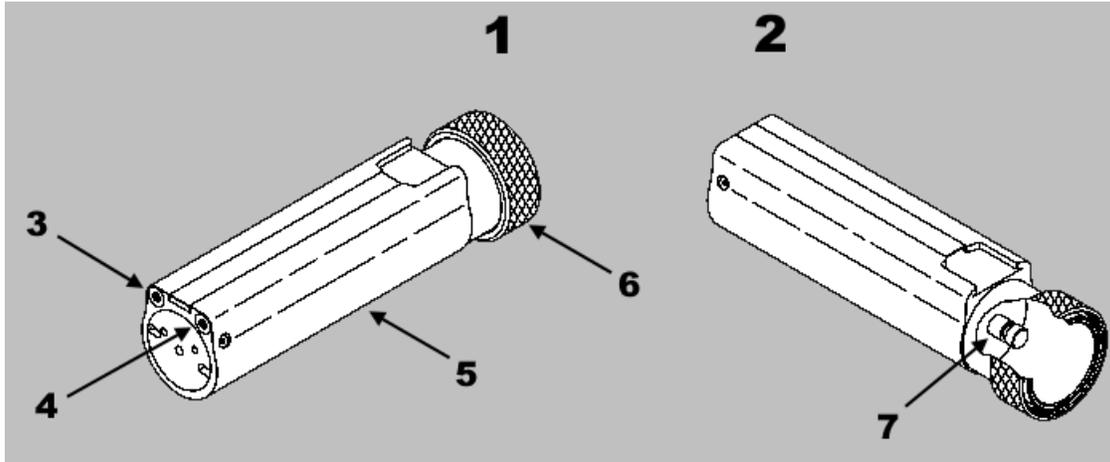
The logic control feature of the tool holder assemblies assures consistent and repeatable crimping cycles, providing fully crimped products and essentially eliminating the possibility of partial crimps. In effect, once the actuation device (hand or foot switch) is depressed, the operator must hold the actuation device closed momentarily to ensure the tool performs a complete crimping cycle.

The date code is marked on the body of the tool. The date code is formatted as YYWW, where YY represents the year of the manufacture, and WW represents the week of manufacture. For example, if the date code marked on a tool is 1942, the tool was made in the 42nd week of 2019.

2.1. Power unit

The power unit (Figure 3) has two air input ports (back of unit) used to extend and retract the power unit pistons. With air activation, three internal piston stages, operating in tandem, extend or retract the main piston rod at the front of the unit. A locking collar on the front end of the power unit is used to attach any one of the tool holder assemblies.

Figure 3: Power unit



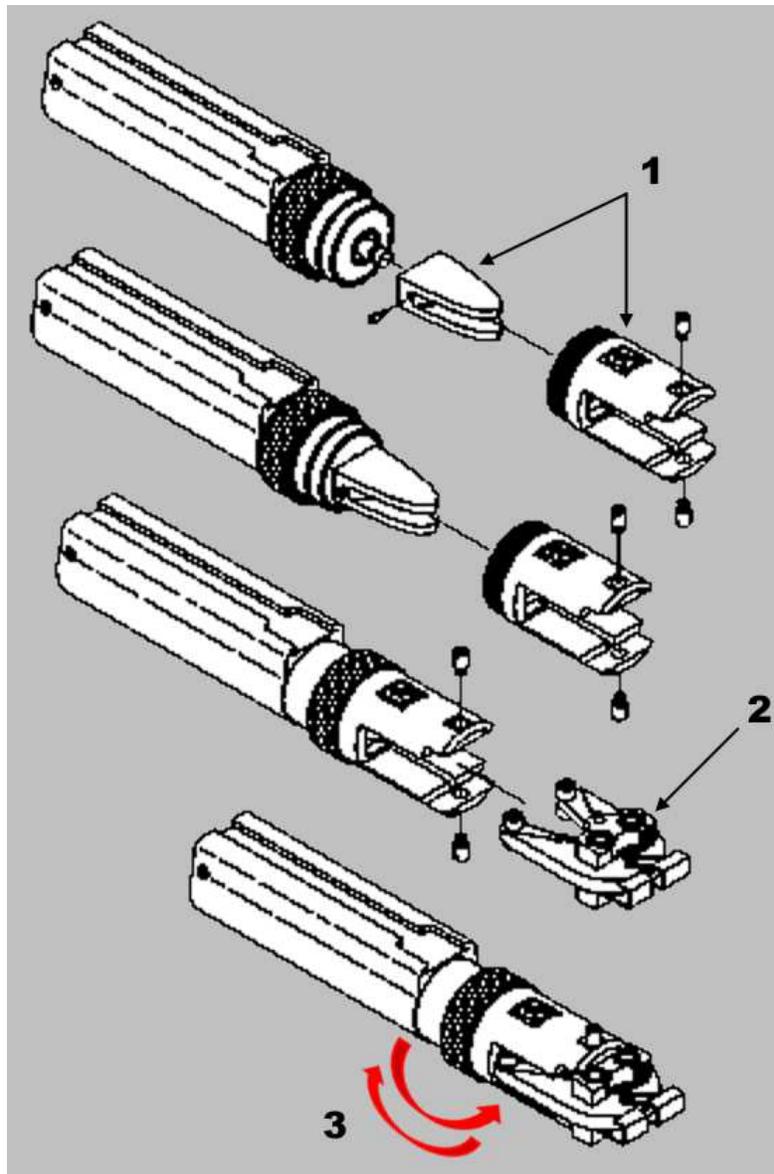
- | | |
|---------------------------------|----------------------------|
| 1 Rear view | 5 Air cylinder body |
| 2 Front view | 6 Locking collar |
| 3 Extend air input port | 7 Main piston rod |
| 4 Retract air input port | |

Table 1: Power unit specifications

Weight	0.708 kg [1.56 lbs]
Length	203 mm [8 in.]
Diameter	51 mm [2 in.]
Air supply	620-690 kPa [90-100 psi]
Noise (max)	90-95 dBA
Vibration	<2.5 m/s ²

Figure 4 shows a typical tool holder assembly and its associated crimping head being attached to the power unit. Each tool holder assembly has a unique cam that attaches directly to the piston rod of the power unit. Once the cam is attached to the piston rod and secured by means of a setscrew, the associated tool holder assembly is placed over the cam onto the front of the power unit. The locking collar is then threaded onto the threads on the base of the tool holder assembly, securing the tool holder to the power unit. The associated crimping head or adapter is then attached to the tool holder assembly. When properly assembled, the power unit head with the cam and tool holder assembly is free to swivel in either direction. This swivel feature permits the crimping head or adapter to move freely when the operator positions the terminal or splice and wire into the crimping head or adapter.

Figure 4: Attaching tool holder assembly to power unit



- 1** Typical cam and tool holder assembly
- 2** Typical crimping head
- 3** Power unit head rotates freely in either direction

2.2. Hand-actuated system (non-logic)

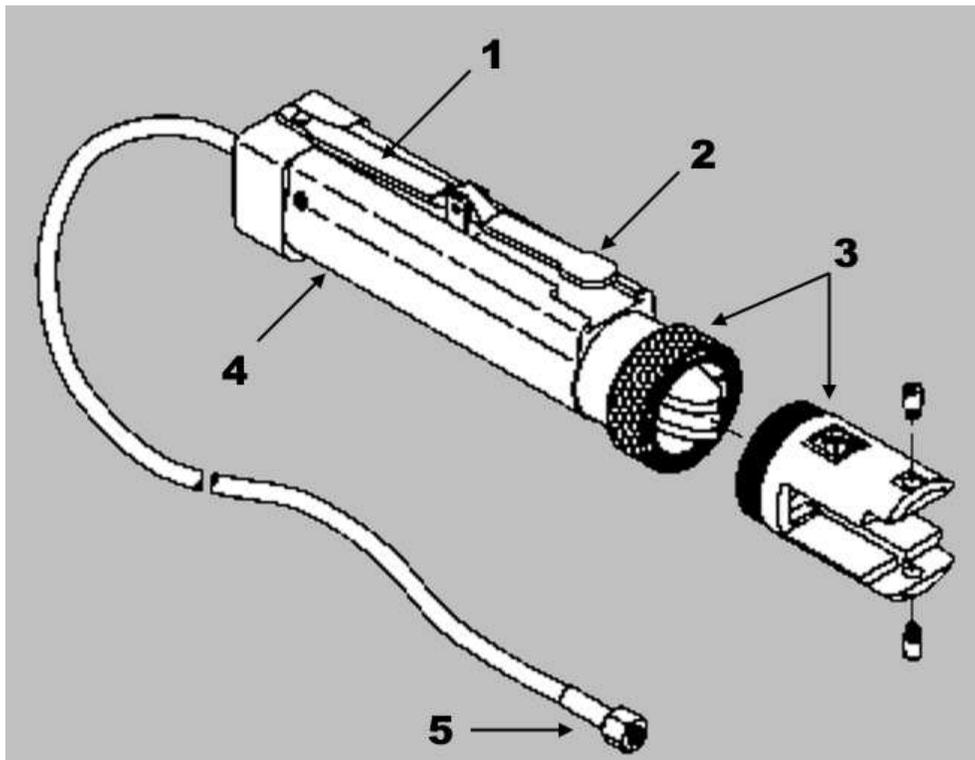


DANGER

Air pressure must be removed from the unit while head or tool holder is detached.

The hand actuated system (shown in Figure 5) has a hand switch assembly mounted on the back of the power unit. The hand switch assembly contains a manually operated four-way valve with one input port (connects to main air supply) and two output ports that mate with the input ports of the power unit. The hand switch assembly therefore controls the application of air to either extend or retract the pistons of the power unit. When the switch lever is pressed inward toward the cylinder body of the power unit, extension occurs. When released, the spring-loaded switch lever returns to its normal position, causing retraction. As previously described, any of the tool holder assemblies (with associated crimping head or adapter) can be attached to the power unit as shown in Figure 4.

Figure 5: Hand-actuated system



- 1 Hand switch assembly
- 2 Switch lever
- 3 Typical cam and tool holder assembly
- 4 Power unit
- 5 Connects to main air supply

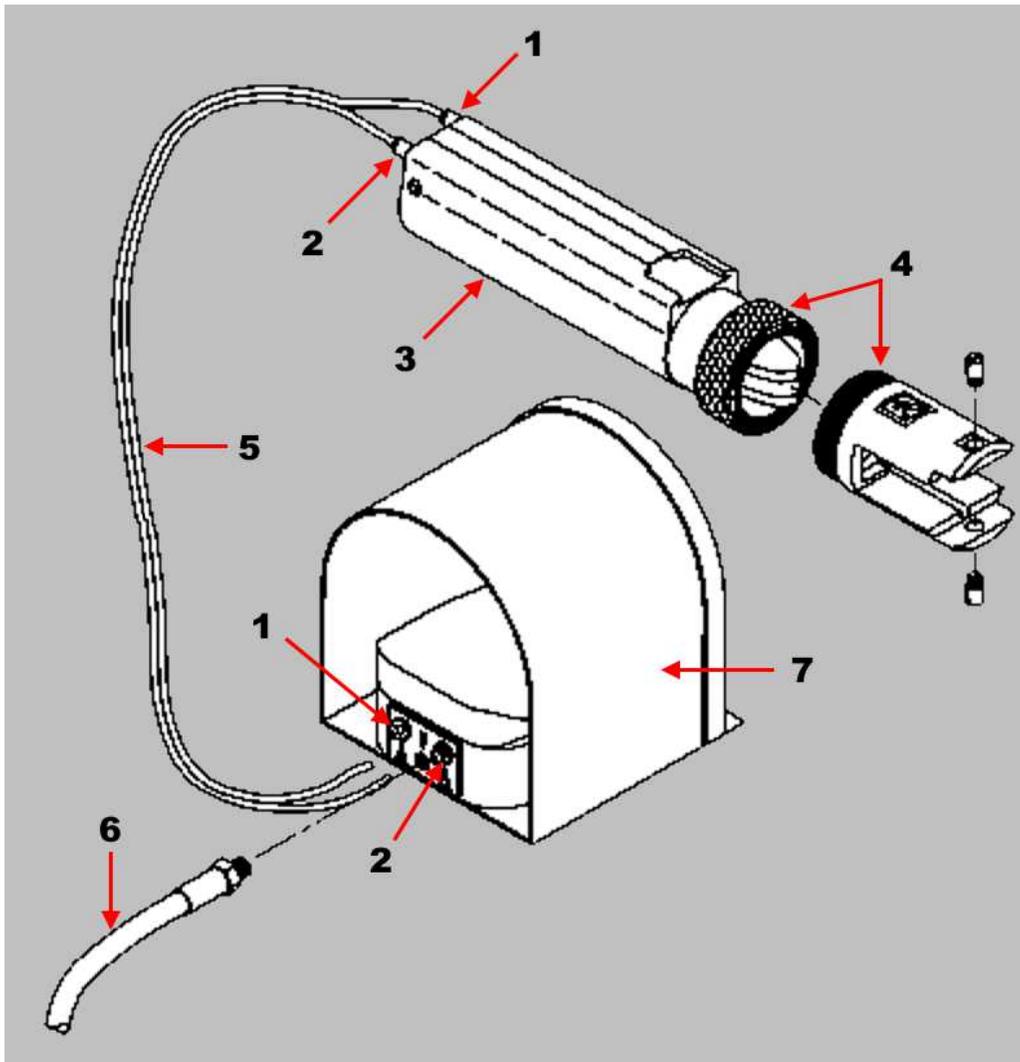
2.3. Foot-actuated system (non-logic)


DANGER

Air pressure must be removed from the unit while head or tool holder is detached.

The foot actuated system (shown in Figure 6) has a separate foot switch assembly which controls the application of air to the power unit. The foot switch assembly contains a foot-operated, four-way valve with one input port (connected to main air supply) and two output ports, which connect to the input ports of the power unit via two air lines. In the unactuated condition, main air is passed through the normally closed port of the valve to the retract input port of the power unit. When the foot switch is activated, the valve is switched and main air is passed through its normally open port to the extend input port of the power unit. Thus, the foot switch assembly remotely controls extension and retraction of the power unit.

Figure 6: Foot-actuated system



- | | | | |
|---|--------------------------------------|---|-----------------------------|
| 1 | Extend | 5 | Molded twin air lines |
| 2 | Retract | 6 | Connects to main air supply |
| 3 | Power unit | 7 | Foot switch assembly |
| 4 | Typical cam and tool holder assembly | | |

3. AIR LINE REQUIREMENTS AND SETUP



DANGER

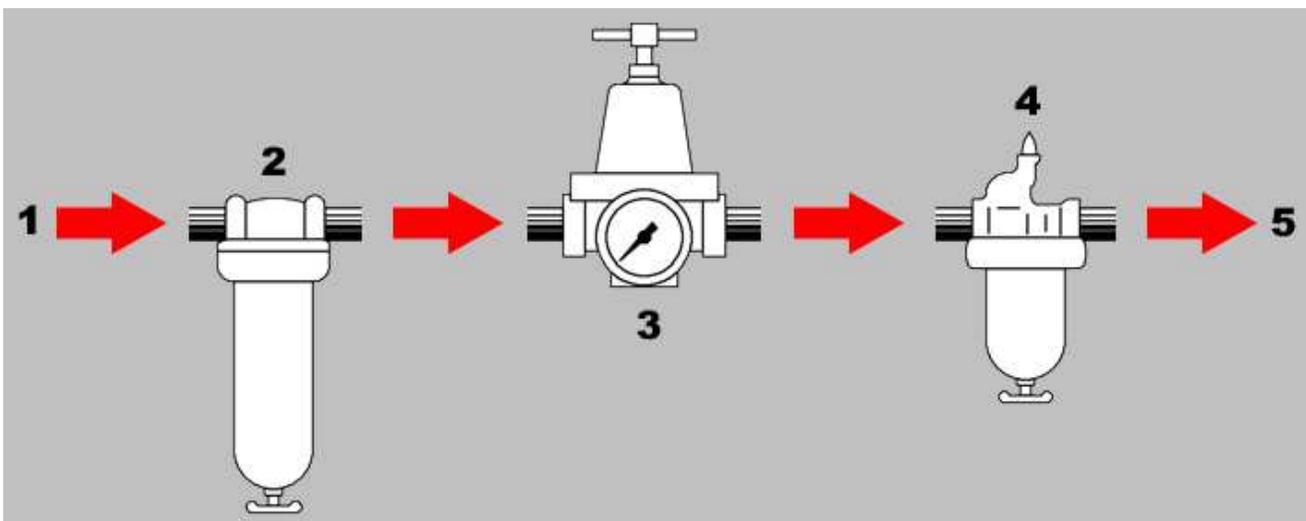
Air pressure must be removed from the unit while head or tool holder is detached.

For proper operation, the power units (pneumatic tooling assemblies) require an adequate air supply to maintain between 620 and 690 kPa [90 and 100 psi] constant air pressure.

- Pressure less than 620 kPa [90 psi] is insufficient for proper crimp operation.
- Pressure greater than 690 kPa [100 psi] can cause damage to the tooling system.

A filter and moisture separator, regulator, and lubricator (Figure 7) must be used with these tooling assemblies to ensure dependable performance and long life. Use quick-disconnect fittings to connect the tool to the air supply. If not using quick-disconnect fittings, provide a pneumatic lock-out on the air line that bleeds air after it is turned off.

Figure 7: Filter and moisture separator, regulator, and lubricator



- 1 Air flow
- 2 Filter and moisture separator
- 3 Regulator
- 4 Lubricator
- 5 To machine

Install these items at *each tool station* in the order shown in Figure 7. Mount the items as close as possible to the tooling assembly, preferably where the tool hose is connected to the air system.

These items are customer supplied. Table 2 lists recommended suppliers for this equipment.

Table 2: Recommended suppliers

Item	Supplier
<ul style="list-style-type: none"> • Filter/moisture separator • Regulator • Lubricator 	<ul style="list-style-type: none"> • C.A. Norgen Co. — Littleton, CO • Chicago Pneumatic — New York, NY
Lubricator oil [‡]	Chicago Pneumatic Air Tool Airoilene™ Oil (SAE™ 10) Chicago Pneumatic — New York, NY

[‡] Use only good quality, non-synthetic air lubricant.

Make sure the items are checked after every 40 hours of use by the tool operator or maintenance personnel as described in Table 3.

Table 3: Air flow maintenance

Perform regularly	Benefits
Drain	<ul style="list-style-type: none"> • Minimizes clogging and excessive wear • Minimizes rust and corrosion • Prevents water from washing away lubricants • Prevents water emission from exhaust ports
Check air pressure <ul style="list-style-type: none"> • 620 kPa [90 psi] min • 690 kPa [100 psi] max 	<ul style="list-style-type: none"> • Promotes smooth, consistent performance • Protects hoses and components from damage
Check oil level Adjust to very fine mist-(approximately 1 drop per 15-20 tool cycles)	<ul style="list-style-type: none"> • Eliminates sluggish or sticking valves and pistons • Provides protective film for highly polished or close tolerance surfaces • Provides seal in close tolerance areas • Extends life of pistons, cylinders, and valves

4. SYSTEM SETUP AND PREPARATION FOR OPERATION



DANGER

Air pressure must be removed from the unit while head or tool holder is detached.

As delivered, both systems have required air lines installed with the main air supply line ready for connection to the main air supply. Perform the steps in this section for initial setup and any time a different cam and/or tool holder assembly is to be used.

4.1. General steps

System setup includes the following general steps:

1. Make sure the power unit is not connected to the main air supply.
2. Assemble the applicable cam to the power unit.
3. Assemble the tool holder assembly to the power unit, ensuring that the cam and tool holder assembly are properly aligned.
4. Connect the main air supply.

4.2. Air supply

If the tool is connected to an air supply, disconnect the tool and make sure there is no residual pressure in the tool.

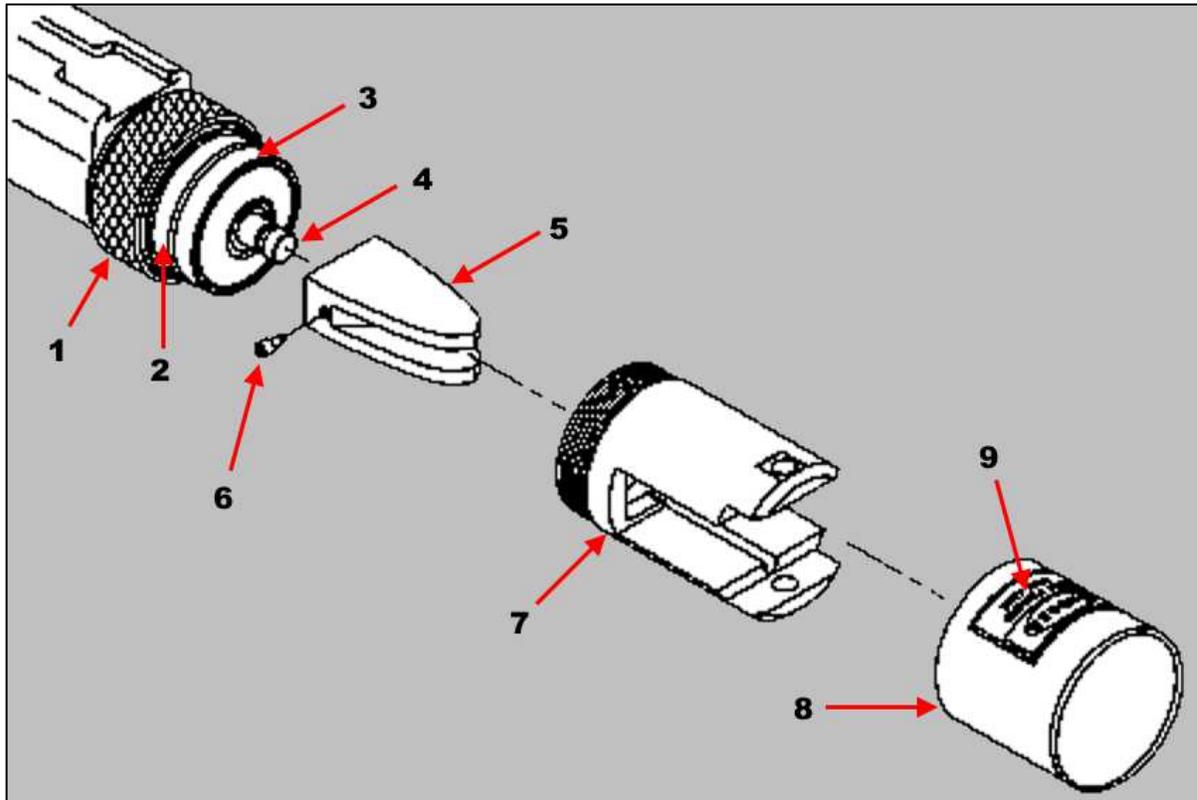
4.3. Extending the piston

If the piston is not extended, grasp the piston with the piston pliers and pull away from the body of the tool.

4.4. Installing the cam and tool holder assembly (non-logic)

1. A strip of adhesive-backed safety labels, printed in various languages, is packaged with the tool holder assembly. Remove the appropriate label from the strip and attach it to the safety sleeve (which is supplied with the small and large tool holder assemblies) as shown in Figure 8 or directly to the adapter (which does not require the safety sleeve).

Figure 8: Installing the cam and tool holder assembly (non-logic)



- | | | | |
|---|----------------|---|--|
| 1 | Locking collar | 6 | Cam setscrew |
| 2 | Stop ring | 7 | Tool holder assembly (non-logic) |
| 3 | Friction ring | 8 | Safety sleeve |
| 4 | Piston rod | 9 | Safety labels (attach to top and bottom of sleeve) |
| 5 | Cam | | |



NOTE

Previously installed cam and tool holder assembly must be removed before installing different ones. Removal is the reverse of installation.

2. Select the applicable cam for the tool holder assembly to be used.



CAUTION

Make sure to select the correct combination of tool holder assembly and cam. If an incorrect combination is used, the system cannot operate properly.

3. If cam setscrew is not installed in cam, thread setscrew into cam two to three turns.
4. Place cam (with setscrew) onto piston rod as shown in Figure 8. The cam should butt against the piston rod face. If not, turn the cam setscrew *counterclockwise* until cam fits on piston rod properly.



CAUTION

Over-tightening the cam setscrew can damage the setscrew or cam.

5. Tighten the cam setscrew.

6. Pull on the cam to ensure that it is firmly attached.
7. Align the tool holder assembly with the cam, and the push tool holder assembly onto the power unit so that it passes over the friction ring on the power unit piston.

**CAUTION**

After installation, ensure that the cam and tool holder assembly are aligned before operation of system. If the cam and tool holder assembly are misaligned while the power unit is operating, damage can occur to the system.

8. Slide the power unit locking collar toward the tool holder assembly until it butts against the stop ring on the power unit piston.
9. Turn the locking collar *clockwise* to engage threads on the bottom of the tool holder assembly.
10. Tighten the locking collar to fully secure the tool holder.

**NOTE**

When tool holder is properly installed, the locking collar butts against the stop ring and the threads of the tool holder are not visible. If not properly installed, check that combination of cam and tool holder assembly is correct and that they are aligned properly.

11. Rotate the tool holder assembly one full turn in each direction.

**NOTE**

The power unit locking collar rotates with the holder.

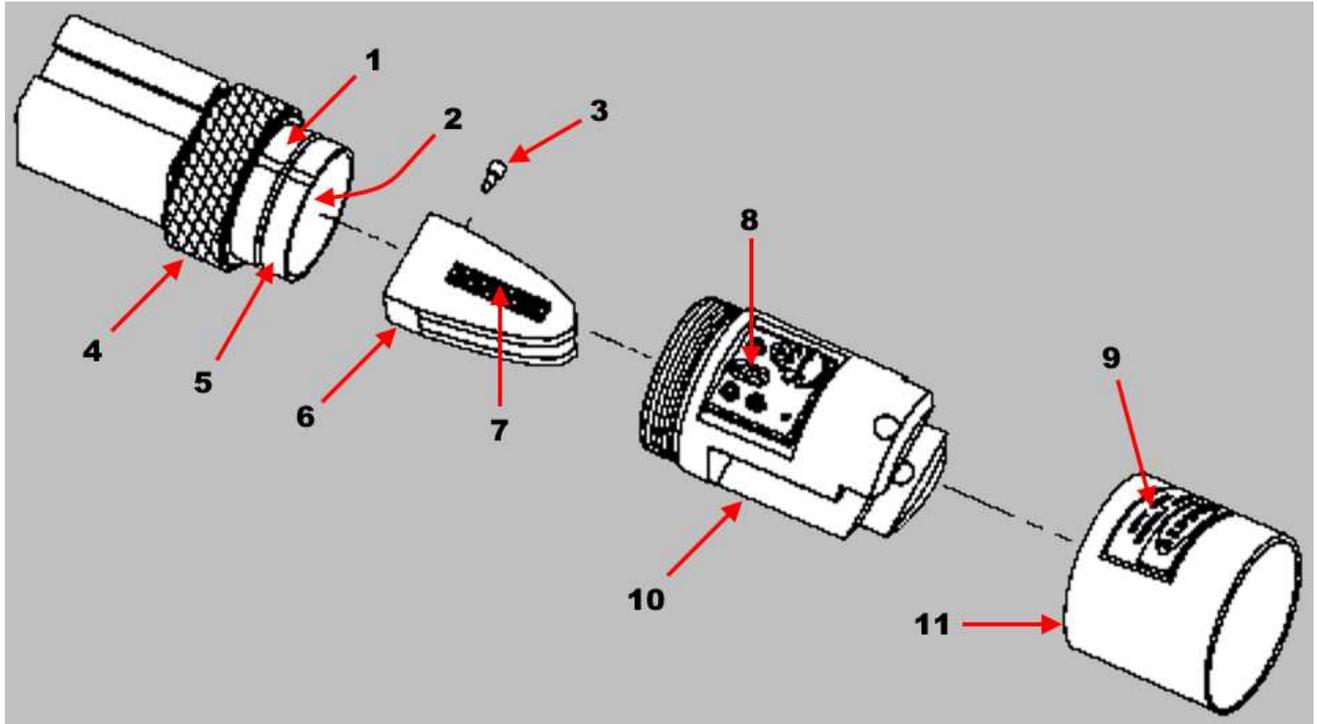
**DANGER**

To avoid personal injury, periodically check that locking collar is tightly securing the tool holder assembly.

4.5. Installing the cam and tool holder assembly (logic)

1. A strip of adhesive-backed safety labels, printed in various languages, is packaged with the tool holder assembly. Remove the appropriate label from the strip and attach it to the safety sleeve (which is supplied with the small and large tool holder assemblies) as shown in Figure 9 or directly to the adapter (which does not require the safety sleeve).

Figure 9: Installing the cam and tool holder assembly (logic)



1 Stop ring	7 Cam teeth
2 Piston rod	8 Ratchet pawl
3 Cam setscrew	9 Safety labels (attach to top and bottom of sleeve)
4 Locking collar	10 Tool holder assembly (logic)
5 Friction ring	11 Safety sleeve
6 Cam	



NOTE

Previously installed cam and tool holder assembly must be removed before installing different ones. Removal is the reverse of installation.

2. Select the applicable cam for the tool holder assembly to be used.



CAUTION

Make sure to select the correct combination of tool holder assembly and cam. If an incorrect combination is used, the system cannot operate properly.

3. If the cam setscrew is not installed in the cam, thread the setscrew into the cam two to three turns.
4. Place the cam (with the setscrew) onto the piston rod as shown in Figure 9. The cam should butt against the piston rod face. If not, turn the cam setscrew *counterclockwise* until the cam fits on the piston rod properly.



CAUTION

Over-tightening the cam setscrew can damage the setscrew or cam.

5. Tighten the cam setscrew.
6. Pull on the cam to ensure that it is firmly attached.

- Align the tool holder assembly ratchet pawl with the cam teeth and push the tool holder assembly onto the power unit so that it passes over the friction ring on the power unit piston.



CAUTION

After installation, ensure that the cam and tool holder assembly are aligned before operation of system. If the cam and tool holder assembly are misaligned while the power unit is operating, damage can occur to the system.

- Slide the power unit locking collar toward tool holder assembly until it butts against the stop ring on the power unit piston.
- Turn the locking collar *clockwise* to engage threads on the bottom of the tool holder assembly.
- Tighten the locking collar to fully secure the tool holder.



NOTE

When tool holder is properly installed, the locking collar should be butted against the stop ring and threads of the tool holder should not be visible. If not properly installed, check that correct combination of cam and tool holder assembly was used and that they are aligned.

- Rotate the tool holder assembly one full turn in each direction. Note that the power unit locking collar rotates with the holder.



DANGER

To avoid personal injury, periodically check that locking collar is tightly securing the tool holder assembly.

4.6. Installing the crimping head or adapter



DANGER

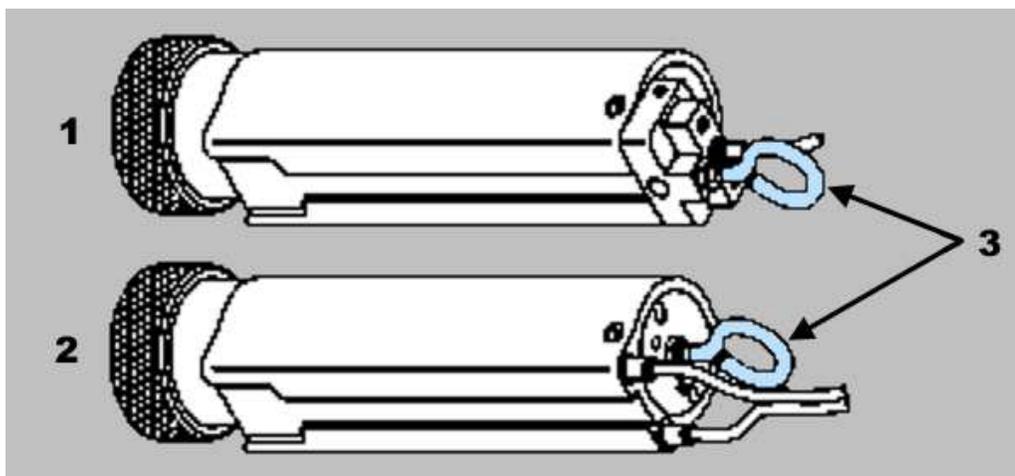
When the power unit is connected to the main air supply, the power unit piston retracts. To avoid personal injury, keep hands and fingers away from front of power unit.

Refer to the instruction sheet packaged with the crimping head or adapter. Figure 4 shows installation of a typical crimping head onto a typical tool holder assembly. After the crimping head or adapter has been installed, the power unit can be reconnected to the main air supply.

4.7. Hanging the power unit

The power unit can be used with a counterweight by attaching the counterweight to the eyebolt on the back of the unit (Figure 10). Do not hang the power unit by its air hose.

Figure 10: Location of eyebolt



- 1 Power unit with hand switch assembly
- 2 Power unit without hand switch assembly
- 3 Eyebolt

5. OPERATION

This section covers instruction for actuating the power unit of both systems. For information concerning wire preparation, terminal or splice placement in crimping head or adapter, and wire insertion, refer to the instructions packaged with the crimping head or adapter being used.



DANGER

To avoid personal injury, always keep fingers clear of crimping area when operating the power unit. Never place anything within the crimping area except terminals or splices.

1. After the terminal or splice and wire are positioned in the crimping head or adapter, depress and momentarily *hold* the hand switch or foot switch until the power unit extends and the crimping head jaws or crimping dies have fully bottomed.
2. When the jaws or dies have fully bottomed, release the hand switch or foot switch. The power unit piston retracts.
3. Remove the crimped product.

6. MAINTENANCE AND INSPECTION

Perform a maintenance and inspection program periodically to ensure dependable operation. Frequency of inspection depends on:

- Care, amount of use, and handling of the system
- Degree of operator skill
- Presence of abnormal amounts of dust and dirt
- Established standards

6.1. Inspection and cleaning

At a minimum, the power unit should be inspected and cleaned after every eight hours of operation as follows:



DANGER

Air pressure must be removed from the unit while head or tool holder is detached.

1. Disconnect the system from the main air supply.
2. Remove tool holder assembly (with crimping head or adapter in place).
3. Firmly grasp the cam with the piston pliers and pull the cam away from the body of the tool so that it is fully extended.
4. Inspect the stop ring, locking collar, and friction ring for wear. Replace if necessary.



DANGER

To avoid personal injury, replace the stop ring every 250,000 cycles (refer to section 9.1 for replacement procedure) and replace the locking collar when any sign of wear is evident.

5. Inspect the piston, cylinder wall, and cam for wear.
6. Remove dust, moisture, and other contaminants with a clean, soft brush or lint-free cloth.
7. Apply a *thin* coat of any good grade SAE 20 motor oil to the cam. Remove any excess oil.
8. Check that the cam setscrew is securely holding the cam onto the piston rod. Tighten the setscrew, if necessary.
9. Check the crimping head or adapter in accordance with the instructions packaged with the specific crimping head or adapter being used.



DANGER

To avoid personal injury and damage to the tool, make sure that quick pins securing the crimping head or adapter to the tool holder assembly are fully tightened. Use a medium-strength threadlocker to prevent the quick pins from loosening.

10. Reassemble the tool holder assembly (with the crimping head or adapter in place).



DANGER

To avoid personal injury, verify that the locking collar is tightly securing the tool holder assembly before operating power unit.

11. Reconnect the power unit to the main air supply.



DANGER

When power unit is connected to main air supply, power unit piston retracts. To avoid personal injury, keep hands and fingers away from front of power unit.

6.2. Lubrication

It is recommended that lubricated air for the main air supply input is provided. However, if the power unit has been or is being used with dry (unlubricated) air, lubricate the power unit after every eight hours of use as follows:

1. Disconnect main air supply.
2. Disconnect the air lines from the back of the power unit.
3. Apply one or two drops of SAE 10 *air cylinder* oil into the inlet fittings.
4. Re-connect the air lines and main air supply.



DANGER

When the power unit is connected to the main air supply, the power unit piston retracts. To avoid personal injury, keep hands and fingers away from the front of the power unit.

7. TROUBLESHOOTING

Table 4 lists some abnormal conditions along with the probable cause and remedy for the condition. If the condition cannot be isolated, call the phone number at the bottom of page 1.

Table 4: Troubleshooting

System type	Abnormal condition	Probable cause	Remedy
Hand-actuated	Power unit piston does not extend when actuated	Power unit not connected to main air supply	Connect power unit to main air supply.
		Faulty hand switch assembly or foot switch assembly	Replace switch assembly
Foot-actuated	Power unit piston extends when connected to main air supply	Air line connections to power unit reversed	Disconnect main air supply, then reverse air line connections on power unit
	Loss of power	Improper lubrication	Check operation of lubricator in main air supply. If dry air is being used, lubricate in accordance with section 6.
		Power unit internal seals worn or damaged	Replace seals or, for information on obtaining evaluation and repair, refer to section 9.2

8. OPTIONS AND ACCESSORIES

Call 1-800-522-6752 to order options and accessories.

9. REPLACEMENT AND REPAIR

9.1. Stop ring replacement

A. Removal

1. Disconnect tool from main air supply.
2. Remove the tool holder (and cam) from the air cylinder body. Remove the friction ring.
3. Remove the stop ring by inserting the end of a flat blade screwdriver under the removal notch and prying outward. Slide the stop ring off the front of the air cylinder.



CAUTION

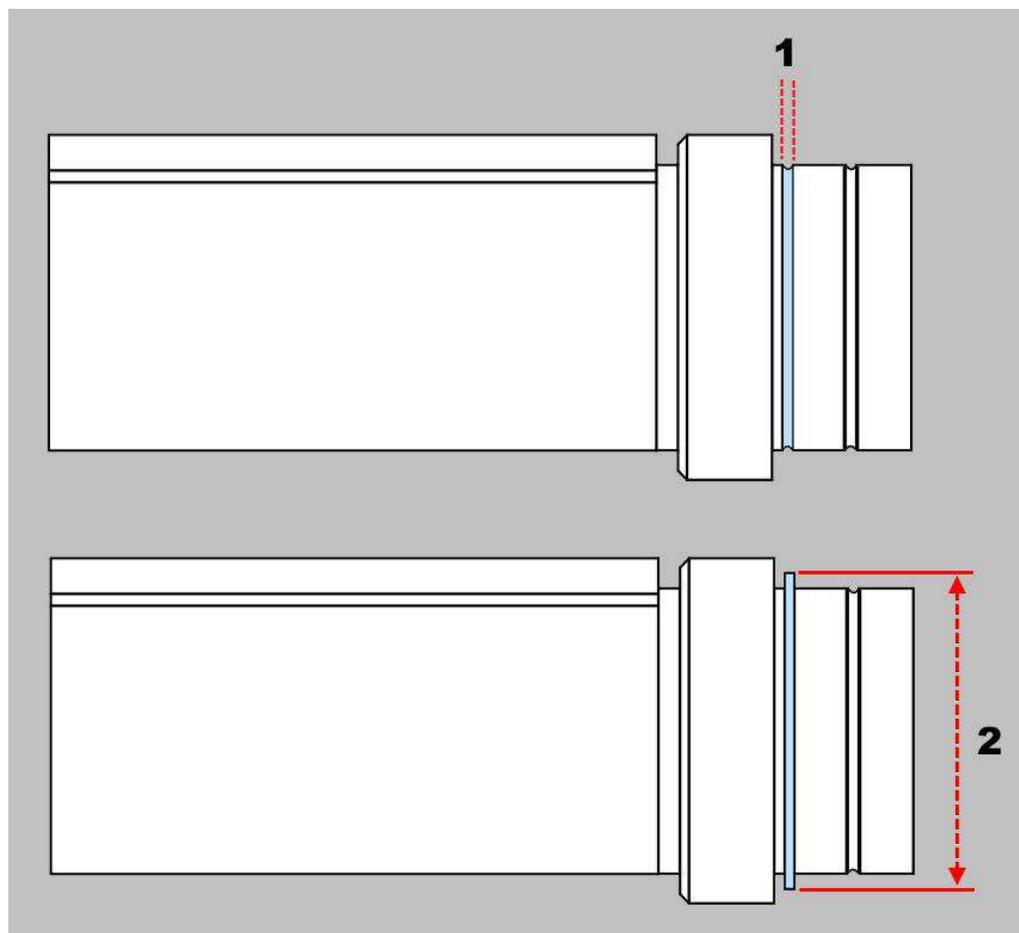
Be careful when removing parts to prevent scarring on the outside surface of the cylinder.

4. Slide the locking collar off the front of the air cylinder.
5. Inspect the stop ring groove for wear or permanent deformation. If excessive wear or damage is evident, refer to section 9.2 for information on obtaining customer repair service.

B. Installation

1. Using a caliper, measure the width of the stop ring groove (Figure 11). Using this dimension, refer to Table 5 and Table 6 for the stop ring to be used.

Figure 11: Stop ring dimensions



- 1 Width of stop ring groove
- 2 Diameter of stop ring

2. Slide the locking collar onto the front of the air cylinder.
3. Slide the stop ring onto the front of the air cylinder and *carefully* seat the ring into the stop ring groove. Do not deform the ring.
4. Install the friction ring.
5. Visually inspect the tooling assembly to assure that the locking collar, stop ring, and friction ring are properly installed.
6. Using a caliper, measure the diameter of the stop ring (Figure 11). Take measurements at several different locations around the ring.
 - If the measurements are within the tolerance (for the stop ring being used) provided in Figure 12 and Figure 13, the tooling assembly is considered dimensionally correct.
 - If any of the measurements are not within the tolerance, refer to section 9.2 for information on obtaining further evaluation and repair.

9.2. Replacement parts and repair

Replacement parts and recommended spares are identified and listed in Figure 12 through Figure 17. For replacement parts for crimping heads, adapters, and crimping dies, refer to the instruction sheet packaged with the head, adapter, or crimping dies.

Order replacement parts through your TE representative. You can also order parts by any of the following methods:

- Go to 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

For customer repair services, call 800-522-6752.

Figure 12: Replacement parts for hand actuated power units 189721-[-] (non-logic)

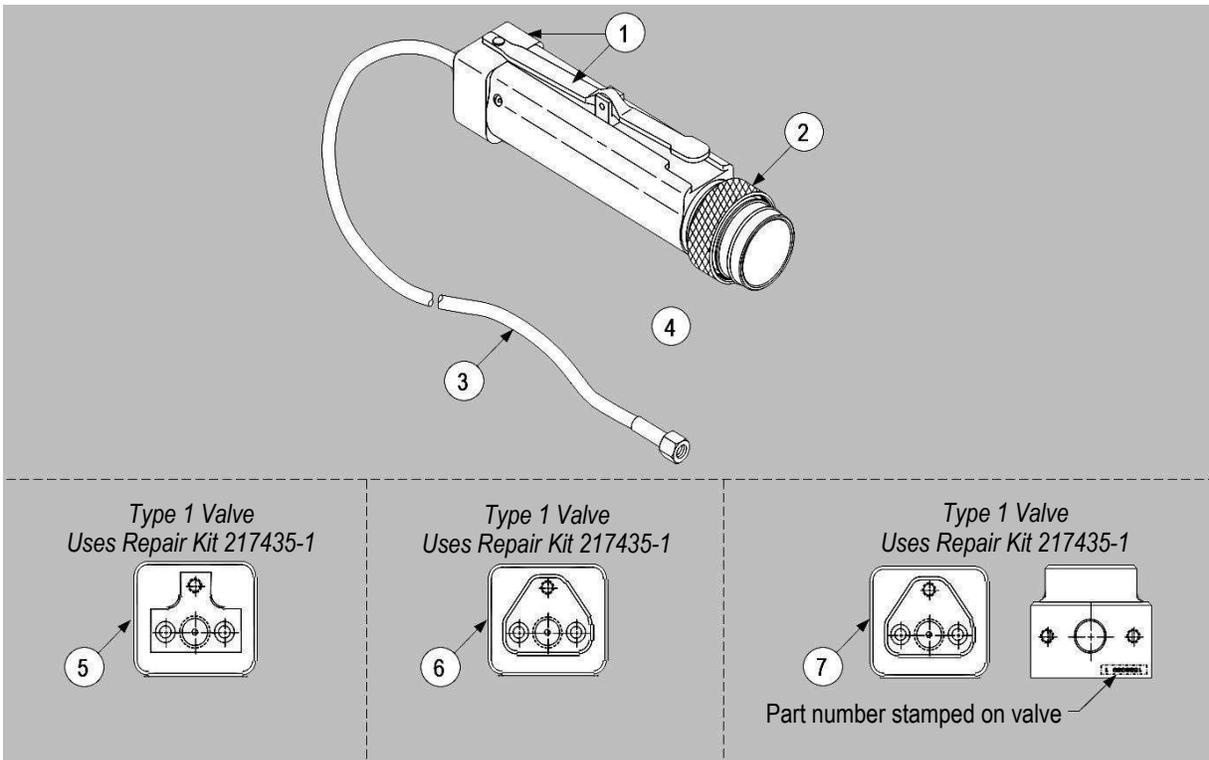


Table 5: Part numbers for hand actuated power units 189721-[-] (non-logic)

Item	Part number	Description	Quantity per unit
1	1583088-1 †	Valve assembly, pneumatic	1
2	189848-1	Collar, locking	1
3	38111 ±0	Hose, air	1
4	904381-1	Ring, stop Groove width 0.99 mm [.039 in.] approx Ring dia 51.05 mm [2.01 in.] max	1
	904384-1 †	Ring, stop Groove width 1.73 mm [.068 in.] approx Ring dia 50.5 mm [1.99 in.] max	
5	217435-1†	Repair kit, spool (O-rings and return spring for valve body)	1
6	217435-2†	Repair kit, spool (O-rings and return spring for valve body)	1
7	1583089-1†	Repair kit, spool (seals, spool cap, and spring for valve body)	1
Not shown	217434-1†	Repair kit, seals (O-rings and snap rings for power unit)	1

†Recommended spare part

Figure 13: Replacement parts for foot-actuated power units 189722-[] (non-logic)

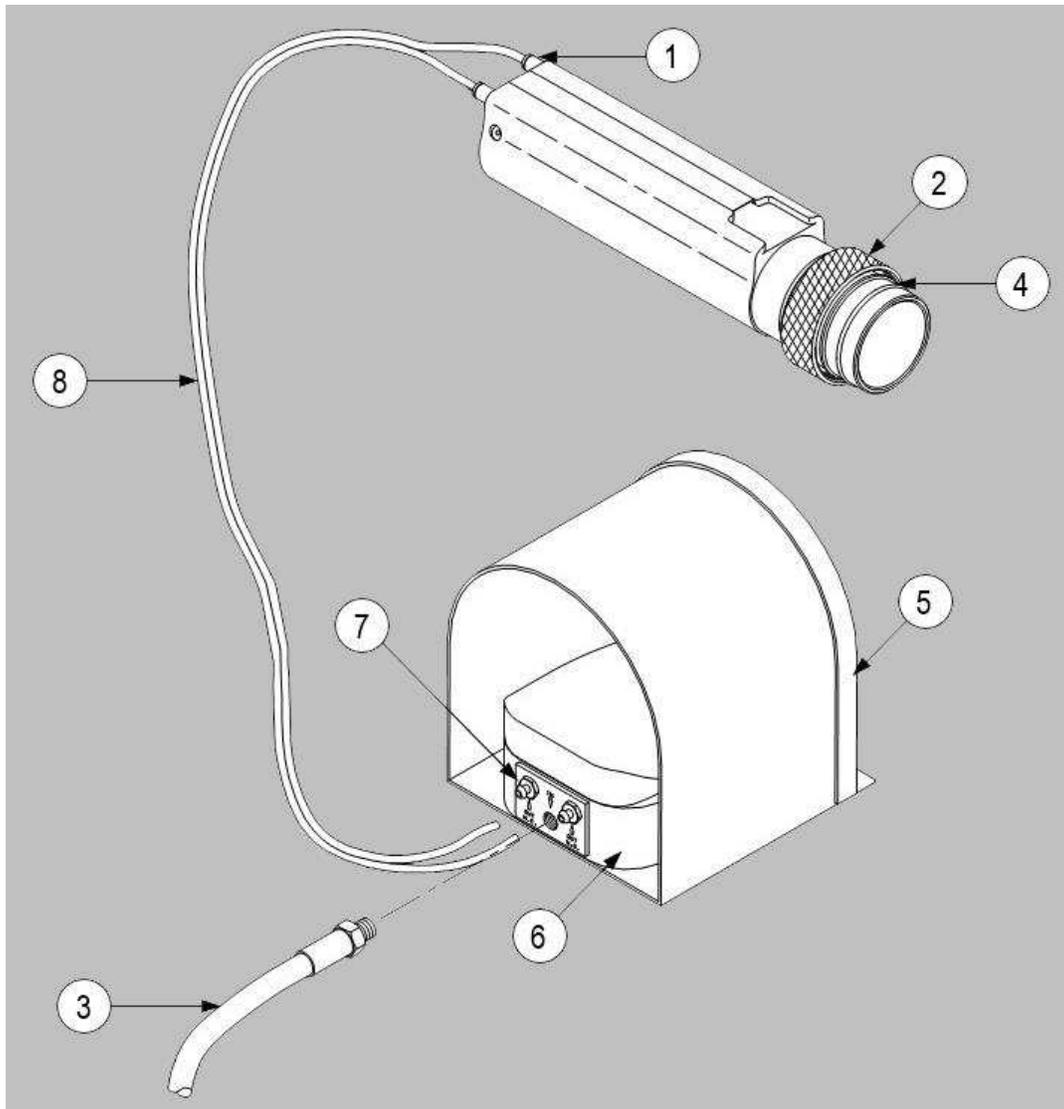


Table 6: Part numbers for foot-actuated power units 189722-[] (non-logic)

Item	Part number	Description	Quantity per unit
1	189847-1	Fitting, quick connect	2
2	189848-1	Collar, locking	1
3	38111-0	Hose, air	1
4	904381-1	Ring, stop Groove width 0.99 mm [.039 in.] approx. Ring dia 51.05 mm [2.01 in.] max	1
	904384-1	Ring, stop Groove width 1.73 mm [.068 in.] approx. Ring dia 50.5 mm [1.99 in.] max	
5	453866-1	Guard	1
6	19912-1	Valve, foot pedal	1
7	986886-2	Fitting, quick connect	2
8	985794-1	Hose, molded, twin	1
Not shown	217434-1 [‡]	Repair kit, seals (O-rings and snap rings for power unit)	1

[‡]Recommended spare part

Figure 14: Small tool holder assembly (non-logic)

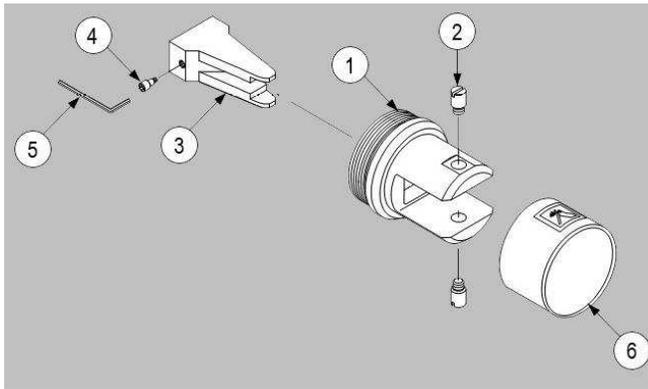


Figure 15: Straight action tool holder assembly (non-logic)

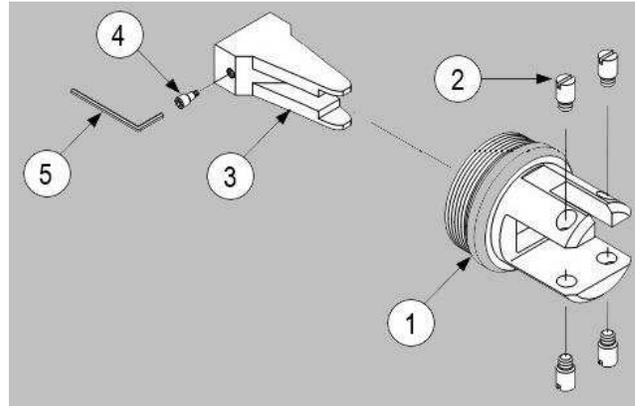


Figure 16: Large tool holder assembly (non-logic)

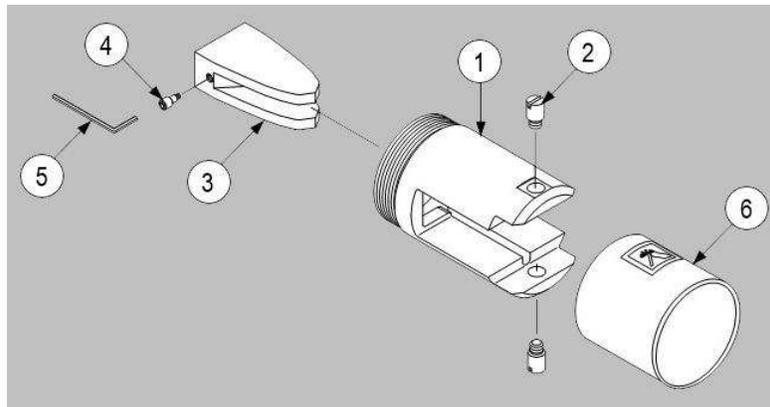


Table 7: Part numbers for tool holder assembly (non-logic)

Item	Part number	Description	Quantity per assembly		
			Large 189767-1	Small 189766-1	Straight action 189928-1
1	189726-1	Tool holder, large	1	—	—
	189725-1	Tool holder, small	—	1	—
	217350-1	Tool holder, straight action	—	—	1
2	‡ 354425-1‡	Pin, pivot	2	2	4
3	189764-1	Cam, large	1	—	—
	189763-2	Cam, small	—	1	—
	189763-1	Cam, straight action	—	—	1
4	‡ 189765-1‡	Setscrew, 10-32	1	1	1
5	21027-6‡	Wrench, hex	1	1	1
6	‡ 356022-1‡	Sleeve, safety	1	1	—

‡Recommended spare part

Figure 17: Replacement parts for tool holder assembly (logic)

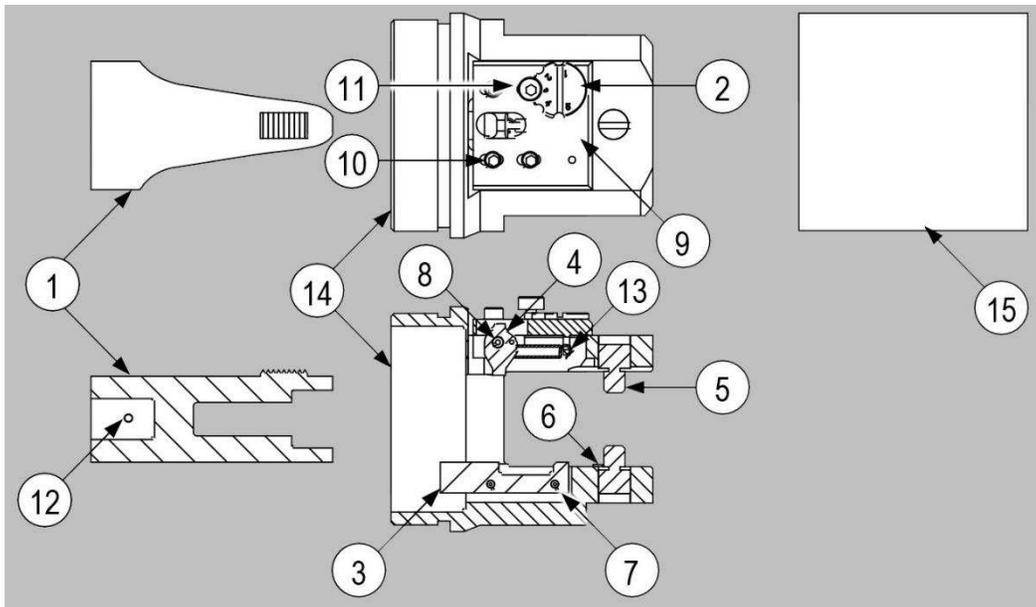


Table 8: Part numbers for tool holder assembly (logic)

Item	Part number	Description	Quantity per assembly		
			Large 189767-1	Small 189766-1	Straight action 189928-1
1	356444-1	Cam, large	1	—	—
	356438-1	Cam, small	—	1	—
	356623-1	Cam, straight action	—	—	1
2	356439-1	Eccentric	1	1	1
3	356440-1	Insert, 626 ratchet	1	—	—
	356440-2	Insert, 626 ratchet	—	1	—
4	356441-1	Pawl	1	1	1
5	354425-1 [‡]	Pin, pivot	2	2	4
6	3-21028-4	Pin, slotted spring (.09 x .375 in.)	—	2	—
7	4-21028-4	Pin, slotted spring (.09 x 1.00 in.)	2	2	—
8	4-21028-9	Pin, slotted spring (.125 x .375 in.)	1	1	1
9	356437-1	Plate, eccentric adjustment	1	1	1
10	1-21000-5	Screw, socket head cap (4-40 x .50 in.)	3	3	3
11	21989-3	Screw, socket head shoulder (.125 x .25 in.)	1	1	1
12	189765-1 [‡]	Setscrew, special	1	1	1
13	37887	Spring	1	1	1
14	356443-1	Tool holder, large	1	—	—
	356442-1	Tool holder, small	—	1	—
	356624-1	Tool holder, straight action	—	—	1
15	356022-1 [‡]	Sleeve, safety	1	1	—

[‡]Recommended spare part

10. REVISION SUMMARY

Revisions to this customer manual include:

- Deleted section on permanent mounting of power unit.
- Deleted electrical warnings from page 2
- Reformatted and edited